Lightsoft Integrated Development Environment (LIDE)

Frequently Asked Questions

Part No. LSA0003

This electronic version of the manual is designed to be viewed in at least 16 colours and preferably 256 or better.
For printing, set the page size to "A4"

Contents

Documentation

Q: The amount of documentation is somewhat overwhelming. Where do I start?
Yes, sorry about that, but it 's better than being underdocumented? Anyway, the simple answer is it depends on what you want to do. Assembly language programmers should first read the Anvil user manual and then the Fantasm user manual. This will be enough until you want to do something a little out of the ordinary when you need to dig about the other docs where LSA9998, the Docs Index can be helpful.

C and C++ programmers should read the Anvil user manual along with the relevant compiler manuals. Again when you need to do something a little out of the ordinary, the other LIDE manuals will probably contain the answer you need.

If you have time to spare we strongly recommend you at least browse the other manuals to get an idea of "what's what". Indexing the hard drive your LIDE docs reside on with Sherlock can be a big help.

Unfortunately no matter how hard we try (being mere human beings) we can not document every little nuance. If you do find a conflict between the documentation and software please let us know about it as soon as possible so we can update. Please email docs@lightsoft.co.uk. Thanks.

Q: Who writes all these docs?
Fluffy the Lightsoft Cat. It's her primary responsibility. Search our web site; there's a picture there somewhere.

But seriously, it's Stuart Ball who authors most of this "bed time" reading.

Projects

Q: How do I add shared libraries to my PowerPC assm project?
A: Use the "Add shared library(s)" menu command from the Project menu. Many shared libraries live in the "extensions" folder, although in MacOS 8 they have all been rolled into the System file.
Anvil will open a file selector, with which you select the file you think is holding the shared Libraries you want to add. Anvil will hunt around in the file looking for all possible PowerPC shared libraries and list them in a window. Now all you have to do is single click on them to add them to your project.

Q: I'm an assembly language programmer. When I click on a file in my Globincs area, Anvil reports there are no dependencies for this file? I'm confused.
A: Anvil is correct. The report you get is one way only. The file you have clicked on is not dependent on any other files. All the other source files in your project are dependent on it however (it's a globinc). If you "get info" on one of them, you'll see this globinc listed.

Q: I'm an assembly language programmer. What is a SrcIncs area?
A: In Fantasm, you have two types of include directives you can use, viz:
includeh - get a file from the "Anvil Low Level Defs" folder.
include - get a file from the _SrcIncs area.
Files you want to "include" should be added to the project in the _SrcIncs area.
They will be found extremely quickly. If you do not, they will still be found, but much more slowly as Anvil may have to search many, many folders. It effectively starts at the highest level source area of your project, finds a file, works out its folder and looks in there. If not found it moves onto the next file. Slow, but reliable, just in case you forget to add an include file.
includeh will not do this. If a file you want to "includeh" isn't found in the Anvil Low Level Defs. folder, then you'll get an error.

You may want to move some of your globincs into the _srcincs area if the file in the globincs area really isn't necessary for every source file in your project. This will speed up Build times.

Q: When I create a new project, I get just the project file. When I check later, there's a folder next to project file called something like "Anvil Project Bits". Where did this come from? And when?

A: Build needs somewhere to store intermediate files. This folder contains all the binary files generated by your project. Normally it is Build that will create this folder, however, there are occasions when Anvil may need to look inside (for project management functions) and if not found, Anvil will create it.

The only time you may be interested in the files in this folder is if you need to set the link order of your binary files. In this case you add all the files in the Phase 3 Output Area to your project, then drag them about. See the "Anvil Linkers" documentation (LSA0005) for complete details of this procedure.

NOTE: Do not have two projects in the same folder at the same level - your binary files will become mixed up which may lead to problems (Anvil 3 will throw an error if you try to create a project in a folder where a project already exists).

Q: Can files in a project come from anywhere? Can I put my libraries on another drive? Can I put my project headers on a networked Mac?

A: Yes, but watch out for removable media. Example: You have one floppy drive. You add a file from a floppy. You remove the floppy, insert another and add a file from that floppy. Hopefully, you can see that building such a project would keep you extremely fit :)

Do NOT move the folders named "Anvil Low Level defs" or "Lightsoft Documentation".

Q: What happens if I delete a file that's part of my project?

A: Well, first Anvil will search the connected universe looking for it. By this we mean it will search all local and networked drives. If not found, you'll be presented with a file selector, and asked if you want to look for it. You may now select an alternative file, or cancel.

