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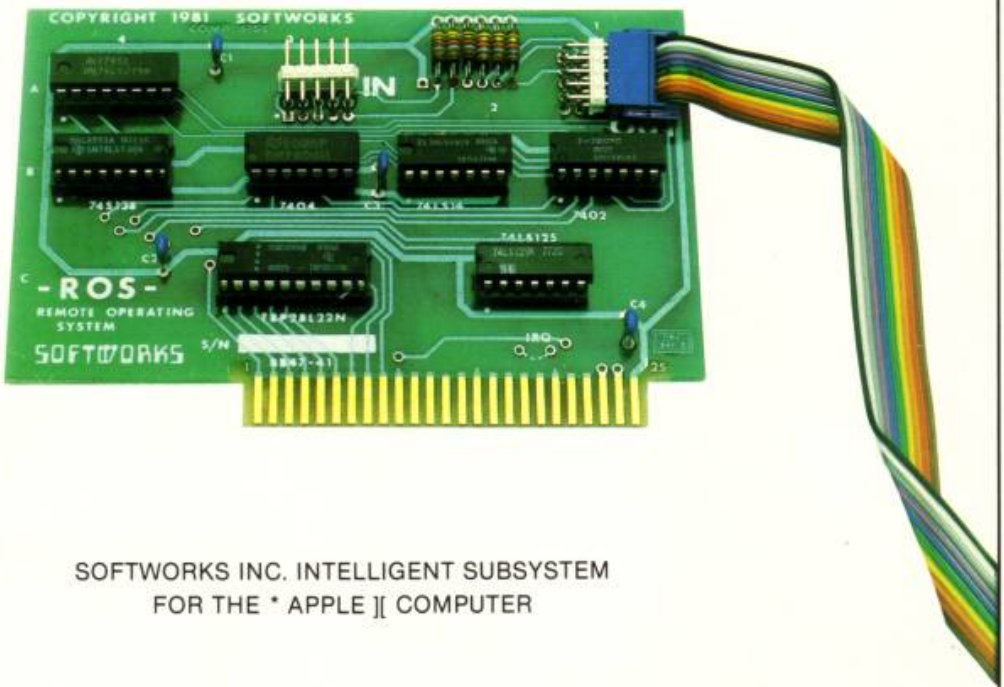
REMOTE OPERATING SYSTEM — DISK ACCESS CARD
"R.O.S."
INSTALLATION AND OPERATION MANUAL



SOFTWORKS INC. INTELLIGENT SUBSYSTEM
FOR THE * APPLE][COMPUTER

*APPLE][, DISK][, AND APPLESOFT ARE REGISTERED TRADEMARKS OF APPLE COMPUTER, INC.

REMOTE OPERATING SYSTEM (R.O.S.)™ DISK ACCESS CARD*

INSTALLATION AND OPERATING MANUAL

PLEASE READ THIS MANUAL BEFORE ATTEMPTING TO INSTALL THE DISK ACCESS CARD INTO THE APPLE][, FRANKLIN ACE 100, 1000 OR BASIS 108. INCORRECT WIRING COULD CAUSE PERMANENT DAMAGE TO BOTH THE DISK ACCESS CARD AND THE APPLE][, FRANKLIN ACE 100, 1000 OR BASIS 108. SOME FAMILIARITY WITH ENTERING COMMAND WORDS, OPERATION OF THE APPLE][, FRANKLIN ACE 100, 1000 OR BASIS 108 COMPUTER AND DISK SUBSYSTEM IS EXPECTED. PLEASE REVIEW THE OPERATION MANUALS PROVIDED WITH YOUR COMPUTER AND KNOW HOW TO POWER-UP AND OPERATE YOUR COMPUTER SYSTEM PRIOR TO INSTALLING THE REMOTE OPERATING SYSTEM. KEEP YOUR APPLE MANUALS AT HAND FOR EASY REFERENCE.

R.O.S. SOFTWARE AND HARDWARE WAS CREATED BY DOUG NERING, CHRIS MCCONNELL AND JAMES BUCANEK AS A SIMPLE AND ECONOMICAL MEANS OF SHARING DISK STORAGE FOR MULTIPLE APPLE][, FRANKLIN ACE 100, 1000 OR BASIS 108 COMPUTERS IN CLOSE PROXIMITY.

At the time of printing this manual, your Remote Operating System Disk Access Card is recommended for use with the APPLE][, Franklin Ace 100, 1000 and Basis 108 computers. Any reference throughout this manual to computer(s), disk drive(s), or authorized dealers is made in regard to all of, but not limited to, the computer manufacturers mentioned above and their authorized dealer program.

*** PATENT pending.**

R.O.S., AROS, and Remote Operating System Disk Access Card are registered trademarks of SOFTWORKS INC.

INSTRUCTIONS FOR UPGRADING FROM ROS 1.2 TO AROS 2.

To upgrade your R.O.S. operating system from ROS 1.2 to AROS 2.01 or higher, you will require the software diskette labeled 2.1 and be required to make a simple modification to your CENTRAL Disk Access Card.

Replace your current ROS 1.2 operating system diskette with AROS 2.1. Once the upgrade has been completed, it is not recommended to attempt downgrading to ROS 1.2.

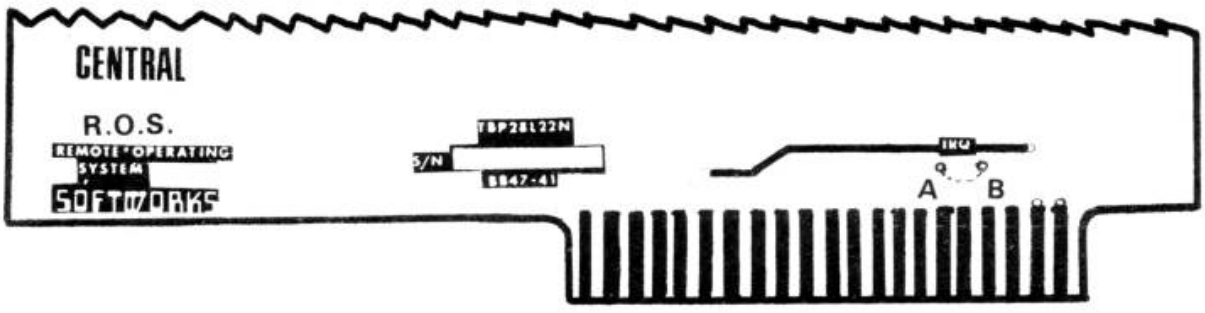
A simple modification to the CENTRAL Disk Access Card is required. DO NOT MAKE THIS MODIFICATION TO ANY OF THE REMOTE CARDS. The Interrupt Request (IRQ) on the CENTRAL card must be connected by being wire jumped prior to loading the AROS 2.1 operating system software. Please note in the diagram below that a wire must be soldered between the points marked "A" and "B" which represent the IRQ. Your CENTRAL card will indicate a dashed line (----) between these points for easier reference. We recommend any wire which may be inserted into the holes and will adhere to solder be used. It may be necessary to clear the holes of solder to insert the wire. If so, hold the wire with a pliers and heat the solder until the wire can be pushed through. Pull the wire out again before the solder cools. Repeat until both holes are clear, then proceed with the installation of the wire. Bend wire and place each end through one of the holes, pull each end through tightly, bend each end over on the back side of the board being sure not to touch any other circuit traces or circuit points. Solder each end for firm connection and trim any excess wire.

Install the modified card in the CENTRAL system and you are ready to BOOT the AROS 2.1 operating system. Please refer to the enclosed documentation which explains the operation of AROS 2.1 and new features available.

NOTE: Your R.O.S. network system will not operate with the AROS 2.1 diskette prior to the hardware modification, nor should you use the ROS 1.2 diskette after the hardware modification is completed.

Should you have any problems or questions, please contact your local authorized R.O.S. dealer or manufacturer.

DIAGRAM OF CENTRAL CARD



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The product Remote Operating System (R.O.S.)™ Disk Access Card is pending patent.

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. As temporarily permitted by regulation it has not been tested for compliance with the limits for Class A computing devices, pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

SOFTWORKS INC.

REMOTE OPERATING SYSTEM - DISK ACCESS CARD
R.O.S.
INSTALLATION AND OPERATION MANUAL

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(A) INSTALLATION

SYSTEM REQUIREMENTS

All computers must be Apple][* or Apple][+*, Franklin Ace 100**, 1000**, or Basis 108*** with at least one computer having an Autostart monitor and the Applesoft* language in ROM.
All Computers must have 48K of RAM Memory.
Minimum of 1 Disk Drive with Controller in Central System.
One R.O.S.**** Central Card in the Central System.
One R.O.S.**** Remote Card for each computer connected to the Central System.
AROS**** software.

COMPONENTS

One AROS Master diskette containing software
One or more Remote cards with connecting cables
One Central Card
One instruction manual (this one)
Warranty and Registration card

SOFTWARE

AROS
AROS SUBMENU
DRIVECNFG $$$
DRIVECNFG.TABL $$$
PASSWORD $$$
PASSWORD.DATA $$$
PASSWORD.COMP $$$
PASSWORD.MACH $$$
PASSWORD.TABL $$$
TURNKEY AROS $$$
INSTALL AROS $$$
BOOTER $$$
REMOTE $$$
CENTRAL $$$
AROS BOOT $$$
INIT ID $$$
ID FILE $$$
SPEED
FEED
PUBLIC
PRIVATE

* Apple][, Apple][+, and APPLESOFT are registered trademarks of Apple Computer, Inc.
** Franklin ACE 100, 1000 are registered trademarks of Franklin Computer Corporation.
*** Basis 108 is a registered trademark of Basis Incorporated.
**** Remote Operating System is a registered trade mark of Softworks, Inc., Patent pending.

From one to eight (1-8) floppy disk drives may be installed as part of the R.O.S. DISK ACCESS CARD SYSTEM. The AROS software supplied on the master diskette is designed to operate with the Apple Disk][subsystem, Franklin ACE 100, 1000 and Basis 108 computers; however, alternative floppy and hard disk R.O.S. systems are available. Contact SOFTWORKS or your local R.O.S. dealer for more information.

The computer with the disk drive(s) will be referred to as the "Central" system (or just "Central"). All other computers connected as part of the network will be referred to as "Remote" systems (or just "Remotes"). You may install as many as 127 Remote system circuit cards, but there will never be more than one Central system for each network.

INSTALL THE CENTRAL CIRCUIT CARD AND CABLE

Examine the circuit cards which are part of the STARTER package. One of these cards is labeled "CENTRAL" and the remaining cards are labeled "REMOTE". Set the REMOTE cards aside for now. Identify the connector cable which comes with the CENTRAL card. It is the longest of all the cables supplied with any R.O.S. package (6.1 Meters/20 Ft).

Either end of the Central cable may be plugged onto the connector pins marked "OUT" at the corner of the Central circuit card (see diagram pages 7 and 8). Each end of the cable has ten holes, one of which is blocked by a small white plug. Make sure this plug matches up with the missing pin on the connector marked "OUT", and install the cable as shown in the diagram.

Check to see that there is no power to the computer and that the POWER light is unlit (power OFF). Remove the cover from the computer you have choosen as the Central system. Pull up on the rear edge of the cover until the fasteners pop loose. Slide the cover to the rear and set it out of the way.

