

Digital Flight Data Format Specification



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Version:	2.00
Date:	October 21, 2024

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Revisions

Version	Date	Changes
2.00	17/10/2024	first public version

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1. Introduction

This document will define the complete dataset specifications of the Digital Flight Data (DFD) format. It is heavily inspired by the ARINC 424 specifications, though tailored to add-ons' use. Whenever possible, I use the same naming conventions as the ARINC specification to avoid confusion. I will also clearly indicate from which sections and record columns the data must be extracted.

We used the standard ARINC424-18 specification, but it should be compatible with 424-19/20. The dataset can be provided in three different formats:

1. ASCII text-file
2. SQLite format
3. in individual file formats (must be requested)

The DFD contains the primary records of the following record types (in parenthesis, the corresponding ARINC 424 section and subsection codes):

- Airports (PA)
- Enroute Airways (ER)
- Enroute NDB Nav aids (DB)
- Enroute Waypoints (EA)
- Holdings (EP)
- IAP - Instrument Arrival Procedures (PF)
- Localizer Marker (PM)
- Localizer/Glideslopes (PI)
- Runways (PG)
- SID – Standard Instrument Departure (PD)
- STAR – Standard Terminal Arrival Route (PE)
- Terminal NDB Nav aids (PN)
- Terminal Waypoints (PC)
- VHF Nav aids (D)
- Airport Communication (PV)
- Airport MSA (PS)
- Controlled Airspace (UC)
- Cruising Tables (TC)
- Enroute Airway Restriction (EU)
- Enroute Communication (EV)
- FIR/UIR (UF)

- Gate (PB)
- GLS (PT)
- Grid Mora (AS)
- Restrictive Airspace (UR)
- Path Point (PP)

1.1. Specification SQLite format

Filename: ng_jeppesen_fwdfd_XXXX.3sdb
(XXXX is the cycle-number)

1.2. Specification ASCII text-file format

All fields in the records are separated with a | character (vertical bar or ASCII 124). All blanks will be trimmed at the end of each field (excluding special marked fields – footnote)

2. Record/Field Specification

2.1. Header / Metadata

SQLite Table:

tbl_hdr_header

ASCII Format:

creator|cycle|data_provider|dataset_version|dataset|
effective_fromto|parsed_at|revision

<i>Field</i>	<i>Format</i>	<i>max. length</i>	<i>ARINC Ref</i>
creator	alphanumeric	16	
cycle	alphanumeric	4	
data_provider	alphanumeric	16	
dataset_version	alphanumeric	16	
dataset	alphanumeric	20	
effective_fromto	alphanumeric	10	
parsed_at	alphanumeric	22	
revision	alphanumeric	3	

Description:

- **creator:** company name (ex. Navigraph)
- **cycle:** valid AIRAC cycle (ex. 2410)
- **data_provider:** data provider (ex. Jeppesen)
- **dataset_version:** dataset specification version (Format: 2.0.xx.xxxx)
- **dataset:** name of the dataset (Format: NG_xxx...)
- **effective_fromto:** the date when the current AIRAC cycle starts/ends (Format DDMMDDMMYY– DD is the day, MM is the month, YY is the year) (ex. 0310301024)
- **parsed_at:** parsing/creation date of this AIRAC cycle (Format YYYY-MM-DD – HH:MM:SS in UTC)
- **revision:** revision of this AIRAC cycle (Format: xxx)

2.2. VHF Nav aids

SQLite Table:

tbl_d_vhfnavaids

ASCII Format:

```
airport_identifier|area_code|continent|country|datum_code|
dme_elevation|dme_ident|dme_latitude|dme_longitude|icao_code|
ilsdme_bias|magnetic_variation|navaid_class|navaid_frequency|
navaid_identifier|navaid_latitude|navaid_longitude|navaid_name|
range|station_declination
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
airport_identifier	alphanumeric	4	5.6
area_code	alphanumeric	3	5.3
continent	alphanumeric	40	-
country	alphanumeric	40	-
datum_code	alphanumeric	3	5.197
dme_elevation	numeric	-	5.40
dme_ident	alphanumeric	4	5.38
dme_latitude	numeric	-	5.36
dme_longitude	numeric	-	5.37
icao_code	alphanumeric	4	5.14
ilsdme_bias	numeric	-	5.90
magnetic_variation	numeric	-	5.39
navaid_class	alphanumeric	5	5.35
navaid_frequency	numeric	-	5.34
navaid_identifier	alphanumeric	4	5.33
navaid_latitude	numeric	-	5.36
navaid_longitude	numeric	-	5.37
navaid_name	alphanumeric	30	5.71
range	numeric	-	-
station_declination	numeric	-	5.66

Description:

- `airport_identifier`: four-character ICAO location identifier
- `area_code`: geographical area of the navaid
- `continent`: the continent in which the navaid is located
- `country`: the country in which the navaid is located
- `datum_code`: 3-letter code of the "local horizontal reference datum"
- `dme_elevation`: DME elevation in feet AMSL
- `dme_ident`: identification of a DME facility, a TACAN facility or the DME (or TACAN) component of a VORDME or VORTAC facility
- `dme_latitude`: DME latitude in degrees decimal floating point (N positive, S negative)
- `dme_longitude`: DME longitude in degrees decimal floating point (E positive, W negative)
- `icao_code`: 2-letter location indicator of the navaid
- `ilsdme_bias`: specify the DME offset
- `magnetic_variation`: magnetic north at the location
- `navaid_class`: navaid type, range/power, additional information & collocation (see appendix 3.1)
- `navaid_frequency`: navaid frequency in kHz
- `navaid_identifier`: navaid identifier
- `navaid_latitude`: navaid latitude in degrees decimal floating point (N positive, S negative)
- `navaid_longitude`: navaid longitude in degrees decimal floating point (E positive, W negative)
- `navaid_name`: navaid name
- `range`: distance in NM at which the signal can be received
- `station_declination`: the angular difference between true north and the zero degrees radial of the navaid in degrees

2.3. Enroute NDB Nav aids

SQLite Table:

tbl_db_enroute_ndbnav aids

ASCII Format:

area_code|continent|country|datum_code|icao_code|magnetic_variation|
navaid_class|navaid_frequency|navaid_identifier|navaid_latitude|
navaid_longitude|navaid_name|range

Field	Format	max.length	ARINC Ref
area_code	alphanumeric	3	5.3
continent	alphanumeric	40	-
country	alphanumeric	40	-
datum_code	alphanumeric	3	5.197
icao_code	alphanumeric	4	5.14
magnetic_variation	numeric	-	5.39
navaid_class	alphanumeric	5	5.35
navaid_frequency	numeric	-	5.34
navaid_identifier	alphanumeric	4	5.33
navaid_latitude	numeric	-	5.36
navaid_longitude	numeric	-	5.37
navaid_name	alphanumeric	30	5.71
range	numeric	-	-

Description:

- area_code: geographical area of the ndb
- continent: the continent in which the ndb is located
- country: the country in which the ndb is located
- datum_code: 3-letter code of the "local horizontal reference datum"
- icao_code: 2-letter location indicator of the ndb
- magnetic_variation: magnetic north at the location
- navaid_class: ndb type, range/power, additional information & collocation (see appendix 3.2)
- navaid_frequency: ndb frequency in MHz
- navaid_identifier: ndb identifier
- navaid_latitude: ndb latitude in degrees decimal floating point (N positive, S negative)
- navaid_longitude: ndb longitude in degrees decimal floating point (E positive, W negative)
- navaid_name: ndb name
- range: distance in NM at which the signal can be received

2.4. Terminal NDB Nav aids

SQLite Table:

tbl_pn_terminal_ndbnav aids

ASCII Format:

Airport_identifier|area_code|continent|country|datum_code|icao_code|
magnetic_variation|navaid_class|navaid_frequency|navaid_identifier|
navaid_latitude|navaid_longitude|navaid_name|range

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
airport_identifier	alphanumeric	4	5.6
area_code	alphanumeric	3	5.3
continent	alphanumeric	40	-
country	alphanumeric	40	-
datum_code	alphanumeric	3	5.197
icao_code	alphanumeric	4	5.14
magnetic_variation	numeric	-	5.39
navaid_class	alphanumeric	5	5.35
navaid_frequency	numeric	-	5.34
navaid_identifier	alphanumeric	4	5.33
navaid_latitude	numeric	-	5.36
navaid_longitude	numeric	-	5.37
navaid_name	alphanumeric	30	5.71
range	numeric	-	-

Description:

- `airport_identifier`: four-character ICAO location identifier
- `area_code`: geographical area of the ndb
- `continent`: the continent in which the ndb is located
- `country`: the country in which the ndb is located
- `datum_code`: 3-letter code of the "local horizontal reference datum"
- `icao_code`: 2-letter location indicator of the ndb
- `magnetic_variation`: magnetic north at the location
- `navaid_class`: ndb type, range/power, additional information & collocation (see appendix 3.1)
- `navaid_frequency`: ndb frequency in MHz
- `navaid_identifier`: ndb identifier
- `navaid_latitude`: ndb latitude in degrees decimal floating point (N positive, S negative)
- `navaid_longitude`: ndb longitude in degrees decimal floating point (E positive, W negative)
- `navaid_name`: ndb name
- `range`: distance in NM at which the signal can be received

2.5. Enroute Waypoints

SQLite Table:

tbl_ea_enroute_waypoints

ASCII Format:

area_code|continent|country|datum_code|icao_code|magnetic_variation|
waypoint_identifier|waypoint_latitude|waypoint_longitude|
waypoint_name|waypoint_type|waypoint_usage

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
area_code	alphanumeric	3	5.3
continent	alphanumeric	40	-
country	alphanumeric	40	-
datum_code	alphanumeric	3	5.197
icao_code	alphanumeric	4	5.14
magnetic_variation	numeric	-	5.39
waypoint_identifier	alphanumeric	5	5.13
waypoint_latitude	numeric	-	5.36
waypoint_longitude	numeric	-	5.37
waypoint_name	alphanumeric	25	5.43
waypoint_type	alphanumeric	3	5.42
waypoint_usage	alphanumeric	2	5.82

Description:

- **area_code**: geographical area of the waypoint
- **continent**: continent in which the waypoint is located
- **country**: the country in which the waypoint is located
- **datum_code**: 3-letter code of the "local horizontal reference datum"
- **icao_code**: 2-letter location indicator of the waypoint
- **magnetic_variation**: magnetic north at the location
- **waypoint_identifier**: waypoint identifier
- **waypoint_latitude**: waypoint latitude in degrees decimal floating point (N positive, S negative)
- **waypoint_longitude**: waypoint longitude in degrees decimal floating point (E positive, W negative)
- **waypoint_name**: waypoint name
- **waypoint_type**: waypoint type (see appendix 3.4)
- **waypoint_usage**: waypoint usage (see appendix 3.8)

2.6. Terminal Waypoints

SQLite Table:

tbl_pc_terminal_waypoints

ASCII Format:

area_code|continent|country|datum_code|icao_code|magnetic_variation|
region_code|waypoint_identifier|waypoint_latitude|
waypoint_longitude|waypoint_name|waypoint_type

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
area_code	alphanumeric	3	5.3
continent	alphanumeric	40	-
country	alphanumeric	40	-
datum_code	alphanumeric	3	5.197
icao_code	alphanumeric	4	5.14
magnetic_variation	numeric	-	5.39
region_code	alphanumeric	4	5.41
waypoint_identifier	alphanumeric	5	5.13
waypoint_latitude	numeric	-	5.36
waypoint_longitude	numeric	-	5.37
waypoint_name	alphanumeric	25	5.43
waypoint_type	alphanumeric	3	5.42

Description:

- **area_code**: geographical area of the terminal waypoint
- **continent**: continent in which the terminal waypoint is located
- **country**: the country in which the terminal waypoint is located
- **datum_code**: 3-letter code of the "local horizontal reference datum"
- **icao_code**: 2-letter location indicator of the terminal waypoint
- **magnetic_variation**: magnetic north at the location
- **region_code**: airport identification code for the terminal waypoint
- **waypoint_identifier**: terminal waypoint identifier
- **waypoint_latitude**: terminal waypoint latitude in degrees decimal floating point (N positive, S negative)
- **waypoint_longitude**: terminal waypoint longitude in degrees decimal floating point (E positive, W negative)
- **waypoint_name**: terminal waypoint name
- **waypoint_type**: terminal waypoint type (see appendix 3.5)

2.7. Holdings

SQLite Table:

tbl_ep_holdings

ASCII Format:

area_code|duplicate_identifier|holding_name|holding_speed|icao_code|
inbound_holding_course|leg_length|leg_time|maximum_altitude|
minimum_altitude|region_code|turn_direction|waypoint_identifier|
waypoint_latitude|waypoint_longitude|waypoint_ref_table

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
area_code	alphanumeric	3	5.3
duplicate_identifier	numeric	-	5.114
holding_name	alphanumeric	25	5.60
holding_speed	numeric	-	5.175
icao_code	alphanumeric	2	5.14
inbound_holding_course	numeric	-	5.62
leg_length	numeric	-	5.64
leg_time	numeric	-	5.65
maximum_altitude	numeric	-	5.127
minimum_altitude	numeric	-	5.30
region_code	alphanumeric	4	5.41
turn_direction	alphanumeric	1	5.63
waypoint_identifier	alphanumeric	5	5.13
waypoint_latitude	numeric	-	5.36
waypoint_longitude	numeric	-	5.37
waypoint_ref_table	alphanumeric	2	-

Description:

- `area_code`: geographical area of the waypoint
- `duplicate_identifier`: used for more than one holding pattern for a single navaid or waypoint
- `holding_name`: holding name
- `holding_speed`: holding speed limit in knots
- `icao_code`: location indicator of the waypoint
- `inbound_holding_course`: inbound magnetic course in degrees floating point
- `leg_length`: inbound leg length in nautical miles, decimal floating point
- `leg_time`: inbound leg time in minutes, decimal floating point
- `maximum_altitude`: contain altitudes in feet or flight level
- `minimum_altitude`: contain altitudes in feet or flight level
- `region_code`: static text ENRT or airport identification code
- `turn_direction`: holding turn direction (see appendix 3.9)
- `waypoint_identifier`: navaid or waypoint identifier
- `waypoint_latitude`: navaid or waypoint latitude in degrees decimal floating point (N positive, S negative)
- `waypoint_longitude`: navaid or waypoint longitude in degrees decimal floating point (E positive, W negative)
- `waypont_ref_table`: reference table for more information about the specific waypoint

2.8. Enroute Airways

SQLite Table:

tbl_er_enroute_airways

ASCII Format:

```
area_code|crusing_table_identifier|direction_restriction|
flightlevel|icao_code|inbound_course|inbound_distance|
maximum_altitude|minimum_altitude1|minimum_altitude2|
outbound_course|route_identifier_postfix|route_identifier|
route_type|seqno|waypoint_description_code|waypoint_identifier|
waypoint_latitude|waypoint_longitude|waypoint_ref_table
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
area_code	alphanumeric	3	5.3
crusing_table_identifier	alphanumeric	2	5.134
direction_restriction	alphanumeric	1	5.115
flightlevel	alphanumeric	1	5.19
icao_code	alphanumeric	2	5.14
inbound_course	numeric	-	5.28
inbound_distance	numeric	-	5.27
maximum_altitude	numeric	-	5.127
minimum_altitude1	numeric	-	5.30
minimum_altitude2	numeric	-	5.30
outbound_course	numeric	-	5.26
route_identifier_postfix	alphanumeric	1	5.8
route_identifier	alphanumeric	6	5.8
route_type	alphanumeric	1	5.7
seqno	numeric	-	5.12
waypoint_description_code	alphanumeric	4	5.17
waypoint_identifier	alphanumeric	5	5.13
waypoint_latitude	numeric	-	5.36
waypoint_longitude	numeric	-	5.37
waypoint_ref_table	alphanumeric	2	-

Description:

- `area_code`: geographical area of the waypoint
- `cruising_table_identifier`: indicate the cruising table (see appendix 3.6)
- `direction_restriction`: indicate the flyable direction (see appendix 3.15)
- `flightlevel`: defines the airway structure (see appendix 3.14)
- `icao_code`: location indicator of the waypoint
- `inbound_course`: inbound magnetic course to the waypoint identified
- `inbound_distance`: contain segment distances/along track distances/excursion distances/DME distances in nautical miles
- `maximum_altitude`: contain altitudes in feet
- `minimum_altitude1`: contain altitudes in feet
- `minimum_altitude2`: contain altitudes in feet
- `outbound_course`: outbound magnetic course from the waypoint identified
- `route_identifier_postfix`: postfix character for the `route_identifier`
- `route_identifier`: enroute route identifier
- `route_type`: indicated the route type (see appendix 3.103.10)
- `seqno`: sort order of each enroute airway, no duplicate sequences per airway are possible
- `waypoint_description_code`: provides information on the type of fix (see appendix 3.3)
- `waypoint_identifier`: navaid or waypoint identifier
- `waypoint_latitude`: navaid or waypoint latitude in degrees decimal floating point (N positive, S negative)
- `waypoint_longitude`: navaid or waypoint longitude in degrees decimal floating point (E positive, W negative)
- `waypoint_ref_table`: reference table for more information about the specific waypoint

2.9. Airports

SQLite Table:

tbl_pa_airports

ASCII Format:

```
airport_identifier|airport_name|airport_ref_latitude|
airport_ref_longitude|airport_type|area_code|ata_iata_code|city|
continent|country_3letter|country|elevation|fuel|icao_code|
ifr_capability|longest_runway_surface_code|magnetic_variation|
speed_limit_altitude|speed_limit|state_2letter|state|time_zone|
transition_altitude|transition_level
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
airport_identifier	alphanumeric	4	5.6
airport_name	alphanumeric	30	5.71
airport_ref_latitude	numeric	-	5.36
airport_ref_longitude	numeric	-	5.37
airport_type	alphanumeric	1	5.177
area_code	alphanumeric	3	5.3
ata_iata_code	alphanumeric	3	5.107
city	alphanumeric	24	-
continent	alphanumeric	40	-
country_3letter	alphanumeric	3	-
country	alphanumeric	40	-
elevation	numeric	-	5.55
fuel	alphanumeric	14	JS5.5
icao_code	alphanumeric	2	5.14
ifr_capability	alphanumeric	1	5.108
longest_runway_surface_code	alphanumeric	1	5.54
magnetic_variation	numeric	-	5.39
speed_limit_altitude	alphanumeric	5	5.73
speed_limit	numeric	-	5.72
state_2letter	alphanumeric	2	-
state	alphanumeric	50	-
time_zone	alphanumeric	3	5.178
transition_altitude	numeric	-	5.53
transition_level	numeric	-	5.53

Description:

- `airport_identifier`: four character ICAO location identifier
- `airport_name`: airport name
- `airport_ref_latitude`: airport reference latitude in degrees decimal floating point (N positive, S negative)
- `airport_ref_longitude`: airport reference longitude in degrees decimal floating point (E positive, W negative)
- `airport_type`: defines the type of airport (see appendix 3.38)
- `area_code`: geographical area of the airport
- `ata_iata_code`: IATA/ATA airport designator code
- `city`: the city where the airport is located
- `continent`: the continent where the airport is located
- `country_3letter`: 3-letter country code of the airport
- `country`: the country where the airport is located
- `elevation`: elevation in feet above MSL
- `fuel`: available fuel specification (see appendix 3.39)
- `icao_code`: location indicator of the airport
- `ifr_capability`: indicates if the airport has a published IAP (see appendix 3.16)
- `longest_runway_surface_code`: define if there is a hard runway or not (see appendix 3.17)
- `magnetic_variation`: magnetic north at the location
- `speed_limit_altitude`: altitude below which speed limit may be imposed (feet or flight level)
- `speed_limit`: speed limit in knots
- `state_2letter`: 2-letter state code
- `state`: the state where the airport is located
- `time_zone`: time zone where the airport is located (see appendix 3.40)
- `transition_altitude`: transition altitude in feet
- `transition_level`: transition level in feet

2.10. Runways

SQLite Table:

tbl_pg_runways

ASCII Format:

```
airport_identifier|area_code|displaced_threshold_distance|icao_code|
landing_threshold_elevation|llz_identifier|llz_mls_gls_category|
part_time_lights|runway_gradient|runway_identifier|runway_latitude|
runway_length|runway_lights|runway_longitude|
runway_magnetic_bearing|runway_true_bearing|runway_width|
surface_code|threshold_crossing_height|traffic_pattern|
altitude_pattern_altitude
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
airport_identifier	alphanumeric	4	5.3
area_code	alphanumeric	3	5.14
displaced_threshold_distance	numeric	-	5.6
icao_code	alphanumeric	2	5.46
landing_threshold_elevation	numeric	-	5.36
llz_identifier	alphanumeric	4	5.37
llz_mls_gls_category	alphanumeric	1	5.212
part_time_lights	alphanumeric	1	5.58
runway_gradient	numeric	-	5.94
runway_identifier	alphanumeric	3	5.68
runway_latitude	numeric	-	5.69
runway_length	numeric	-	5.67
runway_lights	alphanumeric	1	5.57
runway_longitude	numeric	-	5.109
runway_magnetic_bearing	numeric	-	5.44
runway_true_bearing	numeric	-	5.80
runway_width	numeric	-	
surface_code	alphanumeric	3	JS5.19
threshold_crossing_height	numeric	-	
traffic_pattern	alphanumeric	1	JS5.27
traffic_pattern_altitude	numeric	-	JS5.9

Description:

- `airport_identifier`: four character ICAO location identifier
- `area_code`: geographical area of the runway
- `displaced_threshold_distance`: distance from the extremity of a runway to a threshold in feet
- `icao_code`: location indicator of the runway
- `landing_theshold_elevation`: elevation of the landing threshold in feet
- `llz_identifier`: ILS/MLS/GLS facility
- `llz_mls_gls_category`: ILS/MLS/GLS performance categories (see appendix 3.18)
- `part_time_lights`: part time/full time runway lights (see appendix 3.41)
- `runway_gradient`: overall gradient in percent (positive is upward, negative is downward)
- `runway_identifier`: runway identifier
- `runway_latitude`: runway latitude in degrees decimal floating point (N positive, S negative)
- `runway_length`: runway length in feet
- `runway_lights`: runway lights existing (see appendix 3.42)
- `runway_longitude`: runway longitude in degrees decimal floating point (E positive, W negative)
- `runway_magnetic_bearing`: magnetic bearing of the runway identifier
- `runway_true_bearing`: true bearing of the runway identifier
- `runway_width`: runway width in feet
- `surface_code`: runway surface code
- `threshold_crossing_height`: height above the landing threshold on a normal glide path
- `traffic_pattern`: left/right traffic pattern (see appendix 3.43)
- `traffic_pattern_altitude`: indicate the height above the ground on a traffic pattern

