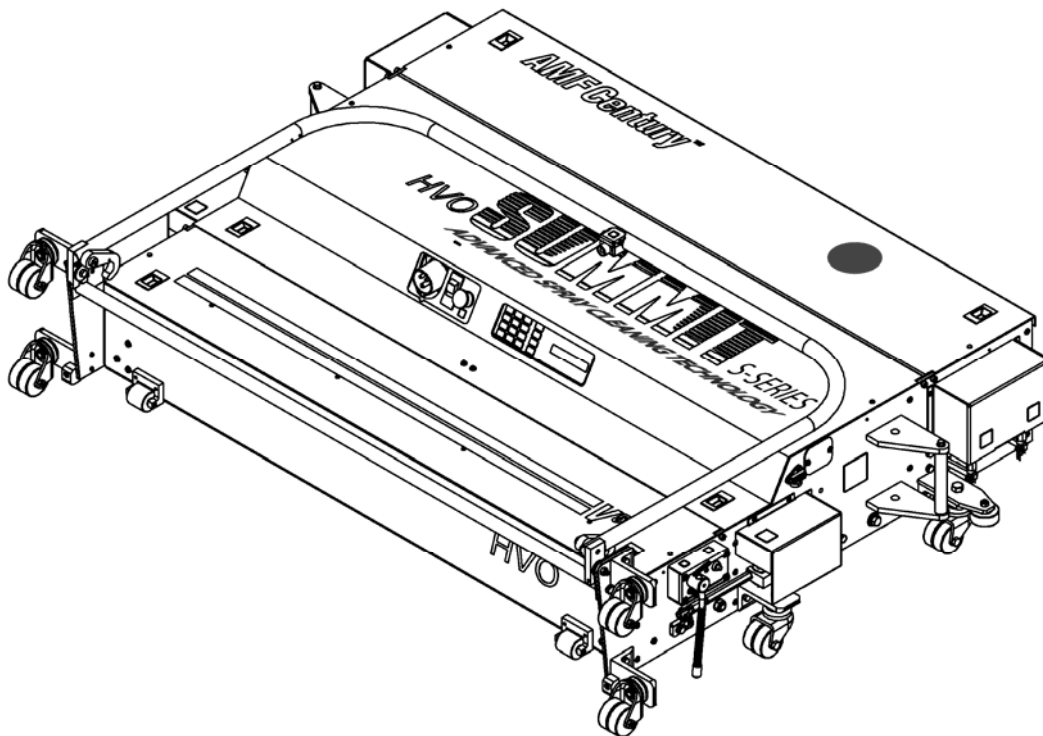


QUBICA  **AMF**



HVO **SUMMIT** S-Series



Programming Guide

For Software Versions 9.0 and higher.
This manual also covers the HVO SUMMIT with the older Drip System.

HVO SUMMIT S-SERIES

Programming Guide

For software versions 9.0 and higher

Copyright © 2007, QubicaAMF Bowling Products, Inc.
All Rights Reserved

QubicaAMF BOWLING PRODUCTS, INC.
8100 AMF Drive
Mechanicsville, Virginia 23111

HVO Summit S-Series

Programming Guide - P/N 294-005-022

Rev. B

Summary of Changes

Change No.	ECR No.