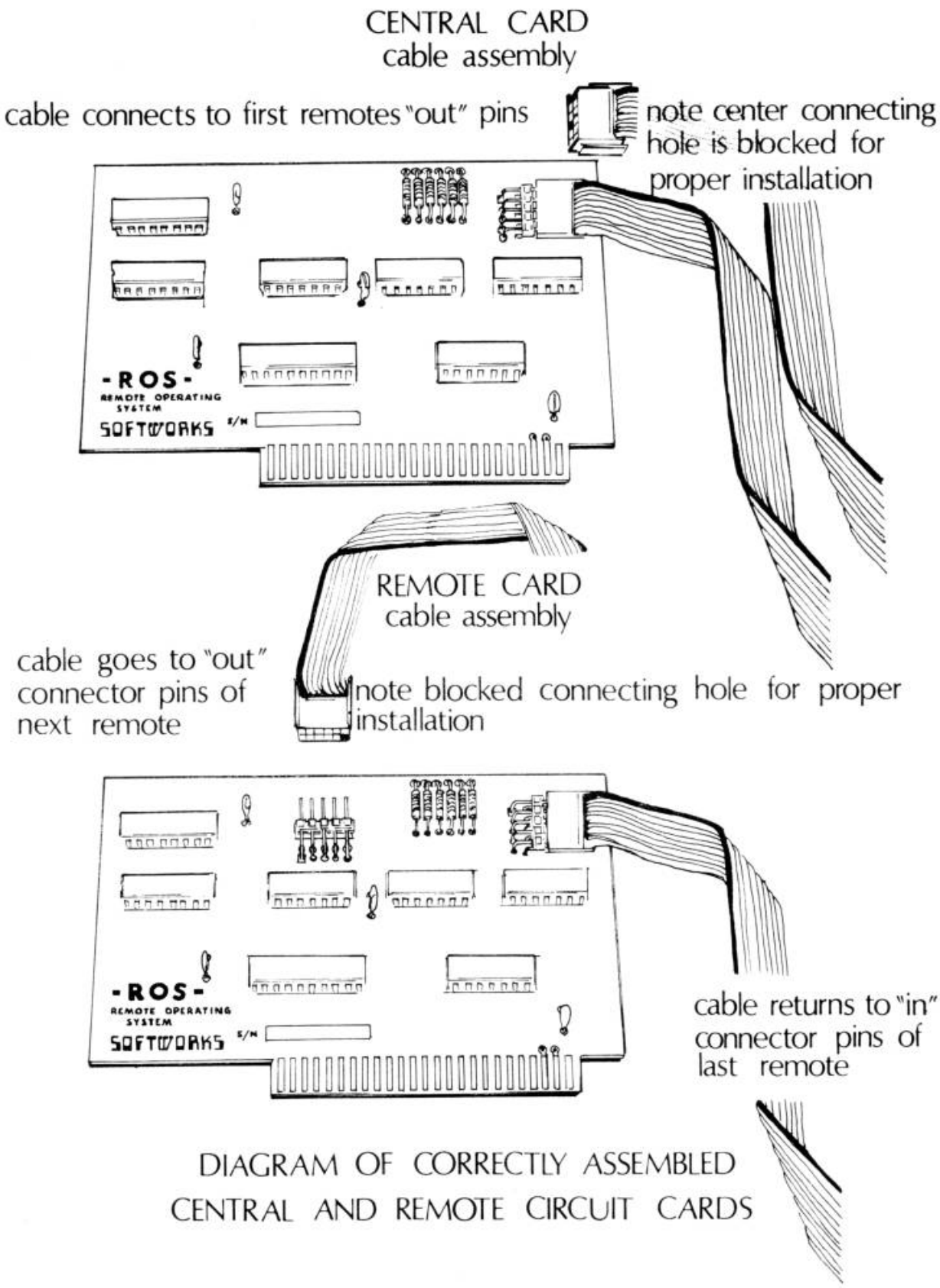
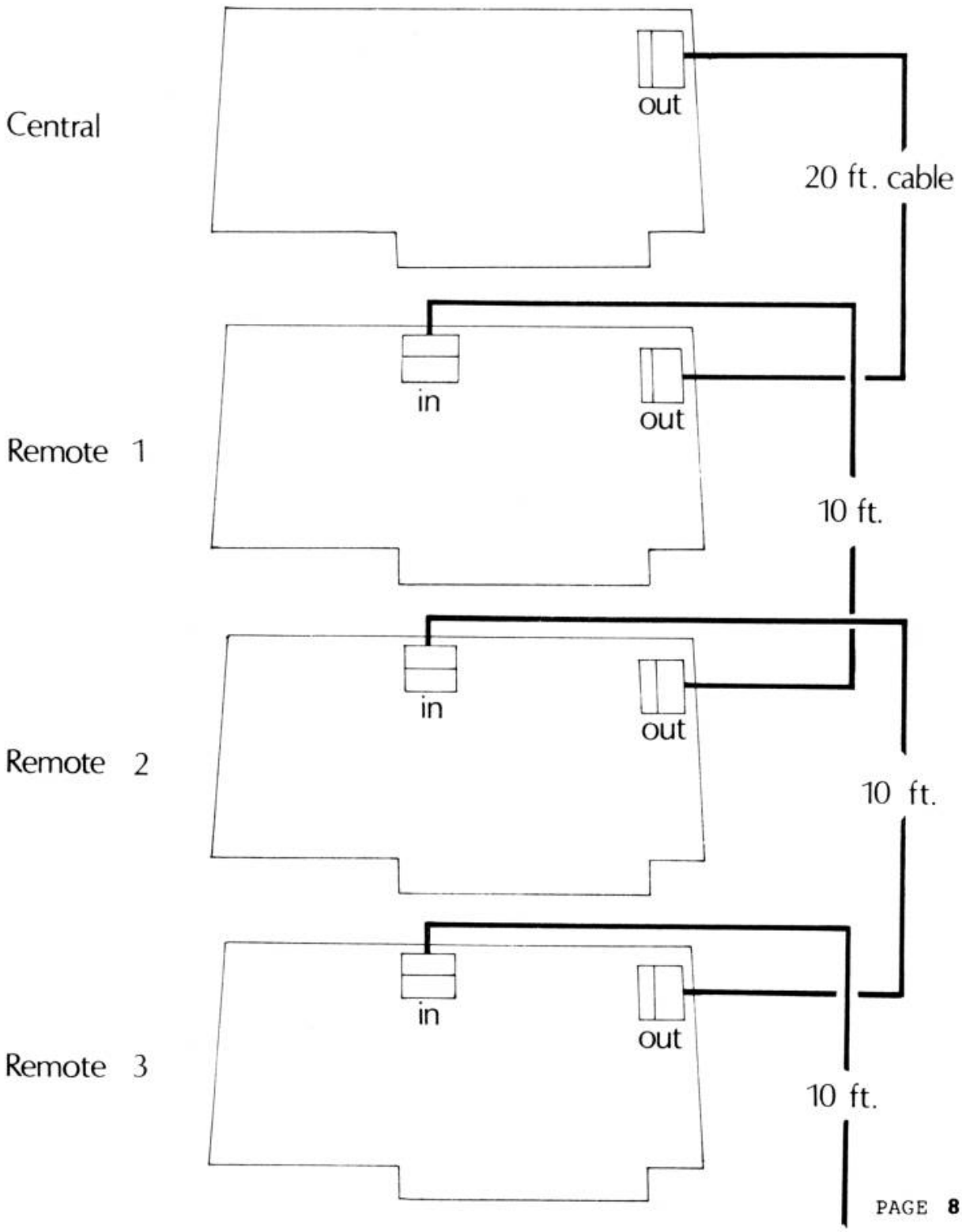


DIAGRAM OF CORRECTLY ASSEMBLED CENTRAL AND REMOTE CIRCUIT CARDS

CORRECT SYSTEM INTERCONNECTION



Examine the inside. Inside the rear of the computer you will see eight slots with metal contacts. The left most slot is Slot 0 and the right most is Slot 7. In Slot 0 you may see a language ROM or RAM card that provides your system with dual language capability. You should have already installed your disk controller card in Slot 6.

Install the Central circuit card in any open slot except Slot 0. Hold the card vertically with the cable toward your right. The gold edge connector at the bottom of the card is the part that goes into the slot. Hold the circuit card over the slot so that the cable goes to the rear. Lower the card into place so that the gold edge connector touches the slot and allows the cable to fit into one of the openings just behind the slot.

Press the card into the slot, keeping it centered and avoiding side-to-side movement. Wiggle the card back-to-front if necessary to fully seat it. Replace the cover, but do not turn on the computer.

PREPARE AND INSTALL REMOTE CIRCUIT CARD AND CABLE

Select one of the Remote circuit cards and push the other end of the cable from the Central system onto the connector pins marked "OUT" on the Remote circuit card. Again, watch to see that the plugged hole matches the missing pin. If it does not, you have selected the wrong cable. Recheck installation of the correct cable at the Central circuit card.

With the cable correctly in place, install the Remote circuit card in any open slot other than Slot 0 of the first Remote system. It is recommended that you use Slot 6, since this is a standard slot for installing disk controllers and the R.O.S™ Disk Access Card takes the place of a disk controller in each Remote system. **If you have a disk controller installed in the Remote, the Disk Access Card must be in a slot numbered higher than the disk controller so that each Remote will boot onto the Network properly.**

CHECK INSTALLATION

Review the instructions and check to see that the cards and cables are fully seated on their connectors and in the correct slot. Now proceed to section (B) GETTING STARTED and verify that everything is working properly before installing additional Remote circuit cards.

INSTALLING ADDITIONAL REMOTE CIRCUIT CARDS AND CABLE

After initial system check-out, you may install additional Remote circuit cards. Locate a Remote system connecting cable (3 Meters/10 Ft). Connect this cable to the connector pins labeled "IN" which are pointing up on the top edge of the Remote circuit card of the first Remote system. You do not have to remove the circuit card to do this, but please remember to turn OFF the power on all computers before making any connections. Refer to the diagram if you are uncertain about correct installation. Some people have commented that the way the pins and boards are labeled seems backwards, so trust the diagram and the fact that the pins on the circuit board and the connectors on the cable can only be plugged in one way. Please do not force the cable if it does not go on easily.

Once the cable has been properly connected to the first Remote system, connect the other end of the cable to an uninstalled Remote circuit board. This connector will plug into the pins marked "OUT". Now install this new Remote circuit card into any open slot except Slot 0 of the next Remote system. You now have two Remote systems connected to the Network. For additional Remote systems, simply repeat these steps until all Remote systems are connected.

(B) GETTING STARTED

STARTING THE R.O.S. DISK ACCESS SYSTEM

Once the hardware elements of the network are installed properly, the next step is to get AROS up and running. This process is commonly known as "BOOTing" the system. Begin with power off on all computers.

Insert a DOS 3.3 diskette in Slot 6, Drive 1 of the Central system and turn power ON to boot the system.

First, and most important, is to make a copy of the AROS Master diskette. Use the COPYA program on the DOS 3.3 Master to copy the AROS diskette to a backup disk. Label the backup and store the original AROS Master diskette in a safe place.

To start the system, insert the backup copy of the AROS diskette (hereafter referred to as AROS Master diskette) in Slot 6, Drive 1. BOOT the Central system by typing PR#6 <RETURN>. The AROS Master may be operated from Drive 1 in any slot, although it must be reconfigured before activating the system. For now, it is simpler to use Slot 6, Drive 1.

The AROS Master diskette is required to remain in the drive only when a Remote BOOTs the AROS operating system and signs on. **SHOULD THE AROS DISKETTE BE REMOVED, ALWAYS PLACE THE DISKETTE BACK INTO THE ORIGINAL DRIVE FROM WHICH THE SYSTEM WAS ACTIVATED.**

Upon successful loading of DOS, the R.O.S. Main Menu will appear as follows:

ADVANCED REMOTE OPERATING SYSTEM
AROS VERSION 2.1

<A> ACTIVATE AROS

<C> CONFIGURE SYSTEM

<Q> QUIT TO BASIC

ENTER SELECTION :

Choose ACTIVATE AROS by pressing the letter A. The disk comes on again and the system is up and running. The screen should display :

ADVANCED REMOTE OPERATING SYSTEM
AROS VERSION 2.1

(C) COPYRIGHT 1982 SOFTWORKS, INC.

