

A vertical spiral binding is located on the left side of the page, consisting of a series of black, rectangular loops connected by a central vertical line.

TRANSPORTATION-MARKINGS

DATABASE:

AERONAUTICAL NAVIGATION AIDS

TRANSPORTATION-MARKINGS:
A STUDY IN COMMUNICATION MONOGRAPH SERIES
(Alternate Title: An Inter-Modal Study of Safety Aids)

Foundations, 3rd edition, 1999

Part A, Volume I, First Studies in Transportation-Marking

A First Study in T-M: The United States, 2nd edition, 1992

Part B, Volume I

International Marine to Navigation, 2nd edition, 1988

Part C (Floating Aids) & Part D (Aids Other Than Floating), Volume I

[Unified 1st edition of Parts A-D, 1981, University Press of America]

International Traffic Control Devices, 1st edition, 1984

Part E, Volume II, Further Studies in T-M

International Railway Signals, 1st edition, 1991

Part F, Volume II,

International Aero Navigation Aids, 1st edition, 1993

Part G, Volume II,

A General Classification of T-M Phenomena, 1st edition, 1994

Part H, Volume II [2nd edition projected]

Transportation-Markings Database:

Marine, 1st edition, 1997 Part Ii, Volume III, Additional Studies in T-M

TCD, 1st edition, 1998, Part Iii, Volume III

Railway, 1st edition, 2000, Part Iiii, Volume III

Aero, 1st edition, 2001, Part Iiv, Volume III

*T-M: Messages, Meanings, Generating Agents & Their Development,
1750-2000*, Projected

Part J, Volume IV, Final Studies in T-M

A Truly Integrative T-M, Projected

Part K, Volume IV

TRANSPORTATION-MARKINGS
DATABASE:

AERONAUTICAL NAVIGATION AIDS

Part Iiv Volume III, Additional Studies,

Transportation-Markings: A Study in
Communication Monograph Series

Brian Clearman

Mount Angel Abbey 2001

DEDICATED TO MY GRANDPARENTS:

Catherine Abbie Brady Sauers, 1878-1919

Frederick William Sauers, 1869-1944

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Frederick William Des Coudres Clearman, 1871-1968

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PREFACE

The Database (Parts Ii, Iii, Iiii, Iiv of TRANSPORTATION-MARKINGS: A STUDY IN COMMUNICATION MONOGRAPH SERIES) draws together the several dimensions of T-M. It shares this drawing together function with the General Classification (Part H). But, paradoxically, Part H and Part I draw together by focussing on the individual entity: Each T-M phenomenon. The Database demonstrates the unity and commonality of T-M but presents each one in its separate state. Yet in that process the full panoply of T-M is unfolded including their shared and connected state.

There are thousands of Transportation-Markings. In addition, there are many variant forms, alternate names, untold permutations. The sheer number of forms may obscure the common thread of T-M that interweaves the multifoliated multiplicity. Yet ultimately the multiplicity leads to the basic unity of safety of whatever kind. The variety and diversity points to a restricted system of messages serving one essential purpose: The promotion of safety. The perennial conundrum of the one and the many is found here in T-M. But the one and the many also interact and explain each other.

The Database examines the four modes of rail, road, aero, and marine T-M safety aids in separate studies though all remain components of Part I. The amount of labor required to prepare the Database precluded the assembling of all four modes of T-M in a single study (Though a composite edition may yet be assembled. The initial study examined Marine Aids to Navigation while the second focusses on Traffic Control Devices. The third study centered on Railway Signals. This fourth and final segment takes up Aero Navigation Aids.

There has been some confusion over the meaning of Transportation-Markings. Some users have interpreted the term as constituting a virtual synonym for Pavement Markings. This is **NOT** the case. T-M is a general, overarching term for all types of safety aids. This perspective is reflected by the Library of Congress which employs T-M as a general heading in its Subject Headings (albeit in a somewhat implied sense for some forms). The Library of Congress includes various kinds of T-M under that general heading including that of Pavement Markings. In order to reduce confusion, a hyphen has been added that conjoins Transportation and Markings: Transportation-Markings instead of Transportation Markings.

The use of the hyphen results in an image of T-M as a single and unified concept thereby reducing misunderstanding over the meaning of the term and especially of mistaking T-M with one of its constituent elements. The end result is an

overarching term encompassing all forms of safety aids including those that incorporate Mark, Marker, or Marking in their names. New compound nouns are often hyphenated as Frederick Crewes notes in his *Random House Handbook*. New compound nouns require the hyphen in order to signal to users that the resulting term is a unit not two independent words existing side by side that can be split apart without significant damage. Developed compound nouns may retain the hyphen, become one word, or simply drop the hyphen without the term losing its character, but an early form of compound noun, such as that of T-M, require the hyphen. Regretably, only after a dozen years has it become apparent how much confusion was generated by T M without the hyphen. Hopefully, a clearer, more emphatic Transportation-Markings can result.

Classification has been a vital part of T-M from the beginning of these studies. In fact, the previous study, Part H, is little more than a collection of classifications. The writer originally intended that the Database would employ the classification system of Part H extensively. This was a reasonable expectation since the classification in the Database has proven to be problematical. Various T-M forms and classification numbers are not always reflected in the Database. And, conversely, terms of significance in the Database are not always reflected in this classification.

A major reason for this situation has been caused by the classification: the classification employed largely official sources though sometimes retaining T-M forms that were passing away. The reverse is also true: the amalgam of sources in the Databases may include forms little noticed in the classification and its sources. The problem of sources and classifications was especially pronounced in Part Ii though less so in Part Iiii. It was quite pronounced in Part Iiii. Though so in this study since Part G is a newer study and included variant classifications. Sources are often decentralized and authors have been inventive in creating variant forms for many terms.

It is not quite apparent that a reworking of the classification is needed that will reflect both core sources and the many fragmented sources of the Database. This is not possible at this time. Some limited alterations are included in the Database but a more extensive revision will have to wait until another time. Taxonomies, of course, are never finished; each variant form requires changes even before the previous form has been implemented. Over the years the classifications of T-M have been "revisited" many times. Now a further Classification Revisited Redux is required.

The Aero Navaid portion of the Database has three segments: Lighted Aids, Radio Aids, and Signs/Markers/Markings. The last segment creates a

organizational problem in that Signs are frequently lighted. The use of light is at variance with that of a light-only Aid yet light is employed. An alternate approach could have subdivided Signs though they are here kept together.

Acknowledgements for Part Iiv include: Bob Booker; Institute of Transportation Studies Library, University of California at Berkeley; Michigan Information Transfer Source, University of Michigan, Ann Arbor; Barbara Schmidt at Mount Angel Abbey Library; University of Michigan Transportation Research Institute; Valley Library, Oregon State University.

ABBREVIATIONS

Organizations:

ARL	Aeronautical Research Library
ATA	Airport Transportation Association
CAA	Civil Aviation Authority
DOD	Department of Defense
DOT	Department of Transportation
FAA	Federal Aviation Administration
HR	U.S. House of Representatives
H & P	Hughey & Phillips
ICAO	International Civil Aviation Organization
IES	Illuminating Engineering Society
ITTE	Institute of Traffic & Transportation Engineering
ME	Multi Electric
NATO	North Atlantic Treaty Organization
Nav Fac Eng Com	Naval Facilities Engineering Command
PICAO	Provisional International Civil Aeronautical Organization
RAE	Royal Aerospace Establishment

Publications:

AI	Airports International
AD	Aerodromes, ICAO
AT	Aeronautical Telecommunications, ICAO
ADM	Aerodrome Design Manual, ICAO
ADS	Airport Design Standards, FAA
AIM	Aeronautical Information Manual
AIP	Airman's Information Publication

AMD	Amendment, AD, AT, ICAO
Ap L Eq	Approved Lighting Equipment
ASM	Airport Service Management
ATW	Airport Transport World
AW	Aviation Week
Ben & Lux	Belgium and Luxembourg AIP
Com Cal Pd	Compass Calibration Pad
Deceptive	Marking of Deceptive ...
EALS	Emergency Airfield Lighting System, US Air Force
EC	Electrical Communication
Econ Ap	Economy Approach Lighting Aids
FI	Flight International
FR Arcata	Final Report, Arcata 1949
FRP	Federal Radionavigation Plan- DOD/DOT
Glob Pol	Global Policies: see Olsen
GPSW	GPS World
HD	Heliport Design
H I Rnwy	High Intensity Runway Lighting
Interagency	U.S. Interagency Ground Inspection Manual
IA	Interavia
IEEE	Institute of Electronics & Electronic Engineering Proceedings
IFH	Instrument Flying Handbook
IB	ICAO Bulletin
IJ	ICAO Journal
JN	Journal of Navigation
Maint	Maintenance Guide ... 1971/Maintenance of Airport ... 1982/ Maintenance of Instrument ... 1986
Mil Spec	Military Specifications
NavAer	Navy Dept, Bureau of Aeronautics
NOTAMS	Notice to Airmen
OML	Obstruction Marking & Lighting
PHAK	Pilot's Handbook of Aeronautical Knowledge
Retro Taxi	Spec for L-859
R & T Edge	Runway & Taxiway Edge Lighting
R & T Mrkrs	Marking of Serviceable ...
Spec	Specification (s)
St Spec	Standard Specifications for Construction of Airports
Supplement	AD, AT, ICAO
Txwy C L	Taxiway Center Line Lighting
Txwy Guid	Taxiway Guidance Sign System

Authors:

A & W	Ashford & Wright
CD	Douglas, Charles
D & B	Douglas & Booker
F & A	Fukumoto & Abe
H &	Hundley & Rowson
L & W	Last & Ward
P &	Parnell & Boughton
S &	Swider & Kaser
T &	Tetley & Calcutt

CHAPTER ONE AERO LIGHTED NAVAIDS

Chapter 1A Indexes

1A1 Categories Index

Overarching Terms: General & Visual Terms (1B)

General Terms for All Aero Navigation Aids (1B1)

Primary Terms (1B a)

General Note

Aeronautical Navigation Aids

Nav aids

Navigation Aids

Navigational Aids

Nav aids Systems

Navigation Aids Systems

Aids

Aids to Air Navigation

Aids to Navigation

Air Nav aids

Air Navigation Aids

Air Navigational Aids

Specialized Terms (1B1 b)

Aeronautical Aids

Aids to Aerial Navigation

Air Navigation Systems

Air Navigation & Obstruction Lighting

Approach & Runway Light System

Electronic & Visual Air Navigational Aids (Nav aids)

Ground Aids to a Contact Flight

Ground-Based Navigation Aids

Landing & Navigation Aids
Mobile Airfield Lighting System
Navigation Systems
Portable Heliport Lighting System
Radio & Navigation Aids System
Temporary Airfield Lighting
Visual Aids for Approach & Landing

Visual Aids Terms (1B2)

General Note
Aeronautical Lighting & Other Airport Visual Aids
Airport Visual Aids/Airport Visual-Aids Systems
Airport Visual Navigation Aids System
All-Weather Visual Aids
Aviation Lighting
Ground Visual Aids
Landing Aerodrome & Airway Lighting
Visual Aids
Visual Aids for Airports
Visual Aids to Air Navigation
Visual Navaids
Visual Aids System
Visual Ground Aids
Visual Landing Aids
Visual Air Navigational Aids
Visual Signals
Visual Landmarks

Sub-Overarching Terms (1B3)

General Note
AGA= Aerodrome Ground Aid
Approach & Landing Systems
Approach & Navigation Lights
Approach & Runway Lighting/Approach & Runway Lighting
Approach & Threshold High Intensity Unidirectional Sequence-Flashing Lights
Approach, Threshold, & Runway Lights & Runway Marking
Approach, Threshold, & Runway End Elevated High-Intensity Light
Approach/Threshold/Runway End Inset Light



Approach/Threshold/Runway High Intensity Unidirectional Elevated Light
Approach/Threshold/Runway End Inset Light
Medium Intensity Approach, Threshold, Runway Edge Lighting
Miscellaneous Visual Approach Aids & Airport Beacons
Semi-Flush Approach & Threshold Lights

Overarching Terms for Lighted Aero Navigation Aids (1B4)

Light and Lighting Aids Terms (1B4 a)

General Note
Light
Light System
Lighting
Lighted Aids
Lighting Aids
Lighting System

Airfield & Airport Light/Lighting Terms (1B4 b)

Aeronautical Ground Light
Air Lights
Airfield Lights
Airfield Lighting
Airfield Lighting Systems
Airfield Ground Lighting
Airport Lighting
Airport Lighting Aids
Airport Lighting Systems
Airport Ground Lighting Equipment
Airport Lighting Equipment
Airport Light Products
Airport Lights
Aerodrome Lighting System
Aeronautical Ground Lights
Aeronautical Ground Lighting
Airport & Air Navigation Lighting & Marking Aids
Airport Lighting for Small Airports
Airway Lighting
Airway Lighting Equipment
Aviation Ground & Seadrome Lighting

Aviation Ground Lighting
Aviation Lighting
Aviation Lighting Equipment
Aviation Lighting Systems
Field-Lighting for Airports
Fixed Lights
Ground Lighting
Ground Lighting Aids
Ground Lighting to Aid Navigation
Ground-Positioned Lighting
Landing Lights
Lighting & Marking System
Lighting/Marking/Lighting & Marking
Marking & Lighting/Lighting & Marking
Navigation Lighting
Passive Airport Lighting
Powered Lighting Systems
Signal Lights
Signal Lighting Equipment
Systems of Lights
Visual Traffic Control Aids

Color & Other Messages (1B5)

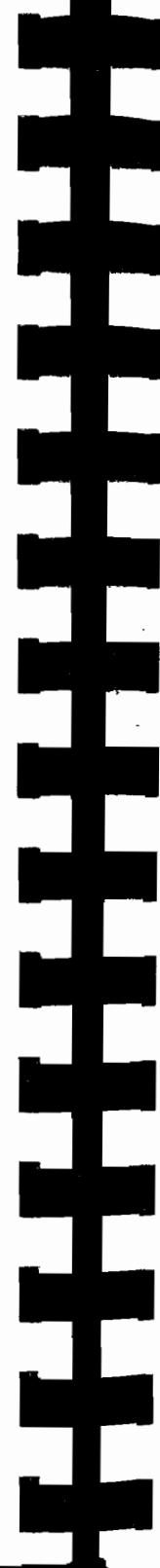
General Note

Colors (1B5 a))

General Notes I, II

Single Colors (1B5 a) 1))

Yellow
Amber
Blue/Blue Glass Filter
Red
Aviation Red
Aviation Green
Aviation Yellow
Ruby Glass/Ruby Glass Globes
Green



White
Aviation White
Aviation Variable White/Variable Intensity White/Variable White/Variable-White
White Hot/Bright White
White (Natural Sunlight)
Clear/Clear Globe/Clear Prismatic Globes/Clean Lens
Clear (White) Light/Clear White/White (Clear)/Clear Light
Bluish White

Color Combinations (1B5 a) 2))

General Note

White/Green
White/Yellow
Red/Yellow
Red/White
Red/Green
Clear/Green
Yellow/Red
Green/Yellow

Day Color Usage

General Note
International Orange
Orange
Aviation Orange
Black/Yellow
Black/Chrome Yellow
Chrome-Yellow/Dead Black
Chrome-Yellow/Black
Chrome-Yellow/Dull Black

b) Historic Uses (1B5 b))

General Note
Boundary Lights
Range Lights/Range-Lights

Contemporary Usages (1B5 c))

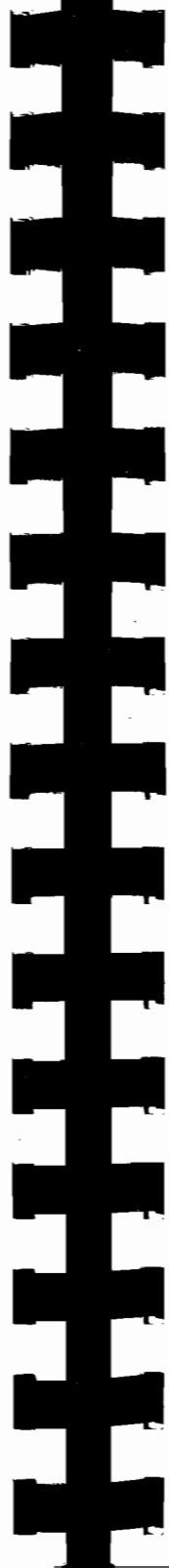
Approach Lighting
Medium Intensity
High Intensity

Beacons
General Note
White and Green
White and Yellow
Green, Yellow, White

Final Approach Lighting
General Note
VASI
T-VASI
PAPI
PLASI
Tri-Color System

Obstruction Lighting
Red
White

Runway & Taxiway Lighting
Taxiway Lighting
Blue
Green
Green & Yellow
Clearance Bars and Runway Guard Lights
Yellow
Runway Centerline Lighting
White
Red and White
Red
Stop Bar Lights
Red
Touchdown Zone Lighting
White
Taxiway Lead-Off Lights
Green and White



Land & Hold Short Lights
White
Runway Edge Lights
White
Yellow
Runway End Lights/Threshold Lights
Red
Green

Beacons & Obstruction Lighting (1C)

General Note

Overarching Terms (1C1)

Beacon
General Note I, II
Aerodrome Beacon
Aeronautical Beacon
Aeronautical Light Beacon
Air Beacon
Aviation Beacon
Beacon
Beacon, High Intensity
Beacon Light
Light Beacon

Physical Apparatus (1C2)

Method of Operation-Related Terms (1C2 a))

Airport 26" Rotating Beacon
Rotating Beacon
Flashing Beacon
Rotating Beacon for Small Airports
Rotating Electric Beacon
Rotating Light Beacon
Revolving Beacon
Oscillating Beacon

Dimension-Related Terms (1C2 b))

General Note

10-Inch Rotating Beacon
18-Inch Beacon
24-Inch Airway Beacon
24-Inch Beacon/Twenty-Four-Inch Beacon/24-Inch-Diameter Beacon/
Twenty-Four-Inch Beacon
Twenty-Four-Inch Double-End Rotating Beacon
24-Inch Rotating Beacon
24-Inch Dome/24-Inch Double End/36-Inch Double End/24-Inch Single End
Rotating 24-Inch Beacon
Beacon, 36-Inch Rotating Beacon
Beacon, 36-Inch, Double-End Type
CAA-291 36-Inch Rotating Beacon
Four-Beam 24-Inch Beacon
36-Inch Beacon
36-Inch Double End, Rotating Beacon/36-inch Double-end Rotating Beacon
36-Inch Rotating Beacon
36" Rotating Beacon
36-Inch Revolving Beacon
Thirty-Six-Inch Spherical Rotating Beacon
Double-Ended 36-Inch Diameter Beacon
DCB 36-Inch Rotating Beacon/DCB Rotating Beacon/DCB Rotating-10 Beacon

Energy Source-Related Terms (1C2 c))

General Note

Acetylene Beacon
Acetylene Gas Beacon
Electric Beacon
Electric Beacon Light
Electric Light Beacon
Flashing Gas Beacon
Gas Beacon
Gas Flashing-Beacon/Gas-Flashing Beacon

Morphological Terms (1C3)

Airport Beacons (1C3 a))

Airfield & Airport Beacons (1C3 a) 1))

General Note

Aerodrome Identification Beacon
Aeronautical Beacon Light
Airfield Beacon
Airport/Heliport Beacon
Airport Identification Beacon
Airport (Land) Beacon/Airport (Water) Beacon
Alternating Green/White Beacon//Alternating Yellow/White Beacon
Civil Airport Light Beacon
Medium Intensity Airport Beacon
Rotating Searchlight Beacon

Code Beacons (1C3 a) 2))

Code Beacon

Airport Code Beacon
Airport Rotating Beacon
Auxiliary Airport Beacon
Auxiliary Beacon
Auxiliary Code Beacon
Auxiliary Airport Code Beacon
Auxiliary Green Code Beacon
Electric Code Beacon
Flashing Code Beacon/Flashing-Code Beacon
Flashing Green Beacon
Identification Beacon
Identification (Code) Beacon/Identification Code Beacon
Long Range Beacon
Rotating Airport Beacon
Rotating Beacon for Small Airports/Airport Rotating Beacon for Small Airports

Airway Beacons (1C3 b))

Acetylene Gas Blinker

Airway Beacon
Air-Way Beacon

Airway Beacon Light
Airway Light Beacon
Air-Route Beacon
Automatic Routing Beacon
Auxiliary Blinker Light
Aviation Routing Beacon
Course Light/Course-Light
Electric Routing Beacon
En Route Beacon
Gas Routing Beacon
Lighted Airway
Route Beacon
Routing Beacon
Sperry Airways Beacon

Heliport Beacons & Other Forms (1C3 c))

Heliport Beacon
Heliport Identification Beacon
High Intensity Heliport/Medium Intensity Heliport Beacon
Heliport Rotating Beacon
Identification Beacon for Heliport Use
Revolving Projector Type of Beacon
Rotating Heliport Beacon
Seaplane Base Identification Beacon
Seaplane Base Light Beacon
High Intensity Seaplane Base Beacon/Medium Intensity Seaplane Base Beacon
Stolport Beacon

Miscellaneous Forms & Support Structures (1C4)

Miscellaneous Forms (1C4 a))

Approach Light Beacon
B.B.T. Flashing Beacon
Cluster Beacon
Flickering Beacon
Incandescent Beacon
Landmark Beacon
Solar Powered Beacon

Support Structures (1C4 b))

General Note

51' Airport Beacon Tower

Beacon Tower:

Prefab Tower Structure

Structural Steel Tower

Tubular Steel Tower

Double Wood Pole Tower

Tubular Tower/Tubular Beacon Tower/Tubular Steel Airport Beacon Tower

Airport Beacon Tower

Tower, Aerial Navigation Beacon

Obstruction Lighting (1C5)

General Note I, II, III

Overarching Terms (1C5 a))

Airport Hazard Beacon

Hazard Light

Hazard Beacons

Hazard Warning Beacon

Obstruction Lighting

Obstruction Identification

Obstruction Lights

Obstruction Marker Lighting

Obstacle Light

Obstruction Marking & Lighting

Tower & Obstruction Lighting/Tower Obstruction Lighting

Red Danger Light

Beacons (1C5 b))

Anticollision Beacon

Beacon, 300mm Hazard/300mm Beacon (Obstruction), 300mm Hazard Beacon/

300-mm Hazard Beacon/300mm Beacon

Red Beacon (Obstruction)

Flashing Beacon
Flashing Hazard Beacon/Flashing Red Hazard Beacon
Flashing, Omnidirectional Beacon
Light, Navigational, Beacon, Obstacle or Code
Obstacle Beacon
Obstruction Strobe Beacon
Rotating Beacon
Rotating 24-Inch Beacon
300 mm Code Beacon/Flashing Code Beacon/300 mm Code & Hazard Beacon
300-Milimeter Fresnel Lensed, Obstacle or Code Beacon Navigation Light

Obstruction Lights-Incandescent & Miscellaneous Forms (1C5 c)

Aviation Red Obstruction Light
Double & Single Obstruction Lights
Double Obstruction Light
Field Obstruction Light
Low Intensity Obstruction Light
Neon Obstruction Lighting
Obstruction Marker Light
Red Obstruction Lighting
Single Obstruction Light
Steady-Burning Light/Steady Burning Red Obstruction Light
Suspension Type Obstruction Light

Obstruction Lighting-Strobe & Composite Forms (1C5 d)

Catenary Lighting
Daytime Lighting for Tall Obstructions
Dual Lighting/Dual Lighting System
Dual Lighting with Red-Medium Intensity Flashing System/Dual Lighting with
Red-Medium Intensity Flashing White/Dual Red-White Medium Intensity
Obstruction Strobe Beacon
High Intensity Flashing White Lights
High Intensity Flashing White Obstruction Light
High Intensity Obstruction Lighting System
High Intensity White Obstruction Light
Low-Power Consumption Strobe-Type/Strobe-Type Flashing Red Obstruction
Light
Medium Intensity Flashing White Obstruction Light



Medium Intensity Flashing White Obstruction Lights 40 FPM/Medium Intensity
Flashing White Obstruction Light, 60 FPM
Medium Intensity Obstruction Strobe Beacon/Medium Intensity Obstruction
Strobe

Medium Intensity Omnidirectional Flashing White Light System
Medium Intensity Strobe
Obstacle Lights

Low-Intensity Lights
Medium-Intensity, Type A 60-90 fpm
Medium-Intensity, Type A 20-60 fpm
Medium-Intensity, Type B 20-60 fpm
High-Intensity Obstruction Light, Type B
Obstruction Strobe Light/Obstruction Warning Light

Approach Lighting (1D)

Overarching Terms (1D1)

Major Terms (1D1 a)

Approach Lighting System
Approach Lights
Approach Lighting

Secondary Terms (1D1 a)

Airport Approach Lighting
Airport Approach Lighting System
Approach Light System
Approach-Light
Approach Aids
Approach System
Civil Visual Approach Aids

Sub-Overarching Terms (1D1 c)

Airfield Approach Systems
Alignment-Type Carrier Landing Systems
Approach Visual Guidance System

Final Approach & Take-Off Area (FATO)
Ground Lights for Landing Guidance
Landing Aids
Lighting Systems
Standard Approach Aid
Visual Aid to Approach for Landing
Visual Approach Aids
Visual Landing Aids

Equipment Terms (1D2)

Physical Terms (1D2 a))

General Note

High Intensity Unidirectional Lamp
Medium Intensity Omnidirectional Elevated Lamp
Low Intensity Omnidirectional Elevated Lamp
Omnidirectional Flashing Lamp
Unidirectional Flashing Lamp

Capacitor Discharge Light
Condenser Discharge Light

Physical/Morphological Terms (1D2 b))

General Note

ALS Threshold Light Bar
Approach Direction Light
Approach Flashers
Approach High Intensity Unidirectional Light
Approach, Inset
Approach Light
Approach Light Bar Assembly
Approach Lights for Other Instrument Runways
Approach Medium Intensity Omnidirectional Elevated Light
Approach Sequence Flashing Uni-Directional Direct Line Couple Flashing Light
Approach Side Row, High Intensity
Approach, Threshold
Barrette/Centre Line Barrette
Bartow D-1 Lights

Electronic-Flashing-Approach Lighting
Elevated Approach Light
Flashers/Flashing Light
Flashing Approach Light
Flush Approach Light
Ground Level Approach Searchlight, High Intensity
Helipad Approach Light
High Intensity Approach Lights
High Intensity & Displaced Threshold Light
High Intensity Double-Skinned Unidirectional Elevated Approach Light
High Intensity Uni-Directional Inset Approach Light
Light Marker Airport Approach
Lights, Flashing, Omni-Directional: ODALS, REILS
PAR 56 Approach Light
Q20A/PAR 56 Approach Light/PAR 56 Approach Light Lamp
Semi-Flush Approach Light
Sequence Flasher/Flasher
Sequence Flashing Lights on Center Line Approach
Sequence Flashing Lights
Sequence Flashing Lights-Units
SFL
Side Row Barrettes
Steady Burning Lights

Support Structures (1D2 c))

General Note

Low-Impact Resistant Structures
LIR
Frangible Safety Mast for Approach System
Frangible Safety Approach Mast
Safety Mast for Approach Lights
Safety Mast for Approach System

Approach Lighting Systems (1D3)

General Note

Approach Lighting Systems (1D3 a))

Approach Light/Approach-Light
 Approach-Light System
 Approach Lighting System
 Approach Light Systems (ALS)
 ALSF-1/ALSF-I
 ALSF-2/ALSF-II
 ALSF-2 System/ALSF-2 Approach-Light System
 Alpha System
 ALSF-II/SSALR Dual Mode High Intensity Approach Light System/ALSF-II/
 SSALR Dual Mode System/Dual Mode High Intensity Approach Lighting
 System
 ALS/SFL Cat I & Cat II
 Approach Light System for Cat II & III Runways
 Approach Strobes
 Cat I ALS
 Cat II ALS
 Cat 2 Approach Lights
 Circling Approach Lights
 FAA High Intensity
 High Intensity Approach Light System/High-Intensity Approach-Light System/
 High-Intensity Approach Lights
 High Intensity Approach Light System with SF
 High-Intensity Approach Lighting
 High Intensity Lights
 MALS
 MALS, Medium Intensity Approach Light System

 Approach Light System, M.I., MALS
 MALS Steady Burning Lights
 MALSF
 MAL/SF
 MALSR
 MALSR System
 Medium Intensity Approach Lighting Equipment
 Medium Intensity Approach Lighting Bar Assembly
 Medium Intensity Approach Lighting
 Medium Intensity Lighting System
 Medium Intensity (MALSR, MALSF, MALS)
 Non-Instrument Approach System
 Non-Precision Approach Light System
 Non-Precision Approach Lighting System
 Non-Precision Cat II & III Lighting System



Precision Airport Category I Lighting System
 Precision Approach Category I Light System
 Precision Approach Cat II & III Lighting System
 SALS
 Simple Approach Light System
 Simple System
 Simplified Approach Lighting/Simplified Approach Lighting System
 "Simplified" Approach Light System
 SSALS
 SSALR
 SSALF
 Standard High Intensity Approach Lighting System
 Straight-In Approach System
 System of Approach-Lights

 Special Approach Lighting Forms (1D3 b))

 Airport Lead-In Lighting System (LDIN)
 Circling Guidance Lights
 Lead-In Lights
 Lead-In Light System (LDIN)/Airport Lead-in Light System/Runway Lead-in
 Lighting System
 Lead-in-Lighting
 Long Lead-In Strobe Lighting System (LLDIN)
 Lead-In-Lighting
 ODALS
 Omnidirectional Approach Light System (ODALS)
 Omnidirectional Approach Lighting System (ODALS)
 Omnidirectional Flashing Lights
 Omnidirectional Lead-in Approach Light System
 Omnidirectional Lead-in Lights
 Omnidirectional Lights
 RAILS/Runway Alignment Indicator Lights/Runway Alignment Indicator
 Light System
 REIL
 RIL, Runway Identification Lights
 Runway End Identifier Light (REIL)
 Strobes
 Visual Vector Omnidirectional Approach Lighting System

Historic Terms (1D3 c)

Sloped Line Systems (1D3 c 1)

Double-Row Funnel-Shaped Slope Line Configuration/Dual-Row Funnel-Shaped Slope Line Configuration

Pearson Slope Line Approach Light System

High Intensity Sloped Line Approach Lights

Sloped Line System

Slope Line Lighting System

Slope Line Approach Lighting System

Slope Line Approach-Light System/Slope-Line Approach-Light System/
Slope Line Approach Line System

Sloped Line Approach Light System

Slope-Line Systems

Slope Line System

Sloped Line-Transverse-Bar Approach-Light System/Sloped Line Approach-Light
Sloped Line Approach-Light System with Transverse Bars (SET)

Slope Line High Intensity Approach Lighting System

Slope Line System of High Intensity Approach Lights

High Intensity Sloped Line Approach Lights

Sloped Line

Slope Line Lights

Slope Lights Approach Lights/Slope-Line Approach Lights

Slope & Approach Light

Slope Approach

Center Line System (1D3 2)

General Note

Center-Line Approach Light System

Center Line Approach System

Centerline Approach Lighting System/Centerline Approach Light System

Center-Line Lights

Center Line System

Center-Line System

Centerline System

Center Line Approach System

Center Line Approach Lighting

Center-Line High Intensity Approach Light System

Center Row System

Center-Line "Configuration A" System

Single-Row Center-line System

Centerline System with Strobeacon

Centerline Crossbar System

Other Historic Forms (1D3 3)

AGA Funnel System

All-Weather Approach Lights Approach System

ALPA System

Air Line Pilots Association (ALPA)

Angled Linear System

Bartow Approach Lights

Bartow Light System

Bartow Multi-Row Approach-Light System

Bartow System

Calvert Bar System

Calvert System

Civil Airfield Approach System

Funnel System

Landing & Approach Light System

Left-Hand Row System/Double-Row System

Modified Calvert System

Calpa or Alpert System

Calvert (English) System

Calvert System of Approach Lights

Calvert & RAE System

Centerline Lighting

Configuration A

Dutch System

EFAS, Electronic Flash Approach System

EFAS

High Intensity Incandescent Approach Lights (ALS)/Medium Intensity
Incandescent Approach Lights (ALS)

Incandescent-Lamp Approach System

Interrupted-Sequence-Flashing Approach-Light System

Left-Hand, Single-Row, Ladder-Type, High Approach Light Lanes

Approach Light Lanes

Left-Hand-Row System/Left-Hand Row "Ladder System"

Multi-Row Approach-Light System

National System
Neon Approach Lighting System
Neon-Lamp-Ladder Approach System
Parallel-Row System/Parallel Row Approach Light System/Parallel Row Approach-Light System -
RAE Horizon-Bar System (RAE)
Row-Type Approach Light System
Standard Approach Light System
System of Neon Approach Lights
Two-Row Approach-Light System
U.S. National Standard Configuration "A"/U.S. Standard Configuration A (Alpha) System.

Wing Bar
Terminating Bar
Steady-Burning Approach Light

Final Approach Equipment (1D4)

Overarching Terms (1D4 a))

Approach Path Slope Indicator
Approach Visual Guidance System
Heliport Approach Path Indicator (HAPI)
Glide Path Light Indicator
Ground-Based Visual Light Guidance System
Medium-Intensity HAPI Unit
Visual Approach Descent Indicator (VADI)
Visual Approach Guidance Indicator Systems
Visual Glide Path Aid
Visual Glide Path Indicator
Visual Guide Path Indicator (VGPI)
Visual Guide Slope Indicator
Visual Guide Slope Indicator System

Precision Approach Path Indicators (1D4 b))

Precision Approach Path Indicator
PAPI
Precision Approach Path Indicator (PAPI) System

PAPI System
PAPI Approach System
PAPI Glide Path Lighting System/GPLS
PAPI Lights/Precision Approach Path Indicator (PAPI) Lights
PAPI-4/PAPI-2
PAPI Wing Bar
APAPI Wing Bar
Abbreviated PAPI
Abbreviated Precision Approach Path Indicator (APAPI)
APAPI
Mini-PAPI
CHAPI/CHAPI System
Portable PAPI
Three Lamp PAPI

VASI Systems (1D4 c))

Forms (1D4 c) 1))

Visual Approach Slope Indicator (VASI)
Visual Approach Slope Indicator (VASI) System/Visual Approach Slope Indicator System
Visual Approach Slope Indicator System (VASIS)
Visual Approach Slope Indicator System
VASI
VASI System
VASIS
A-VASIS
AVASIS
Abbreviated Visual Approach Slope Indicator
Abbreviated Visual Approach Slope Indicator System (AVASIS)
SAVASI
RT-VASIS
AT-VASIS
T-VASIS Light Units (Blade Type)/T-VASIS Light Units (Projector Type)
T-VASIS/Tee Visual Approach Slope Indicator

2) VASIS: Types (1D4 c) 2))

VASI-2/VASI-4/VASI-6/VASI-12/VASI-16

VASI-II/VASI-IV/VASI-VI[3 Bar]/VASI-XII/VASI-XVI [3 Bar]
2-VASIS
12-Box VASI/12-Box VASI System
4-Box VASI
2-Box VASI
2-Bar VASI/2-Bar VASIS/3-Bar VASI/3-Bar VASIS/2-Bar System/3-Bar System
VASI-2nd Light Bar/VASI 1st Light Bar
2-Bar System/3-Bar System

Other Forms (1D4 d))

Glide Path Forms (1D4 d) 1))

Approach-Angle Lights
Glide Path Indicator
GPI
Glidepath Indicator
Precision Visual GlidePath (PVG)
Pulsating System
PVG
TEE System
Tee Visual Glidepath
TVG

Tri-color Forms (1D4 d) 2))

Tri-Color Glide Path Indicator
Tri-Color systems
Tri-Color Visual Approach slope Indicator

Fresnel Forms (1D4 d) 3))

Navy Fresnel System/Navy Fresnel Lens Optical Landing System/Fresnel Optical
Landing Systems, FLOLS/FLOLS, Fresnel Lens Optical Landing System
Fresnel System
MDLA, Mirror Deck Landing Aids
Mirror System

PLASI Forms (1D4 d) 4))

HAPI-PLASI
HELI-PLASI
PLASI
PLASI I, II
Portable PLASI
Pulsating Visual Approach Slope Indicator
Pulse Light Approach Slope Indicator (PLASI)
Pulsed Light Approach Slope Indicator

Miscellaneous Forms (1D4 d) 5))

AAI System
Alignment of Elements System
Angle of Approach Indicator (AAI)
Angle of Approach Light/Angle-of-Approach Light
Generic Visual Approach Descent Indicator
Generic Visual Glideslope Indicator (GVGI)
Optical Projector Ground Aids
Optical ILS
Pulsating Systems
Pulse Code Optical Landing Aid
SAGA (System of Azimuth Guidance for Approach
Standard Visual Approach Guidance Aid
Visual Approach Descent Indicator (Rotary Wing)
Visual Angle of Approach Indicator
VGSI

Runway & Taxiway Lighting (1E)

Runway Lighting (1E1)

Overarching Terms (1E1 a))

General Note
Runway Lighting
Runway Lights
Runway Lighting System
In-Runway Lighting

Primary Airfield Lights
Runway/MOS Lighting

Runway Edge Lights (1E1 b))

Runway Edge Lights
Runway-Edge Lights
Runway Edge Light System
Runway Edge Lighting/Runway Edge Lighting System
Runway Outline Lights
Standard Lights/Standard Edge Lights

Edge Lights/Edge-Lights
Edge Lighting
Elevated Edge Lights
Low Intensity Edge Lights

Runway Centerline Lights (1E1 c))

Airport Centerline Lights
Centerlights
Centerline Lights
Centerline Lighting System
Centerline Guidance Lights
Centerline Runway Lights
Centre Line Lights
RCLS
Runway Centreline Lights/Runway Centre Line Lights
Runway Centerline Lights
Runway Centerline Lighting (RCLS)
Runway Centerline Lighting System/Runway Centerline Lighting System

Threshold, Touchdown Zone, Runway End & Other Lights (1E1 d))

General Note
"Narrow Gauge" Pattern
Road-Holding Position Light for Vehicles
Runway Touchdown Zone Lights/Runway Touchdown Zone Lights (TDZ)
Touchdown Zone Lights



Touchdown Zone Light System
Touchdown Zone Lighting
TDZ Light Bar
Airport In-Runway Touchdown Zone Light
Runway End Lights
Runway Threshold Lights
Runway Threshold & Wing Bar
Threshold/End Lights//Threshold/End Lighting
Threshold Lights
Threshold Lighting
End Light, End of Runway Lights
Lights, Runway End
Runway Remaining Lightig/Runway Distance Remaining
Exit Taxiway Lighting
Taxiway Turnoff Lights
Taxiway Lead-Off Lights
Taxiway Traffic Signals
Stopway Light

Runway Equipment Terms (1E1 e))

General Terms (1E1 e) 1))

General Note
Bidirectional
Elevated
Omnidirectional
Unidirectional

Flush
In-Pavement/Inpavement
In-Runway
Inset
Semi-Flush

Physical Apparatus Terms (1E1 e) 2))

Airport In-Runway Light
Airport In-Runway TDZ Light
Bidirectional Center Line Fixtures

Bidirectional High/Medium-Intensity Runway Light
 Bi-Directional Semiflush Inset Light Assembly
 Elevated Edge Lights
 Elevated Lights
 Elevated Runway Edge Light
 Elevated Runway Light
 Elevated Threshold Light
 Fixed Focus Bidirectional High Intensity Runway Light/Fixed Focus
 Unidirectional High Intensity Runway Light
 500 Watt High Intensity Runway Light with Automatic Beam Control
 Flash Lights
 Flush Centerline Light
 Flush Light
 In-Runway Light Fixture
 In-Runway Lights
 Inset Light
 Light Assembly, Airport Runway Centerline & TDZ/Light Assembly, Airport
 Runway, Centerline & TDZ Zone/Light Assembly, Airport Runway &
 Centerline
 Light Assembly, Airport Taxiway Centerline
 Lights, Portable Runway
 Lights, Runway Edge Low Intensity
 Lights, Runway, In-Pavement
 Multiple-Purpose Elevated Light
 Narrow Gauge Runway Lights/Narrow Gauge Lighting System (Runway)
 Omnidirectional Lights
 Portable Edge Light
 Portable Runway End Identifier Light
 Radio-Controlled Runway Edge Light
 Rnwy/LGTS
 Runway In-pavement Light/Runway Inpavement Light
 Semiflush Airport Light/Semiflush Airport Lighting
 Semiflush Inset Prismatic Light
 Semiflush Intersection Light
 Semiflush Light
 Semiflush Prismatic Airport Light/Semiflush Inset Prismatic Airport Light
 Standard High Intensity Runway Lighting
 Unidirectional Lights
 Unidirectional Semiflush Inset Light Assembly
 Unidirectional Threshold Light
 Undirectional Touchdown Zone Light Fixture



Terms by Intensity (1E1 e) 2)

General Note

Elevated High Intensity Runway Light Fixtures
 High-Intensity Bidirectional Inset Lights
 High Intensity, Elevated Type D-1 Lights
 High-Intensity Lights
 High Intensity Lighting System
 High Intensity Runway Lighting
 HIRL
 High Intensity Light System/High Intensity Runway Light System
 High Intensity Runway Edge Lights/High-Intensity Runway Edge Lights/
 Runway High-Intensity Edge Lighting System
 High Intensity Approach Runway Light
 High Intensity Runway Edge Light
 High Intensity Light
 High Intensity Runway Light
 HIRL/MIRL
 Low Intensity Edge Lights
 Low Intensity Runway Edge Lighting
 Low Intensity Runway, Landing Strip & Taxiway Light
 Low Intensity Runway Lights (LIRL)/Medium Intensity Lights (MIRL)/High
 Intensity Runway Lights (HIRL)
 Medium Intensity Elevated Runway Edge Light Fittings
 Medium Intensity Lights
 Medium Intensity Lighting System
 Medium Intensity Type M-1 Runway Edge Lights/High Intensity Type M-1
 Runway Edge Lights
 Medium Intensity Threshold Special Light
 Medium/Low-Intensity Runway Light
 Medium Intensity Runway Edge Light
 Runway Edge Lights: LIRL, MIRL, HIRL

Taxiway Lighting (1E2)

Overarching Terms (1E2 a)

Low Visibility Taxiway Lighting Systems
 Systems of Taxiway Lights
 Taxiway Lead-Off Lights
 Taxi Light

Taxiway Light
Taxiway Lighting
Taxiway Lighting System
Taxiway Marker Light
Taxiway/Obstruction Lighting
Taxiway Series Lighting System

Taxiway Edge Lighting (1E2 b))

Taxiway Edge Lights
Taxiway Edge Lighting
Taxiway Edge Lighting System

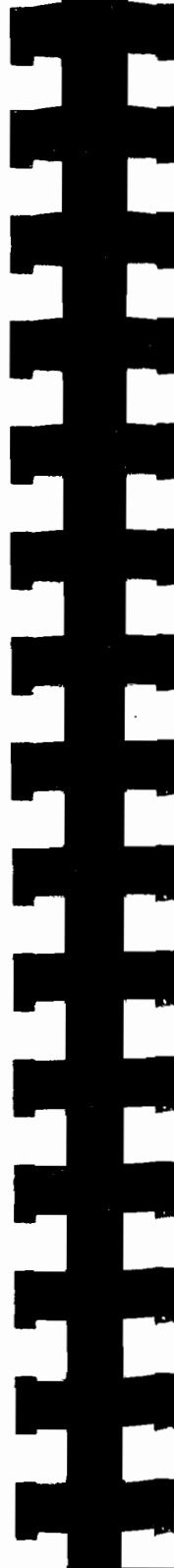
Taxiway Centerline Lighting (1E2 c))

Center-Line Lighting
Centerline Guidance System
Taxiway Centerline Lights
Taxiway Centerline Lighting
Taxiway Centerline Lighting Systems
Taxiway Centre Lights
Taxiway Centreline Lights
Taxiway Centre Line Lights
Taxiway Centre Line Light on an Exit Taxiway
Taxiway Center Line Lighting on Taxiway/Taxiway Center Line Lighting on
Rapid Exit Taxiways/Taxiway Center Line Lighting on Other Exit
Taxiways
Taxiway Centreline Lighting

Physical Apparatus & Other Terms (1E2 d)

Physical Apparatus (1E2 d 1))

General Note
Bidirectional Lights
Blister Lights
Button Lights
Edge Lights
Elevated Taxiway Lights for Holding Position Markings



45w Taxiway Edge Lamps
Fully-Flush Lighting Fixture/Fully Flush Fixture
Holding Position Edge Lights
In-Pavement Taxiway Lights/Lights, Taxiway, In-Pavement
Inset-Type Runway & Taxiway Lights
Light Assembly, Airport Taxiway Center
Low Intensity Taxiway Light (LITL)/Low Intensity Taxiway Edge Light
Medium Intensity Light (MIRL)/Medium Intensity Edge Light
Medium-Intensity Light/High Intensity Light
Medium-Intensity, Omnidirectional Elevated Light
Semi-Flush Fixtures
Semiflush Inset Lights
Taxiway Inpavement Light/Taxiway In-Pavement Light
Unidirectional, Bidirectional, Light Assembly Airport Taxiway Centerline

Other Terms (1E2 d) 2))

Aircraft Arresting Marker Light
Automatic Block Signal Control System
Barrette
Clearance Bars
Clearance Bar Lights
Entrance-Exit Lights
Runway Guard Light
Snow Area Lights (Elevated Lights)
Stop-And-Go Signals
Stop Bars/Stop Bar System
Taxiway Guidance Lights
Taxi-Holding Position Lights
Taxiway Intersection Lights
Taxiway Traffic Control System

Historic and Composite Terms (1E3)

Historic Terms: Boundary, Contact & Range Lights (1E3 a))

Boundary Lights
Boundary Light System
Contact Lights
Contact-Light System/Contact Light System

Distance-To-Go (DTG) Marker Lights/-Lighting
Floating Seadrome Lights
Land & Hold Short Lights
Range Lights

Composite Terms (1E3 b))

General Note

Centerline & or Touchdown Zone Lights

Centerline & Touchdown Zone Lighting Systems

End/Threshold Light

Lights, Runway & Taxiway Edge, Low Intensity Lights, Runway & Taxiway
Edge, Medium Intensity

Runway Center & TDZ Lights/Runway Centerline & TDZ Lighting System

Runway & Strip Light

Runway & Taxiway Edge Lighting Systems

Runway & Taxiway Lights

Runway Threshold/End Light

Threshold & Runway End Light/Threshold Runway End Light

Touchdown & Centerline Light

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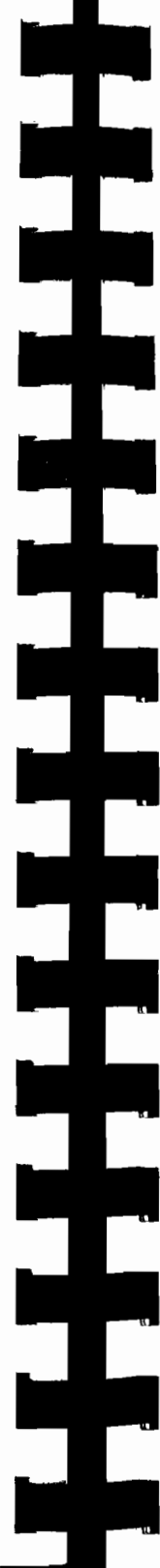
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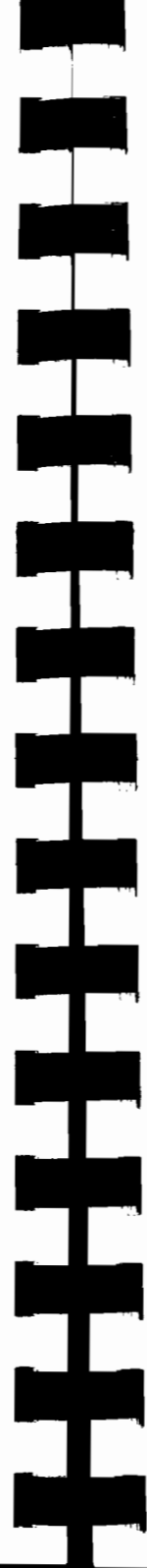
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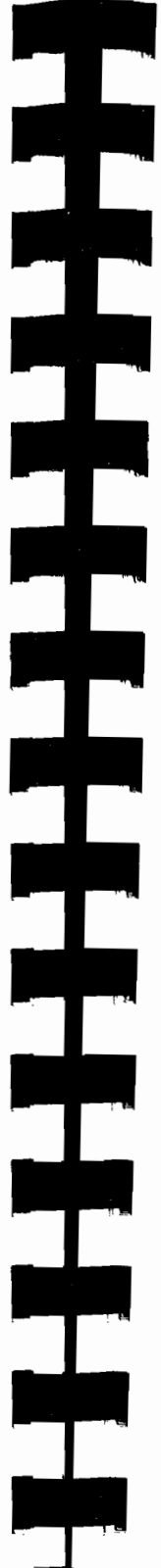
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Chapter 1B Overarching Terms: General and Visual Terms

1B1 General Terms for All Aero Navigation Aids

1B1 a) Primary Terms

General Note. All primary terms include the word "Aids". Nearly all terms include the words "Navigational" or "Navigation". Several terms include the word "Air". In many instances terms beginning with Aid or Aid to ... refer to devices external to aircraft though not always (T-Ms are always external). A common term in the literature, Navaid, is a contraction of Navigation or Navigational and Aid. In some sources Navaid is a radio aid term only. In U.S. marine usage Navigation aids are external to a mode of transport while Navigational Aids can be mode-based; this is not the case, for example, in the United Kingdom. However, in aero usage navigation and navigational are very often interchangeable. The listing and describing of terms is not a precise exercise: the welter of terms overlap, intermingle with one another; though there are fewer contradictions than it may first seem.

AERONAUTICAL NAVIGATION AIDS. Term employed in Part G of the Monograph Series. which was possibly coined by author. A single term was required for that study which would encompass all safety aids for air navigation. AIM '73 (U.S.) so employed Navigation Aids though many other sources did not. AIM also employs the word Aeronautical in several places and that usage may have influenced the use of that term. The word aeronautical is needed when Navigation is not included though perhaps it is not needed when navigation is present. Nonetheless, Part G includes both aeronautical and navigation. References: AIM (U.S.) 1973, Part G

NAVAIDS. This term is a contraction of Navigation and Aid and/or Navigational and Aid. It is a general term though not infrequently associated only with Radio Aids. Navaids can have a meaning simply beyond specific aids. It may include airborne equipment and other processes and devices. There are instances in which the term has a more restricted meaning because the topic under discussion is restricted in nature; such a usage may not exclude other uses. References: Wilson '79, AIM '73, Komons '78, Olsen AI '91

NAVIGATION AIDS. This term is closely allied with Navaids and Navigational Aids. It can include Visual Aids and is thereby a general term. Possibly Navigation Aids is possibly more of a general term than Navaids since Navaids is often associated with Radio Aids. Non-aids may be included in this term (such as radar). Navigation Aids probably has a radio-only meaning for some sources.

References: Taneja '87, IFH '71, AIM '91, PHAK '71, Field '85

NAVIGATIONAL AIDS. This term is closely related with Navigation Aids terms. The meaning is similar though more non-aid elements may be included in this term at least for some sources. The diversity of sources and uses precludes a precise describing of terms's meaning.

References: Field '85, Whitnah '66, Airport Design '89

NAVAID SYSTEMS. This terms seemingly appears only in one source. It applies only to radio systems which is true of the publication in its entirety.

References: DOT & AID Aids ... S.E.ASIA '71

NAVIGATION AIDS SYSTEMS. Seemingly only Taneja includes this term. The term includes all forms of Aids. It is probably the equivalent of Navigation Aids though in a more explicit form.

Reference: Taneja '87

AIDS. A very general term that is almost too general in character. PHAK employs the term but the precise meaning is not clear. Clark employs the term in reference to two specific Visual Aid Indicators but does not employ the term in a general way.

Reference: PHAK '71 Clark '93

AIDS TO AIR NAVIGATION. This term can be confined to radio devices though often it is a more general term. Library catalogues frequently employ it as a subject heading. CAA sees it as an overarching term.

References: DOT & AID SE Asia ...71, CAA '45

AIDS TO NAVIGATION. This more often refers to marine aids though aero aids are somewhat often included. Some library catalogues include aero aids under this heading while other libraries exclude such aids. It is very much an overarching term. Field drops the "s" from Aids.

References: Leary '85, CAA '45, Field '85

AIR NAVAIDS. This term and the following two terms can be regarded as general terms though some sources seemingly include radio aids only. Navaids not infrequently include only Radio Aids.

References: DOT & AID Aids SE Asia ... '71

AIR NAVIGATION AIDS. This term, while giving the appearance of a general term, refers only to radio aids in some sources.

References: AIM '91, NOTAMS '87, DOT & AID Aids ... S.E. Asia '71

AIR NAVIGATIONAL AIDS. Only a few sources include this term. One is explicitly visual in scope; a second tends toward radio though some limited visual aids are included.

References: Pilots Guide '44, Airport Design '73, AIM '91

1B1 b) Specialized Terms

AERONAUTICAL AIDS. This appears to qualify as an overarching term for current use. Yet only one surveyed source includes it and that source is historical. Its meaning is not fully clear. It seemingly excludes Lighted Beacons, and Radio Beacons. It possibly includes airport lights.

Reference: CAA '47

AIDS TO AERIAL NAVIGATION. A rare term in the literature. It is from 1922 and reflects the employment of the word aerial in early aviation. It refers to visual aids only because of the time period (Radio Aids were in an early stage).

