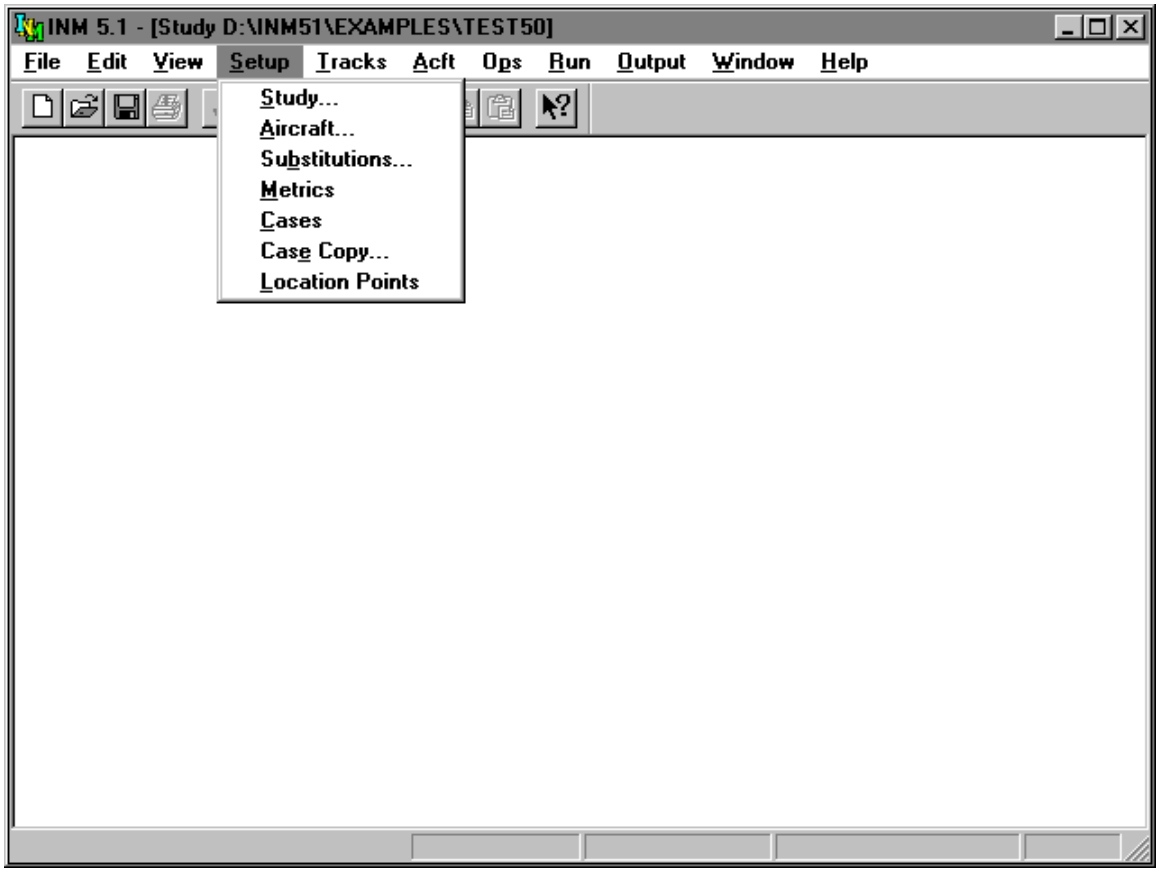
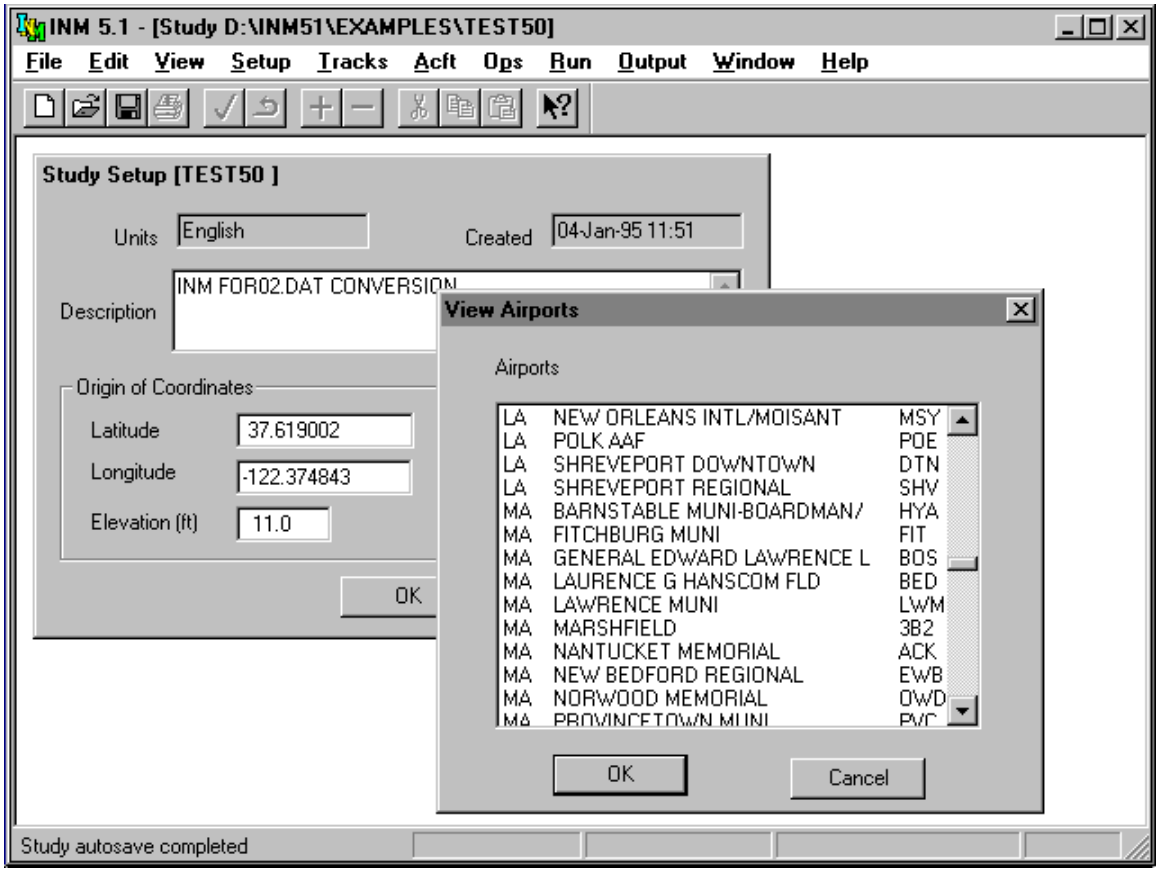


