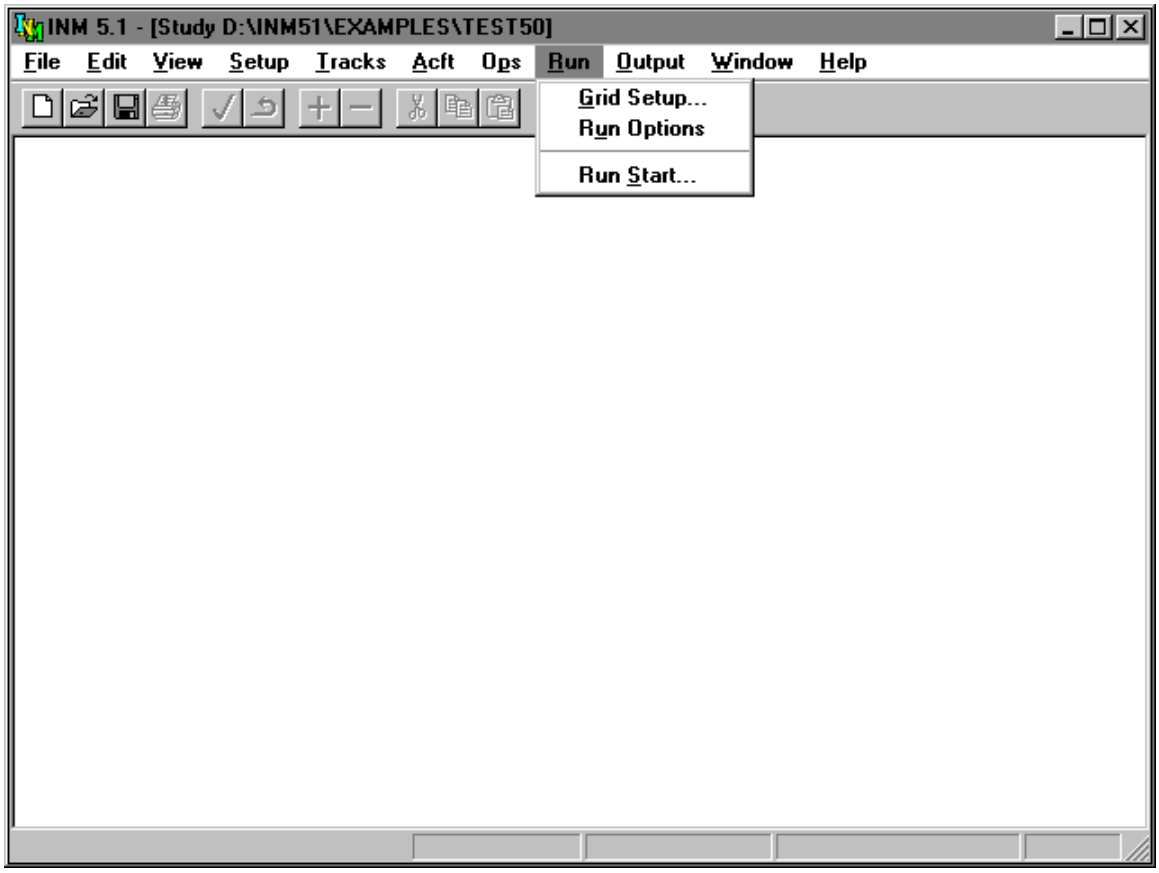
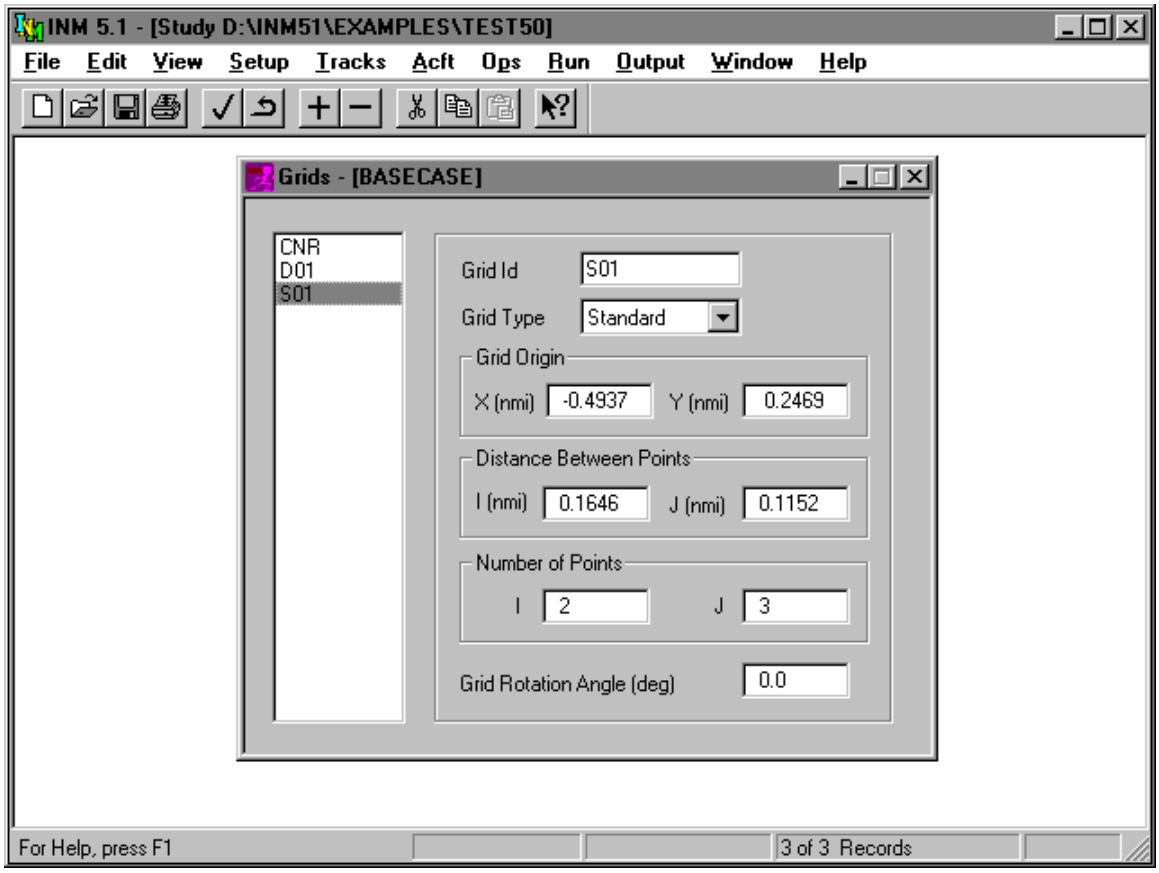


