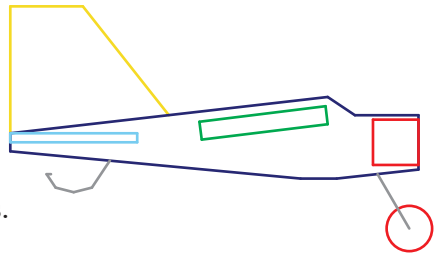
Airplane



A. Create Rectangle.

Step 1. If necessary start a new Mastercam file, click **New** (**Ctrl-N**) on the Quick Access Toolbar QAT. Units **inches**.

Step 2. Sketch rectangle **cyan**. **Right click** in the graphics window and on the Mini Toolbar click **Wireframe Color** drop down arrow and select **cyan**, **Fig. 1**.

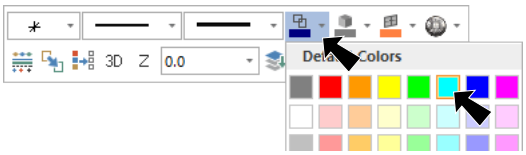


Fig. 1

Step 3. On the Wireframe tab Wireframe click **Rectangle** Rectangle.

Step 4. In the Rectangle function panel:
under Dimensions, **Fig. 2**
Width 9
Height 1.8 and press ENTER
Press **O key** on keyboard to select Auto Cursor **Origin** override
Click OK .

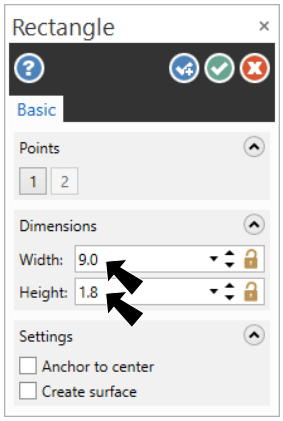


Fig. 2

Step 5. **Right click** the graphics window and click **Fit** (**Alt-F1**).

B. Save As "AIRPLANE"

Step 1. Click **Save As** (**Ctrl-Shift-S**) on the Quick Access Toolbar QAT.

Fig. 3

Step 2. Key-in **AIRPLANE** for the filename and press ENTER.

C. Set Grid and Snap .2.

Step 1. On the View tab View click **Show Grid** Show Grid and **Snap to Grid** Snap to Grid.

Step 2. Click the **Dialog Box Launcher** (**Alt-G**), **Fig. 4**.

Step 3. In the Grid Settings dialog box:
under Spacing, **Fig. 5**.
X and Y Spacing .2
Click OK .

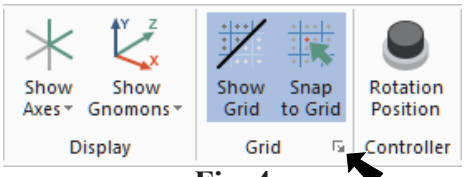


Fig. 4

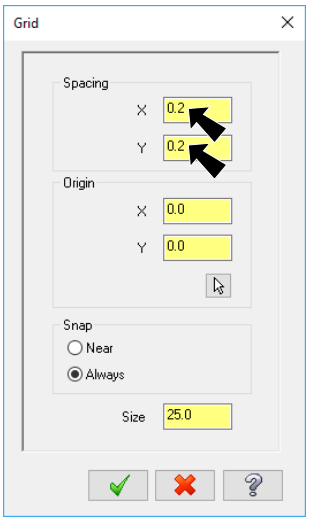


Fig. 5

4-29-19

http://www.cudacountry.net email:cudacountry@hotmail.com

D. Sketch Fuselage.

Step 1. Sketch lines dark blue. **Right click** in the graphics window and on the Mini Toolbar click **Wireframe Color** drop down arrow and select **dark blue** in Standard Colors, **Fig. 6**.

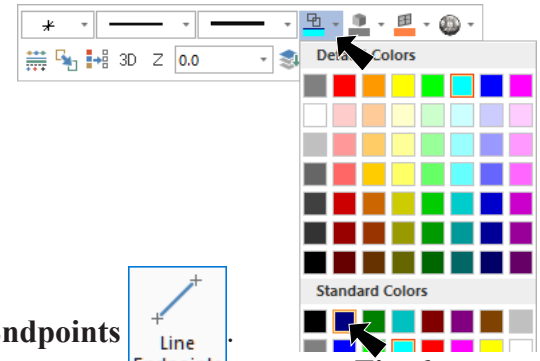


Fig. 6

Step 2. On the Wireframe tab click **Line Endpoints**.

Step 3. In the Line Endpoints function panel:
under Type, **Fig. 7**
select **Multi-line**
Sketch lines, **Fig 8**.
Use tracking in Status Bar to view coordinates
Click OK when done.

