DIGITAL AVIATION / FLIGHT1 NAVIGATION DATA FILE FORMAT

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Version 2.03 03. Feb 09

= Recent Changes = Not for Trimble 2000 GPS

NOTES

All fields in the records are comma-separated

All string fields MUST contain at least one character (blank)

All numeric fields MUST contain a valid number (0 or 0.0)

Fields marked as required need to contain valid data. Other fields might be zero or blank

ISO country codes are 3-letter codes except where not available

FILE O	VERVIEW					
Nr	Sample content	Description	Type	Size	Req	Units/Remarks
1	Airports.txt	Airports and Runways				
2	Navaids.txt	VOR, DME and NDB				
3	Waypoints.txt	Fixes				
4	ATS.txt	ATS-Routes				
5	Proc*.txt	SIDs and STARs				

1. AIRAC CYCLE INFORMATION

used in Airports.txt

1	X	Record identifier	string	1
2	0405	Current AIRAC cycle	string	4
3	13MAY9JUN/04	Effective from/to	string	13
4	0404	Previous AIRAC cycle	string	4
5	15APR12MAY/04	Effective from/to	string	13

2.	AIRPORT					
used in	Airports.txt					
1	Α	Record identifier	string	1		
2	EDDF	ICAO code	string	4		
3	FRANKFURT MAIN	Airport name	string	20		
4	50.02642	Latitude	double		degrees	
5	8.54312	Longitude	double		degrees	
6	364	Elevation	int		feet	
7	5000	Transition altitude	int		feet	
8	5000	Transition level	int		feet	
9	13123	Length of longest runway	int		feet	
3.	RUNWAY					
used in	Airports.txt					
1	R	Record identifier	string	1		
2	07L	Runway ID	string	3		
3	69	Runway heading	int		degrees	
4	13123	Runway length	int		feet	
5	200	Runway width	int		feet	
6	1	ILS available	bool		1 if ILS available	
7	110.100	ILS frequency	double		frequency	
	60	ILS heading	int		degrees	
8	69	iLS rieauling	1111		acgrees	
8 9	50.03261	Threshold latitude	double		degrees	

int

int

int

int

double

feet

feet

degrees

see runway surfaces below

see runway status below

Elevation at threshold

Threshold overflying height

Glideslope angle

Surface type

Runway status

11 329

12 3.00

13 49

14 3

15 0

4.	NAVAID / USER NAV	/AID			
used in	Navaids.txt and UserN	Navaids.txt			
1	HMM	Navaid identifier	string	3	
2	HAMM	Navaid name	string	40	
3	115.650	Navaid frequency	double		frequency
4	1	VOR flag	bool		1 if VOR
5	1	DME flag	bool		1 if DME available
6	195	Range	int		nautical miles
7	51.85686	Latitude	double		degrees
8	7.70829	Longitude	double		degrees
9	237	Elevation	int		feet
10	DEU	Country code	string	3	ISO code
11	0	Exclude from auto-tune	int		1 = exclude, 0 = include
5.	WAYPOINT				
used in	Waypoints.txt				
1	BOMBI	Waypoint identifier	string	5	
2	50.0566				
	30.0300	Latitude	double		degrees
3	8.80027	Latitude Longitude	double double		degrees degrees
3 4			0.00.0.0		=
-	8.80027	Longitude	double		degrees
-	8.80027	Longitude	double		degrees
4 6.	8.80027 DEU	Longitude	double		degrees
4 6.	8.80027 DEU ATS ROUTE	Longitude	double	1	degrees
4 6. used in	8.80027 DEU ATS ROUTE ATS.txt	Longitude Country code	double string	1 6	degrees
4 6. used in 1	8.80027 DEU ATS ROUTE ATS.txt A	Longitude Country code Record identifier	double string		degrees

7.	ATS ROUTE SEGME	NT			
used in	ATS.txt				
1	S	Record identifier	string	1	
2	BOMBI	Waypoint 1 identifier	string	5	
3	50.05666	Waypoint 1 latitude	double		degrees
4	8.80027	Waypoint 1 longitude	double		degrees
5	ABUMO	Waypoint 2 identifier	string	5	
6	50.14166	Waypoint 2 latitude	double		degrees
7	8.92333	Waypoint 2 longitude	double		degrees
8	43	Inbound course	int		degrees
9	43	Outbound course	int		degrees
10	7	Distance	double		nautical miles
8.	USER DEFINED WAY	YPOINT			
used in	UserWpt.txt				
1	ALOHA	Waypoint identifier	string	5	
2	52.322338	Latitude	double		degrees
3	7.856697	Longitude	double		degrees
4	0	Overfly	int		1 if waypoint must be overflown
5	1	Custom waypoint type	int		see custom waypoint types below
6	OSN	Parameter 1	string	5	Parameters 1 - 4 show how the
7	135	Parameter 2	string	5	waypoint was created.
8	DOM	Parameter 3	string	5	This is only for reference! Lat/Lon
9	360	Parameter 4	string	5	should be used for navigation
9.	STANDARD TERMIN	IAL ARRIVAL ROUTE (STAR)	1		
1	STAR	Record identifier	string	4	always STAR
2	GED1W	STAR identifier	string	10	
3	ALL	Transition/Runway identifier	string	3	ALL = for all runways
4	2	STAR segment	int		see STAR segments below

The contents of field 3 depend on the airport. This may be either a runway or a transition identifier. Please use field 3 for text output on your GPS/FMS only, not for route calculation!