2.11. Localizers/Glideslopes

SQLite Table:

tbl_pi_localizers_glideslopes

ASCII Format:

```
airport_identifier|area_code|gs_angle|gs_elevation|gs_latitude|
gs_longitude|icao_code|ils_mls_gls_category|llz_bearing|
llz_frequency|llz_identifier|llz_latitude|llz_longitude|
llz_truebearing|llz_width|runway_identifier|station_declination
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
airport_identifier	alphanumeric	4	5.3
area_code	alphanumeric	3	5.14
gs_angle	numeric	-	5.52
gs_elevation	numeric	-	5.74
gs_latitude	numeric	-	5.36
gs_longitude	numeric	-	5.37
icao_code	alphanumeric	2	5.14
ils_mls_gls_category	alphanumeric	1	5.80
llz_bearing	numeric	-	5.47
llz_frequency	numeric	-	5.45
llz_identifier	alphanumeric	4	5.44
llz_latitude	numeric	-	5.36
llz_longitude	numeric	-	5.37
llz_truebearing	numeric	-	5.94
llz_width	numeric	-	5.51
runway_identifier	alphanumeric	3	5.46
station_declination	numeric	-	5.66

Description:

- `airport_identifier`: four character ICAO location identifier
- `area_code`: geographical area of the localizer
- `gs_angle`: glide slope angle of an ILS facility/GLS approach in degrees
- `gs_elevation`: elevation of LLZ in feet
- `gs_latitude`: GS latitude in degrees decimal floating point (N positive, S negative)
- `gs_longitude`: GS longitude in degrees decimal floating point (E positive, W negative)
- `icao_code`: location indicator of the localizer
- `ils_mls_gls_category`: ILS/MLS/GLS performance categories (see appendix 3.18)
- `llz_bearing`: magnetic bearing of the localizer course
- `llz_frequency`: VHF frequency of the facility in MHz
- `llz_identifier`: identification code of the LLZ, MLS facility or GLS reference path
- `llz_latitude`: LLZ latitude in degrees decimal floating point (N positive, S negative)
- `llz_longitude`: LLZ longitude in degrees decimal floating point (E positive, W negative)
- `llz_truebearing`: true bearing of the localizer course
- `llz_width`: specifies the localizer course width (in degrees) of the ILS facility
- `runway_identifier`: runway identifier
- `station_declination`: angular difference between true north and the zero degree radial of the LLZ in degrees

2.12. Localizer Marker

SQLite Table:

tbl_pm_localizer_marker

ASCII Format:

```
airport_identifier|area_code|icao_code|llz_identifier|  
marker_identifier|marker_latitude|marker_longitude|marker_type|  
runway_identifier
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
airport_identifier	alphanumeric	4	5.3
area_code	alphanumeric	3	5.14
icao_code	alphanumeric	2	5.14
llz_identifier	alphanumeric	4	5.44
marker_identifier	alphanumeric	5	5.33
marker_latitude	numeric	-	5.36
marker_longitude	numeric	-	5.37
marker_type	alphanumeric	3	5.36
runway_identifier	alphanumeric	5	5.47

Description:

- **airport_identifier:** four character ICAO location identifier
- **area_code:** geographical area of the marker
- **icao_code:** location indicator of the marker
- **llz_identifier:** identification code of the LLZ, MLS facility or GLS reference path
- **marker_identifier:** marker identifier
- **marker_latitude:** marker latitude in degrees decimal floating point (N positive, S negative)
- **marker_longitude:** marker longitude in degrees decimal floating point (E positive, W negative)
- **marker_type:** defines the type of marker (see appendix 3.19)
- **runway_identifier:** runway identifier

2.13. Terminal Procedures (SID/STAR)

SQLite Table:

tbl_pd_sids
tbl_pe_stars

ASCII Format:

airport_identifier|altitude_description|altitude1|altitude2|
arc_radius|area_code|authorization_required|
center_waypoint_icao_code|center_waypoint_latitude|
center_waypoint_longitude|center_waypoint_ref_table|
center_waypoint|course_flag|course|distance_time|path_termination|
procedure_identifier|recommended_navaid_icao_code|
recommended_navaid_latitude|recommended_navaid_longitude|
recommended_navaid_ref_table|recommended_navaid|rho|rnp|
route_distance_holding_distance_time|route_type|seqno|
speed_limit_description|speed_limit|theta|transition_altitude|
transition_identifier|turn_direction|vertical_angle|
waypoint_description_code|waypoint_icao_code|waypoint_identifier|
waypoint_latitude|waypoint_longitude|waypoint_ref_table

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
airport_identifier	alphanumeric	4	5.6
altitude_description	alphanumeric	1	5.29
altitude1	numeric	-	5.30
altitude2	numeric	-	5.30
arc_radius	numeric	-	5.204
area_code	alphanumeric	3	5.3
authorization_required	alphanumeric	1	-
center_waypoint_icao_code	alphanumeric	2	5.14
center_waypoint_latitude	numeric	-	5.36
center_waypoint_longitude	numeric	-	5.37
center_waypoint_ref_table	alphanumeric	2	-
center_waypoint	alphanumeric	5	5.144
course_flag	alphanumeric	1	-
course	numeric	-	5.26
distance_time	numeric	-	5.27
path_termination	alphanumeric	2	5.21
procedure_identifier	alphanumeric	6	5.9/10
recommended_navaid_icao_code	alphanumeric	2	5.14
recommended_navaid_latitude	numeric	-	5.36
recommended_navaid_longitude	numeric	-	5.37
recommended_navaid_ref_table	alphanumeric	2	-
recommended_navaid	alphanumeric	4	5.23
rho	numeric	-	5.25
rnp	numeric	-	5.211
route_distance_holding_distance_time	alphanumeric	1	-
route_type	alphanumeric	1	5.7
seqno	numeric	-	5.12
speed_limit_description	alphanumeric	1	5.261
speed_limit	numeric	-	5.72
theta	numeric	-	5.24
transition_altitude	numeric	-	5.53
transition_identifier	alphanumeric	5	5.11
turn_direction	alphanumeric	1	5.20
vertical_angle	numeric	-	5.70
waypoint_description_code	alphanumeric	4	5.17
waypoint_icao_code	alphanumeric	2	5.14
waypoint_identifier	alphanumeric	5	5.13
waypoint_latitude	numeric	-	5.36
waypoint_longitude	numeric	-	5.37
waypoint_ref_table	alphanumeric	2	-

Description:

- `airport_identifier`: four character ICAO location identifier
- `altitude_description`: designate whether a waypoint should be crossed (see appendix 3.25)
- `altitude1`: contain altitudes in feet or flight level
- `altitude2`: contain altitudes in feet or flight level
- `arc_radius`: used to define the radius of a precision turn
- `area_code`: geographical area of the procedure
- `authorization_required`: indicates, if this procedure needs special authorization (AR procedures)
- `center_waypoint_icao_code`: location indicator of the center waypoint
- `center_waypoint_latitude`: center fix latitude in degrees decimal floating point (N positive, S negative)
- `center_waypoint_longitude`: center fix longitude in degrees decimal floating point (E positive, W negative)
- `center_waypoint_ref_table`: reference table for more information about the specific center waypoint
- `center_waypoint`: represents the MSA Center, that point (Navaid or Waypoint) on which the MSA is predicated
- `course_flag`: magnetic or true flag (see appendix 3.44)
- `course`: outbound course from the waypoint identified in the record's "waypoint_identifier" field
- `distance_time`: indicates, if the value in the "route_distance_holding_distance_time" column references to a time value, or distance value (see appendix 3.37)
- `path_termination`: defines the path geometry for a single record of an terminal procedure (see appendix 3.22)
- `procedure_identifier`: name of the terminal procedure
- `recommended_navaid_icao_code`: location indicator of the navaid
- `recommended_navaid_latitude`: recommended navaid latitude in degrees decimal floating point (N positive, S negative)
- `recommended_navaid_longitude`: recommended navaid longitude in degrees decimal floating point (E positive, W negative)
- `recommended_navaid_ref_table`: reference table for more information about the specific navaid
- `recommended_navaid`: reference facility for the waypoint
- `rho`: defined as the geodesic distance in nautical miles to the waypoint identified in the record's "waypoint_identifier" field from the "recommended_navaid_identifier" field
- `rnp`: statement of the Navigation Performance necessary for operation within a defined airspace in accordance with ICAO Annex 15 and/or State published rules
- `route_distance_holding_distance_time`: contain segment distances/along track distances/excursion distances/DME distances

- `route_type`: element of the terminal procedure (see appendix 3.11, 3.12)
- `seqno`: sequence definition phase of the terminal procedure
- `speed_limit_description`: designate whether the speed limit coded at a waypoint in a terminal procedure description is a mandatory, minimum or maximum speed (see appendix 3.23)
- `speed_limit`: speed limit in knots
- `theta`: defined as the magnetic bearing to the waypoint identified in the record's "waypoint_identifier" field from the "recommended_navaid_identifier" field
- `transition_altitude`: transition altitude in feet
- `transition_identifier`: describes the type of transition to be made from the enroute environment into the terminal area and vice versa
- `turn_direction`: turn direction (see appendix 3.9)
- `vertical_angle`: defines the vertical navigation path prescribed for the procedure
- `waypoint_description_code`: the field provides information on the type of fix (see appendix 3.3)
- `waypoint_icao_code`: location indicator of the waypoint
- `waypoint_identifier`: navaid or waypoint identifier
- `waypoint_latitude`: navaid or waypoint latitude in degrees decimal floating point (N positive, S negative)
- `waypoint_longitude`: navaid or waypoint latitude in degrees decimal floating point (N positive, S negative)
- `waypoint_ref_table`: reference table for more information about the specific waypoint

2.14. Terminal Procedures (IAP)

SQLite Table:

tbl_pf_iaps

ASCII Format:

```
airport_identifier|altitude_description|altitude1|altitude2|
arc_radius|area_code|authorization_required|
center_waypoint_icao_code|center_waypoint_latitude|
center_waypoint_longitude|center_waypoint_ref_table|
center_waypoint|course_flag|course|distance_time|
gnss_fms_indication|lnav_authorized_sbas|lnav_level_service_name|
lnav_vnav_authorized_sbas|lnav_vnav_level_service_name|
path_termination|procedure_identifier|recommended_navaid_icao_code|
recommended_navaid_latitude|recommended_navaid_longitude|
recommended_navaid_ref_table|recommended_navaid|rho|rnp|
route_distance_holding_distance_time|route_type|seqno|
speed_limit_description|speed_limit|theta|transition_altitude|
transition_identifier|turn_direction|vertical_angle|
waypoint_description_code|waypoint_icao_code|waypoint_identifier|
waypoint_latitude|waypoint_longitude|waypoint_ref_table
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
airport_identifier	alphanumeric	4	5.6
altitude_description	alphanumeric	1	5.29
altitude1	numeric	-	5.30
altitude2	numeric	-	5.30
arc_radius	numeric	-	5.204
area_code	alphanumeric	3	5.3
authorization_required	alphanumeric	1	-
center_waypoint_icao_code	alphanumeric	2	5.14
center_waypoint_latitude	numeric	-	5.36
center_waypoint_longitude	numeric	-	5.37
center_waypoint_ref_table	alphanumeric	2	-
center_waypoint	alphanumeric	5	5.144
course_flag	alphanumeric	1	-
course	numeric	-	5.26
distance_time	numeric	-	5.27
gnss_fms_indication	alphanumeric	1	5.222
lnav_authorized_sbbs	alphanumeric	1	5.276
lnav_level_service_name	alphanumeric	1	5.275
lnav_vnav_authorized_sbbs	alphanumeric	1	5.276
lnav_vnav_level_service_name	alphanumeric	1	5.275
path_termination	alphanumeric	2	5.21
procedure_identifier	alphanumeric	6	5.9/10
recommended_navaid_icao_code	alphanumeric	2	5.14
recommended_navaid_latitude	numeric	-	5.36
recommended_navaid_longitude	numeric	-	5.37
recommended_navaid_ref_table	alphanumeric	2	-
recommended_navaid	alphanumeric	4	5.23
rho	numeric	-	5.25
rnp	numeric	-	5.211
route_distance_holding_distance_time	alphanumeric	1	-
route_type	alphanumeric	1	5.7
seqno	numeric	-	5.12
speed_limit_description	alphanumeric	1	5.261
speed_limit	numeric	-	5.72
theta	numeric	-	5.24
transition_altitude	numeric	-	5.53
transition_identifier	alphanumeric	5	5.11
turn_direction	alphanumeric	1	5.20
vertical_angle	numeric	-	5.70
waypoint_description_code	alphanumeric	4	5.17

waypoint_icao_code	alphanumeric	2	5.14
waypoint_identifier	alphanumeric	5	5.13
waypoint_latitude	numeric	-	5.36
waypoint_longitude	numeric	-	5.37
waypoint_ref_table	alphanumeric	2	-

Description:

- `airport_identifier`: four character ICAO location identifier
- `altitude_description`: designate whether a waypoint should be crossed (see appendix 3.25)
- `altitude1`: contain altitudes in feet or flight level
- `altitude2`: contain altitudes in feet or flight level
- `arc_radius`: used to define the radius of a precision turn
- `area_code`: geographical area of the procedure
- `authorization_required`: indicates, if this procedure needs special authorization (AR procedures)
- `center_waypoint_icao_code`: location indicator of the center waypoint
- `center_waypoint_latitude`: center fix latitude in degrees decimal floating point (N positive, S negative)
- `center_waypoint_longitude`: center fix longitude in degrees decimal floating point (E positive, W negative)
- `center_waypoint_ref_table`: reference table for more information about the specific center waypoint
- `center_waypoint`: represents the MSA Center, that point (Navaid or Waypoint) on which the MSA is predicated
- `course_flag`: magnetic or true flag (see appendix 3.44)
- `course`: outbound course from the waypoint identified in the record's "waypoint_identifier" field
- `distance_time`: indicates, if the value in the "route_distance_holding_distance_time" column references to a time value, or distance value (see appendix 3.37)
- `gnss_fms_indication`: RNAV procedure has been authorized for GNSS based vertical navigation (see appendix 3.45)
- `lnav_authorized_sbass`: Level of Service authorized or not (see appendix 3.46)
- `lnav_level_service_name`: procedure level of service based on published procedure operating minimums information – authorized for SBAS
- `lnav_vnav_authorized_sbass`: Level of Service authorized or not (see appendix 3.46)
- `lnav_vnav_level_service_name`: procedure level of service based on published procedure operating minimums information – authorized for SBAS
- `path_termination`: defines the path geometry for a single record of an terminal procedure (see appendix 3.22)
- `procedure_identifier`: name of the terminal procedure
- `recommended_navaid_icao_code`: location indicator of the navaid
- `recommended_navaid_latitude`: recommended navaid latitude in degrees decimal floating point (N positive, S negative)
- `recommended_navaid_longitude`: recommended navaid longitude in degrees decimal floating point (E positive, W negative)

- `recommended_navaid_ref_table`: reference table for more information about the specific navaid
- `recommended_navaid`: reference facility for the waypoint
- `rho`: defined as the geodesic distance in nautical miles to the waypoint identified in the record's "waypoint_identifier" field from the "recommended_navaid_identifier" field
- `rnnp`: statement of the Navigation Performance necessary for operation within a defined airspace in accordance with ICAO Annex 15 and/or State published rules
- `route_distance_holding_distance_time`: contain segment distances/along track distances/excursion distances/DME distances
- `route_type`: element of the terminal procedure (see appendix 3.13)
- `seqno`: sequence definition phase of the terminal procedure
- `speed_limit_description`: designate whether the speed limit coded at a waypoint in a terminal procedure description is a mandatory, minimum or maximum speed (see appendix 3.23)
- `speed_limit`: speed limit in knots
- `theta`: defined as the magnetic bearing to the waypoint identified in the record's "waypoint_identifier" field from the "recommended_navaid_identifier" field
- `transition_altitude`: transition altitude in feet
- `transition_identifier`: describes the type of transition to be made from the enroute environment into the terminal area and vice versa
- `turn_direction`: turn direction (see appendix 3.9)
- `vertical_angle`: defines the vertical navigation path prescribed for the procedure
- `waypoint_description_code`: the field provides information on the type of fix (see appendix 3.3)
- `waypoint_icao_code`: location indicator of the waypoint
- `waypoint_identifier`: navaid or waypoint identifier
- `waypoint_latitude`: navaid or waypoint latitude in degrees decimal floating point (N positive, S negative)
- `waypoint_longitude`: navaid or waypoint latitude in degrees decimal floating point (N positive, S negative)
- `waypoint_ref_table`: reference table for more information about the specific waypoint

2.15. Airport Communication

SQLite Table:

tbl_pv_airport_communication

ASCII Format:

```
airport_identifier|area_code|callsign|communication_frequency|
communication_type|frequency_units|guard_transmit|icao_code|
latitude|longitude|narrative|remote_facility_icao_code|
remote_facility|sector_facility_icao_code|sector_facility|
sectorization|service_indicator|time_of_operation_1|
time_of_operation_2|time_of_operation_3|time_of_operation_4|
time_of_operation_5|time_of_operation_6|time_of_operation_7
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
airport_identifier	alphanumeric	4	5.6
area_code	alphanumeric	3	5.3
callsign	alphanumeric	25	5.105
communication_frequency	numeric	-	5.103
communication_type	alphanumeric	3	5.101
frequency_units	alphanumeric	1	5.104
guard_transmit	alphanumeric	1	5.182
icao_code	alphanumeric	2	5.14
latitude	numeric	-	5.36
longitude	numeric	-	5.37
narrative	alphanumeric	60	-
remote_facility_icao_code	alphanumeric	2	5.14
remote_facility	alphanumeric	4	5.200
sector_facility_icao_code	alphanumeric	2	5.14
sector_facility	alphanumeric	4	5.185
sectorization	alphanumeric	6	5.183
service_indicator	alphanumeric	3	5.106
time_of_operation_1	alphanumeric	10	5.195
time_of_operation_2	alphanumeric	10	5.195
time_of_operation_3	alphanumeric	10	5.195
time_of_operation_4	alphanumeric	10	5.195
time_of_operation_5	alphanumeric	10	5.195
time_of_operation_6	alphanumeric	10	5.195
time_of_operation_7	alphanumeric	10	5.195

Description:

- `airport_identifier`: four character ICAO location identifier
- `area_code`: geographical area of the facility
- `callsign`: name of the facility being called
- `communication_frequency`: specifies a frequency for the facility identified in the communication type field
- `communication_type`: specifies the type of communication unit (see appendix 3.33)
- `frequency_units`: designate the frequency spectrum area for the frequency (see appendix 3.31)
- `guard_transmit`: receive voice communications or transmit voice communications (see appendix 3.47)
- `icao_code`: location indicator of the facility
- `latitude`: latitude in degrees decimal floating point (N positive, S negative)
- `longitude`: longitude in degrees decimal floating point (E positive, W negative)
- `narrative`: time of operation in plain text
- `remote_facility_icao_code`: location indicator of the remote facility
- `remote_facility`: navaid or airport with a Remote Communications Outlet (RCO) will be transmitted
- `sector_facility_icao_code`: location indicator of the sector facility
- `sector_facility`: navaid or airport upon which the information in the "sectorization" is based
- `sectorization`: used to define the airspace sector a communication frequency is applicable for when an airport defines sectors by bearing from the same point
- `service_indicator`: define the use of the frequency for the specified communication type (see appendix 3.34)
- `time_of_operation_1-7`: indicates the time of operation of the facility (see appendix 3.48)

2.16. Enroute Communication

SQLite Table:

tbl_ev_enroute_communication

ASCII Format:

area_code|callsign|communication_frequency|communication_type|
fir_rdo_ident|fir_uir_indicator|frequency_units|latitude|longitude|
remote_facility_icao_code|remote_facility|remote_name|
service_indicator

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
area_code	alphanumeric	3	5.3
callsign	alphanumeric	30	5.190
communication_frequency	numeric	-	5.117
communiation_type	alphanumeric	3	5.101
fir_rdo_ident	alphanumeric	4	5.103
fir_uir_indicator	alphanumeric	1	5.104
frequency_units	alphanumeric	1	5.106
latitude	numeric	-	5.189
longitude	numeric	-	5.105
remote_facility_icao_code	alphanumeric	2	5.36
remote_facility	alphanumeric	4	5.37
remote_name	alphanumeric	25	
service_indicator	alphanumeric	3	

Description:

- `area_code`: geographical area of the facility
- `callsign`: name of the facility being called
- `communication_frequency`: specifies a frequency for the facility identified in the communication type field
- `communication_type`: specified the type of communication unit (see appendix 3.33)
- `fir_rdo_ident`: identified the Flight Information Region or Upper Information Region
- `fir_uir_indicator`: obtain the identifier of a FIR, UIR or combined FIR/UIR (see appendix 3.7)
- `frequency_units`: designate the frequency spectrum area for the frequency (see appendix 3.31)
- `latitude`: latitude in degrees decimal floating point (N positive, S negative)
- `longitude`: longitude in degrees decimal floating point (E positive, W negative)
- `remote_facility_icao_code`: location indicator of the remote facility
- `remote_facility`: navaid or airport with a Remote Communications Outlet (RCO) will be transmitted
- `remote_name`: name of unmanned air/ground facility
- `service_indicator`: define the use of the frequency for the specified communication type (see appendix 3.34)

2.17. Grid Mora

SQLite Table:

tbl_as_grid_mora

ASCII Format:

```
mora01|mora02|mora03|mora04|mora05|mora06|mora07|mora08|  
mora09|mora10|mora11|mora12|mora13|mora14|mora15|mora16|mora17|  
mora18|mora19|mora20|mora21|mora22|mora23|mora24|mora25|mora26|  
mora27|mora28|mora29|mora30|quadrant_code|starting_latitude|  
starting_longitude
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
mora01 - mora30	alphanumeric	3	5.143
quadrant_code	alphanumeric	1	JS5.33
Starting Latitude	alphanumeric	4	5.141
Starting Longitude	alphanumeric	4	5.142

Description:

- mora01 - mora30: terrain and obstruction clearance within the section outlined by latitude and longitude blocks in feet
- quadrant_code: indicates for which of the 30-minute quadrants of a one-degree grid square, defined by the "starting_latitude/starting_longitude", the grid mora record applies (see appendix 3.49)
- starting_latitude : defines the lower left corner for the first block
- starting_longitude : defines the lower left corner for the first block

2.18. Airport MSA

SQLite Table:

tbl_ps_airport_msa

ASCII Format:

```
airport_identifier|area_code|icao_code|magnetic_true_indicator|
msa_center_icao_code|msa_center_latitude|msa_center_longitude|
msa_center_ref_table|msa_center|multiple_code|radius_limit|
sector_altitude_1|sector_altitude_2|sector_altitude_3|
sector_altitude_4|sector_altitude_5|sector_bearing_1|
sector_bearing_2|sector_bearing_3|sector_bearing_4| sector_bearing_5
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
airport_identifier	alphanumeric	4	5.6
area_code	alphanumeric	3	5.3
icao_code	alphanumeric	2	5.14
magnetic_true_indicator	alphanumeric	1	5.165
msa_center_icao_code	alphanumeric	2	5.14
msa_center_latitude	numeric	-	5.36
msa_center_longitude	numeric	-	5.37
msa_center_ref_table	alphanumeric	2	-
msa_center	alphanumeric	5	5.144
multiple_code	alphanumeric	1	5.130
radius_limit	numeric	-	5.145
sector_altitude_1-5	numeric	-	5.147
sector_bearing_1-5	numeric	-	5.146

Description:

- `airport_identifier`: four character ICAO location identifier
- `area_code`: geographical area
- `icao_code`: location indicator of the airport
- `magnetic_true_indicator`: indicator if the course is true or magnetic
- `msa_center_icao_code`: location indicator of the center waypoint
- `msa_center_latitude`: MSA Center fix latitude in degrees decimal floating point (N positive, S negative)
- `msa_center_longitude`: MSA Center fix longitude in degrees decimal floating point (E positive, W negative)
- `msa_center_ref_table`: reference table for more information about the specific center waypoint
- `msa_center`: represents the MSA Center, that point (Navaid or Waypoint) on which the MSA is predicated
- `multiple_code`: indicate Restrictive Airspace having the same designator but subdivided or differently divided by lateral and/or vertical detail
- `radius_limit`: provides a 1000 foot obstacle clearance with a specific radius from the navigational facility/fix
- `sector_altitude_1-5`: sector altitude in feet
- `sector_bearing_1-5`: sector bearing in degrees

2.19. Enroute Airways Restriction

SQLite Table:

tbl_eu_enroute_airway_restriction

ASCII Format:

```
area_code|block_indicator1|block_indicator2|block_indicator3|
block_indicator4|block_indicator5|block_indicator6|block_indicator7|
end_date|end_waypoint_icao_code|end_waypoint_identifier|
end_waypoint_latitude|end_waypoint_longitude|end_waypoint_ref_table|
restriction_altitude1|restriction_altitude2|restriction_altitude3|
restriction_altitude4|restriction_altitude5|restriction_altitude6|
restriction_altitude7|restriction_identifier|restriction_type|
route_identifier|start_date|start_waypoint_icao_code|
start_waypoint_identifier|start_waypoint_latitude|
start_waypoint_longitude|start_waypoint_ref_table|units_of_altitude
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
area_code	alphanumeric	3	5.3
block_indicator1-7	alphanumeric	1	5.203
end_date	alphanumeric	7	5.157
end_waypoint_icao_code	alphanumeric	2	5.14
end_waypoint_identifier	alphanumeric	5	5.13
end_waypoint_latitude	numeric	-	5.36
end_waypoint_longitude	numeric	-	5.37
end_waypoint_ref_table	alphanumeric	2	-
restriction_altitude1-7	numeric	-	5.161
restriction_identifier	numeric	-	5.154
restriction_type	alphanumeric	2	5.201
route_identifier	alphanumeric	5	5.8
start_date	alphanumeric	7	5.157
start_waypoint_icao_code	alphanumeric	2	5.14
start_waypoint_identifier	alphanumeric	5	5.13
start_waypoint_latitude	numeric	-	5.36
start_waypoint_longitude	numeric	-	5.37
start_waypoint_ref_table	alphanumeric	2	-
units_of_altitude	alphanumeric	1	5.160

Description:

- `area_code`: geographical area
- `block_indicator1-7`: specify that the altitudes that follow in the restriction record (see appendix 3.50)
- `end_date`: specific the effective date which does not corresponding with the AIRAC date
- `end_waypoint`: end waypoint identifier
- `end_waypoint_icao_code`: location indicator of the "end_waypoint"
- `end_waypoint_identifier`: end waypoint identifier
- `end_waypoint_latitude`: end waypoint latitude in degrees decimal floating point (N positive, S negative)
- `end_waypoint_longitude`: end waypoint longitude in degrees decimal floating point (E positive, W negative)
- `end_waypoint_ref_table`: reference table for more information about the specific end waypoint
- `restriction_altitude1-7`: specify the altitude profile for a specific restriction
- `restriction_identifier`: assign a unique identifier
- `restriction_type`: define the type of the restriction (see appendix 3.28)
- `route_identifier`: enroute route identifier
- `start_date`: specific the effective date which does not corresponding with the AIRAC date
- `start_waypoint_icao_code`: location indicator of the "start_waypoint"
- `start_waypoint_identifier`: start waypoint identifier
- `start_waypoint_latitude`: start waypoint latitude in degrees decimal floating point (N positive, S negative)
- `start_waypoint_longitude`: start waypoint longitude in degrees decimal floating point (E positive, W negative)
- `start_waypoint_ref_table`: reference table for more information about the specific start waypoint
- `units_of_altitude`: indicate the units of measurement for the restriction altitudes (see appendix 3.29)

2.20. Controlled Airspace

SQLite Table:

tbl_uc_controlled_airspace

ASCII Format:

```
airspace_center|airspace_classification|airspace_type|arc_bearing|
arc_distance|arc_origin_latitude|arc_origin_longitude|area_code|
boundary_via|controlled_airspace_name|flightlevel|icao_code|
latitude|longitude|lower_limit|multiple_code|seqno|time_code|
unit_indicator_lower_limit|unit_indicator_upper_limit|upper_limit
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
airspace_center	alphanumeric	5	5.214
airspace_classification	alphanumeric	1	5.215
airspace_type	alphanumeric	1	5.213
arc_bearing	numeric	-	5.120
arc_distance	numeric	-	5.119
arc_origin_latitude	numeric	-	5.36
arc_origin_longitude	numeric	-	5.37
area_code	alphanumeric	3	5.3
boundary_via	alphanumeric	2	5.118
controlled_airspace_name	alphanumeric	30	5.216
flightlevel	alphanumeric	1	5.19
icao_code	alphanumeric	2	5.14
latitude	numeric	-	5.36
longitude	numeric	-	5.37
lower_limit	alphanumeric	5	5.121
multiple_code	alphanumeric	1	5.130
seqno	numeric	-	5.12
time_code	alphanumeric	1	5.131
unit_indicator_lower_limit	alphanumeric	1	5.133
unit_indicator_upper_limit	alphanumeric	1	5.133
upper_limit	alphanumeric	5	5.121

Description:

- **airspace_center**: define the navigation element upon which the controlled airspace being defined is predicated, but not necessarily centered
- **airspace_classification**: indicating the published classification of the controlled airspace, when assigned
- **airspace_type**: indicate the type of controlled airspace (see appendix 3.24)
- **arc_bearing**: contains the true bearing from the "Arc Origin" position to the beginning of the arc
- **arc_distance**: define the distance in nautical miles from the "Arc Origin" position
- **arc_origin_latitude**: arc origin latitude in degrees decimal floating point (N positive, S negative)
- **arc_origin_longitude**: arc origin longitude in degrees decimal floating point (E positive, W negative)
- **area_code**: geographical area
- **boundary_via**: defines the path of the boundary from the position identified in the record to the next defined position (see appendix 3.26)
- **controlled_airspace_name**: the name of the controlled airspace when assigned
- **flightlevel**: defines the airway structure (see appendix 3.14)
- **icao_code**: location indicator of the airspace center
- **latitude**: latitude in degrees decimal floating point (N positive, S negative)
- **longitude**: longitude in degrees decimal floating point (E positive, W negative)
- **lower_limit**: contain the lower limits
- **multiple_code**: indicate Restrictive Airspace having the same designator but subdivided or differently divided by lateral and/or vertical data
- **seqno**: sort order of each airspace, no duplicate sequences per airspace are possible
- **time_code**: Active Time (see appendix 3.36)
- **unit_indicator_lower_limit**: specified as "above mean sea level" (MSL) or "above ground level" (AGL)
- **unit_indicator_upper_limit**: specified as "above mean sea level" (MSL) or "above ground level" (AGL)
- **upper_limit**: contain the upper limits

2.21. Cruising Tables

SQLite Table:

tbl_tc_cruising_tables

ASCII Format:

```
area_code|course_from|course_to|cruise_level_from1|
cruise_level_from2|cruise_level_from3|cruise_level_from4|
cruise_level_to1|cruise_level_to2|cruise_level_to3|cruise_level_to4|
cruise_table_identifier|mag_true|seqno|vertical_separation1|
vertical_separation2|vertical_separation3|vertical_separation4
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
area_code	alphanumeric	3	5.3
course_from	numeric	-	5.135
course_to	numeric	-	5.135
cruise_level_from1-4	numeric	-	5.136
cruise_level_to1-4	numeric	-	5.136
cruise_table_identifier	alphanumeric	2	5.134
mag_true	alphanumeric	1	5.165
seqno	numeric	-	5.12
vertical_separation1-4	numeric	-	5.136

Description:

- **area_code**: geographical area
- **course_from**: indicate the lowest course for which a block of cruising levels are prescribed
- **course_to**: indicate the highest course for which a block of cruising levels is prescribed
- **cruise_level_from1-4**: indicate the lowest cruising level prescribed for use within the Course From/To fields
- **cruise_level_to1-4**: indicate the highest cruising level prescribed for use within the Course From/To fields
- **cruise_table_identifier**: indicate the cruising table (see appendix 3.6)
- **mag_true**: course from/to in magnetic or true degrees
- **seqno**: sort order of each cruise table, no duplicate sequences per cruise table are possible
- **vertical_separation1-4**: indicate the minimum separation prescribed to be maintained between the cruising levels

2.22. FIR/UIR

SQLite Table:

tbl_uf_fir_uir

ASCII Format:

```
adjacent_fir_identifier|adjacent_uir_identifier|arc_bearing|
arc_distance|arc_origin_latitude|arc_origin_longitude|area_code|
boundary_via|cruise_table_identifier|fir_uir_address|
fir_uir_identifier|fir_uir_indicator|fir_uir_latitude|
fir_uir_longitude|fir_uir_name|fir_upper_limit|
reporting_units_altitude|reporting_units_speed|seqno|
uir_lower_limit|uir_upper_limit
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
adjacent_fir_identifier	alphanumeric	4	5.116
adjacent_uir_identifier	alphanumeric	4	5.116
arc_bearing	numeric	-	5.120
arc_distance	numeric	-	5.119
arc_origin_latitude	numeric	-	5.36
arc_origin_longitude	numeric	-	5.37
area_code	alphanumeric	3	5.3
boundary_via	alphanumeric	2	5.118
cruise_table_identifier	alphanumeric	2	5.134
fir_uir_address	alphanumeric	4	5.151
fir_uir_identifier	alphanumeric	4	5.116
fir_uir_indicator	alphanumeric	1	5.117
fir_uir_latitude	numeric	-	5.36
fir_uir_longitude	numeric	-	5.37
fir_uir_name	alphanumeric	25	5.125
fir_upper_limit	alphanumeric	5	5.121
reporting_units_altitude	numeric	-	5.123
reporting_units_speed	numeric	-	5.122
seqno	numeric	-	5.12
uir_lower_limit	alphanumeric	5	5.121
uir_upper_limit	alphanumeric	5	5.121

Description:

- `adjacent_fir_identifier`: identifies the Flight Information Region and Upper Information Region of airspace
- `adjacent_uir_identifier`: identifies the Flight Information Region and Upper Information Region of airspace
- `arc_bearing`: contains the true bearing from the "Arc Origin" position to the beginning of the arc
- `arc_distance`: define the distance in nautical miles from the "Arc Origin" position
- `arc_origin_latitude`: arc origin latitude in degrees decimal floating point (N positive, S negative)
- `arc_origin_longitude`: arc origin longitude in degrees decimal floating point (E positive, W negative)
- `area_code`: geographical area
- `boundary_via`: defines the path of the boundary from the position identified in the record to the next defined position (see appendix 3.26)
- `cruise_table_identifier`: indicate the cruising table (see appendix 3.6)
- `fir_uir_address`: communication address of the FIR/UIR to supplement the FIR/UIR ident (see appendix 3.35)
- `fir_uir_identifier`: identifies the Flight Information Region and Upper Information Region of airspace
- `fir_uir_indicator`: indicate the type of controlled airspace (see appendix 3.7)
- `fir_uir_latitude`: FIR/UIR latitude in degrees decimal floating point (N positive, S negative)
- `fir_uir_longitude`: FIR/UIR longitude in degrees decimal floating point (E positive, W negative)
- `fir_uir_name`: the name of the controlled airspace when assigned
- `fir_upper_limit`: contain the FIR upper limits
- `reporting_units_altitude`: indicate the units of measurement concerning the altitude used in the specific FIR/UIR (see appendix 3.21)
- `reporting_units_speed`: indicate the units of measurement concerning True Air Speed used in the specific FIR/UIR (see appendix 3.20)
- `seqno`: sort order of each airspace, no duplicate sequences per airspace are possible
- `uir_lower_limit`: contain the UIR lower limits
- `uir_upper_limit`: contain the UIR upper limits

2.23. Restrictive Airspace

SQLite Table:

tbl_ur_restrictive_airspace

ASCII Format:

```
arc_bearing|arc_distance|arc_origin_latitude|arc_origin_longitude|
area_code|boundary_via|flightlevel|icao_code|latitude|longitude|
lower_limit|multiple_code|restrictive_airspace_designation|
restrictive_airspace_name|restrictive_type|seqno|
unit_indicator_lower_limit|unit_indicator_upper_limit|upper_limit
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
arc_bearing	numeric	-	5.120
arc_distance	numeric	-	5.119
arc_origin_latitude	numeric	-	5.36
arc_origin_longitude	numeric	-	5.37
area_code	alphanumeric	3	5.3
boundary_via	alphanumeric	2	5.12
flightlevel	alphanumeric	1	5.19
icao_code	alphanumeric	2	5.14
latitude	numeric	-	5.36
longitude	numeric	-	5.37
lower_limit	alphanumeric	5	5.121
multiple_code	alphanumeric	1	5.130
restrictive_airspace_designation	alphanumeric	10	5.129
restrictive_airspace_name	alphanumeric	30	5.126
restrictive_type	alphanumeric	1	5.128
seqno	numeric	-	5.12
unit_indicator_lower_limit	alphanumeric	1	5.133
unit_indicator_upper_limit	alphanumeric	1	5.133
upper_limit	alphanumeric	5	5.121

Description:

- `arc_bearing`: contains the true bearing from the "Arc Origin" position to the beginning of the arc
- `arc_distance`: define the distance in nautical miles from the "Arc Origin" position
- `arc_origin_latitude`: arc origin latitude in degrees decimal floating point (N positive, S negative)
- `arc_origin_longitude`: arc origin longitude in degrees decimal floating point (E positive, W negative)
- `area_code`: geographical area of the airspace
- `boundary_via`: defines the path of the boundary from the position identified in the record to the next defined position (see appendix 3.26)
- `flightlevel`: defines the airway structure (see appendix 3.14)
- `icao_code`: location indicator of the airspace
- `latitude`: latitude in degrees decimal floating point (N positive, S negative)
- `longitude`: longitude in degrees decimal floating point (E positive, W negative)
- `lower_limit`: contain the lower limits
- `multiple_code`: indicate Restrictive Airspace having the same designator but subdivided or differently divided by lateral and/or vertical detail
- `restrictive_airspace_designation`: contains the number or name that uniquely identifies the restrictive airspace
- `restrictive_airspace_name`: name of the restrictive airspace when assigned
- `restrictive_type`: indicate the type of Airspace in which the flight of aircraft is prohibited or restricted (see appendix 3.28)
- `seqno`: sort order of each airspace, no duplicate sequences per airspace are possible
- `unit_indicator_lower_limit`: specified as "above mean sea level" (MSL) or "above ground level" (AGL)
- `unit_indicator_upper_limit`: specified as "above mean sea level" (MSL) or "above ground level" (AGL)
- `upper_limit`: contain the upper limits

2.24. Gate

SQLite Table:

tbl_pb_gates

ASCII Format:

airport_identifier|area_code|gate_identifier|gate_latitude|
gate_longitude|icao_code|name

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
airport_identifier	alphanumeric	4	5.6
area_code	alphanumeric	3	5.3
gate_identifier	alphanumeric	5	5.56
gate_latitude	numeric	-	5.36
gate_longitude	numeric	-	5.37
icao_code	alphanumeric	2	5.14
name	alphanumeric	25	5.60

Description:

- **airport_identifier:** four character ICAO location identifier
- **area_code:** geographical area of the gate
- **gate_identifier:** airport gate identifier
- **gate_latitude:** latitude in degrees decimal floating point (N positive, S negative)
- **gate_longitude:** longitude in degrees decimal floating point (E positive, W negative)
- **icao_code:** location indicator of the gate
- **name:** name of the gate

2.25. GLS

SQLite Table:

tbl_pt_gls

ASCII Format:

```
airport_identifier|area_code|gl_s_approach_bearing|  
gl_s_approach_slope|gl_s_category|gl_s_channel|gl_s_ref_path_identifier|  
gl_s_station_ident|icao_code|magnetic_variation|runway_identifier|  
station_elevation|station_latitude|station_longitude|station_type
```

<i>Field</i>	<i>Format</i>	<i>max.length</i>	<i>ARINC Ref</i>
airport_identifier	alphanumeric	4	5.6
area_code	alphanumeric	3	5.3
gl_s_approach_bearing	numeric	-	5.47
gl_s_approach_slope	numeric	-	5.52
gl_s_category	alphanumeric	1	5.80
gl_s_channel	numeric	-	5.244
gl_s_ref_path_identifier	alphanumeric	4	5.44
gl_s_station_ident	alphanumeric	4	5.243
icao_code	alphanumeric	2	5.14
magnetic_variation	numeric	-	5.39
runway_identifier	alphanumeric	5	5.46
station_elevation	numeric	-	5.74
station_latitude	numeric	-	5.36
station_longitude	numeric	-	5.37
station_type	alphanumeric	3	5.247

Description:

- `airport_identifier`: four character ICAO location identifier
- `area_code`: geographical area of the GLS ground station
- `glb_approach_bearing`: magnetic bearing of the GLS course
- `glb_approach_slope`: glide slope angle of an GLS approach in degrees
- `glb_category`: ILS/MLS/GLS performance categories (see appendix 3.18)
- `glb_channel`: identifies the channel that will be decoded to identify the augmentation system used. 20001 – 39999 for GBAS, 40000 – 99999 for SBAS
- `glb_ref_path_identifier`: Identification code of the GLS Reference Path
- `glb_station_ident`: identification code for retrieval of such a transmitter (not a transmitted identifier)
- `icao_code`: location indicator of the gate
- `magnetic_variation`: specifies the angular difference between true north and magnetic north at the location
- `runway_identifier`: runway identifier
- `station_elevation`: elevation of GLS ground station in feet
- `station_latitude`: latitude in degrees decimal floating point (N positive, S negative)
- `station_longitude`: longitude in degrees decimal floating point (E positive, W negative)
- `station_type`: identifies the type of the different ground station (see appendix 3.32)

2.26. Path Point

SQLite Table:

tbl_pp_pathpoint

ASCII Format:

```
airport_icao_code|airport_identifier|
approach_performance_designator|approach_procedure_ident|
approach_type_identifier|area_code|course_width_at_threshold|
flight_path_alignment_point_latitude|
flight_path_alignment_point_longitude|fpap_ellipsoid_height|
fpap_orthometric_height|glide_path_angle|
gnss_channel_number|hal|landing_threshold_point_latitude|
landing_threshold_point_longitude|length_offset|
ltp_ellipsoid_height|operation_type|path_point_tch|
reference_path_data_selector|reference_path_identifier|
route_indicator|runway_identifier|sbas_service_provider_identifier|
tch_units_indicator|val
```

Field	Format	max.length	ARINC Ref
airport_icao_code	alphanumeric	4	5.14
airport_identifier	alphanumeric	4	5.6
approach_performance_designator	alphanumeric	1	5.258
approach_procedure_ident	alphanumeric	6	5.10
approach_type_identifier	alphanumeric	10	5.262
area_code	alphanumeric	3	5.3
course_width_at_threshold	numeric	-	5.228
flight_path_alignment_point_lat	numeric	-	5.267
flight_path_alignment_point_lon	numeric	-	5.268
fpap_ellipsoid_height	numeric	-	5.225
fpap_orthometric_height	numeric	-	5.227
glide_path_angle	numeric	-	5.226
gnss_channel_number	numeric	-	5.244
hal	numeric	-	5.263
landing_threshold_point_latitude	numeric	-	5.267
landing_threshold_point_longitude	numeric	-	5.268
length_offset	numeric	-	5.259
ltp_ellipsoid_height	numeric	-	5.225
ltp_orthometric_height	numeric	-	5.227
operation_type	numeric	-	5.223
path_point_tch	numeric	-	5.265
reference_path_data_selector	numeric	-	5.256
reference_path_identifier	alphanumeric	4	5.257
route_indicator	alphanumeric	1	5.224
runway_identifier	alphanumeric	4	5.46

sbas_service_provider_identifier	numeric	-	5.255
tch_units_indicator	alphanumeric	1	5.266
val	numeric	-	5.264

Description:

- `airport_icao_code`: location indicator of the airport
- `airport_identifier`: four character ICAO location identifier
- `approach_performance_designator`: indicate the type or category of approach
- `approach_procedure_ident`: Identifier of the approach route
- `approach_type_identifier`: Identifies the approach types published on a given approach procedure
- `area_code`: geographical area of the point
- `course_width_at_threshold`: width of the lateral course at the Landing Threshold Point (LTP)
- `flight_path_alignment_point_latitude`: latitude of the navigation feature identified (N positive, S negative)
- `flight_path_alignment_point_longitude`: longitude of the navigation feature identified (E positive, W negative)
- `fpap_ellipsoid_height`: height of a surveyed point in reference to the WGS-84 ellipsoid
- `fpap_orthometric_height`: height of a surveyed point in reference to Mean Sea Level (MSL)
- `glide_path_angle`: angle in degrees
- `gnss_channel_number`: identifies the channel
- `hal`: horizontal alert limit is the radius of a circle in the horizontal plane
- `landing_threshold_point_latitude`: latitude of the navigation feature identified (N positive, S negative)
- `landing_threshold_point_longitude`: longitude of the navigation feature identified (E positive, W negative)
- `length_offset`: distance from the stop end of the runway (SER) to the FPAP
- `ltp_ellipsoid_height`: height of a surveyed point in reference to the WGS-84 ellipsoid
- `ltp_orthometric_height`: height of a surveyed point in reference to Mean Sea Level (MSL)
- `operation_type`: contains information on the type of final approach
- `segment_path_point_tch`: height above the runway threshold (LTP)
- `reference_path_data_selector`: enables the automatic tuning of a procedure by ground based augmentation systems (GBAS) avionics
- `reference_path_identifier`: identifier to confirm selection of the correct approach procedure
- `route_indicator`: a single alpha character used to differentiate between multiple final approach segments to the same runway
- `runway_identifier`: runway identifier
- `sbas_service_provider_identifier`: associate the approach procedure to a particular satellite based approach system service provider
- `tch_units_indicator`: define the units (meters or feet)

- `val`: vertical alert limit is half the length of a segment on the vertical axis

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3. Appendixes

3.1. Navaid Class

	1	2	3	4	5
Facility	Navaid Type 1	Navaid Type 2			
VOR	V				
DME		D			
TACAN		T			
MIL TACAN		M			
ILS/DME		I			
ILS/TACAN		I			
MLS/DME N		N			
MLS/DME P		P			
			Range Power		
Terminal			T		
Low Altitude			L		
High Altitude			H		
Undefined			U		
ILS/TACAN			C		
				Additional Information	
Bias ILS/DME or ILS/TACAN				D	
Automatic Transcribed Weather Broadcast				A	
Scheduled Weather Broadcast				B	
No voice on Frequency				W	
Voice on Frequency				blank	
					Collocation
Collocated Navaid					blank
Non-Collocated Navaid					N

3.2. NDB Class

	1	2	3	4	5
Facility	Navaid Type 1	Navaid Type 2			
NDB	H				
SABH	S				
Marine Bacon	M				
Inner Marker		I			
Middle Marker		M			
Outer Marker		O			
Back Marker		C			
			Range Power		
200 Watts or More			H		
50 to 1999 Watts			blank		
25 to Less Than 50			M		
Less Than 25 Watts			L		
				Additional Information	
Automatic Transcribed Weather Broadcast				A	
Scheduled Weather Broadcast				B	
No voice on Frequency				W	
Voice on Frequency				blank	
					Collocation
BFO Operation					B

3.3. Waypoint Description Code

	1	2	3	4
Airport as Waypoint	A			
Essential Waypoint	E			
Off Airway Waypoint	F			
Runway as Waypoint	G			
Heliport as Waypoint	H			
NDB navaid as Waypoint	N			
Phantom Waypoint	P			
Non-Essential Waypoint	R			
Transition Essential Waypoint	T			
VHF Navaid as Waypoint	V			
end of SID/STAR/IAP route Type		B		
end of enroute Airway or terminal procedure		E		
uncharted airway intersection		U		
Fly-Over Waypoint		Y		
unnamed Stepdown Fix After final Approach Fix			A	
unnamed Stepdown Fix before Final Approach Fix			B	
ATC Compulsory Waypoint			C	
Oceanic Gateway Waypoint			G	
First leg of Missed Approach Procedure			M	
Path Point Fix			P	
Named Stepdown Fix			S	
Initial Approach Fix				A
Intermediate Approach Fix				B
Initial Approach Fix with Holding				C
Initial Approach with Final Approach Course Fix				D
Final End Point Fix				E
Published Final Approach Fix or Database Final Approach Fix				F
Holding Fix				H
Final Approach Course Fix				I
Published Missed Approach Point Fix				M

3.4. Waypoint Type for Enroute Waypoints (EA)

Waypoint Type	1	2	3
Combined named intersection and RNAV unnamed, charted intersection	C		
NDB navaid as waypoint	N		
named intersection	R		
uncharted Airway intersection	U		
VFR Waypoint	V		
RNAV Waypoint	W		
Final Approach Fix		A	
Initial and Final Approach Fix		B	
Final Approach Course Fix		C	
Intermediate Approach Fix		D	
Off-Route intersection in the FAA National Ref System		E	
Off-Route Intersection		F	
Initial Approach Fix		I	
Final Approach Course Fix at Initial Approach Fix		K	
Final Approach Course Fix at Intermediate Approach Fix		L	
Missed Approach Fix		M	
Initial Approach Fix and Missed Approach Fix		N	
Oceanic Entry/Exit Waypoint		O	
Pitch and Catch Point in the FAA High Altitude Redesign		P	
AACAA and SUA Waypoints in the FAA High Altitude Redesign		S	
FIR/UIR or Controlled Airspace Intersection		U	
Latitude/Longitude Intersection Full Degree of Latitude		V	
Latitude/Longitude Intersection, Half Degree Latitude		W	
SID			D
STAR			E
Approach			F
Multiple			Z

3.5. Waypoint Type for Terminal Waypoints (PC)

Waypoint Type	1	2	3
ARC Center Fix Waypoint	A		
Combined Named Intersection and RNAV Waypoint	C		
Unnamed, Charted Intersection	I		
Middle Marker as Waypoint	M		
Terminal NDB Navaid as Waypoint	N		
Outer Marker as Waypoint	O		
Named Intersection	R		
VFR Waypoint	V		
RNAV Waypoint	W		
Final Approach Fix		A	
Initial Approach Fix and Final Approach Fix		B	
Final Approach Course Fix		C	
Intermediate Approach Fix		D	
Initial Approach Fix		I	
Final Approach Course Fix at Initial Approach Fix		K	
Final Approach Course Fix at Intermediate Approach Fix		L	
Missed Approach Fix		M	
Initial Approach Fix and Missed Approach Fix		N	
Unnamed Stepdown Fix		P	
Named Stepdown Fix		S	
FIR/UIR or Controlled Airspace Intersection		U	
SID			D
STAR			E
Approach			F
Multiple			Z

3.6. Cruise Table Identifier

Field	Description
AA	ICAO standard cruise table
AO	Exception to ICAO cruise table
BB-ZZ	Modified cruise table
BO-ZO	Exception to modified cruise table

3.7. FIR/UIR Indicator

Field	Type
F	FIR
U	UIR
B	Combined FIR/UIR

3.8. Waypoint Usage

Usage	1	2
High and Low Altitude		B
High Altitude only		H
Low Altitude only		L
Terminal Use Only		blank
RNAV	R	

3.9. Turn Direction

Turn	Description
L	Left turn
R	Right turn

3.10. Route Type for Enroute Airways

Airway Type	Field Content
Control	C
Direct Route	D
Helicopter Route	H
Offical Designated Airways expect RNAV Airways	O
RNAV Airways	R
Undesignated ATS Route	S

3.11. Route Type for SIDs (PD)

SID Route Type	Field Content
Engine Out SID	0
SID Runway Transition	1
SID or SID Common Route	2
SID Enroute Transition	3
RNAV SID Runway Transition	4
RNAV SID or SID Common Route	5
RNAV SID Enroute Transition	6
FMS SID Runway Transition	F
FMS SID or SID Common Route	M
FMS SID Enroute Transition	S
Vector SID Runway Transition	T
Vector SID Enroute Transition	V

3.12. Route Type for STARs (PE)

STAR Route Type	Field Content
STAR Enroute Transition	1
STAR or STAR Common Route	2
STAR Runway Transition	3
RNAV STAR Enroute Transition	4
RNAV STAR or STAR Common Route	5
RNAV STAR Runway Transition	6
Profile Descent Enroute Transition	7
Profile Descent Common Route	8
Profile Descent Runway Transition	9
FMS STAR Enroute Transition	F
FMS STAR or STAR Common Route	M
FMS STAR Runway Transition	S

3.13. Route Type of IAPs (PF)

IAP Route Type	Field Content
Approach Transition	A
Localizer/Back course Approach	B
VORDME Approach	D
FMS Approach	F
IGS Approach	G
ILS Approach	I
GLS Approach	J
LOC only Approach	L
MLS Approach	M
NDB Approach	N
GPS Approach	P
NDB DME Approach	Q
RNAV Approach	R
VOR Approach using VORDME/VORTAC	S
TACAN Approach	T
SDF Approach	U
VOR Approach	V
MLS Type A Approach	W
LDA Approach	X
MLS Type B and C Approach	Y
Missed Approach	Z

3.14. Level

Level	Description
B	All Altitudes
H	High Level Airways
L	Low Level Airways

3.15. Directional Restriction

Direction	Description
F	One way in direction route is coded (Forward)
B	One way in opposite direction route is coded (backwards)
blank	no restrictions on direction

3.16. IFR Capability

Direction	Description
Y	Instrument Approach Procedure published
N	no Instrument Approach Procedure published

3.17. Longest Runway Surface

Code	Description
H	Hard Surface (asphalt or concrete)
S	Soft Surface (gravel, grass or soil)
W	Water Runway
U	undefined

3.18. ILS/MLS/GLS Category

Definition	Category/Classification
ILS Localizer Only, no glideslope	0
ILS Localizer/MLS/GLS Category I	1
ILS Localizer/MLS/GLS Category II	2
ILS Localizer/MLS/GLS Category III	3
IGS Facility	I
LDA Facility with Glideslope	L
LDA Facility no Glideslope	A
SDF Facility with Glideslope	S
SDF Facility no Glideslope	F

3.19. Marker Type

Field	Type of Facility
-IM	Inner Marker
-MM	Middle Marker
-OM	Outer Marker
-BM	Back Marker
L--	Locator at Marker

- blank

3.20. Reporting Units Speed

Field	Reporting Units
0	not specified
1	TAS in Knots
2	TAS in Mach
3	TAS in Kilometer/hour

3.21. Reporting Units Altitude

Field	Reporting Units
0	not specified
1	Altitude in Flightlevel
2	Altitude in Meters
3	Altitude in Feet

3.22. Path and Termination

Path & Termination	Description
IF	Initial Fix
TF	Track to a Fix
CF	Course to a Fix
DF	Direct to a Fix
FA	Fix to an Altitude
FC	Track from a Fix for a Distance