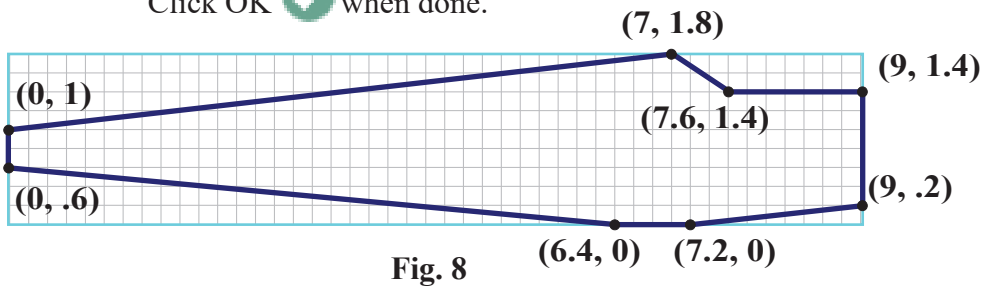


Fig. 8

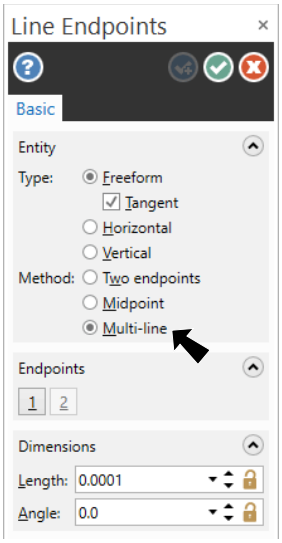


Fig. 7

E. Create a Rectangle for Fuselage in Top View.

Step 1. On the Wireframe tab click **Rectangle**.

Step 2. In the Rectangle function panel:
under Dimensions, **Fig. 9**
Width 9
Height 1.2 and press ENTER
Press **spacebar** to activate **Fast Point**
Key-in **0, 9** and press ENTER **twice**
Click OK.

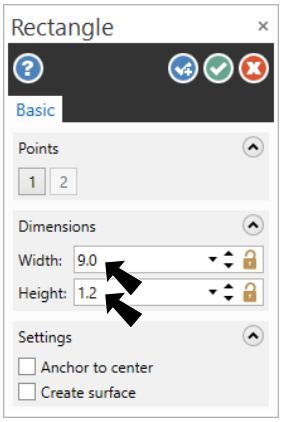
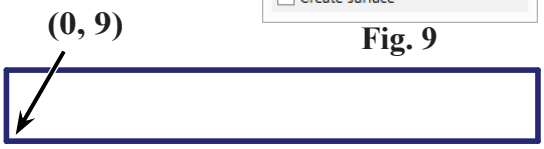


Fig. 9



Step 3. **Right click** the graphics window and click **Fit** (**Alt-F1**).

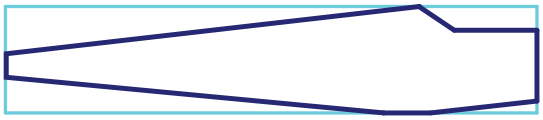
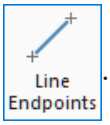


Fig. 10

F. Sketch Fuselage in Top View.

Step 1. On the Wireframe tab 

click **Line Endpoints** 

.

Step 2. In the Line Endpoints function panel:
Sketch lines, **Fig 11**.
Use tracing in the Status Bar to view coordinates
Click OK  when done.

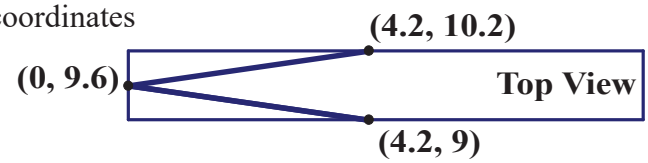
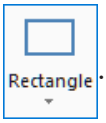


Fig. 11

Step 3. Save  (**Ctrl-S**).

G. Wing.

Step 1. On the Wireframe tab 

click **Rectangle** 

.

Step 2. In the Rectangle function panel:
Sketch two rectangles for wing, **Fig. 12**.
First, sketch a rectangle in Top View from (**4.2**, **9**) to (**7**, **2**)
Click **OK and Create New Operation**  .
Then, sketch 2nd rectangle in Side View from (**4.2**, **1.6**) to (**7**, **1.2**)
Click OK  .

