NAME
>   rgbasm-old — obsolete language documentation

DESCRIPTION
>   This is the list of features that have been removed from the *rgbasm*(5) assembly language over its decades
>   of evolution, along with their modern alternatives. Its goal is to be a reference for backwards incompatibil-
>   ity, when upgrading an old assembly codebase to work with the latest RGBDS release. It does *not* attempt
>   to list every syntax bug that was ever fixed (with some notable exceptions), nor new reserved keywords that
>   may conflict with old identifiers.

REMOVED
>   These are features which have been completely removed, without any direct alternatives. Usually these fea-
>   tures were limiting the addition of other features, or had awkward limits on their own intended effects.

Automatic LD to LDH conversion (rgbasm -l)
>   Deprecated in 0.7.0, removed in 0.8.0.
>
>   *rgbasm*(1) used to automatically treat 'LD' as LDH if the address was known to be in the *$FF00-$FFFF*
>   range, with the −L flag to opt out. *rgbasm*(1) 0.6.0 added a −l flag to opt in instead.
>
>   Instead, use LDH, and remove the −L and −l flags from *rgbasm*(1).

Automatic NOP after HALT (rgbasm -H)
>   Deprecated in 0.7.0, removed in 0.8.0.
>
>   *rgbasm*(1) used to automatically insert a NOP after HALT, with the −h flag to opt out. *rgbasm*(1) 0.6.0
>   added a −H flag to opt in instead.
>
>   Instead, use an explicit NOP after HALT, and remove the −h and −H flags from *rgbasm*(1).

Nested macro definitions
>   Removed in 0.4.2.
>
>   Instead, put the nested macro definition inside a quoted string (making sure that none of its lines start with
>   **ENDM**), then interpolate that string. For example:

```
MACRO outer
    DEF definition EQUS """
        MACRO inner
            println (\1) - (\\1)
        \nENDM"""
    {definition}
    PURGE definition
ENDM
    outer 10
    inner 3 ; prints 7
```

Negative DS
>   Removed in 0.3.2.
>
>   This was used to "rewind" the value of @ in RAM sections, allowing labeled space allocations to overlap.
>
>   Instead, use **UNION**.

Section-local charmaps
>   Deprecated in 0.3.9, removed in 0.4.0.
>
>   Defining a **CHARMAP** inside a **SECTION** when the current global charmap was the 'main' one used to only
>   define that character mapping within that **SECTION**.
>
>   Instead, use **PUSHC** and **POPC** and switch to a different character mapping for that section.

__FILE__ and __LINE__
    Deprecated in 0.6.0, removed in 0.7.0.

    Instead, use **WARN** or **FAIL** to print a complete trace of filenames and line numbers.

_PI
    Deprecated in 0.5.0, removed in 0.6.0.

    Instead, use `3.141592653`.

Treating multi-character strings as numbers
    Deprecated in 0.9.0.

    Instead, use a multi-value **CHARMAP**, or explicitly combine the values of individual characters.

rgbgfx -f/--fix and -F/--fix-and-save
    Removed in 0.6.0.

    Instead, use `rgbgfx -c/--colors` to explicitly specify a color palette. If using `-c embedded`, arrange the PNG's indexed palette in a separate graphics editor.

rgbgfx -D/--debug
    Removed in 0.6.0.

REPLACED
    These are features whose syntax has been changed without affecting functionality. They can generally be updated with a single search-and-replace.

Defining constants and variables without DEF
    Deprecated in 0.7.0, removed in 0.8.0.

    EQU, **EQUS**, **=**, **RB**, **RW**, and **RL** definitions used to just start with the symbol name, but had to be typed in column 1.

    Instead, use **DEF** before constant and variable definitions. Note that **EQUS** expansion does not occur for the symbol name, so you have to use explicit {interpolation}.

Defining macros like labels
    Deprecated in 0.6.0, removed in 0.7.0.

    Macros used to be defined as `name: MACRO`.

    Instead, use `MACRO name`. Note that **EQUS** expansion does not occur for the macro name, so you have to use explicit {interpolation}.

Defining variables with SET
    Deprecated in 0.5.2, removed in 0.6.0.

    Variables used to be defined as `name SET value`.

    Instead, use `DEF name = value`.

Global labels without colons
    Deprecated in 0.4.0, removed in 0.5.0.

    Labels used to be definable with just a name, but had to be typed in column 1.

    Instead, use explicit colons; for example, `Label:` or exported `Label::`.

'\,' in strings within macro arguments
    Deprecated in 0.5.0, removed in 0.7.0.

    Macro arguments now handle quoted strings and parenthesized expressions as single arguments, so commas inside them are not argument separators and do not need escaping.

    Instead, just use commas without backslashes.

'∗' comments

Deprecated in 0.4.1, removed in 0.5.0.

These comments had to have the '∗' typed in column 1.

Instead, use '**;**' comments.

PRINTT, PRINTI, PRINTV, and PRINTF

Deprecated in 0.5.0, removed in 0.6.0.

These directives were each specific to one type of value.

Instead, use **PRINT** and **PRINTLN**, with **STRFMT** or {interpolation} for type-specific formatting.

IMPORT and XREF

Removed in 0.4.0.

Symbols are now automatically resolved if they were exported from elsewhere.

Instead, just remove these directives.

GLOBAL and XDEF

Deprecated in 0.4.2, removed in 0.5.0.

