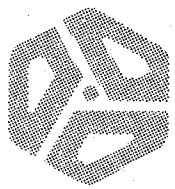
Time Sharing BASIC Documentation



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1. INTRODUCTION

Altair Time Sharing BASIC allows a maximum of eight users to access the same Altair 8800 series microcomputer simultaneously. Each user has access to most of the features of Altair Extended BASIC and can operate independently of any other user. A variety of terminals can be connected to the Time sharing (T/S) BASIC system so that some tasks can use CRT terminals for fast data transfer while others use hardcopy terminals for output in permanent form.

The users' tasks are kept independent of each other by a "fixed partition" system whereby each user is assigned a memory region that can be accessed only by that user. Jobs are executed in turn as required by the job. Jobs with extensive CPU time demand are prevented from monopolizing the system by a "time-slice" arrangement that automatically suspends a job after it has been executed for 16 milliseconds. For this reason, four simultaneous users do not see significant response delays. With more than four users, delays may become noticeable.

A printer can be connected to the system and shared among the users. Printer service requests are automatically queued to prevent conflicts.

A disk version of T/S BASIC is available that allows users to save and recall programs stored in disk files. The disks are shared by all users, but files can be protected to prevent unauthorized access.

2. LOADING TIME SHARING BASIC

The following instructions are for loading both versions of Altair Time Sharing BASIC. The disk version is loaded from floppy disk and the non-disk version from cassette or paper tape.

2-1. Loading T/S BASIC from Disk

A. Systems with a Disk Boot Loader (DBL) PROM mounted in the proper slot of a PROM Memory Card have the loader program for disk programs readily available in non-volatile memory. Use the following procedure to load T/S BASIC with the DBL PROM:

1) Turn on the power to the computer, disk drives and peripherals.
2) Raise STOP and RESET simultaneously and then release them.
3) Raise switches A15-A8 and lower switches A7-AØ.

4) Actuate EXAMINE.

5) Make sure the T/S BASIC diskette is mounted in disk drive 0, that the door is closed and the disk has come up to speed (approximately 5 seconds).

6) Return switches A15 - A7 to the down position.

7) Press RUN.

T/S BASIC should start up and print ALTAIR T/S BASIC V. x.x. For the remainder of the initialization procedure, see Section 4.

B. For systems without the DBL PROM, the loading procedure involves entering a bootstrap loader from the computer front panel, running it to load a disk loader program from paper tape or cassette and then running that checksum loader to load the system from disk. The procedure for doing this is as follows:

1) Turn on the power to the computer, disk drives and peripheral devices.

2) Make sure the terminal is on-line (on a Teletype™, this means the mode switch is set to LINE).

3) Now enter the proper loader program for the device through which the loader tape is to be entered. (The bootstrap loaders are in Appendix B of the Altair 8800 BASIC Reference Manual.)

The bootstrap loaders are entered on the front panel switches A7 - AØ. Each switch has two positions, up and down. By convention, up is designated as 1 and down as 0. Therefore, the eight switches represent one byte of data. Each group of three switches, starting from the right, can represent the digits 0 through 7. The leftmost two switches represent the digits 0 through 3. For example, to enter the octal number 315, the switches A7 through AØ are set to correspond to the following table:

Switch	A7	A6	A5	A4	A3	A2	A1	AØ
Position	up	up	down	down	up	up	down	up
Octal Digit	3		1			5		

The data bytes of the loader programs are shown in octal and are to be entered on A7 - AØ in this manner. To enter the programs:

4) Put switches A15 - AØ in the down position.

5) Raise EXAMINE.

6) Put the first loader program data byte in switches A7 - AØ.

7) Raise DEPOSIT.
8) Put the next data byte in A7 - AØ.
9) Depress DEPOSIT NEXT.
10) Repeat steps 8) and 9) for each successive data byte until the loader is completely entered. Now check the loader to make sure it has been entered correctly:
11) Put switches A15 - AØ in the down position.
12) Raise EXAMINE.
13) Check to see that the lights DO - D7 correspond to the correct data byte for the first location. A light on indicates 1; off means 0. The rightmost three lights correspond to the rightmost octal digit. The next three lights represent the middle digit and the leftmost two lights represent the left digit.

    If the data byte is correct, go to step 16.