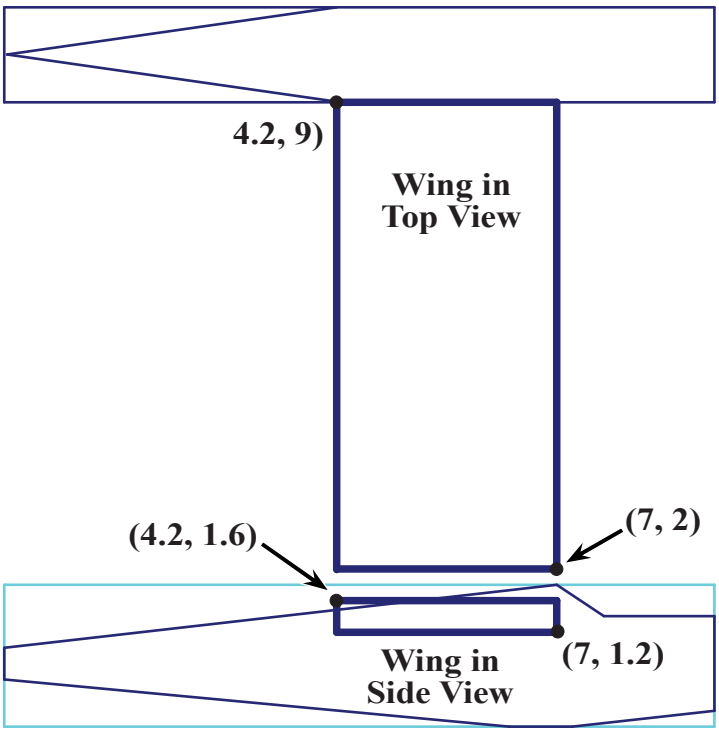
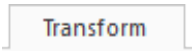


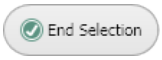
Fig. 12

H. Rotate Angle of Attack.

Step 1. On the Transform tab 

click **Rotate** 

.

Step 2. **Shift click** a line of wing rectangle in the Side View to chain rectangle and click **End Selection** 

(ENTER), Fig. 13.

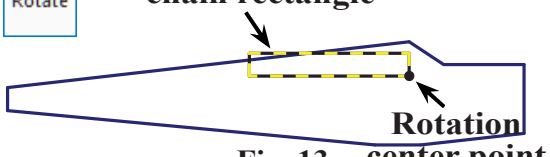


Fig. 13

Step 3. In the Rotate function panel set:
under Method, **Fig. 14**
select **Move**
under Instances
Number 1
Angle 7
under Rotation Center Point
click **Reselect**
Click **bottom right corner** for point to rotate about, **Fig. 13**.
Click OK 
.


Fig. 15

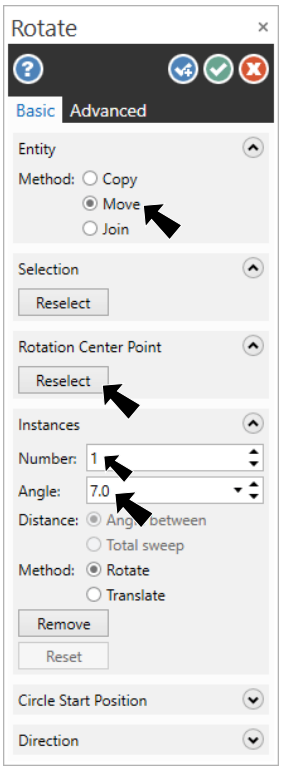


Fig. 14

Step 4. **Right click** the graphics window and click **Clear Colors** 
.

I. Delete Lines.

Step 1. Delete **5 Lines**, **Fig. 16**. To delete, Shift click rectangle in Side View and click rear line in Top View and press **Delete** key on keyboard.

Step 2. Save 
(Ctrl-S).

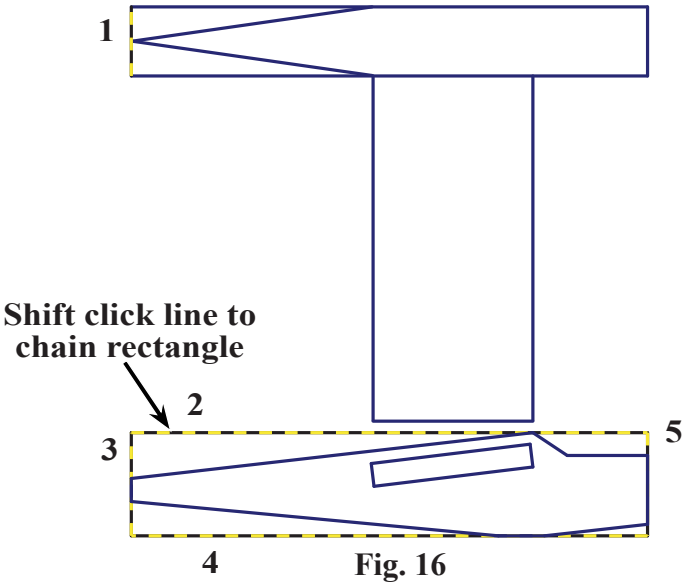
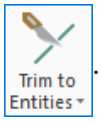


Fig. 16

J. Trim Lines.

Step 1. On the Wireframe tab click **Trim to Entities**.



