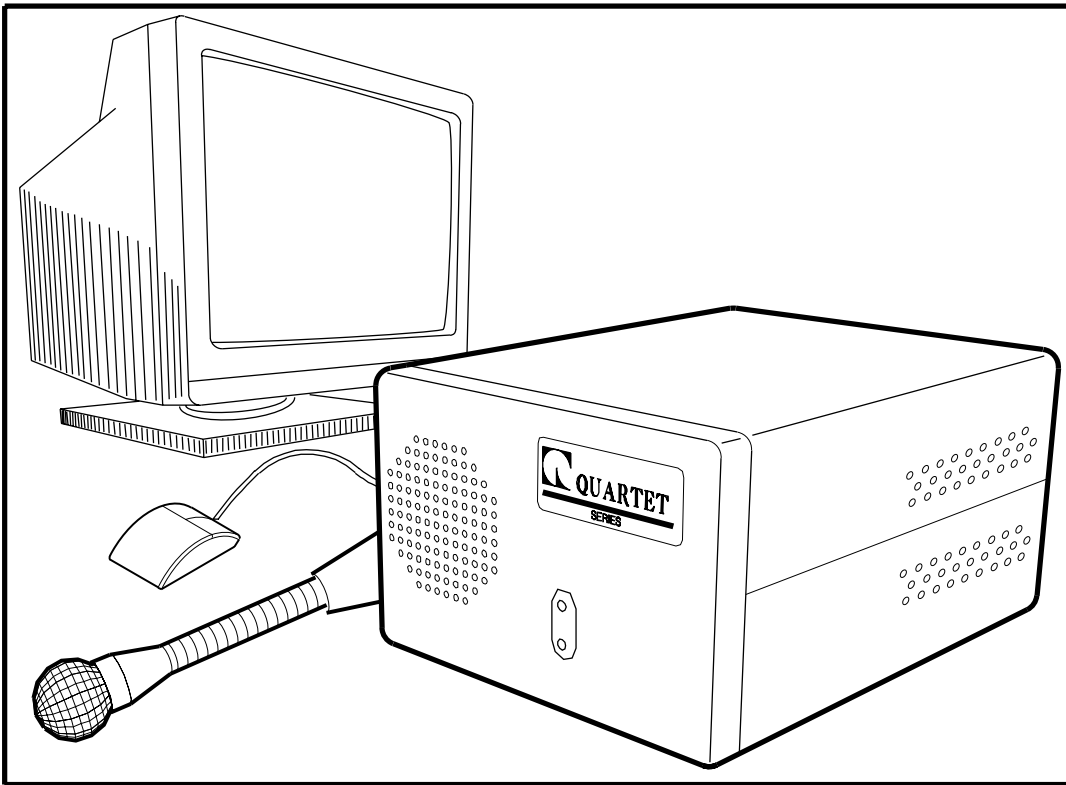




Read Manual Before Attempting To Install Or Operate System



VMK™ *Owners Manual*

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Chapter

1

Learning About Your VMK™

Introduction

Congratulations and thank you for your purchase of a Quartet Technology "Voice Mouse/Keyboard" (VMK™) controller. The VMK™ is a state-of-the-art system designed to provide a complete voice interface allowing full control of both keyboard and mouse functions for any IBM compatible personal computer.

In addition, the VMK™ is operating system independent. This means the VMK™ will work with Microsoft Windows, UNIX, OS/2, DOS, etc. The VMK™ *does not* require any special software to be installed on your computer. At your spoken command, the VMK™ can do a variety of functions, such as:

- ◆ Start and stop mouse movement
- ◆ Select any direction for the mouse
- ◆ Select various speeds for the mouse
- ◆ Click, double click, triple click mouse buttons
- ◆ Click and hold mouse buttons
- ◆ Select any key on the keyboard
- ◆ Select special keys (SHIFT, ALT, CTRL)
- ◆ Perform a "CTRL/ALT/DEL" if needed
- ◆ Record both mouse and/or keyboard commands for future playback

Despite its sophistication, your new VMK™ is very simple to operate because you control it with your voice. To simplify operation even more, this manual provides step-by-step instructions on installing your VMK™.

The **VMK™** has been designed for years of trouble free use. And like all the **Simplicity™** line of products, installation is simple and operation is natural.

For setup, no technical training is required. The only tools you will need are a small phillips and flathead screwdriver. Please take a moment to read through this guide to familiarize yourself with its operation.

Thank you for purchasing a product from Quartet Technology, Inc.

Identifying System Components

The **VMK™** is designed to be "plug-n-play" compatible with either the **Simplicity™** Series 6 or the **Simplicity™** Four-in-One environmental control units (ECU's).

Before you begin, take the time now to identify the following components included in your **VMK™** kit. **Figure 1-1** identifies your system components:

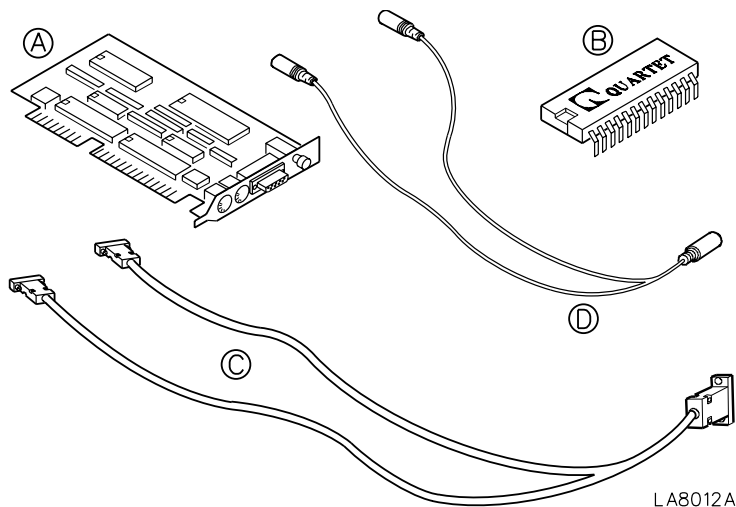


Figure 1-1. System Component

- (A) **VMK™ Board** This is the board that contains the necessary electronics for control of the mouse and keyboard.
- (B) **Program PROM** This integrated circuit (IC) contains the new ECU system software that will allow access to the **VMK™**.
- (C) **Mouse Cable** This "Y" cable consists of a 9-pin DB-9 connector at one end and two 9-pin DB-9 connectors at the other end.
- (D) **Keyboard Cable** This "Y" cable consists of a 8-pin circular mini DIN connector at one end and two 8-pin circular DIN connectors at the other end.