    If the data byte is not correct, go to step 14.
14) Put the correct value in switches A7 - AØ.
15) Depress DEPOSIT.
16) Depress EXAMINE NEXT.
17) Check each successive byte by repeating steps 13 through 16 until the whole loader is checked.
18) If there were any incorrect bytes, check the whole loader again to see that they were corrected.

Now the paper tape or cassette labelled DISK LOADER can be read. For the paper tape version, put the tape in the reader and make sure it is positioned on the leader. The leader is the section of tape at the beginning with a series of 302_8 characters (3 of 8 holes punched). For the cassette version, put the cassette in the reader and make sure it is completely rewound.

19) Put switches A15 - AØ in the down position.
20) Raise EXAMINE.
21) Enter the proper sense switch settings for the load device in use. The sense switches are A11 - A8 on the front panel. T/S BASIC reads the setting of the sense switches to determine the form in which data is to be received from the loading device. Table 2-A shows the load switches to be raised for each standard

Altair system peripheral interface and the address that T/S BASIC assumes for them.

Table 2-A.

Device	Load Switches	Channels
2SIO (2 stop bits)	none	20,21
2SIO (1 stop bit)	A8	20,21
SIO	A9	0,1
ACR	A9,A8	6,7
4PIO	A10	40,41 42,43
PIO	A10,A8	4,5

22) Start the loading process. If the load device is connected to the computer through an 88-SIO A, B or C or an 88-PIO board, start the tape reader and then press the RUN switch on the computer front panel. For the 2SIO or 4PIO boards, press RUN and then start the reader. For the ACR, rewind and start the cassette. Listen to the signal from the tape (through an auxiliary earphone). When the steady tone changes to a warble, press RUN on the computer.

2-2. Loading T/S BASIC from Cassette or Paper Tape

To load Time Sharing BASIC from cassette or paper tape, a bootstrap loader must be entered into the computer's memory and run. There are two ways to do this, with or without the Multi-Boot Loader (MBL) PROM.

A. With the Multi-Boot PROM

If the MBL PROM is mounted in the correct slot of a PROM Memory Card and properly installed in the computer, the following procedure can be used to load T/S BASIC:

1) Simultaneously raise STOP and RESET; then release them.
2) Raise switches A15 - A11.
3) Press EXAMINE. This sets the location counter of the CPU at the starting address of the MBL PROM.

4) Set the sense switches for the load device according to Table 2-A on page 6.

5) To load from cassette, make sure the T/S BASIC cassette is fully rewound and start the tape. Listen to the output of the tape player with an earphone. When the steady tone changes to a warble, press RUN on the computer.

6) To load from paper tape, use the procedure on pp. 3-4 for loading the DISK LOADER tape (steps 18-22).

B. Without the Multi-Boot Loader PROM

To load T/S BASIC from cassette without the aid of the MBL PROM, use the following procedure:

1) Simultaneously raise STOP and RESET; then release them.

2) Put all address switches in the down position.

3) Press EXAMINE.

4) Enter the proper bootstrap loader according to the directions on page 3, steps 4 through 18.

5) Return switches A15 - AØ to the down position.

6) Press EXAMINE.

7) Enter the sense switch settings for the load device from Table 2-A.

8) To load from cassette, make sure the T/S BASIC cassette is loaded in the player and is fully rewound. Start the player and listen to its output with an earphone. When the steady tone changes to a warble, press RUN on the computer.

9) To load from paper tape use the procedure on pp 3-4 for loading the DISK LOADER tape (steps 18-22).

2-3. Loader Errors

If the checksum loader detects a loading error, it turns on the Interrupt Enable light and stores the ASCII code of an error letter in memory location 0. The error letter is also transmitted over all the terminal data channels shown in Table 2-A. If a terminal is connected to one of these ports, it prints the error letter. The error letters are as follows:

C Checksum error. If the checksum on the T/S BASIC disk file does not equal the checksum generated by the loader, C error results. The error may not occur if the diskette is loaded again. If it does occur three times consecutively, the BASIC disk or loader tape is at fault and must be replaced.

M Memory error. Data from the disk does not store properly. The location at which the error occurred is stored at locations 1 and 2 absolute.

O Overlay error. An attempt was made to load data over the loader.

I Invalid Load Device. The setting of the sense switches was incorrect.

3. NOTATION CONVENTIONS

Time Sharing BASIC accepts both upper and lower case input, although the LIST converts all lower case letters to upper case. This manual shows all terminal input and output in upper case. Output from the computer is underlined. Example:

SAVE "TEST"	Typed by the user.
OK	Printed by the computer (after the command has been executed).