Step 2. In the Trim to Entities function panel:
under Type, **Fig. 17**
select **Trim 1 entity**
Trim two lines. Click line to trim at Position 1, then trim to line at Position 2, **Fig. 18**. Repeat at the other line. That is, click the part of line you are keeping, Position 1, then click Position 2.

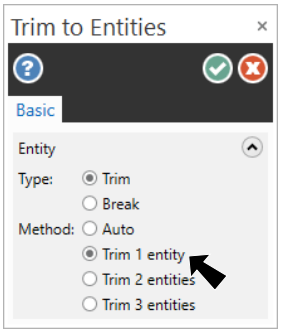


Fig. 17

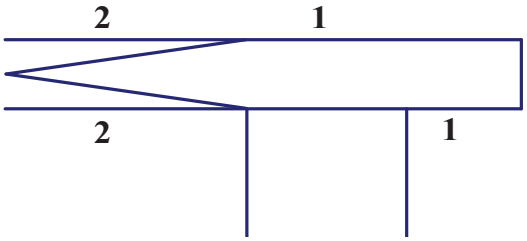


Fig. 18

Click OK when done.

K. Horizontal Stabilizer.

Step 1. Zoom-in on rear end of fuselage in Top View.
Use **F1** and make a zoom window, **Fig. 19**.

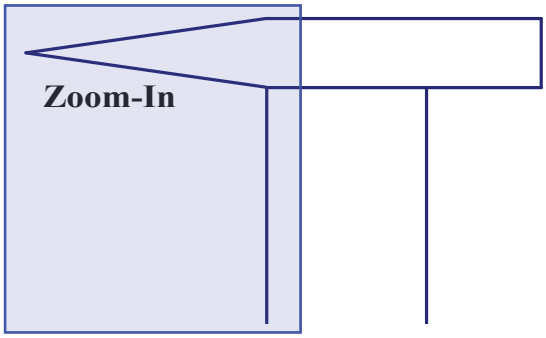


Fig. 19

Step 2. Sketch horizontal stab **cyan**. **Right click** in the graphics window and on the Mini Toolbar click **Wireframe Color** drop down arrow and select **cyan**, **Fig. 20**.

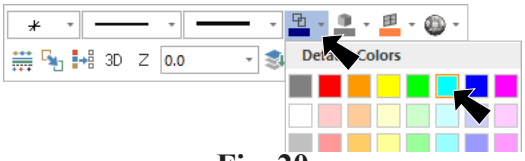
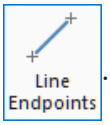


Fig. 20

Step 3. On the Wireframe tab click **Line Endpoints**.



Step 4. In the Line Endpoints function panel:
under Type
select **Multi-line**
Sketch the 3 lines, **Fig. 21**
Press **Escape** key to restart multi-line

Pan down to Side View, use **Down Arrow** key
Sketch the lines to make rectangle **Fig. 22**
Use **M key** Midpoint Auto Cursor override

Click OK when done.

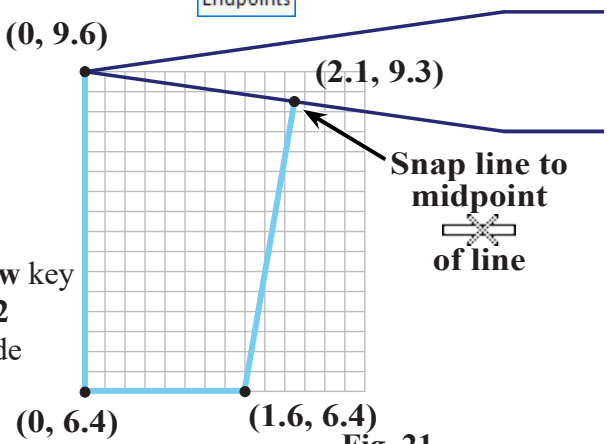


Fig. 21

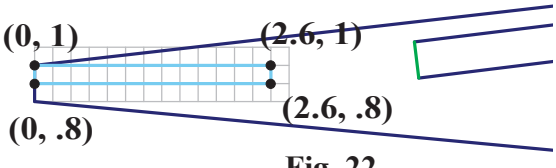


Fig. 22

L. Vertical Stabilizer.

Step 1. Sketch vertical stab **yellow**. **Right click** in the graphics window and on the Mini Toolbar click **Wireframe Color** drop down arrow and select **yellow**, **Fig. 23**.

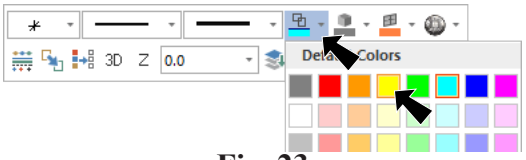


Fig. 23

Step 3. On the Wireframe tab Wireframe click **Line Endpoints** Line Endpoints.