Reference: Lights as ... '22

AIR NAVIGATION & OBSTRUCTION LIGHTING. Overarching term for Aeronautical Light Beacons, Code Beacons, Course Lights, Obstruction Lights.

Reference: AIP '99

AIR NAVIGATION SYSTEMS. This term probably refers only to Radio Aids though it gives an appearance of a general term. However, it is a broad term in that context and includes aircraft-based devices.

Reference: Kendal '90

APPROACH & RUNWAY LIGHT SYSTEM. Term in Douglas '79 from a study of "optimum intensity settings" that includes these two visual systems.

Reference: Douglas '79

ELECTRONIC & VISUAL AIR NAVIGATIONAL AIDS (NAVAIDS). A seldom employed composite term that includes two forms of Aids.

Reference: Airport Design '80

GROUND AIDS TO A CONTACT FLIGHT. Term includes Day Marking Devices and "Luminous Devices."

Reference: PICA0 '44

GROUND-BASED NAVIGATION AIDS. Sources can present very different views of a term. A historical source applies this term to visual aids (entirely or

nearly so) while a more recent source (Field) sees it as one form of Radio Navigational Aids (airborne representing the other form).

References: Wilson '79, Field '85

GROUND SYSTEMS. A somewhat vague term which one source apparently regards as a synonym for Nav aids.

Reference: Grounds ... AI '92

LANDING AIDS. Library catalogues sometime employ this term as a general for nav aids (including radio). It is possibly a specialized term for Wilson which refers only to Approach Lights.

Reference: Wilson '79

LANDING AIDS TO AIR NAVIGATION. CAA included only radio aids in what appears to be a general term. It also included radar.

Reference: CAA '45

LANDING & NAVIGATION AIDS. Topic heading in Index of IB, Vol I-X

Reference: IB Index

MOBILE AIRFIELD LIGHTING SYSTEM. This term encompasses a full range of Lighted Aids.

Reference: Momberger '86

NAVIGATION SYSTEMS. A term seemingly overly vague for Nav aids. However, Toshiba employs it for radio and visual aids; seemingly other elements are included such as radar. The term is viewed as the equivalent of Nav aid.

Reference: Toshiba

PORTABLE HELIPORT LIGHTING SYSTEM. Term includes Heliport Light, Flashing Beacon, Heliport Approach Precision Indicator (HAPI).

Reference: Momberger AF '86

RADIO & NAVIGATION AID SYSTEM. The meaning is not fully clear. Seemingly it refers to radio entirely (non-nav aid radio and nav aid radio). It may give a general appearance but only an appearance.

Reference: Wilson '79

TEMPORARY AIRFIELD LIGHTING. Term is more of a description of Emergency Airfield Lighting System (EALS) than an official and formal term in itself.

Reference: EALS '99

VISUAL AIDS FOR APPROACH & LANDING. This term is taken from Committee of the same name.
Reference: Douglas '79

1B2 Visual Aids Terms

GENERAL NOTE. These terms may include all forms of Visual Aids including all forms of Lights as well as Signs, Markers, Markings. Some uses are more restricted and so noted. A limited number of the terms do not include the word "Visual."

AERONAUTICAL LIGHTING & OTHER AIRPORT VISUAL AIDS. This "term" is a chapter heading in AIM '91. It includes Airport Lighting Aids, Beacons, Course Lights, Obstruction Lights, Signs & Marking Aids
Reference: AIM '91

AIRPORT VISUAL AIDS/AIRPORT VISUAL-AIDS SYSTEMS. These terms are presumably more explicit versions of the basic term (Visual Aids). McKelvey employs both forms. The second terms is more explicit since System is added to core term.
References: Maintenance of ... '82, FR Arcata '49, McKelvey JN '87, Pollock AI 90

AIRPORT VISUAL NAVIGATIONAL AIDS SYSTEMS. Overarching term which probably emphasizes lighted forms.
Reference: Warskow '50

ALL-WEATHER VISUAL AIDS. Alternate name for Airport Lighting (by a Swiss author).
Reference: Friedl AF '86

AVIATION LIGHTING. Overarching term for aircraft and Ground Lights.
Reference: Breckenridge '55

GROUND VISUAL AIDS. A variant of Visual Ground Aids. See also Visual Ground Aids.
Reference: ADM '83

LAND AERODROME & AIRWAY LIGHTINGS. Term is from a publication title.
Reference: UK '37

VISUAL AIDS. This term can include all visual forms. The term in some sources cover a smaller range of devices since those sources cover only some Navaids. In some instances Obstruction Aid forms have been excluded (though infrequently). Floodlighting is sometimes included.
References: Honeja '93, Standby Power '71, ADM '83, Berry IJ 92, Warskow '50, AD '99

VISUAL AIDS FOR AIRPORTS. Terms specifically focusses on Approach and Runway Light.
Reference: Douglas '78, '79

VISUAL AIDS TO AIR NAVIGATION. This term is a more explicit version of the basic term that clearly denotes the types of Aids. The name stems from a committee that experimented with Navaids at Arcata, CA after World War II.
Reference: FR Arcata '49

VISUAL NAVAIDS. This version of the basic term combines Visual with a common abbreviated form of Navigation Aid: Navaid. It includes Approach and related Lights as well as Rotating Beacons. The source in question was restricted to those topics.
Reference: FAA ADS-Site '80

VISUAL AIDS SYSTEM. A general appearing term with specific reference to Aids examined at Arcata: Approach, Runway, Taxiway, Threshold.
Reference: FR Arcata '49

VISUAL GROUND AIDS. Does this term differ from Visual Aids? It would appear to be interchangeable since Visual Ground Aids is in chapter title but Visual Aids in text. Does "Ground" make the basic term more explicit? See also: Ground Visual Aids
Reference: ADM '83

VISUAL LANDING AIDS. Few details are available for this term. It may be a general term though possibly it refers to Approach Lights only. Landing Aids suggests a more general meaning or does it refer to Approach Lights only?
Reference: IB 2nd Air Navigation '55, Douglas '78, Warskow '50

VISUAL AIR NAVIGATIONAL AIDS. Term includes facilities and equipment as well as lights, signs, markings and what it termed symbols.
Reference: ADS '69

VISUAL SIGNALS. This term includes Stop Bars and Clearance Bars. This term may suggest traffic signals since such devices create stop and go movements: a meaning that can be applied here.

Reference: ADM '83

VISUAL LANDMARKS. A UK term in ICAO whose meaning is not clear. It is not an official Navaid term (unless in UK).

Reference: AD '58

1B3 Sub-Overarching Terms

General Note. These terms incorporate terms from two or more categories in the Chapter. They are considered separately in the appropriate segment. They are listed here as a type of sub-overarching term.

AGA = AERODROME GROUND AID.

Reference: Clark JN '93

APPROACH & LANDING SYSTEM.

Reference: Kendal '90

APPROACH & NAVIGATION LIGHTS

Reference: C-H '91

APPROACH & RUNWAY LIGHTING/APPROACH & RUNWAY LIGHTING SYSTEM.

Reference: Idman; Denmark '93 (1st); ADM '83 (2nd)

APPROACH & THRESHOLD HIGH INTENSITY UNIDIRECTIONAL SEQUENCE-FLASHING LIGHTS.

Reference: ADB

APPROACH, THRESHOLD, & RUNWAY LIGHT & RUNWAY MARKING.

Reference: Moore AW '50

APPROACH, THRESHOLD, RUNWAY END ELEVATED HIGH-INTENSITY LIGHT.

Reference: Idman

APPROACH/THRESHOLD/RUNWAY END ELEVATED LIGHT

Reference: ADB

APPROACH/THRESHOLD/RUNWAY END INSET LIGHT.

Reference: ADB

APPROACH/THRESHOLD/RUNWAY HIGH INTENSITY UNIDIRECTIONAL ELEVATED LIGHT.

Reference: ADB

MEDIUM INTENSITY APPROACH, THRESHOLD, RUNWAY EDGE LIGHTING.

Reference: ADB

MISCELLANEOUS VISUAL APPROACH AIDS & AIRPORT BEACONS.

Reference: ADS-Site '69

SEMI-FLUSH APPROACH & THRESHOLD LIGHTS.

Reference: Pollock AI '90

1B4 Overarching Terms for Lighted Aero Navigation Aids

a) Light and Lighting Aids Terms

GENERAL NOTE. This group of term constitutes only a small number of the fifty-some terms in the Lighted Aero Navigation Aids category. However, they represent over 40% of the references in the surveyed literature. The most frequently employed are general in nature if not vague. They can function within an aero context though they are not free-standing in nature.

LIGHT. This term can refer to physical apparatus. It can also refer to the emission of light energy. Usually the former meaning is intended unless the context is the production, emission of light energy. Light can sometimes take on a very general nature. Though in many instances represents a short form for a specific type of Light. For example, a discussion of Taxiway Lights may refer to them as Lights more often than as Taxiway Lights.

References: Many references including Whitnah, Walker '91, ADM '83, AD '99, Douglas '79, D & B '77

LIGHT SYSTEM. Term gives appearance of an overarching term though reference specifically applies to Approach and Runway Lighting.

Reference: Douglas '79

LIGHTED AIDS FOR AIR NAVIGATION. Term seemingly included by only one source. A more explicit version of basic term.
Reference: Breckenridge '55

LIGHTING. This term can serve as a synonym for Airport Lighting. It can also be employed in a discussion of a specific form of lighting situation. The term usually refers to a group of lights of an be integrated nature.
References: AD '51, ADS AC '70, Komons '78, Keller '92

LIGHTED AIDS. This term is included in only one surveyed source. It emanates from the historic era of the late 1920s. The term includes Boundary Lights, Range Lights, Illuminated Wind Cones.
Reference: Whitnah '66

LIGHTING AIDS..This is an overarching term for all forms of Lighted Visual Aids. On occasion it may include non-lighted Aids.
References: IES '72, ADM '83, NOTAMS '87

LIGHTING SYSTEM. This non-specific term is the most common overarching term (with more than 10% of surveyed sources employing it). The term is often employed as a general term as well as some more restricted usages.
References: Taylor '58, AIP, Idman, FR Arcata '49, CD '79, D & B '77

b) Airfield and Airport Light/Lighting Terms

AIR LIGHTS. Informal term for Airway Beacons and historical.
Reference: Boone '32

AIRFIELD LIGHTS. The term "Airfield" is comparable to Airport. While not exclusively employed in Europe it is much more common there than elsewhere. At least one military source in the U.S. does employ the term. Are Airfield Lights different from Airfield Lighting? There is a possible difference though in an operational sense they seem similar: both refer to an integrated group of lights at an airfield/airport.
References: PICA0 '44, Idman, Keller '92,

AIRFIELD LIGHTING. This term definitely refers to a group of integrated lights at an airfield/airport. Airfield Light may have the same meaning though it may also be more restricted in meaning. Terms including the word(s) "Airfield" represent near 10% of the total entries in surveyed literature; this specific term is about two-thirds of that figure.

References: NATO '91, Nav Fac Com '81, ADB, Thorn, Danaid

AIRFIELD LIGHTING SYSTEMS. This term is probably very similar to the previous term though the present of System makes it more explicit.
References: Latest Dev.'91, Nav Fac Com '81

AIRFIELD GROUND LIGHTING. This term is supplied by Cegelec. The reason for adding Ground is not given. Perhaps it is a more explicit form. It may possibly differentiate from terms referring to airborne aids.
Reference: Cegelec

AIRPORT LIGHTING. A general term that in some instances extends to flood-lighting and Obstruction/Obstacle Lights. The term presumably refers to a group of integrated lights at an airport. Airport Lighting is the most frequently cited term outside of Light/Lighting terms.
References: ITTE '62, Wood '40, Glidden '46, Godfrey, Warskow '50

AIRPORT LIGHTING AIDS. This term includes the word "Aids" which is pivotal to overarching Aero Navaid terms. Three sources employed it in literature surveyed. AIM '91 employs it as a very encompassing term while AIP '91 distinguishes it from Air Navigation and Obstruction Lighting. Douglas includes Approach and Runway Lightiing within the term.
References: NATO '92, AIM '91, AIP '91, Douglas '79

AIRPORT LIGHTING SYSTEMS. This term is similar to previous overarching terms. The addition of "System" makes more explicit the fact that Airport Lighting is an integrated system of Aids at a given site. Of the five sources employing the term three were manufacturers.
References: Omnipol, Glidden '46, G.E.

AIRPORT GROUND LIGHTING EQUIPMENT. One source, Cegelec, uses the term. It refers to physical apparatus.
Reference: Cegelec

AIRPORT LIGHTING EQUIPMENT. This term bears resemblance to Airport Ground Lighting Equipment. It is a general term that centers on physical apparatus. It resembles the previous term; two of the three users are manufacturers.
References: Leary '85, H & P '77, Omnipol

AIRPORT LIGHT PRODUCTS. Title of Crouse-Hinds catalogue but may qualify as a term indicating physical apparatus.

Reference: C-H '91

AIRPORT LIGHTS. This may refer to a single apparatus though probably it is employed at times as an integrative, systems term. PICA0 '44 employs both Airfield Lights and Airport Lights.

References: PICA0 '44, Keller '92

AERODROME LIGHTING SYSTEMS. Aerodrome is a common term in British English though rarely included in Air Navaid terms. This term from ADM '83 is seemingly equivalent to Airport Lighting Systems.

Reference: ADM '83

AERONAUTICAL GROUND LIGHT. This term is defined as any Light that serves specifically as an Aid to Air Navigation (excludes lights on aircraft).

Reference: AD '99

AERONAUTICAL GROUND LIGHTING. This term applies to all devices intended as Aids to Air Navigation that are external to aircraft.

Reference: NATO '92

AIRPORT & AIR NAVIGATION LIGHTING & MARKING AIDS. A lengthy term in PHAK that encompasses all forms of Visual Aids. It specifically refers to chart markings.

References: PHAK '71

AIRPORT LIGHTING FOR SMALL AIRPORTS. Overarching term for smaller operations and includes Wind Cone in Segmented Circle.

Reference: Warskow '50

AIRWAY LIGHTING. This is a seemingly general term and it not restricted to Airway Beacons.

Reference: Black '29

AIRWAY LIGHTING EQUIPMENT. This term refers to all forms of Lighted Aids.

Reference: Leary '85

AVIATION GROUND & SEADROME LIGHTING. A single term that encompasses the field through a double term rather than by the more common practice of a single term.

Reference: ATA '46

AVIATION GROUND LIGHTING. For IES '87 this term focusses on ground lights and excludes Obstruction Lights. However, NATO includes all forms in that title.

References: IES '87, NATO '92

AVIATION LIGHTING. This term and associated terms may suggest aircraft lighting. While it may include such lighting it has only limited uses for Aero Nav aids. The term as employed by one source encompasses aircraft lighting and Nav aids in three parts: airport, heliport, obstruction. That source includes all forms of T-M forms and hence the use of general terms. A second source uses it as a general term in a context of a discussion of optics and related issues.

Reference: IES '66, D & B '77

AVIATION LIGHTING EQUIPMENT. A term that focusses on physical apparatus and, appropriately, is the title of a catalogue of Crouse-Hinds.

Reference: C-H '62

AVIATION LIGHTING SYSTEMS. A source, a manufacturer employs this term as an overall term for its lighting products and engineering systems work.

Reference: ADB

FIELD-LIGHTING FOR AIRPORTS. This term is equivalent of Airport Lighting. Over the years IES has employed a variety of alternate terms including this term.

Reference: IES '47

FIXED LIGHTS. "A light having a constant luminous intensity when obscured from a fixed point."

References: AD '71, '91, '99, Lexicon '86, PICA0 '44

GROUND LIGHTING. For IES the term is a short form of Aviation Ground Lighting. For Harper it is possibly interchangeable with Airport/Aerodrome Lighting, Beacons.

References: Harper '38, IES '87

GROUND LIGHTING AIDS. ADM '83 employs this term to distinguish Air Nav aids from aircraft-based lights.

Reference: ADM '83

GROUND LIGHTING TO AID NAVIGATION. This term, from IES '72, is the equivalent of Airport Lighting.

Reference: IES '72

GROUND-POSITIONED LIGHTING. A questionable term: it is an aspect of older Glide Slope Indicator not an Aid in itself.
Reference: Cook '60

LANDING LIGHTS. This term possibly refers to aircraft landing lights or to aircraft based-lights (Potts). For Grief it is an historic term referring to flush or semi-flush Lights that denote landing direction..
Reference: Potts '94, Grief '79, NavAer '46

LIGHTING/MARKING/LIGHTING & MARKING. Sub-overarching term for Visual Aids.
Reference: Airports Served By '71

LIGHTING & MARKING SYSTEM. Finch offers a variant form by adding system to core term.
Reference: Finch '61

MARKING & LIGHTING/MARKING & LIGHTING SYSTEMS. The first term goes beyond scope of Lighted Aids though it apparently does not include all forms.
Reference: The Development of ... IB '53

NAVIGATION LIGHTING. This term is very broad in scope: road, rail, marine and aero forms are included.
Reference: Cayless '83

PASSIVE AIRPORT LIGHTING. This refers to reflectors not to actual lighting apparatus. A possible sub-overarching term.
Reference: Potts IJ '94

POWERED LIGHTING SYSTEMS. This term may provide a differentiation from the previous term.
Reference: Potts IJ '94

SIGNAL LIGHTS. Term possibly refers to ATC equipment.
Reference: Warskow '50

SIGNAL LIGHTING EQUIPMENT. Term refers to physical apparatus rather than to morphology.
Reference: IES '52

SYSTEM OF LIGHTS. Specific reference is to Taxiway Lights which includes Signs that are presumably lighted.
Reference: IES '66

VISUAL TRAFFIC CONTROL AIDS. This frequently employed term includes Taxiway Lights, Route Markings, Signal Lights.
Reference: Warskow '50.

1B5 Color & Other Messages

General Note. The Database primarily lists and describes terms of Transportation-Marking phenomena. These terms include physical, morphological and system terms. However, the messages produced by T-M phenomena remain a vital element in the process. This is particularly the case with color and its meanings. This segment will list colors in use and meanings: both general messages in T-M and variant meanings in T-M. This segment also includes historic color usage (colors and near current forms). A review of contemporary usage with a focus on FAA and ICAO practices is also included.

a) Colors

General Note I. Messages have been an integral part of the Database. Terms and meanings are the core of the Database and that includes messages and that which produces messages. The topic of messages can easily become a lengthy and complex phenomena that goes beyond the nature of the Database. Listing of terms, summary statement of messages is the realistic limit in this context.

Colors are listed in several groups: basic and major colors, more specialized colors, colors used in groups. Messages are presented in summary form only.

Visual messages pertain primarily to Chapter 1, Chapter 3. Visual and aural aspects of Radio Aid messages are considered in Chapter 2.

General Note II. Colors are formulated for specific uses. Color limits, for example, for railway Signals are at variance with those for aviation colors. The world aviation is sometimes added to core terms. However, only limited sources employ that version of terms.

1) Single Colors

YELLOW. The primary meaning of yellow is that of caution. This is true in most

modes of transportation. However, that is only partially true with Aero Nav aids. Yellow is employed in Beacons, Runway Lighting and other purposes where a cautionary message is not present (or at most is partial and implicit). Some purposes are clearly cautionary: Clearance Bar Lights, Holding Position/Runway Guard Lights.

References: FR Arcata 49, Mil Spec '63, NATO '92

AMBER. This term can be viewed as an adjunct of Yellow. It is difficult to describe it fully and easily. There is a discussion of the issues in Part F. Amber can be viewed as a less saturated Yellow hue. It appears in some historic usages and also in contemporary situations including some Final Approach Indicators. References: Clark '81, Segm Circle Airport Mk '63, C-H, G.E. Manairco, Glidden '46, Norvell AC '40, Sodium '39

BLUE/BLUE GLASS FILTER. This color has generally only limited uses in T-M. It is a secondary color in those modes where it does find use. It has been employed for Taxiway lighting since the 1930s. The addition of Taxiway Centerline Lighting (with Green and some use of Yellow) has diluted its role. References: IES '47, FR Arcata '49, Mil Spec '63, NavAeroDesign '46 (2nd)

RED. Red has a long-enduring meaning of danger or warning. Historically it carried that meaning into Aero Nav aids. However the significance of that meaning is lessened by selective use of Red in Approach Lighting (and in the partial usage of White for Obstruction Lighting). References: Caldwell '28 , Leary '85, Duke '27, CAA '41,

AVIATION RED. A more official (and precise) designation of the Red employed for Aero Nav aids. Reference: OML '70, Seaplane Bases '94

AVIATION GREEN. A more official, precise designation of the Green employed in Aero Nav aids. Reference: Seaplane Bases '94

AVIATION YELLOW. A more official, precise designation of the Yellow employed in Aero Nav aids. Reference: Seaplane Bases '94

RUBY GLASS/RUBY GLASS GLOBES. A historic term that can be seen as within the Red color spectrum. It was employed in Obstruction Lighting in the 1930s. References: Caldwell, The Lighting of ... AC '28

GREEN. Green at one time was a color of caution. It has become a readily-recognized message of clear/proceed/safety. That meaning is found in Aero Nav aids though somewhat muted. It is employed with Threshold, Runway Edge Lights where it portrays a proceed message. But that message is less present in Taxiway Centerline Lighting, various Beacons, some Final Approach Indicators. References: IES '52, Whitnah 66, Norvell AC '41, Sharp '44, Black '29, FR Arcata '49

WHITE. This color constitutes the most complex color and meaning situation among Aero Nav aid colors. Some sources of this color are incandescent light globes while other sources include xenon gas tubes which alters the hue. White was at one time a clear or proceed indication (in Railway Signals). It no longer has that meaning for general use in T-M. White can have various meanings depending on the situation. References: Cayless '83, St John Sprigg '34, Finch '38, Mil Spec '63

AVIATION WHITE. A more precise, official designation employed for Aero Nav aids. Reference: OML '91, H.I. '73

AVIATION VARIABLE WHITE/VARIABLE INTENSITY WHITE/VARIABLE WHITE/ VARIABLE-WHITE. These terms refer to white that is produced by various means including xenon flashtubes. References: ADS '51, IES '81

WHITE HOT/BRIGHT WHITE. These descriptive terms apply to strobe beacons in an early or earlier state of development. They probably lacked a formal, official clear standing. Reference: Christian AW '56

WHITE (NATURAL SUNLIGHT). Term refers to color produced by Strobe Lamp. Reference: Sola Basic

CLEAR/CLEAR GLOBES/CLEAR PRISMATIC GLOBES/CLEAR LENS. Clear can be employed to designate White. Clear Globes and Clear Prismatic Globes refer to physical dimension of light emissions where color filters are absent. References: Glidden '46, NavFacCom AFL '81, ATA '46, Specs SF '75

CLEAR (WHITE) LIGHTS/CLEAR WHITE./WHITE (CLEAR)/CLEAR

LIGHT. Designations that bring together two key elements for color: White and Clear.

References: Mil Spec (1st, 3rd), Multi Electric (2nd), Krooger AW '48

BLUISH WHITE.

Reference: Toshiba

2) Color Combinations

General Note. Two or more colors can be employed together. Uses and meanings can be complex. For example, Final Approach Indicators may use red and white to denote aircraft is on glidepath, above, below. Red and white with Threshold Lights can denote approach direction (white) and red for wrong direction. Individual entries in Database may indicate actual color usage.

Principal color combinations are:

White/Green
White/Yellow
Red/Yellow
Red/White
Red/Green
Clear/Green
Yellow/Red
Green/Yellow

Day Color Usage:

General Note: Signs and Markings color usage partially mirror night uses. Colors are included in entries. White is a significant color for surface markings. Yellow and Black are common combinations in colors for Signs. Older sources frequently refer to Chrome-Yellow. Black is sometimes referred to as Dull Black or Dead Black. Orange and permutations are employed in Obstruction Markings.

INTERNATIONAL ORANGE. References: Norvell AC '40, Sharp '44, Godfrey ORANGE. References: IES '81, AD '90

AVIATION ORANGE. References: IES '81, OML '73, '91

BLACK/YELLOW. Reference: Komons '78

BLACK/CHROME-YELLOW. Reference: Whitnah '66

CHROME-YELLOW/DEAD BLACK. Reference: Black '29

CHROME-YELLOW/BLACK. Reference: Young '28

CHROME-YELLOW/DULL BLACK. Reference: Air Marking AC '27

b) Historic Uses

General Note. These uses are for the most part at variance with current practices. In most instances the type of Light is no longer employed.

BOUNDARY LIGHTS. Boundary Lights employed the color White for outlining the landing area.

Reference Glidden '46, Wood '40, AD '51, CAA '41

RANGE LIGHTS/RANGE-LIGHTS. These Lights were Green in color. They denoted the best approaches for landing. Range Lights were inserted in Boundary Lights apparatus.

Reference: CAA '41, AD '58

c) Contemporary Usages

General Note. These terms with colors and meanings are extrapolated from appropriate categories in Database. Further details, including references, are in those categories.

APPROACH LIGHTING

MEDIUM INTENSITY. White, steady burning lights in light bar configurations. They may include sequenced flashing lights.

HIGH INTENSITY. Steady-burning white lights augmented by red steady-burning lamps. Sequenced flashing lights are also present.

BEACONS

General Note. Beacons for airports, heliports identify those installations. Colors and meanings do not cohere closely with established meanings of those colors. Sources for color meanings are mostly from FAA, ICAO.

White and Green: Lighted land airports (can be green alone)

White and Yellow: Lighted water airports (can be yellow alone)

Green, Yellow, White: Heliports (ICAO: white only)

These lights are flashing rather than steady-burning.

FINAL APPROACH LIGHTING.

General Note. This is the most complex aspect of messages. Part G devotes several pages to this topic. The following remarks offers a brief overview.

VASI. Color coding is primary with white denoting above approach level, red and white on approach, and red only below the correct level.

T-VASIS. Pattern coding is primary and color coding is secondary. "T" in various permutations are displayed in white. Far below approach results in red

"T". This is termed the "gross undershoot signal."

PAPI. Two R/Two W on; Increasingly W denotes degrees above; R below.

PLASI. Steady W on; Steady R well below; increasing pulse denotes degree of deviation.

TRI-COLOR SYSTEM. Amber above, Green on, Red below.

OBSTRUCTION LIGHTING

Historically flashing and steady-burning red lights have been employed. Newer forms include strobe lights that can be white in color rather than red..

Runway & Taxiway Lighting

TAXIWAY LIGHTING. Blue has been historically associated with Taxiway Lighting. The addition of Taxiway Centerline Lighting has changed that perception: Green -- not Blue -- is employed for that purpose. Alternating green and yellow lights are employed at Taxiway Intersections. Those Green lights are flashing while Yellow Lights are steady-burning (or fixed) lights.

CLEARANCE BARS AND RUNWAY GUARD LIGHTS. These both employ yellow and in a cautionary manner. Clearance Bar Lights are steady-burning while Runway Guard Lights are flashing.

STOP BAR LIGHTS. These lights control runway incursions. They display steady-burning red lights which are both in in-pavement and elevated forms.

RUNWAY CENTERLINE LIGHTING. These are white, steady-burning lights. However, lower end lights are alternating red and white; lowest end lights red only.

TOUCHDOWN ZONE LIGHTING. These are white, steady-burning white lights. They are arranged in two rows of transverse light bars.

TAXIWAY LEAD-OFF LIGHTS. These appear to correspond to Taxiway Exit Lights of ICAO. They too display green and yellow alternating lights.

LAND & HOLD SHORT LIGHTS. These lights found at hold short point display pulsing white lights.

RUNWAY EDGE LIGHTS. These lights are steady-burning white lights. On instrument runways the last 2000 feet are in yellow. A possible cautionary message is suggested by this usage.



RUNWAY END LIGHTS/ THRESHOLD LIGHTS. These are separate Aids according to function but often occupy reverse sides of the same fixture. Runway End Lights are red and denote end of the runway and have a traditional meaning of danger, hazard. Threshold Lights are green in color and have a proceed, clear message.

1C Beacons and Obstructing Lighting

General Note. Beacons and Obstruction Lighting are sufficiently different from other forms of Visual Aero Nav aids to constitute a separate category. Both are often stand-alone forms rather than groups of Lights. Obstruction Lighting, though a relatively small group, is too large and significant to be placed in a catch-all miscellaneous group. Many Obstruction Lights are of the beacon form and are therefore closely related to the former category. This coverage is divided into Overarching, Physical, Morphological, Miscellaneous, and Obstruction forms.

1C1 Overarching Terms

BEACONS.

General Note I. The term Beacon is a basic term for many forms of T-M. It has special significance in marine and aero forms. Lighted forms can be divided into Signal and Beacon forms. The former having changing messages; the later unchanging messages even if complex. The term Beacon has multiple and even confusing uses in Aero safety aids. It can be a sub-overarching term. It can be a short form of many more explicit terms. This coverage takes a general character and presents a welter of meanings.

General Note II. The most common meanings are those of Airport Beacons and Airway Beacons. In an earlier era of aviation many routes were marked by Airway Beacons or Beacons. These were sometimes viewed as an aero and land form of the marine lighthouse. Some European nations employed the term Aerial Lighthouse (sometimes abbreviated to Beacon).

Obstruction or Hazard Lights or Beacons are not infrequently listed as Beacons. The various uses often center on a powerful light that flashes or rotates/revolves surmounting a tower or other distinctive elevation.

FAA employs Beacon as a virtual sub-overarching term. It is increasingly employed as the basic term with various uses subsumed within it.

PICAO '44 offers a definition of Beacon which continues to have significance: the Beacon is a light that can be seen at all azimuths. This visibility can be achieved through optics or motion. The light denotes a specific point. Types of Beacons include Airfield Beacon, Airway Beacons, Auxiliary Beacons, Code Beacons, Hazard Beacons, Oscillating Beacon, Rotating Beacons.
References: PICAO '44, Blee '29, Norvell AC '41, Whitnah '66, Ap L Eq '89 among many sources.

AERODROME BEACON. Aid denotes location of Aerodrome. British English employs aerodrome instead of airport.
Reference: Lexicon '85, AD '99, ADM '93

AERONAUTICAL BEACON. Only ICAO includes this term (Though AIP has a similar term). It seems to be an overarching term for Aids denoting a specific geographical point. Beacon for ICAO expands on the shorter definition of Aeronautical Beacon.
References: AD '51, '71

AERONAUTICAL LIGHT BEACON. A generic term for all forms of Beacons in aviation service: airport, heliport, landmark, airways, obstructions. Meaning denoted by color(s) employed. Seemingly a single source uses the term.
Reference: AIP '99

AIR BEACON. Possibly another term for Aerial Lighthouse. It is a historic term.
Reference: Finch '38

AVIATION BEACON. An infrequently used term employed by Crouse-Hind '54 appears to encompass many forms of Beacons including those for airports, airways, hazard beacons.
References: C-H '54

BEACON, HIGH INTENSITY. This term may have a specific meaning rather than act as an overarching term; however, C-H offers few details.
Reference: C-H '54

BEACON LIGHT. This term appears to be an informal, descriptive term for one or more types of Beacons including Airway, Airport and Route Beacons.
References: CAA '47, CAA '45, Black '29, Duke '27

LIGHT BEACON. Do inversions of the words "Light" and "Beacon" alter the meaning? This is possible though this supposition is not certain. Most references are to Airway Beacon though the term seems to include other uses.
References: CAA '45, Black '29, Taylor '48

1C2 Physical Apparatus

a) Method of Operation-Related Terms

AIRPORT 36" ROTATING BEACON. The word Airport is added to basic term which is at variance with common practice.
Reference: St. Specs '59

ROTATING BEACON. The type of operation (rotating light apparatus) is incorporated in the title. Rotating Beacon is a primary term that includes various functions such as Airport and Airway Beacons.
References: CAA '45, ADS-Site '80, Black '29, Komons '78, Warskow '50

FLASHING BEACON. This form of Beacon is less often employed than Rotating Beacon. In this form the light apparatus mechanism interrupts the passage of light energy creating the desired number of flashes in a given period of time. Flashing Beacons include Airport Beacon, Airway Beacon among various Beacon types.
References: Solberg '79, Glidden '46, CAA '45

ROTATING BEACON FOR SMALL AIRPORTS. A single source supplies this term. The inner apparatus revolves though not the entire mechanism. It may be an obsolete term.
Reference: GE '66

ROTATING ELECTRIC BEACON. This term refers to an Airway Beacon. Only one surveyed source included it though it seems of sufficiently general character to be found elsewhere in the literature.
Reference: Komons '78

ROTATING LIGHT BEACON. This term which also refers to an Airway Beacon. The term has potential for broader use.
Reference: Komons '78

REVOLVING BEACON. The term Revolving Beacon is probably identical in meaning to Rotating though only infrequently employed; most uses are historical. One source refers simply to Airway Beacons while a second designates Airway Beacons with Revolving Beacon. CAA '45 divides Airway Beacons into Flashing and Revolving forms.
References: CAA '45, Duke '27, Davies '72, P & B '88

OSCILLATING BEACON. PICA0 along includes this term. The nature of the characteristic is that of an undulating beam. This is achieved by "periodic motion of the light source near the focal point of the optic."
Reference: PICA0 '44

b) Dimension-Related Terms

General Note. Many forms of Beacons include the diameter of the Beacon in the title. This is a practice more of the past than in the present. Intensity and light source are now more significant. In many instances the terms refer to a specific function so the terms can also be viewed as morphological. These entries are very terse except when longer explanation is needed.

10-INCH ROTATING BEACON
Reference: ADS-Site '80

18-INCH BEACON. This Beacon is of smaller size than many forms. It is a historic reference to emergency fields Beacons of the 1920s.
Reference: Davies '72

24-INCH AIRWAY BEACON. Variant term which includes function of Beacon in title.
Reference: Breckenridge '55

24-INCH BEACON/TWENTY-FOUR-INCH BEACON/24-INCH-DIAMETER BEACON/TWENTY-FOUR-INCH BEACON. These are largely historic in character and refer to airport, airway or emergency field functions.
References: Duke '27, Glidden '46, Black '29, Leary '85

TWENTY-FOUR-INCH DOUBLE-END ROTATING BEACON. Many traditional Airport Beacons were double-ended with fresnel lenses. Only rare terms include that information in the title. This version consists of two single-end units back to back. The term is subsumed under Airport Beacon for CAA.
Reference: CAA '47

24-INCH ROTATING BEACON. Most of these Beacon forms rotate though only rarely is the fact of rotating incorporated into the title.
Reference: Black '29, Duke '27

24-INCH DOME/ 24-INCH DOUBLE END/36-INCH DOUBLE END/24-INCH SINGLE END. Model of Rotating Beacon described by diameter and number of ends.
Reference: CAA '53

ROTATING 24-INCH BEACON
Reference: IES '72

BEACON, 36-INCH ROTATING BEACON. An alternate term that is of a more bureaucratic configuration.
Reference: Ap L Eq '66

BEACON, 36-INCH, DOUBLE-END TYPE. A bureaucratic term for the 36-inch Double-End Beacon.
Reference: CAA '48

CAA-291 36-INCH ROTATING BEACON. A fuller form of the basic title that includes the specification designation as part of the title.
Reference: GE '66

FOUR-BEAM 24-INCH BEACON. Is this a formal name or a descriptive term?
Reference: Breckenridge '55

36-INCH BEACON. This term appears to refer to floodlights as well as Airport Beacon usage.
Reference: Davies '72

36-INCH DOUBLE END, ROTATING BEACON/36-INCH DOUBLE-END ROTATING BEACON. These terms are variants of the basic term. The first variation is from CAA. While the second variant is supplied by Westinghouse (formerly a major Navaid supplier).
Reference: Westinghouse, CAA '41

36-INCH ROTATING BEACON. A basic term for an essential Airport Beacon. This title is employed by several manufacturers.
Reference: Westinghouse

36 " ROTATING BEACON. This form conforms to Beacon, 36-inch Double-end Type.
Reference: CAA '48

36-INCH REVOLVING BEACON. This Aid is located at landing fields of the airway system. Not a formal title but, instead, it is a descriptive term. The source describes the Beacon as a "36-inch, 500,000 candle-power revolving beacon."
Reference: Davies '72

THIRTY-SIX-INCH SPHERICAL ROTATING BEACON. This represents one form of Airport Beacon. Also referred to as Dome Beacon.
Reference: CAA '53

DOUBLE-ENDED 36-INCH DIAMETER BEACON. One of two forms of Airport Beacon.
Reference: Glidden '46

DCB 36-INCH ROTATING BEACON/DCB ROTATING BEACON/DCB ROTATING -10 BEACON. These terms refer to product designations.
Reference: GE '66

c) Energy Source-Related Terms

General Note. Older forms of Aero Nav aids, certainly Beacon forms, included the energy source in the title. The following entries are terse since the morphological dimension is the primary description.

ACETYLENE BEACON. Reference is to Airway Beacon.
Reference: Leary '85

ACETYLENE GAS BEACON
Reference: Whitnah '66

ELECTRIC BEACON. Both references refer to Airway Beacons.
References: Komons '78, Whitnah '66.

ELECTRIC BEACON LIGHT
Reference: Flight '71

ELECTRIC LIGHT BEACON. A historic term that refers to Airway Beacons.
Reference: Komons '78

FLASHING GAS BEACON. Davies refers to Airway Beacons with this term.
Reference: Davies '72

GAS BEACON. Historic term that refers to Airway Beacon.
Reference: Komons '78

GAS FLASHING-BEACON/GAS-FLASHING BEACON. Both terms refer to Airway Beacons where electricity is not available.
Reference: Duke '27

1C3 Morphological Terms

a) Airport Beacons

1) Airfield & Airport Beacons

General Note. Airport Beacons is employed as an overarching term for Lighted Aids found largely at airports; they are in use also at heliports, and sea plane bases. The term also includes Identification and Code Beacons which may not always be located at airports.

AERODROME IDENTIFICATION BEACON. Term comparable to Airport Identification Beacon.
Reference: P & B '88

AERONAUTICAL BEACON LIGHT. Terms refers to Airport Beacons; also Auxiliary Beacons, Course-Lights. Historical term.
Reference: Blee '29

AIRFIELD BEACON. Some sources employ airfield instead of airport or aerodrome. The terms appear to be interchangeable. An Airfield Beacon is the same as an Airport Beacon.
Reference: PICA0 '44

AIRPORT/HELIPORT BEACONS. Overarching term for two forms of Beacons.
Reference: AIM '99

AIRPORT IDENTIFICATION BEACON. Current FAA term. The flash rate consists of "6-8 words per minute." A word is the 3 or 4 alphanumeric identifier (in Morse Code). The flashes are in green. Corresponds to Code Beacon.
Reference: Spec for Airport & Heliport Beacon '84

AIRPORT (LAND) BEACON/AIRPORT (WATER) BEACON. The CAA in describing Code Beacons speaks of Airport Beacons as being of land or water forms.
Reference: CAA '42

ALT GREEN/WHITE BEACON//ALT YELLOW/WHITE BEACON. ADM '93 denotes Land, Water Airport/Aerodrome Beacons by color and arrangement of color.
Reference: ADM '93

CIVIL AIRPORT LIGHT BEACON. FAA distinguishes between civil and military forms. There are high intensity and medium intensity forms.

Reference: Spec for Airport & Heliport Beacon '84

MEDIUM INTENSITY AIRPORT BEACON. FAA distinguishes between Medium Intensity and High Intensity. The light has alternating green and white flashes; 24-30 fpm.
Reference: Spec for Airport & Heliport Beacon '84

ROTATING SEARCHLIGHT BEACON. Term refers to physical apparatus Airport Beacon.
Reference: Blee '29

2) Code Beacons

CODE BEACONS. This Beacon identifies Airports and Landmarks. The Beacon emits coded messages in Morse Code. The term has also identified Airway Beacons. The Beacon is a long-enduring Aid consisting of fresnel lenses of a stationary nature with flashing messages. It is also a physical entity and finds other uses including Airport Beacons and Hazard Beacons. In some situations it marked airports when the actual Airport Beacon was away from the airport.
References: CAA '41, CAA '58, AIM '99, AIP '99

AIRPORT CODE BEACON. A fuller, more explicit title though Code Beacon remains the basic form has a more restricted meaning since it pertains only to airports.
Reference: CAA '41

AIRPORT ROTATING BEACON. This is the full title for FAA-approved Airport Beacons found in older sources. Newer sources refer simply to Beacon which can be either rotating or flashing. This Beacon is some times divided into 10 and 36 inch diameter sizes.
References: ADS-Site '73, Airport Design '89

AUXILIARY AIRPORT BEACON. Norvell so describes this Beacon that it appears to be a Code Beacon.
Reference: Norvell AC '41

AUXILIARY BEACON. PICA0 refers to an Auxiliary Beacon as one employed in conjunction with a primary Beacon so that it completes the message of that beacon This is possibly a Code Beacon.
Reference: PICA0 '44

AUXILIARY CODE BEACON. CAA '41 speaks of this as a Flashing, Auxiliary

Beacon, and Code Beacon in addition to Auxiliary Code Beacon. It is auxiliary to the Airport Beacon. In some instances the Airport Beacon is away from the airport and the Code Beacon is added at the airport. In other cases both are found at an airport. It display green and coded flashes.
Reference: CAA '41

AUXILIARY AIRPORT CODE BEACON. Westinghouse supplements the term by adding the location of the Code Beacon to the title.
Reference: Westinghouse

AUXILIARY GREEN CODE BEACON. Sharp '44 includes the color in the title. This version of Code Beacon marks an airport when the Airport Beacon is more than 1.25 miles from the airport.
Reference: Sharp '44

ELECTRIC CODE BEACON. This term from CAA suggests there are multiple energy source by including energy souce in title.
Reference: CAA '53

FLASHING CODE BEACON/FLASHING-CODE BEACON. CAA refers to one Obstruction Light by this title. Other Code Beacons also flash but this form is within the context of Obstruction Lighting. Glidden adds a hyphenated form which refers to Code Beacon employed at airport when the Airport Beacon is away from the airport.
Reference: CAA '53, Glidden '46

FLASHING GREEN BEACON. IES adds the color to the title of this term which appears to be a Code Beacon.
Reference: IES '66

IDENTIFICATION BEACON. This term can refer to more than a single function. A primary function is to identify an airport. It is similar in appearance to the old Code Beacon apparatus. Lexicon '85 notes that the Beacon displays a coded message for identification of "point of reference."
Reference: Thom, NATO '92, Lexicon '85

IDENTIFICATION (CODE) BEACON/IDENTIFICATION CODE BEACON. Both terms add the function of identification to the title. Both tend toward historic usage. Sharp places Identification Beacon within Airport Beacon category. Term refers to Code Beacon employed as Identification Beacon for Airport. It is so utilized when an additional airport nearby.
Reference: Sharp '44, IES '47

LONG RANGE BEACON. An historic term that refers to Airport Beacon.
Reference: Black '29

ROTATING AIRPORT BEACON. Alternate form of Airport Rotating Beacon. The term appears in somewhat older FAA sources.
Reference: Airport Design '73

ROTATING BEACON FOR SMALL AIRPORTS/AIRPORT ROTATING BEACON FOR SMALL AIRPORTS. Both terms refer to reduced sized Beacon for less complex levels of aviation. The GE form had an inner rotating apparatus while larger unit remained stationary.
References: CAA '48, GE '66

b) Airway Beacons

ACETYLENE GAS BLINKER. Colloquial term of Art Johnson. Seemingly a term for Route or Routing Beacon. Such Beacons are spaced three miles apart.
Reference: Johnson '71

AIRWAY BEACON. Airway Beacons marked air routes for many years. This was formerly a major Air Navaid. Only remnants remain because of the use of Radio Aids. Airway Beacons often had the form of Rotating Beacons though the Code Beacon form has also been employed.
References: CAA '42, PICA0 '44

AIR-WAY BEACON. A slight alteration of the basic term.
Reference: Finch '38

AIRWAY BEACON LIGHT. A permutation of Airway Light Beacon. Employed by one surveyed source.
Reference: Finch '38

AIRWAY LIGHT BEACON. This term is a more explicit form of the basic term. It was employed by CAA in some publications. CAA describes the function of the Beacon as one of providing "Visual Directional Guidance."
References: CAA '58, CAA '63

AIR-ROUTE BEACON. This is the equivalent of an Airway Beacon.
Reference: Caldwell '30

AUTOMATIC ROUTING BEACON. This version of the Routing Beacon was clock regulated and lacked a caretaker.
Reference: Air Mail Service '26

AUXILIARY BLINKER LIGHT. This term appears to approximate Route or Routing Beacons. Such lights were placed three miles apart on early air routes.
Reference: Finch '38

AVIATION ROUTING BEACON. These are small Beacons set three miles apart.
Reference: Night Mail '33

COURSE LIGHT/COURSE-LIGHT. These Aids are associated with the Lighted Airway System. Two such Lights indicate airway course in each direction. Blee and Breckenridge '55 offer a hyphenated version.
References: AIM '99, Johnson '71, Blee '29, Breckenridge '55

ELECTRIC ROUTING BEACON. A form that incorporates the energy source in the title.
Reference: Leary '85

EN ROUTE BEACON. Term from Art Johnson. He describes the term as referring to Airway Beacons in both 18" and 24" models.
Reference: Johnson '71

GAS ROUTING BEACON. A second form that includes the energy source in the title. No caretaker for this form. Gas supply could last four months.
Reference: Leary '85, Air Mail Service '26

LIGHTED AIRWAYS. This is perhaps a debateable term. It refers more to airways that are lighted than the Lighted Aids marking the airway routes.
Reference: Breckenridge '55

ROUTE BEACON. Route Beacon and variant terms were often employed for early Airway Beacons. Black offers few details on this Beacon which is seemingly an Airway Beacon.
Reference: Black '29

ROUTING BEACON. For Glidden this constitutes an Airport Beacon. The meaning of the term for other sources is not clear though Route and Routing Beacons frequently function as Airway Beacons.
References: Glidden '46, Leary '85,

SPERRY AIRWAYS BEACON. The manufacturer's name is included in the title.
Reference: Black '29

c) Heliport Beacons & Other Forms

HELIPORT BEACON. This is the equivalent of the Airport Beacon except that it is for heliports. It emits a message of alternating green, yellow and white flashes.
References: IES '81, ADB

HELIPORT IDENTIFICATION BEACON. This term is akin to the Airport Identification Beacon and related to Code Beacon.
References: HD '77, HD '94, AD '95

HIGH INTENSITY HELIPORT BEACON/MEDIUM INTENSITY HELIPORT BEACON. FAA provides lower and higher cp versions. They present messages of green, yellow, white flashes at the rate of 30-45 fpm.
References: Specs for Airport & Heliport Beacons '84

HELIPORT ROTATING BEACON. ADB presents this variant title. ADB describes it as both an identification and location aid. Heliport Beacon has the same meaning for ADB.
Reference: ADB

IDENTIFICATION BEACON FOR HELIPORT USE. An alternate title provided by a maker of Air Nav aids. It has three heads or light units and revolves 12 rpm which translates into 36 fpm
Reference: Manairco

REVOLVING PROJECTOR TYPE OF BEACON. More a description than a formal name. It is employed for airway routes and emergency fields.
Reference: Air Mail Service '26

ROTATING HELIPORT BEACON. For C-H this apparently has the meaning of Heliport Identification Beacon
Reference: C-H '91

SEAPLANE BASE IDENTIFICATION BEACON. The equivalent of Code Beacon. It emits a message in yellow with 6-8 alphanumeric words or characters per minute.
Reference: Specs for Airport & Heliport Beacons '84

SEAPLANE BASE LIGHT BEACON. Term refers to a Beacon that identifies

Seaplane Base. It is a variant form of Airport and Heliport Beacon category.
References: Specs for Airport & Heliport Beacons '84, HD '94

HIGH INTENSITY SEAPLANE BASE BEACON/MEDIUM INTENSITY SEAPLANE BASE BEACON. Both forms emit alternate white and yellow messages 24-30 fpm. The high intensity has a 75000 cp intensity while the medium form has 50000 cp.
Reference: Spec for Airport & Heliport Beacons '84

STOLPORT BEACON. Aid under development in 1970. Outcome of that development is unknown.
Reference: Planning & Design '70

1C4 Miscellaneous Forms & Support Structures

a) Miscellaneous Forms

APPROACH LIGHT BEACON. ICAO employs Beacon rather than Light for this strobe light apparatus. It has white flashes at a rate of 60 fpm.
Reference: AD '71, Lexicon '86

B.B.T. FLASHING-BEACON. A historic term with few details available. Term includes maker's name of the Beacon. It has a 25 mile range and can display Morse Code messages.
Reference: Duke '27

CLUSTER BEACON. A historic term. It consisted of four lower cp lamps clustered together to form one unit. Lamps are of automobile type and the Beacon is a GE product. It was employed as an Airway Beacon.
Reference: Duke '27

FLICKERING BEACON. This term may suggest a faltering light apparatus. However, it is employed by CAA'45 for Approach Lighting. It may indicate a strobe lamp with very rapid flashes.
Reference: CAA '45

INCANDESCENT BEACON. This is more of a description than an official title. It refers to early Beacons at emergency fields.
Reference: Leary '85, Night Mail '33

LANDMARK BEACON. This term is from PICA0 and is possibly a type of Airway Beacon. It aids the navigator in determining position.

Reference: PICA0 '44

SOLAR POWERED BEACON. This is a reference to REILS powered by solar energy. Beacon rather than Light is included in the title.
Reference: Potts LJ '94

b) Support Structures

General Note. Most references in the literature are to light apparatus and few are to the supporting structures. A limited number of sources, however, provide mention of towers for Beacons. The following brief listing suggests the kinds of supports in use.

51' AIRPORT BEACON TOWER. Reference: National Airport Equipment

BEACON TOWER. FAA includes several forms:
PREFAB TOWER STRUCTURE,
STRUCTURAL STEEL TOWER,
TUBULAR STEEL TOWER,
DOUBLE WOOD POLE TOWER
Reference: Airport Misc. Lighting Visual Aids '71, G.E. (1st)

TUBULAR TOWER/TUBULAR BEACON TOWER/TUBULAR STEEL
AIRPORT BEACON TOWER
Reference: Airport 51-Ft Tubular Bn Twr

AIRPORT BEACON TOWER
Reference: Meyer Machine

TOWER, AERIAL NAVIGATION BEACON
Reference: CAA '48

1C5 Obstruction Lighting

General Note I. While there are a diversity of terms for Obstruction Lighting, this segment of Nav aids is a cohesive, integrated unit. Historically such lighting was red in color which closely adhered to the meaning of red for danger or warning. Historically as well those Obstruction aids that rotated or flashed were termed Beacons while smaller, simpler units were termed Lights. More recently the line seems to have blurred as newer forms of lights have been introduced. Red is no longer exclusively the color employed. Increasingly strobe lights of white or blue-

white have been employed.

General Note II. The term Light or Lighting is only infrequently employed in this category. Beacon or light accompanied by a more specific term (for example, hazard, obstruction, etc) are more common. However, Obstruction Lighting remains in use and is the overarching term for this category. Obstruction is the qualifying word most often employed. Hazard and obstacle are also used though less frequently. A final term, 300 mm, is often found in Obstruction Lighting. Fresnel Beacons for Code, Identification and Hazard Beacons all employ 300mm Beacons. These Beacons continue in use.

