



Arm[®] Compiler for Embedded

Version 6.21

Errors and Warnings Reference Guide

Non-Confidential

Copyright © 2014–2023 Arm Limited (or its affiliates).
All rights reserved.

Issue 00

100074_6.21_00_en



Arm® Compiler for Embedded Errors and Warnings Reference Guide

Copyright © 2014–2023 Arm Limited (or its affiliates). All rights reserved.

Release information

Document history

Issue	Date	Confidentiality	Change
A	14 March 2014	Non-Confidential	Arm Compiler v6.00 Release.
B	15 December 2014	Non-Confidential	Arm Compiler v6.01 Release.
C	30 June 2015	Non-Confidential	Arm Compiler v6.02 Release.
D	18 November 2015	Non-Confidential	Arm Compiler v6.3 Release.
E	24 February 2016	Non-Confidential	Arm Compiler v6.4 Release.
F	29 June 2016	Non-Confidential	Arm Compiler v6.5 Release.
G	4 November 2016	Non-Confidential	Arm Compiler v6.6 Release.
0607-00	5 April 2017	Non-Confidential	Arm Compiler v6.7 Release.
0608-00	30 July 2017	Non-Confidential	Arm Compiler v6.8 Release.
0609-00	25 October 2017	Non-Confidential	Arm Compiler v6.9 Release.
0610-00	14 March 2018	Non-Confidential	Arm Compiler v6.10 Release.
0611-00	25 October 2018	Non-Confidential	Arm Compiler v6.11 Release.
0612-00	27 February 2019	Non-Confidential	Arm Compiler v6.12 Release.

Issue	Date	Confidentiality	Change
0613-00	9 October 2019	Non-Confidential	Arm Compiler v6.13 Release.
0614-00	26 February 2020	Non-Confidential	Arm Compiler v6.14 Release.
0615-00	7 October 2020	Non-Confidential	Arm Compiler v6.15 Release.
0615-01	14 December 2020	Non-Confidential	Documentation update 1 for Arm Compiler v6.15 Release.
0616-00	3 March 2021	Non-Confidential	Arm Compiler v6.16 Release.
0616-01	12 March 2021	Non-Confidential	Documentation update 1 for Arm Compiler v6.16 Release.
0617-00	20 October 2021	Non-Confidential	Arm Compiler for Embedded v6.17 Release.
0618-00	22 March 2022	Non-Confidential	Arm Compiler for Embedded v6.18 Release.
0619-00	12 October 2022	Non-Confidential	Arm Compiler for Embedded v6.19 Release.
0620-00	15 March 2023	Non-Confidential	Arm Compiler for Embedded v6.20 Release.
0621-00	11 October 2023	Non-Confidential	Arm Compiler for Embedded v6.21 Release.

Proprietary Notice

This document is protected by copyright and other related rights and the practice or implementation of the information contained in this document may be protected by one or more patents or pending patent applications. No part of this document may be reproduced in any form by any means without the express prior written permission of Arm. No license, express or implied, by estoppel or otherwise to any intellectual property rights is granted by this document unless specifically stated.

Your access to the information in this document is conditional upon your acceptance that you will not use or permit others to use the information for the purposes of determining whether implementations infringe any third party patents.

THIS DOCUMENT IS PROVIDED “AS IS”. ARM PROVIDES NO REPRESENTATIONS AND NO WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING, WITHOUT LIMITATION,

THE IMPLIED WARRANTIES OF MERCHANTABILITY, SATISFACTORY QUALITY, NON-INFRINGEMENT OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE DOCUMENT. For the avoidance of doubt, Arm makes no representation with respect to, and has undertaken no analysis to identify or understand the scope and content of, patents, copyrights, trade secrets, or other rights.

This document may include technical inaccuracies or typographical errors.

TO THE EXTENT NOT PROHIBITED BY LAW, IN NO EVENT WILL ARM BE LIABLE FOR ANY DAMAGES, INCLUDING WITHOUT LIMITATION ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES, HOWEVER CAUSED AND REGARDLESS OF THE THEORY OF LIABILITY, ARISING OUT OF ANY USE OF THIS DOCUMENT, EVEN IF ARM HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

This document consists solely of commercial items. You shall be responsible for ensuring that any use, duplication or disclosure of this document complies fully with any relevant export laws and regulations to assure that this document or any portion thereof is not exported, directly or indirectly, in violation of such export laws. Use of the word “partner” in reference to Arm’s customers is not intended to create or refer to any partnership relationship with any other company. Arm may make changes to this document at any time and without notice.

This document may be translated into other languages for convenience, and you agree that if there is any conflict between the English version of this document and any translation, the terms of the English version of the Agreement shall prevail.

The Arm corporate logo and words marked with ® or ™ are registered trademarks or trademarks of Arm Limited (or its affiliates) in the US and/or elsewhere. All rights reserved. Other brands and names mentioned in this document may be the trademarks of their respective owners. Please follow Arm’s trademark usage guidelines at <https://www.arm.com/company/policies/trademarks>.

Copyright © 2014–2023 Arm Limited (or its affiliates). All rights reserved.

Arm Limited. Company 02557590 registered in England.

110 Fulbourn Road, Cambridge, England CB1 9NJ.

(LES-PRE-20349|version 21.0)

Confidentiality Status

This document is Non-Confidential. The right to use, copy and disclose this document may be subject to license restrictions in accordance with the terms of the agreement entered into by Arm and the party that Arm delivered this document to.

Unrestricted Access is an Arm internal classification.

Product Status

The information in this document is Final, that is for a developed product.

Feedback

Arm welcomes feedback on this product and its documentation. To provide feedback on the product, create a ticket on <https://support.developer.arm.com>

To provide feedback on the document, fill the following survey: <https://developer.arm.com/documentation-feedback-survey>.

Inclusive language commitment

Arm values inclusive communities. Arm recognizes that we and our industry have used language that can be offensive. Arm strives to lead the industry and create change.

We believe that this document contains no offensive language. To report offensive language in this document, email terms@arm.com.

Contents

List of Tables.....	7
1. Introduction.....	8
1.1 Conventions.....	8
1.2 Useful resources.....	9
1.3 Other information.....	9
2. Licensing Errors and Warnings.....	10
2.1 List of the licensing error and warning messages.....	10
3. Legacy Assembler Errors and Warnings.....	13
3.1 List of the legacy armasm error and warning messages.....	13
4. Linker Errors and Warnings.....	54
4.1 Suppressing armlink error and warning messages.....	54
4.2 List of the armlink error and warning messages.....	54
5. ELF Image Converter Errors and Warnings.....	107
5.1 List of the fromelf error and warning messages.....	107
6. Librarian Errors and Warnings.....	110
6.1 List of the armar error and warning messages.....	110
7. Other Errors and Warnings.....	111
7.1 Internal faults and other unexpected failures.....	111
7.2 List of other error and warning messages.....	112
A. Arm Compiler for Embedded Errors and Warnings Reference Guide Changes.....	113
A.1 Changes for the Arm Compiler for Embedded Errors and Warnings Reference Guide.....	113

List of Tables

Table A-1: Changes between 6.21 and 6.20..... 113

Table A-2: Changes between 6.20 and 6.19..... 113

Table A-3: Changes between 6.19 and 6.18..... 113

Table A-4: Changes between 6.18 and 6.17..... 114

Table A-5: Changes between 6.17 and 6.16..... 114

Table A-6: Changes between 6.16 and 6.15..... 114

Table A-7: Changes between 6.15 and 6.14..... 114

1. Introduction

The Arm® Compiler for Embedded Errors and Warnings Reference Guide provides lists of the errors and warnings that each of the compilation tools can generate. It does not include errors and warnings produced by `armclang`.

1.1 Conventions

The following subsections describe conventions used in Arm documents.




Glossary




The Arm Glossary is a list of terms used in Arm documentation, together with definitions for those terms. The Arm Glossary does not contain terms that are industry standard unless the Arm meaning differs from the generally accepted meaning.

See the Arm Glossary for more information: developer.arm.com/glossary.

Typographic conventions

Arm documentation uses typographical conventions to convey specific meaning.

Convention	Use
<i>italic</i>	Citations.
bold	Interface elements, such as menu names. Terms in descriptive lists, where appropriate.
monospace	Text that you can enter at the keyboard, such as commands, file and program names, and source code.
monospace <u>underline</u>	A permitted abbreviation for a command or option. You can enter the underlined text instead of the full command or option name.
<and>	Encloses replaceable terms for assembler syntax where they appear in code or code fragments. For example: <pre>MRC p15, 0, <Rd>, <CRn>, <CRm>, <Opcode_2></pre>
SMALL CAPITALS	Terms that have specific technical meanings as defined in the <i>Arm® Glossary</i> . For example, IMPLEMENTATION DEFINED , IMPLEMENTATION SPECIFIC , UNKNOWN , and UNPREDICTABLE .
 Caution	Recommendations. Not following these recommendations might lead to system failure or damage.
 Warning	Requirements for the system. Not following these requirements might result in system failure or damage.
 Danger	Requirements for the system. Not following these requirements will result in system failure or damage.

Convention	Use
 Note	An important piece of information that needs your attention.
 Tip	A useful tip that might make it easier, better or faster to perform a task.
 Remember	A reminder of something important that relates to the information you are reading.

1.2 Useful resources

This document contains information that is specific to this product. See the following resources for other useful information.

Access to Arm documents depends on their confidentiality:

- Non-Confidential documents are available at developer.arm.com/documentation. Each document link in the following tables goes to the online version of the document.
- Confidential documents are available to licensees only through the product package.

Arm product resources	Document ID	Confidentiality
Arm Compiler for Embedded User Guide	100748	Non-Confidential
Arm Compiler for Embedded Reference Guide	101754	Non-Confidential
Arm Compiler for Embedded Migration and Compatibility Guide	100068	Non-Confidential
Arm Compiler for Embedded Arm C and C++ Libraries and Floating-Point Support User Guide	100073	Non-Confidential
Arm Support	-	-

1.3 Other information

See the Arm website for other relevant information.

- [Arm® Developer](#).
- [Arm® Documentation](#).
- [Technical Support](#).
- [Arm® Glossary](#).

2. Licensing Errors and Warnings

Describes license-related error and warning messages that might be displayed by the legacy assembler, the linker, or the ELF image converter.

2.1 List of the licensing error and warning messages

A list of the error and warning messages that are caused by license-related issues.

The license error codes have three components; a prefix letter, an error number, and a suffix letter:

`<L><NNNN><D>`

The prefix letter `<L>` indicates the tool that generated the error:

- For the legacy assembler, `armasm`, the error code starts with `A`.
- For the linker, `armlink`, the error code starts with `L`.
- For the ELF image converter, `fromelf`, the error code starts with `Q`.

The error numbers, `<NNNN>`, are identical for each tool.

The suffix letter, `<D>`, indicates the severity of the error:

- `W` means warning.
- `E` means error.
- `F` means fatal.



For the compiler, `armclang`, error messages are still generated, but with no error code.

[A9503E|L9503E|Q9503E]: Keys for <targetName> back-end could not be found in product definition.

[A9506E|L9506E|Q9506E]: Message received by <targetName> back-end is not valid.

[A9507E|L9507E|Q9507E]: <targetName> back-end returned status=<status> with invalid version number (<versionNumberReceived>).

[A9511E|L9511E|Q9511E]: Unable to determine the current toolkit. Ensure that `ARM_TOOL_VARIANT` is set correctly.

[A9515E|L9515E|Q9515E]: There is at least one feature `CheckedOut` for module <moduleName>. `Unregister` is not allowed until you `CheckedIn` all the features.

[A9517E|L9517E|Q9517E]: Parsing error: <errorMessage> (<fileName>:<lineNumber>).

[A9518W|L9518W|Q9518W]: Parsing warning: <warningMessage> (<fileName>:<lineNumber>).

[A9519E|L9519E|Q9519E]: Your installation appears to be corrupt.

[A9520E|L9520E|Q9520E]: Product definition string is empty. Set command will be ignored.

[A9521E|L9521E|Q9521E]: File I/O error when determining the current toolkit. Ensure that ARM_TOOL_VARIANT is set correctly, and you have read permissions for the complete toolchain installation.

[A9526W|L9526W|Q9526W]: Failed to write to license cache file <fileName>. Error <errorNumber>: <errorString>.

[A9527W|L9527W|Q9527W]: Failed to calculate license cache file contents <fileName>.

[A9528W|L9528W|Q9528W]: Failed to close license cache file <fileName>. Error <errorNumber>: <errorString>.

[A9529W|L9529W|Q9529W]: Failed to move or copy license cache file from <source_fileName> to <destination_fileName>. Error <errorNumber>: <errorString>.

[A9530W|L9530W|Q9530W]: Failed to remove license cache file <fileName>. Error <errorNumber>: <errorString>.

[A9531W|L9531W|Q9531W]: Failed to read license cache file <fileName>. Error <errorNumber>: <errorString>.

[A9533W|L9533W|Q9533W]: License cache file invalid <fileName>.

[A9534E|L9534E|Q9534E]: Failed to create hash of cache file.

[A9535F|L9535F|Q9535F]: Dynamic library: error <error> while finding address of function <function> in library <dllPath>.

[A9536F|L9536F|Q9536F]: Dynamic library: error <error> while loading library <dllPath>.

[A9539F|L9539F|Q9539F]: Dynamic library: failed to create checking module in library <dllPath>.

[A9540F|L9540F|Q9540F]: Could not call DoCommand of external library, as the pointer to it is NULL.

[A9542F|L9542F|Q9542F]: Could not allocate memory for encryption key.

[A9544E|L9544E|Q9544E]: Cannot check in feature <featureName> with version <featureVersion> because it has not been checked out.

[A9545E|L9545E|Q9545E]: Info key <keyName> could not be found in product definition <mappingOrigin>.

[A9546E|L9546E|Q9546E]: Your license has expired (expiry date: <expiryDate>).

[A9547E|L9547E|Q9547E]: No license checking back-end registered with id <id> for feature <featureName>.

[A9549E|L9549E|Q9549E]: The feature <featureName> is not available with your current toolkit and license. Ensure that ARM_TOOL_VARIANT is set correctly for your toolkit.

[A9550E|L9550E|Q9550E]: The feature <featureName> is not available with your current toolkit and license. Ensure that ARM_TOOL_VARIANT is set correctly for your toolkit.

[A9552E|L9552E|Q9552E]: The feature <featureName> is not available with your current toolkit and license. Ensure that ARM_TOOL_VARIANT is set correctly for your toolkit.

[A9554E|L9554E|Q9554E]: Invalid data returned from <moduleId> back-end for feature <featureName>.

[A9555E|L9555E|Q9555E]: Unable to checkout a license.

See [Common licensing errors](#) for more specific error messages and more information for each Flex error code.

[A9558E|L9558E|Q9558E]: System clock tampering detected. License checkout will fail.

[A9559E|L9559E|Q9559E]: License information retrieval for feature <featureName> with version <version> was cancelled because no back-end is associated with it.

[A9561E|L9561E|Q9561E]: No generation date specified, but relative expiry dates present.

[A9580E|L9580E|Q9580E]: <target> is not available with your current toolkit and license. Ensure that ARM_TOOL_VARIANT is set correctly for your toolkit.

3. Legacy Assembler Errors and Warnings

Describes the error and warning messages for the legacy assembler, `armasm`.

The `armasm` legacy assembler is deprecated, and it has not been updated since Arm® Compiler 6.10. Also, `armasm` does not support:



Note

- Armv8.4-A or later architectures.
- Certain backported options in Armv8.2-A and Armv8.3-A.
- Assembling `svE` instructions.
- Armv8.1-M or later architectures, including MVE.
- All versions of the Armv8-R architecture.

As a reminder, `armasm` always reports the deprecation warning `A1950W`. To suppress this message, specify the `--diag_suppress=1950` option.

3.1 List of the legacy `armasm` error and warning messages

A list of the error and warning messages that the legacy assembler, `armasm`, produces.

The `armasm` legacy assembler is deprecated, and it has not been updated since Arm® Compiler 6.10. Also, `armasm` does not support:



Note

- Armv8.4-A or later architectures.
- Certain backported options in Armv8.2-A and Armv8.3-A.
- Assembling `svE` instructions.
- Armv8.1-M or later architectures, including MVE.
- All versions of the Armv8-R architecture.

As a reminder, `armasm` always reports the deprecation warning `A1950W`. To suppress this message, specify the `--diag_suppress=1950` option.



Note

License-related error messages can be found in the [List of the licensing error and warning messages](#) section.

A1017E: :INDEX: cannot be used on a pc-relative expression

The :INDEX: expression operator has been applied to a PC-relative expression, most likely a program label. :INDEX: returns the offset from the base register in a register-relative expression.

If you require the offset of a label called <label> within an area called <areaname>, use <label> - <areaname>.

See [Unary operators](#) in the legacy `armasm` documentation.

A1020E: Bad predefine: <directive>

The operand to the `--predefine` or `--pd` command-line option was not recognized. The directive must be enclosed in quotes if it contains spaces, for example on Windows:

```
--predefine "versionnum SETA 5"
```

If the `SETS` directive is used, the argument to the directive must also be enclosed in quotes, which might require escaping, depending on the operating system and shell. For example:

```
--predefine "versionstr SETS \"5A\""
```

A1021U: No input file

No input file was specified on the command line. This might be because there was no terminating quote on a quoted argument.

A1023E: File "<filename>" could not be opened: <reason>

A1024E: File "<filename>" could not all be loaded: <reason>

A1042E: Unrecognized APCS qualifier '<qualifier>'

There is an error in the argument given to the `--apcs` command-line option. Check the spelling of <qualifier>.

A1051E: Cannot open --depend file '<filename>': <reason>

A1055E: Cannot open --errors file '<filename>': <reason>

A1056E: Target cpu '<cpu>' not recognized

The name given in the `--cpu` command-line option is not a recognized processor name. Check the spelling of the argument.

Use `--cpu=list` to list the supported processors and architectures.

A1067E: Output file specified as '<filename1>', but it has already been specified as '<filename2>'

More than one output file, `-o filename`, has been specified on the command line. Misspelling a command-line option can cause this.

A1071E: Cannot open listing file '<filename>': <reason>

The file given in the `--list <filename>` command-line option could not be opened. This could be for any of the following reasons:

- The given name is not valid.
- There is no space.
- A read-only file with the same name already exists.
- The file is in use by another process.

Check you have specified the correct path for the file.

A1072E: The specified listing file '<filename>' must not be a .s or .o file

The filename argument to the `--list` command-line option has an extension that indicates it is a source or object file. This might be because the filename argument was accidentally omitted from the command line. Check that the correct argument is given to the `--list` command-line option.

A1073E: The specified output file '<filename>' must not be a source file

The object file specified on the command line has a filename extension that indicates it is a source file. This might be because the object filename was accidentally omitted from the command line.

A1074E: The specified depend file '<filename>' must not be a source file

The filename argument to the `--depend` command-line option has an extension that indicates it is a source (.s) file. This might be because the filename argument was accidentally omitted from the command line. Check that the correct arguments are given.

A1075E: The specified errors file '<filename>' must not be a source file

The filename argument to the `--errors` command-line option has an extension that indicates it is a source (.s) file. This might be because the filename argument was accidentally omitted from the command line. Check that the correct arguments are given.

A1085W: Forced user-mode LDM/STM must not be followed by use of banked R8-R14

The Arm architecture does not permit you to access banked registers in the instruction immediately following a User registers LDM or STM. Adding a `NOP` immediately after the LDM or STM is one way to avoid this.

For example:

```
stmib sp, <r0-r14>^ ; Return a pointer to the frame in a1.
mov r0, sp
```

change to:

```
stmib sp, {r0-r14}^ ; Return a pointer to the frame in a1.
nop
mov r0, sp
```

A1088W: Faking declaration of area AREA |\$\$\$\$\$|

This warning is reported when no `AREA` directive is specified. See also message number A1105E.

A1099E: Structure stack overflow max stack size <max>

A1100E: Structure stack underflow

A1105E: Area directive missing

This error is reported when no `AREA` directive is specified. See also message number A1088W.

A1106E: Missing comma

A1107E: Bad symbol type, expect label

A1108E: Multiply defined symbol '<name>'

A1109E: Bad expression type

A1110E: Expected constant expression

A constant expression was expected after, for example, `SETA`.

See [Numeric expressions](#) in the legacy `armasm` documentation.

A1111E: Expected constant or address expression

A1112E: Expected address expression

A1113E: Expected string expression

A string expression was expected after, for example, `SETS`.

See [String expressions](#) in the legacy `armasm` documentation.

A1114E: Expected register relative expression

A1116E: String operands can only be specified for DCB

A1117E: Register symbol '<name>' already defined

A1118E: No current macro expansion

A1119E: MEND not allowed within conditionals

`MEND` means `END` of Macro.

See [Use of macros](#) in the legacy `armasm` documentation.

A1120E: Bad global name

A1121E: Global name '<name>' already exists

A1122E: Locals not allowed outside macros

A1123E: Bad local name

A1125E: Unknown or wrong type of global/local symbol '<name>'

A1126E: Bad alignment boundary, must be a multiple of 2

A1127E: Bad `IMPORT/EXTERN` name

A1128E: Common name '<sym>' already exists

A1129E: Imported name '<sym>' already exists

A1130E: Bad exported name

A1131E: Bad symbol type for exported symbol '<sym>'

A1132E: REQUIRE directive not supported for <entity> format output

A1133E: Bad required symbol name

A1134E: Bad required symbol type, expect (symbol is either external or label) and (symbol is relocatable and absolute)

A1135E: Area name missing

AREA names starting with any non-alphabetic character must be enclosed in bars. For example, change:

```
AREA 1_DataArea, CODE, READONLY
```

to:

```
AREA |1_DataArea|, CODE, READONLY
```

A1136E: Entry address already set

A1137E: Unexpected characters at end of line

This error is given when extra characters that are not part of an instruction are found on an instruction line.

For example:

```
ADD r0, r0, r1 comment
```

You could change this to:

```
ADD r0, r0, r1 ; comment
```

A1138E: String "<string>" too short for operation, length must be > <oplength>

A1139E: String overflow, string exceeds <max> characters

A1140E: Bad operand type

A1141E: Relocated expressions may only be added or subtracted

A1142E: Subtractive relocations not supported for <entity> format output

This can occur when subtracting symbols that are in different areas, for example:

```
IMPORT sym1
IMPORT sym2
DCD (sym2 - sym1)
```

A1143E: COMMON directive not supported for %s format output

A1144E: DCDO directive not supported for %s format output

A1145E: Undefined exported symbol '<sym>'

A1146E: Unable to open output file <filename>: <reason>

A1147E: Bad shift name

A1148E: Unknown shift name <name>, expected one of LSL, LSR, ASR, ROR, RRX

A1150E: Bad symbol, not defined or external

This typically occurs in the following cases:

- When the current file requires an `INCLUDE` of another file to define some symbols, for example:

```
"init.s", line 2: Error: A1150E: Bad symbol 2 00000000 DCD EBI_CSR_0
```

In this case, the solution is to include the required definitions file. For example:

```
INCLUDE targets/eb40.inc
```

- When the current file requires `IMPORT` for some symbols, for example:

```
"init.s", line 4: Error: A1150E: Bad symbol 4 00000000 LDR r0, =||Image$$RAM  
$$ZI$$Limit||
```

In this case, the solution is to import the required symbol, for example:

```
IMPORT ||Image$$RAM$$ZI$$Limit||
```

A1151E: Bad register name symbol

Example:

```
MCR p14, 3, R0, Cr1, Cr2
```

The coprocessor registers `CR` must be labeled as a lowercase `c` for the code to build. The register can be `r` or `R`:

```
MCR p14, 3, r0, c1, c2
```

or

```
MCR p14, 3, R0, c1, c2
```

A1152E: Unexpected operator

A1153E: Undefined symbol

A1154E: Unexpected operand, operator expected

A1155E: Unexpected unary operator equal to or equivalent to <operator>

A1156E: Missing open bracket

A1157E: Syntax error following directive

A1158E: Illegal line start, should be blank

Some directives, for example, `ENTRY`, `IMPORT`, `EXPORT`, and `GET` must be on a line without a label at the start of the line. This error is given if a label is present.

