

**NAME**

rgbasm — Game Boy assembler

**SYNOPSIS**

```
rgbasm [-EhLVvw] [-b chars] [-D name[=value]] [-g chars] [-i path]
        [-M depend_file] [-MG] [-MP] [-MT target_file] [-MQ target_file]
        [-o out_file] [-p pad_value] [-r recursion_depth] [-W warning]
        file ...
```

**DESCRIPTION**

The **rgbasm** program creates an RGB object file from an assembly source file. The input *file* can be a file path, or - denoting stdin.

Note that options can be abbreviated as long as the abbreviation is unambiguous: --verb is --verbose, but --ver is invalid because it could also be --version. The arguments are as follows:

- b *chars*, --binary-digits *chars*  
Change the two characters used for binary constants. The defaults are 01.
- D *name*[=*value*], --define *name*[=*value*]  
Add a string symbol to the compiled source code. This is equivalent to *name* **EQU** "*value*" in code, or *name* **EQU** "1" if *value* is not specified.
- E, --export-all  
Export all labels, including unreferenced and local labels.
- g *chars*, --gfx-chars *chars*  
Change the four characters used for gfx constants. The defaults are 0123.
- h, --halt-without-nop  
By default, **rgbasm** inserts a **nop** instruction immediately after any **halt** instruction. The -h option disables this behavior.
- i *path*, --include *path*  
Add an include path.
- L, --preserve-ld  
Disable the optimization that turns loads of the form **LD [\$FF00+n8],A** into the opcode **LDH [\$FF00+n8],A** in order to have full control of the result in the final ROM.
- M *depend\_file*, --dependfile *depend\_file*  
Print *make*(1) dependencies to *depend\_file*.
- MG To be used in conjunction with -M. This makes **rgbasm** assume that missing files are auto-generated: when **INCLUDE** or **INCBIN** is attempted on a non-existent file, it is added as a dependency, then **rgbasm** exits normally instead of erroring out. This feature is used in automatic updating of makefiles.
- MP When enabled, this causes a phony target to be added for each dependency other than the main file. This prevents *make*(1) from erroring out when dependency files are deleted.
- MT *target\_file*  
Add a target to the rules emitted by -M. The exact string provided will be written, including spaces and special characters.  
-MT fileA -MT fileB  
is equivalent to  
-MT 'fileA fileB'.  
If neither this nor -MQ is specified, the output file name is used.

- MQ *target\_file*  
Same as -MT, but additionally escapes any special *make*(1) characters, essentially '\$'.
- o *out\_file*, --output *out\_file*  
Write an object file to the given filename.
- p *pad\_value*, --pad-value *pad\_value*  
When padding an image, pad with this value. The default is 0x00.
- r *recursion\_depth*, --recursion-depth *recursion\_depth*  
Specifies the recursion depth at which RGBASM will assume being in an infinite loop.
- V, --version  
Print the version of the program and exit.
- v, --verbose  
Be verbose.
- W *warning*, --warning *warning*  
Set warning flag *warning*. A warning message will be printed if *warning* is an unknown warning flag. See the “DIAGNOSTICS” section for a list of warnings.
- w  
Disable all warning output, even when turned into errors.

## DIAGNOSTICS

Warnings are diagnostic messages that indicate possibly erroneous behavior that does not necessarily compromise the assembling process. The following options alter the way warnings are processed.

- Werror  
Make all warnings into errors.
- Werror=  
Make the specified warning into an error. A warning’s name is appended (example: -Werror=obsolete), and this warning is implicitly enabled and turned into an error. This is an error if used with a meta warning, such as -Werror=all.

The following warnings are “meta” warnings, that enable a collection of other warnings. If a specific warning is toggled via a meta flag and a specific one, the more specific one takes priority. The position on the command-line acts as a tie breaker, the last one taking effect.