Step 4. In the Line Endpoints function panel:
under Type
select **Multi-line**
Sketch the **3 lines**, **Fig. 24**.

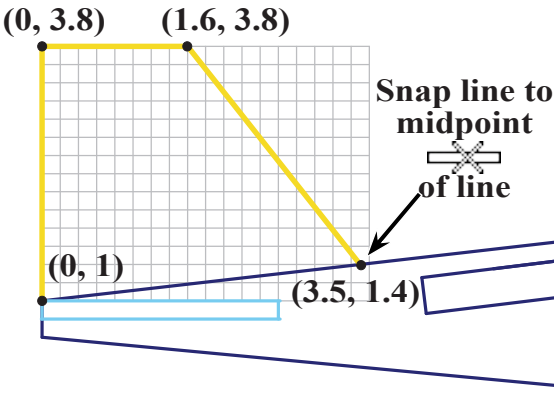


Fig. 24

Use **M key** Midpoint Auto Cursor override

Press **Escape** key to restart multi-line

Pan up to Top View, use **Up Arrow** key

Change **Grid and Snap to .1**. Use **Alt-G**.
Set **X and Y Spacing .1** and click OK, **Fig. 25**.
Sketch the 4 lines in **Fig. 26**.

Click OK when done.

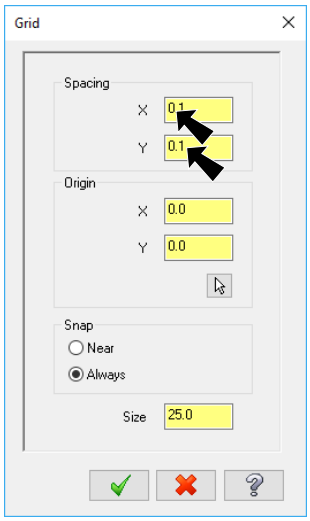


Fig. 25

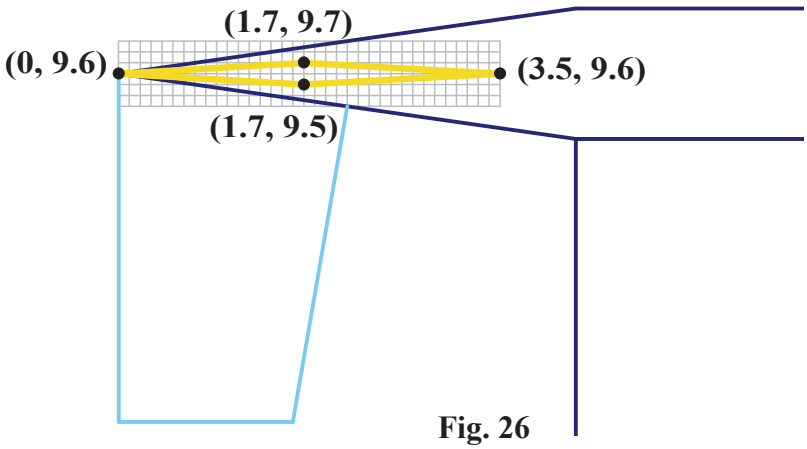


Fig. 26

M. Motor.

Step 1. **Right click** the graphics window and click **Fit**  **(Alt-F1)**.

Step 2. Sketch the motor **red**. **Right click** in the graphics window and on the Mini Toolbar click **Wireframe Color**  drop down arrow and select **red**, **Fig. 27**.

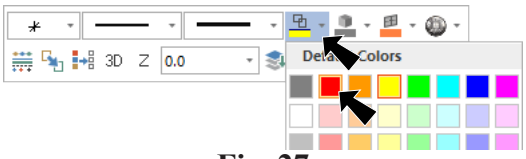
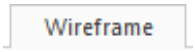
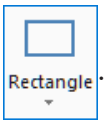


Fig. 27

Step 3. On the Wireframe tab  click **Rectangle**  .

Step 4. In the Rectangle function panel:
under Dimensions, **Fig. 28**
Lock **both Width and Height**
Width **1**
Height **1** and press ENTER

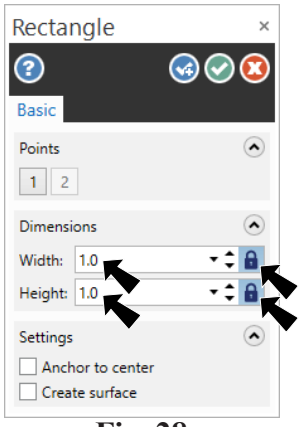
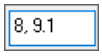
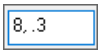


Fig. 28

Press **spacebar** to activate Auto Cursor **Fast Point** 

Key-in **8**, **9.1**  and press ENTER **twice**

Press **spacebar** to activate **Fast Point** 

Key-in **8**, **.3**  and press ENTER **twice**

Click OK  .