List of Effective Pages

Page	Change No.	Effective Date
All	Original	01/23/2007

Table of Contents

<u>INTRODUCTION</u>	1	<u>SECTION 7</u>	
<u>SECTION 1</u>		Security Functions	7-1
Start-up	1-1	Set Security - Menu Function 30	7-3
		Set Passwords - Menu Function 31	7-4
		Enter/Exit Security Mode - Menu Function 32	7-5
<u>SECTION 2</u>		<u>SECTION 8</u>	
The Display, Keypad, & User Interface Guidelines	2-1	Lane Functions	8-1
The Display	2-1	Lane Tracker - Menu Function 40	8-2
The Keypad	2-2	Lane Odometer & Tripmeter - Menu Function 41	8-3
General User Interface Guidelines	2-4		
<u>SECTION 3</u>		<u>SECTION 9</u>	
Menu Functions	3-1	Adjustment Functions	9-1
		Pass 2 Start Distance- Menu Function 80	9-3
		Adjust Foul Line Stop - Menu Function 81	9-4
		Reversing Switch Brake Delay - Menu Function 82	9-4
		Calculate Speed Factor - Menu Function 83	9-5
		Edit Speed Factor - Menu Function 84	9-6
		HVO Summit or HVO Magnum Select - Menu Function 85	9-7
		Vacuum Head Shakes (1, 2, or 3) – Menu Function 86	9-8
		Cleaner PRE-STOP Distance – Menu Function 87**	9-8
		Cleaner PRE-START Distance – Menu Function 88**	9-9
		Cleaner PRE-LOAD – Menu Function 89***	9-9
		Set Switch Type - Menu Function 90	9-10
		Test Function - Menu Function 91	9-10
		Saturate - Menu Function 92	9-12
		Adjust Oil - Menu Function 93	9-13
		Adjust Buffer - Menu Function 94	9-13
		Adjust Cleaner Pad & Vacuum Head - Menu Function 95	9-14
		Cleaner Presoak - Menu Function 96	9-15
		DRIP or SPRAY – Menu Function 97	9-16
<u>SECTION 4</u>		<u>SECTION 10</u>	
Program Functions	4-1	Lane Recovery	10-1
Retrieve Program - Menu Function 01	4-2	Power Failure	10-1
View Program - Menu Function 02	4-3	Drive Timeout	10-1
Edit Program - Menu Function 03	4-9		
<u>SECTION 5</u>		<u>INDEX</u>	I-1
Clock Functions	5-1		
Display Clock - Menu Function 10	5-1		
Set Clock - Menu Function 11	5-2		
<u>SECTION 6</u>			
Scheduler Functions	6-1		
Set Timezones - Menu Function 21	6-2		
Set Maximum Number of Lanes - Menu Function 22	6-3		
Schedule Program Range - Menu Function 23	6-3		
View Schedule - Menu Function 24	6-5		
Clear Program Range - Menu Function 25	6-5		
Scheduler Override - Menu Function 26	6-6		
Scheduler Security - Menu Function 27	6-6		
Set Scheduler ON/OFF - Menu Function 28*	6-7		
Scheduler Operation	6-7		

* Was Function 20 in Version 8.1a.

** Used with Spray Mode Only.

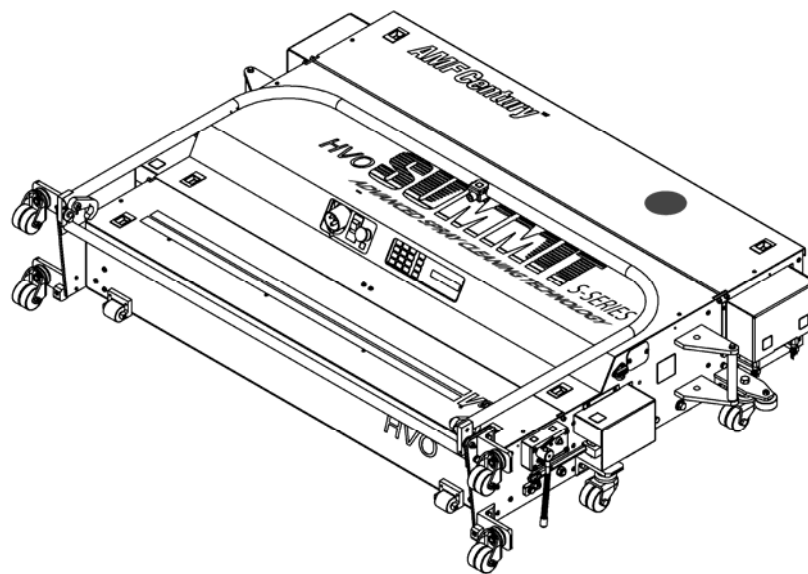
*** Used with Drip Mode Only.



HVO SUMMIT S-SERIES

ADVANCED SPRAY CLEANING TECHNOLOGY

PROGRAMMING GUIDE



The *HVO Summit S-Series* from *AMFCentury*[™] offers the latest in state-of-the-art operating features for wick type lane maintenance machines including our new Spray and Pad System for Advanced Cleaning.

