Watch This
Space!

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The Internet. Big deal. Now that you've dialed up weird politics.com, http://www. Elvis sightings and alt.naughty bits, what's online that's useful? Anything that would make your job easier, answer important questions, solve tough design problems? Information about, say, gearing? Is there anything out there in cyberspace worth the expense and hassle of going after?

Yes. Behind the hype is a reality: the Internet can provide relatively cheap, very fast access to information that otherwise would be at least inconvenient, if not impossible to lay your hands on. For gear people, the amount is still small, but it's growing.

NCADT's home page.

Long before its more glitzy and bizarre aspects became media obsessions, engineers were using the Internet as a giant electronic library/phone line/coffee house/bulletin board for information exchange, and as more and more of the Internet superhighway is developed, gear information buried in large libraries or available only to the few who can spare the time and cash to go to a particular seminar could become available via computer almost instantaneously.

A Few Cautionary Remarks

The infobahn is not without its problems. First, it is at present a giant, chaotic system still under construction, with all the delays and hassles that implies. The technology is also still in its infancy, and the glitches are by no means out of the system. Depending on your equipment (and that on the other end), you will encounter your share of delays, roadblocks, blind corners and dead ends to be navigated. Patience may be your most important travel accessory on the information highway.

Second, in spite of what many true believers will tell you, traveling the Net is not always as easy as a few mouse clicks, but it's not gear engineering either. The learning curve will vary, depending a great deal on your comfort level with computers and on the hardware/software configuration of your machine.

Be prepared to spend some time (and money) getting yourself ready to travel cyberspace. A good Internet experience requires that you do some homework. But there's a thriving publishing sub-industry out there more than willing to provide you with guides on paper, disk and CD-ROM to ease your navigation.

Finally, don't assume that what you see on the Net today is all that will be there tomorrow. Even the most sophisticated web pages are not cast in stone. (Part of their beauty is the ease with which their content can be changed and updated.) The Web is growing exponentially. Just because you don't see a particular site today doesn't mean it won't be there tomorrow or next week or in six months. The distance between the promise and the reality of the Internet is shrinking daily.

National Center for Advanced Drivetrain Technologies

Applied Research Laboratory
The Pennsylvania State University

Who We Are and What We Do

- NCADT Statement
- Our Beginnings
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Mission Statement

The mission of the Drivetrain Center is to strengthen, revitalize and enhance the technological capabilities of the domestic gear and transmission industry. The Drivetrain Center will focus on research and development (R&D) projects which are recognized and accepted by the domestic gear and transmission manufacturing industrial sectors as primary technology drivers for major potential improvements to their manufacturing infrastructure and knowledge base.

Drivetrain Center R&D projects are structured for production implementation and a high return on investment (ROI). The strategy charted will facilitate revitalization of the domestic gear and transmission manufacturing infrastructure. It will allow for cross-disciplinary research efforts which addresses manufacturing challenges too complex for single-investor programs. The results of Drivetrain Center R&D will technologically advance these segments of the U.S. manufacturing industry. It will provide a capability which maintains a viable domestic gear and transmission production capability which enhances both national security and economic competitiveness. Technology advancements will achieve stated DoD gear manufacturing goals which include:

WWW—Main Street, Cyberspace

If the Internet is a giant, virtual boom town, then the World Wide Web is its Main Street. It's where everybody goes to see and be seen, and this is a good first stop in your search for good gearing information.

Most web sites have the same basic configuration. The first thing you'll see is a "home page," which will have more or less elaborate graphic design and copy telling you where you are and what's available at this web site. Phone and fax numbers and addresses (both e-mail and USPS "snail mail") are also often on this page.

This opener will also contain a kind of table of contents—a list of other "pages" at the site. These key descriptors are either in colored type or underlined (depending on your computer system). They are the "hyperlinks" that will get you to other places on the web site.

Suppose you call up the home page of a technical society. Among the key words is "Membership." You click on that word and are taken immediately to a screen that gives you information about joining the society. Frequently a form appears, and, if you're willing to give your credit card number on-screen, you can join instantly.

