#pragma directive, 104
\$SEGCALL, 85
\$SEGRES, 85
 description, 145
\_infoblk table, description, 141
\_loaded, and soft externals, 106

# A

ABS directive, overview, 35 Absolute binary module, definition, 149 ADA, 1 ADDBSS directive, 90 ALIGN directive, overview, 47 pseudo-op, 47 Allocating Central Memory Cray PVP system, 99, 100 default allocation scheme, 98 definitions of terms, 96 overview, 95 segmented programs, overview, 99 shared-text allocation scheme, 98 TEXT, DATA, BSS allocation scheme, 98 Assigning modules to segments, 67 Assignment, block & program duplication nonsegmented programs, 75 overview, 75 segmented programs, 76 Automatic duplicaiton of movable blocks using FLOAT directive, 80

### B

Barrier, definition, 149 bin and lib files, exceptions and differences, 24 BIN directive example, 125 with DUPORDER directive, 32 with FORCE directive, 30 with NODEFLIB directive, 28 **BIN** directive (global) example, 26 overview, 26 BIN directive (segment) example, 70 overview, 69 Bin file, definition, 149 Block assignment and program duplication, 75 definition, 75 nonsegmented, 76 definition, 149 movable, handling using FLOAT directive, 80 BLOCKDATA subprograms, 25, 30 Branch segment, definition, 55, 56, 149 BSS sections, and shared-text memory allocation, 98

## С

C. 1 CAL definition, 149 version 2, 1 Calling tree, precautions for design, 57 CALLXFER directive, overview, 113 Case conversion controlling, 51 convention, vi CASE directive, overview, 51 CAUTION message, definition, 137 CDBX, definition, 150 Central Memory, allocation of, 95 CF90, 1 CFT77, 1 CODE attributes, and shared-text memory allocation, 98 Command line 1d(1), 10options, -k, 137 segldr(1), 4Command line options ld(1), 10segldr(1), 4

Command options, 15 Commands, explain(1), 138 COMMENT directive, as segment description directive, 66 COMMENT message, definition, 137 Comments example, 37 overview, 36 using in SEGLDR, 21 Common block allocation, ORDER directive, 97 assignment overview, 76 segmented block, 79 definition, 150 duplication in nonsegmented loads, 76 names, duplication in segmented loads, 76 naming, directives for COMMONS, 31 FORCE, 30 MODULES, 30 reference map, 135 use and assignment, 75, 79, 83 block data routines, 84 data load restrictions, 83 duplicate common blocks, 77 referencing data in common blocks, 84 Common block use and assignment, user-assigned common blocks, 83 COMMONS directive (global) and duplicated common blocks, 76 overview, 31 COMMONS directive (segment) in segmented loads, 76 overview, 68 COMPRESS directive, overview, 52 Control, load map, 35 Controlling entry points and execution, 44-47, 113 Controlling entry points and execution, directives for CALLXFER, 113 EQUIV, 45 overview, 44, 113 SET. 46 START, 113 UNSAT, 46 XFER, 44Controlling error messages, 39 Controlling error messages, directives for DUPENTRY, 41 DUPLOAD, 42

MLEVEL, 39 MSGLEVEL, 43 NODUPMSG, 42 NOUSXMSG, 43 overview, 39 REDEF, 40 USX,40 Controlling listings, directives for Comments, 36 ECHO, 36 MAP, 37 TITLE, 38 TRIAL, 35 Controlling loading, 47 Conventions, for loader directives, 21 COPY directive, overview, 73 CPUCHECK directive, overview, 51

#### D

DATA attributes, and shared-text memory allocation, 98 Data loading, definition, 150 Data loads and FORCE directive, 80 and MODULES directive, 80 restrictions, 83 block data routines, 84 referencing data in common blocks, 84 Debug symbol table, 50 Debugging, symbolic CDBX definition, 150 overview, 50, 114 SYMBOLS directive, 50 Default, directives file, 17 Default directives files, 19 Default libraries, 25 Default system libraries, 18 DEFDIR directive example, 111 overview, 109 DEFHEAP directive, overview, 117 DEFLIB directive example, 29 overview, 29 DEFSTACK directive, 118 DEX, definition, 150 Differences between segldr and ld, 17

