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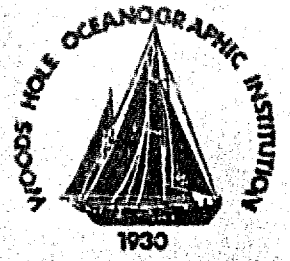

W.H.O.I. CTD MicroVAX II Data Acquisition System Part I Installation Manual

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J.M. Allen

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Technical Report

Funding was provided by the National Science Foundation under Grant Nos. OCE87-12087 and OCE90-05218.

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Approved for Distribution:

Robert C. Groman, Director
Information Systems Center

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Related publications

WHOI CTD MicroVAX II Data Acquisition System Part II:	Operator's Guide
WHOI CTD MicroVAX II Data Acquisition System Part III:	Reference Manual
WHOI CTD MicroVAX II Data Acquisition System Part IV:	Guide to Writing Programs to Access the Global Section
WHOI CTD MicroVAX II Data Acquisition System Part V:	Directory Structure, Source Code and DCL files

1 Introduction

This manual describes the procedure for installation of the **AQUI89** CTD data acquisition system on a microVAX II computer. The required hardware configuration is described in section 2. The **AQUI89** CTD data acquistion system was developed under VAX/VMS version 4.4 and later revised to run under VAX/VMS 5.3; this software package has not been tested on and is not supported for higher versions of VAX/VMS. See the Reference Manual, section 9 for details on the conversion from VAX/VMS version 4.4 to version 5.3.

The **AQUI89** system, as implemented on the microVAX II, allows a certain amount of time-shared processing to take place without interfering with the acquisition process. However, we strongly recommend that the microVAX II that is to be used for at sea data acquisition be completely dedicated to the acquisition process while data logging is in progress, since there is no adequate means at present to determine exactly how much extra processing can be done without interfering with the acquisition process.

2 Hardware configuration

The **AQUI89** system is designed to operate on a MicroVAX II computer with the following minimum hardware configuration:

- 2 mB memory
- 5 RS232 ports configured as follows:
  - TTA0: CTD deck unit
  - TTA1: user terminal
  - TTA2: printer
  - TTA3: plotter
  - CSA0: or OPA0: operator's console
- 2 user VMS
- 71 mB disk (AQUI89 system uses < 1 mB, including source code < 5mB)
- 95 mB cartridge tape (for installation and backup)
- 10-20 mB 9T magnetic tape, 1600 bpi
- ZETA 12" plotter
- 1 user terminal
- 1 batch printer (Epson FX-85 or look-alike)

When running **AQUI89** under the minimum configuration, it is advisable to avoid any other processing on the MicroVAX II system during data acquisition.

2.1 Switch settings for ZETA plotter

The **AQUI89** plotting programs operate on a ZETA pen plotter. The switch settings for the two ZETA models available at WHOI are described in the following sections.

Note that the cabling for the ZETA plotter must be a direct line from the microVAX TTA3: port to the J102 plotter port. Problems will occur if an additional user terminal is hooked up behind the plotter via the J103 port. This is because the terminal creates a TTA3: process which conflicts with the allocation of the TTA3: port by the **AQUI89** plotting process. The TTA1: port is reserved for the user terminal.

2.1.1 Switch settings for ZETA plotter - model 8A and 912

	Mode/interface = 0				GML - RS-232-C			
SW01	1	2	3	4	5	6	7	8
	UP	UP	UP	UP	UP	UP	UP	UP
SW02	1	2	3	4	5	6	7	8
	UP	UP	UP	UP	DN	UP	UP	UP
SW03	1	2	3	4	5	6	7	8
	UP	DN	DN	DN	DN	DN	DN	DN

1	2	3 -	baud rate (use `$ SH TERM` to determine baud rate)
UP	DN	UP	1200
UP	UP	DN	2400
DN	UP	DN	4800
UP	DN	DN	9600

SW04A - 0 (5 for model 912) speed selection

SW04B - 6 (5 for model 912) pen pressure

2.1.2 Switch settings for ZETA plotter - model 8

	Mode/interface = 0				GML - RS-232-C				
SW01	1	2	3	4	ON = UP = 1				
	DN	DN	UP	DN	OFF = DOWN = 0				
SW02	1	2	3	4	5	6	7	8	ON = DOWN
	DN	DN	UP	UP	UP	UP	DN	UP	OFF = UP
SW03	1	2	3	4	5	6	7	8	ON = DOWN
	UP	UP	UP	UP	DN	UP	UP	UP	OFF = UP

SW04A - 8 9600 baud

SW04B - 6 pen pressure

---

3 Installation

The installation procedure must be followed at system startup. When **AQUI89** is to be installed on a new system, first ensure that VMS version 5.3 is operational, then follow Sections 3.1 through 3.10.

After installation, if the VMS system has been rebooted, only Section 3.10 is required.

Begin by logging into the system account.

3.1 Setting system time

Time used in the system is based on the VAX/VMS system clock, which is normally set to GMT. To set the time on the MicroVAX II, use the VMS **SET TIME** command:

```
$ SET TIME=DA-MON-YEAR:HR:MN:SC.DS
```

where **DA** is the day number (1-31)
MON is the month (3 characters)
YEAR is the year (eg. 1989)
HR is the hour (0-24)
MN is the minutes (0-59)
SC.DS is the decimal seconds (0.00-59.99)

example: `$ SET TIME=18-JAN-1989:13:05:00.00`

```
$ SHO TIME
18-JAN-1989 13:05:17.12
```

3.2 Create CTD_AQUI login and home directory

Login on the system account. If there is not already a **CTD_AQUI** login on the system, follow these steps to create one:

```
$ CREATE/DIR DUA0:[CTD.AQUI]
$ SET DEF SYS$SYSTEM
$ RUN AUTHORIZE
```

```
UAF> ADD CTD\_AQUI/UIC=[300,300]/PASSWORD=your_password/DEV=DUA0: -
_UAF> /DIR=[CTD.AQUI]/PRIV=(OPER,SYSPRV,SETPRV,SYSGBL)/OWNER=CTD_AQUI
UAF> SH CTD_AQUI
        .
        .
        .
UAF> EXIT
$
```

If a **CTD_AQUI** login already exists, check to make sure that it has the correct setup:

```
$ SET DEF SYS$SYSTEM
$ RUN AUTHORIZE
UAF> SH CTD_AQUI
        .
        .
        .
UAF> EXIT
$
```

If necessary, remove the current **CTD_AQUI** login and replace it:

```
$ SET DEF SYS$SYSTEM
$ RUN AUTHORIZE
UAF> REMOVE CTD_AQUI
UAF> ADD CTD_AQUI/UIC=[300,300] -
_UAF> /PASSWORD=your_password/DEV=DUA0:/DIR=[CTD.AQUI] -
_UAF> /PRIV=(OPER,SYSPRV,SETPRV,SYSGBL)/OWNER=CTD_AQUI
UAF> SH CTD_AQUI
        .
        .
        .
UAF> EXIT
$
```

Create the **AQUI89** home directory if it does not exist:

```
$ SET DEF USER:[000000]
$ CREATE/DIR/OWN=CTD_AQUI [.CTD.AQUI]
```

The VAX/VMS Backup Utility will create the rest of the **AQUI89** directory structure (figure 1) during installation.

3.3 Restore AQUI89 system from installation tape

This section describes the procedure to restore the files required to run the AQUI89 system, using the VAX/VMS Backup Utility. The backup tape cartridge contains two VMS save sets. The first,

Figure 1: **AQUI89** Directory Structure

The following directory structure includes all files and directories required to run the **AQUI89** CTD data acquisition system:

DUA0:[CTD.AQUI]	home directory, **LOGIN.COM** file
BIN.DIR	executable files
COM.DIR	command files
CONFIG.DIR	default configuration file
DATA.DIR	archived data and bookeeping files
DOC.DIR	documentation
JOURNALS.DIR	journal files
LOG.DIR	log files
SHARE.DIR	shared commons
TEMPLATE.DIR	template files
URIEXE.DIR	URI executable files

These directories contain the **AQUI89** source code, include files and libraries; they are only necessary if modifications are made or if the system is to be rebuilt:

DUA0:[CTD.AQUI]	home directory
URILIBS.DIR	URI libraries
URISRC.DIR	URI source code
COMMON.DIR	common files for URI C code
CONFIG.DIR	URI **CTD_CONFIG** program and modules
CONTROL.DIR	**CTD_CONTROL** program and modules
GRABBER.DIR	**CTD_GRAB** program and modules
HELP.DIR	help files and libraries
LIBS.DIR	C library routines
LOG.DIR	**CTD_LOG** program and modules
WHOISRC.DIR	WHOI source code
AQUI89.DIR	modules for **CTD78** acquisition code
CONFIG.DIR	WHOI **CTD78** configuration program
LIB.DIR	WHOI library routines and commons
PLOT.DIR	plot programs and subroutines
UTILS.DIR	**CTD78** utility programs
ZETA.DIR	ZETA plotting subroutines

AQUI89_SYSTEM.BCK (~1747 blocks), contains the executable, command, and template files and shared commons required to operate the **AQUI89** system. The second VMS backup save set, **AQUI89_SOURCE.BCK** (~3479 blocks), contains all of the source code files, header and include files and command files needed to completely re-make the **AQUI89** system. The **AQUI89_SOURCE.BCK** save set is only used when a modification to the source code is required or if the system needs to be re-compiled and re-linked. Directions for installation of the source code are contained in the Programmers' Reference Manual, section 1.1.