10. RUN MENU

Use this menu to setup and run your Case. The setup functions include defining grids and defining run options. The execution functions include launching one or more Cases and managing runs in progress.



10.1. Grid Setup

Menu Item: Run // Grid Setup

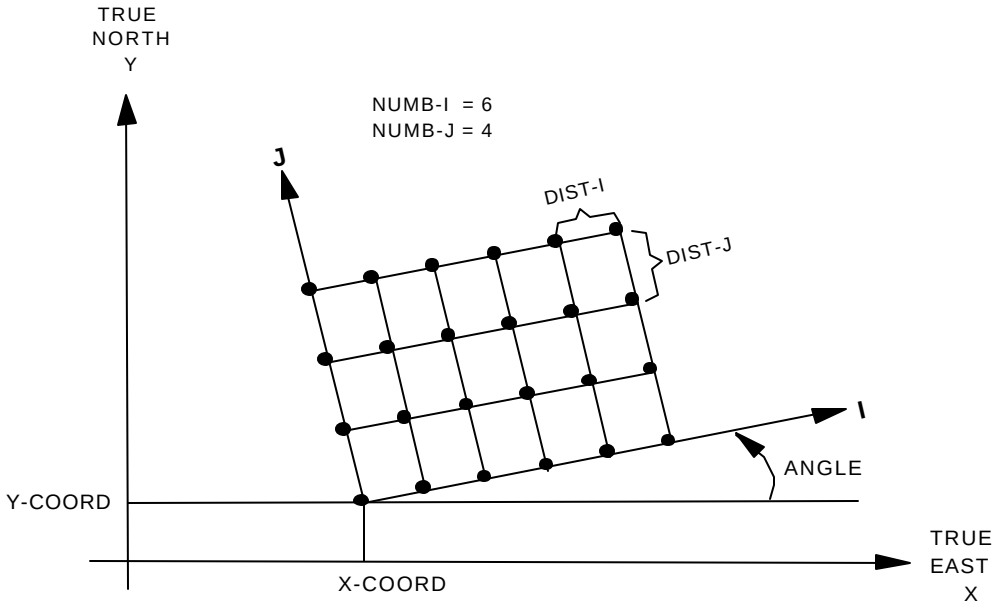
Use this function to define various kinds of grids that are used in calculating noise metrics for a given Case. Each Case has its own set of grid records. If you want to use the same set of grids for several Cases, use the Setup // Case Copy function or the Edit // Copy Records and Paste Records functions.