General Note III. To a partial degree Beacon and Light can provide differentiation for this form of Navaid. However, to an increasing degree the differentiation breaks down. Light is employed to a greater degree though Beacon is still in use. Strobe apparatus are often referred to as Lights and they are more powerful than Beacons and at times replacements for Beacons. Beacons are a major category though few forms use the single, core term.

a) Overarching Terms

AIRPORT HAZARD BEACON. Term employed by St Spec '59 though few details. Term seemingly refers to Hazard Beacon at Airports though not in general use.
Reference: St. Specs '59

HAZARD BEACON. This can be an overarching term but some sources referring to Hazard Beacon mean Code Beacon, 300 mm Beacon.
References: NATO '92, Toshiba [Cross-Reference]

HAZARD LIGHT. Seemingly a synonym for Obstruction Lighting. Hazard Beacon can have a more specific meaning.
Reference: Finch '61

HAZARD WARNING BEACON. This is seemingly an overarching term though Cayless specifically refers to a High Intensity White Neon Lamp.
Reference: Cayless '83

OBSTRUCTION LIGHTING. This is the basic term for this form of Navaid and is an encompassing term for the field.
References: OML '91, IES '72

OBSTRUCTION IDENTIFICATION. Overarching term for Obstruction Marking

and Lighting. The term in itself may not be an Aid though it encompasses Aids.
Reference: IES '81

OBSTRUCTION LIGHTS. A term of elastic meaning. It can be an overarching term yet not infrequently it denotes simple steady-burning lights of red hue that represent the basic level of Obstruction Lighting. The term can be used in a general, imprecise manner while at others times it is employed to specifically mean simple Lights.
References: IES '72, A & W '92, Sharp '44, CAA '41, CD '78, D & B '77

OBSTRUCTION MARKER LIGHTING. A subsystem of Emergency Airport Lighting System (EALS). Equivalent of Obstruction Lighting.
Reference: EALS '99

OBSTACLE LIGHT. This is the primary term for ICAO. This term encompasses Low-Intensity (LI) Obstacle Light, Medium-Intensity (MI) Obstacle Light, High Intensity (HI) Obstacle Lights. L-I are fixed (steady-burning) red lights, M-I are red flashing, H-I are flashing white (some M-I may be white, when associated with H-I).
Reference: AD '90, '99, Lexicon '86, Air Corps News Letter '36

OBSTRUCTION MARKING & LIGHTING. A overarching term that encompasses all visual forms. It also serves as a publication title.
References: Ben & Lux AIP, OML

TOWER & OBSTRUCTION LIGHTING/TOWER OBSTRUCTION LIGHTING. H & P publication title. It can serve as a possible overarching term. H & P distinguishes between actual Obstructions (Hazards?) and Towers though both are obstructions. Second term does not appear to be a possible overarching term though also from H & P and included here.
Reference: H & P '94, Nat Airport Equipment

RED DANGER LIGHT. A historic term that can be an overarching term. It dates back to 1927. The term incorporates the color and the traditional meaning of red in the title.
Reference: Duke '27

b) Beacons

ANTICOLLISION BEACON. Term contributed by ILC. A descriptive or possibly company term for the High Intensity Strobe Obstruction Light.
Reference: ILC

BEACON, 300mm HAZARD/300mm BEACON (OBSTRUCTION)/300mm HAZARD BEACON/300-mm HAZARD BEACON/300mm BEACON/300mm Hazard Beacon (RED). All of these are forms of Code Beacon which see. They employ Fresnel lenses and are of a flashing character. They display red messages. References: Ap L Eq '76 , OML '73, CAN DOT, Westinghouse, H & P

There are other terms closely allied to the above terms:

RED BEACON (OBSTRUCTION). This is a 300 mm Beacon. It presents a shorter form of basic name but within obstruction category. Reference: OML '91

FLASHING BEACON. Shorter form of Flashing Omnidirectional Beacon which is a 300 mm Code Beacon in hazard mode. Reference: FAA OML '91

FLASHING HAZARD BEACON/FLASHING RED HAZARD BEACON. Reference: C-H '79

FLASHING, OMNIDIRECTIONAL BEACON. See also Red Beacon, Flashing Beacon, Flashing Omnidirectional Beacons. Reference:

LIGHT, NAVIGATIONAL, BEACON, OBSTACLE OR CODE. See also next entry. Reference: Mil Specs '83

OBSTACLE BEACON. A term from U.S. Military Specs. According to C-H it is the equivalent of Light, Obstruction, Medium Intensity (FAA). See also: Obstacle Light. References: C-H '91 (reprint of U.S. Mil Specs)

OBSTRUCTION STROBE BEACON. See Also: Obstruction Strobe Light. Reference: H & P '94

ROTATING BEACONS. CAA's OML for 1953 included three Beacons for Obstruction Lighting. The Beacons were also employed for other purposes. The Beacons were: Beacon, 36-inch, Rotating, Double End Type, Beacons, 24-inch, Rotating Drum Type, Lamp Assembly -24-inch Rigid Drum Type Rotating Beacon.

Reference: CAA '53

ROTATING 24-INCH BEACONS. IES '72 includes this Beacon in its Obstruction Lighting mode. This Beacon has been employed as well for airport and airway uses. The term in itself refers to physical apparatus. Reference: IES '72

300-MILIMETER FRESNEL LENSED, OBSTACLE OR CODE BEACON NAVIGATION LIGHT. This is, obviously, a government and military term. The title offers a comprehensive descriptive of physical apparatus and morphological dimension include obstructing marking. Reference: Mil Spec '83

300 mm CODE BEACON/FLASHING CODE BEACON/300 mm CODE & HAZARD BEACON. The first two terms refer to obstruction marking in this context. The third term is a category of lights for Westinghouse that includes the core Code Beacon, and a variant form employ for Hazard Beacons. References: H & P '94 (L), CAA '53 (C), Westinghouse (R).

c) Obstruction Lights-Incandescent & MiscellaneousForms

AVIATION RED OBSTRUCTION LIGHT. Term is either a formal name that includes color in title, or a more descriptive appellation that may not be an actual title. Reference: IES '81

DOUBLE & SINGLE OBSTRUCTION LIGHTS. A sub-overarching term that brings together both forms of Steady-burning Obstruction Lights. Reference: CAA '53

DOUBLE OBSTRUCTION LIGHT. This term usually refers to a simple Light, Steady-burning with cover/lens. Obstruction Light by itself can suggest a broader range of Light forms. Reference: H & P '94

FIELD OBSTRUCTION LIGHT. Obstruction Lights at early airfields. Seemingly its role was to denote location. A descriptive term rather than a form alone. Reference: Whitnah '66

LOW INTENSITY OBSTRUCTION LIGHT. Possibly a descriptive title more than one that is an official, formal title. It conforms to the steady burning basic

level light.
Reference: IES '72

NEON OBSTRUCTION LIGHTING. A Steady Burning and Low Intensity Aid. It qualifies as Red Light for ICAO. There are both single and double forms.
Reference: H & P '94

OBSTRUCTION MARKER LIGHT. This is probably the equivalent of Obstruction Light. But only limited details available. From AMA Private, LTD.
Reference: Momberger AF '86

RED OBSTRUCTION LIGHTING. A sub-overarching term. It includes Flashing Omnidirectional Beacons, and Steady Burning Lights (Single Obstruction, Double Obstruction Light).
Reference: OML '73

SINGLE OBSTRUCTION LIGHT. This usually refers to a single unit, basic Obstruction Light. See Also: Double Obstruction Light.
Reference: H & P '67

STEADY-BURNING LIGHTS/STEADY BURNING RED OBSTRUCTION LIGHT. Term refers to basic level of simple Obstruction Lights.
Reference: OML '78

SUSPENSION TYPE OBSTRUCTION LIGHTS. A form that can be raised, lowered by cables.
Reference: CAA '53

d) Obstruction Lighting-Strobe & Composite Forms

CATENARY LIGHTING. Consists of Lighted Marker for marking high-voltage catenary wires (day and night). Possibly applied to support structures as well.
Reference: AIM '99

DAYTIME LIGHTING FOR TALL OBSTRUCTIONS. IES '72 employs this term for High Intensity Strobe Light under development in the early 1970s.
Reference: IES '72

DUAL LIGHTING/DUAL LIGHTING SYSTEM. Two systems of Lights are included: one for night use (traditional incandescent red), and one for day use (strobe, white).
Reference: OML '78, '91



DUAL LIGHTING WITH RED--MEDIUM INTENSITY FLASHING SYSTEM/DUAL LIGHTING WITH RED--MEDIUM INTENSITY FLASHING WHITE/DUAL, RED-WHITE MEDIUM INTENSITY OBSTRUCTION STROBE BEACON. Two colors of red and white are in one unit. HI day is 120,000 cp. MI is 20,000 cp.
Reference: OML '91; H & P '94 (3rd term)

HIGH INTENSITY FLASHING WHITE LIGHTS. These are for tall structures and presumably strobe in nature. Probably equivalent of following entry.
Reference: AIP '99, AIM '99

HIGH INTENSITY FLASHING WHITE OBSTRUCTION LIGHT. Term refers to Strobe Lighting System that can be used during the daylight hours. There are reduced intensities for twilight, night operations.
Reference: OML '91

HIGH INTENSITY OBSTRUCTION LIGHTING SYSTEM. The meaning is probably little different from that of terms lacking "system" though inclusion of that word makes the system character more explicit.
Reference: H & P '94

HIGH INTENSITY WHITE OBSTRUCTION LIGHT. Presumed equivalent of previous and next entries.
Reference: AIM '99

LOW-POWER CONSUMPTION STROBE-TYPE/STROBE-TYPE FLASHING RED OBSTRUCTION LIGHT. This Aid employs an xenon flashtube and employed where commercial a.c. power not available.
Reference: H & P '94

MEDIUM INTENSITY FLASHING WHITE OBSTRUCTION LIGHT. Term refers to a form that supplies daylight and twilight obstruction lighting.
Reference: OML '91

MEDIUM INTENSITY FLASHING WHITE OBSTRUCTION LIGHTS, 40 FPM/MEDIUM INTENSITY FLASHING WHITE OBSTRUCTION LIGHT, 60 FPM. Newer FAA standards includes flash rate as part of the title.
Reference: Specs for OML '88, '95

MEDIUM INTENSITY OBSTRUCTION STROBE BEACON/MEDIUM INTENSITY OBSTRUCTION STROBE. This form of MI Obstruction Light

employs strobe lighting technology. White only in color. 20,000 cp fo day use, and 2,000 cp at night.

Reference: H & P '94

MEDIUM INTENSITY OMNIDIRECTIONAL FLASHING WHITE LIGHT SYSTEM. Lights, day and night, for catenary support structures.

Reference: AIM '99, AIP '99

MEDIUM INTENSITY STROBE. Short form of full title. See Medium Intensity Obstruction Strobe Beacon.

Reference: H & P '94

OBSTACLE LIGHTS. ICAO divides this into three basic groups:

LOW-INTENSITY LIGHTS. These are employed on fixed objects. Types A and B display fixed-red lights.

MEDIUM-INTENSITY, TYPE A. This form is white, flashing, 60-90 fpm.

MEDIUM-INTENSITY, TYPE A. White, flashing, 20-60 fpm.

MEDIUM-INTENSITY, TYPE B. Red, flashing, 20-60 fpm.

HIGH-INTENSITY OBSTRUCTION LIGHTS. There are two types A and B. Both display white, flashing messages. A is 200,000 cp; B is 100,000.

Reference: AD '99

OBSTRUCTION STROBE LIGHT/OBSTRUCTION WARNING LIGHT.

Physical apparatus employed in High Intensity Obstruction Light System. Second term is actual company name of product.

Reference: H & P '94

1D1 Overarching Terms

a) Major Terms

APPROACH LIGHTING SYSTEM. An arrangement of lights extending from the beginning of the runway and outward toward the start of the aircraft approach area. The patterns are now nearly all of the centerline form. Lights can be white and or colored. Some flashing lights may accompany the steady burning lights. References: NATO '92, Multi-Electric, IES '87, McKelvey JN '87, AD Vol II '95

APPROACH LIGHTS. This term can suggest the physical and individual unit of lamp, lamp holder, housing, support. But frequently it seems to suggest a system of Approach Lights configured into an approach pattern. The term may differ little in meaning from Approach Lighting Sytem. More than 20 surveyed sources employ the term ending in system, and nearly as many this shorter term. References: Godfrey, Wood '40, Taneja '87, Glidden '46, D & B '77

APPROACH LIGHTING. This term is more clearly a system term. Though it is employed less frequently than Approach Lights. Users included historic and contemporary sources, governmental agencies, and manufacturers. References include: Nav Fac Eng Com '81, New Hope AW '51, Planning & Design '70, Warskow '50

b) Secondary Terms

AIRPORT APPROACH LIGHTING. This term suggests a primary term. Yet few sources employ it. Most major terms omit Airport. Possibly because the context of the terms is that of airports and hence airport is implicit. Only a few terms use this term and they are mostly historical. References: Pilots ... AW '52, Doty AW '57, Wilson '79

AIRPORT APPROACH LIGHTING SYSTEM. This term appears to be the arch-type for terms in this category. Yet only one source uses it and that source is historical. Reference: CAA Tests ... '45

APPROACH LIGHT SYSTEM. A largely historic term though another term that seems to be an ideal term for Approach Lights in a systematic pattern.

Reference: New Hope AW '51, Horonjeff '62, Christian AW '66, Slope Line AW '48, D & B '77

APPROACH-LIGHT. A single source employs this hyphenated variant of what otherwise is a major term.

Reference: CAA Pushes ... AW '50

APPROACH AIDS. For Cegelec this refers to Helicopter Glide Path Indicator and other Tri-Color Indicators. For MLS it refers to PAPI and PLASI. The term gives the appearance of a very general term.

References: Cegelec, MLS: Setting AI '84

APPROACH SYSTEM. Presumably short form for Approach Light System.

Reference: AD '69, Supplement '71

CIVIL VISUAL APPROACH AIDS. For Cegelec this refers to a broad range of Navaids for Heliports including Radio Aids

References: Cegelec, PAPI AI '84

c) Sub-Overarching Terms

FINAL APPROACH & TAKE-OFF AREA (FATO). This refers to helicopter landing operations.

Reference: Thorn

GROUND LIGHTS FOR LANDING GUIDANCE. A general term for Landing Aids that are lighted.

Reference: Cayless '83

LANDING AIDS. A near-overarching term for a variety of Aids that refer to landing operations.

Reference: Cayless '83

VISUAL LANDING AIDS. A similar term though more specific in meaning.

Reference: Cayless '83

AIRFIELD APPROACH SYSTEMS. Term refers to Radio Aids rather than Visual Aids. Overarching term for various systems including ILS, SBA.

Reference: Kendal JN '90

ALIGNMENT-TYPE CARRIER LANDING SYSTEM. Term refers to systems employed on aircraft carriers including FLOLS, MDLA

Reference: Clark '81

APPROACH VISUAL GUIDANCE SYSTEM. For Thorn this is an overarching term for PAPI, HAPI; Discharge Capacitor Lights (REIL, Runway Lead-in Lighting System, etc).

Reference: Thorn

LIGHTING SYSTEMS. Term gives an overarching appearance but instead refers to Approach Lighting.

Reference: Christian AW '56

STANDARD APPROACH AID. A Radio Aid term that refers to MLS.

Reference: Butterworth-Hayes AI '86

VISUAL AID TO APPROACH FOR LANDING. Debateable term. Describes Approach Lighting.

Reference: CAA '58

VISUAL APPROACH AIDS. Overarching term for Approach Lighting and other Aids including VASI.

Reference: Clark '81

1D2 Equipment Terms

a) Physical Terms

General Note. These terms from Part G all refer to lamps with various qualifiers attached.

HIGH INTENSITY UNIDIRECTIONAL LAMP

MEDIUM INTENSITY OMNIDIRECTIONAL ELEVATED LAMP

LOW INTENSITY OMNIDIRECTIONAL ELEVATED LAMP

OMNIDIRECTIONAL FLASHING LAMP

UNIDIRECTIONAL FLASHING LAMP

Further Terms:

CAPACITOR DISCHARGE LIGHT. Reference: AD '99, Lexicon '85

CONDENSER DISCHARGE LIGHT. Reference: Warskow '50

b) Physical/Morphological Terms

General Note. These terms contain both mention of physical apparatus and morphological function in the title. Since the physical is considered in the previous segment these terms are not given extensive descriptions

ALS THRESHOLD LIGHT BAR. Reference: FAA ADS-Site '73

APPROACH DIRECTION LIGHT. Reference: NATO '92,
Naval Fac Eng Com '46

APPROACH FLASHERS. Reference: Flash Technology

APPROACH HIGH INTENSITY UNIDIRECTIONAL LIGHT. Reference: ADB

APPROACH, INSET. Reference: Flash Technology

APPROACH LIGHT. Note: This term in plural form can also have the meaning of a system of Approach Lights.
Reference: Godfrey

APPROACH LIGHT BAR ASSEMBLY. Reference: Spec. for L-848 '65

APPROACH LIGHTS FOR OTHER INSTRUMENT RUNWAYS. Reference:
IES '87

APPROACH MEDIUM INTENSITY OMNIDIRECTIONAL ELEVATED
LIGHT. Reference: ADB

APPROACH SEQUENCE FLASHING UNI-DIRECTIONAL DIRECT LINE
COUPLE FLASHING LIGHT. Reference: Idman

APPROACH SIDE ROW LIGHT. Reference: ADM '83

APPROACH, THRESHOLD. Reference: Flash Technology.

BARRETTE/CENTRE LINE BARRETTE. Reference: AD '99

BARTOW D-1 LIGHTS. Reference: Douglas '78

ELECTRONIC-FLASHING-APPROACH LIGHTING. Reference: GTE Sylvania

ELEVATED APPROACH LIGHTS. References: Pollock AI '9, C-H, Momberger
AF '86

FLASHERS/FLASHING LIGHTS. Reference: Douglas '78

FLASHING APPROACH LIGHT. Reference: Stone AW '57

FLASHING LIGHTS. Reference: Haber '58

FLUSH APPROACH LIGHT. Reference: USAF AW '57

GROUND LEVEL APPROACH SEARCHLIGHT, HIGH INTENSITY.
Reference: Toshiba, Ulmer

HELIPAD APPROACH LIGHT. Reference: IES '81

HIGH INTENSITY APPROACH LIGHTS. Reference: Pilots ... AW '52

HIGHT INTENSITY & DISPLACED THRESHOLD LIGHT. Reference: Sepco

HIGH INTENSITY DOUBLE-SKINNED UNIDIRECTIONAL ELEVATED
APPROACH LIGHT. Reference: Cegelec

HIGH INTENSITY UNI-DIRECTIONAL INSET APPROACH LIGHT.
Reference: Cegelec

LIGHT MARKER AIRPORT APPROACH. Reference: Godfrey.

LIGHTS, FLASHING, OMNI-DIRECTIONAL: ODALS, REILS. Reference:
Ap L Eq '76, '81

PAR 56 APPROACH LIGHT. Reference: Godfrey

Q20A/PAR 56 APPROACH LIGHTS/PAR 56 APPROACH LIGHT LAMP.
Reference: Douglas '79

SEMI-FLUSH APPROACH LIGHT. Reference: Douglas '78

SEQUENCE FLASHERS/FLASHERS. Reference: Douglas '78

SEQUENCE FLASHING LIGHTS ON CENTER LINE APPROACH.
Reference: NATO '92

SEQUENCE FLASHING LIGHTS. Reference: Breckenridge '55, Finch '61

SEQUENCE FLASHING LIGHTS-UNITS. Reference: Spec for L-849 '65

SFL This is acronym for Sequenced Flashing Lights. Reference: Douglas '79

SIDE ROW BARRETTES. Reference: Douglas '78

STEADY BURNING LIGHTS. Reference: Douglas '78

c) Support Structures

General Note. Most references to Approach Lighting functions and apparatus omit mention of the necessary support structures. These structures can be substantial and of considerable height. A few sources include these structures and are here listed. Necessary notes included when required.

LOW-IMPACT RESISTANT STRUCTURES. Reference: Jacquith

LIR. An acronym for previous term. Reference: Jacquith

FRANGIBLE SAFETY MAST FOR APPROACH SYSTEM. Frangible refers to the ability of a structure to break off easily when struck. Such structures are sturdy yet easily break if struck by an aircraft.
Reference: Danaid

FRANGIBLE SAFETY APPROACH MAST. Reference: Jacquith

SAFETY MAST FOR APPROACH LIGHTS. Reference: Idman

SAFETY MAST FOR APPROACH SYSTEM. Reference: Danaid

1D3 Approach Lighting Systems

General Note. Part "H" Classification divided systems into two segments: IACO & NATO, and U.S.-FAA. That approach may have been somewhat simplistic yet it provided a reasonably well-functioning instrument for handling the welter of terms. This coverage instead divides Approach Lighting into Approach Lighting Systems, Special Approach Light Forms, and Historic Terms. Some terms in a) are identical with -- or overlap with -- overarching terms. Those terms fit as well or nearly so with both overarching and system themes.

a) Approach Lighting Systems

APPROACH LIGHT/APPROACH-LIGHT. System terms despite appearance of individual units? Both terms appears in one near-historic source. For Douglas '78 the second term does refer to types of Lights.
Reference: Breckenridge '55

APPROACH-LIGHT SYSTEM. Specific reference is to early system for Approach Lighting.
Reference: Douglas '78

APPROACH LIGHTING SYSTEM. The core term is employed by few sources. This term can encompass all forms of approach systems.
Reference: ADM '93

APPROACH LIGHT SYSTEMS (ALS). Term refers to the essential system for aircraft transition from enroute operations to landing process. Includes acronym.
Reference: AIM '99

ALSF-1/ALSF-I. Abbreviated term for High Intensity Approach Lighting System for Category I ILS operations. It includes one crossbar, sequenced flashers, two wing bars with red lamps.
References: Ap L Sys Config '77, Facility Ops '91, VGLS '69, '74
A & W '79 (2nd)

ALSF-2/ALSF-II. Abbreviated term for High Intensity Approach Lighting System for Category II and III ILS operations. It includes two cross bars, extensive series of flanking wing bars with red lamps.
References: AIP '91 (1st), A & W '79

ALSF-2 SYSTEM/ALSF-2 APPROACH-LIGHT SYSTEM. Variant form that includes the word System thereby clarifies the system character of ALSF-2.

Reference: IES '81 (1st), Douglas '78 (2nd)

ALPHA SYSTEM. Alternative term for ALS employed by IES.

Reference: IES '87

ALSF-II-SSALR DUAL MODE HIGH INTENSITY APPROACH LIGHT SYSTEM/ ALSF-II- SSALR DUAL MODE SYSTEM/DUAL MODE HIGH INTENSITY APPROACH LIGHTING SYSTEM. These terms refer to two modes within one system. It is a complete high intensity system with full white lamp configuration and also red wing bars and two cross-bars. In reduced level of operation it is a more brief system. SSALR is regarded as a "building block" for more complex operations.

References: Godfrey, Airflow '85

ALS/SFL CAT I & CAT II. Naval acronym for Approach Light System for Cat II & III operations.

Reference: NavFacEngCom '46

APPROACH LIGHT SYSTEM FOR CAT II & III RUNWAYS. This is an IES-employed term that is the equivalent of ALSF-2

Reference: IES '81, '87

APPROACH LIGHT SYSTEM FOR CAT I OPERATIONS. An IES term that includes three forms of Approach Lighting: Modified Calvert, Alpha, Medium Intensity Category I System.

Reference: IES '87

APPROACH STROBES. Part of EALS. Seemingly comparable to standard strobes used in REIL, ODALS, etc. See also Strobes.

Reference: EALS '99

CAT I ALS/CAT II ALS. Acronyms for High Intensity Systems for Category I and Category II operations.

Reference: IES '72

CAT 2 APPROACH LIGHTS. Term appears in a context of color study.

Reference: McKelvey JN '87

CIRCLING APPROACH LIGHTS. Finch describes these Lights as "similar to the boundary lights." Therefore, not similar to Strobe Lights?

Reference: Finch '61

FAA HIGH INTENSITY. Atypical descriptive term for some forms of Approach Lighting.

Reference: A & W '79

HIGH INTENSITY APPROACH LIGHT SYSTEM/HIGH-INTENSITY APPROACH-LIGHT SYSTEM/HIGH-INTENSITY APPROACH LIGHTS.

These terms can refer to intense level of systems for ALS Category I and II operations. Some references, however, are historic and refer to systems in an early stage of development.

References: Instruction Details for R '75, ADS-Site '73, CAA Withdraws AW '50

HIGH INTENSITY APPROACH LIGHT SYSTEM WITH SF. An IES term for ALSF-2.

Reference: IES '81

HIGH-INTENSITY APPROACH LIGHTING. (HIAL in Australia, Calvert, or RAE).

Reference: McKelvey JN '87

HIGH INTENSITY LIGHTS. Term includes Approach Lights but may go beyond that category.

Reference: NavAero '46

MALS. Acronym for U.S. Medium Intensity Approach Light System.

Reference: Douglas '79

MALS, MEDIUM INTENSITY APPROACH LIGHT SYSTEM. Acronyms are plentiful in U.S. practice. This term refers to Medium Intensity system for non-precision approaches. FAA describes it as an "economy type system."

Reference: VGLS '69, '74, ALNACO, SEPCO

Other Medium Intensity systems can be seen as offshoots of the core system. Those systems are listed here with selected remarks only:

APPROACH LIGHT SYSTEM, M.I., MALS.

Reference: FAA 150/150-5340-14B

MALS STEADY BURNING LIGHTS.

Reference: SEPCO '71

MALSF. Acronym for Medium Approach Lighting with Sequence Flashers. SF added when identification difficulties exist in approach areas.

Reference: VGLS, '69, GTE Sylvania, C-H '79, ADS-Site '69, '71

MAL/SF. Altered formulation of Medium Approach Lighting with Sequenced Flashers.
Reference: NOTAMS '87

MALSR. Acronym for Medium Approach Lighting System with Runway Alignment Lights. This system is an economy form of precision approach system.
Reference: VGLS '74, Douglas '79

MALSR SYSTEM. A variant of basic term that emphasizes its system character.
Reference: Douglas '78

MALSR APPROACH-LIGHT SYSTEM. Combines acronym and word form though two symbol entities are not fully compatible.
Reference: Douglas '78

MEDIUM INTENSITY APPROACH LIGHTING EQUIPMENT
Reference: FAA Approved Lighting '68, '73

MEDIUM INTENSITY APPROACH LIGHTING BAR ASSEMBLY
Reference: Ap L Eq '73, NOTAMS '87, Spec for L-848 '65, Vis Ap L Ind Sys '76

MEDIUM INTENSITY APPROACH LIGHTING.
Reference: SEPCO '71

MEDIUM INTENSITY LIGHTING SYSTEM.
Reference: SEPCO '71

MEDIUM INTENSITY (MALSR, MALSF, MALS). Medium Intensity includes several systems.
Reference: A & W '79

NON-INSTRUMENT APPROACH SYSTEM. An additional "Centerline cross-bar system" with single row of steady-burning lights in aviation yellow or aviation red.
Reference: IES '87

NON-PRECISION APPROACH LIGHTING SYSTEM. For IES this category included MALS and MALSF.
Reference: IES '72

PRECISION AIRPORT CATEGORY I LIGHTING SYSTEM. Alternate form.
Reference: AD '99

PRECISION APPROACH CATEGORY I LIGHT SYSTEM. A system consisting of a row of Lights, and one crossbar. It displays variable white color. The system incorporates Capacitor discharge Lights.
Reference: AD '99

PRECISION APPROACH CAT II & III LIGHTING SYSTEM. Term consists of 900m length centerline of lights and two side rows and two crossbars.
Reference: AD '99

SALS. Acronym for Short ALS.
Reference: IFH '71, NOTAMS '87

SIMPLE APPROACH LIGHTING SYSTEM. Basic system for ICAO. It has a row of lights with one crossbar. Lamps can be singles or barrettes. Lights are fixed (steady-burning). Color is not specified; however, it is not to be confused with other aviation lights.
Reference: AD '71, '99

SIMPLE SYSTEM. One of two approach forms for early ICAO; this is Type A.
Reference: AD '51

SIMPLIFIED APPROACH LIGHTING/SIMPLIFIED APPROACH LIGHTING SYSTEM. Presumably conforms to ICAO. One row of fixed (steady-burning); flashing lights can be added.
Reference: Ben & Lux AIP

"SIMPLIFIED" APPROACH LIGHT SYSTEM. Term includes SSALS, SALSF, SALS. Reference: Douglas '79

SSALF. Acronym for Simplified Short Approach with Sequenced Flashers.
Reference: CD '79, Econ Ap '70

SSALR. Acronym for Simplified Short Approach Lighting System with Runway Alignment Indicator Lights (RAILS).
Reference: CD '79, Econ Ap '70

SSALS. Acronym for Simplified Short Approach Lighting System. It is employed for non-precision approaches.

References: VGLS '74, Econ Ap '70

STANDARD HIGH INTENSITY APPROACH LIGHTING SYSTEM.

Descriptive phrase more than formal name.

Reference: Warskow '50

STRAIGHT-IN APPROACH SYSTEM. System including Non-Visual Aids allowing for straight approach rather than circling approach.

Reference: ADB

SYSTEM OF APPROACH-LIGHTS. Informal, descriptive term more than official, formal term.

Reference: Douglas '78

b) Special Approach Lighting Forms

AIRPORT LEAD-IN LIGHTING SYSTEM (LDIN). Flashing Lights that denote route to runway final approach.

Reference: AIP '91

CIRCLING GUIDANCE LIGHTS. Term is seemingly akin to ODALS. ICAO term while ODALS is of U.S. provenance.

Reference: ADM '93, AD '99

LEAD-IN LIGHTS. Listed without description. Possibly Landing Direction Lights conform to term: five yellow Lights delineating approach path.

Reference: HD '94

LEAD-IN LIGHT SYSTEM (LDIN)/AIRPORT LEAD-IN LIGHT SYSTEM/RUNWAY LEAD-IN LIGHTING SYSTEM. A group of Flashing Lights that indicates course to airport runway and final approach. LDIN employed where terrain or other factors make approach to airport a particular problem. Second and third terms are variants of the core term.

Reference: ADS-Site '80, Econ Ap L '70, AIP '91 (2nd), ADM '93 (3rd)

LEAD-IN-LIGHTING. FAP notes this form all but eliminated due to Approach Lighting. A near-historic term?

Reference: CAA '58

LONG LEAD-IN STROBE LIGHTING (LLDIN). Omnidirectional Strobe Lights. Provides guidance to specific runways.

Reference: "Short Takes" AI '94

ODALS. Acronym for Omnidirectional Approach Lighting System.

Reference: Ameriel, AD Vol II '95

OMNIDIRECTIONAL APPROACH LIGHT SYSTEM (ODALS). This system is made up of seven Omnidirectional Flashing Lights. Color of message is white. Five of the seven Lights are in a row. The remaining two flank the corners of the runway threshold.

Reference: IES '87, ADS-Site '80

OMNIDIRECTIONAL APPROACH LIGHTING SYSTEM (ODALS). Slight variant with Lighting instead of Light.

Reference: IES '87

OMNIDIRECTIONAL FLASHING LIGHTS. This is more a reference to physical apparatus than to function. Context of the Lights is ODALS which see.

Reference: AIP '99

OMNIDIRECTIONAL LEAD-IN APPROACH LIGHT SYSTEM. Term listed only. Corresponds to AIP '91.

Reference: Ap L Eq '73

OMNI-DIRECTIONAL LEAD-IN LIGHTS. Descriptive term. Formal term is Approach Lights. Row of Lights for helicopter operations in low visibility.

Reference: Cegelec AGLE

OMNIDIRECTIONAL LIGHTS. Term has specific reference to Circling Guidance Lights.

Reference: ADM '93

RAILS/RUNWAY ALIGNMENT INDICATOR LIGHTS/RUNWAY ALIGNMENT INDICATOR LIGHT SYSTEM. These are seven sequenced flashing lights 200 feet apart below the threshold of the runway. Terminology varies from acronym only to acronym and full name to full name only.

References: IES, '66

REIL. Acronym for Runway End Identifier Light which see.

References: AIP '99, A & H '79

RIL, RUNWAY IDENTIFICATION LIGHTS. These lights are also termed REIL or Runway End Identification lights. They are two lights near runway threshold and identify the threshold.

References: IES '81, C-H '91, FAA ADS-Site '80, NATO '92

References: IES '81, C-H '91, FAA ADS-Site '80, NATO '92
RUNWAY END IDENTIFIER LIGHT (REIL). This Aids provides identification of a runway. Two flashing Lights, omnidirectional or unidirectional. It helps when identification of runway unclear because of other lights, terrain, low visibility.
Reference: AIP '91

STROBES. A somewhat vague term. Perhaps a "shorthand term" for Lights employed in REIL, ODALS and other systems. See also: Approach Strobes
Reference: EALS '99

VISUAL VECTOR OMNIDIRECTIONAL APPROACH LIGHTING SYSTEM.
Term joined by maker's model name.
Reference: Unitron

c) Historic Terms

1) Slopeline Systems

DOUBLE-ROW FUNNEL-SHAPED SLOPE LINE CONFIGURATION/DUAL-ROW FUNNEL-SHAPED SLOPE LINE CONFIGURATION. Both terms are more a descriptive title than a formal name for Slopeline Systems.
Reference: C-L Test AW '50

PEARSON SLOPE LINE APPROACH LIGHT SYSTEM. The name of the inventor of Slope Line (or one form) is attached to the basic term.
Reference: Haber '58

H. I. SLOPELINE APPROACH LIGHTS. But all forms were high intensity?
Reference: IES '52

SLOPELINE SYSTEM. A welter of terms and variant forms accompanies this Navaid. No form dominates. Slopeline System can serve as a base term. This system was promoted by the U.S. CAA in the late 1940s/very early 1950s. It never met with widespread approval and was eventually dropped. The system created a system of lights resembling a funnel. The outer most lights were well apart while those near the runways were close together. When on target the pilot saw two narrowing rows of solid lights. If off-course then the lights appeared as segmented slats of light either to the left or to the right.
References: Moore AW '50, Clark '81, Wilson '79, Warskow '50

SLOPE LINE LIGHTING SYSTEM. Slope Line as two is a variant of the basic term. A single and historic source uses this variant form.

Reference: CAA Withdraws ... AW '50

SLOPE LINE APPROACH LIGHTING SYSTEM. This is the most complete form of the term. Though only a single, historic source employs it among surveyed references.
Reference: Approach AW '50

SLOPE LINE APPROACH-LIGHT SYSTEM/SLOPE-LINE APPROACH-LIGHT SYSTEM/SLOPE LINE APPROACH LINE SYSTEM. Variant forms of the basic term.
Reference: FR Arcata '49, CD '79 (2nd), Warskow '50 (3rd)

SLOPELINE APPROACH LIGHT SYSTEM. Another slightly nuanced variant form of the base term.
Reference: More on Slopeline AW '55, CD '55

SLOPE-LINE SYSTEMS. Similar to base term. Only two surveyed references employ it. One, Newsweek, does offer a succinct and helpful description of Slopeline which influenced the entry under Slopeline Systems.
Reference: Kroger AW '48, Lights For ... Newsweek '58

SLOPE LINE SYSTEM. This term is akin to base term of Slopeline System and previous hyphenated version.
Reference: Light Squabble AW '49, Slopeline AW '48

SLOPELINE-TRANSVERSE-BAR APPROACH-LIGHT SYSTEM/SLOPELINE APPROACH-LIGHT SYSTEM WITH TRANSVERSE BARS (SET). These terms denote a variant form of Slopeline with transverse or cross-bars in contrast to the original form with linear lights only.
Reference: FR Arcata '49

SLOPE LINE HIGH INTENSITY APPROACH LIGHTING SYSTEM. Among the earliest of terms for Slopeline. Slopeline was employed in some airports in 1948 and nearly approved for general use.
Reference: Slopeline AW '48

SLOPE LINE SYSTEM OF HIGH INTENSITY APPROACH LIGHTS. A second term from early usage.
Reference: ALPA AW '49, Slopeline AW '48

SLOPELINE. A very short form of basic term.
References: New Policy AW '50, ARL '81

SLOPE LINE LIGHTS. Is this term equivalent of Slopeline System?
Reference: New Policy AW '50, Slope Line AW '48

SLOPE LIGHTS APPROACH LIGHTS/SLOPE-LIGHTS APPROACH LIGHTS. Possibly equivalent of Slope Line System.
Reference: Lights Squabble AW '49

SLOPE & APPROACH LIGHTS. A possibly sub-overarching term.
Reference: IES '87

SLOPE APPROACH. This term is more descriptive than a formal name.
Reference: Kroger '48

2) Center Line System

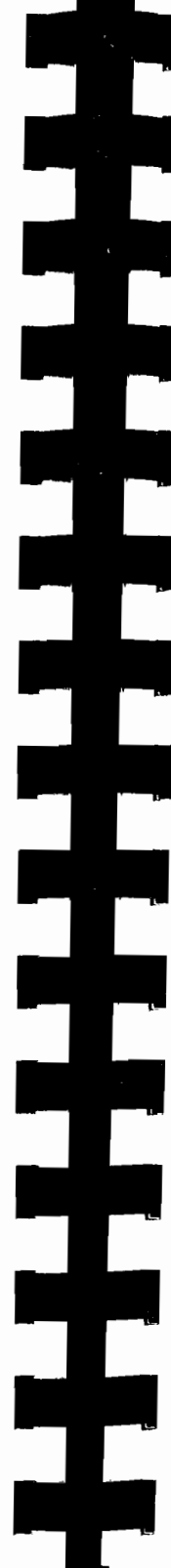
General Note. Centerline Systems are now standard. And rarely is the word Centerline included in the title. Early forms, however, very often included the term. In early times Centerline competed with many other forms. The forms in this segment are historic in nature (half-century or older).

CENTER LINE APPROACH SYSTEM. Centerline, like Slopeline, is listed under many terms though few forms are employed by very many of the surveyed sources for this study. This form employed by several sources, including Moore '50, is a relatively common form. Center Line Systems display one row of lights and these are on the extended centerline axis. Transverse or crossbars or lights are a common feature as are sequenced flashing lights. This term is perhaps a descriptive term more than a formal term.
References: Moore AW '50, USAF AW '55,

CENTERLINE APPROACH LIGHTING SYSTEM/CENTERLINE APPROACH LIGHT SYSTEM. This term employed by two sources in the mid-50s describes a form that approximates the modern version. Doty refers to it as the "national standard" and it contained "Type A", 3000' length with white bar lights, and Type B, 2000' length with red bar lights. Warskow has Light instead of Lighting.
References: USAF Pilots AW '57, Doty AW '57, Warskow '50

Other terms that are very similar in appearance include:

CENTER-LINE LIGHTS
Reference: Warskow '50



CENTER-LINE APPROACH LIGHT SYSTEM. Variant of basic form.
Reference: Warskow '50

CENTER LINE SYSTEM
Reference: Slope Line AW '48

CENTER-LINE SYSTEM.
References: CAA Pushes AW '50, CAA Withdraws AW'50

CENTERLINE SYSTEM.
References: Doty AW '50, Moore AW '50, Pilots AW '50, USAF Pilots AW '57

CENTER LINE APPROACH SYSTEM.
References: Stone AW '57, Four Honored AW '51, Shorttakes AI '94

CENTERLINE APPROACH LIGHTING.
Reference: USAF AW '57

Other Terms of a More Specialized Nature Include These Terms:

CENTER-LINE HIGH INTENSITY APPROACH LIGHT SYSTEM. This early term, 1950, included sequenced flashing lights and crossbars.
Reference: Center-Line Test AW '50

CENTER ROW SYSTEM.
Reference: Light Squabble AW '49

CENTER-LINE "CONFIGURATION A" SYSTEM.
Reference: Horonjeff '62

SINGLE-ROW CENTER-LINE SYSTEM. A descriptive name more than an official name. It may have been used to distinguish it from Slopeline (2-row) and Left-hand only Slopeline.
Reference: New Policy AW '50

CENTERLINE SYSTEM WITH STROBEACON.
Reference: USAF AW '52

CENTERLINE-CROSSBAR CONFIGURATION. A system employing assemblage of several lights for each unit of the line of lights rather than single lamp units.

Reference: Moore AW '52

CENTERLINE SYSTEM WITH STROBEACON.

Reference: USAF AW '52

CENTERLINE CROSSBAR SYSTEM. Three Cat I Approach System are included this form: Modified Calvert, Alpha System (ALS-1), M.I. Cat I System.
Reference: IES '81, Moore AW '52

3) Other Historic Forms

AGA FUNNEL SYSTEM. Slopeline was also funnel but AGA had two rows of single red lights rather than multi-lamp units.
Reference: Kroger AW '50

ALL-WEATHER APPROACH LIGHTS APPROACH SYSTEM. A descriptive term more than an official, formal name. It refers to early flashing lights. They emitted up to 3.3 billion cp. These lights were of quartz tubing and contained krypton gas.
Reference: Brightest AC '49

ALPA SYSTEM. Airline Pilots Association proposed a Centerline System long before CAA did. The Alpha bears a substantial resemblance to current models.
Reference: Moore AW '50, CAA Pushes AW '50, Finch '61

AIR LINE PILOTS ASSOCIATION (ALPA). This term refers to early centerline proposal which was later substantially implemented.
Reference: FR Arcata '49

BARTOW APPROACH LIGHTS. One version of the Bartow System. System by implication.
Reference: Breckenridge '55

BARTOW LIGHT SYSTEM. Alternate name and possible basic name for this System..
Reference: CAA Tests AC '45

BARTOW MULTI-ROW APPROACH-LIGHT SYSTEM. This system has sets of double rows: four rows for 1000 feet, three rows for 1000 feet, two rows for 1000 feet, one row to runway. Green for left-hand, Red for right-hand.
Reference: FR Arcata '49, Kroeger '48

BARTOW SYSTEM. Core name for this System. See other entries beginning with Bartow.

References: CAA '58, Kroger AW '48

CALVERT BAR SYSTEM. This term may contain the word Bar in order to distinguish it from Slopeline and other systems lacking crossbar or transverse bars. Calvert has a crossbar and is among Centerline Crossbar Systems which see.
Reference: Approach ... AW '50

CALVERT SYSTEM. An early Approach Lighting system that combined centerline lights and cross bars.
References: Moore AW '50, Four Honored AW '51, Horonjeff '62, CD '78

CIVIL AIRFIELD APPROACH SYSTEM. Addition of the word Civil contrasts the system with military approach system. Term employed in early 1950s during a time of intense disagreement on the form of Approach Light Systems.
Reference: Pilots ... AW '52

FUNNEL SYSTEM. This may suggest the Slopeline System yet the Arcata FR does not tie the two together. It appears to be an earlier version of Slopeline. Slopeline employed units of 10 lamps per installation while Funnel seems to have used single units which were green (left-hand) and red (right-hand) in a later edition.
Reference: FR Arcata '49

LANDING APPROACH LIGHT SYSTEM. A general term included in a 1951 article referring to an early pioneer in modern Approach Aid work.
Reference: Four Honored AW '51

LEFT-HAND ROW SYSTEM/DOUBLE-ROW SYSTEM. CAA references are from Federal Airway Plan 1959-63. Terms possibly refer to old Slopeline System and Single-row left of Center system.
Reference: CAA '58

MODIFIED CALVERT SYSTEM. A variant form that employs white, red, green lights. All are steady-burning and are accompanied by sequence flashing lights.
Reference: IES '86, '87

CALPA OR ALPERT SYSTEM. Dutch form of early 1960s system that combines Alpha and the Calvert Systems.
Reference: Finch '61

CALVERT (ENGLISH) SYSTEM. English: indicates provenance of system.
Reference: Finch '61

CALVERT SYSTEM OF APPROACH LIGHTS. Variant form of basic term.
Reference: Horonjeff '62

CALVERT & RAE SYSTEM. This refers to a Glidepath System which see.
Reference: Cook AW '60

CENTERLINE LIGHTING. Term refers to Centerline Approach Lighting.
Reference: Finch '61

CONFIGURATION A. Short name of U.S. Standard System, Configuration A.
Reference: Finch '61

DUTCH SYSTEM. See Calpa System.
Reference: Finch '61

EFAS, ELECTRONIC FLASH APPROACH SYSTEM. This is not a system in itself but rather part of a larger approach system. It was a component of then U.S. National Configuration "A".
References: Christian AW '56, Stone AW '57

EFAS. Acronym for previous entry.
Reference: Stone AW '57

HIGH INTENSITY INCANDESCENT APPROACH LIGHTS (ALS)/MEDIUM INTENSITY INCANDESCENT APPROACH LIGHTS (ALS). Provides differentiation from older neon systems?
Reference: Douglas '78

INCANDESCENT-LAMP APPROACH SYSTEM. A historic term for a two-row system in line with runway lights. The word incandescent distinguished it from the Neon System.
Reference: IES '47

INTERRUPTED-SEQUENCE-FLASHING APPROACH-LIGHT SYSTEM (ISF). Term from Arcata experiments and therefore historic. It was a left of center system that alternated flashing lights with neon steady burning lights.
Reference: FR Arcata '49

LEFT-HAND, SINGLE-ROW, LADDER-TYPE, HIGH INTENSITY

APPROACH LIGHT LANES. (Or: "L-H, S-R, Ladder-type program"). Similar in meaning to following entry. Though Lanes are perhaps more restrictive than System. Also: Single-line, L-H System.
Reference: CAA Pushes AW '50.

LEFT-HAND-ROW SYSTEM/LEFT-HAND ROW "LADDER SYSTEM". CAA promoted Slopeline System but later abandoned it because of insurmountable problems. For a time they then promoted a ladder-shaped arrangement on left side of extended runway life.
Reference: Moore AW '50

LEFT-ROW SYSTEM. A formal name or descriptive?
Reference: Breckenridge '55

MULTI-ROW APPROACH-LIGHT SYSTEM. An early system of "8 parallel rows of controlled-narrow-beam lights arranged symmetrically." The longest row was located near the threshold while the shortest row were the outer-most. Yellow denoted left of axis, and red for right of axis.
Reference: FR Arcata '49

NATIONAL SYSTEM. Refers to ultimate system in 1950s: Slopeline System, Centerline System.
Reference: Warskow 1950

NEON APPROACH LIGHT/NEON APPROACH-LIGHTS/NEON LIGHT SYSTEM. Historic terms for early Approach Light System utilizing neon tubes.
Reference: Douglas 79 (1st, 3rd), CD '78 (2nd),

NEON LADDER/NEON-LAMP-LADDER APPROACH SYSTEM. Historic term. Single-row left of extended centerline. Steady-burning, neon tubes within parabolic reflectors. First term is shorthand version of full term.
Reference: IES '47, Douglas '78 (1st)

PARALLEL-ROW SYSTEM/PARALLEL ROW APPROACH LIGHT SYSTEM/PARALLEL ROW APPROACH-LIGHT SYSTEM. Long form is historic term from J.B. Bartow in 1930. Both Approach and Runway Lights displayed double rows.
Reference: Douglas '78 (1st), Douglas '79 (2nd), Douglas '78 (3rd)

RAE HORIZON-BAR SYSTEM (RAE). A historic term. A centerline system with transverse bars. Bars are in three groups: outer 1000 feet; then two groups for next thousand feet; one group for inner 1000 feet.

Reference: FR Arcata '49

ROW-TYPE APPROACH LIGHT SYSTEM. Haber does not specify type of row. Perhaps any (and all) systems with rows are intended. Near-historical term.
Reference: Haber '58

STANDARD APPROACH LIGHT SYSTEM. Term refers to Centerline System which was nearing widespread approval in 1950.
Reference: Moore AW '50

SYSTEM OF NEON APPROACH LIGHTS. Descriptive term for experimental study; few details given. It is perhaps more of a descriptive term than an official name.
Reference: CAA Tests ... AC '45

TWO-ROW APPROACH-LIGHT SYSTEM. Another name for Slopeline System. This term highlights one danger with Slopeline: an air crew might follow one row rather than fly between the two rows.
Reference: Moore AW '50

U.S. NATIONAL STANDARD CONFIGURATION "A"/U.S. STANDARD, CONFIGURATION A (ALPHA) SYSTEM. Earlier name and form of present day ALSF-1, -2. Second term is a further variant form.
Reference: Christian AW '56, Finch '61 (2nd)

Components of Approach Systems:

WING BAR. Reference: Finch '61

TERMINATING BAR. Reference: Finch '61

STEADY-BURNING APPROACH LIGHT. Reference: Finch '61

1D4 Final Approach Indicators

a) Overarching Terms

APPROACH PATH SLOPE INDICATOR. System of universal nature intended for VASI and PAPI. Seemingly physical apparatus is meant.
Reference: Omnipol

APPROACH VISUAL GUIDANCE SYSTEM. Overarching term for a series of systems including: PAPI, HAPI, Discharge Capacitor Lights (Circling Guidance, Runway Lead-in Lighting Systems, REILS, Sequence Flashing Lighting System).
Reference: Thorn

HELIPORT APPROACH PATH INDICATOR (HAPI). PAPI adapted for helicopter operations.
Reference: HD '94

GLIDE PATH LIGHT INDICATOR. This term refers to light fixtures for PAPI, Glide Path Slope System. It is employed in mobile airport lighting system.
Reference: Omnipol

GROUND-BASED VISUAL LIGHT GUIDANCE SYSTEM. An overarching term for all forms of these systems.
Reference: Clark '81

MEDIUM-INTENSITY HAPI UNIT. More of a description than formal name. Refers to Philips product. Physical apparatus is referent more than signals.
Reference: Momberger AF '86

VISUAL APPROACH DESCENT INDICATOR (VADI). For IES this is an overarching term that includes VASI and PAPI. It is a "configuration of lights that furnish the pilot with approach slope information during the landing descent."
Reference: IES '87

VISUAL APPROACH GUIDANCE INDICATOR SYSTEMS. Overarching term for a variety of Indicators include VGPI, TVG, PVG which see.
Reference: Clark '81

VISUAL GLIDE PATH AID. Overarching term for a variety of Aids such as Tri-Color, Amber, Calvert & RAE, Double Bar, Mirror System.

Reference: Cook AW '60

VISUAL GLIDE PATH INDICATOR. Seemingly an overarching term for HAPI, VASI, PAPI.

Reference: HD '94

VISUAL GUIDE PATH INDICATOR (VGPI). This is a Visual Landing Aid employing a R/W principle. It is also known as Angle of Approach Indicator and VASIS. RAE was primary force in development of this approach. It is possibly a broader term in meaning.

References: HD '88, Clark '81

VISUAL GUIDE SLOPE INDICATOR. Overarching term for VASI, PAPI, PLASI.

Reference: Vertiport Design '91

VISUAL GUIDE SLOPE INDICATOR SYSTEM. "Aeronautical lights so arranged as to encompass the beginnings of glide path and thereby create information on vertical azimuth, roll guidance. This term includes VASI and PAPI.

Reference: NATO '92

b) Precision Approach Path Indicators

PRECISION APPROACH PATH INDICATOR(PAPI). This unit is often referred to by the acronym of PAPI. It is a replacement for the older VASI. ICAO approved it in 1982. The regular form has four units positioned on the left side of runway threshold. It displays red and or white messages. Unlike older indicators the color separation are precise so that pink hues are not received by air crew.

There are four possible messages with PAPI: if on approach path two whites and two reds are observed. If slightly low than one white and three reds. If far under correct path then four reds. If well above path then four whites. Each unit has two or three projectors. Some sources add acronym to word form.

References: PAPI AI '84, Latest Dev. AI '91, AIP '99, Clark '81, Airport Light Eq Cert Program '94

PAPI. A frequently employed acronym for Precision Approach Path Indicator. The acronym is employed at least as often as the full name.

References: ADM '83, AD '99, AD Vol II '95, FAA AIM '91, Norway CAA

PRECISION APPROACH PATH INDICATOR (PAPI) SYSTEM. This FAA

term is a more precise and complete version employing name, acronym and system.

Reference: PAPI System '85

PAPI SYSTEM. This term employs both acronym and system thereby more fully indicating the systems character of PAPI; use of system is employed by several manufacturers.

Reference: ME, ADB

PAPI APPROACH SYSTEM. PAPI is an element for approach systems though this term suggests it is an approach system in its own right as a free-standing assemblage.

Reference: Omnipol, Thorn

PAPI GLIDE PATH LIGHTING SYSTEM/GPLS. Friedl's fuller title adds additional explanation to the core title. This title is an early designation for PAPI. GPLS suggests an overarching term but it refers only to PAPI for Friedl.

Reference: Friedl AF '86

PAPI LIGHTS/PRECISION APPROACH PATH INDICATOR (PAPI) LIGHTS. EALS employs Lights rather Indicator. But the meaning is seemingly unchanged.

Reference: EALS '99

PAPI-4/PAPI-2. Terms equivalent of PAPI and APAPA: four units for the former; two units for the latter.

Reference: IES '87

PAPI WING BAR. Term refers to physical apparatus for PAPI. Wing Bars contain light apparatus.

Reference: AD '90

APAPI WING BAR. Term refers to physical apparatus for system.

Reference: AD '90

ABBREVIATED PAPI. This system consists of two lights rather the four of PAPI.

Reference: Ap Light Eq '86

ABBREVIATED PRECISION APPROACH PATH INDICATOR (APAPI). Formulation that includes both word form and acronym.

Reference: Lexicon '86

APAPI. Abbreviated form of PAPI. Two units instead of four.
Reference: AD '99, AD Vol II '95, Devasenapathy IJ '94

MINI-PAPI. A form of PAPI that is substantially smaller in size. A product of Thorn-EMI.
Reference: PAPI AI '84

CHAPI/CHAPI SYSTEM. A helicopter version of PAPI. Some firms add a green light that adds "descent-rate" data.
Reference: C-H, PAPI AI '84, Cegelec (2nd)

PORTABLE PAPI. A component of portable Airport Lighting System (for temporary use or standby status).
Reference: Slo-Idman

THREE-LAMP PAPI. A term in an older source that that lacks details. Possibly a three-color form?
Reference: Momberger AF '86

c) VASI Systems

1) Forms

VISUAL APPROACH SLOPE INDICATOR (VASI). Final approach indicators provide approach slope data during the time a plane is descending. VASI has been a major form of this Indicator type for many years. There are many forms of VASI including the basic form of a 2-Bar System with a R/W lighted panel. A plane on target will see white in the downwind unit and red in the upper unit. Above glide path the crew will see two white lights and if low then two red messages. Frequently the acronym of VASI or VASIS (2nd "S" for System) is employed. The acronym is omitted by AD Vol II.
References: IES '87, PAPI AI '84, ADM '83, AD Vol II '95

VISUAL APPROACH SLOPE INDICATOR (VASI) SYSTEM/VISUAL APPROACH SLOPE INDICATOR SYSTEM. This version of the title is slightly more expansive by including System in the title.
Reference: ADS-Site '73, Spec for L-851, '72, Multi-Electric, AD Vol II '95

VISUAL APPROACH SLOPE INDICATOR SYSTEM (VASIS). A slightly nuanced variant title for this Navaid. ADM '93 lacks acronym.
Reference: Clark '81, AD '99, ADM '93

VISUAL APPROACH SLOPE INDICATOR SYSTEM. A nuanced variant form of the basic term. Five surveyed sources use this version; four are manufacturers.
Reference: Cegelec AI '92, ADM '83, GE, Lexicon '86

VASI. Acronym for Visual Approach Slope Indicator. Acronym often stands alone.
Reference: Airport Lighting ASM '78

VASI SYSTEM. Acronym added to the word System.
Reference: IES '81, ME, Sepco

VASIS. Acronym for Visual Approach Slope Indicator System. Only a limited number of references employ this term and only a single U.S. source is included.
References: AD '71, '90, H & P, ADM '93

A-VASIS. Term that refers to Abbreviated VASIS.
Reference: Devansenapathy IJ '94

AVASIS. Acronym for Abreviated VASIS.
Reference: Clark '81, ADM '83

ABBREVIATED VISUAL APPROACH SLOPE INDICATOR. Approved Lighting Equipment lists the term; explanations not included in that publication.
Reference: Ap L Eq '68

ABBREVIATED VISUAL APPROACH SLOPE INDICATOR SYSTEM (AVASIS). A variant form that adds acronym.
Reference: Lexicon '86

SAVASI. Acronym for Simple Abbreviated VASI.
References: ADS-Site '71, Sepco

RT-VASIS. RT-VASIS= Reduced T-VASIS which see.
Reference: Clark '93

AT-VASIS. An abbreviated version of T-VASIS which see.
References: Clark '81, ADM '83

T-VASIS LIGHT UNITS (BLADE TYPE)/T-VASIS LIGHT UNITS (PROJECTOR TYPE). ADM '83 includes the physical apparatus that makes up T-VASIS.