Identifying VMK Board Connectors

Figure 1-2 below identifies the connectors found on the VMK™ board.

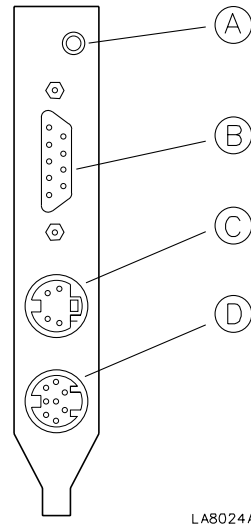


Figure 1-2

- (A) **VMK™ Reset Switch** When pushed, causes the VMK™ to initialize. It *will not* reset the ECU.
- (B) **Mouse Connector** Mouse cable connector.
- (C) **Feature Connector** Future expansion connector.
- (D) **Keyboard Connector** Keyboard cable connector.

Compatibility

The VMK can be installed on any IBM or compatible personal computer that meets the following requirements:

- ◆ The keyboard is a 101 Enhanced AT compatible type.
- ◆ The system uses a Microsoft® or compatible serial mouse.
- ◆ The system has Microsoft® or compatible mouse drivers installed.

Chapter

2

Installing Your VMK™

Overview

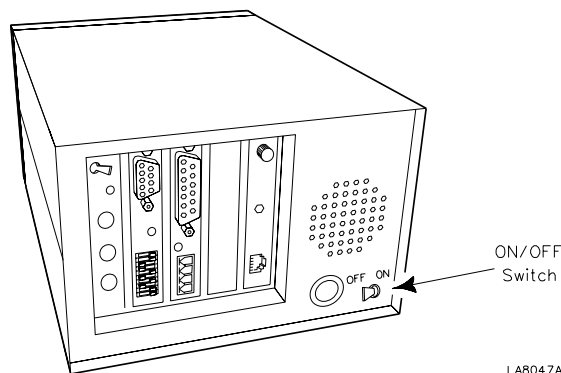
Your Quartet VMK™ is easy to install. To start using your VMK™ in minutes, follow these simple instructions:

CAUTION!!

Since the VMK™ board contains electrical components that can be easily damaged by small amounts of static electricity, precautions such as using grounding devices and maintaining contact with any bare sheet metal surfaces while handling the board should be taken to eliminate static discharge. To help prevent static electricity buildup, avoid activities such as moving about the work area, especially if it is carpeted. Handle the board carefully at all times. Avoid touching board components or critical circuit paths. Never flex or put excessive pressure on it.

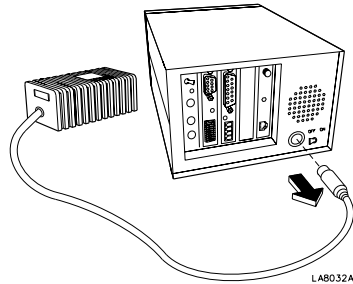
Step 1

Turn the battery switch on the back of the ECU to **OFF**.



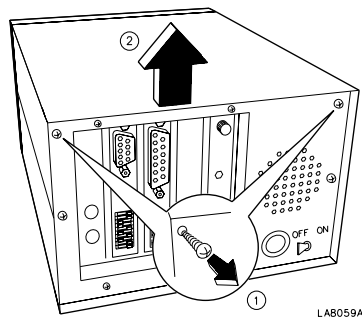
Step 2

Unplug the power connector from the back of the ECU.



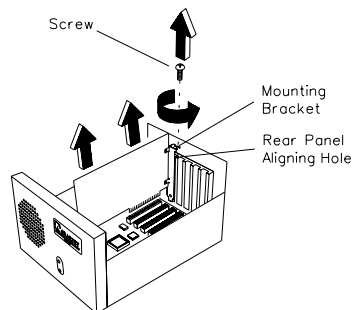
Step 3

Remove the two screws as shown in the figure below. Lift up gently on the back edge of the cover and slide it towards the back.



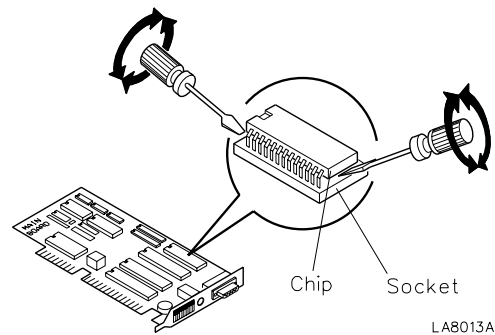
Step 4

Remove the screw holding the Main Processor board in. (This is the board that has the red dipswitches on it.) Carefully lift it straight out.



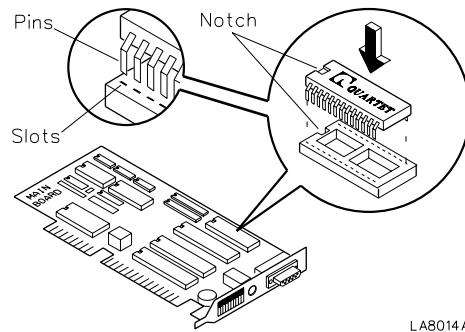
Step 5

Identify the PROM chip on the Main Processor board as shown in the figure below. Using a small flathead screwdriver, *carefully* and *gently* pry each end of the chip a little at a time until it "pops" out of the socket. Do not "hinge" the chip or else the pins will become bent.