10.	STANDARD INSTRU	JMENT DEPARTURE (SID)			
1	SID	Record identifier	string	3	always SID
2	ANE4L	SID identifier	string	10	
3	07L	Transition/Runway identifier	string	3	ALL = for all runways
4	2	SID segment	int		see SID segments below

The contents of field 3 depend on the airport. This may be either a runway or a transition identifier. Please use field 3 for text output on your GPS/FMS only, not for route calculation!

11.		APPROACH TRANS	ITION			
	1	APPTR	Record identifier	string	5	always APPTR
	2	ANE4L	Approach identifier	string	10	
	3	07L	Runway identifier	string	3	
	4	RID	Transition fix	string	5	Initial Approach Fix
12.		FINAL APPROACH				
	1	FINAL	Record identifier	string	5	always FINAL
	2	ANE4L	Approach identifier	string	10	
	3	07L	Runway identifier	string	3	
	4	С	Approach type	string	1	see Approach Types below
13.		WAYPOINT TYPE IF	(Initial Fix)			
	1	IF	Record identifier	string	2 x	always IF
	2	REDGO	Waypoint identifier	string	5 x	
	3	50.10916669	Waypoint latitude	double	Х	degrees
	4	8.85638906	Waypoint longitude	double	Х	degrees
	5	TAU	Navaid identifier	string	5	
	6	69.0	Waypoint bearing	double		degrees
	7	0.0	Waypoint distance	double		nautical miles
	8	1	Altitude constraint	int		see Altitude Constraints below
	9	4000	First altitude	int		feet
	10	0	Second altitude	int		feet
	11	1	Speed constraint	int		see Speed Constraints below
	12	160	First speed	int		knots
	13	0	Second speed	int		knots
	14	0	Special Waypoint	int		see Special Waypoints below
	15	0	Overfly Waypoint	bool		see Overfly Waypoints below
•	16	0	Missed Approach Fix	bool		

14.	WAYPOINT TYPE TO	F (Track to a Fix)			
1	TF	Record identifier	string	2 x	always TF
2	REDGO	Waypoint identifier	string	5 x	
3	50.10916669	Waypoint latitude	double	X	degrees
4	8.85638906	Waypoint longitude	double	X	degrees
5	0	Turn direction	int		see Turn Directions below
6	TAU	Navaid identifier	string	5	
7	69.0	Waypoint bearing	double		degrees
8	0.0	Waypoint distance	double		nautical miles
9	249	Magnetic course	int		degrees
10	4.3	Distance	double		nautical miles
11	1	Altitude constraint	int		see Altitude Constraints below
12	4000	First altitude	int		feet
13	0	Second altitude	int		feet
14	1	Speed constraint	int		see Speed Constraints below
15	160	First speed	int		knots
16	0	Second speed	int		knots
17	0	Special Waypoint	int		see Special Waypoints below
18	0	Overfly Waypoint	bool		see Overfly Waypoints below
19	0	Missed Approach Fix	bool		

15.	WAYPOINT TYPE C	F (Course to a Fix)			
1	CF	Record identifier	string	2 x	always CF
2	REDGO	Waypoint identifier	string	5 x	
3	50.10916669	Waypoint latitude	double	Х	degrees
4	8.85638906	Waypoint longitude	double	Х	degrees
5	0	Turn direction	int		see Turn Directions below
6	TAU	Navaid identifier	string	5 x	
7	69.0	Waypoint bearing	double		degrees
8	0.0	Waypoint distance	double		nautical miles
9	249	Magnetic course	int	Х	degrees
10	4.3	Distance	double		nautical miles
11	1	Altitude constraint	int		see Altitude Constraints below
12	4000	First altitude	int		feet
13	0	Second altitude	int		feet
14	1	Speed constraint	int		see Speed Constraints below
15	160	First speed	int		knots
16	0	Second speed	int		knots
17	0	Special Waypoint	int		see Special Waypoints below
18	0	Overfly Waypoint	bool		see Overfly Waypoints below
19	0	Missed Approach Fix	bool		

