

# Composer CMS: Content Make System

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# Chapter 1

## Composer CMS



“Creating Made Simple.”

Composer CMS v3.0	License: GPL
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### 1.1 Overview

**Composer is a simple but powerful CMS based on Pandoc, Bootstrap and GNU Make.** It is a document and website build system that processes directories or individual files in Markdown format.

Traditionally, CMS stands for Content Management System. Composer is designed to be a Content **Make** System. Written content is vastly easier to manage as plain text, which can be crafted with simple editors and tracked with revision control. However, professional documentation, publications, and websites require formatting that is dynamic and feature-rich.

Pandoc is an extremely powerful document conversion tool, and is a widely used standard for processing Markdown into other formats. While it has reasonable defaults, there are a large number of options, and additional tools are required for some formats and features.

Composer consolidates all the necessary components, simplifies the options, and prettifies the output formats, all in one place. It also serves as a build system, so that large repositories can be managed as documentation archives or published as Bootstrap Websites.

```
=====
# >> Composer CMS v3.0 :: ../composer
=====
# MAKEFILE_LIST      [../composer/Makefile]
# COMPOSER_INCLUDES  [../composer/.composer.mk]
# CURDIR             [../composer]
# MAKECMDGOALS       [all] (all)
# MAKELEVEL          [1]
=====
# >> Creating        | ../composer :: Composer-v3.0.Manual.pdf
# >> Creating        | ../composer :: README.html
# >> Creating        | ../composer :: README.pdf
# >> Creating        | ../composer :: README.epub
# >> Creating        | ../composer :: README.revealjs.html
# >> Creating        | ../composer :: README.docx
```

### 1.2 Quick Start

Use make help to get started:

```
make [-f .../ Makefile] [ variables ] <filename>.<extension>
make [-f .../ Makefile] [ variables ] <target>
```

Fetch the necessary binary components (see Requirements):

```
make __update-all
```

Create documents from source Markdown files (see Formatting Variables):

```
make README.html
make Composer-v3.0.Manual.html c_list="README.md LICENSE.md"
```

Save a persistent configuration (see Recommended Workflow, Configuration Settings and Special Targets):

```
make template >.composer.mk
$EDITOR .composer.mk
    book-Composer-v3.0.Manual.html: README.md LICENSE.md
make clean
make all
```

Recursively install and build an entire directory tree (see Recommended Workflow):

```
cd .../documents
mv .../composer .Composer
make -f .Composer/Makefile install-all
make all-all
```

See help-all for full details and additional targets.

## 1.3 Principles

The guiding principles of Composer:

- All source files in readable plain text
- Professional output, suitable for publication
- Minimal dependencies, and entirely command-line driven
- Separate content and formatting; writing and publishing are independent
- Inheritance and dependencies; global, tree, directory and file overrides
- Fast; both to initiate commands and for processing to complete

Direct support for key document types (see Document Formatting):

- HTML & Bootstrap Websites
- PDF
- EPUB
- Reveal.js Presentations
- Microsoft Word & PowerPoint

## 1.4 Requirements

Composer has almost no external dependencies. All needed components are integrated, including Pandoc. The repository needs to be initialized with \_\_update-all to fetch the Pandoc and YQ binaries (see Repository Versions).

Composer does require a minimal command-line environment based on GNU tools, particularly GNU Make, which is standard for all GNU/Linux systems. The Windows Subsystem for Linux for Windows and MacPorts for macOS both provide suitable environments.

The one large external requirement is TeX Live, and it can be installed using the package managers of each of the above systems. It is only necessary for creating PDF files.

Below are the versions of the components in the repository, and the tested versions of external tools for this iteration of Composer. Use check to validate your system.

Repository	Commit	License
Pandoc	2.18	GPL
YQ	v4.24.2	MIT
Bootstrap	v5.1.3	MIT
Markdown Viewer	059f3192d4ebf5fa9776	MIT
Reveal.js	4.3.1	MIT

Project	Composer Version
GNU Bash	5.0.18
- GNU Coreutils	8.31
- GNU Findutils	4.8.0
- GNU Sed	4.8
GNU Make	4.2.1
- Pandoc	2.18
- YQ	4.24.2
- TeX Live (pdf)	2021 3.14159 2.6-1.40.22

Markdown Viewer is included both for its CSS stylesheets, and for real-time rendering of Markdown files as they are being written. To install, follow the instructions in the README.md, and select the appropriate manifest.\*.json file for your browser.

The versions of the integrated repositories can be changed, if desired (see Repository Versions).

---





## Chapter 2

# Composer Operation

### 2.1 Recommended Workflow

The ideal workflow is to put Composer in a top-level `.Composer` for each directory tree you want to manage, creating a structure similar to this:

```
.../.Composer
.../
.../tld/
.../tld/sub/
```

Then, it can be converted to a Composer documentation archive (Quick Start example):

```
make -f .Composer/Makefile install-all
make all-all
```

If specific settings need to be used, either globally or per-directory, `.composer.mk` files can be created (see Configuration Settings, Quick Start example):

```
make template >.composer.mk
$EDITOR .composer.mk
```

Custom targets can also be defined, using standard GNU Make syntax (see Custom Targets).

GNU Make does not support file and directory names with spaces in them, and neither does Composer. Documentation archives which have such files or directories will produce unexpected results.

It is fully supported for input files to be symbolic links to files that reside outside the documentation archive:

```
cd .../tld
ln -rs ../README.md ./
make README.html
```

Finally, it is best practice to install-force after every Composer upgrade, in case there are any changes to the Makefile template (see Primary Targets).

The archive is ready, and each directory is both a part of the collective and its own individual instance. Targets can be run per-file, per-directory, or recursively through an entire directory tree. The most commonly used targets are in Primary Targets.

