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of user
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Cray Research, Inc.



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ABOUT THIS CATALOG

This catalog describes the content and purpose of Cray Research, Inc., (CRI) publications produced and planned by the Technical Publications Department for use by employees and customers. Check the enclosed price list for current availability. Orders can be placed with local sales offices or directly with:

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These publications are grouped as follows for ease of reference. A table of contents precedes each grouping.

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- Languages, Products, and Utilities
- Stations
- Hardware Reference Manuals
- Software Technical Notes
- Miscellaneous

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SR-0011 CRAY-OS Version 1 Reference Manual

Describes the external features of the Cray Operating System (COS). It is a reference document for all users of COS. The manual is divided into three parts: Introduction to job processing, job control statements, and control statement structures.

SR-0012 Macros and Opdefs Reference Manual

Describes macro and opdef instructions for use with the Cray Operating System (COS). Macros are available in Cray Assembler Language (CAL) and are subject to the rules defined in the CAL Assembler Version 1 Reference Manual, publication SR-0000.

Macro instructions in this manual include two groups:

- Macros intended for typical users
- Macros and opdefs intended for internal system users

SQ-0023 CRAY-OS Version 1 Ready Reference Manual

Provides condensed descriptions of Cray Operating System (COS) control statements, overlay directives, BUILD directives, UPDATE directives, SEGLDR directives, SID directives, and CSIM directives in a pocket-size handbook.

SR-0039 CRAY-OS Message Manual

Describes all user logfile, system logfile, and program output listing messages issued by Cray Operating System software. It is organized so that the user does not need to know where a message originated.

SM-0040 COS EXEC/STP/CSP Internal Reference Manual[†]

Describes the internal software design of EXEC, STP, and CSP portions of the Cray Operating System (COS).

[†] This publication is part of the set of manuals describing the internal software design of the Cray Operating System (COS) for CRI programmers, analysts, and field engineers who have the responsibility for installing, debugging, and modifying the CRI standard software.

- SM-0041 COS Product Set Internal Reference Manual†
Describes the internal software design of product set members excluding the FORTRAN compiler.
- SM-0042 Front-end Protocol Internal Reference Manual†
Describes communication protocol between a front-end computer system and the CRAY X-MP or the CRAY-1. This is required information for programmers designing front-end stations that interface with the Cray mainframe.
- SM-0043 COS Operational Procedures Reference Manual†
Describes the procedures to follow when generating, installing, or debugging COS software.
- SM-0044 COS Operational Aids Reference Manual†
Describes how to use the COS programs designed specifically for generating, testing, operating and debugging COS software.
- SM-0045 COS Table Descriptions Internal Reference Manual†
Shows each COS table in graphic form and provides a detailed breakdown of fields.

This manual is also available in machine-readable form. See your local CRI analyst for further information.

† This publication is part of the set of manuals describing the internal software design of the Cray Operating System (COS) for CRI programmers, analysts, and field engineers who have the responsibility for installing, debugging, and modifying the CRI standard software.

SM-0072 COS Simulator (CSIM) Internal Reference Manual[†]

Describes the internal software design of the Cray Simulator (CSIM), which executes on all Cray hardware under the Cray Operating System (COS).

SR-0073 Cray Simulator (CSIM) Reference Manual

Describes the usage requirements and directives included in the Cray Simulator (CSIM), a product designed to simulate the hardware of various CRI computer products to allow testing of software. It is intended to be used by CRI system analysts and development personnel to debug operating system and diagnostic software.

[†] This publication is part of the set of manuals describing the internal software design of the Cray Operating System (COS) for CRI programmers, analysts, and field engineers who have the responsibility for installing, debugging, and modifying the CRI standard software.