The following backup procedures replace any current **AQUI89** files with those restored from the backup cartridge tape.

login as **CTD_AQUI**

```
$ SET DEF DUA0:[CTD.AQUI]
$ SET PROC/PRIV=(OPER,SYSPRV,SETPRV)
$ MOUNT/FOR MUA0:
$ BACKUP/LABEL=AQUI89/LOG/NOCRC MUA0:AQUI89_SYSTEM.BCK/SAVE_SET [*...]/REPLACE
$ DISM MUA0:
```

At this point, execute the **LOGIN.COM** file to create the **AQUI89** logical names and global symbols:

```
$ @LOGIN.COM
```

3.4 Copy shared commons to SYS$SHARE

The shared common files must be copied from the directory **CTDROOT:[SHARE]** to the system directory **SYS$SHARE:** before they can be installed. Type the following:

```
$ DEFINE/SYSTEM USER DUA0:
$ SET DEF SYS$SHARE
$ COPY/LOG CTDROOT:[SHARE]*.*  *.*
```

this will copy files: **CTD78_COMMON.EXE**
CTD78_PLOT_COM.EXE

3.5 Edit the SYLOGIN.COM file

```
$ SET DEF SYS$MANAGER
$ ED SYLOGIN.COM
```

make sure the following line has been removed or commented out:

```
$ MOU*NT :== MOUNT/NOASSIST
```

(otherwise there will be no error message if the user tries to archive data to a tape that has not been mounted)

3.6 Edit SYSTARTUP_V5.COM and CTD_STARTUP.COM files

login as **SYSTEM**:

```
$ SET DEF SYS$MANAGER
$ COPY/LOG CTDROOT:[SYSMGR]*.*  *.*
```

this will copy files: **AQUI89_STARTUP.COM**
CTD_STARTUP.COM

```
$ ED SYSTARTUP_V5.COM
```

add the following lines:

```
$! ************************************************************
$! Execute AQUI89_STARTUP for CTD acquisition
$!
$  write sys$output "...AQUI89 startup procedure"
$  @SYS$MANAGER:AQUI89_STARTUP
$!
```

Note that although the above lines are the only ones required for the **AQUI89** system, the user must ensure that there are no conflicts with other processes which may attempt to allocate devices already allocated by the **CTD_GRAB** process. For example:

- KERMTERM may be defined to run on port TTA0: (comment out lines)
- TTA1: and TTA3: need WRITE access (**$ SET PROT=(W:RW)/DEVICE TTA3:**)

Next, edit the **CTD_STARTUP.COM** file:

```
$ ED CTD_STARTUP.COM
```

and make sure that the following line is present:

```
$ SET TERM CTD_DEV: /NOTYPE /ALTYPE /PERM
```

The **/NOTYPE** command specifies that the terminal port assigned to the CTD is dedicated and will accept input only when a program issues a read to the terminal. The **/ALTYPE /PERM** commands create a permanent alternate type-ahead buffer; the size of the type-ahead buffer is determined by the **SYSGEN** parameter **TTY_ALTYPAHD**.

3.7 Check system configuration and start CTD_GRAB

This section is intended as a guide for setting up the VMS SYSGEN parameters for the microVAX II to be used for the **AQUI89** CTD data acquisition system. Since each installation is unique, it is strongly suggested that a new installation be thoroughly tested before being sent to sea.

3.7.1 SYSGEN parameters

The **SYSGEN** parameters discussed in this section pertain only to the **AQUI89** system. Other site-dependent parameters should be determined by the system supervisor. Refer to the Guide to Setting up a VMS System (VMS Version 5.0), section 6.1.5 for a description of **AUTOGEN**. Descriptions of the **SYSGEN** parameters can be found in the VMS System Generation Utility Manual, section A.

The modifications to system parameters described here are specifically designed for the minimum hardware configuration specified in Section 2.0. These parameters are required to accomodate a global section that will hold approximately 7 hours of CTD data scans and to prevent I/O data overruns due to other high priority activities. The **CTD_GRAB** and **CTD_LOG** processes will be the highest priority non-realtime tasks; conflicts will be with realtime activities like other I/O. Follow these guidelines to configure a standard **AQUI89** system:

```
$ SET DEF SYS$SYSTEM
```

Edit the **MODPARAMS.DAT** file to define the pertinent SYSGEN parameters:

```
$ ED MODPARAMS.DAT
```

First comment out any lines containing the following modifications, (so that **AUTOGEN** will compute the proper values):

NPAGEDYN = ...
PAGEDYN = ...

Then check the settings for the following parameters and change accordingly:

```
ADD_GBLSECTIONS          =    100   ! adds the number of global section
                                    descriptors; 100 should be sufficient

ADD_GBLPAGES             =  30800   ! adds the number of global page table
                                    entries required by AQUI89 (see
                                    section 3.7.3)

ADD_SYSMWCNT             =    244   ! add 1 for every 128 GBLPAGES added

TTY_ALTYPAHD             =   2048   ! sets the size of the alternate type-
                                    ahead buffers

TTY_ALTALARM             =   1900   ! sets the size of the alternate type-
                                    ahead buffer alarm (indicates at which
                                    point an XOFF should be sent to
                                    terminals that use the alternate type-
                                    ahead buffers

ADD_MAXPROCESSCNT        =      6   ! adds the number of process entry slots
                                    reequired by AQUI89 (allows at least 6
                                    concurrent processes)

ADD_VIRTUALPAGECNT       =  30800   ! maximum number of virtual pages that
                                    can be mapped for any one process
```

Reboot the system, saving any modified parameters, by typing:

```
$ SET DEF SYS$UPDATE
$ SET PROC/PRIV=CMKRNL
$ @AUTOGEN SAVPARAMS REBOOT
```

3.7.2 Starting the CTD_GRAB and JOURNAL processes

When the system is rebooted, the **CTD_GRAB** and **JOURNAL** processes are automatically invoked. To start **CTD_GRAB** without re-booting the system:

Login as **CTD_AQUI**

```
$ START_GRAB
```

After about 20-30 seconds, a message will appear on the screen similar to the following:

```
%RUN-S-PROC_ID, identification of created process is 0000006F
15-MAY-1990 15:45:07.15: %CTDGRAB-I-NEW, Starting ...
```

To start the **JOURNAL** task:

```
$ SET PROC/PRIV=ALL
$ @URIEXE:JOURNAL_START
```

After about 30 seconds, a message similar to the following will appear on the screen:

```
% RUN-S-PROC_ID, identification of created process is 00000070
15-MAY-1990 15:45:05.29: JOURNAL_START
```

To ensure that both processes have started, type:

```
$ SH SYS
```

Check to make sure **CTD_GRAB** is in the CEF state and **JOURNAL** is in the LEF state before continuing.

3.7.3 Change maximum time of cast

The size of the global section does not limit the length of a station. If the time limit is exceeded, data acquisition will still continue. The global section will begin to overwrite itself, with the 'oldest' data in the section overwritten first. This 'wrap-around' of the global section will not affect the data being archived to tape and/or disk file. In fact, if disk space is limited, the maximum cast time can be set very low (for example, 10 minutes). A global section that has 'wrapped-around' will only contain the most recent data collected. Plotting and printing of data from the global section during a cast will thus be limited to the most recent scans.

The addition of 30800 global pages (**ADD_GLBPAGES** parameter in **SYS$SYSTEM:MODPARAMS.DAT**, section 3.7.1) is sufficient for 7 hours of CTD data logging. This means that a global section can be defined that will hold all of the data for a 7 hour cast, although usually a shorter cast time will be sufficient. If stations longer than 7 hours are anticipated, this parameter must be increased. To calculate the number of global pages needed:

1 page = 512 bytes (1/2 kB)
data are logged at a rate of approximately 2 mB/hour
i.e. ~4400 pages/hour
(7 hours * 4400 pages/hour = 30800 pages)
for every 128 global pages added, increase parameter ADD_SYSMWCNT by 1

The **actual** size of the global section (**CTDGBL**) is determined by a runtime parameter defined in the file:

USER:[CTD.AQUI.COM]CTD78_AQUI.COM

During initialization, this parameter is set to 180 minutes (3 hours).

To change this parameter, edit the file:

USER:[CTD.AQUI.COM]CTD78_AQUI.COM

and modify the line:

```
$ time = 180        !Maximum time of data logging 180 minutes (3 hours)
```

3.8 Check baud rate on printer port

If the printer baud rate is not 9600, the file:

USER:[CTD.AQUI.COM]START_PRINT_Q.COM

must be edited to change the speed parameter:

```
$ SET TERMINAL $PRINTER /PERMANENT /NOBROADCAST /NOTYPEAHEAD
_$ /NOWRAP /SPEED=(9600) /WIDTH=(80) /PAGE=(66) /NOTAB
```

3.9 Hook up the deck unit and other peripherals

There must be at least 4 RS232 ports on the MicroVAX. The suggested hardware configuration is as follows:

Hardware	Terminal port	Logical name
CTD deck unit	TTA0:	**CTD_DEV**
user's console	TTA1:	(optional)
printer	TTA2:	**CTD_PRINTER**
ZETA plotter	TTA3:	**CTD_PLOTTER**

3.9.1 Change port for CTD deck unit

The CTD deck unit is normally assigned to the terminal port TTA0: on the microVAX, via the system logical **CTD_DEV**. If TTA0: is unavailable, edit the command file:

SYS$MANAGER:CTD_STARTUP.COM

and modify the line:

```
$ DEFINE/SYSTEM/TRANSLATION=(TERMINAL) CTD_DEV TTA0:
```

3.10 Install shared commons and allocate ports

The command **INSTALL_AQUI** must be issued after each system boot. This command allocates and assigns the plotter and printer devices to the proper hardware ports and installs the shared commons **CTD78_COMMON** and **CTD78_PLOT_COM**. If the **CTD_GRAB** process is not running, it will be started.

```
$ INSTALL_AQUI
Enter port for plotter (tta3): TTA3:
Enter port for printer (tta2): TTA2:
Enter baud rate for printer (9600): 9600
```

Installation of the **AQUI89** data acquisition system is now complete.