Mechanical Features

AMFCentury's patented V^5 HVO Conditioning System Consisting of:

- V^1 ariable Flow Tanks and Foam Wicks
- V^2 ariable Speed Oil Transfer Roller
- V^3 ariable Machine Speed
- V^4 ariable Distance and Position Tank Sections
- V^5 ariable Distance Dressing Buffer

Electronic Features

- Microprocessor Control of All Electronics
- Hewlett Packard® Optical Sensor for Accurate Distance Tracking
- Pulse Width Modulation Cleaner System Flow Control
- 5-Volt Logic for All Micro-Control Switches
- Real Time Clock

Software Features

- 20 Fully Programmable Operational Programs for: Conditioning Only, Stripping Only, or Conditioning and Stripping
- Independent Left and Right Oil Tank Operation
- Independently Programmable Buffer and Oil Distances in Two Bi-directional Passes
- Multilevel Password Security Control for Individual Menu Functions
- Full Feature Scheduler for Automatic Daily & Weekly Scheduling of Programs
- Automated Adjustment Sequences
- Power Failure Lane Recovery
- Lane Odometer and Lane Tripmeter
- Configurable Lane Number Tracker
- Two-Way Communication with PC-Based Host Software (Century Programmer™ for Windows®)
- Custom Marquee Display (with Century Programmer™ For Windows®)
- Drive Failure Timeout with Full Lane Recovery

Section
1

Start-up

When the *HVO Summit S-Series* is powered up, the unit name and software revision level are displayed on the control panel as shown below.

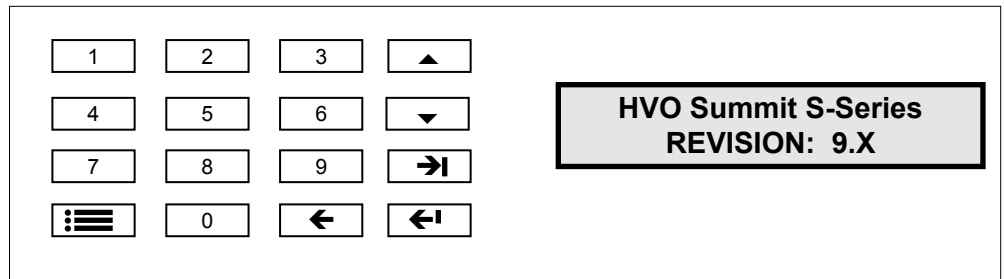


Figure 1-1, HVO Summit & HVO Summit S-Series Control Panel

MULTIPLE WICK
APPLICATION SOFTWARE

(c) 1999 CENTURY

The initial screen is followed by two additional startup screens as shown at the left. The first screen indicates that the software has been written with the *HVO Summit S-Series*'s multiwick design in mind, while the second screen is a copyright statement. Each of the three startup screens is displayed for approximately two seconds.

HVO Summit S-Series
PGM:XX READY

At the completion of the unit's startup, the screen displays this message:
Where **XX** is a lane conditioning program number between 01 and 20.

The unit name, *HVO Summit S-Series*, scrolls across the screen from right to left. This is the **Custom Marquee Display** that can be changed to your center's name, or otherwise customized by using the **CENTURY Programmer for Windows (CPWIN)** software package from *AMFCentury™*.

This screen is called the **READY DISPLAY**, and indicates that the machine is ready to accept a command from the user through the **Start Switch** or through the **Keypad** located by the digital display. If the start switch is pressed at this time, the program that will be executed is the program shown on the display.

This page intentionally left blank

The Display, Keypad, & User Interface Guidelines

The *HVO Summit S-Series* is simple to program and operate. Understanding the interface that the machine uses is all that is needed to navigate through the numerous programs and menu functions. This section provides the user with the tools needed to get started.

THE DISPLAY

The **Display** on the *HVO Summit S-Series* consists of two lines of alphanumeric characters that provide information on the status of the machine, and allows the user to customize lane conditioning programs, security levels, and scheduling options. The *HVO Summit S-Series* can be easily programmed to provide custom lane conditioning that is matched to each center's (or each lane's) unique requirements.

