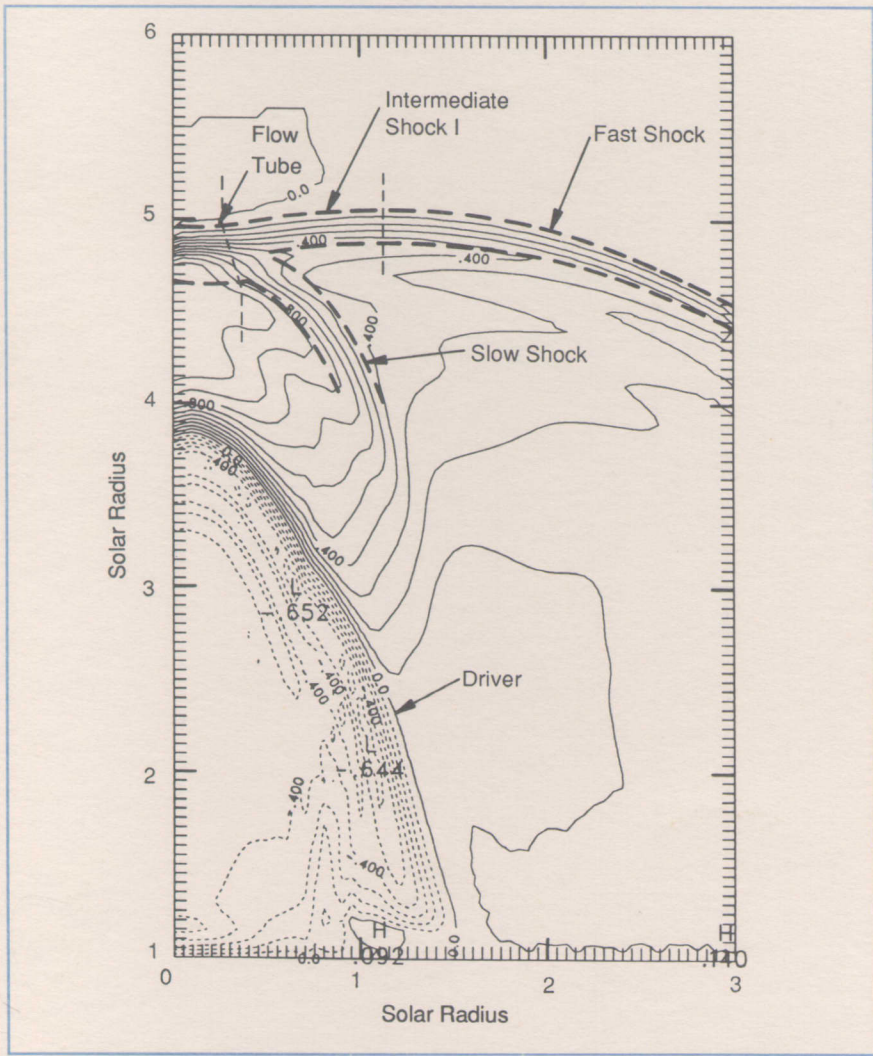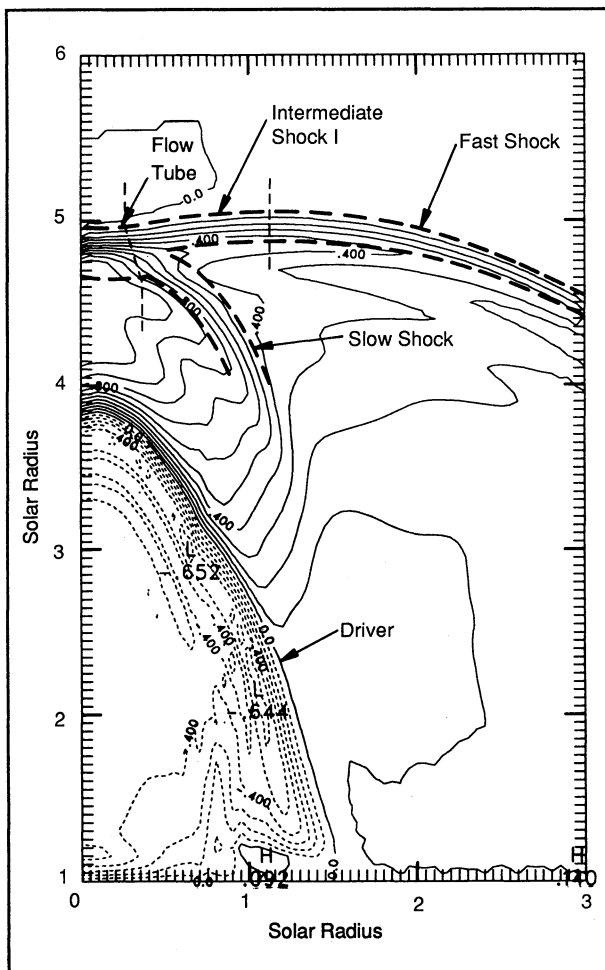# SCD COMPUTING NEWS

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- **HINTS ON COMMON CRAY ERROR CODES**

SCIENTIFIC COMPUTING DIVISION
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH

Intermediate
Shock I

Flow
Tube
.0.0

Fast Shock

.400

.400

Slow Shock

Driver

652

644

Solar Radius

6

5

4

3

2

1

0   1   2   3

Solar Radius

About the cover

Violent forms of activity on the Sun's surface, such as flares and eruptive prominences, often produce large-scale disruptions referred to as coronal mass ejections in the solar atmosphere. These mass ejections may propagate to Earth and disrupt radio, satellite, and other atmospheric communications. The cover graphic shows contours of equal plasma density in a simulated mass ejection in the lower atmosphere. Interesting features identified in the figure are the occurrence of all three forms of magnetohydrodynamic shock waves (slow, intermediate, and fast shock). Of particular interest is the formation of the intermediate shock, which is generally believed not to occur in nature. Both simulations and analytic theory, however, demonstrate that such shocks must exist for conditions believed to arise in coronal mass ejections.

The output is produced from a numerical code, which solves the time-dependent, nonlinear, magnetohydrodynamic equations, constructed by Dr. Richard Steinolfson of the University of Texas in collaboration with Dr. Art Hundhausen of the High Altitude Observatory (HAO). The simulation is used to assist in the interpretation of observations from the coronagraph/polarimeter operated by HAO on the Solar Maximum Mission satellite. Identification of predicted signatures in the observations lends further support to the existence of the various shocks. The vectorized code is run on the NCAR CRAY X-MP/48 computer. The NCAR Graphics routine CONREC produced the plotter instructions that were then output to an HAO laser printer to generate the cover illustration.

Δ

Software change articles: The delta symbol (Δ) appears next to the title of articles that may affect how you run your jobs.

FEATURES

SOFTWARE NEWS

DEPARTMENTS

SCD COMPUTING NEWS

CRAY X-MP/18 computer with UNICOS arriving soon; networking ethics

by Bill Buzbee

I am pleased to report that we are about to embark on "the path to UNIX" for our supercomputing facility. The SCD Director's Column in the January 1988 issue of the *SCD Computing News* sets forth our rationale for having the UNIX operating system available on supercomputers at NCAR. Barring unforeseen complications, we will lease and install a CRAY X-MP/18 computer on April 1, 1989. We will implement UNICOS on it, then connect it to the Mainframe and Server Network (MASnet) and to the Mass Storage System (MSS) fastpath.

To prepare the site for this machine, we must decommission the CRAY-1A computer by February 1, 1989. As this transition will have significant impact on users, please read the article in this issue titled "CRAY-1A Serial Number 003 to be decommissioned" for details.

We will make the CRAY X-MP/18 computer usable as soon as possible, but we will need several months to fully integrate it with the MSS and make it generally available. During these months, we will move some of the large simulations from the CRAY X-MP/48 computer to the CRAY X-MP/18 computer to make both machines productive. We regret this period of inconvenience.

I am sure that most readers of the *SCD Computing News* are aware that the Internet was partially disabled in November because of the virus (or precisely, the "worm" program) that was injected into it. Some have estimated the total cost of this incident, including the "cleanup" and lost time, to be $100 million.

This incident brings up an interesting analogy between computer networks and our system of highways. Both are community resources that provide a variety of benefits to society. And the successful functioning of both depends on responsible behavior by the people who use them. For our traffic systems to function properly, drivers must know the proper side of the road on which to drive, honor traffic signals, give signals in advance of certain maneuvers, and so forth.

A single driver can disrupt the entire system by failing to comply with the "rules of the road." Likewise, networks can be disrupted by individuals. In the case of traffic systems, there are immediate consequences to irresponsible users: they may be physically injured and their vehicles may be damaged. Unfortunately, our society has yet to impose any substantial penalty on those who disrupt computer networks, but there is growing pressure to do so. More important is our attitude toward networks and their use. I urge you to read and reflect on the article titled "Call for ethical standards in networking issued" in this newsletter.

CRAY-1A Serial Number 003 to be decommissioned

by Brian Bevirt

After ten full years of reliable service, the CRAY-1A computer at NCAR (CRAY,C1) will be decommissioned. Barring unforeseen circumstances, this venerable workhorse will be permanently offline at 00:01 MST on February 1, 1989. Affectionately known in SCD as "Serial Three," this is the third computer built by Cray Research, Inc., and the oldest Cray computer operating in the field. We will commemorate its passing in a gala ceremony featuring tales of joy and woe. SCD will then move forward along the "path to UNIX" with plans to obtain a Cray computer running the UNICOS operating system (see the SCD Director's Column and News from SCDUG in this issue).

All current users of CRAY,C1 should read the online Daily Bulletin (dailyb) regularly as the fateful decommissioning day approaches. Information about the preparations for the decommissioning day will be published and kept up to date in the dailyb.

Please begin your preparations for computing only on the CRAY X-MP/48 computer at NCAR (CRAY,CX). You can expect a variety of changes in the ways you compute at NCAR, and you can save both time and General Accounting Units (GAUs) by adapting your methods as soon as possible.

Impact on users

This article describes most of the significant impacts to CRAY,C1 users when the decommissioning day arrives. SCD staff is preparing all systems in the computing facility to make this change as transparent as possible to users. However, some of the older methods for supercomputing at NCAR must be abandoned as more modern practices become standard. There are very few changes you will be required to make to your CRAY,C1 jobs to run them on CRAY,CX. However, you may want to make other changes to take advantage of the CRAY,CX capabilities. These capabilities are discussed in the last section of this article.

New status for round tapes

After the decommissioning day, users will no longer be able to access data on "round" tapes (1/2-inch magnetic tape on 10-1/2-inch reels) through their Cray Job Control Language (JCL). The MF=MT parameter in ACQUIRE and DISPOSE statements will no longer be valid. After the decommissioning day, users will be required to move their data between round tapes and the MSS through the new MIMPORT/MEXPORT facility. Instructions for using this facility from CRAY,CX are provided in the SCD document "MEXPORT and MIMPORT: Transferring Data Between the Mass Storage System and Tape." Instructions for ordering SCD documentation are provided on the back cover of this newsletter. SCD will continue to accept incoming data from round tapes, but after January 1, 1989, users are required to transfer their data from incoming round tapes to our Mass Storage System (MSS) within 30 days. (See the article about SCD's new tape policy on page 5 of the December 1988 issue of the *SCD Computing News*.)

After ten full years of reliable service, the CRAY-1A computer at NCAR will be permanently offline at 00:01 MST on February 1, 1989.

One version of the Cray Operating System (COS)

CRAY,C1 is running COS Version 1.14, and CRAY,CX uses COS Version 1.16. After the decommissioning day, all Cray jobs must run on COS 1.16. However, it is unlikely that you will need to change your JCL. If you encounter any problems, please contact an SCD consultant for assistance. The e-mail addresses are consult1@ncar.ucar.edu on the Internet and CONSULT1 on the IBM 4381 (IO) computer. You may also call the consultants at (303) 497-1278.

One version of the Cray Fortran Compiler (CFT)

CRAY,C1 is running CFT Version 1.14 and CRAY,CX uses CFT Version 1.15 with the Bug Fix 3 software upgrade. The differences between these two

software levels may introduce compiler or execution errors in some codes. If a problem occurs, please contact a consultant.

We urge you to make test runs on CRAY,CX while CRAY,C1 is still operational. If your code produces different numerical results, it is easier to track the problem if intermediate results can be printed and compared using both computers.