**Welcome to Composer. Happy Making!**

## 2.2 Document Formatting

As outlined in Overview and Principles, a primary goal of Composer is to produce beautiful and professional output. Pandoc does reasonably well at this, and yet its primary focus is document conversion, not document formatting. Composer fills this gap by specifically tuning a select list of the most commonly used document formats.

Further options for each document type are in Formatting Variables. All improvements not exposed as variables will apply to all documents created with a given instance of Composer.

Note that all the files referenced below are embedded in the ‘Embedded Files’ and ‘Heredoc’ sections of the Makefile. They are exported by the `_release` target, and will be overwritten whenever it is run.

### 2.2.1 HTML

In addition to being a helpful real-time rendering tool, Markdown Viewer includes several CSS stylesheets that are much more visually appealing than the Pandoc default, and which behave like normal webpages, so Composer uses them for all HTML-based document types, including EPUB.

Information on installing Markdown Viewer for use as a Markdown rendering tool is in Requirements.

### 2.2.2 Bootstrap Websites

Bootstrap is a leading web development framework, capable of building static webpages that behave dynamically. Static sites are very easy and inexpensive to host, and are extremely responsive compared to truly dynamic webpages.

Composer uses this framework to transform an archive of simple text files into a modern website, with the appearance and behavior of dynamically indexed pages.

*(This feature is reserved for a future release as the `site` target, along with `page` and `post` in *Special Targets*.)*

### 2.2.3 PDF

The default formatting for PDF is geared towards academic papers and the typesetting of printed books, instead of documents that are intended to be purely digital.

Internally, Pandoc first converts to LaTeX, and then uses TeX Live to convert into the final PDF. Composer inserts customized LaTeX to modify the final output:

```
.../artifacts/pdf.latex
```

### 2.2.4 EPUB

The EPUB format is essentially packaged HTML, so Composer uses the same Markdown Viewer CSS stylesheets for it.

### 2.2.5 Reveal.js Presentations

The CSS for Reveal.js presentations has been modified to create a more traditional and readable end result. The customized version is at:

```
.../artifacts/revealjs.css
```

It links in a default theme from the `.../revealjs/dist/theme` directory. Edit the location in the file, or use `c_css` to select a different theme.

It is set up so that a logo can be placed in the upper right hand corner on each slide, for presentations that need to be branded. Simply copy an image file to the logo location:

```
.../artifacts/logo.img
```

To have different logos for different directories (using Recommended Workflow, Configuration Settings and Precedence Rules):

```
cd .../presentations
cp .../logo.img ./
ln -rs .../.Composer/artifacts/revealjs.css ./composer.css
echo 'override c_type := revealjs' >>./composer.mk
make all
```

## 2.2.6 Microsoft Word & PowerPoint

The internal Pandoc templates for these are exported by Composer, so they are available for customization:

```
.../artifacts/reference.docx
.../artifacts/reference.pptx
```

They are not currently modified by Composer.

## 2.3 Configuration Settings

Composer uses `.composer.mk` files for persistent settings and definition of Custom Targets. By default, they only apply to the directory they are in (see `COMPOSER_INCLUDE` in Control Variables). The values in the most local file override all others (see Precedence Rules).

The easiest way to create a new `.composer.mk` is with the template target (Quick Start example):

```
make template >composer.mk
$EDITOR .composer.mk
```

All variable definitions must be in the override `[variable] := [value]` format from the template target. Doing otherwise will result in unexpected behavior, and is not supported. The regular expression that is used to detect them:

```
override [[[:space:]]+([^\[:space:]]+)[[:space:]]+[:]=]
```

Variables can also be specified per-target, using GNU Make syntax (these are the settings used to process the Composer README.\* files):

```
README.%.override c_css := css_alt
README.%.override c_toc := 0
README.epub.override c_css :=
README.revealjs.html.override c_css :=
README.revealjs.html.override c_toc :=
```

In this case, there are multiple definitions that could apply to `README.revealjs.html`, due to the `%` wildcard. Since the most specific target match is used, the final values for both `c_css` and `c_toc` would be empty.

## 2.4 Precedence Rules

The order of precedence for `.composer.mk` files is global-to-local (see `COMPOSER_INCLUDE` in Control Variables). This means that the values in the most local file override all others.

Variable aliases, such as `COMPOSER_DEBUGIT/c_debug/V` are prioritized in the order shown, with `COMPOSER_*` taking precedence over `c_*`, over the short alias.

Selection of the CSS file can be done using `.composer.css` or the `c_css` variable, with `.composer.css` taking precedence (unless `c_css` comes from `.composer.mk`). The process for `.composer.css` files is identical to `.composer.mk` (see `COMPOSER_INCLUDE` in Control Variables).

All values in `.composer.mk` take precedence over everything else, including `.composer.css` and environment variables.

## 2.5 Specifying Dependencies

If there are files or directories that have dependencies on other files or directories being processed first, this can be done simply using GNU Make syntax in `.composer.mk`:

```
LICENSE.html: README.html
all-subdirs-artifacts: all-subdirs-bootstrap
```

This would require `README.html` to be completed before `LICENSE.html`, and for `bootstrap` to be processed before `artifacts`. Directories need to be specified with the `all-subdirs-*` syntax in order to avoid conflicts with target names (see Custom Targets). Good examples of this are the internal docs and test targets, which are common directory names.

Chaining of dependencies can be as complex and layered as GNU Make will support. Note that if a file or directory is set to depend on a target, that target will be run whenever the file or directory is called.

## 2.6 Custom Targets

If needed, custom targets can be defined inside a `.composer.mk` file (see Configuration Settings), using standard GNU Make syntax. Naming them as `*-clean` or `*-all` will include them in runs of the respective targets. Targets with any other names will need to be run manually, or included in `COMPOSER_TARGETS` (see Control Variables).

There are a few limitations when naming custom targets. Targets starting with the regular expression `[_.]` are hidden, and are skipped by auto-detection. Additionally, there is a list of reserved targets in `Reserved`, along with a list of reserved variables.

