November 1994 marked the beginning of a CHILL experiment with the WorldWideWeb (WWW). The experiment was both technical and social. We needed to explore the technical capabilities of the Web and assess its utility to CHILL. On the social level, we had to assess whether the staff was willing to explore new ways to convey information to CHILL and MacCHILL users. It succeeded, and we also needed to spend the effort needed to learn yet another computer document format (HTML, the hyperextensible markup language).

In retrospect, we couldn’t have picked a better time to start. At that time, the software needed to setup and maintain a fully equipped server was sufficiently developed (and cost) that starting was relatively straightforward and the new capabilities being developed and discovered daily made it an especially exciting time. Concurrently, the popular media became saturated with the idea that the Internet would become a major commercial frontier, so much so that articles about the WWW appeared weekly in even small-town newspapers. Thus the personal (and personnel) motivation to participate in our experiment was forthcoming. No one wanted to “miss the boat.”

But what about it? If the Web could only deliver a facsimile of plain paper documents (which I still knew, prior to November) then we would see little advantage of a server. Sure, it delivers information on demand, 24 hours a day, but the labor required to keep that information correct and current seemed an unnecessary bureaucratic burden.

This much more than that the Web provides means for your computer to retrieve information from anywhere in the world using a highly intuitive graphical interface called a “browser”. The browser is a computer program that displays a page of text and/or images on a video screen. If part of the text or image is a highlighted link, a simple mouse click jumps to another page of text and images. Since any page can link to any other page on any other computer in the world, the computer user becomes a “browser” in a book with an almost infinite number of pages.

Everyone at CHILL and MacCHILL is invited to contribute to the on-line information.

Staff with particular responsibilities include Jim Laliga, who keeps the server software running; and someone who maintains the on-line documentation, Martin Selkowitz, who is responsible for the CHILL content and overall organizational bureaucracy. Each staff member maintains pages describing their own initiatives and scientific interests.

In contrast to a paper document, the information on the server can be easily changed and improved. Therefore, we invite users of CHILL and MacCHILL to explore the facilities described below and respond to us with comments or further needs.

Use URL reachable on-line documentation and help. Noticing the buttons on the control panel of the new station computers (see the next article), we first imagined that the server could provide, with the click of a button, a graphical browser interface that provided the CHILL user with on-line documentation and experimental assistance. Distributing information this way seems to avoid the labor necessary to keep paper documents up-to-date at each of the eleven experimental stations. Although some time must be spent translating existing documentation into hypertext, one immediate benefit is that topics can be related using links. For example, instead of reading a manual page that ends with “See also...”, the hypertext page contains a link that jumps instantly to related pages.

While links are useful for short searches, rapid full text searching can only be done by computer. Towards this end we added a WAIS search mechanism (Wide Area Information Server, an freely available software) along with a WWW form that allows information requests to be submitted from the browser (see Figure 1). Processing the WAIS search requires the server to handle CGI (Common Gateway Interface) protocol, which allows browser information to be passed to a computer program, which in turn creates an HTML response. The task of creating a comprehensive search-able index is left to a computer program.
that runs automatically once each day. Any document that is added or modified will have its entire text in the searchable index within 24 hours.

Use fast, multi-user, multi-platform graphical user interface. While the most popular use of the WWW is to request and receive existing documents, the capabilities provided by CGI are far more complex and powerful. Since the CGI program processes information submitted via the browser, the remote user can receive an individually tailored server response. And, since browser programs are able to display graphic images, it is possible to write a CGI that searches through data files, selecting, sorting, analyzing, and creating a plot image of returning data to a remote user.

We've used this combination of CGI server and browser to create a graphical user interface for use by our Technical Operations staff. As part of our record keeping, we monitor (and archive) signals that are important to our balance, CHSS, and CHSS temperatures, vacuum levels, voltages, beam currents and beam position signals as recorded on a computer file once per minute. A CGI display program is used to extract and plot signals, as shown in Figure 2. Analogous to the function of an electronic strip-chart recorder, the program plots signals vs. (this), (this), and (this) in a form that allows the plot to be altered, either by adding signals, changing the time span of the data, changing the limits of the graph, etc.

Use fast, administrative: proposal form distributed and automatic email. Along with being able to read about our facilities, browsers can request information and send themselves to our mailing list. This function is built into existing CGI programs (for example) that extracts information from full-text form and originates an email letter to the CHSS Proposal-Administrator. For a more immediate response, the request form includes a number of links that let the browser download a downloadable and portable faclibility document. Since CHSS has proposed and safety-related documents going out and coming in incessantly, the method of electronic transfer could save a substantial amount of time.

In order to send exact replicas of CHSS proposal forms, i.e., forms that can be read and printed, but not altered, our server supports sending a file format called "PDF." The Portable Document Format is easiest described as a type of "display Postscript," and was invented by the same company (Adobe) that created the universal laser printer language "Postscript." The utility of PDF is that pages maintain their format and print in high-resolution, and that any program on any computer that prints to a Postscript laser printer can create a PDF file in, there is no need to learn or be limited by HTML.

Use just public and facility information. The CHSS Newsletter and Facility Descriptions are presently available in PDF. Given all the improvements to CHSS planned for the near future (new options and station hardware), the CHSS Facility Description will become a paper document that's out of date a week or two after being printed. Having this document in electronic form provides for remote access as well as immediate editing capabilities.

Looking ahead, even if it is true that the majority of CHSS and MacCHESS users do not use a WWW browser daily, we envision that as browser programs become more universal, incorporating more features like full-featured capabilities and becoming a native part of future operating system distributions, more and more scientists will find themselves using software that provides immediate access to CHSS information. It only seems natural then that the CHSS server should grow to satisfy the need to disseminate information and the user need to obtain it rapidly.