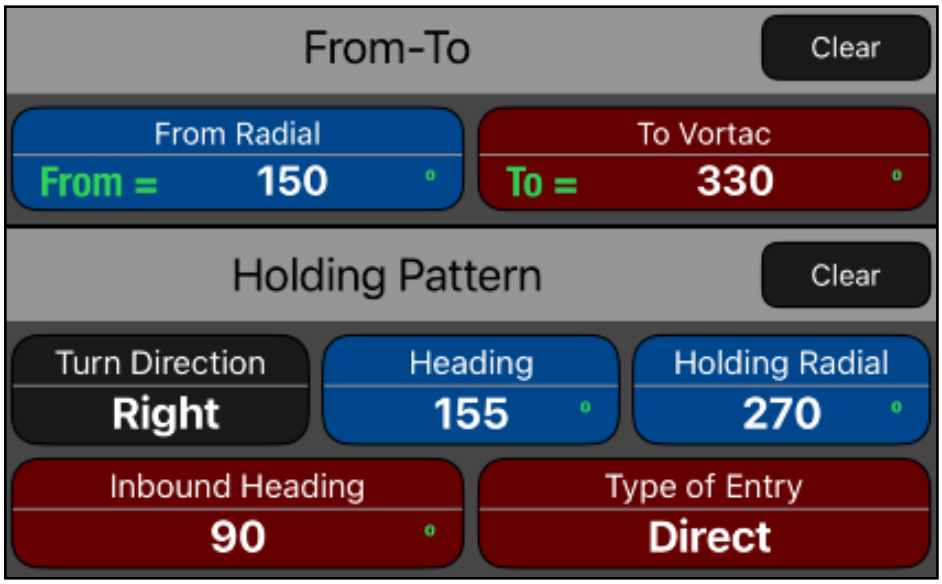
Holding Pattern & From-To Worksheet



Clear	Set all variables to a invalid state keeping the current value. If it is touched again, clears all values to 0.
From	Stores or calculate the course from a location.
To	Stores or calculate the course to the location
Turn Direction	Toggles “Right” or “Left” standard turns for the holding pattern.
Heading	Stores the airplane actual heading.
Holding Radial	Stores the radial instructed to hold on.
Inbound Heading	Shows the computed inbound heading.
Type of Entry	Shows the computed entry mode (Direct, Teardrop, or Parallel).

This worksheet gathers two different functions: The From-To function and the Holding Pattern function.

The “From-To” function converts a course from (**From**) a location into the course to (**To**) the same location along the same radial, providing the opposite of any course.

The “Holding Pattern” may be necessary when ATC is unable to clear a flight to its destination. This function will make easy to determine what type of entry is necessary, as well as the inbound heading.

Example 1:

What is the course TO the VORTAC if you are on the 150° radial?.

Solution:

Keystrokes	Description
[Clear]	Invalidate all inputs to start a new calculation.
type 150 **[From]**	Stores 150º in **From** (the button change to blue) and automatically calculates the course to the station: **To = 330º** (the button change to red).

Example 2:

What is the recommended procedure to enter the holding pattern when an airplane is heading 155° and is instructed to hold on the 270° radial, performing standard right turns?.

Solution:

Keystrokes	Description
[Clear]	Invalidate all variables.
[Turn Direction] **“Right”**	Set the Turn Direction to “Right”.
type 155 **[Heading]**	Stores 155º in **Heading** (the button change to blue).
type 270 **[Holding Radial]**	Stores 270º in **Holding Radial** (the button change to blue) and automatically calculates: **Inbound Heading = 90º** **Type of Entry = Direct**.

Appendix : Equations Used

The equations that this worksheet calculates are:

a) From-To:

To = **From** + IF(**From** < 180º, 180º, -180º)
From = **To** + IF(**To** < 180º, 180º, -180º)

b) Holding Pattern :

Inbound Heading = **Holding** + IF(**Holding** < 180º, 180º, -180º)

IF **Turn Direction** = Right:
    IF SIN(**Heading** - **Holding** + 70º) < 0
        Type of Entry = “Direct”

    ELSE IF COS(**Heading** - **Holding** + 50º) < 0
        Type of Entry = “Parallel”

    ELSE
        Type of Entry = “Teardrop”

ELSE
    IF SIN(**Heading** - **Holding** + 110º) < 0
        Type of Entry = “Direct”

    ELSE IF COS(**Heading** - **Holding** + 50º) < 0
        Type of Entry = “Teardrop”

    ELSE
        Type of Entry = “Parallel”