In the descriptions of commands, the following notation conventions are used:

a. Words in angle brackets (<>) describe items of information to be supplied by the user.

b. Items in square brackets ([ ]) are optional and may be supplied by the user.

c. An item description followed by an ellipsis (...) means that as many items as needed of that description may be typed.

d. Be sure to type all indicated commas and quotation marks.

4. INITIALIZING TIME SHARING BASIC

4-1. Priority Levels

Time Sharing BASIC is an interrupt-driven system. That is, a terminal requests action on its job by requesting an interrupt. Assuming the computer is willing to receive an interrupt request, the request causes the computer to suspend operations on its current job, saving the information about the state of the job so that it can be restarted later, and picking up the new job. In this way, processor time is allocated on the basis of demand and slow processes, such as terminal keyboard input, can take less of the processor's time than fast processes, such as disk I/O or mathematical computations.

Conflicts between simultaneous interrupt requests are resolved through the mediation of the Vector Interrupt board. The Vector Interrupt board assigns priorities to the interrupt requests of the devices of the system.

To prevent monopolizing of the system by high priority devices, a timer is provided which generates interrupt requests at predetermined time intervals. The timer's priority level can be set by the operator.

The first step in initializing the T/S BASIC system is to set the priority for the various devices in the system. When T/S BASIC is loaded and started, it prints the following message:

ALTAIR T/S BASIC V. x.x.
HIGHEST ADDRESS IS xxxxxx

where xxxxxx is the address of the last memory location available for use by the system.

RECONFIGURE (Y,N,L)?

Typing L in answer to RECONFIGURE?
displays the current device configuration in the following form:

LEVEL 0: DISK	(the DISK is always at level 0 even in the non-disk versions. That is, level 0 can only be used in the disk version and then only for the disk.)
LEVEL 1: message	.
	.
	.
LEVEL 7: message	The messages can be of four types:
LEVEL x: NONE	meaning no devices have been assigned to interrupt level x,
LEVEL x: TIMER	meaning the system's timer has been assigned to level x,
LEVEL x: C LINE PRINTER or LEVEL x: Q LINE PRINTER	meaning the C700 or Q70 line printer has been assigned to level x, respectively,
LEVEL x : n - dev 1, dev 2, ... dev n	meaning that n devices have been assigned to level x and that the addresses of their data ports are dev 1, dev 2, ...

After the configuration has been displayed, RECONFIGURE? is asked again.

Typing N indicates that the current configuration is satisfactory. The initialization proceeds with MEMORY SIZE?

To change the I/O configuration, type Y. The system begins the reconfiguration dialog.

4-2. Reconfiguration Dialog

The system is reconfigured by setting the priority level of each device. The priority level is a number from 1 to 7 (level zero is permanently assigned to the disk) which indicates the order in which interrupts are to be serviced. Level 1 has the highest priority and level 7 the lowest. That is, an interrupt an level 1 is serviced immediately while an interrupt at level 7 is serviced only after interrupts at the higher levels have been serviced.

The priority levels are determined by strapping on the I/O interface and VI/RTC boards. Each interface board channel generates interrupt request signals which can be connected to any of the vectored interrupt (VI) lines on the Altair bus. The Real Time Clock on the VI/RTC board generates signals at predetermined time intervals which are also applied to one of the vectored interrupt lines.

The first question assigns the priority of the timer.

TIMER LEVEL?

The operator replies with a number from 1 to 7 which is the interrupt level at which the system time is to be assigned.

Next the system asks:

LINEPRINTER?

to which the operator replies with a letter indicating the type of printer in use as follows:

N - no printer is installed. Proceed to NUMBER OF DEVICES AT LEVEL x?, p 10.

C - the printer is an Altair C700

Q - the printer is an Altair Q70.

If the answer is C or Q, the following questions are asked:

Computer Prints	User Types
LEVEL?	the level at which the printer is to be assigned. This is usually the lowest priority level in the system (level 7).
PAGE LENGTH?	the length of the printer page in lines. At 6 lines per inch, an 11 inch page is 66 lines long.
LINES PER PAGE?	the number of lines to be printed on each page.

After the line printer is configured, the remaining I/O devices (usually terminals) are configured by the following dialog.

The system first asks

NUMBER OF DEVICES AT LEVEL x?