Instead, use **EXPORT**.

HOME, CODE, DATA, and BSS

Deprecated in 0.3.0, removed in 0.4.0.

Instead of **HOME**, use **ROM0**; instead of **CODE** and **DATA**, use **ROMX**; instead of **BSS**, use **WRAM0**.

JP [HL]

Deprecated in 0.3.0, removed in 0.4.0.

Instead, use `JP HL`.

LDI A, HL and LDD A, HL

Deprecated in 0.3.0, removed in 0.4.0.

Instead, use `LDI A, [HL]` and `LDD A, [HL]` (or `LD A, [HLI]` and `LD A, [HLD]`; or `LD A, [HL+]` and `LD A, [HL-]`).

LDIO

Deprecated in 0.9.0.

Instead, use `LDH`.

LD [C], A and LD A, [C]

Deprecated in 0.9.0.

Instead, use `LDH [C], A` and `LDH A, [C]`.

Note that `LD [$FF00+C], A` and `LD A, [$FF00+C]` were also deprecated in 0.9.0, but were *undeprecated* in 0.9.1.

LDH [n8], A and LDH A, [n8]

Deprecated in 0.9.0.

`LDH` used to treat "addresses" from *$00* to *$FF* as if they were the low byte of an address from *$FF00* to *$FFFF*.

Instead, use `LDH [n16], A` and `LDH A, [n16]`.

LD HL, [SP + e8]

Deprecated in 0.3.0, removed in 0.4.0.

Instead, use `LD HL, SP + e8`.

LDHL SP, e8

   Supported in ASMotor, removed in RGBDS.

   Instead, use `LD HL, SP + e8`.

OPT z

   Deprecated in 0.4.0, removed in 0.5.0.

   Instead, use **OPT p**.

rgbasm -i

   Deprecated in 0.6.0, removed in 0.8.0.

   Instead, use `-I` or `--include`.

rgbgfx -h

   Removed in 0.6.0.

   Instead, use `-Z` or `--columns`.

rgbgfx --output-∗

   Deprecated in 0.7.0, removed in 0.8.0.

   Instead, use `--auto-*`.

CHANGED

   These are breaking changes that did not alter syntax, and so could not practically be deprecated.

Trigonometry function units

   Changed in 0.6.0.

   Instead of dividing a circle into 65536.0 "binary degrees", it is now divided into 1.0 "turns".

   For example, previously we had: delim $$

   - `SIN(0.25) == 0.00002`, because 0.25 binary degrees = $0.25 / 65536.0$ turns = $0.000004\ tau$ radians = $0.000008\ pi$ radians, and $sin (0.000008\ pi) = 0.00002$

   - `SIN(16384.0) == 1.0`, because 16384.0 binary degrees = $16384.0 / 65536.0$ turns = $0.25\ tau$ radians = $pi / 2$ radians, and $sin (pi / 2) = 1$

   - `ASIN(1.0) == 16384.0`

   Instead, now we have:

   - `SIN(0.25) == 1.0`, because 0.25 turns = $0.25\ tau$ radians = $pi / 2$ radians, and $sin (pi / 2) = 1$

   - `SIN(16384.0) == 0.0`, because 16384 turns = $16384\ tau$ radians = $32768\ pi$ radians, and $sin (32768\ pi) = 0$

   - `ASIN(1.0) == 0.25`

   delim off

% operator behavior with negative dividend or divisor

   Changed in 0.5.0.

   Instead of having the same sign as the dividend (a remainder operation), '`%`' has the same sign as the divisor (a modulo operation).

   For example, previously we had:

   - `13 % 10 == 3`

   - `-13 % 10 == -3`

   - `13 % -10 == 3`

- `-13 % -10 == -3`

Instead, now we have:

- `13 % 10 == 3`

- `-13 % 10 == 7`

- `13 % -10 == -7`

- `-13 % -10 == -3`

∗∗ **operator associativity**

Changed in 0.9.0.

Instead of being left-associative, '∗∗' is now right-associative.

Previously we had `p ** q ** r == (p ** q) ** r`.

Instead, now we have `p ** q ** r == p ** (q ** r)`.

BUGS

These are misfeatures that may have been possible by mistake. They do not get deprecated, just fixed.

Space between exported labels' colons

Fixed in 0.7.0.

Labels with two colons used to ignore a space between them; for example, `Label: :`.

Instead, use `Label::`.

Space between label and colon

Fixed in 0.9.0.

Space between a label and its colon(s) used to be ignored; for example, `Label :` and `Label ::`. Now they are treated as invocations of the `Label` macro with ':' and '::' as arguments.

Instead, use `Label:` and `Label::`.

ADD r16 with implicit first HL operand

Fixed in 0.5.0.

For example, `ADD BC` used to be treated as `ADD HL, BC`, and likewise for 'DE', 'HL', and 'SP'.

Instead, use an explicit first 'HL' operand.

= instead of SET

Fixed in 0.4.0.

The **=** operator used to be an alias for the **SET** keyword, which included using **=** for the **SET** *instruction*.

Instead, just use **SET** for the instruction.

SEE ALSO

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

HISTORY

rgbasm(1) was originally written by Carsten Sørensen as part of the ASMotor package, and was later repackaged in RGBDS by Justin Lloyd. It is now maintained by a number of contributors at https://github.com/gbdev/rgbds.