	WAYPOINT TYPE D	F (Direct to a Fix)			
1	DF	Record identifier	string	2 x	always DF
2	REDGO	Waypoint identifier	string	5 x	
3	50.10916669	Waypoint latitude	double	Х	degrees
4	8.85638906	Waypoint longitude	double	Х	degrees
5	0	Turn direction	int		see Turn Directions below
6	TAU	Navaid identifier	string	5	
7	69.0	Waypoint bearing	double		degrees
8	0.0	Waypoint distance	double		nautical miles
9	1	Altitude constraint	int		see Altitude Constraints below
10	4000	First altitude	int		feet
11	0	Second altitude	int		feet
12	1	Speed constraint	int		see Speed Constraints below
13	160	First speed	int		knots
14	0	Second speed	int		knots
15	0	Special Waypoint	int		see Special Waypoints below
16	0	Overfly Waypoint	bool		see Overfly Waypoints below

17.	WAYPOINT TYPE A	F (Arc to a fix; aka DME Arc)			
1	AF	Record identifier	string	2 x	AF
2	REDGO	Waypoint identifier	string	5 x	
3	50.10916669	Waypoint latitude	double	Х	degrees
4	8.85638906	Waypoint longitude	double	Х	degrees
5	0	Turn direction	int	Х	see Turn Directions below
6	TAU	Navaid identifier	string	5 x	
7	69.0	Sweep angle	double	Х	degrees
8	0.0	DME distance	double	X	nautical miles
9	249	Start radial	int	X	Start radial in degrees
10	1	Altitude constraint	int		see Altitude Constraints below
11	4000	First altitude	int		feet
12	0	Second altitude	int		feet
13	1	Speed constraint	int		see Speed Constraints below
14	160	First speed	int		knots
15	0	Second speed	int		knots
16	0	Special Waypoint	int		see Special Waypoints below
17	0	Overfly Waypoint	bool		see Overfly Waypoints below
18	0	Missed Approach Fix	bool		
40	MANDONIT TYPE P	- (B. 11)			
18 .	WAYPOINT TYPE R		atria a	0	alvana DE
1	RF	Record identifier	string	2 x	always RF
1 2	RF REDGO	Record identifier Start fix	string	5 x	•
1 2 3	RF REDGO 50.10916669	Record identifier Start fix Waypoint latitude	string double	5 x x	degrees
1 2 3 4	RF REDGO 50.10916669 8.85638906	Record identifier Start fix Waypoint latitude Waypoint longitude	string double double	5 x x x	degrees degrees
1 2 3 4 5	RF REDGO 50.10916669 8.85638906 0	Record identifier Start fix Waypoint latitude Waypoint longitude Turn direction	string double double int	5 x x x x	degrees
1 2 3 4 5 6	RF REDGO 50.10916669 8.85638906 0 TAU	Record identifier Start fix Waypoint latitude Waypoint longitude Turn direction Arc Center	string double double int string	5 x x x x x 5 x	degrees degrees see Turn Directions below
1 2 3 4 5 6 7	RF REDGO 50.10916669 8.85638906 0 TAU 249	Record identifier Start fix Waypoint latitude Waypoint longitude Turn direction Arc Center Sweep angle	string double double int string int	5 x x x x 5 x	degrees degrees see Turn Directions below degrees
1 2 3 4 5 6 7 8	RF REDGO 50.10916669 8.85638906 0 TAU 249 4.3	Record identifier Start fix Waypoint latitude Waypoint longitude Turn direction Arc Center Sweep angle Radius	string double double int string int double	5 x x x x x 5 x	degrees degrees see Turn Directions below degrees nautical miles
1 2 3 4 5 6 7 8 9	RF REDGO 50.10916669 8.85638906 0 TAU 249 4.3	Record identifier Start fix Waypoint latitude Waypoint longitude Turn direction Arc Center Sweep angle Radius Altitude constraint	string double double int string int double int	5 x x x x 5 x	degrees degrees see Turn Directions below degrees nautical miles see Altitude Constraints below
1 2 3 4 5 6 7 8 9 10	RF REDGO 50.10916669 8.85638906 0 TAU 249 4.3 1	Record identifier Start fix Waypoint latitude Waypoint longitude Turn direction Arc Center Sweep angle Radius Altitude constraint First altitude	string double double int string int double int int	5 x x x x 5 x	degrees degrees see Turn Directions below degrees nautical miles see Altitude Constraints below feet
1 2 3 4 5 6 7 8 9 10 11	RF REDGO 50.10916669 8.85638906 0 TAU 249 4.3 1 4000	Record identifier Start fix Waypoint latitude Waypoint longitude Turn direction Arc Center Sweep angle Radius Altitude constraint First altitude Second altitude	string double double int string int double int int int	5 x x x x 5 x	degrees degrees see Turn Directions below degrees nautical miles see Altitude Constraints below feet feet
1 2 3 4 5 6 7 8 9 10 11 12	RF REDGO 50.10916669 8.85638906 0 TAU 249 4.3 1 4000 0	Record identifier Start fix Waypoint latitude Waypoint longitude Turn direction Arc Center Sweep angle Radius Altitude constraint First altitude Second altitude Speed constraint	string double double int string int double int int int	5 x x x x 5 x	degrees degrees see Turn Directions below degrees nautical miles see Altitude Constraints below feet feet see Speed Constraints below
1 2 3 4 5 6 7 8 9 10 11 12 13	RF REDGO 50.10916669 8.85638906 0 TAU 249 4.3 1 4000 0	Record identifier Start fix Waypoint latitude Waypoint longitude Turn direction Arc Center Sweep angle Radius Altitude constraint First altitude Second altitude Speed constraint First speed	string double double int string int double int int int int	5 x x x x 5 x	degrees degrees see Turn Directions below degrees nautical miles see Altitude Constraints below feet feet see Speed Constraints below knots
1 2 3 4 5 6 7 8 9 10 11 12 13 14	RF REDGO 50.10916669 8.85638906 0 TAU 249 4.3 1 4000 0 1	Record identifier Start fix Waypoint latitude Waypoint longitude Turn direction Arc Center Sweep angle Radius Altitude constraint First altitude Second altitude Speed constraint First speed Second speed	string double double int string int double int int int int int int	5 x x x x 5 x	degrees degrees see Turn Directions below degrees nautical miles see Altitude Constraints below feet feet see Speed Constraints below knots knots
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	RF REDGO 50.10916669 8.85638906 0 TAU 249 4.3 1 4000 0 1 160 0	Record identifier Start fix Waypoint latitude Waypoint longitude Turn direction Arc Center Sweep angle Radius Altitude constraint First altitude Second altitude Speed constraint First speed Second speed Special Waypoint	string double double int string int double int int int int int int int int	5 x x x x 5 x	degrees degrees see Turn Directions below degrees nautical miles see Altitude Constraints below feet feet see Speed Constraints below knots knots see Special Waypoints below
1 2 3 4 5 6 7 8 9 10 11 12 13 14	RF REDGO 50.10916669 8.85638906 0 TAU 249 4.3 1 4000 0 1	Record identifier Start fix Waypoint latitude Waypoint longitude Turn direction Arc Center Sweep angle Radius Altitude constraint First altitude Second altitude Speed constraint First speed Second speed	string double double int string int double int int int int int int	5 x x x x 5 x	degrees degrees see Turn Directions below degrees nautical miles see Altitude Constraints below feet feet see Speed Constraints below knots knots

