INM Version 7.0c Software Update

01/03/2011

Version Information

INM Version 7.0c is a database and software update to Version 7.0b. You must already have INM Version 7.0, 7.0a or 7.0b to use this update. The INM Version 7.0c update may be downloaded from the FAA web site at:

http://www.faa.gov/about/office_org/headquarters_offices/apl/research/models/inm_model/

If you do not have INM Version 7.0, you can order a CD-ROM containing INM Version 7.0 by downloading the INM Order Form from the FAA web site (above). After installing INM Version 7.0, you can download and apply the INM Version 7.0c software update.

The Version 7.0 User's Guide is the current manual for INM Version 7.0c software. The Version 7.0 Technical Manual is the current technical description of the methods used by INM Version 7.0c to calculate aircraft noise around airports. Release notes *Inm70a.pdf*, *INM70b.pdf* and this document, *Inm70c.pdf*, record the changes to INM since the User's Guide and Technical Manual were published.

Installation Instructions

1. Use MS Windows to make a copy of your existing *INM7.0b* directory. Select your *INM7.0b* directory and, using the Windows File Manager under the "Edit" menu, select "copy" and then select "paste". This will create a new directory called "*Copy of INM7.0b*".

2. Use the right button of your mouse to select the *Copy of INM7.0b* directory created in step 1. Select "Rename" and rename the directory *INM7.0c*.

3. **Make sure that the attributes for the new *INM7.0c* directory as well as for all sub-directories and files are not set to "Read-only".** The attribute settings for each file and folder can be viewed by right-clicking that file or folder within Windows Explorer and selecting "Properties".

4. Download the *INM70c.EXE* file from the FAA Web site. Put it in the new *INM7.0c* directory.

5. Double click on the *INM70c.EXE* file name to automatically extract the updated files into the new *INM7.0c* directory. Select the "Unzip" button. This process will overwrite the old INM Version 7.0b files and replace them with those required for INM Version 7.0c. The distributed files are presented in Table 1:

Table 1. Files Distributed For INM Version 7.0c[1]

File	Date
inm.exe	***12/15/2011***
flight.exe	***12/02/2011***
compute.exe	***12/14/2011***
compu50.dll	***11/30/2011***
graph.dll	***12/15/2011***
terraincheck.dll	***12/15/2011***
GlobalMapperInterface.dll	***03/11/2007***
lti_dsdk_dll.dll	***09/06/2006***
NCScnet.dll	***02/28/2007***
NCSEcw.dll	***02/28/2007***
NCSEcwC.dll	***02/28/2007***
NCSUtil.dll	***02/28/2007***
TerraServiceAccessor.dll	***04/20/2005***
Inm70a.pdf	09/17/2008
Inm70b.pdf	09/29/2009
Inm70c.pdf	***01/03/2012***
sys_data.dbf (24 files)*	***12/21/2011***
sys_data\acdb70.bin	***12/21/2011***
sys_data\spectra.bin	***10/24/2011***

Database Modifications

1. Approach noise-power-distance (NPD) data for nine (9) Airbus aircraft were updated in INM Version 7.0c, including the **A300-622R**, **A310-304**, **A319-131**, **A320-211**, **A320-232**, **A321-232, A330-301**, **A330-343**, and **A340-211**. The performance data for these aircraft were most recently updated in INM Version 7.0b, which supplemented the noise data that were mostly recently updated in INM Version 6.2a. However, issues related to the reference speed assumptions used in the development of these approach noise data were recently identified. Therefore, the approach noise data updates for these aircraft in INM Version 7.0c include approach noise data originally available in INM Version 6.2[2] , which are considered to better represent the approach noise generated near an airport and do not include this reference speed assumption issue. In addition, Approach NPD data for three Airbus aircraft were updated with manufacturer re-developed data in INM Version 7.0c, including the **A340-642**, **A380-841**, and **A380-861**, replacing approach noise data available in INM Version 7.0b that included this reference speed assumption issue. These updated approach noise data represent the noise source state of the aircraft flying at a reference

[1] Note that "***italicized and bolded***" entries indicate that these files were updated in INM Version 7.0c.

