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ABSTRACT

Since electronic networking via microcomputers is fast becoming one of the most popular communications mediums of this decade, this manual is designed to help educators use personal computers as communication devices. The purpose of the document is to acquaint the reader with: (1) the many available communications options on electronic networks; (2) how-to activities that will, with some practice and experience, make one a "networking expert"; and (3) resources and services related to electronic networking. Presuming no technological sophistication since none is required, it presents a step-by-step description of computer networking and the ways it is being used by educators and students throughout the country. Suggestions for ways to ease into computer networking are also provided, along with some examples of how a typical networking session might proceed. The manual does not detail hardware and software requirements, nor does it recommend any particular brands of hardware and software. A glossary and 11 references are included. (THC)

EDUCATOR'S GUIDE TO NETWORKING: USING COMPUTERS

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EDUCATOR'S GUIDE TO NETWORKING:
USING COMPUTERS

CONTENTS

INTRODUCTION

One of the most valuable resources educators have is other educators, people who experience the same problems, deal with the same situations, have the same concerns, and wrestle with the same questions. Although many of us know others have the same problems, finding that someone else is often difficult. You may be the only person in your school dealing with a certain situation, but chances are good someone else in the city, the district, or the region is dealing with it, too. A major advantage of communicating through computer networks is the ability to converse with someone without knowing precisely who that person is.

This manual is designed to help the educator use personal computers as communication devices. Once any initial fears of the technology are overcome, you will find that computers, like telephones, automobiles, washing machines, or any number of other technological wonders, can be operated with complete satisfaction by someone with no technical background or knowledge. Just as you do not have to know the intricacies of the internal combustion engine to drive a car, neither do you have to know how to program a computer to use it for communication.

This manual, **Educator's Guide to Networking: Using Computers**, then, will presume no technological sophistication because none is required. It does presume, however, that you are familiar enough with your own computer system to be able to use the modem and software required for computer networking. It will present a step-by-step description of computer networking and the ways it can and is being used by educators and students throughout the country.

Suggestions for ways to ease into computer networking are included along with some examples of how a typical networking session might proceed.

The manual does not go into detail about hardware or software requirements, nor does it recommend any particular brands of hardware or software. It is assumed that you or someone you know will set up your computer so that it is equipped to communicate. Once that is done, and if the steps given in the manual are followed, you and your students (or peers) should be able to begin computer networking immediately. That is when the fun begins.

I. USING THIS GUIDE

Objective: To assist educators in understanding computer networking and the ways in which microcomputers may be used as communication tools.

Electronic networking via microcomputers is fast becoming one of the most popular communications mediums of this decade. Computer networking allows the user a wide range of efficient, fast, and pleasingly sophisticated options for communications. Networking can provide entertainment, essential business news, and information on topics of personal interest. Best of all, computer networking may increase your effectiveness as a professional while enriching your personal life, all with a minimum of required technical background or training.

The purpose of this document is to acquaint the reader with 1) the many available communications options on electronic networks; 2) how-to activities that will, with some practice and experience, will make you a "networking expert;" and 3) resources and services related to electronic networking.

The following steps are recommended to the reader who is planning to use this document in a workshop situation:

1) Review this guide.

2) Locate and review resources in the bibliography if time permits.

3) Get as much hands-on experience with computer systems and networking capabilities as possible. This will make presentations of networking techniques more comfortable for the presenter and allow for personal experiences to influence presentations of information.

4) Adjust content of the guide to meet the needs and expectations of the audience. Allow for as much hands-on experience as possible for participants.

5) Prepare copies of this guide and other handouts ahead of time. Check out equipment early to make sure everything works.

6) Check the facility (meeting room, conference center, classroom) to make sure there are phone jacks, adequate electrical outlets, extension cords, and any audiovisual aids needed for the hands-on experiences or presentation.

7) Prepare an introduction and biographical sketch of any consultants or assistants for the training session.

The **Educator's Guide to Networking: Using Computers** is a companion guide to another SEDL Turnkey Training package, the **Educator's Guide to Conferencing: Using Computers.** Much of the information may be used as background information and prefacing materials for the workshop on computer conferencing.

II. WHAT IS COMPUTER NETWORKING?

Objectives: To assuage any fears that participants may have about computer technology; to provide a brief discussion of what hardware and software components are needed to network (computer, modem, and communications software) and to reemphasize that these need not be fully understood to be taken advantage of.

Teachers fight an eternal battle against slang and jargon. All of us have met people who enjoy speaking their own profession's language just to confuse and annoy. The people who develop computers are the same way. After all, technology is their baby. They want to make it sound important, mysterious, so incredibly clever and sophisticated that no mere mortal could possibly understand it. And their plan has worked. Although a great many more people are comfortable with computers now than ten years ago, there remains a substantial group whose palms begin to sweat, whose shoulders turn to iron, and whose feet head for the door when they hear a phrase like "computer networking."

The secret to feeling comfortable with networking is to understand the uses of computer communication. It is all words, jargon rooted in imagination rather than in fact. Networking is talking; it is communicating with other people. Computer networking is talking with others with the aid of a computer, which is nothing more than a fancy adding machine/typewriter.

How Networking Works

A computer network is basically the same sort of thing as a telephone "network." It is a way of talking with other people through a technically sophisticated device that does not require understanding the device itself. A telephone network can be thought of as an electronic connection established whenever you call another person. A computer network is exactly the same thing, except that you call a computer to transmit your messages without having to know the particular person you are calling or having to be online at the same time.

Computer networks provide ways of getting in touch with other people. You may wish to communicate with one specific person or you may want to communicate with a large group of people. It is your choice, just as it is your choice when you dial a number on the telephone. Simply put, a computer network can be a way of shouting so that a great many people hear what you have to say or a way of whispering so only one person may listen.

"Network" is a term bandied about in many different circles. People are "networking" to obtain jobs and information, to meet new people, and to accomplish political and social goals. Opportunities for networking seem to be everywhere. Initially, computer networks were pretty much what they sound like; people who had computers - usually programmers or other such computer enthusiasts - networked via computers with others who had computers (and they naturally talked about computers). That is no longer the case. Now teachers, artists, writers, and firemen have computers and they talk to each other about

anything that interests them. Networks are composed of people who come together because of common interests. Computers are simply one communications vehicle that can be used to establish a network.

When you use a computer to set up a network or join an existing network, the results are similar to those achieved by telephone answering machines. A plus is that you do not have to feel silly while talking out loud to a machine. In computer networking, you call up a computer (using a modem), type your message on your own screen, and read messages that other people have left. If you have a question, you can call back later to see what answers someone may have left for you.

Hardware and Software Requirements

To participate in computer networking, certain pieces of equipment are needed. You must have a personal computer, communications software, a modem, and a telephone line. Any kind of computer can be made to communicate - from the most expensive to the kind you buy at the corner drugstore. It must either be able to print on paper, or "hard copy", or have a **CRT** (cathode ray tube) screen. Most computers come with CRTs, screens, **monitors** (the words are interchangeable) so that you can see what you are doing, but a few bargains do not. The communications **software** tells the computer to get ready to talk to the outside world and tells it how to do so. You do not have to know anything that the software is saying to the computer. Free communications software, which is available for many major brands of computers, can usually be acquired through local computer clubs. A basic communications package allows you to

network. More sophisticated programs also allow you to copy files from a network or transfer files from your system to the network. These abilities can come in handy, but they are not necessary for networking.

A modem is a piece of hardware that connects your computer to the telephone lines and translates the impulses given out by the computer into the kind of impulses that travel over the phone lines. You do not have to know anything about the conversion process, either. Like everything else in the computer business, there are many different kinds of modems. Some of them are simple little rubber cups into which your telephone receiver fits after you have manually dialed the number. Others are small boxes into which you plug the telephone cord or even circuit boards that fit inside the computer and take a telephone plug. Also, modems work at varying speeds and do a variety of tasks. Some dial numbers automatically; some answer your phone for you; some of them do everything but cook breakfast. All of them make your computer work with the telephone lines. Finally, you have to have a telephone line to hook into your modem.

Many computers come with built-in modems so that all you have to do is hook in the telephone plug, call up the software, and you are ready to network. In most cases, a technical person at your school or office will know enough to be able to buy communications software, install it, and hook up the modem. If there is no such person, it is easy to find someone who can do those chores for you. More than likely there are students in the school who have all the technical knowledge necessary. A nice thing about communicating with computers is that once the software is installed, the modem hooked up, and the telephone

line in place. it need .ver be done again. From that point on, you can le.rn by rote the steps to take to make your computer into a talking wonder.