JCL differences

Since the ACCOUNT statement for a CRAY,C1 job is optional, you are required to specify your user number and project number in the JOB statement with the US=xxxxyyyyyyyy parameter. On CRAY,CX, the ACCOUNT statement is required and you must declare your user number and project number in it with the AC=xxxxyyyyyyyy parameter. Therefore, the US parameter is optional in a CRAY,CX JOB statement. The ACCOUNT statement must immediately follow the JOB statement.

The MF=MT parameter in ACQUIRE and DISPOSE statements will not be valid after the decommissioning day. See the preceding discussion of round tapes.

The JCL statements COPYSD, COPYSF, and COPYSR are not allowed on CRAY,CX (except in Fortran-callable form). They are replaced by the COPYD, COPYF, and COPYR statements with an S=n parameter (n is the number of ASCII blanks to be inserted at the beginning of each line of text). For more information, see the SCD document "Cray JCL with NCAR Site-specific Parameters." Instructions for ordering SCD documentation are provided on the back cover of this newsletter.

The NETACQ and NETDISP statements will no longer be valid after the decommissioning day.

Job class changes

The Mono-program 2 (MP2) class on CRAY,C1 differs from the MP2 class on CRAY,CX. CRAY,CX allows field lengths up to 6.5 megawords, charging is assessed for the entire computer but at 1/2 the full rate, and the minimum charge for running an MP2 job is 2.00 GAUs. Special permission is required to run in the MP2 class on CRAY,CX. Contact Bob

Niffenegger in Operations at (303) 497-1240 to make the necessary arrangements.

Charging difference

The discount in GAU charges available to National Science Foundation (NSF) grantees who run CRAY,C1 jobs will end when the CRAY-1A computer leaves.

Advantages of computing on CRAY,CX

CRAY,CX provides many more capabilities than CRAY,C1. With four processors on CRAY,CX, users can multitask their jobs. The Mono-program 1 job class is available for debugging multitasking jobs before they are run in the Mono-program 2 class. The Large Model class is available for jobs that run one hour or more on a single processor and use no more than 3 megawords of memory. The SCD document titled "Charges for SCD Computing Resources" describes all aspects of these classes. Instructions for ordering SCD documentation are provided on the back cover of this newsletter.

CRAY,CX provides 6 megawords of user-accessible memory and can access the 256-megaword Solid-state Storage Device (SSD) and 19,200 megabytes of high-speed disk storage. A clock period of 8.5 nanoseconds allows each CRAY,CX processor to perform at speeds exceeding 100 million floating-point operations per second (Mflops). Benchmark tests have shown CRAY,CX performance exceeding 500 Mflops. In comparison, CRAY,C1 has only 0.65 megawords of user-accessible memory and 4800 megabytes of hard disk storage, and it cannot access the SSD. The clock period of CRAY,C1 is 12.5 nanoseconds, allowing performance no faster than 100 Mflops.

The maximum dataset size allowed on CRAY,C1 is 60,000 512-word blocks, while CRAY,CX allows up to 500,000 512-word blocks. Other advantages include the availability of a C language compiler, the CFT77 compiler, and the performance monitoring utility (PERFMON).

In conclusion, there may be some inconvenience involved in this change, but we are moving on the path to UNIX!

Brian Bevirt is a writer/editor in the Documentaion Group within SCD.

T1 network installed

by Marla Meehl

Installation of a T1 network connecting Research Lab 6 (RL6), Jefferson County Airport (Jeffco), Marshall Field Site, and the Mesa Laboratory was completed December 27. These sites now use T1 lines provided by US West, along with Timeplex multiplexers combined in a star configuration, to communicate with the Mesa site and each other. There are some new terms involved in this type of networking, and we will clarify some of these concepts first.

T1 is a transmission technology that allows 1.544 megabits per second (Mbps) of digital data to travel over common media. The physical media that are used could include copper wire, fiber optics, and microwave. The medium is not usually important to the end user – it should be transparent.

Multiplexing is a technology that combines various kinds of data (analog, digital, synchronous, and asynchronous) onto a larger bandwidth, for example, a T1 link. As you might guess, a multiplexer is the piece of equipment that actually accomplishes the task of interleaving these data so that they can be transmitted on a single channel.

The NCAR T1 network consists of four nodes (see figure on next page). The nodes are known as MESA, which is at the Mesa in the computer room; RL6, which resides in the computer room at RL6; JEFFCO, which resides in the computer room at the Jeffco site; and MARSHALL, which resides in the central branch exchange (CBX) room at Marshall. RL6, JEFFCO, and MARSHALL are linked to the MESA node via three T1 links.

The concept of multiplexing is to divide a high-bandwidth line, for example a T1 line (1.544 Mbps bandwidth), into separate channels carrying any type of digital data (for example, voice, modem, local area network) all on one link. Table 1 shows the type of data being multiplexed to and from the MESA node.

User impacts

How does this affect the user in the long run? Some changes are user-invisible. For example, if a person at

Table 1. T1 Networking Features

RL6 to/from MESA

Total bandwidth available	1544 Kbps
Ethernet (includes TCP/IP and DECnet/MASnet traffic)	460.8 Kbps
16 channels of 32 Kbps voice (replaces tie lines currently used by the Rolm telephone system)	512 Kbps
2 channels of 9.6 Kbps asynchronous (PACX access from RL6)	19.2 Kbps
4 channels of 2.4 Kbps asynchronous (PACX access to RL6)	9.6 Kbps

JEFFCO to/from MESA

Total bandwidth available	1544 Kbps
Ethernet	460.8 Kbps
8 channels of 32 Kbps voice (replaces tie lines currently used by the Rolm telephone system)	256 Kbps
4 channels of 9.6 Kbps asynchronous (PACX access from JEFFCO)	38.4 Kbps
4 channels of 2.4 Kbps asynchronous (PACX access to JEFFCO)	9.6 Kbps

MARSHALL to/from MESA

Total bandwidth available	1544 Kbps
Ethernet	256 Kbps
6 channels of 32 Kbps voice (replaces tie lines currently used by the Rolm telephone system)	192 Kbps
2 channels for slow scan video (monitors parking lot for guards)	128 Kbps

NCAR T1 NETWORK

TIMEVIEW

NETWORK MANAGEMENT
SYSTEM

ROLM M
CBX II

28 voice
Ethernet 3
PACX Async 6
Host Async 8
Video monitor

ROLM M
CBX II

16 voice

Ethernet

Host Async
4 @ 2.4 Kbps

PACX Async
2 @ 9.6 Kbps

RL6

MESA

video & control
(planned)

ROLM VS
CBX II

8 voice

JEFFCO

Ethernet

Host Async
4 @ 2.4 Kbps

PACX Async
4@9.6 Kbps

T1 (1.544 Mbps)

video &
control

MARSHALL

6 voice   Ethernet

ROLM VS
CBX II
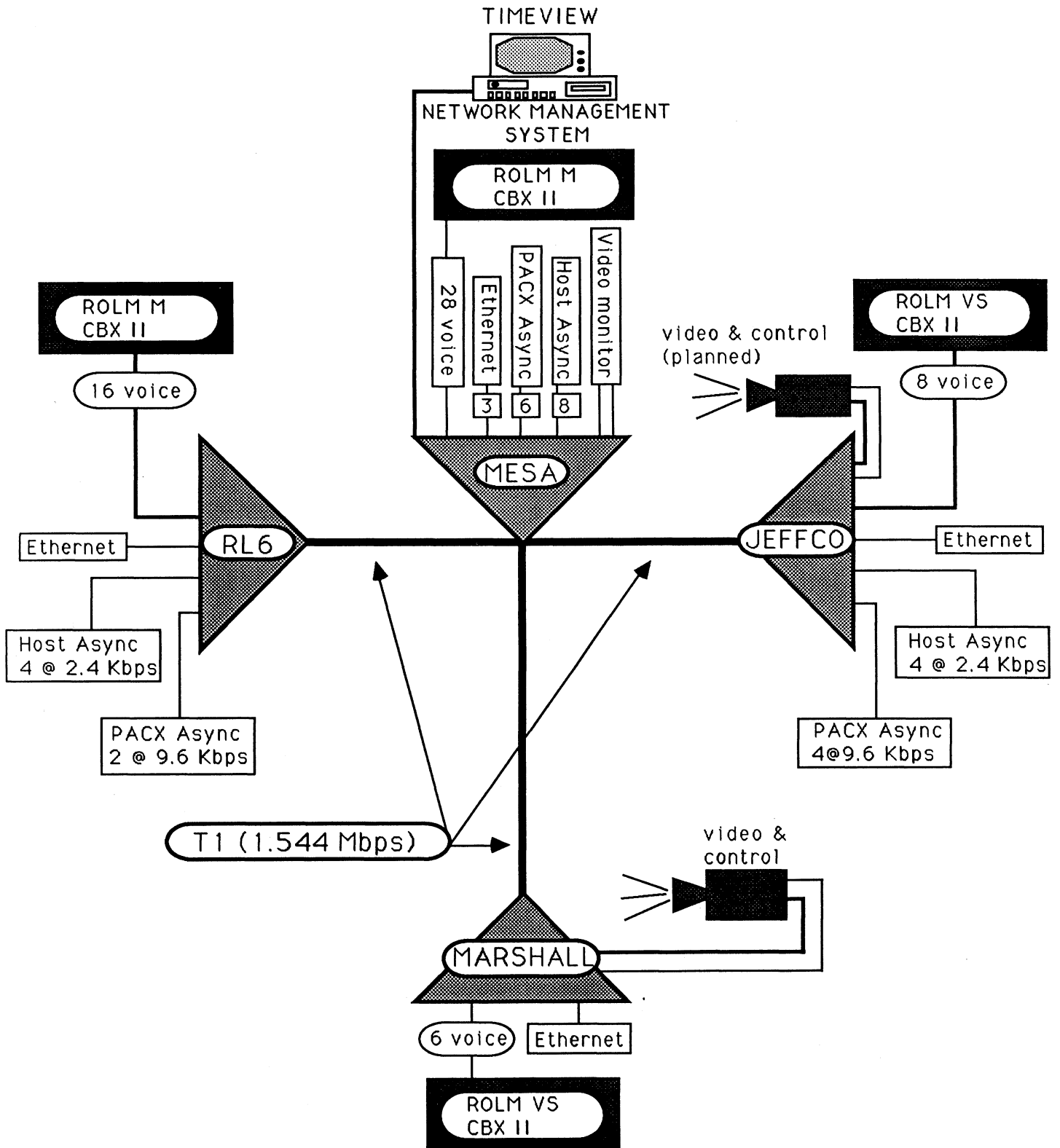
The NCAR T1 multiplexing system combines many types of data into a single high-bandwidth link enabling us to connect three of our Boulder sites to the Mesa Laboratory and each other. The shaded triangles symbolize multiplexers.

the Mesa phones someone at RL6, that traffic now goes through the T1 link between those two sites on a 32-kilobit per second (Kbps) subchannel. Previously, this call would have gone over a telephone tie line.

Some changes are highly visible, providing capabilities that did not previously exist. For example, VAX/ VMS gateway services now transfer files five times faster with T1, making it easier for you to transmit larger files.

When connecting from the VAX computer at RL6 to the Masscomp computer at Jeffco using the Ethernet, the traffic will go via a subchannel on the T1 link. Jeffco and Marshall were not previously reachable via Ethernet. The T1 system has allowed us to add that functionality. The Masscomp at Jeffco is named spock.ucar.edu (128.117.84.1) and the Alliant computer at Marshall is named toadwar.ucar.edu (128.117.81.4). For more information on using the Ethernet to or from these sites, you can contact the SCD Consulting Office by calling (303) 497-1278 or by sending e-mail to consult1@ncar.ucar.edu on the Internet or CONSULT1 on the IBM 4381 (IO) front-end computer.

Asynchronous access has also been provided to and from RL6 and Jeffco. You can now reach the VAX at RL6 through NCAR's port selection device (PACX) by choosing class mmm (for Mesoscale and Microscale Meteorology). For information about procedures, see the article "New PACX access for RL6 and Jeffco added" in this issue.