The same principle operates for the other screens. You can look up information on (and order or register for) conferences, publications, special programs, etc. Sites may include complete lists of books, papers, video tapes and other materials available for purchase. Internet security is still a major concern, and most sites also have an 800 phone number, which may be a wiser course to take when ordering anything. On some sites, certain areas—usually bulletin boards for information exchange or options for downloading papers and/or software—are open to members only.

Some organizations will list key members, their qualifications or backgrounds, their e-mail addresses and direct phone/fax numbers, even their pictures. What you find at a particular site is limited only by the imagination and inclination of the site provider.

Cool Sites

Many of the traditional sources for gearing information have gone online. The **Society of Manufacturing Engineers (SME)** has a site much like the hypothetical one described above. Along with membership and conference information, the site contains a list, with brief descriptions, of 250 books, arranged by subject matter, that are available for purchase from the society. There's also a page for video tapes and courses. There's a bulletin board, accessible by members only, called SME ON-LINE. It provides employment informa-

tion exchange and other discussion groups, plus manufacturing-specific software that can be downloaded right to your computer.

The **National Center for Advanced Drivetrain Technologies (NCADT)** at Penn State publishes its quarterly newsletter online. It provides e-mail addresses and qualifications and areas of expertise for key staff members. There's also information about the center, its functions and capabilities, current projects and its facilities.

The **American Society for Metals International (ASM)** has a web site, but its webmaster cautions that it is still very much "under construction." Work is in progress to link its successful members-only bulletin board to its web site. Along with membership information, the site has a guide to materials producers, a database of monthly magazines published by the society and members-only discussion groups and forums. ASM is experimenting with a number of other site possibilities, and this is one web address it might be well worth your while to watch carefully over the next months.

You can access the gear research information at **NASA's Lewis Research Center** from the Web. Information about the Center's Tech Briefs are online. So is information about opportunities for business and industry and technology transfer. You can get to the Lewis Tech Report Server and the general NASA Tech Report Server from this home page. This web site also has its own search engine, called Recon, which scans a very large data base of NASA research information.

ITTRI and **INFAC** can be accessed through the home page of the **Manufacturing Technologies Information Analysis Center (MTIAC)**. This is a Department of Defense-sponsored organization operated by IITRI to provide defense industry-related information. From here you can check on resources at universities and other government agencies. For example, the National Center for Excellence in Metalworking Technologies (NCEMT), the University of California at Berkeley Consortium on Deburring and Oak Ridge National Labs can all be called up from this home page.

The **American Society of Mechanical Engineers (ASME)** has a simple web site which outlines all its various programs. It also has a unique and useful e-mail feature. You can call up a simple form which allows you to e-mail questions to "Information Central." Fill in the blanks, click the "send" icon and your message is on its way.

AMT—The Association For Manufacturing Technology began its site in May of 1994 as a way to publicize IMTS'96. Information about the

show, including registration, is available online. In November, the general organization's web site opened at the same address. It contains information about the organization, membership and services. Like many other organizations, AMT is viewing its site as "experimental." Plans for future additions to the site will be dependent on the response to these initial offerings.

The **National Center for Manufacturing Sciences (NCMS)** has an elaborate site clearly divided between services for members and "guests." The best information, naturally, is available to members only, but as a guest, you can get a thorough tour of the organization's purposes and available services.

The **Materials Research Society (MRS)** is another group with a very rich site. It contains the usual information on membership, meetings, awards, publications, exhibits, etc., plus mechanisms to allow you to register for short courses. An FTP (computerese for "File Transfer Protocol," the software necessary to allow you to download information) site is under development. When this is done, it will allow members and others to share materials, information and software.

Commercial Sites

Research, government and technical societies are not the only people using the Net. There are thousands of commercial sites as well. As time goes on, more and more companies will be putting brochures, product lists and technical information about their products on the Web.

At present, one of the more interesting commercial sites is **Industry.Net**. It's a business-to-business directory that works very much like a controlled-circulation magazine. When you access the site, you're asked a number of questions about the type of business you're in and the kind of

Industry.Net's home page.

information you're looking for. Then, once you're "qualified," you have free access to over 4,000 companies with web pages on the Industry.Net Online Marketplace. These companies offer product descriptions, photos, manufacturer and supplier information, downloadable software and demos, catalogs, brochures and news items. Among the types of products offered are engineering software, PCs and workstations, industrial control products and design tools.