19.	WAYPOINT TYPE C	A (Course to an Altitude)			
1	CA	Record identifier	string	2 x	always CA
2	0	Turn direction	int		see Turn Directions below
3	249	Magnetic course	int	X	degrees
4	1	Altitude constraint	int	X	see Altitude Constraints below
5	4000	First altitude	int	X	feet
6	0	Second altitude	int		feet
7	1	Speed constraint	int		see Speed Constraints below
8	160	First speed	int		knots
9	0	Second speed	int		knots
10	0	Special Waypoint	int		see Special Waypoints below
11	0	Overfly Waypoint	bool		see Overfly Waypoints below
12	0	Missed Approach Fix	bool		

WAYPOINT TYPE C	D (Course to a DME Distance))		
CD	Record identifier	string	2 x	always CD
REDGO	Waypoint identifier	string	5	
50.10916669	Waypoint latitude	double		degrees
8.85638906	Waypoint longitude	double		degrees
0	Turn direction	int		see Turn Directions below
TAU	Navaid identifier	string	5 x	
53.0	Waypoint bearing	double		degrees
0.0	Waypoint distance	double	X	nautical miles
249	Magnetic course	int	Х	degrees
4.3	DME Distance	double		nautical miles
1	Altitude constraint	int		see Altitude Constraints below
4000	First altitude	int		feet
0	Second altitude	int		feet
1	Speed constraint	int		see Speed Constraints below
160	First speed	int		knots
0	Second speed	int		knots
0	Special Waypoint	int		see Special Waypoints below
0	Overfly Waypoint	bool		see Overfly Waypoints below
0	Missed Approach Fix	bool		
	CD REDGO 50.10916669 8.85638906 0 TAU 53.0 0.0 249 4.3 1 4000 0 1 160 0 0	CD Record identifier REDGO Waypoint identifier 50.10916669 Waypoint latitude 8.85638906 Waypoint longitude 0 Turn direction TAU Navaid identifier 53.0 Waypoint bearing 0.0 Waypoint distance 249 Magnetic course 4.3 DME Distance 1 Altitude constraint 4000 First altitude 0 Second altitude 1 Speed constraint 160 First speed 0 Second speed 0 Special Waypoint 0 Overfly Waypoint	REDGO Waypoint identifier string 50.10916669 Waypoint latitude double 8.85638906 Waypoint longitude double 0 Turn direction int TAU Navaid identifier string 53.0 Waypoint bearing double 0.0 Waypoint distance double 249 Magnetic course int 4.3 DME Distance double 1 Altitude constraint int 4000 First altitude int 0 Second altitude int 1 Speed constraint int 160 First speed int 0 Second speed int 0 Special Waypoint bool	CD Record identifier string 2 x REDGO Waypoint identifier string 5 50.10916669 Waypoint latitude double 8.85638906 Waypoint longitude double 0 Turn direction int TAU Navaid identifier string 5 x 53.0 Waypoint bearing double 0.0 Waypoint distance double x 249 Magnetic course int x 4.3 DME Distance double 1 Altitude constraint int 4000 First altitude int 0 Second altitude int 1 Speed constraint int 160 First speed int 0 Second speed int 0 Special Waypoint bool