A1159E: Label missing from line start

Some directives, for example, `FUNCTION` or `SETS`, require a label at the start of the line, for example:

```
my_func FUNCTION
```

or

```
label SETS
```

This error is given if the label is missing.

A1160E: Bad local label number

A numeric local label is a number in the range 0-99, optionally followed by a name.

See [Numeric local labels](#) in the legacy `armasm` documentation.

A1161E: Syntax error following local label definition

A1162E: Incorrect routine name '<name>'

A1163E: Unknown opcode <name> , expecting opcode or Macro

The most common reasons for this are:

- Forgetting to put white space in the left hand margin, before the instruction. For example, change the following:

```
MOV r0,#1
```

to:

```
MOV r0,#1
```

- Use of a hardware floating point instruction without using the `--fpu` switch. For example:

```
FMXR FPEXC, r1 ;
```

must be assembled with `armasm --fpu=vfp`

- Mis-typing the opcode:

```
ADDD
```

instead of:

```
ADD
```

A1164E: Opcode not supported on selected processor

The processor selected on the `armasm` command line does not support this instruction.

A1165E: Too many actual parameters, expecting <actual> parameters

A1166E: Syntax error following label

A1167E: Invalid line start

A1168E: Translate not allowed in pre-indexed form

A1169E: Missing close square bracket

A1170E: Immediate 0x<adr> out of range for this operation, must be below (0x<adr>)

This error is given when a `DCB`, `DCW` or `DCWU` directive is used with an immediate that is too large.

See the following in the legacy `armasm` documentation:

- [DCB directive](#).
- [DCW and DCWU directives](#).

A1171E: Missing close bracket

A1172E: Bad rotator <rotator>, must be even and between 0 and 30

A1173E: ADR/L cannot be used on external symbols

The `ADR` and `ADRL` pseudo-instructions can only be used with labels within the same code area. To load an out-of-area address into a register, use `LDR` instead.

A1174E: Data transfer offset 0x<val> out of range. Permitted values are 0x<min> to 0x<max>

A1175E: Bad register range

A1176E: Branch offset 0x<val> out of range. Permitted values are 0x<min> to 0x<max>

Branches are PC-relative, and have a limited range. If you are using numeric local labels, you can use the `ROUT` directive to limit their scope. This helps to avoid referring to the wrong label by accident.

See [Numeric local labels](#) in the legacy `armasm` documentation.

A1179E: Bad hexadecimal number

A1180E: Missing close quote

A1181E: Bad operator

A1182E: Bad based <base> number

A1183E: Numeric overflow

A1184E: Externals not valid in expressions

A1185E: Symbol missing

A1186E: Code generated in data area

An instruction has been assembled into a data area. This can happen if you have omitted the `CODE` attribute on the `AREA` directive.

See [AREA directive](#) in the legacy `armasm` documentation.

A1187E: Error in macro parameters

A1188E: Register value <val> out of range. Permitted values are <min> to <max>

A1189E: Missing '#'

A1190E: Unexpected '<entity>'

A1191E: Floating point register number out of range 0 to <maxi>

A1192E: Coprocessor register number out of range 0 to 15

A1193E: Coprocessor number out of range 0 to 15

A1194E: Bad floating-point number

A1195W: Small floating point value converted to 0.0

A1196E: Too late to ban floating point

A1198E: Unknown operand

This can occur when an operand is accidentally mistyped.

For example:

```
armasm --cpu=8-A.64 init.s -g -PD "ROM_RAM_REMAP SETL {FALS}"
```

must be:

```
armasm --cpu=8-A.64 init.s -g -PD "ROM_RAM_REMAP SETL {FALSE}"
```

See [Assembly time substitution of variables](#) in the legacy `armasm` documentation.

A1199E: Coprocessor operation out of range 0 to <maxi>

A1200E: Structure mismatch expect While/Wend

A1201E: Substituted line too long, maximum length <max>

A1202E: No pre-declaration of substituted symbol '<name>'

See [Assembly time substitution of variables](#) in the legacy `armasm` documentation.

A1203E: Illegal label parameter start in macro prototype

A1204E: Bad macro parameter default value

A1205E: Register <reg> occurs multiply in list

A1206E: Registers should be listed in increasing register number order

This warning is given if registers in, for example, `LDM` or `STM` instructions are not specified in increasing order and the `--checkreglist` option is used.

A1207E: Bad or unknown attribute

This error is given when an invalid attribute is given in the `AREA` directive. For example:

```
AREA test, CODE, READONLY, HALFWORD
```

`HALFWORD` is invalid, so remove it.

See the following in the legacy `armasm` documentation:

[AREA directive](#).

A1209E: ADRL cannot be used with PC as destination

A1210E: Non-zero data within uninitialized area '<name>'

A1211E: Missing open square bracket

A1212E: Division by zero

A1213E: Attribute <entity> cannot be used with attribute <entity>

A1214E: Too late to define symbol '<sym>' as register list

A1215E: Bad register list symbol

A1216E: Bad string escape sequence

A1217E: Error writing to code file <codeFileName>: <reason>

A1219E: Bad APSR, CPSR or SPSR designator

For example:

```
MRS r0, PSR
```

It is necessary to specify which status register to use (CPSR or SPSR), such as, for example:

```
MRS r0, CPSR
```

A1220E: BLX <address> must be unconditional

A1221E: Area attribute '<entity>' not supported for <entity> object file format

A1223E: Comdat Symbol '<name>' is not defined

A1224E: <entity> format does not allow PC-relative data transfers between areas

A1225E: ASSOC attribute is not allowed in non-comdat areas

A1226E: SELECTION attribute is not allowed in non-comdat areas

A1227E: Comdat Associated area '<name>' undefined at this point in the file

A1228E: Comdat Associated area '<name>' is not an area name

A1229E: Missing COMDAT symbol

A1230E: Missing '}' after COMDAT symbol

A1234E: Undefined or Unexported Weak Alias for symbol '<sym>'

A1237E: Invalid register or register combination for this operation

A1238E: Immediate value must be word aligned when used in this operation

A1240E: Immediate value cannot be used with this operation

A1241E: Must have immediate value with this operation

A1242E: Offset must be word aligned when used with this operation

A1243E: Offset must be halfword aligned with this operation

A1244E: Missing '!'

A1245E: B or BL from Thumb code to ARM code

A1246E: B or BL from ARM code to Thumb code

A1247E: BLX from ARM code to ARM code, use BL

This error occurs when there is a `BLX label` branch from A32 code to A32 code within this legacy assembler file. Such a branch is not permitted because `BLX label` always results in a change of instruction set state. The usual solution is to use `BL` instead.

A1248E: BLX from Thumb code to Thumb code, use BL

This error occurs when there is a `BLX label` branch from T32 code to T32 code within this legacy assembler file. Such a branch is not permitted because `BLX label` always results in a change of instruction set state. The usual solution is to use `BL` instead.

A1249E: Post indexed addressing mode not available

A1250E: Pre indexed addressing mode not available for this instruction, use [Rn, Rm]

A1253E: Thumb branch to external symbol cannot be relocated: not representable in <fmt>

A1254E: Halfword literal values not supported

In the following example, change the `LDRH` into `LDR`, which is the standard way of loading constants into registers:

```
LDRH R3, =constant
```

A1256E: DATA directive can only be used in CODE areas

A1259E: Invalid PSR field specifier, syntax is <PSR>_ where <PSR> is either CPSR or SPSR

A1260E: PSR field '<entity>' specified more than once

A1261E: MRS cannot select fields, use APSR, CPSR or SPSR directly

This error is caused by an attempt to use fields for CPSR or SPSR with an `MRS` instruction. For example:

```
MRS r0, CPSR_c
```

A1262U: Expression storage allocator failed

A1265U: Structure mismatch: IF or WHILE unmatched at end of INCLUDE file

A1267E: Bad GET or INCLUDE for file <filename>

A1268E: Unmatched conditional or macro

A1269U: unexpected GET on structure stack

A1270E: File "<entity>" not found

A1271E: Line too long, maximum line length is <MaxLineLength>

A1272E: End of input file

A1273E: '\\ ' should not be used to split strings

A1274W: '\\ ' at end of comment

A1283E: Literal pool too distant, use LTORG to assemble it within 1KB

For T32 code, a literal pool must be within 1KB of an `LDR` instruction that is trying to access it. See also messages A1284E: and A1471W.

A1284E: Literal pool too distant, use LTORG to assemble it within 4KB

For A32 code, a literal pool must be within 4KB of an `LDR` instruction that is trying to access it. To solve this, add an `LTORG` directive into your assembly source code at a convenient place.

See the following in the legacy `armasm` documentation:

- [Load addresses to a register using LDR Rd, =label.](#)
- [LTORG directive.](#)

A1285E: Bad macro name

A1286E: Macro already exists

A1287E: Illegal parameter start in macro prototype

A1288E: Illegal parameter in macro prototype

A1289E: Invalid parameter separator in macro prototype

A1290E: Macro definition too big, maximum length <max>

A1291E: Macro definitions cannot be nested

A1310W: Symbol attribute not recognized

A1311U: macro definition attempted within expansion

A1312E: Assertion failed

A1313W: Missing END directive at end of file

The legacy assembler requires an `END` directive to know when the code in the file terminates. You can add comments or other such information in free format after this directive.

A1314W: Reserved instruction (using NV condition)

A1315E: NV condition not supported on targeted CPU

A1316E: Shifted register operand to MSR has undefined effect

A1319E: Undefined effect (using PC as Rs)

A1320E: Undefined effect (using PC as Rn or Rm in register specified shift)

A1321E: Undefined effect (using PC as offset register)

A1322E: Unaligned transfer of PC, destination address must be 4 byte aligned, otherwise result is UNPREDICTABLE

This error is reported when you try to use an `LDR` instruction to load the PC from a non word-aligned address. For example:

```
AREA Example, CODE
LDR pc, [pc, #6] ; Error - offset must be a multiple of 4
END
```

This code gives an **UNPREDICTABLE** result.

A1323E: Reserved instruction (Rm = Rn with post-indexing)

A1324E: Undefined effect (PC + writeback)

A1327E: Non portable instruction (LDM with writeback and base in register list, final value of base unpredictable)

In the `LDM` instruction, if the base register `<Rn>` is specified in `<registers>`, and base register writeback is specified, the final value of `<Rn>` is **UNKNOWN**.

A1328E: Non portable instruction (STM with writeback and base not first in register list, stored value of base unpredictable)

In the `STM` instruction, if `<Rn>` is specified in `<registers>` and base register writeback is specified:

- If `<Rn>` is the lowest-numbered register specified in `<register_list>`, the original value of `<Rn>` is stored.
- Otherwise, the stored value of `<Rn>` is **UNKNOWN**.

A1329E: Unpredictable instruction (forced user mode transfer with write-back to base)

This error is caused by an instruction such as `PUSH {r0}^` where the ^ indicates access to user registers. Writeback to the base register is not available with this instruction. Instead, the base register must be updated separately. For example:

```
SUB sp, sp, #4 STMID sp, {r0}^
```

Another example is replacing `STMFD R0!, {r13, r14}^` with:

```
SUB r0, r0, #8 STM r0, {r13, r14}^
```

See also message A1085W.

A1331E: Unpredictable instruction (PC as source or destination)

A1332E: Unpredictable effect (PC-relative SWP)

A1334E: Undefined effect (use of PC/PSR)

A1335E: Useless instruction (PC cannot be written back)

A1337E: Useless instruction (PC is destination)

A1338E: Dubious instruction (PC used as an operand)

A1339E: Unpredictable if RdLo and RdHi are the same register

A1341E: Branch to unaligned destination, expect destination to be <max> byte aligned

A1342W: <name> of symbol in another AREA will cause link-time failure if symbol is not close enough to this instruction

A1344I: host error: out of memory

A1355U: A Label was found which was in no AREA

This can occur if no white space precedes a legacy assembler directive. Assembler directives must be indented. For example use:

```
IF :DEF: FOO
; code
ENDIF
```

instead of:

```
IF :DEF: FOO
; code
ENDIF
```

Symbols beginning in the first column are assumed to be labels.

A1356E: Instruction not supported on targeted CPU

This error occurs if you try to use an instruction that is not supported by the selected architecture or processor.

A1406E: Bad decimal number

A1407E: Overlarge floating point value

A1408E: Overlarge (single precision) floating point value

A1409W: Small (single precision) floating value converted to 0.0

A1411E: Closing '>' missing from vector specifier

A1412E: Bad vector length, should be between <min> and <max>

A1413E: Bad vector stride, should be between <min> and <max>

A1414E: Vector wraps round over itself, length * stride should not be greater than <max>

A1415E: VFPASSERT must be followed by 'VECTOR' or 'SCALAR'

A1416E: Vector length does not match current vector length <len>

A1417E: Vector stride does not match current vector stride

A1418E: Register has incorrect type '<type>' for instruction, expect floating point/double register type

A1419E: Scalar operand not in a scalar bank

A1420E: Lengths of vector operands are different

A1421E: Strides of vector operands are different

A1422E: This combination of vector and scalar operands is not allowed

A1423E: This operation is not vectorizable

A1424E: Vector specifiers not allowed in operands to this instruction

A1425E: Destination vector must not be in a scalar bank

A1426E: Source vector must not be in a scalar bank

A1427E: Operands have a partial overlap

A1428E: Register list contains registers of varying types

A1429E: Expected register list

The legacy assembler reports this when `FRAME SAVE` and `FRAME RESTORE` directives are not given register lists.

See the following in the legacy `armasm` documentation:

- [FRAME-RESTORE directive](#).
- [FRAME-SAVE directive](#).

A1430E: Unknown frame directive

A1431E: Frame directives are not accepted outside of PROCs/FUNCTIONs

See [Frame directives](#) in the legacy `armasm` documentation.

A1432E: Floating-point register type not consistent with selected floating-point architecture

A1433E: Only the writeback form of this instruction exists

The addressing mode specified for the instruction did not include the writeback specifier (that is, a '!' after the base register), but the instruction set only supports the writeback form of the instruction. Either use the writeback form, or replace with instructions that have the required behavior.

A1434E: Architecture attributes '<attr1>' and '<attr2>' conflict

A1435E: {PCSTOREOFFSET} is not defined when assembling for an architecture

{PCSTOREOFFSET} is only defined when assembling for a processor, not for an architecture.

A1437E: {ARCHITECTURE} is undefined

{ARCHITECTURE} is only defined when assembling for an architecture, not for a processor.

A1446E: Bad or unknown attribute '<attr>'. Use --apcs /interwork instead

For example:

```
AREA test1, CODE, READONLY
AREA test, CODE, READONLY, INTERWORK
```

To eliminate the error:

1. Remove the ", INTERWORK" from the AREA line.
2. Assemble with `armasm --apcs /interwork foo.s` instead.

A1447W: Missing END directive at end of file, but found a label named END

This warning is caused by the `END` directive not being indented.

A1448E: Deprecated form of PSR field specifier used (use _f)

A1449E: Deprecated form of PSR field specifier used (use _c)

A1450E: Deprecated form of PSR field specifier used (use _cxsf for future compatibility)

`armasm` supports the full range of MRS and MSR instructions, in the following forms:

```
MRS(cond) Rd, CPSR
MRS(cond) Rd, SPSR
MSR(cond) CPSR_fields, Rm
MSR(cond) SPSR_fields, Rm
MSR(cond) CPSR_fields, #immediate
MSR(cond) SPSR_fields, #immediate
```

where `fields` can be any combination of `cxsf`.

Legacy versions of the assembler permitted other forms of the `MSR` instruction to modify the control field and flags field:

- `cpsr` or `cpsr_all`, control and flags field
- `cpsr_flg`, flags field only
- `cpsr_ctl`, control field only.

Similar control and flag settings apply for SPSR.

These forms are deprecated and must not be used. If your legacy code contains them, the legacy assembler reports:

```
Deprecated form of PSR field specifier used (use _cxsf)
```

To avoid the warning, in most cases you can modify your code to use `_c`, `_f`, `_cf` or `_cxsf` instead.

See the following in the legacy `armasm` documentation:

- [Conditional execution in A32 code.](#)
- [Conditional execution in T32 code.](#)
- [General-purpose registers in AArch32 state.](#)
- [Access to the inline barrel shifter in AArch32 state.](#)

A1454E: FRAME STATE RESTORE directive without a corresponding FRAME STATE REMEMBER

See the following in the legacy `armasm` documentation:

- [Frame directives.](#)
- [FRAME-STATE-REMEMBER directive.](#)
- [FRAME-STATE-RESTORE directive.](#)

A1456W: INTERWORK area directive is obsolete. Continuing as if --apcs /inter selected

For example, the following code generates this warning:

```
AREA test, CODE, READONLY, INTERWORK
```

To eliminate the warning:

1. Remove the `", INTERWORK"` from the `AREA` line.
2. Assemble with `armasm --apcs /interwork foo.s` instead.

See also message A1446E.

A1457E: Cannot mix INTERWORK and NOINTERWORK code areas in same file

For example:

```
AREA test1, CODE, READONLY
...
AREA test2, CODE, READONLY, INTERWORK
```

To eliminate the error, carry out the following steps:

1. Move the two `AREA` s into separate assembly files, for example, `test1.s` and `test2.s`.
2. Remove `, INTERWORK` from the `AREA` line in `test2.s`.
3. Assemble `test1.s` with `armasm --apcs /nointerwork`.
4. Assemble `test2.s` with `armasm --apcs /interwork`.
5. At link time, the linker adds any necessary interworking veneers.

See also message A1446E.

A1458E: DCFD or DCFDU not allowed when fpu is None

A1459E: Cannot B or BL to a register

A1461E: Specified processor or architecture does not support Thumb instructions

It is likely that you are specifying an architecture or processor using the `--cpu` option and incorporating T32 code in the `AREA` that is generating this error.

For example, in the following command line, `code.s` contains T32 code but the `--arm_only` option forces only A32 code to be generated.

```
armasm --arm_only --cpu=7-A code.s
```

A1462E: Specified memory attributes do not support this instruction

A1463E: SPACE directive too big to fit in area, area size limit 2^32

A1464W: ENDP/ENDFUNC without corresponding PROC/FUNC

A1466W: Operator precedence means that expression would evaluate differently in C

`armasm` has always evaluated certain expressions in a different order to C. This warning might help C programmers from being caught out when writing in assembly language.

To avoid the warning, do either of the following:

- Modify the code to make the evaluation order explicit, by adding brackets.
- Suppress the warning with the `--unsafe` switch.

See [Operator precedence](#) in the legacy `armasm` documentation.

A1467W: FRAME ADDRESS with negative offset <offset> is not recommended

A1468W: FRAME SAVE saving registers above the canonical frame address is not recommended

A1469E: FRAME STATE REMEMBER directive without a corresponding FRAME STATE RESTORE

See the following in the legacy `armasm` documentation:

- [Frame directives](#).
- [FRAME-STATE-REMEMBER directive](#).
- [FRAME-STATE-RESTORE directive](#).

A1471W: Directive <directive> may be in an executable position

This can occur with, for example, the `LTOrg` directive (see messages A1283E: and A1284E). `LTOrg` instructs the legacy assembler to dump literal pool `DCD` data at this position.

To prevent this warning, the data must be placed where the processor cannot execute them as instructions. A good place for an `LTOrg` is immediately after an unconditional branch, or after the return instruction at the end of a subroutine.

As a last resort, you could add a branch over the `LTOrg` to avoid the data being executed. For example:

```
B unique_label
LTOrg
unique_label
```

A1475E: At least one register must be transferred, otherwise result is UNPREDICTABLE

A1476E: BX r15 at non word-aligned address is UNPREDICTABLE

A1477E: This register combination results in UNPREDICTABLE behavior

A1479W: Requested alignment <alignreq> is greater than area alignment <align>, which has been increased

This warning is about an `ALIGN` directive that has a coarser alignment boundary than its containing `AREA`. Such an alignment is not permitted. To compensate, the legacy assembler automatically increases the alignment of the containing `AREA` for you. A simple test case that gives the warning is:

```
AREA test, CODE, ALIGN=3
ALIGN 16
BX lr
END
```

In this example, the alignment of the `AREA` (`ALIGN=3`) is $2^3=8$ byte boundary, but the `BX lr` instruction is on a 16-byte boundary, causing the error.



Note

The two alignment types are specified in different ways.

This warning can also occur when using `AREA ... ALIGN=0` to align a code section on a byte boundary. Such an alignment is not possible. Code sections can only be aligned on:

- A four-byte boundary for A32 code, so use "`ALIGN=2`".
- A two-byte boundary for T32 code, so use "`ALIGN=1`".

See the following in the legacy `armasm` documentation:

- [ALIGN directive](#).

- [AREA directive](#).

A1480W: Macro cannot have same name as a directive or instruction

A1481E: Object file format does not support this area alignment

A1482E: Shift option out of range, allowable values are from <min> to <max>

A1484W: Obsolete shift name 'ASL', use LSL instead

The Arm architecture does not have an `ASL` shift operation. The AArch32 barrel shifter only has the following shift types:

- `ROR`.
- `ASR`.
- `LSR`.
- `LSL`.

An arithmetic (that is, signed) shift left is the same as a logical shift left, because the sign bit always gets shifted out.

If the name `ASL` is used, the legacy assembler reports this warning and converts the `ASL` to `LSL`.

See the following in the legacy `armasm` documentation:

- [--unsafe](#).
- [ASR](#).

A1485E: LDM/STM instruction exceeds maximum register count <max> allowed with --split_ldm

A1486E: ADR/ADRL of a symbol in another AREA is not supported in ELF

The `ADR` and `ADRL` pseudo-instructions can only be used with labels within the same code section. To load an out-of-area address into a register, use `LDR` instead.

A1487W: Obsolete instruction name 'ASL', use LSL instead

This warning is given when the `ASL` instruction is used in pre-UAL T32 code, that is, when you assemble using the `--16` command-line option, or you use the `CODE16` directive. See the corresponding A32 `ASL` message A1484W.

A1488W: PROC/FUNC at line <lineno> in '<filename>' without matching ENDP/ENDFUNC

A1489E: <FPU> is undefined

A1490E: <CPU> is undefined

{`CPU`} is only defined by assembling for a processor and not an architecture.

A1491W: Internal error: Found relocation at offset <offset> with incorrect alignment

This might indicate a legacy assembler fault. Contact your supplier.

A1492E: Immediate 0x<val> out of range for this operation. Permitted values are 0x<min> to 0x<max>

A1493E: REQUIRE must be in an AREA

A1495W: Target of branch is a data address

armasm determines the type of a symbol and detects branches to data. To suppress this warning, specify `--diag-suppress 1495`.

A1496W: Absolute relocation of ROPI address with respect to symbol '<symbol>' at offset <offset> may cause link failure

For example, when assembling the following code with `--apcs /ropi`, this warning is given. This warning is because it generates an absolute relocation (`R_ARM_ABS32`) to a PI code symbol.

```
AREA code, CODE codeaddr DCD codeaddr END
```

A1497W: Absolute relocation of RWPI address with respect to symbol '<symbol>' at offset <offset> may cause link failure

For example, when assembling the following code with `--apcs /rwpi`, this warning is given. This warning is because it generates an absolute relocation (`R_ARM_ABS32`) to a PI data symbol.

```
AREA data, DATA dataaddr DCD dataaddr END
```

A1498E: Unexpected characters following Thumb instruction

For example, the following instruction is valid in both UAL and pre-UAL code:

```
ADD r0, r0, r1
```

However, the following instruction is invalid in pre-UAL T32 code. The unexpected characters are `, ASR #1`.

```
ADD r0, r0, r1, ASR #1
```

A1499E: Register pair is not a valid contiguous pair

A1500E: Unexpected characters when expecting '<eword>'

A1501E: Shift option out of range, allowable values are 0, 8, 16 or 24

A1502W: Register <reg> is a caller-save register, not valid for this operation

A1505E: Bad expression type, expect logical expression

A1506E: Accumulator should be in form accx where x ranges from 0 to <max>

A1507E: Second parameter of register list must be greater than or equal to the first

A1508E: Structure mismatch expect Conditional

A1509E: Bad symbol type, expect label, or weak external symbol

A1510E: Immediate 0x<imm> cannot be represented by 0-255 and a rotation

A1511E: Immediate cannot be represented by combination of two data processing instructions

A1512E: Immediate 0x<val> out of range for this operation. Permitted values are <min> to <max>

A1513E: Symbol not found or incompatible Symbol type for '<name>'

A1514E: Bad global name '<name>'

A1515E: Bad local name '<name>'

A1516E: Bad symbol '<name>', not defined or external

A1517E: Unexpected operator equal to or equivalent to <operator>

A1539E: Link Order dependency '<name>' not an area

A1540E: Cannot have a link order dependency on self

A1541E: <code> is not a valid condition code

A1542E: Macro names <name1> and <name2>[parameter] conflict

A1543W: Empty macro parameter default value

A1544E: Invalid empty PSR field specifier, field must contain at least one of c,x,s,f

A1545U: Too many sections for one <objfmt> file

A1546W: Stack pointer update potentially breaks 8 byte stack alignment

The stack must be eight-byte aligned on an external boundary so pushing an odd number of registers causes this warning. For example:

```
PUSH {r0}
```

This warning is suppressed by default. To enable it, use `--diag_warning 1546`.