Directive termination, 22

Directives ABS, 35 ADDBSS, 90 ALIGN, 47 BIN (global), 26 BIN (segment), CALLXFER, 113 CASE, 51 comments, 36 COMMONS (globa

BIN (segment), 69 CALLXFER, 113 comments, 36 COMMONS (global), 31 COMMONS (segment), 68 COMPRESS, 52 conventions, 21 COPY, 73 CPUCHECK, 51 DEFDIR, 109 defheap, 117 DEFLIB, 29 DEFSTACK, 118 DUP, 71 DUPENTRY, 41 DUPLOAD, 42DUPORDER, 32 DYNAMIC, 90, 91 ECHO, 36 ENDSEG, 66 EQUIV, 45 FORCE, 30 FREEHEAP, 119 HARDREF, 108 HEAP, 87INCFILE, 114 INCLUDE, 23 LBIN, 26 LIB, 27LIBDIR, 111 LINCLUDE, 23 LLIB, 28LOGFILE, 53 LOGUSE, 53 MAP, 37 MLEVEL, 39 MODULES (global), 30 MODULES (segment), 67 MSGLEVEL, 43 NODEFLIB, 28 NODUPMSG, 42NOUSXMSG, 43 OMIT, 34

ORDER, 97 ORG, 49 OUTFORM, 112PRESET, 48 REDEF, 40SAVE (global), 72 SAVE (segment), 70 SCOMMONS (global), 31 SCOMMONS (segment), 68 SEGMENT, 66 SEGORDER, 74 SET, 46 SLT, 72 SMODULES (global), 30 SMODULES (segment), 67 SOFTREF, 108 specification order, 21 STACK, 88 **START**, 113 SYMBOLS, 50 SYSTEM, 114 TITLE, 38 TRIAL, 35 TSTACK, 89 UNSAT, 46 USX, 40 XFER, 44 ZEROCOM, 116, 117 ZSYMS, 115 Directives file, default, 17, 19 Directives processing order, 14 Directives, miscellaneous global, 50, 114 Directives, segment ENDSEG directive, 66 segment description, 66 SEGMENT directive, 66 tree definition. 65 Directives, zero address, 115 Distributed EXpression table, definition, 150 Distributed mode, definition, 150 DUP directive example, 71, 125 in nonsegmented loads, 75 in segmented loads, 76, 77 overview, 71 DUPENTRY directive default setting, 18 keywords, 41 overview, 41

**Duplicate** names entry point, 75 module, 75 Duplicated common blocks and COMMONS directive, 76 entry point errors, controlling, 32 Duplication definition, 75 in nonsegmented loads, 75 common blocks, 76 entry point names, 75 module names, 75 in segmented loads, 76 common blocks, 77 entry point names, 77 module names, 76 program and block assignment, 75 using DUP, 71 using MODULES, 67 DUPLOAD directive, overview, 42 DUPORDER directive default setting, 18 example, 33 overview, 32 Dynamic common block allocation, 90 and heap memory, 87 DYNAMIC directive example, 91, 124 overview, 90 with the heap, 92 Dynamic memory management, 87