For each interrupt level, the operator types the number of devices to be assigned to that level. Up to 4 devices can be assigned to each level. Typing just a carriage return with no number is equivalent to typing zero, which means that no devices are to be assigned to level x. The question is asked again for level x + 1. If a number (not zero) is typed, the system asks:

DEVICE ADDRESS?

to which the operator responds with the address of the data channel of the 2SIO port for the device. The DEVICE ADDRESS question is repeated for each device at the level. When all of the devices at any given level are assigned, the question:

NUMBER OF DEVICES AT LEVEL x?

is repeated for the next level. After all levels are configured, the system prints:

NO TERMINALS DEFINED

if no devices (except the timer) were assigned to any level, or it prints the entire device configuration and asks

RECONFIGURE (Y,N,L)?

again. The dialog proceeds as above from that point. When the configuration is satisfactory, the dialog is made to proceed by answering RECONFIGURE with N. The system then asks:

MEMORY SIZE?

The operator can specify the number of bytes of memory to be used by T/S BASIC. Typing a carriage return directs the system to use all available read/write memory. The system responds with:

xxxxx BYTES AVAILABLE

This is the number of bytes that can be used for user programs, buffers, etc.

4-3. Designating User Space

After configuration is complete and T/S BASIC prints the amount of space available, the operator can divide that space as desired between the users. The system first asks:

NUMBER OF USERS?

The operator types the number of terminals that were assigned in the device configuration dialog. For each user, the system prints the following dialog:

Computer Prints	User Types
TERMINAL ADDRESS?	the address of one of the terminals assigned in the device configuration dialog.
REGION SIZE?	the amount of memory space (in bytes) to be allocated to this user.

The minimum region size is 1K bytes. The size includes 300 bytes used by a portion of the BASIC interpreter as well as variable storage, string space, etc.

When the region size has been specified, one of three messages is printed:

REGION TOO SMALL	indicates that the answer to REGION SIZE? was less than 1K bytes.
NOT ENOUGH SPACE. SIZE LEFT = xxxxx	means the answer to REGION SIZE? was more than the total remaining unassigned space.

In either of these cases, REGION SIZE? is asked again. After all terminals are assigned, the system prints:

xxxxx BYTES LEFT

where xxxxx is the number of bytes not assigned to any user.

4-4. Disk File Protection

To prevent one user from depriving other users of access to disk files, the system asks:

MOUNT PASSWORD?

to which the operator responds with one to four characters. Before a MOUNT, UNLOAD and a carriage return or a DSKINI command can be executed, this password must be given. This password is distinct from the SAVE command password described on page 17.

5. CAPABILITIES OF T/S BASIC

All of the users of T/S BASIC have access to the facilities of Altair Extended BASIC with the following exceptions (page numbers refer to the Altair 8800 BASIC Reference Manual, Version 4.1):

Cassette I/O. The ACR board is not supported, so CSAVE, CLOAD and their variants are not allowed (pp 25-26, 69-70, 114-115).

Byte oriented I/O. PEEK, POKE (pp 26-27, 76), INP, OUT (pp 27, 75, 79) and WAIT (pp 26, 77) are not allowed.

Disk I/O Primitives. DSKI$ and DSKO$ (pp 68, 69) are not allowed.

Machine language subroutines. DEFUSR (pp 71, 82, 112) is not available.

5-1. Terminal Input

Each user of the Timesharing BASIC system is assigned an input buffer that collects input from the terminal until the system is ready to accept it. The buffer allows the user to input data and programs continuously even though the jobs are serviced only periodically by the system. Since the T/S BASIC system echoes input characters, the characters typed into the buffer are not printed on the terminal until they are accepted by the system.

When the buffer is full (an unlikely occurrence unless the job has been suspended), additional input characters are not accepted. After that point each additional character is echoed with a bell.

Special characters allow the input buffer to be manipulated.

NOTE

The following characters are not included in the input buffer and have no effect on program execution.

Character	Function
Control/U	deletes the current contents of the input buffer back to the last carriage return character or the beginning of the buffer, whichever comes first. Thus, if the buffer contains two lines of input, only the last line is deleted by typing Control/U.
Rubout	deletes the last character in the buffer. Typing Rubout causes a backslash (/) and the last character in the buffer to be printed on the terminal. Typing successive Rubouts prints the previous characters in the buffer. Typing any non-Rubout character causes a second backslash and the character to be printed. The characters between backslashes are deleted.