Industry.Net also contains a search engine that allows you to type in the product you're looking for and get directions on where to find it. The company has recently cut a deal with NETCOM Online Communication Services to distribute its NetCruiser software free to Industry.Net customers. Call 412-967-3500 or e-mail info@industry.net for more information.

Lycos & Yahoo—The Library & The Phone Book

Two of the most useful sites currently on the Web for people searching out information on particular subjects are **Lycos** and **Yahoo**. Developed by Carnegie-Mellon University in Pittsburgh, Lycos is like a giant card catalog, providing a means of searching out specific information available on the Net and directions for finding it.

To do a Lycos search, you simply type the subject (say, "gear manufacturing") you're looking for in the box shown on your screen and let the computer go to work.

For the search on "gear manufacturing," Lycos scanned 8,545,325 unique URLs (internet addresses) in less than five minutes. It found 14,857 documents with either the word "gear" or "manufacturing" in them; 137 contained both.

Then it showed brief abstracts of the documents ten at a time and, almost more important, Internet addresses for them and their document size, which is an important consideration if you're considering downloading. The first ten called up were on subjects including gear metrology, ausrolling, face gearing, friction gears, gear grinding, gear patents and the home page of a machine tool manufacturing company.

Yahoo is more like the Yellow Pages. Developed by two college students—many cybermillionaires aren't yet old enough to shave—it is a series of menus. It divides the Web into categories to help you narrow your search. You start by clicking on "Engineering," and Yahoo begins calling up the addresses of Web sites that might contain the kind of information you're looking for.

Gopher and WAIS

In all the hype surrounding the World Wide Web, it's easy to lose site of the fact that it's not
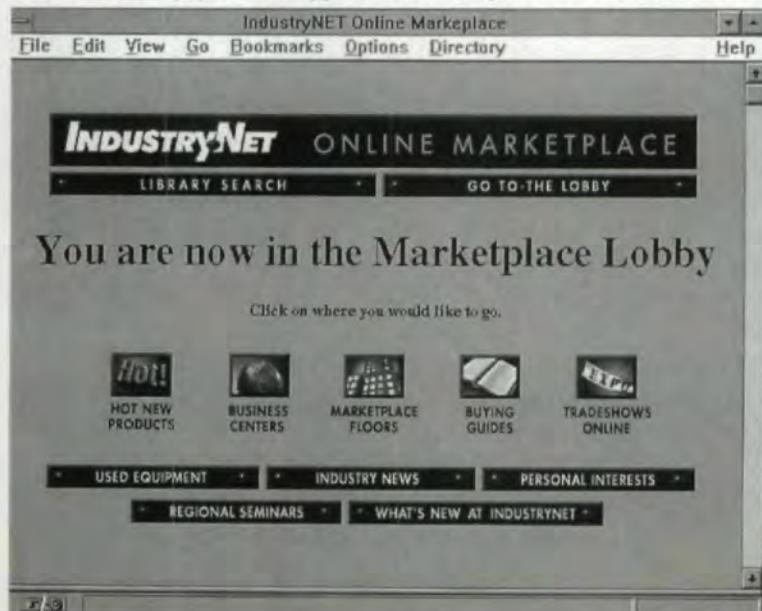
the only thing on the Internet. There are other information sources on the Net that can be just as useful. **Gopher** and **WAIS** are ways of organizing the vast quantities of information spread all over cyberspace. Gopher, named for the mascot at the University of Minnesota, where it was developed, is like the table of contents of a book. You look through the various menus listed to see if there's anything of interest in a particular area. WAIS (pronounced "ways") stands for "Wide Area Information Server." It's like a book's index. Even if a subject didn't seem of sufficient importance to rate a place in the table of contents, it might be included in the index. As with Lycos, you type in the name of the subject that interests you, and WAIS pulls up menus that contain possible locations to check.

The amazing (and a little scary) thing about Gopher and WAIS is that a few mouse clicks will suddenly bring you to a menu item like "Library-Oxford University" or "Search all Gophers in South America." Some Gopher sites are also cross-linked to the Web. For example, we first found the NIST (National Institute of Standards and Technology) site in Gopherspace, but it can also be accessed through the World Wide Web.