4 Backup and removal of AQUI89 system from the microVAX

Before the **AQUI89** system is backed up, the user will usually want to first delete any unnecessary files in the directories to be backed up. The backup procedure comprises the following four steps:

1. Terminating all **AQUI89** detached processes
2. Deleting unnecessary files and directories
3. De-installing **AQUI89** shared commons
4. Backing up **AQUI89** to TK50 cartridge tape

This section also contains instructions for removing the **AQUI89** system from the computer (in case the space is needed).

4.1 Terminating CTD_GRAB and JOURNAL processes

In order to delete the **CTD_GRAB.LOG** file and the files in the directory **CTDROOT:[JOURNALS]**, and free the **CTD_DEV** port, the **CTD_GRAB** and **JOURNAL** processes must be stopped. This section describes how to terminate the **CTD_GRAB** and **JOURNAL** processes.

```
$ SH SYS
```

Your listing should include lines looking something like the following:

```
   Pid      Process Name   State   .....
    .       .....            .     .....
    .       .....            .     .....
 00000027   JOURNAL        LEF     (your pid will probably be different)
 00000028   CTD_GRAB       CEF     (your pid will probably be different)
    .       .....            .     .....
    .       .....            .     .....
```

To stop the **CTD_GRAB** process:

```
$ FORCEX [pid]      ! use the pid that is shown for the CTD_GRAB process
```

for example,

```
$ FORCEX 28         ! to stop the CTD_GRAB process in the example above
```

If there is a **JOURNAL** task running, do the following to terminate the process:

```
$ SET PROC/PRIV=WORLD
$ STOP/ID=27                ! to stop the JOURNAL process (pid=27)
```

4.2 Cleanup disk files and directories

This section describes how to delete the archived disk data files and the log files. **Important:** make sure that all data and log files have been backed up (or are no longer needed) before removing them from the system.

To delete all **AQUI89** data and log files:

```
      $ SDDATA                    ! (same as $ SET DEF CTDROOT:[DATA])
or    $ SET DEF data_directory    ! where data_directory is the default data
                                  directory defined during acquisition in
                                  START_AQUI

      $ SET PROT=(W:WERD) [...]*.*;*
      $ DELETE *.*;*

      $ SDLOG                     ! (same as $ SET DEF CTDROOT:[LOG])
      $ SET PROT=(W:WERD) [...]*.*;*
      $ DELETE *.*;*

      $ HOME                      ! (same as $ SET DEF USER:[CTD.AQUI])
      $ PURGE/LOG [...]           ! optional, but a good idea...
```

4.3 De-install shared commons

```
$ SD SYS$SHARE
$ SET PROC/PRIV=CMKRNL
$ INSTALL
INSTALL> REMOVE SYS$SHARE:CTD78_COMMON.EXE
```

```
INSTALL> REMOVE SYS$SHARE:CTD78_PLOT_COM.EXE
INSTALL> EXIT
$ SET PROC/PRIV=NOCMKRNL
$ DELETE CTD78*.EXE;*
```

4.4 Backup AQUI89 system

This section describes the procedure used to backup the **AQUI89** system. All files and subdirectories in the **USER:[CTD.AQUI]** directory will be backed up.

```
$ SET DEF USER:[CTD.AQUI]          ! (same as $ HOME)
$ INIT MUA0: CTDAQU                ! initialize the TK50 cartridge backup tape
$ MOUNT/FOR MUA0:                  ! mount the tape
$ BACKUP/LABEL=AQUI89/LOG/NOCRC/LIST=USER:[CTD.AQUI.BACKUP]CTD_BACKUP.DOC -
_$ [CTD.AQUI...]*.*  MUA0:CTD_AQUI.BCK/SAVE_SET
$ DISM MUA0:
```

When backup is complete, dismount the tape and push the write protect switch on the TK50 cartridge to the left (exposing the orange indicator), to prevent any accidental data recording on the cartridge.

4.5 Getting rid of the acquisition system

This procedure may be used to completely remove **AQUI89** from the system. The user should make sure to have a complete and current backup (see section 4.4) of the system before removing it!

stop the **CTD_GRAB** process (see section 4.1)
stop the **JOURNAL** process, if one is running (see section 4.1)

```
$ SD USER:[CTD.AQUI]     ! same as $ HOME
$ SET PROT=(W:WERD) [...]*.*;*
$ DEL [...]*.*;*         ! you won't be able to delete the directories
                           though, so ignore messages telling you that
                           they aren't deleted
$ SET PROT=(W:WERD) [...]*.DIR
```

type the following line until all levels of directories are gone (~ 2 times):

```
$ DEL [...]*.DIR;*
```

Then de-install the shared commons, section 4.3, and delete the commons:

```
$ DELETE SYS$SHARE:CTD78_*.EXE;*
```

Appendices

A Diagnostics for the Mark IIIB deck unit

TEST A - test data coming from deck unit directly into a CIT-101 terminal

1. cable directly from deck unit to terminal (plug into RS232 port, NOT the printer port)
2. setup the CIT terminal characteristics:

   SETUP B (5)
   set transmit speed → 9600 (7)
   set receive speed → 9600 (8)

   parity (group 4, location 2) toggle to disable
   bits per character (group 4, location 3) toggle to 8

   SETUP C
   control characters (group 2, location 1) toggle to visible
   (this makes any control characters sent to the screen non-executable)
   SETUP
3. set tape player to PLAY - should see 'junk' (strings of characters running across the terminal)

TEST B - test data coming from deck unit through RS232 port on microVAX

1. cable deck unit to port TTAn: (where n = 0,1,2,3)
   (note: The TTA0: port may not be available if the **CTD_GRAB** process is running in the background.)
2. **$ ALLOC TTAn:**
3. **$ SET TERM/SPEED=9600/NOBROADCAST/NOECHO/EIGHTBIT/FULLDUP -**
   _$ /NOLINE/NOHOSTSYNC/NOMODEM/PARITY=NONE/PASTHRU -
   _$ /NOTTSYNC/TYPE_AHEAD/FRAME=8 TTAn:
4. set terminal characteristics on CIT-101 (see step 2 above)
5. **$ SET HOST/DTE TTAn:**

   example:

   ```
   $ ALLOC TTA1:
   $ SET TERM/SPEED=9600/NOBROADCAST/NOECHO/EIGHTBIT/FULLDUP -
   _$ /NOLINE/NOHOSTSYNC/NOMODEM/PARITY=NONE/PASTHRU -
   _$ /NOTTSYNC/TYPE_AHEAD/FRAME=8 TTA1:
   $ SET HOST/DTE TTA1:
   ```
6. 'Junk' should appear on the terminal screen (strings of characters running across the screen).

7. To exit, type CTRL-\ (hold down the control key and type backslash).

TEST C - to copy something to an RS232 port

1. **$ ALLOC TTAn:**
2. **$ COPY TT: TTAn:**

   example: **$ ALLOC TTA1:**
   $ COPY TT: TTA1:

3. To exit, type CTRL-Y (hold down the control key and type Y).

B Save_set listings for AQUI89 installation tape

```
Save set:                AQUI89_SYSTEM.BCK


   Listing of save set(s)

   Save set:             AQUI89_SYSTEM.BCK
   Written by:           CTD_AQUI
   UIC:                  [000300,000300]
   Date:                 11-OCT-1990 14:39:13.13
   Command:              BACKUP/LABEL=AQUI89/LOG/NOCRC/LIST=
   (CTDROOT:[BACKUP]AQUI89_SYSTEM.DOC)
   USER:[CTD.AQUI]*.*,CTDROOT:[BACKUP...]*.*,
   CTDROOT:[BIN...]*.*,CTDROOT:[COM...]*.*,
   CTDROOT:[CONFIG...]*.*,CTDROOT:[DATA...]*.*,
   CTDROOT:[DOC...]*.*,CTDROOT:[JOURNALS...]*.*,
   CTDROOT:[LOG...]*.*,CTDROOT:[SHARE...]*.*,
   CTDROOT:[SYSMGR...]*.*,
   CTDROOT:[TEMPLATE...]*.*,
   CTDROOT:[URIEXE...]CREMBX.EXE,
   CTDROOT:[URIEXE...]DELMBX.EXE,
           USER:[CTD.AQIU.URIEXE...]FORCEX.EXE,
   CTDROOT:[URIEXE...]JOURNAL.COM,
   CTDROOT:[URIEXE...]JOURNAL_START.COM,
   CTDROOT:[URIEXE...]WALL.EXE
   MUA0:AQUI89_SYSTEM.BCK/SAVE_SET
   Operating system:     VAX/VMS version V5.3
   BACKUP version:       V5.3
   CPU ID register:      08000000
   Node name:            _CTD03::
   Written on:           _CTD03$MUA0:
   Block size:           8192
   Group size:           10
   Buffer count:         15

   [CTD.AQUI]BACKUP.DIR;1                          1  21-JUN-1990 15:19
   [CTD.AQUI]BIN.DIR;1                             2  21-JUN-1990 15:19
   [CTD.AQUI]COM.DIR;1                             3  21-JUN-1990 15:19
   [CTD.AQUI]CONFIG.DIR;1                          1  21-JUN-1990 15:19
   [CTD.AQUI]CTD_COMMON.EXE;8                    132  29-AUG-1986 00:00
   [CTD.AQUI]DATA.DIR;1                            1  21-JUN-1990 15:19
   [CTD.AQUI]DOC.DIR;1                             1  21-JUN-1990 15:19
   [CTD.AQUI]FORCEX.C;1                            2  18-JAN-1989 18:47
   [CTD.AQUI]JOURNALS.DIR;1                        1  21-JUN-1990 15:19
```

```
[CTD.AQUI]LOG.DIR;1                              1  21-JUN-1990 15:19
[CTD.AQUI]LOGIN.COM;47                           8   5-OCT-1990 12:49
[CTD.AQUI]MAIL.MAI;1                            44  10-NOV-1988 20:00
[CTD.AQUI]SHARE.DIR;1                            1  21-JUN-1990 15:19
[CTD.AQUI]SYSMGR.DIR;1                           1  21-JUN-1990 15:19
[CTD.AQUI]TEMP.DIR;1                             1  26-JUL-1990 10:23
[CTD.AQUI]TEMPLATE.DIR;1                         1  21-JUN-1990 15:19
[CTD.AQUI]TTA3.;1                                1  22-AUG-1990 14:5
[CTD.AQUI]URIEXE.DIR;1                           1  21-JUN-1990 15:19
[CTD.AQUI]URILIBS.DIR;1                          4  21-JUN-1990 15:19
[CTD.AQUI]URISRC.DIR;1                           1  21-JUN-1990 15:19
[CTD.AQUI]WHOISRC.DIR;1                          1  21-JUN-1990 15:19
[CTD.AQUI]ZETA.DIR;1                             1  21-JUN-1990 15:19
[CTD.AQUI.BACKUP]BIN_BCK.DOC;1                   6  11-JAN-1990 14:51
[CTD.AQUI.BACKUP]COM_BCK.DOC;1                   7  11-JAN-1990 14:52
[CTD.AQUI.BACKUP]CONFIG_BCK.DOC;1                3  11-JAN-1990 14:50
[CTD.AQUI.BACKUP]SHARE_BCK.DOC;1                 2  11-JAN-1990 14:51
[CTD.AQUI.BACKUP]TEMPLATE_BCK.DOC;1              4  11-JAN-1990 14:54
[CTD.AQUI.BACKUP]URILIBS_BCK.DOC;1              16  11-JAN-1990 14:48
[CTD.AQUI.BACKUP]URISRC_BCK.DOC;1               23  11-JAN-1990 14:46
[CTD.AQUI.BACKUP]WHOISRC_BCK.DOC;1               8  11-JAN-1990 14:45
[CTD.AQUI.BIN]CTD.HLB;1                         33  14-JUL-1987 00:17
[CTD.AQUI.BIN]CTD78_CONFIG.EXE;4                28  20-SEP-1990 11:41
[CTD.AQUI.BIN]CTD78_LOG.EXE;16                 227  11-OCT-1990 14:37
[CTD.AQUI.BIN]CTD78_PLOT.EXE;10                 83  20-SEP-1990 11:43
[CTD.AQUI.BIN]CTD_CONTROL.EXE;3                 34  20-SEP-1990 11:40
[CTD.AQUI.BIN]CTD_CONTROL.HLB;5                 25  21-NOV-1989 13:46
[CTD.AQUI.BIN]GET_SCAN.EXE;7                    59   9-OCT-1990 16:59
[CTD.AQUI.BIN]GRABBER.EXE;3                     37  20-SEP-1990 11:40
[CTD.AQUI.BIN]PLOT_CTD78.EXE;7                 155  20-SEP-1990 11:44
[CTD.AQUI.BIN]POS_TAPE.EXE;4                     9  20-SEP-1990 11:41
[CTD.AQUI.BIN]R_CTD78_DISK.EXE;6                22   9-OCT-1990 17:27
[CTD.AQUI.BIN]R_CTD78_TAPE.EXE;2                90  26-JUL-1990 14:33
[CTD.AQUI.COM]AQUI89_SOURCE.COM;16               3  11-OCT-1990 14:08
[CTD.AQUI.COM]AQUI89_SYSTEM.COM;28               4  11-OCT-1990 14:24
[CTD.AQUI.COM]AQUI_LOGIN.COM;3                   3  29-AUG-1990 11:52
[CTD.AQUI.COM]BELL.COM;1                         1  18-NOV-1987 09:30
[CTD.AQUI.COM]BOX.COM;1                          1  18-NOV-1987 16:39
[CTD.AQUI.COM]CHECK_TEMPLATE.COM;3               1   5-JAN-1990 16:09
[CTD.AQUI.COM]CLINK.COM;2                        1   6-APR-1988 15:37
[CTD.AQUI.COM]CLINK.OPT;1                        1   6-APR-1988 15:35
[CTD.AQUI.COM]CLRSCR.COM;2                       1  18-NOV-1987 16:41
[CTD.AQUI.COM]CMND.DAT;318                       1  18-JUL-1990 06:50
[CTD.AQUI.COM]CTD78_AQUI.COM;52                  5  26-JUL-1990 16:20
[CTD.AQUI.COM]CTD78_CONFIG.COM;4                 1  19-JAN-1990 10:31
[CTD.AQUI.COM]CTD78_PLOT.COM;8                   1   2-MAR-1990 11:00
[CTD.AQUI.COM]CTD_GRAB.COM;24                    3  19-APR-1990 08:47
[CTD.AQUI.COM]CTD_INIT.COM;1                     1  22-MAR-1988 16:03
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[CTD.AQUI.COM]CTD_LOG.COM;37                    3  17-JUL-1990 13:56
[CTD.AQUI.COM]DOWN.COM;3                        1   5-APR-1987 11:57
[CTD.AQUI.COM]GET_SCAN.COM;3                    1  16-FEB-1990 09:28
[CTD.AQUI.COM]INSTALL_AQUI.COM;24               6  20-AUG-1990 09:56
[CTD.AQUI.COM]INSTALL_COMMON.COM;2              2  15-MAY-1990 12:06
[CTD.AQUI.COM]KILL_PRINT_Q.COM;13               1   9-OCT-1990 09:22
[CTD.AQUI.COM]LINKCOM.COM;6                     1  19-APR-1990 09:51
[CTD.AQUI.COM]LINK_COMMON.COM;1                 1  20-APR-1990 09:18
[CTD.AQUI.COM]LINK_URI.COM;1                    1  15-FEB-1990 15:16
[CTD.AQUI.COM]PCTD.COM;5                        2   2-MAR-1990 11:01
[CTD.AQUI.COM]PLOT.COM;15                       4   2-MAR-1990 11:01
[CTD.AQUI.COM]PLOT_CTD78.COM;5                  1  26-JUL-1988 20:41
[CTD.AQUI.COM]POS_TAPE.COM;4                    1  11-APR-1990 15:16
[CTD.AQUI.COM]PRINT.COM;2                       1  23-FEB-1990 08:40
[CTD.AQUI.COM]READ_DISK.COM;5                   1  10-OCT-1990 16:04
[CTD.AQUI.COM]REDO_URI.COM;7                    3  28-AUG-1990 14:39
[CTD.AQUI.COM]REDO_URI_DBG.COM;2                3  26-JUL-1990 14:42
[CTD.AQUI.COM]REDO_WHOI.COM;9                   2  20-APR-1990 09:19
[CTD.AQUI.COM]REDO_WHOI_DBG.COM;2               3  26-JUL-1990 14:55
[CTD.AQUI.COM]R_CTD78_DISK.COM;2                1  15-MAY-1990 10:50
[CTD.AQUI.COM]SD.COM;14                         2   9-SEP-1988 14:54
[CTD.AQUI.COM]START_AQUI.COM;67                13   9-OCT-1990 16:30
[CTD.AQUI.COM]START_GRAB.COM;19                 1   5-APR-1988 14:51
[CTD.AQUI.COM]START_PRINT_Q.COM;21              3  16-DEC-1988 10:55
[CTD.AQUI.COM]STOP_AQUI.COM;21                  2   9-OCT-1990 14:36
[CTD.AQUI.COM]TAPE_UTIL.COM;20                  4  17-JUN-1988 10:27
[CTD.AQUI.COM]TEMP.COM;6                        1  21-SEP-1990 09:24
[CTD.AQUI.CONFIG]DEFAULT.CTD_CFG;1             20  10-OCT-1990 10:32
[CTD.AQUI.DOC]CTD_INSTALL.DOC;14               16   4-DEC-1988 17:54
[CTD.AQUI.DOC]GBL_SEC_GUIDE.DOC;16             45   7-MAR-1990 14:57
[CTD.AQUI.DOC]INSTALL_GUIDE.DOC;29             59   7-MAR-1990 14:57
[CTD.AQUI.DOC]OPERATOR_GUIDE.APP;16           106   7-MAR-1990 15:39
[CTD.AQUI.DOC]OPERATOR_GUIDE.DOC;35            96   7-MAR-1990 14:57
[CTD.AQUI.DOC]PROG_GUIDE.DOC;84               133  20-APR-1990 11:33
[CTD.AQUI.DOC]TEST_INSTALL.DOC;4                2  20-APR-1990 11:42
[CTD.AQUI.SHARE]CTD78_COMMON.EXE;8             18  20-SEP-1990 11:39
[CTD.AQUI.SHARE]CTD78_PLOT_COM.EXE;7            7  20-SEP-1990 11:39
[CTD.AQUI.SYSMGR]AQUI89_STARTUP.COM;2           6  29-AUG-1990 11:45
[CTD.AQUI.SYSMGR]CTD_STARTUP.COM;38             3  16-DEC-1988 18:19
[CTD.AQUI.TEMPLATE]CTD01.TPL;33                 6   9-OCT-1990 16:27
[CTD.AQUI.TEMPLATE]CTD02.TPL;5                  7   2-JAN-1990 13:54
[CTD.AQUI.TEMPLATE]CTD09.SAV;1                  7  10-OCT-1990 15:19
[CTD.AQUI.TEMPLATE]CTD09.TPL;44                 6  10-OCT-1990 15:22
[CTD.AQUI.TEMPLATE]CTD10.TPL;7                  9  24-JUL-1990 07:47
[CTD.AQUI.URIEXE]CREMBX.EXE;1                   5  16-DEC-1986 23:21
[CTD.AQUI.URIEXE]DELMBX.EXE;1                   5  16-DEC-1986 23:36
[CTD.AQUI.URIEXE]FORCEX.EXE;1                   5  17-DEC-1986 00:08
[CTD.AQUI.URIEXE]JOURNAL.COM;1                  6  18-NOV-1988 20:11
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[CTD.AQUI.URIEXE]JOURNAL_START.COM;1                    1  10-NOV-1988 12:17
[CTD.AQUI.URIEXE]WALL.EXE;1                             5   4-AUG-1986 01:35

Total of 107 files, 1747 blocks
End of save set
```