THE R.O.S. / DISK ACCESS CARD WAS
CONCEIVED AND DESIGNED BY :

DOUG NERING

THE ADVANCED REMOTE OPERATING SYSTEM WAS
DESIGNED AND WRITTEN BY :

DOUG NERING,
CHRIS MC CONNELL, AND
JAMES BUCANEK

TURN ON ALL COMPUTERS FOR INITIAL START
TYPE <CTRL-R> TO RESTART
TYPE <CTRL-I> TO CLEAR ID FILE
PRESS <RETURN> TO ACTIVATE NETWORK :_

Since this is the initial start of AROS, this is the time to turn ON power at each Remote system. It does not matter what order you turn the computers on; simply turn on the power switch at each Remote. If you have a main power control switch you can turn them all on at the same time. If Autostart is present in the Remote, the letters **ROS** will appear on the screen of each Remote system in flashing letters, indicating that the Remote is ready to begin the boot process. If Autostart is not present, pressing the <RESET> key followed by a <CTRL-B> <RETURN> should bring up the Applesoft prompt (]) or the Integer prompt (>). Then type in <RETURN> **PR#S** <RETURN>, where **S** is the slot number in which the Disk Access Card is installed.

The <CTRL-R> and <CTRL-I> options will be explained later; simply press the <RETURN> key to continue the usual start-up procedure. The Central computer will execute a program called SPEED which will be described later in this manual. The word **LOADING** will appear next to **ROS** on the Remotes. If all is proceeding correctly, an exclamation mark will appear after **LOADING.** This will indicate that the next stage has begun loading correctly. Allow approximately fifteen seconds for this phase to be completed; then, the the operating system will be sent announced by another exclamation mark.

In some rare instances not all the computers will boot at the same time. If, after the initial boot, there are any unbooted computers remaining, the Central will immediately restart the process for the benefit of the late comers.

NOTE: ONCE ALL REMOTES HAVE BEEN BOOTED, THE AROS MASTER DISKETTE IS REQUIRED TO REMAIN IN YOUR DISK DRIVE WHENEVER A REMOTE NEEDS TO BE BOOTED, A REMOTE TYPES **BYE** TO SIGN OFF, OR THE CENTRAL EXECUTES AN AROS UTILITY PROGRAM.

Suddenly the Remote system screen will change, prompting for a password. If no passwords have been defined, enter NETWORK <RETURN> (this password comes with the system diskette). The following screen will be displayed immediately thereafter.

ADVANCED REMOTE OPERATING SYSTEM

COPYRIGHT (C) SOFTWORKS, INC. 1982

YOUR TAG IS ROS

VALID DRIVES :

S6 D1 FLOPPY

PRESS RETURN:_

<CTRL-Q> may be entered to allow re-entering the password. Pressing <RETURN> will display the **ID NUMBER :001** (where multiple users are logging onto the network, the numbers will range from 001 thru 127) and immediately run a program called SAMPLE from the default drive Slot 6, Drive 1.

CHECKING AROS

The easiest and quickest way to verify the proper operation of your R.O.S. network is to request a catalog of the programs on the Master diskette. On any Remote system, type in CATALOG and press <RETURN>. The disk on the Central system will turn on for a few seconds, the catalog of the master diskette appears on the Remote and the language prompt reappears.

If this is your first check-out during installation, you now know that the circuit cards and software are functioning properly. Go back to section (A) INSTALLATION - Installing additional Remotes and cables, and complete the installation for the remainder of your Remote systems.

RULES FOR BOOTING REMOTES

Do not turn power ON or OFF or access the network with any Remote system unless the Central has already been activated or the Activate AROS sequence prompts you to turn ON the computers. Do not turn power ON or OFF at any Remote system while other Remotes are displaying the "ROS LOADING" message.

SOLVING STARTING PROBLEMS

First, note that AROS software is recorded on a 16 sector disk format. If you have a 13 sector system (DOS 3.2), it will not boot from the AROS Master diskette. You must update your system to DOS 3.3 to run AROS.

If the message **ROS LOADING** disappears, beeps, and returns the prompt, a loading error occurred. Restart by typing PR#S <RETURN>, where S is the slot in which the Disk Access Card is installed (example: "PR#6").

If the message **ROS LOADING ERR** appears, the software is unable to find, read or transmit the file named AROS BOOT **$$$** on the AROS Master. Check to make sure the AROS Master is properly inserted and in the same drive from which the system was activated. Open and close the drive door flap to re-center the diskette in the drive. If there is something wrong with the file on the diskette, it can be reconstructed using the <I> INSTALL REMOTE OPERATING SYSTEM option from the Configuration Menu.

If the Central is equipped with an AUTOSTART ROM, simply press <RESET>. If there is no response or an unusual response to Reset, try <CTRL-Q> <RESET>, and then restart the operating system by rebooting DOS (PR#6 for example) and reactivating AROS. As last resort, turn off the power and reboot the Central system from power off. Something is wrong with your computer or the diskette if this persists.

Diskettes do get worn out or accidentally ruined. Make another backup from the original AROS Master diskette and use the backup diskette of the AROS Master diskette (see section (D), USING THE CENTRAL SYSTEM WITH AROS-BACKUP SUGGESTIONS, although it may be too late if you forgot to make a back-up copy) and try to restart the system. If this solves the problem, discard the bad diskette. If you are lacking a back-up copy, contact SOFTWORKS, inc. or your dealer for a duplicate.

Make sure all power is OFF before plugging and unplugging any electronics.

Additional circuit cards or other unusual hardware or modifications to your computer may interfere with the AROS programs. If you have problems, remove these items to make certain they are not the cause of the difficulty and try to restart the system.

Check all cables and cable connections for proper connection, damage from heat, stress, crushing, misalignment. Make sure the right cable is connected at the right location on the card. (See section (A) INSTALLATION).

Try to isolate the problem by turning off each Remote system one at a time, starting with the computer at end of the line and working towards the Central. When the problem goes away, you have probably found the computer causing the problem.

Poor or improper grounding of the electrical power supply system for your computers may cause failure to boot or erratic operation of the network. One or more computers with a defective system clock will also cause problems.

If all else fails, exchange duplicate items in your system (computers, cables, Remote cards) to find the offending part. In the event a bad circuit card is found or if tests fail to locate the problem, please contact your local R.O.S. dealer. If you have a bad Remote card, or computer, simply bypass that computer and run the rest of the system as usual until the equipment is repaired.

Repairs covered by warrantee will be handled by prompt exchange of the defective components. In case of repairs outside of the terms of the warranty, defective circuit cards or cable must be returned to SOFTWORKS postage prepaid. Cost of repair/exchange of any circuit card will not exceed $25.00 plus $2.50 handling. Repair of cables in most cases will not exceed $5.00 plus handling.

(C) UNDERSTANDING R.O.S. NETWORK AND HOW IT WORKS

DAISY CHAIN CONCEPT

R.O.S. uses the "Daisy Chain" principle. Daisy Chaining is very similar in concept to the way many fires once were extinguished. One person stands by the well with the water, dips out a bucketful and passes the bucket along a line of people until it gets to the person who throws it on the fire. The person by the well has all the water and one person in the line wants so many bucketfuls. Other people in the line merely pass the bucket along without using the water. This was called a bucket brigade.

R.O.S. can be related to a bucket brigade. One computer has the disk (well) with the data and programs (water) and passes the program through each system to the appropriate computer. There the program is dumped into the memory of that computer.

R.O.S. is an active network. Unlike passive networks, if the power to a computer is OFF or one of the cables to the R.O.S circuit card is removed, the physical link between the Central system and all Remote systems beyond the bad link will be lost, just as removing one person from the bucket brigade would shorten the distance water could be sent. Therefore, if the fifth computer in the daisy chain was turned off, all computers beyond it (the 6th, 7th, 8th, 9th, etc.) would be cut off from the network. It is interesting to note, however, that the first four computers can still access, and the computers beyond the break can still run their programs as long as they don't need data from the disk.

AROS

AROS is an abbreviation for Advanced Remote Operating System. AROS is the operating system used in the R.O.S. network which allows multiple computers to share disk storage and be networked together to share common programs and data files as well as operate independent of each other.

REQUESTS

A request is any standard DOS 3.3 command or special AROS command from a Remote system that accesses a disk drive resident at the Central system. A request from a Remote accesses the drive via the R.O.S. network.

THE ORDER OF AROS

It is not necessary to know in what order each Remote request is processed; however, the following explanation is provided for the curious.

When a request is sent from a Remote system to the Central system, it is processed immediately. Often, however, the instance arises when two Remote systems attempt to access the network at the same time. If this occurs, the first system to request a command will gain access to the network and any other systems will be put into a "WAIT" mode until AROS is free.

There is also the very likely possibility that several Remote systems are all in a "WAIT" mode. When the Central computer becomes free again, AROS must decide which Remote computer will be allowed access next. AROS is designed to accept the next Remote by ID number in order from highest to lowest number. This method is often called a cyclic poll, or a "Round Robin Queue". It places all of the Remotes in a circle and "walks around" the circle until it finds a system that requested an access.

So, if Remote system number 22 is loading a program, and Remote systems number 5, 7, 10, and 18 are all waiting for access, the Central system will process Remote number 18 next. When Remote 18 has completed, the processing would continue with Remote 10, and then 7, etc.

In addition to responding to requests by ID number, AROS V2.1 also keeps track of how long each system has been waiting in the queue. The longer the wait, the higher priority that system is given on the next try. So, referring back to the example in the last paragraph, even if Remote number 12 enters the queue while number 18 has access and 5, 7, and 10 are waiting, 5, 7, and 10 will all be served before 12. Once the lowest number ID has been served, AROS will look for the the next system that has been waiting the longest. If more than one system has been waiting the same time, AROS will accept that group in order of ID number, highest to lowest.

One exception to this smooth operation is the CATALOG command. Since this command usually requires more than one access to list all the files on a disk, whatever priority that Remote has gained from waiting will be retained until the CATALOG is completed. The same is true of other disk operations which read or write via the "RWTS" subroutines in DOS 3.3. Other commands which are affected by priority are booting Remotes, which has lowest priority, and the FEED command which has highest priority.

Note that the last two paragraphs describe a refinement of AROS V2.1 which is an improvement over lower number versions.

INTERRUPTS

The Central system operates in an "on demand" or "interrupt driven" environment. When a Remote accesses AROS, the Central system immediately halts any processing it is doing and handles the request. After all outstanding requests are satisfied the Central system will return to whatever it was doing, oblivious to the fact that an interrupt took place.

Keep in mind that the Central can be interrupted doing virtually anything. This includes typing, listing, running a program, or just sitting there. Therefore, if the Central user is typing the word "LIST" and three Remotes access the system during that time, the Central user will have to wait until all requests are satisfied before being able to complete the command.

There are times, however, that the Remotes cannot interrupt the Central. This would occur while any DOS command is currently underway on the Central. If a LOAD or CATALOG, for example, is being executed on the Central, no Remotes will be allowed access until it is completed. MULTI-PAGE CATALOGS ON THE CENTRAL SYSTEM WILL SUSPEND THE NETWORK UNTIL THE CATALOG IS COMPLETED. Some application software and AROS utilities, such as SPEED and FEED (see section (D) USING THE CENTRAL SYSTEM WITH AROS - SPEED and FEED), can suspend the network as well.

If the network is used regularly (50% or more of the time), operation of the Central system will be both difficult and slow, and many applications may prove impractical. At this time is is recommended that SPEED, or some other useful AROS utility, be activated and let the Central system concentrate on the optimization of the network.

ID NUMBERS

Every Remote connected to the R.O.S. network must have a unique ID number. These ID numbers are used by AROS to access and address the network. This function is performed automatically by the system, so there is no need to remember what your ID number is and it may differ the next time you sign on.

However, it is important to note that only one ID Number is allocated per password, so two persons may not use the same password at the same time.

FILES: PUBLIC AND PRIVATE

AROS supports two types of files, Public and Private. A public file (program files, text files, and binary files) can be loaded and used by all users on a given diskette or volume. A private file is one that only an individual Remote user may see, load, use, change, etc. Private files are identified with a tag consisting of three letters, or two letters and another character, which is automatically appended to all private file names.

