Topics

25 Glossary

A

absolute address: An address that is permanently assigned to a memory location.

absolute lister: a debugging tool that allows you to create assembler listings that contain absolute addresses.

alignment: A process in which the linker places an output section at an address that falls on an *n*–bit boundary, where *n* is a power of 2. You can specify alignment with the SECTIONS linker directive.

allocation: A process in which the linker calculates the final memory addresses of output sections.

archive library: A collection of individual files that have been grouped into a single file.

archiver: A software program that allows you to collect several individual files into a single file called an archive library. The archiver also allows you to delete, extract, or replace members of the archive library, as well as to add new members.

assembler: A software program that creates a machine–language program from a source file that contains assembly language instructions, directives, and macro directives. The assembler substitutes absolute operation codes for symbolic operation codes, and absolute or relocatable addresses for symbolic addresses.

assembly–time constant: A symbol that is assigned a constant value with the .set or .equ directive.

assignment statement: A statement that assigns a value to a variable.

auxiliary entry: The extra entry that a symbol may have in the symbol table and that contains additional information about the symbol (whether the symbol is a filename, a section name, a function name, etc.).

B

binding: A process in which you specify a distinct address for an output section or a symbol.

block: A set of declarations and statements that are grouped together with braces.

.bss: One of the default COFF sections. You can use the .bss directive to reserve a specified amount of space in the memory map that can later be used for storing data. The .bss section is uninitialized.

byte: A sequence of 8 adjacent bits operated upon as a unit.

C

C compiler: A program that translates C source statements into assembly language source statements.

command file: A file that contains linker options and names input files for the linker.

comment: A source statement (or portion of a source statement) that is used to document or improve readability of a source file. Comments are not compiled, assembled, or linked; they have no effect on the object file.

common object file format (COFF): An object file that promotes modular programming by supporting the concept of *sections*.

conditional processing: A method of processing one block of source code or an alternate block of source code, according to the evaluation of a specified expression.

configured memory: Memory that the linker has specified for allocation.

constant: A numeric value that can be used as an operand.

cross–reference listing: An output file created by the assembler that lists the symbols that were defined, what line they were defined on, which lines referenced them, and their final values.

D

.data: One of the default COFF sections. The .data section is an initialized section that contains initialized data. You can use the .data directive to assemble code into the .data section.

directive: Special–purpose commands that control the actions and functions of a software tool (as opposed to assembly language instructions, which control the actions of a device).

E

emulator: A hardware development system that emulates MSP430 operation.

entry point: The starting execution point in target memory.

executable module: An object file that has been linked and can be executed in a MSP430 system.

expression: A constant, a symbol, or a series of constants and symbols separated by arithmetic operators.

external symbol: A symbol that is used in the current program module but defined in a different program module.

F

field: For the MSP430, a software–configurable data type whose length can be programmed to be any value in the range of 1-16 bits.

file header: A portion of a COFF object file that contains general information about the object file (such as the number of section headers, the type of system the object file can be downloaded to, the number of symbols in the symbol table, and the symbol table's starting address).

G

global: A kind of symbol that is either 1) defined in the current module and accessed in another, or 2) accessed in the current module but defined in another.

GROUP: An option of the SECTIONS directive that forces specified output sections to be allocated contiguously (as a group).

H

high–level language debugging: The ability of a compiler to retain symbolic and high–level language information (such as type and function definitions) so that a debugging tool can use this information.

hole: An area between the input sections that compose an output section that contains no actual code or data.

I

incremental linking: The linking of files that have already been linked.

initialized section: A COFF section that contains executable code or initialized data. An initialized section can be built up with the .data, .text, or .sect directive.

input section: A section from an object file that will be linked into an executable module.

L

label: A symbol that begins in column 1 of a source statement and corresponds to the address of that statement.

line number entry: An entry in a COFF output module that maps lines of assembly code back to the original C source file that created them.

linker: A software tool that combines object files to form an object module that can be allocated into system memory and executed by the device.

listing file: An output file created by the assembler that lists source statements, their line numbers, and their effects on the SPC.

loader: A device that loads an executable module into system memory.