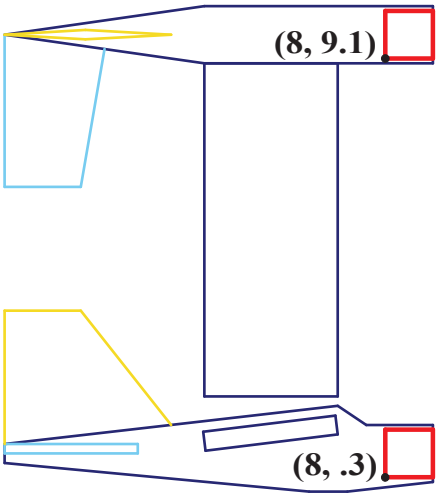
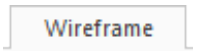
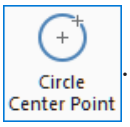


Fig. 29

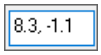
N. Wheel.

Step 1. On the Wireframe tab 

click **Circle Center Point** 

.

Step 2. In the Circle Center Point function panel:
under Size, **Fig. 30**
Diameter 1 and press **ENTER**

Press **spacebar** to activate Auto Cursor **Fast Point** 
Key-in **8.3, -1.1** 

and press ENTER **twice**

Click OK  .

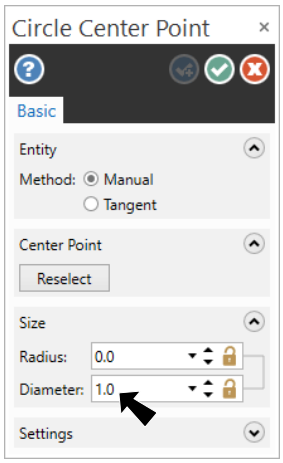


Fig. 30

Step 3. **Fit**  **(Alt-F1)** to see circle.

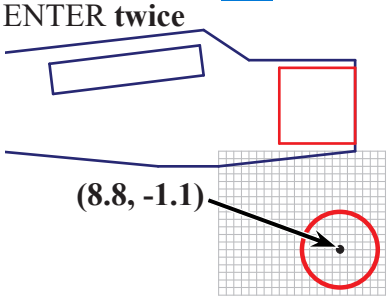


Fig. 31

Step 4. Save  **(Ctrl-S)**.

O. Sketch Landing Gear in Side View.

Step 1. Zoom-in on lower front end of fuselage in Side View. Use **F1** and make a zoom window, **Fig. 32**.

Step 2. Sketch landing gear **light gray**. **Right click** in the graphics window and on the Mini Toolbar click **Wireframe Color**  drop down arrow and select **light gray**, **Fig. 33**.

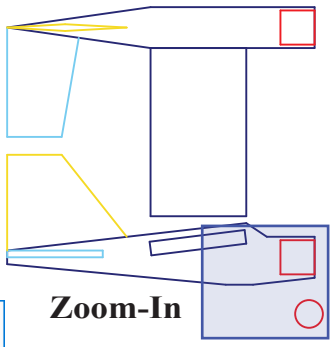
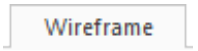
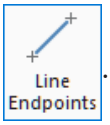


Fig. 32

Step 3. On the Wireframe tab 

click **Line Endpoints** 

.

Step 4. In the Line Endpoints function panel:
Sketch line, **Fig. 34**

Click OK  when done.

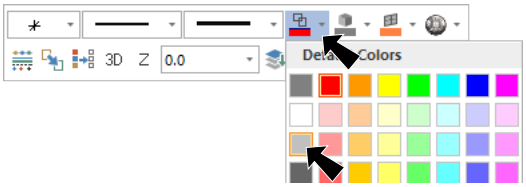


Fig. 33

Tip: Mr. PK will give you extra credit if you trim line.

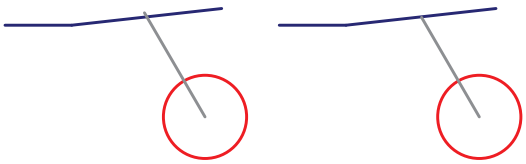


Fig. 35

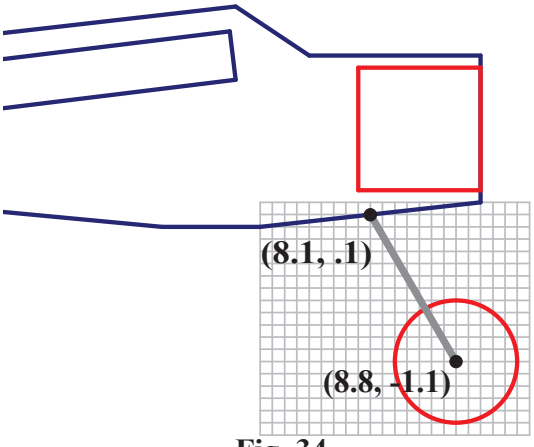


Fig. 34

P. Sketch Lines for Tail Hook.

Step 1. **Fit** (**Alt-F1**).