Reference: ADM '83

T-VASIS/TEE VISUAL APPROACH SLOPE INDICATOR. A system that in some modes displays a "T" shaped indication. When on correct path two white lights are displayed on both sides of the runway. If above then one of three messages: one for slightly above, two for moderately above, and three well above (for an inverted T). If below correct level the messages are reversed. Clark describes a final message of "Gross Undershoot Signal" for danger. This is a T-shaped message.

References: Clark '81, ADM '83, AD '99, P & B '88

2) Vasis: Types

General Note. The VASI System consisted of many forms ranging from simple to complex. The various groups and designations are here described. Notes are included as needed. The primary terms offer an explanation of the workings of VASI.

VASI-2/VASI-4/VASI-6/VASI-12/VASI-16. The basic level consists of just two boxes while additional units up to 16 offer a more complex configuration. References include a variety of FAA A/C, IES '81, Katz '89

VASI-II/VASI-IV/VASI-VI [3 Bar]/VASI-XII/XVI[3 Bar]. Sepco offers a different format employing Roman numerals.

Reference: Sepco

2-VASIS. H & P offers a slight variation of the regular formulation.

Reference: H & P

12-BOX VASI/12-BOX VASI SYSTEM. Reformulation of basic formulation of VASI-12.

Reference: Multi Electric, Sepco, IES '72

4-BOX VASI. A variant formulation of the basic terminology of bars.

References: Sepco, IES '72

2-BOX VASI. A variant formulation of the basic terminology of bars.

Reference: IES '72

2-BAR VASI/2-BAR VASIS/3-BAR VASI/3-BAR VASIS/2-BAR SYSTEM/3-BAR SYSTEM. Variant formulations of basic term that employs Bar rather than Box.

References: AIP '91, IES '81, Clark '81

VASI-2ND LIGHT BAR/VASI 1ST LIGHT BAR.

Reference: ADS-Site '69, '71, '73, '80

2-BAR SYSTEM (VASI-2, -4, -12)/3-BAR SYSTEM (VASI-6, -16). Alternate formulations of basic terms.

Reference: IES '87

d) Other Forms

1) Glide Path Forms

APPROACH-ANGLE LIGHTS. A form of heliport glide slope Indicator. Historic.

Reference: Breckenridge '55

GLIDE PATH INDICATOR. For Cegelec this is known as the Helicopter Glide Path Indicator. It is a Tri-color System displaying: red, green, yellow.

References: HD '94, CAA Tests AC '45, AIP '99

GPI. This is an acronym for Glide Path Indicator.

Reference: Cegelec

GLIDEPATH INDICATOR. This term with Glidepath as one word appears to be an overarching term. However, it instead refers to a specific Heliport Aid by Officine Paneri (Italy). Few details are available.

Reference: Latest Developments AI '91

PRECISION VISUAL GLIDEPATH (PVG). A term from 1950s. It consisted of two bars of white lights flashing on runway (above threshold). Third bar of amber lights placed near threshold. Alignment of white and amber indicates on glidepath.

Reference: Clark '81

PULSATING SYSTEM. One unit, two-color Visual Approach with these messages: above=pulsating white; below: red, steady. Well below: pulsating red light. On= white, steady. Pulsating rate: varies according to position above, below, on course.

Reference: AIM '99

PVG. Acronym for Precision Visual Glidepath.

Reference: Clark '81

PVG. Acronym joined by system. This Aid contains a limited number of parts yet it is an integrated unit and thereby a system.

Reference: Clark '81

TEE SYSTEM. Presumably Tee Visual Glidepath Aid employing short form and system in title.

Reference: Clark '81

TEE VISUAL GLIDEPATH (TEE or TVG). It is a combination of aspects of PVG and AAI Systems. ICAO's T-VASIS is very similar.

Reference: Clark '81

TVG. Acronym for Tee Visual Glidepath.

Reference: Clark '81

2) Tri-Color Forms

TRI-COLOR GLIDE PATH INDICATOR. Aid employed by RAF in World War II. PLASI and HAPI are also three-color Aids.

Reference: Clark '81

TRI-COLOR SYSTEMS. A category in AIM '91 which seemingly presents a single form: Tri-Color Visual Approach Slope Indicator which see.

Reference: AIM '91

TRI-COLOR VISUAL APPROACH SLOPE INDICATOR. A three-color system in amber, green, red. Messages: When amber is present pilot above glide path; when red present then below the glide path. When green visible then on glide path.

Reference: AIM '91

3) Fresnel Forms

NAVY FRESNEL SYSTEM/NAVY FRESNEL LENS OPTICAL LANDING SYSTEM/ FRESNEL LENS OPTICAL LANDING SYSTEMS, FLOLS/FLOLS, FRESNEL LENS OPTICAL LANDING SYSTEM. This Aid is used on aircraft carriers. It is comprised of two colors: yellow and green. There are 12 green units and one yellow bar. Both colors need to be in alignment. When the yellow bar is above the green units the plane is above the glide slope. When yellow below the

green then the plane is too low. There are also red lights that indicate: do not land.
References: IES '66, IES '72, Clark '81

FRESNEL SYSTEM. A shorter term for Fresnel Lens Optical Landing System.
Reference: IES '66

MDLA, MIRROR DECK LANDING AIDS. See also Fresnel, Navy Fresnel. Lamp reflected off of mirror. Light perceived as a "central spot of light." Accompanied by light which may be amber. Central light (green) needs to be aligned with accompanying lights.
Reference: Clark '81

MIRROR SYSTEM. FLOLS is a modified version of this Aid though not explained.
Reference: IES '66

4) PLASI Forms

HAPI-PLASI. This is a helicopter version of PLASI.
Reference: Devore

HELI-PLASI. A form of PLASI for helicopter operations.
Reference: PAPI AI '84

PLASI. Acronym for Pulse Light Approach Slope Indicator.
Reference: Norway CAA

PLASI I, II. Roman numerals denote cooling systems with II indicating extreme climate use.
Reference: Ap L. Eq '86, Devore

PORTABLE PLASI. A temporary unit when other systems are not working.
Reference: Pollock A.I. '90

PULSATING VISUAL APPROACH SLOPE INDICATOR. AIM '99 gives this variant formulation for PLASI. PLASI meanings Pulsating in this form instead of Pulsed or Pulse Light Approach Slope Indicator.
Reference: AIM '99

PULSE LIGHT APPROACH SLOPE INDICATOR (PLASI). A one box system in which pulses increase with deviation from glide path. Steady white light indicates on path; red indicates far below path.

References: Clark '81 , PAPI AI '94

PULSED LIGHT APPROACH SLOPE INDICATOR. FAA has Pulsed but manufacturer, Devore, has Pulse.

Reference: Ap L Eq '83

5) Miscellaneous Forms

AAI SYSTEMS. Acronym for Angle of Approach Indicator which see.

Reference: Clark '81

ALIGNMENT OF ELEMENTS SYSTEM. A simple unlighted Landing Aid: painted panels of plywood are painted either in black and white, or fluorescent orange. When three panels are in alignment plane is on glide path. If middle panel above the flanking panels then the pilot is above the correct position; if middle panel below flanking panels the pilot below desired angle of descent.

Reference: AIM '91, AIP '91

ANGLE OF APPROACH INDICATOR (AAI). This Aid displays light that indicates "The desired angle of descent during an approach." It is a R/W system. [REWORK].

Reference: NATO '92

ANGLE OF APPROACH LIGHT/ANGLE-OF-APPROACH LIGHT. Indicates glide path: Green=on; Red=low; Yellow=High

Reference: AD '53

GENERIC VISUAL APPROACH DESCENT INDICATOR.

Reference: Generic V. Gl Sl In '88

GENERIC VISUAL GLIDESLOPE INDICATOR (GVGI). GVG provides visual glideslope guidance at general aviation airports.

Reference: Generic V. Gl Sl In '88

OPTICAL PROJECTOR GROUND AIDS. An early Aid giving glide slope data: Green= on correct path, Red=high, Amber=low.

Reference: Clark '81

OPTICAL ILS. This system is a combination of PAPI and SAGA which see.

Reference: Thorn

PULSATING SYSTEMS. This term refers to a single-unit Aid with two colors. When on glide path the message is steady white. When slightly below then steady red. When above, pulsating white and below is denoted by pulsating red. Pulsating rate denotes distance from correct glide path.

Reference: AIM '91

PULSE CODED OPTICAL LANDING AID. According to Clark this is one form of Aid that employs projected sectors that are color or flash coded. Employed for helicopters and airports with less intense operations.

Reference: Clark '81

SAGA (SYSTEM OF AZIMUTH GUIDANCE FOR APPROACH). "Combined signal of approach azimuth guidance and runway threshold identification lights (REILS)." Two unidirectional rotating units near corners of threshold. Depending on plane's position either the RT or AAG function activated.

Reference: Thorn

STANDARD VISUAL APPROACH GUIDANCE AID. Term refers to PAPI as having the status of the standard aid.

Reference: Cegelec AI '92

VISUAL APPROACH DESCENT INDICATOR (ROTARY WING). Former name for GVADI.

Reference: Ap L Eq '85

VISUAL ANGLE OF APPROACH INDICATOR. An overarching term for VASI and Navy Fresnel System.

Reference: IES '66

VGSI. Terms interchangeable, or two systems who can interchange optical assembly. Word forms in other sources refers to an overarching term that includes several forms.

Reference: GE '65; See Vertiport Design '91

Chapter 1E Runway & Taxiway Lighting

a) Overarching Terms

General Note. There are several overarching terms for this category yet numerous sources do not employ them. In many instances specific terms (for example, Running Edge Light, Runway Centerline Light) are used but not general terms. In some instances what appear to be overarching terms are short forms of a specific term (for example, Runway Lighting System for High Intensity Runway Lighting Systems). Composite terms are also employed on occasion. In some instances very general terms are in use (for example, Airport Lighting).

RUNWAY LIGHTING. A few FAA sources employ this term. The term strongly suggests a system of integrated lights for a common purpose. Yet the actual usage refers to a specific usage. A second and dated source does employ the term in an encompassing term. Friedli includes an inventory of forms: Threshold, TDZ, Centerline, Runway Edge, Runway End Lights.

References: Med Int Runway Lighting Systems & VASI for Utility Airports '70, Planning & Design '70,

RUNWAY LIGHTS. This term can refer to a singular light though in most cases it refers to a group of Lights (and probably an integrated group). A variety of sources, many of U.S. provenance, employ the term. Older sources from the 1940s to the 1960 also employ the term. But many newer sources do not use term. Possibly because of a preference for specific terms. Yet, other sources, conversely, employ more overarching terms such as Airport Lighting.

References: Doty AW '57, AIP '91, FAA ADS-Site '69, CD '79, D & B '77

RUNWAY LIGHTING SYSTEM. This would appear to be a core term for a system of Runway Lights. Yet there is only limited use of the term. Two older sources include the term in a discussion of the development of Runway Lighting Systems. One FAA source uses it as a shorter form of High Intensity Runway Lighting Systems.

References: CAA Will Test ... AW '56, Cook AW '60, H I Light Sys '65, Warskow '50

RUNWAY VISUAL AIDS. This may be more of a general overarching term. Though seemingly it can be a near synonym with Lighted Aids.

Reference:

IN-RUNWAY LIGHTING. A general term for one source. It includes Touchdown Zone, Runway Centerline, Runway Remaining, Taxiway Turnoff Lights.

Reference: AIP '90

PRIMARY AIRFIELD LIGHTS. Seemingly an overarching term for Runway and Taxiway Lighting.

Reference: Momberger AF '86

RUNWAY/MOS LIGHTING. MOS= Minimum Operating Stripe. Aid is part of Emergency Airport Lighting System (EALS).

Reference: EALS '99

b) Runway Edge Lights

RUNWAY EDGE LIGHTS. A pattern of lights that outlines vertical and horizontal boundaries of landing area for night use and during poor daytime conditions. Lights are steady-burning and white in color. For displaced thresholds the lights consist of red lights. Yellow lights are employed for part of the runway (opposite end of approach direction). For ICAO lights are employed day and night under certain conditions. ICAO speaks of fixed lights which has the meaning of steady-burning. Finch offers a full view of the forms of these Lights: Low Intensity (1000 cp), Medium Intensity (1000-10,000 cp), High Intensity (10,000-100,000 cp). Heights include: Low-profile (no more than 1" above pavement), Flush (1 3/4"), Semi-flush (3 1/2"), Elevated (30").

References: IES '81, AD '90, AIM '91, D & B '77.

RUNWAY-EDGE LIGHTS. Several sources offer a hyphenated version of basic term.

Reference: ADM '93, D & B '77, Douglas '78

RUNWAY EDGE LIGHT SYSTEM. The addition of the word System makes the basic term more explicit. AIP refers to amber rather than yellow for last 2000 feet. See Railway Signal monograph, Part F, for a discussion of amber and yellow. AIP includes HIRL, MIRL, LIRL forms within this term.

Reference: AIP '90

RUNWAY EDGE LIGHTING/RUNWAY EDGE LIGHTING SYSTEM. IES '72 offers a variant form of the term that employs Lighting instead of Light. The meaning seems unchanged. Friedl and Momberer omit System.

Reference: IES '72, Friedl AF '86, Momberger AF '86

RUNWAY OUTLINE LIGHTS. Term appearing in a paper on development of Lighting. Possibly broader in scope than Runway Edge Lights.
Reference: Finch '61

STANDARD LIGHTS/STANDARD EDGE LIGHTS. Doubtful terms. Finch refers to Runway Edge Lights that are Standard or Standard Edge. Apparent differentiation from non-standard forms.
Reference: Finch '61

There are Runway Edge Light terms without the word Runway. These terms are part of the category though in implicit mode. They include:

EDGE LIGHTS/EDGE-LIGHTS.
Reference: IES '66, '87, Pollock '90, Horonojeff '62, D & B '77, McKelvey JN (2nd) '87

EDGE LIGHTING.
Reference: McKelvey JN '87

EDGE LIGHTING SYSTEM.
Reference: "Short Takes", AI, '94, Finch '61

ELEVATED EDGE LIGHTS
References: IES '81, A & W '92

LOW INTENSITY EDGE LIGHTS.
Reference: IES '72

c) Runway Centerline Lights

AIRPORT CENTERLINE LIGHTS. An older term for Runway Centerline Lights. A possibly workable term before the advent of Taxiway Centerline Lights.
References: Ap L Eq '66, '68, '73, Spec for Seq Fl L '75, Spec for L-843 '64

CENTERLIGHTS. Philips term for Runway Centerline (Flush) Lights.
Reference: Momberger AF '86

CENTERLINE LIGHTS. This is part of Runway Lighting though runway not in title.
References: Instal Details '75, Maint Vis Aids '82, A & H '79, CD '79, D & B '77

CENTERLINE LIGHTING SYSTEM. This term from an older edition of Approved Lighting Equipment predates Taxiway Centerline Lights.
Reference: Ap L Eq '68, D & B '77

CENTERLINE GUIDANCE LIGHTS. A possible reference to Runway Centerline Lights.
Reference: Finch '61

CENTERLINE RUNWAY LIGHTS. A nearly historic source and one that places Centerline before Runway. This is a rare practice.
Reference: Centerline Runway ... AW '51

CENTRE LINE LIGHTS. British English spelling of basic term.
Reference: D & B '77 (8th Air Nav. Conference)

RCLS. Acronym for Runway Centerline Light System.
Reference: Douglas '79

RUNWAY CENTRELINE LIGHTS/RUNWAY CENTRE LINE LIGHTS. While Runway Edge Lights are a basic feature of most airports, Centerline Lights are not found at all airports. This term, in British English, is from ICAO. According to ICAO these Lights are provided for CAT II and III PAR operations. They are fixed (or steady-burning). They are of variable white color. The lower end of the runway has variant color patterns. From 900 to 350m the lights alternate between red and white; the last 350m are red only.
Reference: AD '76, ADM '93, AD '99 (2nd)

RUNWAY CENTERLINE LIGHTS. This term can refer to individual units though the term can also refer to a system of such Lights.
References: Instal Details '75, H I L. Sys '65, AD '79, D & B '77

RUNWAY CENTERLINE LIGHTING (RCLS). This term occupies an intermediate state between Lights and Lighting System. The meaning is probably unchanged. Friedl omits acronym.
References: AIP '91, AIM '91, Friedl AF '86

RUNWAY CENTERLINE LIGHTING SYSTEM/RUNWAY CENTERLINE LIGHTING SYSTEM. This term is more explicit from the vantage point of systems. Sources and explanation are more in the U.S. mode. They are employed on some PARs. The lights are 50 feet apart and positioned on the centerline. They are white color except last 3000 feet: first 2000 are white and red; last thousand

feet are red only.

References: IFH, AIP '99, AD '93 (2nd)

d) Threshold, Touchdown Zone, Runway End & Other Lights

General Note. There are a variety of specialized Lights associated with runway operations. They are associated with Edge and Centerline Lights yet have a distinctive character. These various Lights are grouped together in this segment.

"NARROW GAUGE" PATTERN. Early form of TDZ Lights.

Reference: Finch '61

ROAD-HOLDING POSITION LIGHT FOR VEHICLES. Traffic Signals for motor vehicles in aircraft operation areas. Red/green or Flashing-red Lights of regular Traffic Signals are employed.

Reference: AD '90

RUNWAY TOUCHDOWN ZONE LIGHTS/RUNWAY TOUCHDOWN ZONE LIGHTS (TDZ). These are a series of transverse Light Bars (3-barrette unidirectional units) flanking the lower end of Centerline Lights. They are installed for some PARs and denote the zone in poor visibility. A variety of sources refer to Touchdown Zone Lights minus the word Runway. ICAO adds Runway thereby increasing the specificity of the term.

References: AD '90, AIP '99, Lexicon '86, AD '99 (2nd)

TOUCHDOWN ZONE LIGHTS. A more common version of Runway Touchdown Zone Lights though less explicit in meaning. FAA Maintenance Guide refers to maintenance and possibly that usage suggests individual units not TDZ as a system.

References: ADS-Site '69, AIP '91, CD '79, D & B '77, AD '99, Apr Airp L '66, Maint Guide '71

TOUCHDOWN ZONE LIGHT SYSTEM. A version of the basic term that includes System in the title though not Runway.

References: Standards for Airport Signs '91, Part G

TOUCHDOWN ZONE LIGHTING. Presumably the equivalent of those touchdown zone terms employing Light

Reference: ADM '93

TDZL. Acronym for Touchdown Zone Lighting System.

Reference: Douglas '79

TDZ LIGHT BAR. This term refers to individual physical apparatus more than to the morphological dimension.

Reference: Standards ... Airport Signs '91

AIRPORT IN-RUNWAY TOUCHDOWN ZONE LIGHT. Term appears in list of approved terms. It is more complete though no description of term available.

Reference: Ap L. Eq. '73

RUNWAY END LIGHTS. This term refers to Lights marking the end of a runway. They are of a fixed or steady-burning character in red and face toward the runway. Runway End and Threshold Lights often share the same fixture.

Reference:

RUNWAY THRESHOLD LIGHTS. These are fixed, unidirectional Lights. They are located near the outer end (threshold) of the runway. They face the approach direction. They emit steady-burning green messages. Threshold Light term is probably more common. They denote the threshold for approach aircraft.

References: IES '80, ICAO '90

RUNWAY THRESHOLD & WING BAR/RUNWAY THRESHOLD & WING BAR LIGHTS. ICAO includes this combined term. Wing Bars are added lights provided where more illumination is needed.

Reference: ICAO '90, AD 99

THRESHOLD/END LIGHTS//THRESHOLD/END LIGHTING. Runway End and Threshold Lights often share the same fixtures. EALS here conjoins the names of the two forms.

Reference: EALS '99

THRESHOLD LIGHTS. Shorter form of the full term though more common in use. It can refer to individual units though it probably refers as well to a system of Threshold Lights.

Reference: Centerline Runways ... AW '51, Doty AW '57, Spec for R & T Edge L. '75, H I Runway Lighting System '73

THRESHOLD LIGHTING. This term probably refers to a system of Threshold Lights. Confusion is possible since variations of this form of Light have a similar if not identical meanings. Lights positioned at base of runway. Two wing bars flank the runway; a second group is positioned at the base of the runway. Lights alternate green and yellow; back side is red.

References: IES '81, ICAO '90, H I Rnwy Lighting System '65, '73, Stolports '70

END LIGHTS, END OF RUNWAY LIGHTS. Variant forms of the basic term that lack the word Runway.

Reference: Spec for R & T Edge L '75 (R), Maint. '82 (L)

LIGHTS, RUNWAY END. A more bureaucratic formulation of the basic term with general term at the beginning and followed by specifics.

References: FAA 150/5345-53.

RUNWAY REMAINING LIGHTING/RUNWAY DISTANCE REMAINING. A few sources give a separate name to the Lights for the lower end of runways that have two-color light configurations. It is not clear why this practice has arisen for selected sources.

References: AIM '91, AIP '90 (L), Stolports '70 (R)

EXIT TAXIWAY LIGHTING. ADM has a category under this name which includes Taxiway Lights. The term then refers to Taxiway Light that carry out exit functions.

Reference: ADM '93

TAXIWAY TURNOFF LIGHTS. This Light is a Taxiway Exit Light for ICAO and other sources. Yet AIP lists it with Runway Lighting.

Reference: AD '85

TAXIWAY LEAD-OFF LIGHTS. This Light is close in meaning to previous term. It displays green and yellow lights which conform to Taxiway Centerline Light including Taxiway Exit Lights.

Reference: AIP '99, AIM '99

TAXIWAY TRAFFIC SIGNALS. Term from 1930s-1940s era. Such Signals probably control movement for aviation operations.

Reference: Breckenridge '55

STOPWAY LIGHTS. These are Lights of an unidirectional character. Red light controls stopway on taxiway exit.

Reference: AD '90, Lexicon '86

e) Runway Equipment Terms

General Note. These terms are generally both physical and morphological in nature. There are several terms that recur with Light terms. For that reason these terms are divided into general terms and specific terms.

1) General terms

BIDIRECTIONAL. Two directional Light apparatus.

ELEVATED. Unit other than in-pavement. It may be some inches off pavement. Lighted mounted on pipes or conduits.

OMNIDIRECTIONAL. A Light that can be viewed 360 degrees.

UNIDIRECTIONAL. Light apparatus for single direction only.

Light fixtures that can be run over without harm have gone through a variety of seemingly interchangeable names including:

FLUSH

IN-PAVEMENT/INPAVEMENT

IN-RUNWAY

INSET

SEMI-FLUSH

2) Physical Apparatus Terms (related to previous segment)

AIRPORT IN-RUNWAY LIGHT.

Reference: Ap L Eq '66, '68

AIRPORT IN-RUNWAY TDZ LIGHT.

Reference: Spec for Seq L '75

BIDIRECTIONAL CENTER LINE FIXTURES.

Reference: Maint Guide '71

BIDIRECTIONAL HIGH/MEDIUM-INTENSITY RUNWAY LIGHT. Intensity according to size of lamp (45w for MI; 200 w for HI).

Reference: Momberger AF '86

BI-DIRECTIONAL SEMIFLUSH INSET LIGHT ASSEMBLY.

Reference: Spec, L-850 '66

ELEVATED EDGE LIGHTS.

Reference: Douglas 11-20-77

ELEVATED LIGHTS.

Reference: AD Vol II '95, Vertiport '91

ELEVATED RUNWAY EDGE LIGHT.

Reference: Douglas 11-20-77

ELEVATED RUNWAY LIGHT.

References: ATA '46, Horonjeff '62

ELEVATED THRESHOLD LIGHT.

Reference: Horonjeff '62

**FIXED FOCUS BIDIRECTIONAL HIGH INTENSITY RUNWAY LIGHT/
FIXED FOCUS UNIDIRECTIONAL HIGH INTENSITY RUNWAY LIGHT.**

References: H I Light '65, Ap L Eq '66

**500 WATT HIGH INTENSITY RUNWAY LIGHT WITH AUTOMATIC
BEAM CONTROL.** A term with nearly every element in the title.

Reference: Ap L Eq '66

FLASH LIGHTS. Alternative name for Sequence Flashing Lights or Stroble
Lights?

Reference: Momberger AF '86

FLUSH CENTERLINE LIGHT.

Reference: Momberger AF '86

FLUSH LIGHT. Term employed for multiple functions including Centerline,
TDZ, Approach, Threshold, Runway-end functions.

Reference: Momberger AF '86

IN-RUNWAY LIGHT FIXTURE

Reference: Spec for L-845

IN-RUNWAY LIGHTS.

Reference: AIM '91, AIP '91

INSET LIGHT.

Reference: Vertiport '91, Momberger '86, ADM '93, AD Vol II '95, Lexicon '86

**LIGHT ASSEMBLY, AIRPORT RUNWAY CENTERLINE & TDZ/
LIGHT ASSEMBLY, AIRPORT RUNWAY, CENTERLINE & TDZ ZONE/
LIGHT ASSEMBLY, AIRPORT RUNWAY & CENTERLINE.**

Reference: Ap L. Eq '68 (L) Spec for Seq L '75 (C), Spec L-850 (R)

LIGHT ASSEMBLY, AIRPORT TAXIWAY CENTERLINE.

Reference: Ap L Eq '68

LIGHTS, PORTABLE RUNWAY.

Reference: Ap L. Eq Cert Prog '95

LIGHTS, RUNWAY EDGE LOW INTENSITY.

Reference: Ap L Eq Cert Prog '95

LIGHTS, RUNWAY, IN-PAVEMENT.

References: Ap L. Eq. Cert. '94, Ap L Eq '76

MULTIPLE-PURPOSE ELEVATED LIGHT. Runway and Taxiway Edge Light.

Reference: Momberger '86

**NARROW GAUGE RUNWAY LIGHTS/NARROW GAUGE LIGHTING
SYSTEM (RUNWAY).** Refers to Lights employed in testing, but little
information on meaning of term.

Reference: Doty '57, Lexicon '86 (2nd)

OMNIDIRECTIONAL LIGHTS. Physical apparatus of an overarching nature.
Douglas notes that early visual Landing Aids followed that configuration. Some
current Lights are omnidirectional though unidirectional, bidirectional forms also
in use.

Reference: Douglas '78

PORTABLE EDGE LIGHT.

Reference: Spec for Port Rnwy L '78

PORTABLE RUNWAY END IDENTIFIER LIGHT.

Reference: Spec for Port Rnwy L '78

RADIO-CONTROLLED RUNWAY EDGE LIGHT. Temporary Landing Strip Lights in emergency situations.
Reference: Momberger AF '86

RNWX/LGTS Abbreviation for Runway Lights.
Reference: NOTAMS '93

RUNWAY IN-PAVEMENT LIGHT/RUNWAY INPAVEMENT LIGHT.
Reference: Spec for R & T L Fix '84

SEMIFLUSH AIRPORT LIGHT/SEMIFLUSH AIRPORT LIGHTING.
References: Maint of Airp Vis Aid Fac '82, Spec for L-838 '64

SEMIFLUSH INSET PRISMATIC LIGHT.
Reference: Spec for L-845 Seq Fl L Prism Ap L '64

SEMIFLUSH INTERSECTION LIGHT.
Reference: H I Runw L Sys '73

SEMIFLUSH LIGHT.
Reference: H I Runw L Sys '73, CD '79

SEMIFLUSH PRISMATIC AIRPORT LIGHT/SEMIFLUSH INSET PRISMATIC AIRPORT LIGHT.
References: H I Light Sys '65, Ap L Eq '66

STANDARD HIGH INTENSITY RUNWAY LIGHTING. Term is more of a descriptive term than an official name. Suggests standard and approved ideas on Lighting rather than experimental forms (this was in 1950).
Reference: Warskow '50

UNIDIRECTIONAL LIGHTS.
Reference: ADM '93

UNIDIRECTIONAL SEMIFLUSH INSET LIGHT ASSEMBLY.
Reference: FAA Spec L-850, '66

UNIDIRECTIONAL THRESHOLD LIGHT.
Reference: Spec for Seq L '75

UNIDIRECTIONAL TOUCHDOWN ZONE LIGHT FIXTURE.
Reference: Maint Guide for Det '71

2) Terms by Intensity

General Note. Frequently Light terms include the intensity of the light fixture in the titles the following terms indicate.

ELEVATED HIGH INTENSITY RUNWAY LIGHT FIXTURES. This term includes physical apparatus as well as intensity in title. Term refers to Edge Light.
Reference: H I Runway Light Sys '73

HIGH-INTENSITY BIDIRECTIONAL INSET LIGHTS. Lights are within the context of Runway Centerline Lights.
Reference: Momberger AF '86

HIGH INTENSITY, ELEVATED TYPE D-1 LIGHTS. Physical apparatus for Approach and Runway Edge Lights.
Reference: Douglas '79.

HIGH-INTENSITY LIGHTS. A somewhat overarching term for a series of Lights produced by AEG.
Reference: Momberger AF '86

HIGH INTENSITY LIGHTING SYSTEM. This system refers to Approach and Runway Lighting.
Douglas '79

HIGH INTENSITY RUNWAY LIGHTING. Older Such Lighting in the U.S. was of three forms: L-818 (500w), L-819 (200w), L-820 (95w Sealed Beam, and 45w Conventional)
Reference: Warskow '50

HIRL. Acronym for U.S. High Intensity Runway Light System.
Reference: Douglas '79

HIGH INTENSITY LIGHT SYSTEM/HIGH INTENSITY RUNWAY LIGHT SYSTEM. Both terms refer to Elevated Lights for edge of instrument runways; also high-volume non-instrument runways. The second has a more complete sense.
References: H I Runway L System '73, CD '79 (L)

HIGH INTENSITY RUNWAY EDGE LIGHTS/HIGH-INTENSITY RUNWAY EDGE LIGHTS/RUNWAY HIGH-INTENSITY EDGE LIGHTING SYSTEM

Reference: Spec for L-838 Prism Ap L '64, Spec for L-845, Seq Fl Inset Prism Ap L '64, H I Runw L Sys '73

HIGH INTENSITY APPROACH RUNWAY LIGHT. A historic term that is at variance with modern terms since it brings together Approach and Runway Lights
Reference: New High-Intensity AC '47

HIGH INTENSITY RUNWAY EDGE LIGHT.
Reference: H I Runway L System '73

HIGH INTENSITY LIGHTS. This term refers to Edge Lights.
Reference: H I Runway L System '73, Douglas '79

HIGH INTENSITY RUNWAY LIGHT. This term refers to Edge Lights.
Reference: ATA '46, Spec for R & T Edge L '75

HIRL/MIRL. Acronyms refer to Edge Lights.
Reference: Spec for R & T Edge L '75

LOW INTENSITY EDGE LIGHTS.
Reference: IES '72

LOW INTENSITY LIGHT.
Reference: ADM '93

LOW INTENSITY RUNWAY EDGE LIGHTING.
Reference: IES '72

LOW INTENSITY RUNWAY, LANDING STRIP & TAXIWAY LIGHT.
FAA Ap L Eq '66

LOW INTENSITY RUNWAY LIGHTS (LIRL)/MEDIUM INTENSITY RUNWAY LIGHTS (MIRL)/HIGH INTENSITY RUNWAY LIGHTS (HIRL)/LOW INTENSITY RUNWAY EDGE LIGHTS/MEDIUM INTENSITY RUNWAY EDGE LIGHTS/HIGH INTENSITY RUNWAY LIGHTS..
References: R & T Edge L Sys '75 (1st). Spec for R & T Edge Lights '75

MEDIUM INTENSITY ELEVATED RUNWAY EDGE LIGHT FITTINGS.
Term refers to physical apparatus. Also employed for Elevated Taxiway Lights.
Reference:

MEDIUM INTENSITY LIGHTS. Term refers to stake and base-mounted forms. Term also included by Douglas.
Reference: Standard Specs ... '59, Douglas '79

MEDIUM INTENSITY LIGHTING SYSTEM. System encompasses Approach and Runway Lights.
Reference: Douglas '79

MEDIUM INTENSITY TYPE M-1 RUNWAY EDGE LIGHTS/HIGH INTENSITY TYPE M-1 RUNWAY EDGE LIGHTS. USAF physical apparatus designations (L-802 and L-819 are civil versions).
Reference: Douglas '79

MEDIUM INTENSITY THRESHOLD SPECIAL LIGHT.
Reference: FAA Spec for R & T L. Fix '75

MEDIUM/LOW-INTENSITY RUNWAY LIGHT. Fixture for smaller airports.
Reference: Momberger '86

MEDIUM INTENSITY RUNWAY EDGE LIGHT.
Reference: IES '66, Pollack '90

RUNWAY EDGE LIGHTS: LIRL, MIRL, HIRL.
Reference: IES '87

1E2 Taxiway Lighting

a) Overarching Terms

LOW VISIBILITY TAXIWAY LIGHTING SYSTEMS. This is a FAA publications title. It is an overarching term for low visibility Taxiway Centerline Lights, Runway Guard Lights (ICAO : Holding Position Lights), Stop Bars, Clearance Bars. It excludes Taxiway Edge Lights which are of one intensity.
Reference: Low Vis Txwy Light Sys '98

SYSTEMS OF TAXIWAY LIGHTS.
Reference: FAA ADS-GA '69

TAXIWAY LEAD-OFF LIGHTS. These Lights indicate route from runway centerline to an exit taxiway. They display Green and Yellow alternating Lights. Term is within In-Runway Lighting category.
Reference: AIM '99

TAXI LIGHTS. A single reference and one that is nearly historic. It refers to Taxiway Edge Lights and is therefore not an overarching term.
Reference: Airport Receive ... AW '56

TAXIWAY LIGHT. There are three possible meanings: physical apparatus (equipment), individual unit (physical and morphological), or system (when plural). It is more frequently employed than Taxiway Lighting.
Reference: A & W '92, Horonjeff '62, IES '52, ATA '46, AD Vol II '95

TAXIWAY LIGHTING. This is an overarching term that includes Centerline, Edge Lights and also Taxiway Guidance Signs. Friedl includes Stop Bars.
Reference: Horonjeff '62, Friedl AF '86, Finch '61

TAXIWAY LIGHTING SYSTEM. Term refers to Taxiway Edge Lights.
Reference: Douglas '77 (Letter)

TAXIWAY MARKER LIGHT. Seemingly a synonym for Taxiway Edge Lights displaying lights in Aviation Blue.
Reference: NavAer '46

TAXIWAY/OBSTRUCTION LIGHTING. Two forms of lights but maintained by one group of personnel in emergency lighting system.
Reference: EALS '99

TAXIWAY SERIES LIGHTING SYSTEM. A rather dubious term: a number of different Navaid types are batched together which end in "series lighting system."
Reference: Hevi Duty ... AI '94

b) Taxiway Edge Lighting

TAXIWAY EDGE LIGHTS. A fixed light of blue color. It is not employed where Taxiway Centerline lights are used. Term could refer to individual unit or to a system situation.
Reference: IES '81, Pollack AI '90, Light Repairs AI '89, A & H '79, AD '99

TAXIWAY EDGE LIGHTING. Presumably a system term. Fixtures are often elevated though some semi-flush units are used.
Reference: IES '66

TAXIWAY EDGE LIGHTING SYSTEM. This term is an explicit systems term.

It indicates the lateral boundaries of the taxing area.
Reference: IES '87

c) Taxiway Centerline Lighting

CENTER-LINE LIGHTING. Horonjeff here refers to Taxiway Centerline Lighting. The term taxiway drops away because the term is w/i the context of Taxiway Lighting.
Reference: Horonjeff '62

CENTERLINE GUIDANCE SYSTEM. Term has meaning of Taxiway Centerline Lights.
Reference: Momberger AF '86

TAXIWAY CENTERLINE LIGHTS. The equivalent of Taxiway Centerline Lighting. AIP notes they are employed in low visibility conditions. FAA notes they are divided into straight and curve forms.
References: AIP '99

TAXIWAY CENTERLINE LIGHTING. This can possibly serve as the basic term for this form of Aid. They are employed at airports with PAR and especially for heavy traffic situations. The lights are steady-burning (ICAO: fixed) and green in character.
Reference: IES '81

TAXIWAY CENTERLINE LIGHTING SYSTEMS. This FAA term is employed as a title for publications. It is explicitly an system term. These lights are uni-directional or bi-directional. They can be in-pavement or flush.
Reference: FAA Txwy Cntr L Sys '68

TAXIWAY CENTRE LIGHTS. "Line" is omitted contrary to most sources. Most likely the specific term refers to individual usage. The same source also includes Taxiway Centreline Lights and simply Centreline.
Reference: Clear Reliable ... AI '89

TAXIWAY CENTRELINE LIGHTS. Term is either individual unit and/or a group of integrated lights serving as a system. The specific reference focusses on individual usage.
Reference: Latest Development ... AI '91

TAXIWAY CENTRE LINE LIGHTS. This version with the key word as two words is from ICAO. British English is employed. It is viewed as an individual

term here.

Reference: AD '99, Pollock AI '90, ADM '93

TAXIWAY CENTRE LINE LIGHT ON AN EXIT TAXIWAY. ICAO distinguishes between Taxiways and Exit Taxiways. The later form is subdivided into rapid taxiway and other taxiways. The lights alternate green and yellow; other Taxiway Centre Line Lights are green only.
Reference: AD '90

TAXIWAY CENTER LINE LIGHTING ON TAXIWAY/TAXIWAY CENTER LINE LIGHTING ON RAPID EXIT TAXIWAYS/TAXIWAY CENTER LINE LIGHTING ON OTHER EXIT TAXIWAYS. Terms refer to spacing of Lighting on various types of taxiways. All display alternating Green and Yellow Lights with Green in flashing mode.
Reference: AD '99

TAXIWAY CENTRELINE LIGHTING. British spelling. Term presumably refers to a system of such lights.
Reference: McKelvey JN '87

d) Physical Apparatus and Other Terms

1) Physical Apparatus

General Note. This is primarily a listing of physical apparatus. Many sources do not include references to physical apparatus terms. Many of these references are from FAA and trade literature.

BIDIRECTIONAL LIGHTS.
Reference: Taxiway Ctr L Sys '68

BLISTER LIGHTS. Limited information only. Some forms are entirely flush. Semi-flush forms excluded.
Reference: Friedl AF '86

BUTTON LIGHTS. Not defined other than low-profile.
Reference: Finch '61

EDGE LIGHTS. A seemingly overarching term. However specific reference is in context of Taxiway Lights.
Reference: Taxiway Ctr L Sys '68

ELEVATED TAXIWAY LIGHTS FOR HOLDING POSITION MARKINGS. This term also includes Holding Position Light and Holding Position Edge Light.
Reference: Spec for R & T L Fix '98

45w TAXIWAY EDGE LAMPS. In context of new developments in Airport Lighting.
Reference: Momberger AF '86

FULLY-FLUSH LIGHTING FIXTURE/FULLY FLUSH FIXTURE. Friedl employs Fully-Flush instead of the more conventional Flush.
Reference: Friedli AF '86

HOLDING POSITION EDGE LIGHTS. Older name for Runway Guard Light.
Reference: Spec for R & T L Fix '84

IN-PAVEMENT TAXIWAY LIGHT/LIGHTS, TAXIWAY, IN-PAVEMENT.
References: FAA Spec for Seq Fl Airport L '75), Airp L Eq Cert Prog '94, 95

INSET-TYPE RUNWAY & TAXIWAY LIGHTS.
Reference: Momberger AF '86

LIGHT ASSEMBLY, AIRPORT TAXIWAY CENTERLINE.
Reference: Ap L. Eq '68

LOW INTENSITY TAXIWAY LIGHT (LITL)/LOW INTENSITY TAXIWAY EDGE LIGHT.
Reference: Spec for L-849 Fl L CD Type, Spec for R & T Edge L. '75

MEDIUM INTENSITY LIGHT (MITL)/MEDIUM INTENSITY EDGE LIGHT.
Reference: Spec for R & T Edge L. '75

MEDIUM-INTENSITY LIGHT/HIGH INTENSITY LIGHT. Physical apparatus with two-part light mechanism.
Reference: Friedl AF '86

MEDIUM-INTENSITY, OMNIDIRECTIONAL ELEVATED LIGHT. Context is that of Taxiway Edge Lights.
Reference: Momberger AF '86

SEMI-FLUSH FIXTURES.
Reference: Friedl AF '86

SEMIFLUSH INSET LIGHTS.

Reference: Txwy Ctr L Sys '68

TAXIWAY INPAVEMENT LIGHT/TAXIWAY IN-PAVEMENT LIGHT. Sub-overarching term for Taxiway Light fixtures.

References: Spec for R & T L. Fix, '84, 98

UNIDIRECTIONAL, BIDIRECTIONAL, LIGHT ASSEMBLY AIRPORT TAXIWAY CENTERLINE. This term includes gasket, lamp, optical assembly and base receptacle.

Reference: Spec L-852, Light Assembly, Airp Txwy Ctrl '71

2) Other Terms

AIRCRAFT ARRESTING MARKER LIGHT. Term refers to Lights that illuminate Aircraft Arresting Markers.

Reference: EALS '99

AUTOMATIC BLOCK SIGNAL CONTROL SYSTEM. A form of taxiway control; analogy with Railroad Block Signals in sorting yards.

Reference: Warskow '50

BARRETTE. "3 or more aeronautical ground lights closely spaced in transverse line" Gives appearance of a bar of Light at a distance.

Reference: Lexicon '85

CLEARANCE BARS. Term denotes plane approaching hold point or intersecting taxiway. Series of steady burning yellow lights. ICAO notes limits indicate limits but "stop-and-go" signals not required (stop bar).

Reference: AD '90

CLEARANCE BAR LIGHTS. Variant form that is more complete. Function is to denote holding position in poor visibility.

Reference: AIM '99

ENTRANCE-EXIT LIGHTS. Denotes intersection of runway with Taxiing Lights.

Reference: NavAer '46

RUNWAY GUARD LIGHT. Found at Taxiway/Runway Intersections. Flashing yellow instead of steady burning Clearance Bars known as Hold Bars.

References: AIM '99, Txwy Ctr L. Sys '68, AD '99



SNOW AREA LIGHTS (ELEVATED LIGHTS). Term refers to Taxiway Lights well above ground. Such Lights also appropriate where there is high grass, maintenance problems. Lights are contrasted to Semi-flush Lights.

Reference: NavAer '46

STOP-AND-GO SIGNALS. A component of Automatic Block Signal Control System which see.

Reference: Warskow '50

STOP BARS/STOP BAR SYSTEM. A stop signal. Controls access to runways. ICAO found at taxi-holding position.

Reference: ICAO '90, Low Vis Txwy L Sys '98

STOP BAR LIGHT/STOP-BAR LIGHT. Term indicates when ATC has approved aircraft to enter/cross runway. Displays rows of lights (red, unidirectional, steady-burning, inset). When -- and if Lead-in Lights are in operation -- then approval has been gained.. Hyphenated form is contributed by Momberger '86

Reference: AIP '99

TAXIWAY GUIDANCE LIGHTS. These are Taxiway Edge Lights under an older name. It is a near-historic term.

Reference: IES '52

TAXI-HOLDING POSITION LIGHTS. Apparently, ICAO's name for Runway Guard Lights. Alternating yellow lights.

Reference: AD '90, Clear ... AI '91

TAXIWAY INTERSECTION LIGHT. These Lights display omnidirectional yellow lights.

Reference: IES '81

TAXIWAY TRAFFIC CONTROL SYSTEM. In this instance, refers to Taxiway Signals= Traffic Signals. They control vehicular traffic on taxiways.

Reference:

1E3 Historic & Composite Terms

a) Historic Terms: Boundary, Contact & Range Lights

BOUNDARY LIGHTS. An early form of Navaid. They predate Edge and other

Lights. They, as the name indicates, formed a boundary around the landing area. They were frequently steady-burning and white in color (in U.S. but often red in other countries). Some sources note that green lights were included for best direction for landing. That form appears to correspond to Range Lights which see. Boundary Lights may have also included red lights which indicate hazards. Most references in the literature are for the years 1926-1952; few references after 1952.

References: Caldwell, 30, Black '29, Duke '27, Glidden '46, Wood '40, Norvell AC '41

BOUNDARY LIGHT SYSTEM. An integrated arrangement of Boundary Lights. Shorter term, Boundary Lights, is implicitly a system term.
Reference: Norvell AC '41, Wood '40, Glidden '46

CONTACT LIGHTS. This is a forerunner of Edge Lights. Norvell notes that intensely used airports (Class III) displayed floodlights or contact lights. They were positioned on both sides of the runway.
References: Norvell AC '41, Douglas '78

CONTACT-LIGHT SYSTEM/CONTACT LIGHT SYSTEM. Term probably has meaning of Contact Lights but adds System to basic term.
References: Haber '58, Douglas '79

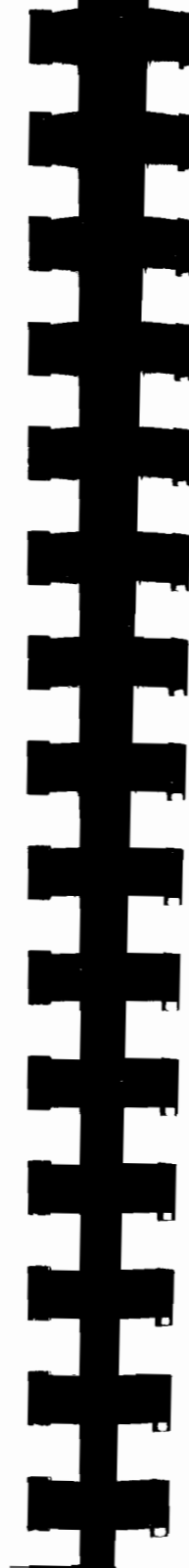
DISTANCE-TO-GO (DTG) MARKER LIGHTS/-LIGHTING. Literally lighting (Floodlamp) that illuminates DTG Markers.
Reference: EALS '99

FLASH MARKER LIGHT. Located at edge or near edge of paved runways. Meaning: an aid that helps crew "to properly contact the runway." It can display split filters of Clear/Amber which warn of approach end of runway.
Reference: Glidden '46

FLOATING SEADROME LIGHT. Term is equivalent of Runway Edge Light. A 1930/1940s term.
Reference: Breckenridge '55

LAND & HOLD SHORT LIGHTS. Denote "the hold short point on certain runways which are approved for Land and Hold Short Operations (LAHSO)." Pulsing white Lights across hold short point of runway.
Reference: AIM '99

RANGE LIGHTS. These Lights are included in Boundary Lights. According to



some sources Range Lights varied in number according to importance of the airport. Some airports displayed two lights at ends of landings, while others had three or even four lights. Fewer sources include Range Lights.
References: Glidden '46, Norvell AC '41. Wood '40., CD '78

b) Composite Terms

General Note. These terms involve two or more types of Runway/Taxiway Lights (and associated forms). The terms may refer to physical apparatus or to integrated systems. Individual components described in appropriate categories.

CENTERLINE & OR TOUCHDOWN ZONE LIGHTS.
Reference: Maint Guide '71

CENTERLINE & TOUCHDOWN ZONE LIGHTING SYSTEMS.
Reference: Maint Guide '71

END/THRESHOLD LIGHT.
Reference: Utility Airports '75

LIGHTS, RUNWAY & TAXIWAY EDGE, LOW INTENSITY/LIGHTS, RUNWAY & TAXIWAY EDGE, MEDIUM INTENSITY
Reference: Spec for L-842 Airport C. L.

RUNWAY CENTER & TDZ LIGHTS/RUNWAY CENTERLINE & TDZ LIGHTING SYSTEM.
Reference: Maint Guide '71, Spec for R & T L Fix '84, '98

RUNWAY & STRIP LIGHT.
Reference: M I Runwy L Sys '67, Ap L Eq

RUNWAY & TAXIWAY EDGE LIGHTS.
Reference: VASI (VASI) Sys '76

RUNWAY & TAXIWAY EDGE LIGHTING SYSTEMS.
Reference: Spec for R & T Light Fix '84, '98

RUNWAY & TAXIWAY LIGHTS.
Reference: Facility Ops & Adm '91

RUNWAY THRESHOLD/END LIGHT.
Reference: H I Runwy L Sys '73

THRESHOLD & RUNWAY END LIGHT/THRESHOLD RUNWAY END LIGHT.