At Jeffco, you can choose to access the PACX at the Mesa and gain access to any of the computers to which the PACX has connections and, of course, any ones on which you have a valid ID and password. For more information, Jeffco users can contact Ron Ruth. His e-mail address is ruth@ncar.ucar.edu. Telephone: (303) 497-1048. Through the VAX at RL6, users will be able to access the PACX and again have the same functions as stated above. For more information on these procedures, contact Pat Waukau. Her e-mail address is waukau@ncar.ucar.edu. Telephone: (303) 497-8906.

Marla Meehl is a telecommunications specialist in the Networking and Data Communications Group in the Distributed Computing Section within SCD.

Directory of UCAR scientists now online

by Jim Robinson and Brian Bevirt

The University Corporation for Atmospheric Research (UCAR) provides an online directory of more than 1,200 scientists at UCAR, NCAR, the Institute for Naval Oceanography (INO), and UCAR member universities. This directory allows any user who can log on the IBM 4381 (IO) front-end computer at NCAR to locate basic information about scientists affiliated with UCAR. The directory is named UCAR Scientists' Technical Areas of Research (USTAR). USTAR is a database containing information organized into four indexes:
*   NAME (scientist's name)
*   RESEARCH (research areas in which the scientist is working; this includes the main scientific discipline and specific topics of interest within disciplines)
*   STATE (location in the United States where the scientist is working)

*   UNIV (the scientist's current research institution; this includes the institution's name, its full street address, the name of the local UCAR contact person, and the contact person's telephone number)

An online directory of scientists affiliated with UCAR is now available to users who can log on to the IBM 4381 (IO) front-end computer.

USTAR is maintained with Stanford Public Information Retrieval System (SPIRES) database management

software and can be used in a variety of ways. The query language allows you to search for information in any index or any combination of indexes. For example, you might organize your search request to obtain a list of all scientists studying ocean chemistry at Scripps Institute of Oceanography.

By placing this information online in a SPIRES database, UCAR now offers easy access, powerful search capabilities, and in the near future, frequent updates to the information about scientists affiliated with UCAR. This article provides basic instructions for using the information in USTAR and describes ways you can obtain help with your searches.

Accessing the USTAR database

Users of the IBM 4381 (IO) computer (scd4381.ucar.edu) may access USTAR via the Internet or Telenet. If you currently have a logon (userid) on this computer, you may use USTAR by typing CATALOG <return> at the command line to access the database directory. When the menu of databases appears, type USTAR <return> or type 3 <return> to obtain the menu of USTAR indexes.

Obtaining online help within the database

For help with one of the four indexes, type HELP *index_name* <return>. Replace *index_name* with NAME, RESEARCH, STATE, or UNIV. For help with the directory, type HELP USTAR <return>. To return to the menu of indexes at any time, type FIND <return>. To exit the directory, type END <return> or LOGOFF <return>.

Using the online search capabilities

Two methods are available for searching the USTAR database: menu mode (for new users) and command mode (for complex searches).

Note: Some acronyms have been included as aliases in the database. You may use the acronym instead of the full name of some research institutions (for example, UCLA will match with "University of California at Los Angeles"). In addition, you may use the U.S. Postal Service abbreviation for any state (for example, use CO instead of Colorado).

Searching with menu mode

To use menu mode, type FIND <return> to obtain the menu of indexes. Type the name of the index you want to search. For example, type NAME <return> to search for a scientist name. When the prompt appears, type the specific information you want to find. For this example, type SMITH <return> to obtain a list of all scientists with "Smith" as their last name. If you need help with an index, type ? <return> to obtain information about the index you have specified.

To maintain current information in the USTAR database, UCAR staff requests that all scientists check their entries and update them when needed.

Searching with command mode

To use command mode, type the FIND command, a space, an index name, a space, the specific information, then <return>. For example, type FIND NAME SMITH <return> to obtain a list of all scientists with "Smith" as their last name.

Narrowing your search

To reduce the number of records you retrieve, you may use more than one term after you specify an index. For example, type FIND RESEARCH RADAR METEOROLOGY <return> to obtain a list of all scientists that include both the word "radar" and the word "meteorology" in their research interests.

Expanding your search

To increase the number of records you retrieve, you may use the word "or" between terms after an index name. For example, type FIND RESEARCH SNOW OR ICE <return> to obtain a list of all scientists that list either the word "snow" or the word "ice" in their research interests. You may also expand your search by using the pound sign as a "wildcard" character. For example, type FIND RESEARCH OCEA#

<return> to obtain a list of all scientists that use the character string "ocea" in their research interests. This search will match all occurrences of the words "ocean," "oceans," "oceanic," "oceanography," and "oceanographic."

Focusing your search with multiple indexes

To use more than one index in your search, you may use the word "and" to add index names to a single FIND command. For example, type **FIND UNIV SCRIPPS AND RESEARCH OCEA# CHEM#** <return> to obtain a list of all scientists working at an institution with a name that contains the word "Scripps," whose listed research interests contain the string "ocea" combined with the string "chem."

Displaying and printing search results

When your search locates only one name, USTAR displays the complete record for that name. If your search locates two or more names, USTAR displays an abbreviated citation for each name with a citation number to the left of each name.

To display the full citation for one name from this list, use the citation number (*n*) after the command to display in full format: **DF *n*** <return>. To view a group of citations in full format, use the DF command and separate the first and last citation numbers with a slash: **DF 1/6** <return>. To view specific citations in full format, separate the citation numbers with commas: **DF 3,4,6** <return>. To view all of the citations in full format, type **DF ALL** <return>.

To print your search results, you may connect an auxiliary printer to the printer port on your terminal and use the <print screen> key to record the contents of each screen.

Obtaining help with your search

For help with conducting searches, Carol Chatfield of the NCAR Library provides training and tips for using SPIRES databases. Her e-mail address is ncarlib@ncar.ucar.edu on the Internet and her telephone number is (303) 497-1178. Upon request, Carol will provide brochures that contain procedures for accessing and using the SPIRES databases available at NCAR.

Obtaining a userid on the IBM 4381 (IO) front-end computer

If you do not have a userid on the IBM 4381 (IO) computer and you are affiliated with a UCAR university, you may access USTAR by requesting a special-purpose userid from Susan Stilwell at UCAR. Her telephone number is (303) 497-1653. The special-purpose userid also allows you to use the SPIRES databases named NCAR Online Library Access (NOLA) and Access to NCAR Archives (ANA). NOLA is an online catalog of all book holdings in the NCAR Library. ANA is the online catalog of all UCAR and NCAR historical documents in the NCAR Archives.

Keeping the database up to date

To maintain current information in the USTAR database, UCAR staff requests that all scientists check their entries and update them when needed. Any scientist affiliated with UCAR, NCAR, INO, or a UCAR university who has not been listed, or any scientist in these organizations who needs to update an entry may contact Dianne Bernier at the UCAR Corporate Affairs Office, P.O. Box 3000, Boulder, CO, 80307-3000. Dianne's e-mail address is ustar@ncar.ucar.edu on the Internet, and her telephone number is (303) 497-1655.

As a scientist, you gain several advantages from maintaining current data in your USTAR listing. You can speed up the free exchange of information with your colleagues, assist in educating students of science, and help inform the general public. You can take maximum advantage of the three SPIRES databases available at NCAR by using USTAR to locate the names of scientists currently involved with specific research topics, then searching NOLA and ANA for publications authored by those scientists. To facilitate this process, you can phrase your entries in the RESEARCH index in ways that will be most likely to match the search parameters used by various researchers. For guidance in phrasing your entries in a manner consistent with the rest of the database, you can request a copy of UCAR's research topic list from Dianne Bernier.

Jim Robinson is a User Support Specialist in the Operations Support Group within SCD; Brian Bevirt is a writer/editor in the Documentation Group within SCD.

Scientist from Livermore describes
latest supercomputing technology
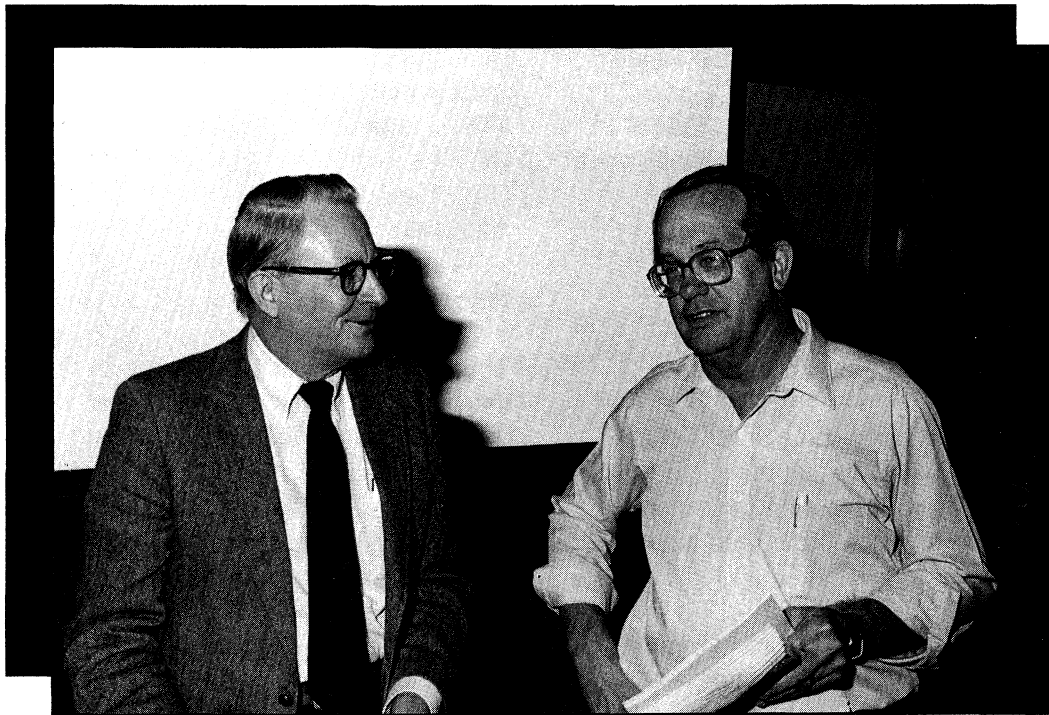
Roger Anderson discusses the latest supercomputing hardware with SCD Director Bill Buzbee.

Roger Anderson, Staff Scientist in the Computation Department at Lawrence Livermore National Laboratory, presented a seminar at NCAR on November 30, 1988, titled "Current Trends in High-end Computing and Parallel Processing Architecture." He described a variety of advances in high-end computer architectures and provided a detailed system for classifying these computers.

Despite all the progress in hardware design, Roger noted that software limitations are among the major forces restraining the advancement of high-end computers. In particular, he specified the development costs for software, the availability of software tools for analyzing internal operations of new computers, and the lack of a general-purpose partitioning procedure to optimize programs for massively parallel processing.

New directory of climatologists available

by Tom Downing

John Arnfield, an associate professor of geography at Ohio State University, is compiling an international directory of climatologists and other people with closely related interests. The directory currently contains the names, affiliations, and e-mail addresses

Interested people from the United States and abroad are encouraged to send their names, affiliations, and e-mail addresses for inclusion in the directory.

of less than 100 people. John wants to expand the directory to include more climatologists, other scientists in related disciplines, graduate students, and others interested in joining this new professional network.

John encourages interested people from the United States and abroad to send him their names, affiliations, and e-mail addresses for inclusion in the directory. Please list all applicable e-mail addresses and affiliations. Addresses in any e-mail network are welcome. Please use the format appropriate to your host network(s) when specifying your e-mail address(es).

To establish your name in the directory or request the current listing, send a message to John on BITNET. His address is TS0199@OHSTVMA.BITNET. You may also contact him by writing to:

John Arnfield
Department of Geography, Ohio State University
103 Bricker Hall
190 North Oval Mall
Columbus, OH 43210-1361

Tom Downing is a Postdoctoral Fellow in the Advanced Study Program (ASP) at NCAR.

Call for ethical standards in networking issued

by David Farber

Editor's note: SCD Computing News thanks David Farber, chair of the Division Advisory Panel of the National Science Foundation Division of Networking and Communications Research and Infrastructure (DNCRI-DAP) for permission to reprint this report. It first was published in December 1988 as an electronic mail message sent over the Internet to a group interested in computer networking. It follows in the wake of an incident in November 1988 in which a "worm" was introduced into systems linked via the Internet. A worm is a program that can run by itself and can propagate a fully working version of itself to other computers.