Step 6

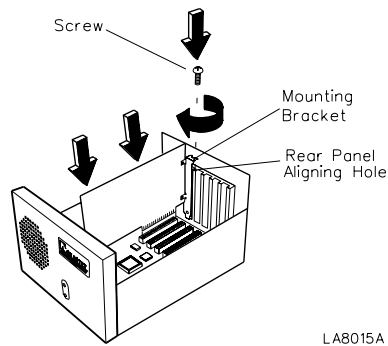
Identify the notch on the PROM chip. Align the notch on the PROM chip with the notch on the socket. Make sure the chip is inserted correctly. Press *firmly* and *evenly* down on the chip to ensure that every pin on the chip is properly inserted into the socket.



Seat the chip firmly to ensure good contact. Note that the notch on the chip faces the same way as *all* the others on the board.

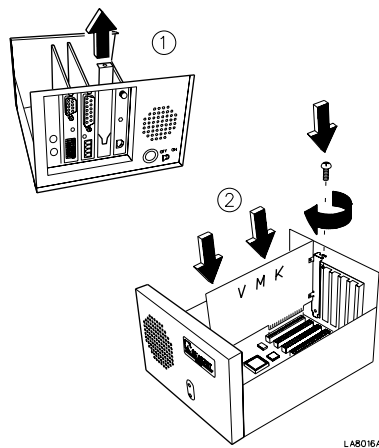
Step 7

Replace the Main Processor board back into the ECU. Push down evenly on the board and make sure it is *firmly* seated. Replace the screw that holds the board down.



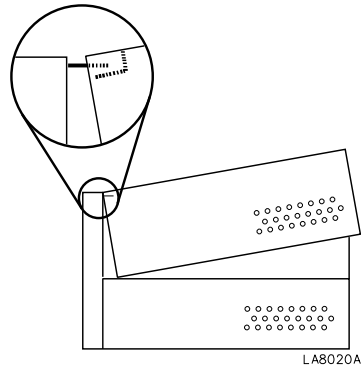
Step 8

Identify the spare slot on the back of the ECU. (It is the second from the right, looking from the back). Remove the screw holding the blank "shoehorn" in place. Install the **VMK™** board into the spare slot of the ECU. Push down evenly on the board and make sure it is firmly seated. Use the screw you removed from the blank shoehorn to hold the **VMK™** board in place.



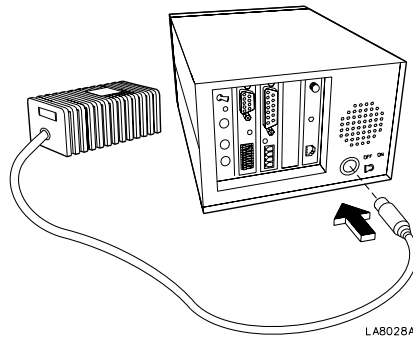
Step 9

Replace the cover on the ECU by gently putting the front lip of the cover on first, then lowering the back end. Install the two panel screws and fasten securely.



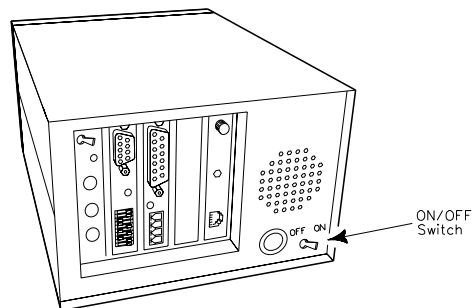
Step 10

Plug the power supply back into the ECU.



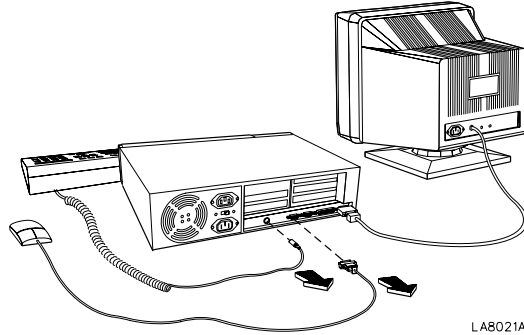
Step 11

Turn the battery On/Off switch to **ON**.



Step 12

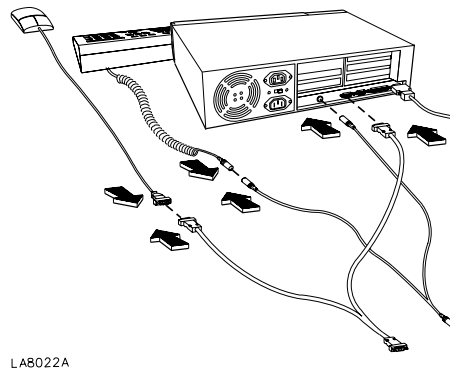
Unplug the keyboard and mouse from the computer.



Note: Computer back panels vary with model and manufacturer and do not necessarily conform to this drawing.

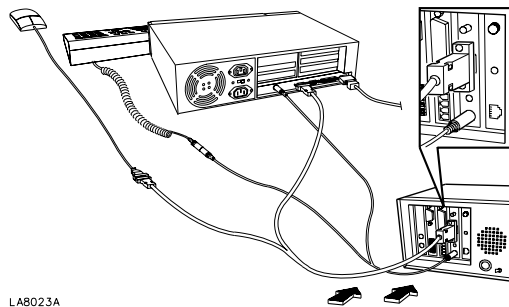
Step 13

Plug the mouse and keyboard into the "Y" cables as shown. Plug the other half of the "Y" cables back into the computer.



Step 14

Plug the other end of the "Y" cables into the **VMK™** board as shown.