If you cancel Anvil will ask you if you want to remove the file from the project, or not open the project whilst you go search some back-up media.

Q: How do a rename file that is part of a project.

A: Close the project, use the Finder to rename the file then reopen the project.

Q: How do I rename my target?

A: Either edit the file name via the Edit Project dialog, or simply change the name in the Finder.

Q: Why can't I nest user folder?

A: Just the way it is right now :)

Q: How do I add a project to a project?
A: Just add it. Anvil will place it in the highest level language area, so that's either VHL, HL or SRC depending on your project.

Q: To remove a project from a project, I just drag it over the trash icon in the project window?
A: Yup.

Q: So, how about setting the order sub-projects are built?
A: Just drag them about in the project window - they'll be processed in the order you put them. From the top of the project window downwards.

Q: What happens if my project file goes corrupt?
A: Use a backup. You did make one didn't you? If not, you have no option but to make a new project. In our experience, a corrupt project file is rare (since rev. 3 of the project file we have not had a single corruption. The current revision is 5), but nonetheless we do strongly urge you to make backups regularly as well as performing other crucial functions such as sleep, eat and get the occasional whiff of fresh air. You need to do these things.

Q: Just how, exactly do I quickly add all the files in a folder to my project?
A: If Navigation Services is available, select all the files by shift clicking on them in the Nav Services file selector. If Nav services is not available, i.e. you are presented with the older Standard File dialog box then:
Click the "add file" icon in the project window. Find a file in the folder you want to add all the files from. Select the file. Click the "add all user files" checkbox. Now click the "Add this file" button. All files in the folder will be checked and added if possible.

Q: When I move a source file, Anvil tells me a binary related to the file is included in the project and do I want to delete it. Huh?
A: Binary files, or object files, are derived from the source file. When you move or remove a source file Anvil will check whether you want to remove the binary file (This only happens if the binary file has been manually added to the project, Anvil can automatically manage binary files that haven't been manually added).

Q: When I drag a file over the trash icon in the project window, it flashes - why?
A: It does that, just as a warning. Besides I have to have _some_ fun writing this thing :)

Q: Sending projects to other people

If you have files all over the place, move all files to within the folder of the project file (possibly within folders)and open the project. This will cause Anvil to update the project file with the new locations of all files relative to the project file.

Now you can stuff up the project folder and send it.

If you do not move your files into one folder, but send them as seperate attachments, then the person receiving the project has to figure out where to put everything, and also suffers a delay when opening the project for the first time whilst Anvil searches for all the files - this is not polite.

Anvil

Q: I have an original 68000 based Mac. Will Anvil run on it?
A: No. Anvil needs at least an 020 processor but we do not recommend running Anvil 3 or later on 68K Macs.

Q: What happens if I close the "log" window?
It'll be opened again when needed.

Q: Can I copy text out of the log window?
A: Yes. The log acts a read only memory resident file as far as Anvil is concerned.

Q: How big is the Log buffer?
A: About 50K.

Q: When I get an error pop up in the error window it'd be nice to be able to edit it before the build finishes. Can I do this?
A: Yes. Anvil can build and edit at the same time. Switch off "Build Hogs CPU" in the general preferences dialog. Anvil can now work whilst building rather than just freezing but of course Build will take slightly longer.

Q: Can I use another editor with Anvil?
A: Yes, as long as you remember to save all changed files before building. Put an Alias to your editor in the Anvil Tools folder. Call the alias "Editor" without the quotes. See LSA0100 for details.

Q: When I print my tabs are not aligned correctly? What can I do?
A: Print with the chroma coder on (Anvil general prefs). The tabs should then line up OK.

Q: I had a nasty crash after a long period of work. When I "rebooted" Anvil there seemed to be quite a long delay before it came up. What happened?
Q: After a long period of work, Anvil seems to take a while to shutdown. Why?
A: Anvil creates temporary files for it's internal use (undo buffers/context info etc.). When Anvil shuts down, it deletes these files. If, when Anvil is booting it finds these files, again it deletes them. This was the cause of your delay. There shouldn't be much delay if you have an Async SCSI manager as the calls are made asynchronously.

Q: What do the numbers in the Undo menu item mean?
A: This is the current undo stage. When it gets down to "1" that's the last undo operation possible on the file.

Q: I found a file called "User Edit Log" in my System:Preferences:Lightsoft 3.xx folder. What is it?