Any included `.composer.mk` files are sourced early in the main Composer Makefile, so matching targets and most variables will be overridden. In the case of conflicting targets, GNU Make will produce warning messages. Variables will have their values changed silently. Changing the values of internal Composer variables is not recommended or supported.

A final note is that `*-clean` and `*-all` targets are stripped from `COMPOSER_TARGETS`. In cases where this results in an empty `COMPOSER_TARGETS`, there will be a message and no actions will be taken.

## 2.7 Repository Versions

There are a few internal variables used by `__update` to select the repository and binary versions of integrated components (see Requirements). These are exposed for configuration, but only within `.composer.mk`:

- `PANDOC_VER` (must be a binary version number)
- `PANDOC_CMT` (defaults to `PANDOC_VER`)
- `YQ_VER` (must be a binary version number)
- `YQ_CMT` (defaults to `YQ_VER`)
- `BOOTSTRAP_CMT`
- `MDVIEWER_CMT`
- `REVEALJS_CMT`

Binaries for Pandoc and YQ are installed in their respective directories. By moving or removing them, or changing the version number and foregoing `__update-all` (see Additional Targets), the system versions will be used instead. This will work as long as the commit versions match, so that supporting files are in alignment.

It is possible that changing the versions will introduce incompatibilities with Composer, which are usually impacts to the prettification of output files (see Document Formatting).

## Chapter 3

# Composer Variables

### 3.1 Formatting Variables

Variable	Purpose	Value
<code>c_type ~ T</code>	Desired output format	html
<code>c_base ~ B</code>	Base of output file	README
<code>c_list ~ L</code>	List of input files(s)	README.md
<code>c_lang ~ g</code>	Language for document headers	en-US
<code>c_css ~ s</code>	Location of CSS file	(.composer.css)
<code>c_toc ~ c</code>	Table of contents depth	
<code>c_level ~ l</code>	Chapter/slide header level	2
<code>c_margin ~ m</code>	Size of margins (PDF)	0.8in
<code>c_options ~ o</code>	Custom Pandoc options	

Values: <code>c_type</code>	Format	Extension
html	HyperText Markup Language	*.html
pdf	Portable Document Format	*.pdf
epub	Electronic Publication	*.epub
revealjs	Reveal.js Presentation	*.revealjs.html
docx	Microsoft Word	*.docx
pptx	Microsoft PowerPoint	*.pptx
text	Plain Text (well-formatted)	*.txt
markdown	Pandoc Markdown (for testing)	*.md.txt

- Other `c_type` values will be passed directly to Pandoc
- Special values for `c_css`:
  - `css_alt ~` Use the alternate default stylesheet
  - `0 ~` Revert to the Pandoc default
- Special value `0` for `c_toc ~` List all headers, and number sections
- Special value `0` for `c_level ~` Varies by `c_type` (see `help-all`)
- An empty `c_margin` value enables individual margins:
  - `c_margin_top ~ mt`
  - `c_margin_bottom ~ mb`
  - `c_margin_left ~ ml`
  - `c_margin_right ~ mr`

### 3.1.1 `c_type` / `c_base` / `c_list`

The compose target uses these variables to decide what to build and how. The output file is `[c_base].<extension>`, and is constructed from the `c_list` input files, in order. The `<extension>` is selected based on the `c_type` table above. Generally, it is not required to use the compose target directly for supported `c_type` files, since it is run automatically based on what output file `<extension>` is specified.

The automatic input file detection works by matching one of the following (Quick Start example):

<code>make README.html</code>	<code>~ README (empty [COMPOSER_EXT])</code>
<code>make README.html</code>	<code>~ README.md</code>
<code>make README.md.html</code>	<code>~ README.md</code>
<code>make Composer-v3.0.Manual.html</code>	<code>c_list="README.md LICENSE.md"</code>

Other values for `c_type`, such as `json` or `man`, for example, can be passed through to Pandoc manually:

```
make compose c_type="json" c_base="README" c_list="README.md"
make compose c_type="man" c_base="Composer-v3.0.Manual" c_list="README.md"
```

Any of the file types supported by Pandoc can be created this way. The only limitation is that the input files must be in Markdown format.

### 3.1.2 `c_lang`

- Primarily for PDF, this specifies the language that the table of contents (`c_toc`) and chapter headings (`c_level`) will use.

### 3.1.3 `c_css`

- By default, a CSS stylesheet from Markdown Viewer is used for HTML and EPUB, and one of the Reveal.js themes is used for Reveal.js Presentations. This variable allows for selection of a different file in all cases.
- The special value `css_alt` selects the alternate default stylesheet. Using 0 reverts to the Pandoc default.
- This value can be overridden by the presence of `.composer.css` files. See Precedence Rules for details.

### 3.1.4 `c_toc`

- Setting this to a value of [1–6] creates a table of contents at the beginning of the document. The numerical value is how many header levels deep the table should go. A value of 6 lists all header levels.
- Using a value of 0 lists all header levels, and additionally numbers all the sections, for reference.

### 3.1.5 `c_level`

- This value has different effects, depending on the `c_type` of the output document.
- For HTML, any value enables `section-divs`, which wraps headings and their section content in `<section>` tags and attaches identifiers to them instead of the headings themselves. This is for CSS styling, and is generally desired.
- For PDF, there are 3 top-level division types: `part`, `chapter`, and `section`. This sets the top-level header to the specified type, which changes the way the document is presented. Using `part` divides the document into “Parts”, each starting with a stand-alone title page. With this division type, each second-level heading starts a new “Chapter”. A chapter simply starts a new section on a new page, and lower-level headings continue as running portions within it. Finally, `section` creates one long running document with no blank pages or section breaks (like a HTML page). To set the desired value:
  - `part ~ 0`
  - `chapter ~ 2`
  - `section ~ Any other value`
- For EPUB, this creates chapter breaks at the specified level, starting the section on a new page. The special 0 simply sets it to the default value of 2.