References: R & T Edge Light Sys, D & B '77

TOUCHDOWN & CENTERLINE LIGHT

Reference: AIP '91

CHAPTER TWO RADIO AIDS

Chapter 2A Indexes

2A1 Categories Index

Radio Aids Overarching Terms (2B)

General Terms (2B1)

Aeronautical Radio Navigation

Aeronautical Radio Navigation Services

Aeronautical Radionavigation Services

Air Navigation Aids/Air-Navigation Aids

Air Navigation Radio Aids

Air Navigation Facility (Nav aids)

Air Navigational Radio Aids

Air Nav aids

Air Navigatin Systems

Electronic Aids

Electronic Landing Aids

Electronic Navigation Aids

Electronic Navigational Aids

Ground Aids

Ground-Based Radio Aids

Ground-Based Navigation Aids

Ground Aids to Instrument Flight

 Landing Area Radio Navigational Aids

 Route Radio Navigation Aids

Instrument Flight Aids

Nav aid Systems

Navigation System

Primary Nav aids

Radio Aids

Radio Aids to Air Navigation

Radio Aids to Navigation

Radio-Based Navigation Service

Radio Nav aids

Radio Navigation Aids

Radio Navigational Aids/Radio-Navigational Aids

Radio Navigation/Radionavigation

Radionavigation Aids/Radio-Aids

Radio Navigation System/Radionavigation Systems/Radio-Navigation Systems
Radio Navigation Service
Radio-Navigational System

Sub-Overarching Terms (2B2)

Long-Distance Aids
Long-Distance Aids to Navigation
Long-Distance Navigation Aid/Long-Distance Navigation Aids
Long-Distance Radionavigation Aids
Long-Range Navaids
Long Range Radio Navigation Aids
Short & Long Distance Radio Navigational Aids
Short Distance Aids to Air Navigation/Short-Distance Aids to Air Navigation
Short Distance Aids/Short-Distance Aids
Short-Distance Radio Aids/Short Distance Radio Aids
Short-Distance Radio Aids to Navigation/Short Distance Radio Aids to Navigation
Short Range Navaids
Short-Range Navigational Aids

Special Terms (2B3)

General Note
Area Navigation
Area Navigation (RNav)/Area Navigation (R-Nav)
Area Navigation System
Long Distance Rnav/Short Distance Rnav
Nonprecision Rnav
Rnav
Rnav/FMS
Vnav
Fan/Fans
Future Aviation Navigation Systems
ATM
ATM/CNS/ATM
CNS
Communication, Navigation, Surveillance
Flight Management System/Flight Management System (FMS)
INS

Inertial Navigation System/Inertial Navigation System (INS)
Inertial Systems/Inertial Systems (INS)
Integrated Global Surveillance & Guidance System (IGSAGS)

Terminal Navaids/Aids to Final Approach & Landing (2C)

General Terms (2C1)

Aids to Final Approach
Aids to Final Approach & Landing
Landing Aids
Landing Area Radio Navigational Aids
Landing Area System of Radio Navigation Aids
Landing Systems
Precision Landing System
Standard Non-visual Aid
Standard Non-visual Aid to Final Approach & Landing
Terminal Navigational Aids (Nav aids)
Terminal Navaids

Historic Terms (2C2)

Landing-Beam System
Wireless Beacon Landing System

Instrument Landing Systems, ILS (2C3)

Principal Terms (2C3 a)

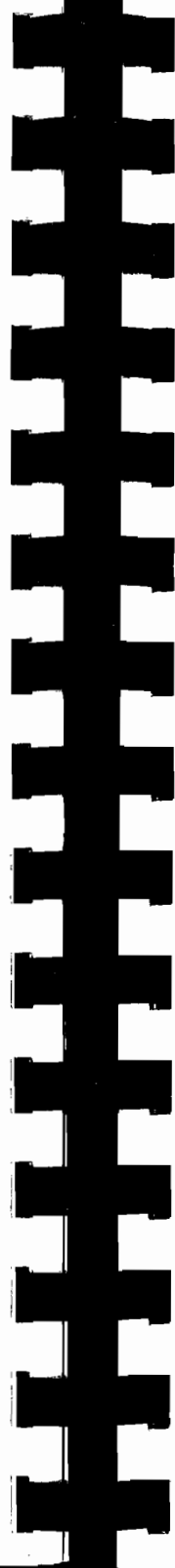
General Note I, II
Instrument Landing Systems, ILS
ILS
Instrument Landing System (ILS)/Instrument Landing System/ILS, Instrument Landing System
Instrument-Landing System
I.L.S. (Instrument Landing System)

Other Terms (2C3 b)

Instrument Low-Approach (ILS)
Fixed-Beam Low-Approach System
ILS 381
Cat I Instrument Landing System
ILS Cat II/III
ILS Cat II
Cat II/III ILS
Cat III, ILS
Cat III ILS

Constituent Elements (2C3 c))

General Note
Glide Slope
Glide Slope Radio Course
Glide Slope/Glide Path
Glide Slope Facility
Glide Slope (GS) Facility
Glide Slope System/Glide-Slope System
Glide Path
Glide-Path
ILS Glidepath Transmitter
ILS Glideslope
Null-Type Glide Slope
Straight-Line Glide Path
ILS Glide Slope
ILS Glide Slope Subsystem
Two-Frequency Glide Path System
UHF Glide Slope Transmitter
ILS Glide Path Transmitter
ILS Glide Path
Localizer Unit (LO)
Localizer
Wide-aperture Localizer
ILS Localizer
Offset Localizer
Two-Frequency Localizer System
Localizer Facility
Marker Beacons
ILS Middle Marker Beacon/ILS Inner Marker Beacon



Outer Marker Compass Locator/Middle Marker Compass Locator
ILS Markers
ILS-Associated Fan Marker
Solid-State Markers
Pole-Mounted Markers
75 MHz ILS Markers
VHF Marker Beacon
Back Course Markers
Back Course Marker Beacon

Microwave Landing Systems, MLS (2C4)

General Note
Microwave Landing System (MLS)/Microwave Landing System, MLS/
Microwave Landing System
MLS
MLS System
(Microwave Landing System) (MLS)
Standard MLS

MLS Constituent & Other Terms (2C4 b))

Departure System
Duplex MLS
Tactical MLS Station
Interim Standard Microwave Landing System/Interim-Standard Microwave
Landing System (ISMLS)/Interim Microwave Landing System (ILSMS)/
ISMLS
MLS/RNAV
MLS Precision Distance Measuring Equipment
Doppler MLS
Time Reference Scanning-Beam System
Scanning Beam MLS
SCAMLS
Stol/MLS

Azimuth Station
Elevation Station
MLS Azimuth/MLS Azimuth Station
MLS Azimuth Equipment

MLS Ground Station
MLS Elevation Equipment

Cat I MLS
Cat II MLS
Cat III MLS
Cat II Mobile MLS (MMLS)
Cat I/II/III MLS

En-Route Aids (2D)

Historic Terms (2D1)

Early Terms (2D1 a))

Telefunken Compass/Telefunken Rotating Beacon
The Course Setter/Equi-Signal Course Setter
Scheller Course Setter System
The Wireless Lighthouse
Standard Beacon (Beam?) Approach (SBA)
Lorenz Azimuth Guidance Beacon
Small Loop Aerial System
Bellini Tosi System
Two Course Beacon/Four Course Beacon

Intermediate Terms (2D1 b))

Radio Range/Radio-Range
Radio Range Beacon/Radio-Range Beacon
Radio Marker/Radio Marker Beacon/Radio-Marker Beacon
Radio Range Station/Radio Station
Range
Aural Radio Range
Aural-Type Radio Range Beacon

Low/Medium Frequency Radio Range (LLFR)
Low or Medium Frequency Radio Beacon
Low or Medium-Frequency Radio Range
Low and Medium Frequency Radio Range
Low-Frequency Four-Course Range
Low-Frequency Radio Range

Low/Medium Frequency (L/MF) Radio Range
Low Frequency Range
Four-Course Radio Range
Four-Course Radio Station
Four-Course Range

Vor/Vortac/DME/Tacan Forms (2D2)

General Note

Vor, VHF Omnidirectional Radio Range (2D2 a))

General Note

VOR
VHF Omnidirectional (VOR)
VHF Omnidirectional Radio Range
VHF Omni-directional Radio Range (VOR)
VHF Omni-Directional Radio Range
VHF Omnidirectional Range (VOR)
VHF Omni-directional Range (VOR)
Very High Frequency Omnidirectional (VOR)
VOR (VHF Omni-Range)
VOR (VHF Omnidirectional Radio Range)
Conventional VOR
Doppler VOR
General Note
Doppler VHF Omni-directional Range
Doppler VOR
Doppler VOR (DVOR)
DVOR
D-VOR

Distance Measuring Equipment, DME (2D2 b))

General Note

Distance Measuring Equipment (DME)
DME
Distance Measuring Devices
Distance-Measuring Equipment (DME)
DME System

UHF Distance Measuring-Equipment (DME)

DME/W

DME/P

DME/N

Precision Distance Measuring Equipment (P-DME)

Tacan/Tactical Air Navigation (2D2 c))

General Note

Tacan

Tactical Air Navigation (Tacan)

Tactical Air Navigational Aid

Tactical Air Navigation System

Tacan, Tactical Air Navigation

Tacan System

Composite Terms (2D2 d))

DVOR/DME

DVORTAC

SVOR/DVOR

VOR/DME//VORDME

Doppler VOR/DME

VOR/DME-Based RNAV//VOR/DME RNAV

VORTAC

VHF Omni-Directional Range/Tactical Air Navigation (Vortac)

VHF Omni-Directional Range/Tactical Air Navigation

Associated Vor & TACAN (VORTAC)

VOR/DME (TACAN)

Backfit VOR with TACAN Rho/Theta

Hyperbolic Aids (2D3)

General Note I, II

Overarching Terms (2D3 a))

Hyperbolic Aids

Hyperbolic Navigation Systems
Hyperbolic Radio Nav aids
Hyperbolic Airborne Navigation Aids
Hyperbolic Systems

Loran (2D3 b))

General Note

Loran

Loran A/Loran-A/Loran-C

Loran-C/Loran A/Loran-C System

Standard-Loran/Standard Loran/Loran, Standard

H.F. Loran

Low-Frequency Loran/L.F. Loran

SS-Loran (Synchronized Loran)/S.S. Loran/Skywave Synchronized Loran (SS Loran).

Loran-B/Loran-D

Differential Loran

Chaika/Chaika (Seagull) System

Cyclan

Cytac

Gee

Gee Hyperbolic System/Gee System

QH

Decca (2D4 c))

General Note

Decca

Decca Navigator/Decca System/Decca Navigation System

QM

Decca Hi-Fix

Delrac

Dectra

Consol (2D4 d))

Consol

Consol System

Consolan
Sonne
Consol (Sonne)
Sonne/Consol
Sonne (Sun)
Sonne (Consol)
Mond (Moon)/Stern (Star)

Omega (2D4 e))

Omega
Omega/VLF//Omega/VLF Navigation System
Omega/NCS System
Omega System/Omega Navigation System
Differential-Omega
Omega/Loran C
Omega Global Navigation

Miscellaneous Hyperbolic Aid Forms (2D4 f))

Eureka/Rebecca-Eureka/Rebecca/Eureka/Rebecca-Eureka Distance Measuring System
Lorac
Navaglobe-Navarho
Navaglobe/Navaglobe System
Navarho System
Navarho-H, HH, RHO,
Post Office Position Indicator (POPI)/POPI (Post Office Position Indicator)/P.O.P.I
Raydist
Radio-Mailles System
Radio-Web/Radio-Mesh
Radio Mesh System (Radio-Mailles)
Radux
Radux-Omega
Rana
Toran

Satellite Nav aids (2D4)

GPS (2D4 a))

Main Terms (2D4 a) 1))

GPS, Global Positioning Systems

General I, II

GPS

GPS System

Global Positioning System

Global Positioning System (GPS)

GPS, Global Positioning System

Specialized Terms & Composite Terms (2D4 a) 2))

Cat II/III GPS

Global Positioning Satellites

GPS/Glonass/GPS-Glonass

GPS (Global Positioning System) Satellite-Based Navigation System

Global Positioning System

Standard Positioning Service (SPS)

Precise Positioning Service (PPS)

RAIM

GPS/RAIM

Navstar GPS (2D4 a) 3))

Navstar (Navigation System with Timing and Ranging)

Navstar

Navstar System

Navstar Global Positioning System/Navstar Global Positioning System (GPS)

Navstar GPS

Navstar-GPS

Navstar/GPS

Navstar Satellites

Global Positioning System (Navstar)

Glonass (2D4 a) 4))

Glonass/Glonass (Global Navigation Satellite System)
Glonass, Global Orbiting Navigation Satellite System

Augmentation Terms (2D4 b))

DGPS (2D4 b) 1))

Differential GPS
DGPS
Differential GPS (DGPS)
DGPS
DGPS System
Differential Global Positioning System/Differential Global Positioning Systems (DGPS)
DGPS Landing System/Special Category I DGPS Landing System/DGPS Special Category Landing System
DGPS Ground Reference System
DGPS Ground Station
Aeronautical-DGPS
GPS Differential Correcton (dGPS)
DGPS/INS
Helicopter-Borne DGPS System
Intelligent Small Area DGPS

WAAS & LAAS Augmentation Terms (2D4 b) 2))

LAAS
Local Area Augmentation System (LAAS)
LADGPS
SADGPS
Wide Area Augmentation System (WAAS)
WADGPS
WAAS
W.A.A.S.
WAS

GNSS (2D4 c))

Global Navigation Satellite System (GNSS)
GNSS
GNSS, Global Navigation Satellite System
GNSS (Global Navigation Satellite System)
GNSS-1
GNSS-2
Differential GNSS System
Cat II/III GNSS Approaches
GNSS-Based Operating System
Global Satellite System for Navigation

Other Satellite Navigational Terms (2D4 d))

Satellite Navigation Terms (2D4 d) 1))

Navigation Satellite System
Navsat
Satcom/Satcom/Satnav
Sat Navigation
Satellite-Assisted Navigatin (GNSS/GPS)
Satellite Landing System
Satellite Navigation
Satellite Navigation System
Satellite Positioning System
Satellite System
Spaced-Based Navigation & Position System

Transit & U.S. Navy System (2D4 d) 2))

General Note
U.S. Navy Navigation Satellite System
U.S. Navy System
NNSS (Navy Navigation Satellite System)/Navy Navigation Satellite System (NNSS)
Transit
Transit System
U.S. Transit
U.S. Transit System

Miscellaneous Terms (2D4 d) 3)

Defense Navigation Satellite System (DNSS)
Geostar/Locstar
Granat
Integrated Global Surveillance & Guidance System (IGSAGS)
Starfix/Starfix Positioning System
Timation
Tsikada
TSPI System
Inmarsat Satellite
Inmarsat-A System
Inmarsat-1, -2, -3 Satellite
General Note
IOR, Inmarsat III Satellites
IOR Satellites
Artemis Satellites
General Note
MT Sat
MT Sat-1, -2
Mtsat System
Mtsat Satellites
General Note

Intercategory Group: Beacons (2E)

Nondirectional Beacons (2E1)

NDB Navigation
Non-Directional Beacon
Non-Directional Beacon (NDB)
NDB Ground-Based System
Nondirectional Radio Beacon
Non-Directional Radio Beacon
NDB
NDB (L/MF Non-Directional Radio Beacon)
NDB, Non-Directional Radio Beacon
NDB (Non-Directional Beacons)
NDB, Non-Directional Beacon
Nondirectional Beacon (NDB)
Non-Directional Radio Beacon (NDB)



L-F Markers
Low-Frequency Nondirectional Beacon
Low Frequency Non-Directional Beacon
Low -& Medium-Frequency Nondirectional Radio Beacon
LF/MF NDB (Non-Directional Radio Beacon)
LF/MF NDB
L/MF Non-Directional Radio Beacon
Compass Locator
Homer
Low & Medium Frequency Non-Directional Radio Beacon
Aeronautical Nondirectional Beacon/Aeronautical Non-Directional Beacon
Aeronautical Nondirectional Beacon (Non-ILS)
Aeronautical Radiobeacons
ILS Nondirectional Beacon (NDB/ILS-Associated Nondirectional Beacon)

Marks, Markers, Beacons (2E2)

General Note

Beacon
Beacon Station
Directional Radio Beacon
En-Route VHF Marker Beacons (75 MHz)
Fan-Type Marker
Fan Marker
Fan Marker Beacon
Fan Marker (FM)
Low Frequency Nondirectional Homing Beacon
Low-Powered Fan Marker/Low-Power Version of the Fan Marker
"M" Marker
Marker
Marker Beacon
Marker Beacon (Mkr)
Marker Beacon, 75 MHz
Marker Station
Nondirectional Radio Marker Station
Radio Beacon
Radio Beacon Station
Radio Marker
Radio Marker Beacon/Radio-Marker Beacon
Radio-Marker-Beacon Station

Rotating Beacon
75-mc Fan Marker
75-mc Marker Station
Station Location Marker
Ultra-High-Frequency Radio Fan Marker
Vertical Marker Beacon
Very-High-Frequency Course Marker
Very-High-Frequency Marker
V-H-F Markers
VHF Marker Beacon
Z-Beacons
Z Marker/Z-Marker
Z Marker Beacon

Miscellaneous Terms (2E3)

Direction-Finding Beacon/Direction Finding Beacon/DF Beacon/
Omnidirectional DF Beacon
Ground D/F Station
Wireless Direction Finding
Wireless Beacon Landing System

2A2 Alphabetical Index

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Chapter 2B Radio Overarching Terms

2B1 General Terms

AERONAUTICAL RADIO NAVIGATION. Overarching term from Kendal in his study of "Directional Radio Techniques" (1910-1940). Term includes Rotating Beacon, Course Setters, VOR. While most included forms are Navaids they also include airborne equipment.

Reference: Kendal 1990

AERONAUTICAL RADIO NAVIGATION SERVICE. Slight variation from basic term. Possibly of more recent vintage.

Reference: AT '85, Lexicon '85

AERONAUTICAL RADIONAVIGATION SERVICES. Term from ICAO AT Procedures. It is influenced by ITU radio regulations. Term refers to "Radio-location service" for aviation use with three functions: position-determination, direction determination, obstruction warning.

Reference: AT '58, Lexicon '85

AIR NAVIGATION AIDS/AIR-NAVIGATION AIDS. Main entry is in general overarching terms but term included here since several sources refer exclusively to Radio Aids. Second term from Casabona who includes Ranges, Markers, ILS; also radar.

References: AIM '91, NOTAMS '87, DOT/AID Aids ... SE Asia '71, Casabona '59

AIR NAVIGATION RADIO AIDS. This term is partly an Navaid term. For PICA0 it includes Aids but also radio stations. For AIM '99 it includes Navaids and also radar, flight management systems).

References: PICA0 '44, AM '99

AIR NAVIGATIONAL FACILITY (NAVAIDS). A very general that more plausibly belongs with General Overarching though often associated with radio forms. It includes visual and radio aids but also any facility aiding flights including landing areas.

References: AIM '73

AIR NAVIGATIONAL RADIO AIDS. A broad term that includes terminal and en-route aids but also INS, FMS though not radar.

References: AIM '91

AIR NAVAIDS. Term refers to Radio Aids; also includes radar. Context of publication was Radio Aids which affects components of term. Included in General Overarching because of appearance of term. But included here as cross-reference.

Reference: DOT & Aids ... SE Asia '71

AIR NAVIGATION SYSTEMS. A very broad term that encompasses Aids but goes beyond them. It includes very early developments to recent events.

Reference: Kendal '90

ELECTRONIC AIDS. A very general term. It pertains to Navaids and excludes radar. Taylor refers to WW II-era forms and newer forms. For CAA the immediate context is Vortac.

References: CAA-FAP '58, IFH '71, Taylor '58,

ELECTRONIC LANDING AIDS. For VGLS this includes ILS and seemingly other unnamed Aids.

Reference: VGLS '69

ELECTRONIC NAVIGATION AIDS. Overarching term. It lacks reference to specific forms. The term refers to WW II and post-WW II forms.

Reference: Kayton '90

ELECTRONIC NAVIGATIONAL AIDS. A general term with few specifics. Radio Aids more commonly employed though some terms include electronic instead.

References: ADS-Site '71, '73, '80

GROUND AIDS. Main entry in General Overarching. But C/R here because of association with Radio Aids.

Reference: IB '53

GROUND-BASED RADIO AIDS. Term has reference to 1930s. No details given but obviously an OA term for the cross-section of Aids.

Reference: Komons '78

GROUND-BASED NAVIGATION AIDS. A reference to 1920s era; similar in meaning to previous term.

Reference: Wilson '79

GROUND AIDS TO INSTRUMENT FLIGHT. Terms includes two forms:

LANDING AREA RADIO NAVIGATIONAL AIDS
ROUTE RADIO NAVIGATION AIDS

Reference: PICA0 '44

INSTRUMENT FLIGHT AIDS. US draft in PICA0 includes Radio Ranges, Radio Landing Aids and Direction Finding Facilities in this term.

Reference: PICA0 '44

NAVAID SYSTEMS. Radio Aids only (in publications) but gives appearance of more general term. Cross-reference here with main entry in General Overarching.

Reference: DOT & AID, Aids ... SE Asia '71

NAVIGATION SYSTEMS. A very general-appearing term that in fact specifically refers to forms of Radio Aids with emphasis on present and developing forms. It needs to be listed in General Overarching as well because of its appearance.

Reference: Olsen AI J/A '91

PRIMARY NAVAIDS. A single reference to this term. Wilso employs it in reference to Radio Range in early 1950s. Perhaps not an official term though it did denote core en-route Aids. It has more of the character of a general overarching term.

Reference: Wilson '79

RADIO AIDS. An obviously OA term though references to event in 1930s. The term may include voice and airborne equipment.

Reference: Whitnah '66

RADIO AIDS TO AIR NAVIGATION. This term from an early ICAO AT includes three forms: Aids to Final Approach & Landing, Short-Distance to Air Navigation, Long-Distance to Air Navigation. This became Radio Navigation Aids later on. It was altered then to Radio Navigation Aids but Radionavigation returned only to be altered again to Radio Navigation Aids.

Reference: AT '49

RADIO AIDS TO NAVIGATION. A general term employed by a few sources. ITT refers specifically to TACAN but that source has a restricted scope.

References: ITT, AD '53

RADIO-BASED NAVIGATION SYSTEM. Seemingly a Overarching term. It refers to newer forms of Radio Aids rather than older forms.

Reference: Johns IJ '97

RADIO NAVAIDS. An overarching term. Seemingly restricted to actual Nav aids.
Reference: Blanchard JN '90

RADIO NAVIGATION AIDS. A general term. For ICAO it can be applied to all forms as well as radar. It has a similar meaning for AIP '91. PHAK seemingly refers to enroute Aids. For AIP '91 this term is synonymous with Air Navigation Aids.

References: PHAK '71, AT '72, '85, AIP '91

RADIO NAVIGATIONAL AIDS/RADIO-NAVIGATIONAL AIDS. These terms serve as a general term for several sources. For PICA0 it encompasses short and distance forms.

References: PICA0 '44, IB '53, AIM '73, Grover '57

RADIO NAVIGATION/RADIONAVIGATION. A very general term but nonetheless an overarching term for a few sources. Olsen refers to Nav aids but also to radar. Komons also employs it as an overarching term; voice communication is separate. Forsell includes enroute, approach and landing categories in second term.

References: Olsen, Glob Pol, AI '91, Komons '79, Forsell '91

RADIONAVIGATION AIDS/RADIO-AIDS. For several editions of AT this term has the same meaning, components as Radio Navigation Aids.

References: AT '58, '60, '63

RADIO NAVIGATION SYSTEM/RADIONAVIGATION SYSTEMS/RADIO-NAVIGATION SYSTEMS. The basic term (1st) has several meanings. For Olsen it is seemingly an overarching for all Radio Nav aids. ITT refers to TACAN but that is a restricted-scope publication. IFH has a broader meaning: airborne self-contained systems, radar systems, ground/air-borne systems (Nav aids and receivers). Forsell offers a second version which is an overarching term. French includes a third version which is an overarching term divided into space-based and ground-based forms.

References: Olsen AI '91, ITT, IFH '71

RADIO NAVIGATION SERVICE. Employed by AIP '91. Adjoining terms include Nav aids, Air Navigation Radio Aids. Specific references to Air Navigation Aids and Radio Navigation Aids; terms are perhaps interchangeable.

References: AIP '91

RADIO-NAVIGATIONAL SYSTEMS. Term interchangeable with Radio Aids

but it also includes radar.
Reference: Grover '57

2B2 Sub-Overarching Radio Terms [Encompasses two or more forms of Radio Aids; terms for one form attached to specific category; for example, Landing terms part of Terminal Aids]

LONG-DISTANCE AIDS. Term includes Consul, Loran, and, in some circumstances, NDB.
References: AT '63, '65, '72

LONG-DISTANCE AIDS TO NAVIGATION. Term includes Consul, Loran, NDB.
Reference: AT '49, '63

LONG DISTANCE NAVIGATION AIDS/LONG-DISTANCE NAVIGATION AIDS. Several sources include terms but with details.
Reference: IB 2nd ed '55, AT '58, AT '96 (2nd)

LONG-DISTANCE RADIONAVIGATION AIDS. Term is a longer explication of the core term of Long-Distance Aids.
Reference: AT '58, '63

LONG-RANGE NAVAID. Term not defined nor examples given.
References: Aids ... SE Asia, Olsen AI '90

LONG RANGE RADIO NAVIGATION AIDS. Term refers to Aids in development in 1984. Possible entries: Navaglobe-Navarho, Dectra, Delrac.
Reference: IB 5th '54

SHORT & LONG DISTANCE RADIO NAVIGATIONAL AIDS. Is this an actual term? It may be more on the order of a descriptive, lower-case name than actual title.
Reference: PICA0 '44

SHORT DISTANCE AIDS TO AIR NAVIGATION/SHORT-DISTANCE AIDS TO AIR NAVIGATION. Terms appear in "Attachments" (in AT). They refer to terms involved in research, development, and it may not be fully in operation. Aids include VHF Multi-track Pulse Range, GEE System. (Note: VOR referred to as CW Omnirange). AT '58, '63 have non-hyphenated form while AT '49 has an hyphenated version.
References: AT '49, '58, '63

SHORT DISTANCE AIDS/SHORT-DISTANCE AIDS. Term refers to VOR, DME. AT '49 has non-hyphen form while other editions have a hyphen in the term.

References: many editions of ICAO AT

SHORT-DISTANCE RADIO AIDS/SHORT DISTANCE RADIO AIDS. A variant form of previous term though more explicit.

References: AD '49 (1st, 2nd), AT '53 (2nd)

SHORT DISTANCE RADIO AIDS TO NAVIGATION/SHORT-DISTANCE ADIO AIDS TO NAVIGATION. A second variant form.

References: many editions of ICAO AT

SHORT RANGE NAVAIDS. Term includes VOR, VOR/DME, VORTAC, TACAN.

References: VOR ... '86, Olsen AI '90

2B3 Special Terms

General Note. The terms in this segment are not Nav aids in themselves. They refer to systems of navigaton and related matters but they employ Nav aids in one manner or another. Since they use a variety of types of Nav aids the terms are attached to General Overarching terms.

AREA NAVIGATION. This navigation system employs on-board computers that calculate courses drawing on signals from several sources which can include Doppler Navigation System, INS, Omega, Loran, GPS. ICAO (via Underwood) describes Area Navigation as a system operating on flight paths "within station-referenced navigation aids" or "self-contained aids" or both. Underwood notes it is a means of navigation that does not require flying over a point-source aid.
References: Taneja '87, Underdown '93

AREA NAVIGATION (RNAV)/AREA NAVIGATION (R-NAV). These are variant forms that include a widely employed acronym in two forms.
Reference: Forssell '91, HR (2nd)

AREA NAVIGATION SYSTEM. Robson in Beck adds Systems to the basic term. The meaning is not changed. In fact, the added word makes more clear that Area Navigation constitutes a system.
Reference: Robson in Beck '71

LONG DISTANCE RNAV/SHORT DISTANCE RNAV. HR divides RNAV into two basic forms: A short distance form that refers to VOR, DME. And a long distance type that utilizes INS, Omega, Loran, GPS, etc. HR also refers to variants of RS3, RL1 and RL3. The first is for short distance operations and includes three categories of en route, terminal, approach. The second is long distance and only for en route operations. The third is long distance and can be used for enroute, terminal, approach. HR also refers to two specialized forms: STOL/RNAV and VOR/DME RNAV.

Reference: HR '84

NONPRECISION RNAV. An Area Navigation system for approaches of a non-precision nature. It is predicated on VOR.

Reference: DOT/DOD FRP '96

RNAV. Acronym for Area Navigation.

Reference: HR '84, Tanjea '87

RNAV/FMS. For HR this is seemingly a Flight Management System that includes integration of RNAV activities into a comprehensive control and guidance system. See also FMS.

Reference: HR '84

FAN/FANS. Acronym for Future Aviation Navigation Systems.

Reference: D. Olsen AI 11-92

FUTURE AVIATION NAVIGATION SYSTEMS. ICAO has created a committee under this name which is formulating navigation systems for future use. The systems are to be largely based on satellite technology. The focus of the work is on CNS: Communication, Navigation and Surveillance. ATM, Air Traffic Management is also a concern of FANS. The systems provide an integrated system involving all aspects of air navigation which includes Nav aids. The terms, FUN and CNS are nearly interchangeable in some of the literature. GPS is a prime component though FANS focussed on GNSS of which makeup GPS is an element but not necessarily the entire system.

Reference: D. Olsen AI '90 and '91, Jane Olsen AI '93, Loh GPSW '95

ATM. Acronym for Air Traffic Management. Of only limited significance for Nav aids in themselves but integrated systems encompass a variety of functions in a nearly seamless web.

Reference: Olsen AI '91 and '93

ATM/CNS//CNS/ATM. Acronyms for Air Traffic Management and Communication, Navigation, Surveillance. This refers to a global system that integrates many functions including Nav aids.

References: Paylor '94 (1st), Crow 2000 (2nd)

CNS. Acronym for Communication, Navigation, Surveillance.

Reference: Paylor '94

COMMUNICATION, NAVIGATION, SURVEILLANCE. Integrated systems under development that encompass many aspects of air operations.

Reference: Olsen AI '94

FLIGHT MANAGEMENT SYSTEM/(FLIGHT MANAGEMENT SYSTEM) (FMS). System that pre-programs routes. Accuracy updated by reference to conventional Nav aids.

References: AIP '99, Forsell '91

INS. Acronym for Inertial Navigation Systems.

Reference: Loh '94

INERTIAL NAVIGATION SYSTEM/INERTIAL NAVIGATION SYSTEMS (INS). Airborne system not a Nav aid as such. A system not requiring external data. Inertial impact on airborne systems creates data.

Reference: AIM '99

INERTIAL SYSTEMS/INERTIAL SYSTEMS (INS). Shorter form of basic term. Little information provided by source.

Reference: Forsell '91

INTEGRATED GLOBAL SURVEILLANCE & GUIDANCE SYSTEM (IGSAGS). Proposal, concept for "next generation" CNS system. Ground stations direct needed information for navigation and other functions via satellites to aircraft. Possible replacement for GPS and WAAS and LAAS.

Reference: Crow IEEE 2000

2C Terminal Aids/Aids to Final Approach & Landing

2C1 General Terms

AIDS TO FINAL APPROACH. This refers to ILS. It is not a general term.

Reference: AT '72

AIDS TO FINAL APPROACH & LANDING. Term is subdivision of Radio Navigation Aids. It includes ILS and MLS ('63 former only).

References: '63, '85

LANDING AIDS. For Kayton this is a very general term and nearly an overarching term. It includes ILS, MLS; for non-precision approaches: direction-finding Beacons, VOR and even Loran. Visual Aids and radar are also included. Library catalogues sometimes include this as a category; see also Library of Congress *Subject Headings*.

Reference: Kayton '90

LANDING AREA RADIO NAVIGATIONAL AIDS. Term encompasses following term which is an extended version of this term.

Reference: PICA0 '44

LANDING AREA SYSTEM OF RADIO NAVIGATION AIDS. Term does not mention ILS (this is 1944) but does mention components of Localizer, Glide Path, Position Markers.

Reference: PICA0 '44

LANDING SYSTEMS. This term can have a broad meaning and may also be an overarching term. HR includes Radio Ranges, NDB, ILS, MLS. Olsen employs the term in an historic reference but it can have a broader meaning. Taneja seemingly employs it as a synonym with Landing Aids which see.

Reference: Taneja '87, Olsen AI '90, HR '84

PRECISION LANDING SYSTEM. Terms refers to ILS and MLS.

Reference: HR '84

STANDARD NON-VISUAL AID. For ICAO this refers to ILS and MLS until January 1, 1998 when it means only MLS.

Reference: ICAO AT '85

STANDARD NON-VISUAL AID TO FINAL APPROACH & LANDING. This term refers to ILS.

Reference: AT '63

TERMINAL NAVIGATIONAL AIDS (NAVAIDS). Term refers to facilities that provide electronic and/or visual aid in approaching airport for the purpose of landing. While the term suggests a general overarching meaning it is retained here because it strongly suggest Radio Nav aids. Term includes TVOR, ILS, COMLO, LTDA.

Reference: AIP '73

TERMINAL NAVAIDS. Short version of previous term.

Reference: VGLS '69, '74

2C2 Historic Terms

LANDING-BEAM SYSTEM. An early terminal aid.

Reference: Pirath '38

WIRELESS BEACON LANDING SYSTEM. Synonym for Landing-Beam System.

Reference: Pirath '38

2C3 Instrument Landing Systems, ILS

a) Principal Terms

General Note I. This integrated system of Nav aids includes various permutations of the core term. The acronym is employed nearly twice as often as the word form. However, the word form followed by acronym will be the basic term in this coverage. Full name followed by acronym is somewhat often employed. Full name without acronym is used by older sources much more often than newer sources. Some use is made of acronym followed by word form.

General Note II. ILS appears to mean instrument-assisted with the meaning of radio aids and aircraft-based receivers. However, Visual Aids are sometimes included within ILS. This is true of AIP and AIM publications. Some older sources seemingly refer exclusively to visual forms. Those forms are not included in this coverage.

INSTRUMENT LANDING SYSTEMS, ILS. This system creates a path for approaching aircraft. Information for alignment and descent is provided for the final approach. ILS can be traced to the 1930s. U.S. Army Signal Corps experimented and developed what became known as SCS-51. A modified version

was adopted by ICAO in 1948. There are three components to ILS: Localizer, Glideslope (or Glidepath), and Marker Beacons. The localizer provides an azimuth function that gives horizontal guidance. The Glideslope provides vertical guidance on the descent path. Two or three Marker Beacons provide radio checks during descent.

References include: Underdown '93, Taneja '87, Williams, AIM '99, AIP '99

ILS. Acronym for Instrument Landing System. Employed far more frequently than word form version.

References: Bauss '63, Daly FI '94, Casabona '59, Williams '92

INSTRUMENT LANDING SYSTEM (ILS)/INSTRUMENT LANDING SYSTEM/ILS, INSTRUMENT LANDING SYSTEM. Variant forms of the basic term that involve word forms followed by acronym, and acronym followed by word forms.

References include: IB Aero '53, Tugs AI '85, ADS-Site '80, AT '96 (c)

INSTRUMENT-LANDING SYSTEM. Two sources provide a hyphenated version which conjoins instrument and landing though the meaning is unchanged.

References: Poritsky '50, Daly FI '94

I.L.S. (INSTRUMENT LANDING SYSTEM). A single and nearly historic source offers a punctuated form of the acronym.

Reference: Smith '48

b) Other Terms

INSTRUMENT LOW-APPROACH (ILS). Casabona (Henney) in the 1950s translated ILS as Instrument Low-approach System. It contained the same components of Localizer, Glide Slope, and Marker Beacons.

Reference: Casabona '59

FIXED-BEAM LOW-APPROACH SYSTEM. Casabona offers this category of Aids which includes the Instrument Low-Approach System. Seemingly no other system is included in the category.

Reference: Casabona '59

ILS 381. Possibly a reference to a manufacturers name/model number.

Reference: Tugs AI '85

Various levels (categories) of aviation require specific levels of performance. A

variety of ILS terms are attached to one of these categories. The functioning of the system remains essentially unchanged. These terms are listed with only necessary and selective notes.

CAT I INSTRUMENT LANDING SYSTEM

Reference: Johns IJ '97

ILS CAT II/III.

Reference: DOT/DOD FRP '96

ILS CAT II

Reference: Tugs AI '85

CAT II/III ILS

Reference: Short Takes AI '92 b)

CAT III, ILS

Reference: Glines '89, Sutton IA '93

CAT III ILS

Reference: Daly FI '94

c) Constituent Elements

General Note. The coverage of general ILS terms includes names of component parts and brief descriptions of their functions. This coverage will list principal and variant terms for these components. Notes will be selective according to the need for explanations.

GLIDE SLOPE. An Aid providing guidance path (angle of descent) which consists of radio impulses. Transmitter provides UHF path above the runway. Reference: Flight '71, AIP '91, Casabona '59, Crew 2000

GLIDE SLOPE RADIO COURSE. This may be less an official name than an informal, descriptive term. It has the meaning of Glide Slope. Vertical guidance is given along descent angle.

References: NOTAMS '93, Taneja, Olsen AI '90

GLIDE SLOPE/GLIDE PATH. At times Glide Path seems to be a synonym for Glide Slope. For AIP Glide Path is that part of Glide Slope "that intersects the localizer." Possibly the meaning of Glide Slope in that context is more the signal than the physical apparatus.

Reference: AIM '91, AIP '99

GLIDE SLOPE FACILITY. Seemingly this refers to transmitter and its emissions. Glide Slope, the core term, may be a shorter term with same meaning.
Reference: DOT/DOD FRP '94

GLIDE SLOPE (GS) FACILITY. Variant of previous term with acronym.
Reference: NavFacEngCom '87

GLIDE SLOPE SYSTEM/GLIDE-SLOPE SYSTEM. Variant form that makes explicit the system character of the Aid.
Reference: Cook AW '60, Olsen AI 93-1

GLIDE PATH. Grover refers to Glide Path TX (=transmitter?)
Reference: Whitnah '66, L & M '47, Grover '57

GLIDE-PATH (GP). Casabona offers a hyphenated version and adds unit which makes the physical apparatus meaning more clear.
Reference: Casabona '59

ILS GLIDEPATH TRANSMITTER. Term refers more to physical apparatus than signals emitted.
Reference: Underdown '93

ILS GLIDESCOPE. Often Glide Slope constituents two words, this source seems to seem them as a single word. ILS then added to basic term.
Reference: Hundley & Rowson '93

STRAIGHT-LINE GLIDE PATH Term referring to developmental, experimental system.
Reference: CAA L & M '47

ILS GLIDE SLOPE. ILS added to core term which thereby identifies system that contains Glide Slope.
Reference: Kleiber '84

ILS GLIDE SLOPE SUBSYSTEM. FRP refers to Glide Slope as subsystem; possibly viewed in context of ILS to which Glide Slope forms a component.
Reference: DOT/DOD FRP '99

TWO-FREQUENCY GLIDE PATH SYSTEM. A system that creates coverage by broadcasting on two frequencies within one glidepath.

Reference: Lexicon '85

UHF GLIDE SLOPE TRANSMITTER. Term refers to physical apparatus.
Reference: AIM '91

ILS GLIDE PATH TRANSMITTER. Term refers to physical apparatus.
Reference: AIM '91

ILS GLIDE PATH. Some sources add ILS to basic term thereby indicating system to which Glide Path belongs.
Reference: Williams '92

LOCALIZER UNIT (LO). Casabona refers to Localizer as a Localizer Unit but seemingly identical to core term of Localizer.
Reference: Casabona '59

LOCALIZER. A basic component of ILS. The Localizer provides lateral guidance (course guidance for runway).
Reference: Casabona '59, Forssel '91

WIDE-APERTURE LOCALIZER. A nearly historic term. This form replaced an earlier version. Presumably Localizer in source refers to contemporary version.
Reference: Casabona '59

ILS LOCALIZER. Some sources add system to which an Aid is part of. This is true for several surveyed references.
Reference: Kleiber EC '84, H & R '84

OFFSET LOCALIZER. A Localizer off to one side of runway in contrast to regular position in which Localizer is in alignment with runway centerline.
Reference: Grover '57, VGLS '69, '74

TWO-FREQUENCY LOCALIZER SYSTEM. A Localizer that broadcasts on two frequencies creating a single coverage.
Reference: Lexicon '85

LOCALIZER FACILITY. Addition of word facility to basic term denotes physical apparatus.
Reference: DOT/DOD FRP '94

MARKER BEACONS. Such Beacons when within ILS are a component of ILS that provides ranging information. They emit cone or fan shaped signals and

denote points in the ILS approach path. There are several forms: Outer Marker, Middle Markers, Inner Markers. There are also Locator Outer Markers and Locator Middle Markers. Acronyms include IM, OM, MM, LOM, LMM..
References: IFH '71, NOTAMS, Field '85,

ILS MIDDLE MARKER BEACON/ILS INNER MARKER BEACON. ICAO provides a fuller title for two forms of Marker Beacons.
References 2nd Air IB '55

OUTER MARKER COMPASS LOCATOR/MIDDLE MARKER COMPASS LOCATOR. Compass Locators positioned at Outer and Middle Markers.
Reference: AIM '73

ILS MARKERS. Alternative name: Marker Beacon. 75-mc. Transmits pattern in fan-shape. Indicates distance along approach path. Includes Outer Marker and Middle Markers. Also called Fan Marker.
Referenc: Poritsky '59

ILS-ASSOCIATED FAN MARKER (FM). Or Marker Beacon (MB). Three types: Outer Marker, Middle Marker, and Inner Marker.
Reference: Maint... '86

SOLID-STATE MARKERS. ILS Marker equipment can take several forms. This form is housed in an enclosed shelter which in some cases can be transported. Other forms involve pole-mounted, and more permanent shelters.
Reference: Siting '85

POLE-MOUNTED MARKERS. Newer forms of ILS Marker Equipment employs less permanent and substantial forms.
References: Siting '85

75 MHz ILS MARKERS. General heading for treatment in Maint... ..
Reference: Maint. ... '85

VHF MARKER BEACON. This term or a similar one is also included in the Inter-category. This specific version refers to ILS Outer Marker and Middle Marker.
Reference: Taneja '87

BACK COURSE MARKERS. Markers are sometimes established on back course approaches in order to gain enhanced use of localizer. These Markers may be ILS Markers or Fan Markers or Lower-Power Fan Markers. Message: Steady tone,

3000 Hz accompanied by two dots (72) or Tube-type equipment (95 on solid state eq).
Reference: Siting '85

BACK COURSE MARKER BEACON. Fuller form of basic term.
Reference: ADS-GA '69

BACK COURSE MARKER BEACON. A fuller form of basic term.
Reference: ADS-GA '69

2C4 Microwave Landing Systems, MLS

General Note. MLS is a newer system for landing approaches and was intended to replace ILS. It constitutes a smaller body of terms than ILS. Word forms are more common in usage than acronym in contrast to ILS. Possibly its newer status required use of the full name since it was more unfamiliar. This coverage is divided into major terms, and constituent and other terms.

a) Principal Terms

MICROWAVE LANDING SYSTEM (MLS)/MICROWAVE LANDING SYSTEM, MLS/MICROWAVE LANDING SYSTEM. MLS gains its name from the frequency it employs: 5 GHz microwave band. This frequency reduces the problem of multipath. ILS is affected considerably by multipath reduces the quality of signals. The problem is generated by terrain and weather conditions. MLS has more channels and has a signal of higher quality. MLS components consist of the azimuth station which has a role akin to an ILS localizer. The station determines the aircraft's angle of approach. The elevation station is similar in function to ILS glide slope. However, GPS and DGPS have truncated the use of MLS and MLs may actually end before ILS does. Word form of MLS followed by acronym in parenthesis is most common form.
References: AIM '99, Forssell '91, Dodington EC '84, AT '96 (R)

MLS. Acronym for Microwave Landing System. Unlike some other acronyms it is less employed than word form.
References include: Reynish ATW '94, Sutton IA '94, Pilling AI '94

MLS SYSTEM. A short form that is often employed though system in title is less common.
Reference: Clausing '87

(MICROWAVE LANDING SYSTEM) (MLS). One source places both word form and acronym within parenthesis).

Reference: Forssel '91

STANDARD MLS. Condom speaks of this form as having four elements. Possibly a non-standard unit has less units.
Reference: Condom IA '85

b) MLS Constituent and Other Terms

DEPARTURE SYSTEM. German firm of SEL views MLS as both landing and departure system.
Reference: Olsen AI '90

DUPLEX MLS. Referred to in Condom but w/o explanation.
Reference: Condom IA '85

TACTICAL MLS STATION. Military version of a portable nature.
Reference: Clausing '87

INTERIM STANDARD MICROWAVE LANDING SYSTEM/INTERIM-STANDARD MICROWAVE LANDING SYSTEM (ISMLS)/INTERIM MICROWAVE LANDING SYSTEM (ISLMS)/ISMLS. These various terms suggest an early form that was provisional in nature.
References: IFH '71 (1st), AIP '91 (2nd), AIM '91 (3rd), HR '84 (4th)

MLS/RNAV. This reference is primarily to aircraft based equipment. This level of operation goes beyond basic receiver and includes computer technology allowing selection of airport other than nearby field.
Reference: Glines '89

MLS PRECISION DISTANCE MEASURING EQUIPMENT. This form operates as does the standard form. However, frequency is different and it can be activated by aircraft.
Reference: AIP '99

DOPPLER MLS. A form of MLS that adopts the Doppler principle.
Reference: Forssel '91

TIME REFERENCE SCANNING-BEAM SYSTEM. A MLS that uses "to-fro" measurements. Transmissions emit fan beam that scans the operational area. Each scanning provides pulse that can be received in the aircraft. The time difference between "to" scan and "fro" scan denotes direction.
Reference: Forssel '91

SCANNING BEAM MLS. Variant name for Time Reference Scanning-Beam System.
Reference: HR '84

SCAMLS. Acronym for Scanning Beam MLS, TRSB.
Reference: HR '84

STOL/MLS. MLS adapted to STOL Port operations.
Reference: HR '84

The components of MLS include:

AZIMUTH STATION
Reference: AIP '99

ELEVATION STATION
Reference: AIP '99

MLS AZIMUTH/MLS AZIMUTH STATION.
References: MLS AI '84 (1st), Tugs (2nd)

MLS AZIMUTH EQUIPMENT
Reference: Charnley JN '85

MLS GROUND STATION
Reference: Tugs AI '85

MLS ELEVATION EQUIPMENT
Reference: Charnley JN '85

There are a series of terms referring to application of MLS to categories of aviation operation. Reference in all cases is Pilling '94 The terms include:

CAT I MLS

CAT II MLS

CAT III MLS

CAT II MOBILE MLS (MMLS)

CAT I/II/III MLS

2D En-Route Aids

EN-ROUTE AIDS. This term serves as an overarching term for all Radio Aids other than Terminal Aids. However, there is little use of it in the literature. One article on MLS includes the term but in a partial sense. AIP includes Radio Navigational Aids-En Route which is closer in meaning (The abbreviation ENR designates the individual pages in that coverage). One other source speaks of Short-Distance En Route Aids.

References: MLS AI '84, AIP '99, Casabona '59

2D1 Historic Terms

a) Early Terms

TELEFUNKEN COMPASS/TELEFUNKEN ROTATING BEACON. A form of Rotating beacon, began in about 1917-18 (1st term). A much later development would be the VOR.

Reference: Kendal JN '90

THE COURSE SETTER/EQUI-SIGNAL COURSE SETTER. 1907 A Lorenz installation with two single individual aerials emitting A to N messages. A steady tone denoted on course; A indicated off course.

Reference: Kendal JN '90

SHELLER COURSE SETTER SYSTEM. Inventor's name is attached to basic term of Course Setter. Predecessor of Lorenz system, SBA systems and finally ILS.

Reference: Kendal JN '90

THE WIRELESS LIGHTHOUSE. Marconic work that resulted in Marine Radio Beacon and employed by aircraft.

Reference: Kendal JN '90

STANDARD BEACON APPROACH (SBA). Further development of course setter resulted in landing approach system, azimuth guidance, vertical guidance. "Distance-to-run" data supplied by Marker Beacon. Superseded by ILS.

Reference: Kendal JN '90

LORENZ AZIMUTH GUIDANCE BEACON. This Aid is a predecessor of SBA, and descendent of Course Setter.

Reference: Kendal JN '90

SMALL LOOP AERIAL SYSTEM. Term indicates early experiment at producing figure-of-eight transmission pattern. Applied to airborne D/F system. Reference: Kendal JN '90

BELLINI TOSI SYSTEM. Early system employing a method producing figure of eight pattern. Also known as Bellini Tosi D/F system. The transmitting dimension is the MF Radio Range. Reference: Kendal JN '90

TWO COURSE BEACON/FOUR COURSE BEACON. U.S. Dept of Commerce carried out experiments on these forms. Further research efforts led to VOR which see. Reference: Kendal JN '90

b) Intermediate Terms

RADIO RANGE/RADIO-RANGE. A now (seemingly) obsolete form of Navaid. Radio Range transmitted double "figure-eight" pattern of signals. The signals, in dots and dashes, emitted letters of "A" and "N". When on course or on the beam the signals merged and created a "T" but a A or N when off course. The Radio Range also emitted a identification signal for each station. The signal was approximately 3-10 miles wide and about 100 miles in length. Before VOR this was the primary Aid for navigation. The hyphenated form is an alternative formulation. Reference: Whitnah '66 (1st, 2nd), Solberg '79 (1st), Kendal JN '90 (1st)

RADIO RANGE BEACON/RADIO-RANGE BEACON. Terms refer to transmitter in the Radio Range System. References: Witnah '66 (1st), Komons '78 (2nd), Kendal JN '90 (1st)

RADIO MARKER/RADIO MARKER BEACON/RADIO-MARKER BEACON. This Aid was a second system in the early days of aviation. It denoted the location of each Radio Range and thereby permitted aviators to determine position. Whitnah notes the supplying of weather information by Radio Markers. Reference: Komons '78, Whitnah '66

RADIO RANGE STATION/RADIO STATION. This may be a synonym for the Radio Range though it may have a larger in scope: the entire physical plant and other functions than Radio Navaid communications. Solberg and Finch use the shorter term which refers to Radio Range. Reference: Komons '78, Wilson '79, Finch '38

RANGE. Term refers to Radio Range. Reference: Komons '78

AURAL RADIO RANGE. Aural= Sound yet some sources refer to visual indicator on control panel. Reference: Komons '78

AURAL-TYPE RADIO-RANGE BEACON. This refers to a form that is received through ear phones. Reference: Whitnah '66

Radio Ranges by Frequency
General Note. A variety of Radio Ranges incorporated frequency in the title. These include the following terms with added selective notes.

LOW/MEDIUM FREQUENCY RADIO RANGE.. There are two forms according to antenna system: Loop range, and Adcock Range. Possibly obsolete by 1970s. Reference: AIM '73

LOW/MEDIUM FREQUENCY RADIO RANGE (LLFR)
Reference: Interagency '67

LOW OR MEDIUM FREQUENCY RADIO BEACON
Reference: AIP '91

LOW OR MEDIUM-FREQUENCY RADIO RANGE.
Reference: PICA0 '44

LOW AND MEDIUM FREQUENCY RADIO RANGE.
Reference: Poritsky '59

LOW-FREQUENCY FOUR-COURSE RANGE. Range often listed as LF/MF; here Wilson specifies LF. The Radio Range was four-course though often that is omitted from title; though not in this instance. Reference: Wilson '79

LOW-FREQUENCY RADIO RANGES. Another name for Low/Medium Frequency Radio Range. Contradiction not explained. Reference: AIM '73

LOW/MEDIUM FREQUENCY (L/MF) RADIO RANGE. Seemingly obsolete before 1973 yet listed in AIM '73. Term refers to two forms of Low-Frequency (not L/MF) Radio Ranges: Loop Range and Adcock Range.

Reference: AIM '73

LOW FREQUENCY RANGE. This is presumably a shorter form of the full term, Low-Frequency Radio Range.

Reference: FAA Flight '71

FOUR-COURSE RADIO RANGE. An early Aid that lasted into comparatively recent times. It consisted of two antenna loops that created double figure eights. One figure emitted Morse Code character A (dot-dash); the second an N. When on course the air crew received a steady signal (long dash) and an A or N when off course or off the beam.

Reference: Komons '78, Kayton '90, Solberg '79

FOUR-COURSE RADIO STATION.

Reference: Taneja '87

FOUR-COURSE RANGE. Short form of Four-Course Radio Range.

Reference: Komons '78, Tanjea '87

2D2 VOR, VORTAC, DME & TACAN Forms

General Note. VOR, DME, TACAN and related Aids have served as the primary short-range Navaid for a half-century. These Aids have been employed in North America, and other regions. The advent of GPS is eclipsing their importance though they remain in use. This segment will take up the coverage under headings of VOR, DME, TACAN, and composite forms. There are some Terminal Navaid use of these Aids which will be noted here and in Terminal Aids.

a) VOR, VHF OMNIDIRECTIONAL RADIO RANGE

General Note. VOR, as well as other Aero Navaids, are frequently better known by an acronym than by a word title. VOR can stand for several versions of that term including VHF Omnidirectional Radio Range. VHF is infrequently spelled out: Very High Frequency. Some terms include radio range and others range only. Omnidirectional can be one word or it can be hyphenated. VOR may preceded or follow the written form even though VOR alone is often the title, this study will use VOR followed by the written form as the primary term.

VOR. A radio navigation system that replaced Radio Ranges. It provides bearing (azimuth) data in all directions. It is primarily a short-distance Navaid though some terminal forms are in used. Cannes notes that there are three forms: Terminal, 25 nm; Low altitude, 40 nm and 13000 feet and lower; High altitude, 100 nm for 14,500 altitude to 17,999 and 130 nm, 18000 to 40000. Many VORs are collocated with DME or TACAN units.

References: DOT/DOD FRP '96, Cannes '92, VOR ... '86 and other sources.

VHF OMNIRANGE (VOR). A variant form of the term that encapsulate the core features: VHF with an omnidirectional range.

References: Wilson '79, AIM '73

VHF OMNIDIRECTIONAL RADIO RANGE. This may constitute the basic and complete form of the term though it lacks the acronym. Omnidirectional is one word rather than two words in a hyphenated form.

Reference: Solberg '79

VHF OMNI-DIRECTIONAL RADIO RANGE (VOR). A slightly variant form of basic term.

References: AIP '91, IFH '71, AT '85, '96

VHF OMNI-DIRECTIONAL RADIO RANGE. A similar form but without the acronym.

Reference: AT '68

VHF OMNIDIRECTONAL RANGE (VOR). Alternate form that omits Radio from the title. But it remains the same Aid.

Reference: Kayton '90, FAA Flight '71

VHF OMNI-DIRECTIONAL RANGE (VOR). A variation on the previous term save that Omni and Directional are two words in hyphenated form.

Reference: AIP '99

VERY HIGH FREQUENCY OMNIRANGE (VOR). An infrequently employed form that spells out VHF.

Reference: ADS-GA '69

VOR (VHF OMNI-RANGE). Many terms end with acronym ; however this one begins with the acronym.

Reference: AT '49

VOR (VHF OMNIDIRECTIONAL RADIO RANGE). This version of the basic

term begins with acronym. It is a fuller form in that radio added to range.
Reference: AT '58

CONVENTIONAL VOR. It is questionable whether this constitutes a term. The source differentiates between Conventional VOR and the Doppler VOR and thereby denotes the method of operation.
Reference: VOR ... '86

Doppler VOR
General Note. A variety of terms refer to this system through variant forms. They are treated separate though integration is feasible. Selective notes added when needed.

DOPPLER VHF OMNI-DIRECTIONAL RANGE. Variant form of term.
Reference: Singapore

DOPPLER VOR. This form of VOR employs a different antenna system (based on the Doppler principle). It is employed when standard VOR encounters siting problems.
Reference: Canada, Tugs AI '91, VOR ... '86, ADS-Site '69

DOPPLER VOR (DVOR). Variant form of term.
Reference: Field '85

DVOR. Acronym for basic term: Doppler VOR.
References: Olsen AI '90, Ben & Lux AIP

D-VOR. Toshiba offers hyphenated version of acronym.
Reference: Toshiba

b) Distance Measuring Equipment, DME

General Note. DME has acronym, non-acronym and combined forms to designate this Aid. There are fewer variant name forms than with VOR. But on the other hand there are more variations of DME. DME is the most common name though for this study a composite of Distance Measuring Equipment plus DME will be the basic name.

DISTANCE MEASURING EQUIPMENT (DME).
Reference: Kendal JN '90, Kayton '90, AIM '91, AT '96

DME. This is the most common name for this Aid. A word form, and word form

with acronym are less employed. A variety of sources note that DME gives distance information. Cannes further notes that ground speed data is also given. The speed information is termed slant-range data since speed determined from aircraft to ground station at a slant.
References: Cannes '92, CAA-FAP '58, Toshiba

A diversity of variant terms for DME is employed by some sources:

DISTANCE MEASURING DEVICES.
Reference: Singapore

DISTANCE-MEASURING EQUIPMENT (DME)
Reference: Wilson '79

DME SYSTEM.
Reference: AT '68, '72

UHF DISTANCE MEASURING-EQUIPMENT (DME). The frequency is part of the name for some Aids including VOR. That is less often the case with DME though this ICAO term does include it.
Reference: AT '49, '85

There are a variety of specialized forms of DME:
DME/W. W denotes characteristics are wide spectrum. No longer installed.
Reference: ICAO AT '68, '85

DME/P. P=Precise Distance Measurement. An acronym for word form.
Reference: ICAO AT '85, Glines

PRECISION DISTANCE MEASURING EQUIPMENT (P-DME)/MLS
PRECISION DISTANCE MEASUREMENT EQUIPMENT (DME/P).
References: Wilson '79, MLS ... AI '84, AIP '99 (2nd)

DME/N. N= Narrow spectrum.
Reference: ICAO AT '68, '85

c) TACAN/TACTICAL AIR NAVIGATION

General Note. The term is from military air navigation. The acronym is heavily employed. A second form is Tactical Air Navigation followed by the acronym Acronym followed by word form is less employed. Several other more obscure

forms are also employed.