You specify a grid by:

- X,Y values of the lower-left corner point (rotation is around this point)
- Distances between neighboring points along the I and J axes
- Numbers of points along the I and J axes
- Rotation angle relative to the X-axis (maximum ±90 degrees).

A grid is a rectangular array of points. A grid can be rotated relative to the X,Y coordinate system. Because it can be rotated, grid coordinates I,J are differentiated from X,Y coordinates. When the rotation angle is zero, the I-axis is parallel to the X-axis, and the J-axis is parallel to the Y-axis.

INM COORDINATE SYSTEM



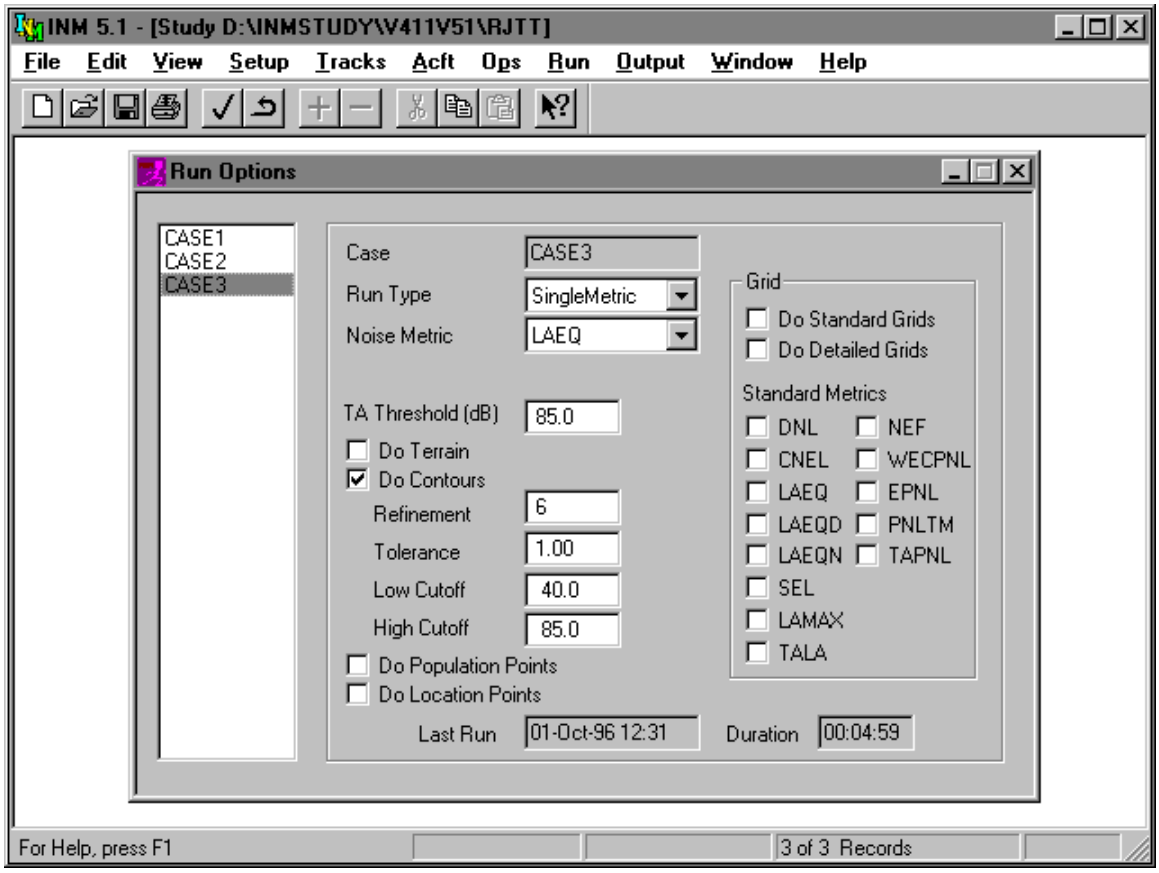
There are three kinds of grids: contour, standard, and detailed. You must define at least a contour-type grid before you can run your Case.