- For Reveal.js Presentations, the top-level headings can persist on the screen when moving through slides in their sections, or they can rotate out as their own individual slides. Setting to 0 enables persistent headings, and all other values use the default.
- An empty value defers to the Pandoc defaults in all cases.

### 3.1.6 c\_margin

- The default margins for PDF are formatted for typesetting of printed books, where there is a large amount of open space around the edges and the text on each page is shifted away from where the binding would be. This is generally not what is desired in a purely digital PDF document.
- This is one value for all the margins. Setting it to an empty value exposes variables for each of the individual margins: `c_margin_top`, `c_margin_bottom`, `c_margin_left` and `c_margin_right`.

### 3.1.7 c\_options

- In some cases, it may be desirable to add additional Pandoc options. Anything put in this variable will be passed directly to Pandoc as additional command-line arguments.

## 3.2 Control Variables

Variable	Purpose	Value
MAKEJOBS	Parallel processing threads	1 (makejobs)
COMPOSER_DOCOLOR	Enable title/color sequences	(boolean)
COMPOSER_DEBUGIT	Use verbose output	(debugit)
COMPOSER_INCLUDE	Include all: .composer.mk	(boolean)
COMPOSER_DEPENDS	Sub-directories first: all	(boolean)
COMPOSER_LOG	Timestamped command log	.composed
COMPOSER_EXT	Markdown file extension	.md
COMPOSER_TARGETS	See: all/clean	config/targets
COMPOSER_SUBDIRS	See: all/clean/install	config/targets
COMPOSER_IGNORES	See: all/clean/install	config

- *MAKEJOBS ~ c\_jobs ~ J*
- *COMPOSER\_DOCOLOR ~ c\_color ~ C*
- *COMPOSER\_DEBUGIT ~ c\_debug ~ V*
- *(makejobs) = empty is disabled / number of threads / 0 is no limit*
- *(debugit) = empty is disabled / any value enables / 0 is full tracing*
- *(boolean) = empty is disabled / any value enables*

### 3.2.1 MAKEJOBS

- By default, Composer progresses linearly, doing one task at a time. If there are dependencies between items, this can be beneficial, since it ensures things will happen in a particular order. The downside, however, is that it is very slow.
- Composer supports GNU Make parallel execution, where multiple threads can be working through tasks independently. Experiment with lower values first. When recursing through large directories, each make that instantiates into a sub-directory has it's own jobs server, so the total number of threads running can proliferate rapidly.
- This can drastically speed up execution, processing thousands of files and directories in minutes. However, values that are too high can exhaust system resources. With great power comes great responsibility.
- A value of 0 does parallel execution with no thread limit.

### 3.2.2 COMPOSER\_DOCOLOR

- Composer uses colors to make all output and help text easier to read. The escape sequences used to accomplish

this can create mixed results when reading in an output file or a \$PAGER, or just make it harder to read for some.

- This is also used internally for targets like debug-file and template, where plain text is required.

### 3.2.3 COMPOSER\_DEBUGIT

- Provides more explicit details about what is happening at each step. Produces a lot more output, and can be slower. It will also be hard to read unless MAKEJOBS is set to 1.
- Full tracing using 0 also displays GNU Make debugging output.
- *When doing debug, this is used to pass a list of targets to test (see Additional Targets).*

### 3.2.4 COMPOSER\_INCLUDE

- On every run, Composer walks through the MAKEFILE\_LIST, all the way back to the main Makefile, looking for .composer.mk files in each directory. By default, it only reads the one in its main directory and the current directory, in that order. Enabling this causes all of them to be read.
- In the example directory tree below, normally the .composer.mk in .Composer is read first, and then tld/sub/.composer.mk. With this enabled, it will read all of them in order from top to bottom: .Composer/.composer.mk, .composer.mk, tld/.composer.mk, and finally tld/sub/.composer.mk.
- This is why it is best practice to have a .Composer directory at the top level for each documentation archive (see Recommended Workflow). Not only does it allow for strict version control of Composer per-archive, it also provides a mechanism for setting Composer Variables globally.
- Care should be taken setting “Local” variables from template (see Templates) when using this option. In that case, they will be propagated down the tree. This may be desired in some cases, but it will require that each directory set these manually, which could require a lot of maintenance.
- This setting also causes .composer.css files to be processed in an identical manner (see Precedence Rules).

Example directory tree (see Recommended Workflow):

```
.../.Composer/Makefile
.../.Composer/.composer.mk
.../Makefile
.../.composer.mk
.../tld/Makefile
.../tld/.composer.mk
.../tld/sub/Makefile
.../tld/sub/.composer.mk
```

### 3.2.5 COMPOSER\_DEPENDS

- When doing all-all, Composer will process the current directory before recursing into sub-directories. This reverses that, and sub-directories will be processed first.
- In the example directory tree in COMPOSER\_INCLUDE above, the default would be: .../ , .../ tld, and then .../ tld/sub. If the higher-level directories have dependencies on the sub-directories being run first, this will support that by doing them in reverse order, processing them from bottom to top.
- It should be noted that enabling this disables MAKEJOBS, to ensure linear processing, and that it has no effect on install or clean.

### 3.2.6 COMPOSER\_LOG

- Composer appends to a .composed log file in the current directory whenever it executes Pandoc. This provides some accounting, and is used by list to determine which \*.md files have been updated since the last time Composer was run.
- This setting can change the name of the log file, or disable it completely (empty value).
- It is removed each time clean is run.



### 3.2.7 COMPOSER\_EXT

- The Markdown file extension Composer uses: \*.md. This is for auto-detection of files to add to COMPOSER\_TARGETS, files to output for list, and other tasks. This is a widely used standard, including GitHub. Another commonly used extension is: \*.markdown.
- In some cases, they do not have any extension, such as README and LICENSE in source code directories. Setting this to an empty value causes them to be detected and output. It also causes all other files to be processed, because it becomes the wildcard \*, so use with care. It is likely best to use COMPOSER\_TARGETS to explicitly set the targets list in these situations.