BITNET/CSNET

The network worm (sometimes called virus) affair raises issues that are very important to our field. Both the BITNET Board of Trustees and the CSNET

Executive Committee have been struck by the fact that many public comments on the event have contained statements such as, "We learned from it," "We will make sure technically it will not happen again," or "He did us a favor by showing...," unaccompanied by expressions of ethical concern.

Recent events have accentuated the importance of establishing community standards for the ethical use of networks.

We have succeeded as a profession technically in creating facilities – the BITNET, CSNET, and other

components of the national research network – which are now critical to the conduct of science and engineering in our nation's academic, industrial, and government research laboratories. Further, this technology has spread within our nation's commercial research and development organizations and even into their manufacturing and marketing.

Just as medical malpractice can have a serious effect on an individual's health, one of the costs of our success is that we are now in a position where misuse of our national and private computer networks can have as serious an effect on the nation's economic, defense, and social health. Yet while almost every medical college has at least one course on medical

Recent events have accentuated the importance of establishing community standards for the ethical use of networks.

ethics and insists on the observance of ethical guidelines during practice, computer scientists seem to avoid such non-scientific issues.

The worm "experiment" caused a major disruption in the research community. Among other points of attack, the worm exploited a trapdoor that had been distributed as a software "feature." Many hours of talent were wasted finding and curing the problems raised by this "game." Many additional hours were lost when researchers were unable to access supercomputers and mail systems due to system overload and network shutdown.

We condemn the perpetration of such "experiments," "games," or "features" by workers in our field, be they students, faculty, researchers or providers. We are especially worried about widespread tendencies to justify, ignore, or perpetuate such breaches. We must behave as do our fellow scientists who have organized around comparable issues to enforce strong ethical practices in the conduct of experiments.

We propose to join with the relevant professional societies and the national research networks to form a Joint Ethics Committee charged with examining

existing statements of professional ethics and modifying them as necessary in order to create a strong statement of networking ethics and recommendations for appropriate enforcement procedures.

DNCRI-DAP

The DAP of the NSF DNCRI passed the following resolutions in its bi-annual meeting last week [December 1988].

1. The DAP unanimously supports the statement of BITNET/CSNET on the breach of ethics implied by the Worm.

2. The DAP unanimously endorsed the following statement.

Ethical Network Use Statement

The Division Advisory Panel of the National Science Foundation Division of Networking and Communications Research and Infrastructure deplores lapses of ethical behavior which cause disruption to our national network resources. Industry, government, and academia have established computer networks in support of research and scholarship. Recent events have accentuated the importance of establishing community standards for the ethical use of networks. In this regard, the DNCRI DAP defines as unethical any activity which purposefully, or through negligence:

    a) disrupts the intended use of the networks

    b) wastes resources through such actions (people, bandwidth, or computer)

    c) destroys the integrity of computer-based information

    d) compromises the privacy of users

    e) consumes unplanned resources for control and eradication

We encourage organizations managing and operating networks to adopt and publicize policies and standards for ethical behavior. We also encourage these organizations to adopt administrative procedures to enforce appropriate disciplinary responses to violations and to work with appropriate bodies on drafting legislation in this area.

FISHPAK to be separated from LOCLIB and $NCARLB △

by Richard Valent

Cray computer FISHPAK subroutines and functions will be removed from the LOCLIB source library on January 17, 1989, at 10:00 MST. This change will avoid redundancy within NCAR's software libraries and simplify the location of software on NCAR's Cray computers. After this change goes into effect, Cray computer users who want FISHPAK source code and documentation must change their Job Control Language (JCL) to include GETSRC and GETDOC

All FISHPAK entries will be located in the FISHPAK binary library rather than in $NCARLB.

---

statements with the LIB=FISHPAK keyword-value specifier. This affects the following files:

BLKTRI	GNBNAUX	HW3CRT	POIS3D
CBLKTRI	HSTCRT	HWSCRT	POISTG
CMGNBN	HSTCSP	HWSCSP	SEPAUX
COMF	HSTCYL	HWSCYL	SEPELI
FFTPACK	HSTPLR	HWSPLR	SEPX4
GENBUN	HSTSSP	HWSSSP	

All FISHPAK entries will be located in the FISHPAK binary library rather than in $NCARLB, so all LDR and SEGLDR statements in your Cray JCL must contain the LIB=FISHPAK keyword-value specifier.

FISHPAK source code changes

Header comments and revision control information have been inserted in the source code, so all subroutines in FISHPAK now have new line numbers. In addition, the complex block tridiagonal solver file CBLKTRI has been modified so that its subroutine

names do not conflict with the subroutine names in real block tridiagonal solver file BLKTRI. If you are modifying these routines after January 17, you need to change your modpacks accordingly.

Test drivers in FISHPAK

The FISHPAK source library contains test drivers for all user-callable subroutines. Each driver routine provides a simple test and an example program for users. These test driver files are

TBLKTRI	THSTCSP	THWSCRT	TPOIS3D
TCBLKTRI	THSTCYL	THWSCSP	TPOISTG
TCMGNBN	THSTPLR	THWSCYL	TSEPELI
TGENBUN	THSTSSP	THWSPLR	TSEPX4
THSTCRT	THW3CRT	THWSSSP	

Documentation

A documentation file named README contains overview information about the FISHPAK library. To obtain a copy of this file, run a Cray job containing this statement:

    GETDOC,LIB=FISHPAK,FILE=README.

All subroutines in FISHPAK now have new line numbers.

Additional information

If you have questions or concerns about FISHPAK or other software libraries, please contact Dick Valent. His telephone number is (303) 497-1302, and his e-mail address is valent@ncar.ucar.edu on the Internet.

Richard Valent is the Software Librarian in the User Services Section within SCD.

Status of IMSL Edition 10.0

by Richard Valent

The International Mathematical and Statistical Library (IMSL) Edition 10.0 contains about 800 routines in applied mathematics, statistical analysis, and special functions. Within SCD, IMSL is licensed for use on the Cray computers only. Edition 10.0 was announced in the June 1988 issue of the *SCD Computing News*, and the article on page 13 of that issue provides information for using Edition 10.0 on the Cray computers. The following article describes the current status of this version of IMSL.

On August 22, 1988, Edition 10.0 became the default version and replaced Edition 9.2. Since that time, SCD has received and investigated six user complaints about Edition 10.0. In each case, the users were reporting software problems in code that had run without problems under IMSL Edition 9.2. For each of the six complaints, an SCD User Services staff member isolated the problem in the user code. Surprisingly, each problem had existed undetected in the code that executed under Edition 9.2. For example,

Users of the Cray computers at NCAR have found Edition 10.0 to be a successful replacement for Edition 9.2.

one user had neglected to declare a Fortran array to be COMPLEX, so the compiler treated the array as REAL and a floating point error resulted.

It is encouraging that the users of the Cray computers at NCAR have found Edition 10.0 to be a successful replacement for Edition 9.2. However, you may experience some difficulty when converting your code because all entry points except the Basic Linear

Algebra Subroutines (BLAS) have been renamed, and many require different arguments.

SCD has extended its support of Edition 9.2 until June 30, 1989, the last day this version will be supported by IMSL.

SCD has extended its support of Edition 9.2 until June 30, 1989.

If you have any difficulty converting your code to operate with Edition 10.0, please contact an SCD consultant for assistance. If you need documentation, request a copy of "IMSL Update Guide" from Mary Buck. Her e-mail addresses are maryb@ncar.ucar.edu on the Internet and MARYB on the IBM 4381 (IO) front-end computer. You may also call her at (303) 497-1232.

IMSL also offers two sets of manuals for Edition 10.0: a three-volume softcover set for $37.00 and a seven-volume set in three-ring binders for $105.00. Both sets contain the same information. You may order these manuals from:

> IMSL
> 2500 Park West Tower One
> 2500 City West Boulevard
> Houston, Texas 77042-3020
> (713) 782-6060

Please direct any questions or concerns about IMSL to Dick Valent. His e-mail address is valent@ncar.ucar.edu on the Internet. You may also call him at (303) 497-1302.

Richard Valent is the Software Librarian in the User Services Section within SCD.

New PACX access for RL6 and Jeffco added Δ

by Marla Meehl

There is a new way to reach RL6 and the Atmospheric Technology Divison (ATD) Research Aviation Facility (RAF) at the Jefferson County Airport (Jeffco). Access to and from the NCAR automatic port selection device (PACX) has been added for these sites.

To reach the Mesoscale and Microscale Meteorology (MMM) Division VAX computer at RL6, you can choose class mmm after connecting to the PACX. Access is currently available at 1200 and 2400 bits per second (bps). If you ordinarily access the VAX by dialing to a directly connected modem, you will now dial the SCD modem banks connected to the PACX and then choose class mmm.

Access to the RAF port selection device data switch at Jeffco will be added in late January. Additional information will be provided in the Daily Bulletin and in the *SCD Computing News*.

The SCD modem banks comprise a rotary containing 18 2400-bps modems. These are all open for PACX access.

Accessing the PACX with a modem

Following are instructions for accessing the PACX from a modem.

To reach the SCD modem banks, dial:

494-0501

for 1200 or 2400-bps access.

After obtaining the CONNECT message, press <return>.

Following the "WELCOME TO NCAR..." message, at the "Enter class:" prompt, type the PACX code for the computer you wish to reach. For example, to reach the MMM VAX, type:
mmm <return>

Log on to the computer as usual.

Accessing the PACX from the MMM VAX

Access from the MMM VAX will be available in late January. Additional information will be provided in the Daily Bulletin and in the *SCD Computing News*.

Accessing the PACX from Jeffco

Access the data switch as usual from Jeffco. When prompted, type:
c pacx <return>

to access a PACX port. Get the attention of the PACX by pressing <return> until you receive the "WELCOME TO NCAR..." message. At the "Enter class:" prompt, type the PACX code for the computer you wish to reach. For example, to reach the MMM VAX, type:
mmm <return>

Some hosts available through the PACX

PACX code	Internet name/Computer type
io	scd4381/IBM 4381
aap1	aap1/CGD VAX
aap2	aap2/CGD VAX
cgd	cgdra/CGD terminal server
ha	hao/Sun-4
is	hao-is/Integrated Solutions V10
hv	haovax/VAX 750
ncar	ncar/Sun-4/280
mmm	mmmvax/VAX

For any questions about these procedures, contact your system administrator. At RL6 this is Pat Waukau. Her e-mail address is waukau@ncar.ucar.edu. Telephone: (303) 497-8906. At Jeffco the system administrator is Ron Ruth. His e-mail address is ruth@ncar.ucar.edu. Telephone: (303) 497-1048. You may also contact the SCD consultants. Their e-mail address is consult1@ncar.ucar.edu. Telephone: (303) 497-1278.

Marla Meehl is a telecommunications specialist in the Networking and Data Communications Group in the Distributed Computing Section within SCD.

CRAY-1A computer departing

by Brian Bevirt

The CRAY-1A computer at NCAR (CRAY,C1) will be permanently offline at 00:01 Mountain Standard Time on February 1, 1989. Additional information about the decommissioning of CRAY,C1 will be published and kept up to date in the online Daily Bulletin (dailyb).

SCD staff hopes to make this change as easy as possible for users. Please prepare to compute on the CRAY X-MP/48 computer at NCAR (CRAY,CX) as soon as you can. If you make test runs on CRAY,CX while CRAY,C1 is still operational, it is considerably easier to track down any problem that might occur.

Please read the feature article titled "CRAY-1A Serial Number 003 to be decommissioned" in this issue. It discusses the most significant impacts of this change on users.

Brian Bevirt is a writer/editor in the Documentation Group within SCD.

MIMPORT/MEXPORT will replace CRAY-1A tape facility

by Ken Hansen

SCD's newly implemented MIMPORT/MEXPORT facility was released for general use on the CRAY-1A (CRAY,C1) and CRAY X-MP/48 (CRAY,CX) computers on Monday, December 12. It will become the primary method for staging 9-track, 1/2-inch magnetic tapes to and from the Mass Storage System (MSS) when CRAY,C1 is disconnected. Because CRAY,C1 is expected to be decommissioned February 1, we strongly encourage you to become familiar with this facility as soon as possible.

The SCD UserDoc "MEXPORT and MIMPORT: Transferring Data Between the Mass Storage System and Tape" is available in draft form and can be ordered from Mary Buck. Her e-mail addresses are maryb@ncar.ucar.edu on the Internet and MARYB on the IBM 4381 (IO) front-end computer, and her telephone number is (303) 497-1232. If you are at the Mesa Lab, you can also obtain SCD documentation from the SCD Consulting Office, Room 17.