TACAN. A UHF Aid that has been the military equivalent of VOR/DME. It is the primary air navigation system for military services. It is often colocated with VOR thereby creating VORTAC. Tacan includes distance measuring function. It is several times more accurate than VOR in providing data.
References: DOT/DOD FRP '96, Glob Pol AI '91

TACTICAL AIR NAVIGATION (TACAN). Word form of title followed by acronym.
References: Kayton '90, AIP '91, AIM '73, Flight '71

TACTICAL AIR NAVIGATIONAL AID. This term appears to focus to some degree on the individual unit though the term is part of TACAN system.
Reference: NOTAMS, '87

TACTICAL AIR NAVIGATION SYSTEM. The term adds system to title and is thereby more explicit in meaning.
Reference: Blake (Beck) '71

TACAN, TACTICAL AIR NAVIGATION. Variant form in which acronym precedes word version.
Reference: ITT

TACAN SYSTEM. ITT offers this version of term. For ITT it included ground and shipboard "receiver-transmitter stations" and "airborne transmitter receivers".
Reference: ITT

d) Composite Terms

DVOR/DME. DVOR=Doppler VOR. This form employs the Doppler principle thereby reducing interference in the quality of signals. This term refers to a colocated installation.
Reference: Field '85, Ben & Lux AIP

DVORTAC. Term refers to colocated unit of Tacan and Vor of the Doppler form.
Reference: Ben & Lux AIP

SVOR/DVOR. Canadian acronym for Standard VOR/Doppler Vor. Limited information only.
Reference: Transport Canada

VOR/DME//VOR-DME. A colocated system that forms an integrated Aid. Somewhat more sources employ VOR/DME form than VOR-DME. Most of the "slash" version are from government sources while most of the hyphenated forms are from book and journal references.
References: AIP '99 (1st), Wilson '79 (2nd)

DOPPLER VOR/DME. A system that conjoins Doppler form of VOR with DME.
Reference: Toshiba

VOR/DME-BASED RNAV//VOR/DME RNAV. Term refers to a short range Aid. RNAV is a computer-based and airborne system that picks up signals from various sources and plots courses. This form engages VOR and DME systems.
Reference: Clausing '87 (1st), HR '84 (2nd), AIM '91 (2nd)

VORTAC. A colocated facility involving civil aviation's VOR with military TACAN which permits military aviation users to operation within civilian airspace. There are two sources for bearing information and one for distance data. Acronym is often employed instead of lengthy word form.
Reference: DOT/DOD FRP '96, Taylor '58

VHF OMNI-DIRECTIONAL RANGE/TACTICAL AIR NAVIGATION (VOR-TAC). Full form of the term though less employed than acronym of VORTAC.
Reference: AIM '73

VHF OMNI-DIRECTIONAL RANGE/TACTICAL AIR NAVIGATION. Variant form with hyphen.
Reference: AIM '91

ASSOCIATED VOR & TACAN (VORTAC). Variant form of term from Taiwan practice.
Reference: Taiwan

VOR/DME (TACAN). An infrequently used term which seemingly refers to a TACAN as fulfilling functions normally handled by civil aviation VOR/DME units. Source of term primarily concerned with civil aviation.
Reference: DOT & AID-Aids ... SE Asia '71

BACKFIT VOR WITH TACAN RHO/THETA. Listed in FAP without explanation. VORTAC explained but not specific forms.
Reference: CAA-FAP '58

2D3 Hyperbolic Aids

General Note I. These aids have been a vital element in navigation for sixty-some years in one form or another. Many or most forms are now obsolescent or obsolete though they continue to find inclusion in recent and somewhat recent literature of the field. This coverage encompasses both recent and historic entries.

General Note II. Hyperbolic Aids have been vital to marine navigation as well. Part II of this Database included a variety of forms in current or past usage. There is no sharp dividing line between Aids for aero use and those for marine use. Therefore this coverage overlaps with that of Part II.

a) Overarching Terms

HYPERBOLIC AIDS. These aids employ at least two transmitting stations. Transmissions from these stations are compared and position of craft is thereby established. The lines of positions (LOPs) take on the shape of a hypobolae hence their name. There is no single term employed for these Aids. Hyperbolic Aids was employed in Part II and a few references employ the term in this study. It seems a workable term for the subject.

References: Grover '57, Underdown '93

HYPERBOLIC NAVIGATION SYSTEMS. This is a more explicit term for Aids employing hyperbolic approach to navigation. It is employed by few sources despite its overarching character. It is an alternate term for II.

References: Bauss '63, McGraw-Hill '92

HYPERBOLIC RADIO NAVAIDS. Blanchard contributes this term which has a plausible nature as a general term though seemingly no other source employs it. Blanchard notes that Hyperbolic Radio Nav aids focus on area coverage rather than a single point approach.

Reference: Blanchard JN '91

HYPERBOLIC AIRBORNE NAVIGATION AIDS. This term from Blanchard is part of a title of a series of essays. Possibly "airborne" denotes the aeronautical focus of his work.

Reference: Blanchard JN '91

HYPERBOLIC SYSTEMS. A term favored by several references though it tends toward the vague.

References: Forssell '91, Blanchard JN '91

b) Loran

General Note. This term encompasses a variety of Aids. The term can be employed as a general term for all of the forms though it can also apply to one specific form.

LORAN. This acronym is formed from the words LONg RANGE Navigation. A chain consists of a master station and several slave stations. The master station transmits a signal which, when received at a slave station, causes first a delay at the slave station then a transmission from the slave station. Airborne equipment measures the difference in time from the signals.. This creates a line of position; two LOPs determines plane's position. Two principal forms are Loran-A and Loran-C. ICAO Lexicon '86 describes Loran as Long Range Air Navigation System which is a fuller name, explanation of the acronym.

References: Part II, Taneja '87, Henney '59 (Casabona), Kayton '90

LORAN A/LORAN-A/LORAN-C. This is older than Loran-A and is obsolete. It transmitted on MF and for shorter distances than Loran-C.

References: Taneja '87, Williams '92, AT '85,

LORAN-C/LORAN A/LORAN-C SYSTEM. This refers to a form that is still operational though of declining significance. It is of LF nature and transmits over longer distances.

References: Forssell '91, Blanchard '91

STANDARD-LORAN/STANDARD LORAN/LORAN, STANDARD. There are older terms for Loran-A.

References: Bauss '63, Powell '71 (Beck)

H.F. LORAN. According to Williams this is a later name for Loran-A. Yet Loran A is MF.

Reference: Williams '92

LOW-FREQUENCY LORAN/L.F. LORAN. This is a form of Standard or Loran A. It was LF rather than MF. It transmitted pulse rates different from Loran A and was less accurate.

References: Henney '59 (Casabona), Hall '57, Smith '48

SS-LORAN (SYNCHRONIZED LORAN/S.S. LORAN/SKYWAVE SYNCHRONIZED LORAN (SS LORAN). A World War II-era form that utilized the ionospheric reflections of the E-layer. It was accurate but the reflections were

only in existence at night. It had military value but much less value for civil aviation.

Reference: Bauss '63, Hall '47, Blanchard '91

LORAN-B/LORAN-D. There are forms of Loran that appear in the literature but have little bearing on air navigation. Loran-B was for marine use and did not achieve operational status. Loran-D was a tactical aid for military usage. It employed transmitters.

Reference: Blanchard '91

DIFFERENTIAL LORAN. A form of Loran that provides corrections for transmitted signals thereby reducing errors, increasing accuracy.

Reference: Forssell '91

CHAIKA/CHAIKA (SEAGULL) SYSTEM. The word is Russian for Seagull. It was developed by the former USSR. It was similar to Loran-C except for limited differences in the shape of pulses.

References: Kayton '91

CYCLAN. This is the original name for Loran.

Reference: Bauss '63

CYTAC. A second older name for Loran.

Reference: Bauss '63

GEE. A hyperbolic system usually referred to by GEE though alternate names are in use. It was a system developed in UK during World War II. It is similar to Loran (there was simultaneous development of the two systems), and equipment could be interchanged. Gee was short to medium range while Loran served longer ranges. Gee was of higher frequency transmission than Loran. Gee permitted two LOPs at a time while Loran transmitted one LOP at a time. However, Gee required many chains to cover a large area. Gee was complex in operation and labor-intensive. It found more military than civil use.

Reference: Smith '48, Grover '57, Hall '47, Williams '92, Part II

GEE HYPERBOLIC SYSTEM/GEE SYSTEM.. Alternate names for Gee that better explain the function than the core name.

Reference: Blanchard '91

QH. An earlier name for GEE

Reference: Blanchard '91

c) Decca

c) Decca

General Note. Decca includes not only Decca but a variety of systems that are derivative of Decca. They are all taken up in this segment.

DECCA. Decca is a hyperbolic system that employs continuous wave transmissions and phase comparison measurement. Each unit has a master station and two to three slave stations. The stations broadcast continuous wave (cw) signal at different frequencies but which are interlocked through frequencies which follow a fixed ratio to one another. Measurement consists of determining wave length arrival differences on a phase meter (Deccometer).

References: Casabona '59, Kaayton '90, Part II

DECCA NAVIGATOR/DECCA SYSTEM/DECCA NAVIGATION SYSTEM.

These terms are variant names that give a fuller idea of the nature of Decca.

References: Part II, Casabona '59, Williams '92, Grover '57

QM. Official name for Decca in 1940s.

Reference: Blanchard JN '91

DECCA HI-FIX. A marginal term that relates mostly to surveying. But it appears in one surveyed source. Part II includes a Decca system known simply as Hi-Fix.

Reference: Part II, Bauss '63

DELRAC. Acronym from DECCA/Long/R/Area/Covering. A phase comparison VLF system of considerable accuracy. Decca created Delracc in order to provide area coverage. VLF employed in order to create long distance coverage. It is hyperbolic in nature.

Reference: Grover '57, Williams '92, Blanchard JN '91, Bauss '63

DECTRA. Acronym from DECCA Tracking and Ranging. It is an older hyperbolic system included in older ICAO publications. It is apparently out of service. It was of British provenance. It achieved high accuracy and long range. It provided directional coverage rather than area coverage. Dectra supplied coverage on a specific trunk routes. It borrowed substantial elements of its apparatus from Decca. Stations at each end of a route created a "track-guide system."

Reference: Bauss '63, Grover '57

d) Consol

CONSOL. This refers to a hyperbolic system that employs short baselines. These lines are more in the nature of straight lines or great circles than hyperbolae.

Consol is known as a "collapsed" hyperbolic system as a result. Consol can be

seen as both radial and hyperbolic; in effect, the hyperbolic dimension is not employed. Each unit has one transmitting station with three antennas. Bearings of a long distance character are provided. Consol is a derivative of Sonne. Sonne was Germany's long range Aid in World War II. ICAO included it under the UK designation of Consol. Differences between Sonne and Consul are small. References: Part II, ICAO AT '58, '63, Fifth Session IB '54

CONSOL SYSTEM. Variant term for Consol that expresses its system's character.

Reference: Casabona '59, AT '58, '63, '68, '72, Fifth Session IB '54

CONSOLAN. This refers to the U.S. version which employed two antennas instead of the normal three. It was employed for a time in the San Francisco Bay area and Nantucket areas.

Reference: Bauss '63

SONNE. A German Radio Aid that was later named Consol. An earlier version of Sonne was named Elektra.

References: Part II, Hall '47

Some variant terms for Consul and/or Sonne include:

CONSOL (SONNE), Casabona '59
SONNE/CONSOL, Blanchard '91
SONNE (SUN), Blanchard '91
SONNE (CONSOL), Blanchard '91

MOND (MOON)/STERN (STAR). Versions of Sonne that employed alternative frequencies.

Reference: Blanchard '91

e) Omega

OMEGA. A global hyperbolic system of somewhat recent vintage which is already shut down because of GPS. It operated in the VLF range and emitted CW signals. Eight stations, operating on time-share arrangements, provided world-wide coverage. Phase comparison of transmissions led to LOPs determinations. It was similar to Decca except that any two stations could be employed.

References: AIP '91, DOT/DOD FRP '92, Part II

OMEGA/VLF//OMEGA/VLF NAVIGATION SYSTEM. A possibly confusing term. U.S. Navy maintains a VLF band for communication. Some aircraft

receivers could receive the Navy signals but not a separate Omega system signal. While the Navy system could be utilized for navigation it was not an official navigation system.

References: AIP '91, Clausing '87, AIM '99

OMEGA/NCS SYSTEM. A naval communication system. It is a VLF system as is Omega. The combined system is not a Navaid but it can be combined into an integrated system.

Reference: Taneja '87

OMEGA SYSTEM/OMEGA NAVIGATION SYSTEM. Variant terms that indicate more explicitly the purpose of Omega. Often times the core word of Omega was employed without amplification.

References: Clausing '87 (1st), Taneja '87 (2nd)

DIFFERENTIAL-OMEGA. A special installation that corrected regular signals and thereby improved their accuracy.

Reference: Kayton '90, Forssell '91

OMEGA/LORAN-C. Term included in a chart of current systems. Both placed together; possibly because of long-distance nature.

Reference: Ostiguy II '99

f) Miscellaneous Hyperbolic Aid Forms

EUREKA/REBECCA-EUREKA/REBECCA/EUREKA/REBECCA-EUREKA DISTANCE MEASURING SYSTEM. A system developed in World War II and included briefly in a few sources. Eureka was a Radar Responder Beacon.

Rebecca was an airborne unit that interrogated (activated) Eureka for navigational data. This is not a Hyperbolic system though it is an En-Route Aid.

References: Smith '48 (1st), Bauss '63 (2nd), Grover '57, Smith '48 (3rd), Blake '71 (4th)

LORAC. Blanchard includes forms (other forms are Rana and Toran). that appear to be marginal for aero navigation. Lorac (LONg/RANGE/ACCURACY) is a system that employs phase comparison methods to create hyperbolic LOPs. A Lorac chain has a main station and two side stations. It is seemingly employed for survey work. It is similar to Raydist which is discussed in Part II.

Reference: Blanchard '91, Part II

NAVAGLOBE-NAVARHO. These are terms of confusion. For Bauss a system known as Facon provided distance measuring. Navaglobe provided bearing

information only. When combined they became Navarho. For Casabona it is Navaglobe when bearing only but adding additional airborne equipment allows ground equipment to add distance data and the system thereby becomes Navarho. While for Grover Navarho is a bearing/distance system; Navaglobe was "passed over in favor of Navarho." ICAO employs both names together. The Navaglobe phase is long range and is an area coverage aid.
References: Bauss '63, Casabona '59, Grover '57

NAVAGLOBE/NAVAGLOBE SYSTEM. See Navaglobe-Navarho.
References: Bauss '63, Casabona '59 (1st), Casabona '59 (2nd)

NAVARHO SYSTEM. See Navaglobe-Navarho.
Reference: Casabona '59

NAVARHO-H, -HH, -RHO. Single H is a position aid determined by one radial and one hyperbolic lines intersecting. HH consists of two hyperbolic lines intersecting. The rho form consists of two radial lines intersecting.
References: Bauss '63

POST OFFICE POSITION INDICATOR (POPI)/POPI (POST OFFICE POSITION INDICATOR)/P.O.P.I. A World War II era system commissioned by the UK Post Office. It was of a hyperbolic nature and employed a cw phase comparison system. It is similar to Decca though it used shorter base lines and displayed more lineal LOPS.
References: Casabona '59 (1st), Blanchard '91 (2nd), Smith '48 (3rd and 4th)

RAYDIST. A navigation system employed largely for hydrographic, geophysical survey and ship trials work. It employs phase comparison methods employing two physically separate cw signals. There are several versions.
Reference: Bauss '63, Special Issue-IEEE '93, Part Ii

RADIO-MAILLES SYSTEM. This is a Hyperbolic system under development in early 1960s. It is of French provenance; its fate is unknown. It was employed for navigation and position determination; also employed for traffic control and collision avoidance.
Reference: Bauss '63

RADIO-WEB/RADIO-MESH. Alternate names for Radio-Mailles.
Reference: Bauss '63

RADIO MESH SYSTEM (RADIO-MAILLES). English-language term for Radio-Mailles System.
Reference: Bauss '63

RADUX. This is a LF hyperbolic system with long-base lines for long- distance navigation. It transmitted from at least three stations. There are references to Radux in the 1940s-1960s but not seemingly not beyond that time period.
References: Casabona '59, Blanchard JN '91, Part Ii

RADUX-OMEGA. A form of Radux (which was LF) with an added component at VLF which created Radux-Omega. Eventually a VLF version was developed and Radux dropped out.
References: Sakran IEEE '98, Blanchard JN '91

RANA. A system included by Blanchard but seemingly of limited involvement with aero navigation. It is a hyperbolic system that is a cw system using phase comparison methods. A chain has three stations with two sets of transmitters per station. The slave unit synchronizes emissions which creates a hyperbolic pattern. Bauss claims Rana is the French name for Lorac but IALA considers them separately.
References: Blanchard JN '91, Part Ii

TORAN. A hyperbolic system of considerable precision. Shipbased receiver determines phase difference from three transmitters. Toran is Hf though the confocal transmitters produce an LF beat indication.
References: Blanchard JN '91, Part Ii

2D4 Satellite Nav aids

- a) GPS 1) Main Terms

GPS, GLOBAL POSITIONING SYSTEMS.

General Note I. GPS, a relatively new aid, has blossomed into many forms with many users. The literature in book and journal forms is extensive. The core idea and explanation has simplicity and coherence. Yet the primary term has many nuanced forms. The primary coverage in this segment is under the heading of the acronym, GPS, which is the most common title for the Aid. The coverage also includes briefer coverage of various combinations of letter and word titles. Specialized and composite terms are also included.

General Note II. Forms of GPS include: Word form, Word form followed by acronym, Acronym followed by word form, finally forms centering on Navstar-GPS in several permutations.

GPS. The three-letter acronym is the most common designation. GPS is

sometimes referred to as space-based while in other instances it is termed satellite-based. While it is situated in space it is based in a series of satellites. It is described as both a navigation and a positioning system. It is operated by DOD but has widespread civil use. It is global in character. GPS has been fully operational since 1995 though it dates back to the late 1970s. It provides position, velocity, time data. It is increasingly employed by all forms of transportation. While there are numerous satellites in the system only a small number are required for accurate position determination. Two forms of data are given: one phase gives satellite position in a context of time while the second phase gives orbits and operational status of all the satellites. The receiver uses the data to determine pseudorange and also to decide which satellites present the best data for position determination.

References: French '96, AIM '99, Part Ii, DOT/DOD FRP '99

GPS SYSTEM. System appears twice in the title: in the acronym and in word form. This may suggest that an acronym can take on a life of its own and words represented by letters effectively drop out or become hidden. Arguably, the system is not duplicated. A relatively limited number of references include the term.

References: Burgess IEEE '88, T & C '91, Loh GPSW '95

Other forms of GPS and variations include:

GLOBAL POSITIONING SYSTEM. This is hardly a variant though less common than the acronym.

References: Dodington EC '84, Lazzaroni EC 84

GLOBAL POSITIONING SYSTEM (GPS). Basic term followed by acronym.

References include: AIM '91, Clausing '87, Olsen AI 7-91, French '96, Gupta '96 IEEE

GPS, GLOBAL POSITIONING SYSTEM. Acronym followed by word form.

References: Europe IJ '97

2) Specialized Terms and Composite Terms

CAT II/III GPS. GPS applied to navigation on Cat 2, Cat 3 level.

Reference: Daly '94

GLOBAL POSITIONING SATELLITES. Kayton refers to satellites that are part of GPS. This represents the physical infrastructure of GPS.

Reference: Kayton '90

GPS/GLONASS/GPS-GLONASS. Two sources that include these terms are referring to receivers in aircraft that can receive signals from either GPS or GLONASS. Despite appearance they are not Nav aids in themselves. References: Kayton '90 (2nd), DOT/DOD FRP '99 (1st)

GPS (GLOBAL POSITIONING SYSTEM) SATELLITE-BASED NAVIGATION SYSTEM. This may be more of a descriptive than an official name?

Reference: Bethmann '84 EC

GLOBAL POSITIONING SYSTEM
STANDARD POSITIONING SERVICE (SPS).
PRECISE POSITIONING SERVICE (PPS).

GPS has two forms. A more precise and accurate form for military and a standard version less accurate. President Clinton dissolved the distinction.

References: DOT/DOD FRP '99

RAIM. RAIM= Receiver Autonomous Integrity Monitoring. This refers to a dimension of aircraft-based equipment that determines if a satellite is emitting information that is corrupted and thereby not accurate. This is not an Nav aid though closely related to Nav aids and on occasion closely related to GPS.

Reference: AIM '99

GPS/RAIM. Seemingly one source sees RAIM as a component that augments accuracy of GPS and thereby an element of the GPS process.

Reference: Loh '95 GPSW

3) Navstar GPS

General Note. This coverage consists of primary entry followed by various alternate titles and several specialized terms.

NAVSTAR (NAVIGATION SYSTEM WITH TIMING AND RANGING). Navstar is an acronym from the words Navigation System with Timing and Ranging. French possibly employs the extended phrase since he separates Navstar GPS from the extended term.

References: Forssel '91, French '96

NAVSTAR. Wright employs Navstar as the complete name. This, however, was in the early 1970s when Satnav was in an early stage.

Reference: Wright '71 (Beck)

NAVSTAR SYSTEM. An alternate name for GPS.
Reference: T & C '91

NAVSTAR GLOBAL POSITIONING SYSTEM/NAVSTAR GLOBAL POSITIONING SYSTEM (GPS). This represents the full and official name of what is often termed GPS. The second form is from Runkle, project manager for Navstar GPS. He almost invariably uses GPS after beginning with the full name.
References: Williams '92, Runkle '88 IEEE

NAVSTAR GPS. A slightly shorter version combining Navstar with the acronym GPS.
References: Runkle '88 IEEE, Burgess IEEE '88

NAVSTAR-GPS. This hyphenated version may not be different in meaning from other versions of the basic term. Kayton's use of the term is unclear. Bethmann's use of the term is seemingly a synonym for other versions of the basic term.
References: Kayton '90, Bethmann '84 EC

NAVSTAR/GPS. Forssell begins with Navstar then moves to GPS without explanation. Clausing employs this version consistently. Clausing wrote before the system was fully operational. Clausing's usage may suggest two terms or systems that are brought together as a combined or single system.
References: Forssell '91, Clausing '87

NAVSTAR SATELLITES. Term refers to satellites in themselves. A reference to Navstar along also appears to indicate satellites rather than entire system.
Reference: GPS The One... AI '91

GLOBAL POSITIONING SYSTEM (NAVSTAR). Navstar seemingly serves as an alternate name for GPS.
Reference: T & C '91

4) GLONASS

GLONASS/GLONASS (GLOBAL NAVIGATION SATELLITE SYSTEM). Soviet satellite navigation system similar to GPS. Glonass is an apparent acronym for Global Navigation Satellite System. It is an element of ICAO's planned GNSS operation.
References: Lechner '94 GPSW, Sutton IA '93, Olsen AI 11-93, DOT/DOD FRP '99 (1st), Forssell '91 (2nd)

GLONASS, GLOBAL ORBITING NAVIGATION SATELLITE SYSTEM. This version adds the word Orbiting.
Reference: IJ Europe Tripartite ... '97

b) Augmentation Terms

1) DGPS

DIFFERENTIAL GPS. Term refers to system of ground stations that provide information corrections of satellite-based GPS. Various conditions affect GPS transmission including atmospheric factors can induce GPS signals. Maritime DGPS consists of stations under that name which provides corrections to users. Users then correct GPS signals. For aero use DGPS is utilized through WAAS and LAAS which see.
References: Blacklock AI '91, Fitzsimmons AF '95, DOT/DOD FRP '90,

DGPS terminology appears in a variety of guises. However the concept and Aids are closely united. Variant forms of terms include:

DIFFERENTIAL GPS (DGPS) References: Daly FI '94, Fitzsimmons AF '95, L & W GPSW '95

DGPS References: Daly FI '94, Sutton IA '93, L & W GPSW '95, Pace '95

DGPS SYSTEM Reference: Fitzsimmons AF '95

DIFFERENTIAL GLOBAL POSITIONING SYSTEM/DIFFERENTIAL GLOBAL POSITIONING SYSTEMS (DGPS) Reference: Gupta '96 IEEE

DGPS LANDING SYSTEM/SPECIAL CATEGORY 1 DGPS LANDING SYSTEM/DGPS SPECIAL CATEGORY LANDING SYSTEM. Hundley and Rowson described testing and development of Wilcox DGPS system. These various terms and systems appear to be a form of LAAS which see. They are intended to provide precision assistance for approach and landing operations in lieu of ILS and MLS.
Reference: Hundley and Rowson (H & R) GPSW '93

DGPS GROUND REFERENCE SYSTEM. Term refers to physical apparatus on the ground; other equipment is airborne.
Reference: H & R GPSW '93

DGPS GROUND STATION. This refers to ground aspect of DGPS system. And refers to makers of equipment.

Reference: Fitzsimmons AF '95, H & R '93

AERONAUTICAL-DGPS. FRP includes various forms of GPS and addition of Aeronautical is primarily done to distinguish between Marine and Aero forms.

Reference: DOT/DOD FRP 1992

GPS DIFFERENTIAL CORRECTION (dGPS). Seemingly the equivalent of DGPS unless it describe the process of corrections.

Reference: Underdown '93

DGPS/INS. This term is doubtful. It seems to indicate a phase of APALS (Autonomous Precision Approach Landing System, a new experimental system).

Reference: Daly '94

HELICOPTER-BORNE DGPS SYSTEM. A system in UK for Lighthouse authorities engaged in helicopter operations. Marine Radiobeacons supply differential corrections.

Reference: Last and Ward GPSW '95

INTELLIGENT SMALL AREA DGPS. Term refers to use of artificial neural network technology for small area DGPS. Designed especially for Singapore. Presumably SADGPS need not have the intelligent (ANN) dimension.

Reference: Gupta '96 IEEE

2) WAAS & LAAS Augmentation Terms

LAAS. Acronym for Local Area Augmentation System.

Reference: DOT/DOD FRP '96

LOCAL-AREA AUGMENTATION SYSTEM (LAAS). Augmentation system that is ground based. It focusses on local conditions and is employed for Cat II and III precision approaches. In some circumstances it is applied to Cat I as well.

References: Fitzsimmons AF '95, DOT/DOD FRP '99

LADGPS. French employs this acronym and written form of Local Area DGPS. Though LAAS is a more common term.

Reference: French '96

SADGPS. =Small Area DGPS. This form employs artificial neural network for increasing accuracy in a small area such as Singapore. It does not employ DGPS

Reference: Gupta IEEE '96

WIDE AREA AUGMENTATION SYSTEM (WAAS). This refers to a satellite-based augmentation system. It provides data for a variety of aviation approaches and provides differential corrections for GPS transmissions.

References: DOT/DOD FRP '99, Fitzsimmons AF '95, Johns IJ '97

WADGPS. WADGPS= Wide Area DGPS. There are two forms: WAAS: Wide Area Augmentation System in U.S. And FANS: Future Aids to Navigation System in remainder of the world.

Reference: Gupta IEEE '96

WAAS. Acronym for Wide Area Augmentation System. It is often employed as a stand-alone term.

References: DOT/DOD FRP '96

W.A.A.S. French provides a variant form of the basic acronym. French also employs WAAS as well as a spelled-out version.

Reference: French '96

WAS. Acronym for Wide Area System. WAS includes Wide Area System and LADGPS, Local Area DGPS.

Reference: French '96

c) GNSS

GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS). This term has three possible meanings. It can refer to any system that provides navigation aid data by satellite (Underdown for example). It can refer to existing systems such as GPS and GLONASS (Olsen AI 3-90). Or it can refer to a system in development by ICAO that goes beyond existing satellite nav aids. GPS is perceived as not fully supplying the level and breadth of navigation needs and is less than adequate in some respects. GNSS is to be a civil system that measure up to all users. Such a system supplies information for position, velocity, time.

References: Fitzsimmons '95, Loh '95, IJ Europe Tripartite ... '97

GNSS. Acronym for Global Navigation Satellite Systems which is often employed as a stand-alone term.

Reference: Crow 2000

GNSS, GLOBAL NAVIGATION SATELLITE SYSTEM. Acronym accompanied by word form employed by some sources. A slightly variant form.

Reference: D. Olsen AI 3-93

GNSS (GLOBAL NAVIGATION SATELLITE SYSTEM). Yet another slight variant of basic title.

Reference: D. Olsen AI 2-93

GNSS-1. In Europe GPS and GLONASS are sometimes termed GNSS-I to differentiate from more advanced forms under development. GNSS-I also includes the various kinds of augmentation forms of GPS and GLONASS.

Reference: Europe Tripartite ... '97

GNSS-2. Future system for satellite systems. GNSS-2 sometimes known simply as GNSS. See also GNSS-1.

Reference: Europe Tripartite ... '97

DIFFERENTIAL GNSS System. Includes GPS receiver but seemingly goes beyond the level of GPS. Entry not clear.

Reference: Fitzsimmons '95

CAT II/III GNSS APPROACHES. A system or sub-system for precision approaches

Reference: Sutton '93

GNSS-BASED OPERATING SYSTEM. This is not an official term. Rather, it is more of a descriptive phrase for navigation operations using GNSS (which is not yet in operation).

Reference: Loh '95

d) Other Satellite Navigational Terms

1) Satellite Navigation Terms

NAVIGATION SATELLITE SYSTEM. Overarching term for satellite navigation system.

Reference: Canada '93

NAVSAT. This is a specific term more than an overarching term for satellites. It is a specific system of European Space Agency in mid-1980s. It was intended to monitor GPS and GLONASS.

Reference: Taneja '87

SATCOM//SATCOM/SATNAV. Seemingly specific terms and meanings but references provide few details.

References: Olsen (several references)

SATELLITE NAVIGATION. A general term if correct rendering.

Reference: Reynish ATW '99

SATELLITE-ASSISTED NAVIGATION (GNSS/GPS). This can be viewed as a general term since it includes two major forms; one developed, one in the process of development.

Reference: Underdown '93

SATELLITE LANDING SYSTEM. One maker of DGPS System hardware employs this name which may suggest an overarching or sub-overarching term.

See also: DGPS Ground Station

Reference: Fitzsimmons '97

SATELLITE NAVIGATION. A general term that can refer to Satellite Navigation Systems.

References: Clausing '87, Olsen, AI '91, -'93

SATELLITE NAVIGATION SYSTEM. A generic, overarching term.

Reference: Blake, Bethmann, T & C '91

SATELLITE POSITIONING SYSTEM. Term with Transit listed as one such system.

Reference: Cleasby, I J '99

SATELLITE SYSTEM. A very general term though reference is to specific terms.

Reference: McDonald in Beck '71

SPACED-BASED NAVIGATION & POSITION SYSTEM. This reference is to GPS and is not an overarching term though it could so employed.

Reference: French '96

2) Transit & U.S. Navy System

General Notes. There are a welter of terms and sub-terms for what is often known as Transit. Despite the variety of terms it focusses on a single aid. It is necessary to

include and separate many of these essentially similar (in meaning) terms.

U.S. NAVY NAVIGATION SATELLITE SYSTEM. This is possibly the official designation. Often U.S. is deleted. Transit (from the satellite hardware) is a common name. The system is a positioning system based on satellites. It was mostly intended for ships and few planes. Initially it was intended for submarines then surface ships. It employed polar orbits and was of a Doppler form. Its use ended in 1996.

References: DOT/DOD FRP '92, Blake in Beck '71

U.S. NAVY SYSTEM. A somewhat shorthand form of the full name. Presumably the reader knows it refers to navigation satellites.

Reference: McDonald in Beck '71

NNSS (NAVY NAVIGATION SATELLITE SYSTEM)/NAVY NAVIGATION SATELLITE SYSTEM (NNSS). Frequently one of these terms (acronym alone or followed by full name or preceded by full name) were employed.

References: DOT/DOD FRP '92, Forssell '91

TRANSIT. A term of some confusion. It is frequently a common name for U.S. Navy Navigation Satellite System. In some cases it is an alternate for NNSS while in other cases NNSS is an alternate. For at least one source it is the former name for the Navaid. Possibly the satellites known as Transit contributed the name.

References: Blake in Beck, Williams '92, Kayton '90, Cleasby '99

TRANSIT SYSTEM. Two sources add System to Transit thereby making the core term more explicit.

References: Blair '84 EC, Forssell '91

U.S. TRANSIT. One source adds U.S. to the core word. It is possibly a identification aid to Transit rather than part of the actual term.

Reference: Wright in Beck '71

U.S. TRANSIT SYSTEM. French, a major source for GPS, offers this term. It may further identify the Aid and possibly differentiate it more adequately from other systems.

Reference: French '96

3) Miscellaneous Terms

DEFENSE NAVIGATION SATELLITE SYSTEM (DNSS). A merger of System

621B and Timation; Navstar-Gps emerged from this system {Enlarge}.
Reference: French '96

GEOSTAR/LOCSTAR. A system similar to Starfix. It was of a different frequency. It had the character of a "two-way ranging system."

Reference: Forssell '91

GRANAS. A proposed system by SEL; it was similar to Navsat (European Space Agency).

Reference: Blair '84 EC

INTEGRATED GLOBAL SURVEILLANCE & GUIDANCE SYSTEM (IGSAGS). A possible replacement for GPS. It is a complete CNS/ATM system which is more economical and more secure system. In development.

Reference: Crow 2000

STARFIX/STARFIX POSITIONING SYSTEM. A private system operating in the Gulf of Mexico primarily and for the petroleum industry. It provided "pseudo range data".

Reference: Forssell '91, Ott IEEE '88, Williams '92, Ott (2nd term)

TIMATION. A prototype Position and Navigation system that was never operational. It precedes GPS.

Reference: French '96

TSIKADA. A Soviet system similar to Transit. It ended when Glonass began.

Reference: Forssell '91

TSPI SYSTEM. TSPI=Time Space Position Information. It is referred to as a "truth system" and its function was to measure accuracy of LAAS developmental prototype.

Reference: S & K '99

There are a number of terms that refer to satellites. While they many not be Navaids in themselves they are the physical structure of Navaids.

INMARSAT SATELLITE, Reference: Forssell '91

INMARSAT-A SYSTEM, Reference: Olsen AI J/A '91

INMARSAT-1, -2, -3 Satellite, Reference: Olsen AI 11-93

General Note. Inmarsat, International Maritime Satellite Organization, forms the basis of GPS.

IOR INMARSAT III SATELLITES, Reference: European Tripartite ICAO '97
General Note: Attachment of IOR is not explained nor is IOR explained.

IOR SATELLITES. Reference: European Tripartite ICAO '97

ARTEMIS SATELLITES, Reference: European Tripartite ICAO '97
General Note: IOR INMARSAT SATELLITES, IOR SATELLITES undergird European EGNOS program.

MT SAT, Reference: Fukumoto & Abe '97 (F & A '97)

MT SAT-1, -2, F & A '97

MTSAT SYSTEM, F & A '97

MTSAT SATELLITES, F & A '97

General Note: MTSAT=Multi-faceted Transport Satellite. A system of satellites in Japan that serves as the basic for a CNS/ATM operation.

Reference: F & A '97

2E Intercategory Group: Beacons [with cross-references where needed]

2E1 Nondirectional Beacons (NDB)

NDB NAVIGATION. This is simply navigation that employs NDBs. It is the oldest extant electronic navigation form. The transmitter apparatus bears resemblance to to AM radio transmitter. Airborne equipment, put simply, consists of receiver, indicator, circuits that translate signals to bearing data. U.S. enroute navigation now rare save for Alaska; it is also employed in some parts of the world. It is employed as a Terminal Aid for numerous small airports.
Reference: Clausing '87

NON-DIRECTIONAL BEACON. Term refers to L/MF transmitter for broadcasting bearing information. There are four types: Compass Locator, Approach facility, enroute beacon, high-power beacon at coastal sites (which presumably refers to a Radio Beacon). Other sources may give a single use for the NDB.
Reference: Clausing '87

NON-DIRECTIONAL BEACON (NDB). One source refers to this permutation as an "ILS-associated" type. A second source refers to both enroute and terminal forms.
References: Maint ... '86 (1st); Olsen AI '92 (2nd)

NDB GROUND-BASED SYSTEM. This term refers to physical apparatus: radiator and transmitter/monitor.
Reference: Maint. ... '86

NONDIRECTIONAL RADIO BEACON. This version adds the word radio. The specific source places it in a context of Terminal Aids (which is focus of publication). FAA-approved forms are termed COMLOs; non-FAA version may be a homing beacon.
Reference: ADS-Site '73

NON-DIRECTIONAL RADIO BEACON. While Nondirectional Beacon is the basic form of this Aid a variety of sources hyphenate the term and add radio. Messages are in Morse code in a continuous three letter format. Canada includes four forms under this heading: air routes, airways w/o VOR, approach aid for non-precision situations, compass locators.
References: AIP '73, '91, Glob Pol AI '91, Canada

NDB. An acronym frequency employed in lieu of Nondirectional Beacon. Acronym probably used more often.
References: DOT/DOD FRP '90, '99 among many other sources

NDB (LF/MF NON-DIRECTIONAL RADIO BEACON). This version includes frequency and radio.
Reference: AT '52, '58

NDB, NON-DIRECTIONAL RADIO BEACON. A slight variation in the basic term. The source did not provide details of contents of term.
Reference: 2nd Air Navigation IB 12-65

NDB, (NON-DIRECTIONAL BEACON). Table of contents listing in AIM '73. Refers to Non-Directional Radio Beacon.
Reference: AIM '73

NDB, NON-DIRECTIONAL BEACON. A slight variant form of the basic term. This version refers to a long-distance Aid.
Reference: Fifth Session IB 5-64

NONDIRECTIONAL BEACON (NDB). Variant form with full name followed by acronym.
Reference: DOT/DOD FRP '96

NON-DIRECTIONAL RADIO BEACON (NDB). This variant form from AIM '73 includes four classes arranged by sending distance of transmissions: Compass Locator, 15 miles; class MH, 25 miles; class H, 50 miles; class HH, 75 miles.
Reference: AIM '73

L-F MARKERS. This refers to NDB. Employed primarily with airborne ADF (Automatic Direction Finders). There are three types: HH, H, MH. See also Non-directional Radio Beacon.
Reference: Casabona '59

LOW-FREQUENCY NONDIRECTIONAL BEACON. This version comes from IFH. It can include navigation fixes or homing functions. Four forms of homing function: Higher powered form for over-water routes, lower power type, and compass locator (divided into Outer Locator or LOM or Middle Locator or LMM).
Reference: IFH '71

LOW FREQUENCY NON-DIRECTIONAL BEACON. AIP includes this term in

its table of contents but the entry omits Low Frequency and notes it can be either LF or MF.
Reference: AIP '91

LOW - & MEDIUM-FREQUENCY NONDIRECTIONAL RADIO BEACON. Term adds radio to basic term. RTCA in Poritsky notes the term is a general heading for a class of Radio Aids to Navigation. Its major use involves "mobile direction finders" and provides bearing data. Poritsky also notes that: NDB = Marine Radio Beacon. They were begun by Bureau of Lighthouses in 1921. In 1934 airborne direction finder developed which was designed for picking up NDB signals.
Reference: Poritsky '59

LF/MF NDB (NON-DIRECTIONAL RADIO BEACON). Under the classes of Radionavigation Aids (ICAO) there is a segment of Radio Beacons which includes Marker Beacons and this Aid.
Reference: AT '52, '58

LF/MF NDB. ICAO AT '63 refers only to Locator (not Compass Locator).
Reference: AT '63

L/MF NON-DIRECTIONAL RADIO BEACON. Alternate name for Non-Directional Radio Beacon.
Reference: CAA-FAP '58

COMPASS LOCATOR. Principal entry in Terminal Aids. This is a NDB operating with ILS Markers.
Reference: AIM '73, NOTAMS '93

HOMER. Seemingly a colloquial term though in an official source. It refers to low and medium frequency NDB termed Non-Directional Radio Beacons.
Reference: CAA FAP '58

LOW & MEDIUM FREQUENCY NON-DIRECTIONAL RADIO BEACON (L/MF). The information provided gives direction information (azimuth) from ground signals. Location can be determined by using data from two such Beacons. Beacon in ILS provides information for determining localizer course; it can also act as distance marker for runway end.
Reference: CAA FAP '58

AERONAUTICAL NONDIRECTIONAL BEACON/AERONAUTICAL NON-DIRECTIONAL BEACON. FRP adds Aeronautical to basic term. Probably

because publication includes both marine and aero forms (OA term: Aeronautical and Maritime Radiobecons). FRP sees the NDB as a transition Aid between en route and precision terminal approach facilities. It also serves as non-precision approach Aids. This is in contrast to viewing NDB as both en route and terminal Aid.

References: DOT/DOD FRP '92, '99 (1st form), DOT/DOD FRP '90 (2nd form)

AERONAUTICAL NONDIRECTIONAL BEACON (NON-ILS). This refers to a NDB in Terminal Navaid service. Aeronautical probably added because publication also includes marine forms.

Reference: DOD/DOD FRP '96

AERONAUTICAL RADIOBEACONS. An alternative term that refers to NDB.

Reference: DOT/DOP FRP '96

ILS NONDIRECTIONAL BEACON (NDB)/ILS-ASSOCIATED NONDIRECTIONAL BEACON. These terms do not mention COMLO but instead notes NDB may be collocated with Outer Marker (LOM: Locator Outer Marker) and sometimes Middle Marker (LMM: Locator Middle Marker).

Reference: Maint. ... '86

2E2 Marks, Markers, Beacons

General Note. This category contains a variety of Marker Beacons and also a limited number of Marks and Markers. They may be employed for a variety of functions. Specifically ILS and MLS forms are to be found in those categories.

BEACON. Beacon for Kendal is short form for various aids including the Wireless Lighthouse (Radio Beacon).

References: Kendal '90, St John Sprigg '34, Solberg IB '53

BEACON STATION. This term that refers to Radio Range Beacon and Radio Marker Beacon.

Reference: Komons '78

DIRECTIONAL RADIO BEACON. Few details are offered in source. Sources in Part Ii note the A-N Radio Range is a Directional Beacon.

Reference: Finch '38, Part Ii

EN-ROUTE VHF MARKER BEACONS (75 MHZ). Term encompasses Fan Marker Beacon and Z Marker Beacon. Both of which give the appearance of

obsolescence. Both terms continue to be listed in ICAO.
Reference: AT '72, '85

FAN-TYPE MARKER. This is possibly a descriptive term rather than an official term.

Reference: CAA-McKeel '38

FAN MARKER. Replacement for "M" Marker in 1930s. This grew out of the Z-Marker. Also VHF but fan-shaped transmissions not cone-shaped. Message in Morse Code: two dashes for M. Frequently it was an En Route Aid.
Reference: Casabona '59, CAA-FAP '58, Whitnah '66, Komons '78

FAN MARKER BEACON. This Aid is a form of Radio Beacon. Transmissions have a pattern in a fan-shape.

Reference: Lexicon '86; a variety of AT editions

FAN MARKER (FM). Term includes acronym. Few details for this variant form.
Reference: AIM '91, IFH '71

LOW FREQUENCY NONDIRECTIONAL HOMING BEACON. Term only.
Reference: NOTAMS '93

LOW-POWERED FAN MARKER/LOW-POWER VERSION OF THE FAN MARKER. A Marker employed for special purposes. Lower power reduced interference with Z Marker. Second term is from Casabona.
References: AIM '73, Casabona '59

"M" MARKER. An early En-Route Aid. It was designed to indicate distance between plane and Radio Range station. This allowed pilot to determine position. However, it was LF and too weak to be effective.
Reference: Komons '78

MARKER. Subject to various meanings. This specific usage refers to Radio Marker Beacon. An early Aid. It was attached to Radio Range. Radio Range gave directions but not position. Markers denoted position. They were nondirectional and short range.
Reference: Komons '78

MARKER BEACON. Two versions of this term: en route and terminal. It is in 75-MHz frequency. Associated with ILS and Radio Range (though an obsolete or nearly so Aid). Four types: Fan Marker, Low-Powered Fan Marker, Z-Markers (or Station Location Markers), and ILS Marker Beacons. An older source,

Casabona speaks of both VHF and LF versions. AIM '73 has en route and terminal forms; the other references only to en route.
Reference AIM '73, AIM '91, Casabona '59

MARKER BEACON (MKR). This form is from a list of terms that includes acronym.
Reference: "Short Takes" AI '92 a)

MARKER BEACON, 75 MHZ. Term adds frequency to basic name.
Reference: Interagency '67

MARKER STATION. An informal descriptive term for Radio Range installations.
Reference: Whitnah '66

NONDIRECTIONAL RADIO MARKER STATION. Few details available.
Possibly this is a Radio Beacon Station.
Reference: CAA '45

RADIO BEACON. This term can have a clear meaning for marine navigation but less so in aero usage. For ICAO it is an overarching term that includes NDB, En Route VHF Marker Beacons. For some sources it has the meaning of Radio Range. Possibly it is a descriptive term for one or more aero Navaids though without specificity in other sources.
References: AIM '73, AIP '91, Whitnah '66, Finch '38, Komons '78, Solberg '79, St John Sprigg '34

RADIO BEACON STATION. This may refer to a Radio Range installation with emphasis on physical apparatus and plant.
Reference: Komons '78

RADIO MARKER. A term that can have a specific meaning or a less than specified meaning given by various authors. For Komons this may be a Radio Range while for Whitnah it is possibly a Z Marker.
Reference: Komons '78, Whitnah '66

RADIO MARKER BEACON/RADIO-MARKER BEACON. A term that is seemingly specific in meaning yet becomes amorphous in practice. The hyphenated form may be a Radio Marker. Other possible meanings include Radio Range and Z Marker.
References: Finch '38, Komons '78, Whitnah '66

RADIO-MARKER-BEACON STATION. For Casabona this is the fuller name

for Marker Beacons.
Reference: Casabona '59

ROTATING BEACON. Original form dates back to 1906. Approximate bearing information could be obtained. Further work in the 1930s and beyond by CAA in U.S. Eventually this resulted in VOR.
Reference: Kendal '90

75 mc FAN MARKER. An En Route Aid. Term is frequently associated with Radio Range.
Reference: CAA-FAP '58

75-MC MARKER SYSTEM. A reference to aids employing this frequency which include Z and Fan Markers
Reference: Poritsky '59

STATION LOCATION MARKERS. Seemingly an alternate name for the Z Marker.
Reference: Casabona '59

ULTRA-HIGH-FREQUENCY RADIO FAN MARKER. Note: Ultra not Very. This refers to an experimental Aid from about 1938.
Reference: CAA-McKeel '38

VERTICAL MARKER BEACON.
Reference: GPS ... AI '91

VERY-HIGH-FREQUENCY COURSE MARKER. Descriptive term rather than a formal name. Refers, at least in part, to Fan Marker.
Reference: Komons '78

VERY-HIGH-FREQUENCY MARKER. This term can refer to both Fan and Z Markers but specific reference is only to Z Marker.
Reference: Komons '78

V-H-F MARKERS. For Casabona this included Station Location Markers ("designation Z"), Fan Markers and Low Power Fan Marker.
Reference: Casabona '59

VHF MARKER BEACON. For ICAO this can seemingly refer to a En Route Fan Marker, or a Fan Marker for final descent. ICAO has a class of Aids known as En Route VHF Marker Beacons (75 MHz) which includes Fan and Z Markers

Reference: AT '52

Z-BEACONS. Variant term for Z Marker Beacon.

Reference: Kayton '90

Z MARKER/Z-MARKER. An En-Route Aid. It was added to the Four-Course Radio Range. It was designed to help pilots determine position at range. It was VHF (75 mc) and activated sound and visual signals in airplane. It is also included with ILS.

Reference: Komons (2nd), AIM '91 (1st), Poritsky '59 (1st)

Z MARKER BEACON. A form of Radio Beacon. Transmissions are in shape of a vertical cone.

Reference: Lexicon '86, AT '72, '85

2E3 Miscellaneous Terms

DIRECTION-FINDING BEACON/DIRECTION FINDING BEACON/DF BEACON/OMNIDIRECTIONAL DF BEACON. An Aid beginning in late 1920s. Aided aircraft to determine location in relation to airport and achieve nonprecision approach when in proximity to airport.

Reference: Kayton '90

GROUND D/F STATION Overarching term for several systems including Bellini Tossi.

Reference: Kendal '90

WIRELESS DIRECTION FINDING. Title of book by R. Keen which included the Lorenz Azimuth Guidance Beacon.

Reference: Kendal '90

WIRELESS BEACON LANDING SYSTEM. German system of the 1930s. Employs Wireless Marker Beacon that denotes route way. Aircraft used aural receivers and visual indicators. Relationship to other and newer systems unclear.