### 3.2.8 COMPOSER\_TARGETS

- The list of output files to create or delete with clean and all. Composer does auto-detection using c\_type and COMPOSER\_EXT, so this does not usually need to be set. Hidden files that start with . are skipped.
- Setting this manually disables auto-detection. It can also include non-file targets added into a .composer.mk file (see Custom Targets).
- The .null target is special, and when used as a value for COMPOSER\_TARGETS or COMPOSER\_SUBDIRS it will display a message and do nothing. A side-effect of this target is that an actual file or directory named .null will never be created or removed by Composer.
- An empty value triggers auto-detection
- Use config or targets to check the current value.

### 3.2.9 COMPOSER\_SUBDIRS

- The list of sub-directories to recurse into with install, clean, and all. The behavior and configuration is identical to COMPOSER\_TARGETS above, including auto-detection and the .null target. Hidden directories that start with . are skipped.
- An empty value triggers auto-detection
- Use config or targets to check the current value.

### 3.2.10 COMPOSER\_IGNORES

- The list of COMPOSER\_TARGETS and COMPOSER\_SUBDIRS to skip with install, clean, and all. This allows for selective auto-detection, when the list of items to process is larger than those to leave alone.
  - Use config to check the current value.
-



# Chapter 4

## Composer Targets

### 4.1 Primary Targets

Target	Purpose
help	Basic help overview (default)
help-all	Console version of README.md (mostly identical)
template	Print settings template: .composer.mk
compose	Document creation engine (see Formatting Variables)
site	Recursively create Bootstrap Websites
install	Current directory initialization: Makefile
install-all	Do install recursively (no overwrite)
install-force	Recursively force overwrite of Makefile files
clean	Remove output files: COMPOSER_TARGETS :: *-clean
clean-all	Do clean recursively: COMPOSER_SUBDIRS
*-clean	Any targets named this way will also be run by clean
all	Create output files: COMPOSER_TARGETS :: *-all
all-all	Do all recursively: COMPOSER_SUBDIRS
*-all	Any targets named this way will also be run by all
list	Print updated files: *.md » .composed

#### 4.1.1 help / help-all

- Outputs all of the documentation for Composer. The README.md has a few extra sections covering internal targets, along with reserved target and variable names, but is otherwise identical to the help-all output.

#### 4.1.2 template

- Prints a useful template for creating new .composer.mk files (see Configuration Settings and Templates).

#### 4.1.3 compose

- This is the very core of Composer, and does the actual work of the Pandoc conversion. Details are in the c\_type / c\_base / c\_list section of Formatting Variables.

#### 4.1.4 site

- *(This feature is reserved for a future release to create Bootstrap Websites. It will also include page and post from Special Targets.)*

### 4.1.5 install / install-all / install-force

- Creates the necessary Makefile files to set up a directory or a directory tree as a Composer archive. By default, it will not overwrite any existing files.
- Doing a simple install will only create a file in the current directory, whereas install-all will recurse through the entire directory tree. A full install-force is the same as install-all, with the exception that it will overwrite all Makefile files.
- The topmost directory will have the Makefile created for it modified to point to Composer.

### 4.1.6 clean / clean-all / \*-clean

- Deletes all COMPOSER\_TARGETS output files in the current directory, after first running all \*-clean targets, including those for Specials.
- Doing clean-all does the same thing recursively, through all the COMPOSER\_SUBDIRS.

### 4.1.7 all / all-all / \*-all

- Creates all COMPOSER\_TARGETS output files in the current directory, after first running all \*-all targets, including those for Specials.
- Doing all-all does the same thing recursively, through all the COMPOSER\_SUBDIRS.

### 4.1.8 list

- Outputs all the COMPOSER\_EXT files that have been modified since COMPOSER\_LOG was last updated (see both in Control Variables). Acts as a quick reference to see if anything has changed.
- Since the COMPOSER\_LOG file is updated whenever Pandoc is executed, this target will primarily be useful when all is the only target used to create files in the directory.

## 4.2 Special Targets

There are a few targets considered Specials, that have unique properties:

Base Name	Purpose
book	Concatenate a source list into a single output file
page	<i>(Reserved for the future site feature)</i>
post	<i>(Reserved for the future site feature)</i>

For each of these base names, there are a standard set of actual targets:

Target	Purpose
%s-clean	Called by clean, removes all %-* files
%s-all	Called by all, creates all %-* files
%s	Main target, which is a wrapper to %s-all
%-*	Target files will be processed according to the base

### 4.2.1 book

An example book definition in a .composer.mk file (Quick Start example):

```
book-Composer-v3.0.Manual.html: README.md LICENSE.md
```

This configures it so that books will create Composer-v3.0.Manual.html from README.md and LICENSE.md, concatenated together in order. The primary purpose of this Special is to gather multiple source files in this manner, so that larger works can be comprised of multiple files, such as a book with each chapter in a separate file.

### 4.2.2 page / post

(Both *page* and *post* are reserved for the future site feature, which will build website pages using Bootstrap.)

## 4.3 Additional Targets

Target	Purpose
debug	Diagnostics, tests targets list in COMPOSER_DEBUGIT
debug-file	Export debug results to a plain text file
check	List system packages and versions (see Requirements)
check-all	Complete check package list, and system information
config	Show values of all Composer Variables
config-all	Complete config, including environment variables
targets	List all available targets for the current directory
_commit	Timestamped Git commit of the current directory tree
_commit-all	Automatic _commit, without \$EDITOR step
_release	Full upgrade to current release, repository preparation
_update	Update all included components (see Requirements)
_update-all	Complete _update, including binaries: Pandoc, YQ

### 4.3.1 debug / debug-file

- This is the tool to use for any support issues. Submit the output file to: [composer@garybgenett.net](mailto:composer@garybgenett.net)
- Internally, it also runs:
  - test
  - check-all
  - config-all
  - targets
- If issues are occurring when running a particular set of targets, list them in COMPOSER\_DEBUGIT.
- For general issues, run in the top-level directory (see Recommended Workflow). For specific issues, run in the directory where the issue is occurring.