Save set: AQUI89_SOURCE.BCK

```
Listing of save set(s)

Save set:           AQUI89_SOURCE.BCK
Written by:         CTD_AQUI
UIC:                [000300,000300]
Date:               11-OCT-1990 14:41:50.03
Command:            BACKUP/LABEL=AQUI89/LOG/NOCRC/LIST=
USER:[CTD.AQUI.BACKUP]AQUI89_SOURCE.DOC
USER:[CTD.AQUI.URILIBS...]*.*,
USER:[CTD.AQUI.URISRC...]*.*,
USER:[CTD.AQUI.WHOISRC...]*.*,
USER:[CTD.AQUI.URIEXE]CC_NDL.COM,*.C,
USER:[CTD.AQUI.ZETA...]*.*
MUA0:AQUI89_SYSTEM.BCK/SAVE_SET
Operating system:   VAX/VMS version V5.3
BACKUP version:     V5.3
CPU ID register:    08000000
Node name:          _CTD03::
Written on:         _CTD03$MUA0:
Block size:         8192
Group size:         10
Buffer count:       15

[CTD.AQUI.URILIBS]AGAIN.CMD;1                           1  18-JUL-1988 17:47
[CTD.AQUI.URILIBS]BRKDEF.H;2                            7  30-NOV-1988 14:58
[CTD.AQUI.URILIBS]BROADCAST.C;3                         2  30-NOV-1988 18:06
[CTD.AQUI.URILIBS]C.OPT;2                               1   7-JUL-1986 20:16
[CTD.AQUI.URILIBS]DEBUG.LOG;160                        12   1-DEC-1988 14:34
[CTD.AQUI.URILIBS]DELETE.C;3                            3   2-APR-1988 00:20
[CTD.AQUI.URILIBS]FHT.C;4                               7  18-JUL-1988 17:34
[CTD.AQUI.URILIBS]FIND_FILE.C;4                         2   8-JUN-1988 23:09
[CTD.AQUI.URILIBS]JULIAN_DATE.C;8                       5  22-OCT-1987 17:43
[CTD.AQUI.URILIBS]MATCHING_FILES.C;1                    1   3-NOV-1988 16:34
[CTD.AQUI.URILIBS]OLD_MENU.C;1                         11  22-JUL-1988 12:30
[CTD.AQUI.URILIBS]PARSE.C;6                             1  19-APR-1988 23:17
[CTD.AQUI.URILIBS]RENAME.C;4                            4   2-APR-1988 00:09
[CTD.AQUI.URILIBS]SECTION.C;12                          4  17-JUN-1988 18:42
```