III. HOW OTHERS USE NETWORKING IN EDUCATION

Objectives: To provide examples of ways that people involved in education are using computer networks; to describe how administrators, teachers, and students are using computers to extend their own knowledge and information.

Throughout this manual you will find terms commonly used by computer networkers, along with translations into English for those of us who are latecomers to the computer revolution. A glossary at the end of this manual is also provided for quick reference. **Networking** is obviously one of those terms. Another one that pops up quickly is **online.** **Online** means that your computer is hooked to your telephone and you are communicating with your computer - like "on the phone."

Throughout the country, educators are going online to share information, gain information, and provide assistance and new learning experiences for their students. In rural Appalachia, gifted high school students connect with students in 14 other schools to create a store of research information that can then be shared with the rest of the student population. In Texas, all the district-level school boards in the state are linked together and to the Texas Association of School Boards (TASB) through a statewide network. Educators in Texas thereby have immediate access to information on what is happening in the state legislature as well as in the other school districts. The public schools in Cheyenne Wells, Colorado, boasting an enrollment of 230 students (K-12), have set up a network used by teachers, students, and the community at large.

Students can turn in papers directly through the computer, ask questions and get answers without having to schedule a meeting with the teacher. People interested in education - teachers, parents, community leaders, and administrators - discuss common problems and possible solutions through a national network called **CompuServe.**

These are just a few of the ways computer networking is being used as a tool in education. One of the best things about computer communication is the ability to tailor a network to fit your own time schedule. When the telephone rings, you generally answer it, regardless of how inconvenient it may be. If someone asks a question, most people take the time to answer, even though they really do not have the time at that moment. Computer communication can take place at any time. If you are a nightowl, you can leave your message late at night without fear of disturbing the people you need to communicate with. If you are an early riser, you can be sure your message will be gladly received even if it is left at 6 a.m. Another benefit of networking is the timesaving factor. Instead of wasting time calling someone, finding that person busy, having your call returned while you are out - simply leave your message electronically. Your time is precious, and any device that helps you accomplish what you need to do at your convenience, cannot be all bad.

Another advantage of computer networking is the ability to accomplish the communications link in the privacy of your home or office. Time to gather your thoughts, put them in logical and convincing order, and present them clearly when you are online is a valuable aspect of networking. The usual anxieties of face-to-face communication are avoided. It does not matter if you look a mess

or your pants are wrinkled. The person with whom you are communicating bases his or her own response on your words and ideas rather than on your appearance, accent, or posture.

Administrators

School administrators are constantly concerned with staying abreast of issues that affect funding and school management. The Texas Association of School Boards uses a statewide communications utility network, **The Electric Pages,** as a way to transmit information quickly and reliably to and from members. TASB's private network provides members timely information on legislative and personnel issues and on state and national education news. When the Texas legislature is in session, superintendents and board members can access daily reports on what happened in the session that day, as well as access the current status of the bills TASB follows. Using the electronic mail and conferencing functions, TASB members can voice their opinions on what the association's stance should be on a bill, ask questions about what the bill will mean if passed, or pass along their experience relating to the bill, all in a matter of seconds. The network is the only way, according to Orbry Holden, TASB executive director, "we can keep all our members informed simultaneously."

Stop for a moment and imagine what would be involved in this kind of communication in the traditional manner. Telephone calls would be placed - getting the right person would take time. More than likely the person being called would be in a meeting and would have to return the call. It would take the association a lot of time to telephone members on important legislative updates.

Putting the updates in the mail also takes time, and there is the chance the updates can get lost and never be received. But when the network is used, the information is immediately available. Both the person calling and the person answering save time, frustration, and energy.

The more accurate and timely the information administrators have about issues that directly affect their schools, the more readily they can prepare for changes, make necessary budget adjustments, and generally respond to situations. **The Electric Pages** serves as a meeting place for educators throughout the state, a place where they can exchange ideas, information, and concerns without ever having to leave home. In addition to TASB, the Texas Association of School Administrators, the Texas Public/Community Junior College Association, the Texas Industrial Arts Association, the Texas Education Agency, and TCEA also have networks on **The Electric Pages** that their members can use whenever they wish.

Teachers

On occasion, teachers feel trapped by their own profession. They spend all day with students, go to meetings with administrators, and have very little time or opportunity to talk with their peers. Often the person who has the information a teacher needs is another teacher, but finding that person and getting the information is not always easy. Computer networks offer an excellent way for teachers to find out what they need to know, share their own experiences, and get the peer support so essential to all of us.

Local school networks and electronic bulletin boards (like TCEA's) are open to all callers and provide helpful, specific ways teachers can integrate computers into their classrooms. Representing the experiences of fellow educators, this information can be invaluable to a teacher struggling with new rules and new requirements.

Local computer bulletin board systems (BBSs) offer a place for people interested in that system's topic to leave messages for each other; in some urban areas, there are local BBSs on education. **CompuServe**, a national computer utility, has several forums dedicated specifically to problems in education. Teachers, administrators, and anyone else interested can call in and raise an issue. Others respond and a discussion begins. Discussions can range from methods of teaching trigonometry to how to deal with disciplinary problems; how to interest a gifted student in learning the multiplication tables to how to locate the best supplementary readers for learning-disabled students in the third grade. According to Cindy Sulvani-Lacey of **CompuServe**, "We have a number of education forums either online or in the works for teachers and parents who want to exchange information and then apply what they learn to their children or students." And remember, this network covers the entire country. You can share information with a person you have never met simply by dialing a number and typing on a keyboard.

Students

Teachers and students both benefit when students become involved in computer networking. We all know kids who are less afraid of technology than are

adults. It is part of the world into which they were born and they take it for granted. Getting them interested in learning through a computer network is one way of making learning fun.

Results of a study conducted by Professor Susan Tyler Eastman and others in the Department of Telecommunications at Indiana University indicated that eighth graders observed during the study enjoyed network learning. As a part of a writing assignment, students used an online encyclopedia to gather information. The students, who had no previous computer training, engaged in the process of getting the information and reported a sense of accomplishment at learning a new skill. They believed the entire process to be "easier" than standard ways of writing a theme.

Four elementary schools in Austin, Texas, participated in a creative writing pilot project in conjunction with **The Electric Pages (TEP).** Sixth-grade students called into **TEP** and used the system in a variety of ways: they wrote their own stories and others were able to read them online; they began a story and others added elements until someone decided it was finished and wrote the ending; and they left messages for each other. According to Janet Kennedy, a teacher at one of the schools, "All the children involved gained from it. It is a great motivational tool for creative writing and it has real life applications." Even though all the students lived in the same city, they were strangers to each other and their communications were very different from the kind of verbal and written communication they had experienced previously, when they were limited to sharing their work with students in their own school. Ellen Bell, principal at one of the participating schools, said, "The

motivation of sharing with other schools has taught children that computers can talk to each other. It extended the children's learning through a real application."

Students in an elementary school in Michigan are using computers to get to know students in an elementary school in Alaska. The students exchange information about their classmates, communities, and life-styles. The result is that these children are learning how other people live in very different parts of the country. Few, if any, of the children relate the experience to a traditional geography lesson. Often the response to textbook information is "What has this got to do with me?" By communicating with real people through the computer, the information comes to life: "It has to do with me because I have a friend in Alaska who tells me all this neat stuff." You can imagine how much more fun it would be to talk with a kid in Alaska about the Northern Lights or glaciers than to read about those things in a textbook.

Computer networks are also places where students, teachers, parents, and administrators can come together to discuss issues of mutual interest. David Hughes of Colorado Springs, a Colorado pioneer in the field of computer networking says that schools are a logical place for computer networking to begin. "The school has always been a kind of social center, especially in small towns. When you add a computer bulletin board, all of a sudden it becomes a community resource." Hughes runs a bulletin board of his own that includes a section he calls "L'il Red Schoolhouse." People from all over the community call in to leave messages relating to school issues. Hughes says, 'Kids are using it to find friends in other schools and to tell each other about classes and

teachers." They also use it to voice complaints and make suggestions. Everyone is on equal footing on a bulletin board, so genuine communication is not hampered by the embarrassment that might come in a face-to-face confrontation with someone older or younger or someone with more status. When school officials in Colorado Springs proposed bringing a breathalyzer to the senior prom, Hughes says the debate raged for weeks, with students, parents, and school officials all joining in.

Throughout the country, educators are realizing that computer networking is a viable tool. Any school campus or district office, whether large or small, can easily become a closed-in world with little or no interaction among peers in other school settings. Opening a window on that world brings in new life, new inspiration, and new ideas that help make education a delightful and rewarding experience for everyone involved. Computer networking is one way of opening that window. All you need to know is how to turn the crank.