1) A contour grid is used to define four corners of a rectangle. INM produces noise contours inside of this rectangle. Define only one contour grid. Make two points in the I and J directions (the corner points). When you add a record, INM creates a default, un-rotated, square contour grid, 16 nmi on a side, and centers it on the X,Y coordinate origin. You can override the default contour grid by changing its parameters.

2) A standard grid is used to create a concise noise analysis. For a standard analysis at a point, INM computes up to 14 noise metrics (the user-defined Metric and 13 standard Metrics, see Section 11.5).

3) A detailed grid is used to create an extensive noise analysis. For a detailed analysis at a point, INM computes and saves various geometric and acoustic measures for each flight operation (see Section 11.6).

You can have any number of standard and/or detailed grids per Case. However, please be aware that the output from a detailed grid analysis can be very large, and you should limit the number of detailed grids, the number of points in them, and the number of standard Metrics calculated.



10.2. Run Options Case Setup

Menu Item: Run // Run Options

Use this function to setup run options before running a Case.

You can run INM in one of two modes:

- SingleMetric
- MultiMetric

10.2.1. Single Metric Run

SingleMetric is essentially the same method as used in previous versions of INM. You can compute contours, standard grids, detailed grids, population points, and/or location points, all in one pass.

In setting up SingleMetric run options, you select a noise Metric from the list. The list includes the 13 standard Metrics (see Section 6.4), and any other Metrics that you may have created.

If you are computing a time-above Metric, you also need to input the threshold level above which time is accumulated.

10.2.2. Multi-Metric Run

MultiMetric is used for computing contours only. You specify which noise family you want (A-weighted or Perceived) and INM calculates and saves enough information to later construct any noise Metric that belongs to that noise family.

The advantage of the MultiMetric mode is that you do not have to run INM over and over to get different kinds of contours (for example, DNL, LAMAX, and TALA).

A MultiMetric run saves a large amount of computing time if you need multiple Metric contours. If you do not need multiple Metrics, or if you do need grids and/or points, you should run in the SingleMetric mode.

A MultiMetric run takes longer than a SingleMetric run. However, it takes less time than two SingleMetric runs.

10.2.3. Terrain Option

Check the Do-Terrain box if you have a terrain elevation file (extension "3CD") in your Study directory, and if you want to use it for the run.

You can create a terrain elevation file by purchasing a terrain elevation CD-ROM and using the Terrain Source Data Processor (see Section 14.2).

INM uses terrain elevation data to:

1) Compute the distance from a ground-based observer to an airplane

2) Compute the angle from the ground surface to an airplane for the purpose of applying the "lateral attenuation" adjustment to the observed noise level (see Section 8.3.2).

INM runs faster without the terrain elevation file. If a terrain file is not used for a run, INM assumes that the ground around the airport is completely flat, and that it is at the same elevation as the airport.

10.2.4. Contours Option

Check the Do-Contours box if you want INM to calculate contouring data for the specified Metric.

INM uses a recursively subdivided-grid method to calculate data for contours. Areas where the noise changes substantially are divided into small grids, whereas areas where there is little change are left undivided.

You can control the size of the smallest contouring grid with the refinement parameter. The size d of the smallest grid is:

$$d = D / 2^{N+1}$$

where D is the distance between corner points, and N is the refinement number.

You can control the process of subdividing a contouring grid with the tolerance parameter. If the tolerance is small, INM is more sensitive to changes in the noise Metric over an area, and is more likely to divide a grid. The units for tolerance are decibels for noise level Metrics, and minutes for time-above Metrics.

The combination of a large refinement number and a small tolerance level causes INM to calculate more contouring grid points, resulting in a longer run time, but producing higher-fidelity contours.

- You may need to increase contour fidelity for cases where the runway is at an angle to the underlying grid of points. This situation can cause bumpy noise and spurious contours. This is because there are not enough points for NMPLOT to produce smooth, symmetric contours relative to the runway. Try using refinement = 8 and tolerance = 0.5 dB to clean up strange-looking contours.

- However, very finely subdivided areas may cause COMP50 (the noise-calculation module) and/or NMPLOT (the contouring program) to run out of computer memory. The only solution is to install more real memory in your computer.

For a SingleMetric run, low cutoff and high cutoff parameters also control contour fidelity and run time. Contouring grids that have noise values lower than the "low cutoff" level are not subdivided. Likewise, contouring grids that have noise values higher that the "high cutoff" level are not subdivided.

- For a SingleMetric run, the valid noise area for computing contours is the area that lies between the low-cutoff and high-cutoff contour levels. Noise levels outside the valid noise area are not accurately calculated.