[2] The approach noise data available in INM Version 6.2 were originally added to the INM database in the following versions:

- A320-211, A330-301, and A340-211 data were added in INM Version 6.0b;
- A319-131, and A320-232 data were added in INM Version 6.0c; and
- A300-622R, A310-304, A321-232, and A330-343 data were added in INM Version 6.1.

speed of 160 kt, which is consistent with SAE AIR 1845 and with other aircraft data in INM. The approach NPD dataset captures a single airframe noise state, corresponding to a common landing aerodynamic configuration with landing gear down[3]. These updates result in a small but noticeable increase in noise levels underneath approach flight paths at distances further than 4 nautical miles from the corresponding airport runway. For an airport study with significant number of operations of these updated Airbus aircraft, these noise updates may result in larger 55 dB DNL contours but should have a minimal effect on 65 dB DNL contours[4]. This representation has been reviewed by the manufacturer, the SAE A-21 Aircraft Noise Committee, and several international government agencies and has been deemed appropriate for modeling approach noise from these aircraft in the vicinity of airports. Note that the SAE A-21 Aircraft Noise Committee is currently researching additional improvements to approach noise data and modeling methodology. Approach noise data and modeling methodology may be updated in future releases of INM/AEDT pending the results of this research. As such, these NPD updates are considered to be a reasonable interim implementation until more comprehensive solutions are developed and refined.

Table 2. Airbus Approach NPD Updates

AIRCRAFT IDENTIFIER	ENGINE	NOISE IDENTIFIER	SOURCE OF UPDATED APPROACH NPDS
A300-622R	PW4168	PW4158	Updated (INM Version 6.2 data)
A310-304	GE CF6-80 C2A2	A310	Updated (INM Version 6.2 data)
A319-131	IAE V2522-A5	V2522A	Updated (INM Version 6.2 data)
A320-211	CFM56-5A1	CFM565	Updated (INM Version 6.2 data)
A320-232	V2527-A5	V2527A	Updated (INM Version 6.2 data)
A321-232	V2530-A5	V2530	Updated (INM Version 6.2 data)
A330-301	GE CF6-80 E1A2	CF680E	Updated (INM Version 6.2 data)
A330-343	TRENT 772B	TRENT7	Updated (INM Version 6.2 data)
A340-211	CFM56-5C2	CF565C	Updated (INM Version 6.2 data)
A340-642	TRENT 556	TRENT5	Redeveloped by manufacturer
A380-841	TRENT 970	TRENT9	Redeveloped by manufacturer
A380-861	GP7270	GP7270	Redeveloped by manufacturer

2. The INM standard aircraft substitution list has been reviewed and updated. 22 new aircraft are added to the substation list, 38 substitutions are modified, and 8 are

[3] For Airbus aircraft, this landing configuration is known as "Conf 3" and refers to a specific flap and slat state that is commonly used for landing.

[4] Note that the A340-642 data may exhibit a different effect (i.e., smaller 55 dB DNL contours in INM Version 7.0c when compared to previous releases), because the approach NPD update corrected an error in the data set.

deleted. The update is based on comprehensive review of aircraft configuration, aircraft aerodynamic performance, noise certification levels, and noise contour area comparisons. These changes are outlined in the tables below and can be found in the "acft_sub.dbf" file:

Table 3. New INM Aircraft Substitutions

SUBSTITUTION ID	SUBSTITUTION DESCRIPTION	AIRCRAFT ID
737215HK	737-200 ADV w/JT15QN (with hushkit)	737N17
737222HK	Boeing 737-222 (with hushkit)	737N9
747122S3	Boeing 747-122 (stage 3 engines)	74710Q
BAE-125-400	Bae Raytheon Hawker 125-400	LEAR35
BD100	BD-100 Challenger 300 CL30	CL601
BD700	Bombardier BD-700 Global Express	GV
C56X	Cessna 560XL Citation Excel	CNA55B
D328J	Dornier 328-300 Jet / PW306B	CL600
DA42	DA-42 Twinstar	BEC58P
FAL50	Falcon 50	F10062
FAL900	Falcon 900 with TFE7313-5AR-1C	F10062
G150	Gulfstream 150	IA1125
G200	Gulfstream 200	CL600
HK4000	Hawker 4000 (Horizon 1000)	CL600
P180	Piaggio P-180	SD330
PC12	Pilatus PC12-NG	CNA208
R390	Raytheon 390 Premier	LEAR35
R850	Raytheon Hawker 850XP (TFE731-5)	LEAR35
SR22	Cirrus SR-22	GASEPV
STBM7	Socata TBM700	CNA208
YAK42HK	Yakolev Yak-42 (with hushkit)	727EM1

Table 4. Modified INM Aircraft Substitutions[5,6]

SUBSTITUTION ID	SUBSTITUTION DESCRIPTION	PREVIOUS AIRCRAFT ID	UPDATED DESCRIPTION	UPDATED AIRCRAFT ID
737215	737-200 ADV w/JT15QN	737D17		***737QN***
737222	Boeing 737-222	737QN		***737D17***
747122	Boeing 747-122	74720A	***Boeing 747-122 (stage 2 engines)***	***737QN***
A321	Airbus A-321	A320-211		***A321-232***
AN26	Antonov-26	CVR580		***HS748A***
AN74TK	Antonov-74	DC9Q9		***DC930***
ATR72	Avions de Transport Regional ATR-72	HS748A		***DO328***
BAEATP	British Aerospace Advanced Turboprop ATP	HS748A		***DO328***
BAEJ31	British Aerospace BAe Jetsream 31	DHC6		***DO228***
BEC200	Beech Super King Air 200	DHC6		***CNA441***
BEC300	Beech Super King Air 300	DHC6		***DO228***
BEC30B	Beech Super King Air 300B	DHC6		***CNA441***
BEC60	Beechcraft Model 60 Duke	BEC58P		***PA31***
BEC99	Beech Airliner Model 99	DHC6		***CNA441***
BL26	Bellanca Super Viking Model 17-30A	GASEPF		***GASEPV***
CNA550	Cessna Model 550 Citation II	MU3001		***CNA500***
CNA551	Cessna Citation II Single Pilot (SP)	MU3001		***CNA500***
CNV640	Convair 640	HS748A		***CVR580***
DHC2	De Havilland DHC-2 Beaver	GASEPV		***DHC-2FLT***
EMB170	Embraer EMB-170	GV		***737500***
EMB190	Embraer EMB-190	GV		***A319-131***
FAL200	Falcon 200	LEAR35		***CL600***
FAL20A	Falcon 2000	CL600		***CL600***
FK50	Fokker 50	DHC830		***CVR580***
HS125	Hawker-Siddeley 125	LEAR25		***LEAR35***
JST1TF	Jetstar 1 Turbofan	LEAR35	***Lockheed JetStar 1 Turbofan***	No Change

[5] Note that when importing studies from previous releases of INM that have substitution aircraft, the substitution aircraft and corresponding operations need to be added to the INM study after importation, if the aircraft substitutions have been modified/updated in INM Version 7.0c. The updated substitution aircraft ***will not*** be automatically populated in the imported study.

[6] Note that "***italicized and bolded***" entries indicate that these data were updated in INM Version 7.0c.