IV. TAKING THE PLUNGE

Objectives: To simulate using a computer as a communications device; to learn the branch diagram as a means of understanding how communication by computer works; to follow the examples of screen commands and responses until they become familiar and clear.

Computer networking is a good idea, it works, and it can get me the information I need, but I still do not know how to do it!

The very first thing to remember about computer networking or computer-anything-else: computers are really hard to break. If you mess up, you will have messed up, but you will not have destroyed a thousand-dollar machine or multimillion-dollar network. Probably the worst you will do is hang up on the computer on the other end of the line, and it will not really care.

The second thing to remember: learning to communicate with computers is just like learning most other things - you do it by practice, by trial and error, by taking a chance. Assuming your hardware and software are all in place, you are now ready to become an amazing creature, a computer networker.

Computer bulletin boards were first started in 1978 when Ward Christensen and Randy Suess of Chicago designed a system for local computer club members to leave notes for each other. That original board is still in operation and has been parent to thousands of other boards across the country. General interest and special interest boards are springing up wherever people want to

communicate and share ideas and experiences. A sampling of BBSs are listed in section VI of this manual.

How to Network

Begin by finding the telephone number of a computer network. The least expensive and easiest networks to practice on are local bulletin boards. Bulletin boards are free, are easily accessible, and contain a hodgepodge of information. Generally, they are set up by individuals who run and maintain them for their own entertainment.

Some local bulletin boards are run by young people. In fact, one of your students may be the SYSOP of a bulletin board. A **SYSOP** (pronounced sis'op) is the system operator, or boss, of the board. It is his or her machine and he or she can run it however desired. A SYSOP can set up several different categories within the board where people discuss specific topics, or he or she can have one board where callers talk about everything at once. Most boards are divided into areas of interest such as Movie Board, Games Board, Music Board, Restaurant Board, and so forth. People call into the board and leave messages such as, "I just saw Rambo and it was absolutely the worst movie ever made. If Stallone ever took a shower, he might completely disappear." People who call later will read that "review" and add their own opinion or just ignore it altogether.

There are several ways to find out about bulletin boards in your area. Many books have been published that list telephone numbers for bulletin boards

around the country. When you have one number, you can usually get other numbers from that board. People who are already participating in computer networking will have access to telephone numbers. Students are good resources for these numbers, since many of them are already networking. Finally, you can generally get the number of a local bulletin board by asking someone at a computer store.

Beginning a Session

To begin your first networking session, turn on your computer, put in the software, and get it running. Follow the steps that you have learned to make your machine communicate.

Call the number you have. When a computer answers the telephone on the other end of the line, you may hear a screaming or whistling noise. That means that a computer is answering instead of a person. Your computer will recognize the noise as the voice of a kindred spirit and proceed to make the necessary connections. Once the connection is made, words will begin to appear on your screen. Often the first thing that appears on your screen is the word "CONNECT". This message means that you have indeed made the connection. You do not have to respond in bulletin board systems. They will proceed to talk to you. You talk back to them whenever they ask a question or tell you to give a command. Otherwise you sit and read what is appearing on your screen:

```
--------------------------------------------------
WELCOME TO JBBS - THE BBS WITH STYLE
YOU HAVE NOW ENTERED THE WONDERFUL WORLD OF JOHN BROWN
WHO THE HECK ARE YOU?
--------------------------------------------------
```

Each time you call a computer network, it will want to know who you are. If you have never called before, type in NEW (without quotation marks) or follow whatever directions the system gives you. The board will begin to explain itself. Sometimes a board will ask "Are you new?", in which case you type "yes" or "Y". The following is a typical introduction to a local bulletin board.

"IF THIS IS YOUR FIRST CALL TO A NETWORKS SYSTEM, RELAX.
IT'S ONE OF THE EASIEST COMPUTER DIAL-UP SYSTEMS TO USE.
THIS SECTION WILL GIVE YOU THE ADVICE YOU NEED TO GET STARTED."

The board will proceed to tell you what to do at each step. Most boards also have a HELP option that you may ask for anytime you get lost or confused. If you forgot what it told you to do in the first place, just type "HELP" or in some cases "?" and it will tell you all over again. Most bulletin boards have a section specifically designed for new users. (You are now a **user**, rather than a regular person. That means you are using the board. Some of these things are pretty simple.)

Occasionally you will get an "error message." This means that the computer does not understand the last command you gave it. Some systems put in a lot of exclamation points and stars when they give error messages to make you think you did something terrible, but don't worry about it. Either type your command in again or ask for help to make sure you are typing what you intended. In some cases, error messages are the result of errors in the system itself and you can do nothing about them. If for any reason the system will not allow you to proceed, hang up and call back. In any event, error messages look a lot more dramatic than they are and you need not be overly concerned.

The new user section of a BBS describes the choices available on the board, tells you what you have to do to exercise those choices and gives you a list of commands that work on that board. **Commands** are things you type in to tell the bulletin board what you want to do. Throughout this manual, specific commands are shown in quotation marks, for example, "HELP." When you give any system a command, however, you simply type the letters, not the quotation marks. On most systems, commands have to be followed by a **carriage return (CR)** for the machine to hear them. Just hit the return key on your keyboard after typing in the command.

The first time you call a bulletin board you will have to decide on a way to identify yourself on the board. Most boards ask for your real name for the records, but you can choose a "handle" for use on the board. In some cases, this handle is also your **password** to get back in the next time you call. In other cases, the board will assign you a password like "PLN223."

A handle allows you to remain anonymous on the board until you are ready to reveal your identity. The password allows the computer to recognize you when you call again. Most bulletin boards have electronic mail services that allow others to leave messages specifically for you. The password lets the computer know when to deliver the messages. Once you have gotten your password or chosen your handle, you will be asked to give the system a command.

Commands are selected from a **menu** - a list of choices. Some menus are alphabetical:

```
---------------------------------------------------
A - Apple Users's Group
B - Barn Dancing
C - Corn Recipes
---------------------------------------------------
```

Others are numerical:

```
---------------------------------------------------
1 - Movie Review Board
2 - Jokes Board
3 - Restaurant Board
---------------------------------------------------
```

When the board is through getting all the information it needs, it will give you a menu of choices that says perhaps, "A,B,C,D,?" "1, 2, 3, 4" and ask you to make a selection. Since, at this point you don't know what any of that means, you type in "?" and it will explain the letters or numbers. You look them over and type in the one you like. In the last example, you may decide you want to read a few jokes, so you simply type in "2."

The board will then present you with another menu that will probably look something like this:

```
---------------------------------------------------
"P,Q,R,S,T,?"
----------- -----------------------------------
```

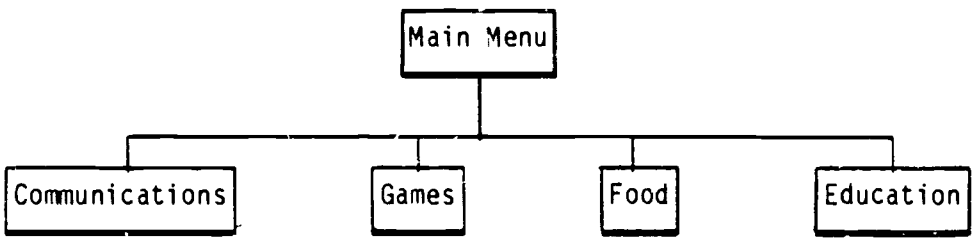
Naturally, you type in "?" and it will explain itself.

```
---------------------------------------------------
P--Post a bulletin
Q--Quit bulletin board
R--Read bulletins
S--Scan bulletins
T--Titles only
------------------------------ ------------------
```

The process takes only a few seconds and once you become familiar with the commands, you can dispense with the listings.

Menus on Networks

Computer networks resemble a maze, and the menus are your maps for getting where you want to go and getting back to the beginning once you have finished. The diagram below will give you some idea of what is happening when you make a choice from a menu. You begin at the top level. Your choice at that point takes you into one subsection. Once you are in that subsection, you usually cannot go to another subsection without going back to the top. Once you are in communications, you cannot go to games without first exiting communications and returning to the main menu. From there you can make another selection from the entire field of choices. The menu shows you the path to take to find the place you want to be.



Remember, the computer cannot hear what you are saying in most cases until you hit the return key. Also, if you make one choice then change your mind before hitting the return, you can back up with an arrow key or back space key and change the command. (Keep in mind, you can say "HELP" at any point.)

Let's assume that you need a good joke, so you type "2." That means you want to read the jokes in the joke file. A message may come up on your screen that says, "There are 12 messages on this board. Read message #_____." You type in "1" and joke number one appears on your screen.

At this point you may decide to read a few more, share a joke of your own, or check out the restaurants, work your way back by using the same menus. Type "Q" to quit the Jokes board, then "3" for Restaurants.

Getting around in computer networks is similar to getting around in some buildings. On occasion you have to wander a bit. Go down one hall and if that doesn't take you where you want to be, go back and try another. Mistakes are common - everyone makes them - and they do no damage to the system. If you are using a local bulletin board system, they are also free of charge.

BBSs are used as sample networking sessions because they are the simplest form of computer networking. They are also an excellent way to become accustomed to "talking" with your computer and to gain confidence. Another thing about BBSs is that they can be a lot of fun, as well as mildly addictive.

There are few problems associated with using local bulletin boards, but of course there are some. The most common is the busy signal. Local boards commonly have one phone line, and everyone who uses the system has to call in on that line. The busiest time of the day is in the evening, when people are home from work. Another problem is that some people get a charge out of leaving obscene or spurious messages. This is one of the reasons many SYSOPs want to know who is using the board in case abuse becomes a problem.

The first time you call a BBS, it may ask you some silly questions. For the novice user, this can be intimidating, but don't give up on networking before you really begin. If you have the documentation that came with your system or

can contact the person who set it up, it might be a good idea to be prepared with an answer to the following questions:

"How many nulls?"

Nulls are pauses in the information-sending pattern. Most computers require no nulls, but a few older models need some to sort things out as the information comes in. If you don't know and can't find out, your best guess is "0."

"Do you require line feed?"

This is asking whether your computer has enough sense to know when it has come to the end of a line. If it doesn't, it will print one line on top of the last and you will end up with a mess. Most printers need line feed; most CRTs do not. If you say "NO" and you end up with illegible garbage, hang up, call back, start over again and say "YES."

"Can you accept lower case?"

Some computers type only capital letters and can only read capital letters. Generally, if your machine can type lower case, it can receive them as well.

While BBSs are not the most educational or stimulating of computer networks, they are a wonderful way to practice your networking skills. If you call a BBS in your town, it is free; if you call one in another town, the only cost is the long-distance telephone call charge. BBSs are easy to learn and easy to use. Once you are confident of your ability to use a BBS, you are ready to expand your network.

V. WAYS TO NETWORK

Objectives: To learn how to leave public and specific messages on computer networks; to explain what conferencing means and how it works; to discuss and describe surveys of members, conferencing, and special interest groups; and to provide a step-by-step guide through a database search so that participants will be comfortable enough to conduct a search on their own.

Message Sending: Electronic Mail

Popular as they are, the uses of local bulletin boards are limited. It is often difficult to get online because so many people are calling, and the number of people with whom you can communicate is limited. The community of users determines the complexion of any network. To broaden your particular network, you will probably want to expand from the local orbit into a regional or national network.

Bulletin boards generally allow users to leave short messages either for the world in general or for a specific person. Many BBSs limit the number of lines in your message to as few as five. Obviously, any in-depth conversation and transfer of information is difficult in this situation. To expand your network and find the people or information you really need to find, you have several options beyond the local bulletin board.

Messages left for the world at large are "posted" on the bulletin board and anyone who calls in may read the message. The other option is to use electronic mail. Electronic mail means that you tell the system the specific person or people you want to get your message, and the message is put into their "electronic mailbox." When your correspondent calls in, a message will usually appear on the screen announcing the presence of mail. No one except the person to whom you address the message can read it. That person then has the option of replying to your message by sending you a note in your electronic mailbox.

Several businesses operate specifically as hosts for computer networks. Instead of one person having a small computer hooked up to the telephone all the time, these businesses have very large computers with many telephone lines that allow a great number of people to call in simultaneously and leave messages. Because the computer is bigger, the messages can be more extensive. The name commonly used for these businesses is **information utility.**

An advantage of information utilities is that when you join you receive a user's manual explaining the uses of the system, options, and answers to many of your questions. Some manuals are clearer and better written than others, but all of them list the choices you have. Since you pay for connect time (the time that you spend "logged on" to the computer), it is prudent to learn the commands in advance rather than spend money typing "HELP" again and again. Also, it is easier to refer to a manual than to get all your information on the screen.

When you first subscribe to any information utility, you will be given instructions for calling into the system. In most cases, you simply call a local number (you will be given a choice of numbers) and listen for the tone. Depending on what number you call, you will have to respond in a particular way. All of the local numbers connect you with what is called a **Packet Switching System.** These are simply technological ways to make a local call and end up with someone or some computer a long distance away. **Telenet, Tymnet,** and **Uninet** are three commercial packet switching companies that transfer data over long distances even though the caller dials a local number. These systems charge for their services and although the charges are generally less than long distance services, they do add to the cost of networking electronically.

An information utility generally charges its members a fee for access to its computers. Most fees are based on the amount you use the system (called connect time). **CompuServe** and **The Source** are the two largest information utilities in the United States. They have members across the nation and some abroad.

One of the most widely used features of information utilities is electronic mail. Because of the speed at which messages are transmitted and answered, untold hours of waiting for a letter via the USPS can be saved. Electronic mail on information utilities works in the same manner as it does on BBSs, except that you are not limited to a few lines of text. You can send your message to one person on the system or to hundreds, but it is always your choice as to who reads your message.

Sending mail electronically is a simple procedure. Most systems have a "communications" or "mail" section specifically designed for that purpose. Simply choose from the menu the option describing what you want. One of the big advantages of electronic mail is the ability to send the same letter to many individuals. All that is necessary is to type the letter once, give the system the list of people to whom the letter is to be sent, and it will be on the way in a matter of seconds.

Information utilities offer sections where you can post a message to the general membership that is more extensive than local bulletin boards allow. They have special-interest boards and a much broader user group. **CompuServe,** for example, offers bulletin boards in many different areas. The Educational Products Information Exchange (EPIE), maintains a bulletin board divided into several topics people can use for leaving messages to each other and to anyone else who calls in. When you join the group, a message will appear on your screen listing the number of messages on the bulletin board and the number of the message you read the last time you called in. This feature allows you to catch up on messages without having to read through old messages. You are then given a choice of things to do in the section:

```
--------------------------------------------------
Function Menu
 1  (L) Leave a Message
 2  (R) Read Messages
 3  (CO) Conference Mode
 4  (DL) Data Libraries
 5  (B) Bulletins
 6  (V) View Member Directory
 7  (SS) Set Sub-topic
 8  (OP) Set User Options
 9  (I) Instructions
10  (E) Exit from EPIE
Enter choice or H for Help:
--------------------------------------------------
```

You may then select the number or letter that corresponds to your choice, type it in, and the system will do as you have indicated. Bulletins in this case are news items placed on the board by the SYSOP of general interest to members of the group.

If you choose to read messages, you will be given another menu from which to choose. In some cases the next menu will list subtopics (math, science, physics, etc.), and in others it will simply ask you to tell it how you wish to read the messages:

```
-----------------------------------------------------
Messages Menu
1 (RF) Forward - oldest first
2 (RR) Reverse - newest first
3 (RN) New - not yet read by you
4 (RM) Marked - messages for you
5 (RS) Search mode
6 (T) Return to Function Menu
-----------------------------------------------------
```

If you are new to the system and select RN, the first message on this board will appear on your screen ard will continue until they have all been read or you tell it to stop. The messages look something like this:

```
-----------------------------------------------------
#33445/Mathematics          (# and sub-topic of message)
15-Oct-85  19:10:28         (date and time message left)
Sb: #Math and Apples        (subject the writer gives
                             messages
Fm: Jane H. Jones 7777,777  (sender's name and mail code)
To: All                     (person to whom message is
                             sent

We have new Apple computers in our math lab and are trying
ways to make them more effective. Does anyone have a good
program for teaching multiplication to five-year-olds?
-----------------------------------------------------
```

General notices are useful when you do not know who has the information you seek or when you have a question or situation to which you want a wide response. Although postings are not as limited on information utilities as on BBSs, they generally remain short. Extended conversations take place in the conferencing section of the service.

Conferencing

One of the options on both regional and national networks is conferencing. Conferencing, unlike BBS messages, allows people with a particular interest to conduct long, ongoing discussions. **The Source, CompuServe,** and **The Electric Pages** all offer members the opportunity to participate in conferences specifically related to education.

The method of starting or joining a conference is similar to the method used to find your way around in a BBS. Simply select "conference" as your menu choice and follow the directions. Again, on nearly every network, "HELP" is always an option.

Once you are connected to a network, conferencing is one of your choices. Type in the appropriate commands to take you to the conferencing section. Below is a sample conferencing session on **The Electric Pages (TEP).** This session assumes that you have already signed up and are a member of the network, thus you know your password to get onto the system.

You dial the number, TEP says hello, asks you to identify yourself, and asks what you want to do. Because this is your first call, you say "HELP" and the main menu is displayed. You are now ready to begin. From looking at the main menu, you learn that the command "COMM" brings up the section that includes all Communications - Mail, Personal Interests, Conference, Editor, and upload.

```
---------------------------------------------------
ENTER COMMAND: comm
THE ELECTRIC PAGES: COMMUNICATIONS
ENTER COMMAND: conference
ENTER CONFERENCE COMMAND: help

(these are      OPEN--START A CONFERENCE
commands from   CLOSE--END A CONFERENCE  (this tells what
which you       LISTS--LIST CONFERENCES  the command will
choose)         JOIN--JOIN A CONFERENCE  let you do.)
                  (Etc.)

FOR MORE INFORMATION ON ANY COMMAND, TYPE COMMAND NAME; TO
EXIT HELP FILE, PRESS RETURN:

ENTER CONFERENCE COMMAND:
---------------------------------------------------
```

You are now in the conference section of **The Electric Pages.** You can ask for further information about any of the options by typing in the command, or you can get out of the HELP section by hitting the return key. Probably you are ready to get on with it, so you press "return" and are asked for your command. On your first visit to a conference center, the most logical thing to do is read the list of conferences that are in progress. In this case, the appropriate command is "LIST."

When you ask for a list of current conferences, **TEP** provides the following information:

```
---------------------------------------------------
NAME      DATE      PRIVATE?      ENTRIES      HEADLINE
---------------------------------------------------
```

The Electric Pages is now giving you the information you need to decide which conference is of interest to you. The NAME of the conference is the way it is identified on the system. The name of the conference is also what you type in when you decide to look at a specific conference. The DATE is the day on which the conference was begun. PRIVATE? (Yes or No) means that the conference is public or private. On **The Electric Pages,** there are several conferences that are going on between members of a group such as TASB. If you are a member, you can join the conference; if you are not, you cannot. When you originally sign up for **The Electric Pages,** the computer will be coded so that it can recognize to which groups you have access. ENTRIES indicates how many different pieces of communication there are in the conference. The HEADLINE is a brief description of the conference subject.

In mid-July there were conferences on **The Electric Pages** dealing with health education, industrial arts education, early childhood education, library science, education administration, English/language arts, and a great many other subjects. After you choose the conference of interest to you, go into the text to read what the other people have said. Then add your own thoughts, ideas, experiences, or questions.

Conferencing allows for in-depth communication about a specific topic with other people who are interested in the same subject. It is an excellent way to find what other people are thinking and to find others who share your interests. Many conferences on **CompuServe** and **The Source** have been going on for years. It is possible to read page after page of lively conversation between individuals who have never met personally, but who share similar concerns.

More detailed information about computer conferencing can be found in the manual, **Educator's Guide to Conferencing: Using Computers** (SEDL/RX, 1985).

Information Gathering

Conferencing is one method of gathering information. Any discussion will provide information about other people's experiences and give you the benefit of their knowledge. A public conference on health education, for example, might allow participants to discuss the pros and cons of specific films or textbooks with peers. The sharing of perspectives and information is a very special function that computer conferencing offers to participants.

Another way to gather information through computer networks is by surveying the networking population. TASB conducts monthly surveys on **The Electric Pages** covering a variety of topics of interest to educators. These surveys involve no direct communication between members, but they provide valuable and timely information made available to all members.

Periodic news bulletins provide a great deal of up-to-the-minute information for networkers. For example, a bill pending in the legislature can potentially affect every person involved in public school education. Your schedule, your responsibilities, and your salary can depend on the outcome of that vote. Obviously, you will want to know as much as possible about the bill, the ways you can influence the vote, and the inclinations of legislators regarding the bill. A network providing dated information on a consistent basis can be invaluable. As a member of the network, it is your responsibility to monitor news reports that concern you.

Special interest bulletin boards can serve the same purpose as news reports when you are gathering information.

Databases

A **database** is a storage tank for facts, and it can save immeasurable amounts of time and effort when you are looking for information. One of the key elements of education, whether you are a student or an educator, is knowing how and where to find the information you need. The well-educated person does not know everything, but he or she is more likely than the uneducated to know how to find out.

Data about every imaginable topic are stored in huge computers, and all these data are available to you as a computer networker. Imagine, if you will, walking into an immense library. Books of every kind line the walls. You are interested in learning about Portuguese parakeets, and instead of going through the card catalogue, or scanning the encyclopedia, you simply stand in the middle of the floor and yell, "Portuguese parakeets!" At once, every book that contains information on these rare birds falls open at the correct page.

That is essentially how databases work. Instead of yelling out your topic, you type commands. The books do not appear before you, but a detailed description does. It is almost that simple.

Databases can contain any kind of data. They can be catalogues of newspaper articles, lists of books in print medical reference texts, or encyclopedias.

The distinguishing characteristic of databases is that they contain information that can be selected in a variety of ways. For example, suppose you have a database with this record in it:

LAST NAME--BROWN
FIRST NAME--ENCYCLOPEDIA
MIDDLE NAME--LEROY
PROFESSION--DETECTIVE
HOBBY1--STAMP COLLECTING
HOBBY2--SCUBA DIVING
HOBBY3--CLOG DANCING
ADDRESS--13 ROVER AVENUE
CITY--IDAVILLE
COMPUTER--COMMODORE
MARITAL STATUS--SINGLE

If you call the database that contains this entry, you can find Encyclopedia Brown in any number of ways. You can ask for everyone who lives in Idaville and find him. You can ask for everyone who likes clog dancing and find him. You ask for single clog dancers whose middle name is Leroy and find him. Even if you do not know that Encyclopedia Brown exists, you can find him if you know the sort of person he is just by giving the database a few commands.

Your field of research can be as broad or as narrow as you wish. By selecting several characteristics that define your search, you end up with more specific data. Obviously, if you ask for everyone who owns a Commodore computer, you will end up with more names than if you ask for detectives who are interested in stamp collecting and scuba diving.

Several database options are available for computer networkers. **The Source**, **CompuServe**, and **Delphi** all offer research opportunities. Other systems specialize in databases and offer broader and deeper research facilities. **DIALOG** and **BRS** are two of the larger database services.

Databases have their own command systems and some of them are very complex. Unless you intend to do extensive and exhaustive research, however, you will more than likely use an information utility or a general database service. These operate similarly to other networks. They have a list of commands that you type in, and the machine does all the work.

CompuServe has a Reference Library section. After signing on to **CompuServe**, you select this as your choice from the main menu, and the following menu appears on your screen.

```
-------------------------------------------------
                REFERENCE LIBRARY

 1. ACADEMIC AMER. ENCYCLOPEDIA
 2. INFORMATION ON DEMAND
 3. U.S. GOVERNMENT PUBLICATIONS
 4. BIBLIOGRAPHIC SERVICES
 5. FAMILY                    6. FASHION
 7. GARDENING                 8. GOLF
 9. DEVELOPMENT               10. SCIENCE
11. SATIRE                    12. SEXUALITY
13. WINE                      14. THE NEW TECH TIMES
-------------------------------------------------
```

You then type in the number of your choice, and following the directions in your **CompuServe** manual, begin your search. **Delphi** and **CompuServe** have online encyclopedias. Sometimes an extra charge is levied for using the research facilities or general-interest information utilities.

The databases that operate independently - Dialog, **Knowledge Index**, Orbit, **BRS** - are known as "encyclopedic databases," which means they have a giant database containing many other more specific databases. Just as a printed encyclopedia contains information of all types, so do encyclopedic databases. Some databases are specifically designed to contain information related to education. These include **ERIC** and **AIM/ARM**.

Most databases use key words as their commands. Before you call, have in mind the topic you plan to research and the words that best describe it. One of the subdatabases available on the **Knowledge Index (KI)** is **ERIC**, known to **KI** as EDUC1. **ERIC** is the complete source of educational materials collected by the Educational Resources Information Center of the National Institute of Education, U.S. Department of Education. Virtually all types of print materials, published and unpublished, that deal with education are included. If the entire reference is not on the database, a summary is included. **ERIC** is also accessible through **Delphi** and a few other networks.

Databases do not usually give the complete text of articles. A summary is provided, enough information to help you determine whether you want the entire article. If you decide to order the article, it will be mailed to you. Each **ERIC** citation contains a descriptive abstract.

As of August 1982, **ERIC** contained 470,750 citations, and the number has grown by the thousands since. Imagine trying to sort through all of them manually! Using the **Knowledge Index**, the process is greatly simplified and can be done in minutes. Suppose, for example, that you are looking for information concerning

junior colleges in Arizona offering teacher education. After you sign on to the system, the search will look like this: (You are typing in all caps now; the computer is responding in lower case.)

? (KI doesn't mess around with a lot of talk. When it is ready for you to tell it something it says, "?")

```
? BEGIN EDUC1
  7/7/85 13:55:05 est
  now in education (educ) section
  eric (educ1) database
? FIND ARIZONA AND COLLEGE AND TEACHER
       44321 arizona
      223999 college
      327618 teacher
s1      44 arizona and college and teacher
```

S1 means "Search 1"; this is your first search this session. The system has told you there are 44,321 entries dealing with Arizona, 223,999 dealing with colleges, 327,618 dealing with teachers, and 44 dealing with all three. You now have the option of looking at those 44 or narrowing your field. Let us assume that you want to get even more specific.

```
? FIND S1 AND JUNIOR
         44 s1
        250 junior
s2      7 junior and s1
```

What you have asked the computer to do is take the results of Search 1 and find among those the entries containing the key word junior. The results of Search 2 (S2) locates seven articles. This is a much more manageable number. To look at the first citation, you enter "DISPLAY S2" and the system lists the first of the seven records for you. A display might look like this:

? DISPLAY S2
display 2/L/1
JK9088998 Ps4433221
Junior Colleges in Arizona Offer Refreshers for Teachers
Smith, Jane
Arizona Highways, v 22 p 13-16 July 1984
Available from: Reprint: XYZ
Language: English
Document Type: Magazine article

Lists and summarizes a new program in Arizona state junior college system that focuses on teacher enrichment classes d the summer. Names and addresses of contacts are in text.

Descriptors: "Junior" "College" "Teachers" "Enrichment" "Refreshers" "Courses"

Having looked at the first entry, you decide you have found just what you need. You can order the reprint directly from the database or you can **LOG OFF** (tell the system you are finished) and go look in the public library for your magazine. This example entry is fictional, but it includes all the elements of a genuine citation.

When you enroll with a database service, you will receive a workbook that contains all the categories contained in the system as well as directions for using the system. Each system has its own peculiarities, but the most often used ones are designed for ordinary people.

Whether you choose to network via BBSs. subscription information utilities, database services, or a combination of all three, you will be surprised at how easy it is to adjust to the variations in the systems. All of them work as a result of commands that are typed into the computer. If the wrong command is entered, the system will complain, but will not cut you off or explode. It

costs money to wander around without a plan in databases and information utilities; therefore, a user should consult the system's manual or workbook before making the first call. In any event, the first call is always the hardest, but, once you see how quickly you get results, confidence will grow. Most systems provide times when lower rates are in effect (nights and weekends), and if it is convenient for you to take advantage of those hours, you can save a good deal of money. **Knowledge Index** and **BRS/After Dark** are specifically designed for consumers who can use the systems after the regular workday, and are not available at other times.

VI. WHERE TO NETWORK

Objective: To learn to identify some BBSs that specialize in education-related topics; to go through a session on a regional network that offers several education specific options; to learn about specific national information utilities, including **The Source, CompuServe,** and **Delphi,** their offerings related to education, and how to use the systems; to learn about encyclopedic database services, how they work, and how to choose a system.

BBSs Specifically for Education

The most immediate use of BBSs for most educators will be as practice grounds for learning how to network. Once familiar with the process, however, many educators begin thinking about setting up a BBS of their own. Bulletin boards that can be used by students are particularly valuable both as a way to learn about computers and as a vehicle for gathering information from other people.

An ambitious program has been started by the Brooklyn Math and Science Research Academy. The BBS is headquartered on an Apple IIe at Edward R. Murrow High School, and 19 other schools in Brooklyn have access to the system. Called Brainwave, the BBS includes a message system where students can leave notes for each other, read news about scholarships and deadlines, or post messages about school events. There is also a section listing volunteer tutors from ea colleges and universities.

Teachers use Brainwave as a center for math and science competitions. Marc Licht, assistant director of the Academy, describes the way these competitions work. "In the morning, we'll put math or science questions on the board. Students at each school will log on, get the questions, and try to answer them. Then teachers will file the scores and we'll post the winners the next day."

The system began with 15 schools in 1984, will have 20 in 1985, and plans are being considered to expand in order to include all of New York City's public schools.

Setting up and keeping a bulletin board in operation is a process that can be the primary responsibility of students. Bulletin boards can also be set up to facilitate communication between teachers and administrators in a city or district. Given a relatively small amount of equipment, a goodly amount of enthusiasm, and a moderate amount of effort, BBSs can be a potent educational tool.

If you are interested in seeing how existing BBSs with an emphasis on education operate, call into one of the following and browse for a bit. (Remember, you will have to pay for the long-distance call. The bulletin boards are free.)

BBS	Location	Telephone #
Brainwave	Brooklyn, New York	212/258-7078
Ed Tech	San Diego State University	619/265-3428
Education-80	Greenwich, Connecticut	203/629-4375
High School	Cheyenne Wells, Colorado	303/767-5533
David Hughes	Colorado Springs, Colorado	303/632-3391

The Electric Pages

Located in Austin, Texas, The **Electric Pages** (TEP) was begun in March 1983 by John Clark, David Gibbs, and Flynn Nogueira. Unlike most information utilities, TEP has both a subscription service and a free section that is open to the public. Subscribers, of course, have access to much more information and are able to do many more things than are people who call in free.

From the beginning **TEP** has identified education as its primary interest. One of the first groups to use the service was the Texas Association of School Boards. TASB ran a pilot project in 1984 with 16 school districts and four Education Service Centers participating. The goal of the project was to determine whether using a computer network as a means of communicating legislative information would be (a) feasible and (b) helpful. As a result of the pilot project, all Texas school districts began using **TEP** in February 1985 to share association news, including daily updates from the Sixty-ninth Legislature.

Other education associations have joined TASB in using **TEP** as the groups' primary communication vehicle with excellent results. In addition to the sections of the network open to members only, there are also several other networking options available to general subscribers. The Conference section allows any member to start a new conference or join an existing conference. The Magazine section reports on items of general interest ranging from movie reviews to cooking to posture. Restaurant guide, energy resources, financial management and investment, and science fiction are just a few of the topics covered by **TEP.**

One of the sections of **The Electric Pages** of great interest to educators is the Texas Computer Education Association (TCEA) a group dedicated to providing information and assistance in bringing computers into the classroom. One of the free offerings of **TEP**, the TCEA board can be accessed by anyone with a communicating computer. After you have dialed the number and given FREE as your password, you can type in TCEA as your command to the system. The TCEA menu will then appear on your screen:

```
-------------------------------------------------
TCEA ELECTRONIC RESOURCE CENTER
1.  TCEA News
2.  TCEA Education Computing Calendar
3.  Special Interest Corner
4.  TCEA's Computing Magazine
5.  Send a message to TCEA - Box 3953
6.  Membership Info
7.  TCEA Sponsor's Information

NOTE:  ENTER THE HELP COMMAND FOR ASSISTANCE
PLEASE ENTER A NUMBER; TO QUIT TYPE "Q"
ENTER COMMAND:
-------------------------------------------------
```

There are several choices available here. Choice 5 lets you send questions and comments to the SYSOP of the board. Choice 4 lets you read articles that members of the boards have written and made available to all callers. Choice 1 provides timely information on what is happening in the field of computers and education in Texas and the world. Choice 3, Special Interest Corner, provides a bibliography, software review, and constant updates about computers and software as they apply to specific fields of interest. If 3 is your selection, you will see the following menu:

```
-------------------------------------------------
TCEA SPECIAL INTEREST CORNER:
HELP FILE

A - Bilingual Education              B - Business Education
C - Computer Science Education       D - Early Childhood Ed
E - Education Administration         F - English/Lang Arts
G - Foreign Language Education       I - Gifted/Talented
J - Health Education                 K - Instruct Television
L - Interactive Video                M - Library Science
N - Mathematics                      O - Migrant Education
P - Reading                          R - Science Education
S - Social Studies                   T - Special Needs
U - Teacher Training                 V - Vocational Education

ENTER ITEM NUMBER*
-------------------------------------------------
```

The voice phone number for **TEP** is 512/472-6432. The number to call from your computer is 512/472-6028. If you wish to access the free part of the system on your first call, simply call the latter number and type "FREE" when asked for your identification.

The Source

Located in McLean, Virginia, **The Source** was established in 1979 primarily as an electronic mail system. In 1980 Reader's Digest bought the company and began developing new ideas for the system. Today, **The Source** offers more than 700 options for subscribers, including six areas specifically designed for communications. To become a subscriber of **The Source** you can buy a membership from a computer store or contact the company directly. The customer service number is 800/336-3330.

When you subscribe to **The Source**, you pay a one-time membership fee and receive a user's manual, an ID number and a password to allow you onto the system, a

command guide, a subscription to the newsletter, and a customer-support hotline number to call if you have any problems. In many locations, you can dial a local number and be automatically connected to the system. **The Source** has a minimum monthly charge for which you are billed, regardless of whether you use the system or not.

When you call **The Source,** you will see the following on your screen:

TELENET **(this is the packet switching system you are using)**

512 16B **(computer talking to itself, ignore)**

TERMINAL=D1 **(some systems ask type of terminal, your instructions or instructor will tell you how to respond)**

@C 30128 **(this tells the packet switching service where you are calling; again check instructions)**

301 28 CONNECTED

Connected to THE SOURCE **(you have made the connection)**
>ID **(you type in your identification number)**
Password? **(type in your password)**

RD0260 (user 22) logged in Monday 31, Oct 85 21:11:44

Welcome, you are connected to The Source
Last login Tuesday 12, Sept 85 18:18:18
Copyright (c) Source Telecomputing Corp

The system will go on to make announcements and give you a menu from which you can begin your choices.

The **Source** offers several different methods of computer networking. SOURCEMAIL is the electronic mail feature that allows you to send messages to any of the

other subscribers to the system. MAILGRAM Message Service allows you to send messages on paper to people who are not subscribers. You type it in; they send it out. CHAT is an option available only on the large information utilities. When you chat, you communicate directly with another person who is online at the same time you are. You type in your message; they respond. It is a silent conversation. BULLETIN BOARDS let you post messages either to the whole community of subscribers or to people in a particula interest group. The MEMBER DIRECTORY lets you get in touch with other members who share your interests. Members who choose can fill out an interest form that is then accessible to others. If you are looking for that elusive single, scuba-diving detective, you may find nim here. PARTI (Participate) is the conferencing option on **The Source.**

There are two ways of moving about in **The Source.** One is the traditional menu method that is used on BBSs. Because there are so many subareas in this giant utility, however, that is not always the most efficient method. You have to go through many menus to get to your destination. The other method is called Command Level. Once you are familiar with commands, this system is quicker. Menus are simpler, however, and will get you where you want to go. If you are interested in conferencing and follow the menu route on **The Source,** your trip will look something like this:

```
---------------------- ----------------------------
     WELCOME TO THE SOURCE

1    USING THE SOURCE
2    TODAY
3    BUSINESS UPDATE
4    THE SOURCE MAIN MENU
5    COMMAND LEVEL
ENTER ITEM NUMBER OF HELP 1
  You then enter your choice: "4"

     THE SOURCE MAIN MENU

1    NEWS AND REFERENCE RESOURCES
2    BUSINESS/FINANCIAL MARKETS
3    CATALOGUE SHOPPING
4    HOME AND LEISURE
5    EDUCATION AND CAREER
6    MAIL AND COMMUNICATIONS
7    CREATING AND COMPUTING
8    SOURCE*PLUS
  Your choice here is "6"

     MAIL AND COMMUNICATIONS

1    MAIL
2    CHAT
3    POST
4    PARTICIPATE
5    MAILGRAM MESSAGES
ENTER ITEM NUMBER OF HELP P
  To participate, you type in "4"
-----------------------------------------------------
```

At this point you can learn what conferences are going on and how to join a discussion. Please note that "HELP" is an option on the big services as well as on the small BBSs, and often it can be a very handy command to remember.

If you had studied your **Source** command guide, you would have known to select "5" at the first menu level and then gone directly to Parti. **The Source** provides access to databases and special-interest groups as well as communications. ED-LINE, CCSSO, AASA, NIE are particularly interesting to educators.

ED-LINE is a section specifically designed for educators and people interested in education. It provides timely news reports, discussions of legislation that affects education, information about current problems in education, and a source for locating other people with similar interests. When you have selected ED LINE as your command to the system, you will see the following menu of choices:

```
------------------------------------------------------
ED-LINE Main Menu
  1.  Education USA Newsline
  2.  School PR Line:  The NSPRA Network
  3.  Federal Alert 10-2-85
  4.  EDTECH Update 9-8-85
  5.  Legal Briefs:  The Law of the Land
  6.  Community Education Update
  7.  RuraLine 8-1-85
  8.  National Networks
  9.  Regional Networks
 10.  State Networks
 11.  Excellence in Education
 12.  Network Directory
 13.  Ed Exchange
 14.  Useful Facts and Figures
 15.  What's New in Research from NIE
 16.  Classroom Ideas
 17.  ED-LINE BONUS:  September/October 1985

Enter command or RETURN for help:
------------------------------------------------------
```

From this menu you may reach other educators through the news and information service of the Council of Chief State School Officers (CCSSO) under "8. National Networks," or you can get ideas about how to manage your classroom under "16. Classroom Ideas," or you can read the morning edition of news specifically related to education under "1. Education USA Newsline."

Widely used in the business community, **The Source** offers its members access to professionals and experts in a wide variety of fields. Education is one of those fields, and **The Source** provides many choices that range from catching up

on news to connecting with fellcw professionals to finding specific solutions to specific problems.

CompuServe

CompuServe, a division of H&R Block, is headquartered in Columbus, Ohio. Boasting more than 100,000 members, **CompuServe** continues to be a fast-growing network. Although less expensive than **The Source**, it offers many of the same options and some additional ones. Whereas **The Source** is geared toward businesses, **CompuServe** targets a broad r consumer market. Like **The Source**, **CompuServe** subscriptions can be bought either from a computer store or from the company. The **CompuServe** number to call for information about signing up for the service is 800/848-8199.

CompuServe can be reached by calling a local phone number, and in many cases the call is free. There is no minimum monthly charge for membership in and once you join you are a member for life. When you join, you are assigned an ID number and password. When using subscription services, it is very important to remember your ID and password. You will not be allowed on the system without them, and they are not available to the people who answer the customer service lines. If you lose that information, you will have to start over with a new number and a password, and time will be lost when you could be networking.

CompuServe's networking options are similar to those of **The Source**: electric mail, bulletin boards, conferences, and a member directory. In addition to the conferences that take place in special-interest group sections (SIG), there are

also conference that are scheduled so that participants can all call in at the same time and talk back and forth. There are more than 50 SIGS on **CompuServe** and new ones are added all the time. Many of these have regularly scheduled conferences when an expert in the field is invited to join the group. Within each group a SYSOP moderates the discussion and keeps the conversation moving.

A feature unique to **CompuServe** is the CB simulator. True to its name, CB works just like the car versions do. People join the group, take a handle, and chat back and forth. Comments are brief and chatty, but hundreds of people swear they have made lasting friends in this part of the system, and there have even been a few marriages resulting from initial contact on CB.

To enter **CompuServe,** you follow the same procedure as you do to get on a bulletin board. **CompuServe** has its own packet switching system, which lets you avoid the extra charges that the commercial systems charge. If they have a number in your city, it is the best number to call. When you join, they will send you a list of numbers that you can call and a simple-to-follow sheet of directions that tell you how to get online. Assuming you are using the **CompuServe** number, your screen will say "CONNECT." When you see this, you can hold down the control key (marked control or CTRL) and type C. This is a signal to **CompuServe's** computer that you are there. If you are using **Telenet** or **Tymnet** or another service, you need to follow its directions for telling it you want to be on **CompuServe.** You will then be asked for your ID number and password. It sometimes takes a while to check the password, so don't panic if everything stops for a few seconds. Type your password carefully because in

most cases it will be invisible on your screen. You have three chances to get it right or **CompuServe** will hang up on you.

Once you have been cleared to enter the system, it will tell you hello and give you some news - announcements of interest to subscribers. You will then see the main menu and an exclamation point appear on your screen. "!" is the prompt from **CompuServe** that indicates it is your turn to issue a command. If you do not see the "!" and type in a command anyway, you will probably be ignored. There are twelve major sections of **CompuServe.**

```
-----------------------------------------------------
 1    INSTRUCTIONS/USER INFORMATION
 2    FIND A TOPIC
 3    COMMUNICATIONS/BULLETIN BDS.
 4    NEWS/WEATHER/SPORTS
 5    TRAVEL
 6    THE ELECTRONIC MALL/SHOPPING
 7    MONEY MATTERS & MARKETS
 8    ENTERTAINMENT/GAMES
 9    HOME/HEALTH/FAMILY
10    REFERENCE/EDUCATION
11    COMPUTERS AND TECHNOLOGY
12    BUSINESS/OTHER INTERESTS

 !
-----------------------------------------------------
```

When you see this menu, you have three choices. You can type "HELP" and get more information about the choices, or you can type one of the numbers to select a category, or you can issue a command that you have learned from your user's manual. The most time-saving and thus economical method is to decide where you want to go before you call, look up the command to get there, and then type it in at the "!" prompt.

If you follow the menu route from the main menu to the CB simulator, for example, you have to make a selection from four menus to get there, or you can type

"GO CB" and be there immediately. **CompuServe** provides a handy guide to members that lists each of the options of the service and the command needed to use that option.

CompuServe has several sections of interest to educators. One of the command choices from the main menu is "GO EDU-1." This command takes you directly to the section dedicated to education.

```
CompuServe                REFERENCE

Reference

1  Academic Am. Encyclopedia ($)
2  U.S. Government Publications
3  Demographics ($E)
4  Information on Demand ($)

EDUCATION

5  Services for Educators
6  Services of the Handicapped/Students and Parents
7  Forums

Enter choice !
```

The dollar sign beside a choice indicate that there is an additional charge beyond the regular connect time fee for that selection. If you select "5 Services for Educators" you will be given another menu from which to choose.

```
-------------------------------------------------
SERVICES FOR EDUCATORS

 1  Academic Am. Encyclopedia ($)
 2  The Multiple Choice
 3  College Press Service
 4  EPIE Database
 5  The Whiz Quiz
 6  LOGO Database
 7  Edutech Project Pilot
 8  The College Board
 9  Words of Wit and Wisdom
10  Educational Travel Connection

Enter choice !
-------------------------------------------------
```

When you subscribe to **CompuServe**, you will receive a user's guide and a subscription to Online Today, a magazine specializing in computer networking with particular reference to **CompuServe.** These materials will help you decide how you want to use the system, what choice you want to make, and what you want to do before you ever begin your call. It is very helpful to you as well as money-saving to plan your online session in advance so that you don't waste time wandering around in the system.

Delphi

Delphi is the youngest of the large information utilities, but it, too, provides good opportunities for networking. Established in February 1983, **Delphi** operates out of Cambridge, Massachusetts. Although not as large as either **The Source** or **CompuServe, Delphi** has many of the same options. For information about the system, contact customer information at 800/544-4005. **Delphi** charges no minimum use fee and its rates are competitive with the other services - lower than **The Source**, somewhat higher than **CompuServe.**

In addition to Bulletin Boards, Electronic Mail, Chat, Conferencing, Delphi also offers section called **DEAR ORACLE.** This feature is designed to allow users to get advice on just about any topic from other members with special skills. If you have a question, you enter the DEAR ORACLE section, leave your query, and return later to find answers. Another section - INFOMANIA - provides a space for users to communicate in just about any way they wish. Some publish their writing, other collaborate on novels, and still others design and implement polls.

Delphi's strength lies in the ease of the command system. English words like "Library," "Add," "Change," and "Calendar" are used as basic commands. There are also numerous clear help messages that explain rather than simply listing commands.

The first time you call in to **Delphi**, you will be given a guided tour of the system. The "guide" explains the various sections, and how to move about within them, then lets you visit each section briefly. This tour is very helpful and directions are easy to understand.

Delphi's conference mode is somewhat different from those offered by other systems. When you select "Conference" from the menu, you are given several choices. One choice is "Who?" The system will then tell you who is online at that moment. If you see someone on the list you'd like to talk with, you can send that person a message and a beep to meet you in the conference section. If that is mutually agreeable, the conversation can begin. If, however, one of you wishes to work undisturbed, you can tell the system and you won't be bothered.

Announcements of regularly scheduled conferences on various topics are made on the bulletin boards. Spontaneous conferences also occur frequently, and newcomers are welcome to join.

Because **Delphi** is a relatively new system, it is quite open to suggestions from users. Several groups locate their private networks on the system and provide newsletters for the general membership to read for an additional fee. The Space Research Newsletter is one such option. Designed for people interested in aerospace research, the newsletter includes bibliographies of research reports, analyses of space experiments, classified ads, and more.

Knowledge Index

Dialog, a subsidiary of Lockheed Missile and Space, is the largest database system in the United States. It contains more than 150 individual databases and the search language for using it is quite complex. **Knowledge Index** is a selection of the most-used databases from **Dialog** and has been tailored for easy use by nontechnical people. Information about **Knowledge Index** is available by calling 800/227-5510. There is an initial subscription fee, then services are charged for on an hourly basis. There is no minimum charge. Because searching is done without chatting or wandering around, most searches can be accomplished very quickly, assuming you know what you are looking for before you call in. You are charged for the actual number of minutes that you are online with the service.

BRS

BRS is the other major encyclopedic database in the United States. The **Bibliographic Research Service** is comparable to **Dialog** in its difficulty to use and cost. **BRS AFTER DARK,** however, offers a subset of databases that is easier to access, less expensive, and will probably meet the needs of most general researchers. Available in the evenings and on weekends, **BRS After Dark** charges a one-time subscription fee, plus a minimum monthly fee. Databases on this system include business, math, science, health, psychology, and the full text of the Academic American Encyclopedia. Information is available from **BRS** at 800/833-4707.

Orbit and Others

Orbit is the third encyclopedic database available to computer networkers. It does not, however, have an easy-to-use counterpart. The **Orbit** system requires some training to become proficient on the system. For information about **Orbit,** call 800/421-7229.

Many other database services are operated throughout the country. The U.S. government maintains virtually thousands of databases that are accessible if you can find out where they are and how to get into them. The New York Times Information Bank contains the full text of the New York Times since 1969 as well as abstracts from many other periodicals. Hundreds of other databases - both encyclopedic and dealing with a single subject - are available to users willing to seek them out.

VII. ENTERING THE WORLD OF COMPUTER NETWORKING

Objective: To summarize what has gone before and reaffirm the simplicity of using computer networks.

There are unquestionably many technically difficult, sophisticated, and complicated things people do on computer networks. The nice thing about networking, however, is that you can begin slowly with minimum information and grow with the process. Just as you would not swim the English Channel your first time in the water, neither do you need to begin networking by searching **Dialog.** You can dip a toe into the water, wade in up to your knees, then scuttle quickly back to shore. Many of us never get in above our knees, yet still benefit greatly from the process called computer networking.

Because education is primarily concerned with information and the transmission of information, computer networking is ideally suited to educators. The goals of both processes are compatible - networking is a way of exchanging and gathering information quickly and efficiently. Education is, among other things, a process of disseminating information. By combining the two, both can profit from the exchange.

VIII. GLOSSARY

CARRIAGE RETURN - a term left over from when typewriters actually had carriages that returned. On a computer, the key is marked "return," "carriage return," or "enter." The key is also sometimes referred to simply as "CR."

COMMAND - the directions you give the computer. For example, a READ command would tell the network that you want to read a file and, it will display the file for you.

CONNECT TIME - the amount of time that your computer is connected to another computer. Connect time determines your costs when you are using a subscription service.

CRT - Cathode Ray Tube. In this context, it is the screen of your computer; it may also be referred to as a monitor.

HARDWARE - anything you can see that relates to computers - computers, screens, modems are all hardware.

INFORMATION UTILITY - a business designed to provide data and communications links for users of communicating computers, generally by subscription.

INPUT - the things you type into your computer or someone else's computer network.

LOG IN - to enter whatever information is necessary to join a network. Usually to log in, you enter your password and user identification number.

LOG OFF - to tell the system you are finished and want to be disconnected.

LOG ON - same as log in.

LOG OUT - same as log off.

MENU - a display that lists your choices on a particular system.

MODEM - acronym for MOdulator-DEModulator. A device that allows your computer to communicate through telephone lines with other computers.

MONITOR - the screen of your computer. Same as CRT.

NETWORKING - to converse with other people or gather information by using a computer as a communications device.

ONLINE - when your computer is connected to another computer via the telephone lines or other cable.

PACKET SWITCHING - businesses that provide quick links between distant computers; they allow you to call a local number and connect with a computer in another city or state.

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