A: This file may be useful to you if there is more than one person working on a project. It logs Anvil sessions. It is a standard Text file, a typical entry might look like:

●●●●●●●●●●●●

Anvil booted at 1:05:05 on 3rd August 1999. User is Stu.
File "OSA.h" saved at 1:06:01 on 3rd Aug 1999 by Stu.
File "OSA.h" saved at 1:06:08 on 3rd Aug 1999 by Stu.
Anvil shut-down at 1:13:19 on 3rd August 1999.

You can stop and enable the user edit log writes from Anvil's General Prefs.

This file can grow very large over a period of time, so you may want to occasionally delete it (if in use).

Q: After I've been using Anvil for a while, I notice the available space on my drive is decreasing! Why?

A: Anvil saves temporary files in the Lightsoft folder whilst working. These are all deleted when Anvil quits (or starts up, just in case a crash means you have to restart your machine and Anvil doesn't get to tidy up before quitting), so you do need free space on your System drive (and it MUST be writable - no running your System off a CD).

Q: I tried to UNDO and got an error - why?

A: Either Anvil could not save undo information (see the question above) and hence couldn't get it back or there was not enough free memory to perform the undo.

Q: I'm typing away in Anvil when all of a sudden I get a dialog saying "Anvil Filing System error". Why?

A: Anvil tried to write to disk and failed. This can happen when typing under two circumstances:
1. Autosave - check your disk with Disk First Aid or a third party disk testing package.
2. Undo.
In the case of Undo, if you have booted your Mac off of a CD, you will get a lot of errors, as Anvil keeps trying to write to the Lightsoft folder in the Preferences folder.

Q: Is Anvil happy on multiple monitors?

A: Yes. If you switch your monitors around, Anvil will move windows to fit when Anvil is rebooted.

Q: Is Anvil compatible with Sony's CDRFS filing system?

A: Yes.

Q: OK, I'm on MacOS8.x and I've got Nav Services installed. When I open something with Anvil ,the only kinds available in the Nav Services open dialog are "All Anvil Documents" and "All documents". It'd be nice to be able to filter by specific Anvil file types - for example just source files. Can I do this?
A: Yes, make sure File Exchange is enabled from your Extensions Manager and reboot. Your desktops will be rebuilt and then you'll have loads of filter options in the open dialog.

Q: How do I add my own definitions to the syntax colouring. For example I wish to add my own type definitions and have them coloured as per the normal type defs?
A: Open the relevant Language Definition File found in the Language Definitions folder with Anvil. Add your keywords to the LDF and save it. Now reboot Anvil for the changes to take place. Speed isn't much of an issue even with very large LDF's as Anvil compiles each LDF into a structure suitable for fast searching as it boots up. See LSA0110 for complete details.

High Level Languages - C, C++

Q: Can I mix Fantasm and C files in the same project?
A: No. Have separate Anvil projects, one for your high level project and one for the assm.
Load the assm from the C with GetDiskFragment or similar call.

Q: I can't create new C or C++ projects. Anvil complains I am missing a tool?
A: Check you have the MrC AIT (Anvil Interface Tool) and MrCpp AIT's installed in your
Anvil Tools folder.

**Q: Anvil automatically launches ToolServer when Anvil is booted. I don't want this,
can I stop it and if not is it OK to quit ToolServer?**
A: There is no way of stopping Anvil launching ToolServer. It is OK to quit ToolServer after
Anvil has launched it; but be aware that if you try to build any C or C++ projects the Build
will fail as Anvil expects ToolServer to continue running once it has been launched. Quit and
relaunch Anvil to cure the problem.

**Q: Sometimes when I open a C project and it builds OK I can't use the Run With
Debugger command. What's wrong?**
A: This is a bug in Anvil version 3.00. The work around is to quit and reboot Anvil ensuring
you have enabled auto opening of the last project in Anvils General Preferences.

Fantasm/Assembly language

Q: In 68K assembly language, how do I find out the size of my data?
A: Officially, you can't. However, if you have all your data in separate files which are included into the required source files, you would normally have these files in the "SrcIncs" area. However, if you move them into the _Src area, they will still be included fine, but will also be sent to the assembler! Now assuming they will assemble fine, you will then find the data size reported in the project window. You will of course have an object file that is completely unused, but you will know the exact data size. This can be very handy.

Q: I'm programming in PPC assembly language. When in my low level debugger (Macsbug for example) it would be nice to see some labels. Can I do this?
A: Yes, go to LinkPPC's preferences and select "Export all global code labels". These labels will now be displayed when debugging as PPC C.F.M. labels.

Q: When I do this, and then use MacsBug's "D" command, I don't see a list of my labels. I either see junk or nothing?
A: Switch off V.M. With V.M. on, nearly all of the fragment can be spooled out to disk when in Macsbug and hence it may not be able scan your Table of Contents.