6. SETUP MENU

The Setup menu contains functions that help you create a Study. You can:

- Specify the Study latitude, longitude, and elevation
- Select INM standard Aircraft to use
- Select INM standard aircraft Substitutions to use
- Define your own noise Metrics
- Create or copy Cases for analysis
- Create Location Points for noise calculation.



6.1. Study Setup

Menu Item: Setup // Study

INM automatically starts this function when you create a new Study.

First, fill out the Study description. The description of your Study can be up to 255 characters and span several lines. The description can be edited at any time, not just when you setup the Study for the first time.

The latitude, longitude, and elevation of the origin of coordinates for the Study can be entered by hand, or you can have INM fill in the data by using the Setup // Study "View Airports" function.

If you enter an origin by hand, pick one that is near the center of the of the airport because INM graphical functions are centered on X=0, Y=0. You can change the lat/long coordinates, but please be aware that if you used the old lat/long coordinates when you processed source data, certain graphical overlays (for example, terrain) will not be aligned to the new coordinates. You will have to reprocess source data that depend on the X,Y origin.

INM contains latitude, longitude, and elevation data for about 450 airports in the U.S. You access these airports by pressing the "View Airports" button. A list of airports appears. They are arranged by state, and you can quickly move through the list by typing the first letter of the state.

When you press "OK" for a particular airport, INM performs three actions.

1) Geographical data for the airport are copied into the latitude, longitude, and elevation fields.

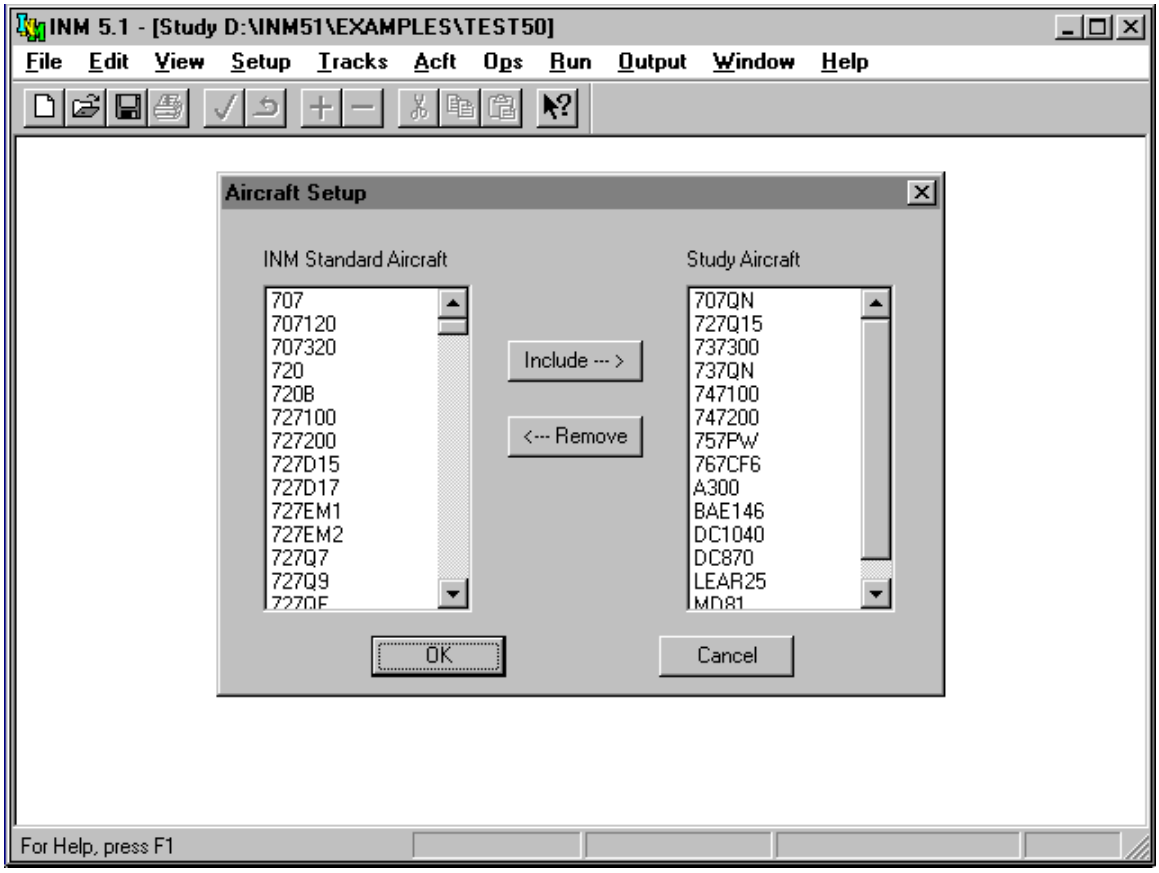
2) Runway and Runway End records are automatically created for you. It is important to check the lat/long values inserted by INM because they occasionally are in error. Check the BAD_RWY.TXT file in the USR_DATA subdirectory.

3) INM finds all U.S. navaids and fixes that are inside a box centered on the airport. The east/west dimension of the box is 58/cos(latitude) nautical miles, and the north/south dimension is 58 nmi. The points are copied into a LOC_PTS file in the Study directory. You can view them using the Setup // Location Points function, and see them displayed in the Track // Input Graphics and Output // Output Graphics windows.

You can have more than one airport in your Study. Select one airport in the "View Airports" function, and then do it again. The second airport's geographical data will become the origin of coordinates, or you can change (by hand) the origin to a position between the two airports.

The second airport's runway data will be appended to the first set of runways. If the second airport has a runway of the same name as the first airport, the runway data will not be appended because of the name conflict. In this case, change the first airport's runway identifier so that it is differs from the second airport's runway, and use the "View Airports" function again to append the additional runway.

Users outside of the U.S. may want to change the airport, runway, and location point files to depict airports, navaids, and fixes in their countries. Using a DBMS program, you can delete the records in the SYS_APRT, SYS_RWY, and LOC_PTS files, which are in the system USR_DATA subdirectory. You can then add your own records. Please do not change the definition of the fields in these files, however.

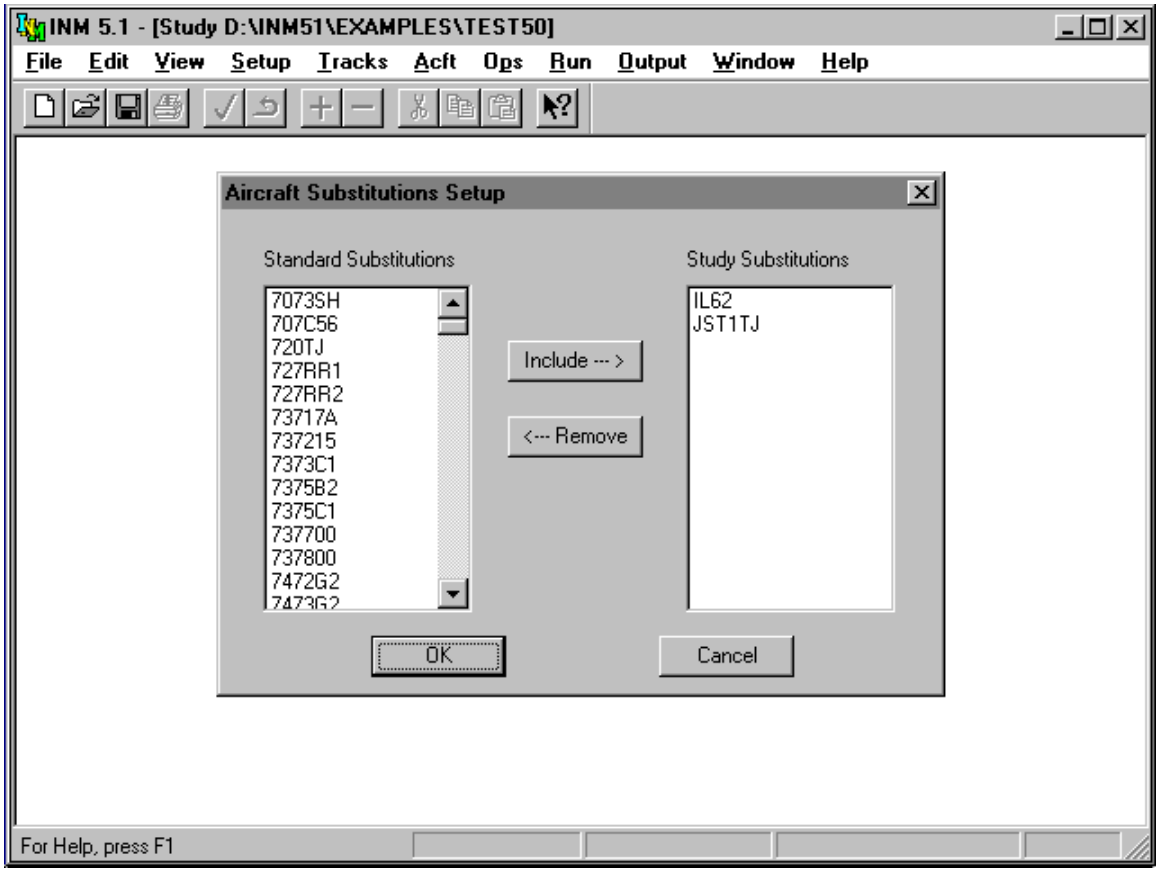


6.2. Aircraft Setup

Menu Item: Setup // Aircraft

The next step in setting up a Study is to pick standard Aircraft that are to be used. You do this by selecting one or more Aircraft in the left-hand list box, and then press the "Include" button. INM moves the selected Aircraft to the right-hand list box. You can do multiple selections before pressing "OK". You can also remove Aircraft from your Study by reversing the process.

If you want to define your own Aircraft, use the Acft // Aircraft window and the Edit // Add Record function (see Section 8.1).



6.3. Aircraft Substitution Setup

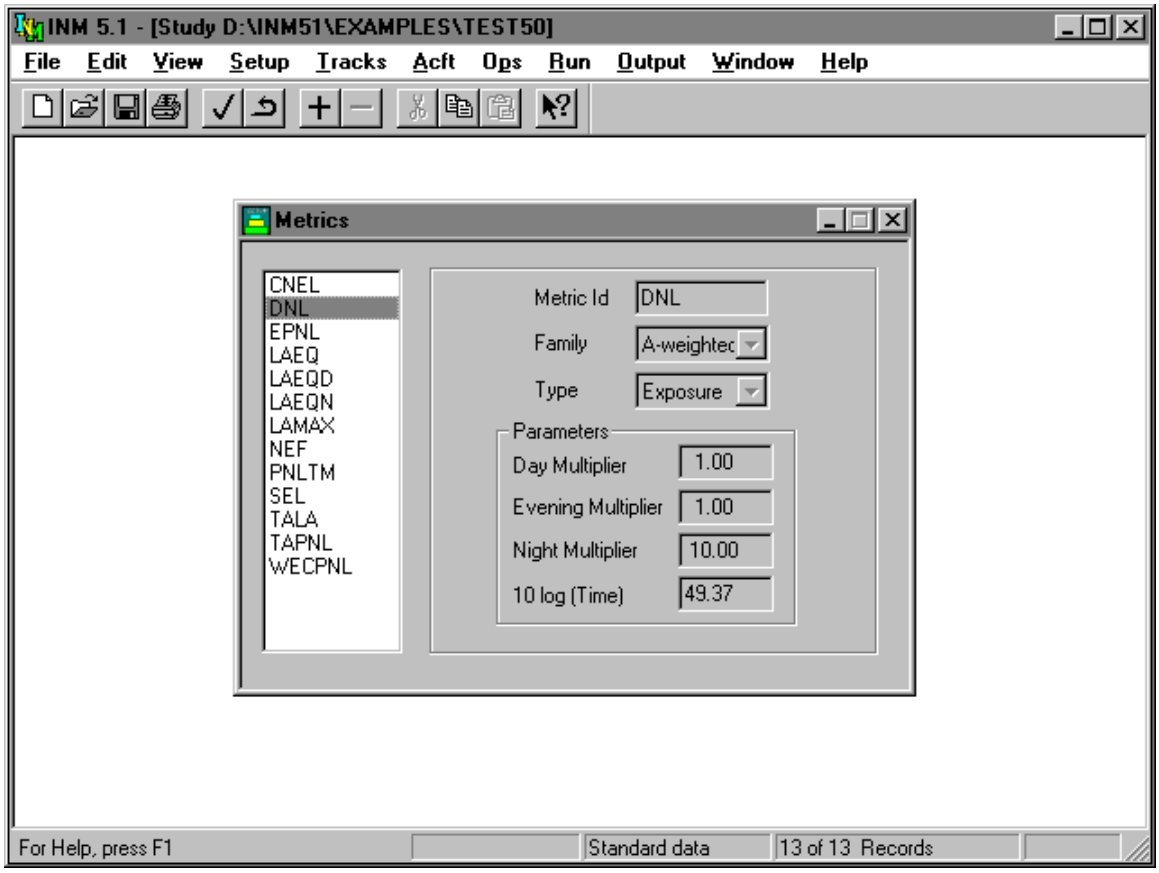
Menu Item: Setup // Substitutions

If you cannot find a particular aircraft that you need, try looking on the Substitution list. Aircraft in the left-hand list box are FAA-approved substitutions. They are associated with INM standard Aircraft. You select Substitution aircraft and then move them into the Study with the "Include" button.

You can view the definition of Substitution aircraft by using the Acft // Substitution function (see Section 8.2) or by consulting Appendix I. You can also create your own Substitution aircraft using the Acft // Substitution function.

You can use Substitution aircraft when creating flight operation data, just as though they were regular study Aircraft. Before calculating noise, INM automatically substitutes study Aircraft for Substitution aircraft.

The INM standard database is updated periodically to include new Substitution aircraft. Check the FAA Web page for new INM files (see Appendix A for the Web page address).



6.4. Noise Metric

Menu Item: Setup // Metrics

This function allows you to view standard noise Metrics and to create your own metrics.

INM provides 13 pre-defined standard Metrics, which are:

A-weighted noise Metrics:

DNL	Day-Night average sound Level
CNEL	Community Noise Equivalent Level
LAEQ	Equivalent sound level (24 hours)
LAEQD	Equivalent sound level for day time (0700-2200)
LAEQN	Equivalent sound level for night time (2200-0700)
SEL	Sound Exposure Level (multi-event)
LAMAX	Maximum sound level
TALA	Time-Above a sound level threshold

Tone-corrected perceived-noise Metrics:

NEF	Noise Exposure Forecast
WECPNL	Weighted Equivalent Continuous Perceived Noise Level
EPNL	Effective Perceived Noise Level (multi-event)
PNLTM	Maximum PNLT sound level
TAPNL	Time-Above a PNLT threshold

Standard Metric records cannot be changed. However, you can add your own Metrics if you need a noise metric that is not on the list.

When adding a Metric, you first type in an identifier, which can be up to six characters long. If you choose the "A-Weighted" noise family, single-event SEL and LAMAX noise tables are used to calculate noise. If you choose the "Perceived" noise family, single-event EPNL and PNLTM noise tables are used (see Section 8.4.2).

The Metric types are Exposure, MaxLevel, and TimeAbove:

- Use Exposure for true noise exposure (mean-squared sound pressure multiplied by a time duration). Also, use Exposure for "equivalent" or "average" noise levels that are derived from noise exposure.

- Use MaxLevel when you want the maximum noise level.

- Use TimeAbove for the total number of minutes that noise levels are above a given threshold. The value of the threshold is not part of the definition of the Metric. The threshold is defined in the Run // Run Options function (see Section 10.2).

For example, the "Australian NEF" Metric is set up as follows:

Metric Id	ANEF
Noise Family	Perceived
Metric Type	Exposure
Day Multiplier	1.0
Evening Multiplier	4.0
Night Multiplier	4.0
10 log(Time)	88.0

For Exposure Metrics, the day, evening, and night multipliers and the time parameter are used as follows:

$$L_E = 10 \log(W_1 E_1 + W_2 E_2 + W_3 E_3) - 10\log(T)$$

L_E Noise exposure level or equivalent noise level (dB).

W_1 W_2 W_3 Weighting factors (multipliers) for day, evening, and night time periods. These are the number of equivalent aircraft operations relative to one aircraft operation during the day time. For example, in the DNL metric, one night-time operation is worth 10 day-time operations, so the weights are W_1=1, W_2=1, and W_3=10 (in this case, the evening period is considered daytime).

E_1 E_2 E_3 Noise exposure ratios for day, evening, and night time periods. These ratios are computed by INM. A-weighted sound exposure ratio is the time-integrated mean-square pressure, in units of $(\mu Pa)^2 s$, divided by a reference sound exposure of $(20\mu Pa)^2(1s)$. Perceived tone-corrected exposure ratio uses a reference noise exposure of $(20\mu Pa)^2(10s)$.

10 log(T) Ten times the base-10 logarithm of the ratio of the averaging time over the reference time. For example, for a 24-hour averaging time in seconds and a reference time of one second,

```
10 log( 24×60×60 s / 1 s )  =  49.37
```

For average-noise Metrics derived from SEL, you must use a reference time of 1 second. For average-noise Metrics derived from EPNL, you must use a reference time of 10 seconds. For true exposure metrics, set 10 log(T) = 0 .

For MaxLevel Metrics, the day, evening, and night multipliers are used as follows:

$$L_{Max} = Max(W_1 L_{Max1} , W_2 L_{Max2} , W_2 L_{Max3})$$

L_{Max} Maximum noise level (dB).

Max(x,y,z) Function that returns the maximum of the three numbers.

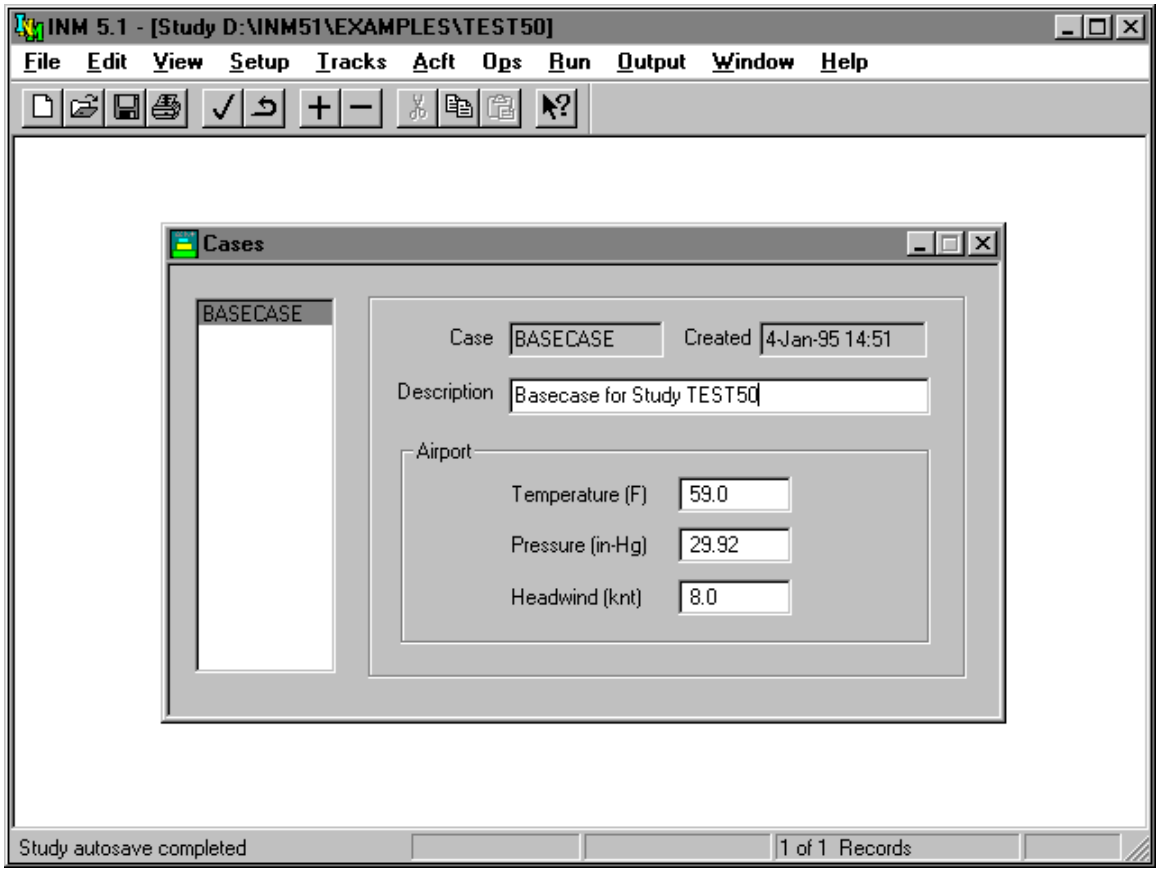
W_1 W_2 W_3 Parameter "switches" that include a time period (W=1) or exclude a time period (W=0). The weights must be either 0 or 1. Use (1,1,1) to calculate the maximum level during all three time periods.

L_{Max1} L_{Max2} L_{Max3} Maximum noise levels for day, evening, and night time periods. INM calculates these values.

For TimeAbove Metrics, the day, evening, and night multipliers are used as follows:

$$TA = W_1 TA_1 + W_2 TA_2 + W_3 TA_3$$

TA	Time-above (minutes) for the time period defined by the weights.
W_1 W_2 W_3	Parameter "switches" that include a time period (W=1) or exclude a time period (W=0). The weights must be either 0 or 1. Use (1,1,1) to calculate the time-above metric during all three time periods.
TA_1 TA_2 TA_3	Time-above (minutes) for day, evening, and night time periods. INM calculates these values.



6.5. Case Setup

Menu Item: Setup // Cases

You create Case records and their associated subdirectories with this function. INM records the time and date that the Case is created. You need to supply the following data:

- Case identifier, which is used as the subdirectory name. Use the DOS 8-dot-3 format.
- 40-character case description (more information can be put in the Study description field in Setup // Study).
- Average airport temperature, atmospheric pressure, and headwind.

INM uses temperature, pressure, and headwind when computing profiles using Procedure Steps (see Section 8.9). INM supplies default values for these parameters, but you can change the defaults, if you wish.

- The default airport temperature is computed by using the International Standard Atmosphere (ISA) equation for "standard-day" temperature versus altitude at the airport elevation. ISA temperature is 59°F at mean sea level, and it gets progressively colder at higher airport elevations.

- The default airport pressure is 29.92 inches-Hg at all airport elevations because atmospheric pressure is referred to sea-level.

- The default average headwind is 8 knots because that is the value used in the SAE-AIR-1845 equations. The average airport headwind can be modified for each Runway End by specifying a percentage change from the average (see Section 7.3).

When you commit a new Case record, a new subdirectory is created under the Study directory. You cannot change the name of the Case subdirectory once it is created.

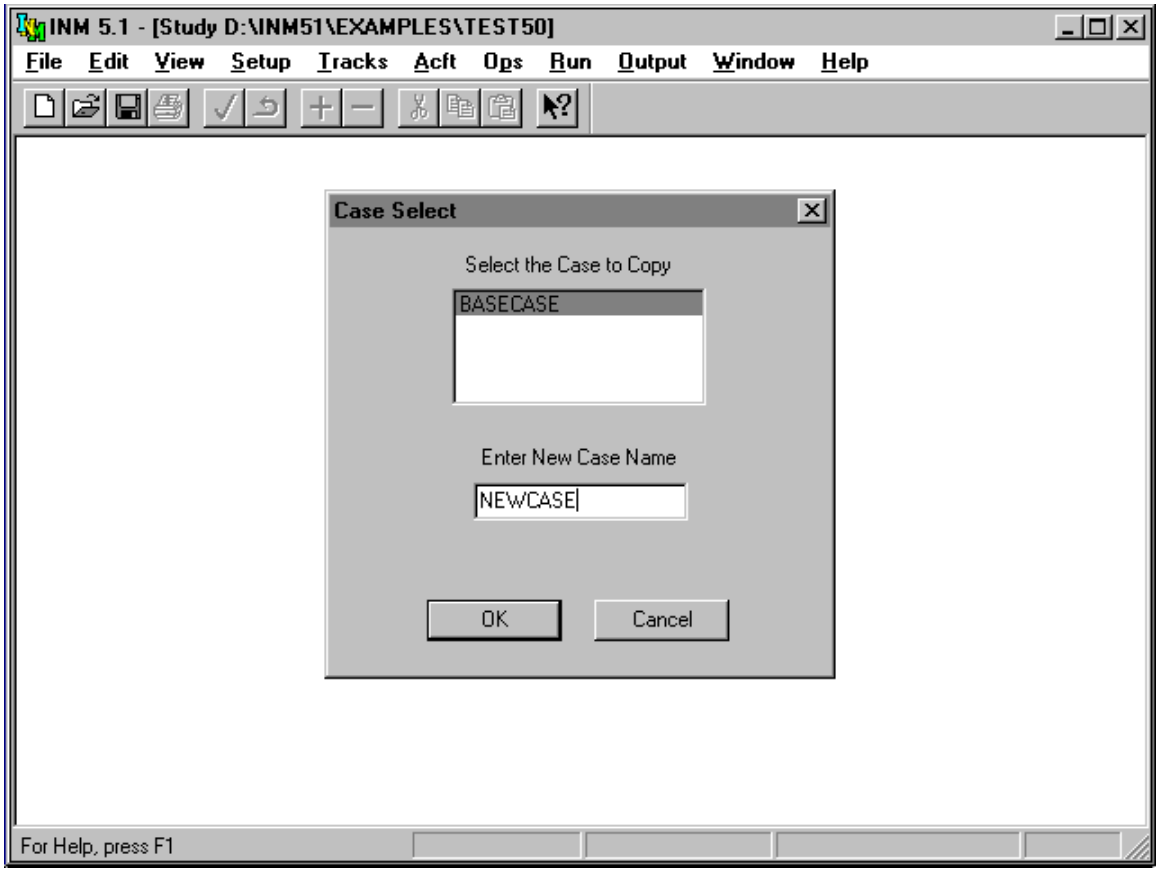
You can delete a Case (and its subdirectory of files) by using the Edit // Delete Record function. If an Output record references the Case that you are trying to delete, INM will not allow the deletion. (Output post-processing functions access Case data, see Section 11.1.) You must first delete the Output record or change the reference to the Case by using the Output // Output Setup function. Then, you can delete the Case.

Part of the INM input setup task is to create a Case so that there is a place to put the flight operations input data. After Study and Case input data are in place, you can "run" a Case. Each Case has its own "run options" and these data are specified in the Run // Run Options function (see Section 10.2).

Run options are really data fields on a Case record, so you deal with Case records under two different menus:

- Setup // Cases
- Run // Run Options.

Only in the Setup // Cases function can a record and its associated subdirectory be added and deleted. Add and delete are disabled in the Run // Run Options function.



6.6. Case Copy

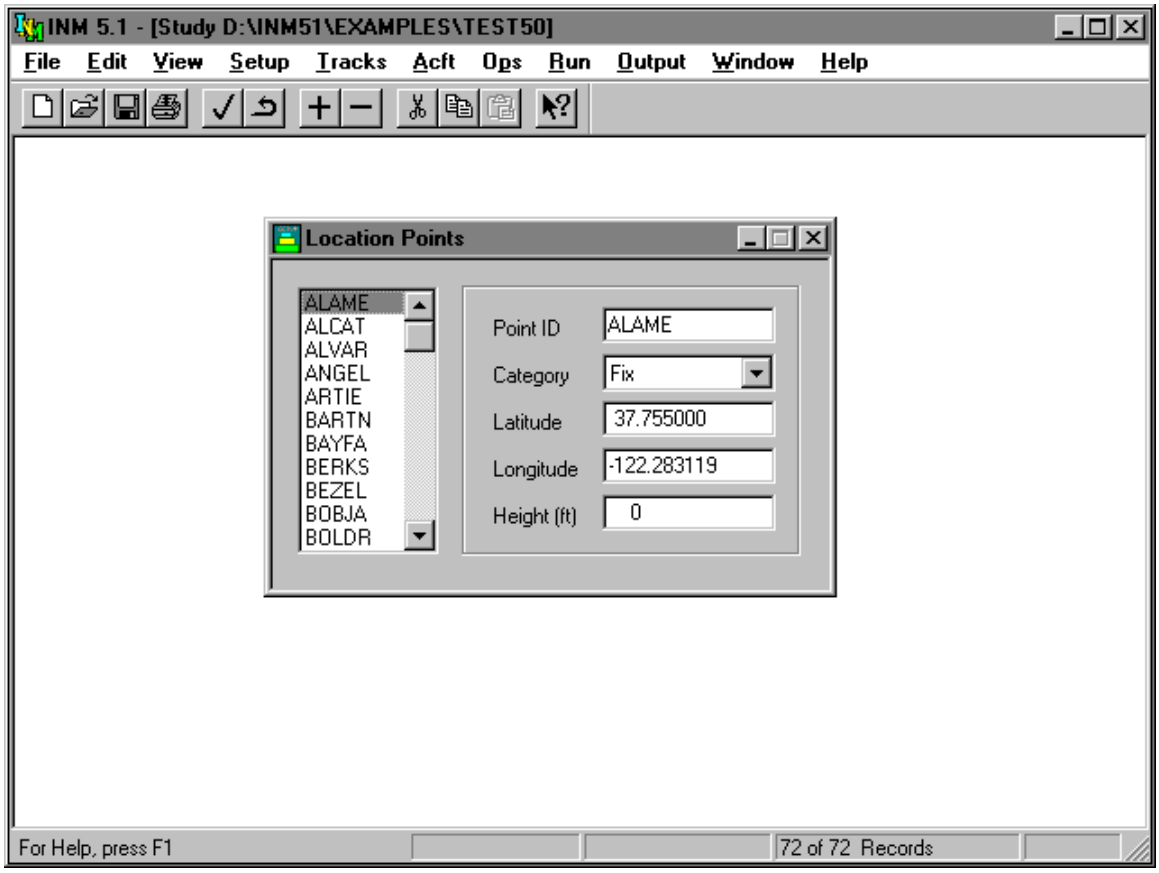
Menu Item: Setup // Case Copy

You can use the Case Copy function to create a new Case by copying input files from an old Case. You may want to do this if you plan to make only small changes in the new Case (for example, only the airport temperature is changed).

The DBF files that are copied are:

1) OPS_APRT
2) GRP_PCT
3) OPS_FLT
4) OPS_RNUP
5) GRID.

The run-option information on the old Case record is also copied.



6.7. Location Points Setup

Menu Item: Setup // Location Points

You use the Location Points function to add and delete location points. Location points are special user-defined points around an airport.

You may want to add Location Points so that you can display them in Input and Output Graphics windows, or because you may want to calculate noise at special points.

If you used the "View Airports" button when you created your Study, navaids and fixes probably already exist in the DBF window. If you want to get rid of the clutter of unwanted fixes, delete them with the Edit // Delete Records function.

Use the Edit // Add Record function and fill out a six-character point name, latitude, longitude, and height above the ground. The height parameter is added to the terrain elevation value, so if you want the noise calculated near the ground, use the default zero value.

You can also create your own table of points by using a DBMS program or by creating a text file and processing it with the File // Import // Text-to-DBF function.

In either case, you need to know the single-letter codes INM uses for the different kinds of points:

A	User-defined text (no associated symbol)
B	Building
C	Church, religious building
H	Hospital, medical facility
S	School, college, university
U	VOR
V	VORTAC
W	VOR/DME
T	TACAN
N	NDB
M	NDB/DME
F	Fix (air traffic control)
X	Other

The six types U V W T N M are collectively called "navaids", meaning electronic aids to airborne navigation. Please use only the above capital letters because INM will not read a record that has an unknown enumerated type.