See `--diag_warning=tag[,tag,...]` ([armasm](#)) in the legacy `armasm` documentation.

A1547W: PRESERVE8 directive has automatically been set

Example:

```
PUSH {r0,r1}
```

This warning is given because you have not explicitly set the `PRESERVE8` directive, but the legacy assembler has set it automatically. This warning is suppressed by default. To enable it, use `--diag_warning 1547`.

See the following in the legacy `armasm` documentation:

- `--diag_warning=tag[,tag,...]` ([armasm](#)).
- [REQUIRE8 and PRESERVE8 directives](#).

A1548W: Code contains LDRD/STRD indexed/offset from SP but REQUIRE8 is not set

This warning is given when the REQUIRE8 directive is not set when required. For example:

```
PRESERVE8
STRD r0,[sp,#8]
```

See [REQUIRE8 and PRESERVE8 directives](#) in the legacy `armasm` documentation.

A1549W: Setting of REQUIRE8 but not PRESERVE8 is unusual

Example:

```
PRESERVE8 {FALSE}
REQUIRE8
STRD r0,[sp,#8]
```

A1550U: Input and output filenames are the same

A1551E: Cannot add Comdef area <name> to non-comdat group

A1560E: Non-constant byte literal values not supported

A1561E: MERGE and STRING sections must be data sections

A1562E: Entry size for Merge section must be greater than 0

A1563W: Instruction stalls CPU for <stalls> cycle(s)

The legacy assembler can give information about possible interlocks in your code caused by the pipeline of the processor chosen by the `--cpu` option. To do this, assemble with `armasm --diag_warning 1563`.



Note

If the `--cpu` option specifies a multi-issue processor such as Cortex®-A8, the interlock warnings are unreliable.

See also warning A1746W.

A1572E: Operator SB_OFFSET_11_0 only allowed on LDR/STR instructions

A1573E: Operator SB_OFFSET_19_12 only allowed on Data Processing instructions

A1574E: Expected one or more flag characters from "<str>"

A1575E: BLX with bit[0] equal to 1 is architecturally UNDEFINED

A1576E: Bad coprocessor register name symbol

A1577E: Bad coprocessor name symbol

A1578E: Bad floating point register name symbol '<sym>'

A1581W: Added <no_padbytes> bytes of padding at address <address>

By default, the legacy assembler warns when it adds padding bytes to the generated code. This padding occurs whenever an instruction or directive is used at an address that requires

a higher alignment. For example, to ensure A32 instructions start on a four-byte boundary after some T32 instructions, or where there is a `DCB` followed by a `DCD`.

For example:

```

        AREA Test, CODE, READONLY
        THUMB
ThumbCode
        MOVS r0, #1
        ADR r1, ARMProg
        BX r1
        ; ALIGN ; <<< uncomment to avoid the first warning
        ARM
ARMProg
        ADD r0, r0, #1
        BX LR
        DCB 0xFF
        DCD 0x1234
        END

```

This code results in the following warnings:

```

A1581W: Added 2 bytes of padding at address 0x6
8 00000008 ARM
A1581W: Added 3 bytes of padding at address 0x11
13 00000014 DCD 0x1234

```

The warning can also occur when using `ADR` in T32-only code. The `ADR` T32 pseudo-instruction can only load addresses that are word aligned, but a label within T32 code might not be word aligned. Use `ALIGN` to ensure four-byte alignment of an address within T32 code.

See the following in the legacy `armasm` documentation:

- [ADR \(PC-relative\)](#).
- [ADR \(register-relative\)](#).
- [ALIGN directive](#).
- [DCB directive](#).
- [DCD and DCUD directive](#).

A1582E: Link Order area '<name>' undefined

A1583E: Group symbol '<name>' undefined

A1584E: Mode <mode> not allowed for this instruction

A1585E: Bad operand type (<typ1>) for operator <op>

A1586E: Bad operand types (<typ1>, <typ2>) for operator <op>

A1587E: Too many registers <count> in register list, maximum of <max>

A1588E: Align only available on VLD and VST instructions

A1589E: Element index must remain constant across all registers

A1590E: Mix of subscript and non-subscript elements not allowed

A1593E: Bad Alignment, must match transfer size UIMM * <dt>

A1595E: Bad Alignment, must match <st> * <dt>, or 64 when <st> is 4

A1596E: Invalid alignment <align> for dt st combination

A1597E: Register increment of 2 not allowed when dt is 8

A1598E: Bad Register list length

A1599E: Out of range subscript, must be between 0 and <max_index>

A1600E: Section type must be within range SHT_LOOS and SHT_HIUSER

A1601E: Immediate cannot be represented

A1603E: This instruction inside IT block has UNPREDICTABLE results

A1604W: Thumb Branch to destination without alignment to <max> bytes

A1606E: Symbol attribute <attr1> cannot be used with attribute <attr2>

A1607E: Thumb-2 wide branch instruction used, but offset could fit in Thumb-1 narrow branch instruction

A1608W: MOV pc,<rn> instruction used, but BX <rn> is preferred

A1609W: MOV <rd>,pc instruction does not set bit zero, so does not create a return address

This warning is caused when the current value of the PC is copied into a register while executing in T32 state. An attempt to create a return address in this way fails because bit[0] is not set. Attempting to branch with bx to this instruction causes a state change to A32.

To create a return address, you can use:

```
MOV r0, pc ADDS r0, #1
```

You can then safely suppress this warning with:

```
--diag_suppress 1609
```

A1611E: Register list increment of 2 not allowed for this instruction

A1612E: <type> addressing not allowed for <instr>

A1613E: Invalid register or register combination for this operation, <registers>, expected one of <expected>

A1614E: Scalar access not allowed when dt is 64

A1615E: Store of a single element or structure to all lanes is UNDEFINED

A1616E: Instruction, offset, immediate or register combination is not supported by the current instruction set

This error can be caused by attempting to use an invalid combination of operands. For example, in T32:

```
MOV r0, #1 ; /* Not permitted */
MOVS r0, #1 ; /* Ok */
```

See [A32 and T32 Instructions](#) in the *Instruction Set Assembly Guide for Armv7 and earlier Arm architectures Reference Guide*.

A1617E: Specified width is not supported by the current instruction set

A1618E: Specified instruction is not supported by the current instruction set

A1619E: Specified condition is not consistent with previous IT

A1620E: Error writing to file '<filename>': <reason>

A1621E: CBZ or CBNZ from Thumb code to ARM code

A1622E: Negative register offsets are not supported by the current instruction set

A1623E: Offset not supported by the current instruction set

A1624W: Branch from Thumb code to ARM code

A1625W: Branch from ARM code to Thumb code

A1626W: BL from Thumb code to ARM code

A1627W: BL from ARM code to Thumb code

This warning occurs when there is a branch from A32 code to T32 code (or from T32 code to A32 code) within this file. The usual solution is to move the T32 code into a separate legacy assembler file. Then, at link-time, the linker adds any necessary interworking veneers.

A1630E: Specified processor or architecture does not support ARM instructions

Arm M-profile processors, for example Cortex-M3 and Cortex-M1, implement only the T32 instruction set, not the A32 instruction set. It is likely that the assembly file contains some A32-specific instructions and is being built for one of these processors.

A1631E: Only left shifts of 1, 2 and 3 are allowed on load/stores

A1632E: Else forbidden in IT AL blocks

A1633E: LDR rx,= pseudo instruction only allowed in load word form

A1634E: LDRD/STRD has no register offset addressing mode in Thumb

A1635E: CBZ/CBNZ can not be made conditional

A1636E: Flag setting MLA is not supported in Thumb

A1637E: Error reading line: <reason>

A1638E: Writeback not allowed on register offset loads or stores in Thumb

A1639E: Conditional DCI only allowed in Thumb mode

A1640E: Offset must be a multiple of four

A1641E: Forced user-mode LDM/STM not supported in Thumb

A1642W: Relocated narrow branch is not recommended

A1643E: Cannot determine whether instruction is working on single or double precision values.

A1644E: Cannot use single precision registers with FLDMMX/LSTMX

A1645W: Substituted <old> with <new>

armasm can be configured to issue a warning in cases where it chooses to substitute an instruction. For example:

- ADD <negative_number> is the same as SUB <positive_number>.
- MOV <negative_number> is the same as MVN <positive_number>.
- CMP <negative_number> is the same as CMN <positive_number>.

For the T32 instruction set, unpredictable single register LDM s are transformed into LDRs.

This warning is suppressed by default, but can be enabled with `--diag_warning 1645`.

For example, when the following code is assembled with `--diag_warning 1645`:

```
AREA foo, CODE
ADD r0, #-1
MOV r0, #-1
CMP r0, #-1
```

the legacy assembler reports:

```
Warning: A1645W: Substituted ADD with SUB
3 00000000 ADD r0, #-1
Warning: A1645W: Substituted MOV with MVN
4 00000004 MOV r0, #-1
Warning: A1645W: Substituted CMP with CMN
5 00000008 CMP r0, #-1
```

and the resulting code generated is:

```
foo
0x00000000: e2400001 ..@. SUB r0,r0,#1
0x00000004: e3e00000 .... MVN r0,#0
0x00000008: e3700001 ..p. CMN r0,#1
```

A1647E: Bad register name symbol, expected Integer register

An integer (core) register is expected at this point in the syntax.

A1648E: Bad register name symbol, expected Wireless MMX SIMD register

A1649E: Bad register name symbol, expected Wireless MMX Status/Control or General Purpose register

A1650E: Bad register name symbol, expected any Wireless MMX register

A1651E: TANDC, TEXTRC and TORC instructions with destination register other than R15 is undefined

A1652W: FLDMMX/FSTMMX instructions are deprecated in ARMv6. Please use FLDMD/FSTMD instructions to save and restore unknown precision values.

A1653E: Shift instruction using a status or control register is undefined

A1654E: Cannot access external symbols when loading/storing bytes or halfwords

A1655E: Instruction is UNPREDICTABLE if halfword/word/doubleword is unaligned

A1656E: Target must be at least word-aligned when used with this instruction

A1657E: Cannot load a byte/halfword literal using WLDREB/WLDREH =constant

A1658W: Support for <opt> is deprecated

An option passed to `armasm` is deprecated.

See [armasm Command-line Options](#) in the legacy `armasm` documentation.

A1659E: Cannot B/BL/BLX between ARM/Thumb and Thumb-2EE

A1660E: Cannot specify scalar index on this register type

A1661E: Cannot specify alignment on this register

A1662E: Cannot specify a data type on this register type

A1663E: A data type has already been specified on this register

A1664E: Data type specifier not recognized

A1665E: Data type size must be one of 8, 16, 32 or 64

A1666E: Data type size for floating-point must be 32 or 64

A1667E: Data type size for polynomial must be 8 or 16

A1668E: Too many data types specified on instruction

A1669E: Data type specifier not allowed on this instruction

A1670E: Expected 64-bit doubleword register expression

A1671E: Expected 128-bit quadword register expression

A1672E: Expected either 64-bit or 128-bit register expression

A1673E: Both source data types must be same type and size

A1674E: Source operand 1 should have integer type and be double the size of source operand 2

- A1675E:** Data types and sizes for destination must be same as source
- A1676E:** Destination type must be integer and be double the size of source
- A1677E:** Destination type must be same as source, but half the size
- A1678E:** Destination must be untyped and same size as source
- A1679E:** Destination type must be same as source, but double the size
- A1680E:** Destination must be unsigned and half the size of signed source
- A1681E:** Destination must be unsigned and have same size as signed source
- A1682E:** Destination must be un/signed and source floating, or destination floating and source un/signed, and size of both must be 32-bits
- A1683E:** Data type specifiers do not match a valid encoding of this instruction
- A1684E:** Source operand type should be signed or unsigned with size between <min> and <max>
- A1685E:** Source operand type should be signed, unsigned or floating point with size between <min> and <max>
- A1686E:** Source operand type should be signed or floating point with size between <min> and <max>
- A1687E:** Source operand type should be integer or floating point with size between <min> and <max>
- A1688E:** Source operand type should be untyped with size between <min> and <max>
- A1689E:** Source operand type should be <n>-bit floating point
- A1690E:** Source operand type should be signed with size between <min> and <max>
- A1691E:** Source operand type should be integer, floating point or polynomial with size between <min> and <max>
- A1692E:** Source operand type should be signed, unsigned or polynomial with size between <min> and <max>
- A1693E:** Source operand type should be unsigned or floating point with size between <min> and <max>
- A1694E:** Instruction cannot be conditional in the current instruction set
Conditional instructions are not permitted in the specified instruction set. The instruction `MOVEQ`, for example, is permitted in A32 code, and in T32 code in architectures in which the `IT` instruction is available.
- A1695E:** Scalar index not allowed on this instruction
- A1696E:** Expected either 32-bit, 64-bit or 128-bit register expression
- A1697E:** Expected either 32-bit or 64-bit VFP register expression
- A1698E:** Expected 32-bit VFP register expression

A1699E: 64-bit data type cannot be used with these registers

A1700E: Source operand type should be integer with size between <min> and <max>

A1701E: 16-bit polynomial type cannot be used for source operand

A1702E: Register Dm can not be scalar for this instruction

A1704E: Register Dm must be in the range D0-D<upper> for this data type

A1705W: Assembler converted Qm register to D<rnum>[<idx>]

A1706E: Register Dm must be scalar

A1708E: 3rd operand to this instruction must be a constant expression

A1709E: Expected ARM or scalar register expression

A1710E: Difference between current and previous register should be <diff>

A1711E: Scalar registers cannot be used in register list for this instruction

A1712E: This combination of LSB and WIDTH results in UNPREDICTABLE behavior

A1713E: Invalid field specifiers for APSR: must be APSR_ followed by at least one of n, z, c, v, q or g

A1714E: Invalid combination of field specifiers for APSR

A1715E: PSR not defined on target architecture

A1716E: Destination for VMOV instruction must be ARM integer, 32-bit single-precision, 64-bit doubleword register or 64-bit doubleword scalar register

A1717E: Source register must be an ARM integer, 32-bit single-precision or 64-bit doubleword scalar register

A1718E: Source register must be an ARM integer register or same as the destination register

A1719W: This PSR name is deprecated and may be removed in a future release

A1720E: Source register must be a 64-bit doubleword scalar register

A1721E: Destination register may not have all-lanes specifier

A1722E: Labels not allowed inside IT blocks

A1723W: __RELOC is deprecated, please use the new RELOC directive

A1724E: RELOC may only be used immediately after an instruction or data generating directive

A1725W: 'armasm inputfile outputfile' form of command-line is deprecated

A1726W: Decreasing --max_cache below 8MB is not recommended

A1727W: Immediate could have been generated using the 16-bit Thumb MOVS instruction

A1728E: Source register must be same type as destination register

A1729E: Register list may only contain 32-bit single-precision or 64-bit doubleword registers

A1730E: Only IA or DB addressing modes may be used with these instructions

A1731E: Register list increment of 2 or more is not allowed for quadword registers

A1732E: Register list must contain between 1 and 4 contiguous doubleword registers

A1733E: Register list must contain 2 or 4 doubleword registers, and increment 2 is only allowed for 2 registers

A1734E: Register list must contain <n> doubleword registers with increment 1 or 2

A1735E: Post-indexed offset must equal the number of bytes loaded/stored (<n>)

A1736E: Number of registers in list must equal number of elements

A1737E: PC or SP can not be used as the offset register

A1738E: Immediate too large for this operation

A1739W: Constant generated using single VMOV instruction; second instruction is a NOP

A1740E: Number of bytes in FRAME PUSH or FRAME POP directive must not be less than zero

A1741E: Instruction cannot be conditional

A1742E: Expected LSL #Imm

A1744E: Alignment on register must be a multiple of 2 in the range 16 to 256

A1745W: This register combination is DEPRECATED and may not work in future architecture revisions

This warning is generated when all the following conditions are satisfied:

- You are using a deprecated register combination, for example:

```
PUSH    {r0, pc}
```

- You are assembling for a target architecture that supports 32-bit T32 instructions.
- You are assembling to A32 code.



When assembling to T32, rather than A32 code, the legacy assembler generates error A1477E instead.

A1746W: Instruction stall diagnostics may be unreliable for this CPU

This warning is shown when you enable message A1563W for a processor that is not modeled accurately by the legacy assembler. It indicates that you cannot rely on the output of A1563W when improving your code.

See also warning A1563W.

A1753E: Unrecognized memory barrier option

A1754E: Cannot change the type of a scalar register

A1755E: Scalar index has already been specified on this register

A1756E: Data type must be specified on all registers

A1757W: Symbol attributes must be within square brackets; Any other syntax is deprecated

A1758W: Exporting multiple symbols with this directive is deprecated

A1759E: Specified processor or architecture does not support Thumb-2EE instructions

A1760W: Build Attribute <from> is '<attr>'

A1761W: Difference in build attribute from '<diff>' in <from>

A1762E: Branch offset 0x<val> out of range of 16-bit Thumb branch, but offset encodable in 32-bit Thumb branch

This error is caused when assembling for T32 if an offset to a branch instruction is too large to fit in a 16-bit branch. The `.w` suffix can be added to the instruction to instruct the legacy assembler to generate a 32-bit branch.

A1763W: Inserted an IT block for this instruction

This error indicates that the legacy assembler has inserted an IT block to permit a number of conditional instructions in T32 code. For example:

```
MOVEQ r0,r1
```

This warning is off by default. It can be enabled using `--diag_warning A1763`.

A1764W: <name> instructions are deprecated in architecture <arch> and above

A1765E: Size of padding value on ALIGN must be 1, 2 or 4 bytes

This error is caused when the optional `padsize` attribute is used with an `ALIGN` directive, but has an incorrect size. It does not refer to the parameter to align to. The parameter can be any power of 2 from 2^0 to 2^{31} .

A1766W: Size of padding value for code must be a minimum of <size> bytes; treating as data

A1767E: Unexpected characters following attribute

A1768E: Missing '='

A1769E: Bad NEON or VFP system register name symbol

A1771E: Bad floating-point bitpattern when expecting <exp>-bit bitpattern

A1772E: Destination type must be signed or unsigned integer, and source type must be 32-bit or 64-bit floating-point

A1773E: Floating-point conversion only possible between 32-bit single-precision and 64-bit double-precision types

A1774E: Fixed-point conversion only possible for 16-bit or 32-bit signed or unsigned types

A1775E: Conversion between these types is not possible

A1776E: This operation is not available for 32-bit single-precision floating point types

A1777E: <n> is out of range for symbol type; value must be between <min> and <max>

A1778E: <n> is out of range for symbol binding; value must be between <min> and <max>

A1779E: DCDO cannot be used on READONLY symbol '<key>'

A1780E: Unknown ATTR directive

A1781E: Tag #<id> cannot be set by using ATTR

A1782E: Tag #<id> should be set with ATTR <cmd>

A1783E: Attribute scope must be a label or section name

A1784W: Reference to weak definition '<sym>' not relocated

A1785E: Macro '<macuse>' not found, but '<macdef>' exists

A1786W: This instruction using SP is deprecated and may not work in future architecture revisions

This warning is generated when all the following conditions are satisfied:

- You explicitly use the SP in a deprecated way, for example:

```
ADD sp, r0, #100
```

- You are assembling for a target architecture that supports 32-bit T32 instructions.
- You are assembling to A32 code.

Arm deprecates the explicit use of the SP in A32 instructions in any way that is not possible in the corresponding T32 instruction. Such deprecated register uses are still possible in A32 instructions for backwards compatibility and you can suppress this warning by using the legacy assembler's command-line option `--diag_suppress=1786`. However, Arm recommends you modify your code, because it might not work in future architecture revisions.

You can replace the deprecated use of the SP shown in the example with a sequence like:

```
ADD r1, r0, #100 MOV sp, r1
```



When assembling to T32, rather than A32 code, the legacy assembler generates error A1477E instead.

Note

A1787W: Use of VFP Vector Mode is deprecated in ARMv7

A1788W: Explicit use of PC in this instruction is deprecated and may not work in future architecture revisions

This warning is generated when all the following conditions are satisfied:

- You explicitly use the PC in a deprecated way, for example:

```
CMP pc, #1
```

- You are assembling for a target architecture that supports 32-bit T32 instructions.
- You are assembling to A32 code.

Arm deprecates the explicit use of the SP in A32 instructions in any way that is not possible in the corresponding T32 instruction. Such deprecated register uses are still possible in A32 instructions for backwards compatibility and you can suppress this warning by using the legacy assembler's command-line option `--diag_suppress=1786`. However, Arm recommends you modify your code, because it might not work in future architecture revisions.



Note

When assembling to T32, rather than A32 code, the legacy assembler generates error A1477E instead.

A1789W: Explicit use of PC in this instruction is deprecated and may not work in future architecture revisions, except as destination register

A1790W: Writeback ignored in Thumb LDM loading the base register

This warning is caused by incorrectly adding an exclamation mark to indicate base register writeback.

For example:

```
LDM r0!, {r0-r4}
```

is not a legal instruction because r0 is the base register and is also in the destination register list. In this case, the legacy assembler ignores the writeback and generates:

```
LDM r0, {r0-r4}
```

A1791W: Previous value of tag #<id> will be overridden

A1792E: Undefined build attributes tag

A1793E: Conversion only possible between 16-bit and 32-bit floating point

A1794E: Conversion operations require two data types

A1795E: Source and destination vector must contain <n> elements

A1796E: Register type not consistent with data type

A1797E: Specified FPU is not compatible with CPU architecture

A1798W: Output is not WYSIWYG (<output>)

A1799W: Output has not been checked for WYSIWYG property

A1800W: No output for line

A1801E: Instruction is UNPREDICTABLE in current instruction set

A1803E: Bad system instruction name

A1804E: Bad CP14 or CP15 register name for instruction

A1805E: Register is Read-Only

A1806E: Register is Write-Only

A1807W: Instruction executes as NOP on target CPU

A1808E: Generated object file may be corrupt (<reason>)

A1809W: Instruction aligns PC before using it; section ought to be at least 4 byte aligned

This warning is generated when all the following conditions apply:

- You are using a PC-relative offset in a T32 instruction that requires the PC to be word-aligned.
- The code section containing this instruction has less than 4-byte alignment.
- The instruction is not relocated at link time (because of a relocation emitted by the legacy assembler).

If these conditions are all met, and the code section containing this instruction is not placed at a 4-byte aligned address when linking, the instruction might operate on or with the wrong address at runtime. This erroneous operation is because the instruction aligns the PC to a 4-byte address before using it.