Q: Can I export PPC code labels that are not global?
A: No.

Q: I'm building a PPC shared library. How do I export labels?
A: You can export global code labels by creating a file called "project_exports" and adding it to your project. The code labels you specify in this file will be exported. See "LSA0005" for full details. You can't export data labels.
Note that a shared library should have it's stack size set to zero and the cfrg ID must also be zero - same as for an Application.

Q: My shared library simply isn't being recognized! Help!
A: See "Creating a PPC shared library - hints and tips" in the chapter "Advanced Anvil" in LSA0100.

Q: How do I weak link to a shared library?
A: Make sure you have LinkPPC PEF selected as the linker for your project. Next add the shared library you wish to weak link to to your project. Next CTRL click on the shared library in the project window and select "weak link". See the section on Linkers for more detail.

Q: "What books would you recommend for 680x0 programming?"
Motorola Programmers Reference Manual - available from Motorola, part number M68000PM/AD.

Programming the 68000 by Steve Williams and published by Sybex. ISBN0-89588-133-0.

Inside Mac for the relevant data structures, however you can always contact us if you have problems with a Mac trap, or any related data structures.

Any ST or Amiga machine code books, of which there are plenty.

Q: And PowerPC?
Pop into any computer book shop and take your pick. Fantasm's reference is "The PowerPC architecture" by I.B.M. along with the Motorola 60x user and programmers guides (available for free from Motorola).

Q: Is Fantasm compatible with other assemblers?
Fantasm is not specifically modeled on any one previous assembler, but it is compatible with source code from Devpac™ or Genam™ by Hisoft, which are assemblers for the ST and Amiga respectively. Other than that, it attempts to understand most other assembler syntaxes, and has a few unique directive names of it's own - i.e. Globoff (what were we thinking of?).

Q: You've used the RS directive to define BSS offsets. Does this mean I can't define my own RS blocks in PPC?
Not at all. Of course you can use RS as normal. See the RS directive for PPC section of LSA0040 for more details.

Q: Data definitions...
Data section labels are defined thus:
Follow the label by a data definition directive such as dc.w
label: data definition directive - e.g. dc.b, ds.w,cstring etc
OR
follow the label with an explicit "data" directive:
label: data
        dc.x
        ds.x etc
This is the neatest way.

If you make a mistake the code will assemble fine, but your data reference will be rubbish (as it will be a code section label) and you will probably crash.
For more information, see the PowerPC specific chapter in LSA0040.

2. How to use the BSS section in Fantasm.
a). Create a new file and call it my_bss.def or whatever you want.

b). Add the file the _globincs area of your project.
This file will now be included in every file that is assembled.

c). In the my_bss.def file, define your global variables with rs directives - e.g.
my_scratch1: rs.w   1
my_x: rs.b   1
my_y: rs.b   1
etc

d). In your source code you can now refer to these variables off of the BSS pointer. The start_up macro defines r30 as being the bss pointer. So, in your code you can use global variables thus:

        lwz   r11,my_x(r30)

etc.

It's best to requ r30 to BSS so the code reads:

        lwz   r11,my_x(`bss)

3. DO NOT put anything but RS directives in your BSS definition file, else you'll get all sorts of weird double defined errors.

Again, see the PowerPC specific chapter in LSA0040.

Linkers

Q: How do I set the Link order of my project?
A: Build the project.
Now, add all the binary files to the project: Go to the Anvil Bits:Phase 3 output folder and select a file. Check the "Add all user files" checkbox and then on "Add this file" (or if using Nav Services select all the binary files you wish to add). All the binaries will be added to the binaries area of your project window. Now drag them about to set the link order. You do not necessarily need to add all the object files. Just the ones you need to specify the order for. See LSA0005.

Q: How do I make a library?
A: See LSA0008

Q: Are you ever going to update the Lightsoft Librarian program. It's getting a bit old in the tooth now and the interface sucks?
A: Yes. It will be integrated into Anvil as time permits.

Q: How to I weak link to a shared library?
A: For Fantasm, make sure you have LinkPPC PEF selected as the linker for your project. Next add the shared library you wish to weak link to to your project. Next CTRL click on the shared library in the project window and select "weak link".