Reference: Pirath '38

CHAPTER THREE

SIGNS, MARKINGS, MARKERS & MARKS

3A Indexes

3A1 Categories Index

General Notes I, II, III, IV

Overarching Terms (3B1)

- Air Marking
- Airmarking
- Airport Marking Aids
- Airport Marking Aids & Signs
- Airport Pavement Markings & Signs
- Day Markings
- Day Marking Aids
- Day Marking Devices
- Daytime Markings
- Marking Aids
- Surface Markings & Markers
- Uniform System of Ground Marks

Aids

- Airport Visual Aids
- Ground Aids
- Visual Aids
- Visual Ground Aids
- Visual-Aids System/Visual Aids System

- Airport Marking & Lighting
- Air Navigation Lighting & Marking Aids
- Lighting/Marking
- Lighting & Marking
- Lighting & Marking System
- Marking & Lighting

Marks and Markers (3B2)

Marks
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 Cone Markers
 Corner Marker
 Cylindrical Marker
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 Distance Marker
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 Hold Line Markers
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 Landscape Marker
 Limed Marker



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 "Manmade" Markers
 Markers, Retroreflective
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 RBI Markers/RBI Retroreflective Markers
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 Reflective Marker
 Reflectorized Marker
 Retroreflective Airport Marker
 Retroreflective Markers
 Retroreflective Runway & Identification Markers
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 Painted Highway Marker
 Plane Marker
 Power Line Obstruction Marker
 Raised Edge Marker
 Roof Town Marker
 Runway Marker
 Runway Touchdown Zone Marker
 Safe Heading Marker Board
 Segmented Circle Marker
 Segmented Circle Marker System
 Segmented Circle
 Indicators
 Closed Field Signal
 System of Airport Marking
 Segmented Markers
 Semiflush Marker/Semiflush Marker for Centerline Marking/Semiflush
 Retroreflective Marker
 Snowplowable Marker
 Spherical Marker
 Standard Air Marker
 Standard Boundary Marker
 Standard Marker
 Stopway Edge Marker
 Stopway Day Marker
 Supplemental Reflective Marker/Supplementary Markers
 System of Approach Day Markers

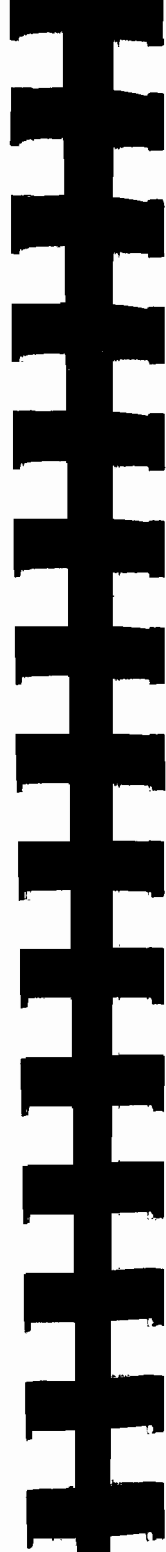
Taxiway Centre Line Markers/Taxiway Centerline Markers
Taxiway Edge Markers
Taxiway Ending Marker
Taxiway Holding Post/Taxiway Holding Post Marker
Taxiway Route Edge Marker
Threshold Marker
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Unserviceability Markers
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Centerline Reflectors
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Reflector, Taxiway, Strip & Runway
Reflectors



Retroreflective Pavement Marker
Retro-Reflective Markings/Retro-Reflective Aerodrome Marking
Retroreflectives
Runway & Taxiway Reflective Markers/Runway & Taxiway Retro
 Reflective Markers
Runway Centerline Reflectors
Runway/Taxiway Reflectors
Taxiway Centerline Reflector
Taxiway Edge Reflector

Signal Panels, Signal Areas, Indicators, Other Objects & Miscellaney (3B3 b))

Checkerboards Patterns
Checkerboard Markings
Compass Callibration Pad
Cones
Cones Marker
Flags
Ground Signal Panels
Ground Signal Panel & Signal Areas
Guidance Sign Boards
Half Drum
Indicator
Landing Direction Indicator
Signal Area Panel
Signal Panel
Taxiway Edge Reflector
Unserviceability Cone Marker/Unserviceability Cone
Unserviceability Flags
Unserviceability Marker Boards
Vee Boards
Wind Cones
Wind Direction Indicator
Windsock
Wind Tees/Lighted Wind Tee

Signs & Markings (3C)

General Note

Markings (3C1)

Overarching Terms (3C1 a))

Airfield Markings
Airport Markings
Airport Pavement Markings
Markings
Markings for Paved Runway & Taxiway
Markings for Surface
Paint Markings
Painted Markings
Pavement Markings
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Standard Markings
Surface Markings
Surface Markings & Marker

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Aiming Point Marking
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Basic Markings
Centerline Marking
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Chevron/Chevron Markings
Conflicting Runway Marking
Day Marking of Snow-Covered Runways
Instrument Runway Markings
Landing Zone Markings
Longitudinal Runway Markings
Markings for Unpaved Markings
Markings of Displaced Thresholds/Displaced Threshold Markings
Markings of Paved Areas
Marking of Snow-Covered Runways
Non-Precision Instrument Runway Markings/Nonprecision Instrument Runway
Nonprecision Runway & Visual Runway Markings
Painted Numbers
Painted Runway Marking
Paved Runway Day Marking/Paved Runway Markings



Precision Instrument Runway Markings
Relocated Threshold Marking
Runway - & Taxiway -Surface Markings
Runway Central Circle Marking
Runway Centerline Marking/Runway Centre Line Marking
Runway Day Markings
Runway Designation Marking/Designation Marking
Runway Direction Numbers
Runway Edge Marking
Runway End Markings
Runway End-Zone Markings
Runway Markings
Runway Mid-Point Markings
Runway Numbers
Runway Numerals & Letters/Runway Designation Numeral & Letters
Runway Shoulder Marking
Runway Side Stripes Markings/Side Stripes Marking/Side Stripes
Runway Surface Marking
Runway Threshold Marking/Threshold Markings
Runway Threshold Stripes
Touchdown Zone Marking/Touchdown-Zone Marking
Threshold Markings
Unpaved Runway Marking
Visual & Nonprecision Markings
Visual Runway Markings

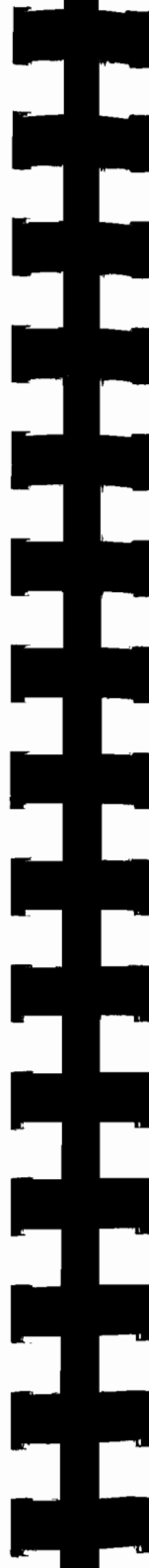
Taxiway Markings (3C1 c))

Aids to Taxying
Day Marking-Taxying Aids
Painted Hold Position Markings
Paved Taxiway Marking/Paved Taxiway Day Markings
Taxiway Centerline Markings/Taxiway Centre Line Markings
Taxiway Continuous Markings/Taxiway Dashed Markings
Taxiway Day Markings
Taxiway Edge Markings
Taxiway Holding Line Markings
Taxiway Holding Position Marking
Taxi-Holding Position Markings
Taxiway Identification Markings
Taxiway Intersection Holdline Marking

Taxiway Intersection Marking
Taxiway Markings
Taxiway Route Marking
Taxiway Side Stripe Markings
Taxiway Shoulder Marking
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Markings Other Than Overaching, Runway, Taxiway, Special
Categories (3C1 d))

Approach Day Marking System
Apron & Holding Pad Shoulder Marking
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Closed Runway & Taxiway Markings/Close or Temporarily Closed Runway &
Taxiway Markings
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Continuous Markings/Dashed Markings
Critical Area Hold Line Markings
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Fixed Distance Marking
Geographic Position Marking
Hanger Roof Marking/Roof Marking
Holding Position Marking
ILS Holding Position Markings
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Off-Airport Marking/On-Airport Marking
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Seaplane Base Marking
Segmented Circle/Segmented Circle Marking System



Striated Markings
Stripes
Roadway Edge Stripes/Zipper Markings
Threshold Stripes
Surface Movement Guidance Control System (SMGGS)
Taxiway/Runway Intersection Markings
Temporary Markings
Transverse Markings
Undershoot & Overrun Area Marking
Unserviceability Markings
Vehicle Roadway Markings
VOR Aerodrome Check-Point Markings
VOR Check Points/VOR Aerodrome Check-Points
VOR Checkpoint Marking/VOR Checkpoint Receiver Markings//VOR Receiver
Checkpoint Marking
Ground Receiver Checkpoint Markings
Check-Point Markings

Special Category (3C1 e))

Heliport and Vertiport Markings (3C1 e) 1))

Aiming Point Marking
Apron Marking
Boundary Marking
Centerline Stripes
Cylindrical Marker for Hover Taxi Route Edge Marker
Dashed FATO Markings
Double Line Edge Stripes
Equipment/Object Marking
FATO Markings
Final Approach & Take-off Area Markings or Marker
Final Approach & Take-Off Designation Markings
Helideck Obstacle-Free Sector Marking
Heliport "H" Marking
Heliport Landing Aids
Heliport Markings
Heliport Marking & Lighting
Heliport Lighting & Marking
Heliport Visual Aids
Heliport Guidance, Position & Other Markings/Guidance or Position Markings/

Guidance & Position Markings
Heliport Identification Marking
Heliport Name Markings
Helipad & Helideck Markings
Hospital Marking
Hospital Heliport Marking
Identification Marking
 Standard Heliport Marking
 Hospital Heliport Marking
In-Ground FATO Corner/Edge Marking
In-Ground Marking
Landing Direction Arrow
Large Marker for Air Taxing Centerline
Marking of Closed Heliport
Maximum Allowable Mass Marking
Painted H Marking
Painted Markings
Park Position Markings
Standard Heliport Marking Symbol
Heliport Markers & Markings
Heliport with Markers & Markers
Taxi Route Edge Markers
Taxi Route & Taxiway Markings
Taxi Route Markings
Taxiway Markings
Touchdown & Landing Area Markings
Touchdown Markings
Touchdown Pad Boundary Marking
Weight Limit Marking
Winching Area Marking
Wire Marking

Vertiport Marking
 In-Ground Edge Markers
 Raised Markers
 Painted Lines
 Centerlines
 Taxiway Markings
 Raised Markers II
 Symbol



Holding Position Markings (3C1 e) 2))

Holding Position Markings
Holding Position Markings for Instrument Landing System(ILS)/Holding Position
 Marking for Instrument Landing Systems
Holding Position Markings for Instrument Landing System/Microwave Landing
 System (ILS/MLS) Critical AREas/Holding Position Markings: ILS Critical
 Areas/Holding Positon Markings for ILs (or MLS) Critical Area
Holding Positon Makrings for Taxiway/Taxiway Intersections/Holding Position
 Markings: Taxiways/Runway Holding Position Markings on Taxiways.
Holding Position Markings on Runways
 Holding Positions for Ruwnays/Runway Intersections
 Holding Positions Markings for Runway/Taxiway Intersections
Intermediate Holding Position Making
Intermediate Holding Position Marking for Taxiway/Taxiway Intersections
Road-Hold Position
Runway Holding Position Markings
 Runway Holding Position Markings on Taxiways
 Runway Holding Position Markings on Runways
Runway-Holding Position Marking
Taxi-Holding Position Marking
Taxiways Located in Runway Approach Areas [Markings]

Obstruction Markings (3C1 e) 3))

Flags/Flag Marker
Markers [w/i Context of Obstructions]
Markings [W/i Context of Obstruction Marking]
Navigational Boundary & Obstruction Marker
Obstruction Identification
Obstruction Lighting & Marking
Obstruction Markings
Obstruction Mrkings & Lighting
Obstacle Marking
Painted Cones for Day Markings
Patterns
 Solid Patterns
 Checkerboard Patterns
 Alternate Bands
 Teardrop Patterns
Spherical Markers

Visual Aids for Denoting Obstacles

Apron Markings (3C1 e) 4)

Apron Markings

Guide Lines

Lead-Out Lines

Lead-In Lines

Simple Lead-In Lines

Straight-Lead-In Lines

Simple Nose-Wheel Lead-In Line

Simple Nose-White Lead-Out Line

Wing Tip Clearance Lines

Towing Lines

Equipment Limit Lines

Passenger Path Lines

Reference Bars

Turn Bars

Stop Line

Signs (3C2)

Overarching Terms (3C2 a)

Signs

Sign System

Airfield Sign System

Airport Signs

Airport Sign System

Airside Sign System

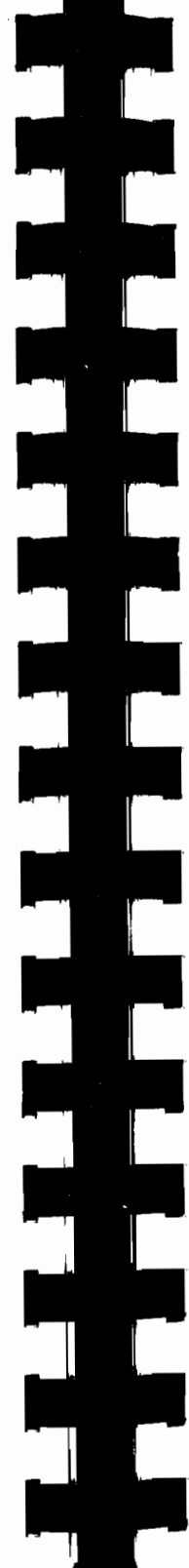
Airside Signage

Airway Signs

Signing Aids

Sign Array

Sign Forms Other than Runway & Taxiway Types (3C2 b)



General Note

Aerodrome Identification Sign

Airfield Directional Signs/Runway & Taxiway Directional Signs

Cautionary Signs

Convenience Signs

Direction Signs

Direction Signs for Runway Exit

Direction Sign for Runway Exit/Direction Sign Array for Simple Intersections

Distance to go Sign

Entrance-Exit Signs

Exit Signs

ILS Critical Boundary Sign

Internally Lighted Signs/Externally Lighted Sign

Intersection Signs

No Entry Signs

Signs Prohibiting Aircraft Entry into an Area

Special Purpose Sign

Station Sign

Stop Signs

Unlighted Signs

VOR Aerodrome Check-Point Sign

Runway Signs (3C2 c)

Runway Approach Area Boundary Sign

Runway Approach Area Holding Position Sign

Runway Boundary Sign

Runway Distance Remaining Signs/Runway Distance-Remaining Signs

Runway Exit Signs

Runway Holding Position Sign--

Runway Intersection Sign

Runway Location Sign

Runway Marking Sign

Runway Sign

Runway Safety Area/OFZ & Runway Approach Area Boundary Signs

Taxiway Signs (3C2 d)

Non-Illuminated Taxiway Guidance Signs

Signs, Taxiway Guidance/Signs, Guidance/Retroreflective Taxiway Guidance

Signs

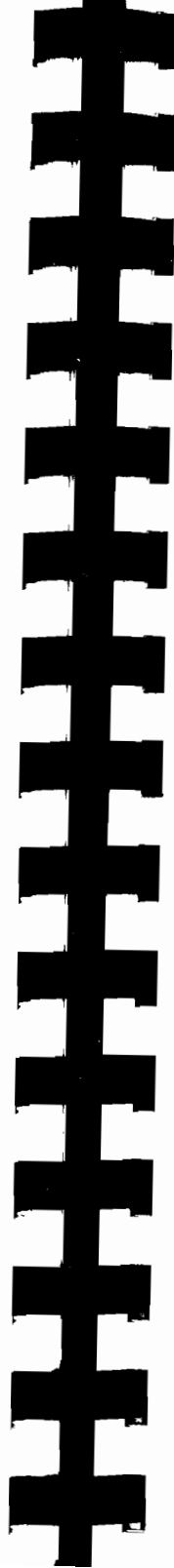
- Taxiway Direction & Location Signs
- Taxiway Direction Signs
- Taxiway Identification Sign
- Taxiway Guidance Sign
- Taxiway Guidance Sign System
- Taxiway Location Sign
- Taxiway/Runway Intersection Sign
- Taxiway Sign
- Taxiway Sign System

Special Category: Holding Position Sign (3C2 e))

- Category II Critical Areas Hold Line Sign/Category II Hold Line Sign
- Holding Position Sign
- Holding Position Sign at Beginning Takeoff Runway
- Holding Position Sign for Approach Areas
- Holding Position Sign for ILS Critical Area/ILS Holding Position Sign/ILS Critical Area Boundary Sign
- Holding Position Sign for Taxiway/Runway Intersection/Holding Position Sign for Runway/Runway Intersection
- Holdline Signs
- Road-Holding Position Sign
- Runway-Holding Position Sign
- Cat I, II, III Holding Position Signs/Cat II Holding Position Sign/Cat II or III Holding Position Sign/Cat II and III Holding Position Signs

Sign Forms Other (3C2 e))

- Destination Signs
 - Outboard Destination Signs
 - Inboard Destination Signs
- Surface Painted Signs
 - General Note
 - Surface Painted Taxiway Direction
 - Surface Painted Location Sign
 - Surface Painted Holding Position Sign
 - Surface Painted Sign
 - Surface Painted Gates ID Sign
 - Surface Painted Apron Entrance Point ? Sign



Surface Painted Direction Signs

- Guidance Sign
- Information Sign
- Informational Sign
- Informative Sign
- Location Sign
- Mandatory Instruction Sign
- Mandatory Sign
- Roadway Sign

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Chapter 3B Overarching, Marks, Markers & Miscellaneous Terms

General Notes for Ch 3B & 3C

General Note I. There is no adequate term for all of unlighted Visual Aids. A few terms are partially adequate, but all terms fall short of full inclusivity. Specific types of unlighted Visual Aids have a variety of satisfactory terms in contrast to the general body of terms. "Unlighted Visual Aids" may serve as an adequate term though it is seemingly not represented in the literature. Terms including the words Visual Aids often include Lighted Aids. The approximately half-dozen terms in the overarching group are in two groups: Air Markings (and variants), and several terms that include the words Day and Marking.

General Note II. Chapter 3 is a chapter of disparate elements. Adding to the medley of forms is the presence of a lighted dimension for some Aids. Even lighted forms bear a strong resemblance to unlighted forms and remain apart from Airport Lighting. To some degree the use of light represents a substitute for daylight.

General Note III. Special Issues: a) Overarching terms that include lighted forms. These are primarily a feature of Ch 1 but limited coverage is found in Ch 3. b)The problem of sign and lighted dimension of some forms.

General Note IV. Components of Chapter 3: 3A, Indexes; 3B, Overarching Terms and Marks & Markers & Miscellaneous Terms; 3C Signs & Markings

3B1 Overarching Terms

AIR MARKING. This and similar terms are of an older vintage and generally refer to Roof Markings in the earlier days of aviation. Air Markings include Roof Marking, Hanger Roof Marking, Town Marker, even Landscape Markers, and Highway Markers. They are frequently illuminated.
References: Blee '29, Black '29, Glidden '46

AIRMARKING. A variant form that uses the conjoined term as a single word. The letters for this form were of chrome yellow on a dull black ground. They were floodlighted at night.
Reference: Airmarking AC '27

AIRPORT MARKING AIDS. For AIP '91 this term includes Airport Signs and Markings. It is not clear the extent of inclusivity for this term. Do Signs include

lighted forms? Markings presumably are pavement forms. Are Elevated Markers excluded? Presumably Obstruction Markers of various types are in that special category. Nonetheless Marking Aids (as opposed to Markings) is a possible overarching term that can be expanded to include other forms.
Reference: AIP '91

AIRPORT MARKING AIDS & SIGNS. AIP '99 altered the meaning of Marking Aids and excluded Signs from inclusion. Signs are now conjoined to Marking Aids.. Obstruction Markings are excluded in this version.
Reference: AIP '99

AIRPORT PAVEMENT MARKINGS & SIGNS. An adjoining variant form of Airport Marking Aids & Signs.
Reference: AIP '99

DAY MARKINGS. An overarching term for Breckenridge that includes Cones for Boundary Lights. Blee '29 specifically mentions only cones. AD '51 employs the term as a process of day marking more than objects. However, Day Marking Aids has extensive employment for actual Aids.
References: Breckenridge '55, AD '51, Blee '29

DAY MARKING AIDS. Newer editions of AD seemingly drop day from significant usage. AD '71 restricts the term to marking of boundary of landing area that lack runways. The objects are triangular shape (3 by 10 feet and six inches high). They are orange in color or orange/white or red/white. AD '51 uses the term as an overarching terms for many forms of Runway Markings. It is also attached to Obstacle Markings.
Reference: AD '51, AD '71

DAY MARKING DEVICES. For Breckenridge this term refers to Cone and color pattern of Bounday Lights. For PICA0 '44 it encompasses signs, shapes, flags. Shapes refer to Boundary Markers, Circle Markers, Wind Direction Indicators, Landing Direction Indicators.
Reference: PICA0 '44, Breckenridge '55

DAYTIME MARKINGS. A term of general appearance though specific reference is to Heliport Markings.
Reference: IES '72

There are terms of a sub-overarching nature that include two or more categories but not the full range. These include:

MARKING AIDS. This subdivision in Airport, Air Navigation Lighting & Marking Aids centers on Markings and includes Pavement Markings only. Despite its broader appearance it is a restricted term.
Reference: AIM '73

SURFACE MARKINGS & MARKERS. This joint term includes Pavement Markings and Elevated Markers.
Reference: ADM '83

UNIFORM SYSTEM OF GROUND MARKS. A 1919 term lacking specificity. Limited lighted forms that might be included. The original French term, "Reperes Aeronautiques" can be translated as Aeronautical Marks.
Reference: Convention 1919

There are terms that include unlighted Aids but that also include lighted forms and are therefore more relevant to the concerns of Chapter 1. They constitute a cross-reference here with the primary entries are in Chapter 1.

AIDS, PHAK '71, Clark '93
AIRPORT VISUAL AIDS, AIM '99
GROUND AIDS, PICA0 '44
VISUAL AIDS, STOL Port '70
VISUAL GROUND AIDS, ADM '83
VISUAL-AIDS SYSTEM/VISUAL AIDS SYSTEM, McKelvey '87, FR Arcata '49

AIRPORT MARKING & LIGHTING, ADS-TA '83, Whittenberg '64
AIR NAVIGATION LIGHTING & MARKING AIDS, PHAK '71
LIGHTING/MARKING, ADS-AC '71
LIGHTING & MARKING, ADS-AC '71, Alaska '84
LIGHTING & MARKING SYSTEM, Finch '38, Alask a '84
MARKING & LIGHTING, Stolport '70, ADS-TA '83

3B2 Marks and Markers

MARKS. A seemingly singular form of Marking for one source though frequently Marking is the singular form of Markings.

References: Whitnah '66, Marking of Deceptive '63

MARKERS. This is overwhelmingly the core term for this form of Aid. However it is only infrequently employed as an overarching term. Most uses are in the nature of a short form of a longer specific term. For example, Boundary Marker are often termed simply Marker in descriptions of Boundary Markers. ICAO,

however, employs Marker as an overarching term. Newer editions of Aerodromes include a variety of types of Aids under the general term. There are other sources that use Marker in a general sense though there may be few specific forms under the general term so that Marker and specific form are nearly synonymous. References: ICAO AD (many editions), Heliport Design (several editions), IES '81, '72, '87; OML (several editions); NATO, Potts II '99

ABOVE GROUND MARKER. This could be a general term but it refers specifically to "outer edge of peripheral turfed touchdown pad." Forms include: half drums, vee boards, flowerbeds, low hedges, painted rocks, low board fences. Reference: HD '77, '88

AIMING MARKER FOR TURBOJET OPERATIONS. This Marker is described as a Marking and it conforms to that form. It is a Surface/Pavement Marking. It displays three stripes on each side of the runway centerline. Reference: Marking of Serv R & T '66

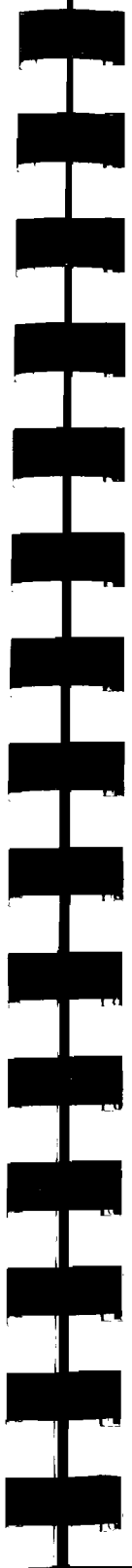
AIR-MARK. This may appear to be a major term. Yet only a single surveyed source includes it. And it serves as a verb not a noun. The term refers to Roof Signs. The terms Markings and Airway Signs are also employed. Lighting is involved and the Signs are chrome-yellow on black. Reference: Young '28

AIR MARKER/AIR-MARKER/AIRMARKER. Terms include various Aids with a focus on displaying the names of towns to aviators. Most were Roof Signs. Color scheme included black and orange. Purposes included: identify locality, indicate north bearing, given distance/direction to nearby airport. Features included name of town, latitude/longitude, arrow. The terms may give appearance of general use but they were often of a very specific function. References: Glidden, CAA '48, Air Markers, Time '36, Airmarking AC 6-48

AIR TAXIWAY MARKER. Edge Marker for heliport operations. Reference: Suppl '71, 91-Vol II

AIRCRAFT ARRESTING MARKERS. These Markers are in a Sign form. They are diamond-shaped and illuminated. Reference: EALS.

APPROACH DAY MARKER. Term refers to three-dimensional objects which give increased contrast to background than flat Markers affixed to ground. These Markers constitute the elements of the Approach Day Marking System. See also: Day Markers.



Day Markers.
Reference: AD '58

APPROACH DAY MARKING SYSTEM. A system consisting of Elevated Markers. Components listed as Markers not Markings. Reference: AD '58

BARRIER ENGAGEMENT MARKERS/HOOKCABLE MARKERS. These terms refer to Markers that indicate location of arresting gear. They display black ground with orange circle. Possibly similar to Aircraft Arresting Marker. Reference: IES '81, '87

BIDIRECTIONAL REFLECTIVE MARKERS. This form marks centerlines for runways and taxiways. Colors combinations include clear, red/clear, green, yellow/clear, red. Color meaning reflects those of Lights. Reference: Spec L-853 R & T '71

BOUNDARY MARKERS. For PICA0 these markers denote boundaries of landing areas. For AD '90 they perform the same function for landing areas that lack runways. There are two forms: a conical type and a triangular-shaped object that is 3m long, 1 m wide and .5 m high. Reference: PICA0 '44, AD '90, Supplement '61, '91

CENTERLINE MARKER. Term is short form of Runway Centerline Markers & Taxiway Centerline Markers. Similar terms include Reflective Markers, Markers, terms with color attached. Term specifically refers to retroreflective Markers of a "low profile" design which is affixed to pavement. See also Type I-VI Markers. References: Spec L-853 R & T Markers '71, Installation Details '69

CIRCLE MARKER. Two sources included this Aid but without details. Is this similar to Marker Circle? Reference: Whitnah '66, PICA0 '44

CONE MARKERS. While Cones are employed as Markers, seemingly only Australia incorporates them into a title. See also Standard Boundary Marker Cones. Reference: Supplement '71

CORNER MARKER. Seemingly a term for both In-Ground Markers and also Ground Markers at corners of heliport pad. Reference: HD '88

CYLINDRICAL MARKER. Term refers to Elevated Marker for Runway & Taxiway Edge Marking.
Reference: R & T Markers '80

CYLINDRICAL RAISED MARKERS. Term has specific reference to edges (outer) of hover taxi route safety area for Vertiports.
Reference: Vertiport '91

DAY MARKER. A general-appearing term but instead it is a specific reference to Approach Day Marking which is comprised of Markers. The Markers are three-dimensional objects which are preferable to flat forms on the ground. See also Approach Day Marking System, Approach Day Marker, System of Approach Day Markers.
Reference: AD '51

DAY MARKERS FOR SNOW-COVERED RUNWAYS. Denotes bounds of runways covered with snow. Such Markers need to be clearly visible. Spruce trees and tripods are two acceptable forms for this type of Marker.
Reference: AD '71

DISTANCE MARKER. Shorter name for Runway Distance Marker. It is described as a "numbered sign" that gives distance to runway end.
Reference: NavFacEngCom AF '81

DISTANCE-TO-GO MARKERS/DISTANCE TO GO MARKERS. Seemingly a more explicit name for Distance Marker is in Sign form. The first version is internally lighted with number; it is also termed a Sign.
Reference: Cegelec (1st), V.I. (2nd)

EDGE MARKER/EDGEMARKER. Markers of an elevated design Panels are attached to legs. Pollock offers a conjoined form.
Reference: Utility Airport '75, Vertiports '71, Pollock AI '90

EDGE MARKERS FOR SNOW-COVERED RUNWAYS. Visible objects employed as Markers. They can be evergreen trees or "light-weight markers". See also Markings for snow-covered runways. Reference: AD '90

ELEVATED MARKER. This represents one form of Runway and Taxiway Retroreflective Marker. There are two types: cylindrical, 360 degrees, and one with displaying flat surfaces.
References: Spec L-853 R & T Mkrs '71, Memo-Airport Lighting Equipment '92

ELEVATED TAXIWAY EDGE MARKERS. Term includes the specific function of the Marker in the title. See also: Elevated Marker.
Reference: V.I.

FATO EDGE MARKER. Equivalent to In-Ground FATO Corner/Edge Markings.
Reference: HD '94

1500-FT MARKER/RUNWAY 1500-FT MARKER. This consists of Stripes marking distance from end of runway. Is it designated Marker because there are no alphanumeric symbols?
Reference: PICA0 '44

FIXED DISTANCE MARKER. This Aid consists of a block (wide band) of black paint applied to runway for turbojet aircraft landings. There are also other stripe and band forms termed Markers. Alphanumeric forms and lines are not so designated.
Reference: AIM '73, '91

FLAG MARKER. This is an Obstruction Marking. Flags replace Spherical Markers in some circumstances. Flags can display solid, triangular or checkerboard patterns. Solids are orange only. Triangulars and checkerboards have orange and white patterns.
Reference: OML '73, '91, IES '81

FLUSH-TYPE MARKERS. Term refers to Markers at turf ed heliport. Term could have more general meaning but the specific reference is to this situation. Examples: white stones, concrete slabs. These Markers are at touchdown pad edges.
References: HD '77

HALF WAY MARKERS. Term included in trade literature; few details. Title may be maker's or an informal descriptive term.
Reference: V.I.

HELICOPTER APPROACH MARKERS. Potts in IJ supplies this term. How does it correlate with similar ICAO and FAA terms? Term specifically refers to a new form of Retroreflective Marker.
Reference: Potts IJ '99

HOLD LINE MARKERS. Maker's descriptive term for Holding Position Markers/Markings.
Reference: V.I.

IDENTIFICATION MARKERS. General term for Markers that can replace Lights at heliports, smaller airports. The material of the Markers is a new form of retroreflective material so designed to "bounce" nearly all reflected light back to source.

Reference: Potts IJ '99

ILLUMINATED DAY AND NIGHT MARKER. One type of Air Marker which displays town name, latitude and longitude. There are two forms: "Crushed stone or concrete marker", "baked enamel or porcelain raised marker".

Reference: Glidden '46

IN GROUND CORNER MARKER. A flush Marker delineating corners of turf FATO. Shorter form is In-Ground Marker. It may also include side locations.

Reference: HD '88

IN-GROUND MARKERS. This form "...provid[ed] color and textural differences on the natural surface, [and was] ... used to mark turfed surfaces."

Reference: HD '88

IN-GROUND EDGE MARKERS/IN-GROUND MARKERS. For Vertiports these terms seem to refer to Edge Markers in the ground. The second term may be at variance with meaning of In-Ground Marker.

Reference: Vertiports '71

LANDSCAPE MARKER. This is a form of Air Marker that is found at parks, along highways. See also Air Marker.

Reference: Glidden '46

LIMED MARKER. Term refers to Heliport Marking symbol for turfed heliports. Standard symbol created with lime on natural surface.

Reference: HD '77

MARKERS & MARKINGS FOR SNOW-COVERED RUNWAYS. These are objects that are very visible. For example, spruce trees (about 5" high) or wooden tripods. They denote limits (usable) of snow-covered runways.

Reference: Marking of Serv R & T '66

MARKER CIRCLE. Aid indicates location of landing areas. It display white design on chrome-yellow ground. It consists of a circle 100' in diameter and a band 4' wide. Cp Segmented Circle.

Reference: Black '29

"MANMADE" MARKERS. An actual term? More descriptive of nature of Marking than formal term. Refers specifically to Markers at turfed heliports.

Reference: HD '77

MARKERS, RETROREFLECTIVE. Approved Lighting Equipment follows a more bureaucratic formulation: Marker followed by form rather than form followed by Marker.

Reference: Ap L Eq '94, '95, '98

NATURAL ABOVE GROUND MARKERS. These Markers are for heliports. Forms include low hedges, flower beds. Contrast with Above Ground Markers (which are artificial forms).

Reference: HD '94

NON-SNOWPLOWABLE MARKERS. This form is not designed to survive encounters with snowplows. See also Snowplowable Markers.

Reference: Spec L-853 R & T Ctr Mkrs '71

RBI MARKERS/RBI RETROREFLECTIVE MARKERS. RBI= Reginald Bennett Int'l. Intials of maker attached to form. Refers to new form described by Potts.

Reference: Potts IJ '99

REFLECTING MARKER. An alternating name for Retroreflective Markers.

Reference: Potts IJ '99

REFLECTIVE DISTANCE MARKERS. This term appears to include Signs and Markers (or uses Signs and Markers interchangeably). It includes numerical symbols.

Reference: V.I.

REFLECTIVE MARKER. A variant name for Retroreflective Markers.

Reference: Txwy Ctrl Ref '69, V.I., Installation Details '68

REFLECTORIZED MARKERS. Specific reference to Elevated Marker consisting of cylindrical Marker on pole. It displays yellow message for "ground guidance on taxiways."

Reference: Ulmer

RETROREFLECTIVE AIRPORT MARKERS. A somewhat general terms that refers to Elevated Markers for multiple purposes.

Reference: V.I.

RETROREFLECTIVE MARKERS. A general term for Markers employing various kinds of reflective materials. Seemingly both low-elevation and elevated forms. Employed for edge and centerline functions.
References: V.I., Installation Detail '69, Spec L-853 R & T Markers '69, Txwy CL L. Sys '68

RETROREFLECTIVE RUNWAY & IDENTIFICATION MARKERS. Specific reference is to a new form of Retroreflective Marker though term can suggest more general coverage.
Reference: Potts IJ '99

RUNWAY DISTANCE MARKER. This Marker indicates meters remaining for landing takeoff. It is a lighted form. It is also described as a Sign. Displays numbers not words: the reason for being termed a Marker? Marker serves as short name for it.
Reference: IES '72, '81, '87

VERTICAL RUNWAY DISTANCE MARKER. Marker is within illuminated Runway Distance Markers. It is also listed as a Sign.
Reference: NATO '92

PAINTED HIGHWAY MARKER. A type of Air Marker which see.
Reference: Glidden '46

PLANE MARKER. A form of Elevated Marker with plane (flat) surfaces.
Reference: Spec L-853 R & T Ret. Mkr '80

POWER LINE OBSTRUCTION MARKER. Term refers to spheres in international orange.
Reference: Manairco

RAISED EDGE MARKER. Specific forms at Vertiports. Employed for marking taxi routes. Includes In-Ground Edge Markers.
Reference: Vertiport '91

ROOF TOWN MARKER. A type of Air Marker which see.
Reference: Glidden '46

RUNWAY MARKERS. This term gives the appearance of a general term. Specific reference is to Tritium wands (illuminated) in Alaska.
Reference: Alaska '84

RUNWAY TOUCHDOWN ZONE MARKER. It consists of groups of rectangular bars on pavement. Marker and Marking apparently interchangeable here.
Reference: AIM '99

SAFE HEADING MARKER BOARD. This term is within category of Illuminated Taxiway Guidance Signs. Few details given.
Reference: NATO '92

SEGMENTED CIRCLE MARKER. Seemingly the equivalent of Segmented Circle Marker System.
Reference: Segmented Markers AW '47

SEGMENTED CIRCLE MARKER SYSTEM. This system of Airport Marking contains various aids for pilots and also Traffic Control Devices. The components include:

SEGMENTED CIRCLE. It is an Aid to finding obscure airports. It is the central location for various "indicators and signal devices".

INDICATORS. These include: Wind Direction Indicator, Wind Cone, Landing Direction Indicator, Landing Strip Indicator, Traffic Pattern Indicator, Right-Turn Indicator.

**CLOSED FIELD SIGNAL.
SYSTEM OF AIRPORT MARKING.**
Reference: Seg Cir Apt Mkr Sys '63, '84

SEGMENTED MARKERS. Seemingly a shorter name for Segmented Circle Marker.
Reference: Segmented Markers '47

SEMIFLUSH MARKER/SEMIFLUSH MARKER FOR CENTERLINE MARKING/SEMIFLUSH RETROREFLECTIVE MARKER. Seemingly all three terms refer to same Marker. They are one form of R & T Retroreflective Markers. They are employed for Centerline Marking.
Reference: Spec L-853 R & T Mkr '80

SNOWPLOWABLE MARKER. A semi-flush Marker for Centerline Marking that can withstand contact with a snowplow.
Reference: R & T Marker '80

SPHERICAL MARKERS. This term is within Obstruction Markings. It is placed on overhead wires and is in aviation orange. It is also listed here because it is of

the Marker form.
References: OML '71, '91, IES '81

STANDARD AIR MARKER. Despite appearance this is not a general term. The category of seaplane base contains this single Aid. Anchor symbol painted on roofs and other areas. Numerals, other symbols can be employed. The word Marking can be interchanged with Marker. Marker is shorthand for the full term.
Reference: Seaplane Base '94

STANDARD BOUNDARY MARKER. This refers to Cones and Cone Markers in Australia.
Reference: Suppl '71, 5th ed. '69

STANDARD MARKER. Term appears to have general meaning but instead has a specific meaning: Segmented Circle Marker which see.
Reference: Segmented ... AW '47

STOPWAY EDGE MARKERS. Marker employed where stopway boundaries are not clear. It consists of small vertical boards. See also Stopway Edge Markers.
Reference: AD '90

STOPWAY DAY MARKERS. Consists of vertical boards. It can possibly be confused with Runway Edge Markers. Details limited. See also Stopway Edge Markers.
Reference: AD '71

SUPPLEMENTAL REFLECTIVE MARKERS/SUPPLEMENTARY MARKERS. Reflective Markers for Taxiway Edges. They supplement Taxiway Centerline Lighting. Both terms share the same meaning.
Reference: Txwy Ctr L Sys '68

SYSTEM OF APPROACH DAY MARKERS. Alternate name for Approach Day Marking System which see.
Reference: Suppl. '61

TAXIWAY CENTRE LINE MARKERS/TAXIWAY CENTERLINE MARKERS. These are Reflective Markers in green. Employed in several situations including lack of Centerline Lights or Edge Lights; also lack of Edge Markers.
Reference: AD '90, Installation Details '69

TAXIWAY EDGE MARKER. These Markers are of a retroreflective nature. It is



blue in color and of a frangible form. They are employed on Code 1 or Code 2 Taxiways. Lights and Taxiway Centerline Markers are not employed.
References: AD '90, ADM '83

TAXIWAY ENDING MARKER. Sign form. Retroreflective nature and frangible. Listed as Marker because of lack of an alphanumeric component?
Reference: Standard Airport Signs '91

TAXIWAY HOLDING POSTS/TAXIWAY HOLDING POST MARKER. Painted surface Markings; indicate places where aircraft may be held in traffic control.
Reference: PICA0 '44

TAXIWAY ROUTE EDGE MARKER. This is an Elevated Marker. It displays bands of yellow-blue-yellow.
Reference: HD '94

THRESHOLD MARKER. Term included in publication but only to indicate such an Aid is not included in said publication (beyond title).
Reference: Installation Details '69

TYPE I-VI MARKERS

General Note. Older FAA sources classified a variety of Markers as Types and Styles. This coverage brings together those various forms.

Specific Name: **BIDIRECTIONAL REFLECTIVE MARKERS**
Shorter Name: **REFLECTIVE MARKER**/Short Name: **MARKER**
Purpose: Delienate Centerlines (Airport Runways, Taxiways, Apron Surfaces)

- | | |
|--------|----------------------------|
| Type I | Bidirectional Clear |
| II | Bidirectionl Red-Clear |
| III | Bidirectional Green |
| IV | Bidirectional Yellow-Clear |
| V | Bidirectional Red |
| VI | Unidirectional Clear |

References: Spec L-853 R & T '69, -'70

Style A-D Markers:	"A"	360 degrees	White Retroreflective Cylindrical 12'H
	"B"		Green
	"C"		Red
	"D"		Yellow

Reference: Spec L-853 R & T Marker '71

UNIDIRECTIONAL L-853 TYPE IV MARKERS. A components of above Aids. First compilation was in outline form. This source includes one of those components in a full word and number format.

Reference: Installation Detail '69

UNSERVICEABILITY BOARDS. This Aid denotes areas that can be used for aircraft movements. Types of objects include Flags, Cones, Marker Boards, Lights. The word unserviceability is added to each of those words.

UNSERVICEABILITY CONES

UNSERVICEABILITY FLAGS

UNSERVICEABILITY MARKER BOARDS

Reference: AD '90

UNPAVED RUNWAY EDGE MARKERS. Marker is of two forms: flat surfaces or conical. They mark the limits of the runway. When feasible the Markers can be attached to the structures of Lights.

Reference: AD '90

UNPAVED TAXIWAY EDGE MARKERS. This Marker is employed where limits of taxiway not clear. It has a conical shape. It can be affixed to structure of Light when feasible.

Reference: AD '90

UNSERVICEABILITY MARKERS. Markers denote areas that can't be used by aircraft but can be safely bypassed. They can take form of Flags, Cones, Marker Boards, also Lights.

Reference: AD '90

VOR CHECK-POINT MARKER. A somewhat confused terminology exists with this term. AD '90 and '99 refers to it as a Marking. AD '69 lists it as a Marker though the Aid is made up of Sign and Pavement Marking.

References: ICAO AD '69, '90, '99

3B3 Other Forms

3B1 Reflective Aids

General Note. Some reflective elements are attached in terminology to various Signs, Markings, Markers. Yet other reflective elements are stand-alone units. It

becomes a question where such Aids should be placed. IES refers to some of those elements as supplements to Lights and Markings. For that reason free-standing reflective aids are placed in this separate category since they may not be integral to established forms of Aids. Cross-references are included for elements elsewhere in which reflective words are included in titles.

CENTERLINE REFLECTORS. This term is a short form of Taxiway Centerline Reflectors. They supplement Lights and Markings.

Reference: IES '81

EDGE REFLECTORS. IES includes these Reflectors under other names as well. These include: Elevated Edge Reflectors, and Taxiway Edge Reflectors. They are cylindrical in shape, blue in color and cover 360 degrees.

References: IES '87

ELEVATED EDGE REFLECTOR. Term is interchangeable with Taxiway Edge Reflectors.

Reference: IES '81

ELEVATED REFLECTORS. Specific term is a subdivision of Marker, Retroreflective which see.

References: Ap L Eq '73, '76

ELEVATED TAXIWAY EDGE REFLECTOR. Variant form of basic term of Taxiway Edge Reflector.

Reference: IES '87

MARKER, RETROREFLECTIVE. Approved Lighting Equipment provides a form that begins with the general term before qualifying it. The 1978 edition adds subdivisions of On-Pavement Reflector, and Elevated Reflector.

References: Ap LEq '76, '78

ON-PAVEMENT REFLECTORS. A subdivision of Markers, Retroreflective which see.

References: Ap LEq '73, '76

"PASSIVE LIGHTING".

General Note. Potts, "Passive Lighting": Potts in IJ describes a new form of material for reflective Markings. The material in effect consists of many tiny reflecting units which can "bounce" back nearly all light shown upon the material. Potts employs many terms some of which duplicate terms in the literature or at least overlap. However, other terms may be exclusive to him. The following terms

are from that source and incorporate the new form of reflective material. All of these terms are linked by that material. RBI Markers: The acronym is from the maker: Reginald Bennett International (RBI).

HELICOPTER APPROACH MARKERS
HELICOPTER MARKERS
IDENTIFICATION MARKERS
RBI REFLECTORS
RETROREFLECTIVE AIDS
RETROREFLECTIVE IDENTIFICATION MARKERS
RETROREFLECTIVE MARKERS
RETROREFLECTIVE RUNWAY & IDENTIFICATION MARKERS
RUNWAY REFLECTOR

REFLECTOR, TAXIWAY, STRIP & RUNWAY. A term from Military Specifications.
Reference: Taxiway Centerline Lighting System '68

REFLECTORS. A term with overarching appearance. Specific reference is to Reflectors as one part of Taxiway Guidance Systems.
Reference: IES '81, '87

RETROREFLECTIVE PAVEMENT MARKERS. Term refers to project testing Markers to determine effectiveness in specified conditions. Term has overarching possibilities but is seemingly rare in the literature.
Reference: Brown FAA '83

RETRO-REFLECTIVE MARKINGS/RETRO-REFLECTIVE AERODROME MARKING. This term present an appearance of an overarching term. However, it insteads refers to the use of glass beads in Painted Markings.
Reference: ADM '83

RETROREFLECTIVES. This term refers to Runway & Taxiway Markers; also Taxiway Edge Markers.
Reference: IES '72

RUNWAY & TAXIWAY REFLECTIVE MARKERS/RUNWAY & TAXIWAY RETRO REFLECTIVE MARKERS. These overarching terms are from FAA Approved Lighting Lists. They refer to pertinent literature in the field but provide no details. The second term, from '73, includes subdivision of On-Pavement Reflectors and Elevated Reflectors.
References: Ap LEq '71, '73



RUNWAY CENTERLINE REFLECTORS. These Reflectors serve as a supplement to Centerline Lights, Painted Markings. They are bidirectional in white or red/white. They are 5/8" high.
Reference: IES '81

RUNWAY/TAXIWAY REFLECTORS. Term refers to Retroreflective Pavement Markers.
Reference: Brown '83

TAXIWAY CENTERLINE REFLECTOR. These Reflectors supplement Lights and Painted Markings. They are bidirectional, green, 5/8" high (15.9 mm).
Reference: IES '81, '87

TAXIWAY EDGE REFLECTOR. These are elevated in blue and cover 360 degrees. They are a supplement to Taxiway Edge Lights.
Reference: IES '81, '87

3B3 b) Signal Panels, Signal Areas, Indicators, Other Objects & Miscellaney

CHECKERBOARDS PATTERNS. An Obstruction Marking. Cross-reference here. To speak of Checkerboards seems a natural form of expression but FAA and CAA both add pattern.
Reference: CAA '53, OML '91

CHECKERBOARD MARKINGS. This is not an Obstacle Marking. The Aid, employed in France, assists aircraft approaches for non-precision instrument, and visual approach operations.
Reference: Supplement '91

COMPASS CALLIBRATION PAD. This Aid provides a means of callibrating aircraft compasses. Its core is a circle with 12 radials (one per 30 degrees). 3 magnetic headings for each radial. Radials consists of 6" wide stripes employed in one major form.
Reference: Comp Cal Pad '69

CONES. This usage from Australia, is a short form of Unserviceability Cone Markers. They employ Standard Boundary Marker Cones. Cones substituted for Flags.
Reference: Supplement '61

CONE MARKER. Term is equivalent of Cones/Unserviceability Cones.

Reference: Supplement '61

FLAGS. Flags can have several uses. Many of them are within Obstruction Markings which see.

References: AD '51, CAA '53, Potts II '92, PICA0 '44, AD '90

GROUND SIGNAL PANELS. The function of the Panels are to control aerodrome traffic. They contain Dumb-Bell Signal, Landing T, Red Square with Yellow cross, with Yellow diagonal cross.

Reference: AD '71, '51

GROUND SIGNAL PANEL & SIGNAL AREAS. Conjoins Signal Area and Panels found there in. Area set aside for needed Signal Panel. See Ground Signal Panels, Signal Areas

Reference: AD '51

GUIDANCE SIGN BOARDS. An element of Taxiway Guidance System. Similar to Signs? If so, which?

Reference: Taiwan

HALF DRUM. This Aid is employed at heliports. They serve as Corner Markers which see.

Reference: HD '77

INDICATORS. Overarching term for Wind Direction Indicator or Landing Direction Indicator.

Reference: AD '51, '71

LANDING DIRECTION INDICATOR. T or Landing Tetrahedron or Launch "T" is orange on white, Tetrahedron is orange or black or white or aluminum; with lights.

Reference: AD '51, '71

SIGNAL AREA PANEL. The Panel is within Signal Area Location. See also Ground Signal Panel.

Reference: ADM '83, AD '71

SIGNAL PANEL. Apparent synonym for Signal Area Panels.

References: Thorn, ADM '83

TAXIWAY EDGE REFLECTOR. These are elevated, in blue, and cover 360 degrees. They are a supplement to Taxiway Edge Lights.

Reference: IES '81, '87

UNSERVICEABILITY CONE MARKER/UNSERVICEABILITY CONE. See Cones.

References: Supplement '61, AD '99

UNSERVICEABILITY FLAGS. This is one form of Unserviceability Markers. The Flags are 0.5m square, and red, orange, yellow or r/w, o/w, y/w.

References: AD '90, AD '99

UNSERVICEABILITY MARKER BOARDS. Seemingly one form of Unserviceability Boards. They display Red/White or Orange/Violet vertical stripes.

Reference: AD '90

VEE BOARDS. a Heliport Marking. Similar in appearance to Boundary Markers. They are triangular shaped, elongated. They are found at corners of installation.

Reference: HD '77

WIND CONES. Fabric cones with illumination denote wind direction even light wind.

Reference: Black '29, Spec for Wind Cone Assem '85

WIND DIRECTION INDICATOR. A more overarching term though it refers to Wind Cone.

Reference: AD '51, '71

WINDSOCK. Alternate name for Wind Cone.

Reference: St John Sprigg '34

WIND TEE/LIGHTED WIND TEE. An older device for indicating wind direction. A T-shaped structure is painted yellow with green lamps outlining the structure at night. Roller and radial bearings cause the assemblage to move easily. It is referred to as a "Big Sign" by St John Spriggs in the 1930s.

Reference: St John Sprigg '34, Spec for L-808 Lighted W T '65, Airp Mis L Vis Aids '71

Chapter 3C Signs & Markings

General Note. These two separate forms are included together in this sub-chapter. While they are distinct forms the coverage of the Database does not require separate sub-chapters. Signs offer a vertical form of Aids while Markings are horizontal. The diverse forms of Markers overlap with Markings. But the many forms of Markers and related forms required separate coverage because of the needed coverage.

3C1 Markings

3C1 a) Overarching Terms

AIRFIELD MARKINGS. The specific reference is to tritium wands in Alaska. The specific reference is restricted though the term gives the appearance of a broader term. The reference is also to a Lighted Aid.
Reference: Alaska '84

AIRPORT MARKINGS. Frequently Markings serves as the basic term for Pavement, Surface Markings. This term is a more explicit version of the basic term. It can include Runway and Taxiway Markings.
Reference: Utility Airports '75, '81, ADS-GA '69

AIRPORT PAVEMENT MARKINGS. A general term for Surface Markings including Runway, Taxiway and Holding Position Markings.
Reference: AIM '99

MARKINGS. This is the basic term for Pavement, Surface Markings. The term is employed in a variety of situations both in restricted senses (short form of a specific term) and more general term. More than 20 sources include the term both in general and as "short hand" for a specific form. —
References: Black '29, ADM '83, IES '87, OML '91, NATO '92

MARKINGS FOR PAVED RUNWAYS & TAXIWAYS. An overarching term for runways, taxiways, aprons, roadways.
Reference: Standards for Airp Mkings '93

MARKINGS FOR SURFACE. A curious term. Seemingly overarching in nature. Specific reference is to elimination of current Aids by WAAS.
Reference: Loh '95

PAINT MARKINGS. These are Surface Markings comprised of paint.

Reference: Finch '61, Brown '83

PAINTED MARKINGS. An overarching-appearing term though the specific reference is to Apron Markings. For ICAO the specific reference is to the removal of Painted Markings.
Reference: IES '81, '87, ADM '83

PAVEMENT MARKINGS. This term refers to all Markings that consist of paint on surfaces. Specific reference is to Heliport Markings.
Reference: HD '88, IES '87, ADM '83

RUNWAY & TAXIWAY MARKINGS. An overarching term for a broad range of Markings.
Reference: Marking of Serv. R & T '66

STANDARD MARKINGS. A general term that refers to regular Runway Markings though it gives appearance of a more overarching term.
Reference: Finch '61

SURFACE MARKINGS. A general term though rarely employed.
Reference: Amd 32, '78

SURFACE MARKINGS & MARKERS. This term also appears in General Overarching terms for Chapter 3. Markers are in a painted and surface form. This term can also apply to coverage of Markers though at variance with precise meaning of Marker.
Reference: ADM '83

b) Runway Markings

AIM POINT MARKING. No details for this term. It is possibly a variant of the more common Aiming Point Marking.
Reference: STOL Port '70

AIMING POINT MARKING. Shorter form of Runway Aiming Point Marking. Its purpose is to furnish a "visual aiming point". It consists of stripes (two) about 1000' from threshold.
Reference: AIM '99, Standards for Airp Mkings '93

ALL-WEATHER RUNWAY MARKINGS. For FAA this level of Marking includes Instrument Runway Markings, Landing Zone Markings, Side Stripes.
Reference: Markings of Serv R & T '66

BASIC MARKINGS. The FAA has three levels of Runway Markings. This is the simplest form and provides Markings need for VFR operations. It consists of Centerline Markings, Runway Direction Numbers. More complex Markings can be added if needed.

Reference: Marking of Serv R & T '66, AIM '73

CENTERLINE MARKING. A basic element of Runway Markings which consists of dashed lines.

Reference: AIM '91

CENTRE-LINE MARKINGS/CENTRE LINE MARKINGS. ICAO prefaces Centre Line Markings with Runway but some entries omit Runway. Czech Republic in Supplement '61 adds a hyphen.

Reference: Supplement '61, '91

CHEVRON/CHEVRON MARKINGS. First term employed as identification of pavement that can't be used for landing, taxiing, takeoffs. The second term from ICAO is more explicitly an Aid. It specifically refers to pavement before the threshold that is not to be used for aircraft operations. Both Markings employ yellow.

References: AIP '99, AD '90

CONFLICTING RUNWAY MARKINGS. Term describes a situation in which Markings that intersect are not properly aligned, positioned.

Reference: Standards for Airp Mkngs '93

DAY MARKING OF SNOW-COVERED RUNWAYS. Older Markings in AD add Day to Markings; this was later dropped. Newer sources speak of Markers.

Reference: AD '53

INSTRUMENT RUNWAY MARKINGS. These Markings consist of Basic Markings plus Threshold Makings.

Reference: Marking of Serv R & T '66, ADS-GA '69

LANDING ZONE MARKINGS. An element of All-Weather Markings. It consists of Landing Zone Markers which are painted bars on pavements in groups of bars beginning with four and descending to one.

Reference: Markings of Serv R & T '66

LONGITUDINAL RUNWAY MARKINGS. Older term for Centerline Marking. Centerlines of course are longitudinal in direction, shape.

Reference: AD '51

MARKINGS FOR UNPAVED RUNWAYS. Future category in source. ICAO has Unpaved Runway Markings in some editions of AD.

Reference: Standards for Airp Mkngs '99

MARKING OF DISPLACED THRESHOLDS./DISPLACED THRESHOLD MARKINGS. Denoted by four arrowheads, bar across threshold of runway.

References: Marking of Paved '87, Marking of Serv R & T '66

MARKINGS OF PAVED AREAS. Sub-overarching term for Paved Markings.

Reference: ADS-AC '75

MARKING OF SNOW-COVERED RUNWAYS. These are Markers in form. They consist of evergreen or wood tripods. See also Markers.

Reference: AD '51

NON-PRECISION INSTRUMENT RUNWAY MARKING/NONPRECISION INSTRUMENT RUNWAY. These are Basic Runway Markings with addition of Threshold Marking.

Reference: Standards for Airp Mkngs '93, AIM '73

NONPRECISION RUNWAY & VISUAL RUNWAY MARKINGS. Specific reference is to illustrations of two levels of Markings considered together.

Reference: Standards for Airp Mkngs, '99

PAINTED NUMBERS. Specific reference to number on generator house for Airway Beacon. This is not an actual term.

Reference: Breckenridge '55

PAINTED RUNWAY MARKING. These Markings are usually painted but normally without mention of paint. The context in this instance is a discussion of color and painted runway Markings placed in contrast to Lights.

Reference: ADM '83

PAVED RUNWAY DAY MARKING/PAVED RUNWAY MARKINGS.

Overarching term for all forms of Paved Runway Markings; newer editions drop an overarching term for Runway Markings; apparently there is no further reference to Paved and Unpaved Markings. Old editions included Day for Unlighted Markings including the first named term.

References: AD '53 (1st), AD '58, AD '71

PRECISION INSTRUMENT RUNWAY MARKINGS. For FAA this level of Markings has a full panoply of Markings: Centerline Marking, Designation Marking, Threshold Marking, Fixed Distance Marking, TD Zone Markings, Side Stripes, Holding Position Markings.

Reference: Markings of Paved Areas '80, '87, AIM '73, AIP '99

RELOCATED THRESHOLD MARKINGS. These Markings when used as taxiway, consist of bar across former runway (less than fully wide) and accompanied by Taxiway Centerline Markings.