For example:

```
make COMPOSER_DEBUGIT="books README.html" debug-file
```

### 4.3.2 check / check-all / config / config-all / targets

- Useful targets for validating tooling and configurations.
- Use check to see the list of components and their versions, in relation to the system installed versions. Doing check-all will show the complete list of tools that are used by Composer.
- The current values of all Composer Variables is output by config, and config-all will additionally output all environment variables.
- A structured list of detected targets, available Specials, \*-clean and \*-all targets, COMPOSER\_TARGETS, and COMPOSER\_SUBDIRS is printed by targets.
- Together, config and targets reveal the entire internal state of Composer.

### 4.3.3 \_commit / \_commit-all

- Using the directory structure in Recommended Workflow, .../ is considered the top-level directory. Meaning, it is the last directory before linking to Composer.
- If the top-level directory is a Git repository (it has <directory>.git or <directory>/.git), this target creates a commit of the current directory tree with the title format below.
- For example, if it is run in the .../ tld directory, that entire tree would be in the commit, including .../ tld/sub. The purpose of this is to create quick and easy checkpoints when working on documentation that does not necessarily fit in a process where there are specific atomic steps being accomplished.

- When this target is run in a Composer directory, it uses itself as the top-level directory.

Commit title format:

```
[Composer CMS v3.0  :: 2022-05-11T13:03:24 -07:00]
```

#### 4.3.4 `__release` / `__update` / `__update-all`

- Using the repository configuration (see Repository Versions), these fetch and install all external components.
- The `__update-all` target also fetches the Pandoc and YQ binaries, whereas `__update` only fetches the repositories.
- In addition to doing `__update-all`, `__release` performs the steps necessary to turn the current directory into a complete clone of Composer.
- If `rsync` is installed, `__release` can be used to rapidly replicate Composer, like below.
- One of the unique features of Composer is that everything needed to compose itself is embedded in the Makefile.

Rapid cloning (requires `rsync`):

```
mkdir .../clone
cd .../clone
make -f .../.Composer/Makefile __release
```

## 4.4 Internal Targets

Target	Purpose
<code>help-force</code>	Complete README.md content (similar to <code>help-all</code> )
<code>.template-install</code>	The Makefile used by <code>install</code> (see Templates)
<code>.template</code>	The <code>.composer.mk</code> used by <code>template</code> (see Templates)
<code>docs</code>	Extracts embedded files from Makefile, and does all
<code>headers</code>	Series of targets that handle all informational output
<code>headers-template</code>	For testing default headers output
<code>headers-template-all</code>	For testing complete headers output
<code>.make_database</code>	Complete contents of GNU Make internal state
<code>.all_targets</code>	Extracted list of all targets from <code>.make_database</code>
<code>.null</code>	Placeholder to specify or detect empty values
<code>test</code>	Test suite, validates all supported features
<code>test-file</code>	Export test results to a plain text file
<code>check-force</code>	Minimized check output (used for Requirements)
<code>subdirs</code>	Expands <code>COMPOSER_SUBDIRS</code> into <code>*--subdirs--*</code> targets

*(None of these are intended to be run directly during normal use, and are only documented for completeness.)*

---

## Chapter 5

# Reference

### 5.1 Templates

The install target Makefile template (for reference only):

```
override COMPOSER_MY_PATH := $(abspath $(dir $(lastword $(MAKEFILE_LIST))))
override COMPOSER_TEACHER := $(abspath $(dir $(COMPOSER_MY_PATH)))/Makefile
include $(COMPOSER_TEACHER)
```

Use the template target to create .composer.mk files:

```
# >> Global
# override MAKEJOBS := 1
# override COMPOSER_DOCOLOR :=
# override COMPOSER_DEBUGIT :=
# override COMPOSER_INCLUDE :=
# override COMPOSER_DEPENDS :=
# override COMPOSER_LOG := .composed
# override COMPOSER_EXT := .md
# override c_type := html
# override c_lang := en-US
# override c_css :=
# override c_toc :=
# override c_level := 2
# override c_margin := 0.8in
# override c_margin_top :=
# override c_margin_bottom :=
# override c_margin_left :=
# override c_margin_right :=
# override c_options :=
# >> Local
# override COMPOSER_TARGETS := README.html README.pdf README.epub README.revealjs.html README
# override COMPOSER_SUBDIRS :=
# override COMPOSER_IGNORES :=
# override c_base := README
# override c_list := README.md
# >> Special
# book-Composer.book.html: README.md LICENSE.md
# page-Composer.page.html: README.md LICENSE.md
# post-Composer.post.html: README.md LICENSE.md
```

## 5.2 Reserved

Reserved target names, including use as prefixes:

```
.all_targets
.make_database
.null
all
book
books
check
clean
compose
config
debug
docs
headers
help
install
list
page
pages
post
posts
site
subdirs
targets
template
test
_commit
_release
_update
```

Reserved variable names:

```
~
7Z
7Z_VER
BASE64
BASH
BASH_VER
BOOTSTRAP_CMT
BOOTSTRAP_DIR
BOOTSTRAP_LIC
BOOTSTRAP_SRC
CAT
CHECKIT
CHMOD
CLEANER
CODEBLOCK
COLUMNS
COLUMN_2
COMMENTED
COMPOSER
COMPOSER_ART
COMPOSER_BASENAME
COMPOSER_COMPOSER
COMPOSER_CONTENTS
```