The following example shows an LDR instruction in T32 that is diagnosed by this warning because the section has an alignment of 2 bytes:

```
AREA ||.text||, CODE, READONLY, ALIGN=1
THUMB
LDR r0, [pc, #8] ; gives warning A1809W
```

A1810E: Base register writeback value unclear; use '[rn,#n]!' or '[rn],#n' syntax

A1811E: Size of fill value must be 1, 2 or 4 bytes and a factor of fill size

A1812W: Instruction cannot be assembled in the opposite instruction set

A1813W: 32-bit instruction used where 16-bit could have been used

A1814E: No output file

A1815E: SHT_ARM_EXIDX sections require a link order dependency to be set

A1816E: Unknown opcode '<name>' in CODE16, but exists in THUMB

A1817W: ATTR tag #<id> setting ignored in <scope>

A1818W: ATTR COMPAT flag <flag> and vendor '<vendor>' setting ignored in <scope>

A1819W: ATTR compatible with tag #<id> setting ignored in <scope>

A1820E: Register and processor mode not valid for instruction

A1821E: Expected constant or register expression

A1822E: Expected list of 32-bit extension registers

A1823E: Expected list of 64-bit extension registers

A1824E: Expected core register or 32-bit, 64-bit or 128-bit extension register

A1825E: Expected constant or 32-bit extension register

A1826E: Expected constant or 64-bit extension register

A1827E: Expected constant or 128-bit extension register

A1828E: Expected core register or 32-bit extension register

A1829E: Expected core register or 64-bit extension register

A1830E: Expected core register or 128-bit extension register

A1831E: Expected constant, floating-point constant, core register or 64-bit extension register

A1832E: Expected floating-point constant, core register or 32-bit extension register

A1833E: Expected constant or '{option}', where option is a constant from 0 to 255

A1834E: Expected register or address expression

A1835E: Too few data types specified on instruction

A1836E: Expected '<dt>' data type for destination

A1837E: Expected '<dt>' data type for first source

A1838E: Unexpected characters when expecting '<word1>' or '<word2>'

A1839E: Destination register must be scalar

A1840E: First source register must be scalar

A1841E: Alignment specified on base register not valid for instruction

A1842E: Syntax not allowed for a pseudo-instruction

A1843E: Literal load not supported for instruction

A1844E: Literal type not supported

A1845E: Register type not available in current instruction set

A1846E: Invalid field specifiers for CPSR or SPSR: must be followed by at least one of c, x, s or f

A1847E: Expression requiring more than one relocation not allowed

This can occur during the assembly of A32 instructions when trying to access data in another area. For example, using:

```
LDR r0, [pc, #label - . - 8]
```

or its equivalent:

```
LDR r0, [pc, #label-{PC}-8]
```

where `label` is defined in a different AREA.

Change your code to use the simpler, equivalent syntax:

```
LDR r0, label
```

This works if `label` is either in the same area or in a different area.

A1848W: State change in IT block

A1849E: Scalar index on operand out of range for data type

A1850E: Width must be before any data type qualifiers

A1851E: Invalid line start - local label not supported on this directive

A1852E: Use of VFP Vector Mode is not supported on target FPU

A1853E: Alignment of instruction or target must be at least <n>-byte aligned

A1854E: Unknown opcode '<name>', maybe wrong target CPU?

A1856E: Shifted register operand not allowed

A1857E: Specified shift not allowed

A1858E: Flag setting form of this instruction not available

A1859E: Flag preserving form of this instruction not available

A1860E: Register operands must be from R0 to R7 in this instruction

A1861E: Option '<opt>' is obsolete.

A1862E: Data type size for floating-point must be 16 or 32

A1863E: Data type size for floating-point must be 32

A1864E: Data type size for floating-point must be 16, 32 or 64

A1865W: '#' not seen before constant expression

A1866E: Wireless MMX Control register not defined on target CPU

A1867E: Immediate 0x<val> out of range for this operation. Permitted values are multiples of <mult> from 0x<min> to 0x<max>

A1868E: Bitfield LSB out of range. Permitted values are 0 to <max>

A1869E: Register <field> must not be PC

A1870W: Area '<name>' has incorrect attributes, expect '<attrs>'

A1871E: Immediate 0x<imm> cannot be represented by 0-255 shifted left by 0-23 or duplicated in all, odd or even bytes

This error occurs when `armasm` cannot encode the instruction with the specified immediate.

For example, the following instruction causes this error in T32 state:

```
ADDS    r0, r1, #-20
```

A workaround is to use the equivalent `SUBS` instruction instead:

```
SUBS    r0, r1, #20
```

A1872E: Shift by register not allowed

A1873E: Only the non-writeback form of this instruction exists

A1874E: Specified register list cannot be loaded or stored in target instruction set

A1875E: Register Rn must be from R0 to R7 in this instruction

Change the specified register to be in the range R0 to R7.

A1876W: Use of '|' as a synonym for the `:OR:` operator is deprecated.

A1877E: Specified register for <field> not allowed in current instruction set

A1878E: Offset must be <realign>-byte aligned when used with this operation

A1879E: Specified addressing mode not available

A1880E: Data transfer size not available

A1881E: <mode> load/store mode is not permitted

A1882E: Destination and first source register must be same

A1883E: Destination and second source register must be same

A1884E: Specified AIF bits not available on target CPU

A1885E: Cannot change processor mode in current instruction set

A1886E: Invalid operand size for add with carry-in: must be 16 or 32

A1887E: Specified source data type not allowed; must be one of: <str>

- A1888E:** Specified destination data type not allowed; must be one of: <str>
- A1889E:** Specified register type not available on target architecture
- A1890E:** Specified shift results in UNPREDICTABLE behaviour
- A1891E:** With this register combination, writeback results in UNPREDICTABLE behaviour
- A1892W:** Writeback with this register combination is deprecated and may not work in future architecture revisions
- A1893E:** The specified flags result in UNPREDICTABLE behaviour
- A1894E:** The specified immediate results in UNPREDICTABLE behaviour
- A1895E:** The specified condition results in UNPREDICTABLE behaviour
- A1896E:** Specified alignment not supported on this instruction
- A1897E:** Bitfield width out of range. Permitted values are 1 to <max>
- A1898E:** Target cannot be relocated. No suitable relocation exists for this instruction
- A1899E:** Specified operator is only allowed on the following instructions: <instrs>
- A1900W:** Deprecated system instruction name
- A1901E:** Specified system instruction not supported on target architecture
- A1902E:** Specified special register not supported on target architecture
- A1903E:** Line not seen in first pass; cannot be assembled

This error occurs if an instruction or directive does not appear in pass 1 but appears in pass 2 of the legacy assembler.

The following example shows when a line is not seen in pass 1:

```
AREA x, CODE
[ :DEF: foo
num EQU 42 ; Assembler does not see this line during pass 1 because
           ; foo is not defined at this point during pass 1
]
foo DCD num
END
```

- A1905U:** Pre-processor step failed for '<filename>'
- A1906W:** Unfinished IT block
- A1907W:** Test for this symbol has been seen and may cause failure in the second pass.
- This diagnostic is suppressed by default. Enable it to identify situations that might result in errors A1903E, A1908E, or A1909E.

A1908E: Label '<name>' value inconsistent: in pass 1 it was <val1>; in pass 2 it was <val2>

The following example generates this error because in pass 1 the value of `x` is `0x0004+r9`, and in pass 2 the value of `x` is `0x0000+r0`:

```
map 0, r0
if :lnot: :def: sym
    map 0, r9
    field 4
endif
x field 4
sym LDR r0, x
```

A1909E: Line not seen in second pass; cannot be assembled

This error occurs if an instruction or directive appears in pass 1 but does not appear in pass 2 of the legacy assembler.

The following example shows when a line is not seen in pass 2:

```
AREA x, CODE
[ :LNOT: :DEF: foo
MOV r1, r2 ; Assembler does not see this line during pass 2 because
           ; foo is already defined
]
foo MOV r3, r4
END
```

A1911E: Immediate 0x<val> out of range for this operation. Immediate value must be 0

A1912E: In this instruction, register <field> must not be PC when flag-setting is specified

A1913E: Specified operand type not allowed in this position

A1914E: Expected expression

A1915W: Relocation is not recommended on this instruction or directive

A1916E: Unknown built-in variable '<name>'

A1917E: Expected vector register expression

A1921E: Expected 8-bit byte register expression

A1922E: Expected 16-bit halfword register expression

A1923E: Expected list of vector registers

A1925E: Coprocessor number must be 14 or 15 on this architecture

A1927E: Expected core register, 64-bit extension register or vector register

A1931W: This instruction inside IT block is deprecated

A1932E: Register type not allowed on this architecture

A1933E: Option '<opt>' not supported on target architecture

A1934E: Shift by <shift> not allowed. Permitted values are <allowed>

A1936E: Literal pool too distant, use LTOrg to assemble it within <distance>

A1937E: Conversions to fixed point only support rounding mode Z

A1938E: Coprocessor number must be 14 on this architecture

A1939W: This mnemonic is deprecated

A1940E: Execute only is not compatible with <option>

A1941E: Unable to align to a non-multiple of <nopsiz> using NOP instructions

A1942E: Data declarations are not permitted in execute-only sections

A1943E: INCBIN cannot be used in execute-only sections

A1944E: Literal pool entries cannot be generated in execute-only sections

A1950W: The legacy armasm assembler is deprecated. Consider using the armclang integrated assembler instead.

The armasm legacy assembler is deprecated, and it has not been updated since Arm Compiler 6.10. Also, armasm does not support:

- Armv8.4-A or later architectures.
- Certain backported options in Armv8.2-A and Armv8.3-A.
- Assembling `svE` instructions.
- Armv8.1-M or later architectures, including MVE.
- All versions of the Armv8-R architecture.

To suppress this message, specify the `--diag_suppress=1950` option.

Migrate your legacy Arm-syntax assembly code to the armclang integrated assembler GNU syntax. For more information, see:

- [Migrating from armasm to the armclang Integrated Assembler.](#)
- [armclang Integrated Assembler.](#)

A1992E: MOVt of external symbol must follow corresponding MOVW instruction

A1993E: This operator requires a relocation that is not supported in <objfmt>

A1994E: This directive is not supported in <objfmt>

A1995E: Weak definitions are not supported in <objfmt>

A1996E: TYPE must only be used after WEAK on IMPORT

A1997E: Expected alias for weak extern symbol

A1998E: Comdat Associated area must have Comdat Associative selection type

A1999E: Comdat Associated area cannot be another Comdat Associated area

4. Linker Errors and Warnings

Describes the error and warning messages for the linker, `armlink`.

4.1 Suppressing armlink error and warning messages

You can use command-line options to suppress or downgrade some of the diagnostic messages that the linker produces.

All linker warnings are suppressible with `--diag_suppress`. For example:

```
--diag_suppress 6306
```



Reducing the severity of diagnostic messages might prevent the tool from reporting important faults. Arm recommends that you do not reduce the severity of diagnostics unless you understand the impact on your software.

Some errors such as L6220E, L6238E and L6784E can be downgraded to a warning by using:

```
--diag_warning
```

Related information

`--diag_suppress=tag[,tag,...]` (`armlink`)

4.2 List of the armlink error and warning messages

A list of the error and warning messages that `armlink` produces.



License-related error messages can be found in the [List of the licensing error and warning messages](#) section.

L6000U: Out of memory.

For more details on why you might see this error and possible solutions, see the description for error L6815U.

L6001U: Could not read from file <filename>.

L6002U: Could not open file <filename>: <reason>

This indicates that the linker was unable to open a file specified on the linker command line. This can indicate a problem accessing the file or a fault with the command line. Some common examples of this message are:

- L6002U: Could not open file /armlib/<libname>: No such file or directory
Specify the library path with `--libpath`.
- Error : armlink : L6002: Could not open file errors=ver.txt This error is caused by a missing double-dash (--) in front of errors=ver.txt. If you do not prefix options with -- or -, the linker treats them as input files and fails the link step because it is unable to load all the specified files.

See `--libpath=pathlist` in the `armlink` documentation.

See [Toolchain environment variables](#) in the *Arm Compiler for Embedded User Guide*.

L6003U: Could not write to file <filename>.

An file I/O error occurred while reading, opening, or writing to the specified file.

L6004U: Incomplete library member list <list> for <library>.

This can occur if there is whitespace in the list of library objects.

The following example fails with Fatal error: L6004U: Missing library member in member list for x.lib:

```
armlink x.lib(foo.o, bar.o)
```

The following example succeeds:

```
armlink x.lib(foo.o,bar.o)
```

Another less common cause is a corrupt library, or possibly a library in an unsupported format.

L6005U: Extra characters on end of member list for <library>.

L6006U: Overalignment value not specified with OVERALIGN attribute for execution region <regionname>.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Syntax of an input section description](#).
- [Alignment of execution regions and input sections](#).

L6007U: Could not recognize the format of file <filename>.

The linker can recognize object files in ELF format and library files in AR format. The specified file is either corrupt, or is in a file format that the linker cannot recognize.

L6008U: Could not recognize the format of member <mem> from <lib>.

The linker can recognize library member objects in the ELF file format. The specified library member is either corrupt, or is in a file format that the linker cannot recognize.

L6009U: File <filename> : Endianness mismatch.

The endianness of the specified file or object did not match the endianness of the other input files. The linker can handle input of either big endian or little endian objects in a single link step, but not a mixed input of some big and some little endian objects.

L6010U: Could not reopen stderr to file <filename>: <reason>

An file I/O error occurred while reading, opening, or writing to the specified file.

L6011U: Invalid integer constant : <number>.

Specifying an illegal integer constant causes this. An integer can be entered in hexadecimal format by prefixing `&`, `0x`, or `0X`.

L6015U: Could not find any input files to link.

The linker must be provided with at least one object file to link.

For example, the linker reports this error if you try to link with:

```
armlink lib.a -o foo.axf
```

You must instead use, for example:

```
armlink foo_1.o foo_2.o lib.a -o foo.axf
```

L6016U: Symbol table missing/corrupt in object/library <object>.

This message can occur when linking with libraries built with the GNU tools, because GNU `ar` can generate incompatible information.

The workaround is to replace `ar` with `armar` and use the same command-line arguments. Alternatively, the error is recoverable by using `armar -s` to rebuild the symbol table.

L6017U: Library <library> symbol table contains an invalid entry, no member at offset 0x<offset>.

The library might be corrupted. Try rebuilding it.

L6018U: <filename> is not a valid ELF file.

L6019U: <filename> is not a valid 64 bit ELF file.

L6020U: <filename> is not a valid 32 bit ELF file.

L6022U: Object <objname> has multiple <table>.

The object file is faulty or corrupted. This might indicate a compiler fault. Contact your supplier.

L6024U: Library <library> contains an invalid member name.

The file specified is not a valid library file, is faulty or corrupted. Try rebuilding it.

L6025U: Cannot extract members from a non-library file <library>.

The file specified is not a valid library file, is faulty or corrupted. Try rebuilding it.

L6026U: ELF file <filename> has neither little or big endian encoding

The ELF file is invalid. Try rebuilding it.

L6027U: Relocation #<rel_class>:<rel_number> in <objname>(<secname>) has invalid/unknown type.

This might indicate a compiler fault. Contact your supplier.

L6028U: Relocation #<rel_class>:<rel_number> in <objname>(<secname>) has invalid offset.

This might indicate a compiler fault. Contact your supplier.

L6029U: Relocation #<rel_class>:<rel_number> in <objname>(<secname>) is wrt invalid/missing symbol.

The relocation is with respect to a symbol that is either:

- invalid or missing from the object symbol table
- a symbol that is not suited to be used by a relocation.

This might indicate a compiler fault. Contact your supplier.

L6030U: Overallignment <overallignment> for region <regname> must be at least 4 and a power of 2

See [Execution region attributes](#) in the *Arm Compiler for Embedded Reference Guide*.

- [Syntax of an input section description](#).
- [Alignment of execution regions and input sections](#).

L6031U: Could not open scatter description file <filename>: <reason>

An I/O error occurred while trying to open the specified file. This could be because of an invalid filename.

L6032U: Invalid <text> <value> (maximum <max_value>) found in <object>

L6033U: Symbol <symbolname> in <objname> is defined relative to an invalid section.

L6034U: Symbol <symbolname> in <objname> has invalid value.

This message is most often caused by a section-relative symbol having a value that exceeds the section boundaries.

L6035U: Relocation #<rel_class>:<rel_number> in ZI Section <objname>(<secname>) has invalid type.

ZI Sections cannot have relocations other than of type R_ARM_NONE.

L6036U: Could not close file <filename>: <reason>

An I/O error occurred while closing the specified file.

L6037U: '<arg>' is not a valid argument for option '<option>'.

The argument is not valid for this option. This could be because of a spelling error, or because of the use of an unsupported abbreviation of an argument.

L6038U: Could not create a temporary file to write updated SYMDEFS.

An I/O error occurred while creating the temporary file required for storing the SYMDEFS output.

L6039W: Relocation from #<rel_class>:<rel_number> in <objname>(<secname>) with respect to <symname>. Skipping creation of R-type relocation. No corresponding R-type relocation exists for type <rel_type>.

--reloc is used with objects containing relocations that do not have a corresponding R-type relocation.

L6041U: An internal error has occurred (<clue>).

Contact your supplier.

L6042U: Relocation #<rel_class>:<rel_number> in <objname>(<secname>) is wrt a mapping symbol(#<idx>, Last Map Symbol = #<last>).

Relocations with respect to mapping symbols are not permitted. This might indicate a compiler fault. Contact your supplier.

L6043U: Relocation #<rel_class>:<rel_number> in <objname>(<secname>) is with respect to an out of range symbol(#<val>, Range = 1-<max>).

Relocations can only be made with respect to symbols in the range (1-n), where n is the number of symbols.

L6047U: The size of this image (<actual_size> bytes) exceeds the maximum allowed for this version of the linker

L6048U: Invalid input. This variant of Arm Compiler is licensed only for use with <toolkit>.

L6049U: The linker is unable to continue the link step (<id>). This version of the linker will not link with one or more given libraries.

L6050U: The code size of this image (<actual_size> bytes) exceeds the maximum allowed for this version of the linker.

L6064E: ELF Executable file <filename> given as input on command line

This might be because you specified an object file as output from from the compiler without specifying the -c compiler option. For example:

```
armclang --target aarch64-arm-none-eabi file.c -o file.o
```

```
armlink file.o -o file.axf
```

L6065E: Load region <name> (size <size>) is larger than maximum writable contiguous block size of 0x80000000.

The linker attempted to write a segment larger than 2GB. The size of a segment is limited to 2GB.

L6077E: Region table entry for region <region> is missing.

armlink generates a region table entry in preparation for adding sections at a later stage in its processing. You might have placed an object in an execution region that is also used for linker-generated sections, such as veneers to enable long branches. If this object is removed by the unused section elimination feature of the linker, then the linker also removes the region table entry associated with this execution region. Subsequently, when the linker later attempts to assign linker-generated sections to the execution region, it cannot.

To prevent `armlink` from removing the region table entry, link with either the `armlink` option `--no-remove` OR `--keep`.

For more information, see the following in the *Arm Compiler Reference Guide*:

- [--keep=section_id \(armlink\)](#).
- [--remove, --no_remove](#).
- [Scatter-loading Features](#).
- [Scatter File Syntax](#).

L6089E: Execution Region <exec_regname> appears after ZI data in Load Region <load_regname>. With option <option>, all ZI data must be at the end of the Load Region.

You must modify your scatter-file to place all execution regions containing `ZI` data at the end of the load region.

L6099E: <attribute> region attribute is not allowed in SysV.

The specified execution region attribute is not allowed in SysV. For example:

```
Error: L6099E: OVERLAY region attribute is not allowed in SysV.
Error: L6099E: PI region attribute is not allowed in SysV.
Error: L6099E: RELOC region attribute is not allowed in SysV.
```

L6102E: <region> region is not allowed in SysV

You have specified the `armlink` option `--sysv` with `--scatter`, and the scatter file contains one of the following execution regions:

- `ARM_LIB_STACK`
- `ARM_LIB_HEAP`
- `ARM_LIB_STACKHEAP`

To use scatter files containing these region names in the bare-metal context, you must also specify the `--bare-metal-sysv` option. For more information, see [--bare_metal_sysv](#).

L6109E: Execution Region <regname> does not immediately follow from previous Execution Region or from its load address. With option <option>, all non-EMPTY Execution Regions must be root regions.

Your scatter file contains execution regions without the `EMPTY` attribute. Such non-`EMPTY` execution regions must be root regions when linking with `--paged` OR `--sysv`.



EMPTY execution regions can be non-root regions.

Note

For more information, see:

- [Execution region attributes](#).
- [--paged](#).

- [--sysv](#).

L6110W: Composition of BTI and non-BTI objects detected. The PACBTI-M library variant has been selected. Use --info=bti to print out the list of objects with their corresponding BTI mark.

You are linking mixed BTI and non-BTI user objects without specifying the `--library_security=pacbti-m` option. For more information, see:

- [--info=topic\[,topic,...\]](#) (armlink).
- [--library_security=protection](#).
- [--require-bti](#).

L6111E: Composition of BTI and non-BTI objects detected. Use --info=bti to print out the list of objects with their corresponding BTI mark.

You are linking mixed BTI and non-BTI user objects with `--require-bti`, but without specifying the `--library_security=pacbti-m` option. For more information, see:

- [--info=topic\[,topic,...\]](#) (armlink).
- [--library_security=protection](#).
- [--require-bti](#).

L6123E: LTO bitcode in <objname> was generated by an incompatible version of armclang

You have attempted to link objects containing bitcode for *Link-Time Optimization* (LTO) that were created by different versions of the compiler. Any objects or libraries created for LTO must all be compiled and linked with the same Arm® Compiler for Embedded version.

L6134E: LTO module created from LLVM bitcode in <objname>(<llvmbitcode>) could not be added to the codegen.

A general error that is generated when a problem with LTO occurs. `<llvmbitcode>` is either `.llvm.bc` or `.llvm.lto` depending on the Arm Compiler for Embedded version use to create the object `<objname>`. Arm Compiler for Embedded version 6.21 and later uses `.llvm.lto`. You must compile and link all objects and libraries with the same Arm Compiler for Embedded version.

You might also see another error that points to a specific issue. See [Restrictions with Link-Time Optimization](#) in the *Arm Compiler for Embedded User Guide* for more information.

L6137E: Symbol <symname> was not preserved by the LTO codegen but is needed by the image.

L6142W: Composition of PAC and non-PAC objects detected. Use --info=pac to print out the list of objects with their corresponding PAC mark.

You have linked mixed PAC objects and non-PAC objects, and used the `--check_pac_mismatch` linker option to ask for a warning in that situation. See:

- [--info=topic\[,topic,...\]](#) (armlink).
- [--library_security=protection](#).
- [--check_pac_mismatch](#).

L6175E: EMPTY region <regname> cannot have any section selectors.

You have an execution region in a scatter file that has the `EMPTY` attribute assigned, and that region contains section selectors.

For more information, see [Execution region attributes](#).

L6176E: A negative max_size cannot be used for region <regname> without the EMPTY attribute.

Only regions with the `EMPTY` attribute are permitted to have a negative `max_size`.

L6177E: A negative max_size cannot be used for region <regname> which uses the +offset form of base address.

Regions using the `+offset` form of base address are not permitted to have a negative `max_size`.

L6188E: Special section <sec1> multiply defined by <obj1> and <obj2>.

A special section is one that can only be used once, such as `"Veneer$$Code"`.

L6195E: Cannot specify both '<attr1>' and '<attr2>' for region <regname>

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Load region attributes](#).
- [Execution region attributes](#).
- [Inheritance rules for load region address attributes](#).
- [Inheritance rules for execution region address attributes](#).
- [Inheritance rules for the RELOC address attribute](#).

L6200E: Symbol <symbolname> multiply defined by <object1> and <object2>.

A common example of this:

```
Symbol __stdout multiply defined (by retarget.o and stdio.o).
```

This means that there are two conflicting definitions of `__stdout` present in `retarget.o` and `stdio.o`. The one in `retarget.o` is your own definition. The one in `stdio.o` is the default implementation, which was probably linked-in inadvertently.

`stdio.o` contains a number of symbol definitions and implementations of file functions like `fopen`, `fclose`, and `fflush`.

`stdio.o` is being linked-in because it satisfies some unresolved references.