Ken Hansen is a consultant in the User Services Section within SCD.

Color DICOMED system adds new parameters

by Dennis Colarelli

You may have already begun producing color output as a friendly user of SCD's newly implemented Sun/UNIX DICOMED Online Operating System (SUDOOS). The following article is an update of current progress on SUDOOS.

New keyword control parameters

A new option is available for the MAIL identification control parameter. If you specify

MAIL=FAIL

SUDOOS will send an e-mail message only if something goes wrong. If you are submitting a lot of jobs, this will prevent your e-mail box from

getting cluttered with congratulatory SUDOOS messages.

A new graphical control parameter is available to indicate special handling of your job. The NOTE parameter will alert the film processing staff of your special needs. Currently, the only value supported for NOTE is MOUNT. If you specify

NOTE=MOUNT

for jobs with 35-mm film and PULL=LONG (as is set by MACR=SLIDES or MACR=SQSLIDES), your film will be mounted in 35-mm slide mounts.

Available macros

The current list of macros for 35-mm film is: FILM, VIEWER, SLIDES, and SQSLIDES. The function of these macros is as follows:

For 35-mm film, values of FILM or VIEWER scale a full virtual image to an 18.7-mm by 24.9-mm area on the film; a value of SLIDES clips off the top of a full virtual image and scales the remaining virtual image to a 33.6-mm by 21.4-mm area on the film (the image will fill the area in a standard 35-mm slide); SQSLIDES scales a full virtual image to a 21.4-mm by 21.4-mm area on the film. (Lengths are given in terms of the x-axis dimension followed by the y-axis dimension.)

SUDOOS documentation and information

For detailed information on using SUDOOS from the Cray computers, order the SCD UserDoc, "User's Guide to Producing Color Output from the Cray Computers," which is available in draft form. A draft version of the "Preliminary Sun/UNIX DICOMED Online Operating System Reference Manual" is also available.

You can order SCD documentation from Mary Buck. Her e-mail addresses are maryb@ncar.ucar.edu on the Internet and MARYB on the IBM 4381 (IO) front-end computer, and her telephone number is (303) 497-1232. If you are at the Mesa Lab, you can also obtain SCD documen-tation from the SCD Consulting Office, Room 17. If you have questions about SUDOOS, contact the SCD Consultants. Their e-mail address is consult1@ncar.ucar.edu on the Internet or CON-SULT1 on the IBM 4381 (IO) front-end computer. Telephone: (303) 497-1278.

Dennis Colarelli is a systems programmer in the Distributed Systems Group of the Systems Section within SCD.

NETWORKING AND DATA COMMUNICATIONS NEWS

Mail queue warnings implemented

By Greg Woods

On Monday, November 21, SCD implemented a scheme to inform users who have sent electronic mail messages outside of NCAR via the central post office if the message cannot be delivered immediately for some reason. Senders will receive an e-mail message informing them of nondelivery after 1 hour and again after 24 hours if the message has still not been delivered. After 5 days of nondelivery, a temporary problem is considered to be permanent and the entire message will be returned to the sender. Previously, the entire message came back after a 5-day period, but senders were not notified prior to that.

The warning messages will contain reasons for nondelivery. The most common failures are:

1. **Host name lookup failure:** The mail system was unable to look up the Internet Protocol (IP) address of the destination host. This is usually due to inability to contact any of the known name servers for the domain being sent to, which in turn is usually caused by temporary network connectivity problems.

2. **Network is unreachable:** The address was successfully looked up, but there is currently no routing information available on how to reach it.

This is usually a problem at the other end rather than here at NCAR.

3. **Connection timed out:** The address is to a host that cannot be contacted at the present time. Either there are temporary network connectivity problems, or the destination host is down.

4. **Connection refused:** The destination host or its mail server program is down.

5. **Bad file number:** This indicates that the remote host closed the connection before the message could be transferred. This normally happens when there is very poor network connectivity, but can also happen if the destination host or its mail server goes down during the transaction.

Greg Woods is the e-mail specialist in the Networking and Data Communications Group of the Distributed Computing Section within SCD.

MILNET mailbridges disabled

by Brian Bevirt

The MILNET connects all the host computers having Internet Protocol Network Number 26. All mailbridges (electronic mail gateways) to computers on the MILNET were disabled after a security breach occurred at the end of November. Since NCAR's only e-mail access to the MILNET is via these mailbridges, we were unable to send or receive mail to users on MILNET computers between the end of November and December 6. All mail messages from NCAR to MILNET computers were queued during the time the mailbridges were offline. If any message was in this queue for more than five days, it was returned. All other messages were delivered despite the delay.

Brian Bevirt is a writer/editor in the Documentation Group within SCD.

DOCUMENTATION

Recently released documents from SCD:

The Primer

The Primer, Version 2.2, October 1988 (186 pages) is now available. This document introduces you to the computing equipment and peripheral resources available at NCAR and informs you how to access and use them. After reading this guide, you will know how to use the data communications systems to access the IBM 4381 (IO) front-end computer, how to use the IBM 4381 (IO) front-end computer to create a Cray job, and how to process a job on either Cray computer. Appendixes contain a handy list of IBM 4381 computer commands and execs, Cray Job Control Language (JCL) statements, and error message descriptions.

Using the NCAR Internet Remote Job Entry system

"Using the NCAR Internet Remote Job Entry System," Version 2.0, November 1988 (13 pages) is now available. This document explains how university users can use IRJE to submit jobs directly from their local host computers to the Cray computers at NCAR. This new version of IRJE documentation contains examples of DISPOSE statements, two useful UNIX C-shell scripts, and information on how output is returned. Two new keywords, designed to assist users at sites with poor connections, are described. This document replaces previous IRJE documentation.

New charging document

"Charges for SCD Computing Resources," Version 4.1, November 1988 (11 pages) is now available. This document provides the charging formulas used to compute General Accounting Unit (GAU) charges for using the computing resources in SCD. The document describes the Job Queue Manager,

the Cray job class structure, and how job classes affect charges. The new information in Version 4.1 includes a section describing default job classes, the new names for two job classes, and a corrected parameter definition in the CRAY,CX charging formula. This document replaces previous charging documentation.

Ordering instructions for SCD documentation

To order SCD documentation, send e-mail to maryb@ncar.ucar.edu on the Internet or MARYB on the IBM 4381 (IO) computer, or call Mary Buck at (303) 497-1232. If you are at the Mesa Lab, you can obtain SCD documentation from the SCD Consulting Office, Room 17.

HINTS FROM THE SCD CONSULTANTS

Commonly occurring Cray error codes

by Lynne Andrade

All of us have, at one time or another, encountered an error message that is not self-explanatory, ultimately resulting in our not being able to solve the problem that caused the error. The following lists some of the more commonly encountered Cray error messages, briefly explains their meaning (if necessary), and notes the kinds of mistakes that usually cause the errors to occur.

AB000 JOB STEP ABORTED. P=*xxxxxx*.
This supplies the user field address (P=*xxxxxx*) where the job abort occurred. The P address can be helpful in debugging the program. (See the "Tracking down run-time errors" article on page 19 of the December 1988 *SCD Computing News* for details about debugging with the P-address technique.)

AB014 MORE MEMORY REQUESTED THAN ALLOWED
This error indicates that you requested more memory than was available to your job on the

Cray computer. Use the MFL parameter on your JOB statement to request more memory. The maximum memory you can request on CRAY,CX is 6,000,000 words; the maximum allowed on CRAY,C1 is 650,000 words. (Different maximums are allowed in certain job classes. See the SCD document "Charges for SCD Computing Resources." Ordering instructions are on the back cover of this newsletter.)

AB019 JOB COMMUNICATIONS BLOCK DESTROYED
This is usually caused by an error in your program that results in the Job Communications Block (JCB) being overwritten. It is similar to the operand range error (AB054) in its causes and solutions. The JCB begins at Location 0 in the user field and is 128 words long.

AB030 BLOCK NUMBER ERROR
The block control word of the record that was just read is not the expected block number. This is usually corrected by using a REMOVE statement to delete all editions of the dataset from the Cray disks and to re-acquire it using an ACQUIRE statement from the appropriate remote mainframe. (Refer to the SCD document "Locally Developed Cray Utilities" for information about the REMOVE utility. Ordering instructions are on the back cover of this newsletter.)

AB033 READ AFTER WRITE OR PAST END-OF-DATA
This error message indicates that (1) a read operation was issued directly after a write operation, or (2) a read request was issued after the end-of-data was encountered. In the first case, a read operation can follow a write operation without an intervening REWIND or BACKSPACE statement only when the datasets are being accessed in random mode. The occurrence of the second case is usually caused by not adequately testing for the end-of-data in your program.

AB046 DATASET SIZE LIMIT EXCEEDED
The last write operation caused the size limit of a dataset to be exceeded. The default size limit for datasets on the Cray computers is 40,000 blocks (512 words/block). The maximum dataset size limit on CRAY,CX is 500,000 blocks; on CRAY,C1 it is 60,000 blocks. To increase the size limit of a dataset, use the LM=*#blocks* parameter on your ASSIGN statement and specify the required number of 512-word blocks.

AB048 DATASET COULD NOT BE SAVED ON FRONT-END

A DISPOSE request was issued, but the dataset could not be saved by the destination mainframe. Several things may cause this error: the dataset is too large for the destination mainframe to which it is being DISPOSEd; there are not sufficient permissions on the destination mainframe to write the file; or there are incorrect TEXT field parameters being passed in your DISPOSE statement.

AB053 FLOATING POINT ERROR

The Central Processing Unit (CPU) detected a floating-point underflow or overflow while executing an instruction. This error is discussed on page 19 of the December 1988 *SCD Computing News*.

AB054 OPERAND RANGE ERROR

An attempt was made to load or store a register outside the user field. This error is discussed on page 19 of the December 1988 issue of the *SCD Computing News*.

AB058 ERROR EXIT

This error is usually caused by your program overwriting memory. It is similar to the operand range error (AB054) in its causes and solutions.

AB225 SOURCE OUT OF RANGE FOR COPY

This error is often seen when you use the GO directive in your SEGLDR statement rather than using $ABD to initiate program execution.

IO017 ILLEGAL FORMAT CHARACTER

An unrecognized character appeared in a format statement. This error is typically the result of a mismatch between the data and the format specification being used.

IO019 VALUE AND SPECIFICATION TYPE DIFFER

A variable is being read or written under format control, and the format conversion specification is inappropriate for the variable type. An example is a floating-point variable being printed with an integer format specification.

IO020 RECORD LENGTH EXCEEDED

This error is often caused in an unformatted read process by attempting to read more columns than were supplied on an input record. Check for proper array dimensions and make sure the expected record is being read.

IO045 READ AFTER WRITE OR EOD

This error is virtually the same as the AB033 error code that was discussed earlier.

SG024 NO TRANSFER ENTRY POINT

The entry point named in the XFER directive is not located in any binary input dataset, or no primary entry point exists. Be sure to specify the binary input dataset containing the desired transfer entry point. Another thing to look for is missing or misplaced \EOF statements in your job dataset.

SL017 UNCLEARED END OF FILE

An input operation attempted to read beyond the end-of-file, or a read was issued without an intervening test for the end-of-file. This error is virtually the same as the AB033 error code that was discussed earlier, except that it applies to the end-of-file rather than to the end-of-data.

SY001 RLS COULD NOT FIND DNT FOR *dn*

An attempt was made to release a dataset that did not exist. (The *dn* in the error description stands for the dataset name.)

COMPILER ERROR - INTERNAL TABLE OVERFLOW

One of the Cray Fortran compiler's (CFT) internal tables has overflowed while compiling. This error is often corrected by recompiling your source and specifying a small block size. This can be accomplished with the MAXBLOCK directive on the CFT statement.

These and other error messages can be found in the *COS Message Manual*, SR-0039 E (Version 1.16). There are reference copies available in the Consulting Office (Room 17 of the Mesa Lab) and in the SCD visitor area (Mesa Lab Rooms 22A and 22D). To order your own manual or a copy of Cray's *User Publications Catalog*, call (612) 681-5907 or write:

> Order Desk
> Cray Research, Inc.
> 2360 Pilot Knob Road
> Mendota Heights, MN 55120

If you order documentation by telephone, please state that you are affiliated with NCAR and provide a billing and a shipping address.