Tags are established at the Central system when an account is created for that user. When each Remote user logs onto the network he or she is assigned the tag stored in their account. Any time a CATALOG is executed from a Remote, all public files, and only the private files belonging to that account, will be displayed. All other private files not associated with that account will be neither displayed, nor accessible by that user. **Remote users need not enter the tags as part of the file name at any time.**

Unique tags allow many private files with the same name to exist on a diskette. As an example, five different Remote users may all save a program called "MY STUFF" on a single diskette. Each user will see, and have access to, only the one private file with his or her tag.

CATALOGs and accesses from the Central system will display and allow access to all files, both public and private. The Central user must include the appropriate tags in the file name of any private files. To access a private file from the Central, the cursor escape codes and right arrow must be used to read in the inverse characters which follow a private file name. **The Central user may make a file public by renaming the file to a name with no tags and vice versa.**

Many of the files on the AROS Master diskette are tagged by the inverse characters $$$. This is a reserved tag used by the operating system to protect the file from unauthorized access from any Remote system. These files should be accessed only through AROS software supplied on the AROS Master diskette.

DOS COMMANDS EXECUTED BY REMOTES

Since both public and private files are supported by AROS, when Remotes execute DOS commands it is very important that you understand how AROS processes the DOS commands between public and private files.

All executable DOS commands from a Remote will be tried first at the private file level. If the file exists, the DOS

command will be processed: the commands SAVE and DSAVE may create a new private file. If the file does not exist, the DOS commands RUN, BRUN, LOAD, BLOAD, VERIFY and OPEN will then try again at the public file level. If the file exists, the command will be executed. If the public file still does not exist, only the OPEN command will create the files as a private text file.

Therefore, the Remote will not execute the DOS commands DELETE, RENAME, SAVE, BSAVE, LOCK or UNLOCK for any file which exists as a public file. A Remote can only create a text file once AROS has determined that the file does not exist as either a public or a private file. AROS will never create a new file as a public file.

If a diskette or volume contains a public file and a private file of the same name, AROS will always access the private file. If the Remote user wishes to access the public file when such a conflict exists, the private file must be RENAMEd so that no conflict of file names will exist on the same diskette or volume.

Removing the public file name from the diskette will force the system to create a new private text file for each user who runs the program(s) using that file. This may be very useful in keeping the recorded data for each user separate.

A Remote user may make a private file public, if they so wish, by saving the file to disk and BRUNning the utility "PUBLIC" supplied on the AROS Master diskette. A Remote user can make a private copy of a public file by loading the public file and then saving it. The save will create a private file that can be used and modified; however, this is only possible with file types A, I or B (programs or binary files).

PUBLIC FILE LOCK-OUT

The logic behind not allowing Remote users to modify public files is simple. If users 1 and 2 both read a file and user 1 makes a change to the file and reSAVEs it, then user 2 makes a change to the same file and reSAVEs it, the second change would overwrite the first and the first change would be lost forever. Such collisions are called "interleaved updates". Without a method of protection against these collisions, untold and even unknown loss of data would result.

To prevent this problem from occurring, a method is needed to keep user 2 from reading and updating a file before user 1 is finished. APPLE Disk Operating System (DOS) was not designed with the expectation that more than one user might have access to the same file; therefore, some change to the DOS was required to protect against update collisions. The solution developed for AROS provides such protection without changing the operation of the Apple Disk Operating System or introducing new commands, and is called "File lock-out".

"File lock-out" applies only to text files. Public text files that are never changed need not be considered since any number of users may read a public file at the same time with no adverse consequences. File lock-out has nothing to do with locking files using the LOCK <filename> command.

If a public text file is updated at any time, steps should be taken to preserve data integrity. When an updatable public file is used a DOS "WRITE" should follow immediately after the file is OPENed. Once the DOS WRITE is executed, any other users requesting access to the file will be denied. The file is effectively locked and is "owned" exclusively by that user. After updates are complete the file must be CLOSEd. This will then release, or unlock, the file so that it may be accessed by other users.

If a user wishes to only read a text file that may be updated by other users, it should first be locked-out to insure that an update from another user does not take place during a read. This can be accomplished with a "blank" WRITE as follows: Print a legal DOS WRITE command, but don't write any data to the file [Example: **PRINT CHR$(4);"WRITE <filename>":PRINT CHR$(4)**]. The WRITE will lock-out the file from intruders until the user has finished. Remember to CLOSE the file when done so other users may gain access to the file again.

The Central system maintains a list of public files that are locked-out and to whom they currently belong. The Central system is capable of maintaining 16 locked-out public files at any one time. Requests to lock-out another file while 16 files are already locked-out will be denied until one of the 16 locked-out files is released. There is no limit on the number of private files which may be opened, or the number of public files which may be opened and read without being locked-out.

When designing multi-user software or changing existing software, attempt to determine at what point data in the file may be added to or changed. Immediately prior to the point at which the decision will be made whether or not to add or change data, insert the WRITE command to lock-out the file. Be sure to close the file regardless of whether new data is written.

The following example illustrates this process:

```
  5 D$=CHR$(4)                          : REM D$ = CTRL D
 10 PRINT D$;"OPEN FILE,L10"            : REM OPENS FILE
 20 PRINT D$;"WRITE FILE" : PRINT D$ : REM LOCKS-OUT FILE
 30 PRINT D$;"READ FILE,R0"             : REM READ CONTROL RECORD
 40 INPUT NR                            : REM HOW MANY RECORDS?
 50 IF NR > 110 THEN GOTO 110           : REM TOO MANY RECORDS!
 60 NR = NR + 1                         : REM ADD ONE RECORD
 70 PRINT D$;"WRITE FILE,R0"            : REM WRITE CONTROL RECORD
 80 PRINT NR                            : REM NEW RECORD COUNT
 90 PRINT D$;"WRITE FILE,R";NR          : REM WRITE NEW RECORD
100 PRINT "DATA FOR THE NEW RECORD"     : REM WRITE NEW DATA
110 PRINT D$;"CLOSE FILE"               : REM RELEASES LOCK-OUT
```

If this example is unclear (and it may be if you are not a programmer) a full explanation of the process of writing to text files may be found in the Apple DOS Manual. If you can follow the above example, then you can easily modify most software requiring lock-out protection. Note that lock-out must be accomplished **before** the decision whether to add new data.

It is also important to CLOSE a file after locking it. If a locked-out file is not CLOSEd, no other user will be able to use the file until it is released. If a Remote user locks a file, and then fails to release it, the Central system may release it manually. (See section (D) USING THE CENTRAL SYSTEM WITH AROS-SPEED and RELEASE.)

BOOT PROCESS

When a Remote system boots, it receives a bootstrap program. The bootstrap is a machine language program that loads the operating system into memory, gets the password from the user, and assigns the tag, drive table, and ID number which that Remote will use. The bootstrap gets this information from a special table of legal passwords, tags, and drive configurations sent with the operating system. (See section (D) USING THE CENTRAL SYSTEM WITH AROS - PASSWORD UTILITY.)

Once the tag for that user is known, the bootstrap accesses the network and reads a special system file called "ID FILE". This file contains a list of all of the tags that have logged onto the network and what ID number they were assigned. If the Remote logging on has a tag that is not in the table, a new entry is made assigning the next available ID number. If the tag was already in the table, the same ID number is reassigned.

After a Remote user is finished with the computer, he or she SHOULD execute the special AROS BYE command. This command will remove the current tag and ID number entry from the ID FILE. This will prevent unauthorized entry into their files, and more importantly, it will release that ID number so it may be reassigned to another account. There are 127 legal ID numbers, so if there are more than 127 password accounts the BYE command MUST be entered whenever a user finishes using the computer. If the network has less than 127 accounts, there should never be any reason to clear the ID FILE as any Remotes logging on will simply receive the same ID number they had last time.

Two users MUST NOT log onto the system with the same password. If so, they will receive the same ID number. Two or more Remotes logged on with same password may cause loss of data and confusion for the user.

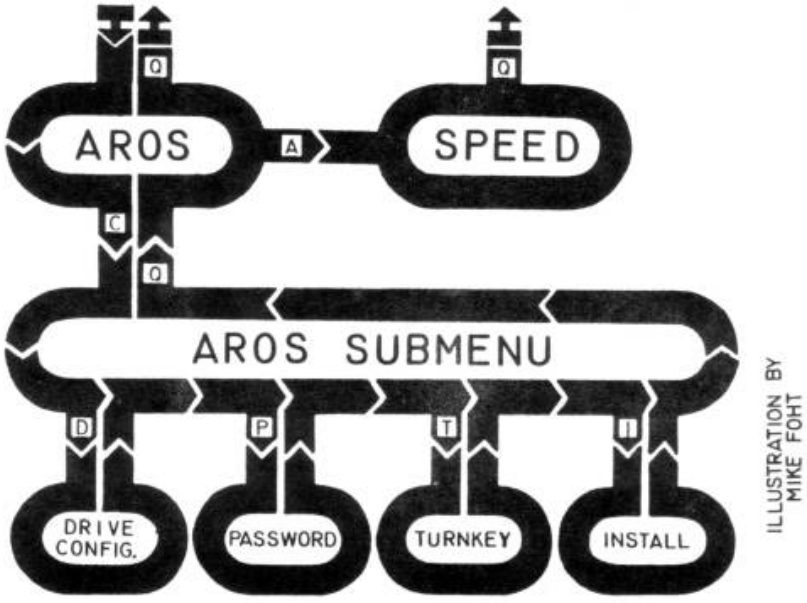
If users are logged onto the network and the ID FILE is cleared, all Remotes should reBOOT to assure continuity within the system that no two Remotes will be assigned the same ID number. Ordinarily there is no reason to clear the ID FILE during operation.

RULES FOR ID NUMBERS:

Never log on two Remotes with the same password.
Never clear the ID FILE while users are logged on.
When a Remote user has completed using the system, log off by typing BYE, (required only if more than 127 passwords have been established).

(D) USING THE CENTRAL SYSTEM WITH AROS

The AROS Master diskette contains programs which will assist you in using and configuring your network system. Many of these programs are linked together by "menu" programs which offer a selection of system functions. The diagram below shows how the programs are connected to each other as well as showing an example of typical program flow during the configuration process. Note that menu selections in most cases lead to "dead ends" and you must return to the menu from which you made the last selection; only the AROS and SPEED programs have true exits. The functions of each of these programs are described in the sections that follow.



AROS PROGRAM LEVELS SHOWING PROGRAM FLOW DURING SYSTEM CONFIGURATION. LETTERS IDENTIFY MENU SELECTIONS.

MAIN MENU

After a normal disk boot is done with the AROS Master diskette, the Main Menu is displayed showing three selections.

ADVANCED REMOTE OPERATING SYSTEM
AROS VERSION 2.1

<A> ACTIVATE AROS

<C> CONFIGURE SYSTEM

<Q> QUIT TO BASIC

ENTER SELECTION :_

Make your selection by pressing the appropriate key. You may also reach this menu by RUNning the Applesoft program "AROS". The selections are described below:

MAIN MENU OPTION: <A> ACTIVATE AROS

This option will start (or restart) the Central operating system. The three options given are :

TYPE <CTRL-R> TO RESTART NETWORK
TYPE <CTRL-I> TO CLEAR ID FILE
PRESS <RETURN> TO ACTIVATE NETWORK :_

The normal way to activate AROS is pressing the <RETURN> key, which will activate the network and start SPEED. Pressing <CTRL-R> will activate the network, but will not start SPEED.

The third option controls initialization of the ID FILE. Remember, the ID FILE stores up to 127 active and distinct passwords which have logged onto the network and are assigned an ID number. As mentioned in section (C) UNDERSTANDING R.O.S. NETWORK AND HOW IT WORKS - BOOT PROCESS, each Remote user must have a unique ID number to allow proper operation of AROS.