Step 2. Zoom-in on lower rear end of fuselage in Side View. Use **F1** and make a zoom window, **Fig. 36**.

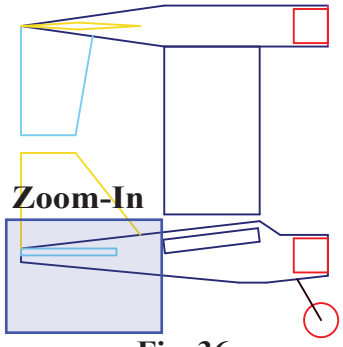


Fig. 36

Step 3. On the Wireframe tab Wireframe click **Line Endpoints** Line Endpoints.

Step 4. In the Line Endpoints function panel:

under Type
select **Multi-line.**

Fig. 37

Press **spacebar** to activate Auto Cursor **Fast Point** or click Auto Cursor **Fast Point** on the Selection Bar, **Fig. 37**.

Key-in the line coordinates and press ENTER. Then spacebar for next set of coordinates.

Click OK when done.

Step 5. Save (**Ctrl-S**).

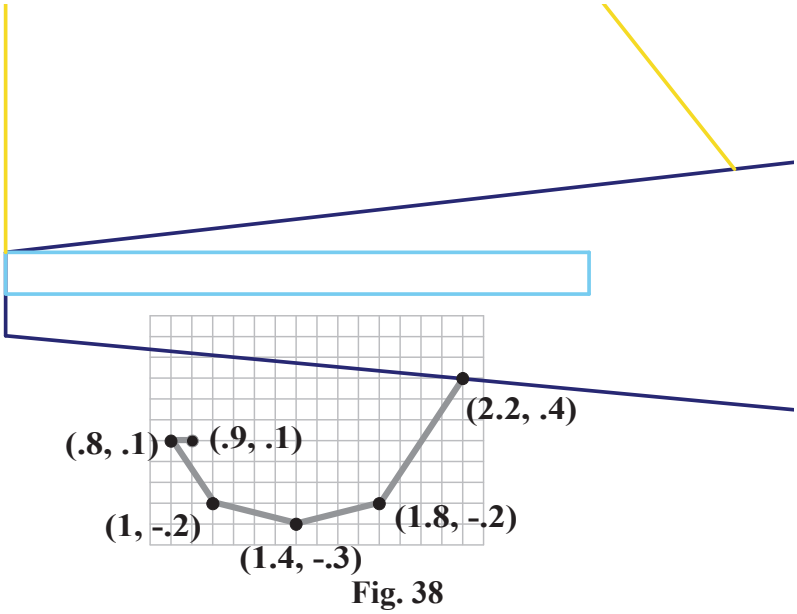


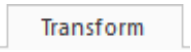
Fig. 38

Line Points using Grid

1) **Click Point 1 (2.2, .4) then**
2) **Down 6 and over 4**
3) **Over 4 and down 1**
4) **Over 4 and up 1**
5) **Over 2 and up 3**
6) **Right 1**

Q. Rotate Top View for Printing.

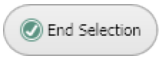
Step 1. **Fit**  **(Alt-F1)**.

Step 2. On the Transform tab 

click **Rotate** 

.

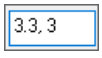
Step 3. Select all Top View entities. To select, first drag a selection around V Stab and Fuselage, then Shift click wing lines, **Fig. 39**.

Step 4. Click **End Selection** 

(ENTER).

Step 5. In the Rotate function panel set:
under Method, **Fig. 40**
select **Move**
under Instances
Number 1
Angle 90
under Rotation Center Point
click **Reselect**

Press **spacebar** to activate Auto Cursor **Fast Point** 

Key-in **3.3, 3** 

and press ENTER for point to rotate about
Click OK  .

Step 6. **Right click** the graphics window and click **Fit**  **(Alt-F1)**.

Step 7. **Right click** the graphics window and click **Clear Colors**  .