Lynne Andrade is a consultant in the User Services Section within SCD.

November 28, 1988

by Brian Bevirt

Report from SCD – Gary Jensen

Gary Jensen stated that NCAR was not affected by the computer virus that spread by electronic mail on November 2, 1988.

Gary noted that the *Report of the Documentation Advisory Committee* (NCAR TN-323+STR) is now available from Laura Morreale at (303) 497-1288. If you are at the Mesa Lab, you may obtain the document from Laura in Room 15C.

Gary introduced Ginger Caldwell (SCD), who reported on current MIMPORT/MEXPORT testing (see articles in *SCD Computing News*: November 1988, page 14 and December 1988, page 8). SCD is finishing friendly user testing on the Cray version and will make this new facility available to all users on December 5, 1988. SCD will post information on additional options in the online Daily Bulletin as the options become available.

Gary introduced Joe Choy (SCD), who announced that the T1 communications lines and multiplexer hardware are now installed and operational (see article on page 27 of the October 1988 issue of the *SCD Computing News*; also see "T1 network installed" and "New PACX access for RL6 and Jeffco added" in this issue). The voice and Ethernet links are also running properly, but Pat Waukau (MMM) pointed out that users in RL6 are having difficulties accessing the Mainframe and Server Network (MASnet) via their Ethernet connection. Joe replied that although the networks are operating correctly, problems can be created by the application software that implements various protocols on the ends.

Joe reported that other problems occurred when some users attempted to operate their modems on the voice lines. Joe pointed out that the voice lines are tuned for optimum speech transmission

and that different frequencies are required for accurate data transmission. When the voice lines are tuned for data traffic, human voices sound tinny and unrealistic. The voice lines will remain tuned for their intended use, and Joe indicated that users will use digital asynchronous lines for terminal and modem use. SCD plans to provide asynchronous modem linkages using the T1 lines as early as the end of this calendar year.

Gary Jensen stated that Release 4 of the CMS operating system has been running on the IBM 4381 (IO) front-end computer since November 21, 1988. A few problems were noted during the first week, but Release 4 is functioning very well now.

Gary announced that upgrades to the CFT and CFT77 compilers for the CRAY X-MP/48 computer (CRAY,CX) will be installed on December 14, 1988. We will upgrade the CFT compiler with Bug Fix 3 from Cray Research, Inc., and CFT77 will be upgraded to Version 3.0. Barbara Horner-Miller (SCD) noted that the Bug Fix 3 release can be accessed by adding the following statement to your Job Control Language (JCL): ACQUIRE,DN=CFT,ID=V115BF3. Version 3.0 of CFT77 can be accessed by adding the following statement to your JCL: ACQUIRE,DN=CFT77,ID=C7730. Barbara reported the following highlights in Version 3.0 of the CFT77 compiler:

- Gives improved debugging support for optimized code when the ON=Z parameter is invoked
- Has new intrinsic functions to provide additional bit manipulation capabilities
- Enables users to invoke in-line procedure and function expansion
- Has a recursive prefix available for FUNCTION and SUBROUTINE statements
- Allows character and numerical data equivalencing (note that this feature violates the FORTRAN 77 standard)
- Supports autotasking under UNICOS

Gary Jensen announced a new plan for obtaining another CRAY X-MP computer on which to run the UNICOS operating system. (UNICOS is the UNIX-based operating system for Cray computers developed by Cray Research, Inc.) SCD now proposes to lease a CRAY X-MP/18 computer.

SCD hopes to install this computer in March or April 1989 and lease it for 24 months. This plan still requires approval from the NCAR director and the National Science Foundation (NSF). If SCD acquires this computer, the CRAY-1A computer (CRAY,C1) may be retired before February 1989.

Implementation plan for Cray computer running UNICOS

Bernard O'Lear (SCD) introduced the implementation plan for the CRAY X-MP/18 computer prepared by the SCD Systems Section. He stressed the importance of acquiring this computer as soon as possible to ease our users' transition from the Cray Operating System (COS) to UNICOS without disrupting production on CRAY,CX. When SCD replaces CRAY,CX in the early 1990s with the next-generation Cray computer, it will not run COS, and all users will be required to use UNICOS at that time. If we have a UNICOS computer available between now and that date, both users and the Systems Section staff can prepare properly for the change. Bernard stressed that a great deal of time and effort will be required to connect the UNICOS computer to our MASnet, Mass Storage System (MSS), and to one or more front-end computers. He then introduced two members of the Systems staff who are working on plans for the CRAY X-MP/18 computer.

David Kitts gave a presentation titled "Path To UNICOS" in which he explained a five-phase plan for making the CRAY X-MP/18 computer available to all users by the end of the 1989 calendar year. In Phase 1, the CRAY X-MP/18 computer will be installed and tested, its UNICOS software will be tested, all necessary SCD personnel will be trained in UNICOS, software will be developed for system administration, job control, accounting, and establishing user channels, then UNICOS will be installed on the computer. In Phase 2, TCP/IP (Transmission Control Protocol/Internet Protocol) will be installed as an interface, and a UNIX or VM station may also be installed. These interfaces will allow program access with extremely limited data capabilities. The user interface will then be installed, the MASnet connection will be completed, and limited access to the MSS will be available. At the end of Phase 2, development staff in SCD will have limited access to the

computer and to the MSS. In Phase 3, NCAR Graphics and libraries will be connected and external data representation will be implemented, making the system available to friendly users. At the end of Phase 4, a single path to the MSS with full fastpath capability will be available to friendly users who require only small quantities of external data. Access to the MSS will then be provided by a Network Systems Corporation (NSC) A517 channel adapter. By the end of Phase 5, full UNICOS functions will be available to general users, allowing multiple paths to the MSS with full fastpath capability for users requiring heavy external data loads. These MSS capabilities will be provided by an NSC DL500 channel adapter.

David and Bernard explained that the CRAY X-MP/18 computer will have extreme limitations on interactive processes that use lots of resources. This computer will have eight megawords of memory available, but it is not a virtual memory machine. It will have only 600 megawords of disk space, and access to the Cray Solid-state Storage Device (SSD) on the CRAY X-MP/48 computer will not be available.

Paul Bailey (ACD) expressed his concern that there would not be sufficient interactive access to the CRAY X-MP/18 computer for users to become completely familiar with the full capabilities of the UNIX operating system on a front-end computer.

Carl Mohr (ATD) asked Bernard what impact this installation will have on the SCD workload. Bernard replied that Systems staff will not install a COS Release 1.17 on CRAY,CX, but the project will speed up critical development work on the NSC DL500 channel adapter. In addition to the TCP/IP interface to the CRAY X-MP/18, this installation will probably require the placement of UNIX station software on one or more Sun-4 computers. There will be minimal impact on the communications groups. Development of the MSS and our color graphics capabilities will proceed as usual. The MASnet/Internet Gateway System (MIGS) will operate through the Ethernet as normal. Code conversion can be aided by a variety of packages supplied by Cray Research for converting user programs to run under UNICOS JCL. A major obstacle will be preparing our CMS users to start using UNIX on a front-end computer.

Gene Schumacher (SCD) gave a presentation titled "Cray UNICOS Software" in which he described components of UNICOS Release 5.0, the version to be installed on the CRAY X-MP/18 computer. UNICOS 5.0 has full COS functionality, uses both the C and the Bourne shells, and uses TCP/IP for file transfer and virtual terminal access. The Network File System (NFS) is used for sharing files, and the X Window System is provided. Remote Procedure Calls (RPCs) and External Data Representation (XDR) are used for distributing applications to other hosts and for transmitting machine-independent data across networks.

The Network Queuing System (NQS) facility allows batch processing under UNICOS. NQS provides system control for queues, resources, and access by users and user groups. NQS provides user control for batch queues, job submission, monitoring and status queries, job termination, and device queues. NQS allows interactive access for direct job submission and remote access through TCP/IP links from other UNICOS/NQS computers. NQS also allows access by a variety of front-end station machines through the UNICOS Station Control Processor (USCP).

Text editors available on the UNICOS computer will include ed, ex, and vi. Compilers will include CFT, CFT77, Pascal, C, and CAL. Both the LDR and SEGLDR loaders will be available. All libraries and accounting utilities currently available at NCAR will be accessible.

Cray Research provides a variety of migration tools to ease the transition from COS to UNICOS. These include JCL analysis and conversion utilities, dataset conversion packages, and a program for checking the availability of library routines. All these utilities include appropriate documentation. Performance analysis tools include flowtrace, ftref, gmat, hpr, mtdump, perftrace, and prof. The gmat tool provides users of Sun workstations with a very useful graphical analysis of their multi-tasking jobs. Debuggers include debug, symdump, symdebug, drd, dda, dbx, adb, and yadb. Cray Research also provides online diagnostics and online help (via the man command).

Gene stressed that this is the best way and the best time to convert to UNICOS because COS will not be available on the next generation of Cray computers. It is much less expensive to have a small-capacity computer free from production demands during this development effort than to have a very expensive CRAY-3 or CRAY Y-MP computer sitting idle while we integrate it into our facility.

David Kitts then requested that all users provide him with input about the best way to implement calls to the MSS from the CRAY X-MP/18 computer. Does any user feel that we should retain the existing ACQUIRE and DISPOSE calls or should the user interface be consistent with standard UNIX systems? Carl Mohr suggested that most users will not miss the ACQUIRE and DISPOSE statements. Paul Bailey suggested that MSS calls be implemented within FORTRAN 77 to avoid problems with Fortran-callable Cray JCL such as ACQUIRE and DISPOSE statements. Paul noted that people who use FORTRAN 77 on UNIX or VMS systems usually use OPEN and CLOSE statements in FORTRAN 77 code to access datasets on their local systems or on connected UNIX systems via NFS. Since FORTRAN 77 provides a data access mechanism within its syntax, we could design our system to use it instead of inventing a new method. Craig Kunitani (CGD) supported this statement by asserting that this is his preferred method for making calls. Carl Mohr then called for a vote to poll the people present and determine if anyone is in favor of retaining the ACQUIRE and DISPOSE interface; no one voted to retain it.

Users wishing to influence the design of the UNICOS interface to the MSS should contact David Kitts by sending e-mail to kitts@ncar.ucar.edu on the Internet or by calling him at (303) 497-1263. Users with comments or questions about the proposed acquisition of a CRAY X-MP/18 computer should write the SCD Systems Section at NCAR, P.O. Box 3000, Boulder, CO, 80307-3000. Ray Bovet (HAO) asked if anyone has proposed a name for the new Cray computer. At this stage of the proposal, it has no name.

Progress of SUDOOS and color DICOMED film recorder

Carl Mohr introduced Basil Irwin (SCD), who began a report on current activities of the Distrib-

uted Systems Group. Basil announced that Darrell Holley (SCD) is organizing a user group via e-mail for comments on using the Xerox 4050 laser printers and the Sun/UNIX DICOMED Online Operating System (SUDOOS). SUDOOS uses the NCAR Fortran Computer Graphics Metafile (CGM) translator and the new DICOMED color film recorder in SCD to produce color output from CGM metafiles that were produced with the Graphical Kernel System (GKS) version of NCAR Graphics. To send or read comments about these SCD resources, send e-mail to holley@ncar.ucar.edu on the Internet.

Basil described the hardware on which SUDOOS operates: a Sun-4 computer with 3.6 gigabytes of hard disk storage and connections to Ethernet and the HYPERchannel at NCAR. SUDOOS requires CGM metafiles to produce color slides and movies on the DICOMED color film recorder. SUDOOS will not produce color film output from pre-CGM metafiles. To allow users to obtain color output from pre-CGM files, SCD may develop a filter to change pre-CGM files to CGM files. At present, users can access the color film recorder via the Cray computers or other computers on the Main-frame And Server Network (MASnet). By February, access will be available via the newly-developed SUDOOS MASnet/Internet Gateway Server (SMIGS). SMIGS uses e-mail on systems that interface with Internet Protocol (IP).

At this time, all color slides can be mounted by the NCAR Photographics staff on request by the user. Color film is processed three times per day on weekdays and mailed to university sites once each weekday. Users at the NCAR Mesa Lab should pick up their film in the Input/Output area, Room 9A of the Mesa Lab. Color film is not processed on the weekends or during third shift hours (00:00 to 08:00 Mountain Standard Time). However, users can record color film at any time.