Should the ID FILE contain 127 passwords, not all active, but additional users are required to log onto the network, then the ID FILE must be initialized. You may also want to initialize the ID FILE if you wish to have ALL users obtain new ID numbers. ANY TIME THE ID FILE IS INITIALIZED, ALL REMOTES MUST BOOTUP OR IF PRESENTLY OPERATIONAL, REBOOT TO OBTAIN A NEW ID. IF YOU HAVE MORE THAN 127 PASSWORD ACCOUNTS, IT IS BEST TO CLEAR THE ID FILE ON INITIAL START FOR THE DAY.

MAIN MENU OPTION: <C> CONFIGURE SYSTEM

This will bring the user into the AROS Configuration Menu by RUNning the Applesoft program "AROS SUBMENU". The operation of this program is described in the Configuration Menu section.

MAIN MENU OPTION: <Q> QUIT TO BASIC

Exits from Main Menu and returns the Central system to BASIC with the AROS program still in memory.

CONFIGURATION MENU

The Configuration Menu may be accessed by selecting option <C> CONFIGURE SYSTEM from the Main Menu, or, alternatively you may RUN the Applesoft program "AROS SUBMENU". This menu provides selections allowing you to configure AROS to your particular application.

AROS CONFIGURATION MENU

<D> DRIVE CONFIGURATION

<P> PASSWORD UTILITY

<T> TURNKEY COMMAND

<I> INSTALL REMOTE OPERATING SYSTEM

<Q> QUIT

ENTER SELECTION :_

There are three elements to configuring the system. These are (1)Drive Configuration, describing what disk drives are connected to the Central and how they may be accessed; (2)Password Accounts, identifying who will be using the system; and (3)Turnkey Selection, choosing the first command to run after sign on. When these three elements have been configured, there is a selection which will install the new configuration. Each selection is described below in complete detail before going on to the next option.

CONFIGURATION MENU OPTION: <D> DRIVE CONFIGURATION

The Drive Configuration Utility is used to setup and maintain logical to physical drive tables in the Remote systems.

AROS LOGICAL TO PHYSICAL DRIVE TABLE

TABLE 1

(Logical) SLOT	DRIVE 1 (Physical) SL	DR	VOL(S)	DRIVE 2 (Physical) SL	DR	VOL(S)
1	-	-	------	-	-	------
2	-	-	------	-	-	------
3	-	-	------	-	-	------
4	6	2	FLOPPY	-	-	------
5	4	2	FLOPPY	4	1	FLOPPY
6	6	1	FLOPPY	-	-	------
7	-	-	------	-	-	------

<C> CHANGE A DRIVE
<S> SELECT TABLE
<Q> QUIT

ENTER SELECTION :_

The table represents a map (used by the Remote computers) to find drives on the Central system. Logical drives are what the Remote user will be using. Physical drives are what is actually attached to the Central system. When a Remote user or application software makes a reference to a logical slot and drive number (in the example table above say Slot 4, Drive 1, as in the command: CATALOG,S4,D1) it will be cross-indexed in the table and translated into a physical slot and drive number (again as in the case of the above table, the floppy disk drive physically located in Slot 6, Drive 2 of the Central system would be read by this command.

The Central system may then allow or disallow access to any floppy disk drive for any group of Remote users. Also, the same drive may be allocated several times in the table if you wish.

A Remote with drive configuration table 1 (this one) that enters the command "RUN HELLO,S6,D1" would run the program HELLO on the disk in Slot 6, Drive 1. However, another user with a different drive configuration table which defines Slot 6, Drive 1 as Slot 4, Drive 2 could enter the same command and run a different program on a different disk drive. As far as the Remote user or any software is concerned, they will be unaware of the translation and never know the difference.

Each Remote system user entering their password will receive one of the eight possible tables as defined for their account in the Password Utility.

<C> CHANGE A DRIVE

Enter the slot and drive number of the LOGICAL drive to redefine without pressing <RETURN>. Press <RETURN> to exit.

The cursor will move to the table entry that you have selected to change. Press <RETURN> to disallow access to this logical drive. To allow access to a drive, enter the PHYSICAL slot and PHYSICAL drive number that this LOGICAL drive will be translated into. Press <RETURN> to enter the new definition.

You may choose another entry to change or press <RETURN> to exit.

<S> SELECT TABLE

To edit another drive configuration table (there are 8 possible) enter the number of the table (1 thru 8).

<Q> QUIT

Returns to the Configuration Menu. If you have made any changes to the drive configuration, you will see the message:

SAVE DRIVE CONFIGURATION CHANGES?
PRESS <N> TO ABANDON :

If you press any key but <N> the changes you made will be saved as the new drive configuration before returning to the Configuration Menu.

Drive Configuration Examples:

The importance of the configuration table is that, with the exception of AROS boot and the BYE command, all drive accesses from the Remote must pass through this table. If a disk drive does not appear in the drive table, it cannot be accessed.

There are two reasons for leaving out certain physical slot and drive values from the table. The first is if there is no drive controller installed in that slot, or the controller connects only Drive 1 and not Drive 2.

Example: There is no drive controller installed in Slot 4, and there is only one drive on the controller in Slot 5. The values Slot 4, Drive 1 or 2 should not appear in any of the eight configuration tables, nor should the value Slot 5, Drive 2. Slot 5, Drive 1 is valid and may appear anywhere in the table.

If you move a controller in the Central system, you should change all the tables accordingly, otherwise the DOS system may hang up as described in the DOS Manual (page 22). Changing the table will also prevent unnecessary I/O ERROR messages at the Remotes. As few changes as possible are recommended to prevent confusion.

The second reason for limiting drive values in the configuration table is to restrict Remote users from accessing certain files. By using different drive configurations, some users may be restricted and others not. Of course, data on floppy diskettes may be made inaccessable by removing the diskette. Hard disk users must use the drive configuration tables to restrict access. Additional information on configuration for hard disk users is supplied in supplementary documentation for purchasers of AROS hard disk interface options.

Examples of how the drive configuration capability may be used are provided below:

Example: The teacher is using the drive in Slot 4, Drive 2 to maintain class records and wishes to restrict all other users from access. The teacher may configure the drive table(s) leaving out Slot 4, Drive 2 except for one table in which access to Slot 4, Drive 1 is allowed and which is assigned to the teacher's password.

Exception: Access to a restricted drive may be enabled by using the FEED command to send a program from the restricted volume. FEED alters the drive configuration until AROS is reBOOTed by the affected Remote user.

The TURNKEY and DRIVE CONFIGURATION may be used together to increase flexibility. Up to eight different outcomes are possible from running a single Turnkey Configuration.

Example: The turnkey command is **RUN HELLO,S6,D1.** Each of three different drive configuration tables specifies three different physical drive numbers in the logical drive entry for Slot 6, Drive 1. (For instance, Table 1 defines Slot 6, Drive 1 as Slot 4, Drive 1; Table 2 defines Slot 6, Drive 1 as Slot 4, Drive 2; and Table 3 defines Slot 6, Drive 1 as Slot 5, Drive 2) Then, each password would be assigned one of the three drive configurations. Let's say three student's passwords were assigned Table 1, four were assigned Table 2, and one was assigned Table 3. When the AROS system is started and passwords are entered, three different HELLO programs will automatically be run from the three different floppy disk drives, depending on the drive configuration assigned each password. (Note: Any other logical and physical slot and drive values could be used rather than those given in this example.)

Many existing pieces of software are designed for Slot 6, Drive 1 or 2. The drive configuration tables may be used to

point Slot 6, Drive 1 or 2 to as many as 8 different physical drives for operating different software simultaneously.

CONFIGURATION OPTION: <P> PASSWORD UTILITY

The password section is for maintaining and modifying accounts for AROS. The Password Utility Menu looks like this:

AROS PASSWORD UTILITY

<A> ADD AN ACCOUNT

<D> DELETE AN ACCOUNT

<C> CHANGE AN ACCOUNT

<S> SEARCH

<L> LIST ACCOUNTS

<Q> QUIT

ENTER SELECTION :_

1 PASSWORD(S) IN FILE

An example password is included in the password file on the AROS Master diskette. Work with the Password Utility options to gain familiarity with adding, deleting and changing passwords. The selections are as follows :

<A> ADD AN ACCOUNT

ADD AN ACCOUNT

NAME : SAMPLE; THE

PASSWORD : NETWORK

TAG : ROS

REFERENCE : SAMPLE

DRV CONFIG : 1

Simply enter the account name. A suggestion is to use the last name first for people, as this will make searching for them much easier later. Commas are not accepted, use semicolns (;) to separate names. The account name field is 25 characters long. A maximum of 500 accounts may be established.

The password is up to eight letters long and must consist of alphabetic letters and/or any of these special symbols: - . , @ and / . Blank passwords are not allowed.

The tag is a three character field that will be appended to all file activity associated with this account. The tag consists of three letters, or two letters plus any other character.

The reference is up to six characters long and is for your use only in any way you choose.

The drive configuration is a number from 1 through 8. This will define which drive configuration table is assigned to this user.

When the information is correct, type Y to the question **ALL OK (Y/N).** If the computer does not detect any duplicate passwords or tags already on file, then the account will be created.

<D> DELETE AN ACCOUNT

Search fields are used to find an account you wish to delete. As each field is prompted, typing a <RETURN> will leave the search field blank. If a search field is blank it will match on all accounts. Typing in three letters for NAME and REFERENCE will match every account with a field that begins with those three letters. (Any number of characters my be entered).

Search fields can be used in any combination. If all search fields are left blank, the computer will match every account in the file.

Once all the search fields are entered, the computer will search the file for any matches and ask the user if the account being displayed is the one to delete. If the user enters Y the account will be deleted. If the user enters N the program will continue to search the file for more accounts that match the search fields.

<C> CHANGE AN ACCOUNT

Enter the search fields as in section - DELETE AN ACCOUNT. When the desired account is found you may modify the name, reference, and drive configuration fields ONLY. To leave a field unchanged, press <RETURN>.To change passwords or tags, the account must first be deleted and the recreated.

<S> SEARCH

Enter the search fields as in section - DELETE AN ACCOUNT. The program will give you the option to continue searching or stop.

<L> LIST ACCOUNTS

This will list all accounts on file to a printer. Enter the slot number of the printer interface (if installed) and whether passwords are to be printed. If there is no printer installed press <RETURN>.

<Q> QUIT

Returns to the Configuration Menu. If changes were made in any of the password accounts, the password table will be recompiled to reflect the changes. The process of compiling may be halted by typing <CTRL-Q>; if halted, another change must be made at a later time to re-trigger the compile process. Changes will not become part of the system until the <I> INSTALL REMOTE OPERATING SYSTEM option is selected from the Configuration Menu.

CONFIGURATION OPTION: <T> TURNKEY COMMAND

After a Remote system has booted and the user has logged on the network by entering their password, AROS will automatically execute an AROS disk command for that Remote. This option parallels the "HELLO" program in APPLE'S DOS, but is much more flexible.

AROS TURNKEY CONFIGURATION

<1> LOAD (APPLESOFT OR INTEGER)

<2> RUN (APPLESOFT OR INTEGER)

<3> EXEC (COMMAND FILE)

<4> BRUN

<5> FP (PASSIVE, NO ACCESS)

<6> INT (PASSIVE, NO ACCESS)

<7> CATALOG

<Q> QUIT

ENTER NUMBER OF DOS COMMAND TO EXECUTE ON BOOT :

Enter the number of the command to execute after booting. LOAD, RUN, EXEC, and BRUN require file names. LOAD, RUN, EXEC, BRUN, and CATALOG all require a logical slot and drive number. REMEMBER, THIS IS THE LOGICAL SLOT AND DRIVE NUMBER OF THE REMOTE, NOT THE PHYSICAL DRIVE OF THE CENTRAL. The volume number will default to zero.

CONFIGURATION OPTION: <I> INSTALL REMOTE OPERATING SYSTEM

If you add or delete a password, change the drive configurations, or change the turnkey command, you must INSTALL the newly configured AROS before it can be used by the Remotes. Remotes receive all operating information when booted. Changing a drive configuration, for example, after a Remote has already booted will not effect it's operation until it reboots.