Example:

EXAMPLE LENE\ENE\INE

After three Rubouts and "INE" are typed, the buffer contains:

EXAMPLE LINE

Control/R — displays the current contents of the input buffer.

5-2. Job Control

The user can control execution of a job by means of special characters.

NOTE

These characters are not included in the input buffer and take effect as soon as they are typed.

Character	Function
Control/C	terminates a job. The system's response is OK.
Control/S Control/Q	suspends a job until Control/Q is typed. This feature is useful when a program produces more output than can be contained on a CRT screen. Typing Control/S allows the operator to pause and examine the output at length. Typing Control/Q causes

The CONSOLE command allows control of a job to be transferred from one terminal to another. The format of the CONSOLE command is as follows:

CONSOLE <terminal address>

where <terminal address> is the address of the I/O port connected to the terminal to which control of the job is to be transferred.

Notice that no passwords or other protection are required in the CONSOLE command since users can transfer only their own jobs and no others.

The CONSOLE command in Time Sharing BASIC differs from that in Extended and Disk Altair BASIC in that T/S BASIC does not require the sense switch setting of the new terminal interface board. This is because only 2SIO boards are used to interface terminals.

execution (and output) to resume. Control/Q has no effect unless the job has been suspended.

5-3. Disk Program Files

Programs may be saved for later use in files on floppy disk. Files may be recalled from disk by name and executed in the same manner as programs entered from the terminal. Commands are provided to save, load, run, delete and rename disk program files.

All of the following disk commands act upon disk program files that are designated by a file name and disk number. File names are strings of up to eight characters whose first character is a letter. The following are valid file names:

```
FILE
ABC123
abc
A$BC
FILE.NAM
```

The disk number is the number (0, 1, 2, ...) of the disk drive upon which the file's disk is mounted. The disk containing the T/S BASIC system is always mounted on drive 0. Except for the MOUNT and UNLOAD commands, if no number is given in a command, drive zero is assumed.

Examples:

```
SAVE "SAVFILE",1
LOAD "FILNAM",0
DEL "TEST"
```

} These commands both use drive zero.

6. COMMANDS

6-1. Disk Commands

SAVE

Definition:

The program currently in the user's region is saved in a floppy disk file. The file has the specified name and is stored on the specified disk number. The file may be protected from unauthorized reading and/or modification by means of a password.

Format:

SAVE "<file name>" [,<disk number>] ,A

Notes:

Before the SAVE command is executed, the system asks:

NEW PROTECTION CODE?

The user answers with one of the following letters:

R read protection. The file saved in this command cannot be loaded, run, deleted or renamed without giving the correct password.

W write protection. The file saved in this command cannot be deleted or renamed without giving the correct password.

N no protection.

No carriage return is needed after typing the protection code. If the protection code is N, the saving action is executed immediately. If the protection code is R or W, the system now asks:

NEW PASSWORD?

The user types up to four characters which constitute the password for all subsequent uses of this file.

After the password is typed, the file is saved as commanded. If a file already exists on the specified disk with the same name as that in the SAVE command, the existing file is deleted before the new file is saved. Therefore, in order to change a file's password, it is only necessary to save the file with the new password. Note that if the protection code of the existing file is R or W, the file cannot be deleted without giving the correct password.

When an incorrect password is given, T/S BASIC prints the following message:

INVALID PASSWORD

and then calls the STOP routine. This causes the system to print:

BREAK @ xxxxx

where xxxxx is the number of the program line where the password was requested. If the password was requested in a direct mode statement (see BASIC Reference Manual, p. 5), the STOP routine prints:

BREAK

Normally, the file is saved on disk in BASIC's internal representation. Specifying the A option in the SAVE command allows the lines of the BASIC program to be saved on disk in ASCII coded form. ASCII coded program files may be loaded, run, deleted and renamed in the same manner as program files, but all operations on the coded files are much slower than the corresponding operations on internal files.

NOTE

Occasionally, files written on diskette by Altair Disk BASIC cannot be read by Time Sharing BASIC. This is especially true for diskettes where the directory track has been altered, either intentionally or by accident. If the first five bytes of the directory track after the file name are not zeros, T/S BASIC assumes they are a protection code and a password. Since the "password" in this case is unknown, access to the file is virtually impossible. To circumvent this problem, use Disk BASIC or DOS to again alter the directory track and zero the five file protection bytes.