Color movies will be available sometime before the end of January 1989, when the film transport mechanism is ready. Before March 1989, SCD will provide raster capabilities on the color-film recorder. We can then support graphic output from either cell array format or the NCAR-defined raster format. Eventually, both DICOMED black-and-white film recorders will be controlled by a

Sun computer, and a second DICOMED color-film recorder will probably be added by next August. By then, we hope that one color recorder will have a 16-mm film transport and the other will have a 35-mm film transport to expedite film recording.

Basil then introduced Nancy Dawson (SCD), who presented the documentation plan for SUDOOS and the DICOMED color film recorder. Two types of documents will be produced: user guides and a reference manual. Each user guide will be specific to one access method and will document only the commonly used features that have been implemented and released. User guides will be short and specific, designed for all users, and will contain many examples to aid learning. The reference manual will be designed for 10% to 20% of the color-film recorder users, and will contain complete details of every feature planned for the color-film recorders, even for features that have not been implemented.

In the reference manual, features that are described but not yet implemented will be flagged to indicate their preliminary status. As new features are released, they will be announced in SCD's online Daily Bulletin. Updates to the reference manual will be mailed to users or printed in the *SCD Computing News*.

We will release the user guide for producing color graphics from the Cray computers first, because this is the first access method available. Then, depending on availability and user demand, user guides will be released for access via MIGS, SMIGS, UNIX, VM/CMS, and VAX/VMS.

The Documentation Group is now recruiting friendly readers for all categories of user guides. As documents become available to friendly readers, they will be announced in the Daily Bulletin. Please contact Mary Buck to obtain copies of the preliminary *Sun/UNIX DICOMED Online Operating System (SUDOOS) Reference Manual* and the SCD document "User's Guide to Producing Color Output from the Cray Computers." You may call Mary at (303) 497-1232, or stop by Room 6 in the Mesa Lab. Her e-mail addresses are maryb@ncar.ucar.edu on the Internet and MARYB on the IBM 4381 (IO) computer.

Basil then introduced Dennis Colarelli (SCD), who displayed color slides produced by alpha-test users of the color-film recorder. He showed a group of test slides produced by the SCD Graphics Group. Bob Lackman (SCD) described features in each of the CGM metafile slides. Bob noted that users should expect color differences between their various color terminals and the DICOMED color-film recorder. When you use either the default QUAL=GOOD keyword control parameter or the more time-consuming QUAL=BETTER parameter in the TEXT field of your DISPOSE statement, SUDOOS makes no attempt to resolve the color mixing that occurs when graphical elements of different colors overlap. The QUAL=GOOD parameter draws polygon boundaries, and the QUAL=BETTER parameter fills GKS fill areas with solid colors. Bob also pointed out that vector mode allows you to obtain 32K addressability on your color images.

Dennis then showed slides produced by Paul Bailey using data obtained in the field. Paul pointed out the differences that occur on the same set of data when he used palettes of 16, 68, and 135 colors. The sharp distinctions between data boundaries on the images are reduced by using the larger color palettes. He noted that the image using 135 colors requires 200,000 bytes of storage when no compression techniques are used. Fred Clare (SCD) noted that the NCAR CGM translator supports a total of 256 colors for simultaneous use, and the color DICOMED film recorder can record 16,777,216 (256^3) discrete colors. All of Paul's images were produced using the standard NCAR CGM translator.

Craig Ruff (SCD) stated that he is developing a raster translator using rasterized data for input. This new translator will not rasterize CGM files. Craig noted that the slides in the presentation used 4096 by 4096 pixel resolution. The raster slides shown were from two sets of input rasters. The first set was produced by ray-tracing geometric primitives to produce 512 by 512 pixels, then replicating each pixel in the x and y directions to quadruple its size before plotting. The second set contained Mandelbrot images in Sun raster file format. The input rasters were 640 by 480 pixels in size, then each pixel was replicated in the x and y directions to quadruple its size before plotting.

Dennis stated that when users submit jobs to the DICOMED system through SUDOOS, they receive e-mail to notify them that the film has been exposed. Color slides will then need time for processing and mounting. Andy Robertson (SCD) said that color film processing is currently being done at 10:00, 14:00, and 22:00 MST on week-days. This means that finished slides should be ready on those days at 12:00, 17:00, and midnight. If changes are made to this schedule, users will be notified via the Daily Bulletin.

Fred Clare reported that SCD will soon publish a color table with the Red-Green-Blue (RGB) intensity values for each color.

Basil noted that this color graphics project requires a very large team effort. He acknowledged the members of this team: Dennis Colarelli, Fred Clare, Basil Irwin, Craig Ruff, Steve Chapel (SCD), Andy Robertson, Paul Bailey, Lynne Andrade (SCD), Barbara Horner-Miller, Don Middleton (SCD), David Kennison (SCD), Nancy Dawson, Susan Smith, and all the alpha test users.

Suggestions and problems

No suggestions or problems were mentioned.

Future agenda

Carl stated that no December meeting will be held because of the Christmas holidays. The next meeting will be held on Monday, January 23, 1989.

Brian Bevirt is a writer/editor in the Documentation Group within SCD.

The next SCDUG meeting is January 23, 1:30 p.m., in the Damon Room of the Mesa Lab.

ACRONYMS AND TERMS

The following list includes acronyms and terms used in this issue and in the NCAR computing environment.

ANA	Access to NCAR Archives
BLAS	Basic Linear Algebra Subroutines
BLKTRI	Block tridiagonal solver file
CBLKTRI	Complex block tridiagonal solver file
CFT77	Cray FORTRAN 77 compiler
CGM	Computer Graphics Metafile
COS	Cray Operating System
CPU	Central Processing Unit
CRAY, C1	CRAY-1A computer at NCAR
CRAY, CX	CRAY X-MP/48 computer at NCAR
DICOMED	Online graphic recorder used at NCAR for producing output on film
DTR	Data Terminal Ready
EBDIC	Extended Binary-coded Decimal Interchange Code
FTP	File Transfer Protocol
GAU	NCAR's General Accounting Unit; used in charging
GKS	Graphical Kernel System
IMSL	International Mathematical and Statistical Library
IP	Internet Protocol
IRJE	Internet Remote Job Entry
JCB	Job Communications Block
JCL	Job Control Language
MSCP	Mass Storage Control Processor
MSS	Mass Storage System at NCAR
NFS	Network File System
NOLA	NCAR Online Library Access
NQS	Network Queuing System
NSC	Network Systems Corporation
PACX	Private Automatic Computer Exchange, NCAR's port selection device
PERFMON	Performance monitoring utility
RCP	Remote File Copy
RPCs	Remote Procedure Calls
SPIRES	Stanford Public Information Retrieval System
SSD	Solid-state Storage Device
SUDOOS	Sun/UNIX DICOMED Online Operating System
TCP/IP	Transmission Control Protocol/Internet Protocol
Telenet	A public packet-switching network operated by US Sprint
UNICOS	UNIX-based Cray Operating System
USCP	UNICOS Station Control Processor
USTAR	UCAR Scientists' Technical Areas of Research
VM/CMS	Virtual Machine/Conversational Monitor System
VM/SP	Virtual Machine/System Product
VMS	Virtual Memory System; a Digital Equipment Corporation operating system
worm	A program that can run by itself and can propagate a fully working version of itself to other computers.
XDR	External Data Representation

Organizations

ACD	NCAR Atmospheric Chemistry Division
ATD	NCAR Atmospheric Technology Division
CGD	NCAR Climate and Global Dynamics Division
DNCRI-DAP	Division Advisory Panel of the National Science Foundation Division of Networking and Communications Research and Infrastructure

HAO	NCAR High Altitude Observatory
INO	Institute for Naval Oceanography
Jeffco	Jefferson County Airport, location of NCAR's Research Aviation Facility
MMM	NCAR Mesoscale and Microscale Meteorology Division
RAF	NCAR Research Aviation Facility
SCDUG	Scientific Computing Division Users Group

Networks

BITNET	Because It's Time Network; an international wide area network primarily for IBM computers at educational and research institutions
CSNET	Computer Science Network
DECnet	Digital Equipment Corporations' layered transmission protocol family based on DEC's communications network architecture
Ethernet	A network standard for the hardware and data link levels
Internet	A collection of interconnected regional and wide area networks that use the IP protocol
MASnet	NCAR's Mainframe and Server Network (formerly the NCAR Local Network)
MIGS	MASnet/Internet Gateway Server at NCAR
MILNET	Network connecting all host computers having Internet Protocol Network Number 26
RSCS	Remote Spooling Communications Subsystem
SMIGS	SUDOOS MASnet/Internet Gateway Server

COMPUTER RESOURCES ALLOCATED

November 1988

Scientist		Project Title	GAU Request	Allocation
Paola Rizzoli Massachusetts Institute of Technology	(OCE)	Modeling of the Eastern Mediterranean general circulation under different driving forces	28.0	28.0
Leo J. Donner University of Chicago		Convective processes in climate and numerical weather prediction	45.0	45.0
David A. Randall Colorado State University		Class project on general circulation modeling	5.0	5.0
Edward R. Benton University of Colorado		Ionospheric/magnetospheric electric currents	2.0	2.0
Toby Carlson Pennsylvania State University		Modeling the meteorology and dust transport of the Saharan air layer	2.0	2.0
Richard L. Walterscheid The Aerospace Corporation		Gravity wave saturation in the middle atmosphere	5.0	5.0
Rainer Bleck University of Miami		Numerical modeling activities related to the GARP mountain subprogram (ALPEX)	20.0	20.0

John T. Merrill University of Rhode Island	Glacial/interglacial mineral aerosol transport	21.0	21.0
Brian Ulrickson University of Washington	Surface variations and mesoscale circulations	48.0	48.0
David G. Hummer University of Colorado	Optically thick winds of hot stars (Phase I)	50.0	50.0
Lawrence E. Buja University of Utah	The atmospheric response to tropical heating	21.0	21.0
Tomislava Vukicevic University of Utah	The influence of the lateral boundary conditions and fixed-surface forcing upon predictability	40.0	40.0
Steven A. Rutledge Colorado State University	Studies of middle-latitude mesoscale convective systems	38.0	38.0
William M. Frank Pennsylvania State University	Vortex formation in mesoscale convective systems	47.5	47.5
Eugene S. Takle Iowa State University	Modeling baroclinic coastal ABL flows	12.0	12.0
*William R. Cotton Colorado State University	Numerical simulation and analysis of convective storms	140.0	140.0
**Gregory J. Tripoli Colorado State University	Scale interaction of cumulus and mesoscale convective systems	290.0	290.0

* This request was reviewed by the Scientific Computing Division Advisory Panel on October 6-7, 1988.

** This request was reviewed by the Scientific Computing Division Advisory Panel on March 24-25, 1988.

OCE: This allocation was made from SCD's 10% computing resources earmarked for University Oceanography.

Note: The NCAR review procedures may result in a request being supported at a lower level than requested.

SCD Advisory Panel Meeting Schedule

Requests for a total of more than 50 GAUS on the NCAR Cray computers must be considered by the SCD Advisory Panel, which will meet March 30-31, 1989. All panel-sized requests for students should be submitted jointly in the names of the major advisor or principal investigator and the student. University users should submit large requests to Dr. John C. Adams of the Scientific Computing Division by Wednesday, January 18, 1989. Nine to ten weeks are needed for the preliminary review of requests and for the preparation, printing, and distribution of Panel materials. Please note that requests for 50 GAUs or less can be processed at any

JoAn Knudson (SCD) compiles the allocation information.

An index of articles from the past 12 months appears in each issue. Beginning with this issue, several new categories appear and many redundant entries have been eliminated. If you do not find an article in the first category you try, please scan the headings and check the entries in related categories. New categories include Conferences, Documentation, and UNIX Systems. In addition, articles concerning Cray job classes are now included under Charging – GAUs – Job Classes.

