Cessna Citation Mustang Flight Planner

V1.0 Explanatory notes

The accompanying spreadsheet attempts to provide a fuel/payload/flight time planning tool for use with the Flight 1 Cessna Citation Mustang, for flight simulation use only.

The principle of operation uses published performance tables that consider the effect of Density Altitude (modified to suit) and basic trigonometry as a calculation basis.

The user is required to provide certain details pertaining to the planned flight, and the system validates these details and provides a useable plan.

Certain areas of the spreadsheets are shaded to illustrate their purpose.

Required input areas are shaded like this and are found on the **Route** and **Planner** sheets.

Information presented for action by the pilot before or during the flight, or inspection for validity.

Performance data captured from published sources. These include Flight 1 performance tables and real world King Air tables.

Procedure

1 Plan the route (see step 4.1), and enter each leg in the table on the **Route** sheet. If #N/A! or #REF! or #VALUE! Indications appear, you have most likely entered a value that falls outside of the aircraft flight envelope, and such values should be revised before continuing.

1.1 Indicate whether the flight will be conducted under Instrument Flight Rule (IFR) or Visual Flight Rules (VFR). This is to ensure observation of the ICAO semi-circular rule of flight levels. It is also used to apply an IFR fuel reserve if necessary (See 2.2.2).

1.2 A leg should be completed for each change in track, Outside Air Temperature (OAT), altitude or wind vector. Where the OAT or wind vector at altitude is not known, enter conservative estimates. [Active Sky provides a good source]

1.3 Since the direction of forecast winds aloft is stated in degrees, true, the magnetic variation at each waypoint is required to convert to degrees magnetic. Be sure to enter the magnetic variation of the departure field in the **Initial Climb** row, as this

allows the calculation of average variation along each leg. [Data accessible in FS Navigator]

1.4 Pressure Altitudes entered must conform to the ICAO semi-circular rule, and if not, will be flagged as “NON” in the ICAO RULE column. (See the **Tables** sheet for required levels.) You may wish to use the “Best TAS” levels shown, but be advised that no account is taken of the effect on fuel consumption and flight time of flight level changes in the cruise.

1.5 The distances of the automatically calculated climb and descent legs must be manually deducted from the distances of the first and last cruise legs, respectively. For example, if the flight plan calls for 100nm for the first leg of the route, and the distance to climb is calculated by the system as 55.3nm, then enter =100-55.3 for the first leg distance. Do the same (using the calculated distance to descend) for the last route leg.

2 On the **Planner** sheet, enter the following:

2.1 In the **Fuel Plan** box, enter the taxi/climb/descent and approach parameters to suit your personal preference. Consider taxiway lengths at large fields, time at the holding point at busy fields, time during run-up.

Note that IFR reserve range (if applicable) and ground covered during the approach are excluded from the trip distance, but included for fuel/range/endurance/block time purposes.

Some definitions for the purpose of this exercise:

Endurance represents the time it will take to consume the entire useable fuel load according to the plan, including all reserves.

Block Time is the time from starting the take-off roll to touchdown at the planned destination.

ETE or Estimated Time En-route is time in the cruise from Top of Climb (ToC) to Top of Descent (ToD).

2.2 In the Trip Details box, enter the following:

2.2.1 Departure Field Pressure Altitude – “Depart”. This is used as a starting point in the fuel/distance/time to climb calculation.

2.2.2 Destination Field Elevation – “Arrive”. This is used as the end point in the fuel/distance/time to descend calculation.

2.2.3 Distance to Alternate destination airfield. The fuel/time to the Alternate at average cruise will replace the IFR reserve if this time exceeds the statutory minimum.

2.2.4 Outside Air Temperature at the point of departure. The expected climb performance is based on this temperature.

In areas of very low OAT, "#DIV/0!" may appear in the **climb** row of the **Planner** sheet. This is because the system predicts that the aircraft flight envelope will be exceeded during the climb. You may need to increase the temperature entered over that observed to allow a climb calculation to take place. Watch the lapse rate during the climb – you may find it to be lower than standard, and if not, be sure to observe the published limitations of the aircraft. The tables provide for temperatures between ISA-20 and ISA+30.

2.3 In the **Weight and Balance** box:

2.3.1 Enter the crew and payload details, considering the cell comments provided. While the commonly used term (W&B) for this exercise is used, no account is taken of CG position, only weight is considered.

2.4 In the Fuel to Load box:

2.4.1 Enter the total amount of fuel required, preferably between the suggested max and min limits. This quantity is automatically distributed to the aircraft main tanks according to their capacity, and will be referred to in step 4.2.

3 Optimize

If any limitation (particularly weight and balance) is equaled or exceeded, an amber CAUTION or red DO NOT DEPART flag is prominently displayed. Referring to the blue area, model those input parameters affecting any items shown as negative. Repeat this process until a green GO FLIGHT flag appears. Refine any or all of the entered data for optimal flight efficiency, ensuring that the process ends with a green GO FLIGHT flag.

4 In the **Flight Simulator**:

4.1 Enter/load the flight plan as required. This could precede step 1, providing leg details.

4.2 Enter the fuel load, distributed as proposed in the **Fuel to Load** box on the **Planner** sheet.

4.3 Enter crew/passengers/baggage as shown in the **Weight and Balance** box on the **Planner** sheet. If you have one crew only, locate one of the passengers in the right crew seat, ensuring proper weight distribution. Place the baggage in the nose and aft baggage lockers.

5 Pre-start check – from the **Planner** sheet to the **Fuel and Payload** summary in the Flight Simulator:

5.1 Crew + Payload = Payload

5.2 Ramp Weight = Gross Weight

5.3 Fuel + OWN/OP (Owner/operator) discretion = Fuel

5.4 Agree Trip distance = Navigation Log (or equivalent) distance

End Procedure

Change Management