05 BUFFER P1
MODE : DOUBLE

To the left is an example of a display screen from **Menu Function 03, Edit Program**. (Menu functions will be covered in detail later on.) The screen contains a substantial amount of information. This section of the manual is not intended to be a step-by-step “how-to” on programming the *HVO Summit S-Series* (that is also discussed elsewhere in this manual), but is provided to help you become familiar with the layout and terminology associated with the display.

05 BUFFER P1
MODE : DOUBLE

The display consists of several areas, or **fields**. Note that different Menu Functions provide different displays, so the specific fields shown here are not always present. In this example, the first field on the top line (underlined) shows the **Program Number** (05) that was selected to be edited. The unit is capable of storing 20 different user-customizable lane conditioning programs.

05 BUFFER P1
MODE : DOUBLE

The next field shows the **Program Section** being edited. This example addresses buffer operation. It is just one of a number of program sections, which are: **Buffer, Buffer Distance, Oil, Oil Distance, Transfer Rate, Strip, Vacuum, Cleaner Pad, Cleaner Flow, Short Run, and Speeds**. These can

be selected and edited separately for each of the 20 lane conditioning programs.

05 BUFFER P1
MODE : DOUBLE

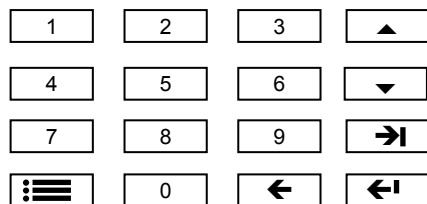
The last field on the top line indicates that this period of buffer operation applies to the first pass of the machine. (A **pass** is one complete cycle down the lane and back to the foul line.) The *HVO Summit S-Series* can make two passes (P1 & P2) during program execution. Each pass can be further broken down into a forward component (P1F or P2F – read, “pass one forward or pass two forward”) and a reverse component (P1R or P2R). The different passes, and for some program sections the different components of each pass, can be programmed separately.

05 BUFFER P1
MODE : DOUBLE

The bottom line shows that the **Mode** associated with this program section is programmable. Several modes (**forward**, **reverse**, **double**, and **off**) are available. Here, **Double** has been selected. Modes are one type of **Option** field. The other type of option field is a **Data** field, also referred to as a **Data Option** field. This simply means that a number is required to be entered (for example, 40.0) or an option is to be selected (such as the day of the week). The result is a program (Program 05) that directs the machine to perform a specific programmed action (BUFFER operation), on the first pass (P1), in a selected mode (DOUBLE - i.e., both forward and reverse directions), for a specified distance (40 feet). Note that the Data Option Field of 40 feet is entered under another program section, and is not part of the screen shown in this example. Simply complete data entry for the remaining program sections, and the program is complete. Detailed programming instructions are given in the Menu Functions section.

THE KEYPAD

The **Keypad** on the *HVO Summit S-Series* is used to program the lane machine and is configured on the control box as follows:



There are 16 different keys that accommodate all of the programming options for the lane machine.

The Number Keys

There are ten number keys, 0 through 9, for entering all numeric options. These options include choosing **Menu Functions** 01 through 99, selecting Lane Conditioning Programs 01 through 20, entering numeric values, and specifying conditioner transfer rates and cleaner flow rates.

Special Use Keys

There are six specially labeled keys that aid in operating and programming the machine:

Menu Key



MENU Key - Starts and Ends a Menu Function

Begins all movement from the **Ready Display**.
Exits most Menu Functions.

Scroll Keys



SCROLL Keys - Select an Option

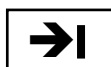
Select from a list of **Options**.

Increase or **decrease Numbers**.

▲ – This is the **SCROLL UP** key.

▼ – This is the **SCROLL DOWN** key.

Next Key



NEXT Key - Moves the Prompt:

From the **Program Section** field to an **Option** field.

From the **Mode** field to a **Data Option** field.

Between **Data Option** fields.

Enter Key



ENTER Key - Enters and Saves Program Changes and Advances Software

Accepts and confirms information on the screen.

Exits function to the **Ready Display**.

Moves the prompt back to the **Program Section** field.