M

member: The elements or variables of a structure, union, or enumeration.

macro: A user–defined routine that can be used as an instruction.

macro call: The process of invoking a macro.

macro definition: A block of source statements that define the name and the code that make up a macro.

macro expansion: The source statements that are substituted for the macro call and are subsequently assembled.

macro library: An archive library composed of macros. Each file in the library must contain one macro; its name must be the same as the macro name it defines, and it must have an extension of .asm.

magic number: A COFF file header entry that identifies an object file as a module that can be executed by the MSP430.

map file: An output file, created by the linker, that shows the memory configuration, section composition, and section allocation, as well as symbols and the addresses at which they were defined.

memory map: A map of target system memory space that is partitioned into functional blocks.

mnemonic: An instruction name that the assembler translates into machine code.

model statement: Instructions or assembler directives in a macro definition that are assembled each time a macro is invoked.

N

named section: An initialized section that is defined with a .sect directive, or an uninitialized section that is defined with a .usect directive.

O

object file: A file that has been assembled or linked and contains machine–language object code.

object format converter: A program that converts COFF object files into Intel–format, Tektronix–format, TI–tagged format, or Motorola–S format object files.

object library: An archive library made up of individual object files.

operand: The arguments, or parameters, of an assembly language instruction, assembler directive, or macro directive.

optional header: A portion of a COFF object file that the linker uses to perform relocation at download time.

options: Command parameters that allow you to request additional or specific functions when you invoke a software tool.

output module: A linked, executable object file that can be downloaded and executed on a target system.

P

partial linking: The linking of a file that will be linked again.

R

raw data: Executable code or initialized data in an output section.

relocation: A process in which the linker adjusts all the references to a symbol when the symbol's address changes.

S

section: A relocatable block of code or data that will ultimately occupy contiguous space in the memory map.

section header: A portion of a COFF object file that contains information about a section in the file. Each section has its own header; the header points to the section's starting address, contains the section's size, etc.

section program counter: See SPC.

sign–extend: To fill the unused MSBs of a value with the value’s sign bit.

SPC (section program counter): An element of the assembler that keeps track of the current location within a section; each section has its own SPC.

static: A kind of variable whose scope is confined to a function or a program. The values of static variables are not discarded when the function or program is exited; their previous value is resumed when the function or program is re–entered.

storage class: Any entry in the symbol table that indicates how a symbol should be accessed.

string table: A table that stores symbol names that are longer than 8 characters (symbol names of 8 characters or longer cannot be stored in the symbol table; instead, they are stored in the string table). The name portion of the symbol's entry points to the location of the string in the string table.

structure: A collection of one or more variables grouped together under a single name.

symbol: A string of alphanumeric characters that represents an address or a value.

symbolic debugging: The ability of a software tool to retain symbolic information so that it can be used by a debugging tool such as a simulator or an emulator.

symbol table: A portion of a COFF object file that contains information about the symbols that are defined and used by the file.

T

tag: An optional “type" name that can be assigned to a structure, union, or enumeration.

target memory: Physical memory in a MSP430–based system into which executable object code is loaded.

.text: One of the default COFF sections; an initialized section that contains executable code. You can use the .text directive to assemble code into the .text section.

U

unconfigured memory: Memory that is not defined as part of the memory map and cannot be loaded with code or data.

uninitialized section: A COFF section that reserves space in the memory map but that has no actual contents. These sections are built up with the .bss, .reg, and .usect directives.

union: A variable that may hold (at different times) objects of different types and sizes.

unsigned: A kind of value that is treated as a positive number, regardless of its actual sign.

W

well–defined expression: An expression that contains only symbols or assembly–time constants that have been defined before they appear in the expression.

word: A 16–bit addressable location in target memory.