To identify why `stdio.o` is being linked-in, you must use the `--verbose` link option switch. For example:

```
armlink [... your normal options...] --verbose --list err.txt
```

Then study `err.txt` to see exactly what the linker is linking in, from where, and why.

You might have to either:

- eliminate the calls like `fopen`, `fclose`, and `fflush`
- reimplement the `_sys_XXXX` family of functions.

See [Tailoring input output functions in the C and C++ libraries](#) in the *Arm Compiler for Embedded Arm C and C++ Libraries and Floating-Point Support User Guide*.

L6201E: Object <objname> contains multiple entry sections.

The input object specifies more than one entry point. Use the `--entry` command-line option to select the entry point to use.

See `--entry=location` in the *Arm Compiler for Embedded Reference Guide*.

L6202E: <objname>(<secname>) cannot be assigned to non-root region '<regionname>'

A root region is a region that has an execution address the same as its load address. The region does not therefore require moving or copying by the scatter-load initialization code.

Certain sections must be placed in a root region in the image, including:

- `__main.o`.
- The linker-generated table (`Region$$Table`).
- Scatter-loading (`__scatter*.o`) objects from the library.
- Decompressor (`__dc*.o`) objects from the library.

If a required section is not placed in a root region, the linker reports, for example:

```
anon$$obj.o(Region$$Table) cannot be assigned to a non-root region 'RAM'.
```

You can use `InRoot$$Sections` to include all required sections in a root region:

```
ROM_LOAD 0x0000 0x4000
{
    ROM_EXEC 0x0000 0x4000 ; root region
    {
        vectors.o (Vect, +FIRST) ; Vector table
        * (InRoot$$Sections) ; All library sections
                                ; that must be in a root region
                                ; for example, __main.o, __scatter*.o,
                                ; dc*.o and * Region$$Table
    }
    RAM 0x10000 0x8000
    {
        * (+RO, +RW, +ZI) ; all other sections
    }
}
```

L6203E: Entry point (<address>) lies within non-root region <regionname>.

The image entry point must correspond to a valid instruction in a root-region of the image.

L6204E: Entry point (<address>) does not point to an instruction.

The image entry point you specified with the `--entry` command-line option must correspond to a valid instruction in the root-region of the image.

See `--entry=location` in the *Arm Compiler for Embedded Reference Guide*.

L6205E: Entry point (<address>) must be word aligned for ARM instructions.

This message is displayed because the image entry point you specified with the `--entry` command-line option is not word-aligned. For example, you specified `--entry=0x8001` instead of `--entry=0x8000`.

See [--entry=location](#) in the *Arm Compiler for Embedded Reference Guide*.

L6206E: Entry point (<address>) lies outside the image.

The image entry point you specified with the `--entry` command-line option is outside the image. For example, you might have specified an entry address of `0x80000` instead of `0x8000`, as follows:

```
armlink --entry=0x80000 test.o -o test.axf
```

See [--entry=location](#) in the *Arm Compiler for Embedded Reference Guide*.

L6208E: Invalid argument for --entry command: '<arg>'

See [--entry=location](#) in the *Arm Compiler for Embedded Reference Guide*.

L6209E: Invalid offset constant specified for --entry (<arg>)

See [--entry=location](#) in the *Arm Compiler for Embedded Reference Guide*.

L6210E: Image cannot have multiple entry points. (<address1>,<address2>)

One or more input objects specifies more than one entry point for the image. Use the `--entry` command-line option to select the entry point to use.

See [--entry=location](#) in the *Arm Compiler for Embedded Reference Guide*.

L6211E: Ambiguous section selection. Object <objname> contains more than one section.

This can occur when using the linker option `--keep` on an assembler object that contains more than one `AREA`. The linker must know which `AREA` you want to keep.

To solve this, use more than one `--keep` option to specify the names of the `AREAs` to keep, such as:

```
--keep boot.o(vectors) --keep boot.o(resethandler) ...
```



Note

Using assembler files with more than one `AREA` might give other problems elsewhere, so such use is best avoided.

L6213E: Multiple First section <object2>(<section2>) not allowed. <object1>(<section1>) already exists.

Only one `FIRST` section is permitted.

L6214E: Multiple Last section <object2>(<section2>) not allowed. <object1>(<section1>) already exists.

Only one `LAST` section is permitted.

L6215E: Ambiguous symbol selection for --First/--Last. Symbol <symbol> has more than one definition.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [--first=section_id](#)
- [--last=section_id](#)

L6216E: Cannot use base/limit symbols for non-contiguous section <secname>

The exception handling index tables that are generated by the compiler are placed in SHT_ARM_EXIDX sections. For more information, see [Exception Handling ABI for the Arm Architecture - ABI 2020Q3](#).

At link time these tables must be placed in the same execution region and be contiguous. If you explicitly place these sections non-contiguously using specific selector patterns in your scatter file, then this error message is likely to occur. For example:

```
LOAD_ROM 0x00000000
{
  ER1 0x00000000
  {
    file1.o (+RO) ; from a C++ source
    * (+RO)
  }
  ER2 0x01000000
  {
    file2.o (+RO) ; from a C++ source
  }
  ER3 +0
  {
    * (+RW, +ZI)
  }
}
```

This might produce the following error if exception handling index tables are in both `file1.o` and `file2.o`, because the linker cannot place them in separate regions:

```
Error: L6216E: Cannot use base/limit symbols for non-contiguous
section .ARM.exidx
```

Also, the `.init_array` sections must be placed contiguously within the same region for their base and limit symbols to be accessible.

The correct code is:

```
LOAD_ROM 0x00000000
{
  ER1 0x00000000
  {
    file1.o (+RO) ; from a C++ source
    * (0x70000001) ; The exception handling index tables must be placed
                  ; explicitly in a single region. We use 0x70000001,
                  ; the identifier of SHT_ARM_EXIDX, to collect all the
                  ; exception tables into this execution region.
    *.init_array ; Section .init_array must be placed
                  ; explicitly, otherwise it is shared between
                  ; two regions and the linker is unable to
                  ; decide where to place it.
  }
}
```



```

    * (+RO)
}
ER2 0x01000000
{
    file2.o (+RO)    ; from a C++ source
}
ER3 +0
{
    * (+RW, +ZI)
}
}

```

In this example, the base and limit symbols are contained in `.init_array` in a single region.

See [C++ initialization, construction and destruction](#) in the *Arm Compiler for Embedded Arm C and C++ Libraries and Floating-Point Support User Guide*.

L6217E: Relocation #<rel_class>:<rel_number> in <objname>(<secname>) with respect to <symbol>. R_ARM_SBREL32 relocation to imported symbol

L6218E: Undefined symbol <symbol> (referred from <objname>).

Some common examples of this are:

- User Error. There is a reference to an undefined or incorrectly defined symbol.
- Undefined symbol `__ARM_switch8` or `__ARM_ll_<xxxx>` functions

The helper functions are automatically generated into the object file by the compiler.



Note

An undefined reference error can, however, still be generated if linking objects from legacy projects where the helper functions are in the `h_<xxx>` libraries (`h` indicates that these are compiler helper libraries, rather than standard C library code).

Re-compile the object or ensure that these libraries can be found by the linker.

- When attempting to refer to a function or entity in C from a function or entity in C++. This error is caused by C++ name mangling. To avoid this situation, mark C functions with `extern "C"`.
- Undefined symbol `thunk{v:0,-44} to Foo_i::~~Foo_i()` (referred from `Bar_i.o`)

The symbol `thunk{v:0,-44} to Foo_i::~~Foo_i()` is a wrapper function round the regular `Foo_i::~~Foo_i()`.

`Foo_i` is a derived class of some other base class, therefore:

- it has a base-class vtable for when it is referred to by a pointer to that base class
- the base-class vtable has an entry for the `thunk`
- the destructor `thunk` is output when the actual (derived class) destructor is output.

Therefore, to avoid the error, ensure this destructor is defined.

- Undefined symbol `main` (referred from `kernel.o`) The linker is reporting that your application does not include a `main()` function.
- Consider a project containing the following `functions.c` program:

```
void func_c( void ) ;

void func_b( void )
{
    func_c( ) ;
}
```

`func_b()` is not referenced in the project and `func_c()` is not implemented.

When linking, `armlink` might remove `func_b()` during unused section elimination. However, references made by `func_b()` still remain, and `armlink` always reports `func_c()` as an unresolved symbol.

`armlink` always produces this L6218E error, even if `func_b()` is removed by unused section elimination. The reason is because unused section elimination is an optimization and the program must not rely on an optimization for correctness. This behavior is different to open-source linkers that usually only give an undefined symbol error if the symbol is directly referred to by the program.

To workaround this issue, define the symbol `func_c()`. You do not have to fully implement it. Using a `symdefs` file is sufficient. See [Access symbols in another image](#).

L6219E: <type> section <object1>(<section1>) attributes <attributes> incompatible with neighboring section <object2>(<section2>).

This error occurs when the default ordering rules used by the linker (RO followed by RW followed by ZI) are violated. This typically happens when one uses `+FIRST` or `+LAST`, for example in a scatter file, attempting to force RW before RO.

L6220E: <type> region <regionname> size (<size> bytes) exceeds limit (<limit> bytes).

Example:

```
Execution region ROM_EXEC size (4208184 bytes) exceeds limit (4194304 bytes).
```

This error can occur where a region is given an (optional) maximum length in the scatter file, but the size of the code and data being placed in that region has exceeded the limit. You can suppress this error with `--diag_suppress 6220`.

For example, this error might occur when using `.ANY<num>` selectors with the `ALIGN` directive in a scatter file to force the linker to insert padding. You might be able to fix this using the `--any_contingency` option.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Manual placement of unassigned sections](#).
- `--any-contingency`.
- `--diag_error=tag[,tag,...]` (`armlink`).

L6221E: <type1> region <regionname1> with <addrtype1> range [<base1>,<limit1>) overlaps with <type2> region <regionname2> with <addrtype2> range [<base2>,<limit2>).

This error can occur even though information in the scatter-loading description file and map information generated by the linker indicate that the execution regions do not overlap.

Example test.s file:

```
AREA areal, CODE
BX lr

AREA area2, READWRITE, NOINIT
SPACE 10

AREA area3, READWRITE
DCD 10
END
```

Example scatter.txt file:

```
LR1 0x8000
{
  ER1 +0
  {
    *(+ro)
  }
  ER2 +0
  {
    *(+zi)
  }
  ER3 +0
  {
    *(+rw)
  }
}
```

Build with:

```
armasm test.s
armlink -o test.axf --scatter scatter.txt test.o
```

armlink generates:

Warning: L6221E: Execution region ER2 with Execution range [0x00008004,0x00008010) overlaps with Execution region ER3 with Load range [0x00008004,0x00008008).

The linker might emit warning message L6221E when an execution region base address overlaps with the load address of another region. This could be due to an incorrect scatter file. The memory map of the image has a load view and an execution view, described by the scatter-loading file. A non-ZI section must have a unique load address and in most cases must have a unique execution address. The linker does not assign space to ZI execution regions. Therefore this warning might be because a load region LR2 with a relative base address immediately follows a ZI execution region in a load region LR1.

Because the overlapping part might not have real code or data inside, the warning might be harmless. You can use the following linker options to find out the addresses of each region, and any regions that overlap with a load region:

```
--load_addr_map_info --map --list=map.txt
```

You can do one of the following:

- Ignore the warning, only if after analysis it is possible to determine that the execution region is not going to corrupt the load region that has not yet been copied to its execution region address. Also, debug the application to confirm that it initializes and executes correctly.
- Adjust the base addresses of the execution regions.
- Use the `FIXED` scatter-loading attribute to make the load regions and execution regions have the same base addresses.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Scatter files containing relative base address load regions and a ZI execution region.](#)
- [Execution region attributes.](#)
- [Effect of the `FIXED` attribute on a root region.](#)

L6222E: Partial object cannot have multiple ENTRY sections, <e_>(<e_>) and <oname>(<sname>).

Where objects are being linked together into a partially-linked object, only one of the sections in the objects can have an entry point.



It is not possible in this case to use the linker option `--entry` to select one of the entry points.

L6223E: Ambiguous selectors found for <objname>(<secname>) from Exec regions <region1> and <region2>.

This error occurs if the scatter file specifies <objname>(<secname>) to be placed in more than one execution region. This can occur accidentally when using wildcards (*). The solution is to make the selections more specific in the scatter file.

L6224E: Could not place <objname>(<secname>) in any Execution region.

This error occurs if the linker cannot match an input section to any of the selectors in your scatter file. You must correct your scatter file by adding an appropriate selector.

See [Section placement with the linker](#) in the *Arm Compiler for Embedded Reference Guide*.

L6225E: Number <str...> is too long.

L6226E: Missing base address for region <regname>.

L6227E: Using `--reloc` with `--rw-base` without `--split` is not allowed.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [--reloc.](#)
- [--ro_base=address.](#)
- [--split.](#)

L6228E: Expected '<str1>', found '<str2>'.

L6229E: Scatter description <file> is empty.

L6230E: Multiple execution regions (<region1>,<region2>) cannot select <secname>.

L6231E: Missing module selector.

L6232E: Missing section selector.

L6233E: Unknown section selector '+<selector>'.

L6234E: <ss> must follow a single selector.

For example, in a scatter file:

```
:
* (+FIRST, +RO)
:
```

+FIRST means place this (single) section first. Selectors that can match multiple sections (for example, +RO or +ENTRY) are not permitted to be used with +FIRST (or +LAST). If used together, the error message is generated.

L6235E: More than one section matches selector - cannot all be FIRST/LAST.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Section placement with the FIRST and LAST attributes.](#)
- [Syntax of an input section description.](#)

L6236E: No section matches selector - no section to be FIRST/LAST.

The scatter file specifies a section to be +FIRST or +LAST, but that section does not exist, or has been removed by the linker because it believes it to be unused. Use the linker option `--info unused` to reveal which objects are removed from your project. Example:

```
ROM_LOAD 0x00000000 0x4000
{
  ROM_EXEC 0x00000000
  {
    vectors.o (Vect, +First) << error here
    * (+RO)
  }
  RAM_EXEC 0x40000000
  {
    * (+RW, +ZI)
  }
}
```

Some possible solutions are:

- Ensure `vectors.o` is specified on the linker command line.

- Link with `--keep vectors.o` to force the linker not to remove this, or switch off this optimization entirely, with `--no_remove`. Arm does not recommend this.

You might also encounter this error when linking against a static library. When the name of a library is specified to the linker, the objects within the library are loaded on-demand, so it is possible that objects referred to by the scatter file have not been loaded. Some possible solutions are:

- Use the `--verbose` option to discover what objects the linker has extracted from libraries.
- If you know the name of a specific object within a library you can ensure it is loaded by specifying it explicitly. For example, if `foo.o` is in `lib.a` then you can specify `lib.a(foo.o)` on the linker command line rather than `lib.a` to ensure that `foo.o` is loaded.

See the following in the `armlink` documentation:

- [Section placement with the FIRST and LAST attributes.](#)
- `--entry=location`.
- `--info=topic[,topic,...]` (`armlink`).
- `--keep=section_id` (`armlink`).
- `--remove`, `--no_remove`.
- [Syntax of an input section description.](#)
- [Specifying user libraries when linking.](#)

See [ENTRY directive](#) in the `armasm` documentation.

L6237E: <objname>(<secname>) contains relocation(s) to unaligned data.

L6238E: <objname>(<secname>) contains invalid call from '<attr1>' function to '<attr2>' function <sym>.

This error is generated when *Application Binary Interface* (ABI) incompatibilities exist, such as:

- Attempting to link RWPI code with non-RWPI code.
- A function that does not preserve eight-byte alignment calls a function that requires eight-byte alignment.

Example of a stack alignment conflict

This linker error is given when you specify the `--strict_preserve8_require8` option and a stack alignment conflict is detected in object code. The *ABI for the Arm Architecture* suggests that code maintains eight-byte stack alignment at its interfaces. This alignment permits efficient use of `LDRD` and `STRD` instructions to access eight-byte aligned `double` and `long long` data types.

Symbols such as `~PRES8` and `REQ8` are used in place of Build Attributes of the objects:

- `PRES8` means that the object preserves eight-byte alignment of the stack.
- `~PRES8` means that the object does not preserve eight-byte alignment of the stack (~ meaning NOT).

- `REQ8` means that the object requires eight-byte alignment of the stack.

This link error typically occurs in the following cases:

- You are assembling code that does not preserve eight-byte stack alignment and that code calls compiled C/C++ code that requires eight-byte stack alignment.
- You are attempting to link legacy objects that have been compiled with older tools with objects that are compiled with recent tools. Legacy objects that do not have these attributes are treated as `~PRES8`, even if they do preserve eight-byte alignment.

For example:

```
Error: L6238E: foo.o(.text) contains invalid call from '~PRES8 (The user
did not require code to preserve 8-byte alignment of 8-byte data objects)'
function to 'REQ8 (Code was permitted to depend on the 8-byte alignment of
8-byte data items)' function bar.
```

This error means that a function (in the object `foo.o`, section `.text`) that does not preserve eight-byte stack alignment, is trying to call function `bar` that requires eight-byte stack alignment.

A similar warning that might be encountered is:

```
Warning: L6306W: '~PRES8' section foo.o(.text) should not use the address
of 'REQ8' function bar
```

Where the address of an external symbol is being referred to.

There are two possible solutions to work around this issue:

- Rebuild all your objects and libraries.

If you have any assembler files, you must check that all instructions preserve eight-byte stack alignment, and if necessary, correct them.

For example, change:

```
STMFD sp!, {r0-r3, lr} ; push an odd number of registers
```

to

```
STMFD sp!, {r0-r3, r12, lr} ; push even number of registers
```

If all instructions preserve eight-byte stack alignment, then `armasm` automatically marks the object as preserving eight-byte alignment of the stack. Therefore, it is no longer necessary to add the `PRESERVE8` directive to the top of each `armasm`-style assembler file.

The `armclang` integrated assembler does not automatically mark an object as preserving eight-byte alignment of the stack. Therefore, you must check that your GNU-style assembly code preserves eight-byte stack alignment. If it does, then add the following directive to your assembly code:

```
.eabi_attribute Tag_ABI_align_preserved, 1
```

- You might have legacy objects and libraries that cannot be rebuilt for the following reasons:
 - You do not have the source code.
 - The old objects must not be rebuilt (for example, for qualification and certification reasons).

If you have objects and libraries that cannot be rebuilt, then you must inspect them to check whether they preserve eight-byte alignment or not.

Use `fromelf -c` to disassemble the object code.

If your objects do preserve eight-byte alignment, then you can suppress the linker error L6238E with the use of `--diag_suppress 6238` on the linker command line.

By using the `--diag_suppress 6238` option, you are guaranteeing that these objects preserve eight-byte alignment.

The linker warning L6306W is suppressible with `--diag_suppress 6306`.

See also [--strict_preserve8_require8](#) in the *Arm Compiler for Embedded Reference Guide*.

L6239E: Cannot call non-interworking <t2> symbol '<sym>' in <obj2> from <t1> code in <obj1>(<sec1>)

Example:

```
Cannot call non-interworking ARM symbol 'ArmFunc' in object foo.o from THUMB
code in bar.o(.text)
```

This problem can be caused by `foo.c` not being compiled with the option `--apcs /interwork`, to enable A32 code to call T32 code (and T32 to A32) by linker-generated interworking veneers.

L6241E: <objname>(<secname>) cannot use the address of '<attr1>' function <sym> as the image contains '<attr2>' functions.

When linking with `--strict`, the linker reports conditions that might fail as errors, for example:

```
Error: L6241E: foo.o(.text) cannot use the address of '~IW' function main as
the image contains 'IW' functions.
```

`iw` means interworking, and `~iw` means non-interworking.

L6242E: Cannot link object <objname> as its attributes are incompatible with the image attributes.

Each object file generated by the compilation tools includes a set of attributes that indicates the options that it was built with. The linker checks the attributes of each object file it processes. If it finds attributes that are incompatible with those of object files it has loaded previously, it generates this error.

There are two common reasons for this error:

- Object files compiled with incompatible options. For example:
 - attempting to link one file compiled for Cortex®-A processors, with another file compiled for Cortex-M processors.
 - attempting to link files that have incompatible FPU options.
- Linking objects that have been compiled with an older toolchain that uses an incompatible ABL.

L6243E: Selector only matches removed unused sections - no section to be FIRST/LAST.

All sections matching this selector have been removed from the image because they were unused. For more information, use `--info unused`.

L6244E: <type> region <regionname> address (<addr>) not aligned on a <align> byte boundary.

L6245E: Failed to create requested ZI section '<name>'.

L6248E: <objname>(<secname>) in <attr1> region '<r1>' cannot have <rtype> relocation to <symname> in <attr2> region '<r2>'.

This error can occur when you are trying to build *Position Independent* (PI) code. Consider, for example the following program, `pi.c`:

```
#include <stdio.h>

const char *str = "test";
int main(void)
{
    printf ("%s",str);
}
```

Compile and link this code with:

```
armclang -c --target=arm-arm-none-eabi -march=armv7-a -fropi -frwpi -fno-rwpi-  
lowering -fno-ropi-lowering pi.c
```

The linker reports the following error message:

```
Error: L6248E: pi.o(.data) in PI region 'ER_RW' cannot have address type  
relocation to .conststring in PI region 'ER_RO'.
```

This error occurs because the compiler generates a global pointer `str` that must be initialized to the address of the string in the `.conststring` section. However, absolute addresses cannot be used in a PI system, so the link step fails.

To resolve this, you must re-write the code to avoid the explicit pointer. You can do this using either of the following methods:

- Use a global array instead of a global pointer, for example:

```
#include <stdio.h>
const char str[] = "test";
int main(void)
{
    printf ("%s",str);
}
```

- Use a local pointer instead of a global pointer, for example:

```
#include <stdio.h>
int main(void)
{
    const char *str = "test";
    printf ("%s",str);
}
```

If you are using an array of pointers, such as:

```
const char * list[] = {"zero", "one", "two"};
```



Note

the linker reports a separate error for each element in the array. In this case, Arm recommends you declare a two dimensional array for the list, with the first dimension as the number of elements in the array, and the second dimension as the maximum size of an element in the array, for example:

```
char list[3][5] = {"zero", "one", "two"};
```

You must change the `printf()` statement to, for example:

```
printf("%s", list[1]);
```

L6249E: Entry point (<address>) lies within multiple sections.

L6250E: Object <objname> contains illegal definition of special symbol <symbol>.

L6251E: Object <objname> contains illegal reference to special symbol <symbol>.

L6252E: Invalid argument for --xreffrom/--xref to command: '<arg>'

L6253E: Invalid SYMDEF address: <number>.

L6254E: Invalid SYMDEF type : <type>.

The content of the symdefs file is invalid.

See [Symdefs file format](#) in the *Arm Compiler for Embedded Reference Guide*.

L6255E: Could not delete file <filename>: <reason>

An I/O error occurred while trying to delete the specified file. The file was either read-only, or was not found.

L6257E: <object>(<secname>) cannot be assigned to overlaid Execution region '<ername>'.

This message indicates a problem with the scatter file.

See [Scatter File Syntax](#) in the *Arm Compiler for Embedded Reference Guide*.

L6258E: Entry point (<address>) lies in an overlaid Execution region.

This message indicates a problem with the scatter file.

See [Scatter File Syntax](#) in the *Arm Compiler for Embedded Reference Guide*.

L6259E: Reserved Word '<name>' cannot be used as a <type> region name.

<name> is a reserved word, so choose a different name for your region.

L6260E: Multiple load regions with the same name (<regionname>) are not allowed.

This message indicates a problem with the scatter file.

See [Scatter File Syntax](#) in the *Arm Compiler for Embedded Reference Guide*.

L6261E: Multiple execution regions with the same name (<regionname>) are not allowed.

This message indicates a problem with the scatter file.

See [Scatter File Syntax](#) in the *Arm Compiler for Embedded Reference Guide*.