CONFIGURATION OPTION: <Q> QUIT

Returns to the Main Menu. If changes have been made to the system configuration without running the INSTALL option, then a reminder message will be given:

```
CONFIGURATION CHANGES NOT INSTALLED
<I> INSTALL CHANGES
<Q> QUIT
SELECT OPTION:_
```

Select <I> to complete installation, or <Q> to return to the Main Menu.

SUSPENDING THE NETWORK

DOS commands and some AROS utilities can suspend the network from use. The Central user may suspend the system at any time by typing <CTRL-Q> <RESET>. AVOID USING <CTRL-Q> <RESET> WHILE A REMOTE IS ACCESSING THE SYSTEM AS THE ACCESS WILL BE DESTROYED. The reset option was incorporated into the AROS because it will stop the network, regardless of activity and is essentially a "Panic Button". This might be used if the operating system is "locked up" (cannot be accessed by Remote or Central) or defective. If this happens type <CTRL-Q> <RESET> and reactivate the Central.

A more civilized method that can be used by both the user and basic programs alike is to CALL 960 to suspend the network, and CALL 964 to restore it. The call to suspend, rather obviously, cannot be executed until the Central is done processing any current requests. CALL 968 will initialize AROS and return language prompt ( ] or >).

Binary programs running on the Central can disable or re-enable the network simply by masking or clearing the IRQ (interrupt request line) with the SEI (set interrupt mask) and CLI (clear interrupt mask) commands.

The Central user may restore a suspended network at any time by pressing <SPACE> (or any key other than <CTRL-Q>) followed by the <RESET> key.

SPEED

SPEED is a Remote access enhancement routine that also doubles as a command monitor. It is stored on the AROS Master disk as "SPEED". SPEED can be executed at any time by typing BRUN SPEED from the Central system. SPEED is called automatically when AROS is activated.

The purpose of SPEED is to increase the speed of access to data in the disk drives, hence the name "SPEED". A secondary benefit of importance especially to floppy disk users is reduction of wear and tear on the disk drive mechanism. How these wonders are accomplished is fully described in this section.

USING SPEED

When SPEED is running, the top of the screen will display the following message :

```
                AROS COMMAND MONITOR
TAG S D VOL CMD FILE NAME
```

This may seem a little criptic, but in reality it is very simple. As Remotes access the network for disk commands, their activity is diplayed on the screen. A typical access might appear as :

```
JDN 6 1 254 ASV MY NEW PROGRAM
********** ERR FILE LOCKED
```

The fields are described below.

TAG S D VOL CMD FILE NAME
JDN

This is the three letter tag associated with the Remote that is requesting the command. If the tag is in normal video then a public access took place. If the tag is in inverse letters the access took place on a private file. The inverse characters **$$$** denote access of an AROS system file.

TAG S D VOL CMD FILE NAME
6 1 254

This is the physical slot, drive, and volume number returned by the access.

TAG S D VOL CMD FILE NAME
ASV

This is an abbreviation of the DOS command requested. A list of the commands that SPEED displays are :

ALD	Applesoft load (or run)
ILD	Integer load (or run)
BLD	Binary load (or run)
ASV	Applesoft save
ISV	Integer save
BSV	Binary save
OPN	Open a text file
LCK	Lock
ULK	Unlock
VER	Verify
DEL	Delete
CAT	Catalog (no file name is displayed)
REN	Rename (both the old file name and the new file name will be displayed)

TAG S D VOL CMD FILE NAME
MY NEW PROGRAM

This is the name of the file accessed (if applicable).

TAG S D VOL CMD FILE NAME
************** ERR FILE LOCKED**

If an error was generated by the request, the error will be displayed directly under the request.
Note - SPEED cannot catch all errors as some are handled at the Remotes.

To see the real heart of SPEED press the <SPACE> bar. The screen will display :

```
          AROS SPEED ACTIVE
SDTKS  SDTKS  SDTKS  SDTKS  SDTKS  SDTKS
```

```
          SL DR VOL TRK SEC REM COM PDA
RWTS REQ 00 00 000 $00 $00 000
  SECTORS BUFFERED 00      SPEED DRIVE
UNSATISFIED WRITES 00  00000000/00000000
DO NOT REMOVE POWER, REMOVE OR REPLACE
DISKETTES, BEFORE TYPING <CTRL-Q>.
```

If any activity has taken place, the screen will fill up with numbers and addresses (see section (D) USING THE CENTRAL WITH AROS - The Theory of SPEED for an explanation). To display the command monitor again press the <SPACE> bar.

SUSPENDING THE SYSTEM

To suspend the system in SPEED (not allow any access to take place) press <CTRL-Q>. If SPEED is busy, an inverse letter Q will appear in the upper left corner indicating your request to suspend the system has been recognized. After the system has satisfied any ongoing network request, SPEED will beep once and display at the bottom of the SPEED screen:

```
<RETURN>=RESUME <CTRL-C>=CHANGE DISKETTE
<CTRL-Q>=QUIT   <CTRL-S>=QUIT & SUSPEND
```

SPEED will wait 17 seconds for a command. If no command is entered it will resume operation automatically. To resume immediately press <RETURN>. To exit the SPEED Utility press <CTRL-Q> a second time, or, if you wish to exit SPEED with the network suspended, press <CTRL-S>. SPEED will stop execution and return control to the keyboard.

CHANGING DISKETTES

If you need to change a diskette or suspend the operation of the network indefinitely press <CTRL-C>. SPEED will display **<RETURN>=RESUME** and produce a tone. This tone is a warning signal that the operation of the network has been suspended indefinitely. The tone will last for approximately four minutes and then stop. THE SYSTEM WILL NOT RESUME AUTOMATICALLY, only the tone ceases. When the Central operator has changed the diskette(s) and/or is ready to continue, pressing <RETURN> will clear SPEED and resume.

RELEASING FILES

SPEED also has the capability of releasing public text files that have been locked-out by a Remote. As mentioned earlier (see section (C) UNDERSTANDING R.O.S. NETWORK AND HOW IT WORKS - PUBLIC FILE LOCK-OUT) if a public file is locked-out and not released, no other Remote system will be allowed access to that file until the network is restarted. When a Remote locks-out a file and fails to properly release it, the Central user may release it while in SPEED.

To review the list of public files that are currently locked-out press <CTRL-L>. The command monitor screen will list the slot, drive, volume number, and file name as well as the Remote number who currently owns each locked-out file.

To release a public file press <CTRL-R>. The command monitor screen will again list the locked-out files. To the left of each file entry there is a locked file number. This number will be between 0 and F (hexidecimal) representing the 16 files that can be locked-out at any one time. To release a file, press the corresponding locked file number. SPEED will then relist the updated file list. Since the network is suspended during the release operation the user has 40 seconds to either release a file or press <RETURN>.

NEVER RELEASE A FILE UNLESS YOU KNOW THAT THE REMOTE WHICH OWNS THE FILE HAS STOPPED PROCESSING AND CANNOT RELEASE THE FILE. If a Remote locks a file properly and the Central user releases that file, then the Remote that owned the file will be subject to interleaved update and could generate an error.

THE THEORY OF SPEED

The SPEED Utility operates under the principal that the users of a network will tend to access the same or related information. Under normal operation of AROS, each request from an individual Remote will be processed independent of any similar request (with the exception of FEED). Therefore, similar commands from two or more Remotes will re-access the storage device, re-read the data, and re-transmit the information again and again, until all the requests are satisfied.

SPEED, however, will keep in memory up to the last 96 sectors that have been read/written to the disk. If any Remote system requires the same, or parts of the same information, SPEED simply re-transmits the data from memory WITH NO PHYSICAL DRIVE ACCESS.

The catalog and VTOC sectors are excellent examples because a program using text files, for instance, may access and reaccess these sectors hundreds of times in the course of just a few reads or writes. Program saves, binary saves, and many text file

operations read, re-read, and then write information to the disk unnecessarily. Often programs and binary images are saved to the disk with little or no change, despite this fact, DOS will save every sector, regardless of changes or lack thereof. SPEED eliminates these inefficiencies.

To more clearly illustrate the function of SPEED, the various parts of the SPEED screen are explained below.

```
                AROS SPEED ACTIVE
SDTKS  SDTKS  SDTKS  SDTKS  SDTKS  SDTKS
6211C
6211D
6211E
6211F
62110
.
.
.
```

This represents the list of sectors that are currently being kept in memory by SPEED. The sector **6211C** represents the sector on slot 6, drive 2, track 11 (HEX), sector C (HEX). Each time a sector is accessed, it is placed at the top of the queue in the upper left hand corner of the screen. The sector in this position is always the most recently accessed sector. The second most recently accessed sector is just below it and below that the third, and so on, down to the ninety-sixth most recently accessed sector at the bottom right hand corner of the screen.

If a sector is requested that is not in memory, SPEED retrieves that sector from disk, as it normally would. Each new sector that is read into a full queue pushes the ninety-sixth most recently accessed sector out of memory.

If a sector has been updated (changed), it will appear in the list with an inverse block to indicate that the change has taken place in SPEED's memory and not on the disk yet. Unwritten sectors are kept in memory and written to the disk when the network is quiet (no one is accessing), thus access time is not wasted by running the drive while requests are begin handled.

SPEED does not waste time redrawing the screen until all waiting Remote requests have been satisfied, so the list of sectors will appear to remain the same during several consecutive accesses. In reality, however, it changes on every sector access made.

SL DR VOL TRK SEC REM COM PDA
RWTS REQ 00 00 000 $00 $00 000

As each sector is used, the line displayed above will reflect the RWTS (Read or Write at a Track and Sector) request being handled. The display consists of (left to right) the Slot, Drive, Volume (base 10), Track (hex), Sector (hex), the number of the Remote making the access (base 10), the Command (READ or WRITE), and a block to indicate a Physical Drive Access. The Physical Drive Access light will indicate any request that was forced to access the drive for the information (the sector was not in SPEED's memory).

SECTORS BUFFERED 00
UNSATISFIED WRITES 00

SECTORS BUFFERED displays the number of valid sectors currently in memory. UNSATISFIED WRITES displays the number of sectors that are in memory that have not yet been written to the disk. These numbers are in base 10 and are only updated when the sectors are re-displayed.

SPEED DRIVE
00000000/00000000

The SPEED/DRIVE numbers will help you rate the effectiveness of SPEED in the operation of your network. Each time an access to a physical disk is make, 1 is added to the number under **DRIVE.** Each time an access is made to memory (saving time), 1 is added to the number under **SPEED.** The average ratio (in our tests at least) is about 3/2 (i.e. for every 5 accesses (3+2), SPEED handled 3 and the DRIVE handled 2). This indicates that approximately 60% of the drive use was eliminated. If several Remotes (say 15) are using the same programs and files, the ratio may jump as high as 40:1 (98% of drive use eliminated). Ratios lower than 1:7 (only a 15% savings) probably do not make SPEED worth using regularly, unless the command monitor proves useful.

DO NOT REMOVE POWER, REMOVE OR REPLACE
DISKETTES, OR PRESS RESET BEFORE EXITING

To exit SPEED you must use <CTRL-Q> <CTRL-Q> to insure all the data on the diskette is intact. REMOVING POWER OR REPLACING DISKETTES WITH OUT USING <CTRL-Q> <CTRL-C> WILL RESULT IN PERMANENTLY LOST FILES AND/OR DATA.

<RESET> or <CTRL-Q> <RESET> function similiar to the way they do without SPEED (see section (D) USING THE CENTRAL SYSTEM WITH AROS - SUSPENDING THE NETWORK) except that SPEED is cleared and program control is restored to the SPEED Utility.

FEED

Under normal operation of the R.O.S. network, when a Remote user loads a program, the Remote would gain access to the network and load the software. Therefore, if sixty users all loaded the same program, that same program would be re-loaded and re-sent sixty times.