COMPOSER\_CONTENTS\_DIRS  
COMPOSER\_CONTENTS\_FILES  
COMPOSER\_CSS  
COMPOSER\_DEBUGIT  
COMPOSER\_DEBUGIT\_ALL  
COMPOSER\_DEPENDS  
COMPOSER\_DIR  
COMPOSER\_DOCOLOR  
COMPOSER\_DOITALL\_check  
COMPOSER\_DOITALL\_clean  
COMPOSER\_DOITALL\_config  
COMPOSER\_DOITALL\_commit  
COMPOSER\_DOITALL\_debug  
COMPOSER\_DOITALL\_all  
COMPOSER\_DOITALL\_install  
COMPOSER\_DOITALL\_test  
COMPOSER\_DOITALL\_update  
COMPOSER\_EXPORTED  
COMPOSER\_EXPORTED\_NOT  
COMPOSER\_EXT  
COMPOSER\_EXT\_DEFAULT  
COMPOSER\_FILENAME  
COMPOSER\_FIND  
COMPOSER\_FULLNAME  
COMPOSER\_HEADLINE  
COMPOSER\_IGNORES  
COMPOSER\_INCLUDE  
COMPOSER\_INCLUDES  
COMPOSER\_INCLUDES\_LIST  
COMPOSER\_LICENSE  
COMPOSER\_LOG  
COMPOSER\_LOG\_DEFAULT  
COMPOSER\_MY\_PATH  
COMPOSER\_NOTHING  
COMPOSER\_OPTIONS  
COMPOSER\_PANDOC  
COMPOSER\_PKG  
COMPOSER\_REGEX  
COMPOSER\_REGEX\_DEFINE  
COMPOSER\_REGEX\_EVAL  
COMPOSER\_REGEX\_OVERRIDE  
COMPOSER\_REGEX\_PREFIX  
COMPOSER\_RELEASE  
COMPOSER\_RESERVED  
COMPOSER\_RESERVED\_SPECIAL  
COMPOSER\_RESERVED\_SPECIAL\_TARGETS  
COMPOSER\_ROOT  
COMPOSER\_SETTINGS  
COMPOSER\_SRC  
COMPOSER\_SUBDIRS  
COMPOSER\_TAGLINE  
COMPOSER\_TARGETS  
COMPOSER\_TEACHER  
COMPOSER\_TECHNAME  
COMPOSER\_TIMESTAMP  
COMPOSER\_TMP

COMPOSER\_VERSION  
CONFIGS  
CONVICT  
COREUTILS\_VER  
CP  
CREATOR  
CSS\_ALT  
DATE  
DATEMARK  
DATENAME  
DATESTAMP  
DEBUGIT  
DEPTH\_DEFAULT  
DEPTH\_MAX  
DESC\_DOCX  
DESC\_EPUB  
DESC\_HTML  
DESC\_LINT  
DESC\_LPDF  
DESC\_PPTX  
DESC\_PRES  
DESC\_TEXT  
DIFF  
DIFFUTILS\_VER  
DISTRIB  
DIST\_ICON\_v1.0  
DIST\_SCREENSHOT\_v1.0  
DIST\_SCREENSHOT\_v3.0  
DIVIDE  
DOFORCE  
DOITALL  
DOMAKE  
DO\_BOOK  
DO\_HEREEDOC  
DO\_PAGE  
DO\_POST  
ECHO  
ENDOLINE  
ENV  
EXAMPLE  
EXPR  
EXTENSION  
EXTN\_DEFAULT  
EXTN\_DOCX  
EXTN\_EPUB  
EXTN\_HTML  
EXTN\_LINT  
EXTN\_LPDF  
EXTN\_PPTX  
EXTN\_PRES  
EXTN\_TEXT  
FIND  
FINDUTILS\_VER  
GIT  
GIT\_OPTS\_CONVICT  
GIT\_REPO

GIT\_REPO\_DO  
GIT\_RUN  
GIT\_RUN\_COMPOSER  
GIT\_VER  
GZIP\_BIN  
GZIP\_VER  
HEAD  
HEADERS  
HEADER\_L  
HEAD\_MAIN  
HELPOUT  
HEREDOC\_GITATTRIBUTES  
HEREDOC\_GITIGNORE  
HEREDOC\_LICENSE  
HEREDOC\_REVEALJS\_CSS  
HEREDOC\_TEX\_PDF\_TEMPLATE  
HEREDOC\_docs\_.composer.mk  
INPUT  
INSTALL  
LESS\_BIN  
LESS\_VER  
LINERULE  
LISTING  
LN  
LS  
MAKEFILE  
MAKEFILE\_LIST  
MAKEFLAGS  
MAKEJOBS  
MAKEJOBS\_DEFAULT  
MAKEJOBS\_OPTS  
MAKE\_DB  
MAKE\_OPTIONS  
MAKE\_VER  
MARKER  
MDVIEWER\_CMT  
MDVIEWER\_CSS  
MDVIEWER\_CSS\_ALT  
MDVIEWER\_DIR  
MDVIEWER\_LIC  
MDVIEWER\_SRC  
MKDIR  
MV  
NEWLINE  
NOTHING  
NOTHING\_IGNORES  
NULL  
OS\_TYPE  
OS\_UNAME  
OUTPUT  
OUTPUT\_FILENAME  
OUT\_LICENSE  
OUT\_MANUAL  
OUT\_README  
PANDOC  
PANDOC\_BIN