SUBSTITUTION ID	SUBSTITUTION DESCRIPTION	PREVIOUS AIRCRAFT ID	UPDATED DESCRIPTION	UPDATED AIRCRAFT ID
JST1TJ	Jetstar 1 Turbojet	LEAR25	***Lockheed JetStar 1 Turbojet / JT12A-8***	No Change
JST2TF	Lockheed Jetstar 2	LEAR35	***Lockheed JetStar 2***	No Change
LEAR60	Learjet 60	LEAR35	***Learjet 60 / PW305***	***CNA55B***
MU2	Mitsubishi MU-2	DHC6		***CNA441***
MU300	Mitsubishi Diamond MU-300	CNA500		***MU3001***
N24	Gov. Aircraft Factories N24	CNA441	***Gov. Aircraft Factories (Australia) N24***	No Change
PA28AR	Piper PA-28-181 Archer II	GASEPF		***PA28***
PA28CC	Piper PA-28-180 Cherokee Challenger	GASEPF		***PA28***
PA28CH	Piper PA-28-140 Cherokee 140	GASEPF		***PA28***
RWCM69	Rockwell Turbo Commander 690	CNA441	***Rockwell Turbo Commander 690 (Turboprop)***	No Change
SAMER2	Swearingen Merlin II	CNA441		***1900D***
SE210	Aerospatiale Caravelle	737		***DC950***
YAK42	Yakolev Yak-42	727100		***L188***

Table 5. Deleted INM Aircraft Substitutions[7]

SUBSTITUTION ID	SUBSTITUTION DESCRIPTION	AIRCRAFT ID	REASON FOR REMOVAL
707C56	707 w/CFM56	DC870	Only one was built as a test aircraft, and it is no longer operational.
C141	Lockheed C-141 Starlifter	707320	This is the same aircraft as the C141A on the military aircraft list in INM VERSION 7.0c.
C17A	Globemaster III C-17	DC870	This is the same aircraft as the C17 on the military aircraft list in INM VERSION 7.0c.
C5	Lockheed Galaxy	74720B	This is similar to the C5 on the military aircraft list in INM VERSION 7.0c.
CNA525	Cessna Citation Jet	CNA55B	Noise and performance data for the CNA525 were added to INM VERSION 7.0c.
KC135E	Boeing KC135 Stratotanker (Re-engined)	707320	This is the similar aircraft as the KC-135 on the military aircraft list, and the KC135R on the commercial aircraft list in INM VERSION 7.0c.
MB339C	Aermacchi M.B. 339-C	A7D	This is a military aircraft, and there is not a good commercial aircraft substitution in INM VERSION 7.0c.

3. Data for the following five new Cessna aircraft were added to INM Version 7.0c. These data were recently developed by the manufacturer, and each aircraft data set includes a single procedural arrival profile at a standard 3-degree descent, and a single STANDARD stage length 1 procedural departure profile. The data also include new Noise data (NPDs, and spectral classes).

[7] Note that data for these 7 substitution aircraft available in previous versions of INM has been deleted. Operations assigned to the former substitution aircraft within studies created in older versions of INM may need to be modified to reconcile the profile identifiers called for in the operation definitions with the profile identifiers available within the new data set.

Table 6. New Cessna Data

				SPECTRAL CLASSES		
AIRCRAFT	**AIRCRAFT IDENTIFIER**	**ENGINE**	**NOISE IDENTIFIER**	**DEP**	**APP**	**OVF**
Cessna Citation CJ4, 525C	CNA525C	FJ44-4A	FJ44-4	136[8]	235	-
Cessna Citation Encore, 560	CNA560E	PW535A	2PW535	138	238	-
Cessna Citation Ultra, 560	CNA560U	JT15D-5D	2J155D	113	237	-
Cessna Citation Excel, 560	CNA560XL	PW545A	PW545A	137	238	-
Cessna Citation Sovereign, 680	CNA680	PW306C	PW306C	136	236	-

4. Data for the following four new Bell helicopters and one updated Bell helicopter were added to INM Version 7.0c. These data were recently developed (or modified) by the manufacturer, and they include STANDARD departure, arrival, and taxi profiles following the same conventions as other helicopters currently in the INM database. The data also include new noise data (NPDs, directivity adjustments and blade tip Mach number adjustment coefficients). For the updated helicopter (B407), these modified data correct an error in the data set concerning the blade tip Mach number adjustment coefficients, and are more representative of the noise generated by the helicopter near an airport. Note that EPNL and PNLTM NPDs for these five helicopters are not included at this time, but will be included in future releases when the data become available.

[8] These data include several new spectral classes: **136**, **137** and **138** for departure; and **235**, **236**, **237** and **238** for approach.