21.	WAYPOINT	TYPE CR (Course to a Radial)			
1	CR	Record identifier	string	2 x	always CR
2	0	Turn direction	int		see Turn Directions below
3	TAU	Navaid identifier	string	5 x	
4	111.0	Radial	double	Χ	degrees
5	261	Course	int	Χ	degrees
6	1	Altitude constraint	int		see Altitude Constraints below
7	4000	First altitude	int		feet
8	0	Second altitude	int		feet
9	1	Speed constraint	int		see Speed Constraints below
10	160	First speed	int		knots
11	0	Second speed	int		knots
12	0	Special Waypoint	int		see Special Waypoints below
13	0	Overfly Waypoint	bool		see Overfly Waypoints below
14	0	Missed Approach Fix	bool		

22.	WAYPOINT TYPE C	l (Course to Intercept Next Le	g)		
1	CI	Record identifier	string	2 x	always CI
2	0	Turn direction	int		see Turn Directions below
3	TAU	Navaid identifier	string	5	
4	094	Intercept course	int		degrees
5	249	Magnetic course	int	Х	degrees
6	1	Altitude constraint	int		see Altitude Constraints below
7	4000	First altitude	int		feet
8	0	Second altitude	int		feet
9	1	Speed constraint	int		see Speed Constraints below
10	160	First speed	int		knots
11	0	Second speed	int		knots
12	0	Special Waypoint	int		see Special Waypoints below
13	0	Overfly Waypoint	bool		see Overfly Waypoints below
14	0	Missed Approach Fix	bool		

WAYPOINT TYPE FA	A (Course from a Fix to an Alt	itude)		
FA	Record identifier	string	2 x	always FA
REDGO	Waypoint identifier	string	5 x	
50.10916669	Waypoint latitude	double	Χ	degrees
8.85638906	Waypoint longitude	double	Χ	degrees
0	Turn direction	int		see Turn Directions below
TAU	Navaid identifier	string	5 x	
69.0	Waypoint bearing	double	Χ	degrees
0.0	Waypoint distance	double	Χ	nautical miles
249	Magnetic course	int	X	degrees
1	Altitude constraint	int		see Altitude Constraints below
4000	First altitude	int		feet
0	Second altitude	int		feet
1	Speed constraint	int		see Speed Constraints below
160	First speed	int		knots
0	Second speed	int		knots
0	Special Waypoint	int		see Special Waypoints below
0	Overfly Waypoint	bool		see Overfly Waypoints below
0	Missed Approach Fix	bool		
	FA REDGO 50.10916669 8.85638906 0 TAU 69.0 0.0 249 1 4000 0 1 160 0 0	FA Record identifier REDGO Waypoint identifier 50.10916669 Waypoint latitude 8.85638906 Waypoint longitude 0 Turn direction TAU Navaid identifier 69.0 Waypoint bearing 0.0 Waypoint distance 249 Magnetic course 1 Altitude constraint 4000 First altitude 0 Second altitude 1 Speed constraint 160 First speed 0 Second speed 0 Special Waypoint 0 Overfly Waypoint	REDGO Waypoint identifier string 50.10916669 Waypoint latitude double 8.85638906 Waypoint longitude double 0 Turn direction int TAU Navaid identifier string 69.0 Waypoint bearing double 0.0 Waypoint distance double 249 Magnetic course int 1 Altitude constraint int 4000 First altitude int 0 Second altitude int 1 Speed constraint int 160 First speed int 0 Second speed int 0 Special Waypoint bool	FA Record identifier string 2 x REDGO Waypoint identifier string 5 x 50.10916669 Waypoint latitude double x 8.85638906 Waypoint longitude double x 0 Turn direction int TAU Navaid identifier string 5 x 69.0 Waypoint bearing double x 0.0 Waypoint distance double x 1 Altitude constraint int x 1 Altitude constraint int 4000 First altitude int 0 Second altitude int 1 Speed constraint int 160 First speed int 0 Second speed int 0 Special Waypoint bool