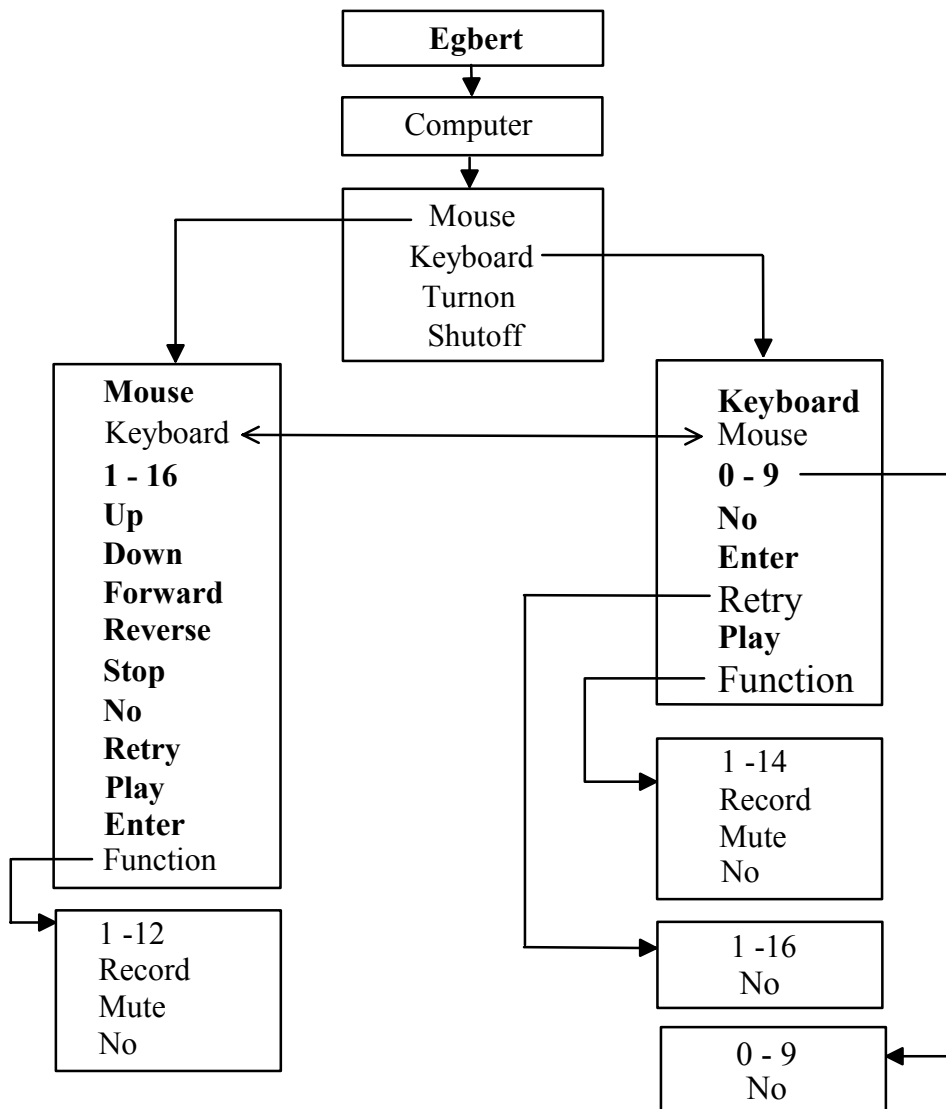


Chapter 3

Operating the Mouse

Overview

The mouse (and keyboard) control can be accessed under the *Computer* menu. The following flowchart shows how the commands are organized.



Navigation Aids

The VMK™ provides three modes to help assist you while navigating through the mouse and/or keyboard menus. They are:

Echo Mode

When enabled, echo mode will cause the ECU to repeat all recognized words. This feature is accessed by saying:

[Egbert], Utility, Function, One

Echo mode is a toggle command. Repeating the command again will turn it off.

Tone Mode

Two types of tones are generated within the ECU, "*hard*" and "*soft*". A "*hard*" tone indicates that a command was recognized and executed. A "*soft*" tone indicates that a command was recognized and the system is waiting for additional input.

When enabled, tone mode will cause the ECU to generate a "soft" tone after every recognized word in the *computer menu only*. This feature is accessed by saying:

[Egbert], Utility, Function, Two

Tone mode is a toggle command. Repeating the command again will turn it off.

Note: Echo mode, when enabled, will suppress tone mode.

Silent Mode

When both the echo mode and the tone mode are deleted, the ECU will not generate any verbal feedback, except for the following three words:

- ◆ Mouse
- ◆ Keyboard
- ◆ No

These words will always generate a single "click" to indicate confirmation of a menu change.

Controlling the Mouse

To use the mouse, choose "**Mouse**" after saying ["Egbert"], "**Computer**". Then choose one of the following commands:

Command	Result
Keyboard	Go to the keyboard menu.
Mouse	Go to the mouse menu. (This menu.)
1 - 16	Selects mouse direction. (Starts or continues movement.)
Up	Increases mouse speed.
Down	Decreases mouse speed.
Forward	If the mouse is <i>moving</i> , this command will cause it to go in the opposite direction if a "Reverse" command was previously issued. If the mouse is <i>stopped</i> , this command will increment the mouse one movement in the last numerical direction entered.
Reverse	If the mouse is <i>moving</i> , this command will cause it to go in the opposite direction if a "Forward" command was previously issued. If the mouse is <i>stopped</i> , this command will increment the mouse one movement in the last numerical direction entered.
Stop	Stops mouse movement.
No	Cancels an incomplete command.
Retry	Re-issues the last mouse button command.
Play	Plays back recorded command sequences from the VMK™ command buffer. (See text for full description.)
Enter	Resumes mouse movement.
Function	Allows access to mouse button controls.

Note: The commands in boldface are repeatable. These commands can be issued over and over again to accomplish the required function. If you wish to exit from the computer mode altogether, you must say "**Cancel**".

Mouse Command Descriptions

Keyboard

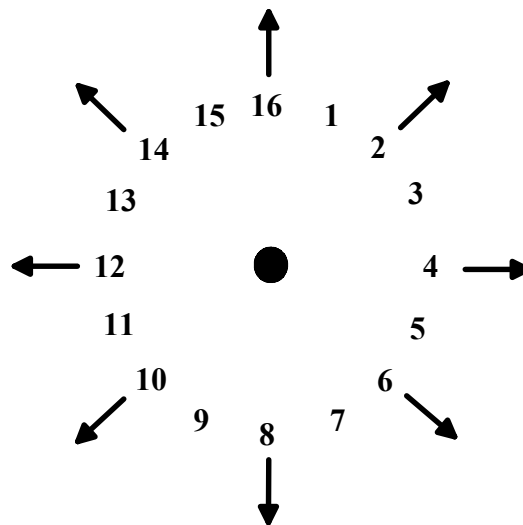
This command allows you to switch to the **Keyboard** menu. Mouse movement will be stopped. Even if you are already in the keyboard menu, you can say "keyboard" again just to be sure.