To resolve this problem FEED was created. FEED is a utility that allows several Remote users to receive the same file simultaneously. The FEED command is similar to the turnkey routine in that it can take the form of a LOAD, RUN, BLOAD, or BRUN.

Once the FEED command is defined at the Central, any Remote user(s) wishing to receive the program specified by the FEED command simply enters FEED <RETURN>. When the Remote has gained access to the network, it and all other Remotes currently waiting for a FEED, will receive the program as a group.

The FEED command installed on your AROS Master will run a binary program displaying the SOFTWORKS logo. To try it out, type FEED <RETURN> at any Remote system and the SOFTWORKS logo will be displayed.

USING FEED

At the Central system catalog the AROS Master diskette. Type RUN FEED. The screen will display the following :

AROS FEED CONTROLLER

<C> CATALOG (DRIVE SELECT)

<D> DISPLAY FEED STATUS

<N> NEW FEED (FILE SELECT)

<E> ENABLE FEED

<I> INSTALL DEFAULT FEED

<S> SUSPEND AROS

<R> RESTORE AROS

<Q> QUIT

<C> CATALOG (DRIVE SELECT)

This command will display the catalog of any slot, drive, and volume. This must be performed prior to setting a new FEED as the FEED Utility will look for the program you specify on the slot and drive last cataloged. Specifying the volume number is optional; enter <RETURN> for 0.

<D> DISPLAY FEED STATUS

This option displays the current configuration of the FEED command. If this is the first time you have run the FEED program, the filename should be "SOFTWORKS", the filetype "BINARY", and the feedtype "BRUN".

<N> NEW FEED (FILE SELECT)

Enter the name of the file you wish to FEED and press <RETURN>. The program will verify that the file is on the diskette last cataloged and fill in the filetype. Text files cannot be used. Next enter the FEED type: RUN, LOAD, BRUN, or BLOAD. The program will fill in the physical slot, drive, and volume the file is on.

Next enter the logical slot and drive which will be used by the Remotes. When FEED is executed, the physical slot, drive and volume parameters of the file to be sent will be placed in the logical slot and drive entry in the Remote. In essence, a new logical drive entry will be installed in the Remote when the FEED is executed and will overwrite any existing logical drive entry with the new one. When all information is correct, press Y. Respond to the installation question with Y to install the program you have selected as the current FEED. Press F from the FEED Menu to verify the correct installation.

<E> ENABLE FEED

This is used to control a synchronized FEED and allow or disallow any subsequent FEEDs to be executed by the Remotes. When you press E from the menu the network will be suspended. Each Remote user who is to rece the Remotes. When you press E from the menu, the network will be suspended. Each Remote user who is to receive the program should now type FEED <RETURN>, they will see an inverse letter "Q". When you press <RETURN> at the Central, all the Remotes that are ready and have the proper language needed, if any, will now receive the program as a group. If you did not want to send a synchronized FEED press <ESC>. Once the FEED is completed, the Central will ask **DISALLOW FEED (Y/N)**. If you press Y any Remote requesting a FEED at a later time will receive a **FEED NOT READY** error. If you press N, any Remote requesting a FEED at a later time will receive the current FEED command.

<I> INSTALL DEFAULT FEED

The default FEED is the FEED command that is active when the Central system boots up, and will remain active until another FEED command is set. To change the default FEED command to something other than the one supplied on the AROS Master diskette, use the <C> and <N> options to set a new FEED command and then press I from the Feed Controller Menu. This will save the current FEED in memory to the diskette as the default FEED.

<S> SUSPEND AROS
<R> RESTORE AROS

These options allow the user to suspend and restore the network. If the network is being used it may be very difficult for the Central user to use the FEED Utility. The network should be restored before exiting.

<Q> QUIT

Exits the FEED Utility.

The FEED command my be used inside a program the same as any other legal imbedded DOS command. (Example: **PRINT CHR$(4);"FEED"**)

THE INIT COMMAND

The Central system may execute the INIT command to initialize diskettes while AROS is active. The Central system is not disk interrupted while INIT is being executed though each Remote system will not be affected unless they attempt to access the disk. INIT will not write DOS to the first three tracks but space will be reserved to later add DOS using the MASTER CREATE program on the DOS 3.3 diskette.

Though the Central system may execute INIT while the network is active, it is not highly recommended because of the processing time required.

LANGUAGES OF REMOTE SYSTEMS

If the Central or any of the Remote systems connected to R.O.S. does not have a RAM language card (blank language systems that must be loaded with a language) you do not need to read this section.

BACKUP SUGGESTIONS

First of all, always keep a duplicate copy of any important software. Diskettes can be ruined by heat, magnetism, dirt, unintentionally deleting a file, opening the drive door while the diskette is being written to, or initializing a diskette. Make two copies of the AROS Master diskette to prevent loss of the most important part of your AROS, the system software. You should have plenty of initialized diskettes to accomodate all of your software plus your programs and backups.

Backing up data is important in any system, but under R.O.S., floppy diskettes often receive more than 30 or 40 times their normal use and wear. Diskettes that should have been expected to last six months, or more, may not survive three weeks. Even on more reliable hard disk systems, loss of data can be just as frustrating.

It should be noted, however, that as much as AROS increases normal diskette use, SPEED may decrease it closer to normal (below normal?). Also diskettes often fail in one or two months because they sit around, get beat up, tossed into drawers, crammed into diskette boxes, collect dust, collect finger prints, get hot, get cold, or get lost for two weeks, instead of because they received six months worth of use. Also be aware that not all diskettes are made equal and that some "bargain" diskettes may cause immeasurable grief.

BACKUPS FOR CLASSROOMS

One method of backing up or saving old copies of programs, is to have six diskettes for each class or group of users. Use one of the diskettes as the working copy and the other 5 as a backup for each day of the week. They should be labeled as to which group and what day of the week they are used. At the end of each day, copy the current working diskettes onto the appropriate backup. If ever a problem should surface on the working diskettes, data may be recovered from as far back as five days.

Using this method, in case of an accident, will allow you to retrieve or recover four to five days worth of work from any point that you made a SAVE. For example, Johnny SAVEd his program Monday and Tuesday. Today, Wednesday, he found out that he accidentally wrecked his program on Tuesday and wants to start over again from Monday. The teacher can change diskettes to Monday's diskette and Johnny can LOAD his old program. Now he won't have to start all over again with his program.

(E) USING THE REMOTE SYSTEMS WITH AROS

With a few exceptions, a Remote system under AROS will act and respond just as any normal Apple][computer with disk drives. If you have any questions concerning the normal operation of DOS 3.3 or your computer, consult the manuals provided with the computer.

THE "IN-USE-LIGHT"

Since a Remote system usually operates far from, and often out of sight, of the actual disk drives, AROS provides the Remote user with the ability to tell when, or when not, he or she is accessing the network. This is accomplished with a simulated "IN-USE-LIGHT" at the extreme lower right hand corner of the text screen.

When any network accesses are attempted, a white square replaces any character currently in the extreme lower corner of the text screen. If the access is not immediately successful (someone else is using the Central) the square will display a steady **Q**. If no one is currently accessing the system, but the Central does not respond (the Central is off or has the network suspended) the square will also display the **Q**. While the **Q** is displayed, the user has the option of typing a <CTRL-Q> to cancel the request. If the AROS command was entered at the keyboard, pressing <CTRL-Q> will ignore the command and control will be returned to the user. If the command was executed from within a program, the <CTRL-Q> will halt the program or return an I/O ERROR code if ONERR GOTO is active. If Reset is used to interrupt a waiting command, the **Q** may be left on the screen. Using reset in this way is not recommended except to recover control in case of an error.

When a Remote user is attempting to access a public text file which another user has reserved through File Lock-Out (see section (A) UNDERSTANDING R.O.S. NETWORK AND HOW IT WORKS - PUBLIC FILE LOCK-OUT), an inverse **F** will appear where the "In-Use-Light" is located. Every 10 seconds, the computer will try again to open the reserved or locked-out file. When the file is free, the program will continue. If the program does not continue after a reasonable period of time, check with other users to determine if someone is holding the file open. If not, the file may be manually released from the Central system using SPEED (see section (D) USING THE CENTRAL SYSTEM WITH AROS - SPEED). It is not necessary to halt operation of the program in the Remote during this process.

Once a successful access has occurred, the command cannot be interrupted and the "IN-USE-LIGHT" light will flicker and then remain on and steady until the request is completed. At this time processing will continue as normal and whatever character originally occupied the lower right hand corner will be replaced there.

Remote systems in full page graphics mode or using an 80 character board will not see an "IN-USE-LIGHT".

THE RESET BUTTON

Accidents do happen, so safeguards were built into AROS However, accidental resets could possibly cause problems under adverse situations. It is particulary important to avoid pressing <RESET> while the "IN-USE-LIGHT" is on. If the program you are running has changed reset to restart the program, then pressing reset while the "IN-USE-LIGHT" is on may hang the Network.

If a <RESET> gives you the Monitor prompt (*), then type 3D0G <RETURN> for non-autostart computers. An autostart computer should normally return you to a language immediately after a reset. If it does not, however, enter a 3D0G <RETURN> for a "warm start" or 3D3G <RETURN> for a "cold start", which is the normal DOS recovery for non-autostart systems. If you pressed <RESET> because of a problem with accessing the network, check to see that AROS system has successfully recovered by typing a catalog, or some other access command. If the Remote does not respond, or gives a "SYNTAX ERR" you should reboot the Remote (PR#**S** from BASIC or **S** <CTRL-P> from the monitor, where **S** is the slot is which the Disk Access Card is installed), for proper operation of the system.

DISK DRIVES

Under AROS all Remote systems networked will share the disk storage resident at the Central system. That disk storage may be either floppy, hard disk, or both. In addition to the shared disk storage used in the network, each Remote system may also use independent disk storage resident at that Remote. This independent disk storage though, is not interfaced to the R.O.S. network. To use independent disk storage, the Remote must first have booted the AROS operating system and from there, would boot the independent disk storage by typing **PR#<S>**, where S is the slot where the disk controller card for the independent disk storage resides.

Remotes using independent disk storage may log back onto the R.O.S. network simply by typing "PR#**S**", where **S** is the slot in which the Disk Access Card is installed.

AROS COMMANDS

In addition to the compliment of standard Apple][DOS 3.3 commands, AROS has a few commands of it's own or slight modifications to existing ones.

Parameters enclosed in {brackets} are optional.
Parameters enclosed in <carets> are expressions.

BYE

When a Remote user is finished using their system, they should type BYE as a command. This command will release that Remote from the network, thereby protecting the user from any unauthorized use of their account after they have left the system. This also frees the system number associated with that Remote to be released and reallocated to another user. After BYE is typed, the system will RESET and reboot AROS. If the AROS Master diskette is still in the drive from which it was originally BOOTed, the account number will be deleted from the ID FILE. If the AROS Master diskette has been removed or placed in another drive, then the account number will not be deleted. The Remote system now has no AROS in memory and cannot access the network again until it is rebooted (PR#7) and a new account password entered.

Example : BYE

CATALOG {,S<Slot number>}{,D<Drive number>}{,V<Volume number>}

Displays the catalog of the specified logical drive. Each catalog may require more than one screen to display all the filenames. To see additional screens, if any, touch any key (except <RESET> or <RETURN>). Pressing the <RETURN> key will abort the display of any remaining screens. More than one access is required to print the entire catalog of a diskette in most cases.

Example : CATALOG,S6,D2

FEED

FEED is used to request a simultaneous program load from the Central system (see section (D) USING THE CENTRAL SYSTEM WITH AROS - FEED). If there is no program to load, a **FEED NOT READY** error will occur.

Example : FEED

INIT

The INIT command is ignored by the Remotes for, we hope, obvious reasons.

KAT

KAT was designed as a fast no-access catalog. This brain-child of the system authors with it's large buffer had to go to make room for the RWTS package in AROS V2.1. Gone also is the "NO KITTY ERR", the price of increased compatibilty with existing software.