L6263E: <addr> address of <regionname> cannot be addressed from <pi_or_abs> Region Table in <regtabregionname>

The Region Table contains information used by the C-library initialization code to copy, decompress, or create ZI. This error message is given when the scatter file specifies an image structure that cannot be described by the Region Table.

The error message is most common when PI and non-PI load regions are mixed in the same image.

L6265E: Non-PI Section <obj>(<sec>) cannot be assigned to PI Exec region <er>.

This might be caused by explicitly specifying the wrong Arm library on the linker command-line. Either:

- Remove the explicit specification of the Arm library.
- Replace the library, for example, `c_t.1`, with the correct library.

L6266E: RWPI Section <obj>(<sec>) cannot be assigned to non-PI Exec region <er>.

A file compiled with `--apcs=/rwp` is placed in an execution region that does not have the PI attribute.

L6271E: Two or more mutually exclusive attributes specified for Load region <regname>

This message indicates a problem with the scatter file.

L6272E: Two or more mutually exclusive attributes specified for Execution region <regname>

This message indicates a problem with the scatter file.

L6273E: Section <objname>(<secname>) has mutually exclusive attributes (READONLY and ZI)

This message indicates a problem with the object file.

L6275E: COMMON section <obj1>(<sec1>) does not define <sym> (defined in <obj2>(<sec2>))

Given a set of COMMON sections with the same name, the linker selects one of them to be added to the image and discards all others. The selected COMMON section must define all the symbols defined by any rejected COMMON section, otherwise a symbol that was defined by a rejected section would become undefined again. The linker generates an error if the selected copy does not define a symbol that a rejected copy does. This error is normally caused by a compiler fault. Contact your supplier.

L6276E: Address <addr> marked both as <s1>(from <sp1>(<obj1>) via <src1>) and <s2>(from <sp2>(<obj2>) via <src2>).

The image cannot contain contradictory mapping symbols for a given address, because the contents of each word in the image are uniquely typed as A32 (\$a) or T32 (\$t) code, DATA (\$d), or NUMBER. It is not possible for a word to be both A32 code and DATA. This might indicate a compiler fault. Contact your supplier.

L6277E: Unknown command '<cmd>'.

L6278E: Missing expected <str>.

L6279E: Ambiguous selectors found for <sym> ('<sel1>' and '<sel2>').

L6280E: Cannot rename <sym> using the given patterns.

See [RENAME steering file command](#) in the *Arm Compiler for Embedded Reference Guide*.

L6281E: Cannot rename both <sym1> and <sym2> to <newname>.

See [RENAME steering file command](#) in the *Arm Compiler for Embedded Reference Guide*.

L6282E: Cannot rename <sym> to <newname> as a global symbol of that name exists (defined) in <obj>.

See [RENAME steering file command](#) in the *Arm Compiler for Embedded Reference Guide*.

L6283E: Object <objname> contains illegal local reference to symbol <symbolname>.

An object cannot contain a reference to a local symbol, because local symbols are always defined within the object itself.

L6285E: Non-relocatable Load region <lr_name> contains R-Type dynamic relocations.

First R-Type dynamic relocation found in <object>(<secname>) at offset 0x<offset>.

This error occurs where there is a PI reference between two separate segments, if the two segments can be moved apart at runtime. When the linker sees that the two sections can be moved apart at runtime it generates a relocation (an R-Type relocation) that can be resolved if the sections are moved from their statically linked address. However the linker faults this relocation (giving error L6285E) because PI regions must not have relocations with respect to other sections as this invalidates the criteria for being position independent.

L6286E: Relocation #<rel_class>:<rel_number> in <objname>(<secname>) with respect to {symname|s}. Value(<val>) out of range(<range>) for (<rtype>)

This error typically occurs in the following situations:

- In handwritten assembly code, where there are not enough bits within the instruction opcode to hold the offset to a symbol.

For example, the offset range is ± 4095 for an A32 state `LDR` or `STR` instruction.

- When the linker is having difficulty placing veneers around a large code section in your image.

When the linker places a veneer near a very large section it must decide whether to place the veneer before or after the section. When the linker has placed the veneer it might have to place more veneers, which could be placed between the original veneer and its target. The additional veneers increases the distance between the veneer and its target.

The linker automatically allows for modest increases in distances between veneers and their targets. However, a large number of veneers placed between the original veneer and its target might result in the target moving out of range. If this situation occurs, the linker generates message L6286E.

To work around this issue, you can move large code sections away from areas where the linker is placing many veneers. You can either place large sections in their own regions or place them first in the region containing them using the `+FIRST` directive in the scatter-loading description file.

For example:

```
LOAD 0x0A000000 0x1000000
{
    ROM1 +0x0
    {
        * (+RO)
    }
}
```

You can change the scatter file to:

```
LOAD 0x0A000000 0x1000000
{
    ROM1 +0x0
    {
        * (+RO)
    }
    ROM1A +0x0
    {
        large.o (+RO)
    }
}
```

- When `.ARM.exidx` exception-handling index tables are placed in different execution regions, or too far from exception handling code.

The `.ARM.exidx` exception-handling index tables must be located in a single execution region. Also, the distance from these tables to the C++ code that uses C++ exception handling must be within the range `-0x40000000` to `0x3fffffff`. Otherwise, the linker reports the following error:

L6286E: Value(0x9ff38980) out of range(-0x9ff38980) out of range(-0x40000000 - 0x3fffffff) for relocation #0 (R_ARM_PREL31), wrt symbol xxx in XXXX.o(.ARM.exidx)

This behavior is specified in the *Exception Handling ABI for the Arm Architecture* (EHABI). The EHABI states that the R_ARM_PREL31 relocation, which .ARM.exidx uses, does not use the highest bit (bit 31) for calculating the relocation.

The most likely cause of this error is that C++ code that must access the .ARM.exidx sections, has been split and placed into separate execution regions, outside of the valid range (-0x40000000 to 0x3fffffff).

To resolve this error, if you have memory between the separated execution regions, place the .ARM.exidx section there with the selector *(.ARM.exidx). For example:

```
LOAD_ROM 0x00000000
{
    ER1 0x00000000 ; The distance from ER2 to ER1 is out of
    {           ; range.
        file1.o (+RO) ; From a C++ source.
        * (+RO)
    }
    ERx 0x30000000
    {
        *(.ARM.exidx) ; ARM.exidx to ER1 and ER2 both in range.
    }
    ER2 0x60000000
    {
        file2.o (+RO) ; From a C++ source.
    }
    ER3 +0
    {
        * (+RW, +ZI)
    }
}
```

Otherwise, try placing the code into an execution region close enough to the tables (within the range of -0x40000000 to 0x3fffffff).

For more information, see the following:

[ARMLINK: L6286E Relocation ... With Respect to ... Out of Range](#)

[Exception Handling ABI for the Arm Architecture.](#)

L6287E: Illegal alignment constraint (<align>) specified for <objname>(<secname>).

An illegal alignment was specified for an ELF object.

L6291E: Cannot assign Fixed Execution Region <ername> Load Address:<addr>. Load Address must be greater than or equal to next available Load Address:<load_addr>.

See [Execution region attributes](#) in the *Arm Compiler for Embedded Reference Guide*.

L6292E: Ignoring unknown attribute '<attr>' specified for region <regname>.

This error message is specific to execution regions with the FIXED attribute. FIXED means make the load address the same as the execution address. The linker can only do this if the

execution address is greater than or equal to the next available load address within the load region.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Effect of the FIXED attribute on a root region.](#)
- [Execution region attributes.](#)

L6294E: <type> region <regionname> spans beyond 32 bit address space (base <base>, size <size> bytes).

This error message relates to a problem with the scatter file.

L6295E: Relocation #<rel_class>:<rel_number> in <objname>(<secname>) with respect to <symname> SBREL relocation requires image to be RWPI

L6296E: Definition of special symbol <sym1> is illegal as symbol <sym2> is absolute.

See L6188E.

L6300W: Common section <object1>(<section1>) is larger than its definition <object2>(<section2>).

This might indicate a compiler fault. Contact your supplier.

L6301W: Could not find file <filename>: <reason>

The specified file was not found in the default directories.

L6302W: Ignoring multiple SHLNAME entry.

There can be only one SHLNAME entry in an edit file. Only the first such entry is accepted by the linker. All subsequent SHLNAME entries are ignored.

L6304W: Duplicate input file <filename> ignored.

The specified filename occurred more than once in the list of input files.

L6305W: Image does not have an entry point. (Not specified or not set due to multiple choices.)

The entry point for the ELF image was either not specified, or was not set because there was more than one section with an entry point linked-in. You must use linker option `--entry` to specify the single, unique entry, for example:

```
--entry 0x0
```

or

```
--entry <label>
```

The label form is typical for an embedded system.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Image entry points.](#)
- [--entry=location.](#)

L6306W: '[<attr1>](#)' section [<objname>](#)([<secname>](#)) should not use the address of '[<attr2>](#)' function [<sym>](#).

See L6238E.

L6307W: Relocation [#<rel_class>:<rel_num>](#) in [<objname>](#)([<secname>](#)) with respect to [<sym>](#). Branch to unaligned destination.

L6308W: Could not find any object matching [<membername>](#) in library [<libraryname>](#).

The name of an object in a library is specified on the link-line, but the library does not contain an object with that name.

L6309W: Library [<libraryname>](#) does not contain any members.

A library is specified on the linker command-line, but the library does not contain any members.

L6310W: Unable to find ARM libraries.

This warning is most often caused by incorrect arguments to `--libpath`.

Set the correct path with the `--libpath` linker option. The default path for a Windows installation is:

```
<install_directory>\lib
```

Ensure this path does not include any of the following:

- `\armlib`
- `\cpplib`
- Any trailing slashes (`\`) at the end. These are added by the linker automatically.

Use `--verbose` or `--info libraries` to display where the linker is attempting to locate the libraries.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [--info=topic\[,topic,...\] \(armlink\)](#).
- [--libpath=pathlist](#).
- [--verbose](#).

See the following in the *Arm Compiler for Embedded User Guide*:

- [Toolchain environment variables](#).

L6311W: Undefined symbol [<symbol>](#) (referred from [<objname>](#)).

See L6218E.

L6312W: Empty [<type>](#) region description for region [<region>](#)

L6313W: Using [<oldname>](#) as an section selector is obsolete. Please use [<newname>](#) instead.

For example, use of `iwv$$code` within the scatter file is obsolete. Replace `iwv$$code` with `Veneer$$Code`.

L6314W: No section matches pattern <module>(<section>).

For example:

```
No section matches pattern foo.*o(ZI).
```

This can be caused by any of the following:

- The file `foo.o` is mentioned in your scatter file, but it is not listed on the linker command line. To resolve this, add `foo.o` to the link line.
- You are trying to place the ZI data of `foo.o` using a scatter file, but `foo.o` does not contain any ZI data. To resolve this, remove the `+ZI` attribute from the `foo.o` line in your scatter file.
- You have used `__attribute__((section(".ARM.__at_<address>")))` in your source code to place code and data at a specific address. You have also specified `*(.ARM.__AT_<address>)` in a scatter file, but you have not specified the address as eight hexadecimal digits. For example, if you specify `__attribute__((section(".ARM.__at_0x10000")))` in your source code, then you must specify the section name as `*(.ARM.__AT_0x00010000)` in the scatter file.

Linking with `--sysv` suppresses this warning by default. To display this message, use `--diag_warning=L6314` or the `--remarks` option.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Methods of placing functions and data at specific addresses.](#)
- [Placement of `__at` sections at a specific address.](#)
- [--sysv.](#)
- [--remarks.](#)

L6315W: Ignoring multiple Build Attribute symbols in Object <objname>.

An object can contain at most one absolute `BuildAttribute$$...` symbol. Only the first such symbol from the object symbol table is accepted by the linker. All subsequent ones are ignored.

L6316W: Ignoring multiple Build Attribute symbols in Object <objname> for section <sec_no>

An object can contain at most one `BuildAttribute$$...` symbol applicable to a given section. Only the first such symbol from the object symbol table is accepted by the linker. All subsequent ones are ignored.

L6317W: <objname>(<secname>) should not use the address of '<attr1>' function <sym> as the image contains '<attr2>' functions.

L6318W: <objname>(<secname>) contains branch to a non-code symbol <sym>.

This warning means that in the file, typically an assembler file, there is a branch to a non-code symbol in another `AREA` in the same file. The cause is most likely a branch to a label or address where there is data, not code.

For example:

```
AREA foo, CODE B bar AREA bar, DATA DCD 0 END
```

This results in the message:

```
init.o(foo) contains branch to a non-code symbol bar.
```

If the destination has no name:

```
BL 0x200 ; Branch with link to 0x200 bytes ahead of PC
```

the following message is displayed:

```
bootsys.o(BOOTSYS_IVT) contains branch to a non-code symbol <Anonymous Symbol>.
```

This warning can also appear when linking objects generated by GCC. GCC uses linker relocations for references internal to each object. The targets of these relocations might not have appropriate mapping symbols that permit the linker to determine whether the target is code or data, so a warning is generated.

L6319W: Ignoring <cmd> command. Cannot find section <objname>(<secname>).

For example, when building a Linux application, you might have the following option on the linker command-line in your makefile:

```
--keep *(.init_array)
```

However, this section might not be present when building with no C++, in which case this warning is reported:

```
Ignoring --keep command. Cannot find section *(.init_array)
```

You can often ignore this warning, or suppress it with `--diag_suppress 6319`.

L6320W: Ignoring <cmd> command. Cannot find argument '<argname>'.

L6323W: Relocation #<rel_class>:<rel_number> in <objname>(<secname>) with respect to <sym>. Multiple variants exist. Using the <type> variant to resolve ambiguity

L6324W: Ignoring <attr> attribute specified for Load region <regname>.

This attribute is applicable to execution regions only. If specified for a Load region, the linker ignores it.

L6325W: Ignoring <attr> attribute for region <regname> which uses the +offset form of base address.

This attribute is not applicable to regions using the +offset form of base address. If specified for a region, which uses the +offset form, the linker ignores it.

A region that uses the `+offset` form of base address inherits the `PI`, `RELOC`, or `OVERLAY` attributes from either:

- the previous region in the description
- the parent load region if it is the first execution region in the load region.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Inheritance rules for load region address attributes.](#)
- [Inheritance rules for execution region address attributes.](#)
- [Inheritance rules for the RELOC address attribute.](#)

L6326W: Ignoring ZEROPAD attribute for non-root execution region <ername>.

`ZEROPAD` only applies to root execution regions. A root region is a region whose execution address is the same as its load address, and so does not require moving or copying at run-time.

See [Execution region attributes](#) in the *Arm Compiler for Embedded Reference Guide*.

L6329W: Pattern <module>(<section>) only matches removed unused sections.

All sections matching this pattern have been removed from the image because they were unused. For more information, use `--info unused`.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Elimination of unused sections.](#)
- `--info=topic[,topic,...]` (armlink).

L6330W: Undefined symbol <symbol> (referred from <objname>). Unused section has been removed.

This means that an unused section has had its base and limit symbols referenced. For more information, use `--info unused`.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Elimination of unused sections.](#)
- `--info=topic[,topic,...]` (armlink).

L6331W: No eligible global symbol matches pattern <pat>.

L6332W: Undefined symbol <sym1> (referred from <obj1>). Resolved to symbol <sym2>.

L6334W: Overalignment <overalignment> for region <regname> cannot be negative.

See [Alignment of execution regions and input sections](#) in the *Arm Compiler for Embedded Reference Guide*.

L6335W: ARM interworking code in <objname>(<secname>) may contain invalid tailcalls to ARM non-interworking code.

The compiler is able to perform tailcall optimization for improved code size and performance. However, there is a problematic sequence for Armv4T code in which a T32 interworking (IW) function calls (by a veneer) an A32 IW function, which tailcalls an A32 non-interworking (~IW) function. The return from the A32 non-IW function can pop the return address off the stack

into the PC instead of using the correct `bx` instruction. The linker can detect this situation and report this warning.

T32 IW tailcalls to T32 non-IW do not occur because T32 tailcalls with `b` are so short ranged that they can only be generated to functions in the same ELF section which must also be T32.

The warning is pessimistic in that an object might contain invalid tailcalls, but the linker cannot be sure because it only looks at the attributes of the objects, not at the contents of their sections.

To avoid the warning, either:

- Recompile your entire code base, including any user libraries, with `--apcs /interwork`.
- Manually inspect the A32 IW function to check for tailcalls, that is, where function calls are made using an ordinary branch `b` instruction, to check whether the problem is a real problem. This warning can be suppressed with `--diag_suppress L6335W`.

L6337W: Common code sections (<s1>) and <o2>(<s2>) have incompatible floating-point linkage

L6339W: Ignoring RELOC attribute for execution region <er_name>.

Execution regions cannot explicitly be given the `RELOC` attribute. They can only gain this attribute by inheriting it from the parent load region or the previous execution region if using the `+offset` form of addressing.

See [Execution region attributes](#) in the *Arm Compiler for Embedded Reference Guide*.

L6340W: options first and last are ignored for link type of <linktype>

The `--first` and `--last` options are meaningless when creating a partially-linked object.

L6366E: <object> attributes<attr> are not compatible with the provided cpu and fpu attributes<cli> <diff>.

L6367E: <object>(<section>) attributes<attr> are not compatible with the provided cpu and fpu attributes<cli> <diff>

L6368E: <symbol> defined in <object>(<section>) attributes<attr> are not compatible with the provided cpu and fpu attributes<cli> <diff>

L6369E: <symbol> defined in <object>(ABSOLUTE) are not compatible with the provided cpu and fpu Attributes<cli> <diff>

L6370E: cpu <cpu> is not compatible with fpu <fpu>

See the following in the *Arm Compiler for Embedded Reference Guide*:

- `--cpu=name` (armlink).
- `--fpu=name` (armlink).

L6371E: Adding attributes from cpu and fpu: <attrs>

L6372E: Image needs at least one load region.

L6373E: libattr.map file not found in System Library directory <dir>. Library selection may be impaired.

L6384E: No Load Execution Region of name <region> seen yet at line <line>.

This might be because you have used the current base address in a limit calculation in a scatter file. For example:

```
ER_foo 0 ImageBase(ER_foo)
```

L6385W: Addition overflow on line <line>

L6386E: Exec Region Expressions can only be used in base address calculations on line <line>

L6387E: Load Region Expressions can only be used in ScatterAssert expressions on line <line>

See the following in the *Arm Compiler for Embedded Reference Guide*:

[ScatterAssert function and load address related functions.](#)

L6388E: ScatterAssert expression <expr> failed on line <line>

See the following in the *Arm Compiler for Embedded Reference Guide*:

[ScatterAssert function and load address related functions.](#)

L6389E: Load Region <name> on line <line> not yet complete, cannot use operations that depend on length of region

L6390E: Conditional operator (expr) ? (expr) : (expr) on line <line> has no : (expr).

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Expression evaluation in scatter files.](#)
- [Expression rules in scatter files.](#)

L6404W: FILL value preferred to combination of EMPTY, ZEROPAD and PADVALUE for Execution Region <name>.

See [Execution region attributes](#) in the *Arm Compiler for Embedded Reference Guide*.

L6405W: No .ANY selector matches Section <name>(<objname>).

See [Manual placement of unassigned sections](#) in the *Arm Compiler for Embedded Reference Guide*.

L6406W: No space in execution regions with .ANY selector matching Section <name>(<objname>).

This warning occurs if there is not sufficient space in the scatter file regions containing .ANY to place the section listed. You must modify your scatter file to ensure there is sufficient space for the section.

See [Manual placement of unassigned sections](#) in the *Arm Compiler for Embedded Reference Guide*.

L6407W: Sections of aggregate size 0x<size> bytes could not fit into .ANY selector(s).

This warning identifies the total amount of image data that cannot be placed in any .ANY selectors.

For example, .ANY(+ZI) is placed in an execution region that is too small for the amount of ZI data:

```
ROM_LOAD 0x8000
{
    ROM_EXEC 0x8000
    {
        .ANY(+RO,+RW)
    }
    RAM +0 0x{...} <<< region max length is too small
    {
        .ANY(+ZI)
    }
}
```

See [Manual placement of unassigned sections](#) in the *Arm Compiler for Embedded Reference Guide*.

L6408W: Output is --fpic yet section <sec> from <obj> has no FPIC attribute.

L6409W: Output is --fpic yet object <obj> has no FPIC attribute.

L6410W: Symbol <sym> with non STV_DEFAULT visibility <vis> should be resolved statically, cannot use definition in <lib>.

L6411W: No compatible library exists with a definition of startup symbol <name>.

L6412W: Disabling merging for <obj>(<sec>), unsupported relocation <type> from <srcobj>(<srcsec>)

L6413W: Disabling merging for section <sec> from object <obj>, Section contains misaligned string(s).

L6414E: --ropi used without --rwpi or --rw-base.

L6415E: Could not find a unique set of libraries compatible with this image. Suggest using the --cpu option to select a specific library.

armlink could not find any build attributes to determine which libraries are required for the link. In this case, you must use the armlink option --cpu to help the linker select the required library.

See [--cpu=name \(armlink\)](#) in the *Arm Compiler for Embedded Reference Guide*.

L6416E: Relocation <type> at <relclass>:<idx> <objname>(<secname>) cannot be veneered as it has an offset <offset> from its target.

L6417W: Relocation #<rel_class>:<rel_number> in <objname>(<secname>) is with respect to a reserved tagging symbol(<idx>).

L6418W: Tagging symbol <symname> defined in <objname>(<secname>) is not recognized.

L6419W: Undefined symbol <symbol> (referred from <objname>) imported.

L6420E: Ignoring <oepname>(<secname>:<secnum>) as it is not of a recognized type.

L6422U: PLT generation requires an architecture with ARM instruction support.

For the linker to generate a Procedure Linkage Table (PLT), you must be using a target that supports the A32 instruction set. For example, the linker cannot generate a PLT for a Cortex-M3 target.

L6423E: Within the same collection, section <secname> cannot have different sort attributes.

L6424E: Within the same collection, section <secname1> and section <secname2> cannot be separated into different execution regions.

L6425E: Within the same collection, section <secname> cannot have their section names with different length.

L6426E: Within the same collection, section <secname> cannot have its name duplicated.

L6427E: Cannot rename <sym> to <newname> as it has already been renamed to <name>).

L6429U: Attempt to set maximum number of open files to <val> failed with error code <error>.

An attempt to increase the number of file handles `armlink` can keep open at any one time has failed.

L6431W: Ignoring incompatible enum size attribute on Symbol <symbol> defined in <object>(<section>).

L6432W: Ignoring incompatible enum size attribute on Object <object>(<section>).

L6433W: Ignoring incompatible enum size attribute on object <object>.

L6434W: Ignoring incompatible `wchar_t` size attribute on Symbol <symbol> defined in <object>(<section>).

L6435W: Ignoring incompatible `wchar_t` size attribute on Section <object>(<section>).

L6436W: Ignoring incompatible `wchar_t` size attribute on object <object>.

L6437W: Relocation #<rel_class>:<idx> in <objname>(<secname>) with respect to <armsym>. Branch relocation to untyped symol in object <armobjname>, target state unknown.

L6438E: `__AT` section <objname>(<secname>) address <address> must be at least 4 byte aligned.

L6439W: Multiply defined Global Symbol <sym> defined in <objname>(<secname>) rejected in favour of Symbol defined in <selobj>(<selsec>).

L6440E: Unexpected failure in link-time code generation

L6440W: Disabling merging for <obj>(<sec>), unsupported relocation <type> from <srcobj>(<srcsec>) to `STT_SECTION` type symbol

L6441U: System call to get maximum number of open files failed <error>.

L6442U: Linker requires a minimum of <min> open files, current system limit is <max> files.

L6443W: Data Compression for region <region> turned off. Region contains reference to symbol <symname> which depends on a compressed address.

The linker requires the contents of a region to be fixed before it can be compressed and cannot modify it after it has been compressed. Therefore a compressible region cannot refer to a memory location that depends on the compression process.

L6444I: symbol visibility : <symname> set to <visibility>.

L6445I: symbol visibility : <symname> merged to <set_vis> from existing <old_vis> and new <new_vis>.