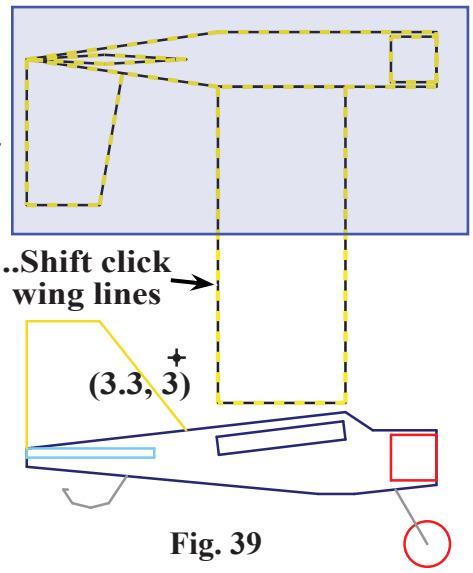


Fig. 39

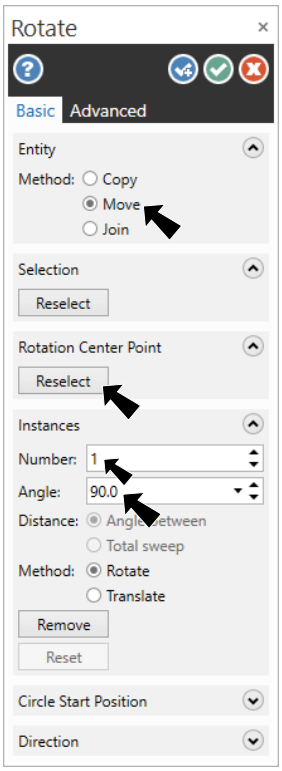


Fig. 40

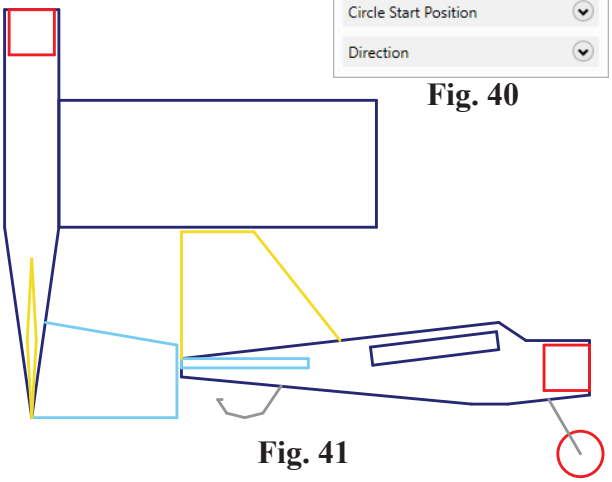
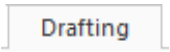
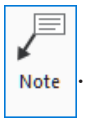


Fig. 41

R. Add Leading Edge, V Stab, H Stab Text.

Step 1. On the Drafting tab 

click **Note** 

.

Step 2. In the Note function panel set:
under Entity, **Fig. 42**
select **Note**
under Note
Lock the Caps and key-in:
LEADING EDGE
Click **inside leading edge of Wing in top view**, **Fig. 43**.
Click **OK and Create New Operation** .

Step 3. In the Note function panel key-in:
V STAB
Click to place note **near the leading edge of the V Stab in the side view**, **Fig. 43**.
Click **OK and Create New Operation** .

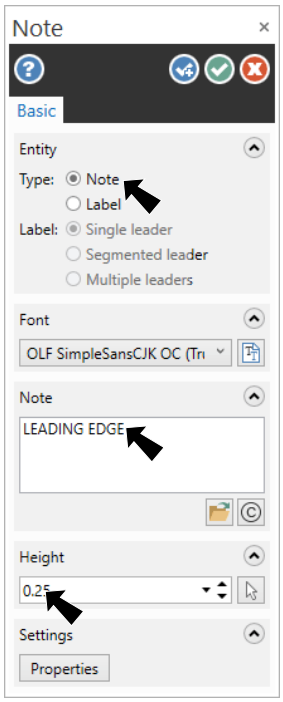


Fig. 42

Step 4. Repeat and add **H STAB** note near the leading edge of the H Stab in the top view, **Fig. 43**.
Click OK when done.

Step 5. Save (**Ctrl-S**).

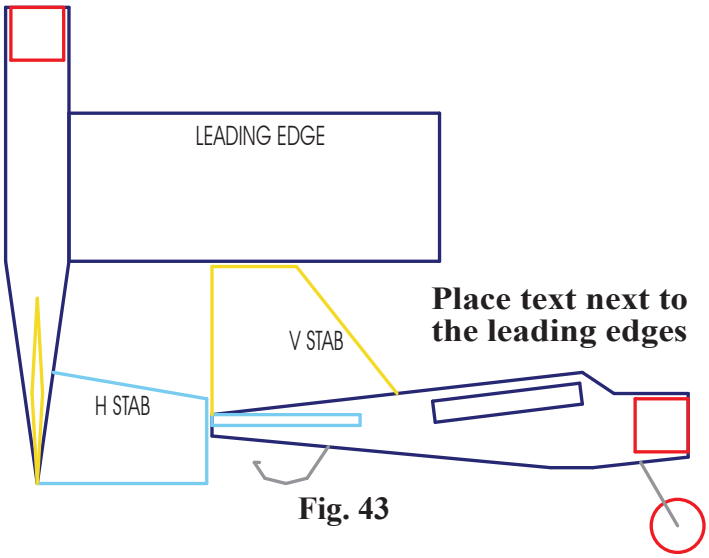


Fig. 43