FD	Track from a Fix to a DME Distance
FM	From a Fix to a Manual termination
CA	Course to an Altitude
CD	Course to a DME Distance
CI	Course to an Intercept
CR	Course to a Radial termination
RF	Constant Radius Arc
AF	Arc to Fix
VA	Heading to an Altitude
VD	Heading to a DME Distance termination
VI	Heading to an Intercept
VM	Heading to a Manual termination
VR	Heading to a Radial termination
PI	045/180 Procedure turn
HA, HF, HM	Holding in lieu of Procedure Turn

3.23. Speed Limit Description

Speed Limit	Description
@	Mandatory Speed, cross fix at speed specified in the Speed Limit field
+	Minimum Speed, cross fix at or above speed specified in Speed Limit field
-	Maximum Speed, cross fix at or below speed specified in Speed Limit field

3.24. Airspace Type

Field	Description
A	Class C Airspace (USA)
C	Control Area, ICAO Designation (CTA)
K	Control Area, ICAO Designation (CTA)
M	Terminal Control Area, ICAO Designation (TMA or TCA)
Q	Military Control Zone (MCTR)
R	Radar Zone or Radar Area (USA)
T	Class B Airspace (USA)
W	Terminal Control Area (TCA)
X	Terminal Area (TMA)
Y	Terminal Radar Service Area (TRSA)
Z	Class D Airspace, ICAO Designation (CTR)

3.25. Altitude Description

Field	Description
+	at or above altitude specified in Altitude1 field
-	at or below altitude specified in Altitude1 field
@	at altitude specified in Altitude1 field
B	at or above to at or below altitudes in Altitude1 field and Altitude2 field
C	at or above altitude specified in Altitude2 field
G	Glide Slope altitude (MSL) specified in Altitude2 field and at altitude specified in Altitude1 field
H	Glide Slope altitude (MSL) specified in Altitude2 field and at or above altitude specified in Altitude1 field
I	Glide Slope Intercept Altitude specified in Altitude2 field and at altitude specified in Altitude1 field
J	Glide Slope Intercept Altitude specified in Altitude2 field and at or above altitude specified in Altitude1 field
V	at altitude on the coded vertical angle in the Altitude2 field and at or above altitude specified in Altitude1 field
X	at altitude on the coded vertical angle in Altitude2 field and at altitude specified in Altitude1 field
Y	at altitude on the coded vertical angle in Altitude2 field and at or below altitude specified in the Altitude1 field

3.26. Boundary Via

Field	Description
C-	Circle
G-	Great Circle
H-	Rhumb Line
L-	Counter Clockwise ARC
R-	Clockwise ARC
-E	End of description, return to origin point

- blank

3.27. Restrictive Airspace Type

Field	Type
A	Alert
C	Caution
D	Danger
M	Military Operations Area
P	Prohabited
R	Restricted
T	Training
W	Warning
U	Unknown

3.28. Restriction Type

Field	Description
AE	Altitude exclusion
TC	Cruising Table Replacement
SC	Seasonal Restriction
NR	Note Restriction

3.29. Units of Altitude

Field	Description
F	Restriction Altitudes are expressed in hundreds of feet
K	Restriction Altitudes are expressed in metric Flightlevel
L	Restriction Altitudes are expressed in feet Flightlevel
M	Restriction Altitudes are expressed in tens of meters

3.30. Block Indicator

Field	Description
B	indicates an altitude block
I	indicates an individual altitudes block

3.31. Frequency Units

Field	Description
H	High Frequency (3.000 kHz – 30.000 kHz)
V	Very High Frequency (30.000 kHz – 200 MHz)
U	Ultra High Frequency (200 MHz – 3.000 MHz)
C	Communication Channel for 8.33 kHz spacing

3.32. Station Type

Field	Description
L--	LAAS/GLS ground station
C--	SCAT-1 station

- blank

3.33. Communication Type

Field	Description	Communication		
		Airport	Enroute	Both
ACC	Area Control Center			X
ACP	Airlift Command Post	X		
AIR	Air to Air	X		
APP	Approach Control	X		
ARR	Arrival Control	X		
ASO	Automatic Surface Observing System (ASOS)	X		
ATI	Automatic Terminal Information Services (ATIS)	X		
AWI	Airport Weather Information Broadcast (AWIB)	X		
AWO	Automatic Weather Observing Service (AWOS)			X
AWS	Aerodrome Weather Information Service (AWIS)	X		
CLD	Clearance Delivery	X		
CPT	Clearance, Pre-Taxi	X		
CTA	Control Area (Terminal)	X		
CTL	Control			X
DEP	Departure Control	X		
DIR	Director (Approach Control Radar)	X		
EFS	Enroute Flight Advisory Service (EFAS)		X	
EMR	Emergency			X
FSS	Flight Service Station			X
GCO	Ground Comm Outlet	X		
GND	Ground Control	X		
GET	Gate Control	X		
HEL	Helicopter Frequency	X		
INF	Information			X
MIL	Military Frequency			X
MUL	Multicom			X
OPS	Operations	X		
PAL	Pilot Activated Lighting	X		
RDO	Radio			X
RDR	Radar			X
RFS	Remote Flight Service Station (RFSS)			X
RMP	Ramp/Taxi Control	X		
RSA	Airport Radar Service Area (ARSA)	X		
TCA	Terminal Control Area (TCA)	X		
TMA	Terminal Control Area (TMA)	X		
TML	Terminal	X		
TRS	Terminal Radar Service Area (TRSA)	X		
TWE	Transcriber Weather Broadcast (TWEB)		X	
TWR	Tower, Air Traffic Control	X		
UAC	Upper Area Control		X	
UNI	Unicom	X		
VOL	Volmet		X	

3.34. Service Indicator

Field	Description
A--	Airport Advisory Service (AAS)
C--	Community Aerodrome Radio Station (CARS)
D--	Departure Service
F--	Flight Information Service (FIS)
I--	Initial Contact (IC)
L--	Arrival Service
P--	Pre-Departure Clearance (Data Link Service)
S--	Aerodrom Flight Information Service (AFIS)
T	Terminal Area Control
-A-	Aerodrome Traffic Frequency (ATF)
-C-	Common Traffic Advisory Frequency (CTAF)
-M-	Mandatory Frequency (MF)
-R-	Air/Air
-S-	Secondary Frequency
--A	Air/Ground
--D	VHF Direction Finding Service (VDF)
--G	Remote Communications Air to Ground (RCAG)
--L	Language other than English
--M	Military Use Frequency
--P	Pilot Controlled Light (PCL)
--R	Remote Communications Outlet (RCO)

- blank

3.35. FIR/UIR Address

Field	Description
ZQZX	related to an IFR Flight
ZFZX	related to an VFR Flight
ZOZX	related to an Oceanic FIR/UIR
ZRZX	related to all other FIR/UIR

3.36. Time Codes

Field	Description
C	active continuously, including holidays
H	active continuously, excluding holidays
N	active none continuously, refer to continuation records
(blank)	active times announced by Notams

3.37. Time Distance

Field	Description
T	Time in minute(s)
D	Distance in nautical miles

3.38. Airport Type

Field	Description
C	Public open airport/heliport (civil)
M	Military airport/heliport (nonpublic)
P	Airport is privately operated (added per specific manufactureer request only)

3.39. Fuel Type

Each position at this field will indicate availability based on:

Field	Description
Y	The fuel type is available
N	The fuel type is not available
P	The fuel type is available on prior request

Pos	Description
1	Unspecified
2	73 octane
3	80-87 octane
4	100 low lead (LL) octane
5	100-130 octane
6	115-145 octane
7	Mogas
8	JET
9	JET A
10	JET A-1
11	JET A+
12	JET B
13	JET 4
14	JET 5

3.40. Time Zone

Field	Difference to Zulu time
Z	0
A	-1
B	-2
C	-3
D	-4
E	-5
F	-6
G	-7
H	-8
I	-9
K	-10
L	-11
M	-12
N	+1
O	+2
P	+3
Q	+4
R	+5
S	+6
T	+7
U	+8
V	+9
W	+10
X	+11
Y	+12

3.41. Part Time Lights

Field	Description
Y	Part time runway lighting availability at an airport
N	Full time (24h) runway lighting availability at an airport

3.42. Runway Lighting

Field	Description
Y	Runway has edge lights
N	No runway edge lights available

3.43. Traffic Pattern

Field	Description
L	left-hand traffic pattern
R	right-hand traffic pattern

3.44. Course Flag

Field	Description
M	Magnetic Course
T	True Course

3.45. GNSS/FMS Indicator

Field	Description
0	Procedure not authorized for GNSS/FMS
1	Procedure authorized for GNSS (primary nav aids operating and monitored)
2	Procedure authorized for GNSS (primary nav aids installed, not monitored)
3	Procedure authorized for GNSS (GPS or GNSS in the title)
4	Procedure authorized for FMS
5	Procedure authorized for FMS and/or GNSS
A	RNAV(GPS) or RNAV(GNSS) procedure SBAS used authorized
B	RNAV(GPS) or RNAV(GNSS) procedure use not authorized SBAS
C	RNAV(GPS) or RNAV(GNSS) procedure, SBAS used not specific
P	Stand alone GPS(GNSS) procedure
U	Procedure authorization not specified

3.46. Level of Service Authorized

Field	Description
A	Designated Level of Service is authorized for the procedure
N	Designated Level of Service is not authorized for the procedure

3.47. Guard/Transmit

Field	Description
G	Radio guards (receives)
T	Radio transmits

3.48. Time Of Operation

The first two positions identify days of the week, with Monday equal to 1 and Sunday equal to 7. A single day, for example, Monday, is depicted as "01". A consecutive series of days, for example Monday through Friday, is depicted as "15". Non-consecutive days require multiple Time of Operation entries. The remaining 8 characters define a starting time of four characters and an ending time of four characters. These times are in the format HHMM (H=hours, M= minutes) using a 24 hour time system.

Times of Operation can also be expressed in terms of Sunrise (SR) and Sunset (SS). When a "Time of Operation" is defined as starting at or ending at Sunrise, that time is specified as "000R". When a "Time of Operation" is defined as starting at or ending at Sunset, that time is specified as "000S". When a "Time of Operation" is defined as starting at or ending at a certain number of hours/minutes before or after Sunrise or Sunset, those times are specified

3.49. Quadrant Code

Field	Description
A	Southwest quadrant
B	Northwest quadrant
C	Northeast quadrant
D	Southeast quadrant

3.50. Block Indicator

Field	Description
B	all altitudes from xxxx to yyyy feet are not available
I	individual altitudes of xxxx and yyyy feet are not available

3.51. Procedure Leg Data Fields (minimum requirements)

AF (Arc to a Fix)

FixIdentifier, TurnDirection, RecommendedNavaid, Theta (fix radial), RHO, MagCourse (boundary radial)

CA (Course to an Altitude)

MagCourse, Alt1+ (at or above)

CD (Course to a DME Distance)

RecommendedNavaid, MagCourse RouteDISTANCEHoldingTime (DME distance)

CF (Course to a Fix)

FixIdentifier, RecommendedNavaid, Theta, RHO, MagCourse (course to specific fix), RouteDISTANCEHoldingTime (Path length)

CI (Course to Intercept)

MagCourse

CR (Course to a Radial termination)

RecommendedNavaid, Theta, MagCourse

DF (Direct to a Fix)

FixIdentifier, FlyOver

FA (Fix to an Altitude)

FixIdentifier, RecommendedNavaid, Theta, RHO, MagCourse, Alt1+ (at or above)

FC (Track from a Fix for a Distance)

FixIdentifier, FlyOver, RecommendedNavaid, Theta, RHO, MagCourse, RouteDISTANCEHoldingTime (Path length)

FD (Track from a Fix to a DME Distance)

FixIdentifier, RecommendedNavaid, Theta, RHO, MagCourse, RouteDISTANCEHoldingTime (DME distance)

FM (From a Fix to Manual termination)

FixIdentifier, RecommendedNavaid, Theta, RHO, MagCourse

HA (Holding mandatory)

FixIdentifier, TurnDirection, MagCourse, RouteTIMEDistanceHoldingTime, Alt1+ (at or above)

HF (Holding in lieu of Procedure Turn)

FixIdentifier, TurnDirection, MagCourse, RouteTIMEDistanceHoldingTime

HM (Holding mandatory)

FixIdentifier, TurnDirection, MagCourse, RouteTIMEDistanceHoldingTime

IF (Initial Fix)

FixIdentifier

PI (045/180 Procedure Turn)

FixIdentifier, TurnDirection, RecommendedNavaid, Theta, RHO, MagCourse,
RouteTimeDISTANCEHoldingTime (excursion distance from fix), Alt1

RF (Constant Radius Arc)

FixIdentifier, TurnDirection, Theta (inbound tangential track), MagCourse,
RouteTimeDISTANCEHoldingTime (along track distance), ArcCenter

TF (Track to a Fix)

FixIdentifier, Overfly

VA (Heading to an Altitude)

MagCourse (Heading), Alt1+ (at or above)

VD (Heading to a DME Distance)

RecommendedNavaid, MagCourse (Heading), RouteTimeDISTANCEHoldingTime (DME distance)

VI (Heading to an Intercept)

MagCourse (Heading)

VM (Heading to a Manual Termination)

MagCourse(Heading)

VR (Heading to a Radial)

RecommendedNavaid, Theta, MagCourse (Heading)