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[CTD.AQUI.URILIBS]SECTION.H;5                          2  17-JUN-1988 18:39
[CTD.AQUI.URILIBS]SET_DIR.C;4                          2   1-APR-1988 05:54
[CTD.AQUI.URILIBS]SHOW_STR.C;9                         1   1-DEC-1988 14:43
[CTD.AQUI.URILIBS]SMG_EXTRA.H;1                        5  30-AUG-1988 19:41
[CTD.AQUI.URILIBS]STDHDR.H;4                           2  12-JUL-1988 18:05
[CTD.AQUI.URILIBS]TEST.C;1                             1  30-AUG-1990 09:34
[CTD.AQUI.URILIBS]TEST.EXE;1                           5  30-AUG-1990 09:35
[CTD.AQUI.URILIBS]TEST.OBJ;1                           1  30-AUG-1990 09:34
[CTD.AQUI.URILIBS]TIMER.C;9                            3   3-AUG-1986 21:07
[CTD.AQUI.URILIBS]TIMER.H;6                            1   3-AUG-1986 21:04
[CTD.AQUI.URILIBS]TIMES.C;8                            2  18-JUL-1988 22:13
[CTD.AQUI.URILIBS]UISCALLS.C;37                       34   6-OCT-1986 03:16
[CTD.AQUI.URILIBS]UISCALLS.H;21                        6  22-APR-1988 16:35
[CTD.AQUI.URILIBS]URI_FORM.C;33                       72   2-DEC-1988 14:58
[CTD.AQUI.URILIBS]URI_FORM.H;6                        13   9-NOV-1988 21:33
[CTD.AQUI.URILIBS]URI_FORM.TJL;1                       1  28-OCT-1988 14:45
[CTD.AQUI.URILIBS]URI_LIB.C;56                        20  20-SEP-1990 11:36
[CTD.AQUI.URILIBS]URI_LIB.C_ORIG;1                    20  20-SEP-1990 08:54
[CTD.AQUI.URILIBS]URI_LIB.H;27                         5  20-SEP-1990 11:37
[CTD.AQUI.URILIBS]URI_LIB.H_ORIG;1                     5  20-SEP-1990 08:57
[CTD.AQUI.URILIBS]URI_LIB.OBJ;3                       10  20-SEP-1990 11:37
[CTD.AQUI.URILIBS]URI_SECTION.C;18                    14   6-JUN-1988 20:39
[CTD.AQUI.URILIBS]URI_SECTION.H;7                      5   6-JUN-1988 19:39
[CTD.AQUI.URILIBS]URI_SECTION.OBJ;2                    6   6-SEP-1990 07:58
[CTD.AQUI.URILIBS]VMS_LIB.C;78                        25  20-SEP-1990 11:02
[CTD.AQUI.URILIBS]VMS_LIB.C_ORIG;1                    28  20-SEP-1990 09:04
[CTD.AQUI.URILIBS]VMS_LIB.H;19                         8  20-SEP-1990 11:03
[CTD.AQUI.URILIBS]VMS_LIB.OBJ;1                       12  20-SEP-1990 11:03
[CTD.AQUI.URISRC]COMMON.DIR;1                          1  29-JUN-1990 14:54
[CTD.AQUI.URISRC.COMMON]CMN_BUF_DEF.FOR;1              4  23-JAN-1987 11:20
[CTD.AQUI.URISRC.COMMON]COMMON_BUF.C;1                20  26-SEP-1988 15:44
[CTD.AQUI.URISRC.COMMON]COMMON_BUF.H;1                 6  26-SEP-1988 15:44
[CTD.AQUI.URISRC.COMMON]COMMON_BUF.OBJ;2               9   6-SEP-1990 08:08
[CTD.AQUI.URISRC.COMMON]CTD_COMMON.C;1                 2   9-SEP-1986 17:03
[CTD.AQUI.URISRC.COMMON]CTD_COMMON.EXE;8             132  29-AUG-1986 00:00
[CTD.AQUI.URISRC.COMMON]CTD_COMMON.OPT;1               1  21-AUG-1986 01:54
[CTD.AQUI.URISRC.COMMON]INSTALL_CTD.COM;1              1   3-SEP-1986 13:46
[CTD.AQUI.URISRC]CONFIG.DIR;1                          1  29-JUN-1990 14:54
[CTD.AQUI.URISRC.CONFIG]AGAIN.CMD;1                    1  30-NOV-1988 19:07
[CTD.AQUI.URISRC.CONFIG]CCNDL_CONFIG.CMD;1             1  22-SEP-1988 18:46
[CTD.AQUI.URISRC.CONFIG]CC_CONFIG.CMD;1                1  26-SEP-1988 16:17
[CTD.AQUI.URISRC.CONFIG]CTD_CONFIG.C;1                31  16-DEC-1988 14:41
[CTD.AQUI.URISRC.CONFIG]CTD_CONFIG.H;1                 3   9-NOV-1988 23:31
[CTD.AQUI.URISRC.CONFIG]CTD_CONFIG.OBJ;2              18   6-SEP-1990 08:09
[CTD.AQUI.URISRC.CONFIG]CTD_CONFIG_EDIT.C;1           23  16-NOV-1988 18:12
[CTD.AQUI.URISRC.CONFIG]CTD_CONFIG_EDIT.OBJ;2         19   6-SEP-1990 08:10
[CTD.AQUI.URISRC.CONFIG]CTD_CONFIG_FILE.C;1           11  10-NOV-1988 01:25
[CTD.AQUI.URISRC.CONFIG]CTD_CONFIG_FILE.OBJ;2          8   6-SEP-1990 08:10
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[CTD.AQUI.URISRC.CONFIG]CTD_CONFIG_GLOB.C;1                22   2-DEC-1988 14:29
[CTD.AQUI.URISRC.CONFIG]CTD_CONFIG_GLOB.H;1                 3  10-NOV-1988 00:15
[CTD.AQUI.URISRC.CONFIG]CTD_CONFIG_GLOB.OBJ;2              11   6-SEP-1990 08:11
[CTD.AQUI.URISRC.CONFIG]LINKCONFIG.COM;1                    1   4-NOV-1988 15:34
[CTD.AQUI.URISRC]CONTROL.DIR;1                              1  29-JUN-1990 14:54
[CTD.AQUI.URISRC.CONTROL]CTD_COMMANDS.CLD;1                 5  29-NOV-1989 16:14
[CTD.AQUI.URISRC.CONTROL]CTD_COMMANDS.OBJ;3                 7   6-SEP-1990 08:12
[CTD.AQUI.URISRC.CONTROL]CTD_COMMANDS_OBJ.SAVE;1            7  15-MAY-1990 11:34
[CTD.AQUI.URISRC.CONTROL]CTD_CONTROL.C;1                   17  29-NOV-1989 16:15
[CTD.AQUI.URISRC.CONTROL]CTD_CONTROL.HLB;1                 24   7-JAN-1990 12:54
[CTD.AQUI.URISRC.CONTROL]CTD_CONTROL.HLP;1                 17   7-JAN-1990 12:54
[CTD.AQUI.URISRC.CONTROL]CTD_CONTROL.OBJ;2                 14   6-SEP-1990 08:11
[CTD.AQUI.URISRC.CONTROL]LINKCONTROL.COM;4                  1  19-APR-1990 09:46
[CTD.AQUI.URISRC.CONTROL]MAKE_HELP.COM;1                    1  27-SEP-1988 10:10
[CTD.AQUI.URISRC]GRABBER.DIR;1                              1  29-JUN-1990 14:54
[CTD.AQUI.URISRC.GRABBER]CTD_GRAB.COM;1                     3   9-SEP-1988 16:24
[CTD.AQUI.URISRC.GRABBER]GRABBER.C;1                       19  26-SEP-1988 15:46
[CTD.AQUI.URISRC.GRABBER]GRABBER.OBJ;2                      8   6-SEP-1990 08:12
[CTD.AQUI.URISRC.GRABBER]LINKGRAB.COM;4                     1  19-APR-1990 09:07
[CTD.AQUI.URISRC.GRABBER]PORT.H;1                           5  26-SEP-1988 15:46
[CTD.AQUI.URISRC]HELP.DIR;1                                 1  29-JUN-1990 14:54
[CTD.AQUI.URISRC.HELP]CTD_HELP.HLB;1                       15   4-AUG-1988 03:44
[CTD.AQUI.URISRC.HELP]CTD_HELP.HLP;1                        9   4-AUG-1988 03:44
[CTD.AQUI.URISRC.HELP]INSTALL_HELP.COM;1                    1  27-SEP-1988 10:07
[CTD.AQUI.URISRC.HELP]SCAN_JOURNAL.HLB;1                   26  16-SEP-1988 11:31
[CTD.AQUI.URISRC.HELP]SCAN_JOURNAL.HLP;1                   10  16-SEP-1988 11:33
[CTD.AQUI.URISRC]LIBS.DIR;1                                 2  29-JUN-1990 14:54
[CTD.AQUI.URISRC.LIBS]AGAIN.CMD;1                           1  26-SEP-1988 17:15
[CTD.AQUI.URISRC.LIBS]C.OPT;1                               1   7-JUL-1986 20:16
[CTD.AQUI.URISRC.LIBS]CC_LIBS.CMD;1                         1  30-NOV-1988 19:04
[CTD.AQUI.URISRC.LIBS]CTD.HLB;1                            21  17-APR-1987 07:56
[CTD.AQUI.URISRC.LIBS]CTD.HLP;1                            26  26-APR-1988 18:21
[CTD.AQUI.URISRC.LIBS]CTD_DATA.H;1                         21  17-NOV-1989 13:29
[CTD.AQUI.URISRC.LIBS]CTD_EXTRA.H;1                         1  26-SEP-1988 15:47
[CTD.AQUI.URISRC.LIBS]CTD_FILE.H;1                          3  19-JAN-1990 11:02
[CTD.AQUI.URISRC.LIBS]CTD_FLAGS.H;1                         4  29-NOV-1988 17:20
[CTD.AQUI.URISRC.LIBS]CTD_FUNCS.C;1                        13  16-DEC-1988 14:22
[CTD.AQUI.URISRC.LIBS]CTD_FUNCS.FOR;1                       1  27-JUL-1987 13:00
[CTD.AQUI.URISRC.LIBS]CTD_FUNCS.H;1                         3  29-NOV-1988 15:15
[CTD.AQUI.URISRC.LIBS]CTD_FUNCS.OBJ;2                       7   6-SEP-1990 08:01
[CTD.AQUI.URISRC.LIBS]CTD_HELP.HLB;1                       15   4-AUG-1988 03:44
[CTD.AQUI.URISRC.LIBS]CTD_HELP.HLP;1                        9   4-AUG-1988 03:44
[CTD.AQUI.URISRC.LIBS]CTD_LIB.C;1                          21  16-DEC-1988 15:16
[CTD.AQUI.URISRC.LIBS]CTD_LIB.H;1                           6  29-NOV-1988 15:45
[CTD.AQUI.URISRC.LIBS]CTD_LIB.OBJ;2                        11   6-SEP-1990 08:06
[CTD.AQUI.URISRC.LIBS]CTD_SECTION.C;1                       6  26-SEP-1988 15:47
[CTD.AQUI.URISRC.LIBS]CTD_SECTION.H;1                       2  26-SEP-1988 15:47
[CTD.AQUI.URISRC.LIBS]CTD_VARIABLES.C;1                    25  16-DEC-1988 14:09
```

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[CTD.AQUI.URISRC.LIBS]CTD_VARIABLES.H;1                    11  19-JAN-1990 11:39
[CTD.AQUI.URISRC.LIBS]CTD_VARIABLES.OBJ;2                  10   6-SEP-1990 08:07
[CTD.AQUI.URISRC.LIBS]PHYPROPSW.FOR;1                      38   2-DEC-1987 06:01
[CTD.AQUI.URISRC.LIBS]PHYPROPSW.OBJ;3                      17   6-SEP-1990 08:08
[CTD.AQUI.URISRC.LIBS]SALSIG.FTN;1                         10  28-JUL-1986 00:00
[CTD.AQUI.URISRC.LIBS]SCAN_JOURNAL.HLB;1                   26  16-SEP-1988 11:31
[CTD.AQUI.URISRC.LIBS]SCAN_JOURNAL.HLP;1                   10  16-SEP-1988 11:33
[CTD.AQUI.URISRC.LIBS]UISCALLS.C;1                         34  26-SEP-1988 15:47
[CTD.AQUI.URISRC.LIBS]UISCALLS.H;1                          6  26-SEP-1988 17:15
[CTD.AQUI.URISRC]LOG.DIR;1                                  3  29-JUN-1990 14:55
[CTD.AQUI.URISRC.LOG]AGAIN.CMD;1                            1  30-NOV-1988 19:23
[CTD.AQUI.URISRC.LOG]CCNDL_LOG.CMD;1                        1   8-SEP-1988 04:27
[CTD.AQUI.URISRC.LOG]CC_LOG.CMD;1                           1   3-AUG-1988 18:20
[CTD.AQUI.URISRC.LOG]CTD_LOG.C;5                            8  11-OCT-1990 13:54
[CTD.AQUI.URISRC.LOG]CTD_LOG.H;1                            7  17-NOV-1989 11:03
[CTD.AQUI.URISRC.LOG]CTD_LOG.OBJ;5                          6  11-OCT-1990 13:54
[CTD.AQUI.URISRC.LOG]CTD_LOG.SRC;1                          1  29-APR-1988 19:07
[CTD.AQUI.URISRC.LOG]CTD_LOG_CMND.C;1                      26  29-NOV-1989 16:19
[CTD.AQUI.URISRC.LOG]CTD_LOG_CMND.H;1                       4  29-NOV-1989 16:09