24.	WAYPOINT TYPE FI	O (Course from a Fix to a DME	Distance)		
1	FD	Record identifier	string	2 x	always FD
2	REDGO	Waypoint identifier	string	5 x	
3	50.10916669	Waypoint latitude	double	Х	degrees
4	8.85638906	Waypoint longitude	double	X	degrees
5	0	Turn direction	int		see Turn Directions below
6	TAU	DME Identifier	string	5 x	
7	69.0	Waypoint bearing	double		degrees
8	0.0	DME Distance	double	X	nautical miles
9	249	Magnetic course	int	Х	degrees
10	4.3	Distance	double		nautical miles
11	1	Altitude constraint	int		see Altitude Constraints below
12	4000	First altitude	int		feet
13	0	Second altitude	int		feet
14	1	Speed constraint	int		see Speed Constraints below
15	160	First speed	int		knots
16	0	Second speed	int		knots
17	0	Special Waypoint	int		see Special Waypoints below
18	0	Overfly Waypoint	bool		see Overfly Waypoints below
19	0	Missed Approach Fix	bool		

25.	WAYPOINT	TYPE FC (Course from a Fix to an A	Along Track	Distanc	e)
1	FC	Record identifier	string	2 x	always FC
2	REDGO	Waypoint identifier	string	5 x	
3	50.10916669	Waypoint latitude	double	Х	degrees
4	8.85638906	Waypoint longitude	double	Х	degrees
5	0	Turn direction	int		see Turn Directions below
6	TAU	Navaid identifier	string	5 x	
7	69.0	Waypoint bearing	double	Х	degrees
8	0.0	Waypoint distance	double	Х	nautical miles
9	249	Magnetic course	int	Х	degrees
10	4.3	Track Distance	double	Х	nautical miles
11	1	Altitude constraint	int		see Altitude Constraints below
12	4000	First altitude	int		feet
13	0	Second altitude	int		feet
14	1	Speed constraint	int		see Speed Constraints below
15	160	First speed	int		knots
16	0	Second speed	int		knots
17	0	Special Waypoint	int		see Special Waypoints below
18	0	Overfly Waypoint	bool		see Overfly Waypoints below
19	0	Missed Approach Fix	bool		

26.	WAYPOINT TYPE FI	<mark>// (Course from a Fix to a M</mark> an	ual Termin	ation)	
1	FM	Record identifier	string	2 x	always FM
2	REDGO	Waypoint identifier	string	5 x	
3	50.10916669	Waypoint latitude	double	X	degrees
4	8.85638906	Waypoint longitude	double	Χ	degrees
5	0	Turn direction	int		see Turn Directions below
6	TAU	Navaid identifier	string	5 x	
7	69.0	Waypoint bearing	double	Х	degrees
8	0.0	Waypoint distance	double	Χ	nautical miles
9	249	Magnetic course	int	Х	degrees
10	1	Altitude constraint	int		see Altitude Constraints below
11	4000	First altitude	int		feet
12	0	Second altitude	int		feet
13	1	Speed constraint	int		see Speed Constraints below
14	160	First speed	int		knots
15	0	Second speed	int		knots
16	0	Special Waypoint	int		see Special Waypoints below
17	0	Overfly Waypoint	bool		see Overfly Waypoints below
18	0	Missed Approach Fix	bool		

27.	WAYPOINT TYPE V	A (Heading to an Altitude)			
1	VA	Record identifier	string	2 x	always VA
2	0	Turn direction	int		see Turn Directions below
3	249	Heading	int	X	degrees
4	1	Altitude constraint	int	X	see Altitude Constraints below
5	4000	First altitude	int	X	feet
6	0	Second altitude	int		feet
7	1	Speed constraint	int		see Speed Constraints below
8	160	First speed	int		knots
9	0	Second speed	int		knots
10	0	Special Waypoint	int		see Special Waypoints below
11	0	Overfly Waypoint	bool		see Overfly Waypoints below
12	0	Missed Approach Fix	bool		

28.	WAYPOINT TYPE \	/D (Heading to a DME Distance	:e)		
1	VD	Record identifier	string	2 x	always VD
2	REDGO	Waypoint identifier	string	5	
3	50.10916669	Waypoint latitude	double		degrees
4	8.85638906	Waypoint longitude	double		degrees
5	0	Turn direction	int		see Turn Directions below
6	TAU	DME identifier	string	5 x	
7	69.0	Waypoint bearing	double		degrees
8	0.0	DME distance	double	Х	nautical miles
9	249	Heading	int	Х	degrees
10	4.3	Distance	double		nautical miles
11	1	Altitude constraint	int		see Altitude Constraints below
12	4000	First altitude	int		feet
13	0	Second altitude	int		feet
14	1	Speed constraint	int		see Speed Constraints below
15	160	First speed	int		knots
16	0	Second speed	int		knots
17	0	Special Waypoint	int		see Special Waypoints below
18	0	Overfly Waypoint	bool		see Overfly Waypoints below
19	0	Missed Approach Fix	bool		