Mouse

This command allows you to switch to the **Mouse** menu. Even if you are already in the mouse menu, you can say "mouse" again just to be sure.

1 - 16

Selecting a number from one to sixteen will set the mouse direction. If the mouse is **stopped**, then selecting a number will start the mouse in the direction chosen. If the mouse is **moving**, then selecting a number will cause the mouse to change direction.



Mouse Direction Settings

Up

Saying the word "**up**", increases the speed of the mouse. Every time you say "up", (for a total of four times), the mouse speed will be increased.

Down

Saying the word "**down**", decreases the speed of the mouse. Every time you say "down", (for a total of four times), the mouse speed will be decreased.

Mouse Command Descriptions (cont.)

Forward

If the mouse is *stopped*, then saying the word "*forward*" will increment the mouse one movement with reference to the *last* numerical direction entered. This is very useful when doing fine graphics work or targeting a small area.

If the mouse is *moving*, this command will cause the mouse to go in the opposite direction if a "*reverse*" command was previously issued.

Reverse

If the mouse is *stopped*, then saying the word "*reverse*" will decrement the mouse one movement with reference to the *last* numerical direction entered. Again, this is very useful when doing fine graphics work or targeting a small area.

If the mouse is *moving*, this command will cause the mouse to go in the opposite direction if a "*forward*" command was previously issued.

Stop

When issued, this command halts mouse movement.

No

If you start a multi-word command and you change your mind, you can say "No" to cancel the command.

Retry

Saying the word "*retry*" will repeat the last mouse *button* command.

Play

Saying the word "*play*" will automatically playback mouse *and* keyboard command sequences that were recorded into the **VMK™** command buffer.

Enter

This command causes a mouse that is stopped to resume movement in the direction of the last entered command.

Mouse Command Descriptions (cont.)

Record

Saying "**Function**", "**Record**" will cause the ECU to respond with "Record Enabled". The ECU will then *start* recording commands into the **VMK™** command buffer. Commands can consist of either mouse or keyboard actions. Saying the word "**Function**", "**Record**" again, will cause the ECU to respond with "Record Training Complete". The ECU will *stop* the record process.

Mute

Saying the word "**Function**", "**Mute**" results in the following action:

- ◆ The ECU will respond with "Mute Enabled"
- ◆ The ECU will "go-to-sleep"
- ◆ The contents of the command buffer will be played
- ◆ The audio output jack will be enabled.

This feature is often used where an external voice recognition program (Dragon, Kurzweil, IBM VoiceType, etc.) requires you to activate a key or mouse button and then say something, such as when setting microphone gain. The "mute" feature allows this to happen and not have the ECU respond.

Remember, you must call the units "Name" to wake the ECU up!!

The unit will then respond with "Mute Deleted" to inform you that you have exited from the mute feature.

VMK "Command Buffer"

The **VMK™** contains a "storage" area where keystrokes and mouse commands are stored. This is called the "**VMK™** command buffer". When you say "**Function**", "**Record**", every mouse and/or keyboard command you request will be stored in this buffer, until you say "**Function**", "**Record**" again.

Saying the word "**Play**" will automatically output commands that were stored in the command buffer. Recording new commands will overwrite any previous commands stored in the command buffer.

Saying "**Function**" "**Record**", "**Function**", "**Record**" will empty the buffer.

Mouse Command Descriptions (cont.)

Function

Saying "*Function X*", (where "x" is a number from one to twelve), allows access to the following mouse button controls:

◆ Left Mouse Button

- ◆ Function 1 - Single clicks the left mouse button
- ◆ Function 2 - Double clicks the left mouse button
- ◆ Function 3 - Holds the left mouse button
- ◆ Function 4 - Releases the left mouse button
- ◆ Function 5 - Clicks left mouse button "n" times
- ◆ Function 6 - Hold left mouse button for "t" delay

Notes:



Function 5 allows you to rapidly *click* the mouse button "n" times. "N" is defined as a number from 1 to 16.



Function 6 allows you to *hold* the mouse button "t" delay. "T" is defined as a number from 1 to 16. (See **Table 3-1** for times.)

◆ Right Mouse Button

- ◆ Function 7 - Single clicks the right mouse button
- ◆ Function 8 - Double clicks the right mouse button
- ◆ Function 9 - Holds the right mouse button
- ◆ Function 10 - Releases the right mouse button
- ◆ Function 11 - Clicks right mouse button "n" times
- ◆ Function 12 - Hold right mouse button for "t" delay

Notes:



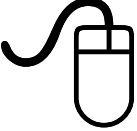
Function 11 allows you to rapidly *click* the mouse button "n" times. "N" is defined as a number from 1 to 16.



Function 12 allows you to *hold* the mouse button "t" delay. "T" is defined as a number from 1 to 16. (See **Table 3-1** for times.)

Function Command Summary

The following table summarizes the mouse function commands:

Left Button	Mouse Function	Right Button
Function		Function
1	Single Click	7
2	Double Click	8
3	Hold Button	9
4	Release Button	10
5	Click "N" Times	11
6	Hold "T" Delay	12

Special Notes:

If the mouse is moving, any word that is miss recognized will cause the ECU to say "Excuse me?" and stop the mouse. Saying "Enter", will cause the mouse to resume movement.

Mouse Hold Times

Functions 6 and 12 allow you to *hold* the mouse button "t" delay. "T" is defined as a number from 1 to 16. **Table 3-1** below shows the times associated with each number.

Number	Time (Seconds)
1	.08
2	0.25
3	.5
4	.75
5	1
6	1.5
7	2
8	2.5
9	3
10	3.5
11	4
12	4.5
13	5
14	6
15	7
16	8.5

Table 3-1

Notice that times 1 thru 4 are typically used for scrolling a screen, while times 5 thru 16 are typically used when drawing.