Table 7. New Bell Data[9]

				SPECTRAL CLASSES			
HELICOPTER	**HELICOPTER IDENTIFIER**	**ENGINE**	**NOISE IDENTIFIER**	**DEP**	**APP**	**OVF**	**SOURCE OF DATA**
Bell 206B-3	B206B3	Rolls-Royce 250-C20J	B206B3	114	219	305	Developed by manufacturer
Bell 407	***B407***	Rolls-Royce 250-C47B	***B407***	***114***	217	***305***	Updated data developed by manufacturer
Bell 427	B427	PW207D	B427	114	219	301	Developed by manufacturer
Bell 429	B429	PW207D1	B429	114	217	301	Developed by manufacturer
Bell 430	B430	Rolls-Royce 250-C40B	B430	114	222	304	Developed by manufacturer

5. Data for the following two floatplane aircraft were added to INM Version 7.0c. Each aircraft has a single procedural arrival profile, representing a standard 3-degree descent. There is also a single STANDARD stage length 1 procedural departure profile for each aircraft. The data also include noise data (NPDs, and spectral classes). The data were developed by the US DOT Volpe National Transportation Systems Center (Volpe Center)[10]. Note that climb performance for both aircraft is marginal even at low altitude ISA conditions. Users who wish to model this aircraft should consult with operators at the airport of interest for arrival and departure procedures. Users may consult the example procedures in the database for information on modeling level flights.

[9] Note that "***italicized and bolded***" entries indicate that these data were updated in INM Version 7.0c.
[10] Lau, Michael C., et al., Floatplane Source Noise Measurements: Summary of Measurements, Data and Analyses for the Cessna 182S Skylane and De Havilland Canada DHC-2 Beaver, DOT-VNTSC-FAA-11-11, 2011 *(publication pending)*

Table 8. New Floatplane Data

AIRCRAFT	AIRCRAFT IDENTIFIER	ENGINE	NOISE IDENTIFIER
Cessna Skylane Model 182S with amphibious floats	CNA182FLT	Lycoming IO-540-AB1A5 piston	IO540AB
De Havilland Canada DHC-2 Beaver with floats	DHC-2FLT	PWR985 radial	R985

6. Modified EPNL and PNLTM NPD data for the following five aircraft\noise identifiers were updated in INM Version 7.0c, correcting an error in the data set. The SEL and EPNL NPD data were not updated. The modified noise data were developed by the Volpe Center.

Table 9. Fixed Wing Aircraft with Updated EPNL and PNLTM NPD Data[11]

AIRCRAFT IDENTIFIER	ENGINE	NOISE IDENTIFIER
CNA182	Continental O-470-R	***O470R***
CNA208	PT6A-114	***PT6A114***
DO228	TPE 331-5	***TPE331-5***
DO328	PW119C	***PW119C***
PA42	PT6A-41	***PT6A41***

7. Modified noise data for two helicopters in INM Version 7.0c, correcting an error in the data set. The data include new NPDs, new directivity adjustments and new reference speeds, correcting errors in the data set and accounting for updates in the SEL and EPNL NPD computation procedure for helicopters[12]. The modified data were developed by the Volpe Center.

[11] Note that "***italicized and bolded***" entries indicate that these data were updated in INM Version 7.0c.
[12] International Civil Aviation Organization (ICAO), Environmental Protection: Volume 1 Aircraft Noise, Annex 16 to the Convention on International Civil Aviation, Sixth Edition, July 2011.