29 .	WAYPOINT TYPE VI	R (Heading to a Radial)			
1	VR	Record identifier	string	2 x	always VR
2	0	Turn direction	int		see Turn Directions below
3	TAU	Navaid identifier	string	5 x	
4	69.0	Radial	double	Х	degrees
5	249	Heading	int	X	degrees
6	1	Altitude constraint	int		see Altitude Constraints below
7	4000	First altitude	int		feet
8	0	Second altitude	int		feet
9	1	Speed constraint	int		see Speed Constraints below
10	160	First speed	int		knots
11	0	Second speed	int		knots
12	0	Special Waypoint	int		see Special Waypoints below
13	0	Overfly Waypoint	bool		see Overfly Waypoints below
14	0	Missed Approach Fix	bool		
30.	WAYPOINT TYPE VI	(Heading to Intercept Next L	.eg)		
1	M	Pecord identifier	etrina	2 v	alwaye VI

30.	WAYPOINT TYPE V	I (Heading to Intercept Next L	eg)		
1	VI	Record identifier	string	2 x	always VI
2	0	Turn direction	int		see Turn Directions below
3	TAU	Navaid identifier	string	5	
4	094	Intercept course	int		degrees
5	249	Heading	int	Х	degrees
6	1	Altitude constraint	int		see Altitude Constraints below
7	4000	First altitude	int		feet
8	0	Second altitude	int		feet
9	1	Speed constraint	int		see Speed Constraints below
10	160	First speed	int		knots
11	0	Second speed	int		knots
12	0	Special Waypoint	int		see Special Waypoints below
13	0	Overfly Waypoint	bool		see Overfly Waypoints below
14	0	Missed Approach Fix	bool		

31.	WAYPOINT TYPE V	M (Heading to a Manual Term	ination)		
1	VM	Record identifier	string	2 x	always VM
2	50.10916669	Waypoint latitude	double		degrees
3	8.85638906	Waypoint longitude	double		degrees
4	0	Turn direction	int		see Turn Directions below
5	249	Heading	int	X	degrees
6	1	Altitude constraint	int		see Altitude Constraints below
7	4000	First altitude	int		feet
8	0	Second altitude	int		feet
9	1	Speed constraint	int		see Speed Constraints below
10	160	First speed	int		knots
11	0	Second speed	int		knots
12	0	Special Waypoint	int		see Special Waypoints below
13	0	Overfly Waypoint	bool		see Overfly Waypoints below
14	0	Missed Approach Fix	bool		
32.	WAYPOINT TYPE P	•			
1	PI	Record identifier	string	2 x	always Pl
2	ANU	Waypoint identifier	string	5 x	
3	50.10916669	Waypoint latitude	double	Х	degrees
4	8.85638906	Waypoint longitude	double	Χ	degrees
5	0	Turn direction	int	Х	see Turn Directions below
6	ANU	Fix identifier	string	5 x	
7	262.0	First turn	double	Χ	degrees
8	12.0	Turn limit to fix	double	X	nautical miles
9	307	Outbound from fix	int	Χ	degrees
10	4.0	Outbound from fix	double	X	nautical miles
11	1	Altitude constraint	int		see Altitude Constraints below
12	4000	First altitude	int		feet
13	0	Second altitude	int		feet
14	1	Speed constraint	int		see Speed Constraints below
15	160	First speed	int		knots
16	0	Second speed	int		knots
17	0	Special Waypoint	int		see Special Waypoints below
18	0	Overfly Waypoint	bool		see Overfly Waypoints below
19	0	Missed Approach Fix	bool		

33.	WAYPOINT TYPE H	F (Hold at a Fix)			
1	HF	Record identifier	string	2 x	always HF
2	REDGO	Waypoint identifier	string	5 x	
3	50.10916669	Waypoint latitude	double	X	degrees
4	8.85638906	Waypoint longitude	double	X	degrees
5	0	Turn direction	int		see Turn Directions below
6	TAU	Navaid identifier	string	5	
7	69.0	Waypoint bearing	double		degrees
8	0.0	Waypoint distance	double		nautical miles
9	249	Inbound course	int	X	degrees
10	4.3	Leg distance	double	X	nautical miles
11	1	Altitude constraint	int		see Altitude Constraints below
12	4000	First altitude	int		feet
13	0	Second altitude	int		feet
14	1	Speed constraint	int		see Speed Constraints below
15	160	First speed	int		knots
16	0	Second speed	int		knots
17	0	Special Waypoint	int		see Special Waypoints below
18	0	Overfly Waypoint	bool		see Overfly Waypoints below
19	0	Leg Distance Type	bool		see Hold Distance Types below
20	0	Missed Approach Fix	bool		

