FRANKLIN ACE 100

OPERATOR'S REFERENCE MANUAL

FRANKLIN
COMPUTER CORPORATION

FRANKLIN ACE 100

USER'S MANUAL

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This is the Franklin ACE 100 User's Manual.

It will show you how to set up and use your ACE, not how to program, how computer graphics work, what disk transfer rates are, or how to master the dozens of other exotic sounding skills you hear about in computerdom. What you WILL find here is all the information you need to get your ACE working for you - quickly and painlessly.

You'll also find plenty of practical information, suggestions and answers to questions that you might otherwise have to learn for yourself the hard way. You'll find advice about products that you can buy for your ACE - what they're for, how they work, what quirks they have and so forth. Because this is an ongoing process at Franklin, you'll receive updates to this manual as different programs and equipment are evaluated.

Since you're reading this, some fast-talking salesperson has probably already persuaded you that the ACE will make your life complete. However, if you bought the ACE simply to keep the kids quiet, you'll be interested to find out how many practical applications there are for your new computer. Dispel those doubts! Put your second thoughts aside and press on regardless! You CAN use your ACE to good purpose.

The following section introduces you to the world of personal computers. It's very general and assumes that you are a first-time computer user. If you're not, then you may want to skip this section and go on to the section entitled "The Ancestral Territorial Imperatives of the Trumpeter Swan."

PERSONAL COMPUTERS

WHAT ARE THEY?

Personal computers are just super-fast, super-expensive calculators designed to let you handle numbers, words, and ideas in much the same way as a calculator lets you deal with numbers. Virtually everything you can do with paper and pencil, you can do with a computer in a fraction of the time, with a fraction of the effort. The machines are durable, relatively inexpensive, and adaptable to personal needs and preferences. Small businesses like them too.

Inside your ACE is a little electrical device called a microprocessor. Just as the word implies, it's small. How small? The one that runs the ACE is only about as big as the SHIFT key on your keyboard. But it's the heart of the system. Without a microprocessor, you wouldn't have a computer.

Everything else in the case is there to support the microprocessor - to help it do its job. You have the power supply to convert and regulate the electrical current going to the computer and its support devices. You have some devices called memories that will hold information for later recall and use. You have

some slots in the back which allow you to plug in additional devices that expand the capabilities of your machine. You have the keyboard. All this shows you that the microprocessor can't do anything by itself. It needs a lot of help from many other elements of the system to do what you bought it to do.

A personal computer is NOT designed to do all of your work for you. If that's what you were led to believe, then you're in for a rather rude awakening. The computer's role is more that of a flunky; it will take care of the tiresome jobs that bore you to death. The computer's strengths lie in its ability to perform miserably dull tasks endlessly and accurately, leaving you free to think about solutions to the real problems at hand. The computer will not even do this kind of work by itself, though. It requires your input and your organization of the data first.

Since a computer won't think for you, don't expect miracles. If you don't know how to do something, then there's absolutely no way that you'll pull it off just because you're using a computer. If you can't write a novel with a pencil or a typewriter, then you'd better hire a ghost writer, preferably one who's also good at word processing, if you want to write one on a computer. You still have to think and organize the work yourself. The computer simply takes the mechanical and repetitive drudgery out of a task.

For example, with a calculator, long division problems that used to consume several minutes and half a sheet of paper with a calculator now take less than a second - and you can count on getting the right answer. With a computer, you have all of the arithmetic functions a calculator provides as well as the ability to manipulate words, documents, charts, etc. with just the same ease.

WHAT CAN THEY DO?

A lot. Computers can be used to type letters (word processing). They can help you with budgeting (a 'spread sheet' program). They can store information that you can later find and recall (a data base program or a filing system program). With your computer you can communicate with another computer system via your phone line (a terminal emulator or modem program). And, perhaps most importantly of all, you can use them to PLAY GAMES!

This is just a sampling of what you can do with your ACE. In fact, if you can think of a possible application of computer technology, someone, somewhere has probably written a program that performs it; and, because the ACE is compatible with one of the most widely used personal computers in the world today, you can probably use that program on your ACE.

It's a little late to bring it up now (unless you're borrowing this manual from a friend), but a good rule of thumb to keep in mind is that you shouldn't buy a computer unless you know of at least two things that you can use it for BEFORE you buy it. Using the packing box as a planter for your petunias shouldn't be one of the two uses for your new acquisition. But even if it is, relax and read on. There are plenty of other things you can do with a computer now that you have one.

Be very careful not to confuse impressive activity with valuable service, however. Programs and add-on devices are proliferating beyond imagination these days. Some of them are good, some of them merely cute, and some of them downright ridiculous. (A clock program, you say? One that will make my Videx display look like a chunk of my kitchen wall? Great! With second hands yet? Wow!) On closer analysis, however, the sole purpose of many of

these goodies is to separate you from your money. Don't fall into the trap of buying a program to run on your ACE simply to have SOMETHING running. There are many worthwhile products available, so take your time, look around, try things out, and then buy what you can really use.

Another trap to avoid is trying to do EVERYTHING on your computer. You can do it, but there are certain tasks for which the computer will actually prove to be a hindrance. Just as you wouldn't take out your calculator to add five plus three, you shouldn't use your computer to write down a shopping list of five items. The pad and pencil will be faster every time. And you can't carry your ACE to the supermarket with you, anyway.

Bear in mind, too, that the ACE can only do one job at a time. Suppose that you decided to computerize your appointment book. Further suppose that you're using a text editing program on the first draft of a novel you're sure will win a National Book Award. The phone rings. Your literary agent wants to make an appointment for lunch at the Berkshire Place in New York. You're in trouble. Because your ACE is busily running your text editor program, your appointment book program isn't available. What to do? Forget the luncheon or destroy the manuscript? Either way, you've lost your chance for an award. The availability of computerized information is always a factor to keep in mind.

WHAT ARE THEIR LIMITS?

Personal computers are limited primarily by the quantity of data they can store and by how long it takes to gain access to that data. For example, the ACE will easily store several years' worth of history of an average checking account, but it will choke very quickly if you

try to feed it the payroll information for a Fortune 500 company. It just doesn't have the storage capacity for such a task. Even if it did, it wouldn't be able to give you the data very quickly. By the time you finished this week's payroll, the next week's would be due.

What does storage capacity mean? Imagine a filing cabinet with four drawers.You could probably store all of your family data in that cabinet with room to spare. It could hold all of your canceled checks, your medical records, your kids' old report cards, insurance papers, and the like. But if you were filing the customer information for your local electric company, you'd be lucky if all of the information on customers whose names begin with 'A' would fit in one cabinet.

So too with your ACE, except that instead of a filing cabinet, you have a floppy diskette, a sort of electronic filing cabinet. It stores information that you can later recall for viewing and updating simply by typing the appropriate commands on your keyboard. Theoretically, you could store an electric utility's customer files on a floppy disk system. Practically, it would be a disaster. You'd need several hundred (maybe several thousand) floppy diskettes (file cabinets) to hold all the information. Generally, if your data is of a personal or small business nature, you should be able to use your ACE effectively.

Be forewarned that somewhere, sometime, someplace, some enterprising young man who seems to know ten times what you do about computers is going to try to convince you that his program will make a jar of cider jump up off the table and dance the beguine into your refrigerator. Look this young man straight in the eye and ask him for references of people who are successfully using his program. DO NOT, under any circumstances, ask him for a demonstration. There's no telling what someone

might be able to make a computer do.

THEY WON'T BITE - BUT YOU CAN BITE YOURSELF

Even though computer types are always talking about bits and bytes (pronounced "bites"), most people aren't afraid that they're going to get bitten. But some people are reluctant to become involved with a computer for any number of reasons, and fear is probably one of them. If this applies to you, congratulations on getting this far. Since you have, you can relax now. There's really nothing to be afraid of. In fact, with personal computers, just the opposite is true.

One of the joys of using a personal computer is the feeling of complete control that you get by having the ON/OFF switch so close to your itchy fingers. You're in charge. You OWN it. Nothing is going to happen unless you make it happen. Your computer will do whatever you ask, whenever you ask.

As in all of life, however, this awesome power is not without some responsibilities. Since you're in charge, if something goes wrong, then you're probably the one who's to blame. Exercise some discretion when using the machine, and look at directions both as a way of developing a common sense about computers and as a way to put things together. Probably the most sensible approach is to treat your ACE, any attached equipment, and your diskettes as if they were an expensive stereo system and records or tapes. What you wouldn't do to your stereo and your record albums you shouldn't do to your ACE or your diskettes. If you keep that in mind, you shouldn't have any serious trouble.

THERE'S MORE TO IT THAN JUST THE COMPUTER

ADDITIONAL EQUIPMENT

If you thought the computer was expensive...

A computer by itself is akin to a car engine with no body or chassis. Their incredible capacity for gorging and disgorging data is useless unless you can type 10,000 words a minute and have a photographic memory. You're going to need some help in supplying and receiving this data as it's required and produced. You need more of the equipment generally known as "peripherals." They aren't really peripheral, though. They're essential. They're called peripherals because they're on the periphery, the outside boundary, of the main activity of the system, but they're much more than mere accessories. The computer simply won't function very effectively without them.

TVs AND MONITORS

The TV screen is to the ACE what a piece of paper is to a typewriter. Everything you type on your keyboard is also displayed on the screen. Also, everything that the ACE wants to tell you - the results of your calculations, the contents of a diskette, the score of the Dodgers' game - is displayed on the screen. A monitor or TV is absolutely essential. Without a display screen, you'll never be able to have two-way communication with your ACE.

A monitor is a trimmed-down, souped-up TV. It doesn't have a channel selector and antenna on it, but it does have a much sharper and clearer picture of the words that the ACE is sending out than a normal TV screen does.

Should you use a TV or a monitor? That depends on what you're primarily using your ACE for. If you intend to spend most of your time performing useful work on the machine, then you should use a monitor. If you're interested in color displays and those programs that make the most intensive use of color (GAMES!), then you should probably use a TV. You can still play games if you use a monitor. They just won't be in color. (At the time this manual was prepared, the ACE did not have a color capability. However, it is a planned additional option in the near future.)

If you do decide to use a TV, then you have to have another device, an RF modulator. The name sounds really exotic, but all it does is let you connect the TV to the ACE. Typically, it consists of a little box about as big as a pack of cigarettes. A cable similar to regular TV antenna wire comes out of one end of the box and plugs into the antenna connections on your TV. Another cable comes out of the other end and plugs into the video connector on the back of your ACE. Tune your TV to the channel suggested by the modulator manufacturer and away you go.

PRINTERS - FOR HARD COPIES OF WHAT YOU DO

A printer is simply a typewriter without any keys on it. After all, why would you need another set of keys when you've already got a nice keyboard on your ACE? With a printer, you can transfer the results of your work to a piece of paper.

Why would you need a copy of your work on paper when you can easily see it on the screen? Well, screens are terrific when you're using your ACE to browse through files, look at the contents of a floppy diskette, or perform a simple calculation. The ACE can put the data

that you requested on a screen much faster (and more quietly) than it can print it. If, however, you want a permanent record of your data, the screen hardly suffices. What if you want to give a copy of your work to someone? Are you going to send them a Polaroid snapshot of your screen? You want a paper copy of your results, and for that you need a printer.

Printers aren't only good for giving copies of your work to other people. They also help to solve a problem sometimes called "window vision." When you're browsing through a multi-page document by viewing it on a screen, your overall view of the document is limited by the number of lines of text that can be displayed on the screen, normally 24. "Window vision" can be aggravating when you're constantly flipping through the document to cross reference information on one page with information on another page. A printer will solve this problem by allowing you to spread the physical pages of the document out on your desk to have instant access to all of the required information.

You should consider attaching a printer to your ACE. But which one should you buy? There are hundreds available. For the highest price/performance ratio, the Epson MX-80 is a good bet. It's not as fast as some of the others, and it can't produce letter quality documents, but at 80 characters per second, it's fast enough for most uses. Besides that, it's compatible with most programs, and there are good manuals to help you with them.

Don't rush out and blindly buy an Epson without looking around a bit first, however. There are a number of printers in its price class that your dealer can show you. If you need a high quality printout such as you'd get from a Selectric TM typewriter, for example, the Epson won't do. Decide what you need before you buy.

If you do buy a printer, you'll have to get several other items before you can use it. You'll need a printer interface card, a cable, and, of course, paper and ribbons. What's a printer interface card? Remember how, if you wanted to use your TV as a display, you had to get an RF modulator? Well, a printer interface card permits a similar arrangement. Your printer cable connects easily with your printer, but there's no place on the ACE to plug in the other end. The printer interface card solves this problem. It's nothing more than a plastic board made about the size of a 3 X 5 index card.

Although you should follow the directions when putting it in, installation is only a little more tricky than plugging in a toaster. Once the card is plugged into the ACE, you'll have a connector where you can plug in the free end of your cable. Presto! Your printer is now connected to your ACE.

DISK DRIVES - UNLESS YOU LIKE TYPING THINGS TWICE

Typing things twice is fine if you're learning how to type, but otherwise, it's a waste of time. You might be wondering why you'd have to type things twice if your computer has a memory. Well, it does, but the memory in the computer itself is very forgetful. When the switch goes off, it forgets everything. Poof! If you want to retain what you've typed in, you've got to get it out of the computer's memory and copy it onto floppy diskettes, your files.

Information stored on a diskette isn't lost when you turn the power off. All you have to do is instruct the computer to empty its memory onto the diskette before you turn off the power. Then, when you need the information

again, you can instruct the disk drive to read what's on the diskette back into the computer's memory. Voila! Whatever you typed in before is now back in the computer so that you don't have to retype it.

Your disk drives are the electronic file transcribers and filing clerks. The disk drives record and correctly file information for you on your diskettes. Because the files are electronic and not on paper, the filing system remains invisible on the diskette, but don't worry because you can't see it. Your computer and disk drives can find and retrieve your files more quickly than you can find a file folder in a filing cabinet drawer.

There is no limit to the number of diskettes you can have for your disk drive. You can only have one diskette in the drive at a time, but your supply of diskettes is limited only by your financial resources.

How many files can you put onto a single diskette? Well, how many file folders can you put into a file drawer? It depends on how big the file drawer is, what kind it is, and how big the file folders are. The same thing is true with diskettes. Just as there's a limit to the number of file folders you can stuff into a file drawer, there is also a limit to how many files you can record onto a single diskette. Don't worry too much about ultimate limits, yet. There's room for plenty of different files.

You really can't live without a disk drive. In fact, you'll find life much easier if you have two disk drives. Two drives are more than twice as good as one. Copying data from one diskette to another for backup purposes is much faster and easier with two disk drives rather than one. Making backup copies of files may not seem crucial but, in fact, it is. There'll be more about it later. Some personal

computers let you use a tape recorder for data storage, but the ACE does not. The reason is that the cassette tape method is a very, very slow and cumbersome system. It offers very little flexibility and can't be used at all in many applications.

You have your choice of many different disk drives. By far the most widely used are the drives commonly referred to as 5-inch floppy disk drives. There are smaller drives (not too many) and bigger drives (a good many), but the 5-inch gives you the most bang for the buck.

The bigger drives are physically larger and they store more data. The 8-inch floppy (standard) disk drive is actually about twice as big as the 5-inch in terms of size, data capacity, and price.

The next step up from a standard floppy is called a "hard" disk, typically a Winchester type. Without going into great detail, a 5-inch Winchester will store about 50 times more data than a 5-inch floppy and you can store and retrieve the data at a much faster rate. As you might expect, the price for this kind of performance is high, especially when you consider that in most systems, the Winchester doesn't completely replace floppies. You still need a storage device (either floppies or a special high-speed tape device) to "backup" the data on the Winchester. A Winchester disk is NOT physically removable from the drive itself, so whatever happens to the drive also happens to your data. Backup becomes twice as important.

Don't get too excited about 8-inch floppies and Winchesters. They present the typical first-time computer user with a lot of problems, only some of which have been mentioned here. Some are solvable, but none are cheaply solvable. Buy a 5-inch floppy disk

system, learn it, use it, and then you'll be ready to investigate the next step up.

VIDEO CARDS - FOR LINES LONGER THAN 40 COLUMNS

As you already know, your ACE is capable of displaying text on your TV or on a monitor screen. The quantity of text you can display on your screen at any one time is limited by the capabilities of your screen and your eyesight. The standard ACE can put up to 24 horizontal lines of text on the screen, with each line containing up to 40 characters. This works out to be a maximum of 960 characters on the screen at any one time. Sounds like a lot, doesn't it? Unfortunately, it's not. And what if you want to see more? There's a way.

Most programs handle this problem by providing you with a 'scrolling' or 'paging' capability. Imagine a long document. Further imagine the document broken up into 'pages,' each 24 lines long. You choose which page (set of 24 lines) that you want to look at at any particular time. Usually, you don't have to worry about specific page numbers, because most programs can give you the ability to move through the document a page at a time in either of two directions. You can ask to see the previous page or the next page. This process is called paging.

Scrolling is similar, except that you move through your document one line at a time instead of one page at a time. For example, if what you see on the screen represents the 10th through the 33rd lines of a document and you scroll forward, you will then see lines 11 through 34. If you scroll backward, you will see lines 9 through 32.

You can scroll horizontally, too. Suppose you're working on a document that's 80 columns

wide. Since the ACE can display only 40 characters on a line, you wouldn't be able to see all of the columns at one time. You'd have to scroll the screen right and left to view data outside the range of the original 40 columns. Unfortunately, this horizontal scrolling isn't as useful as vertical scrolling. Your data may seem disjointed because you'd see half of the first line, half of the second line, etc. the whole way down the screen. If data on any particular line has to be interpreted in context with data on the preceding line (as is the case with most text) then what you see can be very confusing.

You'll soon discover that the majority of computer applications are easier using a line anywhere from 60 to 80 columns wide. Since your ACE will only give you 40 columns, this presents a problem.

One solution is to allow each line of text to "wrap" around to the next line as soon as you get to the 40th column so that anything beyond the 40th column is displayed on the line below. Much of the time, this can be very effective. In fact, if you never knew that it was possible to display 80 characters on a line, you might be perfectly satisfied with only 40 columns. However, you do know that you can display 80 columns, so you might as well know that 80 columns are terrific. Once you try the larger display, you'll never want to go back to 40. You really should get a video card that will give you an 80 column display.

To get 80 columns, buy an 80 column video card, throw away your TV, and buy a monitor. You probably expected having to buy the video card, but the news about the TV might come as an unwelcome surprise. Unfortunately, you'd never be able to read the display if you tried to cram 80 characters on one line of a TV screen. Because the monitor is capable of displaying a clearer and sharper picture than the TV, the characters will be easy to read -

as long as you get a good quality video card.

A video card looks much like a printer interface card, except that it's a little bigger. You install it into your ACE in the same manner. Follow the directions for installation that come with the card and you shouldn't have any trouble.

There are several such video cards available today, each with different advantages and disadvantages. Probably the two most important things to look for in selecting a video card are: 1.) the quality of the display it puts on the monitor screen, and 2.) the number of programs that will work properly with it. These vary, so be choosy.

The quality of the display is a matter of how clearly the card displays 80 character lines on the monitor. It's not easy to accomplish this task, as many a bankrupt video card maker will confirm. Spend some time using a system with the card that you are thinking about buying. Pay particular attention to any symptoms of oncoming headaches, eyestrain, or seasickness, as you read your screen full of 80 character lines. This is Video Card Test 1. If none of these symptoms develops, and you can easily read the text displayed using your card (make sure you try lower case characters, too), then the card passes Test 1. Continue on to test 2.

Test 2 is called "will it work with the programs I'm going to want to use?" Your dealer should be able to answer that question. You see, the video card makers all do things a little bit differently, while the program writers are busy doing things even more differently. This creates some finger pointing and, more importantly, many incompatibilities. Again, it's best to try the card with your programs before you buy it.

These are the ONLY two qualities that you should look for in buying an 80 column card. Don't let yourself be confused by the endless variety of miscellaneous features that the various card manufacturers try to impress you with when they're touting their products. (Unless, of course, you really care if your video card can whistle "Dixie"' in which case, that's the card for you.) In particular, since you've bought an ACE, you already have the lower case features found in many video cards. You don't have to pay for them again as an extra video card feature.

If you want some advice, go out and buy a Videx Videoterm (with the optional switchplate or soft switch accessories) or a Vista Vision-80. These cards don't whistle "Dixie," but they're good 80 column cards.

COMMUNICATION DEVICES - FOR TALKING TO ANOTHER COMPUTER

The purpose of this section isn't to establish a social life for your new machine. Actually, communicating with another computer is one of the more important things you can do with your ACE. In fact, for many people, this telecommunications ability is the only reason they bought a computer in the first place.

You can hook your ACE up to your standard telephone, dial the number of your neighborhood computer center, and start sending and receiving information back and forth. This is an amazingly powerful setup. You now have access to a computer which is very big, very powerful, and way beyond the means of any individual just by calling it on the telephone.

Somebody else buys it and takes care of it. You just use it occasionally. Since a big computer can conceivably be hooked up to many people at the same time, the costs of the big machine are distributed among everyone who uses it. This translates to cheap. In fact, in some cases, it translates to free (except for the cost of the phone call).

Once you're connected to the big computer, you can instruct it do things for you, just the way you do your ACE. A wide variety of services are available to lonely people out there who like to call up computers. Typically, you buy the service from a dealer, who gives you a phone number to call, some identification numbers so that the big computer will talk to you (it won't, unless its humans know where to send the bill), and instruction manuals.

As usual, there's a catch, one very similar to those you've seen before. You settle up with your dealer, run home all excited to call up big brother for a chat, try to plug the

phone into your ACE, and say "Hold on here. Where do I plug the phone in?" Well, unless your dealer has sold you a telephone interface card, you can't. Just as the printer did, the telephone needs an interface card. Computer people being the way they are, though, the telephone interface card isn't called a telephone interface card. You have to learn a buzzword - modem - if you want to buy one. Tell your dealer you want a modem and he'll know what you're talking about.

You plug the modem card into one of the slots in the back of the ACE (now you begin to see why there are so many slots back there), connect a cable to the card, run it out the back of the ACE, and - look out! Here it comes! How do you connect it to your phone? You have two choices, depending on which type of modem you bought.

The first type is called a "direct connect" because it connects directly into your phone line. Where? Into the little outlet jack on your wall that your phone plugs into. With a wall phone, the little jack is hidden behind the phone. If you don't feel like unplugging your phone and plugging in your modem every time you get the urge to call the big computer, call your local phone company and have them install an extra jack for you. It's not too expensive. The only problem is the hassle you generally get if you tell the phone company that you want to hook your computer up to their precious lines. This unpleasant encounter can be avoided. If you don't tell, we won't.

The second type of modem uses what's called an "acoustic" connection to the phone. Instead of directly wiring the modem card into the phone line as in direct connect, you establish the connection by letting the modem use your telephone handset to "talk" and "listen" just as you would through the sound coming out of and going into your handset. This

takes an acoustic coupler, a little more hardware than just an extra wall jack. This coupler is a box with two foam rubber rings on it and a cable coming out. The handset of your phone plugs into the rubber rings, and the cable plugs into your modem. With that done, you're all set.

Which type should you buy? The acoustic method is usually cheaper. It is also less reliable, and it can't provide you with as many features. If you can afford it, buy the direct connect type. It's easier to use and you'll be able to do more with it. If you do decide to buy a modem, you should consider two products: the Micromodem II TM, manufactured by Hayes Microcomputer Products, and the Apple-Cat II TM, manufactured by Novation, Inc.

A word of warning: Don't buy a modem unless you already have a disk drive. Modems come supplied with diskettes that contain programs to instruct the ACE how to communicate through the modem. Without a disk drive, you won't be able to get the modem instructions off the diskette, and your modem card will be worthless.

COMPUTERS IN A COMPUTER - IF ONE IS GOOD, TWO IS BETTER

Your ACE is a very powerful machine. With it you can take advantage of a huge library of programs. You can buy almost any conceivable device to attach to it. You can even attach yourself, if you want, to a club of fellow computer users. You should be happy. You should be satisfied with what you bought. Most people are.

Some people, however, are never satisfied. They want more and sometimes they can find a way to get it. Well, a certain group of

malcontents found a way to get what they wanted and every ACE user is better off for it.

Imagine computers as foreign countries, each with its own language. Computer A understands Swahili, computer B speaks French, and so on. What this means is that computer A can't understand the same set of instructions as computer B. In this Tower of Babel, the sets of instructions are called programs, and the computer that understands "Bonjour" doesn't understand "Uhuru."

Let's further suppose that Joe Coder has come up with a fantastic idea for a program. It's so terrific that the world is going to beat down his door trying to buy it. Joe Coder is going to get rich! Well, not just yet. First Joe has to develop the set of instructions (the program) that will make the computer do what he wants it to do. That's not easy, and that's why people will pay Joe handsomely for his efforts. Unfortunately, Joe has a problem. Since computer A will not understand a program written for computer B, which computer should he write his program for?

Well, Joe isn't stupid. He develops the program for the computer that he thinks will give him the largest market for his program. This is fine for Joe, but not so good for you, unless you share Joe's preference in computers.

In the personal computer field, there are two major types of computers (countries, if you will). There's the type used by the ACE and the type known as "CP/M" systems. CP/M systems encompass a large variety of computers, but they all understand the same language. Programs written for one CP/M system usually work on any other CP/M system. However, as you probably expect, programs written for the ACE type of machine will not work on a CP/M system and vice versa. This is unfortunate, because there are terrific programs written for each system that

half the personal computer owners simply can't use. But thanks to those who are never satisfied, a solution is available. Just plug a CP/M card into one of the slots at the rear of your computer and the problem goes away. All those programs will work on your ACE, and you won't even have any cables to worry about with this card.

What this amounts to is putting another computer inside your ACE. Just as your ACE is controlled by a microprocessor, this CP/M card is also controlled by a microprocessor, only a different kind. Referring back to the earlier analogy, the ACE is computer A running programs written in ACE language, and the CP/M card is computer B running programs written in CP/M language. This is a significant achievement. They even made it very easy for you. You don't have to know which one of those little devils in your ACE is running the program! All you do is stick in a diskette with the software you want to use, start the ACE up, and everything necessary to allow you to use that program is done automatically.

Which CP/M card should you buy? This decision is a little easier than some of the others you've faced, since there are really only three available. One is made by Microsoft. It was the original. The second one, made by Advanced Logic Systems, was introduced fairly recently. The third is made by Personal Computer Products, Inc. It is the newest of the three. Talk to your dealer, discuss the prices and features of all three, then take your pick.

PROGRAMS

Now that you've invested in a lot of expensive equipment, you may be shocked to learn in this, the last section of this chapter, that equipment alone - no matter how

sophisticated - is not all you need to operate your computer. Computers need programs.

Programs are easy to come by, but few people can really explain what it is that they have even after they get them. Nobody can tell you exactly what programs are, although everyone seems to be buying them, selling them, writing them, swearing at them, or pirating them these days.

The standard definition is that a program is a set of instructions to a computer. That's correct, as far as it goes, but what does it really tell you? Does it help you to understand "Pacman," the "computer errors" you get on your bank statement, and the workings of NORAD buried in Cheyenne Mountain in Colorado? Programs are involved in all of these but, people who write them probably couldn't agree on a definition more specific than the one just given.

Why can't people come up with a good definition of programs? First, you can't see, hear, touch, or smell them. Second, you'll never see the program itself, only the effects of the program on the machine. The program is for the machine's "eyes" only. Third, they're somewhat akin to a "life force" that lets a machine be productive when the electricity is turned on. Fourth, you really don't have to know what they are in order to use them.

The last point is probably the most important, and yet it's also the one that engenders the most profound suspicions and rankest uneasiness. But if you think about it, you use things every day that you don't really understand or feel compelled to define. What do you really know (or care) about the telephone signal, without which you couldn't reach out and touch someone? How about those electronic signals that come out of thin air to make your television set full of The Dukes of Hazzard or

Hill Street Blues or Live at the Met with Itzhak Perlman? You don't really need to know what a television program is in order to like or dislike it, to turn it on or turn it off.

So too with computer programs. The fact that they're also electronic signals is about as important and useful for you to know as is the fact that David Hartman is nothing but reconfigured electronic signals when you watch him over coffee in the morning.

Admittedly, when you use a computer program you're more involved in some of the intricacies of how it works than you are in the operation of the television when you sit down to watch a program. You don't really watch computer programs. You use them. You play with them. And, eventually, you develop a sense of what they are. Learn what they are inductively, empirically, not though a textbook definition or a muddled series of analogies that do as much to confuse as they do to clarify.

Just dive in. Start with the programs that came with your disk drive. These are very simple, utilitarian programs, and you'll master them quickly. Next, decide what task you'd like to take a stab at and go out and buy a program for it.

Be warned, however. Programs are expensive and they vary greatly in quality. Before you buy one, make sure it has some practical application to justify its cost, and be sure you're comfortable with the documentation that comes with it. If the manual or instruction booklet is written in computer gibberish, the program may be more trouble than it's worth. Look for lucid and complete explanations. Try before you buy.

WHAT YOU HAVE TO KNOW - THE SEVEN COMMANDMENTS (DEVELOPING THE UNCOMMON SENSE OF COMPUTERDOM)

Regardless of which computer you're using, you should observe certain precautions. Most manuals fail to tell you these things so you find out the hard way, perhaps after smoke starts pouring from the back of your computer. These commandments can save you from a lot of grief. Obey them or be prepared to endure the sweet noxious horror of silicon on fire.

I. ELECTRICAL POWER - DON'T CHANGE A BULB WITH THE POWER ON

Your ACE is an electrical device, so never fool around with its insides when the power is on. Never. Never. Never. Not only is it dangerous for you, but it can be very detrimental to your ACE.

One of the easiest ways to damage your computer seriously is to plug in (or take out) one of the interface cards while the power is on. You'll ruin something almost every time. Unfortunately, it's easy to forget this rule, especially when you want to try a new card or when you're fixing a problem that's been driving you crazy.

You'll have to train yourself to be good. Make a habit not only of turning off the power but also of disconnecting the AC plug in the back of the unit before you make any changes inside. Then, before you play around with a card, always check to make sure that the power cord is disconnected. Always. Force yourself.

Someday you're going to forget. Not even computerdom is free from sin. When you do, immediately turn off the power. Look for obvious signs of damage such as smoke or

glowing circuits. Whether you detect any damage or not, treat your system warily until you (or your dealer) can verify that it's OK. In particular, don't take chances with any of your important programs until you're sure that the system is functioning correctly. In other words, don't use any diskettes that you can't afford to destroy.

II. DISKETTES ARE NOT DRY CLEANABLE

Diskettes are very sensitive items. Treat them gently, tenderly. Imagine how you'd feel if a diskette containing a several hundred dollar program or several days worth of your typing was damaged. Unless you had a backup copy, you'd be out of luck. Here are a few simple rules you can follow to avoid mangling your diskettes.

1.) Don't let anything touch any of the exposed areas on the diskette.

2.) Do not bend, fold, staple, or otherwise mutilate your diskettes.

3.) Do not put a diskette in the oven or the refrigerator. More seriously, keep them out of the hot sun. Do not store them anywhere that you yourself wouldn't feel comfortable in a sweater.

4.) Keep diskettes away from magnetic fields. Some devices that generate magnetic fields are TVs, some monitors, telephones, and airport metal detectors. This means that you shouldn't lay your diskettes on, near, or under your display screen or your telephone.

5.) Keep diskettes clean and free of dust, but never wipe them with anything to do so. Pay particular attention to smoke. Try to refrain from smoking around your diskettes or drives because the smoke contains dust particles.

III. RESET SWITCHES ARE YOUR WORST ENEMY

Most personal computers have a treacherous little device called a reset switch. The ACE is no exception. The reset switch is in the upper right-hand corner of the keyboard. If you didn't know where it was, you'd never have any problems with it.

What's the RESET for if you're not supposed to push it? Well, there are times when a program can become so confused that it will stop talking to you. The program seems to go into never-never land. Why does this happen? That depends on the program, the computer, the diskette, the phases of the moon, the return of the swallows to Capistrano, all kinds of wacko things. It happens.

This is what the RESET is for. The RESET 'wakes up' the computer and gets it going again. The program can't ignore this wake up call. Regardless of what it's doing, it stops in its tracks and answers the RESET. Here's where you can get into trouble.

If the program was sending any data to the disk drive when you hit RESET, it will stop. This can wreak havoc with your diskette. It can wipe out everything on it. The reasons why it does this aren't as important as the results are. Unfortunately, it's not enough to tell you never to hit RESET whenever the disk drive's little red light is lit. You shouldn't, but this warning doesn't account for all the

possible cases of how the RESET can make a mess. In particular, if you've typed information into your ACE, but you haven't yet saved it on a diskette, hitting RESET may destroy all of the information that you've stored in the machine. The effect that this has on typical users is not pretty.

Here's a good rule to follow regarding RESET. Don't ever hit it. If you can't keep your fingers off it, then only hit it when you are COMPLETELY finished using whatever program you're running. Never use it while the program is sending something to or receiving something from a disk drive, or while it's holding some information for you that may or may not be on the diskette.

Incidentally, these same rules also apply to the ON/OFF switch in the back of the ACE. Turning the ACE off in the middle of a program or during disk activity is even worse than hitting RESET. Follow the same rule for turning the unit off, only adhere to it more strictly.

IV. AN ELEPHANT NEVER FORGETS, BUT YOU DIDN'T BUY AN ELEPHANT

No matter how hard you try, you'll never succeed in making a diskette last forever. They wear out eventually because all the time your drive is turned on (when the red light is on), a very hard ceramic device constantly rubs on the diskette turning in the drive. Sooner or later, ceramic prevails over plastic and the diskette wears thin in some places. In fact, the program or data on it will actually rub off.

Fortunately, this usually takes a long time. The key word here, however, is 'usually.' Since the diskette's longevity depends primarily on how you treat it, no one guarantees its performance once you've used it. The diskette's longevity depends on such things as how often you use it, whether or not your drive is properly adjusted, and whether or not you can keep your fingers off of the plastic surface beneath the diskette jacket. Never entrust your life, your data, or your time to a diskette. Not unless you back it up.

Backup, in computerdom, means to keep an extra copy of something, especially of diskettes. Once you have made a backup copy of any diskette (programs to do this are provided on your ACE master diskette), you can rest easy. When the original diskette goes bad (and you can bet your bottom dollar that it will) you'll have nothing to worry about. Just use the backup to recreate the original and keep right on going.

The second greatest joy in personal computerdom is to reach nonchalantly for your backup diskette when your original gives up the ghost. The first greatest joy is when the backup works. In numbers there is safety and reason to act blase.

Backup. Backup. Backup. To fail to do so is folly. What's worth more? The price of a diskette and the time it takes to make a copy, or the time (and/or money) it costs you to replace the data and programs on a diskette that gets damaged? Backup. Backup. Backup.

Believe it or not, however, there are programs out there that are expressly designed to PREVENT you from backing them up. They can't be copied unless you're a teenage computer genius with plenty of free time on your hands. You can try 'til doomsday and you will never make a successful copy of them. This may be a

user's manual, but when it comes to some programs that you buy off the shelf, you're more in a position of being used than you are of being a user.

What's worse is that some of these programs are downright diabolical! They fool you into thinking that you've succeeded in copying them. You spend ten or fifteen minutes typing data onto the diskette. Then, all of a sudden, just after you've typed in your 10,000th character (or some other magic number) the program checks itself to see if it's a copy. This is one function of the program that the programmer has tested and retested so that it works perfectly every time. When the program discovers that it is a copy, your program, along with your typed data, goes bye-bye. Fortunately, the ACE can't explode under program control, because some programmers will stop at nothing to punish you for making a copy of their program!

There is a way to fight back, though. You might not win the war, but you can go down swinging. All you need is a weapon, a program called a nibble copier. It's a cute name, but its purpose in life is malevolent. It's designed to copy uncopiable programs. Make that copy!

The problem is that a nibble copier won't take out everything you throw against it. Some programs are vulnerable to it; others aren't. There are a number of such nibble programs available, however, each capable of copying a different group of programs. By buying two or three nibblers, you'll have a pretty good arsenal to use against these ghouls. You still won't be able to copy every single program that comes down the pike, but you'll be successful a fair percentage of the time.

Unfortunately, nibble copiers are expensive, and they take time and skill to use

effectively. Two examples of high quality nibble copiers are Locksmith 4.1 TM and Nibbles Away TM.

There probably isn't any ideal solution to the problem, short of refusing to buy uncopiable programs. That's not practical, however, since nearly every program of any value has some sort of copy protection built into it. Someday, enough consumers will get fed up with this nonsense to put an end to it. It hasn't happened yet, though.

V. YOU CAN'T FIX IT BUT YOU CAN MAKE IT WORSE

The ACE is called a "pop top" computer because it's easy to pop off the top lid and get at the inner workings of the machine. Most other computers on the market are different; their manufacturers do everything possible to keep users from getting inside the machine easily. Like anything else, the pop-top design has advantages and disadvantages.

One advantage is that you can easily get to the slot connectors in the back of the unit by just lifting off the lid. This allows you to configure the machine with a wide variety of peripheral cards very easily. You can add and remove peripheral cards quickly and easily. The disadvantage is that you also have easy access to all of the other internal parts of the machine which you have no business fooling around with.

Be strong. Resist the temptation to touch anything in the machine except the cards that you plug into and out of the connector slots. A computer isn't like an electric lamp or a toaster. You won't find any loose wires that need reconnecting or any fuses that are blown. In fact, you can't service any of the components - so don't try, no matter how handy you may be working on a stereo. The ACE requires special equipment to test and repair; if you have any problems with it, take it to your dealer.

VI. YOU DON'T GET ANYTHING FOR NOTHING - TRY BEFORE YOU BUY

One of the first things you'll discover when you decide to buy additional equipment or programs for your ACE is that there are a lot of people out there anxious to part you from

your money. The accessory market for the ACE is tremendously large and varied. Anything you want you can find. The trick is to know exactly what you want. The solution is simple. Try before you buy.

A reputable dealer will be happy to demonstrate equipment or programs that you're interested in. Just ask him. Or better still, ask him to let you test out the product for yourself. If you want to remain friends with your dealer, though, try to limit your evaluations to the higher priced products. Don't expect your dealer to spend hours explaining the intricacies of every fifteen dollar game program in his library. However, if you're buying a three hundred dollar word processor, you have every right to insist on a trial run.

Unfortunately, no dealer stocks every product that might pique your interest; he'd need half your city's warehouse district just to store them. Fortunately, there are evaluation methods other than a trial run at your dealer's showroom. The first is to rely on independent reviews of the product published in one of the personal computing magazines. Two excellent magazines for reviews are Peelings and Softalk, both of which should be available at your dealer's. Other excellent publications for both reviews and general purpose industry overviews are Byte, Call A.P.P.L.E., and Nibble. You should consider subscribing to several of these publications.

Another alternative is to become involved with your local computer club. These are excellent sources of information, not only regarding the quality of available accessories but also for general purpose information (rumors, neat tricks, who's who, etc.). A typical club meets monthly, is very informal, and has low yearly dues. If you'd like to meet others of your kind, your dealer can tell you

where and when local clubs meet.

VII. THERE ARE CROOKS ABOUT THEM

Just as in any other business, there are computer houses of ill repute. Some people will try to sell you anything - whether it works or not. Be aware that ads in the personal computer field are no different from ads for any other consumer product. Be prepared for hype, some justified, some not. The computer industry is relatively young, but it does not take long for manufacturers to become sophisticated in the methods they use to entice potential customers to buy their products.

Everyone knows that sizzle and packaging sell units. Enter the marketing departments and advertising agencies. Almost every product on the market today is accompanied by very sophisticated, very slick advertising and professional looking packages. Be sure that you know what you're getting besides a slogan. Leather binding and gold letters do not a good program make.

You should also beware of prematurely marketed products, those that are advertised before they're ready for sale. One solution is to buy only products which you've tested or which are reliably recommended. In general, avoid buying anything whose performance is based on promise, and be leery of products whose usefulness depends on developments expected "any day now." In this industry, availability promises are, at best, hopes and, at worst, outright lies. If a salesperson guarantees 30 days, go back and see him in three months.

YOU

Program manufacturers are natural paranoids. In their zeal to "copy protect" their programs, they tend to regard all customers as potential thieves. They know you're going to backup their program, despite their best efforts to stop you, and that sooner or later, you're going to succeed. Once you do, you are a threat, since conceivably you could start to hand out copies of the program like candy to everyone you meet, thereby depriving them of deserved revenues. They know that they can't really stop you from making the copies, so they do the next best thing: they ask you to sign a licensing agreement when you purchase the program that specifically prohibits you from such dissemination of the program.

These licensing agreements typically stop just short of requiring you to sign away your life, your house, and your first born child. Nobody in his right mind would sign one of them. But personal computerists do it. Are they of unsound mind? Possibly, but signing a licensing agreement doesn't prove it.

It's just a matter of self-preservation. The manufacturer will not stand behind the program or help the customer with post-sale difficulties unless the customer signs and returns the license. Typically, the manufacturer won't even talk to you about any problems with the program unless they have your release on file. It's tough to be judged guilty until proven innocent, but the manufacturers have some legitimate concerns, too. For now, at least, you'll have to live with the situation.

US

We are not crooks.

MYSTERIES, UNCERTAINTIES, AND DOUBTS JUST MELTING AWAY

Many people find computers overwhelming, even threatening. Their own lack of knowledge about the machine scares them; it either stops them from buying a computer, or it prevents them from using it effectively once they get it. If you're suffering from such doubts, banish them. You really DON'T have to be a computer expert to be able to use one - and use it well.

YOU ARE NOT A PROGRAMMER - IT'S A DIRTY JOB

The ACE is not a programmer's delight; it is a user's delight. In fact, the ACE is a programmer's nightmare. That's why you spend all that money buying programs rather than spending your time writing programs. Many, many programmers have spent many, many hours to provide you with many, many programs. Take advantage of their efforts as much as possible, and spare yourself the headaches.

The place to continue learning about using your ACE after you finish reading this manual is with the manual for the program that you want to use first. DO NOT try to write a program as the first thing you do. There will be plenty of time later for you to learn how to program.

As you get accustomed to other people's programs, you'll probably come up with ideas for simple tasks that you'd like to write programs for yourself. The process is just like learning to write; you don't learn how to write until you learn how to read. Learn how to use others' programs before you try to write your own.

THE WORLD CAN LIVE WITHOUT BITS AND BYTES

This section of the manual will not even tell you what bits and bytes are. If you want to know, look in a dictionary of computer terms. You don't have to know these and many other specialized terms to be able to use your ACE effectively. Bits and bytes are just examples of terminology that serves no purpose other than providing a language of communication between two computer experts. You can use most programs popular today without knowing or caring about bits, bytes and all the rest of the jargon.

WHAT NOBODY KNOWS - THE BEST LAID PLANS...

As a new computer user, you should be aware of the "I am not crazy" syndrome. This malady typically strikes a person who has just taken his machine into his dealer's for repair of a problem, only to find that the machine works fine when he tries to demonstrate the difficulty. The repairperson then looks quizzically at the customer, who sputters, "I am not crazy. It really didn't work before!" This syndrome is so widespread in the personal computer industry that most old hands know that the quickest way to fix a problem is to try to demonstrate it to someone so they can fix it.

This is stretching the facts a bit. Most of the time, if the computer doesn't work at home, it won't work for the repairperson either. But the inexplicable does happen. Occasionally a program won't work the first time you try it but will work perfectly the next day. You may try to print something and nothing happens. Try it again, and, sure enough, it prints. These kinds of occurrences are rare, but something similar probably will happen to you sometime.

Problems of this sort aren't unusual or harmful unless they occur consistently with certain programs or peripherals. Persevere. Try whatever is giving you the problem several times. If it doesn't go away by itself, read the manual and try again. If that doesn't work, read the manual again and, finally, call on your dealer.

WHO YOU SHOULD KNOW - YOUR DEALER

Your dealer is probably your best ally if you want to get the most out of your ACE. He can offer you the support that you're going to need.

Your dealer and Franklin are a team whose goal is to offer you the most personal computing power for the dollar. You can rely on both to give you all the help you need.

The company will try to give you the information you'll need to operate the machine effectively. But it's impossible for any manual to answer every possible question that you'll have. That's where the dealer comes in. It's his job to answer your questions, solve your problems, and keep you abreast of new products. Keep in touch with your dealer.

SPECIFIC DISCUSSION - THE ACE 100

This section begins to present some details of computer operation specific to the ACE 100. You'll find out how to get the ACE 100 out of the box, set it up, turn it on, and be sure that it's working. You'll also learn about some ACE 100 features to be aware of.

WHAT IT IS

In terms of technical capability and price, the ACE 100 is about mid-range in the personal computer field. Its strongest feature is its compatibility with an APPLE II computer. The ACE 100 can use almost all peripherals and programs designed to work on the APPLE II. This is a very important feature, since there are probably more peripherals and programs available today for the APPLE II than for any other personal computer. This means that you have a huge selection of accessories and programs. If you want any particular capability, you can probably find someone, somewhere, who manufactures that application of computer technology in the form of a peripheral and/or a program.

COMPATIBILITY - THE GOOD, THE BAD, AND THE UGLY

Compatibility is a very volatile concept in the computer industry. Usually it means something different to the manufacturer than it does to the computer buyer. To the buyer, it means that if something works on X, and Y is compatible with X, then that something should also work on Y. Very simple. The buyer thinks compatible means "the same as." The manufacturer means it was DESIGNED to be 100%

compatible.

Did the manufacturer succeed in his design? Well, almost everything he's tried works. Does he know of anything that doesn't work ? Well, there are one or two programs that don't quite work. Watch out! You're about to come to grips with Murphy's Law of Compatibility: Proof of compatibility rests with the purchaser of the compatible product, not with the manufacturer.

Actually, Franklin doesn't claim that the ACE 100 is 100% compatible with an APPLE. Because the ACE has features not found in the APPLE, it is different. 100% compatibility is lost.

A good example is the keyboard. It produces lower case characters, definitely an advantage to the user. The APPLE lacks this capability. The differences in the ACE produce some compatibility problems. (There'll be more detail on the keyboard in another section.)

So, the ACE 100 is not 100% compatible with an APPLE. That means you're going to confront a problem now and then. Take solace in the fact that the advantages provided by the ACE's unique design more than make up for any problem you might encounter. Whenever possible, you'll find a warning in this manual about compatibility problems. You'll also find solutions.

THE ANCESTRAL TERRITORIAL IMPERATIVES OF THE TRUMPETER SWAN

Obviously, the title of this section is a bit bizarre. Its real title should be "LET'S GET STARTED," but that's such a disgustingly cute phrase that it has no business adorning any page. There's another more devious reason

for the incongruous title. Some of you out there would have turned to this section first if you saw that "Let's Get Started" title in the table of contents without getting your feet on the ground first by reading the introductory section. You may also have a bird fixation, but while that won't necessarily keep you from getting the most out of your ACE, lack of knowledge will. If you cheated, please go back and read the manual from page one or at least skim it to be absolutely sure you understand what's been discussed.

BEFORE YOU LEAVE THE DEALER'S

There are a few things you should bring home with you in addition to the ACE. Did you buy a floppy disk drive ? The ACE isn't much good without one. Did you buy some floppy diskettes? You should probably buy a box to get yourself started. Did you buy a printer too? Make sure you have a cable for it. And don't forget paper. Here's a short checklist of things to remember:

1.) The RF modulator? If you plan to use a TV as a screen, you'll need one.

2.) Do you have enough AC sockets where you're going to set your system up? You'll need at least two, one for the ACE and one for the TV or monitor. You'll need another if you also have a printer.

3.) Did you buy a game program that you can't wait to fire up? Then pick up a set of paddles or joysticks (your dealer can explain what they are).

IT'S OUT OF THE BOX! NOW WHAT ?

First, make sure you've got everything that you're supposed to have. Here's a list:

* the ACE 100
* this manual
* AC power cord (black, about 6 feet long)
* a video cable (thin, approximately 3 feet long, with a male plug on each end)
* a warranty card

And, if you bought a disk drive (or drives):

* the disk drive (or drives)
* the disk controller electronics card
* the disk cable (a broad ribbon about 2 feet long)
* a master diskette

GETTING IT READY

Make sure the power is off before you put anything together. If you haven't tried to connect the AC power cable yet, you should be OK. If you have connected it, disconnect it now.

GETTING THE LID ON AND OFF

Five screws along the back and sides of the ACE 100 hold the lid in place. Unscrew them and lift the dark brown lid off the base.

To get it back on, center the lid so that it lines up with the bottom piece and then press the back of the lid down firmly. Replace the five screws and you're ready to go.

ATTACHING THE CABLES

THE VIDEO CABLE

The video cable is easy to attach. This is the skinnier of the two round cables shipped with the ACE. It's got a little male jack on either end. Facing the keyboard, connect one end of the cable to the back right-hand side of the unit, near the bottom. There's a 1 inch by 1 inch opening in the back where you'll find a small female jack that will receive the male jack on the cable. Plug one end of the cable in there. It doesn't matter which end of the cable you plug into the ACE.

Now you have to attach the other end of the cable to your display device. If you're using a video monitor, the cable should plug right into a female jack similar to the one at the back of the ACE.

If you're using a TV as a display device, things are slightly more complicated. To connect the TV set, you'll have to use an RF modulator. Follow the directions that come with the modulator.

THE DISK DRIVES

The disk drives are only slightly harder to connect than the video cable. Locate the disk controller printed circuit card that was packaged with your disk drive. This is a rectangular piece of plastic 8 inches by 3 inches, covered with electronic components. You have to plug this card into one of the connectors on the main electronics card inside the ACE, so pop the lid off. Look inside the unit. On the floor of the main unit is a board strewn with electronic components. Toward the back, right up against the wall, you'll see eight black connectors. These connectors are called "slots." Look on the main board behind the slots to find numbers printed in large white numerals. These are the "slot numbers." You're going to plug the disk controller card into slot number six. But not quite yet.

First, look at the disk drive cable, a wide, thin cable that looks a lot like a ribbon. Notice that one side is colored black (or possibly red). Now take a look at the controller card and find the two connectors that are marked "DRIVE 1" and "DRIVE 2."

With the colored (red or black) edge of the cable lined up underneath the "D" of the "DRIVE 1" label, plug the cable into the two rows of pins on the connector. Be sure that both of these rows are plugged into the holes on the cable connector because if they're not, you may damage the ACE, disk drive, or both. If you have any doubts about this procedure, ask someone who has done this before to help you.

If you have a second disk drive, connect it to the connector on the disk controller card labeled "DRIVE 2." Follow the same procedure, only substitute "DRIVE 2" for "DRIVE 1." If you have two drives, it doesn't particularly matter which drive is connected to which connector on

the disk controller card, but you've got to remember which drive is drive one and which drive is drive 2 after the connection is made. The computer, the card, and the drive are all indifferent to how you decide to number them as long as you made the connections properly.

Now you're ready to plug the disk controller card into slot number six. The card has a little tab of plastic sticking out from one edge. This tab has many small gold-plated electrical contacts on it. They look something like tiny fingers. Plug this tab into slot number six so that the disk drive cable connectors are on the side of the card toward the back of the main unit. Route the disk drive cables to the very back of the main unit and out the back wall through one of the three vertical openings in that wall. Bending the cables won't hurt them. Make sure that the cables won't interfere with the closing of the lid. That's all there is to it. Your disk drives are now installed.

THE POWER CORD

Now you can plug in the AC power cord, as soon as you make sure the ON/OFF switch in the back of the unit is in the OFF position. The power cord is about 6 feet long, with a standard male plug for an electrical outlet on one end. In the back of the unit, on the left-hand side, there is a three-pronged connector for the power cord. Plug the female end of the power cord into the male connector on the ACE. Plug the other end into your wall socket and you're ready for business.

TURNING IT ON - WHAT IT SHOULD DO

Let's try it without any diskettes first, just to see if it's working. Turn the unit on using the ON/OFF switch on the back, left-hand side. Here's what should happen:

1.) The Power-On indicator in the top right corner of the keyboard should light up.

2.) The display screen should be cleared.

3.) The message "ACE 100 vX.X" should appear on the top line of the screen. (X.X is a version number which will change from time to time.)

4.) You should hear a beep.

5.) The red light on the front of disk drive 1 should light up.

6.) You should hear noises from disk drive 1 for a few seconds.

7.) The disk drive noises should stop and the ACE should stay this way until you tell it to do something.

At this point, the ACE is trying to read something from a diskette. Since there's no diskette in the drive yet, it can't read anything, although it will try to read the nonexistent diskette forever until it's told to stop. (The ACE can't tell if there is a diskette in a drive or not.) For the moment, just turn the machine back OFF now.

If all of this happens, then the ACE is working fine and you can skip the next section. If it doesn't, don't despair.

WHY IT MIGHT NOT BE WORKING

If it isn't doing what it should, go over this checklist and maybe you can find the problem.

1.) Is the Power-On light in the upper right corner of the keyboard lit? If it's not, then you're not getting power. Check the power cord connection, both to the ACE and to your electrical outlet.

2.) Is your display screen doing something strange? Check your video cable connection. If you're using a modulator to a TV, check your modulator connection. If the screen is "rolling" or "breaking up," then you might have to adjust your display device. Play with the horizontal and vertical hold adjustments on the screen. If it's doing nothing, check to see if it's plugged in.

3.) If the disk drive light didn't go on, check the disk drive cable connection. Also make sure that the disk controller card is firmly plugged into slot six on the main electronics board inside the unit.

4.) Is the display screen very dim? You can adjust this a bit in the ACE. Inside the unit, on the main electronics board in the back right-hand corner, is a small half-moon-shaped disk with a slot in it. It's near the video connector. To adjust video brightness, turn this disk using a small screwdriver. Be careful that your screwdriver doesn't touch anything else on the electronics

board. You could damage something. It's best to use a plastic screwdriver for this very reason.

If none of these measures solve the problem, then the unit might have something wrong with it. Do not attempt to fix it yourself. Take it back to your dealer or to a qualified repairperson and have him take a look at it.

WHAT ELSE YOU HAVE TO KNOW - HERE IT COMES, THE HARD PART

Details, details, details...

SAY HELLO TO YOUR KEYBOARD

Since the keyboard is going to be your primary means of entering data into the ACE, you're going to spend a lot of time pounding on it. You might as well get to know what it can do.

LOWER CASE AND ALPHA-LOCK

In most ways, the ACE keyboard works exactly like a standard typewriter. If you type characters without depressing the SHIFT key, you'll get lower case. When you simultaneously depress the SHIFT key and a character key, you'll get an upper case character. However, unlike a standard typewriter, the ACE has no SHIFT LOCK function, but it does have an ALPHA LOCK, which is slightly different. In a SHIFT LOCK mode, ALL the characters on the keyboard are shifted to either an upper case character or the top character on the punctuation keys. In the ACE's ALPHA LOCK mode, only the alphabetic characters are shifted to their upper case values; the punctuation keys are NOT shifted to their top characters. To enter ALPHA LOCK mode, just hit the LOCK key. The tiny red light on the LOCK key should go on to indicate that you're in ALPHA LOCK mode. To get out of ALPHA LOCK, just hit the LOCK key again. The red light should go out.

Although the ability to generate lower case is a distinct advantage, there are times that it can cause some problems. Certain

programs don't handle lower case characters properly. The reason for this deficiency is that these programs were written for use on an APPLE, which normally can't generate lower case characters. Some programs will actually modify every character the keyboard generates to convert all characters to upper case. The result is that, in some programs, you can't type lower case characters with your ACE, even though the keyboard is capable of doing so.

There's no easy solution to this problem. You can enter ALPHA LOCK mode and only type upper case characters. Or, if your program has an upper case only lock command, you can lock in upper case only mode and then type lower case characters. This works sometimes, because when the program is locked into upper case mode, it thinks that the keyboard can generate only upper case characters, so it won't modify the keyboard characters. If you still can't type lower case characters, then about the only thing you can do is to contact the program's manufacturer and ask for either a revised version of the program or a "patch" that you can apply to your version to allow lower case.

NUMERIC PAD

The group of twelve keys on the right of the keyboard is called the numeric pad. It consists of the ten digits, the "greater than" sign, and the decimal point. If you do a lot of typing of numeric data, you'll find you can type the numbers in much faster using the numeric pad than you can using the numbers on the top row of keys.

The ACE has several special keys that can make certain keyboard entries a little easier.

The BREAK key will generate a code that performs a "break" function in many programs. "Break" usually tells the program to abort whatever it's doing at the time. Whenever a program requires that you type CTRL C, you can hit the BREAK instead.

The PAUSE key performs the same function as CTRL S. The CTRL S key is normally used to make a program "pause" in whatever it's doing. For example, hitting CTRL S will temporarily stop the display of data on the screen. Typing the PAUSE key has the same effect.

The three keys just to the left of the numeric pad in the lower three rows of the keyboard (the minus sign, the plus sign, and the asterisk) are designed to speed the typing of commands to Visicalc, a very popular program which allows you to process financial data. These keys have special meanings in the Visicalc program.

KEYCODE DIFFERENCES

There are five keys that must be typed differently on the ACE than they would be on an APPLE. There is one key on the APPLE that CANNOT be typed on the ACE. The following chart lists these keys and shows how they are typed on the APPLE and on the ACE:

APPLE KEY(S)	ACE KEY(S)	HEX CODE
SHIFT M	SHIFT]	DD
CTRL SHIFT M	CTRL SHIFT]	9D
SHIFT N	SHIFT ^	DE
SHIFT P	SHIFT @	C0
CTRL SHIFT P	CTRL SHIFT @	80
CTRL SHIFT N	*** NOT AVAILABLE ON ACE	

Any manual or documentation for a program specifically written for the APPLE will refer to those APPLE keys at times. To type those keys on the ACE, just type the corresponding key from the ACE column of the chart. Unfortunately, if the program requires you to type a CTRL SHIFT N, you can't type that key on the ACE. Once again, the only solution to this problem is to contact the program manufacturer for help.

THE MASTER DISKETTE

If you bought Franklin disk drives, then you should have also received a master diskette. This is labeled "ACE 100 MASTER DISKETTE VX.X." "X.X" is a version number that will change from time to time. It's called a master because it contains a collection of programs that are very important to the operation of the system. You'll find that you'll need to use the programs on the master diskette more often than any other programs.

Before explaining everything that's on the master diskette, let's power up the system with a diskette in the drive. Here's how to put it in: (Put it into drive number 1.)

1.) To open the disk drive door, just put your finger under the latch in the middle of the front of the disk drive and lift up.

2.) Grasp the diskette on the label side and hold it flat so that the label faces up at the ceiling.

3.) With the label end still in hand, insert the diskette into the horizontal slot on the front of the disk drive. The diskette should go all the way in, but don't force it after it stops.

4.) Push the disk drive door down until it snaps shut.

Now turn the ACE on with the power switch in the back. Everything that happened before with no diskette will happen again now, except that now you'll see a few more things happen because the ACE has the diskette to read. Here's what it's going to do:

1.) After the disk drive starts reading the diskette (noises), the screen will clear for a split second. A character ("]") will appear on the bottom left corner of the screen for a few seconds.

2.) The screen will then clear again and you will see the title and version message mentioned earlier on the screen.

3.) Then a second message will appear. It will ask you to wait a moment while a particular program (usually a program called Integer BASIC) goes from the diskette to the machine. This takes about fifteen seconds.

4.) Finally, a third message will appear. It will say that the program mentioned in the second message is in the computer. Everything is now ready. The character "]" will appear in the bottom left corner of the screen.

What just happened is called a "disk boot." A disk boot is a very complex operation if you look at it in detail so for the time being, accept a simplified explanation of what happens.

When the ACE is first turned on, it looks to see if a disk drive is connected. If there is, the ACE will try to read a particular and absolutely essential program from the diskette. This program is stored on the diskette in a special way so that the ACE knows to read it first, as soon as the power comes on. Once the ACE reads this program, it will run it. Typically, when the first program runs, it reads in a second program which then runs in order to read in a third program, and so on, and so on... Finally, after all of the necessary programs are in the machine, the ACE will run whatever other program the diskette has been designed to run.

In the early days of personal computers, you had to type in complex commands to start up a program stored on a diskette. Nobody but computer people could remember the necessary commands. This upset many people, especially salespeople, who couldn't sell the machines because nobody could remember how to start them up. That's why the disk boot was invented. Now you don't have to type anything in. All you have to do is turn the machine on and sit back.

WHAT'S ON THE DISKETTE

Now that you've booted the master diskette, what can you do with your ACE? Unfortunately, not much. The master diskette contains a good many programs, but they're not programs designed to apply the computer's capabilities to any particular task. They're utility programs, necessary evils used to update, sort through, and shuffle the files you'll create with the applications programs that let you do word processing, financial management, data base management, and much more. Think of the utility programs as necessary functions that would not be necessary if you didn't have applications programs to

generate the data shuffled by the utilities.

Here is a list of the programs on your master diskette, along with a short description of each one. At this point, don't worry if you don't quite understand some of the descriptions. You may never use some of these programs. Others operate in such a way that you'll never have to know they're on the diskette. Also, keep in mind that Franklin will upgrade and enhance the master diskette from time to time. The following programs will probably always be on the diskette, but there may some additional ones or some slight name modifications on future versions.

DOS 3.3 This is the only program on the diskette whose name does not show up in the table of contents of the diskette when you use the CATALOG command (a command that lets you see what programs are on the diskette). DOS 3.3 manages and controls the operation of the disk drives for all other programs. You can't use your disk drives without it or an equivalent program. (Some application programs have a disk manager that performs the same functions.) DOS 3.3 is one of the programs that is automatically read in and run when you turn the power on and boot your master diskette. Generally, you can't even tell that it's running, but it remains in the machine until you turn the power off.

HELLO Like DOS 3.3, this program automatically goes from the diskette to run in the machine when you boot the master diskette. It's a very simple program. It displays the three messages that you see during the disk boot and reads the Integer BASIC (INTBASIC) program into the computer. HELLO does its job at power-on time and is never used again.

FPBASIC This is a program called Floating Point BASIC. It allows you to write other programs in a programming language called BASIC. It's an exact copy of the Floating Point BASIC that is always stored in the machine. The only reason it's on the diskette is for diagnostic purposes (One of the diagnostic programs uses this file for a check of memory contents.) You'll never actually use this diskette copy of the program.

INTBASIC This is a program called Integer BASIC. It also allows you to write programs in the BASIC language, although there are slight differences in capabilities between it and FPBASIC. This is one of the programs that is automatically read into the machine at power-on. You'll never have to explicitly run INTBASIC. Once it's read in, it usually stays in memory until the power is turned off.

FUD FUD lets you do such things as copy files, delete files, display the contents of a diskette, and perform several other fundamental file utility functions. You'll be using FUD often.

COPY COPY allows you to make copies of diskettes. This is the program you use to backup diskettes, and you should be using it frequently.

COPY.OBJ COPY.OBJ is a very small program that the COPY program uses to help it copy a diskette. COPY uses COPY.OBJ without your ever knowing it. You will never explicitly use COPY.OBJ.

CHAIN CHAIN is of interest only to sophisticated BASIC language programmers. It allows a program written in Floating Point BASIC to read in and run another program written in Floating BASIC. Don't worry about CHAIN. Most people will probably never use it.

BOOT13 BOOT13 solves a rather infrequent problem. Diskettes have been manufactured for the ACE in two "styles." The older style is referred to as "13-sector," and the newer is called "16-sector." The 13-sector diskettes were designed to be used with DOS 3.2, an earlier version of the DOS 3.3 program. 13-sector diskettes cannot be used with DOS 3.3 because DOS 3.3 presumes a 16-sector diskette. BOOT13 solves this problem.

Typically, the only time you use BOOT13 is when you buy a program that is distributed on 13-sector style diskettes. In most of those cases, the program manufacturer will explain how to use the program, including the use of BOOT13.

DIAGNOSTICS This program allows you to run diagnostics on your machine. Diagnostics perform checks on the machine to see if it's working correctly. If it's not, then the diagnostics may be able to tell you what's wrong. Although DIAGNOSTICS is easy to use because it instructs you in its use as it runs, interpreting its results requires a high degree of knowledge and experience. You'll probably never use DIAGNOSTICS. But, as you learn more about the system and understand some of its inner workings, the time may come when you'll want to run DIAGNOSTICS. If so, then you'll have it available.

PROMTEST.OBJ A program used by the DIAGNOSTICS program. It will test devices called EPROMS inside the ACE. You can forget about this one.

KYBDTEST.OBJ Another program used by the DIAGNOSTICS program. It tests the keyboard. Forget it.

MEMTEST.OBJ Yet another program used by DIAGNOSTICS. It tests the memory devices in the ACE. Forget it too.

DISKTEST.OBJ Ditto. It tests the disk drives. Forget.

PADLTEST.OBJ Ditto. Tests the game I/O connector (paddles). Forget.

HRESTEST.OBJ Ditto. Tests the graphics capabilities of the ACE. Forget.

PICTURE This is data used by the HRESTEST.OBJ program. Forget about it.

HOW TO USE THE PROGRAMS ON THE MASTER DISKETTE

This section describes how to use most of the programs on the master diskette. The descriptions are oriented towards a first-time user, so much unnecessary detail has been omitted. However, when you've completed the section, you should have a good grasp of the basic things that you can do with the master programs. You should also have a working knowledge of the most frequently used DOS commands.

The programs are presented in a logical order. There are good reasons to stick to the sequence we have selected. For example, before trying the examples in the DOS section, you should make a backup of your master diskette. To make the backup, you have to use the COPY program, so the COPY program is discussed first. Please read and practice with the material in the sequence in which it's presented.

HOW TO USE THE COPY PROGRAM

The COPY program lets you make duplicate diskettes - copy all the information stored on one onto another. This is the best way to make backup diskettes. To run the COPY program, boot up the master diskette as described above and then type in the command "RUN COPY" and hit the RETURN key. The COPY program will load and then begin executing.

The screen will clear and the COPY program version message will appear followed by the message "Loading..." "Loading" means that the COPY program is reading additional information from the master diskette that it needs to perform the copy operation. After 5 or 10 seconds, the "Loading..." message should be replaced with the message "Enter slot and drive #."

Below "Enter slot and drive #" is a message asking you to specify the "source slot." When you use COPY, you have to tell it which slot on the main electronics board contains the disk controller card. This message is asking you for that information. Throughout the rest of the description of the COPY program, we'll assume that you installed the disk controller card correctly, so that it's in slot six on the main electronics board. The COPY program assumes this too, so any time you're asked for a slot number, just hit the RETURN key. The COPY program will recognize the RETURN as meaning "use slot six."

So, in response to the "source slot" prompt, just hit the RETURN key. COPY will then ask you for the source drive number. This is the number of the disk drive that contains the diskette that you want to make a copy of. This can be either drive 1 or 2, but it's best to make a habit of always copying from the diskette in drive 1. COPY assumes this is the

case also, so just hit the RETURN key now, and COPY will be set up to copy data from the diskette in drive 1.

After you've specified the source drive number, COPY will prompt you for the destination slot number. Since you only have one disk controller card in the system, this is also slot six. Again, just hit the RETURN key and COPY will default to slot six.

Next you will be prompted for the destination drive number. This is the number of the disk drive that will contain the diskette that you want to copy to (the diskette that will contain a copy of the original diskette after the copy is finished). The answer to this prompt depends on whether you have one or two disk drives. If you only have one, then you don't have any choice; you must type "1." If you have two drives, you can type "1" or "2," but 2 is preferable; the next paragraph explains why.

Copying data from one diskette to another poses a slight problem if you only have one disk drive. You can't just read data from one drive and write it to another drive. You have to read one diskette, take it out of the drive, insert the other diskette, and then write data to the second diskette. This is both time consuming and error prone. Specifying drive 2 as the destination drive if you have two disk drives eliminates the problem. No diskette "swapping" is necessary; COPY can do its job without any help from you.

If you have only one drive, don't worry about which diskette to use and when to put it in the drive. The COPY program will prompt you along the way by asking you to insert either the source or the destination diskette at the appropriate times. Just be careful that you insert the diskette that is requested. If you insert the wrong one, you'll destroy data on

one or both of the diskettes. That could be disastrous.

After entering the slot and drive numbers for the source and destination disk drives, you will be asked "OK to start copy?" If the slot and drive assignments are OK, then insert the source and destination diskettes in their appropriate disk drives and type "Y." If you type "N," you will again be prompted to enter the slot and drive numbers.

After you type "Y," the message "Copying disk" will appear, along with an arrow on the source disk line indicating that the source diskette is being read. After about 10 seconds, the message "Formatting" will appear and the arrow will move to the destination disk line. This indicates that the destination diskette is being initialized in preparation for the copy. (There is a discussion of what "initialized" means in the DOS section of this manual. Don't worry about it for now.) After another 20 seconds or so, "Copying disk" will again appear and will remain as data is alternately read from the source diskette and written to the destination diskette.

If all goes well, the message "Copy finished" will appear, and you'll be asked whether you want to copy another diskette. If you answer "Y," you'll once again be asked for slots and drives to define the new copy operation. If an error occurs during the copy, a message will appear, and you'll be given the choice of abandoning the copy or trying again.

It's a good idea to reseat the diskette that caused the error and try again. Reseat means to take the diskette out of the disk drive and then reinsert it. If reseating the diskettes and retrying the copy still doesn't eliminate the problem, you probably have a bad diskette. You should replace it if it's the destination diskette. If it's the source

diskette, then something is wrong with it and you may have lost one or more files on the diskette. Use the FUD utility "copy files" function to try to recover the files on the suspect diskette.

A strong caution about COPY: Before you allow the copy to start, MAKE ABSOLUTELY SURE that you have correctly specified the source and destination disk drives. If you reverse them (and it's easy to do) you will DESTROY your source diskette! Don't wait to be burned. Make it a habit, right from the start, to double check your source and destination disk drives.

Now that you understand how to use COPY, use it to make a backup copy of your master diskette. In fact, make two copies. Then put the original away in a safe place and use only the two copies. That way you'll always have a good copy of the master; you won't inadvertently destroy your last copy by copying it incorrectly or doing something equally foolish - and likely.

HOW TO USE DOS 3.3

DOS 3.3 is the program you need in order to use your disk drives. When the master diskette is in drive 1, DOS 3.3 goes into the computer automatically as soon as you turn the power on. A lot of DOS 3.3 features are directed to programmers who are writing programs in BASIC, a programming language. This section assumes that you don't want to know how to use DOS as a programmer does, that you just want to perform some simple operations on your diskettes.

Not all of the DOS commands are listed here, only those that are particularly useful to non-programmers. These commands appear in their simplest format, so you won't find all the possible options and parameters of every command discussed thoroughly. For example, the command formats shown assume that the disk controller card is always plugged into slot six on the main electronics board and that you have a one or a two drive system. If this isn't true, you have to provide additional information with some of the commands. That information doesn't appear here, but it's available if you're really interested. Your dealer can help you select any one of a number of good books about DOS.

Before you can see what the DOS commands do, you have to know when and how to enter a command. First of all, the DOS program has to be running before you can give it commands. Unfortunately, it's not always easy to determine whether or not DOS is running. The simplest way to be sure is to power-on with the master diskette in drive 1 in order to boot up DOS. When you get the prompt character "]", you know DOS is running and you can enter DOS commands. More generally, if you've booted up with the master diskette, then any time either of the prompt characters "]" or ">" appears,

you can enter a DOS command.

You don't have to worry about what happens if you enter a DOS command and DOS isn't running. Probably the machine will beep and you'll see some sort of error message on the screen. Make sure you've got the master diskette in drive 1 and try again.

When DOS is running, type the command and then hit the RETURN key. You can type the command in lower case or in upper case, if you've booted up with the ACE master diskette.

If you make a mistake and type an incorrect character, hit the key with the arrow that points left so that you can back up over your error and correct it by typing in the right character. If you make so many mistakes on the command line that you want to forget the whole thing, hold down the CTRL key and type the "X" key at the same time (called "CTRL X"). This cancels the command so that you can start from scratch with the same command or try a new one.

Many commands require you to specify a file name. Whenever you see FILENAME as a part of a command, you can type in any file you please as long as you follow a few simple rules. File names can't be more than thirty characters long. The first character must be a letter, and none of the characters in the name can be commas, because they are used to separate file names from other things such as disk drive numbers. The commas you see in the examples must appear in the command exactly as they're shown here. "D1" and "D2" must be typed exactly as they're shown too, because they indicate to DOS which drive to go to in order to perform the command.

One more thing about disk drive numbers. As many of the examples show, you can enter commands without specifying a drive number. In those cases, DOS will automatically use what's called the default drive number, the number of the last drive used in a DOS command. If you're going to perform a lot of commands on one particular drive, you can type the drive number once and forget about it until you want to perform a command on a different drive.

You're about ready to try the DOS commands, so make sure that you've made a backup copy of the master diskette to use when trying out these examples. Go ahead and boot up with the copied master diskette. Read on and be ready to begin.

CATALOG - DISPLAY DISKETTE TABLE OF CONTENTS

```
CATALOG
CATALOG,D1
CATALOG,D2
```

The CATALOG command shows you names of all the files on a diskette as well as some additional information about each. In response to the command CATALOG, DOS displays the file names on the screen. Type CATALOG and then the RETURN key now. The names of the files on the master diskette should appear on the screen, each with its own line.

The first line of information presented is the message "DISK VOLUME NNN," where NNN is the volume number of the diskette. Most people don't ever use volume numbering, so don't worry about it now. It's just a simple method of identifying particular diskettes. On the ACE master diskette, the volume number tells you which version of the master diskette you happen to be using. The number changes as new versions of the master are produced.

File names appear under the volume number message. For example, in a typical file line such as:

```
*A 004 HELLO
```

"HELLO" is the name of the file. This will probably be the first file on your master diskette. The asterisk at the beginning indicates that the file is "locked." If the file is "unlocked," then no asterisk will appear in this space. The sections of this manual dealing with the LOCK and UNLOCK commands come a little later, so don't worry about them right now.

Another thing you don't have to worry too much about is the letter that appears after the asterisk. In case you're curious, though, "A" indicates that the file is a program written in Floating Point BASIC. There are others. File type "I" indicates that the file is a program written in Integer BASIC. File type "B" indicates that the file is written in assembly language ("B" stands for binary; it's a binary object file). "T" indicates that the file is not a program file, but a text file containing some sort of textual information.

You have to distinguish between different file types when you want to run a particular program. Depending on what file type it is, you'll use a different DOS command to run it. This will be clearer in a little while.

The last bit of information on the line is the size of the file. In the example, "004" means that the file is four sectors long. It's not important at this point to know what a sector is. What is important is that each sector can have up to 256 characters in it. "004" sectors means that the file containing the HELLO program consumes 256 times 4 characters or 1024 characters of diskette space. This isn't the exact size of the HELLO file, only an approximation. It really means that HELLO has more than 768 characters (256 X 3) but is less than or equal to 1024 characters (256 X 4) in size. (Keep in mind that this is an example only. The HELLO file on your version of the master diskette may have more or less than four sectors.)

One more point about CATALOG. Sometimes a diskette will have more files than the screen can display. When this happens, DOS displays the first eighteen names on the screen and then stops to let you see what they are. To see the next eighteen files, hit the SPACE bar. You can continue looking at each succeeding group of eighteen files until you've seen all the files on the diskette. If DOS is waiting for you to hit the SPACE for the next group of files, you'll see no prompt character "]" or ">" at the end of the file list.

RUN - RUN A BASIC PROGRAM

```
RUN FILENAME
RUN FILENAME,D1
RUN FILENAME,D2
```

You can run a type "A" or type "I" program using the RUN command. HELLO has a file type of "A," so you can use the RUN command to make it work by typing "RUN HELLO" and then hitting the RETURN key. The red light on the disk drive should come on, and you should hear noises from the disk drive. On the display screen, you'll see the same sequence of messages that you saw when you booted up the master diskette, since HELLO is the program that displays those messages.

What you've done is to run a program manually that runs automatically when you boot the master diskette. When you see the "]" prompt character at the bottom of the screen, HELLO has finished running and you can continue on.

Don't worry about hurting anything by trying to use the RUN command for a file that isn't type "A" or "I." DOS will recognize the error and just display the error message "FILE TYPE MISMATCH." No harm is done. All you have to do is try again.

BRUN - RUN A MACHINE LANGUAGE PROGRAM

```
BRUNFILENAME
BRUN FILENAME,D1
BRUN FILENAME,D2
```

Use the BRUN command to run a program with file type "B." You use it exactly the same way as you use RUN. Again, don't worry about hurting anything by trying to BRUN a file that is not type "B." You'll just get the "FILE TYPE MISMATCH" error message.

To try out the BRUN command, type "BRUN FUD" and then hit the RETURN key. This will run the program FUD, a type "B" program written in assembly language. When FUD runs, it will display a menu of possible operations. Since FUD is explained later, just hit the "Q" key to stop and leave the FUD program.

LOCK - PROTECT A FILE

```
LOCK FILENAME
LOCK FILENAME,D1
LOCK FILENAME,D2
```

The LOCK command will "protect" a file so that it can't be changed in any way. Once a file is locked, you can't delete it from the diskette, change its name, change any data in it, or add more data to it. It's protected from modification. You ARE permitted to read a locked file, though. For example, you can run a program file that's locked or copy the file to another diskette, but you can't change the file in any way. If you try to modify a locked file with a DOS command, you'll just get the error message "FILE LOCKED."

To lock a file, type the command "LOCK" and the name of the file you want to protect on the same line. From now on, the file is locked, and an asterisk will appear at the beginning of the line in which the name appears in the catalog.

All of the files on your master diskette are locked, so it serves no purpose to try the command at this point. It doesn't hurt anything to lock a file that is already locked, though. If you want, you can type "LOCK HELLO" and then RETURN. Nothing changes, but no harm is done either. Just look at it as computer calisthenics.

UNLOCK - UNPROTECT A FILE

```
UNLOCK FILENAME
UNLOCK FILENAME,D1
UNLOCK FILENAME,D2
```

If you want to change a locked file, you have to unlock it first. Type "UNLOCK" and the name of the file on the same line and then hit the RETURN key. Try it on HELLO. Type "UNLOCK HELLO" and then RETURN. If you now CATALOG the diskette, you'll see that HELLO has no asterisk in front. It's unlocked. Lock it again by typing "LOCK HELLO" and then RETURN.

RENAME - RENAME A FILE

```
RENAME OLDFILENAME,NEW FILENAME
RENAME OLDFILENAME,NEWFILENAME,D1
RENAME OLDFILENAME,NEWFILENAME,D2
```

At some point, you may want to change the name of a file. You can use the RENAME command to do this. For example, let's rename HELLO. Suppose you want to call it GOODBYE. Type "RENAME HELLO,GOODBYE" then hit RETURN.

What happened? If you followed the instructions, you should have gotten the error message "FILE LOCKED." Because the file was locked, DOS couldn't perform the RENAME function.

Do a CATALOG to check this. HELLO should still be named HELLO. Unlock HELLO as explained under the UNLOCK command and then try the RENAME command again. This time it should work. Do a CATALOG to check. HELLO should now be named GOODBYE.

Before going on, change it back to HELLO by typing "RENAME GOODBYE,HELLO" and RETURN. If you don't do this, the diskette will not boot up correctly later. While you're at it, you should also lock it again by typing "LOCK HELLO" and RETURN.

DELETE - DELETE A FILE

```
DELETE FILENAME
DELETE FILENAME,D1
DELETE FILENAME,D2
```

The DELETE command removes a file from a diskette. Once you delete a file, you can't get it back. It's gone forever. To delete a file, type "DELETE" and the name of the file on the same line and then hit RETURN. You can't delete a locked file; if you try, you'll get an error message.

Since all of the files on the master diskette are still necessary, there's no way you can practice using the DELETE command. If you've understood the use of all of the other commands, though, you should have no trouble using DELETE when you have to.

INIT - INITIALIZE A DISKETTE FOR USE

```
INIT FILENAME
INIT FILENAME,D1
INIT FILENAME,D2
```

The ACE can't use a diskette until it's been initialized. New diskettes have no information at all stored on them. But diskettes must have some control information written on them. This control information tells the ACE such things as what files are on the diskette, where the files are stored, and where there is unused space to store new files. The process of writing this control information to the diskette is called initialization. (Sometimes you'll also see initialization referred to as formatting. The personal computer industry uses the terms interchangeably, although there are some differences between them.)

There are three ways of initializing diskettes. The INIT command is one, the COPY program is another, and the format command in the FUD utility program is another. Use the INIT command if you want to initialize a diskette and set it up so that a particular program on it will automatically be run when the diskette is booted up. If you want to initialize a diskette and not put any data at all on it, then use the format command in the FUD program. If you want to make a backup, initialize the diskette using the COPY program.

Let's assume that you want to initialize a diskette and store a program on it that will automatically run on boot up.

Take the master diskette out of drive 1 and insert a new diskette. Make sure that you have a new diskette or one that you don't need when you try this INIT example. If you forget and leave the master diskette in, you'll erase

all of the data on it.

Now type "INIT HELLO" and then RETURN. The ACE will begin initializing the diskette in drive 1. This will take about ten to fifteen seconds. You'll know it's done when you get the prompt character on the next line (either the "]" or the ">"). The diskette is now initialized, but you're not quite done yet.

First, you might be wondering why you typed the file name "HELLO" along with the INIT command. The reason is that when a diskette is initialized, a file name is stored on the diskette in a special place. That program will be run automatically when the diskette is booted up. Remember the description of the disk boot process and the description of the HELLO program? Did you ever notice that the ACE ran HELLO during the boot instead of any of the other files on the diskette? It ran HELLO because, when the master diskette was initialized, the file name HELLO was specified in the INIT command. The diskette you've just initialized will tell the ACE to run the HELLO program when the diskette is booted up.

There's only one slight problem. This freshly initialized diskette has the name HELLO stored on it in some magic place, but it doesn't have any HELLO program file on it! If you now boot this diskette, you'll get the error message "FILE NOT FOUND" because you told the ACE to run the HELLO program during the boot without putting HELLO on the diskette. The ACE is a good machine, but it can't run files that aren't there. The HELLO program must find its way onto the newly initialized diskette.

There are two ways you can get it there. First, you can use the FUD program to copy the HELLO program on the master diskette to the new diskette. Try this second method, however. Put the master diskette in drive 1 and type "LOAD HELLO" and press RETURN. The HELLO program will

go into the computer's memory. Remove the master and put the new diskette back in drive 1. Type "SAVE HELLO" and press RETURN. The HELLO program is now on the new diskette.

You've performed these steps as an act of blind faith, since this manual doesn't explain the LOAD and SAVE commands. Those commands are really useful only to a BASIC programmer.

One more thing about this last stage of the INIT process should be mentioned. The program that you specify to run when you boot the diskette could be any program written in Floating Point BASIC. You can use HELLO or COPY or anything else written in Floating Point BASIC. Your choice depends on what you want to happen when the diskette boots.

HOW TO USE FUD

The letters FUD stand for "Franklin Utility for Diskettes." This program lets you remove old, unused files, make backup copies of files, determine if your files are all still readable, and perform other mundane but essential functions.

Really, there are three groups of functions: diskette management, file management, and quitting. (You shouldn't do the latter, yet.) Diskette management commands operate on the whole diskette at one time. File management commands operate on individual files or groups of files at a time. The quitting group consists of only one command, Quit. Whenever you want to stop using FUD, hit the BREAK key to go back to the main menu and select the "Q" (for Quit) command.

To run the FUD program, boot the system with the master diskette. (Turn off the machine, put the master diskette in drive 1, and then turn it back on.) When you see the "]" prompt at the bottom of the screen, the boot is complete and you should type "BRUN FUD," followed by a tap on the RETURN key. After several seconds, you should see the FUD title and version message (number) on the screen.

The version and title message will remain at the top of the screen the entire time you're using FUD, although the messages below will change, depending on what you and FUD are doing. Below the version and title, you should see the following menu:

```
                    MAIN MENU

          S-how files on diskette
          C-opy files
          D-elete files
          L-ock files
          U-nlock files
          V-erify files
          M-ake MASTER diskette
          F-ormat diskette
          Q-uit


          Please press letter for
          function desired:
```

This is the MAIN MENU. Remember the name, because it's where you return for a fresh start, and you'll hear it mentioned often.

The screen line where MAIN MENU now appears will always let you know what you're doing. (It's easy to get lost. It's dark inside a computer.) As you use each of the functions, this top line will change to indicate which function you are performing.

Select from these nine functions the one you wish to perform by typing its letter. As soon as you press a key, you'll enter that mode. You need not press the RETURN key after you type your selection.

Let's take a look at what each of those options does.

DISKETTE MANAGEMENT COMMANDS

FUD has two diskette management commands: "Make a master diskette" and "Format a diskette." Each of these commands affects the entire diskette.

Selection M - Make master diskette

This command allows you to create a diskette with a MASTER DOS on it. Why would you want to do that? After all, when you INIT a diskette, you put a version of DOS on it, don't you? Well, yes, but a diskette created with the INIT command can't be used on other machines that have less memory than the ACE. The version of DOS stored on an INITed diskette is specially configured for the amount of memory in the system that INITed it originally.

Making a master diskette solves this problem. The DOS stored on a master diskette will work on any system, regardless of the memory size. You'll be able to use the diskette on other ACE compatible machines such as the BASIS, Apollo, and APPLE.

The M command lets you transform an already formatted diskette into a master, indicate which file on the master diskette to run at boot up time, and what type of file it is. For this to work, you'll need a copy of the master diskette that came with the ACE and another diskette that has already been initialized using the DOS INIT command or the FUD F command.

The first thing that the M command asks you is:

> What drive should I get the DOS image from? (Press RETURN for drive #1)

The program wants to know which drive contains the master diskette. If it's in drive 1, just type RETURN. If it's in drive 2, type "2." The screen will now have this message on it:

> Please wait a minute while I load the DOS image into memory.

Whichever drive that you said contained the master will start to spin. In a few seconds it will stop, and this message will appear:

> What file should I run at boot time?

If you didn't get that message, then you got this one:

> I'm sorry, but there isn't a DOS image on that diskette.
>
> Press BREAK to exit, or put a MASTER disk into drive #x and press RETURN to try again.

This means that you probably don't have the master diskette in the same disk drive as the one you specified. Put the master diskette into drive number x (look at the message on the screen to tell what x is) and press RETURN.

Let's assume that everything was all right, and you got the "What file should I run..." message. Just type in the name of the file you want run (HELLO) and press RETURN. You'll then see this message:

```
At boot up time, should I:
  RUN the file (press RETURN),
  BRUN the file (press B), or
  EXEC the file (press E)?
```

If the program that you named in the last question is written in BASIC, then you want to RUN it, so just press RETURN. If you want to run a binary file, then press "B." If you want to EXEC the file, then type "E." EXECing a file is similar to typing in commands from the keyboard. The EXEC file contains commands to BASIC that BASIC reads in one at a time and executes. You'll have to consult a BASIC manual if you want more information about this.

After you answer that question, you will see:

```
What drive am I writing a MASTER to?
(Press RETURN for drive #1)
```

FUD wants to know which disk drive holds the diskette that you want to make into a master. If the diskette hasn't been inserted yet, don't worry. Go ahead and hit the RETURN key or a "2." The next message reads:

```
Please insert the disk to be mastered
into drive #x.  Press RETURN to continue
```

The number x is the number of the drive that you said contains the diskette to be mastered. Insert the diskette into the specified drive if you haven't already done so and then press RETURN. If you don't want to make this diskette into a master, this is your last chance to quit. Press the BREAK key to quit at this point.

If you press RETURN, the disk drive wil
come on for a few seconds, then the screen wil
print:

Writing DOS to disk. Relax a minute

And then, a little bit later, you'll see:

The diskette is now finished. If you
wish to MASTER another diskette, press
RETURN. If you wish to exit this
program, then press BREAK.

Congatulations. You have just made you
diskette into a master diskette. If you pres
RETURN to make another master, you can use thi
copy in place of the system master the nex
time you're asked to put a master diskette in
Pressing the BREAK key at this point wil
return you to FUD's main menu.

If you didn't get that last message, the
an error occurred. If the diskette was writ
protected (the little notch on the side of th
diskette is covered), then you got this erro
message:

The disk is write protected! Please
remove the write protect tab and
try again.

THINK BEFORE YOU DO IT! The diskette wa
probably write protected for a reason. Don't
take off the write protect tab if the diskette
has valuable information on it.

The other error message that you might ge
is:

Sorry, but I can't write to this disk.
It probably needs to be formatted.

The diskette probably was not initialized (formatted), although this isn't the only possible cause. If the diskette were somehow bad, you'd get the same message. Try reformatting the diskette, then try mastering it again. Remember that formatting destroys all data on the diskette!

After either error, you will see this message on your screen:

At this point, you have two options:

BREAK to exit this program, or...
RETURN to try again

If the error can be fixed immediately, then you'll probably press RETURN to try again. But if the error was caused by something like having an unformatted diskette, then you should stop and fix the problem. Pressing the BREAK key will return you to FUD's main menu.

Selection F - Format diskette

As you probably remember from the description of the INIT command in the DOS section, every diskette must be initialized or formatted before you can use it. The F command is almost the same as the INIT command, except that INIT puts a file on the diskette for you, like it or not. Using the F command, however, simply formats the diskette, leaving it empty for your use.

This is the first question format will ask you:

What volume number should I put on the diskette, press RETURN for normal 254:

The volume number is an identification number placed on each diskette when formatted. The number can range from 1 to 254, but most people use 254 since the program doesn't care and few people need a sophisticated reference system for their diskettes.

Now the computer will ask:

Which drive should I format?
(press RETURN for drive #1)

FUD wants to know where to find the diskette that it's supposed to format. Press RETURN for drive number 1, or press "2" for drive number 2. Don't worry, you'll have time to insert a diskette.

This message should now appear on your screen:

Please place the diskette to be formatted into drive #x and press RETURN to continue. If you wish to quit, then press BREAK.

If you've changed your mind about formatting this diskette, you can type the BREAK key and you'll return to the FUD main menu. Otherwise, be sure that you put the correct diskette into the drive specified, because formatting a diskette will destroy any information on it. Be sure that there is nothing important on the diskette! When you're sure, press the RETURN key and relax. The formatting operation will take about a minute. While the diskette is being formatted, you'll see this message:

Formatting diskette, relax a minute

You'll get this message when the format is over:

> The diskette is completed. It is formatted and contains a slave DOS. Press RETURN to format another disk, M to make a master disk or BREAK to exit.

The diskette can now be used to store programs or data. Press RETURN to format another diskette or the BREAK key to return to FUD's main menu. If you want to make the diskette into a master diskette, you can do so now by typing M. (See the section describing FUD's make master option.)

An error occurred if the message above didn't appear. You may have gotten:

> The disk is write protected. Please remove the write protect tab. Press RETURN to try again, or BREAK to quit.

You forgot to remove the piece of paper or plastic that covers the notch in the side of the diskette! But, as was the case with making a new master, before you take it off, try to remember what's on that diskette before removing the tab. Formatting will destroy whatever is on the diskette.

If you don't want to format another diskette, then press the BREAK key to return to the FUD main menu. Or you can put a different diskette into the drive and press RETURN. That would format the new diskette.

If you didn't get a write-protect error, then you got this message:

> Sorry, but I had an I/O error. Try reseating the diskette. Press RETURN to try again, or BREAK to quit.

I/O error is a catch-all phrase. It means "something went wrong." Exactly what went wrong is hard to determine. You might be able to correct whatever it was by reseating the diskette. Do this by opening the disk drive door (only when the red light is off), pulling the diskette out, putting it back in, and closing the door again. Believe it or not, this usually works. If you want to just forget the whole thing at this point, then press the BREAK key to go back to FUD's main menu.

FILE MANAGEMENT COMMANDS

FUD has six file management commands: Show files on diskette, Copy files, Delete files, Lock files, Unlock files, and Verify files. The commands all operate on either single files or groups of files.

Operating on single files presents no real problems, since you already know the conventions for specifying file names from working your way through the DOS section. But since FUD lets you operate on more than one file at a time, you'll need some special naming procedures if, for example, you want to lock all the files on a diskette. How can you specify a group of file names in a single command?

Whenever a file management function requires a file name, you can enter a single file name so that the command operates on that one file alone, or you can enter what's known as an ambiguous file name so that the command operates on a group of files. With ambiguous file names, more than one file meets the specification of the name you've created.

Now for the conventions. A file name is ambiguous if it has either of the characters "?" or "=" in it. These two characters have

special meanings to FUD. The "?" character means "any character is OK." For example, the file name A?E refers to all file names three characters long beginning with "A" and ending with "E." It wouldn't matter what the middle character was. All of these file names would fit the description A?E: ACE, APE, and AXE. The file names ICE and APPLE would not fit this description, the first because its first character is not an "A," and the second because it has more than one character between the "A" and the "E."

The "=" character is a little trickier. It means "any STRING of characters is OK." For example, a file name of A= means: any file name starting with the letter "A." All of the following file names would fit that description: ACE, APPLE, or ANTAGONISTIC. The file name BLARF=STUFF means: any file name which starts with the characters BLARF and ends with the characters STUFF. BLARF=STUFF would match files like: BLARFINGSTUFF or BLARF ME OUT STUFF or even BLARFSTUFF, in which case the "=" matches no characters at all.

Any number of "?"s and "="s can be used in a file name, as long as you can keep straight what the thing really means. For example, A?C=F=D means (take a deep breath): any file name starting with "A" whose third letter is "C," whose last letter is "D," and which contains an "F" somewhere between the "C" and the "D." As you can see, ambiguous names can become very obtruse quite quickly. What's not so obvious is the way they can get you into trouble.

It's possible to specify a file name that matches file names which you did not intend to include in the operation of the command. For example, by using an overly ambiguous name in a delete command, you could delete all of the files on the diskette because every file name matches your ambiguous description.

FUD will try to protect you against such a calamity. If you do specify an ambiguous file name, FUD will pose you the question "Ask before processing each file?" before it begins the command. If you answer "Y," FUD will ask you BEFORE it performs the command on a file if you really want that file to be affected by the command. If you answer "N," FUD will show you the file names as they are processed, but you won't be able to prevent the command from being performed on a file. It's a good idea to say "Y" to FUD. Then, if a file shows up that you don't want to be affected by the command, you can exclude that file from command processing.

If you answer yes, then as each matching file name is displayed a question mark will appear to the right of it. You have three options: press "Y" and the command will be performed on that file; press "N" and the command will NOT be performed on that file; or press the BREAK key and the command will be stopped completely.

When you specify a file name, if you enter just the file name and then press RETURN, FUD will automatically use the default slot and drive numbers. The default slot number is six. You should have your disk controller card in that slot, so you can always let FUD use the default slot number.

However, there may be times when you need to specify a particular drive number. As you'll recall from the DOS section, the default drive number is usually the last specified drive number. So, for example, if you last performed a command on drive 1 and now you want to do something on drive 2, you'll have to specify the new drive number along with the file name. You specify a drive number by typing either ",D1" or ",D2" after the file name to specify either drive 1 or drive 2.

Selection S - Show files on diskette

This command allows you to see what files are on the diskette. It's similar to the CATALOG command described in the DOS section, except that it lets you restrict the list of file names displayed to a specific file or a specific group of files by using ambiguous file names.

When you press the 'S' key, the screen should clear, then display this message:

```
            Show diskette catalog

which file(s)?
 RETURN for all files
 BREAK to abort
 ESC for help
Defaults: slot 6, drive 1, volume 0
:
```

Start by just pressing RETURN. Your disk drive number 1 should start up (the red light will come on) because the default is set to slot six, drive 1. The files on the diskette in drive 1 will then be displayed on the screen. The information displayed about each file is the same information that is shown when you type CATALOG. If you need to refresh your memory about CATALOG, refer back to the DOS section.

Instead of typing RETURN to the program's "show files" prompt, you could type a normal file name or an ambiguous file name instead. If you type a normal file name, FUD will display only that file in the catalog display. If you type an ambiguous file name, FUD will display all files on the diskette that match that description. If the normal file name is not on

the diskette or if no files match the ambiguous file name description, you'll get the message "*no files found.*"

If FUD must display more files than will fit on the screen, the flashing cursor will appear. Press any key except BREAK to have the additional files displayed, or press the BREAK key to stop the file display.

After all files are displayed, the total of all their file sizes will be shown, along with the number of unused 256 character sectors remaining on the diskette. The question "all done?" will appear. If you answer "N," you'll again be asked which files to display. If you answer "Y," the main menu of FUD will appear on the screen.

Selection D - Delete files

The "delete files" command performs the same function as the DELETE command described in the DOS section, except that with FUD, you can specify ambiguous file names. The prompt for deleting is the same as the prompt for the show files function. You answer it the same way, but this time you're specifying which file or files should be deleted instead of which files should be displayed.

The delete command will not delete locked files, and you'll get an error message if you try it.

Be particularly careful when using the delete command with ambiguous file names. Think of how easy - and painful - it is to wipe out entire diskettes this way.

Selection L - Lock files
Selection U - Unlock files

The "lock files" and "unlock files" commands perform the same functions on files as the LOCK and UNLOCK commands described in the DOS section, except that you can specify ambiguous file names with the FUD versions. The prompt for these commands is the same as the prompt for the show files function. You answer it the same way, except that this time you're specifying which file or files should be locked or unlocked instead of which files should be displayed.

Selection V - Verify files

The "verify files" command does just what its name implies: it checks selected files to make sure that they can still be read. This is primarily a confidence builder for the user. All that FUD does in the verification process is to read all of the file. If it can do so without any errors occurring, then you can be fairly confident that the data in the file is still intact.

The prompt for the verify command is the same as the prompt for the show files function. You answer it the same way, but this time you're specifying which file or files should be verified instead of which files should be displayed.

Selection C - Copy files

The "copy files" function lets you copy a file or a group of files from one diskette to another. You'll first be asked which files you want to copy. If you enter a normal file name, only that file will be copied. If you specify an ambiguous file name, all files that match the ambiguous description will be copied.

You'll then be asked which drive you want to copy the file or files to. If you press RETURN, the displayed defaults will be used. To change the default drive number, enter ONLY the drive number, just as you would after a file name. For example, to copy to drive 2, enter "D2."

If you want to, you can also change the default slot number or volume number at this point, although it isn't necessary. To do so, just enter the information as you would after a file name. For example, "S4,D2,V33" would specify a copy to slot 4, drive 2, volume 33.

If your source drive (the diskette you're copying from) is different from the destination drive (the diskette you're copying to), then the diskettes may remain in the drives throughout the copy process.

If you have only one disk drive, you must specify that drive as both the source and the destination drive. You will be prompted to place the source or destination diskette in the drive as the copy proceeds. Make SURE you don't place the incorrect diskette in the drive. This could ruin the diskette and you will DEFINITELY ruin the copying of that file.

If a file being copied already exists on the destination diskette, the message "already exists, replace?" will be displayed. If you answer "N," the file will be left alone; no

copy will take place. If you answer "Y," the file will be deleted from the destination diskette, EVEN IF IT'S LOCKED!

FUD Error Messages

This section lists some of the error messages that you might see while using FUD and tells you what to do about them:

oops, diskette is write protected

Remember the write protect notch on the edge of diskettes? If this notch is covered, you cannot write anything onto the diskette under any circumstances. This error message occurs when you try to delete a file on or copy a file to a write protected diskette. If you really want to modify the diskette, remove the plastic tab to uncover the write protect notch.

oops, wrong volume id

You'll see an error message when the volume i.d. you specified is different from the volume i.d. actually on the diskette. Specifying a volume i.d. of 0 will work for any volume i.d. on the diskette. Actually, since you don't have to specify the volume i.d. in any command, you probably won't be seeing this message.

oops, file is locked

This appears when you try to delete a file that's locked. Unlock it and try again.

oops, no more room on diskette

If you see this, the destination diskette you are copying to is full. Abort the copy and insert a diskette with enough room for the copy. You can determine the size of the file and the amount of free space on a diskette with the "show files" function.

oops, can't find that file

This should never occur in normal use. It might show up if you put the wrong diskette in the drive while you're doing a one drive copy.

oops, bad diskette or none in drive

This indicates that a disk error occurred when a drive was accessed. It probably means there is no diskette in the drive, but it also can be caused by a damaged diskette. If there is a diskette in the drive, open and close the drive door and try the operation again. If it still won't work, the diskette is probably bad. You should either reformat it or, if it's given you problems before, throw it away.

HOW TO USE BOOT13

The BOOT13 utility permits older DOS 3.2 diskettes to be used on the ACE. To boot an older 13-sector diskette, first run the BOOT13 utility by typing "BRUN BOOT13" and then hitting the RETURN key.

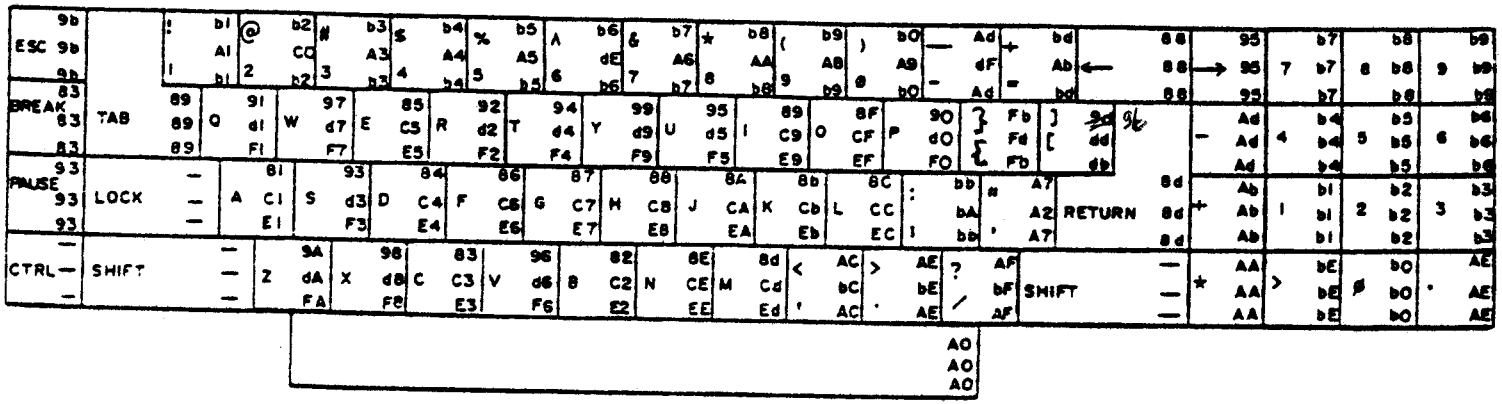
The screen will clear and the BOOT13 version message will appear, followed by a prompt for the slot number to boot from. Insert the 13-sector diskette into drive number 1 and then either press RETURN to use the default slot (six) or press the number of the slot which you want to boot from (one through seven). The red light should light on the drive with the 13-sector diskette in it. If it doesn't, you may have specified the wrong slot number or the diskette may be in drive 2.

In a moment, you should see the digit "0" in the upper left corner of the screen. If all's well, it will count up to 7 and then disappear. Your 13-sector diskette will then be booting. If the 0 remains, try opening and closing the door of the drive. If the 0 stays on the screen, either the diskette doesn't contain a good DOS 3.2 system or it may really be a DOS 3.3 diskette.

If the digit stops somewhere between 1 and 7, the diskette is probably bad. Try it again. If you still have trouble, discard the diskette.

APPENDIX A

KEYBOARD CODE MAP



"LOCK" IS AN ALPHA LOCK — IT CONVERTS ALL ALPHAS TO SHIFTED MODE (UPPER CASE).

CTRL-SHIFT WILL PRODUCE SHIFTED MODE CODES FOR ALL BUT TWO KEYS:
CTRL-SHIFT @ PRODUCES HEX 80
CTRL-SHIFT J PRODUCES HEX 9d

APPENDIX B

MONITOR PROGRAM - DIFFERENCES BETWEEN THE ACE AND APPLE II

This appendix details the program differences between the Franklin ACE computers and the APPLE II Plus computers. The versions of the ACE monitors used for the comparison are three - version 2.0, version 2.1, and version 2.2. Version 2.0 was shipped in most of the ACE 100 models, version 2.1 was shipped in the early ACE 1000's, and version 2.2 is the latest version for the ACE 1000. These are all compared to the Apple monitor known as the AUTOSTART ROM.

There are three primary areas of differences:

1.) The sign-on name and it's location has been changed.

2.) The cassette I/O routines in the APPLE are not present in the ACE.

3.) The ACE will recognize and display lowercase characters.

There was only one change made between versions 2.1 and 2.2. This was at addresses FD11-FD1A. To save space in the following table, version 2.2 is not listed in the version column except at those addresses. Everything elsewhere that is noted as applying to 2.1 also applies to 2.2.

ADDRESSES	APPLE HAS	ACE HAS	ACE VERSIONS
FAD5-FAD6	two NOP's	two bytes of 00h	2.0 only 2.1 has NOP's
FB09-FB10	title: "APPLE II"	8 bytes of 00h	2.0 & 2.1
FB64	title size byte	same but = 0Ch same but = 0Dh	2.0 2.1
FB66	title loc, low byte	same but = B2h same but = FDh	2.0 2.1
FB67	title loc, high byte	same but = FCh	2.1 only
FB69	start screen pos of title, low byte	same but = 0Dh	2.0 & 2.1
FBB3-FBC0	fourteen NOP's	title string = "ACE 100 V2.0" = C1, C3, C5, A0, B1, B0, B0, A0, F6, B2, AE, B0, 00, 00	2.0 only 2.1 has NOP's
FCC9	HEADR routine entry	RTS	2.0 & 2.1

FCCA-FCD5	HEADR routine body	twelve 00h pads	..0 & 2.1
FCD6	WRBIT routine entry	RTS	2.0 & 2.1
FCD7-FCDE	part of WRBIT body	JSR $FCE2 AND #$3F ORA #$40 RTS	2.0 & 2.1
FCDF-FCE8	more of WRBIT body	LDA $200,Y CMP #$E0 BCC $FCE8 AND #$DF RTS	2.0 & 2.1
FCE9-FCEB	end of WRBIT body	three 00h pads	2.0 & 2.1
FCEC	RDBYTE routine entry	RTS	2.0 & 2.1
FCED-FCF9	RDBYTE routine body	thirteen 00h pads	2.0 & 2.1
FCFA-FCFC	RD2BIT routine entry	three NOP's	2.0 & 2.1
FCFD	RDBIT routine entry	RTS	2.0 & 2.1

FCFE-FD0B	RDBIT routine body	fourteen 00h pads	2.0
		title string = "ACE 1000 v2.1" = C1, C3, C5, A0, B1, B0, B0, B0, A0, F6, B2, AE, B1, 00	2.1
FD11-FD1A	part of RDKEY routine	LDY $24 LDA ($28),Y PHA JSR $FCD7 STA ($28),Y PLA JMP ($38) DB 0	2.0 & 2.1
		LDY $24 LDA ($28),Y PHA JSR $FCD7 NOP STA ($28),Y PLA JMP ($38)	2.2

FD7E-FD83	convert to uppercase	six NOP's	2. & 2.1
FEAE-FEAF	two NOP's	two 00h pads	2.0 only 2.1 has NOP's
FEC3	one NOP	one 00h pad	2.0 only 2.1 has NOP's
FEC5-FEC9	five NOP's	five 00h pads	2.0 only 2.1 has NOP's
FECD	WRITE routine entry	RTS	2.0 & 2.1
FECE-FEEC	WRITE routine body	thirty-one 00h pads	2.0 & 2.1
FEED	WRBYTE routine entry	RTS	2.0 & 2.1
FEEE-FEF5	WRBYTE routine body	eight 00h pads	2.0 & 2.1
FEFD	READ routine entry	RTS	2.0 & 2.1
FEFE-FF2C	READ routine body	forty-seven 00h pads	2.0 & 2.1
FFAD-FFAF	LDA $200,Y	JSR $FCDF	2.0 & 2.1
FFCF	CTRL T vector B2h	same but = EDh	2.0 & 2.1

FFD2	CTRL S vector B2h	same but = ECh	2.0 & 2.1
FFE9	CTRL Y vector C4h	same but = C3h	2.0 & 2.1

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