- A MultiMetric run does not use the cutoff test, and the valid noise area for computing contours encompasses the whole area around the airport.

10.2.5. Population Points Option

Check the Do-Population-Points box if you have a POP_PTS file in your Study directory, and if you want noise Metric values calculated at the points.

You can create a POP_PTS file by purchasing U.S. Census data and using the Source Data Processor Census Population Point function (see Section 14.3.3).

Population points are located at the centers of census blocks, which for densely populated areas, correspond to city blocks.

A POP_PTS file can be very large, and it may take a very long time to compute noise values at all the points.

10.2.6. Location Points Option

Check the Do-Location-Points box if you have a LOC_PTS file in your Study directory, and if you want noise Metric values calculated at the points.

"Location points" are navaids, fixes, and special noise-sensitive locations around an airport, such as schools, hospitals, etc.

You create the LOC_PTS file when you setup a Study, and you can add to it by entering data into the Setup // Locations Points window. You can also use a DBMS program, a spreadsheet program, or the File // Import // Text-to-DBF function (see Section 3.5.1) to build a file of location points.

If you use a terrain file and calculate location points, you may get an error message saying that a point is outside of the terrain area. In mid-latitudes the allowed area corresponds to a bounding box that is about 40 nmi east/west and 60 nmi north/south. You need to delete location points that lie outside of the terrain bounding box, or turn off the terrain function.

10.2.7. Standard Grids Option

Check the Do Standard Grids box if you previously defined one or more standard grids (see Section 10.1), and if you want noise Metric values calculated at the grid points.

Up to 14 noise Metrics are calculated for standard grid points — your selected Metric and 13 standard Metrics.

- INM always computes your selected Metric. It is called "METRIC" in the output table.

- In addition, you can select standard Metrics to be calculated. If one or more of your Aircraft is missing a noise family table (for example, EPNL is missing), then you should turn off all of the standard Metrics in that noise family because they will not calculate correctly.

10.2.8. Detailed Grids Option

Check the Do Detailed Grids box if you previously defined one or more detailed grids (see Section 10.1), and if you want noise Metric values and other measures calculated at the grid points.

You should have most of the standard Metric boxes turned off, or you will get an extremely large amount of output data.

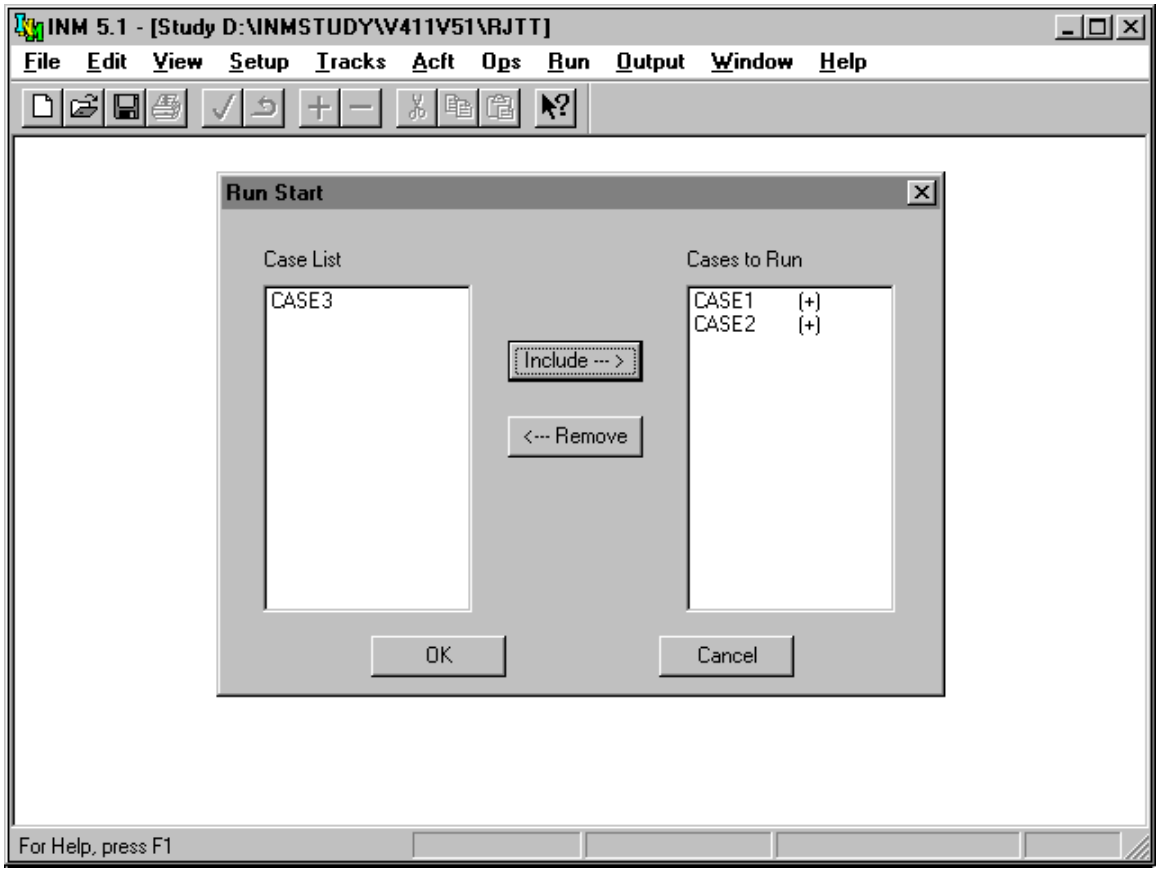
When writing detailed grids, INM also writes records into the GRID_STD file. The reason for doing this is that detailed grid records are identified by I,J values, and you need a standard grid record to convert I,J to X,Y,Z and lat/long. Not repeating X,Y,Z and lat/long values over and over in the GRID_DTL file reduces the file size.