34.	WAYPOINT TYPE HA	A (Hold at a Fix to an Altitude)		
1	HA	Record identifier	string	2 x	always HA
2	REDGO	Waypoint identifier	string	5 x	
3	50.10916669	Waypoint latitude	double	Χ	degrees
4	8.85638906	Waypoint longitude	double	Χ	degrees
5	0	Turn direction	int		see Turn Directions below
6	TAU	Navaid identifier	string	5	
7	69.0	Waypoint bearing	double		degrees
8	0.0	Waypoint distance	double		nautical miles
9	249	Inbound course	int		degrees
10	4.3	Leg distance	double	X	nautical miles
11	1	Altitude constraint	int	X	see Altitude Constraints below
12	4000	First altitude	int	Χ	feet
13	0	Second altitude	int		feet
14	1	Speed constraint	int		see Speed Constraints below
15	160	First speed	int		knots
16	0	Second speed	int		knots
17	0	Special Waypoint	int		see Special Waypoints below
18	0	Overfly Waypoint	bool		see Overfly Waypoints below
19	0	Leg Distance Type	bool		see Hold Distance Types below
20	0	Missed Approach Fix	bool		

35.	WAYPOINT TYPE H	ฟ (Hold at a Fix to a Manual T	ermination))	
1	HM	Record identifier	string	2 x	always HM
2	REDGO	Waypoint identifier	string	5 x	Fix to hold at
3	50.10916669	Waypoint latitude	double	X	degrees
4	8.85638906	Waypoint longitude	double	X	degrees
5	0	Turn direction	int		see Turn Directions below
6	TAU	Navaid identifier	string	5	
7	69.0	Waypoint bearing	double		degrees
8	0.0	Waypoint distance	double		nautical miles
9	249	Inbound course	int		degrees
10	4.3	Leg distance	double	X	nautical miles
11	1	Altitude constraint	int		see Altitude Constraints below
12	4000	First altitude	int		feet
13	0	Second altitude	int		feet
14	1	Speed constraint	int		see Speed Constraints below
15	160	First speed	int		knots
16	0	Second speed	int		knots
17	0	Special Waypoint	int		see Special Waypoints below
18	0	Overfly Waypoint	bool		see Overfly Waypoints below
19	0	Leg Distance Type	bool		see Hold Distance Types below
20	0	Missed Approach Fix	bool		

ARINC 424 PROCEDURE TYPE CODES

1	AF	Constant DME arc to a fix
2	CA	Course to an altitude
3	CD	Course to a DME distance
4	CI	Course to next leg
5	CF	Course to a fix
6	CD	Course to a radial terminati

6 CR Course to a radial termination
7 DF Computed track direct to a fix
8 FA Course from a fix to an altitude
9 FC Course from a fix to a distance

10 FD Course from a fix to a DME distance11 FM Course from a fix to manual termination

12 IF Initial Fix

13 PI Procedure turn followed by course to a fix

14 RF Constant radius to a fix

15 TF Track between two fixes (great circle)

16 VA Heading to an altitude17 VD Heading to a DME distance

18 VI Heading to next leg

19 VM Heading to manual termination

20 VR Heading to a radial

21 HF Hold at a fix after one full circuit
22 HA Hold at a fix after reaching an altitude

23 HM Hold manually

TURN DIRECTIONS

- 0 Use shortest turn
- 1 Turn left
- 2 Turn right

ALTITUDE CONSTRAINTS

- 0 No restriction
- 1 At Altitude1
- 2 Above Altitude1
- 3 Below Altitude1
- 4 Between Altitude1 and Altitude2

SPEED CONSTRAINTS

- No restriction
- 1 All aircraft
- 2 Jets only
- 3 Turboprop only
- 4 Others only

APPROACH TYPES

- C CAT II ILS Approach
- I ILS Approach
- G GPS/RNAV Approach
- D VOR/DME Approach
- N NDB/DME Approach

SPECIAL WAYPOINT TYPES

- 0 Normal Waypoint
- 1 Initial Approach Fix (IAF)
- 2 Final Approach Fix (FAF)
- 3 Missed Approach Point (MAP)

OVERFLY WAYPOINTS

- 0 Fly-by Waypoint
- 1 Overfly Waypoint

HOLD DISTANCE TYPES

- 0 Distance in Nautical Miles
- 1 Distance in Seconds

RUNWAY SURFACES TYPES

- 0 Concrete
- 1 Asphalt or Bitumen
- 2 Gravel, Coral or Ice
- 3 Other

RUNWAY STATUS

- 0 Takeoff and land
- 1 Takeoff only
- 2 Land only3 Closed