WRITE

The standard DOS command "WRITE (filename)" when the filename accesses a public filename, will reserve the file for exclusive access by that Remote until released by "CLOSE (filename)" or "CLOSE". (See section (C) UNDERSTANDING R.O.S. NETWORK AND HOW IT WORKS - PUBLIC FILE LOCK-OUT.)

(F) WRITING PROGRAMS WITH AROS

ANY SOFTWARE THAT WILL RUN UNDER DOS 3.3 AND THAT DOES NOT USE ANY TOTALLY UNORTHODOX DISK SCHEMES WILL RUN UNDER AROS.

There are a few items to note when running or writing programs for use under AROS. The subjects below cover the major differences.

LIKELY ERRORS

DOS will compensate for the forgetful programmer who does not OPEN a text file before READing or WRITEing the file, by OPENing the file on the READ or WRITE command. AROS will also, unless it is a public file or a new file. A "FILE NOT FOUND" error message will be given.

Like DOS, error messages are not printed if ONERR GOTO is active. If an AROS error other than the standard DOS errors has occurred, AROS will return an I/O ERROR code. A likely possible cause is a filename greater than 26 characters. Look for extra control characters if it doesn't appear too long.

PEEKS AND POKES

All standard zero page addresses used by Apple][DOS are used by AROS (see the APPLE][REFERENCE MANUAL). For POKEs, this means that the same caution of using these addresses must be observed under AROS. If you reboot a Remote system, the AROS BOOT will write over memory from $300 to $37F, $800 to $2300, and $9400 to $BFFF.

MACHINE LANGUAGE

BINARY ROUTINES THAT ACCESS A DISK FROM A REMOTE MAY DO SO BY PRINTING CTRL-D AND THE DOS COMMAND THROUGH THE "COUT" ROUTINE AT $FDED, OR USING THE STANDARD DOS 3.3 FILE MANAGER UTILITY ACCESSABLE VIA THE PAGE 3 VECTORS. MACHINE LANGUAGE PROGRAMS MAY ALSO USE THE RWTS SUBROUTINE VIA THE PAGE 3 VECTORS. Note that calls to the File Manager other than CATALOG will not pass through the RWTS routines, track/sector lists are not supported in the file buffers, and the file buffer work area is non-standard. DOS subroutines above the File Manager level are in standard locations. RWTS programmers should be cautious of proper multi-user design.

Accessing the network for specialized applications is very easy to do in machine code. For specifications, and a description of standard AROS protocalls, call or write SOFTWORKS INC. and we will be happy to support the advanced programmer needing this information.

(G) ERROR MESSAGES AND RECOVERY

All error messages are the same as DOS 3.3 with the following additions or exceptions.

FEED NOT READY

If the Remote system requests a FEED command, and the Central system has disallowed the FEED command, no feed takes place (see section (D) USING THE CENTRAL SYSTEM WITH AROS - FEED).

FILE LOCKED

SPECIAL CASE: In addition to the usual instance of a WRITE or SAVE to a locked file, this error message may result when a Remote system LOCKS-OUT a file and the Central overrides the file lock-out by releasing that file via SPEED. Should the Remote then attempt to re-access that file, a FILE LOCKED error will occur if another Remote has locked-out the same file.

INVALID DRIVE

The logical slot and drive or volume number specified was disallowed in the drive configuration table of that Remote.

LINK ERR

Interference on the cable either from static charge or another computer turning power off and on is the usual reason for this error. The Central system may need to be reset afterwards. Disruption of the communication process may also happen if either the Central user presses <RESET> or the AROS operating system is not working correctly. If the power supply of a computer is overloaded, or malfunctioning, no software will function correctly, including AROS. In some cases LINK ERR may result from a previous error, in which case the LINK ERR will clear the system for the next command.

NAME TOO LONG

File names may be a maximum of 26 characters, not including private file tags.

ROS LOADING ERR

The AROS Master diskette is not available or has been placed in a different drive from the one it was activated from; Central user pressed <RESET> during boot; DOS I/O ERROR occurred during boot; power or other disruptions occurred during boot. The file AROS BOOT $$$ must be available and readable to boot any Remote system. This file may be reconstructed by the <I> INSTALL REMOTE OPERATING SYSTEM option from the Configuration Menu. If the error resulted from a bad diskette, you better look for your backup.

(H) FUTURE ENHANCEMENTS

It is important that you fill in and send us your user registration card. By the time you read this paragraph, changes and enhancements to the Remote Operating System will be under way and we would like to keep you up to date on these revisions. Currently under development for the next version of the R.O.S. are additional AROS utilities, special network oriented software, PASCAL, CP/M.

We are very interested in hearing any suggestions for future improvements. Your suggestions can tell us what features are most needed to further enhance the power of the disk access system.

PLEASE take the time to let us know what you like most about the system (we don't want to remove or change anything you like) and what you would like the system to do that it currently does not. Every effort will be made to include the most wanted and useful features in a revised version. And, of course, only a new diskette with new software will be needed to bring these new features into your R.O.S. Disk Access system.

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. As temporarily permitted by regulation it has not been tested for compliance with the limits for Class A computing devices, pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

The information contained in this manual is believed to be correct at the time of publication. SOFTWORKS, Inc. assumes no liability arising from the use of this material.

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For general headings refer to the TABLE OF CONTENTS.

(J) GLOSSARY

6502: The manufacturer's name for the microprocessor at the heart of your Apple.

Apple: 1. The round fleshy fruit of a Rosaceous tree (Pyrus Malus). 2. A brand of personal computer. 3. Apple Computer, Inc., manufacturer of home and personal computers.

AROS: ADVANCED REMOTE OPERATING SYSTEM which is the operating system used exclusively by the R.O.S. network system.

ASCII: An acronym for the American Standard Code of Information Interchange (often called "USASCII" or misinterpreted as "ASC-II"). This standard code assigns a unique value from 0 to 127 to each of 128 numbers, letters, special characters, and control characters.

BASIC: Acronym for "Beginner's All-Purpose Symbolic Instruction Code". BASIC is a higher level language, similar in structure to FORTRAN but somewhat easier to learn. It was invented by Kemney and Kurtz at Dartmouth College in 1963 and has proved to be the most popular language for personal computers.

BOOTSTRAP ("boot"): To get a system running from a cold-start. The name comes from the machine's attempt to "pull itself off the ground by tugging on its own bootstraps."

BROWN-OUTS: Abnormal decrease in line voltage.

BUFFER: A device or area of memory which is used to hold something temporarily. The "picture buffer" contains graphic information to be displayed on the video screen; the "input buffer" holds a partially formed input line.

BUG: An error. A hardware bug is a physical or electrical malfunction or design error. A software bug is an error in programming, either in the logic of the program or typographical in nature. See "feature".

CHARACTER: Any graphic symbol which has a specific meaning to people. Letters (both upper- and lower-case), numbers, and various symbols (such as punctuation marks) are all characters.

CODE: A method of representing something in terms of something else. The ASCII code represents characters as binary numbers, the BASIC language represents algorithms in terms of program statements. Code is also used to refer to programs, usually in low-level languages.

COLD-START: To begin to operate a computer system which has just been turned on, or, to restart the system disregarding any activity since the last cold-start.

COMPUTER: Any device which can receive and store a set of instructions, and then act upon those instructions in a predetermined and predictable fashion. The definition implies that both the instruction and the data upon which the instructions can be changed. A device whose instructions cannot be changed (such as a pocket calculator) is not a computer.

CONTROL (CTRL) CHARACTER: Characters in the ASCII character set which usually have no graphic representation, but are used to control various functions. For example, the RETURN control character is a signal to the Apple that you have fininshed typing an input line and you wish the computer to act upon it.

CRT: Acronym for "Cathode-Ray Tube", meaning any television screen, or a device containing such a screen.

CURSOR: A special symbol which reminds you of a certain position on something. The cursor on a slide rule lets you line up numbers; the cursor on the Apple's screen reminds you of where you are when you are typing.

DATA (DATUM): Information of any type.

DEBUG: To find bugs and eliminate them.

DISPLAY: As a noun: any sort of output device for a computer, usually a video screen. As a verb: to place information on such a screen.

EXECUTE: To perform the intention of a command or instruction. Also, to run a program or a portion of a program.

FEATURE: A bug as described by the marketing department.

GLITCH: A computer malfunction of mysterious origin. As used by a programmer, refering to a hardware problem. As used by an engineer, describing a programming error.

HARDWARE: The physical, touchable parts of a computer.

HEXADECIMAL (HEX): A number system which uses the digits 0 through 9 and the six letters A through F to represent values in base 16. Each hexadecimal digit in a hexadecimal number represents a power of 16.

HIGH-LEVEL LANGUAGE: A language which is more intelligible to humans than it is to machines.

INPUT: As a noun: data which flows from the outside world into the computer. As a verb: to obtain data from the outside world.

INPUT/OUTPUT (I/O): The software, hardware, or process which exchanges data with the outside world.

INSTRUCTION: The smallest portion of a program that a computer can execute. In 6502 machine language, an instruction comprises one, two, or three bytes; in a higher-level language, instructions may be many characters long.

INTERFACE: An exchange of information between one thing and another, or the mechanisms which make such an exchange possible.

INTERLEAVED UPDATES: Collision of updating data by more than one user when the same record or data is processed but one update overwrites the prior update.

LANGUAGE: A computer language is a code which (hopefully!) both a programmer and his computer understand. The programmer expresses what he wants to do in this code, and the computer understands the code and performs the desired actions.

LINE: On a video screen, a "line" is a horizontal sequence of graphic symbols extending from one edge of the screen to the other. To the Apple, an input line is a sequence of up to 254 characters, terminated by the control character RETURN. In most places which do not have personal computers, a line is something you wait in to use the computer.

LINE FILTER: Mechanical device which regulates and corrects changes in line voltage.

LOW-LEVEL LANGUAGE: A language which is more intelligible to machines than it is to humans.

MODE: A condition or set of conditions under which a certain set of rules apply.

MONITOR: 1) A closed-circuit television receiver. 2) A program which allows you to use your computer at a very low level, often with the values and addresses of individual memory locations.

OUTPUT: As a noun, data generated by the computer whose destination is the real world. As a verb, the process of generating or transmitting such data.

PAGE: 1) A screen full of information on a video display. 2) A quantity of memory locations, addressable with one byte. On the Apple, a "page" of memory contains 256 locations.

PASCAL: A noted French scientist.

PERIPHERAL: Something attached to the computer which is not part of the computer itself. Most peripherals are input and/or output devices.

PERSONAL COMPUTER: A computer with memory, languages, and peripherals which are well-suited for use in a home, office, or school.

PROGRAM: A sequence of instructions which describes a process.

RETURN: To exit a subroutine and go back to the program which called it.

RUN: To follow the sequence of instructions which comprise a program, and to complete the process outlined by the instructions.

SOFT SWITCH: A two-position switch which can be "thrown" either way by the software of a computer.

SOFTWARE: The program which gives the hardware something to do.

SUBROUTINE: A segment of a program which can be executed by a single call. Subroutines are used to perform the same sequence of instructions at many different places in one program.

SYNTAX: The structure of instructions in a given language. If you make a mistake in entering an instruction and garble the syntax, the computer sometimes calls this a "SYNTAX ERROR".

TEXT: Characters, usually letters and numbers. "Text" usually refers to large chunks of English, rather than computer, language.

TOGGLE SWITCH: A two-position switch which can only flip from one position to the other and back again, and cannot be directly set either way.

VIDEO: 1) Anything visual. 2) Information presented on the face of a Cathode-Ray Tube.

WARM-START: To restart the operation of a computer after you have lost control of its language or operating system.

WINDOW: Something out of which you jump when the power fails and you lose a large program. Really: a reserved area on a display which is dedicated to some special purpose.

(K) NOTES AND COMMENTS

(K) NOTES AND COMMENTS

SOFTWORKS
inc.