L6447E: SHT_PREINIT_ARRAY sections are not permitted in shared objects.

L6448W: While processing <filename>: <message>

L6449E: While processing <filename>: <message>

L6450U: Cannot find library <libname>.

L6451E: <object> built permitting Thumb is forbidden in an ARM-only link.

L6452E: <object>(<section>) built permitting Thumb is forbidden in an ARM-only link.

L6453E: <symbol> defined in <object>(<section>) built permitting Thumb is forbidden in an ARM-only link.

L6454E: <symbol> defined in <object>(ABSOLUTE) built permitting Thumb is forbidden in an ARM-only link.

L6455E: Symbol <symbolname> has deprecated ARM/Thumb Synonym definitions (by <object1> and <object2>).

L6459U: Could not create temporary file.

L6462E: Reference to <sym> from a shared library only matches a definition with Hidden or Protected Visibility in Object <obj>.

L6463U: Input Objects contain <archtype> instructions but could not find valid target for <archtype> architecture based on object attributes. Suggest using --cpu option to select a specific cpu.

See [--cpu=name \(armlink\)](#) in the *Arm Compiler for Embedded Reference Guide*.

L6464E: Only one of --emit-relocs and --emit-debug-overlay-relocs can be selected.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [--emit_debug_overlay_relocs](#).
- [--emit_relocs](#).

L6467W: Library reports remark: <msg>

L6468U: Only --pltgot=direct or --pltgot=none supported for --base_platform with multiple Load Regions containing code.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [--base_platform](#).
- [--pltgot=type](#).

L6469E: --base_platform does not support RELOC Load Regions containing non RELOC Execution Regions. Please use +0 for the Base Address of Execution Region <ername> in Load Region <lrname>.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [--base_platform](#).
- [Inheritance rules for the RELOC address attribute](#).

L6470E: PLT section <secname> cannot be moved outside Load Region <lrname>.

L6471E: Branch Relocation <rel_class>:<idx> in section <secname> from object <objname> refers to ARM Absolute <armsym> symbol from object <armobjname>, Suppress error to treat as a Thumb address.

L6475W: IMPORT/EXPORT commands ignored when --override_visibility is not specified

The symbol you are trying to export, either with an `EXPORT` command in a steering file or with the `--undefined_and_export` command-line option, is not exported because of low visibility.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [--override_visibility](#).
- [--undefined_and_export=symbol](#).
- [EXPORT steering file command](#).

L6616E: Cannot increase size of RegionTable <sec_name> from <obj_name>

L6617E: Cannot increase size of ZISectionTable <sec_name> from <obj_name>

L6629E: Unmatched parentheses expecting) but found <character> at position <col> on line <line>

This message indicates a parsing error in the scatter file.

L6630E: Invalid token start expected number or (but found <character> at position <col> on line <line>

This message indicates a parsing error in the scatter file.

L6631E: Division by zero on line <line>

This message indicates an expression evaluation error in the scatter file.

L6632W: Subtraction underflow on line <line>

This message indicates an expression evaluation error in the scatter file.

L6634E: Pre-processor command in '<filename>' too long, maximum length of <max_size>

This message indicates a problem with pre-processing the scatter file.

L6635E: Could not open intermediate file '<filename>' produced by pre-processor: <reason>

This message indicates a problem with pre-processing the scatter file.

L6636E: Pre-processor step failed for '<filename>'

This message indicates a problem with pre-processing the scatter file.

L6637W: No input objects specified. At least one input object or library(object) must be specified.

At least one input object or library(object) must be specified.

L6638U: Object <objname> has a link order dependency cycle, check sections with SHF_LINK_ORDER

L6640E: PDTable section not least static data address, least static data section is <secname>

Systems that implement shared libraries with RWPI use a process data table (PDT). It is created at static link time by the linker and must be placed first in the data area of the image.

This message indicates that the scatter file does not permit placing the PDT first in the data area of the image.

To avoid the message, adjust your scatter file so that the PDT is placed correctly. This message can also be triggered if you accidentally build object files with `--apcs=/rwpi`.

L6642W: Unused virtual function elimination might not work correctly, because <obj_name> has not been compiled with --vfe

L6643E: The virtual function elimination information in section <sectionname> refers to the wrong section.

This message might indicate a compiler fault. Contact your supplier.

L6644E: Unexpectedly reached the end of the buffer when reading the virtual function elimination information in section <oepname>(<sectionname>).

This message might indicate a compiler fault. Contact your supplier.

L6645E: The virtual function elimination information in section <oepname>(<sectionname>) is incorrect: there should be a relocation at offset <offset>.

This message might indicate a compiler fault. Contact your supplier.

L6646W: The virtual function elimination information in section <oepname>(<sectionname>) contains garbage from offset <offset> onwards.

This message might indicate a compiler fault. Contact your supplier.

L6647E: The virtual function elimination information for <vcall_objectname>(<vcall_sectionname>) incorrectly indicates that section <curr_sectionname>(object <curr_objectname>), offset <offset> is a relocation (to a virtual function or RTTI), but there is no relocation at that offset.

This message might indicate a compiler fault. Contact your supplier.

L6649E: EMPTY region <regname> must have a maximum size.

See [Execution region attributes](#) in the *Arm Compiler for Embedded Reference Guide*.

L6650E: Object <objname> Group section <sectionidx> contains invalid symbol index <symidx>.

L6651E: Section <secname> from object <objname> has SHF_GROUP flag but is not member of any group.

L6652E: Cannot reverse Byte Order of Data Sections, input objects are <inputendian> requested data byte order is <dataendian>.

L6654E: Rejected Local symbol <symname> referred to from a non group member <objname>(<nongrpname>)

This message might indicate a compiler fault. Contact your supplier.

L6656E: Internal error: the vfe section list contains a non-vfe section called <oepname>(<secname>).

This message might indicate a compiler fault. Contact your supplier.

L6664W: Relocation #<rel_class>:<rel_number> in <objname>(<secname>) is with respect to a symbol(<idx> before last Map Symbol #<last>).

L6679W: Data in output ELF section #<sec> '<secname>' was not suitable for compression (<data_size> bytes to <compressed_size> bytes).

L6682E: Merge Section <oepname>(<spname>) is a code section

L6683E: Merge Section <oepname>(<spname>) has an element size of zero

L6684E: Section <spname> from object <oepname> has SHF_STRINGS flag but not SHF_MERGE flag

L6685E: Section <spname> from object <oepname> has a branch reloc <rel_idx> to a SHF_MERGE section

L6688U: Relocation #<rel_class>:<rel_idx> in <oepname>(<spname>) references a negative element

L6689U: Relocation #<rel_class>:<rel_idx> in <oepname>(<spname>). Destination is in the middle of a multibyte character

L6690U: Merge Section <spname> from object <oepname> has no symbols

L6703W: Section <er> implicitly marked as non-compressible.

L6707E: Padding value not specified with PADVALUE attribute for execution region <regionname>.

See [Execution region attributes](#) in the *Arm Compiler for Embedded Reference Guide*.

L6708E: Could not process debug frame from <secname> from object <oepname>.

L6709E: Could not associate fde from <secname> from object <oepname>.

L6713W: Function at offset <offset> in <oepname>(<secname>) has no symbol.

L6714W: Exception index table section .ARM.exidx from object <oepname> has no data.

L6720U: Exception table <spname> from object <oepname> present in image, --noexceptions specified.

See [--exceptions, --no_exceptions](#) in the *Arm Compiler for Embedded Reference Guide*.

L6721E: Section #<secnum> '<secname>' in <oepname> is not recognized and cannot be processed generically.

L6725W: Unused virtual function elimination might not work correctly, because there are dynamic relocations.

L6728U: Link order dependency on invalid section number <to> from section number <from>.

L6730W: Relocation #<rel_class>:<index> in <objname>(<secname>) with respect to <name>. Symbol has ABI type <type>, legacy type <legacy_type>.

This warning relates to a change in linker behavior between RVCT 2.0 and 2.1. RVCT is a predecessor of Arm Compiler for Embedded.



The following example produces a warning message only when `--strict_relocations` is used, or when the input objects are from RVCT 2.0 or earlier.

Example with `armclang` integrated assembler:

```
section foo, "ax", %progbits
.arm
.global func
.type func, %function
func:
    nop
    .word foo
```

Example with legacy `armasm` assembler:

```
AREA foo, CODE, READONLY
CODE32
ENTRY
KEEP
func proc
    NOP
    ENDP
    DCD foo
    END
```

In RVCT 2.0 and earlier, the linker determines whether interworking is needed based on the content, which in this example is A32 code. In RVCT 2.1 and later, the linker follows the ABI, which defines that it is the type of the symbol, in this example `STT_SECTION` (which is interpreted as data), that determines whether interworking is applied.

The simplest solution is to move the data into a separate data area in the assembly source file.

Alternatively, you can use `--diag_suppress 6730` to suppress this warning.

L6731W: Unused virtual function elimination might not work correctly, because the section referred to from <secname> does not exist.

L6733W: <objname>(<secname>) contains offset relocation from <lr1name> to <lr2name>, load regions must be rigidly relative.

L6738E: Relocation #<rel_class>:<relocnum> in <oepname>(<secname>) with respect to <wrtsym> is a GOT-relative relocation, but `_GLOBAL_OFFSET_TABLE_` is undefined.

Some GNU produced images can refer to the symbol named `_GLOBAL_OFFSET_TABLE_`. If there are no GOT slots generating relocations and the linker is unable to pick a suitable address for the GOT base the linker issues this error message.

L6739E: Version '<vername>' has a dependency to undefined version '<depname>'.

L6740W: Symbol '<symname>' versioned '<vername>' defined in '<symverscr>' but not found in any input object.

L6741E: Versioned symbol binding should be 'local:' or 'global:'.

L6742E: Symbol '<symname>' defined by '<oepname>'. Cannot not match to default version symbol '<defversym>'

L6743E: Relocation #<rel_class>:<index> in <oepname>(<spname>) with respect to <symname> that has an alternate def. Internal consistency check failed

L6744E: Relocation #<rel_class>:<index> <oepname>(<spname>) with respect to undefined symbol <symname>. Internal consistency check:

L6745E: Target CPU <cpuname> does not Support ARM, <objname>(<secname>) contains ARM code

L6747W: Raising target architecture from <oldversion> to <newversion>.

L6748U: Missing dynamic array, symbol table or string table in file <oepname>.

L6751E: No such sorting algorithm <str> available.

L6753E: CallTree sorting needs Entry Point to lie within a CallTree Sort ER.

L6761E: Removing symbol <symname>.

L6762E: Cannot build '<type>' PLT entries when building a <imgtype>.

L6763W: '<optname>' cannot be used when building a shared object or DLL. Switching it off

L6764E: Cannot create a PLT entry for target architecture 4T that calls Thumb symbol <symname>

L6765W: Shared object entry points must be ARM-state when linking architecture 4T objects.

This can occur when linking with GNU C libraries. The GNU startup code `crt1.o` does not have any build attributes for the entry point, so the linker cannot determine which execution state (A32 or T32) the code runs in. Because the GNU C library startup code is A32 code, you can safely ignore this warning, or you can suppress it by using `--diag_suppress 6765`.

L6766W: PLT entries for architecture 4T do not support incremental linking.

L6769E: Relocation #<rel_class>:<relocnum> in <oepname>(<secname>) with respect to <wrtsym>. No GOTSL0Texists for symbol.

L6770E: The size and content of the dynamic array changed too late to be fixed.

L6771W: Address-type relocation #<rel_class>:<rel_idx> in read-only section <obj>(<sec>) requires a dynamic relocation.

L6772W: IMPORT <symname> command ignored when building --sysv.

L6774W: <objname>(<secname>) has debug frame entries of a bad length.

L6775W: <objname>(<secname>) has FDEs which use CIEs which are not in this section.

L6776W: The debug frame in <objname>(<secname>) does not describe an executable section.

L6777W: The debug frame in <objname>(<secname>) has <actual> relocations (expected <expected>)

L6778W: The debug frame in <objname>(<secname>) uses 64-bit DWARF.

L6780W: <origvis> visibility removed from symbol '<symname>' through <impexp>.

L6781E: Value(<val>) Cannot be represented by partition number <part> for relocation #<rel_class>:<rel_number> (<rtype>, wrt symbol <symname>) in <objname>(<secname>)

L6782W: Relocation #<rel_class>:<relnum> '<rtype>' in <oepname> may not access data correctly alongside <pltgot_type> PLT entries

L6783E: Mapping symbol #<symnum> '<msym>' in <oepname>(<secnum>:<secname>) defined at the end of, or beyond, the section size (symbol offset=0x<moffset>, section size=0x<moffset>, section size=0x<secsize>)

This indicates that the address for a section points to a location at the end of or outside of the ELF section. This can be caused by an empty inlined data section and indicates there might be a problem with the object file.

You can use `--diag_suppress 6783` to suppress this error.

L6784E: Symbol #<symnum> '<symname>' in <oepname>(<secnum>:<secname>) with value <value> has size 0x<size> that extends to outside the section.

The linker found a symbol with a size that extends outside of its containing section.

Check if you are using the *Control Flow Integrity* (CFI) sanitizer. If you are, then you can use `--diag_suppress 6784` to suppress this error.

L6785U: Symbol '<symname>' marked for import from '<libname>' already defined by '<oepname>'

L6786W: Mapping symbol #<symnum> '<msym>' in <oepname>(<secnum>:<secname>) defined at unaligned offset=0x<moffset>

L6787U: Region table handler '<handlername>' needed by entry for <regionname> was not found.

This error can occur after you have added some functionality. For example, you might get the error:

```
output.axf: error: L6787U: Region table handler '__scatterload_copy' needed by
entry for DATA was not found.
```

As a normal step at link time, the linker tests if compressing RW init data would save some code space. In case it does, decompression routines are pulled in from the Arm runtime library. In some special cases, the linker can later change this decision and does not compress that RW init data. Instead, this data would be copied by the library startup code. But because the copy functions have not been pulled in before, the linker reports this error.

A trigger for this error can be a data object with a large alignment requirement.

The following are possible workarounds:

- Use linker option `--undefined`:

```
--undefined=__scatterload_copy
```

This option manually creates a reference to the copy function of the Arm runtime library. Therefore, the `__scatterload_copy` function is always pulled in regardless of the linker decision to compress or copy RW init data.

- Use linker option `--datacompressor`:

```
--datacompressor=off
```

This option causes the linker to not try to compress RW init data. All RW init data is copied, and the `__scatterload_copy` function is correctly pulled in.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [--undefined](#).
- [--datacompressor](#).

L6788E: Scatter-loading of execution region <er1name> to [<base1>,<limit1>) will cause the contents of execution region <er2name> at [<base2>,<limit2>) to be corrupted at run-time.

This error occurs when scatter-loading takes place and an execution region is put in a position where it partially or wholly overwrites another execution region (which can be itself or another region).

For example, the following code generates this error:

```
LOAD_ROM 0x0000 0x4000
{
  EXEC1 0x4000 0x4000
```

```
{
* (+RW,+ZI)
}
EXEC2 0x0000 0x4000
{
* (+RO)
}
}
```

and reports:

```
Error: L6788E: Scatter-loading of execution region EXEC2 will cause the
contents of execution region EXEC2 to be corrupted at run-time.
```

This code does not generate the error:

```
LOAD_ROM 0x0000 0x4000
{
EXEC1 0x0000 0x4000
{
* (+RO)
}
EXEC2 0x4000 0x4000
{
* (+RW,+ZI)
}
}
```

See [Scatter-loading Features](#) in the *Arm Compiler for Embedded Reference Guide*.

L6789U: Library <library> member <filename> : Endianness mismatch.

L6790E: Relocation #<rel_class>:<relnum> in <objname>(<secname>) with respect to <symname>. May not IMPORT weak reference through GOT-generating relocation

L6791E: Unknown personality routine <pr> at 0x<offset> <oepname>(<secname>).

L6792E: Descriptor at offset 0x<offset> <oepname>(<secname>).

L6793E: Expecting Landing pad reference at offset 0x<offset> in cleanup descriptor <oepname>(<secname>).

L6794E: Expecting Landing pad reference at offset 0x<offset> in catch descriptor <oepname>(<secname>).

L6795E: Expecting RTTI reference at offset 0x<offset> in catch descriptor <oepname>(<secname>).

L6796E: Descriptor at offset 0x<offset> <oepname>(<secname>) overruns end of section.

L6797E: Data at Offset 0x<offset> in exception table <oepname>(<secname>) overruns end of section

L6798E: Expecting RTTI reference at offset 0x<offset> in Function Specification descriptor <oepname>(<secname>).

L6799E: Expecting Landing Pad reference at offset 0x<offset> in Function Specification descriptor <oepname>(<secname>).

A landing pad is code that cleans up after an exception has been raised. If the linker detects old-format exception tables, it automatically converts them to the new format.

This message does not appear unless you are using a later version of the linker with an earlier version of the compiler.

L6800W: Cannot convert generic model personality routine at 0x<offset> <oepname>(<secname>).

A personality routine unwinds the exception handling stack. If the linker detects old-format exception tables then it automatically converts them to the new format. This message indicates a fault in the compiler. Contact your supplier.

L6801E: <objname>(<secname>) containing <secarmthumb> code cannot use the address of '~IW (The user intended not all code should interwork)' <funarmthumb> function <sym>.

The linker can diagnose where a non-interworking (~IW) function has its address taken by code in the other state. This error is disabled by default, but can be enabled by linking with `--strict`. The error can be downgraded to a warning with `--diag_warning 6801` and subsequently suppressed completely if required with `--diag_suppress 6801`.

Where code, for example, in `a.c` uses the address of a non-interworking function in `t.c`:

```
armclang -c -mcpu=cortex-a9 --target=arm-arm-none-eabi a.c
armclang -mthumb -c -mcpu=cortex-a9 --target=arm-arm-none-eabi t.c
armlink t.o a.o --strict
```

reports:

```
Error: L6801E: a.o(.text) containing ARM code cannot use the address of '~IW'
Thumb function foo.
```

L6802E: Relocation #<rel_class>:<idx> in <objname>(<secname>) with respect to <armsym>. Thumb Branch to non-Thumb symbol in <armobjname>(<armsecname>).

L6803W: Relocation #<rel_class>:<idx> in <objname>(<secname>) with respect to <armsym>. Thumb Branch is unlikely to reach target in<armobjname>(<armsym>).

L6804W: Legacy use of symbol type STT_FUNC detected

L6805E: Relocation #<rel_class>:<idx> in <objname>(<secname>) with respect to <armsym>. Branch to untyped Absolute symbol in <armobjname>, target state unknown

L6806W: Relocation #<rel_class>:<idx> in <objname>(<secname>) with respect to <othersym>. Branch to untyped symbol in <otherobjname>(<othersecname>), ABI requires external code symbols to be of type STT_FUNC.

L6807E: Relocation #<rel_class>:<idx> in <objname>(<secname>) with respect to <othersym>. Branch to untyped symbol in same section. State change is required.

L6809W: Relocation <rel_class>:<idx> in <objname>(<secname>) is of deprecated type <rtype>, please see ARMELF for ABI compliant alternative

L6810E: Relocation <rel_class>:<idx> in <objname>(<secname>) is of obsolete type <rtype>

Relocation errors and warnings are most likely to occur if you are linking object files built with previous versions of the Arm tools.

To show relocation errors and warnings, use the `--strict_relocations` switch. This option enables you to ensure ABI compliance of objects. It is off by default, and deprecated and obsolete relocations are handled silently by the linker.

See [--strict_relocations](#), [--no_strict_relocations](#) in the *Arm Compiler for Embedded Reference Guide*.

L6812U: Unknown symbol action type, please contact your supplier.

L6813U: Could not find Symbol <symname> to rename to <newname>.

See [RENAME steering file command](#) in the *Arm Compiler for Embedded Reference Guide*.

L6815U: Out of memory. Allocation Size:<alloc_size> System Size:<system_size>.

This error occurs because the linker does not have enough memory to link your target object. This situation is not common, but might be triggered for a number of reasons, such as:

- Linking very large objects or libraries together.
- Generating a large amount of debug information.
- Having very large regions defined in your scatter file.

In these cases, your workstation might run out of virtual memory.

This issue might also occur if you use the `FIXED` scatter-loading attribute. The `FIXED` attribute forces an execution region to become a root region in ROM at a fixed address. The linker might have to add padding bytes between the end of the previous execution region and the `FIXED` region, to generate the ROM image. The linker might run out of memory if large amounts of padding are added when the address of the `FIXED` region is far away from the end of the execution region. The link step might succeed if the gap is reduced.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Execution region attributes](#).
- [Effect of the FIXED attribute on a root region](#).

While the linker can generate images of almost any size, it requires a larger amount of memory to run and finish the link. Try the following solutions to improve link-time performance, to avoid the `out of memory` error:

1. Shut down all non-essential applications and processes when you are linking.

For example, if you are running under Eclipse, try running your linker from the command-line, or exiting and restarting Eclipse between builds.

2. Use the `--no_debug` linker option.

This command tells the linker to create the object without including any debug information.

See [--debug](#), [--no-debug](#) in the `armlink` reference documentation.



It is not possible to perform source level debugging if you use this option.

3. Reduce debug information.

If you do not want to use the `--no_debug` option, there are other methods you can use to try to reduce debug information.

You can also use the `fromelf` utility to strip debug information from objects and libraries that you do not have to debug.

See [--strip=option\[,option,...\]](#) in the `fromelf` reference documentation.

4. Use partial linking.

You can use partial linking to split the link stage over a few smaller operations. Doing this also stops duplication of the object files in memory in the final link.

See [--partial](#) in the `armlink` reference documentation.

5. Increase memory support on Windows operating systems.

On some Windows operating systems it is possible to increase the virtual address space from 2GB (the default) to 3GB.

For more information, see the Microsoft article [Memory Support and Windows Operating Systems](#).

6. Use the `--no_eager_load_debug` linker option.

This option causes the linker to remove debug section data from memory after object loading. This lowers the peak memory usage of the linker at the expense of some linker performance, because much of the debug data has to be loaded again when the final image is written.

See [--eager_load_debug](#), [--no_eager_load_debug](#) in the `armlink` reference documentation.

If you are still experiencing the same problem, raise a support case.

L6828E: Relocation #<rel_class>:<idx> in <objname>(<secname>) with respect to <symname>, Branch source address <srcaddr> cannot reach next available pool at

[<pool_base>,<pool_limit>). Please use the `--veneer_pool_size` option to increase the contingency.

The `--veneer_inject_type=pool` veneer generation model requires branches to veneers in the pool to be able to reach the pool limit, which is the highest possible address a veneer can use. If a branch is later found that cannot reach the pool limit, and `armlink` is able to fit all the veneers in the pool into the lower pool limit, then `armlink` reduces the pool limit to accommodate the branch. Error message L6828 is issued only if `armlink` is unable to lower the pool limit.

See `--veneer_inject_type=type` in the *Arm Compiler for Embedded Reference Guide*.

L6831E: Mixing machine types EM_ARM and EM_AARCH64 is not permitted.

All ELF files used in the linking step must have the same ELF machine type. For AArch32, the ELF machine type is `EM_ARM`. For AArch64, the ELF machine type is `EM_AARCH64`.

You can find the machine type of an ELF file in the ELF Header. Use `fromelf` to display this information under Machine: in `** ELF Header Information`, for example:

```
** ELF Header Information

File Name: aarch32.o

Machine class: ELFCLASS32 (32-bit)
Data encoding: ELFDATA2LSB (Little endian)
Header version: EV_CURRENT (Current version)
Operating System ABI: none
ABI Version: 0
File Type: ET_REL (Relocatable object) (1)
Machine: EM_ARM (ARM)
...
```

L6837E: Illegal data mapping symbol found in execute-only section <section> at offset <offset>.

You compiled with the function sanitizer, `-fsanitize=function`, and `-mexecute-only`. The `-fsanitize=undefined` compiler option also enables the function sanitizer. Therefore, if you use `-fsanitize=undefined`, then you must also use the `-fno-sanitize=function` option.

For more information, see `-fsanitize`, `-fno-sanitize` in the *Arm Compiler for Embedded Reference Guide*.