PANDOC\_CMT  
PANDOC\_CMT\_DISPLAY  
PANDOC\_DIR  
PANDOC\_EXTENSIONS  
PANDOC\_LIC  
PANDOC\_LNX\_BIN  
PANDOC\_LNX\_DST  
PANDOC\_LNX\_SRC  
PANDOC\_MAC\_BIN  
PANDOC\_MAC\_DST  
PANDOC\_MAC\_SRC  
PANDOC\_OPTIONS  
PANDOC\_OPTIONS\_DATA  
PANDOC\_OPTIONS\_ERROR  
PANDOC\_SRC  
PANDOC\_TEX\_PDF  
PANDOC\_URL  
PANDOC\_VER  
PANDOC\_WIN\_BIN  
PANDOC\_WIN\_DST  
PANDOC\_WIN\_SRC  
PATH\_LIST  
PRINT  
PRINTER  
PRINTF  
PUBLISH  
READ\_ALIASES  
REALMAKE  
REALPATH  
REVEALJS\_CMT  
REVEALJS\_CSS  
REVEALJS\_CSS\_THEME  
REVEALJS\_DIR  
REVEALJS\_LIC  
REVEALJS\_LOGO  
REVEALJS\_SRC  
RM  
RSYNC  
RSYNC\_VER  
RUNMAKE  
SED  
SED\_VER  
SHELL  
SORT  
SOURCE\_INCLUDES  
SPECIAL\_VAL  
SUBDIRS  
TABLE\_C2  
TABLE\_M2  
TABLE\_M3  
TAIL  
TAR  
TARGETS  
TAR\_VER  
TEE  
TESTING

TESTING\_COMPOSER\_DIR  
TESTING\_COMPOSER\_MAKEFILE  
TESTING\_DIR  
TESTING\_ENV  
TESTING\_LOGFILE  
TEX\_PDF  
TEX\_PDF\_TEMPLATE  
TEX\_PDF\_VER  
TITLE\_LN  
TMPL\_DOCX  
TMPL\_EPUB  
TMPL\_HTML  
TMPL\_LINT  
TMPL\_LPDF  
TMPL\_PPTX  
TMPL\_PREP  
TMPL\_TEXT  
TOKEN  
TR  
TRUE  
TYPE\_DEFAULT  
TYPE\_DOCX  
TYPE\_DO\_BOOK  
TYPE\_DO\_PAGE  
TYPE\_DO\_POST  
TYPE\_EPUB  
TYPE\_HTML  
TYPE\_LINT  
TYPE\_LPDF  
TYPE\_PPTX  
TYPE\_PREP  
TYPE\_TARGETS  
TYPE\_TEXT  
UNAME  
UPGRADE  
VIM\_FOLDING  
VIM\_OPTIONS  
WC  
WGET  
WGET\_PACKAGE  
WGET\_PACKAGE\_DO  
WGET\_VER  
XARGS  
YQ  
YQ\_BIN  
YQ\_CMT  
YQ\_CMT\_DISPLAY  
YQ\_DIR  
YQ\_LIC  
YQ\_LNX\_BIN  
YQ\_LNX\_DST  
YQ\_LNX\_SRC  
YQ\_MAC\_BIN  
YQ\_MAC\_DST  
YQ\_MAC\_SRC  
YQ\_SRC

YQ\_URL  
YQ\_VER  
YQ\_WIN\_BIN  
YQ\_WIN\_DST  
YQ\_WIN\_SRC  
c\_base  
c\_css  
c\_css\_select  
c\_lang  
c\_level  
c\_list  
c\_margin  
c\_margin\_bottom  
c\_margin\_left  
c\_margin\_right  
c\_margin\_top  
c\_options  
c\_toc  
c\_type  
template-print  
template-var  
template-var-static  
headers  
headers-dir  
headers-file  
headers-list  
headers-note  
headers-release  
headers-rm  
headers-run  
headers-skip  
headers-vars  
headers-compose  
headers-subdirs  
help-force-targets-FORMAT  
help-force-targets-SECTIONS  
help-force-targets-TITLES  
help-all-CUSTOM  
help-all-DEPENDS  
help-all-FORMAT  
help-all-GOALS  
help-all-LINKS  
help-all-LINKS\_EXT  
help-all-ORDERS  
help-all-OVERVIEW  
help-all-REQUIRE  
help-all-REQUIRE\_POST  
help-all-SECTION  
help-all-SETTINGS  
help-all-TARGETS\_ADDITIONAL  
help-all-TARGETS\_INTERNAL  
help-all-TARGETS\_PRIMARY  
help-all-TARGETS\_SPECIALS  
help-all-TITLE  
help-all-VARIABLES\_CONTROL  
help-all-VARIABLES\_FORMAT

help-all -VERSIONS  
help-all -WORKFLOW  
install -Makefile  
subdirs -template  
targets -list  
test -COMPOSER\_INCLUDE-done  
test -COMPOSER\_INCLUDE-init  
test -count  
test -done  
test -fail  
test -find  
test -hold  
test -init  
test -load  
test -log  
test -make  
test -mark  
test -pwd  
test -run  
test -speed-init  
test -speed-init -load  
test -headers  
\_C  
\_D  
\_E  
\_F  
\_H  
\_M  
\_N  
\_S

---

*Happy Making!*





# Chapter 6

## Composer CMS License

---

### 6.1 Copyright

Copyright (c) 2014, 2015, 2022, Gary B. Genett  
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---

### 6.2 License

Source: <https://www.gnu.org/licenses/gpl-3.0.html>

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#### 6.2.1 Preamble

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The precise terms and conditions for copying, distribution and modification follow.

## **6.2.2 TERMS AND CONDITIONS**

### **6.2.2.1 0. Definitions.**

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### **6.2.2.2 1. Source Code.**

The "source code" for a work means the preferred form of the work for making modifications to it. "Object code" means any non-source form of a work.

A "Standard Interface" means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The "System Libraries" of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major Component, and (b) serves only to enable use of the work with that Major Component, or to implement a Standard Interface for which an implementation is available to the public in source code form. A "Major Component", in this context, means a

major essential component (kernel, window system, and so on) of the specific operating system (if any) on which the executable work runs, or a compiler used to produce the work, or an object code interpreter used to run it.

The “Corresponding Source” for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work’s System Libraries, or general-purpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

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#### **6.2.2.7 6. Conveying Non-Source Forms.**

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- e) Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d.

A separable portion of the object code, whose source code is excluded from the Corresponding Source as a System Library, need not be included in conveying the object code work.

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```
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