project magenta

Introduction

This document will explain the system with which you can build your own SID/STAR entries for the Project Magenta CDU.

The CDU comes with two very large files, SIDDATA.TXT and STARDATA.TXT. Those files include a world-wide set of departure and arrival procedures which have been created for you. To add your own procedures, the CDU is able to read two other files which will obviously be smaller. SIDDATA2.TXT and STARDATA2.TXT.

Flying a procedure can be quite complicated, explaining it to a computer is at least as difficult. This means that trying certain combinations may result in a very confusing line on your ND and may even generate strange results in the CDU itself.

Structure

Both the SID and the STAR lists follow this general structure:

[{ICAO Code}**]**
{procedure name} {runway(s) used}
{part indication}**>** {description of waypoints}
{procedure name} {runway used}
{part indication}**>** {description of waypoints}
{procedure name} {runway used}
{part indication}**>** {description of waypoints}
{procedure name} {runway used}
{part indication}**>** {description of waypoints}
[{ICAO Code}**]**
{procedure name} {runway used}
{part indication}**>** {description of waypoints}

Example:

[LGMK]
TEST1 16
1> +500 MIL @7000 KEA DDM
TEST2 34
1> +500 +INTC090 MIL @7000 KEA DDM
TEST3 ALL
1> +800 KEA

meaning:

[Mykonos Airport in Greece]
Procedure TEST1, Runway 16
part 1 > maintain present heading until 500 ft, fly to VOR MIL at 7000 ft then on to VORs KEA and DDM
Procedure TEST2, Runway 34
part 1 > maintain present heading until 500 ft, turn to intercept heading 090 fly to VOR MIL at 7000 ft then on to VORs KEA and DDM
Procedure TEST3, All runways
part 1 > maintain present heading until 800 ft, then direct KEA

{ICAO Code} 4 letter ICAO code of the Airport
{procedure name} Name of the procedure
{runway used} Runway Number (e.g. 33R, 33L, 33C), ALL (all runways) or 33B (for runways 33L and 33R)
{part indication} indicates what portion of the procedure is being described
{description of waypoints/commands} List of waypoints/commands to be flown.

{part indication}

- 1> initial (e.g. starting from runway)
- 2> or 3> continuation of that procedure
- A> approach
- I> ILS approach
- N> NDB approach
- V> VOR approach

Waypoints

{altitude} indicates an altitude in feet or a flight level (FL!) is required
{navaid} indicates a navaid name is required
{course} indicates a course is required (always course TO the waypoint)
{heading} indicated an aircraft heading is required (magnetic)

{waypoint name} e.g. VOG, BAMBI etc.

{waypoint radial/distance} e.g. VOG270/15
Defines a point on radial XXX, YY NM from the waypoint (will create the waypoint VOG1 etc.)

{waypoint radial/waypoint radial} e.g. VOG180/LIN280
Defines a point on the intersection of radial XXX from waypoint 1 with radial YYY from waypoint 2

{latitude/longitude} e.g. N13E020, S1530W01545 etc.

Subsequent operations are made on these waypoints. I.e. to set a speed, course to a waypoint, it has to be defined first.

Conditional Waypoints

+{altitude}
e.g. 1> **+500** +INTC090 MIL @7000 KEA DDM

This command sets a condition to step to the next waypoint only when the aircraft is above 500 ft (in the example). Normally used right after take off... but it can be used enroute as well. This waypoint would be displayed as (500)in the CDU.

+INTC{heading}
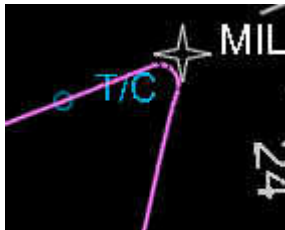e.g. 1> +500 **+INTC050** ABC

This condition means that after passing 500 feet the aircraft should turn to the heading of 050 degrees. Assuming you are on runway 36, taking off heading 360, the +INTC050 would force a right turn to waypoint ABC, which would lie to the south of the runway. The aircraft won't fly to ABC unless it reaches the heading of 50 degrees. To force a left turn to ABC you would have to use +INTC340.

Other Settings/Restrictions

@O (the letter 'O', *not* the digit '0')
e.g. 1> +500 +INTC050 ABC DEF **@O** GHI

Sets/cancels flyover waypoint. By default, all waypoints read from the SID/STAR are flyover waypoints, i.e. ABC would be flown over, the turn to the next waypoint would not be initiated until the aircraft has reached that waypoint, ABC @O would allow the aircraft to fly to the next waypoint as soon as it has to turn to be able to intercept the proper inbound course.

... MIL @220/ **@O** KEA ...
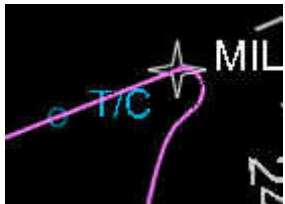
... MIL @220/ KEA ...

@{speed}/
e.g. 1> +500 +INTC050 ABC **@220/** DEF @O GHI

Sets the speed restriction for the waypoint ABC, in this case 200 knots. Important: speed has to be followed by a slash '/'!

@{altitude}
e.g. 1> +500 +INTC050 ABC @220/ **@7000** DEF @O GHI
Sets the altitude restriction for the waypoint ABC, in this case 7000 feet.

@{flight level}
e.g. 1> +500 +INTC050 ABC @220/ @7000 DEF @O **@FL220** GHI
Sets the altitude restriction for the waypoint DEF, in this case flight level 220.

.DIS{distance}

.CRS{course}