Table 10. Helicopters with Updated Noise Data[13]

HELICOPTER IDENTIFIER	ENGINE	NOISE IDENTIFIER
R44	Lycoming O-540-F1B5	***R44***
SC300C	Lycoming HIO-360-D1A	***SC300C***

8. Modified the spectral classes of the following aircraft, to correspond with the updated NPD data and/or to correct an error in the data set:

Table 11. Aircraft with Updated Spectral Class Mappings[14]

AIRCRAFT IDENTIFIER	DEPARTURE SPECTRAL CLASS	APPROACH SPECTRAL CLASS	OVERFLIGHT SPECTRAL CLASS
A340-642	***102***	***205***	-
A340-841	***105***	***205***	-
A380-861	***105***	206	-
B206L	120	222	***307***
M7235C[15]	***112***	-	112

9. Modified noise data for the Cessna 208 with a PT6A-114 engine were added to the INM database, replacing the existing noise data. The aircraft identifier is **CNA208** and the noise identifier is **PT6A114**. The data include new SEL and LAMAX 463 lb approach NPDs, correcting errors in the data set. The modified noise data were developed by the Volpe Center.

10. Modified the speed used in the first step of the approach procedure of R44, to make it consistent with the reference level speed.

[13] Note that "***italicized and bolded***" entries indicate that these data were updated in INM Version 7.0c.
[14] Note that "***italicized and bolded***" entries indicate that these data were updated in INM Version 7.0c.
[15] Note that the Maule M-7-235C with an IO540W engine (aircraft identifier of **M7235C** and noise identifier of **IO540W**) only has overflight NPDs in INM Version 7.0c. As such, only overflight operations may be modeled for this aircraft.

11. Modified several STANDARD arrival procedural profiles with updated reverse thrust implementation. This update is consistent with the standard INM reverse thrust implementation (40% thrust for narrowbody jets, and 10% thrust for widebody jets), and was confirmed as appropriate by the corresponding aircraft manufacturers. The modified procedure steps are summarized below:

Table 12. Arrival Procedural Profiles with Updated Reverse Thrust

ACFT_ID	OP_TYPE	PROF_ID1	PROF _ID2	STEP_NUM	STEP_TYPE	FLAP _ID	THR_TYPE	PARAM1	PARAM2	PARAM3	UPDATED PARAM3
767300	A	STANDARD	1	6	B		V	2956.5	130.1	40.0	***10.0***
767CF6	A	STANDARD	1	6	B		V	2948.4	131.4	40.0	***10.0***
767JT9	A	STANDARD	1	6	B		V	2984.4	131.4	40.0	***10.0***
A300-622R	A	STANDARD	1	10	B		V	2747.8	130.5	60.0	***10.0***
A310-304	A	STANDARD	1	10	B		V	2726.6	131.6	60.0	***10.0***
A319-131	A	STANDARD	1	10	B		V	1370.6	122.3	60.0	***40.0***
A320-211	A	STANDARD	1	10	B		V	2731.6	129.6	60.0	***40.0***
A320-232	A	STANDARD	1	10	B		V	2799.4	130.8	60.0	***40.0***
A321-232	A	STANDARD	1	10	B		V	3451.7	135.5	60.0	***40.0***
A330-301	A	STANDARD	1	10	B		V	1893.8	127.9	60.0	***10.0***
A330-343	A	STANDARD	1	11	B		V	3402.6	132.5	60.0	***10.0***
A340-211	A	STANDARD	1	11	B		V	3436.6	129.1	60.0	***10.0***
A340-642	A	STANDARD	1	11	B		V	2526.5	144.8	60.0	***10.0***
A380-841	A	STANDARD	1	10	B		V	5731.3	136.3	60.0	***10.0***
A380-861	A	STANDARD	1	10	B		V	5731.3	136.3	60.0	***10.0***

12. Modified the STANDARD arrival fixed point profile for the Boeing **767400** with updated reverse thrust implementation. This update is consistent with the standard INM reverse thrust implementation (40% thrust for narrowbody jets, and 10% thrust for widebody jets), where the **767400** was re-categorized as a widebody jet.

