NAME

rgbasm — Game Boy assembler

SYNOPSIS

rgbasm [**-EHhLlVvw**] [**-b** *chars*] [**-D** *name*[=*value*]] [**-g** *chars*] [**-I** *path*]
[**-M** *depend_file*] [**-MG**] [**-MP**] [**-MT** *target_file*] [**-MQ** *target_file*]
[**-o** *out_file*] [**-P** *include_file*] [**-p** *pad_value*] [**-Q** *fix_precision*]
[**-r** *recursion_depth*] [**-W** *warning*] *asmfile*

DESCRIPTION

The **rgbasm** program creates an RGB object file from an assembly source file. The object file format is documented in rgbds(5).

The input *asmfile* can be a path to a file, or **-** to read from standard input.

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* **EQUS** "*value*" in code, or *name* **EQUS** "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, **--nop-after-halt**
: Inserts a **nop** instruction immediately after any **halt** instruction. This option is deprecated and will be removed in the next version.

-h, **--halt-without-nop**
: This option is redundant and will be removed in the next version.

-I *path*, **--include** *path*
: Add a new "include path"; *path* must point to a directory. When a **INCLUDE** (including the implicit one from **-P**) or **INCBIN** is attempted, **rgbasm** first looks up the provided path from its working directory; if this fails, it tries again from each of the "include path" directories, in the order they were provided.

-L, **--preserve-ld**
: This option is redundant and will be removed in the next version.

-l, **--auto-ldh**
: Optimize loads of the form **LD [$FF00+n8],A** into the opcode **LDH [$FF00+n8],A**. This option is deprecated and will be removed in the next version.

-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** (including the implicit one from **-P**) 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 *include_file*, **--preinclude** *include_file*
Pre-include a file. This acts as if a **INCLUDE** "*include_file*" was read before the input *asmfile*.

-p *pad_value*, **--pad-value** *pad_value*
Use this as the value for **DS** directives in ROM sections, unless overridden. The default is 0x00.

-Q *fix_precision*, **--q-precision** *fix_precision*
Use this as the precision of fixed-point numbers after the decimal point, unless they specify their own precision. The default is 16, so fixed-point numbers are Q16.16 (since they are 32-bit integers). The argument may start with a '.' to match the Q notation, for example, **-Q** *.16*.

-r *recursion_depth*, **--recursion-depth** *recursion_depth*
Specifies the recursion depth past which RGBASM will assume being in an infinite loop. The default is 64.

-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 is 2**N or greater, or less than -2**N. **-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.

-Wunmapped-char=
: Warn when a character goes through charmap conversion but has no defined mapping. **-Wunmapped-char=0** or **-Wunmapped-char** disables this warning. **-Wunmapped-char=1** or just **-Wunmapped-char** only warns if the active charmap is not empty. **-Wunmapped-char=2** warns if the active charmap is empty, and/or is not the default charmap 'main'.

-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

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