LOAD

Definition:

The LOAD command reads the specified file from disk and loads it into memory.

Format:

LOAD "<file name>" [,<disk number>]

If <disk number> is omitted, disk zero is assumed.

Notes:

If the file's protection code was set to R, the system asks:

PASSWORD?

before the file is read. The user must answer with the correct password.

An attempt to load a nonexistent file causes a FILE NOT FOUND ERROR. If the specified file does not exist on the specified disk, a FILE NOT FOUND ERROR results.

RUN

Definition:

The RUN command causes the specified file to be loaded from disk and execution to be started at the lowest numbered statement in the loaded program.

Format:

RUN "<file name>" [,<disk number>]

If <disk number> is omitted, disk zero is assumed.

Notes:

If the file's protection code was set to R, the system asks:

PASSWORD?

before the file is read. The user must answer with the correct password.

An attempt to load a nonexistent file causes a FILE NOT FOUND ERROR. If the specified file does not exist on the specified disk, a FILE NOT FOUND ERROR results.

KILL

Definition:

The KILL command causes a file to be deleted. The sectors occupied by the file are marked as free disk space.

Format:

KILL "<file name>" [,<disk number>]

If <disk number> is omitted, disk zero is assumed.

Notes:

If the protection code for the file is R or W, the system asks for the password before deleting the file.

MERGE

Definition:

The MERGE command causes a file to be loaded into the user's memory region without first deleting the existing program. Lines of the merged file replace existing program lines with the same numbers. Other lines of the merged file are added to the existing program in order of line number. The effect is the same as if the lines of the merged file were entered from the terminal.

Format:

MERGE "<file name>" [,<disk number>]

If <disk number> is omitted, disk zero is assumed. The file name and disk number are those of the file to be loaded from disk.

Notes:

If the protection code of the merged file is R, the system asks for the password before reading the file.

The MERGE command is particularly useful for constructing large programs out of smaller modules. The modules can be written and debugged separately and saved on disk. Then the modules can be loaded and linked together by the MERGE command to form a complete program.

The MERGE command also allows commonly used subroutines to be called up from a library accessible to all of the system's users.

NAME

Definition:

The NAME command causes the specified file to be renamed. The file remains unchanged on the same disk; only the name is changed.

Format:

NAME "<old file name>" AS "<new file name>" [,<disk number>]

If <disk number> is omitted, disk zero is assumed.

Notes:

If the protection code of the file is R or W, the system asks for the password before the file is renamed.

If the new file is the same as a file that already exists on the specified disk, a FILE ALREADY EXISTS ERROR occurs and the file is not renamed.

FILES

Definition:

The FILES command causes the names of all of the files on the specified disk or disks to be printed on the user's terminal.

Format:

FILES [<disk number>] [,...]

If <disk number> is omitted, disk zero is assumed.

Notes:

Since only the names of the files are displayed, no protection passwords are necessary for the FILES command.

6-2. Operator Commands

The following commands are available only to the operator. Before each command is executed, the system asks for the password defined at initialization (MOUNT PASSWORD).

MOUNT

Definition:

The MOUNT command causes the system to read all of the sectors on the specified disk(s) and to create a table of unused disk space. When files are created or modified, the system checks the directory for the locations of unused disk sectors. The MOUNT command must be executed before any other operations can be performed on the disk. Otherwise, a DISK NOT MOUNTED ERROR occurs.

Format:

MOUNT [<disk number>[,...]]

If the MOUNT command is given with no arguments, all of the disks in the system are mounted, beginning with the disk having the highest number.

Notes:

Before the MOUNT command is executed, the system asks for the MOUNT PASSWORD. The correct password defined during initialization, page 13, must be given, or the command is ignored.

If the door of the drive is left open or if the drive motor has not had time to come up to full speed (about 5 seconds) before a MOUNT command is issued for that drive, the message ENABLE DISK x is printed on the operator's terminal until the condition is corrected.

UNLOAD

Definition:

The UNLOAD command must be issued before a diskette is removed from a disk drive. Failure to do so may cause FILE LINK ERRORs the next time the disk is used.

Format:

UNLOAD [<disk number>[,...]]

If no disk numbers are given, all mounted disks are unloaded.

DSKINI

Definition:

The DSKINI command initializes the specified disk(s) by marking all sectors as unused. All of the files on the disk are thereby deleted.