L6873W: <loadregion> has multiple non-contiguous child regions <regs>

You have provided a scatter file with multiple relocations that has more than one relocation for each load region. The output text contains the names of the execute regions that cause the problem.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Scatter-loading Features](#).
- [Scatter File Syntax](#).

L6874W: Load Region <loadregion> requires that the first exec region to be root <rootregion>, contains Read-Only Data <read>, and not contain overlay regions <overlay>

Check all load regions to ensure that:

- There is at least one RO region and one root region.
- None of the regions are overlays.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Scatter-loading Features](#).
- [Scatter File Syntax](#).

L6875W: Unable to find placement of region in <region> within <placement> (<range>)

For each region that overlaps, outputs the load region that `armlink` is trying to place into and the range of addresses in the case of unnamed regions.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Scatter-loading Features](#).
- [Scatter File Syntax](#).

L6898E: Relocation #<rel_class>:<idx> in <objname>(<secname>) with respect to <armsym>.
ARM branch to non-ARM/Thumb symbol in <armobjname>(<armsecname>).

L6899E: Existing SYMDEFS file '<filename>' is read-only.

L6900E: Expected parentheses to specify priority between AND and OR operators.

L6901E: Expected symbol name.

L6902E: Expected a string.

L6903E: Cannot execute '<text>' in '<clause>' clause of script.

L6904E: Destination symbol of rename operation clashes with another rename.

L6905E: Source symbol of rename operation clashes with another rename.

L6906E: (This is the rename operation which it clashes with.)

L6907E: Expected an expression.

L6910E: Expected a phase name.

L6912W: Symbol <symname> defined at index <idx> in <oepname>(<secname>), has ABI symbol type <symtype> which is inconsistent with mapping symbol type <maptype>.

L6913E: Expected execution region name.

L6914W: option <spurious> ignored when using --<memoption>.

L6915E: Library reports error: <msg>

The message is typically one of the following:

- Error: L6915E: Library reports error: scatter-load file declares no heap or stack regions and `__user_initial_stackheap` is not defined.

or

Error: L6915E: Library reports error: The semihosting `__user_initial_stackheap` cannot reliably set up a usable heap region if scatter loading is in use

You have most likely not reimplemented `__user_setup_stackheap()` or you have not defined `ARM_LIB_STACK` or `ARM_LIB_HEAP` regions in the respective scatter file.



Note

`__user_setup_stackheap()` supersedes the function `__user_initial_stackheap()`. Arm recommends not using `__user_initial_stackheap()` if possible.

See the following in the *Arm Compiler for Embedded Arm C and C++ Libraries and Floating-Point Support User Guide*:

- [__user_setup_stackheap\(\)](#).
- Legacy function [__user_initial_stackheap\(\)](#).

See [Reserving an empty block of memory](#) in the *Arm Compiler for Embedded Reference Guide*.

- Error: L6915E: Library reports error: `__use_no_semihosting` was requested but `<function>` was referenced.

Where `<function>` represents `__user_initial_stackheap`, `_sys_exit`, `_sys_open`, `_sys_tmpnam2`, `_sys_tmpnam`, `_ttywrch`, `system`, `remove`, `rename`, `_sys_command_string`, `time`, or `clock`.

This error can appear when retargeting semihosting-using functions, to avoid any `svc` or `bkpt` instructions being linked-in from the C libraries.

Ensure that no semihosting-using functions are linked in from the C library by using:

```
__asm(".global __use_no_semihosting");
```

See [Using the libraries in a nonsemihosting environment](#) in the *Arm Compiler for Embedded Arm C and C++ Libraries and Floating-Point Support User Guide*.

If there are still semihosting-using functions being linked in, the linker reports this error.

To resolve this error, you must provide your own implementations of these C library functions.

The `emb_sw_dev` directory contains examples of how to reimplement some of the more common semihosting-using functions. See the file `retarget.c`.

See [Arm Compiler for Embedded Arm C and C++ Libraries and Floating-Point Support User Guide](#) for more information on semihosting-using C library functions.



The linker does not report any semihosting-using functions such as, for example, `__seminhost()`, in your own application code.

To identify the semihosting-using functions that are still linked-in from the C libraries:

1. Link with `armmlink --cpu=8-M --verbose --list err.txt`
2. Search `err.txt` for occurrences of `__Iusesemihosting`

For example:

```
...
Loading member sys_exit.o from c_2.1.
reference : __I$use$semihosting
definition: _sys_exit
...
```

This example shows that the semihosting-using function `_sys_exit` is linked-in from the C library. To prevent the C library being linked-in, you must provide your own implementation of this function.

- Error: L6915E: Library reports error: `__use_no_heap` was requested, but `<reason>` was referenced. If `<reason>` represents `malloc`, `free`, `__heapstats`, or `__heapvalid`, the use of `__use_no_heap` conflicts with these functions.
- Error: L6915E: Library reports error: `__use_no_heap_region` was requested, but `<reason>` was referenced. If `<reason>` represents `malloc`, `free`, `__heapstats`, `__heapvalid`, or `__argv_alloc`, the use of `__use_no_heap_region` conflicts with these functions.
- Error: L6915E: Library reports error: Conflicting stack/heap set up methods in use. `__user_setup_stackheap`, `__user_initial_stackheap` cannot be used with `__initial_sp`, `__heap_base` and `__heap_limit`

You have most likely used `__initial_sp`, `__heap_base`, or `__heap_limit` to set up the stack and heap, but other independent stack and heap setup methods, `__user_initial_stackheap` or `__user_setup_stackheap`, are also in use. Use only one of the following stack and heap setup methods:

- `__initial_sp`, `__heap_base`, `__heap_limit`.
- `__user_setup_stackheap`.
- `__user_initial_stackheap`. The legacy function. Arm recommends not using `__user_initial_stackheap()`, if possible.

L6916E: Relocation #<rel_class>:<idx> in <oepname>(<spname>). R_ARM_CALL for conditional BL instruction).

L6917E: Relocation #<rel_class>:<idx> in <oepname>(<spname>). R_ARM_JUMP24 for BLX instruction).

L6918W: Execution region <ername> placed at 0x<eraddr> needs padding to ensure alignment <spalign> of <oepname>(<spname>).

L6922E: Section <objname>(<secname>) has mutually exclusive attributes (READONLY and TLS)

L6923E: Relocation #<rel_class>:<idx> in <oepname>(<spname>) with respect to <symname>. TLS relocation <type> to non-TLS symbol in <symobjname>(<symsecname>).

L6924E: Relocation #<rel_class>:<idx> in <oepname>(<spname>) with respect to <symname>. Non-TLS relocation <type> to STT_TLS symbol in <symobjname>(<symsecname>).

L6925E: Ignoring <token> attribute for region <region>. MemAccess support has been removed.

L6926E: Relocation #<rel_class>:<idx> in <oepname>(<spname>) has incorrect relocation type <rtype> for instruction encoding 0x<b1>.

L6927E: Relocation #<rel_class>:<idx> in <oepname>(<spname>) has incorrect relocation type <rtype> for instruction encoding 0x<b11><b12>.

L6932W: Library reports warning: <msg>

L6935E: Debug Group contents are not identical, <name> with signature sym <sig> from objects (<new>) and (<old>)

L6936E: Multiple RESOLVE clauses in library script for symbol '<sym>'.

L6937E: Multiple definitions of library script function '<func>'.

L6939E: Missing alignment for region <regname>.

L6940E: Alignment <alignment> for region <regname> must be at least 4 and a power of 2 or MAX.

L6941W: chmod system call failed for file <filename> error <perr>

L6942E: Execution Region <ername> contains multiple <type>, sections:

L6966E: Alignment <alignment> for region <regname> cannot be negative.

L6967E: Entry point (<address>) points to a THUMB instruction but is not a valid THUMB code pointer.

L6968E: Could not parse Linux Kernel version "<kernel>".

L6969W: Changing AT Section <name> type from RW to RO in <ername>.

L6971E: <objname>(<secname>) type <type> incompatible with <prevobj>(<prevname>) type <prevtype> in er <ername>.

You might see this message when placing __at sections with a scatter file. For example, the following code in main.c and the related scatter file gives this error:

```
int variable __attribute__((section(".ARM.__at_0x200000")));
```

```
LR1 0x0000 0x20000
```



```
{
    ER1 0x0 0x2000
    {
        * (+RO)
    }
    ER2 0x8000 0x2000
    {
        main.o
    }
    RAM 0x200000 (0x1FF00-0x2000)
    {
        * (+RW, +ZI)
    }
}
```

The variable has the type ZI, and the linker attempts to place it at address 0x200000. However, this address is reserved for RW sections by the scatter file. This produces the error:

Error: L6971E: stdio_streams.o(.data) type RW incompatible with main.o(.ARM.__AT_0x00200000) type ZI in er RAM.

To fix this, change the address in your source code, for example:

```
int variable __attribute__((section(".ARM.__at_0x210000")));
```

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Methods of placing functions and data at specific addresses.](#)
- [Placement of __at sections at a specific address.](#)

L6972E: <objname>(<secname>) with required base 0x<required> has been assigned base address 0x<actual>.

L6973E: Error placing AT section at address 0x<addr> in overlay ER <ername>.

For example, you attempted to use `__attribute__((section(".ARM.__at_<address>")))` to place a section when building a DLL or application with an overlay region.

`__attribute__((section(".ARM.__at_<address>")))` requires that you specify a fixed location in a scatter file with `.ARM.__at_<address>`. In this case, you must also specify the `--no_autoat` linker option.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Placement of __at sections at a specific address.](#)
- [--autoat, --no_autoat.](#)

Root-region-and-the-initial-entry-point/Placement-of-at-sections-at-a-specific-address

L6974E: AT section <name> does not have a base address.

See [Placement of __at sections at a specific address](#) in the *Arm Compiler for Embedded Reference Guide*.

L6975E: <objname>(<secname>) cannot have a required base and SHF_MERGE.

L6976E: <objname>(<secname>) cannot have a required base and SHF_LINK_ORDER.

L6977E: <objname>(<secname>) cannot be part of a contiguous block of sections

L6978W: <objname>(<secname>) has a user defined section type and a required base address.

L6979E: <objname>(<secname>) with required base address cannot be placed in Position Independent ER <ername>.

L6980W: FIRST and LAST ignored for <objname>(<secname>) with required base address.

See [Section placement with the FIRST and LAST attributes](#) in the *Arm Compiler for Embedded Reference Guide*.

L6981E: __AT incompatible with BPABI and SystemV Image types

See [Restrictions on placing __at sections](#) in the *Arm Compiler for Embedded Reference Guide*.

L6982E: AT section <objname>(<spname>) with base <base> limit <limit> overlaps address range with AT section <obj2name>(<sp2name>) with base <base2> limit <limit2>.

See [Placement of __at sections at a specific address](#) in the *Arm Compiler for Embedded Reference Guide*.

L6983E: AT section <objname>(<spname>) with required base address <base> out of range for ER <ername> with base <erbase> and limit <erlimit>.

This can occur if you specify `__attribute__((section(".ARM.__at_<address>")))` in your code, `.ARM.__at_<address>` in your scatter file, and `--no_autoat` option on the linker command line. In this case, the address part of `.ARM.__at_<address>` must be specified as eight hexadecimal digits. For example:

```
int x1 __attribute__((section(".ARM.__at_0x4000"))); // defined in function.c
```

```
; scatter file
LR1 0x0
{
    ...
    function.o(.ARM.__at_0x00004000)
    ...
}
```

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Placement of __at sections at a specific address](#).
- `--autoat`, `--no_autoat`.

L6984E: AT section <objname>(<spname>) has required base address <base> which is not aligned to section alignment <alignment>.

See [Placement of __at sections at a specific address](#) in the *Arm Compiler for Embedded Reference Guide*.

L6985E: Unable to automatically place AT section <objname>(<spname>) with required base address <base>. Please manually place in the scatter file using the `--no_autoat` option.

See the following in the *Arm Compiler for Embedded Reference Guide*:

- [Placement of __at sections at a specific address](#).
- `--autoat`, `--no_autoat`.

5. ELF Image Converter Errors and Warnings

Describes the error and warning messages for the ELF image converter, `fromelf`.

5.1 List of the `fromelf` error and warning messages

Lists the error and warning messages that `fromelf` produces.



See [List of the licensing error and warning messages](#) for a list of license-related error messages.

Q0105E: Load region #<segindex> extends beyond top of address space.

Q0106E: Out of Memory.

Q0107E: Failed writing output file '<filename>': <reason>

Q0108E: Could not create output file '<filename>': <reason>

Q0119E: No output file specified.

Q0120E: No input file specified.

Q0122E: Could not open file '<filename>': <reason>

A <reason> of Invalid argument might be because you have invalid characters on the command line. For example, on Windows you might have used the escape character `\` when specifying a filter with an archive file:

```
fromelf --elf --strip=all t.a\ (test*.o\ ) -o filtered/
```

On Windows, use:

```
fromelf --elf --strip=all t.a(test*.o) -o filtered/
```

See [input_file \(fromelf\)](#) in the *Arm Compiler for Embedded Reference Guide*.

Q0128E: File i/o failure.

This error can occur if you specify a directory for the `--output` command-line option, but you did not terminate the directory with a path separator. For example, `--output=my_elf_files/`.

See [--output=destination](#) in the *Arm Compiler for Embedded Reference Guide*.

Q0129E: Not a 32 bit ELF file.

Q0130E: Not a 64 bit ELF file.

Q0131E: Invalid ELF identification number found.

This error is given if you attempt to use fromelf on a file which is not in ELF format, or which is corrupted. Object (.o) files and executable (.axf) files are in ELF format.

Q0132E: Invalid ELF section index found <idx>.

Q0133E: Invalid ELF segment index found <idx>.

Q0134E: Invalid ELF string table index found <idx>.

Q0135E: Invalid ELF section entry size found.

Q0136E: ELF Header contains invalid file type.

Q0137E: ELF Header contains invalid machine name.

Q0138E: ELF Header contains invalid version number.

See Q0131E.

Q0147E: Failed to create Directory <dir>: <reason>

A <reason> of File exists might be because you have specified a directory that has the same name as a file that already exists. For example, if a file called filtered already exists, then the following command produces this error:

```
fromelf --elf --strip=all t.a(test*.o) -o filtered/
```

The path separator character / informs fromelf that filtered is a directory.

See [--output=destination](#) in the *Arm Compiler for Embedded Reference Guide*.

Q0171E: Invalid st_name index into string table <idx>.

See Q0131E.

Q0172E: Invalid index into symbol table <idx>.

See Q0131E.

Q0186E: This option requires debugging information to be present

The --fieldoffsets option requires the image to be built with dwarf debug tables.

Q0425W: Incorrectly formed virtual function elimination header in file

This warning might indicate a compiler fault. Contact your supplier.

Q0426E: Error reading vtable information from file

This error might indicate a compiler fault. Contact your supplier.

Q0427E: Error getting string for symbol in a vtable

This error might indicate a compiler fault. Contact your supplier.

Q0433E: Diagnostic style <style> not recognised

Q0440E: No relocation sections for <secname>

Q0447W: Unknown Diagnostic number (<num>)

Q0448W: Read past the end of the compressed data while decompressing section '`<secname>`' #`<secnum>` in `<file>`

This warning might indicate an internal fault. Contact your supplier.

Q0449W: Write past the end of the uncompressed data buffer of size `<bufsize>` while decompressing section '`<secname>`' #`<secnum>` in `<file>`

This warning might indicate an internal fault. Contact your supplier.

Q0450W: Section '`<secname>`' #`<secnum>` in file `<file>` uses a mixture of legacy and current ABI relocation types.

Q0451W: Option '`--strip symbols`' used without '`--strip debug`' on an ELF file that has debug information.

Q0452W: Option '`--strip filesymbols`' used without '`--strip debug`' on an ELF file that has debug information.

Q0453W: Stripping path names from '`<path1>`' and '`<path2>`' produces a duplicate file name '`<filename>`'.

Q0454E: In ELF file: `<details>`

6. Librarian Errors and Warnings

Describes the error and warning messages for the Arm librarian, `armar`.

6.1 List of the `armar` error and warning messages

Lists the error and warning messages that `armar` produces.

L6800U: Out of memory

L6825E: Reading archive '<archive>' : <reason>

L6826E: '<archive>' not in archive format

L6827E: '<archive>': malformed symbol table

L6828E: '<archive>': malformed string table

L6829E: '<archive>': malformed archive (at offset <offset>)

L6830E: Writing archive '<archive>' : <reason>

L6831E: '<member>' not present in archive '<archive>'

L6832E: Archive '<archive>' not found : <reason>

L6833E: File '<filename>' does not exist

L6835E: Reading file '<filename>' : <reason>

L6836E: '<filename>' already exists, so will not be extracted

L6838E: No archive specified

L6839E: One of the actions -[<actions>] must be specified

L6840E: Only one action option may be specified

L6841E: Position '<position>' not found

L6842E: Filename '<filename>' too long for file system

L6843E: Writing file '<filename>' : <reason>

L6874W: Minor variants of archive member '<member>' include no base variant

Minor variants of the same function exist within a library. Find the two equivalent objects and remove one of them.

L6875W: Adding non-ELF object '<filename>' to archive '<name>'

L6876W: Minor variants of archive member '<member>' include multiple base variants

Two object files are placed into your archive that define the same set of symbols. In particular, adding the same object file twice causes this error. Check for a duplicate of the object file that is mentioned in the message and remove it from the command line.

7. Other Errors and Warnings

Describes error and warning messages that might be displayed by any of the tools.

7.1 Internal faults and other unexpected failures

Internal faults indicate that the tool has failed an internal consistency check or has encountered some unexpected input that it could not deal with. They might point to a potential issue in the tool itself.

For example:

```
Internal fault: [0x76fd03:600448]
```

If you see an internal fault, contact your supplier.

To facilitate the investigation, try to send only the single image, object, source file, or function that is causing the error, plus the command-line options used.

If the assembler causes the internal fault, and the source code contains pre-processor macros, it might be necessary to use the compiler to preprocess the source before sending it to your supplier. That is, to take account of files added with `#include`, pass the file through the preprocessor as follows:

```
armclang <options> -E sourcefile.c > PPsourcefile.c
```

Where `<options>` are your normal compile options, such as `-O2`, `-g`, `-I`, `-D`, but without `-c`.

Check that the error is still reproducible with the preprocessed file. For example, compile it with:

```
armclang <options> -c PPsourcefile.c
```

Then provide the `PPsourcefile.c` file and the `<options>` to your supplier.

7.2 List of other error and warning messages

A list of the error and warning messages that any of the tools in the Arm® Compiler for Embedded toolchain report.



When the message is displayed, the <x> prefixing the message number is replaced by an appropriate letter relating to the tool. For example, the code x3900U is displayed as L3900U by the linker when you have specified an unrecognized option.

X3900U: Unrecognized option '<dashes><option>'.

<option> is not recognized by the tool. This could be because of a spelling error or the use of an unsupported abbreviation of an option.

X3901U: Missing argument for option '<option>'.

X3902U: Recursive via file inclusion depth of <limit> reached in file '<file>'.

X3903U: Argument '<argument>' not permitted for option '<option>'.

Possible reasons include malformed integers or unknown arguments.

X3904U: Could not open via file '<file>'.

X3905U: Error when reading from via file '<file>'.

X3906U: Malformed via file '<file>'.

X3907U: Via file '<file>' command too long for buffer.

X3908U: Overflow: '<string>' will not fit in an integer.

X3910W: Old syntax, please use '<hyphens><option><separator><parameter>'.

X3912W: Option '<option>' is deprecated.

X3913W: Could not close via file '<file>'.

X3915W: Argument '<argument>' to option '<option>' is deprecated

X3916U: Unexpected argument for option '<dashes><option>'

X3917U: Concatenated options cannot have arguments: -<option> <arg>

X9905E: cannot use --apcs=/hardfp without floating point hardware

X9906E: cannot use --apcs=/hardfp with fpu <fpu_option>

X9907E: unable to select no floating point support

X9908E: --fpmode=none overrides --fpu choice

Appendix A Arm Compiler for Embedded Errors and Warnings Reference Guide Changes

Describes the technical changes that have been made to the Arm® Compiler for Embedded Errors and Warnings Reference Guide.

A.1 Changes for the Arm Compiler for Embedded Errors and Warnings Reference Guide

Changes that have been made to the Arm® Compiler for Embedded Errors and Warnings Reference Guide are listed with the latest version first.

Table A-1: Changes between 6.21 and 6.20

Change	Topics affected
Updated the linker error messages L6123E and L6134E.	<ul style="list-style-type: none"> List of the armlink error and warning messages.
Added a description of L6837E illegal data mapping symbol error.	<ul style="list-style-type: none"> List of the armlink error and warning messages.
Updated the test case for A1479W.	<ul style="list-style-type: none"> List of the legacy armasm error and warning messages.
Updated the link to the Exception Handling ABI for the Arm Architecture.	<ul style="list-style-type: none"> List of the armlink error and warning messages.

Table A-2: Changes between 6.20 and 6.19

Change	Topics affected
Added details about linking with <code>--sysv</code> to the L6314W description.	<ul style="list-style-type: none"> List of the armlink error and warning messages.

Table A-3: Changes between 6.19 and 6.18

Change	Topics affected
Added a description of L6142W PAC mismatch warning.	<ul style="list-style-type: none"> List of the armlink error and warning messages.
Added a description of L6137E linker error.	<ul style="list-style-type: none"> List of the armlink error and warning messages.
Added descriptions of the L6873W, L6874W, and L6875W scatter file errors.	<ul style="list-style-type: none"> List of the armlink error and warning messages.
Added a note that the <code>armasm</code> legacy assembler is deprecated.	<ul style="list-style-type: none"> Legacy Assembler Errors and Warnings.
Added a description of A1950W warning that <code>armasm</code> legacy assembler is deprecated.	<ul style="list-style-type: none"> List of the legacy armasm error and warning messages.
Added a caution about suppressing diagnostic messages.	<ul style="list-style-type: none"> Suppressing armlink error and warning messages.
Updated descriptions to remove old Arm syntax.	<ul style="list-style-type: none"> List of the armlink error and warning messages.
Updated the description of L6415E.	<ul style="list-style-type: none"> List of the armlink error and warning messages.
Added the <i>Useful resources</i> topic.	<ul style="list-style-type: none"> Useful resources.

Table A-4: Changes between 6.18 and 6.17

Change	Topics affected
Added descriptions of the messages L6110W, L6111E, and L6831E.	<ul style="list-style-type: none"> List of the armlink error and warning messages
Added cross references to image entry point information for message L6305W.	<ul style="list-style-type: none"> List of the armlink error and warning messages

Table A-5: Changes between 6.17 and 6.16

Change	Topics affected
Added amlink error messages L6123E and L6134E related to Link-Time Optimization (LTO).	<ul style="list-style-type: none"> List of the armlink error and warning messages.
Added amlink error messages L6089E, L6099E, L6102E, and L6109E related to the <code>--bare_metal_sysv</code> option, the <code>PI</code> , <code>RELOC</code> , and <code>OVERLAY</code> execution region attributes, and the use of non-root regions in scatter files.	<ul style="list-style-type: none"> List of the armlink error and warning messages.
Updated the description for L6218E.	<ul style="list-style-type: none"> List of the armlink error and warning messages

Table A-6: Changes between 6.16 and 6.15

Change	Topics affected
No changes.	N/A

Table A-7: Changes between 6.15 and 6.14

Change	Topics affected
Added description for L6077E linker error message.	<ul style="list-style-type: none"> List of the armlink error and warning messages.
Updated the description of L6236E to cover the situation when objects inside static libraries are loaded on-demand.	<ul style="list-style-type: none"> List of the armlink error and warning messages.
Added description of how to ensure that examples of problems can be reproduced for investigation.	<ul style="list-style-type: none"> Internal faults and other unexpected failures.
Various minor edits to update or remove outdated text and links.	Throughout.
Progressive terminology commitment added to Proprietary notices section (all documents).	<ul style="list-style-type: none"> Proprietary notices