Documentation (continued)

The Primer (10/88, Documentation News)

Revised version of charges document (10/88, Documentation News)

Revised version of documentation on CRAY-1A direct tape connection (7/88, Documentation News)

Revised version of FISHPAK documentation (6/88, Documentation News)

Revised version of RSCS documentation (7/88, Documentation News)

Revised version of SSDLIN documentation (6/88, Documentation News)

SUDOOS documentation (12/88, Documentation News)

TBM utilities (10/88, Documentation News)

Transferring binary metafiles to VAX/VMS systems (12/88, Documentation News)

UNIX mail hints (6/88, Documentation News)

User Documentation Catalog (9/88)

Using the Cray SSD at NCAR (10/88, Documentation News)

Graphics

Change in NCAR Graphics distribution policy (5/88, Graphics News)

Computer Output Committee releases recommendations (2/88)

The four versions of NCAR Graphics (3/88)

Friendly user period opens for color slide output (12/88)

Graphics output on the Xerox 4050 laser printers (1/88, Hints)

Graphics plans for SCD (6/88, SCDUG News)

Metafile manipulation utilities (12/88, Documentation News)

Metafile manipulation utilities now support CGM (12/88, Graphics News)

Metafile utilities document (12/88, Documentation News)

Movie guide (8/88, Documentation News)

NCAR Graphics – The two-year plan (1/88)

NCAR Graphics Version 2.00 now available for UNIX (8/88, Graphics News)

New GRAPHCAP added (8/88, Graphics News)

New release of NCAR Graphics for VAX/VMS systems (1/88)

Options to process CGM through the DICOMED (2/88, SCDUG News)

SUDOOS documentation (12/88, Documentation News)

Target date for color output is Thanksgiving (11/88, Graphics News)

Transferring binary metafiles to VAX/VMS systems (11/88, Software News)

Transferring binary metafiles to VAX/VMS systems – correction (12/88)

Transferring binary metafiles to VAX/VMS systems (12/88, Documentation News)

Xerox 4050 metafile translator has changed (11/88, Systems News)

IBM 4381 (IO) Front-end Computer

Additional security measures to be implemented on the IBM 4381 (4/88, Software News)

Change on RDR spool files on the IBM 4381 (2/88, Systems News)

Change your IBM 4381 front-end password (10/88, Systems News)

CMS Release 4 now on IBM 4381 (12/88, Systems News)

Having problems using FTP to connect to the IBM? (5/88, Networking News)

IBM documentation available from IBM (12/88, Documentation News)

New version of SAS available (3/88, Software News)

The Primer (10/88, Documentation News)

Sending and receiving mail and files on the IBM 4381 (11/88, Networking News)

Sending and receiving mail and files over the Internet and BITNET from the NCAR IBM 4381 (IO) computer (12/88, Networking News)

Updated documentation available from IBM (12/88, Documentation News)

VMSECURE command imposes new security (2/88, Software News)

Input/Output

Preparing tapes for reading at NCAR (8/88, Hints)

The Primer (10/88, Documentation News)

Printing keywords to change (10/88, Systems News)

Macintosh Computers

Saving and printing screen dumps on the Mac (5/88, Hints)

Mass Storage System

Change in MSS retention periods (2/88, MSS News)

Changing your mass storage passwords (6/88, MSS News)

Duplicate MSS purge notices sent (10/88, MSS News)

Importing data to the MSS from optical disks (3/88)

MAQR speeds multiple ACQUIREs (4/88, Hints)

Mass storage system (MSS) (8/88, SCDUG News)

MEXPORT/MIMPORT (12/88, Documentation News)

MIMPORT/MEXPORT facility ready for friendly users (11/88, MSS News)

MIMPORT/MEXPORT facility ready for general use (12/88, Software News)

MSS ONLINE and OFFLINE parameters implemented (2/88, Software News)

MSS tape facility: MEXPORT/MIMPORT (12/88, Documentation News)

New operating system installed (10/88, MSS News)

Old method of sending MSS purge notices discontinued (12/88, MSS News)

Problem with purge notices corrected (3/88, MSS News)

Should you store duplicate files? (3/88, MSS News)

Status report on MSS Advisory Committee (2/88, SCDUG News)

Tape capability via Export/Import on the MSS for UNIX systems (4/88, SCDUG News)

NCAR News

Administrative Computing Services (11/88, SCDUG News)

Chervin receives parallel computing award (5/88)

Computational support in the Atmospheric Chemistry Division (4/88, SCDUG News)

Computer and Communications Committee report (8/88, SCDUG News)

Computing at the Research Aviation Facility (12/88, SCDUG News)

NCAR has new weather data accessing system (3/88)

Rick Anthes appointed UCAR president (11/88)

Software engineering application at NCAR (11/88, SCDUG News)

Networking and Data Communications

An introduction to networking at NCAR (8/88)

BITNET at NCAR (10/88, Software News)

BITNET now available (8/88, Networking News)

Central post office computer now handling Telemail and Omnet mail (12/88, Networking News)

Changes at NSFNET and ARPANET cause slowdowns (7/88)

Changes to Telenet (2/88, Networking News)

CMS Kermit updated (10/88, Networking News)

Congestion on the NSFNET (3/88, Networking News)

Contact your local representatives with Internet problems (4/88)

Cursor control when using TELNET with KNET/ SPARTACUS (8/88, Networking News)

EM4010 upgrade procedure (4/88, Networking News)

E-mail routing at NCAR (11/88)

Greg Woods: SCD's electronic mail specialist (6/88)

Having problems using FTP to connect to the IBM? (5/88, Networking News)

High-speed WATS access to NCAR now available (3/88, Networking News)

How to access the SCD Daily Bulletin on different computers (4/88, Software News)

How to use "anonymous FTP accounts" (3/88, Software News)

Local T1 data and communications network to be installed (10/88, Networking News)

Marla Meehl: Strengthening SCD's data communications (10/88)

MASnet/Internet Gateway Server now available (10/88, Software News)

MIGS remote systems administrator's guide (10/88, Documentation News)

MIGS user's guide (12/88, Documentation News)

NASA Science Network (1/88, SCDUG News)

NCAR connection to SPAN (5/88)

NSFNET backbone to expand and jump to T1 speeds (6/88)

NSFNET management awarded to MERIT, Inc. (1/88, Networking News)

NSFNET update: Measuring the size of the Internet (12/88, Networking News)

New CMS Kermit version installed (7/88, Networking News)

New NSFNET backbone now in service (8/88, Networking News)

New Telenet line-mode/Simware logon procedure (3/88, Networking News)

Ordering SCD documentation over the Internet (6/88, Documentation Please stand by: NSFNET experiences network difficulties (6/88, Networking News)

The Primer (10/88, Documentation News)

Recent developments in NCAR e-mail (10/88)

Remote Job Entry over the Internet now available (3/88, Software News)

Revised version of RSCS documentation (7/88, Documentation News)

SCD Internet/SPAN gateway operational (10/88, Software News)

Sending and receiving mail and files over the Internet and BITNET from the NCAR IBM 4381 (IO) computer (12/88, Networking News)

SPAN (4/88, SCDUG News)

Telenet, TELNET, and FTP (5/88, Acronyms)

Telenet WATS numbers changed (12/88, Networking News)

Telenet WATS numbers changing (7/88, Networking News)

Telenet WATS numbers remain unchanged (8/88, Networking News)

UNIX mail: Aliasing names and lists (6/88, Hints)

UNIX mail hints (6/88, Documentation News)

USAN expands to eight sites (12/88, Networking News)

Version 2.6 of SPARTACUS/KNET installed (5/88, Networking News)

What are MASnet, UCARnet, LDN, and TGS? (1/88, Acronyms)

SCD News

CAPP receives 8K Connection Machine (10/88)

Colorado Science Fair winner uses CRAY-1A computer at NCAR (6/88)

Computational Space Committee (7/88, SCDUG News)

The Connection Machine (7/88, SCDUG News)

Consulting staff adds new member (1/88)

Distributed computing – What does it mean? (5/88)

Documentation Advisory Committee (12/88, SCDUG News)

Documentation Advisory Committee releases report (12/88)

Election of new chairperson (7/88, SCDUG News)

Graphics plans for SCD (6/88, SCDUG News)

IEEE Computer Society contributes to Global Change Program (7/88)

Joseph receives NCAR Technical Support Award (2/88)

Keep in touch for better service from the Consulting Office (2/88, Hints)

New policy for using half-inch magnetic tapes (12/88)

New tools monitor SCD computing operations (6/88)

Office support and the company store (3/88, SCDUG News)

SCD appoints Consulting Group Head (3/88)

SCD celebrates first anniversary of Director Bill Buzbee (6/88)

SCD News (continued)
SCD conducts performance and benchmarking tests (4/88)
SCD extends Consulting Office hours (7/88)
SCD offers course for new users (8/88)
SCD visitors' area upgraded (11/88)
Status of Fortran 8x proposal (1/88, SCDUG News)
Use your password to help maintain computer security
(8/88)

Software Libraries
Applications libraries compiled on CFT77 Release 2.0
(7/88, Software News)
Automated scripts (5/88, SCDUG News)
How to access the FISHPAK software library (3/88,
Software News)
IMSL Edition 10.0 now available (6/88, Software News)
MUDPAK (8/88, Documentation News)
MUDPAK: New multigrid software for linear elliptic
partial differential equations available (8/88, Software
News)
NAG chapter documentation files available (5/88, Software
News)
NAG Fortran Library is updated (2/88, Software News)
NCAR introduces ODEPACK (11/88, Software News)
New version of SAS available (3/88, Software News)
Proposed software services in distributed computing (5/88,
SCDUG News)
Revised version of FISHPAK documentation (6/88, Docu-
mentation News)
Revised version of SSDLIN documentation (6/88, Docu-
mentation News)
STARPAC 2 now available (1/88, Software News)

UNIX Systems
NCAR Graphics Version 2.00 now available for UNIX
(8/88, Graphics News)
Tape capability via Export/Import on the MSS for UNIX
systems (4/88, SCDUG News)
The path to UNIX (1/88, Director's Column)
Recommended UNIX books (7/88, Hints)
UNIX mail: Aliasing names and lists (6/88, Hints)
UNIX mail hints (6/88, Documentation News)

CHANGE OF ADDRESS FORM

☐ Add to mailing list   ☐ Delete from mailing list   ☐ Change existing entry

Name: _____

New address: _____

_____

_____

_____

_____

User number _____ Phone number _____

Send to: Frieda Garcia, Scientific Computing Division, NCAR, P.O. Box 3000, Boulder, CO 80307-3000.

SCD COMPUTER SCHEDULE

The SCD computers run continuously, except for scheduled maintenance times and unforeseen equipment or power failures. The computers may be unavailable during the following maintenance periods:

Computers	Days	Times (Mountain Time Zone)
All computers	daily as needed	07:00 - 08:30
CRAY, C1	Monday, Wednesday	06:00 - 08:00
CRAY, CX	Tuesday, Thursday	06:00 - 08:30

Read the on-line version of the Daily Bulletin for updated information on the status of all SCD equipment.

SERVICES DIRECTORY

	CONTACT	PHONE (303)	E-MAIL
General Information			
SCD Consulting Office	Consultant on Duty	497-1278	CONSULT1
Visitor/User Information	Frieda Garcia	497-1254	FRIEDA
Graphics Software Distribution	General Information	497-1201	
Project & User Number Assignment	Rosemary Mitchell	497-1235	ROSEMARY
Computing Resource Applications	John Adams	497-1213	JOHNAD
NCAR Switchboard		497-1000	
Remote Access Information			
US Telecom (Telenet)	Marla Meehl	497-1301	MARLA
Internet Access (TCP/IP)	Don Morris	497-1282	MORRIS
Operational Information			
Computer Operations	Bob Niffenegger	497-1240	
Machine Room	Oper. Supervisor	497-1200	
Graphics Operations	Andy Robertson	497-1241/42	
Tape Librarian – 1/2" and MSS	Sue Jensen	497-1245	SUE
Documentation Orders/Output Mailing	Mary Buck	497-1232	MARYB

SENDING ELECTRONIC MAIL: The electronic mail (e-mail) addresses above are for the IBM 4381 (IO) front-end computer. The following examples show the addresses for sending e-mail to the SCD consultants.

From the IBM 4381 (IO) computer, enter: TO CONSULT1
   OR
From a host computer connected to the Internet, use a local mailing program with the Internet address:
consult1@ncar.ucar.edu

If the Internet address does not work, note that the explicit Internet address is 128.117.64.4 and consult your local system administrator.

SCD COMPUTING NEWS

Scientific Computing Division
National Center for Atmospheric Research
P. O. Box 3000, Boulder, CO 80307-3000

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NCAR Library
DIR
Mesa Lab
NCAR
MAIL ROOM
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