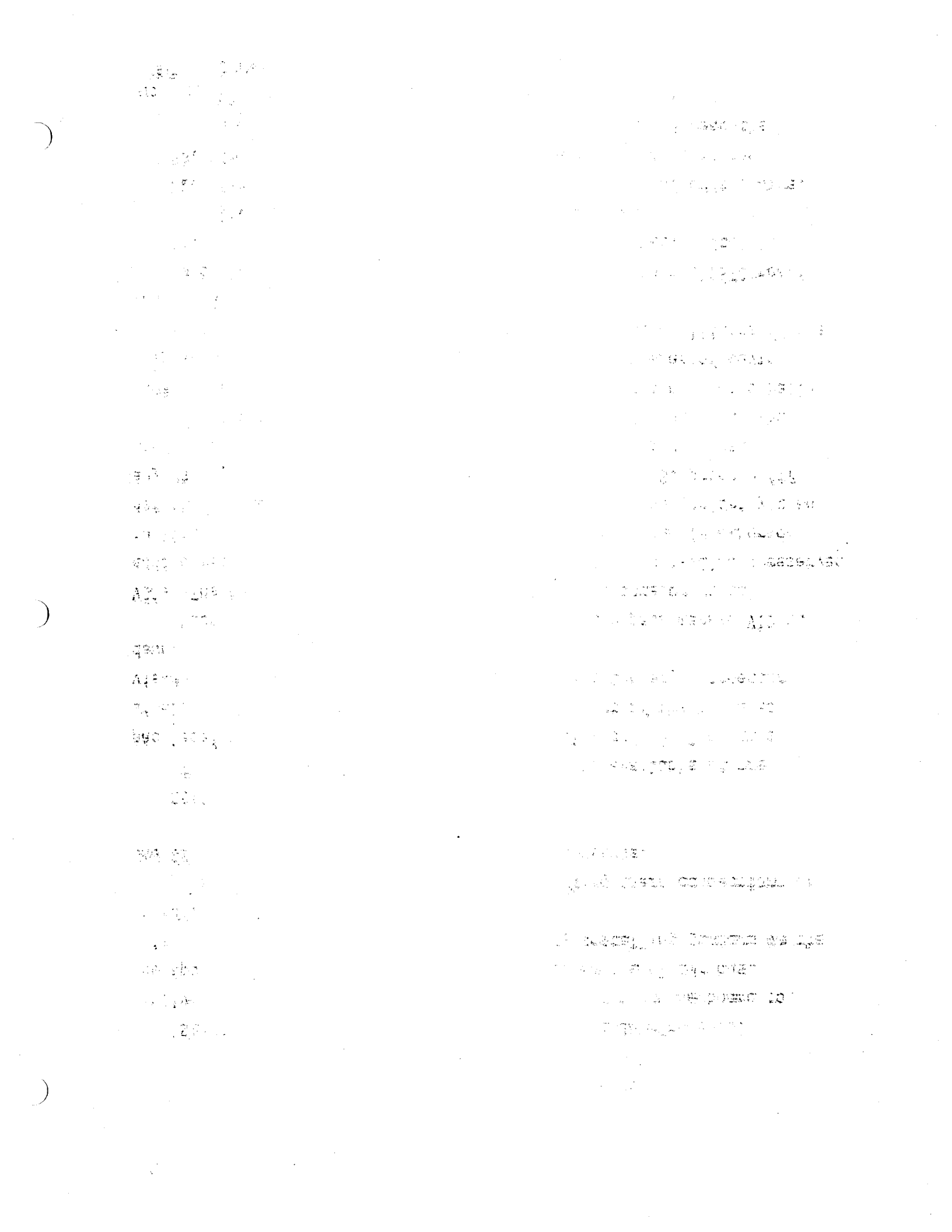
Format:

DSKINI [<disk number>[,...]]

The disk numbers must be given before the command can be executed.

Note:

The disk containing the Time Sharing BASIC system MUST NOT BE INITIALIZED WITH DSKINI; doing so will ERASE THE SYSTEM DISK.



APPENDIX
Strapping I/O and VI/RTC Boards

Strapping the I/O and VI/RTC boards for Time Sharing BASIC involves connecting the interrupt request signals from the board to the appropriate vectored interrupt (VI) lines on the Altair bus. This is done either by setting switches or by installing jumpers on the boards.

The appendix shows the procedures for making these connections on the 2SIO, VI/RTC, Q70C, C700C, DCDD and 88LPC boards.