Mouse Command Examples

Use the following examples to learn how to *move*, *change direction*, *slow down* or *speed up* the mouse and/or *click* the mouse buttons.

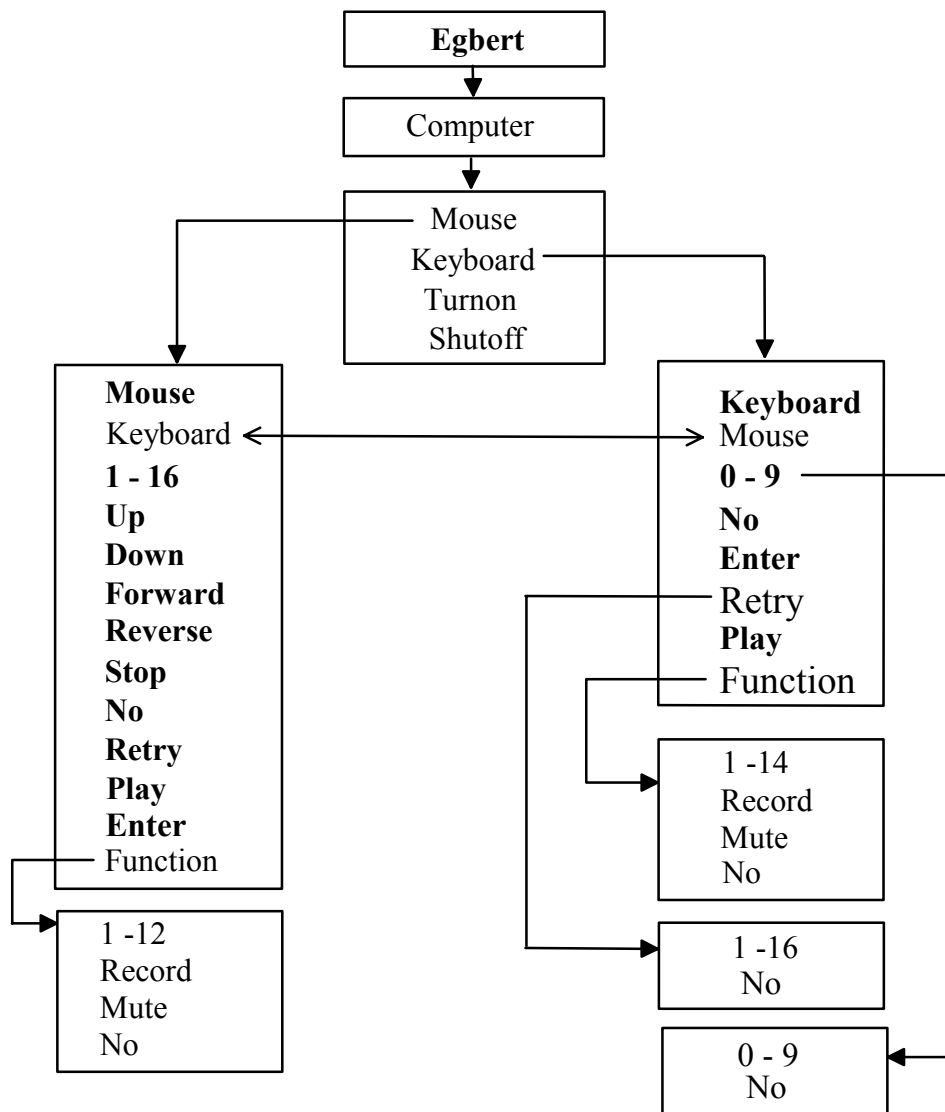
The following examples assume you have already said ["Egbert"], "Computer", "Mouse".

Command	Result
Four-Up-Up	Starts the mouse moving in the numerical four direction and then increases the mouse speed twice.
Seven	Changes the mouse in the numerical seven direction.
Reverse	Causes the mouse to go in the opposite direction. In this example, the mouse will move in the numerical fifteen direction.
Stop	Stops the mouse movement.
Down-Down	Sets the mouse speed slower but <i>does not</i> start the mouse moving.
Enter	Resumes the mouse in the numerical fifteen direction. Note that the mouse is now moving slower due to the two previous down commands.
Stop-Forward-Forward	Stops the mouse and moves it two increments forward.
Function-One	Single clicks the left mouse button.
Function-Five-Three	Clicks the left mouse button three times.
Retry	Clicks the left mouse button six times. (This command repeats the last mouse button command. Since the last command was to click the left mouse button three times, "Retry" will repeat this command twice, resulting in a total of six button clicks.)
Keyboard	Brings you instantly to the keyboard menu.

Operating the Keyboard

Overview

The keyboard (and mouse) control can be accessed under the *Computer* menu. The following flowchart shows how the commands are organized.



Controlling the Keyboard

To control the keyboard, choose "**Keyboard**" after saying ["Egbert"], "**Computer**". Then choose one of the following commands:

Command	Result
Keyboard	Go to the keyboard menu. (This menu.)
Mouse	Go to the mouse menu.
0 - 9	Entering a two digit number selects a key on the keyboard. (see Figure 4-1)
No	Cancels current operation. (See text.)
Enter	Presses the "Enter" key on the keyboard.
Retry	Repeats the last key pushed "x" times. "X" can be a number from 1 to 16.
Play	Plays back recorded command sequences from the VMK™ command buffer. This includes both keyboard and mouse commands.
Function	Allows access to additional keyboard functions.

Note:

The commands in boldface are repeatable. These commands can be issued over and over again to accomplish the required function. If you wish to exit from the computer mode altogether, you must say "**Cancel**".

Keyboard Command Descriptions

Keyboard

This command allows a fast way to get to the *Keyboard* menu. Even if you are already in the keyboard menu, you can say "keyboard" again just to be sure.

Mouse

This command allows a fast way to get to the *Mouse* menu.

Keyboard Command Descriptions (cont.)

0 - 9

When accessing a particular key on the keyboard, you must enter a two digit number (pausing between digits). **Figure 4-1** shows an outline for an AT Enhanced keyboard and the associated two digit number for each key.

No

If you start to enter a two digit number for a key or function, and change your mind, you can say "**No**" to cancel the number.