### Е

ECHO directive as segment description directive, 66 example, 128 overview, 36 ENDSEG directive example, 67, 124, 125, 128 overview, 66 ENDTREE directive example, 66, 121, 122, 124, 125, 128 overview, 65 Entry point control and execution, 44, 113 definition, 75, 150

duplicate names, 75 duplication error message control, 41, 42 figure, 78 in nonsegmented loads, 75 in segmented loads, 77 processing order, 32 names, duplication in segmented loads, 75 value assignment, 46 Entry point references testing with \_loaded, 106 testing with flag words, 107 Entry points, to external functions, 103 Environment variable processing, 12, 17 Environment variables LDDIR, 12LPP, 13 MSG\_FORMAT, 13 NLSPATH, 13 SEGDIR, 13 TARGET, 14 TMPDIR, 14 EQUIV directive example, 45 overview, 45 Error, messages, 137 descriptions, 138 format, 139 load-time, 137 run-time, 137 Error messages controlling, directives for DUPENTRY, 41 DUPLOAD, 42MLEVEL, 39 MSGLEVEL, 43 NODUPMSG, 42 NOUSXMSG, 43 REDEF, 40 USX, 40 overview, 39 printing according to severity, 39 Events, definition, 150 Examples basic loader invocation, 121 BIN directive, 26, 125 **BIN** directive (segment), 70 block maps, 131 Comments, 37

common block reference map, 135 DEFDIR directive, 111 DEFLIB directive, 29 DUP directive, 71, 125 DUPORDER directive, 33 DYNAMIC directive, 91, 124 ECHO directive, 128 ENDSEG directive, 67, 124, 125, 128 ENDTREE directive, 66, 121, 122, 124, 125, 128 entry point cross-reference map, 134 entry point duplication, 78 EQUIV directive, 45 **HEAP directive**, 128 INCLUDE directive, 23 LIB directive, 27 LIBDIR directive, 111 LINCLUDE directive, 23 LLIB directive, 28 MAP directive, 128 map output, 130 MODULES directive, 31, 68, 124, 125, 129 MSGLEVEL directive, 43 NODEFLIB directive, 29 OMIT directive, 34 SAVE directive, 73 SEGMENT directive, 67, 124, 125, 128 segmented load with duplicated modules, 125 TREE directive, 66, 121, 122, 124, 125, 128 tree structure, 121, 122 figure, 123, 126 tree structure with expandable common block, 122 UNSAT directive, 46 Executable program, definition, 151 Executable program control, 34-35, 112 explain(1) command, 138 ext directive, 104 External functions, references to, 103 External reference, definition, 151 External symbols, 104

#### $\mathbf{F}$

FATAL message, definition, 138 File attribute directive, OUTFORM, 112 File naming directives ABS, 35 BIN, global, 26 LBIN, 26

LIB, 27LLIB, 28NODEFLIB, 28 Flag word usage, 107 Flag words, testing entry point references with, 107 FLOAT directive, 80 using automatic duplication, 80 using floating, 80 Floating, 80 definition, 151 FORCE directive and data loads, 84 default setting, 18 overview, 30 Force-loading, definition, 151 Force-loading, definition, 30 Fortran program examples acquiring space from the heap, 92 basic, 121 comprehensive block maps, 131 common block reference map, 135 entry point cross-reference map, 134 Fortran program, 126 loader directives, 128 loader map output, 130 source code, 126 using dynamic common blocks, 93 FREEHEAP directive, 119

## G

General directives, 21 **Global directives** for segmentation, 72 miscellaneous CASE, 51COMPRESS, 52 CPUCHECK, 51 FLOAT. 80 INCFILE, 114 LOGFILE, 53 LOGUSE, 53 ORDER, 97 overview, 50, 114 SYMBOLS, 50 SYSTEM, 114 zsyms, 115

segmentation COPY, 73 overview, 72 SAVE, 72 SEGORDER, 74 SLT, 72 Global heap memory, managing, 87, 117 Global segmentation directives, 72 COPY, 73 SAVE, 72 SEGORDER, 74 SLT, 72 Global symbol table, definition, 151

# H

Hard references, converting to, 107 HARDREF directive, overview, 108 Header creating, 38 example, 38 HEAP directive example, 128 overview, 87 with DEFSTACK directive, 118 with DYNAMIC directive, 91 with STACK directive, 88 Heap memory and Dynamic Common Block, 90 and the stack, 88, 118 global managing, 87, 117 Heap memory management directives ADDBSS, 90 defheap, 117 DEFSTACK, 118 FREEHEAP, 119 HEAP. 87 STACK, 88 TSTACK, 89

## I

INCFILE directive, overview, 114 Include, definition, 151 INCLUDE directive example, 23 overview, 23 Including directives files, 22–23 Including object modules, 24–34 Initial transfer address, definition, 151 Initialization & alignment, program, 47 Initializing data areas, 47 Introduction, 1 Invoking SEGLDR, 3 Id command line, 10 segldr command line, 4

### $\mathbf{L}$

Languages supported, 1 LBIN directive, overview, 26 ld(1), command line, 10 LDDIR environment variable, 12 lib and bin files, exceptions and differences, 24 LIB directive and BIN files, 27 example, 27 overview, 27 with DEFLIB directive, 29 with DUPORDER directive, 32 with FORCE directive, 30 with NODEFLIB directive, 28 LIBDIR directive example, 111 overview, 111 Library, definition, 152 LINCLUDE directive example, 23 overview, 23 LLIB directive example, 28 overview, 28 Load map control, 35-38 Load-time messages, 137 Loader definition, 152 invocation, 3 Loader directives, 15 conventions, 21 specification order, 21 Loader messages, 137 Loader resident routine (\$SEGRES), 85 Loader-created tables, overview, 141 Loading control of, 37

program segments, 1 LOGFILE directive, overview, 53 LOGUSE directive, overview, 53 LPP environment variable, 13

#### Μ

Machine characteristic checking, controlling, 51 Magic number, definition, 152 Managing global heap memory directives ADDBSS, 90 defheap, 117 DEFSTACK, 118 FREEHEAP, 119 HEAP. 87overview, 87, 117 STACK, 88 TSTACK, 89 Map control, load, 37 MAP directive example, 128 overview, 37 Map output example, 130 generation, 37 Mass storage, writing segment state to, 70, 72 Memory, overlays, 1 Message descriptions, 138 format. 139 log file, format, 54 numbers, 138 Messages controlling error, 39 directives for DUPENTRY, 41 DUPLOAD, 42MLEVEL, 39 MSGLEVEL, 43 NODUPMSG, 42NOUSXMSG, 43 REDEF, 40 USX, 40 Miscellaneous global directives, 50, 114 MLEVEL directive, overview, 39 Module assigning to segments, 66 definition, 152

in nonsegmented loads, 75

in segmented loads, 76 using DUP, 71 using MODULES, 67 using SMODULES, 67 names, duplication in nonsegmented loads, 75 names, duplication in segmented loads, 76 naming directives FORCE, 30 MODULE (segment), 67 MODULES, (global), 30 SMODULE (segment), 67 SMODULES, (global), 30 zero address, 115 MODULES directive and data loads, 84 example, 124, 125 in segmented loads, 76 MODULES directive (global) example, 30 overview, 30 MODULES directive (segment) example, 68 overview, 67 Movable block, definition, 152 MSG\_FORMAT, 139 MSG\_FORMAT environment variable, 13 MSGLEVEL directive example, 43 overview, 43

duplication

## N

Naming files ABS directive, 35 BIN directive, (global), 26 LBIN directive, (global), 26 LIB directive, 27 LLIB directive, 28 NODEFLIB directive, 28 NLSPATH environment variable, 13 NODEFLIB directive example, 29 overview, 28 NODUPMSG directive, overview, 42Nonsegmented program, definition, 1 NOTE message, definition, 137

NOUSXMSG directive, overview, 43

# 0

Object module definition, 152 including, 34 OMIT directive example, 34 overview, 34 ORDER directive, overview, 97 Ordered duplicate selection, definition, 152 ORG directive, overview, 49 OUTFORM directive, overview, 112 Output file attributes, OUTFORM directive, 112

# Р

Parallel virtual machine, definition, 153 Partition, definition, 153 Pascal, 1 PRESET directive, overview, 48 Primary entry point, definition, 153 Program alignment and initialization, 47-49 directives ALIGN, 47 ORG, 49 preset, 48 overview, 47 Program duplication & block assignment, 75 Program execution, segmented, 85 Program segmentation, introduction, 55 Program segments, loading, 1 Pseudo instructions and shared-text memory allocation, 98 PVM, definition, 153

### R

REDEF directive, overview, 40 Relocatable binary module, definition, 153 Restrictions, data load, 83 Root segment, definition, 153 Root segment, definition, 55 Routines, block data, 84 Run-time messages, 137

#### $\mathbf{S}$

SAVE directive example, 73 with COPY directive, 73 SAVE directive (global), overview, 72 SAVE directive (segment), overview, 70 SCOMMONS directive (global), overview, 31 SCOMMONS directive (segment), overview, 68 Scratch file controlling position of, 85 execution from, 73 SDT, description, 147 SDT, definition, 153 SECTION pseudo instructions, and shared-text memory allocation, 98 Sector, definition, 153 SEGDIR environment variable, 13 SEGLDR, invocation statements, 3 segldr(1), command line, 4 Segment convention, 1 definition, 154 definition directives, 65-66 description directives, 66-71 description, termination, 65 linkage table (SLT), 72 naming, 66 predecessor, function, 55 root, definition, 55 subroutine calling between, 59 successor, function, 55 tree definition directives, 65 design and restrictions, 57 figures, 56, 57, 58, 59, 61, 62 structure, 55 Segment branch, definition, 56 Segment description directives BIN, 69 COMMONS, 68 DUP, 71 ENDSEG, 66 MODULES, 67 SAVE, 70 SCOMMONS, 68 SEGMENT, 66 SMODULES, 67 ZEROCOM, 116, 117

Segment Description table, definition, 153 Segment Description Table (SDT), description, 147 SEGMENT directive and DUP directive, 71 example, 67, 124, 125, 128 overview, 66 Segment Linkage Table, definition, 154 Segment Linkage Table (SLT), 72 description, 146 Segment tree definition directives, 65-66 restrictions, 57 Segment tree concept, 55 Segment tree definition, 55 Segment tree design, 57 Segmentation features, 55 global directives, 72 Segmentation tables \$SEGRES, 145 overview, 144 SDT, 147 SLT, 146 Segmented load and COMMONS directive, 31 and SCOMMONS directive, 31 program, definition, 1 with duplicated modules, 125 example, 125 Segmented program, definition, 1 SEGORDER directive, overview, 74 SET directive, overview, 46 SHARED allocation scheme, overview, 98 Shared text program, 97 creation, 97 generation, 6 Shared-text allocation scheme advantages, 99 disadvantages, 99 SLT, description, 146 SLT, definition, 154 SLT directive, overview, 72 SMODULES directive (global), overview, 30 SMODULES directive (segment), overview, 67 Soft externals how to convert to, 108 how to convert to hard references, 107 how to declare, 104-105 how to link, 105

overview, 103 references, 103 usage, 106-107 usage (figure), 104 Soft references, 103 Soft references, converting to, 108 SOFTREF directive, overview, 108 Special purpose program, definition, 154 Stack and heap memory, 87, 117 STACK directive, 88 START directive command line equivalent for, 10, 16 overview, 113 Subroutine call overhead, overview, 86 calling between segments, 59 illegal references, diagram, 61 SUMMARY message, definition, 138 Supported languages, 1 Symbolic debugging directives overview, 50, 114 SYMBOLS, 50 SYMBOLS directive, overview, 50 SYSTEM directive, overview, 114 System libraries, default, 18

## Т

Tables \$SEGRES, 145 \_infoblk, 141 Segment Description Table (SDT), 147 Segment Linkage Table (SLT), 146 TARGET environment variable, 14 Termination, of segment description, 65 TEXT, DATA, BSS, allocation scheme for memory allocation, 98 TITLE directive as segment description directive, 66 example, 38 overview, 38 **TMPDIR** environment variable, 14 Transfer entry point, definition, 154 TREE directive, example, 66, 121, 122, 124, 125, 128 TREE segment definition directive example, 66 overview, 65

Tree structure basic example, 121 figure, 126 figures, 121, 122 with expandable common block example, 123 Tree structure, example (figure), 123 Tree trimming, definition, 154 TRIAL directive, overview, 35 TSTACK directive, 89

## U

#### UNICOS

environment variable processing, 12 ld(1) command line, 10 segldr(1) command line, 4 UNSAT directive example, 46 overview, 46 Unsatisfied external reference, definition, 154 Unsatisfied external references, 105 USX directive default setting, 18 overview, 40

# W

WARNING message, definition, 138

# X

XFER directive command line equivalent for, 4, 15 overview, 44

## $\mathbf{Z}$

Zero address, description directives, 115–117 ZEROCOM directive, overview, 116, 117 ZSYMS directive, overview, 115

# **Reader's Comment Form**

Segment Loader (SEGLDR) and 1d Reference Manual

Your reactions to this manual will help us provide you with better documentation. Please take a moment to complete the following items, and use the blank space for additional comments.

List the operating systems and programming languages you have used and the years of experience with each.

Your experience with Cray Research computer systems: \_\_\_\_0-1 year \_\_\_\_1-5 year \_\_\_\_5+years

How did you use this manual: \_\_\_\_\_in a class \_\_\_\_\_as a tutorial or introduction \_\_\_\_\_as a procedural guide \_\_\_\_\_as a reference \_\_\_\_\_for troubleshooting \_\_\_\_\_other

Please rate this manual on the following criteria:

	Excellent			Poor
Accuracy	4	3	2	1
Appropriateness (correct technical level)	4	3	2	1
Accessibility (ease of finding information)	4	3	2	1
Physical qualities (binding, printing, illustrations)	4	3	2	1
Terminology (correct, consistent, and clear)	4	3	2	1
Number of examples	4	3	2	1
Quality of examples	4	3	2	1
Index	4	3	2	1

Please use the space below for your comments about this manual. Please include general comments about the usefulness of this manual. If you have discovered inaccuracies or omissions, please specify the number of the page on which the problem occurred.

Name	Address
	City
	State/Country
Telephone	Zip code
	Electronic mail address



Fold

Fold

# **Reader's Comment Form**

Segment Loader (SEGLDR) and 1d Reference Manual

Your reactions to this manual will help us provide you with better documentation. Please take a moment to complete the following items, and use the blank space for additional comments.

List the operating systems and programming languages you have used and the years of experience with each.

Your experience with Cray Research computer systems: \_\_\_\_0-1 year \_\_\_\_1-5 year \_\_\_\_5+years

How did you use this manual: \_\_\_\_\_in a class \_\_\_\_\_as a tutorial or introduction \_\_\_\_\_as a procedural guide \_\_\_\_\_as a reference \_\_\_\_\_for troubleshooting \_\_\_\_\_other

Please rate this manual on the following criteria:

	Excellent			Poor
Accuracy	4	3	2	1
Appropriateness (correct technical level)	4	3	2	1
Accessibility (ease of finding information)	4	3	2	1
Physical qualities (binding, printing, illustrations)	4	3	2	1
Terminology (correct, consistent, and clear)	4	3	2	1
Number of examples	4	3	2	1
Quality of examples	4	3	2	1
Index	4	3	2	1

Please use the space below for your comments about this manual. Please include general comments about the usefulness of this manual. If you have discovered inaccuracies or omissions, please specify the number of the page on which the problem occurred.

Name	Address
	City
	State/Country
Telephone	Zip code
	Electronic mail address



Fold

Fold