Backspace Key



BACKSPACE Key - Positions the Prompt Within a Data Field

Moves the prompt from right to left (with a wrap feature) within a data entry field.

Prompt



PROMPT - Flashing Rectangle or Cursor

Provides visual indication of location within software.
Indicates changeable option fields.

GENERAL USER INTERFACE GUIDELINES

1. If the Prompt is on a blank space or on a number, it means enter a number. You press the **SCROLL UP** key to increase the number and the **SCROLL DOWN** key to decrease the number, or you can press one or more numbers on the number keypad.
2. The **SCROLL** keys must be pressed once for each desired number increase or decrease.
3. The prompt initially appears in the left-most position of a number field. To enter a number using the number keypad, simply enter the desired number. When the first digit is keyed in, the number under the prompt, if any, is overwritten by the new number, and the prompt moves one space to the right. As you continue keying in the new number, each digit of the old number is overwritten by the new one. If you only want to change part of an existing number, first use the **BACKSPACE** key to position the prompt over the digit to be changed, then enter the new number from the number keypad. **Note that entering a single-digit number, such as the number five, must be entered as a two-digit number using a zero as the first of the two digits (as in '05'). Because the prompt first appears in the left-most position in a number field, simply entering '5' will result in '50' being entered.**

If a number that is outside the allowable range is entered, the *HVO Summit S-Series* will **auto-correct** the number to within the allowable range. For example, when editing a lane conditioning program within Menu Function 03, the screen prompts the user to "Save as Program __". The allowable range is 01 to 20. If '5' is entered instead of '05', it will be entered as '50', which is out of the allowable range. When the **ENTER** key is pressed, the number is automatically corrected to '20' (the upper limit of the allowable range). If the software were to save the edited changes at this point (which it normally does) program 20 would be overwritten instead of program 5. To safeguard against this, the machine beeps to alert the user that an auto-correction was made, and remains in the current screen allowing the user to enter the correct number.

THE DISPLAY, KEYPAD, & USER INTERFACE GUIDELINES

4. If the Prompt is on a word, it means select an option. Press the **SCROLL DOWN** key to scroll to the next option, or use the **SCROLL UP** key to scroll to the previous option.
5. A **FIELD** is an area of the screen where you can enter data by selecting an option or by entering a number. The screen can have more than one **FIELD** at a time. You can move between multiple **FIELDS** by pressing the **NEXT** key or the **ENTER** key depending on the Menu Function!
6. Pressing the **MENU** key from the **Ready Display** is the first action for all Menu Functions.
7. **GENERALLY BUT NOT ALWAYS:**
 - The **ENTER** key means enter or save the data and continue.
 - The **MENU** key means do NOT save the data and exit (escape) the Menu Function to the Ready Screen.

This guide provides a full description of all valid keystrokes for each function.

This page intentionally left blank

Section
3

MENU FUNCTIONS

MENU FUNCTION: _ _
UNDEFINED FUNCTION

Menu functions are selected by pressing the **MENU** key at the **READY DISPLAY**. When this MENU key is pressed, this message is displayed:

To select a function, enter a number at the **MENU FUNCTION** prompt (See the list of menu functions on the following page).

MENU FUNCTION: XX
FUNCTION NAME

The displayed message changes to:

Where **XX** is a function number between 01 and 99. Note that these numbers are *functions* that are different from the lane conditioning *programs*, 1 to 20, discussed previously.

If the selected number has no assigned function, the bottom line will continue to display **UNDEFINED FUNCTION**.

FUNCTION SELECTED:
FUNCTION NAME

When you have entered the desired function number, press the **ENTER** key to execute or initiate the function. This message appears for approximately one second:

Where **FUNCTION NAME** is the actual name of the function selected.