Reference: Marking of Paved Areas '80, '87

RUNWAY - & TAXIWAY - SURFACE MARKINGS. A historic term and a sub-overarching term. It refers to "painted lines and markings". Apparently for Arcata Lines and Markings were different in nature.

Reference: FR Arcata '49

RUNWAY CENTRAL CIRCLE MARKING. Aid employed in China. No explanation of use is given in Supplement.

Reference: Supplement '91

RUNWAY CENTERLINE MARKING/RUNWAY CENTRE LINE MARKING. Basic level of Marking. Consists of dashed line in white. Specific configuration according to level of aviation operations (ICAO). FAA AIP '99 speaks of "stripes and gaps".

References: AD '99, AIP '99

RUNWAY CENTRAL CIRCLE MARKING. An Aid employed in China. No explanation of use is given in Supplement.

Reference: Supplement '91

RUNWAY DAY MARKINGS. An overarching term illustrating, listing levels of Markings and specific forms. Older ICAO publications added Day to Marking.

Reference: AD '58

RUNWAY DESIGNATION MARKING/DESIGNATION MARKING. Markings consisting of numbers (letters if needed) for designating, identifying runways. The term is a shorter form of the full term; Standards employs both forms.

Reference: Standards for Airp Mkngs '93, AIP '99, AD '58

RUNWAY DIRECTION NUMBERS. Seemingly, the equivalent of Runway Designation Marking. End of runway marked by number (and letter when needed for multiple runways). White in color. Placed above Threshold Marking.

Reference: Marking of Serv R & T '66, STOL Port '70

RUNWAY EDGE MARKING. For AD '58 these are for Unpaved Markings and can be placed on on Light structures or "flat rectangular markers" or conical markers. Stolport refers to the Marking but reference is to Side Stripes.

Reference: AD '58, Stol Port '70

RUNWAY END MARKINGS. Two sources have a Marking by this specific name. In Australia it is a wide stripe (border) the width of the runway and partially extending along runway sides. For PICA0 it is one form of "runway length symbols."

Reference: PICA0, Supplement '61

RUNWAY END-ZONE MARKINGS. This term refers to Lights. It is retained here as a cross-reference term because it gives appearances of unlighted Markings.

Reference: FR Arcata '49

RUNWAY MARKINGS. Overarching term that encompasses the full range of Aids of this form. For FAA and other sources there are three types: visual, non-precision instrument, precision instrument. Classes would appear to be more fitting than type but type is what is used. Bars and Chevrons are part of this form. Older ICAO sources included term but more recently all surface forms under Marking.

Reference: AIM '99, Standards for Airp Mkng '93

RUNWAY MID-POINT MARKINGS. This Marking is seemingly found only in Japan. It refers to mid-point of Runway and displays three stripes across width of runway.

Reference: Supplement '65

RUNWAY NUMBERS. This is a short version of Runway Designation Markings which see.

Reference: Utility Airports '75

RUNWAY NUMERALS & LETTERS/RUNWAY DESIGNATION NUMERAL & LETTERS. These are part of Runway Designation Markings. The first term is merely the "physical apparatus" for Markings.

References: Marking of Paved Areas '87

RUNWAY SHOULDER MARKING. They are yellow in color and supplement Side Stripes. They denote pavement not used by aircraft. Stripes are slanted and

3'/1m in length and spaced 100'/30'.
Reference: Standards '99, Deceptive '63

RUNWAY SIDE STRIPES MARKING/SIDE STRIPES MARKING/SIDE STRIPES. These refer to continuous stripes along runway side to delineate runway pavement (full strength) or to provide construct with surrounding terrain. AD: double stripes in white; FAA: continuous white stripe.
References: AD '58, '71, AIM '91, Standards for Airp Mkngs '93

RUNWAY SURFACE MARKINGS. This is possibly an older term for what are simply Runway Markings. It does explicate the meaning of Runway Markings.
Reference: FR Arcata '49

RUNWAY THRESHOLD MARKINGS/THRESHOLD MARKINGS. These Markings denote point on runway where landing can be made. They are White in color, consist of longitudinal stripes. ICAO drops Runway from term. AD speaks of long stripes. Older editions include Runway in title.
Reference: Standards for Airp Mkngs '99, AD '58, AD '64

RUNWAY THRESHOLD STRIPES. Can this be viewed as a Marking? Or is it in a sense the "physical apparatus" for Pavement Markings consisting of stripes?
Reference: AIP '99

TOUCHDOWN ZONE MARKING/TOUCHDOWN-ZONE MARKING. A series of rectangular Markings painted on surface flanking Centerline Marking. There are 1-6 pairs depending on length of runway. For FAA pairs are in batches of single, double or triple configuration. In some sources these are known as Touchdown Zone Markers.
References: AIP '99, AIM '91

THRESHOLD MARKINGS. Markings are a shorter form of full term, Runway Threshold Markings. Eight longitudinal stripes which are grouped proportionally along centerline.
References: Marking of Paved Areas '87

UNPAVED RUNWAY MARKINGS. Older/somewhat older editions of AD distinguished between paved and unpaved aerodromes and Markings. Newer editions batch all Markings together with no unpaved grouping.
References: AD '71, '58

VISUAL & NONPRECISION MARKINGS. Specific reference is of illustrations for both levels of Markings. Runway is omitted though these are Runway

Markings.
References: Marking of Paved Areas '80

VISUAL RUNWAY MARKINGS. A subdivision of Markings. It includes Designation, Centerline, Fixed Distance Markings, Holding Position Markings; an alternate list includes the first two but finishes with Threshold and Aiming Point Markings.
References: AIM '91 (1st list), Standards for Airp Mkngs '93 (2nd)

c) Taxiway Markings

AIDS TO TAXYING. These are two forms: Day Marking-Taxying Aids (on Taxi-Channel Lighting supports) and Lighting-Taxying Aids.
Reference: AD '58

DAY MARKING-TAXYING AIDS. Restricted to Marking of Light Supports for Taxi Channel Lighting.
Reference: AD '53

PAINTED HOLD POSITION MARKINGS. Conforms to Holding Position Signs for Taxiways/Runway Intersections.
Reference: Standards for Airp Sign Sys '91

PAVED TAXIWAY MARKING/PAVED TAXIWAY DAY MARKINGS. Newer editions speak of specific types of Markings but not overarching terms. AD '71 has a Paved Markings component as well as an Unpaved Markings component. Day was added to some older terms.
Reference: AD '71, AD '53

TAXIWAY CENTERLINE MARKINGS/TAXIWAY CENTRE LINE MARKINGS. This is the basic level of Taxiway Markings. They consist of continuous stripes in yellow.
References: AIP '99, Standards for Airp Mkngs '93, AD '71, '99

TAXIWAY CONTINUOUS MARKINGS/TAXIWAY DASHED MARKINGS. These are part of Taxiway Edge Marking and sometimes subsumed under that heading.
Reference: Standards for Airp Mkngs '99

TAXIWAY DAY MARKINGS. Longitudinal (later centerline) and Taxiway HP Markings made up these Markings at an early date.
Reference: AD '51

TAXIWAY EDGE MARKINGS. They consists of two forms: Continuous Markings with double yellow line (which distinguishes between taxiway edge and shoulder); and Dashed Markings which indicates non-taxi pavement that aircraft can use (aprons). These Markings delineate edges and are largely employed when pavement edge and taxiway edges are not the same.
References: AIP '99, AIM '99, IES '81

TAXIWAY HOLDING LINE MARKINGS. These are in aviation yellow. They are placed on taxiways where there is a need to keep (hold) airplanes away from runways.
Reference: IES '81

TAXIWAY HOLDING POSITION MARKING. Markings made up of dashed lines in yellow across taxiway.
Reference: AIM '99,

TAXI-HOLDING POSITION MARKINGS. These mark intersection of taxiway and runways. Reference is to U.S. Color is yellow.
Reference: Supplement '71

TAXIWAY IDENTIFICATION MARKINGS. Markings are employed when there are problems in locating Taxiway Identification Signs.
Reference: IES '87

TAXIWAY INTERSECTION HOLDLINE MARKINGS. Terms listed but with few details. They are comprised of black dashes across taxiway.
Reference: Standards for Aip Sign Sys '91

TAXIWAY INTERSECTION MARKINGS. A new Aid at time of wrting (1989). Consisted of two stripes 6" by 150' parallel centerline Marking and in Yellow.
Reference: Katz FAA '89

TAXIWAY MARKINGS. An overarching term that includes basic Centerline and Holding Position Markings. Also includes Taxiway Edge Marking, and other forms as needed. Older sources speak of Holding Lines rather than Holding Position Markings. Yellow is employed for this Markings though AD '71 calls for white or yellow. AIP '91 gives green as the color in use. Past use only?
References: AD '71, Standards for Airp Mkings '93, AIM '73, Marking of Serv R & T '66, AIP '91

TAXIWAY ROUTE MARKING. Term refers to Center-Line Lighting (form of

Lighting under construction at time of writing, 1962). Term retained here because of term Marking.
Reference: Horonjeff '62

TAXI SIDE STRIPE MARKINGS. Marking differentites load-bearing surface from non-load bearing surfaces. It consists of double line.
Reference: AD '90

TAXIWAY SHOULDER MARKING. These are Markings that indicate paved arethat are not to be used by aircraft (aprons, holding bays). Also taxiways which may have shoulder stabilization to retard blast, water, erosion but not for aircraft use (hence shoulder markings). They are yellow in color.
Reference: AIM '99, Standards for Airp Mkngs '93, '99

UNPAVED TAXIWAY MARKINGS. ICAO publications once contained Markings specifically for non-pavement airports. This practice has been dropped.
Reference: AD '71

d) Markings Other Than Overarching, Runway, Taxiway, Special Categories

APPROACH DAY MARKING SYSTEM. These Markings consist of a series of Day Markers. In some instances the structures of Approach Lights can be utilized for this purpose. They begin at Threshold and work outward. They can be three-dimensional or flat Markers. Colors, patterns, physical appearance not given.
Reference: AD '51, '53

APRON & HOLDING PAD SHOULDER MARKING. Denotes stabilized shoulders but which are not for aircraft use. "Hatch marks" are employed that are "perpendicular to the pavement edge."

BLAST PAD & OVER-RUN OR STOPWAY MARKING. Seemingly this corresponds to Displaced Threshold, Blast Pad and Stopway Markings.
Reference: Marking of Deceptive '63

CLOSED MARKINGS. These consist of crosses in yellow.
Reference: AD '71, Supplement '71

CLOSED RUNWAY & TAXIWAY MARKINGS/CLOSE OR TEMPORARILY CLOSED RUNWAY & TAXIWAY MARKINGS. Crosses placed over pertinent runways and taxiways. Runway crosses are yellow in color and either 60'x60' or 48'x120'; taxiway either 30x30 or 24x60.
References: Marking of Paved Edges '87, Standards for Airp Mkngs '99, AIM '99

CENTERLINE & EDGE MARKERS. Limited details. Specific reference is to use in taxiway bridges.

Reference: ADS-TA '83

CONTINUOUS MARKINGS/DASHING MARKINGS. These are forms of Markings within Taxiway Edge Markings. Continuous Markings separate taxiways from areas not to be used by aircraft. Dashing Markings indicate taxi areas from pavements that may be used by aircraft. Part of Taxiway Markings. Reference: Standards for Airp Mkings '93

CRITICAL AREA HOLD LINE MARKINGS. Denotes sensitive (electronic) areas off-limits to aircraft and "obstacle free areas." They are part of Taxiway Markings.

References: IES '81, '87

FIXED DISTANCE MARKING. Term employed interchangeably with Fixed Distance Marker. It consists of a black bar(?) which denotes distance for approaching aircraft. ICAO speaks of flat Markings in shape of rectangle 15-x200' (45-60m), 300m/1000' from threshold stripe Markings.

References: AD '71, AIM '91

GEOGRAPHIC POSITION MARKINGS. Identify aircraft location engaged in taxiing during low visibility situation. Markings are circle (black ring) with white ring with pink circle. Accompanied by number or number/letter. Designations refer to position of Markings on taxi route.

References: AIM '99

HANGER ROOF MARKINGS/ROOF MARKINGS. A variety of similar terms are to be found in Markers. There are several forms of these terms; all are lighted directly or indirectly. Many of these Markings are Town Markings.

References: Blee '29, Black '29, Wood '40

HOLDING POSITION MARKING. These are Markings positioned at intersection of taxiway and runway, and entrance of taxiway into ILS or MLS critical area. They are comprised both of Markings and Signs. Marking consists of painted hold line and Sign.

Reference: Marking of Paved Areas, '80, '87

ILS HOLDING POSITION MARKINGS. These are Holding Position Markings that offer protection for critical areas of ILS Localizer and Glide Slope.

Reference: Markings of Paved Areas '80

LONGITUDINAL MARKINGS. Older AD publications refer to Longitudinal Markings while newer publications refer to Centerline Markings.

Reference: AD '53

MARKINGS & LIGHTING OF CLOSED OR HAZARDOUS AREAS ON AIRPORTS. Term describes discontinuation of Aids and adding of Aids that indicate closure. Yellow "X"s are a major element of these Markings. For hazardous areas Barricades in orange and white (and orange Flags) are employed. Ccross-reference because of presence of Lights.

Marking of Paved Areas '80, '87

MARKING FOR ARRESTING GEAR/PENDENT CABLE MARKING/DISC WARNING MARKER.

Both are Reflective Discs that identify cables for arresting gear.

Reference: Standards for Airp Mkings '93, '99

MARKING FOR BLAST PAD OR STOPWAY OR TAXIWAY PRECEDING A DISPLACED THRESHOLD. Overall term for three forms of Markings.

Reference: AIM '99

MARKING DISPLACED THRESHOLDS, BLAST PAD & STOPWAYS. Overarching term for two separate forms: a) Displaced Threshold Markings which consist of four arrowheads above threshold bar, in yellow or white. And b) Markings for Blast Pads & Stopways which are chevrons above threshold bar.

Reference: Marking of Paved Areas '80, '87

MARKINGS FOR LARGE AIRCRAFT PARKING POSITIONS. Term listed in Standards '99. Apparently reserved for future use.

Reference: Standards for Airp Mkngs '99

MARKING OF HAZARDOUS AREAS. Crosses are employed for this function.

Reference: Marking of Deceptive '63

MARKING OF TEMPORARILY RELOCATED THRESHOLDS. Temporary Markings are part of construction activity and follow that need.

References: Standards for Airp Mkngs '93, '99

MARKING OF UNSERVICEABLE PORTIONS OF THE MOVEMENT AREA. Both Markings and Lighting is included. This is a form of Unserviceability Marking which see. It was later known as a Closed Marking. It displays a white cross.

Reference: AD '51

NON-MOVEMENT AREA BOUNDARY MARKING. Marking delineates areas under air traffic control/not under control. Marking takes form of solid line, dashed line in yellow. Solid line denotes non-movement side while dashed line denotes movement side.

Reference: Standard '99, AIM '99

OFF-AIRPORT MARKING/ON-AIRPORT MARKING. Specific reference for Off-Airport Marking is to town name Markings; also includes arrow to airport Marking. The context is that of non-governmental Marking programs. On-Airport Markings refers to information (airport name, elevation) painted on roofs, aprons by airport owners. Context is "other marking practices".

Reference: Utility Airports '75

PAINTED CENTERLINE/EDGE MARKINGS. Few details given. Specific reference is to addition of Retroreflective Markers to these Markings. Centerline Markings and Edge Markings are basic terms in themselves. Painted is occasionally added.

Reference: ADS-AC '71

RUNWAY TRANSVERSE STRIPES/TRANSVERSE STRIPES. These are components of Threshold Markings. They are added to Threshold Markings in specific situations.

References: ADS-AC '71

SEAPLANE BASE MARKING. Term refers to single Aid: Standard Air Marker which is considered in Markers which see.

Reference: Seaplane Base '94

SEGMENTED CIRCLE/SEGMENTED CIRCLE MARKING SYSTEM. Segmented Circles are often referred to as Markers and the principal entry is under Markers. This entry has the form of a cross-reference.

References: Utility Airports '75

STRIATED MARKINGS. Markings employed where "frost heave" is a problem for aviation operations.

Reference: Standards for Airp Mkngs '93, '99

STRIPES. Stripes make up Threshold Markings; they are the physical apparatus.

References: Supplement '61, '91

ROADWAY EDGE STRIPES./ZIPPER MARKINGS. A form of vehicle Roadway Marking: in white and zipper style hence the second name. Zipper because each segment of color is to left or right of preceding segment of color.
Reference: AIP '99, AIM '99

THRESHOLD STRIPES. Alternate name for Threshold Markings. They can be seen as components of Threshold Markings. In a sense Stripes are the "physical apparatus of Markings.

References: Supplement '71, '91

SURFACE MOVEMENT GUIDANCE CONTROL SYSTEMS (SMGGS). System of Aids that provides control, guidance of surface operations. It includes most Lighted and Unlighted Aids on airport surfaces.

References: ADM '93

TAXIWAY/RUNWAY INTERSECTION MARKINGS. Seemingly an interchangeable or alternate name for Taxiway Holding Position Markings.
Reference: Marking of Paved Areas '80, '87

TEMPORARY MARKINGS. A few sources include this term. One source includes Lights only with the term; other sources do not provide details.
References: CAA '41, Wood '40, Standards '99

TRANSVERSE MARKINGS. This is not an operational form. It refers to general treatment of Aids.

Reference: ADM '83

UNDERSHOOT & OVERRUN AREA MARKINGS. Non-usable pavement before thresholds are marked by Chevrons in white or yellow.
Reference: AD '71

UNSERVICEABILITY MARKINGS. A type of Marking that denotes closed runways. Red Flags employed for temporary closures. Chevrons denote permanent closures.
References: AD '51, AIP '91

VEHICLE ROADWAY MARKINGS. These refer to Markings on roadways employed by aircraft as well as surface vehicles. Solid lines denotes edges while dashed lines indicate dividing point between lanes.
References: Standards for Airp Markings '93

A series of terms relate to VOR Aerodrome Check-Point Markings. There are

possibly sufficient terms for a special sub-section but, hopefully, this group within an existing category will suffice.

VOR AERODROME CHECK-POINT MARKINGS. Denotes existence of VOR Check-point. A sign is associated with this Marking. AD '58 has a variant term: Vor Aerodrome Check-Point Marker.
Reference: AD '71

VOR CHECK POINTS/VOR AERODROME CHECK-POINTS. These slightly variant versions appearing in AD Supplements have the same meaning despite omission of the word Marking.
References: Supplements '71, '91

VOR CHECKPOINT MARKING/VOR CHECKPOINT RECEIVER MARKINGS/VOR RECEIVER CHECKPOINT MARKING. Marking indicates that aircraft can check out instruments in plane with signals of Navigation Aids. Consists of arrows (pointing in direction for comparing azimuth) and signs added which indicates VOR check course. Black on yellow.
References: Standards for Airp Mkings '93, '99, AIP '99

GROUND RECEIVER CHECKPOINT MARKINGS. Seemingly, an alternate name for VOR Checkpoint Markings. Aid consists of yellow arrow within double band circle (yellow and white). Center of circle is black. Sign accompanies Marking.
Reference: AIM '99, AIP '99, Standards for Airp Mkngs '93

CHECK-POINT MARKING. Seemingly this has meaning of VOR Check Point Marking.
Reference: AIP '91

3C1 d) Special Category

1) Heliport and Vertiport Markings (Also Stolport and Seaplane Bases)

AIMING POINT MARKING. Indicates approach to specific point prior to approach to Touchdown & Lift-off Area. This Marking displays an equilateral triangle with white lines.
Reference: AD Vol II-Heliports '90

APRON MARKINGS. These are Heliport Markings. HD '88 refers to parking positions while H.D. '94 states these Markings define apron edges while parking positions are separate.

Reference: HD '88, '94

BOUNDARY MARKINGS. For heliports these are of two forms: Markers and Paint on the ground. Markers can be In-ground Markers or Above-ground Markers. Above ground forms can be of embedded stones, treated timbers, concrete slabs or low hedges.
References: HD '88

CENTERLINE STRIPES. Name of Aid or description of Aid employing these words? Either way, larger category is that of Markings.
Reference: HD '94

CYLINDRICAL MARKER FOR HOVER TAXI ROUTE EDGE MARKER/LARGE MARKER FOR AIR TAXIING CENTERLINE. The first term consists of reflective material 4"x8" in yellow/blue/yellow. The second measures 2' x 6' in yellow/green/yellow.
Reference: HD '94

DASHED FATO MARKINGS. These are surface Markings for heliports. They consist of segmented yellow dashes.
Reference: HD '94

DOUBLE LINE EDGE STRIPES. Denotes edges of taxi route at heliports. They are yellow in color.
Reference: HD '94

EQUIPMENT/OBJECT MARKING. This refers to mobile objects at least in part. Markings consist of reflective tape, paint, etc is employed on maintenance and service equipment and other objects.
Reference: HD '94

FATO MARKINGS. These Markings consist of white painted line. See also: Painted Markings.
Reference: HD '88

FINAL APPROACH & TAKE-OFF AREA MARKINGS OR MARKER. They consists of Corner, Edge Markers.
Reference: AD Vol II '90

FINAL APPROACH & TAKE-OFF DESIGNATION MARKINGS. This is a more restricted version of previous term.
Reference: AD Vol II '90

HELIDECK OBSTACLE-FREE SECTOR MARKING. This Marking displays chevron for indicating entrance to sector.
Reference: AD Vol II '90

HELIPORT "H" MARKING. Term refers to large H that identifies hospital heliport.
Reference: HD '94

HELIPORT LANDING AIDS. This Aid consists of both day and lighted forms but includes more lighted types.
Reference: Latest Development AI '91

HELIPORT MARKINGS. This is an apparent overall term for Markings used at Heliports and Helipads. However, few sources so employ it. Markings (and Markers) may lack association with Heliports since Markings and Markers are within a context of heliports. One major source employs this term primarily for individual forms.
References: AIM '91, Standards for Airp Mkings '93, HD '77, '88

Several terms encompass both Lighted and Day forms:

HELIPORT MARKING & LIGHTING, IES '72
HELIPORT LIGHTING & MARKING, IES '81
HELIPORT VISUAL AIDS, HD '77

HELIPORT GUIDANCE, POSITION & OTHER MARKINGS/GUIDANCE OR POSITION MARKINGS/GUIDANCE & POSITIONING MARKINGS. These terms include Centerline for Taxiways (a 12" wide line in yellow), Parking Position Line (6" wide stripe in yellow) and Stopping Circle (3' in diameter).
Reference: HD '77

HELIPORT IDENTIFICATION MARKING. This consists of "H" symbol on cross. When at a hospital the H is red on white cross. Cross positioned to indicate best approach for helicopters.
AD Vol II, '90, '95

HELIPORT NAME MARKINGS. This Marking is added when identification is otherwise inadequate. It can consist of either name or "alphanumeric indicator."
AD Vol II, '90, '95, Supplement '91

HELIPAD & HELIDECK MARKINGS. This term suggests an overall meaning, but instead it is very specific: A line (solid, yellow) at edge of Helipad or Helideck apart from a Takeoff and Landing Area, or FATO.
Reference: HD '88

HOSPITAL MARKING. This term is an overarching term for various types of Markings at hospital heliports.
Reference: HD '94

HOSPITAL HELIPORT MARKING. This term refers to Marking identifying hospital heliport: red H on white cross.
Reference: HD '94

IDENTIFICATION MARKING. This term refers to Heliports and includes in turn two terms:

STANDARD HELIPORT MARKINGS. This term provides identification of TD and LA. It consists of an "H" within segmented triangle (made up of dashes in white).

HOSPITAL HELIPORT MARKING. This term displays a red H within a white cross.
Reference: HD '77

IN-GROUND FATO CORNERS/EDGE MARKERS. These Markers denote both sides as well as corners of heliports. They are in segmented forms.
Reference: HD '94

IN-GROUND MARKING. Term has a somewhat overarching character though this form has the specific meaning of "H" (Heliport symbol) and Markers for edges and corners.
Reference: HD '88

LANDING DIRECTION ARROW. This Marking denotes "preferred approach-departure paths to the heliport". The arrow is white; lights may be added.
Reference: HD '77

LARGE MARKER FOR AIR TAXING CENTERLINE. It consists of vertical panels measuring 2x6' and divided into three horizontal panels: yellow, green, yellow. The panel is on one foot legs. Designated as Marker though it is more of a Marking or even a Sign (though lacking alphanumeric symbols). A cross-reference to Markers would not be inappropriate. It is a heliport Aid.
Reference: HD '94

MARKING OF CLOSED HELIPORT. This consists of a cross (St Andrew's) in yellow which is superimposed over existing Markings.

Reference: HD '77

MAXIMUM ALLOWABLE MASS MARKING. Indicates weight limit indication through display of two digits and "t" (tonne).

Reference: AD Vol II '90

PAINTED H MARKINGS. H (Heliport) symbol applied with paint on surfaces.

Reference: HD '94

PAINTED MARKINGS. This term can have broad meanings. This specific usage is for heliports and consists of surface, painted Markings. White painted line.

Reference: HD '88

PARK POSITION MARKINGS. These Markings consists of yellow centerline, and accompanied by yellow circle.

HD '94

STANDARD HELIPORT MARKING SYMBOL. Symbol denotes location of heliport. It consists of triangle, "H", Boundary Markers. White on blue ground.

Reference: HD '77

Two term encompass both Markings and Markers:

HELIPORT MARKERS & MARKINGS, HD '94

HELIPORT WITH MARKERS & MARKINGS, HD '94

TAXI ROUTE EDGE MARKERS. These markers consist of cylindrical Elevated Markers. They are 8" high and display bands of yellow, blue, yellow.

Reference: HD '94

TAXI ROUTE & TAXIWAY MARKINGS. This appears to be a conjoined term. Edge Markers are employed for taxi routes. They are raised Markers 8" maximum high displaying horizontal bands of yellow, blue and yellow. Taxiway Markings for centerline and edges are surface lines in yellow; centerlines are single lines while edges are double.

Reference: HD '94

TAXI ROUTE MARKINGS. This refers to hover/air taxi routes. They are marked by Above-ground Markers in cylindrical forms. They display horizontal bands of yellow/green/yellow. They are a form of Retro-reflective Marker.

Reference: HD '88

TAXIWAY MARKINGS. Term is in context of heliports. It can have a more general, overarching meaning.

Reference: HD '88

TOUCHDOWN & LANDING AREA MARKINGS. In situations where there is not FATO a TDLA white line is installed [FATO w/i TOLA when available].

Reference: HD '88

TOUCHDOWN MARKINGS. Marking denotes specific position for setting down of helicopter.

Reference: AD Vol II '90

TOUCHDOWN PAD BOUNDARY MARKING. These are Markings for TOLA limits or edges. For paved areas it consists of 18" wide stripes, solid or segmented. Stripes are white and may be of crushed stone. AD continuous white line, 30 cm wide.

Reference: HD '77, AD Vol II '90

WEIGHT LIMIT MARKING. This Marking consists of numerals in red on white ground (square-shaped).

Reference: HD '77

WINCHING AREA MARKING. This Marking displays solid circle, 5m in diameter in yellow, positioned in clear zone center.

Reference: AD Vol II-Heliports

WIRE MARKING. Denotes wires that may affect helicopter operations. These are Obstruction Markings. A second term in the surveyed source refers to Wire Marking and Lighting.

Reference: HD '94

A special category is that of Vertiport Markings though few references include it.

VERTIPORT MARKINGS. Overarching term for all Vertiport Markings (and Markers). A variety of specific forms have general names that do not indicate they are part of Vertiport Markings. These forms include:

IN-GROUND EDGE MARKERS (At edges and also corners)

RAISED MARKERS (6"/15 cm in height)

PAINTED LINES (16" wide, white in color)

CENTERLINES (50' by 16" in white)
TAXIWAY MARKINGS (6" wide, yellow for Centerlines)
RAISED MARKERS II (Hover Tax Route, cylindrical shaped, 3' in height, retroreflective)
SYMBOL (For Vertiports: a Circle flanked, touched on 4 sides by "T" in white; identifies a Vertiport)

References: Standards for Airp Mkings '93, '99 for core term of Vertiport Marking; Vertiport '91 for other terms.

2) Holding Position Markings

HOLDING POSITION MARKINGS. This is apparently the core term for this form. It encompasses forms prefaced by Runway, Taxiway, and more specialized forms which see.

References: AIP '99

HOLDING POSITION MARKINGS FOR INSTRUMENT LANDING SYSTEM (ILS)/HOLDING POSITION MARKINGS FOR INSTRUMENT LANDING SYSTEMS. They perform the same function as those including Critical Area in the title.

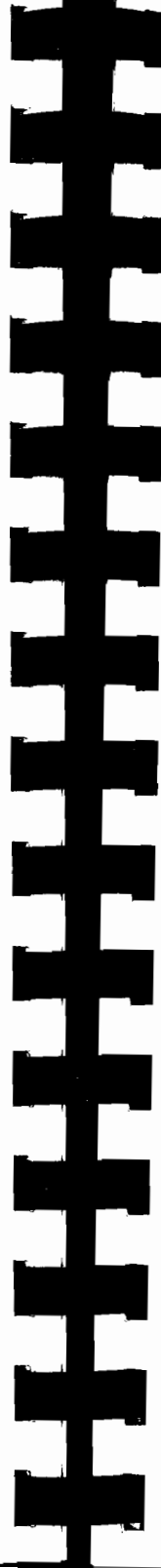
Reference: AIP '99, AIM '99

HOLDING POSITION MARKINGS FOR INSTRUMENT LANDING SYSTEM/MICROWAVE LANDING SYSTEM (ILS/MLS) CRITICAL AREAS/HOLDING POSITION MARKINGS: ILS CRITICAL AREAS/HOLDING POSITION MARKINGS FOR ILS (OR MLS) CRITICAL AREA. Markings offer protection for ILS, MLS equipment installations near aircraft operations.
References: Marking of Paved Areas '87, AIP '99, Standards for Airp Mkings '93

HOLDING POSITION MARKINGS FOR TAXIWAY/TAXIWAY INTERSECTIONS/HOLDING POSITION MARKINGS: TAXIWAY/TAXIWAY INTERSECTIONS/RUNWAY HOLDING POSITION MARKINGS ON TAXIWAYS. Consists of single yellow dashed line. Hold position just outside taxi intersection. Second and third terms are variant forms.
Reference: AIP '99, AIM '99, Standards for Airp Mkings '99

HOLDING POSITION MARKINGS ON RUNWAYS. Seemingly a single term for all forms. Narrative speaks of HP Markings for different positions but it is unclear if these are formal terms. These terms include:

**HOLDING POSITIONS FOR RUNWAYS/RUNWAY INTERSECTIONS
HOLDING POSITIONS MARKINGS FOR RUNWAY/TAXIWAY**



INTERSECTIONS

Reference: Standards for Airp Mkgs '99

INTERMEDIATE HOLDING POSITION MARKING. Displays single dashed (or broken line). Denotes holding position at "a remote de/anti-icing facility adjoining a taxiway."

Reference: Standards for Airp Mkngs '99, AD '99

INTERMEDIATE HOLDING POSITION MARKINGS FOR TAXIWAY/TAXIWAY INTERSECTIONS. This form employed in three situations: holding planes at T/T intersection; giving geographic position, or holding bay. Consists of single dashed yellow stripe.

Reference: Standards for Airp Mkngs '99

ROAD-HOLDING POSITION. This form follows local TCD regulations.

Reference: AD '90

RUNWAY HOLDING POSITION MARKINGS. Indicates position for stopping. It consists of four yellow lines: two solid, two dashed. Stopping point on sold stripe side. Two sub-forms:

**RUNWAY HOLDING POSITION MARKINGS ON TAXIWAY
RUNWAY HOLDING POSITION MARKINGS ON RUNWAYS**
Reference: AIP ?, Standards for Airp Mkngs '939, '99 (sub-forms)

RUNWAY-HOLDING POSITION MARKING. ICAO offers a hyphenated form. There are two patterns: "A" (conforms to standard U.S. form); "B" (conforms to ILS in U.S.). Several rules govern use of this Marking.
Reference: AD '90

TAXI-HOLDING POSITION MARKING. Apparently two forms: single solid/single dashed line and double solid/double dashed stripes. Located at intersections of taxiways and runways.
Reference: AD '71

TAXIWAYS LOCATED IN RUNWAY APPROACH AREAS [MARKINGS]. The word Marking omitted though attached to adjoining terms. Marking indicates aircraft are hold in approach/departure part of runway.
Reference: AIP '99

3) Obstruction Markings

FLAGS/FLAG MARKERS. Second term is full name. Employed when paint or spherical Markers not feasible. Temporary situation common reason for use. Flags are rectangular in shape. Colors: solid aviation orange, orange/white triangular pattern, checkerboard pattern in orange and white. ICAO refers to mobile objects and does not mention temporary usage. Fixed objects use solid or triangular patterns. Mobile objects use checkered patterns.
Reference: OML '73, '99, AD '99

MARKERS [WITHIN CONTEXT OF OBSTRUCTIONS]. In Obstruction Aids this is a component of Markings rather than a subdivision in itself. Comprised of Spherical Markers and Flags. Flags have an independent character in some sources, situations.
Reference: OML '91

MARKINGS [WITHIN CONTEXT OF OBSTRUCTION MARKING]. Overarching term for Day Aids-Obstruction (ICAO Marking of Objects). Obstruction placed in [] to differentiate from other uses. Divided into Patterns and Markers which see.
Reference: OML '91

NAVIGATIONAL BOUNDARY & OBSTRUCTION MARKERS. Military specifications for Lights. Cross-reference.
Reference: OML '73

OBSTRUCTION IDENTIFICATION. Seemingly equivalent of Obstruction Marking and Lighting. Sub-overarching term. Day portion is divided into color and Markers (Spherical Markers, Flags).
Reference: IES '81, '84

OBSTRUCTION LIGHTING & MARKING. Variant formulation. See Below.
Reference: HD '88

OBSTRUCTION MARKINGS. Seemingly, there are two meanings. Unlighted Markings, and ICAO meaning of Day Marking of Obstructions, and Lighting of Obstructions. More limited meaning can be viewed as overarching term for such Markings.
Reference: AD '51, '69, '71, OML (narrower meaning)

OBSTRUCTION MARKING & LIGHTING. Cross-reference.
Reference: OML '91

OBSTACLE MARKING. It gives appearance of overarching term though specific

reference is to a Neon Light employed for this purpose; no separate day aspect.
Reference: Omlipol

PAINTED CONES FOR DAY MARKINGS. Day portion of Boundary Lights. White or yellow Lights: chrome yellow with black band-horizontal. Green: vertical band: chrome yellow/black. Red: horizontal white band/light vermilion main color.
Reference: Blee '29

PATTERNS. This refers to paint applied in standardized designs. There are several specific patterns:

SOLID PATTERNS

CHECKERBOARD PATTERNS. Consists of alternate rectangles of orange and white. Employed on storage tanks, buildings, large structures.

ALTERNATE BANDS. Employed on tall, narrow structures (communication towers, smokestacks, etc)

TEARDROP PATTERNS. A pattern of vertical stripes in alternate colors of orange and white. Employed on spherical water storage tanks.
References: OML '73, '78

SPHERICAL MARKERS. Component of Markers. Employed on catenary wires. Spheres are alternated by colors of orange, white, yellow.
Reference: OML '91

VISUAL AIDS FOR DENOTING OBSTACLES. Divided into two forms: Marking of Object, and Lighting of Object. [Note: process of marking, lighting not same as marking and lighting].
Reference: AD '99, AD '90 Vol II

4) Apron Markings

APRON MARKINGS. These Markings are employed for the manouevring and parking of aircraft. A key form are Guide Lines found within Aircraft Stand Markings. Reference for entire segment: ADM '83, '93.
The following are major forms:

GUIDE LINES. These are Aircraft Stand Markings made up of Guide Lines. They indicate path of movement.

Three Basic subdivisions are:

LEAD-OUT LINES. Indicate Stand to Taxiing

LEAD-IN LINES. Guidance from apron taxiway to particular stand
TURNING LINES. If turning is required on that stand these Lines
indicate procedure.

There are also subdivisions within Lines. These include:

SIMPLE LEAD-IN LINES

STRAIGHT-LEAD-IN-LINES

SIMPLE NOSE-WHEEL LEAD-IN LINE

SIMPLE NOSE-WHEEL LEAD-OUT LINE

WING TIP CLEARANCE LINES. Indicates safety zone between wing tips.

TOWING LINES. Indicates Guidance Lines when towing needed.

EQUIPMENT LIMIT LINES. Denote boundaries for parking various equipment
other than aircraft.

PASSENGER PATH LINES. Display of zebra hatching for safe walking areas.

REFERENCE BARS. Provides supplemental information (Primary information
from Guidance Lines).

TURN BARS. Indicate where Turns begins. Part of Reference Bars.

STOP LINE. Point for stopping. Part of Reference Bar.

3C2 Signs

a) Overarching Terms

SIGNS. This basic term can have both general and specific meanings. It can encompass all Sign forms, and it can be employed as shorthand for various specific types of signs. Signs have a vertical dimension and normally do not include sign-type Aids affixed to pavement surfaces. Many forms have or can have a lighted dimension. Is light playing a different role than in, for example, a Runway Light or Airport Beacon? Perhaps a position can be developed for both perspectives: Light is an integral part of the message, or light is a substitute for natural light. References for Signs include many of the surveyed sources.

SIGN SYSTEM. This term is seemingly an integrative network of signs comprising various classes and types. This specific reference is to Taxiway Guidance Signs: classes (Destination Signs, etc), and Types (either Mandatory or Information).

Reference: Standard Airport Signs '91, IES '91

AIRFIELD SIGN SYSTEM. An actual term or a confused extrapolation of Airfield Signs and Airfield Sign Systems? Reference not located though components of term are in the literature.

AIRPORT SIGNS. Relatively few sources employ this term. Specific names and the general term of Sign are much more common. It obviously serves as an overarching term.

Reference: New Era, FAA, AIP '99

AIRPORT SIGN SYSTEMS. An overarching term and it refers to a series of Signs in an integrated arrangement. The term refers to title of A/C Standards. Reference: New Era, FAA '92, Standards for Airp Signs '91

AIRSIDE SIGN SYSTEM. An apparent overarching term from Vomar Int'l. Reference: US Rules Change AI '92

AIRSIDE SIGNAGE. Overarching term. Sign refers to an "aggregation of signs." References: US Rules Change AI '92, McLendon

AIRWAY SIGNS. This term refers to Roof Signs though the term suggests broader usages. Admittedly, other Sign forms were limited in the 1920s. Reference: Young '28

SIGNING AIDS. Title of chapter in publication includes the word Sign. But specific coverage begins with this term. Though specific Aids are termed Signs. Reference: AD '71

SIGN ARRAY. An amalgamation of several sign components in an integrated pattern. Reference: New Era, FAA '92

b) Sign Forms Other Than Runway & Taxiway Types

General Note. Some or many of these Signs can be assigned to Taxiway or Runway categories. Possible reassignment is in order, or cross-references can be added.

AERODROME IDENTIFICATION SIGN. Part of Aids to Location Signs. Sign required when aerodrome is not adequately identified by other visual identification methods. Consists of name of aerodrome. Character are at least 10' in height. References: AD '51, '71

AIRFIELD DIRECTIONAL SIGNS/RUNWAY & TAXIWAY DIRECTIONAL SIGN. These are apparently informal variant names for the standard Direction Signs and conform to it. Reference: ATC

CAUTIONARY SIGNS. Term suggests relatively broad meaning. However, meaning is actually restricted: employed for informing pilots of runway/taxiway bridge. A dated term. Reference: ADS-AC '71

CONVENIENCE SIGNS. Provides directions to specific positions, locations (either aprons, or w/i aprons). References: SEPCO, Retroreflective Taxi Guidance Signs '70

DIRECTION SIGN. These Signs provide direction for taxiways that exit from intersections. They are Black on yellow; Arrows indicate direction of turning. There are two forms: Taxiway Direction Sign, Runway Exit Signs. Reference: Standard Airport Sign System '91

DIRECTION SIGNS FOR RUNWAY EXIT. Sign displays symbols of black on yellow. It includes letter and arrow. AIM '99 has a different configuration of Sign

names. This term and next two are forms of Direction Signs. Reference: AIM '99

DIRECTION SIGN FOR RUNWAY EXIT/DIRECTION SIGN ARRAY FOR SIMPLE INTERSECTIONS. Direction Sign Array with Location Sign positioned on far side of intersection. Reference: AIM '99

DISTANCE TO GO SIGN. This is, apparently, comparable to a Distance Remaining Sign. See Runway Distance Remaining Sign. Reference: G-H

ENTRANCE-EXIT SIGNS. Lighted Signs that identify taxiways, runways. Message patterns include: black on yellow for runway exits, taxiway intersections. Yellow on black for "Distinction Sign." White on Blue for "apron exit on taxiway supplementary information" application. White on red for runway distinction application. Reference: Omnipol

EXIT SIGNS. Sign provides identification from runway exit. References: IES '81, '87

ILS CRITICAL BOUNDARY SIGN. Denotes boundary of critical area. Aids aircrew in determining if they are outside that area. Black graphic on yellow ground. Graphic is of ILS Holding Position Surface Marking. Reference: AIM '99

INTERNALLY LIGHTED SIGNS/EXTERNALLY LIGHTED SIGN. These are terms primarily of physical apparatus. Reference: ADM '83

INTERSECTION SIGNS. This is a Taxiway Guidance Sign. It is infrequently employed since term usually prefaced by qualifying word. Denotes taxiway, runway intersections. References: IES '81, Standard Signs

NO ENTRY SIGN. Prohibit entrance to an area. Horizontal bar within circle on square ground. Somewhat akin to European TCD No Entry Sign. Reference: AD '90, AIP '99, ADM '83

SIGNS PROHIBITING AIRCRAFT ENTRY INTO AN AREA. Refers to No Entry Sign.
Reference: AIP '99

SPECIAL PURPOSE SIGN. Sign denotes entrance into "special condition areas".
A Taxiway Sign.
Reference: IES '81, '87

STATION SIGN. Markers on "Model Airway Route" (1928). Sign provides location information. Station Sign is an analogy with Station Signs at railroad station signs.
Reference: Making the Air Safe LD '28

STOP SIGNS. This is one of the Mandatory Signs. White inscription on red ground. It is placed where Mandatory stop is needed. It is within Taxiway Guidance Sign.
Reference: ADM '83

UNLIGHTED SIGNS. Probably overarching. Specific reference: one type of Taxiway Guidance Signs. Black symbols on yellow ground.
Reference: Specs Taxiway Guidance Signs '79

VOR AERODROME CHECK-POINT SIGN. This Sign adjoins Check-Point Marking. It displays several forms of information including: VOR denoting Marking is VOR Check- point/radio frequency/VOR reading/Distance to enclosed DME. It is lighted. Yellow symbols on dark ground (internally lighted), Dark symbols on yellow ground (externally lighted).
Reference: AD '71

c) Runway Signs

RUNWAY APPROACH AREA BOUNDARY SIGN. This Sign indicates when outside runway area.
Reference: Standards ... '91

RUNWAY APPROACH AREA HOLDING POSITION SIGN. Sign for HP when plane is in approach, departure area. Sign displays number for runway end (approach) with abbreviation for approach (APCH).
Reference: Standards for Airp Signs '91



RUNWAY BOUNDARY SIGN. Signs indicates runway boundary with black on yellow symbols. Graphic of HP Marking. See Also: Runway Safety Area.
Reference: AIM '99, AIP '99

RUNWAY DISTANCE REMAINING SIGNS/RUNWAY DISTANCE-REMAINING SIGNS. Indicates remaining distance on runway (1000' increments). White symbols on black ground. According to Standards these Signs are lighted when Runway Lights are on.
Reference: AIP '91, Standardsfor Airp Signs '91, AIP '99, Cegelec (hyphenated form)

RUNWAY EXIT SIGNS. One form of Direction Sign. Seemingly similar in appearance to Taxiway Direction Signs.
Reference: Standards for Airp Signs '91

RUNWAY HOLDING POSITION SIGN. Positioned at holding position on taxiways intersection with runways (or runways intersecting other runways). Inscription is for relevant threshold of runways (to left, to right).
References: AIP '99

RUNWAY INTERSECTION SIGNS. These are Signs at each of runway with numbers and letters. These are one form of Intersection Sign. Message of yellow symbols on black ground.
Reference: Taxiway Guidance Sign System '68

RUNWAY LOCATION SIGNS. Sign displays number that indicates adjacent runway. Numbers are yellow with black ground and yellow border.
Reference: AIP '99

RUNWAY MARKING SIGNS. This may suggest an overarching term but it refers specifically to Runway Designation Numbers & Letters (the latter for parallel runways). An historic term.
Reference: PICA0 '44

RUNWAY SIGNS. Overarching term for all forms. Specific reference is Runway Signs that are lighted (internally).
Reference: Curved Signs A.I. '89

RUNWAY SAFETY AREA/OFFZ & RUNWAY APPROACH AREA BOUNDARY SIGNS. Boundary Signs for Safety Area and Obstacle Free Zone (OFZ).
References: AIP '99, Standards for Airp Signs. '91

d) Taxiway Signs

NON-ILLUMINATED TAXIWAY GUIDANCE SIGNS. An older term that includes the lack of lighting in the title. It serves as an overarching term that includes Informational, Convenience, and other Sign forms.

Reference: SEPCO '78

SIGNS, TAXIWAY GUIDANCE/SIGNS, GUIDANCE/RETROREFLECTIVE TAXIWAY GUIDANCE SIGNS. These terms are older titles for the core term of Taxiway Guidance Sign. Two are of more bureaucratic nature (general term first then qualifying term) and one includes retroreflective in the title; that dimension of unlighted Signs is now a common place element and less often included.

References Ap L Eq 71, '73, '76, '82

TAXIWAY DIRECTION & LOCATION SIGNS. Sign array that includes both forms of Signs.

Reference: New Era FAA '92

TAXIWAY DIRECTION SIGNS. A Sign that indicates taxiway direction out of intersection; arrow indicates taxiway alignment.

Reference: Standards for Airp Sign Sys '91, New Era FAA '92

TAXIWAY IDENTIFICATION SIGN. Signs located at taxiway interesections, taxiway exits. Black symbols on yellow ground with black rim.

Reference: Standards ... '84

TAXIWAY GUIDANCE SIGN. This may present a specialized meaning. However it is frequently an overarching term for all kinds of Taxiway Signs. One reference (Standards '91) lists several subdivisions under the term: Mandatory Instruction Signs, Location, Direction, Taxiway Ending Marker, Destination and other forms. ADM '90 also employs it as an overarching term under headings of Mandatory and Information forms. AD arranges signs under Mandatory or Information headings and does not employ the term.

References: Standards for Airp Sign Sys '91, Specs for L-858 Retro Tx Guid Signs '79, ADM '90, IES '81, '87

TAXIWAY GUIDANCE SIGN SYSTEM. This Sign iis described as a "component of a surface movement guidance control system."

Reference: Standards for Airp Sign Sys '91

TAXIWAY LOCATION SIGNS. This Sign designates Taixway. It can free-standing or conjoined with Direction Signs.

Reference: AIP '99

TAXIWAY/RUNWAY INTERSECTION SIGNS. This a Mandatory Sign. Can be employed in place of Stop or HP Sign. It gives runway designation for ends of runways that intersect.

References: ADM '83, AD '99

TAXIWAY SIGNS. An overarching term for Taxiway Signs of all types.

Reference: Curved Signs AI '89, Cegelec, Txwy Guid Signs '68

TAXIWAY SIGN SYSTEM. Signs found at taxiway intersections or runway exits. Letters identify taxiways. Letters are black on yellow ground with black rim.

Reference: IES '87, Taxiway Guidance Signs System '68

e) Special Category: Holding Position Signs

CATEGORY II CRITICAL AREA HOLD LINES SIGN/CATEGORY II HOLD LINE SIGN. Second Sign marks ends of Hold Line Markings. First Sign employed on runways to denote crtical areas where Hold Line Markings are not employed on Runways. Hold Lines are seemingly older term for Holding Position Lines.

Reference: Txwy Guid Signs '68

HOLDING POSITION SIGN. Sign indicates entrances to runways, critical areas. Aircraft to hold before entering such an area. Release from air control (if none, hold until precaution are taken). Within Mandatory Instruction category. White symbols on red ground. Arrows rarely employed

Reference: Standards for Airp Sign Sys '91,

HOLDING POSITION SIGN AT BEGINNING TAKEOFF RUNWAY. Signs displays single number only. Employed at taxiway intersecting take off runway.

Reference: AIM '99

HOLDING POSITION SIGNS FOR APPROACH AREAS. Sign employed in approach area where plane on taxiway encroaches runway safety area or runway airspace. Sign displays runway number and abbreviation for approach (APCH).

Reference: AIM '99, AIP '99, Standards for Airp Sign Sys '91

HOLDING POSITION SIGN FOR ILS CRITICAL AEA/ILS HOLDING POSITION SIGN/ILS CRITICAL AREA BOUNDRY SIGN. Sign displays letters "ILS". Holdline at boundary of critical area.

Reference: AIP '99, Standards for Sign Sys '91

**HOLDING POSITION SIGNS FOR TAXIWAY/RUNWAY INTERSECTION/
HOLDING POSITION SIGN FOR RUNWAY/RUNWAY INTERSECTION.**
These Signs designate holding position by display of numbers. (Two such numbers are separated by dash)
Reference Standards '91

HOLDLINE SIGNS. Seemingly older name for Holding Position Signs. Follows HP format of white symbols on red ground.
Reference: Spec for T & R '83

ROAD-HOLDING POSITION SIGN. Denotes road entrance to roadways. White on red ground. Indicates stopping is mandatory; possible other requirements.
References: AD '99

RUNWAY-HOLDING POSITION SIGN. Denotes HP at extremity of runways, or at taxiway/runway intersection or runway/runway intersection.
Reference? AD '99

CAT I, II, III HOLDING POSITION SIGNS/CAT II HOLDING POSITION SIGNS/CAT II OR III HOLDING POSITION SIGNS/CAT II AND III HOLDING POSITION SIGNS. The several forms are very similar terms in various configurations. Signs identify holding position at runway threshold. Signs within Mandatory Instruction Signs and follow that configurations.
References: ADM '83, '93, AD '99, AD '71,

f) Sign Forms Other

DESTINATION SIGNS. The purpose of these Signs is to provide directions to "remote locations." Apparently an extension of Taxiway Direction Signs. Those Signs normally will suffice but confused situations, remote locations may require Destination Signs.

Two specific forms:

OUTBOUND DESTINATION SIGNS. Provide directions to takeoff runways with message composed of runway number and arrow.

INBOUND DESTINATION SIGNS. Provides information on different types of aprons, various services.



References include: Standards for Airp Sign Sys '91, AIP '91, '99

SURFACE PAINTED SIGNS.
General Note. In TCD Sign-like Aids on pavement are Markings not Signs (Horizontal dimension instead of vertical key element in deciding which are Signs and Markings; perhaps more than form of symbols). But in some major FAA publications Markings on pavement are Signs: Surface Painted Signs (though descriptive coverage can refer to Markings). Sign coverage greatly influences these Aids. Signs on pavement are very much the same as vertical forms. These Aids include the following forms. Selective notes are added when needed.

- SURFACE PAINTED TAXIWAY DIRECTION SIGN, AIM '99, AIP '99
- SURFACE PAINTED LOCATION SIGN, AIM '99, Standard for Airp Mkngs '99
- SURFACE PAINTED HOLDING POSITION SIGNS, AIP, Standards for Airp Mkngs '99
- SURFACE PAINTED SIGNS, AIM '99, ST '99
- SURFACE PAINTED GATES ID SIGN. Aid in locating of destination gates. Black symbols on yellow. Alphanumeric for gates printed on Signs.
Reference: Standard '99
- SURFACE PAINTED APRON ENTRANCE POINT SIGN. Sign aids in determining position on apron Standard for Airp Mkngs '99
- SURFACE PAINTED DIRECTION SIGN, AIP '99

GUIDANCE SIGN. Possibly equivalent of Information Signs. Commonly employed within context of taxiways: Taxiway Guidance Signs.
Reference: Berry II '92, R & T Edge Light '77, VI

INFORMATION SIGN. One form of Taxiway Guidance Signs. Sign gives location, route information.
Reference: Latest Development AI '91, IES '81

INFORMATIONAL SIGNS. Only a few sources employ term; possibly dated term. Possibly a variant form of Information Sign.
References: Retro Taxi Guidance Sign '70,, Specs for T and R, '83, VI

INFORMATIVE SIGN. Seemingly a variant name for major category of Information Sign. Denotes locations, destinations.
Reference: NATO '92

LOCATION SIGN. Denotes runway end, taxiway-runway intersection, taxiway/taxiway intersections. A form of Information Sign.

Reference: Berry IJ '92, ADM '93, AIM '99

MANDATORY INSTRUCTION SIGN. Older version spoke only of Mandatory Sign but both ICAO and FAA have added Instruction to name. Sign denotes areas which cannot be entered without air control approval. Signs include Runway Designation Signs, Holding Position Signs, No Entry Sign which see.
References: AIP '91, AD '71, AD '99

MANDATORY SIGN. Older name for key category of Signs. Denotes matters that could result in hazards if sign ignore. White on red ground.
References: IES '81

ROADWAY SIGNS. Refers to road intersecting with Runway, Taxiway.
Requires Standard Stop Sign.
Reference: Standard Airport Signs '91

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