When a shared library is weak linked, you must check any imports from said library, for example:

```
        lwz     r3,xyz(rtoc)
        cmpwi           r3,0
        beq     cant_call
        Xcall  xyz
cant_call:
```

Alternatively use a global variable at program init time:

```
        lwz     r3,xyz(rtoc)
        cmpwi           r3,0
        li      r4,0
        stw     r4,lib_available?(rtoc)
        li      r4,1
        beq     no_go
        stw     r4,lib_available?(rtoc)
no_go:
```

Memory and speed

Q: Memory is too tight to mention. What's the absolute minimum I can get away with?
A: Officially about 6 megabytes for Anvil 3. How do we arrive at that figure? Well, we test build a large project whilst gradually reducing Anvil's partition size. When Build gives up, we take that partition size, and then like all good designers, double it.

So, unofficially, the bare minimum is about 3 megabytes. The figures are available in *LSA0005 - Link PPC memory requirements and performance.*

You need to give Anvil 10 megabytes to use AnvMOD and maintain comfortable Build speed, which is reduced at low memory extremes. Without AnvMOD, 7 to 10 megs should be fine for general usage.

Q: Half way through Building my project, there's a five second delay and my hard drive gets really agitated. What gives?
A: Turn off virtual memory.

Q: I read in the programmers docs I can set my tools to boot up with Anvil, rather than as needed. How?
A: Use a resource editor to toggle the boot flag in the TLcl resource of the tool you wish to load as Anvil is loading.

Q: Does Virtual Memory (V.M.) affect Anvil to any great extent?
A: Not in our experience (this means "your mileage may vary").

Q: As I was building my project I was watching the "Free Mem:" display in the tool bar and saw that each time it went to compile a file the free memory went from 4MB to 230K. I thought that was a lot to be using if it is a big project...
A: Some Anvil tools grab a block of memory based on a percentage of available memory. Fantasm for example does this. This way if a tool can't translate a file or do it's work because of lack of memory, all you have to do is increase Anvil's partition and the tool will then get more memory. So even if you give Anvil 100 Megabytes, you'll still see the free memory drop pretty low at some points. See LSA0005 - Anvil Linkers for some info on how LinkPPC uses memory

Q: I shared one of my disks over a network, and now Builds are taking ages! Why?
A: File sharing is a very processor intensive task. We found that one of our 040 based PowerBooks took 65 seconds to Build a project whilst it was sharing one of it's local disks, compared to only 2.5 seconds when it wasn't!
Mapping to a shared disk on the network doesn't seem to affect speed quite as much. When we had somebody elses shared disk on the PowerBook's desktop the same project took about 5 seconds to build.

Q: Fantasm gave me an "Out of global (System) memory error" - is this a bug?
A: Upgrade to Fantasm 6. Fantasm 6 doesn't use any System memory, previous versions have.

Music

Q: When does AnvMOD change the type and creator of a file?
A: When you open it manually with AnvMOD's file selector <u>if</u> the file has no type or creator info.

Q: AnvMOD beeped at me. What does this mean?
A: AnvMOD doesn't have enough memory to load a file.

Q: AnvMOD beeped at me twice!
A: AnvMOD tried to load a file it has no import filter for.

Q: How do I play MP3 files?
A: Use AnvAMP available from Cache-Computing. It can be found in your "Third party" folder.

Q: Anvil's CD controller seems to be updating too often. It's slowing my Mac down / causing audio interference because my drive cables are close to my audio cables / driving me nuts. How do I slow it down?
A: Select "Set task priorities" from the edit menu, and increase the value for "CD Display". This will reduce the rate the CD display is updated.

Q: Can you recommend a decent set of speakers at a realistic price?
A: Yes, Missions. Forget anything else and get these. The 76x series are priced at under 200 ukp and beat anything in the sub 500ukp bracket.

Q: Cool working music?
A: Anything by Bjorn Lynne. http://www.digitarx.com/lynne

Q: I have two CD players connected to my Mac, but I can only control one with Anvil!
A: Correct, Anvil's CD controller will only control one CD player (normally the one with the highest scuzzy address) and currently can't select a SCSI address to control.

Misc.

Q: What the &*%$ is LXT?
A: LXT stands for Lightsoft Cross Translation. It is a method of auto translating 68K assembly language source code to PowerPC executable. LXT runs on Fantasm 5.1 and greater and is included with Fantasm. See the LXT manual (LSA0500) for the gory details. We use LXT to generate a lot of our stuff - for example Fantasm itself is written in LXT to generate a fat tool.

Q: Could you recommend a good coffee?
A: Yes, "Roberts" from Ireland.

Q: How's Fluffy?
She's fine, although we do wish she'd stop pulling socks out of the drawers.

Q: What is LIDE?
Lightsoft Integrated Development Environment. Just a term for the whole lot rather than Fantasm which is the assembler, Anvil which is the project manager etc.