13. Modified several STANDARD arrival procedural profiles by adding an additional final landing segment. This update is consistent with the standard INM landing procedure, which ends with 10% static thrust on the final segment. The modified procedure steps are summarized below:

Table 13. Arrival Procedural Profiles with Updated Landing Segments

ACFT_ID	OP_TYPE	PROF_ID1	PROF_ID2	STEP_NUM	STEP_TYPE	FLAP_ID	THR_TYPE	PARAM1	PARAM2	PARAM3
CNA182	A	STANDARD	1	8	B		L	0.0	10.0	10.0
CNA208	A	STANDARD	1	8	B		L	0.0	30.0	10.0
DO228	A	STANDARD	1	8	B		L	0.0	30.0	10.0
DO328	A	STANDARD	1	8	B		L	0.0	30.0	10.0
PA42	A	STANDARD	1	8	B		L	0.0	10.0	10.0

14. Note that the Level overflight fixed point profiles for nine propeller-driven aircraft including the **CNA182, CNA208, DO228, DO328, M7235C, PA28, PA30, PA31**

and **PA42** are intended to be examples of how used-defined overflight profiles may be modeled for these aircraft. These profiles were not designed to represent actual profiles, and they should not be considered STANDARD profiles. Users should define actual profiles based on specific situations of a study.

15. The "Level" overflight procedural profile for the **PA30** was removed from the INM database, as it was a duplicate profile. A "Level" fixed point profile for the **PA30** remains in the INM database.

16. Modified the static thrust value for the **737800**, changing it from 27300 to 26300 pounds, to make it consistent with the entry in the FAA's Advisory Circular AC36-1H. This value appears in the Civil // Airplane Data window.

Program Modifications

1. Added the ability to delete points-type tracks through the *Track//Track Identifiers* window in addition to Input Graphics.

2. Updated to the latest version of Globalmapper for terrain processing. INM uses Global Mapper SDK Version 1.22.0.0.

3. Improved calculations related to bank angle by basing track curvature directly on ground track information, rather than on flight path results. The present treatment leads to more realistic bank angle results.

Reported Problems Fixed

1. Fixed a problem that caused helicopter tracks to be improperly displayed when using the *Export As//DXF* and *Export As//Shapefile* functionalities in Output Graphics.

2. Fixed a problem in Input Graphics that prevented non-zero delta distances from being displayed.

3. Fixed a problem that prevented Ambient Screening output from being displayed in Output Graphics.

4. Fixed a problem that prevented overflight operations from being flown when both Approach and Departure NPD's were missing. Overflight operations can now be processed with only Level\Afterburner noise curves defined.

5. Fixed a problem that prevented helicopter performance from being calculated when the profile altitude starts at a negative value AFE. Previously, an error was reported and flight path processing was stopped.

6. Fixed a problem where the INM GUI would encounter an unrecoverable error if the Run Options window was opened without first defining a scenario.

7. Fixed a problem that prevented track segments from being reordered properly when generating flight paths. Previously, an ambiguous error was written to the Error&Warning.txt file.

8. Fixed a problem where noise was incorrectly computed for helicopter P-Weighted noise metrics.

9. Fixed a problem that allowed modification of standard noise data in the *Civil//NPD Data* window.

10. Fixed a problem where the flight.exe would shut down unexpectedly when creating flight paths if an aircraft operation existed but the aircraft had not been added to the study. An error message will now be written to the Error&Warning.txt file.

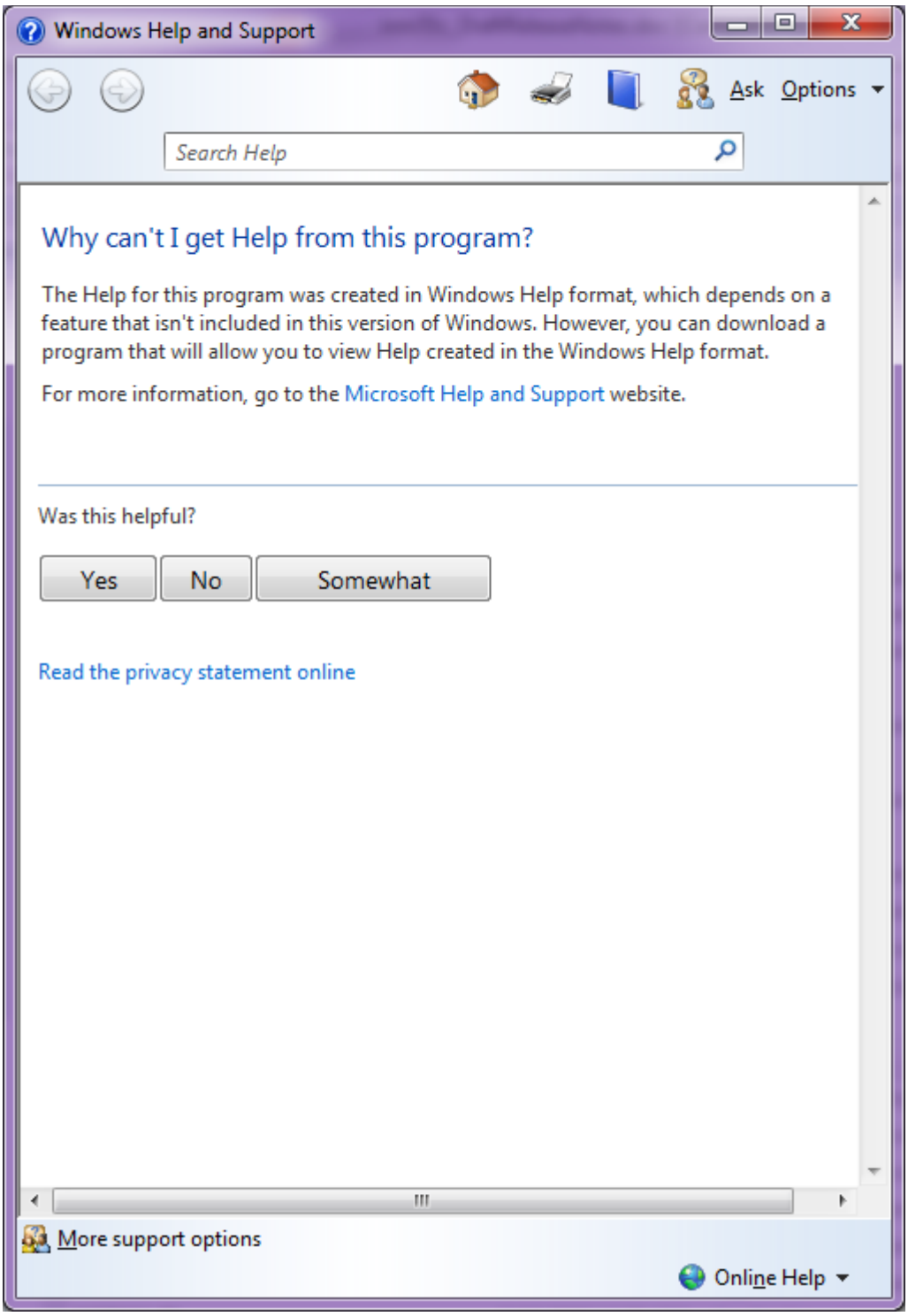
11. Fixed a problem to allow for the segment duration parameter to properly be taken into account for the time audible duration computations. Previously, the duration was computed from speed and distance on each segment, instead of referencing the duration parameter directly.

12. Fixed a problem where the incorrect beta angle was used when terrain was turned on and the receiver position was the same as the source position. Previously, the beta angle at that point was set to 90 degrees, where other points in very close proximity to that segment starting point were assigned the correct beta angle of 0 degrees. INM Version 7.0c now uses a beta angle of 0 degrees under these conditions.

13. Fixed a problem where the directivity adjustment was not applied to runup event noise computations. Previously, INM failed to apply the behind start-of-takeoff directivity adjustment to the runup noise computations.

A note for users running on Windows Vista and later:

Starting with Windows Vista, Microsoft no longer directly supports help files created using previous versions of the Windows Help program. Clicking on the inm.hlp file will generate the following error:



You can click on the “Microsoft Help and Support” embedded link to download the Microsoft Executable, WinHlp32.exe. Or you may go directly to Microsoft Help and Support for this issue by copying the following link into your browser:

http://support.microsoft.com/kb/917607