A. 2SIO

The interrupt request signal from port 0 is available at the pad labelled DI on the 2SIO board. The signal from port 1 appears at EI. These pads are in the lower left-hand part of the board as viewed from the component side of the board with the edge connector down.

Each of these pads is connected to one of the pads marked VI0 to VI7. The pad to choose is not critical, although some practical considerations apply. The vectored interrupt line VI0 is always reserved in Time Sharing BASIC for the floppy disk storage system (whether or not it is used). The Real Time Clock must have a higher priority than any other device except the disk. The Q70, C700 or LP80 printer (if used) must be assigned to the lowest priority level in the system.

The two ports on one 2SIO board should not be connected to the same priority level since it is difficult to connect two jumpers reliably to the same printed circuit pad. The maximum number of devices per level is four. This is determined by the drive capabilities of the interrupt request circuits.

Use the following procedure to install jumpers on the 2SIO board:

1. Cut a length of wire equal to the distance between the DI pad and the desired VI pad plus about 1 inch.
2. Strip one half inch of insulation from each end of the wire.
3. Insert the stripped ends into the selected holes in the component side of the printed circuit board. Spread the wire ends apart on the back side of the board to hold the jumper in place.

If the Disk Controller is a REV. 0 x 4 board, a jumper is installed from SRI to the pad marked VIO. Use the procedure in section A above to install this jumper.

If the Disk Controller Board is REV. 0 x 3 or earlier, the jumper must be soldered directly to the VIO terminal on the card edge connector. To do this, use the following procedure.

1. As viewed from the component side of the board with the edge connector down, the VIO connector pin is the fourth pin from the right.
2. Measure a length of insulated hookup wire long enough to extend downward from the SRI pad, across the top of the edge connector to the VIO pin. Allow an extra inch of wire for connections.
3. Cut the wire to length and strip about one half inch of insulation from each end.
4. Insert one end of the jumper into the SRI hole and solder it from the back side of the board.
5. Turn the board back over and run the wire as indicated in step 2.
6. Carefully solder the wire to the VIO pin on the edge connector by laying the stripped end of the wire across the top of the pin, applying the soldering iron to the wire and the pin conductor and feeding solder into the joint. Use only as much solder as necessary and make sure that no solder is left on the bearing surface of the pin.

F. 88-LPC.

Connect pads E8 (in the lower right-hand corner of the board) and VI7 (in the lower left-hand corner) by means of an eight inch jumper. Install the jumper according to the procedure in section A above.

4. Turn the board over and solder the jumper ends, being careful not to leave solder bridges to short out the printed circuit conductors. Clip off excess lead lengths.

5. Repeat steps 1 - 4 for the jumper from EI to its selected VI pad.

B. VI/RTC

The Real Time Clock on the VI/RTC board generates periodic pulses for system timing. These signals are connected by means of a jumper to one of the vectored interrupt lines marked 0 through 7.

The priority level of the Clock should be higher than any of the other I/O devices in the system except the floppy disk storage system. Since level 0 is always reserved for the floppy disk, the RTC is usually strapped to level 1.

Install the jumper between the printed circuit pads marked RI and 1 in the left-center section of the VI/RTC board. To install the jumper, follow the procedure in section A above.

C. Q70C

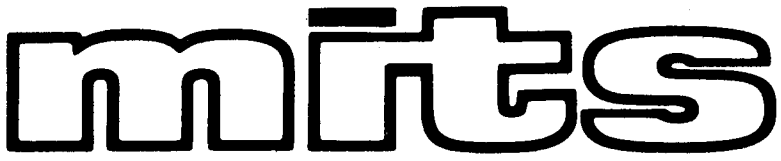
The interrupt request signal is available at the printed circuit board pad marked KA in the lower left-hand corner of the Q70C interface board. The printer should have the lowest priority in the Time Sharing BASIC system, so connect KA to VI7 by means of a jumper according to the directions in section A above.

D. C700C

To generate character interrupts, position 4 of SW2 must be turned ON. These interrupt signals are connected to VI7 by turning the position of SW1 marked VI7 ON.

E. DCDD

The Floppy Disk Controller generates interrupt requests at pad SRI on DCDD board number 1. This pad is connected to the VIO line in one of two ways, depending upon the version of the board in use. The latest version of the Disk Controller board is marked "REV. 0 x 4" in the upper right-hand corner. On earlier boards, the digit to the right of the x is 3 or less.



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