10.2.9. Run Time

The Last Run and Duration boxes are filled with view-only information after you run the Case. The date and time of the run and the length of time for the run are written into these boxes.

Once you edit and commit a record in the Run Options window, these two boxes are cleared in preparation for a new run.

If you make a run, compute and view the contours, change the run options (the run time is cleared), and then you try to look at the output again, INM presents a message warning that the Case should be run again. However, INM will display the Output Graphics window anyway. The warning message is because your change to the run options might change the output.



10.3. Batch Runs

Menu Item: Run // Run Start

After setting up Grids and run options, you are ready to run a Case. To run one or more Cases, select them in the left-hand box in the Run Start dialog box and press the "Include" button. INM moves the selected Cases to the right-hand box. Start the batch run by pressing "OK".

10.3.1. Run Status

For each Case, INM:

1) Reads Study and standard data from disk, if the data are not already in memory.

2) Calculates two-dimensional profiles and three-dimensional flight paths.

3) Writes flight path data to the FLIGHT.PTH file in the Case subdirectory.

4) Writes runway and track graphical data to the _RWY_TRK.BIN file in the Case subdirectory.

5) Displays the Run Status dialog box and starts COMP50, which is the noise computation module.

Cases shown in the left-hand box are queued up to run in the future, the Case in the center box is currently running, and the Cases in the right-hand box have already finished running.

The Run Status dialog box shows the progress of the runs by updating the Percent Done box. COMP50 may take a very long time to execute, depending on how complicated your Case is.

For a "Do-Contours" run:

- COMP50 first calculates 17x17 base points, which are saved in the GRID file in the Case subdirectory (or GRID.MN, etc. files for MultiMetric runs).

- The contour grid area is divided into 8-by-8 sub-grids. Each of the 64 sub-grids is recursively subdivided into smaller and smaller areas. The number of subdivisions depends on the noise field gradients and input parameters: refinement, tolerance, minimum cutoff, and maximum cutoff. Subdivided data are saved in the CONTOUR file in the Case subdirectory (or CONTOUR.MN, etc. files for MultiMetric runs).

While COMP50 is running, you can switch to a different application and continue working, although the system response time may be slow. If the INM window is maximized, you can to use the Alt-Tab method of switching applications.

10.3.2. Run Abort

You can select the "Abort" button to stop the currently running Case. The abort event is processed when the INM user interface communicates with the noise computation module (for example, 64 times during a contouring run), so please be patient, and wait for INM to stop the run.

INM displays a message box if there is an error during a run. Use a text editor such as Notepad to open the FLIGHT.ERR file in the Case subdirectory to find out what went wrong. Correct the input data and try again.

10.3.3. Run Finished

After a batch of runs is finished, INM removes the Run Status dialog box and unlocks the INM user interface. Now, you can go to the Output menu to view the results:

- Grid and noise-at-point results are stored in the Case subdirectory. These output tables are available for immediate viewing.

- Contours require more processing. Contour post-processing occurs when you access Output // Output Graphics, as explained in Section 11.2.