Enter

This is a shortcut command to press the "Enter" key on the keyboard. The "Enter" key can also be pressed by entering its associated two digit number. (See **Figure 4-1**).

Retry

Saying the word "**Retry x**" will repeat the last key pushed "x" times. "X" is a number from 1 to 16.

Play

Saying the word "**Play**" will automatically playback pre-recorded mouse *and* keyboard command sequences. See the following section on how to record commands.

Function

The "**Function**" command allows access to additional keyboard commands such as recording commands, pressing Functions keys, and muting the audio output jack. Function keys are defined as follows:

- ◆ Function 1 thru 12 - These function keys correspond to the twelve function keys on the AT keyboard.
- ◆ Function 13 - Holds all "sticky" keys entered (Ctrl, Alt, or Shift), until told to release (Function 14 or keystroke 9,0). Refer to **Appendix B** for additional information concerning "sticky" keys.
- ◆ Function 14 - Unconditionally releases all keys. (Same as keystroke 9,0).

Keyboard Command Descriptions (cont.)

Record

Saying "**Function**", "**Record**" will cause the ECU to respond with "Record Enabled". The ECU will then *start* recording commands into the **VMK™** command buffer. Commands can consist of either mouse or keyboard actions. Saying the word "**Function**", "**Record**" again, will cause the ECU to respond with "Record Training Complete". The ECU will *stop* the record process.

Mute

Saying the word "**Function**", "**Mute**" results in the following action:

- ◆ The ECU will respond with "Mute Enabled".
- ◆ The ECU will "go-to-sleep" and the contents of the command buffer will be played.
- ◆ The audio output jack will be enabled.

This feature is often used where an external voice recognition program (Dragon, Kurzweil, IBM VoiceType, etc.) requires you to activate a key or mouse button and then say something, such as when setting microphone gain. The "mute" feature allows this to happen and not have the ECU respond.

Remember, you must call the units "Name" to wake the ECU up!!

The unit will then respond with "Mute Deleted" to inform you that you have exited from the mute feature.

"Special" Keys

In addition to the regular keys that are offered under the keyboard menu, Quartet has reserved two additional keyboard keys. They are:

Release All Keys

This command can be accessed using the two digit code 9, 0 or saying "Function 14".

Insert Pause Key

This command can be accessed using the two digit code 9, 1. This command inserts a short pause (approximately .3 seconds long) that can be used when "playing back" commands from the **VMK™** command buffer. This command is useful when a software program might need time to load before accepting additional keystrokes.

Keyboard Command Examples

Use the following examples to learn how to *enter keystrokes*, *record commands*, and *repeat a key*.

The following examples assume you have already said ["Egbert"], "Computer", "Keyboard".

Command	Result
Four-Six Three-Zero Two-Six Enter	Types out the letters "D I R" and presses the "Enter" key. (This causes the computer to display the current directory.)
Six - No	Cancels the number six. No keys are transmitted.
Retry-Three	Presses the "Enter" key three times. (Since the last key entered was the "enter" key above, it will be repeated three times.)
Function-One	Presses the Function 1 key on the keyboard.
Function-Record-Four-Six Three-Zero Two-Six Enter Mouse Six Up Function Record	Records into the command buffer the following sequence: "D", "I", "R", "Enter", move mouse in numerical direction 6, increase mouse speed. (Notice that we started "Function-Record" in the keyboard menu and ended it with "Function-Record" in the mouse menu.)
Play	Plays the sequence stored in the command buffer. (See above example.)
Function-Mute	Forces the ECU to "go-to-sleep", play the command buffer, and enables (turns on) the audio out jack.
[The Name]	"Wakes" the ECU up.
Mouse	Goes to the mouse menu.

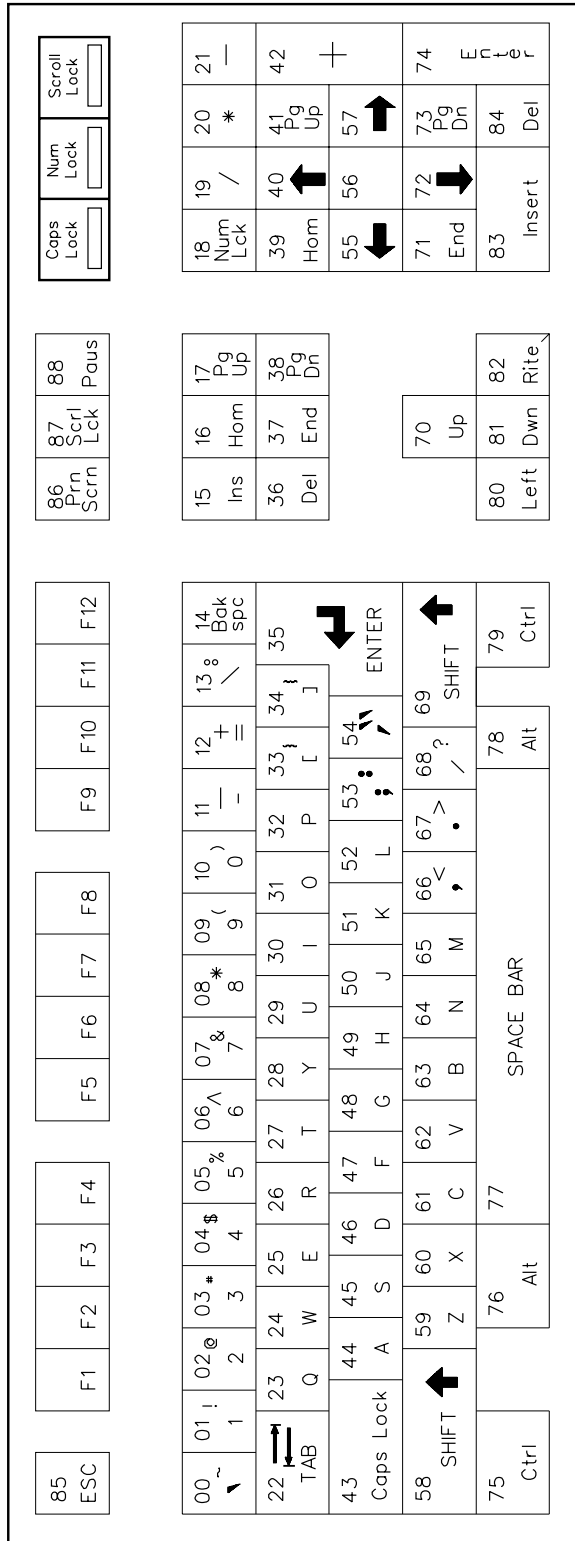
Note:



The "Function - Mute" command allows you to be connected (via the audio output jack) to external voice recognition software such as Dragon Dictate, Kurzweil, or IBM Voice Type. This allows you to use your dictation software and stay in the keyboard mode. ***You must say "[The Name]" to "wake up" the ECU!!***

Keyboard Layout

Figure 4-1 below shows how the keys on the keyboard are assigned.



LA8010B

90 - Release
91 - Pause

Figure 4-1

Chapter

5

Special Functions

Utility Functions

There are several functions included to enhance the use of the VMK™ board. These functions can be accessed by saying ["Egbert"], "Utility", "Function", "X"

"X" is one of the following numbers:

Command	Result
1	<i>Toggles</i> verbal feedback. All recognized words will be repeated. Selecting this command the first time will cause the ECU to respond with "Function Enabled". Selecting this command again will cause the ECU to respond with "Function Deleted".
2	<i>Toggles</i> "tone" in computer mode only. All recognized words in the computer menu will generate a soft "tone" to verify a word was recognized. Selecting this command the first time will cause the ECU to respond with "Function Enabled". Selecting this command again will cause the ECU to respond with "Function Deleted". Note: If verbal feedback is active (Function 1), the tone mode will be suppressed.
3	Resets the VMK™. If the reset was successful, the ECU will respond with "Mouse Keyboard Up". If the reset attempt fails, an error message will be output. This will not reset the ECU!!
4	Report system status. The ECU will output a list of status codes. (Quartet internal use only.)
5	<i>Toggles</i> "breakout" mode. If the ECU cannot recognize the user input, it will automatically exit from the current menu after five consecutive "excuse me's", and wait to hear its "Name" again. Factory default is <i>on</i> . Selecting this command the first time will cause the ECU to respond with "Function Enabled". Selecting this command again will cause the ECU to respond with "Function Deleted".

Utility Function Examples

Use the following examples to learn how to access special functions. The following examples assume you have already said ["Egbert"], "Utility".

Command	Result
Function - One	Causes the ECU to repeat all recognized words.
Function - Two	Causes a soft "tone" to be generated after every recognized word in the <i>"computer" mode only</i> . Note: If verbal feedback is active (Function 1), the tone mode will be suppressed.
Function - Three	Resets the VMK™ only. This <i>does not</i> reset the ECU!
Function - Five	Causes the ECU to "breakout" from the current menu after five consecutive "excuse me's".

Self-Diagnostics

The VMK™ contains extensive built-in self diagnostics. Should an error occur during use, the VMK™ will attempt to correct the problem and re-initialize itself independent of user input.

At no time will the ECU have to be reset!!

It is recommended that the ECU is powered on before connecting it to the computer. If the keyboard or mouse cables are disconnected during use, the VMK™ should be reset by pushing the VMK™ reset switch (see **Figure 1-2**), or reset using the "Utility", "Function", "Three" command.

Status Messages

The following is a list of status codes that are reported by the VMK™ when the "Computer" menu is accessed or commands are issued within the menu.

For completeness, this list is included for informational purposes only. Should you experience a problem with your VMK™, these codes will help Quartet in diagnosing the problem.

Self-Diagnostics (cont.)

Testing Function	Meaning
81	VMK™ synchronization time-out.
82	VMK™ busy. ECU trying to output sync acknowledge.
85	Synchronization request from VMK™ occurred.
86	Unexpected response from VMK™ due to ECU requesting synchronization.
87	Time out waiting for VMK™ to take data.
90	VMK™ O.K.
91	VMK™ not present.
93	ECU timed-out waiting for acknowledge from VMK™ .
96	VMK™ was expecting an acknowledge and received something different.

Notes:

Appendix A

Practicing with your VMK™

Like any fine tool, the VMK™ requires practice to master. Listed below are suggestions to help you become a master craftsman!

Beginner:

Playing the Microsoft Windows game "Solitaire" is an excellent way to familiarize yourself with mouse navigation. In addition, mouse commands are used to pickup or drop playing cards.

In no time, you'll advance so that you can play Solitaire without ever stopping the mouse!

Intermediate:

Using the Microsoft Windows "Paint" program provides a means to practice selecting different objects as well as mouse navigation. Drawing lines provides visual feedback of mouse navigation commands. Keyboard entry can also be practiced here.

Advanced:

Once you have successfully mastered both mouse and keyboard navigation, using the Microsoft Windows "Paint" program provides a means to practice more advanced techniques such as:

- ◆ Drawing circles
- ◆ Drawing spirals
- ◆ Drawing nested circles and spirals

Appendix B

Sticky Keys

Three keys on the keyboard are defined as "sticky" keys. They are:

- ◆ CTRL (Keystroke 75 or 79)
- ◆ ALT (Keystroke 76 or 78)
- ◆ SHIFT (Keystroke 58 or 69)

In the VMK™, sticky keys can be used in one of two ways:

Normal Mode

In the *normal mode*, when a "sticky" is selected, it will remain selected until the next *non-sticky* key is pressed.

For example, if an application calls for a "ALT-F" keystroke, then saying "7", "6", "4", "7" will accomplish this. ("7", "6" for the ALT key, and "4", "7" for the "F" key.)

Extended Mode

In the *extended mode*, saying "Function 13" first and *then* selecting a "sticky" key, will cause that key to remain selected until the "Function 14" (or keystroke 9, 0) is given.

For example, if an application calls for a "ALT-2-5-4" keystroke, then saying "Function", "13", "7", "6", "0", "2", "0", "5", "0", "4", "Function", "14" will accomplish this.