[CTD.AQUI.URISRC.LOG]CTD_LOG_CMND.OBJ;4                    19   9-OCT-1990 12:49
[CTD.AQUI.URISRC.LOG]CTD_LOG_DISP.C;1                      17  29-NOV-1989 16:20
[CTD.AQUI.URISRC.LOG]CTD_LOG_DISP.OBJ;2                     8   6-SEP-1990 08:14
[CTD.AQUI.URISRC.LOG]CTD_LOG_ERR.C;1                        8  29-NOV-1989 16:21
[CTD.AQUI.URISRC.LOG]CTD_LOG_ERR.OBJ;2                      7   6-SEP-1990 08:14
[CTD.AQUI.URISRC.LOG]CTD_LOG_FILE.C;4                      18   4-OCT-1990 16:21
[CTD.AQUI.URISRC.LOG]CTD_LOG_FILE.OBJ;4                    16   4-OCT-1990 16:21
[CTD.AQUI.URISRC.LOG]CTD_LOG_GLOB.C;1                       8  29-NOV-1989 16:20
[CTD.AQUI.URISRC.LOG]CTD_LOG_GLOB.H;1                       5  29-NOV-1989 16:09
[CTD.AQUI.URISRC.LOG]CTD_LOG_GLOB.OBJ;2                     4   6-SEP-1990 08:16
[CTD.AQUI.URISRC.LOG]CTD_LOG_INIT.C;3                      19  19-APR-1990 10:38
[CTD.AQUI.URISRC.LOG]CTD_LOG_INIT.OBJ;2                    14   6-SEP-1990 08:16
[CTD.AQUI.URISRC.LOG]CTD_LOG_PRINT.C;1                      5  21-NOV-1989 11:27
[CTD.AQUI.URISRC.LOG]CTD_LOG_PROC.C;1                      24  29-NOV-1989 16:11
[CTD.AQUI.URISRC.LOG]CTD_LOG_PROC.OBJ;2                    15   6-SEP-1990 08:17
[CTD.AQUI.URISRC.LOG]FONTS.H;1                              3  10-OCT-1986 13:07
[CTD.AQUI.URISRC.LOG]HEAD.DOC;1                             2   9-JAN-1990 14:09
[CTD.AQUI.URISRC.LOG]LINKLOG.COM;1                          1   1-DEC-1988 15:41
[CTD.AQUI.URISRC.LOG]LINKLOG.OPT;1                          1   8-SEP-1988 04:38
[CTD.AQUI.URISRC.LOG]MKZ.C;1                               13  26-SEP-1988 15:49
[CTD.AQUI.URISRC.LOG]MKZ.OBJ;2                             12   6-SEP-1990 08:18
[CTD.AQUI.URISRC]REDO_ALL.COM;14                            3   9-MAY-1989 19:49
[CTD.AQUI.URISRC]SYSMGR.DIR;1                               1  29-JUN-1990 14:55
[CTD.AQUI.URISRC.SYSMGR]CRUISE_STARTUP.COM;1                1  24-MAY-1988 14:28
[CTD.AQUI.WHOISRC]AQUI89.DIR;1                              1  29-JUN-1990 14:55
[CTD.AQUI.WHOISRC.AQUI89]AQUI89.DBG;2                       1   1-FEB-1990 09:54
[CTD.AQUI.WHOISRC.AQUI89]AQUI89.LNK;9                       1  18-APR-1990 16:39
[CTD.AQUI.WHOISRC.AQUI89]AQUI89.OPT;3                       1  18-APR-1990 16:37
[CTD.AQUI.WHOISRC.AQUI89]AQUI89_LIB.FOR;26                111  10-OCT-1990 10:13
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[CTD.AQUI.WHOISRC.AQUI89]AQUI89_LIB.OBJ;4                79  10-OCT-1990 10:13
[CTD.AQUI.WHOISRC.AQUI89]AQUI89_SUBS.FOR;22              47   9-OCT-1990 12:38
[CTD.AQUI.WHOISRC.AQUI89]AQUI89_SUBS.OBJ;3               33   9-OCT-1990 12:50
[CTD.AQUI.WHOISRC.AQUI89]C.OPT;2                          1   7-JUL-1986 20:16
[CTD.AQUI.WHOISRC.AQUI89]MIN_MAX_PRES.FOR;4               2  21-FEB-1990 09:33
[CTD.AQUI.WHOISRC.AQUI89]TEST_TAPE.FOR;9                  7  13-APR-1990 17:06
[CTD.AQUI.WHOISRC]CONFIG.DIR;1                            1  29-JUN-1990 14:55
[CTD.AQUI.WHOISRC.CONFIG]C.OPT;2                          1   7-JUL-1986 20:16
[CTD.AQUI.WHOISRC.CONFIG]CTD78_CONFIG.C;112              26   7-MAR-1990 10:42
[CTD.AQUI.WHOISRC.CONFIG]CTD78_CONFIG.LNK;7               1  19-APR-1990 09:26
[CTD.AQUI.WHOISRC.CONFIG]CTD78_CONFIG.OBJ;2              13   6-SEP-1990 08:45
[CTD.AQUI.WHOISRC.CONFIG]CTD78_TPL_DEF.H;15               3  18-JAN-1990 10:24
[CTD.AQUI.WHOISRC.CONFIG]CTD78_TPL_DEF.INC;5              7  18-JAN-1990 10:24
[CTD.AQUI.WHOISRC.CONFIG]CTD_DEFAULT_VAR.H;11             7  19-APR-1990 09:30
[CTD.AQUI.WHOISRC.CONFIG]CTD_HDR_DISP.C;6                19  19-JAN-1990 11:06
[CTD.AQUI.WHOISRC.CONFIG]CTD_HDR_DISP.LNK;3               1  19-JAN-1990 11:46
[CTD.AQUI.WHOISRC.CONFIG]READ_TPL_CFG.FOR;25              7  18-JAN-1990 10:24
[CTD.AQUI.WHOISRC.CONFIG]READ_TPL_CFG.OBJ;2               7   6-SEP-1990 08:46
[CTD.AQUI.WHOISRC]LIB.DIR;1                               2  29-JUN-1990 14:55
[CTD.AQUI.WHOISRC.LIB]C.OPT;2                             1   7-JUL-1986 20:16
[CTD.AQUI.WHOISRC.LIB]CTD78_COMMON.FOR;3                  1  13-APR-1990 17:08
[CTD.AQUI.WHOISRC.LIB]CTD78_COMMON.INC;3                 26  20-FEB-1990 16:47
[CTD.AQUI.WHOISRC.LIB]CTD78_COMMON.LNK;4                  1  20-APR-1990 09:17
[CTD AQUI.WHOISRC.LIB]CTD78_COMMON.OBJ;2                  1   6-SEP-1990 08:45
[CTD.AQUI.WHOISRC.LIB]CTD78_COMMON.OPT;1                  1  28-AUG-1990 10:12
[CTD.AQUI.WHOISRC.LIB]CTD78_DEFS.INC;1                    2  30-NOV-1989 15:05
[CTD.AQUI.WHOISRC.LIB]CTD78_LIB.FOR;12                   36   9-OCT-1990 12:37
[CTD.AQUI.WHOISRC.LIB]CTD78_LIB.OBJ;3                    33   9-OCT-1990 12:50
[CTD.AQUI.WHOISRC.LIB]CTD_LOG_DEF.INC;1                  10   1-DEC-1988 13:30
[CTD.AQUI.WHOISRC.LIB]GET_DATA_VALUE.C;1                  9  29-NOV-1989 09:48
[CTD.AQUI.WHOISRC.LIB]GET_DATA_VALUE.OBJ;2                4   6-SEP-1990 08:45
[CTD.AQUI.WHOISRC.LIB]PHYPROPSW.FOR;1                    29  13-DEC-1989 11:57
[CTD.AQUI.WHOISRC.LIB]PHYPROPSW.OBJ;2                    14   6-SEP-1990 08:45
[CTD.AQUI.WHOISRC.LIB]PROC_SUBS.FOR;1                    18  11-JAN-1990 15:55
[CTD.AQUI.WHOISRC.LIB]PROC_SUBS.OBJ;2                     8   6-SEP-1990 08:45
[CTD.AQUI.WHOISRC]PLOT.DIR;1                              2  29-JUN-1990 14:56
[CTD.AQUI.WHOISRC.PLOT]CMND.DAT;1                         1  16-FEB-1990 10:48
[CTD.AQUI.WHOISRC.PLOT]CTD78_PLOT.FOR;5                  23  13-APR-1990 17:10
[CTD.AQUI.WHOISRC.PLOT]CTD78_PLOT.LNK;7                   1  18-APR-1990 16:36
[CTD.AQUI.WHOISRC.PLOT]CTD78_PLOT.OBJ;2                  22   6-SEP-1990 08:46
[CTD.AQUI.WHOISRC.PLOT]CTD78_PLOT_COM.FOR;3               1  18-APR-1990 16:43
[CTD.AQUI.WHOISRC.PLOT]CTD78_PLOT_COM.INC;1               3  11-JAN-1990 16:01
[CTD.AQUI.WHOISRC.PLOT]CTD78_PLOT_COM.LNK;6               1  20-APR-1990 09:16
[CTD.AQUI.WHOISRC.PLOT]CTD78_PLOT_COM.OBJ;2               1   6-SEP-1990 08:47
[CTD.AQUI.WHOISRC.PLOT]CTD78_PLOT_COM.OPT;1               1  15-JUL-1988 10:09
[CTD.AQUI.WHOISRC.PLOT]CTD78_PLOT_SUBS.FOR;17            48  13-APR-1990 17:11
[CTD.AQUI.WHOISRC.PLOT]CTD78_PLOT_SUBS.OBJ;2             39   6-SEP-1990 08:47
[CTD.AQUI.WHOISRC.PLOT]FORD_PLOT.COM;1                    1   3-JAN-1990 16:06
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[CTD.AQUI.WHOISRC.PLOT]FOR_PLOT.COM;1                    1  14-DEC-1989 09:45
[CTD.AQUI.WHOISRC.PLOT]LINK_PLOT.COM;4                   1  20-APR-1990 15:33
[CTD.AQUI.WHOISRC.PLOT]PLOT_CTD78.FOR;5                  8  13-APR-1990 17:10
[CTD.AQUI.WHOISRC.PLOT]PLOT_CTD78.LNK;7                  1  18-APR-1990 16.40
[CTD.AQUI.WHOISRC.PLOT]PLOT_CTD78.OBJ;2                  5   6-SEP-1990 08:46
[CTD.AQUI.WHOISRC.PLOT]PLOT_CTD78_SUBS.FOR;5            33  13-APR-1990 17:11
[CTD.AQUI.WHOISRC.PLOT]PLOT_CTD78_SUBS.OBJ;2            19   6-SEP-1990 08:47
[CTD.AQUI.WHOISRC]UTILS.DIR;1                            3  29-JUN-1990 14:56
[CTD.AQUI.WHOISRC.UTILS]CHECK_TEMPLATE.FOR;3            24  13-APR-1990 17:12
[CTD.AQUI.WHOISRC.UTILS]CHECK_TEMPLATE.LNK;2             1  19-JAN-1990 12:34
[CTD.AQUI.WHOISRC.UTILS]GBL_SEC_TEMPLATE.FOR;8          16  13-APR-1990 17:13
[CTD.AQUI.WHOISRC.UTILS]GBL_SEC_TEMPLATE.LNK;2           1  22-FEB-1990 14:01
[CTD.AQUI.WHOISRC.UTILS]GET_SCAN.FOR;8                  18   9-OCT-1990 16:50
[CTD.AQUI.WHOISRC.UTILS]GET_SCAN.LNK;4                   1  18-APR-1990 16:45
[CTD.AQUI.WHOISRC.UTILS]GET_SCAN.OBJ;5                  17   9-OCT-1990 16:59
[CTD.AQUI.WHOISRC.UTILS]LINK_UTILS.COM;4                 1  20-APR-1990 11:31
[CTD.AQUI.WHOISRC.UTILS]POS_TAPE.FOR;19                  7  11-APR-1990 15:08
[CTD.AQUI.WHOISRC.UTILS]POS_TAPE.LNK;3                   1  18-APR-1990 16:45
[CTD.AQUI.WHOISRC.UTILS]POS_TAPE.OBJ;2                   7   6-SEP-1990 08:48
[CTD.AQUI.WHOISRC.UTILS]READ_COMMON.EXE;1                9  20-SEP-1990 17:32
[CTD.AQUI.WHOISRC.UTILS]READ_COMMON.FOR;4                5  20-SEP-1990 17:29
[CTD.AQUI.WHOISRC.UTILS]READ_COMMON.LNK;4                1  20-SEP-1990 17:32
[CTD.AQUI.WHOISRC.UTILS]READ_COMMON.OBJ;1                6  20-SEP-1990 17:29
[CTD.AQUI.WHOISRC.UTILS]R_CTD78_DISK.FOR;8              12   9-OCT-1990 17:27
[CTD.AQUI.WHOISRC.UTILS]R_CTD78_DISK.LNK;4               1  18-APR-1990 16:45
[CTD.AQUI.WHOISRC.UTILS]R_CTD78_DISK.OBJ;4              13   9-OCT-1990 17:27
[CTD.AQUI.WHOISRC.UTILS]R_CTD78_TAPE.FOR;4              11   7-FEB-1990 16:14
[CTD.AQUI.WHOISRC.UTILS]R_CTD78_TAPE.LNK;8               1  26-JUL-1990 14:33
[CTD.AQUI.WHOISRC.UTILS]R_CTD78_TAPE.OBJ;2              16   6-SEP-1990 08:48
[CTD.AQUI.WHOISRC.UTILS]R_CTD_DISK.FOR;1                11  19-DEC-1989 16:00
[CTD.AQUI.WHOISRC.UTILS]R_CTD_DISK.LNK;2                 1  19-JAN-1990 12:37
[CTD.AQUI.URIEXE]CC_NDL.COM;1                            1  26-JUL-1990 13:57
[CTD.AQUI.URIEXE]CREMBX.C;1                              2  18-JAN-1989 18:41
[CTD.AQUI.URIEXE]DELMBX.C;1                              2  18-JAN-1989 18:39
[CTD.AQUI.URIEXE]FORCEX.C;1                              2  18-JAN-1989 18:47
[CTD.AQUI.URIEXE]WALL.C;1                                2  12-SEP-1989 13:26
[CTD.AQUI.ZETA]FPS.FOR;3                               860  30-MAR-1988 15:04
[CTD.AQUI.ZETA]FPS.OBJ;1                               104  20-SEP-1990 11:42

Total of 244 files, 3479 blocks
End of save set
```