The Local Coffee Shop

Chat lines and bulletin boards are another part of the Internet. If the Web is Main Street, Cyberspace, and Gopher is a virtual public library, then BBSs, or bulletin boards, and chat lines ("Usenet" newsgroups in Net-language) are like public kiosks or coffee shops. You post a notice or go in and hang around and see what happens.

BBSs and chat lines are usually segregated by topic. How you find the topic you're searching for will depend on the format your particular Internet service provider uses. "Netiquette" suggests that in a chat room (where you can enter a "live" conversation in real time), you "lurk" for awhile, listening to the ongoing conversation before butting in. After you get a feel for the particular discussion and culture of the group, you just jump in.

One thing to keep in mind: On serious bulletin boards and chat lines among experts and professionals, you're expected to bring something to the party. Legitimate questions—even from "newbies" or first time users—are welcomed, but you can get some pretty testy responses to general questions that suggest you've been either too lazy to do your homework or are clueless about the subject. "Hey, I need all the information you have about spur gears," is not the way to win friends and influence people in this part of cyberspace.

If you cannot find a chat line or BBS about

Honeywell's home page accessed through Industry.Net.
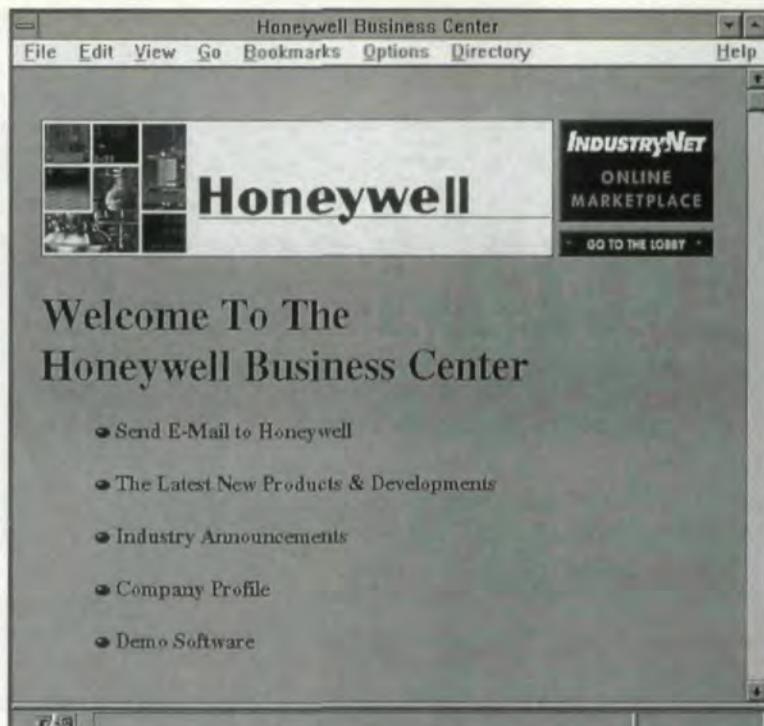
the subject that interests you (we struck out on gearing subjects during a cursory search one afternoon), you can always set one up yourself. Again depending on your service provider, you may have access to a process whereby you can open a discussion group on a new subject. You post a notice that says, for example "I want to exchange information on the subject of gear design with other engineers." Then you wait to see if anyone responds.

We're Not in Kansas Anymore

The Internet is a whole new ball game in terms of accessing information. The medium is also maturing. Cyberspace is not populated entirely by dateless seventeen-year-old propeller heads and cranks broadcasting accounts of their abduction by space aliens. Serious research tools are where the Internet began, and now the software is available to help those of us without advanced degrees in programming to access them. Businesses have also discovered the Internet and are in hot pursuit of ways to use it.

Some gear information is available in cyberspace now, and more will be coming. True, it's still easier in many cases to just grab the phone and call for information, but given the confluence of more user-friendly technology and the demand for more and more information from everywhere faster and faster, an Internet connection may become an important item in your engineer's tool box in the future. Even if you don't feel it's time for you to hit an entry ramp to the information highway yet, you're going to want to be scanning the traffic out there. "Cyber" is definitely a space worth watching. ○