- Wall  
This enables warnings that are likely to indicate an error or undesired behavior, and that can easily be fixed.
- Wextra  
This enables extra warnings that are less likely to pose a problem, but that may still be wanted.
- Weverything  
Enables literally every warning.

The following warnings are actual warning flags; with each description, the corresponding warning flag is included. Note that each of these flag also has a negation (for example, -Wcharmap-redef enables the warning that -Wno-charmap-redef disables). Only the non-default flag is listed here. Ignoring the “no-” prefix, entries are listed alphabetically.

- Wno-assert  
Warn when **WARN**-type assertions fail. (See “Aborting the assembly process” in *rgbasm*(5) for **ASSERT**).
- Wbackwards-for  
Warn when **FOR** loops have their start and stop values switched according to the step value. This warning is enabled by -Wall.

- Wbuiltin-args  
Warn about incorrect arguments to built-in functions, such as **STRSUB**() with indexes outside of the string's bounds. This warning is enabled by **-Wall**.
- Wcharmap-redef  
Warn when re-defining a charmap mapping. This warning is enabled by **-Wall**.
- Wdiv  
Warn when dividing the smallest negative integer ( $-2^{31}$ ) by -1, which yields itself due to integer overflow.
- Wempty-macro-arg  
Warn when a macro argument is empty. This warning is enabled by **-Wextra**.
- Wempty-strrpl  
Warn when **STRRPL**() is called with an empty string as its second argument (the substring to replace). This warning is enabled by **-Wall**.
- Wlarge-constant  
Warn when a constant too large to fit in a signed 32-bit integer is encountered. This warning is enabled by **-Wall**.
- Wlong-string  
Warn when a string too long to fit in internal buffers is encountered. This warning is enabled by **-Wall**.
- Wmacro-shift  
Warn when shifting macro arguments past their limits. This warning is enabled by **-Wextra**.
- Wno-obsolete  
Warn when obsolete constructs such as the **\_PI** constant or **PRINTT** directive are encountered.
- Wnumeric-string=  
Warn when a multi-character string is treated as a number. **-Wnumeric-string=0** or **-Wno-numeric-string** disables this warning. **-Wnumeric-string=1** or just **-Wnumeric-string** warns about strings longer than four characters, since four or fewer characters fit within a 32-bit integer. **-Wnumeric-string=2** warns about any multi-character string.
- Wshift  
Warn when shifting right a negative value. Use a division by  $2^N$  instead.
- Wshift-amount  
Warn when a shift's operand is negative or greater than 32.
- Wtruncation=  
Warn when an implicit truncation (for example, **db** to an 8-bit value) loses some bits. **-Wtruncation=0** or **-Wno-truncation** disables this warning. **-Wtruncation=1** warns when an N-bit value's absolute value is  $2^N$  or greater. **-Wtruncation=2** or just **-Wtruncation** also warns when an N-bit value is less than  $-2^{(N-1)}$ , which will not fit in two's complement encoding.
- Wno-user  
Warn when the **WARN** built-in is executed. (See "Aborting the assembly process" in *rgbasm(5)* for **WARN**).

## EXAMPLES

You can assemble a source file in two ways.

Straightforward way:

```
$ rgbasm -o bar.o foo.asm
```

Pipes way:

```
$ cat foo.asm | rgbasm -o bar.o -  
$ rgbasm -o bar.o - < foo.asm
```

The resulting object file is not yet a usable ROM image—it must first be run through *rgblink*(1) and then *rgbfix*(1).

## BUGS

Please report bugs on *GitHub*: <https://github.com/gbdev/rgbds/issues>.

## SEE ALSO

*rgbasm*(5), *rgbfix*(1), *rgblink*(1), *rgbds*(5), *rgbds*(7), *gbz80*(7)

## HISTORY

**rgbasm** was originally written by Carsten Sørensen as part of the ASMotor package, and was later packaged in RGBDS by Justin Lloyd. It is now maintained by a number of contributors at <https://github.com/gbdev/rgbds>.