C Image backup of AQUI89 microVAX

This section describes how to save or restore the entire disk volume on TK50 cartridge.

C.1 Image backup to TK50 cartridge

- shutdown the system:
  `$ @SYS$SYSTEM:SHUTDOWN`
- Using the Stand Alone Backup Kit floppy disks:
  insert S/A Backup Kit VMS 4.4 floppy disk 1/3 in disk drive

  push ready button IN
  push reset button IN (restart)

  if switch on back of microVAX is flipped UP
  `>>> b DUA1` (for floppy)
  otherwise, ignore

  when floppy 1/3 is done, insert floppy 2/3, type **YES**
  when floppy 2/3 is done, insert floppy 3/3, type **YES**
  Note: leave floppy 3/3 in drive!
- backup system to TK50 cartridge tape
  put TK50 cartridge in drive
  wait for green light to come on, then push in red button
- **Important!!!** turn ready button off (= out)
- at the $ prompt, backup the hard disk to TK50 cartridge:
  `$ BACKUP/IMAGE/LOG/VERIFY/IGNORE=INTERLOCK/NOCRC -`
  `_$ DUA0: MUA0:MICROVMS/SAVE_SET/REW`
- push the red button out (release) on the TK50 device to rewind, remove TK50 cartridge and floppy 3/3
- remember to label the tape and set it to write protect (figure 2)!
- reboot the system from the hard disk

C.2 Restore AQUI89 from image backup

The entire **AQUI89** disk volume can be restored from an image backup TK50 cartridge tape. Note that restoration from an image backup will overwrite the entire system disk. Any data or log files should be backed up before the system is restored from an image backup.

- shutdown the system:
  `$ @SYS$SYSTEM:SHUTDOWN`
- Using the Stand Alone Backup Kit floppy disks:

- insert S/A Backup Kit VMS 4.4 floppy disk 1/3 in disk drive
- push ready button IN (to write protect the disk)
- push reset button IN (restart)
- if switch on back of microVAX is flipped UP,
  >>> b DUA1 (for floppy)
  otherwise, ignore
- when floppy 1/3 is done, insert floppy 2/3, type YES
- when floppy 2/3 is done, insert floppy 3/3, type YES
  Note: leave floppy 3/3 in drive!

- backup system from TK50 cartridge tape
  - put TK50 cartridge in drive
  - wait for green light to come on, then push in red button
  - Important!!!
    turn ready button off (= out)

- at the **$** prompt, restore the hard disk from TK50 cartridge:
  $ BACKUP/IMAGE/LOG/VERIFY/IGNORE=INTERLOCK/NOCRC -
  _$ MUA0:MICROVMS/SAVE_SET/REW DUA0:/INIT

- push the red button out (release) on the TK50 device to rewind; remove TK50 cartridge and floppy 3/3

- Reboot the system (hit restart button on console). At this point, the disk is initialized and the disk DUA0: is **overwritten.**

D Creating the AQUI89 installation tape

To create the **AQUI89** system save_set, do the following:

- Stop the **CTD_GRAB** and **JOURNAL** processes (section 4.1)
- Purge all directories to remove any old versions of files:
  $ SET DEF USER:[CTD.AQUI]
  $ PURGE/LOG [...]*.*
- Delete all files from the following directories (**Make sure important data and log files are backed up!!!**):
  CTDROOT:[DATA]
  CTDROOT:[JOURNALS]
  CTDROOT:[LOG]
- Mount an empty cartridge in the drive and make sure the write protect switch is pushed to the right to allow data recording on the cartridge

Then execute the following command:

```
$ AQUI89_SYSTEM

-----------------------------------------------------
||| Creating installation save_set AQUI89_SYSTEM |||
-----------------------------------------------------

Load TK50 tape in MUA0:
Is tape initialized? (y/n): N
Initializing tape...
Mounting tape...
%MOUNT-I-MOUNTED, AQUI89 mounted on _MUA0:
%BACKUP-S-COPIED, copied USER:[CTD.AQUI]BACKUP.DIR;1
        ...
        ...
        ...
%BACKUP-S-COPIED, copied CTDROOT:[URIEXE]WALL.EXE;1
$
```

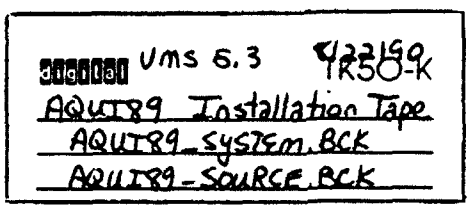
To create the **AQUI89** source code save_set, type the following:

```
$ AQUI89_SOURCE

-----------------------------------------------------
||| Creating installation save_set AQUI89_SOURCE |||
-----------------------------------------------------

Load TK50 tape in MUA0:
Is tape mounted? (y/n): Y
```

```
%BACKUP-S-COPIED, copied USER:[CTD.AQUI.URILIBS]AGAIN.CMD;1
        ...
        ...
        ...
%BACKUP-S-COPIED, copied USER:[CTD.AQUI.ZETA]FPS.OBJ;1
$ SET MAG/REW MUA0:
$ BACKUP/LIST MUA0:*.BCK/SAVE_SET/LABEL=AQUI89        !optional
$ DISM MUA0:
```

After the installation tape has been created, it is important to remember to properly label the tape (figure 2). Also, remember to push the write protect switch to the left (orange indicator can be seen) to prevent any data recording on the cartridge.

Label for TK50 installation tape



Label for 9-track AQUI89 data acquisition tape

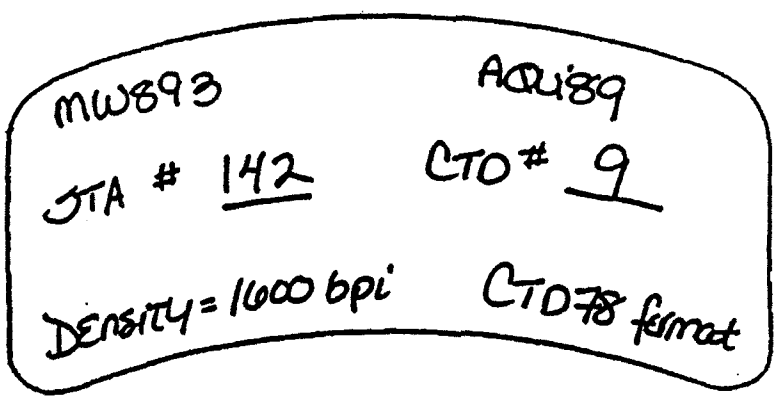


Figure 2: Labels for AQUI89 tapes

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March 11, 1991

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REPORT DOCUMENTATION PAGE	1. REPORT NO. WHOI-92-01	2.	3. Recipient's Accession No.

4. Title and Subtitle
W.H.O.I. CTD MicroVAX II Data Acquisition System Part I Installation Manual

5. Report Date
January 1992

6.

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8. Performing Organization Rept. No.
WHOI-92-01

9. Performing Organization Name and Address
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts 02543

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C) OCE87-12087
(G) OCE90-05218

12. Sponsoring Organization Name and Address
National Science Foundation

13. Type of Report & Period Covered
Technical Report

14.

15. Supplementary Notes
This report should be cited as: Woods Hole Oceanog. Inst. Tech. Rept., WHOI-92-01.

16. Abstract (Limit: 200 words)

AQUI89 is a real-time shipboard Conductivity Temperature Depth profiler (CTD) data acquisition system used at the Woods Hole Oceanographic Institution to collect, preview and store (log) data from the WHOI/Brown Mark III CTD microprofiler on a MicroVAX II computer, running the VAX/VMS operating system, version 5.3. This manual contains the instructions for the installation of the AQUI89 data acquisition system version 1.0.

17. Document Analysis **a. Descriptors**
CTD
acquisition
installation manual

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement
Approved for public release; distribution unlimited.

19. Security Class (This Report)
UNCLASSIFIED

20. Security Class (This Page)

21. No. of Pages
36

22. Price

(See ANSI-Z39.18) *See Instructions on Reverse*

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce