Guide to the VAXlab Interactive Data Acquisition Tool

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This document describes how to communicate with VAXlab through the Interactive Data Acquisition Tool, IDAT, to establish parameters for data acquisition and plotting, and to initiate, control, obtain, analyze, and plot real-time data.

DEC	MicroVAX	VAXstation
DECnet	Q-bus	VMS
DRB32	VAX	VT
LN03	VAXcluster	
LN03 Plus	VAX GKS	
LN03R	VAXlab	

digital ™

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Preface

Intended Audience

The *Guide to the VAXlab Interactive Data Acquisition Tool* is intended for use by scientists and engineers working in a laboratory environment performing real-time data acquisition experiments. The Interactive Data Acquisition Tool, IDAT, is a high-level, simplified user interface for the nonprogrammer.

NOTE

The level of sophistication attained by an IDAT user is directly dependent on the user's understanding of the various components of the VAXlab Software Library, VSL.

This guide assumes a basic understanding of computer concepts and an extensive knowledge of laboratory data acquisition and experiment control concepts.

Document Structure

The *Guide to the Interactive Data Acquisition Tool* provides an overview
of IDAT, including the I/O devices supported for use with IDAT, and
detailed information about how to use IDAT to perform data input,
analog-to-digital (A/D) data analysis, data plotting, disk storage, and
digital-to-analog (D/A) output.

The document is divided into four chapters and one appendix:

Chapter Number	Contents
Chapter 1	Provides an overview of the IDAT software, including the supported I/O devices and operations. Chapter 1 also explains how to begin and end an IDAT session, how to complete menus and data entry screens, and how to recover from error conditions.
Chapter 2	Describes the IDAT menus and data entry screens.
Chapter 3	Provides step-by-step procedures for using IDAT to perform input, analysis, and output operations with all I/O devices.
Chapter 4	Presents a sample IDAT session.
Appendix A	Explains how to convert IDAT-created ASCII files to RS/1 tables.
Appendix B	Describes file header format for input to IDAT.

Associated Documents

In addition to this guide, the VAXlab documentation set includes the
following guides:

- The *VAXlab Master Index* contains index entries from all documents
  in the VAXlab documentation set.
- The *VAXlab Installation Guide* details how to install the VAXlab
  software.

- *Getting Started with VAXlab* is your introduction to the VAXlab system and application software. This document describes the optional hardware you can configure in a VAXlab system, the VAXlab software, and the related software you need to use with your VAXlab system, such as VAX GKS and a high-level programming language.

  This document also describes MANAGER, an interactive, menu-driven utility you can use to perform routine system management tasks. Lastly, this document presents guidelines for developing application programs with VAXlab and considerations specific to programming languages, such as array dimensioning and declaring variables and data types.

- The *Guide to the VAXlab Laboratory I/O Routines* provides a comprehensive overview of the LIO facility, and explains how to initiate, control, and terminate I/O to and from VAXlab I/O devices.

- The *Guide to the VAXlab Laboratory Graphics Package* describes how to specify plotting attributes and how to plot real-time data or data produced by calculations in two dimensions, three dimensions, and two-dimensional contours from a three-dimensional view.

- The *Guide to the VAXlab Signal-Processing Routines* describes how to use the signal-processing routines to perform Fourier transforms, correlation functions, and filtering of data.

The following is a list of associated software documents to reference for additional information about programming concepts and techniques not covered in this guide.

- The *Laboratory Interfacing Handbook* presents detailed descriptions of laboratory I/O concepts. If you are unfamiliar with laboratory data acquistion and control techniques, such as instruments, signals, and interfaces, or if you require additional information about computers, I/O hardware, or applications, read this handbook before you begin using the VAXlab system.

- The *VAX GKS Reference Manual, Volume I and Volume II* provide detailed information about advanced graphics programming concepts and techniques.
- The *VAX Realtime User's Guide* describes those features of VAX systems which pertain to real-time applications in scientific and industrial settings. If you are unfamiliar with VAX systems, read this guide before you begin using the VAXlab system.

The following is a list of associated hardware documents to reference for additional information about the optional I/O devices not covered in this guide.

- *ADQ32 A/D Module User's Guide*
- *AXV11-C/KWV11-C Analog Module and Real-Time Clock Module*
- *DRB32 Technical Manual*
- *DRQ3B Parallel DMA I/O Module User's Guide*
- *DRV11-J Parallel Line Interface User's Guide*
- *DRV11-WA General Purpose DMA Interface User's Guide*
- *IEU11-A/IEQ11-A User's Guide*
- *Q-bus DMA Analog System User's Guide*
- *Universal Data Interface Panel Reference Card*

Conventions

The *Guide to the VAXlab Interactive Data Acquisition Tool* uses the following documentation conventions:

Convention	Meaning
Italics	Words or phrases appearing in *italics* indicate referencing of an associated document.
Bold	A boldface word or phrase indicates emphasis on an important concept or word.
RETURN	Press the key labeled **Return** on the terminal keyboard.
CTRL/x	Press the key labeled **CTRL** on the terminal keyboard while simultaneously pressing the ''x'' key. Here ''x'' is either C, T, W, or Y.
''Double quotes''	Double quotes enclose screen prompts and instructions when they appear in text.
DOWNARROW	Press the key labeled ↓ on the terminal keyboard. Pressing DOWNARROW moves you forward from option to option on scroll-and-select menus and data entry screens, and from data entry field to data entry field on multiple input data entry screens.
UPARROW	Press the key labeled ↑ on the terminal keyboard. Pressing UPARROW moves you backward from option to option on scroll-and-select menus and data entry screens, and from data entry field to data entry field on multiple input data entry screens.

Chapter 1

Introduction to IDAT

This chapter is your introduction to the Interactive Data Acquisition Tool, IDAT. It describes the capabilities of IDAT, the I/O devices you can use with IDAT, the types of user interfaces provided by IDAT, and the appropriate data entry conventions you use to communicate with IDAT.

Read the information contained in this chapter carefully before you begin using IDAT.

1.1 IDAT Overview

IDAT is a high-level, simplified user interface to VAXlab for the non-programmer. Through IDAT, you communicate with VAXlab through a series of screen forms to obtain, analyze, store, retrieve, and output data. You can use IDAT:

- To perform interactive input, A/D data analysis, and output operations

- As a testing tool to ensure that the devices and software configured in your VAXlab system are installed and working properly before you begin writing application programs using the VAXlab Software Library

- As a learning tool to become familiar with some of the functions and capabilities of the VAXlab Software Library

1.2 Data Devices

IDAT supports a subset of the I/O devices available for use with the VAXlab Laboratory I/O (LIO) facility. You can use the following I/O devices with IDAT:

- AAV11-D, a two-channel digital-to-analog converter with direct memory access capability
- ADQ32, a 200 kHz, 32-channel, analog-to-digital converter with an on-board clock
- ADV11-D, a 16-channel analog-to-digital converter
- AXV11-C, a combination board containing one 16-channel analog-to-digital converter and two digital-to-analog converters
- DRB32, a 32-bit, parallel I/O port for the VAXBI bus.
- DRQ3B, a 16-bit, parallel interface I/O board
- DRV11-J, a parallel interface I/O board with four separate 16-bit ports
- DRV11-WA, a 16-bit parallel interface I/O board with direct memory access capability
- Disk files, input and output binary formatted LIO files
- KWV11-C, a real-time clock module
- Preston/DRB32W interface, a 1024-channel analog-to-digital converter
- Preston/DRQ3B interface, a 1024-channel analog-to-digital converter
- Preston/DRV11-WA interface, a 1024-channel analog-to-digital converter

Chapter 3, Using IDAT for Data Input, Analysis, and Output, describes the steps you take to perform I/O using these devices.

For detailed information about these devices and about the LIO facility, see the *Guide to the VAXlab Laboratory I/O Routines*.

1.3   Data Translation

IDAT uses both of the data translation routines available through the Laboratory Signal-Processing (LSP) Routines. IDAT uses the LSP$FORMAT_TRANSLATE_ADC routine to translate data input from an analog-to-digital converter (ADC). This routine converts a 16-bit word buffer to a 32-bit floating-point buffer containing the result of the translation in units of voltage. The precision of the data points is controlled by the value of the channel gain argument passed to the LSP$FORMAT_TRANSLATE routine.

IDAT uses the LSP$FORMAT_TRANSLATE_DAC routine to translate data that is to be output to a digital-to-analog converter (DAC). This routine converts a 32-bit floating-point buffer containing the data in units of voltage to a 16-bit word buffer containing the data values to be output to the DAC.

All data translation takes place internally within IDAT. This means that it is transparent to the user. The user does not need to specify the data translation, and the user does not see the data translation occur.

For detailed information about the signal-processing routines, see the *Guide to the VAXlab Signal-Processing Routines.*

1.4   Data Analysis

IDAT supports a subset of the data analysis capabilities available through the Laboratory Signal-Processing Routines. Using IDAT, you can calculate the power spectrum of one channel of A/D data.

To perform a power spectrum, IDAT uses the LSP$FFT_REAL routine to calculate the forward Fourier transform of the data. Then, IDAT uses the complex output from the LSP$FFT_REAL routine as input to the LSP$POWER_SPECTRUM routine. The LSP$POWER_SPECTRUM routine actually calculates the power spectrum and outputs the data points in 32-bit floating-point format. Chapter 3, Using IDAT for Data Input, Analysis, and Output, describes the steps you take to analyze data using IDAT.

NOTE

You cannot use IDAT to perform only a Fourier tranform. The calculation of the power spectrum of one channel of data is the only data analysis operation that IDAT currently supports. Because the complex output from the LSP$FFT_REAL routine is required as input to the LSP$POWER_SPECTRUM routine, IDAT must perform the forward Fourier transform before calculating the power spectrum.

For detailed information about the signal-processing routines, see the *Guide to the VAXlab Signal-Processing Routines*.

1.5 Data Plotting

IDAT supports a subset of the plotting capabilities available through the Laboratory Graphics Package (LGP). Using IDAT, you can produce:

- a line plot of data from one A/D channel
- additional line plots of data from all A/D channels on the same graph

IDAT uses the LGP$PLOT routine to create the axis system, including axis labeling, and axis annotation, and plots the initial data. Then, IDAT uses the LGP$PLOTM routine to plot the data from the other A/D channels on the same graph.

Before you can use IDAT to plot data, you must define the logical names GKS$WSTYPE and GKS$CONID appropriately for your terminal type and plotting output device, respectively. The logical name GKS$WSTYPE defines the workstation type. The logical name GKS$CONID defines the serial port through which an external output device, such as a plotter, is connected to the MicroVAX. Usually, an external hardcopy device is connected to a serial port on the back of a MicroVAX which is already defined as CSA0. However, if additional serial ports are available, you need to define the port name. If you define GKS$CONID to be TT, all output is directed to the terminal screen.

The following table lists the plotting output devices supported by VAXlab and their corresponding workstation types (GKS$WSTYPE).

Table 1-1:   VAXlab Plotting Devices and Workstation Types

Terminals	GKS$WSTYPE	Printers and Plotters	GKS$WSTYPE
TEKTRONIX 4014	72	HP7550	53
TEKTRONIX 4107	82	LA12	33
VAXstation II	41	LA34	31
VAXstation/GPX	41	LA50	32
VT125 (BW)	12	LA75	32
VT125 (color)	11	LA100	31
VT240	14	LA210	34
VT241	13	LCP01	15
VT330	16	LN03 Plus	38
VT340	17	LN03R	61
		LPS40	61
		LVP16 (8-1/2x11)	51
		LVP16 (11x17)	52

You can define these logical names in one of the following ways:

- Using DEFINE statements in your LOGIN.COM file similar to the following:

```
$! The following command line defines GKS$WSTYPE as a VT240 terminal
$  DEFINE GKS$WSTYPE 14
$!
$! The following command line defines GKS$CONID as TT.  All plotting
$! output is directed to the terminal screen.
$  DEFINE GKS$CONID TT:
```

- Defining the logical names in a command file available to the group which is called from your LOGIN.COM file
- Placing the logical name definitions in the system logical name tables

If you are unfamiliar with login command files or system logical name tables, see your System Manager.

Chapter 3, Using IDAT for Data Input, Analysis, and Output, describes the steps you take to plot data using IDAT. For detailed information about the plotting routines, see the *Guide to the VAXlab Laboratory Graphics Package*.

1.6 Beginning an IDAT Session

To begin an IDAT **session**, you run, or execute, the IDAT software by entering the following command line after the DCL prompt:

$ IDAT RETURN

IDAT displays the Main Menu and is ready to begin accepting information.

An IDAT session comprises all input, analysis, and output operations IDAT performs from the time you run IDAT until the time you exit IDAT. The procedures you use to end an IDAT session, or exit IDAT, are described in Section 1.12, Exiting IDAT.

A **pass** through IDAT is defined as a traversal of those menus and data entry screens that you complete to perform one input, one analysis, or one output operation. Each pass through IDAT begins with the IDAT Main Menu and ends when IDAT completes the operation and returns you to the Main Menu.

1.7 Reading Data into the Internal Buffer

IDAT maintains an **internal buffer** where it stores the data it uses to perform input, analysis, and output operations. When you begin an IDAT session, the internal buffer is empty. **You must perform an input operation first to read data into the internal buffer.** IDAT does not allow you to continue until the internal buffer contains data.

Once the internal buffer contains data, you can perform another input operation, which overwrites the current contents of the internal buffer, or you can perform an analysis or an output operation. If you perform a power spectrum on the input data, IDAT passes the contents of the internal buffer to the appropriate VSL routines, and returns the results of the power spectrum to the internal buffer. In this case, the original input data is replaced, or overwritten, by the results of the power spectrum. This data remains in the internal buffer until it is overwritten

by new input data or until you exit IDAT. When you exit IDAT, all data contained in the internal buffer is deleted.

When you perform an output operation, IDAT outputs the data contained in the internal buffer to the output device, but also maintains this data in the internal buffer until it is overwritten by new data or until you exit IDAT.

When you want to store data contained in the internal buffer for analysis or plotting later on, output the data to a disk file. See Section 3.3.3, Using a Disk File for Data Output, in this guide for information about the steps you take to store data in a disk file.

1.8 Using the Screen Forms Interface

The IDAT screen forms interface consists of:

- Scroll-and-select **menus** from which you select one of several displayed options.
- Scroll-and-select **data entry screens** from which you select one of several displayed options.
- Multiple input **data entry screens** on which you accept default values supplied by IDAT, or enter values of your own.

Section 1.8.1, Selecting Options from Scroll-and-Select Menus and Data Entry Screens, briefly discusses IDAT scroll-and-select menu and data entry screens and the conventions you use to select options from them. Section 1.8.2, Completing Multiple Input Data Entry Screens, briefly discusses IDAT multiple input data entry screens and the conventions you use to accept the default values supplied by IDAT or to supply values of your own.

Chapter 2, IDAT Menu and Data Entry Screen Descriptions, presents the IDAT menu and data entry screens and further describes them.

1.8.1 Selecting Options from Scroll-and-Select Menus and Data Entry Screens

IDAT scroll-and-select menus and data entry screens consist of a list of options, or choices, from which you select one option. When IDAT displays one of these screens, the cursor is positioned at the first option on the menu. The option on which the cursor is positioned is always displayed in reverse video. To select the first option, simply press RETURN. IDAT responds by displaying the next in the series.

To select a different option, use DOWNARROW to scroll down the list of options until the option you want to select is displayed in reverse video, then press RETURN. While using DOWNARROW, you may accidentally scroll past the option you want to select, or you may change your mind and want to select a previous option. Then, you can use UPARROW to scroll back to the option you want to select.

Once you select an option from a scroll-and-select menu or data entry screen, IDAT moves you to the next menu or data entry screen in the series. To move back to a previously completed menu or data entry screen, use the PF3 key. Pressing PF3 moves you backwards from one screen to another until you return to the menu or data entry screen on which you want to enter new information.

Figure 1-1 shows the layout of the IDAT scroll-and-select menus and data entry screens.

Figure 1-1:   Scroll-and-Select Menu and Screen Layout

```
┌─────────────────┬─────────────────────────────────────────────┐
│ IDAT            │Scroll and Select Screen Title Window          │
│         ┌───────┴────────┐                                      │
│         │Menu option 1   │                                      │
│         └────────────────┘                                      │
│         Menu option 2                                           │
│                                                                 │
│              .                                                  │
│                                                                 │
│              .                                                  │
│                                                                 │
│              .                                                  │
│                                                                 │
│              .                                                  │
│                                                                 │
│              .                                                  │
│                                                                 │
│         Menu Option n                                           │
├─────────────────────────────────────────────────────────────── │
│Error Window                                                     │
│                                                                 │
│                                                                 │
└─────────────────────────────────────────────────────────────── ┘
```

1.8.2 Completing Multiple Input Data Entry Screens

IDAT multiple input data entry screens consist of **prompts**, **data entry fields**, and **instructions**. Prompts and data entry fields are grouped in pairs and function together. A prompt is a label that describes the type of information you enter in the data entry field appearing after or beneath the prompt. Data entry fields expecting numeric values appear after the prompt. Data entry fields expecting character string values appear beneath the prompt. Instructions, which appear near the bottom of data entry screens, are sentences that tell you what to do after you enter or accept the values on a data entry screen. The most common instruction is "Press return to continue." Figure 1-2 shows a picture of a generic IDAT data entry screen.

All data entry fields on an IDAT screen form contain default values supplied by IDAT that are used if you do not supply values in place of the default values. If the default value displayed in a data entry field is acceptable, you can accept the default value and move to the next data entry field by pressing RETURN or DOWNARROW. If you want to enter a new value in place of the default value, simply enter the new value in the data entry field, and press RETURN. As you enter the new value, it overwrites the default value. If the new value you enter is invalid, IDAT displays an error message in the error window at the bottom of the screen, and allows you to reenter an acceptable value. See Section 1.10, Interpreting and Correcting Errors, for detailed information about recovering from IDAT errors.

If you accept a default value or enter a new value and move past a data entry field, you can move back to the data entry value by using DOWNARROW. Then, simply enter the new value in the field. Press RETURN, or press either DOWNARROW or UPARROW to move to the next field you want to change, if any.

NOTE

The default values supplied by IDAT are displayed on data entry screens at the beginning of each IDAT session. These values remain the default values for the current IDAT session if you do not change them. If you overwrite any of the default values, the new values you enter are displayed as the default values for a subsequent pass through IDAT during the current IDAT session. To reset the default values supplied by IDAT, you can either reenter them in the appropriate data entry fields, or you can exit IDAT and begin a new IDAT session.

IDAT displays the "Press return to continue." instruction near the bottom the data entry screen. Pressing RETURN after this prompt enters the parameter values into IDAT, completes the screen, and moves you to the next screen in the series.

Once you complete a multiple input data entry screen, IDAT moves you to the next data entry screen in the series. To move back to a previously completed menu or data entry screen, use PF3. Pressing PF3 moves you backwards from one screen to another until you return to menu or data entry screen on which you want to enter new information.

When you complete all the data entry screens in a series, IDAT runs the VSL routines associated with the operation you specified by your selection from the IDAT Main Menu. When the VSL routines complete execution, IDAT returns you to the Main Menu. You can then select to continue by entering another Main Menu option, or you can exit IDAT by selecting the EXIT option.

Figure 1-2 shows the layout of IDAT multiple input data entry screens.

Figure 1-2: Multiple Input Data Entry Screen Layout

```
┌─────────────────────────────────────────────────────────────────────┐
│ IDAT            │Scroll and Select Screen Title Window                │
│        ┌────────┴──────────────────────────────────────────────┐     │
│        │Prompt:  Data entry field where default value appears:│     │
│                                                                       │
│        Prompt:  Data entry field where default value appears          │
│                                                                       │
│           .                                                           │
│                                                                       │
│           .                                                           │
│                                                                       │
│           .                                                           │
│                                                                       │
│           .                                                           │
│                                                                       │
│        Prompt:  Data entry field where default value appears          │
│                                                                       │
│        Press return to continue                                       │
├─────────────────────────────────────────────────────────────────────┤
│ Error Window                                                          │
│                                                                       │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```

1.9 Getting Help

IDAT contains a VMS-style on-line help facility that you can access by:

- Selecting the HELP option from the IDAT Main Menu.
- Pressing the PF2 key.

If you are at the IDAT Main Menu, select the HELP option to access the help facility. If you are in the middle of a pass through IDAT, simply press PF2 on the auxiliary keypad to access the help facility. You do not need to return to the Main Menu to get help.

Take the following steps to access and use the IDAT help facility:

1. Select the HELP option from the IDAT Main Menu **or** press the PF2 key.

   IDAT displays a list of the types or categories of help information available and the "Topic?" prompt, for example:

   ```
   Information available:

   Control_keys    Devices    Files    Input_screens    Menus
   Plotting_data   Special

   Topic?
   ```

2. Enter the type of information you need after the "Topic?" prompt. IDAT displays a help screen containing information about that topic or category. If additional information is available for the topic, IDAT displays the "Subtopic?" prompt, for example:

   ```
   Topic? Devices  RETURN

   DEVICES

       IDAT supports various types of devices including: parallel,
   analog-to-digital, and digital-to-analog converters.  Enter
   the device name for general information on that device.  For
   more specific information look in the VSL manual.


   Additional information available:

   AAFO1     AAV11-D   ADFO1     ADQ32     ADV11-D  ANFO1    ASFO1
   AXV11-C   DRB32     DRQ11-C   DRQ3B     DRV11-J  DRV11-WA IAV11-A
   IAV11-AA  IAV11-B   IAV11-C   IAV11-CA  IDV11-A  IDV11-B  IDV11-C
   IDV11-D   KWV11-C   Preston_devices

   DEVICES Subtopic?
   ```

3. If you require specific information about device, enter the device name after the "DEVICES Subtopic?" prompt. IDAT displays a help screen containing information about that device, for example:

```
DEVICES Subtopic? AAV11-D  RETURN

DEVICES

  AAV11-D

        The AAV11-D is a 2 channel digital-to-analog converter,
    capable of operating at 250-kHz.

DEVICE Subtopic?  RETURN
Topic?  RETURN
```

4. Press RETURN after the "Subtopic?" prompt to redisplay the "Topic?" prompt. Press RETURN after the "Topic?" prompt to return to the menu or data entry screen from which you accessed the help facility.

1.10 Interpreting and Correcting Errors

If you incorrectly enter information on a data entry screen, IDAT displays an **error message** in the **error window** comprising the last three lines of each data entry screen. An error message tells you that IDAT cannot accept the information you entered in a data entry field and why it cannot accept it.

Typically, IDAT displays error messages when one of the following occurs:

- A parameter value entry is invalid
- A device is already attached
- A device timeout occurred
- The I/O driver for a device is not loaded
- An I/O error occurred during the execution of VSL routines

If IDAT displays an error message indicating that a parameter value entry is invalid, the error message also includes guidelines for entering an acceptable value, for example:

Channel gain value must be 1, 2, 4, or 8

If you enter a value other than 1, 2, 4, or 8 in response to the "Enter channel gain:" prompt, IDAT displays the error message shown above. IDAT overwrites your value with the IDAT default value. The cursor remains positioned in the data entry field until you enter an acceptable value or accept the default value. The value contained in the data entry field must be acceptable before IDAT allows you to continue.

If IDAT displays the "device already attached" error message, this means that another user is currently using the device. Wait several minutes and try your operation again.

If IDAT displays a timeout error, your sampling time was greater than 65,535 seconds, or the device was waiting for a trigger that did not occur.

If IDAT displays the "driver not loaded" error message, this means that either the device is not configured in your VAXlab system, or the device is not configured properly. See your system manager to determine the exact cause for this error.

If IDAT displays the "I/O error" message, this means that an internal error was encountered when the VSL routines began execution to perform the operation. See your system manager to determine the exact cause for this error.

For more information about these errors and other I/O errors that might occur, see the *Guide to the VAXlab Laboratory I/O Routines*.

1.11 Using the Control Keys

IDAT supports the use of certain control keys during its execution. Table 1-2 lists the control keys you can use from within IDAT, and briefly describes the function each control key performs.

Table 1-2: IDAT-Supported Control Keys

Control Key	Description
CTRL/C	Interrupts IDAT during execution and returns control to DCL level. Use this control key to return to DCL level at any point during an IDAT session. Press RETURN to redisplay the DCL prompt.
CTRL/T	Displays information about the current state of the running process, such as CPU time used.
CTRL/W	Refreshes the terminal screen. Use this control key to redraw the current screen minus any distortions that may have been displayed on the screen unexpectedly, such as the display of a broadcast message.
CTRL/Y	Interrupts IDAT during execution and returns control to DCL level. Use this control key to return to DCL level at any point during an IDAT session. Press RETURN to redisplay the DCL prompt.

1.12 Exiting IDAT

You can exit IDAT by doing one of the following:

- Returning to the IDAT Main Menu and selecting the EXIT option. IDAT displays a screen containing the "Do you really want to exit?" prompt. Press RETURN after this prompt to exit IDAT. Enter N (for No) to continue the IDAT session. IDAT responds by redisplaying the Main Menu.

- Entering CTRL/Y to stop the execution of IDAT at any time. Then, press RETURN to redisplay the cursor and the DCL prompt. If the cursor is redisplayed in reverse video, enter the SET TERMINAL/INQUIRE command to return the cursor display to normal.

Exiting IDAT:

- resets the terminal, if set-up characteristics were changed by IDAT to perform an operation such as plotting,
- clears the screen
- frees up virtual memory allocated by the current internal buffer
- returns control to DCL level

Chapter 2

IDAT Menu and Data Entry Screen Descriptions

This chapter briefly describes the IDAT menus and data entry screens.

2.1 Menu Screen Descriptions

The IDAT software contains the following four menu screens:

- Main Menu
- Input Source
- Data Analysis
- Output Destination

The conventions you use to make selections from the IDAT menus are described in Section 1.8.1, Selecting Options from Scroll-and-Select Menus and Data Entry Screens. Sections 2.1.1 through 2.1.4 describe the IDAT menus.

2.1.1 The Main Menu Screen

You begin each IDAT session at the Main Menu. You select the operation you want to perform during each pass through IDAT directly from the Main Menu. After you perform each operation, the IDAT software returns you to the Main Menu, unless you exit IDAT during an operation by entering CTRL/C or CTRL/Y.

Figure 2-1 shows the IDAT Main Menu.

Figure 2-1: Main Menu Screen

```
┌─────────────┬──────────────────────────────────────────────┐
│ IDAT        │ Main Menu                                    │
│             ├──────────────────────────────────────────────┤
│       INPUT                                                 │
│                                                             │
│       ANALYZE DATA                                          │
│                                                             │
│       OUTPUT                                                │
│                                                             │
│       HELP                                                  │
│                                                             │
│       EXIT                                                  │
│                                                             │
│                                                             │
│                                                             │
│                                                             │
├─────────────────────────────────────────────────────────────┤
│                                                             │
│                                                             │
│                                                             │
└─────────────────────────────────────────────────────────────┘
```

2.1.2 The Input Source Menu

When you select the INPUT option from the IDAT Main Menu, IDAT displays the Input Source menu. From the Input Source menu, you select the I/O device you want to use for data input.

This list of input source options appearing on the Input Source Menu screen is longer that than actual screen display. To view addition input source options, press DOWNARROW to move the cursor to the last option appearing on the menu. Then, press DOWNARROW again to view the next option in the series, and so on.

Figure 2–2 shows the Input Source Menu screen before you use the downarrow key to scroll the bottom of the list into view. Figure 2–3 shows the Input Source Menu screen after you use the downarrow key to scroll the bottom of the list into view.

Figure 2-2: Input Source Menu before Scrolling

IDAT	INPUT SOURCE MENU
ADQ32	
ADV11-D	
AXV11-C	
DRB32	
DRQ3B	
DRV11-J	
DRV11-WA	
FILE	

Figure 2–3: Input Source Menu after Scrolling

IDAT	INPUT SOURCE MENU
DRQ3B	
DRV11-J	
DRV11-WA	
FILE	
KWV11-C	
PRESTON (DRB32W)	
PRESTON (DRQ3B)	
PRESTON (DRV11-WA)	

2.1.3   The Data Analysis Menu

When you select the ANALYZE DATA option from the IDAT Main Menu, IDAT displays the Data Analysis Menu. From the Data Analysis Menu, you select the POWER SPECTRUM option.[1]

Figure 2-4 shows the Data Analysis Menu screen.

Figure 2-4:   Data Analysis Menu Screen

```
┌─────────────┬──────────────────────────────────────────────────┐
│ IDAT        │ DATA ANALYSIS MENU                                │
├─────────────┴──────────────────────────────────────────────────┤
│      ▐POWER SPECTRUM▌                                            │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
├─────────────────────────────────────────────────────────────────┤
│                                                                 │
│                                                                 │
│                                                                 │
└─────────────────────────────────────────────────────────────────┘
```

---

[1] Power spectrum is the only data analysis operation currently supported by this version of IDAT. Future versions of IDAT may support additional data analysis operations.

2.1.4 The Output Destination Menu

When you select the OUTPUT option from the IDAT Main Menu, IDAT
displays the Output Destination Menu. From the Output Destination
menu, you select the device, file, or plotting operation to which IDAT
outputs the data.

This list of output destination options appearing on the Output
Destination Menu screen is longer that than actual screen display.
To view addition output destination options, press $\boxed{\text{DOWNARROW}}$ to
move the cursor to the last option appearing on the menu. Then, press
$\boxed{\text{DOWNARROW}}$ again to view the next option in the list, and so on.

Figure 2–5 shows the Output Destination Menu screen before you use
the downarrow key to scroll the bottom of the list into view. Figure 2–6
shows the Output Destination Menu screen after you use the downarrow
key to scroll the bottom of the list into view.

Figure 2-5: Output Destination Menu before Scrolling

```
┌─────────────┬──────────────────────────────────────────────┐
│ IDAT        │ OUTPUT DESTINATION MENU                       │
│       ▄▄▄▄▄▄▄▄                                              │
│       █AAV11-D█                                             │
│                                                            │
│       AXV11-C                                              │
│                                                            │
│       DRB32                                                │
│                                                            │
│       DRQ3B                                                │
│                                                            │
│       DRV11-J                                              │
│                                                            │
│       DRV11-WA                                             │
│                                                            │
│       FILE                                                 │
│                                                            │
│       MULTIPLE CHANNEL PLOT                                │
├────────────────────────────────────────────────────────────┤
│                                                            │
│                                                            │
│                                                            │
└────────────────────────────────────────────────────────────┘
```

Figure 2–6: Output Destination Menu after Scrolling

```
┌──────────┬──────────────────────────────────────────────┐
│IDAT      │OUTPUT DESTINATION MENU                        │
├──────────┴──────────────────────────────────────────────┤
│      DRB32                                               │
│                                                          │
│      DRQ3B                                               │
│                                                          │
│      DRV11-J                                             │
│                                                          │
│      DRV11-WA                                            │
│                                                          │
│      FILE                                                │
│                                                          │
│      MULTIPLE CHANNEL PLOT                               │
│                                                          │
│      RS/1 FILE                                           │
│                                                          │
│█████ SINGLE CHANNEL PLOT ████████████████████████████████│
├──────────────────────────────────────────────────────────┤
│                                                          │
│                                                          │
│                                                          │
└──────────────────────────────────────────────────────────┘
```

2.2 Data Entry Screen Descriptions

The following sections present the IDAT data entry screens. The
sections are arranged in alphabetical order for ease of use. Each section
presents a brief description of the screen and a sample image, or
picture, of the screen.

NOTE

Please note that certain screens are used with more than one
input or output device. The default values on these screens
may differ depending upon the device you are using.

2.2.1 A/D Samples and Channels Screen

The A/D SAMPLES AND CHANNELS screen is one in a series of data
entry screens you complete to specify your data input parameters for
the ADQ32, AXV11-C A/D, and Preston devices. Using this screen, you
select the number of channels from which IDAT reads data, and the
number of samples, or data points, IDAT reads from each channel. You
also specify the first channel from which IDAT reads data.

IDAT reads the data from sequential A/D channels. For example, if you
specify 5 A/D channels for use, beginning at channel 2, IDAT reads data
from channels 2, 3, 4, 5, and 6. If the first channel is not less than or
equal to the number of A/D channels on the device minus the number
of A/D channels selected for use, an error is generated. For example,
if you want to use 16 of the 32 A/D channels on the ADQ32 device, the
beginning channel must be less than or equal to 16.

Be aware of the number of A/D channels on your device and select
values for the number of channels and the first channel appropriately.

For the ADQ32 and AXV11-C A/D devices, you also specify the amount
of amplification, or gain, applied to each channel used.

Figure 2–7 shows the A/D SAMPLES AND CHANNELS screen.

Figure 2-7: A/D Samples and Channels Screen

```
┌──────────────┬──────────────────────────────────────────┐
│ IDAT         │ A/D SAMPLES AND CHANNELS                  │
├──────────────┴──────────────────────────────────────────┤
│ Enter number of samples per channel: 100                 │
│                                                          │
│ Enter number of channels:         1                      │
│                                                          │
│ Enter first channel:              0                      │
│                                                          │
│ Enter channel gain:               1                      │
│                                                          │
│ Press return to continue                                 │
│                                                          │
│                                                          │
│                                                          │
├──────────────────────────────────────────────────────────┤
│                                                          │
│                                                          │
└──────────────────────────────────────────────────────────┘
```

2.2.2 A/D Samples and Channel Gains Screen

The A/D SAMPLES AND CHANNEL GAINS screen is one of a series of data entry screens you complete to specify data input parameters for the ADV11-D device. Using this screen, you select the number of samples IDAT reads from the A/D channel you selected to use. You also select the amount of amplification, or gain, applied to the channel.

Figure 2–8 shows the A/D SAMPLES AND CHANNEL GAINS screen.

Figure 2–8: A/D Samples and Channel Gains Screen

```
┌──────────────────────────────────────────────────────────────────┐
│ IDAT          │ A/D SAMPLES AND CHANNEL GAINS                      │
├──────────────────────────────────────────────────────────────────┤
│ Enter number of samples per channel: 100                           │
│                                                                    │
│ Enter channel gain:              1                                 │
│                                                                    │
│ Press return to continue                                           │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
├──────────────────────────────────────────────────────────────────┤
│                                                                    │
│                                                                    │
│                                                                    │
└──────────────────────────────────────────────────────────────────┘
```

2.2.3 ADQ32 Trigger Mode Selection Screen

The ADQ32 TRIGGER MODE SELECTION screen is one of a series of data entry screens you complete to specify input parameters for the ADQ32 device. Using this screen, you specify how data transfers from the device are triggered.

Figure 2-9 shows the ADQ32 Trigger Mode Selection screen before you use the downarrow key to scroll the bottom of the list into view. Figure 2-10 shows the ADQ32 Trigger Mode Selection screen after you use the downarrow key to scroll the bottom of the list into view.

Figure 2-9: ADQ32 Trigger Mode Selection Screen before Scrolling

IDAT	TRIGGER MODE SELECTION

```
Burst point

Clock point

External point

Burst point,        Sweep clock sweep

Clock point,        Sweep clock sweep

Burst point,        External sweep

Clock point,        External sweep

Burst point,                              External start
```

Figure 2-10: ADQ32 Trigger Mode Selection Screen after Scrolling

IDAT	TRIGGER MODE SELECTION		
Burst point,	Sweep clock sweep		
Clock point,	Sweep clock sweep		
Burst point,	External sweep		
Clock point,	External sweep		
Burst point,		External start	
Clock point,		external start	
Burst point,	Sweep clock sweep	External start	
Clock point,	Sweep clock sweep	External start	

2.2.4   Axes Labels Screen

The AXES LABELS screen is one of a series of data entry screens you complete to specify output parameters for single channel and multiple channel plots. Using this screen, you specify a title for the graph and labels for the x and y axes.

Figure 2-11 shows the AXES LABELS screen.

Figure 2-11:   Axes Labels Screen

```
┌─────────────────┬──────────────────────────────────────────────────┐
│IDAT             │MULTIPLE PLOT                                     │
├─────────────────┴──────────────────────────────────────────────────┤
│                      AXES LABELS                                    │
│                                                                     │
│                                                                     │
│           Main Title:                                               │
│Voltage vs Time                                                      │
│           X-axis label:                                             │
│Time                                                                 │
│           Y-axis label:                                             │
│Voltage                                                              │
│Press Carriage return to continue                                    │
│                                                                     │
│                                                                     │
│                                                                     │
├─────────────────────────────────────────────────────────────────────┤
│                                                                     │
│                                                                     │
│                                                                     │
└─────────────────────────────────────────────────────────────────────┘
```

2.2.5 Autoscaling Option Screen

The AUTOSCALING OPTION screen is one of a series of data entry screens you complete to specify output parameters for single channel and multiple channel plots. Using this screen, you specify whether IDAT uses the autoscaling algorithm to label the x and y axes.

Figure 2-12 shows the AUTOSCALING OPTION screen.

Figure 2-12: Autoscaling Option Screen

IDAT	Autoscaling Option
Autoscale	
No Autoscale	

2.2.6 Bit Precision Specification Screen

The BIT PRECISION SPECIFICATION screen is one of the series of data entry screens you complete to specify parameters for Preston series device. Using this screen, you specify the number of bits of precision contained in your Preston device.

Figure 2–13 shows the BIT PRECISION SPECIFICATION screen.

Figure 2–13: Bit Precision Specification Screen

```
┌─────────────┬──────────────────────────────────────────────────┐
│ IDAT        │ BIT PRECISION SPECIFICATION                      │
├─────────────┴──────────────────────────────────────────────────┤
│        ████████                                                 │
│        14 bit                                                   │
│                                                                 │
│        16 bit                                                   │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
├─────────────────────────────────────────────────────────────────┤
│                                                                 │
│                                                                 │
│                                                                 │
└─────────────────────────────────────────────────────────────────┘
```

2.2.7 Channel Number Selection Screen

The CHANNEL NUMBER SELECTION screen is one of the series of
data entry screens you need to complete to specify parameters for the
ADV11-D device. Using this screen, you specify the number of the A/D
channel on the ADV11-D device from which IDAT is to read data.

Figure 2-14 shows the CHANNEL NUMBER SELECTION screen.

Figure 2-14: Channel Number Selection Screen

```
┌─────────────┬──────────────────────────────────────────────────┐
│IDAT         │CHANNEL NUMBER SELECTION                          │
├─────────────┴──────────────────────────────────────────────────┤
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
│Enter channel number: 0                                          │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
├─────────────────────────────────────────────────────────────────┤
│                                                                 │
│                                                                 │
│                                                                 │
└─────────────────────────────────────────────────────────────────┘
```

2.2.8 Clock Function Selection Screen

The CLOCK FUNCTION SELECTION is one of the series of data entry screens you need to complete to specify parameters for the KWV11-C device. Using this screen, you select the event-timing function the KWV11-C device is to perform.

Figure 2–15 shows the CLOCK FUNCTION SELECTION screen.

Figure 2–15: Clock Function Selection Screen

```
┌──────────────┬──────────────────────────────────────────────────┐
│ IDAT         │ CLOCK FUNCTION SELECTION                          │
├──────────────┴──────────────────────────────────────────────────┤
│       EVENT TIMER, ABSOLUTE TIME                                 │
│                                                                  │
│       EVENT TIMER, RELATIVE TIME                                 │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
├──────────────────────────────────────────────────────────────────┤
│                                                                  │
│                                                                  │
└──────────────────────────────────────────────────────────────────┘
```

2.2.9 Clock Rate Selection Screen

The CLOCK RATE SELECTION is one of the series of data entry screens you need to complete to specify parameters for the AAV11-D, ADV11-D, and AXV11-C devices. This screen is displayed only when the KWV11-C clock module is selected to trigger data transfers. Using this screen, you select the rate of the KWV11-C clock.

Figure 2–16 shows the CLOCK RATE SELECTION screen.

Figure 2–16: Clock Rate Selection Screen

```
┌─────────────┬───────────────────────────────────────────┐
│ IDAT        │ CLOCK RATE SELECTION                       │
│             └───────────────────────────────────────────┤
│                                                          │
│                                                          │
│                                                          │
│                                                          │
│ Enter clock rate:   10000.000000                         │
│                                                          │
│                                                          │
│                                                          │
│                                                          │
│                                                          │
├──────────────────────────────────────────────────────── ┤
│                                                          │
│                                                          │
└──────────────────────────────────────────────────────── ┘
```

2.2.10 Clock Source Selection Screen

The CLOCK SOURCE SELECTION screen is one of the series of data entry screens you need to complete to specify parameters for the KWV11-C device. Using this screen, you specify the source for KWV11-C clock ticks.

Figure 2–17 shows the CLOCK SOURCE SELECTION screen.

Figure 2–17: Clock Source Selection Screen

```
┌─────────────────┬──────────────────────────────────────────────────┐
│ IDAT            │ CLOCK SOURCE SELECTION                            │
├─────────────────┴──────────────────────────────────────────────────┤
│      ▐Internal 1 Mhz clock▌                                         │
│                                                                     │
│      Internal 100 kHz clock                                        │
│                                                                     │
│      Internal 10 kHz clock                                         │
│                                                                     │
│      Internal 1 kHz clock                                          │
│                                                                     │
│      Internal 100 Hz clock                                         │
│                                                                     │
│      Schmitt trigger ST1                                           │
│                                                                     │
│      Line frequency                                                │
│                                                                     │
├─────────────────────────────────────────────────────────────────────┤
│                                                                     │
│                                                                     │
│                                                                     │
└─────────────────────────────────────────────────────────────────────┘
```

2.2.11 Clock Trigger Selection Screen

The CLOCK TRIGGER SELECTION screen is one of the series of data entry screens you need to complete to specify parameters for the KWV11-C device. Using this screen, you select the trigger source for the KWV11-C clock.

Figure 2-18 shows the CLOCK TRIGGER SELECTION screen.

Figure 2-18: Clock Trigger Selection Screen

IDAT	CLOCK TRIGGER SELECTION
	Software Start
	Start on Schmitt trigger

2.2.12 Data Length Specification Screen

The DATA LENGTH SPECIFICATION screen is one of a series of data entry screens you complete to specify data acquisition parameters for the DRQ3B, DRV11-J, and DRV11-WA devices. Using this screen, you specify the number of data points IDAT is to input from the device.

Figure 2-19 shows the DATA LENGTH SPECIFICATION screen.

Figure 2-19: Data Length Specification Screen

IDAT	DATA LENGTH SPECIFICATION
Enter number of data points: 1	

2.2.13 File Name Specification Screen

The FILE NAME SPECIFICATION screen is one of a series of data entry screens you complete to specify the name of a file which IDAT is to use for disk file input or output, and for output to an RS/1 file. Using this screen, you specify the name of the file.

Figure 2-20 shows the FILE NAME SPECIFICATION screen.

Figure 2-20: File Name Specification Screen

```
┌──────────────┬─────────────────────────────────────────────────┐
│IDAT          │FILE NAME SPECIFICATION                          │
├──────────────┴─────────────────────────────────────────────────┤
│                                                                 │
│                                                                 │
│                                                                 │
│Enter file name:                                                 │
│OUTPUT.DAT                                                       │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
│                                                                 │
├─────────────────────────────────────────────────────────────────┤
│                                                                 │
│                                                                 │
│                                                                 │
└─────────────────────────────────────────────────────────────────┘
```

2.2.14 Handshake Enable/Disable Screen

The HANDSHAKE ENABLE/DISABLE screen is one of a series of data entry screens you complete to specify parameters for the DRV11-J device. Using this screen, you software-enable or disable the DRV11-J's two-wire handshaking feature.

To transfer more than one data point per buffer, the DRV11-J hardware must be jumpered for a two-wire handshake. The setting of jumper W11 on the DRV11-J board determines whether the two-wire handshaking feature is hardware-enabled. See the *DRV11-J Parallel Line Interface User's Guide* for information about how to jumper the DRV11-J device appropriately for your needs.

When handshaking is hardware-enabled, you can use the HANDSHAKE ENABLE/DISABLE screen to software-enable or disable the use of the handshaking feature. **Handshaking must be both hardware- and software-enabled to transfer more than one data point per buffer.**

• Figure 2–21 shows the HANDSHAKE ENABLE/DISABLE screen.

Figure 2-21: Handshake Enable/Disable Screen

```
┌─────────────────────────────────────────────────────────────────┐
│ IDAT          │ HANDSHAKE ENABLE/DISABLE                          │
│───────────────┴───────────────────────────────────────────────── │
│      ▐HANDSHAKING ON▌                                             │
│                                                                   │
│      HANDSHAKING OFF                                              │
│                                                                   │
│                                                                   │
│                                                                   │
│                                                                   │
│                                                                   │
│                                                                   │
│                                                                   │
│──────────────────────────────────────────────────────────────── │
│                                                                   │
│                                                                   │
└─────────────────────────────────────────────────────────────────┘
```

2.2.15 Input Channel Selection Screen

The INPUT CHANNEL SELECTION screen is one of a series of data entry screens you complete to specify input parameters for the ADV11-D device. Using this screen, you select the number of A/D channels on the ADV11-D device from which you want IDAT to read data.

Figure 2-22 shows the INPUT CHANNEL SELECTION screen.

Figure 2-22: Input Channel Selection Screen

```
┌─────────────────┬───────────────────────────────────────────────┐
│ IDAT            │ INPUT CHANNEL SELECTION                        │
├─────────────────┴───────────────────────────────────────────────┤
│     ONE CHANNEL                                                  │
│                                                                  │
│     ALL CHANNELS                                                 │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
├──────────────────────────────────────────────────────────────────┤
│                                                                  │
│                                                                  │
└──────────────────────────────────────────────────────────────────┘
```

2.2.16 Multiple Channel Input Selection

The MULTIPLE CHANNEL INPUT SELECTION screen is one of a series of data entry screens you complete to specify output parameters for the AAV11-D and AXV11-C D/A devices. You can output to the AAV11-D or AXV11-C the data collected from only two of the A/D channels on your input device. You must select channels that were used for input. Using this screen, you select these channel numbers.

Figure 2-23 shows the MULTIPLE CHANNEL INPUT SELECTION screen.

Figure 2-23: Multiple Channel Input Selection Screen

```
IDAT            MULTIPLE CHANNEL INPUT SELECTION


Enter first input device channel number:  0


Enter second input device channel number: 0




```

2.2.17 Output Channel Selection Screen

The OUTPUT CHANNEL SELECTION screen is one of a series of data entry screens you complete to specify output parameters for the AXV11-C D/A device. Using this screen, you select the AXV11-C D/A channel or channels to which you want IDAT to output the data.

Figure 2–24 shows the OUTPUT CHANNEL SELECTION screen.

Figure 2–24: Output Channel Selection Screen

IDAT	OUTPUT CHANNEL SELECTION
	CHANNEL ZERO
	CHANNEL ONE
	BOTH CHANNELS

2.2.18 Point Size Specification Screen

The POINT SIZE SPECIFICATION screen is one of a series of data entry screens you complete to specify input parameters for the DRB32 device. Using this screen, you specify the width of the DRB32's parallel data path.

Figure 2-25 shows the POINT SIZE SPECIFICATION screen.

Figure 2-25: Point Size Specification Screen

IDAT	POINT SIZE SPECIFICATION
	4 bytes per word
	2 bytes per word
	1 byte per word

2.2.19 Port Specification Screen

The PORT SPECIFICATION screen is one of a series of data entry
screens you complete to specify input parameters for the DRV11-J
device. Using this screen, you select the DRV11-J port from which you
want IDAT to read the data.

Figure 2-26 shows the PORT SPECIFICATION screen.

Figure 2-26: Port Specification Screen

```
┌─────────────┬──────────────────────────────────────────────────┐
│ IDAT        │ PORT SPECIFICATION                                │
│             │                                                    │
│                                                                  │
│                                                                  │
│ Enter port number: 0                                             │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
├──────────────────────────────────────────────────────────────────┤
│                                                                  │
│                                                                  │
│                                                                  │
└──────────────────────────────────────────────────────────────────┘
```

2.2.20 Preston Trigger Mode Selection Screen

The PRESTON TRIGGER MODE SELECTION screen is one of a series of data entry screens you complete to specify parameters for Preston-series A/D devices. Using this screen, you select how data transfers from the device are triggered.

Figure 2–27 shows the PRESTON TRIGGER MODE SELECTION screen.

Figure 2–27: Preston Trigger Mode Selection Screen

```
┌──────────────┬─────────────────────────────────────────────────────┐
│ IDAT         │ PRESTON TRIGGER MODE SELECTION                      │
├──────────────┴─────────────────────────────────────────────────────┤
│         Immediate start one point per clock tick                    │
│                                                                     │
│         Immediate start one channel sweep per clock tick            │
│                                                                     │
│         Immediate start one point per external trigger              │
│                                                                     │
│         External start one point per clock tick                     │
│                                                                     │
│         External start one channel sweep per internal clock tick    │
│                                                                     │
│         External start one point per external trigger               │
│                                                                     │
│         External start one channel sweep per external trigger       │
│                                                                     │
│                                                                     │
├─────────────────────────────────────────────────────────────────────┤
│                                                                     │
│                                                                     │
│                                                                     │
└─────────────────────────────────────────────────────────────────────┘
```

2.2.21 Single Channel Input Selection

The SINGLE CHANNEL INPUT SELECTION screen is one of a series of screens you complete to specify output parameters for the AAV11-D and AXV11-C D/A devices. You also need to complete this screen to produce a single channel plot or to calculate a power spectrum when the internal buffer contains data from more than one input channel.

Using this screen, you select the channel number of the one A/D channel on the input device that you want IDAT to output to either the AAV11-D or AXV11-C D/A devices, to produce as a single channel plot, or to calculate the power spectrum of the data. **The channel you select must have been used for input.**

Figure 2–28 shows the SINGLE CHANNEL INPUT SELECTION screen.

Figure 2-28: Single Channel Input Selection Screen

```
┌──────────────────────────────────────────────────────────────┐
│ IDAT          │ SINGLE CHANNEL INPUT SELECTION                 │
├───────────────┴────────────────────────────────────────────── │
│                                                                │
│                                                                │
│                                                                │
│ Enter input device channel number: 0                          │
│                                                                │
│                                                                │
│                                                                │
│                                                                │
├────────────────────────────────────────────────────────────── │
│                                                                │
│                                                                │
└──────────────────────────────────────────────────────────────┘
```

2.2.22 Start Data Input Screen

The START DATA INPUT screen is the last in a series of data entry screens you complete to specify parameters for all input devices. The parameter values you entered on previous screens in the series are collected and passed to the VSL routines that are executed to perform the input operation. **The actual execution of the VSL routines does not begin until you complete the START DATA INPUT screen.**

Figure 2-29: Start Data Input Screen

IDAT	START DATA INPUT
Press return to start input:	

2.2.23 Start Data Output Screen

The START DATA OUTPUT screen is the last in a series of data entry screens you complete to specify parameters for all output devices. The parameter values you entered on previous screens in the series are collected and passed to the VSL routines that are executed to perform the output operation. **The actual execution of the VSL routines does not begin until you complete the START DATA OUTPUT screen.**

Figure 2–30: Start Data Output Screen

IDAT	START DATA OUTPUT
Press return to start output:	

2.2.24 Sweep Clock Rate Selection Screen

The SWEEP CLOCK RATE SELECTION screen is one of the series of
data entry screens you can complete to specify input parameters for
the ADQ32 device. Using this screen, you select the rate of the sweep
clock.

Figure 2–31 shows the SWEEP CLOCK RATE SELECTION screen.

Figure 2–31: Sweep Clock Rate Selection Screen

```
┌─────────────┬───────────────────────────────────────────────────┐
│ IDAT        │ SWEEP CLOCK RATE SELECTION                         │
│             │                                                    │
├─────────────┴────────────────────────────────────────────────────┤
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│ Enter sweep clock rate:   100.000000                               │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
├────────────────────────────────────────────────────────────────────┤
│                                                                    │
│                                                                    │
│                                                                    │
└────────────────────────────────────────────────────────────────────┘
```

2.2.25 Trigger Mode Selection Screen

The TRIGGER MODE SELECTION screen is one of a series of data entry screens you complete to specify parameters for the AAV11-D, ADV11-D, and AXV11-C A/D devices. Using this screen, you select how data transfers to or from the device are triggered.

Figure 2–32 shows the TRIGGER MODE SELECTION screen.

Figure 2–32: Trigger Mode Selection Screen

```
┌─────────────────────────────────────────────────────────────────────────┐
│ IDAT           │ TRIGGER MODE SELECTION                                   │
│────────────────┴───────────────────────────────────────────────          │
│        Immediate start burst                                              │
│                                                                           │
│        Channel sweep per clock tick                                       │
│                                                                           │
│        Channel sweep per external trigger                                 │
│                                                                           │
│        One channel per clock tick                                         │
│                                                                           │
│        One channel per external trigger                                   │
│                                                                           │
│        Burst on external trigger                                          │
│                                                                           │
│        Sweep on clock pulse                                               │
│                                                                           │
│                                                                           │
├───────────────────────────────────────────────────────────────────────  │
│                                                                           │
│                                                                           │
│                                                                           │
└─────────────────────────────────────────────────────────────────────────┘
```

2.2.26 X-Axis Coordinates Screen

The X-AXIS COORINDATES screen is one of a series of data entry
screens you complete to specify output parameters for single channel
and multiple channel plots. Using this screen, you specify the minimum
and maximum x-axis values, and the increment at which you want an
annotated tick marks made along the x axis.

Figure 2–33 shows the X-AXIS COORDINATES screen.

Figure 2–33: X-Axis Coordinates Screen

```
┌─────────────┬───────────────────────────────────────────────────┐
│ IDAT        │ X-AXIS COORDINATES                                 │
├─────────────┴───────────────────────────────────────────────────┤
│                                                                  │
│ Enter minimum x-axis value: 0.000000                             │
│                                                                  │
│ Enter maximum x-axis value: 100.000000                           │
│                                                                  │
│ Enter delta x value:        10.000000                            │
│                                                                  │
│ Press return to continue                                         │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
├──────────────────────────────────────────────────────────────────┤
│                                                                  │
│                                                                  │
└──────────────────────────────────────────────────────────────────┘
```

2.2.27 Y-Axis Coordinates Screen

The Y-AXIS COORINDATES screen is one of a series of data entry screens you complete to specify output parameters for single channel and multiple channel plots. Using this screen, you specify the minimum and maximum y-axis values, and the increment at which you want an annotated tick marks made along the y axis.

Figure 2–34 shows the Y-AXIS COORDINATES screen.

Figure 2–34:   Y-Axis Coordinates Screen

IDAT	Y-AXIS COORDINATES

```
Enter minimum y-axis value: -10.000000

Enter maximum y-axis value: 10.000000

Enter delta y value:        5.000000

Press return to continue
```

Using IDAT for Data Input, Analysis, and Output

This chapter describes the steps you take to input data, to analyze data, and to output data using IDAT.

This chapter is not intended to be read sequentially. You need to read only those sections relevant to the devices you want to use with IDAT.

3.1   Using IDAT for Data Input

You can use the following devices with IDAT for data input:

- ADQ32
- ADV11-D
- AXV11-C
- Disk file
- DRB32
- DRQ3B
- DRV11-J
- DRV11-WA
- KWV11-C
- Preston

Subsequent sections describe the steps you take to establish data input parameters and to acquire data from these devices. Each I/O device is discussed in a separate section. The sections are arranged alphabetically for ease of use.

3.1.1 Using the ADQ32 for Data Input

This section describes how to establish input parameters and how to input data from the ADQ32 using IDAT. Figure 3–1 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3–1: ADQ32 Input Screen Flow Diagram


```
                          ┌──────────────┐
                          │  Main Menu   │◄──────────────┐
                          └──────┬───────┘               │
                                 │                        │
                          ┌──────▼───────┐               │
                          │ Input Source │               │
                          └──────┬───────┘               │
                                 │                        │
                          ┌──────▼───────┐               │
                          │  A/D Samples │               │
                          │ and Channels │               │
                          └──────┬───────┘               │
                                 │                        │
  External and          ┌────────▼─────────┐   Burst/External
  Sweep Clock           │   Trigger Mode   │   and No Clock
                        │    Selection     │
                          └────────┬───────┘
                                   │
                            Burst/External
                            and Clock
                                   │
                          ┌────────▼───────┐
                          │  Clock Rate    │
                          │  Selection     │
                          └────────┬───────┘
       A/D Clock and
       Sweep Clock          Burst/External
                            and A/D Clock
  ┌─────────────────┐              │
  │  Sweep Clock    │     ┌────────▼───────┐
  │  Rate Selection │     │  Start Data    │◄──────────────┘
  └─────────────────┘     │  Input         │
                          └────────────────┘
```

MR–1374–GE
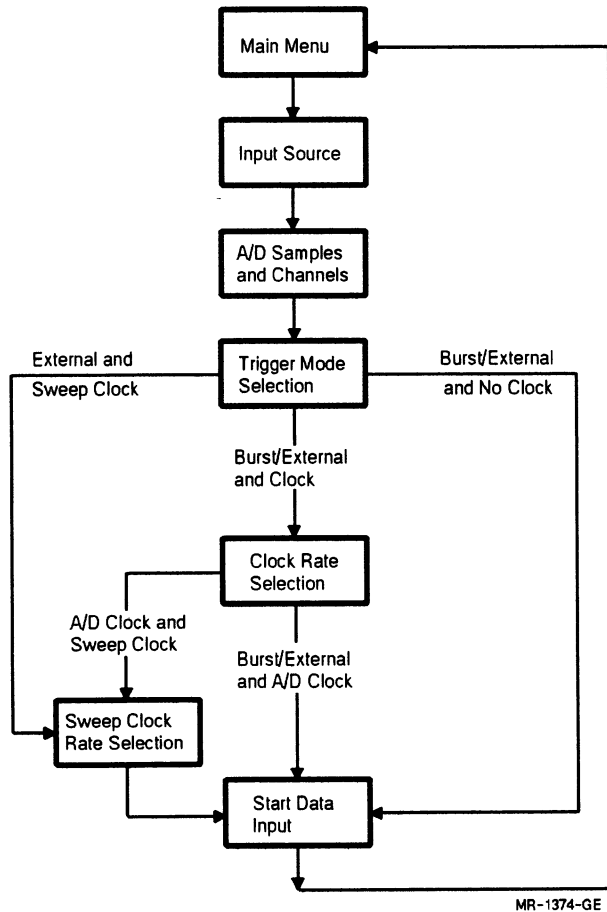
Take the following steps to input data from the ADQ32:

1. Select the INPUT option from the IDAT Main Menu. IDAT displays the Input Source menu.

2. Select the ADQ32 option from the IDAT Input Source menu. IDAT displays the A/D SAMPLES AND CHANNELS screen.

3. To complete the A/D SAMPLES AND CHANNELS screen, you enter:

   a. The number of samples you want IDAT to read from each channel after the "Enter number of samples for each channel:" prompt. If you accept the default value, IDAT reads 100 samples from each channel you specify for use. If you enter a new value, the value must be an integer between 0 and 32768, exclusive.

   b. The number of channels from which you want IDAT to read data after the "Enter number of channels to be sampled:" prompt. If you accept the default value, IDAT reads data from one channel. If you enter a new value, the value must be an integer between 1 and 32, inclusive.

      Please note that **the number of channels times the number of samples to be read from each channel cannot exceed** $64K - 1$, **or 65534, bytes.** Each sample is two bytes in length. This means that, if you select to read data from one A/D channel, you can specify a maximum of $32K - 1$, or 32767, samples. If you select to read data from all 32 channels, you can specify a maximum of $2K - 1$, or 2047, samples.

   c. The number of the first channel to be sampled after the "What is the first channel?:" prompt. If you accept the default value, IDAT reads data from channel 0 first. If you enter a new value, the value must be an integer between 0 and 31, inclusive.

   d. The amount of amplification you want IDAT to apply to each channel after the "What is the gain to be used for all channels?:" prompt. If you accept the default value, IDAT uses a channel gain of one. If you enter a new value, the value must be a discrete integer of value 1, 2, 4, or 8.

   When you complete this screen, IDAT displays the TRIGGER MODE SELECTION screen.

4. Select the device trigger mode. Then, complete step a, b, c, or d below.

   a. If you select one of the following trigger mode options, IDAT displays the START DATA INPUT screen:
      - Burst point
      - External point
      - Burst point, External sweep
      - Burst point,   External start

      Continue at step 7.

   b. If you select one of the following trigger mode options, IDAT displays the CLOCK RATE SELECTION screen before displaying the START DATA INPUT screen:
      - Clock point
      - Clock point, External sweep
      - Clock point, External start

      Continue at step 5, skip step 6, and complete step 7.

   c. If you select one of the following trigger mode options, IDAT displays the CLOCK RATE SELECTION screen and the SWEEP CLOCK RATE SELECTION screen before displaying the START DATA INPUT screen:
      - Clock point, Sweep clock sweep
      - Clock point, Sweep clock sweep, External start

      Continue at step 5 and complete steps 6 and 7.

   d. If you select the follow trigger mode option, IDAT displays the SWEEP CLOCK RATE SELECTION screen before displaying the START DATA INPUT screen:
      - Burst point, Sweep clock sweep
      - Burst point, Sweep clock sweep, External start

      Continue at step 6 and complete step 7.

5. Enter the clock rate after the "Enter clock rate:" prompt. If you accept the default value, IDAT uses a clock rate of 10000.00 Hz. If you enter a new value, the value must be between .008 and 200000.00, inclusive. Then, IDAT displays either the SWEEP CLOCK RATE SELECTION screen or the START DATA INPUT screen.

6. Enter the sweep clock rate after the "Enter sweep clock rate:" prompt. If you accept the default value, IDAT uses a sweep clock rate of 100.00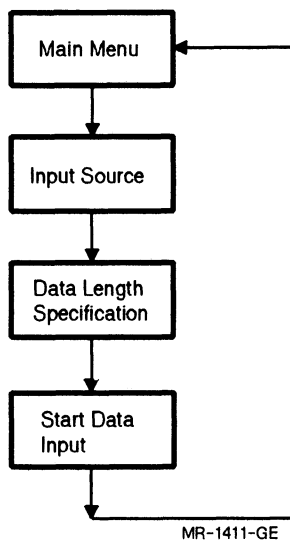 Hz. If you enter a new value, the value must be between .008 and 200000.00, inclusive. Then, IDAT displays the START DATA INPUT screen.

7. Press RETURN after the "Press return to start input." instruction. IDAT reads the data from the device and returns you to the Main Menu.

3.1.2 Using the ADV11-D for Data Input

This section describes how to establish input parameters and how to input data from the ADV11-D using IDAT. Figure 3–2 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3–2:   ADV11-D Input Screen Flow Diagram


```
                        ┌──────────────┐
                        │  Main Menu   │◄──────────────────┐
                        └──────────────┘                   │
                               │                           │
                               ▼                           │
                        ┌──────────────┐                   │
                        │ Input Source │                   │
                        └──────────────┘                   │
                               │                           │
                               ▼                           │
                        ┌──────────────┐                   │
                        │Input Channel │                   │
                        │  Selection   │                   │
                        └──────────────┘                   │
              One Channel     │                            │
      ┌──────────────┐        │                            │
      │Channel Number│        │                            │
      │Selection     │        │                            │
      └──────────────┘        ▼                            │
              │        ┌──────────────┐                    │
              └───────►│A/D Samples & │                    │
                       │Channel Gains │                    │
                       └──────────────┘                    │
                               │                           │
                               ▼                           │
                       ┌──────────────┐                    │
                       │ Trigger Mode │                    │
                       │  Selection   │                    │
                       └──────────────┘                    │
              KWV11-C Clock Triggered                       │
                               │        ┌──────────────┐   │
                               │        │  Clock Rate  │   │
                               │        │  Selection   │   │
                               │        └──────────────┘   │
                               ▼              │            │
                       ┌──────────────┐       │            │
                       │ Start Data   │◄──────┘            │
                       │ Input        │                    │
                       └──────────────┘                    │
                               │                           │
                               └───────────────────────────┘
```

                                                    MR-1409-GE
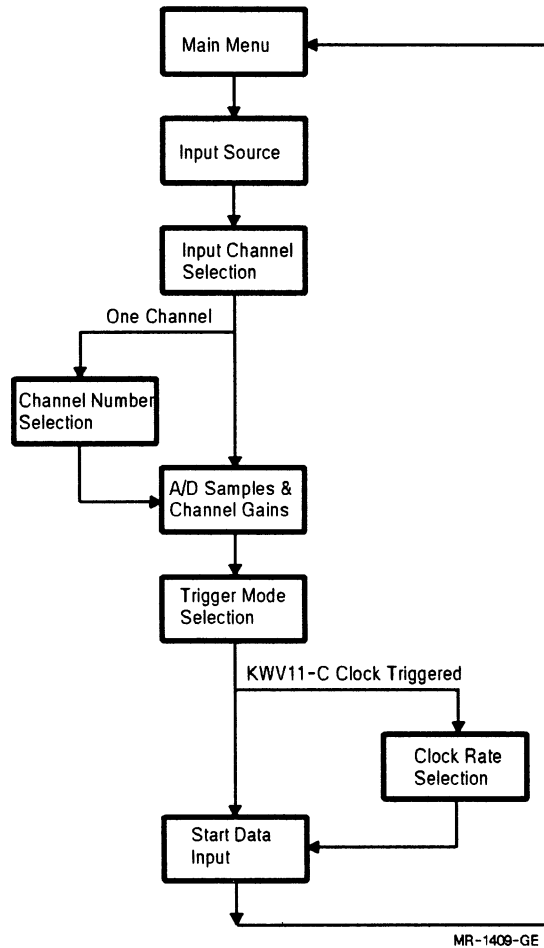
Take the following steps to input data from the ADV11-D:

1. Select the INPUT option from the IDAT Main Menu. IDAT displays the Input Source menu.

2. Select the ADV11-D option from the IDAT Input Source menu. IDAT displays the INPUT CHANNEL SELECTION screen.

3. Select the number of A/D channels on the ADV11-D device from which you want IDAT to read data. Then, complete step a or step b below, and continue at step 4.

   a. If you select the ONE CHANNEL option, IDAT displays the CHANNEL NUMBER SELECTION screen. Enter the number of the channel from which you want IDAT to acquire the data after the "Enter channel number:" prompt. The value must an integer from 0 to 15, inclusive, specifying the channel number. If you accept the default value, IDAT acquires data from channel zero. When you complete this screen, IDAT displays the A/D SAMPLES AND CHANNEL GAINS screen.

   b. If you select the ALL CHANNELS option, IDAT bypasses the CHANNEL NUMBER SELECTION screen and displays the A/D SAMPLES AND CHANNEL GAINS screen.

4. To complete the A/D SAMPLES AND CHANNEL GAINS screen, you enter:

   a. The number of samples you want IDAT to read from each channel after the "Enter number of samples per channel:" prompt. If you accept the default value, IDAT reads 100 samples from each channel you specified for use. If you enter a new value, the value must be an integer between 1 and 65022, inclusive.

      Please note that **the number of channels times the number of samples to be read from each channel cannot exceed** $64K - 512$, **or 65022, bytes.** Each sample is two bytes in length. This means that if you select the ONE CHANNEL option from the CHANNEL NUMBER SELECTION screen in step 3, you can specify a maximum of $32K - 256$, or 32511, samples. If you select the ALL CHANNELS option from the CHANNEL NUMBER SELECTION screen in step 3, you can specify a maximum of 2031 samples.

   b. The amount of amplification you want IDAT to apply to each channel after the "Enter channel gains:" prompt. If you accept the default value, IDAT uses a channel gain of one. If you enter a new value, the value must be 1, 2, 4, or 8.

   When you complete this screen, IDAT displays the TRIGGER MODE SELECTION screen.

5. Select the device trigger mode. Then, complete step a or step b below, and continue at step 6.

   a. If you select the "One channel per clock tick" option, IDAT displays the CLOCK RATE SELECTION screen. Enter the clock rate after the "Enter clock rate:" prompt. The value must be a single-precision, floating-point number between .002 Hz and 50 kHz, or .002 and 50000.0, exclusive. When you complete this screen, IDAT displays the START DATA INPUT screen.

   b. If you select either of the other two trigger mode options, IDAT bypasses the CLOCK RATE SELECTION screen and displays the START DATA INPUT screen.

6. Press RETURN after the "Press return to start input." instruction. IDAT reads the data from the device and returns you to the Main Menu.

3.1.3 Using the AXV11-C for Data Input

This section describes how to establish input parameters and how to input data from the AXV11-C using IDAT. Figure 3–3 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3–3: AXV11-C Input Screen Flow Diagram

MR-1410-GE
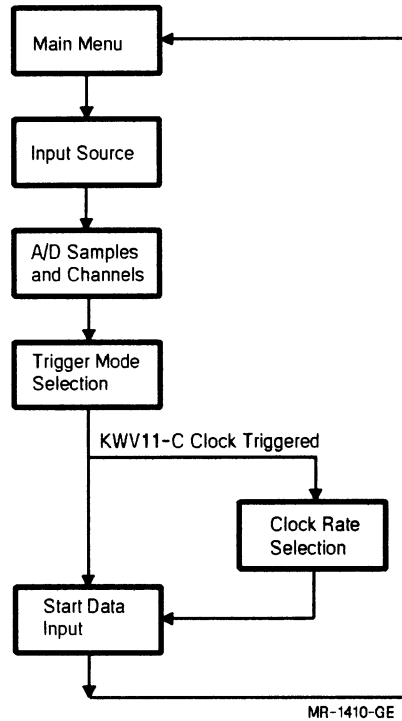
Take the following steps to input data from the AXV11-C:

1. Select the INPUT option from the IDAT Main Menu. IDAT displays the Input Source menu.

2. Select the AXV11-C option from the IDAT Input Source menu. IDAT displays the A/D SAMPLES AND CHANNELS screen.

3. To complete the A/D SAMPLES AND CHANNELS screen, you enter:

   a. The number of samples you want IDAT to read from each channel after the "Enter number of samples per channel:" prompt. If you accept the default value, IDAT reads 100 samples from each channel you specify for use. If you enter a new value, the value must be an integer between 0 and 65535, exclusive.

b. The number of channels from which you want IDAT to read data after the "Enter number of channels:" prompt. If you accept the default value, IDAT reads data from one channel. If you enter a new value, the value must be an integer between 1 and 16, inclusive.

Please note that **the number of channels times the number of samples to be read from each channel cannot exceed** $64K - 1$, **or 65534, bytes.** Each sample is two bytes in length. This means that, if you select to read data from one A/D channel, you can specify a maximum of $32K - 1$, or 32767, samples. If you select to read data from all 16 channels, you can specify a maximum of $2K - 1$, or 2047, samples.

c. The number of the first channel to be sampled after the "Enter first channel:" prompt. If you accept the default value, IDAT reads data from channel 0 first. If you enter a new value, the value must be an integer between 0 and 15, inclusive.

d. The amount of amplification you want IDAT to apply to each channel after the "Enter channel gains:" prompt. If you accept the default value, IDAT uses a channel gain of one. If you enter a new value, the value must be discrete integer of value 1, 2, 4, or 8.

When you complete this screen, IDAT displays the TRIGGER MODE SELECTION screen.

4. Select the device trigger mode. Then, complete step a or step b below, and continue at step 5.

a. If you select the "Channel sweep per clock tick" option, the "One channel per clock tick" option, or the "Sweep on clock pulse" option, IDAT displays the CLOCK RATE SELECTION screen. Enter the clock rate after the "Enter clock rate:" prompt. The value must be a single-precision, floating-point number between .002 Hz and 10 kHz, or .002 and 10000.0, inclusive. When you complete this screen, IDAT displays the START DATA INPUT screen.

b. If you select any of the other four trigger mode options, IDAT bypasses the CLOCK RATE SELECTION screen and displays the START DATA INPUT screen.

5. Press RETURN after the "Press return to start input." instruction. IDAT reads the data from the device and returns you to the Main Menu.

3.1.4 Using a Disk File for Data Input

This section describes how to establish input parameters and how to input data from a disk file using IDAT. Figure 3–4 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure. See Appendix B for information on creating your own binary data files for input to IDAT.

Figure 3–4: Disk File Input Screen Flow Diagram

MR-1414-GE
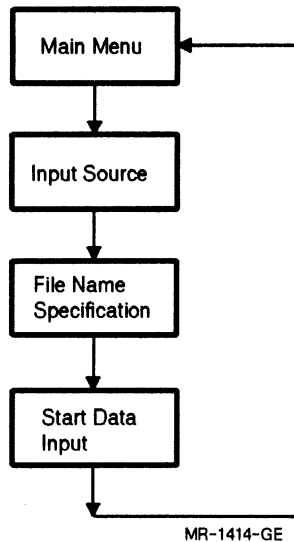
Take the following steps to input data from a disk file:

1. Select the INPUT option from the IDAT Main Menu. IDAT displays the Input Source menu.

2. Select the FILE option from the IDAT Input Source menu. IDAT displays the FILE NAME SPECIFICATION screen.

3. Enter the name of the input file after the "Enter file name:" prompt. If you accept the default value, IDAT attempts to open and read from an existing file called OUTPUT.DAT. If you enter a new value, the file must already exist on your system. The file name must be a valid VMS file specification.

   When you complete this screen, IDAT displays the START DATA INPUT screen.

4. Press RETURN after the "Press return to start input." instruction. IDAT reads the data from the input file and returns you to the Main Menu.

3.1.5 Using the DRB32 for Data Input

This section describes how to establish input parameters and how to input data from the DRB32 using IDAT. Figure 3-5 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3-5:   DRB32 Input Screen Flow Diagram
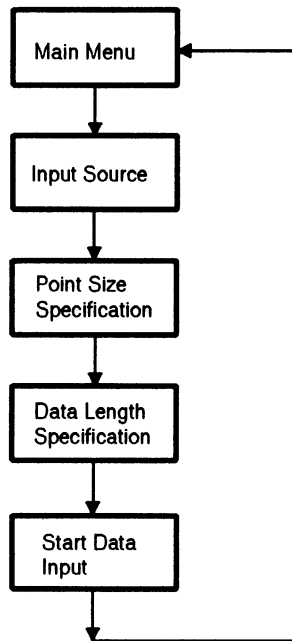
MR-1375-GE

Take the following steps to input data from the DRB32:

1. Select the INPUT option from the IDAT Main Menu. IDAT displays the Input Source menu.

2. Select the DRB32 option from the IDAT Input Source menu. IDAT displays the POINT SIZE SPECIFICATION screen.

3. Select the data point size. Then, IDAT displays the DATA LENGTH SPECIFICATION screen.

4. Enter the number of data points, or the data length, after the "Enter number of data points:" prompt. If you accept the default value, IDAT reads one data point from the DRB32. If you enter a new value, the value must be an integer between 1 and 32767, inclusive.

   When you complete this screen, IDAT displays the START DATA INPUT screen.

5. Press RETURN after the "Press return to start input." instruction. IDAT reads the data the device and returns you to the Main Menu.

3.1.6 Using the DRQ3B for Data Input

This section describes how to establish input parameters and how to input data from the DRQ3B using IDAT. Figure 3-6 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3-6: DRQ3B Input Screen Flow Diagram

```
        ┌──────────────┐
        │  Main Menu   │◄──────────┐
        └──────┬───────┘           │
               │                   │
               ▼                   │
        ┌──────────────┐           │
        │ Input Source │           │
        └──────┬───────┘           │
               │                   │
               ▼                   │
        ┌──────────────┐           │
        │ Data Length  │           │
        │ Specification│           │
        └──────┬───────┘           │
               │                   │
               ▼                   │
        ┌──────────────┐           │
        │ Start Data   │           │
        │ Input        │           │
        └──────┬───────┘           │
               │                   │
               ▼───────────────────┘
              MR-1411-GE
```

Take the following steps to input data from the DRQ3B:

1. Select the INPUT option from the IDAT Main Menu. IDAT displays the Input Source menu.

2. Select the DRQ3B option from the IDAT Input Source menu. IDAT displays the DATA LENGTH SPECIFICATION screen.

3. Enter the number of data points, or the data length, after the "Enter number of data points:" prompt. If you accept the default value, IDAT reads one data point from the DRQ3B. If you enter a new value, the value must be an integer between 1 and 32767, inclusive.

   When you complete this screen, IDAT displays the START DATA INPUT screen.

4. Press RETURN after the "Press return to start input." instruction. IDAT reads the data from the device and returns you to the Main Menu.

3.1.7 Using the DRV11-J for Data Input

This section describes how to establish input parameters and how to input data from the DRV11-J using IDAT. Figure 3-7 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3–7: DRV11-J Input Screen Flow Diagram

MR-1412-GE
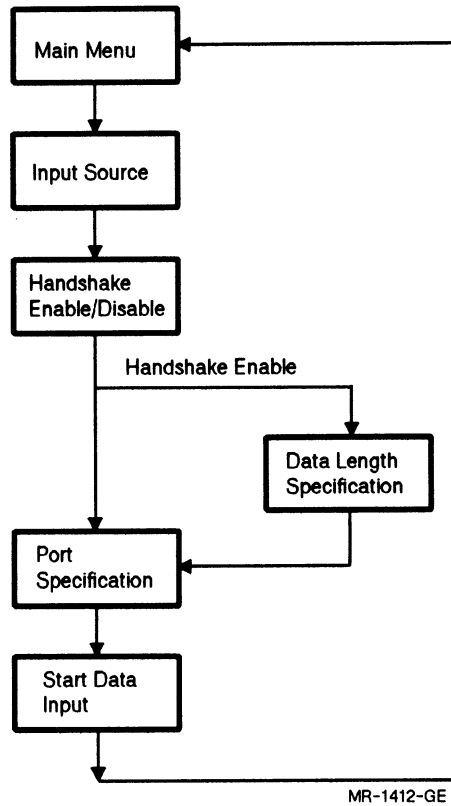
Take the following steps to input data from the DRV11-J:

1. Select the INPUT option from the IDAT Main Menu. IDAT displays the Input Source menu.

2. Select the DRV11-J option from the IDAT Input Source menu. IDAT displays the HANDSHAKE ENABLE/DISABLE screen.

3. Enable or disable the device's handshaking feature. Then, complete complete step a or step b below, and continue at step 4.

NOTE

To transfer more than one data point per buffer, the DRV11-J hardware must be jumpered for a two-wire handshake. The setting of jumper W11 on the DRV11-J board determines whether the two-wire handshaking feature is hardware-enabled. See the *DRV11-J Parallel Line Interface User's Guide* for information about how to jumper the DRV11-J device appropriately for your needs.

When handshaking is hardware-enabled, you can use the HANDSHAKE ENABLE/DISABLE screen to software-enable or disable the use of the handshaking feature. Handshaking must be both hardware- and software-enabled to transfer more than one data point per buffer.

a. If you enable handshaking in this step, then IDAT displays the DATA LENGTH SPECIFICATION screen. To complete the DATA LENGTH SPECIFICATION screen, enter the number of data points you want IDAT to read from the DRV11-J device after the "Enter number of data points:" prompt. If you accept the default value, IDAT reads one data point. If you enter a new value, the value must be between 1 and 32767, inclusive.

When you complete this screen, IDAT displays the PORT SPECIFICATION screen.

b. If you disable handshaking in this step, then IDAT immediately displays the PORT SPECIFICATION screen.

4. Enter the port from which you want IDAT to read the data. If you accept the default value, 0, IDAT reads data from Port A. If you enter 1, IDAT reads data from Port B. If you enter 2, IDAT reads data from Port C. If you enter 3, IDAT reads data from Port D.

When you complete this screen, IDAT displays the START DATA INPUT screen.

5. Press RETURN after the "Press return to start input." instruction. IDAT reads the data from the device and returns you to the Main Menu.

3.1.8 Using the DRV11-WA for Data Input

This section describes how to establish input parameters and how to input data from the DRV11-WA using IDAT. Figure 3–8 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3–8: DRV11-WA Input Screen Flow Diagram

MR-1413-GE
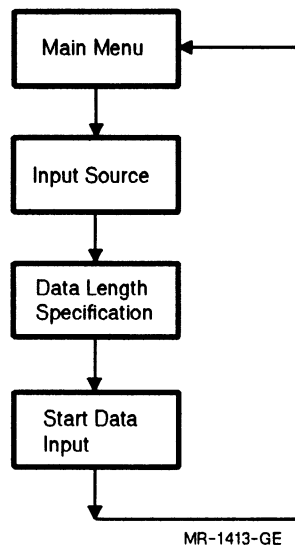
Take the following steps to input data from the DRV11-WA:

1. Select the INPUT option from the IDAT Main Menu. IDAT displays the Input Source menu.
2. Select the DRV11-WA option from the IDAT Input Source menu. IDAT displays the DATA LENGTH SPECIFICATION screen.

3. Enter the number of data points you want IDAT to read from the DRV11-WA device after the "Enter number of data points:" prompt. If you accept the default value, IDAT reads one data point. If you enter a new value, the value must be between 1 and 32767, inclusive.

When you complete this screen, IDAT displays the START DATA INPUT screen.

4. Press RETURN after the "Press return to start input:" instruction. IDAT reads the data from the device and returns you to the Main Menu.

3.1.9 Using the KWV11-C for Data Input

This section describes how to establish input parameters and how to input data from the KWV11-C using IDAT. Figure 3-9 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3-9: KWV11-C Input Screen Flow Diagram
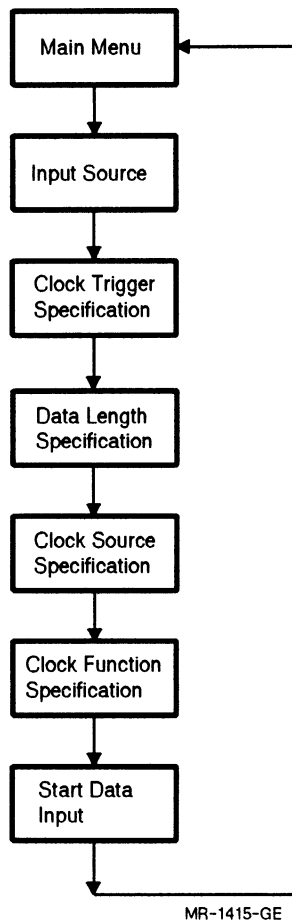
MR-1415-GE

Take the following steps to input data from the KWV11-C:

1. Select the INPUT option from the IDAT Main Menu. IDAT displays the Input Source menu.

2. Select the KWV11-C option from the IDAT Input Source menu. IDAT displays the CLOCK TRIGGER SELECTION screen.

3. Select the clock trigger mode. When you complete this screen, IDAT displays the DATA LENGTH SPECIFICATION screen.

4. Enter the number of data points, or data length, after the "How many points:" prompt.

   When you complete this screen, IDAT displays the CLOCK SOURCE SELECTION screen.

5. Select the clock source. When you complete this screen, IDAT displays the CLOCK FUNCTION SELECTION screen.

6. Select the clock function. When you complete this screen, IDAT displays the START DATA INPUT screen.

7. Press RETURN after the "Press return to start input." instruction. IDAT reads the data from the input device and returns you to the Main Menu.

3.1.10 Using Preston Devices for Data Input

This section describes how to establish input parameters and how to input data from Preston devices using IDAT. Figure 3-10 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3-10: Preston Input Screen Flow Diagram


```
                    ┌─────────────┐
                    │  Main Menu  │◄──────────────────┐
                    └─────────────┘                   │
                           │                          │
                           ▼                          │
                    ┌─────────────┐                   │
                    │ Input Source│                   │
                    └─────────────┘                   │
                           │                          │
                           ▼                          │
                    ┌─────────────┐                   │
                    │Bit Precision│                   │
                    │Specification│                   │
                    └─────────────┘                   │
                           │                          │
                           ▼                          │
                    ┌─────────────┐                   │
                    │ A/D Samples │                   │
                    │and Channels │                   │
                    └─────────────┘                   │
                           │        Immediate/External Start
                           ▼        External Clock    │
                    ┌─────────────┐                   │
                    │Trigger Mode │───────────────────┤
                    │Selection    │                   │
                    └─────────────┘                   │
       Immediate/External Start                       │
       Internal Clock                                 │
                           │                          │
                           ▼                          │
                    ┌─────────────┐                   │
                    │ Clock Rate  │                   │
                    │ Selection   │                   │
                    └─────────────┘                   │
                           │                          │
                           ▼                          │
                    ┌─────────────┐                   │
                    │ Start Data  │◄──────────────────┘
                    │ Input       │
                    └─────────────┘
                           │
                           ▼
```

MR-1416-GE
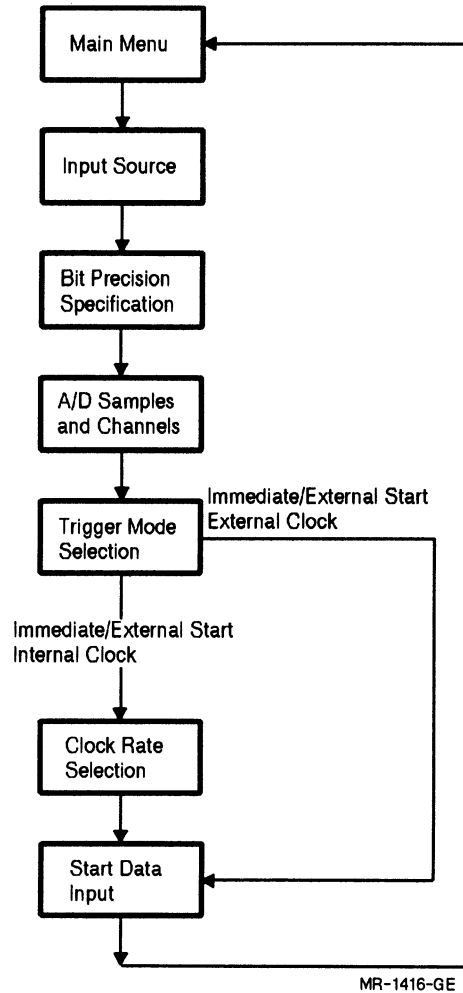
Take the following steps to input data from Preston devices:

1. Select the INPUT option from the IDAT Main Menu. IDAT displays the Input Source menu.

2. Select one of the Preston options from the IDAT Input Source menu. IDAT displays the BIT PRECISION SPECIFICATION SCREEN.

3. Specify the bit precision of your Preston A/D device. IDAT displays the A/D SAMPLES AND CHANNELS screen.

4. To complete the A/D SAMPLES AND CHANNELS screen, you enter:

   a. The number of samples you want IDAT to read from each channel after the "Enter number of samples per channel:" prompt. If you accept the default value, IDAT reads 100 samples from each channel you specify for use. If you enter a new value, the value must be an integer between 0 and 32767, exclusive.

   b. The number of channels from which you want IDAT to read data after the "Enter number of channels:" prompt. If you accept the default value, IDAT reads data from one channel. If you enter a new value, the value must be an integer between 1 and 128, inclusive.

      Please note that **the number of channels times the number of samples to be read from each channel cannot exceed** $32K - 1$, **or 32767, bytes.**

   c. The number of the first channel to be sampled after the "Enter first channel:" prompt. If you accept the default value, IDAT reads data from channel 0 first. If you enter a new value, the value must be an integer between 0 and 1023, inclusive.

   When you complete this screen, IDAT displays the PRESTON TRIGGER MODE SELECTION screen.

5. Select the device trigger mode. Then, complete step a, step b, or step c below, and continue at step 6.

   a. If you select one of the following device trigger mode options, IDAT immediately displays the START DATA INPUT screen.

      Immediate start one point per external trigger
      External start one point per external trigger
      External start one channel sweep per external trigger

b. If you select one of the following device trigger mode options, IDAT displays the CLOCK RATE SELECTION screen before displaying the START DATA INPUT screen.

> Immediate start one point per clock tick
> External start one point per clock tick

To complete the CLOCK RATE SELECTION screen, enter the sampling rate you desire for the Preston internal sampling clock after the "Enter clock rate:" prompt. The value must be a single-precision, floating-point value between 0 Hz and 1 MHz, or 0.0 and 1000000.0, inclusive.

c. If you select one of the following device trigger modes, IDAT displays the CLOCK RATE SELECTION screen and the BURST CLOCK RATE SELECTION screen before displaying the START DATA INPUT screen.

> Immediate start one channel sweep per clock tick
> External start one channel sweep per internal clock tick

To complete the BURST CLOCK RATE SELECTION screen, enter the sampling rate you desire for the Preston internal burst rate clock after the "Enter burst clock rate:" prompt. The value must be a single-precision, floating-point value between 200.0 and 1000000.0.

When you complete the BURST CLOCK RATE SELECTION screen, IDAT displays the START DATA INPUT screen.

6. Press RETURN after the "Press return to start data input." instruction. IDAT reads the data from the device and returns you to the Main Menu.

3.2 Using IDAT for Data Analysis

This section describes how to analyze data using IDAT. Figure 3–11 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3–11: Data Analysis Screen Flow Diagram

MR-1417-GE
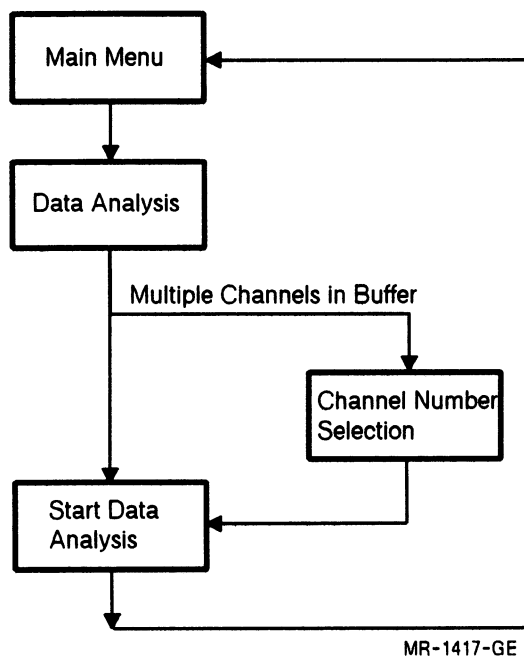
Take the following steps to calculate the power spectrum of a data set using IDAT:

1. Select the ANALYZE DATA option from the IDAT Main Menu. IDAT displays the DATA ANALYSIS MENU screen.

2. Select the POWER SPECTRUM option from the DATA ANALYSIS MENU screen. Then, complete step a or step b below, and continue at step 3.

   a. **If the internal buffer contains data collected from more than one input channel**, IDAT displays the CHANNEL NUMBER SELECTION screen. To complete the CHANNEL NUMBER SELECTION screen, enter the number of the channel on the input device after the "Enter channel number:" prompt.

   Since IDAT performs a power spectrum on the data read from that input channel, you must select a channel that was used for input. IDAT then displays the POWER SPECTRUM screen.

   NOTE

   IDAT places the results of the power spectrum into the internal buffer overwriting all the data contained in the buffer. If you need to save the input data, output it to a disk file before performing a power spectrum operation.

   If the input data is stored in a disk file, you can perform a power spectrum on the data read from each input channel, one at a time, by using the disk file as input to IDAT.

   b. **If the internal buffer contains data from only one input channel**, IDAT bypasses the CHANNEL NUMBER SELECTION screen and displays the POWER SPECTRUM screen.

3. Press RETURN after the "Press carriage return to perform a power spectrum on the data" instruction. IDAT calculates the power spectrum and returns to the Main Menu.

3.3 Using IDAT for Data Output

You can use the following devices with IDAT for data output:

- AAV11-D
- AXV11-C
- Disk file
- DRB32
- DRQ3B
- DRV11-J
- DRV11-WA
- Multiple channel plot
- RS/1 file
- Single channel plot

Subsequent sections describe the steps you take to establish data output parameters and to write data to these devices. Each I/O device is discussed in a separate section. The sections are arranged alphabetically for ease of use.

3.3.1 Using the AAV11-D for Data Output

This section describes how to establish output parameters and how to output data to the AAV11-D using IDAT. Figure 3–12 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

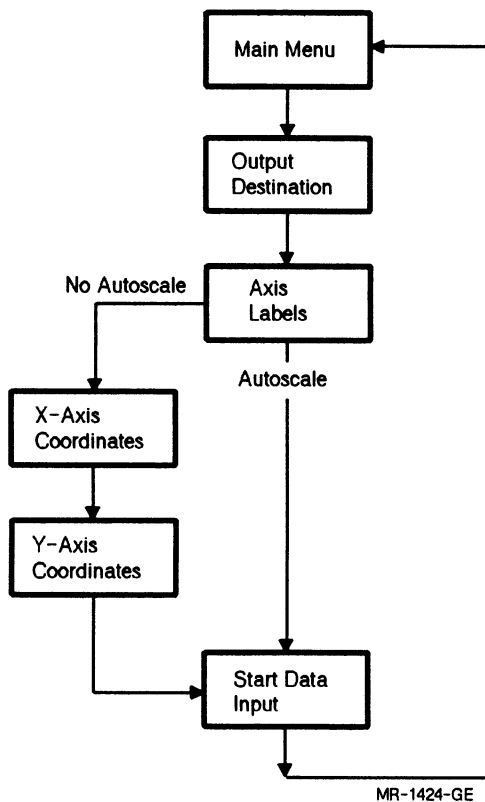**Figure 3-12: AAV11-D Output Screen Flow Diagram**

MR-1418-GE
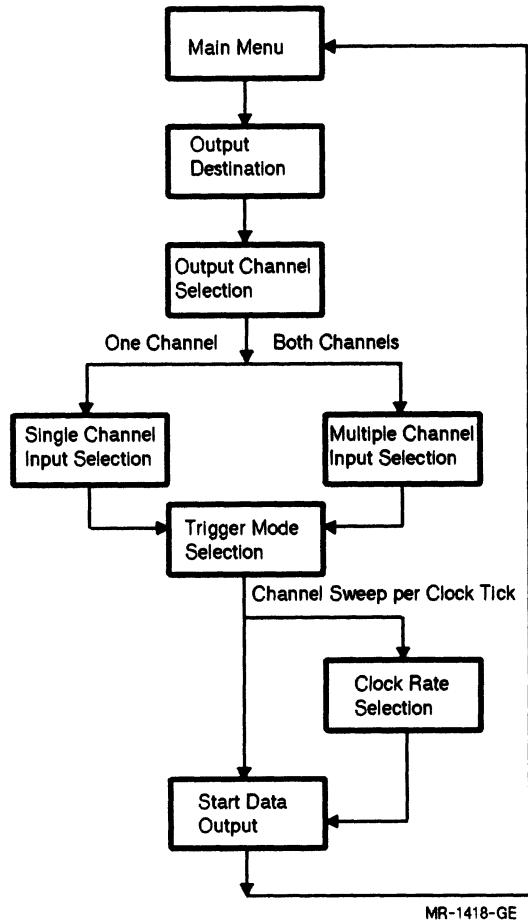
Take the following steps to output data to the AAV11-D:

1. Select the OUTPUT option from the IDAT Main Menu. IDAT displays the Output Destination menu.

2. Select the AAV11-D option from the IDAT Output Destination menu. IDAT displays the OUTPUT CHANNEL SELECTION screen.

3. Select the AAV11-D channel to which you want IDAT to output the data. Then, complete step a or step b below, and continue at step 4.

   a. If you select to output data to only one of the AAV11-D channels, IDAT displays the SINGLE CHANNEL INPUT SELECTION screen. Enter the number of the channel on the input device that you want to output to the AAV11-D channel after the "Enter input device channel number:" prompt. If you accept the default value, IDAT outputs the data collected from channel 0 on the input device to the channel you selected for output on the AAV11-D.

      Keep in mind that you can output to the AAV11-D the data collected from only one of the channels on your input device. For example, if you input data from all 16 channels on the ADV11-D device, you can output only one of them at a time to the AAV11-D. You must select a channel that was used for input.

   b. If you select to output data to both of the AAV11-D channels, IDAT displays the MULTIPLE CHANNEL INPUT SELECTION screen. Enter the number of the first channel on the input device you want to output to the AAV11-D after the "Enter first input device channel number:" prompt. Enter the number of the second channel on the input device you want to output to the AAV11-D after the "Enter second input device channel number:" prompt.

      Keep in mind that you can output to the AAV11-D the data collected from only two of the channels on your input device. For example, if you input data from all 16 channels on the ADV11-D device, you can output only two of them to the AAV11-D. You must select a channel that was used for input.

   When you complete either the SINGLE CHANNEL INPUT SELECTION or MULTIPLE CHANNEL INPUT SELECTION screens, IDAT displays the TRIGGER MODE SELECTION screen.

4. Select the device trigger mode. Then, complete step a or step b below, and continue at step 5.

   a. If you select the "Channel sweep per clock tick" option, IDAT displays the CLOCK RATE SELECTION screen. Enter the clock rate after the "Enter clock rate:" prompt. The value must be a single-precision, floating-point number between .002 Hz and 10 kHz, or .002 and 10000.0, exclusive. When you complete this screen, IDAT displays the START DATA OUTPUT screen.

b. If you select either of the other two trigger mode options, IDAT
    bypasses the CLOCK RATE SELECTION screen and displays
    the START DATA OUTPUT screen.

5. Press RETURN after the "Press return to start output." instruction.
    IDAT writes the data to the device and returns you to the Main
    Menu.

3.3.2 Using the AXV11-C for Data Output

This section describes how to establish output parameters and how to
output data to the AXV11-C using IDAT. Figure 3–13 is a flow diagram
of the IDAT menus and data entry screens you use to perform this
operation. Step-by-step instructions for completing the menus and
screens are presented after the figure.

Figure 3-13: AXV11-C Output Screen Flow Diagram

MR-1419-GE
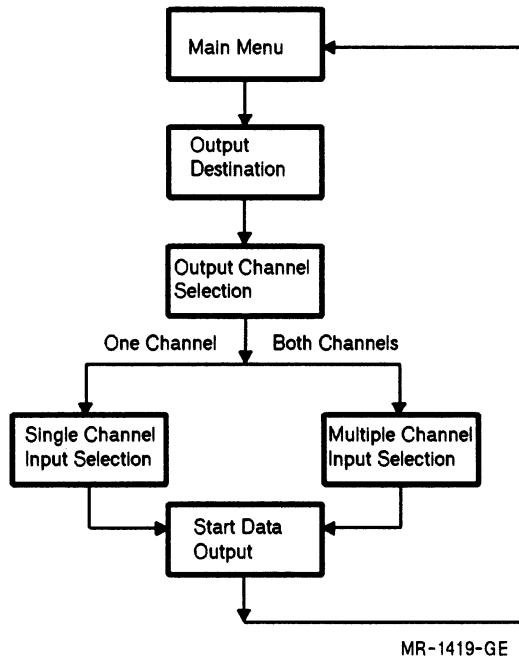
Take the following steps to output data to the AXV11-C:

1. Select the OUTPUT option from the IDAT Main Menu. IDAT displays the Output Destination menu.

2. Select the AXV11-C option from the IDAT Output Destination menu. IDAT displays the OUTPUT CHANNEL SELECTION screen.

3. Select the AXV11-C channels to which you want IDAT to output the data. Then, complete step a or step b below, and continue at step 4.

a. If you select to output data to only one of the AXV11-C channels, IDAT displays the SINGLE CHANNEL INPUT SELECTION screen. Enter the number of the channel on the input device that you want to output to the AXV11-C channel after the "Enter input device channel number:" prompt. If you accept the default value, IDAT outputs the data collected from channel 0 on the input device to the channel you selected for output on the AXV11-C.

    Keep in mind that you can output to the AXV11-C the data collected from only one of the channels on your input device. For example, if you input data from all 16 channels on the ADV11-D device, you can output only one of them to the AXV11-C. You must select a channel that was used for input.

b. If you select to output data to both of the AXV11-C channels, IDAT displays the MULTIPLE CHANNEL INPUT SELECTION screen. Enter the number of the first channel on the input device you want to output to the AXV11-C after the "Enter first input device channel number:" prompt. Enter the number of the second channel on the input device you want to output to the AXV11-C after the "Enter second input device channel number:" prompt.

    Keep in mind that you can output to the AXV11-C the data collected from only two of the channels on your input device. For example, if you input data from all 16 channels on the ADV11-D device, you can output only two of them to the AXV11-C. You must select channels that were used for input.

4. Press RETURN after the "Press return to start output." instruction. IDAT writes the data to the device and returns you to the Main Menu.

3.3.3 Using a Disk File for Data Output

This section describes how to establish output parameters and how to output data to a disk file using IDAT. Figure 3-14 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3-14: Disk File Output Screen Flow Diagram


```
          ┌──────────────┐
          │  Main Menu   │◄──────┐
          └──────┬───────┘       │
                 │               │
                 ▼               │
          ┌──────────────┐       │
          │  Output      │       │
          │  Destination │       │
          └──────┬───────┘       │
                 │               │
                 ▼               │
          ┌──────────────┐       │
          │  File Name   │       │
          │  Specification│      │
          └──────┬───────┘       │
                 │               │
                 ▼               │
          ┌──────────────┐       │
          │  Start Data  │       │
          │  Output      │       │
          └──────┬───────┘       │
                 │               │
                 └───────────────┘
                    MR-1423-GE
```
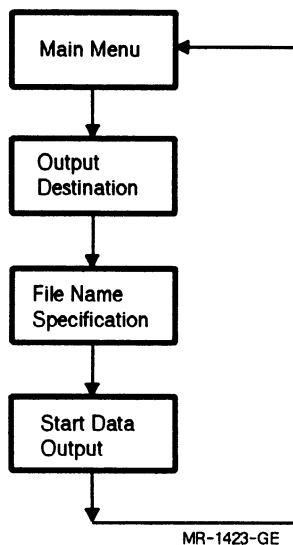
Take the following steps to output data to a disk file:

1. Select the OUTPUT option from the IDAT Main Menu. IDAT displays the Output Destination menu.
2. Select the FILE option from the IDAT Output Destination menu. IDAT displays the FILE NAME SPECIFICATION screen.

3. Enter the name of the file after the "Enter file name:" prompt. If you accept the default value, IDAT creates a file called OUTPUT.DAT into which it writes the data. If you enter a new file name, the name can be any valid VMS file specification.
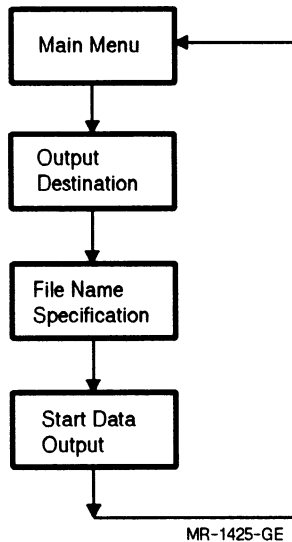
   When you complete this screen, IDAT displays the START DATA OUTPUT screen.

4. Press RETURN after the "Press return to start output." instruction. IDAT writes the data to the file and returns you to the Main Menu.

3.3.4 Using the DRB32 for Data Output

This section describes how to establish output parameters and how to output data to the DRB32 using IDAT. Figure 3–15 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3–15: DRB32 Output Screen Flow Diagram

MR-1420-GE
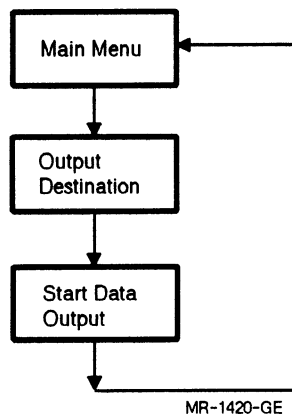
Take the following steps to output data to the DRB32:

1. Select the OUTPUT option from the IDAT Main Menu. IDAT displays the Output Destination menu.

2. Select the DRB32 option from the IDAT Output Destination menu. IDAT displays the START DATA OUTPUT screen.

3. Press RETURN after the "Press return to start output." instruction. IDAT writes the data to the device and returns you to the Main Menu.

3.3.5 Using the DRQ3B for Data Output

This section describes how to establish output parameters and how to output data to the DRQ3B using IDAT. Figure 3–16 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3–16:   DRQ3B Output Screen Flow Diagram

MR-1420-GE
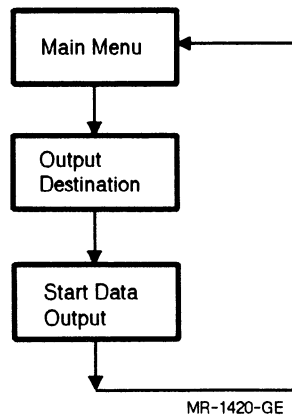
Take the following steps to output data to the DRQ3B:

1. Select the OUTPUT option from the IDAT Main Menu. IDAT displays the Output Destination menu.

2. Select the DRQ3B option from the IDAT Output Destination menu. IDAT displays the START DATA OUTPUT screen.

3. Press RETURN after the "Press return to start output." instruction. IDAT writes the data to the device and returns you to the Main Menu.

3.3.6 Using the DRV11-J for Data Output

This section describes how to establish output parameters and how to output data to the DRV11-J using IDAT. Figure 3–17 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3-17: DRV11-J Output Screen Flow Diagram

MR-1421-GE
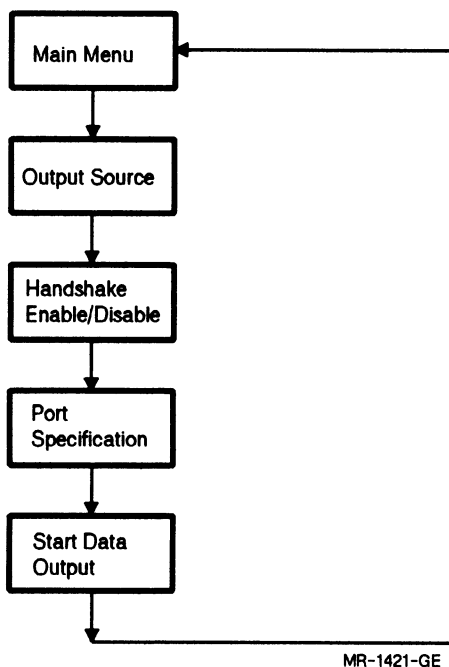
Take the following steps to output data to the DRV11-J:

1. Select the OUTPUT option from the IDAT Main Menu. IDAT displays the Output Destination menu.

2. Select the DRV11-J option from the IDAT Output Destination menu. IDAT displays the HANDSHAKE ENABLE/DISABLE screen.

3. Enable or disable the DRV11-J's handshaking feature. Then, IDAT displays the PORT SPECIFICATION screen.

4. Enter the DRV11-J port to which you want IDAT to write the data. If you accept the default value, 0, IDAT writes data to Port A. If you enter 1, IDAT writes data to Port B. If you enter 2, IDAT writes data to Port C. If you enter 3, IDAT writes data to Port D.

   When you complete this screen, IDAT displays the START DATA OUTPUT screen.

5. Press RETURN after the "Press return to start output." instruction. IDAT writes the data to the device and returns you to the Main Menu.

3.3.7   Using the DRV11-WA for Data Output

This section describes how to establish output parameters and how to output data to the DRV11-WA using IDAT. Figure 3–18 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3–18:   DRV11-WA Output Screen Flow Diagram

MR-1422-GE
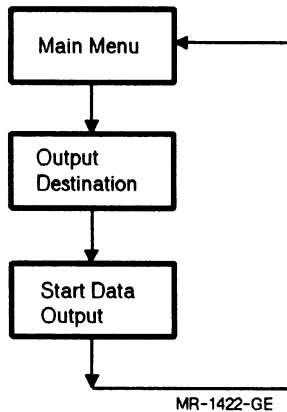
Take the following steps to output data to the DRV11-WA:

1. Select the OUTPUT option from the IDAT Main Menu. IDAT displays the Output Destination menu.

2. Select the DRV11-WA option from the IDAT Output Destination menu. IDAT displays the START DATA OUTPUT screen.

3. Press ⌷RETURN⌷ after the "Press return to start output." instruction. IDAT writes the data to the device and returns you to the Main Menu.

3.3.8 Producing a Multiple Channel Plot

This section describes how to establish plotting parameters and how to produce a multiple channel plot using IDAT. Figure 3-19 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3-19: Multiple Channel Plot Screen Flow Diagram

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Take the following steps to produce a multiple channel plot:

1. Select the OUTPUT option from the IDAT Main Menu. IDAT displays the Output Destination menu.
2. Select the MULTIPLE CHANNEL PLOT option from the IDAT Output Destination menu. IDAT displays the AXIS LABELS screen.

3. To complete the AXIS LABELS screen, you enter:

   a. The graph, or plot, title after the "Main Title:" prompt. If you accept the default value, IDAT titles the graph "Voltage vs Time". If you enter a new title, it can be a combination of letters and spaces, a maximum of 72 characters in length. If the title you enter exceeds 72 characters, IDAT uses only the first 72 characters.

   b. The x-axis label after the "X-axis label:" prompt. If you accept the default value, IDAT labels the x axis "Time". If you enter a new label, it can be a combination of letters and spaces, a maximum of 72 characters in length. If the label you enter exceeds 72 characters, IDAT uses only the first 72 characters.

   c. The y-axis label after the "Y-axis label:" prompt. If you accept the default value, IDAT labels the y axis "Voltage". If you enter a new label, it can be a combination of letters and spaces, a maximum of 72 characters in length. If the label you enter exceeds 72 characters, IDAT uses only the first 72 characters.

   When you complete this screen, IDAT displays the AUTOSCALING OPTION screen.

4. If you select the "Autoscale" option, this signals IDAT to use its internal autoscaling algorithm to determine how to annotate the x and y axes. Then, IDAT moves you immediately to the START DATA OUTPUT screen. Continue at step 7.

   If you select the "No Autoscale" option, IDAT displays the X-AXIS COORDINATES screen.

5. To complete the X-AXIS COORDINATES screen, you enter:

   a. The minimum value you want annotated on the x axis after the "Enter minimum x-axis value:" prompt. If you accept the default value, IDAT begins x-axis annotation at 0.0. If you enter a new value, the value must be a single-precision, floating-point real number between 0.0 and 32000.0, inclusive. **This value must be less than the maximum x-axis value.**

   b. The maximum value you want annotated on the x axis after the "Enter maximum x-axis value:" prompt. If you accept the default value, IDAT ends x-axis annotation at 100.0. If you enter a new value, the value must be a single-precision, floating-point real number between 0.0 and 32000.0, inclusive. **This value must be greater than the minimum x-axis value.**

c. The increment at which you want an annotated tick mark made on the x axis after the "Enter delta x value:" prompt. If you accept the default value, IDAT places annotated tick marks on the x axis in increments of 10.0. If you enter a new value, the value must be a single-precision, floating-point real number between 0.0 and 32000.0, inclusive. **This value must be less than the maximum x-axis annotated value minus the minimum x-axis annotated value.**

When you complete this screen, IDAT displays the Y-AXIS COORDINATES screen.

6. To complete the Y-AXIS COORDINATES screen, you enter:

   a. The minimum value you want annotated on the y axis after the "Enter minimum y-axis value:" prompt. If you accept the default value, IDAT begins y-axis annotation at -10.0. If you enter a new value, the value must be a single-precision, floating-point real number between -10.0 and 32000.0, inclusive. **This value must be less than the maximum y-axis value.**

   b. The maximum value you want annotated on the y axis after the "Enter maximum y-axis value:" prompt. If you accept the default value, IDAT ends y-axis annotation at 10.0. If you enter a new value, the value must be a single-precision, floating-point real number between 0.0 and 32000.0, inclusive. **This value must be greater than the minimum y-axis value.**

   c. Enter the increment at which you want an annotated tick mark made on the y axis after the "Enter delta y value:" prompt. If you accept the default value, IDAT places annotated tick marks on the y axis in increments of 5.0. If you enter a new value, the value must be a single-precision, floating-point real number between 0.0 and 32000.0, inclusive. **This value must be less than the maximum y-axis annotated value minus the minimum y-axis annotated value.**

When you complete this screen, IDAT displays the START DATA OUTPUT screen.

7. Press [RETURN] after the "Press return to start output." instruction. IDAT directs the output to the device defined as GKS$CONID. First, IDAT draws the axis system, titles the graph, labels the axes, and plots the data collected from the first channel. Then, IDAT displays the "Press carriage return for next plot." instruction.

8. Press [RETURN] after the "Press carriage return for next plot." instruction to plot the second channel, and so on, until all the channels are plotted.

9. Press [RETURN] after the "Press carriage return to continue." instruction. IDAT returns you to the Main Menu.

3.3.9 Using an RS/1 File for Data Output

This section describes how to establish output parameters and how to output data to an RS/1 file using IDAT. Figure 3–20 is a flow diagram of the IDAT menus and data entry screens you use to perform this operation. Step-by-step instructions for completing the menus and screens are presented after the figure.

Figure 3-20: RS/1 File Output Screen Flow Diagram


```
Main Menu

Output
Destination

File Name
Specification

Start Data
Output
```

MR-1425-GE

Take the following steps to output data to an RS/1 file:

1. Select the OUTPUT option from the IDAT Main Menu. IDAT displays the Output Destination menu.

2. Select the RS/1 FILE option from the IDAT Output Destination menu. IDAT displays the FILE NAME SPECIFICATION screen.

3. Enter the name of the file after the "Enter file name:" prompt. If you accept the default value, IDAT creates a file called ASCII.DAT into which it writes the data. If you enter a new file name, the name can be any valid VMS file specification.

   When you complete this screen, IDAT displays the START DATA OUTPUT screen.

4. Press RETURN after the "Press return to start output." instruction. IDAT writes the data to the file and returns you to the Main Menu.

Appendix A in this document describes the steps you take to convert the IDAT-created ASCII file to an RS/1 table.

3.3.10 Producing a Single Channel Plot

This section describes how to establish plotting parameters and how
to produce a single channel plot using IDAT. Figure 3–21 is a flow
diagram of the IDAT menus and data entry screens you use to perform
this operation. Step-by-step instructions for completing the menus and
screens are presented after the figure.

Figure 3–21:   Single Channel Plot Screen Flow Diagram

MR-1426-GE
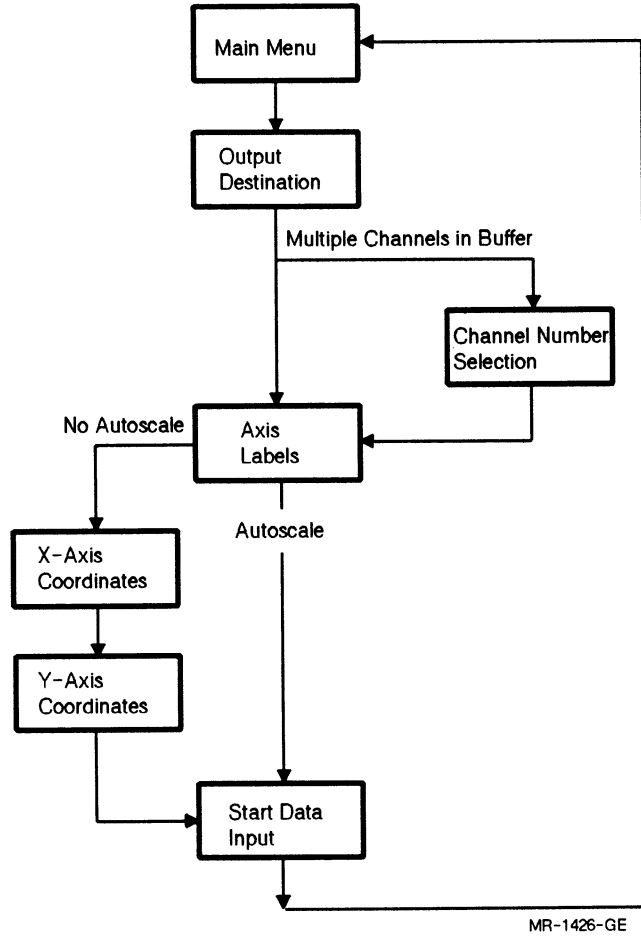
Take the following steps to produce a single channel plot:

1. Select the OUTPUT option from the IDAT Main Menu. IDAT displays the Output Destination menu.

2. Select the SINGLE CHANNEL PLOT option from the IDAT Output Destination menu. Then, complete step a or step b below, and continue at step 3.

   a. If the internal buffer contains data from more than one input channel, IDAT displays the CHANNEL NUMBER SELECTION screen. To complete the CHANNEL NUMBER SELECTION screen, enter the number of the channel on the input device that you want IDAT to plot after the "Enter channel number:" prompt. You must select a channel that was used for input. When you complete this screen, IDAT displays the AXIS LABELS screen.

   b. If the internal buffer contains data from one input channel, then IDAT bypasses the SINGLE CHANNEL INPUT SELECTION screen and displays the AXIS LABELS screen.

3. To complete the AXIS LABELS screen, you enter:

   a. The graph, or plot, title after the "Main Title:" prompt. If you accept the default value, IDAT titles the graph "Voltage vs Time". If you enter a new title, it can be a combination of letters and spaces, a maximum of 72 characters in length. If the title you enter exceeds 72 characters, IDAT uses only the first 72 characters.

   b. The x-axis label after the "X-axis label:" prompt. If you accept the default value, IDAT labels the x axis "Time". If you enter a new label, it can be a combination of letters and spaces, a maximum of 72 characters in length. If the label you enter exceeds 72 characters, IDAT uses only the first 72 characters.

   c. The y-axis label after the "Y-axis label:" prompt. If you accept the default value, IDAT labels the y axis "Voltage". If you enter a new label, it can be a combination of letters and spaces, a maximum of 72 characters in length. If the label you enter exceeds 72 characters, IDAT uses only the first 72 characters.

   When you complete this screen, IDAT displays the AUTOSCALING OPTION screen.

4. If you select the "Autoscale" option, this signals IDAT to use its internal autoscaling algorithm to determine how to annotate the x and y axes. Then, IDAT moves you immediately to the START DATA OUTPUT screen. Continue at step 7.

If you select the "No Autoscale" option, IDAT displays the X-AXIS COORDINATES screen.

5. To complete the X-AXIS COORDINATES screen, you enter:

   a. The minimum value you want annotated on the x axis after the "Enter minimum x-axis value:" prompt. If you accept the default value, IDAT begins x-axis annotation at 0.0. If you enter a new value, the value must be a single-precision, floating-point real number between 0.0 and 32000.0, inclusive. **This value must be less than the maximum x-axis value.**

   b. The maximum value you want annotated on the x axis after the "Enter maximum x-axis value:" prompt. If you accept the default value, IDAT ends x-axis annotation at 100.0. If you enter a new value, the value must be a single-precision, floating-point real number between 0.0 and 32000.0, inclusive. **This value must be greater than the minimum x-axis value.**

   c. The increment at which you want an annotated tick mark made on the x axis after the "Enter delta x value:" prompt. If you accept the default value, IDAT places annotated tick marks on the x axis in increments of 10.0. If you enter a new value, the value must be a single-precision, floating-point real number between 0.0 and 32000.0, inclusive. **This value must be less than the maximum x-axis annotated value minus the minimum x-axis annotated value.**

   When you complete this screen, IDAT displays the Y-AXIS COORDINATES screen.

6. To complete the Y-AXIS COORDINATES screen, you enter:

   a. The minimum value you want annotated on the y axis after the "Enter minimum y-axis value:" prompt. If you accept the default value, IDAT begins y-axis annotation at -10.0. If you enter a new value, the value must be a single-precision, floating-point real number between -10.0 and 32000.0, inclusive. **This value must be less than the maximum y-axis value.**

b. The maximum value you want annotated on the y axis after the "Enter maximum y-axis value:" prompt. If you accept the default value, IDAT ends y-axis annotation at 10.0. If you enter a new value, the value must be a single-precision, floating-point real number between 0.0 and 32000.0, inclusive. **This value must be greater than the minimum y-axis value.**

c. The increment at which you want an annotated tick mark made on the y axis after the "Enter delta y value:" prompt. If you accept the default value, IDAT places annotated tick marks on the y axis in increments of 5.0. If you enter a new value, the value must be a single-precision, floating-point real number between 0.0 and 32000.0, inclusive. **This value must be less than the maximum y-axis annotated value minus the minimum y-axis annotated value.**

When you complete this screen, IDAT displays the START DATA OUTPUT screen.

7. Press RETURN after the "Press return to start output." instruction. IDAT directs the output to the device defined as GKS$CONID. First, IDAT draws the axis system, titles the graph, and labels the axes. Then, IDAT plots the data.

8. Press RETURN after the "Press carriage return to continue." instruction. IDAT returns you to the Main Menu.

Chapter 4

Sample IDAT Session

This chapter presents a sample IDAT session. Follow the step-by-step procedures presented in this chapter to learn how to use IDAT and to verify that your IDAT software is installed and working properly.

4.1 Sample Session Overview

The sample session presented below shows you how to perform the following operations using IDAT:

1. Input data to IDAT from an existing IDAT-created disk file

2. Produce a multiple channel plot of the two channels of data contained in the file

3. Perform a power spectrum on one channel of data

4. Produce a single channel plot of the power spectrum

This sample session comprises four passes through IDAT. Each pass through IDAT corresponds to one of the numbered items in the list above. When you complete this sample session, you will have successfully reproduced, on your terminal screen, the graphical output presented in Figure 4-1, Sample Multiple Channel Plot, and in Figure 4-2, Sample Single Channel Plot.

This sample session can be run on any VAXlab system, regardless of the optional I/O devices that may be configured in your system. Be sure to meet the prerequisites presented in Section 4.3, Sample Session Prestart Checklist, before you begin the session.

4.2 Sample Data File

The sample data file used as input to IDAT was created in a DIGITAL software laboratory during an IDAT session. The data file, called TESTDATA.DAT, is shipped with your VAXlab system and is put online during the installation procedure in a directory with the logical name VSL$EXAMPLES. The logical name VSL$EXAMPLES is also defined during the installation procedure by commands in the appropriate startup command file.

Before you run the sample IDAT session, copy the sample data file, TESTDATA.DAT, from VSL$EXAMPLES to your own directory by entering the following command line:

```
$ COPY VSL$EXAMPLES:TESTDATA.DAT *.*  RETURN
```

The data contained in TESTDATA.DAT was obtained by reading 1000 samples from each of two channels on the AXV11-C A/D device. A function generator provided the signal source for each channel. A 10-Hz sine wave was input through channel 0. A 20-Hz sine wave was input through channel 1. A gain of one was applied to each channel. IDAT performed one channel sweep per clock tick, with a clock rate of 1 kHz, or 1000.0 cycles per second.

4.3 Sample Session Prestart Checklist

Before you proceed with the sample IDAT session presented in this chapter, please make sure that the following prerequisites are met.

- **Read Chapter 1 in this document carefully.** This chapter contains information you need to know to complete the sample session successfully, including how to run IDAT, how to make selections from menus, how to complete data entry screens, how to recover from error conditions should any occur during the sample session, and how to exit IDAT.

- **Define the logical names GKS$WSTYPE and GKS$CONID.** The definition of the logical name GKS$WSTYPE depends on your terminal type. For the purpose of running this sample session, define the logical name GKS$CONID to be TT. Information about defining the logical names is presented in Section 1.5, Data Plotting.

- Copy the sample data file, TESTDATA.DAT, from the VSL$EXAMPLES directory to your own directory.

When you complete the prerequisites listed above, read the remainder of this chapter and begin the sample session.

4.4 Beginning the Sample Session

To begin the sample IDAT session, enter the following command after the DCL $ prompt:

$ IDAT [RETURN]

IDAT displays the Main Menu screen and is ready to begin accepting information.

4.5 Pass 1: Using TESTDATA.DAT as Input to IDAT

Take the following steps to use the sample data file, TESTDATA.DAT, as input to IDAT.

1. Select the INPUT option from the IDAT Main Menu. IDAT displays the Input Source Menu.
2. Select the FILE option from the Input Source Menu. IDAT displays the FILE NAME SPECIFICATION screen.
3. Enter the file name TESTDATA.DAT after the "Enter file name:" prompt and press [RETURN]. Then, IDAT displays the START DATA INPUT screen.
4. Press [RETURN] after the "Press return to start input." instruction. Then, IDAT:
   a. attaches and opens the file
   b. reads the data contained in the file into the IDAT internal buffer
   c. closes and detaches the file
   d. returns you to the Main Menu

4.6 Pass 2: Plotting the Input Data

Before you can use IDAT to plot data, you must define the logical
names GKS$WSTYPE and GKS$CONID appropriately for your terminal
type. See Section 1.5, Data Plotting, for information about how to
define these logical name.

Take the following steps to produce a multiple channel plot of the data.

1. Select the OUTPUT option from the IDAT Main Menu. IDAT
    displays the Output Destination Menu.

2. Select the MULTIPLE CHANNEL PLOT option from the Output
    Destination Menu. IDAT displays the AXIS LABELS screen.

3. To complete the AXIS LABELS screen, accept:

    a. The default graph title. IDAT titles the graph "Voltage vs
        Time".

    b. The default x-axis label. IDAT labels the x-axis "Time".

    c. The default y-axis label. IDAT labels the y-axis "Voltage".

    Press RETURN after the "Press carriage return to continue." in-
    struction to move to the next data entry screen in the series. IDAT
    displays the AUTOSCALING OPTION screen.

4. Select the "Autoscale" option. This signals IDAT to use its internal
    autoscaling algorithm to determine how to annotate the x and y
    axes. Then, IDAT displays the START DATA OUTPUT screen.

5. Press RETURN after the "Press return to start output." instruction.
    IDAT creates the axis system, annotates the axes, titles the graph,
    labels the axes, and plots the data from channel 0. Then, IDAT
    displays the "Press carriage return for next plot." instruction.

6. Press RETURN after the "Press carriage return for next plot." in-
    struction to plot the data from channel 1.

    When you complete this step, IDAT displays the plot shown in
    Figure 4-1 on your terminal screen.

7. Press RETURN after the "Press carriage return to continue." instruc-
    tion. IDAT erases the plot from the screen and returns you to the
    Main Menu.

Figure 4-1: Sample Multiple Channel Plot

Voltage vs Time
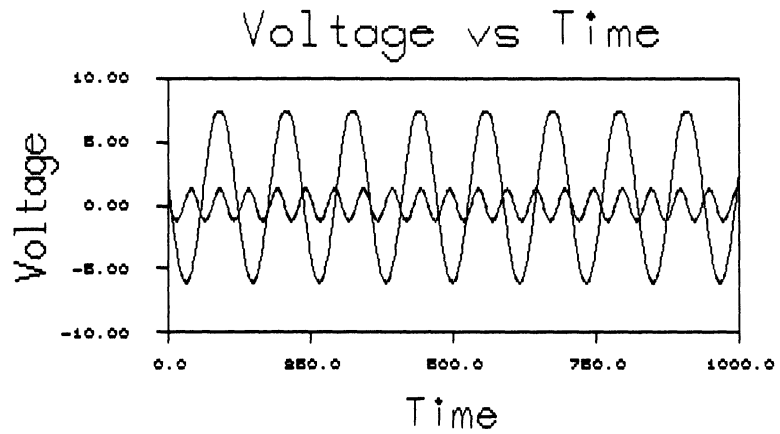
Press carriage return to continue

4.7 Pass 3: Performing a Power Spectrum on the Input Data

Take the following steps to calculate the power spectrum of the data collected from one input device channel.

1. Select the ANALYZE DATA option from the IDAT Main Menu. IDAT displays the Data Analysis Menu.

2. Select the POWER SPECTRUM option from the Data Analysis Menu. Because the internal buffer contains data from more than one input channel, IDAT displays the CHANNEL NUMBER SELECTION screen.

3. To complete the CHANNEL NUMBER SELECTION screen, accept the default value, 0, displayed after the "Enter channel number:" prompt. This tells IDAT to perform a power spectrum on the data collected from channel 0 on the input device.

   When you complete this screen, IDAT displays the POWER SPECTRUM screen.

4. Press ⟨RETURN⟩ after the "Press carriage return to perform a power spectrum on the data." instruction. IDAT calculates the power spectrum and returns you to the Main Menu.

4.8   Pass 4: Plotting the Results of the Power Spectrum

Take the following steps to produce a single channel plot of the results of the power spectrum.

1. Select the OUTPUT option from the IDAT Main Menu. IDAT displays the Output Destination Menu.

2. Select the SINGLE CHANNEL PLOT option from the Output Destination Menu. IDAT displays the AXIS LABELS screen.

3. To complete the AXIS LABELS screen enter:

    a. "Amplitude vs Frequency" beneath the "Main Title:" prompt. IDAT titles the graph "Amplitude vs Frequency".

    b. "Frequency" beneath the "X-axis label:" prompt. IDAT labels the x-axis "Frequency".

    c. "Amplitude" beneath the "Y-axis label:" prompt. IDAT labels the y-axis "Amplitude".

    Press ⌑RETURN⌑ after the "Press carriage return to continue." in-struction to move to the next data entry screen in the series. IDAT displays the AUTOSCALING OPTION screen.

4. Select the "No autoscale" option. Then, IDAT displays the X-AXIS COORDINATES screen.

5. To complete the X-AXIS COORDINATES screen:

    a. Accept the default value, 0.0, displayed after the "Enter mini-mum x-axis value:" prompt. IDAT begins x-axis annotation at 0.0.

    b. Enter 1000.0 after the "Enter the maximum x-axis value:" prompt. IDAT ends x-axis annotation at 1000.0.

    c. Enter 100.0 after the "Enter delta x value:" prompt. IDAT places an annotated tick mark along the x axis at increments of 100.0.

    Press ⌑RETURN⌑ after the "Press return to continue." instruction to move to the next data entry screen in the series. IDAT displays the Y-AXIS COORDINATES screen.

6. To complete the Y-AXIS COORDINATES screen:

   a. Enter 0.0 after the "Enter minimum y-axis value:" prompt. IDAT begins y-axis annotation at 0.0.

   b. Enter 10,000,000.0 after the "Enter the maximum x-axis value:" prompt. IDAT ends y-axis annotation at 10,000,000.00. The commas are included here for readability. When you enter this number in the data entry field, do not include the commas.

   c. Enter 1,000,000.0 after the "Enter delta x value:" prompt. IDAT places an annotated tick mark along the y axis at increments of 1,000,000.0. The commas are included here for readability. When you enter this number in the data entry field, do not include the commas.

   Press RETURN after the "Press return to continue." instruction to move to the next data entry screen in the series. IDAT displays the START DATA OUTPUT screen.

7. Press RETURN after the "Press return to start output." instruction. Then, IDAT:

   a. creates the axis system

   b. annotates the axes

   c. titles the graph

   d. labels the axes

   e. plots the results of the power spectrum

   When you complete this step, IDAT displays the plot shown in Figure 4–2 on your terminal screen.

8. Press RETURN after the "Press return to return to Main Menu." instruction. IDAT erases the plot from the screen and returns you to the Main Menu.

Figure 4-2: Sample Single Channel Plot

Amplitude vs Frequency

```
         1.00E+07
         9.00E+09
         8.00E+09
         7.00E+09
  A      6.00E+09
  m      5.00E+09
  p      4.00E+09
  l      3.00E+09
  i      2.00E+09
  t      1.00E+09
  u      0.00E+00
  d
  e
           0.0  100.0 200.0 300.0 400.0 500.0 600.0 700.0 800.0 900.01000.0

                              Frequency
```
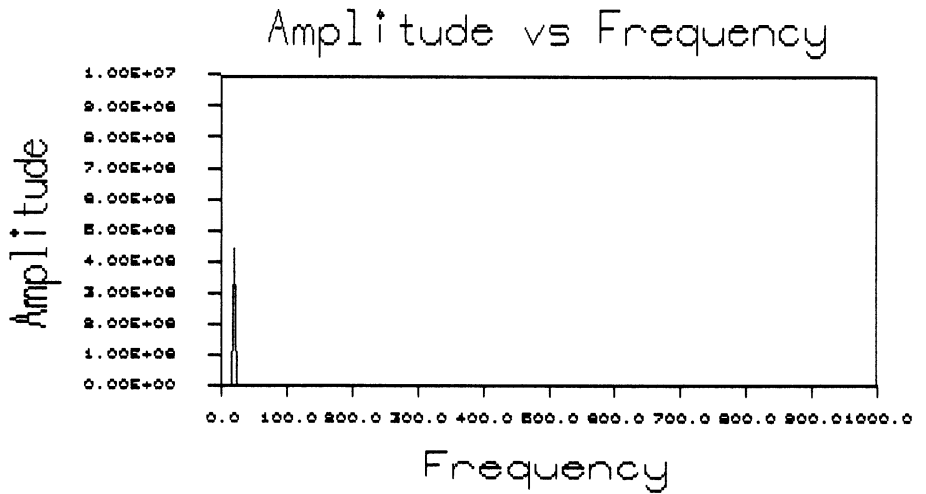
Press carriage return to continue_

Appendix A

Converting IDAT ASCII Files to RS/1 Tables

This appendix describes the steps you take to convert this ASCII file to an RS/1 table. Section 3.3.8, Using an RS/1 File for Data Output, describes the steps you take to output data to an ASCII file appropriate for input into RS/1.

The file RS1FILE.TXT is an RPL program you implement through RS/1 to convert IDAT-created ASCII files to RS/1 tables. The file RS1FILE.TXT is located in a directory with the logical name LIO$EXAMPLES.

Take the following steps to convert IDAT ASCII files to RS/1 tables:

1. Copy RS1FILE.TXT from LIO$EXAMPLES to your user directory by entering the following command line:

   ```
   $ COPY LIO$EXAMPLES:RS1FILE.TXT RS1FILE.TXT  [RETURN]
   ```

2. To run RS/1, enter the following command after the DCL $ prompt:

   ```
   $ RS1  [RETURN]
   ```

   RS/1 returns the # prompt.

3. Enter the following command lines after the RS/1 # prompt to access and compile RS1FILE.TXT:

   ```
   # SET DEF OF RS1FILE TO GETFILE ('RS1FILE.TXT')  [RETURN]
   # COMPILE RS1FILE  [RETURN]
   ```

4. To ensure that RS1FILE is now a user procedure in RS/1, enter the following command line after the # prompt:

 # DISPLAY PROCS [RETURN]

RS/1 displays a list of all user procedures followed by the # prompt.

5. To call the RS1FILE user procedure, enter the following command line after the # prompt:

 # CALL RS1FILE [RETURN]

6. Enter the name of the ASCII file to be converted and the name of the RS/1 table file to contain the converted ASCII file after the following prompts. This sample program run uses a file called ASCII.DAT and creates an RS/1 table called TABLE1.

PLEASE ENTER FILENAME: ASCII.DAT [RETURN]
PLEASE ENTER TABLENAME: TABLE1 [RETURN]

The RS1FILE routine converts the ASCII file called ASCII.DAT to an RS/1 table called TABLE1.

The ASCII file called ASCII.DAT is stored in the format shown in Figure A-1. This file was created using IDAT.

Figure A–1: ASCII File Format

```
40
2
 -3.09158
 -6.56410
 -3.77045
 -7.81929
 -4.24420
 -8.67399
 -4.52747
 -9.14774
 -4.63492
 -8.81563
     .
     .
     .
 -3.96093
 -7.68254
 -3.37973
 -6.43223
 -2.65201
 -4.89866
 -1.81197
 -3.17949
 -0.87912
 -1.29426
```

The RS/1 table called TABLE1 is stored in the format shown in Figure A–2,

where

Column 0 is supplied by RS/1
Column 1 represents the sample numbers
Column 2 is the data from the first channel sampled
Column 3 is the data from the second channel sampled

Figure A-2: RS/1 Table Format

```
TABLE1   40R x 3C

0    1    2         3          0    1    2         3

--------------------------------   --------------------------------
  1    1   -3.09158   -6.56410    15   15    2.34432    5.03541
  2    2   -3.77045   -7.81929    16   16    3.00855    6.30525
  3    3   -4.24420   -8.67399    17   17    3.50672    7.20879
  4    4   -4.52747   -9.14774    18   18    3.83883    7.77045
  5    5   -4.63492   -9.21612    19   19    3.99023    7.96581
  6    6   -4.47375   -8.81563    20   20    3.87790    7.64347
  7    7   -4.12698   -8.04396    21   21    3.58486    6.95971
  8    8   -3.62393   -6.93529    22   22    3.12576    5.93895
  9    9   -2.94994   -5.52381    23   23    2.48596    4.62027
 10   10   -2.13919   -3.85348    24   24    1.71429    3.00855
 11   11   -1.23565   -2.00733    25   25    0.85958    1.24542
 12   12   -0.29304   -0.11233    26   26   -0.07814   -0.62515
 13   13    0.65446    1.77289    27   27   -1.01587   -2.52015
 14   14    1.54335    3.49206    28   28   -1.93895   -4.40049

Continue? [Yes]

TABLE1   40R x 3C

0    1    2         3

--------------------------------
 29   29   -2.81319   -6.00244
 30   30   -3.49695   -7.31136
 31   31   -4.03907   -8.28816
 32   32   -4.41514   -8.96216
 33   33   -4.60562   -9.27472
 34   34   -4.58608   -9.09890
 35   35   -4.36630   -8.55678
 36   36   -3.96093   -7.68254
 37   37   -3.37973   -6.43223
 38   38   -2.65201   -4.89866
 39   39   -1.81197   -3.17949
 40   40   -0.87912   -1.29426
```

Figure A-3: RS1FILE.TXT Source Code

```
PROCEDURE;
    SFLAG = FALSE;
    DO WHILE NOT(SFLAG);
        FNAME = GETTEXT ('PLEASE ENTER FILENAME: ');
        CHAN = INFILE(FNAME,LEN,SFLAG);
        IF NOT(SFLAG) THEN
        TYPE 'UNABLE TO FIND FILE'.FNAME;
    END;
    TABLENAME = GETTEXT ('PLEASE ENTER TABLENAME: ');

    BEGIN;
        CALL GETLINE(T,CHAN);    /* # values */
        CALL GETLINE(N,CHAN);    /* # values */
        NCHAN = DECODE(N,'F(2)');
        TCHAN = DECODE(T,'F(5)');
        BEGIN;
            DO I = 1 TO TCHAN;
                IF (TESTEND(CHAN)) THEN
                    DOEXIT;
                ELSE
                    BEGIN;
                        A[I,1] = I;
                        DO J=2 TO NCHAN+1 ;
                        CALL GETLINE(AX,CHAN);
                        A[I,J] = DECODE(AX,'F(10');
                    END;
                END;
            END;
        END;
        CALL CLOSE(CHAN);
        RENAME TABLE(A) TO TABLENAME;
    END;
END;
```

Appendix B

Creating Binary Data Files

You can create your own binary data files that are acceptable for input to IDAT. However, you must set up a file with a header formatted as shown below.

For A/D or D/A devices (AAV11-D, ADQ32, ADV11-D AXV11-C, and Preston-series), format the file header in the following way:

    4-byte integer - buffer length (size of file in bytes)
    4-byte integer - data length (number of bytes filled with actual data)
    4-byte integer - unused
    4-byte integer - 0 (buffer_type defined by IDAT)
    4-byte integer - 1024 (number of bytes in header)
    4-byte integer - number of channels collecting data
    128 4-byte integers - 4 bytes per channel with a maximum of
        128 channels for Preston-series devices)
    488 bytes - unused

    Data starts at 3rd block (1025 byte)

For a power spectrum, format the file header in the following way:

    4-byte integer - buffer length (size of file in bytes)
    4-byte integer - data length (number of bytes filled with actual data)
    4-byte integer - unused
    4-byte integer - 3 (buffer_type defined by IDAT)
    4-byte integer - 1024 (number of bytes in header)
    1004 bytes - unused

    Data starts at 3rd block (1025 byte)

For all other devices currently supported (DRB32, DRQ3B, DRV11-J, and DRV11-WA), format the file header in the following way:

4-byte integer - buffer length (size of file in bytes)
4-byte integer - data length (number of bytes filled with actual data)
4-byte integer - unused
4-byte integer - 1 (buffer_type defined by IDAT)
4-byte integer - 1024 (number of bytes in header)
4-byte integer - point size (number of bytes per point)
1000 bytes - unused

Data starts at 3rd block (1025 byte)

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For which tasks did you use this manual? (Circle your responses.)

(a) Installation   (c) Maintenance   (e) Training
(b) Operation/use   (d) Programming   (f) Other (Please specify.) _____

Did the manual meet your needs? Yes ☐   No ☐   Why? _____

Please rate the manual in the following categories. (Circle your responses.)

	Excellent	Good	Fair	Poor	Unacceptable
Accuracy (product works as described)	5	4	3	2	1
Clarity (easy to understand)	5	4	3	2	1
Completeness (enough information)	5	4	3	2	1
Organization (structure of subject matter)	5	4	3	2	1
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Illustrations, examples (useful)	5	4	3	2	1
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Page Layout (easy to find information)	5	4	3	2	1
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What things did you like *most* about this manual? _____
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