LANGUAGES, PRODUCTS, AND UTILITIES

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- SR-0000 CAL Assembler Version 1 Reference Manual
- Describes the Cray Assembly Language (CAL) assembler, which allows the user to express symbolically all hardware functions of a CRAY X-MP or CRAY-1 Series central processor.
- SQ-0003 CRAY-1 CAL Reference Card
- Summarizes the CRAY-1 assembler instructions in an easy-to-use, pocket-size quick reference card.
- SR-0009 FORTRAN (CFT) Reference Manual
- Describes the Cray FORTRAN Compiler (CFT), which translates FORTRAN language statements into machine language. This manual describes the Cray FORTRAN language in its entirety and related Cray Operating System (COS) characteristics.
- SR-0013 UPDATE Reference Manual
- Describes UPDATE, a CRI computer program that provides programmers with tools for modifying, editing, and updating source language programs on the Cray Operating System (COS). It also describes AUDPL, which provides information about program libraries written by UPDATE.
- SR-0014 Library Reference Manual
- Describes the subprograms available to users of CRI software.
- SM-0017 FORTRAN (CFT) Internal Reference Manual[†]
- Describes the internal design of the Cray FORTRAN compiler (CFT).
- SQ-0021 CFT Quick Reference Card
- Summarizes frequently used elements of CFT in an easy-to-use, pocket-size quick reference card.

[†] This publication is part of the set of manuals describing the internal software design of the Cray Operating System (COS) for CRI programmers, analysts, and field engineers who have the responsibility for installing, debugging, and modifying the CRI standard software.

SR-0033 SKOL Reference Manual

Describes the features of the SKOL language. Because of SKOL's close association with FORTRAN, this publication assumes that the reader knows FORTRAN. Detailed information about Cray FORTRAN is presented in the Cray FORTRAN (CFT) Reference Manual (publication SR-0009).

SM-0036 APLM Assembler Reference Manual

Describes the APLM assembler, which is intended for execution on a CRI I/O Subsystem. This detailed and precise level of programming is of special use to those wanting to tailor programs to the architecture of the I/O Subsystem and write programs requiring code optimized to the hardware.

SG-0055 Text Editor (TEDI) User's Guide

Describes the external features of the CRI interactive text editor (TEDI). TEDI is designed for a programmer to edit programs or documentation online. The reader is assumed to be familiar with the Cray Operating System (COS).

SG-0056 Symbolic Interactive Debugger (SID) User's Guide

Describes the operation of the CRI Symbolic Interactive Debugger (SID), a powerful debugging tool that allows the programmer to debug programs interactively or in batch mode. SID operates under control of the Cray Operating System (COS) on all series and models of Cray Computer Systems. It can be used for programs written in Cray Assembly Language (CAL), Cray FORTRAN (CFT), or in a combination of CAL and CFT.

SQ-0059 APLM Quick Reference Card

Summarizes the I/O Subsystem instruction set in an easy-to-use, pocket-size quick reference card.

SR-0060 Pascal Reference Manual

Describes the features of the Cray Pascal language. Cray Pascal includes a full implementation of the ISO Version 1 Pascal standard and extensions to the standard developed by CRI. The publication assumes a prior knowledge of Pascal but contains examples of most features and of necessary COS job control language to help the relative newcomer.

SM-0061 Pascal Internal Reference Manual

Describes the internal software design of the Cray Pascal compiler, which translates statements from the Pascal programming language into machine code for a Cray Computer System. This publication details the compiler's methods of code generation, scalar optimization, and vectorization.

SR-0066 Segment Loader (SEGLDR) Reference Manual

Describes the operation of a CRI loader that loads program segments without explicit calls to an overlay manager. SEGLDR executes under the control of COS and loads code produced by language processors such as CAL and CFT.

SQ-0067 CRAY X-MP CAL Reference Card

Summarizes the CRAY X-MP assembler instructions in an easy-to-use, pocket-size quick reference card.

STATIONS

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IBM VM Station

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SG-0006 Data General Station (DGS) Operator's Guide

Describes how to operate a Data General Eclipse being used as either a local or remote batch entry station for the CRAY X-MP or CRAY-1 Series Computer System.

SM-0007 IOS Table Descriptions Internal Reference Manual[†]

Describes tables for the portions of the Cray Operating System (COS) executing in the I/O Subsystem.

SR-0020 DEC VAX/VMS Station Reference Manual

Describes the external features of the CRI software product that logically links a VAX-11 computer system, manufactured by Digital Equipment Corporation (DEC), to a CRAY X-MP or CRAY-1 Series Computer System.

This publication is intended for users of COS wanting to transfer jobs and data to and from a connected VMS system using the VAX/VMS station.

SR-0034 CDC NOS/BE Station Reference Manual

Describes the external features of the software that logically links a Control Data Corporation (CDC) CYBER 70, Models 71, 72, 73, and 74; a CYBER 170 Series; or a CDC 6000 Series Computer System running the NOS/BE operating system to a CRAY X-MP or CRAY-1 Series Computer System.

SR-0035 CDC NOS Station Reference Manual

Describes the external features of the software that logically links a Control Data Corporation (CDC) CYBER 70, Models 71, 72, 73, and 74; a CYBER 170 Series; or a CDC 6000 Series Computer System running the NOS operating system to a CRAY X-MP or CRAY-1 Series Computer System.

[†] This publication is part of the set of manuals describing the internal software design of the Cray Operating System (COS) for CRI programmers, analysts, and field engineers who have the responsibility for installing, debugging, and modifying the CRI standard software.

SG-0037 IBM MVS Station Operator's Guide

Describes the operational features of the IBM MVS station software. This software logically links an IBM or equivalent computer system running the MVS or MVS/XA operating system to a Cray computer system running the Cray Operating System (COS). It enables an operator at an MVS console or an authorized TSO user to control the operation of the IBM MVS Station, control jobs submitted to COS, and to control COS and the Cray computer system. It enables the MVS operator to respond to requests from COS and the station on behalf of jobs running on the Cray system.

SR-0038 IBM MVS Station Reference Manual

Describes the external features of the IBM MVS station software. This software logically links an IBM or equivalent computer system running the MVS or MVS/XA operating system to a Cray computer system running the Cray Operating System (COS). It enables an MVS user to submit jobs and datasets from TSO or from MVS batch to COS and to control and monitor those jobs from TSO. It enables a COS user to transfer datasets between the MVS and COS file bases and to produce output from COS jobs on the MVS system.

SM-0046 IOS Software Internal Reference Manual†

Describes the internal design portion of the Cray Operating System (COS) executing in an I/O Subsystem that is an integral part of the CRAY X-MP Series, all models of the CRAY-1 M Series, and models S/1200 through S/4400 of the CRAY-1 S Series Computer Systems.

SM-0047 CDC NOS Station Internal Reference Manual†

Describes the internal design of the software that logically links a Control Data Corporation (CDC) CYBER 70, Models 71, 72, 73, and 74; a CYBER 170 Series; or a CDC 6000 Series Computer System running the NOS operating system to a Cray Computer System.

† This publication is part of the set of manuals describing the internal software design of the Cray Operating System (COS) for CRI programmers, analysts, and field engineers who have the responsibility for installing, debugging, and modifying the CRI standard software.

SM-0048 IBM MVS Station Internal Reference Manual[†]

Describes the internal design and structure of the IBM MVS station software. This software logically links an IBM or equivalent computer system running the MVS or MVS/XA operating system to a Cray Computer System running the Cray Operating System (COS). It describes the interfaces to MVS and the job entry subsystems, and to the other products with which the station communicates.

SM-0049 Data General Station (DGS) Internal Reference Manual[†]

Describes the operation of the Data General Eclipse station in its role as a maintenance tool and controller of system initialization for CRAY-1 Computer System Models A, B, and S/250-S/1000.

SG-0051 I/O Subsystem (IOS) Operator's Guide

Describes the operational features of a CRI I/O Subsystem running under the Cray Operating System (COS). The manual is for use by computer operators and systems analysts using the CRAY X-MP Series, all models of the CRAY-1 M Series, and models S/1200 through S/4400 of the CRAY-1 S Series Computer Systems.

SM-0052 CDC NOS/BE Station Internal Reference Manual[†]

Describes the internal design of the software that logically links a Control Data Corporation (CDC) CYBER 70, Models 71, 72, 73, and 74; a CYBER 170 Series; or a CDC 6000 Series Computer System running the NOS/BE operating system to a Cray Computer System.

SG-0057 CDC NOS Station Operator's Guide

Describes the operational features of the software that logically links a Control Data Corporation (CDC) CYBER 70, Models 71, 72, 73, and 74; a CYBER 170 Series; or a CDC 6000 Series Computer System running the NOS operating system to a CRAY X-MP or CRAY-1 Series Computer System.

[†] This publication is part of the set of manuals describing the internal software design of the Cray Operating System (COS) for CRI programmers, analysts, and field engineers who have the responsibility for installing, debugging, and modifying the CRI standard software.

SG-0058 CDC NOS/BE Station Operator's Guide

Describes the operational features of the software that logically links a Control Data Corporation (CDC) CYBER 70, Models 71, 72, 73, and 74; a CYBER 170 Series; or a CDC 6000 Series Computer System running the NOS/BE operating system to a CRAY X-MP or CRAY-1 Computer System.

SM-0062 DEC VAX/VMS Station Internal Reference Manual[†]

Describes the internal design of the CRI software product that logically links a CRAY X-MP or CRAY-1 Series Computer System to a VAX-11 Computer System, running under the VMS Operating System.

SG-0063 DEC VAX/VMS Station Operator's Guide

Describes the operator interface to a CRI software product that logically links a VAX-11 Computer System, manufactured by Digital Equipment Corporation (DEC), to a CRAY X-MP or CRAY-1 Series Computer System.

SR-0068 IBM VM Station Reference Manual

Describes the external features of the software that logically links an IBM or equivalent computer system to a CRAY X-MP or CRAY-1 Series Computer System. The software providing the logical link is an authorized application program running under the IBM VM/SP Virtual Machine operating system (VM).

This publication is intended for users of COS who want to transfer jobs, data, and interactive commands to, from, or through a connected VM system.

[†] This publication is part of the set of manuals describing the internal software design of the Cray Operating System (COS) for CRI programmers, analysts, and field engineers who have the responsibility for installing, debugging, and modifying the CRI standard software.

SM-0070 IBM VM Station Internal Reference Manual†

Describes the internal features of the CRI software product that logically links a CRAY X-MP or CRAY-1 Series Computer System to an IBM or equivalent computer system. Part 1 of this publication describes the internal design of the station software. Part 2 describes aspects relating to the site installation, problem determination, internal data structures, configuration, and maintenance of the product.

SM-0078 IBM MVS Station Installation and Maintenance Reference Manual†

Describes how to install and maintain the IBM MVS station software. This software logically links an IBM or equivalent computer system running the MVS or MVS/XA operating system to a Cray computer system running the Cray Operating System (COS). It enables a system programmer or analyst to plan for installation, select generation and installation options, and initialize the station. It describes in detail the modifications necessary to the MVS job entry subsystem. It enables a systems programmer to control the activity of the station by means of installation exit routines and to monitor its activity using the IBM System Management Facility (SMF).

† This publication is part of the set of manuals describing the internal software design of the Cray Operating System (COS) for CRI programmers, analysts, and field engineers who have the responsibility for installing, debugging, and modifying the CRI standard software.

HARDWARE REFERENCE MANUALS

User Reference Manuals

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- HR-0004 CRAY-1 A/B (Serial 3+) Hardware Reference Manual
- Describes the functions of CRAY-1 Models A and B (serial no. 3 and up) Computer Systems and the overall computer system, its configurations, and equipment. It also describes the operation of the Central Processing Unit, which executes programs, runs user jobs, and oversees job flow within the Cray Computer System.
- HR-0025 Solid-state Storage Device (SSD®) Site Planning Reference Manual
- Provides technical information to plan and prepare a typical site for adding a CRI Solid-state Storage Device (SSD®) to an existing system. If the SSD® is part of the initial system, information is included in the mainframe's site planning manual.
- HR-0028 CRAY X-MP Series Models 22 & 24 (12-column) Site Planning Reference Manual
- Provides technical information to plan and prepare a typical site for a facility installing a 12-column CRAY X-MP Model 22 or 24 Series Computer System. This manual includes information for peripheral and support equipment.
- HR-0029 CRAY-1 S Series Mainframe Reference Manual
- Describes the functions of CRAY-1 S Series Computer Systems and the overall computer system, its configurations, and equipment. It also describes the operation of the Central Processing Unit, which executes programs, runs user jobs, and oversees job flow within the CRAY-1 S Series Computer System.
- HR-0030 I/O Subsystem Hardware Reference Manual
- Describes the operation of a CRI I/O Subsystem (IOS) and its I/O processors (IOPs). Also described are IOP instructions and their formats, interface requirements to peripheral devices, and Buffer Memory of an I/O Subsystem.
- HR-0031 Solid-state Storage Device (SSD®) Hardware Reference Manual
- Describes the CRI Solid-state Storage Device (SSD®) for Cray Computer Systems. This publication contains operation and programming information for the SSD®.

HR-0032 CRAY X-MP Series Models 22 & 24 Mainframe Reference Manual

Describes the functions of the CRAY X-MP Series dual-processor Computer Systems. It includes descriptions of the overall computer system, its configurations, and equipment. It also describes the operation of the Central Processing Units, which execute instructions, provide memory protection, report hardware exceptions, and provide interprocessor communications within the computer system.

HR-0064 CRAY-1 M Series Mainframe Reference Manual

Describes the functions of CRAY-1 M Series Computer Systems. It includes descriptions of the overall computer system, its configurations, and equipment. It also describes the operation of the Central Processing Unit, which executes programs, runs user jobs, and oversees job flow within the CRAY-1 M Series Computer System.

HR-0065 CRAY-1 M Series Site Planning Reference Manual

Contains technical information to plan and prepare a typical site for a facility installing a CRAY-1 M Series Computer System. This manual includes information for peripheral and support equipment.

HR-0080 CRAY-1 and CRAY X-MP Peripheral Equipment Site Planning Reference Manual

Contains technical information needed to plan and prepare a typical site for the installation of peripheral equipment.

This manual is one of several site planning manuals required for a CRAY X-MP system installation or the re-installation of a CRAY-1 system. The peripheral equipment in this manual includes: maintenance control equipment, maintenance and remote operator's terminals, disk storage units, front-end interface cabinet, and module test station.

HR-0082 CRAY-1 and CRAY X-MP Support Equipment Site Planning Reference Manual

Contains technical information needed to plan and prepare a typical site for the installation of support equipment.

This manual is one of several site planning manuals required for a CRAY X-MP system installation or the re-installation of a CRAY-1 system. The support equipment in this manual includes: refrigeration condensing units and motor-generator sets.

HR-0084 CRAY X-MP Series Models 11, 12, 14, 22 & 24 (6-Column) Site Planning Reference Manual

Provides technical information to plan and prepare a typical site for a facility installing a 6-column CRAY X-MP Models 11, 12, 14, 22 or 24 Series Computer System. This manual contains information on the mainframe, IOS, and SSD® only, HR-0080 and HR-0082 complete the 3-manual set.

HR-0087 CRAY X-MP Series Model 48 Site Planning Reference Manual

Provides technical information to plan and prepare a typical site for a facility installing a CRAY X-MP Model 48 Series Computer System. This manual contains information on the mainframe, IOS, and SSD® only, HR-0080 and HR-0082 complete the 3-manual set.

HR-0088 CRAY X-MP Series Models 11, 12, & 14 Mainframe Reference Manual

Describes the functions of a CRAY X-MP Series single-processor Computer System. It includes descriptions of the overall computer system, its configuration, and equipment. It describes the Central Processing Unit that executes instructions, provides memory protection, and reports hardware exceptions within the computer system. The manual is written for programmers and engineers and assumes a familiarity with digital computers.

HR-0097 CRAY X-MP Series Model 48 Mainframe Reference Manual

Describes the functions of a CRAY X-MP Series four-processor Computer System. It describes the overall computer system, its configuration, and equipment. It describes the Central Processing Units that execute instructions, provide memory protection, report hardware exceptions, and provide interprocessor communications within the system. It assists programmers and engineers and assumes a familiarity with digital computers.

HR-0630 Mass Storage Subsystem Hardware Reference Manual

Describes the functions of the Mass Storage Subsystem (DD-19 and DD-29 Disk Storage Units, DCU-2 and DCU-3 Disk Controller Units, and DCC-1 Disk Controller Cabinet). It contains operation and programming information for the DCU-2 and DCU-3 Disk Controller Units, and operating instructions for the DD-19 and DD-29 Disk Storage Units.

HR-0802 CRAY-1 S Series Site Planning Reference Manual

Contains technical information needed to plan and prepare a typical site for the installation of a CRAY-1 S Series Computer System. This manual includes information for peripheral and support equipment.

SOFTWARE TECHNICAL NOTES

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- SN-0203 CRAY-1 Complex Fast Fourier Transform Binary Radix Subroutine (CFFT2)
- Describes the FORTRAN callable subroutine Complex Fast Fourier Transform (CFFT2), which can be assembled and executed on a CRAY-1 Computer System. CFFT2 is written in Cray Assembly Language (CAL) for use under the Cray Operating System (COS).
- SN-0204 CRAY-1 Real to Complex Fast Fourier Transform Binary Radix Subroutine (RCFFT2)
- Describes the FORTRAN callable subroutine Real to Complex Fast Fourier Transform (RCFFT2), which can be assembled and executed on a CRAY-1 Computer System. RCFFT2 is written in Cray Assembly Language (CAL) for use under the Cray Operating System (COS).
- SN-0206 Complex to Real Fast Fourier Transform Binary Radix Subroutine (CRFFT2)
- Describes the FORTRAN callable subroutine Complex to Real Fast Fourier Transform (CRFFT2), which can be assembled and executed on a CRAY-1 Computer System. CRFFT2 is written in Cray Assembly Language (CAL) for use under the Cray Operating System (COS).
- 2240210 Linear Digital Filters for CFT Usage
- Presents three callable subroutines of linear digital filtering operations for Cray FORTRAN (CFT) use. It describes a general linear filter for real input data, a program using only half the vector, and a fully vectorized solution.
- SN-0213 CRAY-1 Unit Spaced Fast Matrix Multiply (MXM)
- Describes the FORTRAN callable subroutine Unit Spaced, Column Ordered, Fast Matrix Multiply (MXM), which is accessed from \$SCILIB under the Cray Operating System (COS). MXM is coded in Cray Assembly Language (CAL) with linkages for error exit via COS traceback conventions.

- SN-0214 CRAY-1 Arbitrary Spaced Fast Matrix Multiply (MXMA)
- Describes the FORTRAN callable column-vectorized fast matrix multiply (MXMA), which is coded in Cray Assembly Language (CAL). This subroutine can be accessed from \$SCILIB under the Cray Operating System (COS) of a CRAY-1 computer.
- SN-0215 CRAY-1 Partial Pivoting Linear Equation Solver (MINV)
- Describes the FORTRAN callable row-vectorized Gaussian Elimination procedure MINV, an in-place linear equation solver for multiple right-hand sides. This subroutine can be accessed from \$SCILIB under the Cray Operating System (COS) of a CRAY-1 computer.
- SN-0216 PACK/UNPACK - Packed Word Routines
- Describes the callable subroutine PACK, which takes n words of a 64-bit word list, masks off the low-order bits, and concentrates them in a string of 64-bit words. The inverse routine UNPACK is also described. PACK and UNPACK are accessed from \$SCILIB under the Cray Operating System (COS) of a CRAY-1 Computer.
- SN-0220 CRAY-1 Optimization Guide
- This manual is an optimization guide for the FORTRAN programmer using the CFT compiler and a Cray Computer System. It is designed with short examples with pre- and post-FORTRAN code and the timings of both. No attempt has been made to explain the examples.
- SN-0222 Multitasking User's Guide
- Describes the multitasking features and concepts provided with the Cray Operating System (COS). It describes the use of the multitasking features and how to produce executable programs.
- SN-0223 DD-49 Disk Storage Unit
- Describes Cray Operating System (COS) support for the DCU-5 Disk Controller and DD-49 Disk Storage Unit (DSU). This note also provides the information necessary for non-COS use of the DCU-5 and DD-49.

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Cray Logo Binders

Brown 3-ring binders with the Cray logo are available in 1 inch, 1 1/2 inch, and 2 inch sizes.

CRAY-1/X-MP Label ID Kit

A 3-ring binder label kit consists of divider sheets, spine label cards, and two sets of press on titles of user publications.

Microfiche

User manuals starting with COS 1.12/CFT 1.11, are offered in microfiche form. The prefixes of the manuals are changed to SF and HF rather than SG, SR, SM, and HR. The numeric suffixes are the same but a date rather than a revision level signifies changes.

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