The Menu Functions have been laid out in **General Categories** according to the first digit of the function number:

FUNCTION #	CATEGORY
0X	Program Functions
1X	Clock Functions
2X	Scheduler Functions
3X	Security Functions
4X	Lane Functions
8X	Adjustment Functions
9X	Adjustment Functions

Where **X** is a number between 0 and 9. Bold Font indicates New or Changed Functions on 9.0 only software. The individual functions in the **General Categories** are listed below:

MENU FUNCTIONS

CATEGORY	FUNCTION #	FUNCTION NAME
PROGRAM	01	Retrieve Program
PROGRAM	02	View Program
PROGRAM	03	Edit Program
CLOCK	10	Display Clock
CLOCK	11	Set Clock
SCHEDULER	21	Set Timezones
SCHEDULER	22	Set Maximum Number Of Lanes
SCHEDULER	23	Schedule Program Range
SCHEDULER	24	View Schedule
SCHEDULER	25	Clear Program Range
SCHEDULER	26	Scheduler Override
SCHEDULER	27	Scheduler Security
SCHEDULER	28	Set Scheduler On / Off (Was 20)
SECURITY	30	Set Security
SECURITY	31	Set Passwords
SECURITY	32	Enter / Exit Security Mode
LANE	40	Lane Tracker
LANE	41	Lane Odometer
ADJUSTMENT	80	Pass 2 Start Distance
ADJUSTMENT	81	Adjust Foul Line Stop
ADJUSTMENT	82	Reversing Switch Brake Delay
ADJUSTMENT	83	Calculate Speed Factor
ADJUSTMENT	84	Edit Speed Factor
ADJUSTMENT	85	HVO Summit or HVO Magnum Select
ADJUSTMENT	86	Select 1, 2, or 3 Vac Head Shakes
ADJUSTMENT	87	Cleaner Pre-Stop Distance
ADJUSTMENT	88	Cleaner Pre-Start Distance
ADJUSTMENT	89	Cleaner Drip Mode Re-Charge
ADJUSTMENT	90	Set Switch Type
ADJUSTMENT	91	Test Function
ADJUSTMENT	92	Saturate
ADJUSTMENT	93	Adjust Oil
ADJUSTMENT	94	Adjust Buffer
ADJUSTMENT	95	Adjust Cleaner Pad / Vacuum Head
ADJUSTMENT	96	Cleaner Presoak
ADJUSTMENT	97	Cleaner Drip or Spray Mode

The following pages contain step-by-step instructions, along with an explanation of each screen, for every available Menu Function.

PROGRAM FUNCTIONS

A program tells the lane machine how to condition and/or strip a bowling lane. You can save up to 20 different programs in the lane machine as program numbers 01 through 20. You can execute or run a program on a bowling lane by retrieving the desired program and then pressing the machine's start button.

There are programs, functions, and program functions.

- **PROGRAMS** create lane conditions.
- **FUNCTIONS** allow for machine adjustments and settings.
- **PROGRAM FUNCTIONS** act on programs to either retrieve, view, or edit.

Retrieve Program - This program function retrieves a stored lane conditioning program (01 to 20), and makes that program "current". You can then execute or run that program on a lane by pressing the start switch twice in rapid succession.

View Program - This program function allows the user to view, but not change, any of the stored program information.

Edit Program - This program function allows the user to edit or change any of the 20 stored programs. You are able to edit or change the buffing distances, conditioner application distances, conditioner transfer rates, cleaning solution flow rates, stripping options, and machine speeds.

Note

Editing or changing the program will modify lane conditions.

These **program functions**, along with the built-in software, are the user's main tools for designing custom lane conditioning programs.

RETRIEVE PROGRAM - MENU FUNCTION 01

The purpose of this operation is to retrieve a lane conditioning program that has already been stored in memory.

To select this Menu Function:

Press the **MENU** key.
Enter "**01**".
Press the **ENTER** key.

The above series is entered for every Menu Function except that the number changes to match the Menu Function. This series of instructions will not be restated for the remaining Menu Function instructions.

RETRIEVE PROGRAM: __

When you select this function, this message is displayed:

Enter the program number (01 to 20) to be retrieved.

Press the **ENTER** key to retrieve the program.

HVO SUMMIT PGM:XX READY

The displayed message changes as shown here:
Where **XX** is the program number just selected.

The program has now been retrieved, and the program number is shown on the **Ready Display**. The retrieved program can be executed by simply pressing the machine's start button twice in rapid succession.

REMEMBER!!!

- **A program must first be retrieved to be used.**
- **If SCHEDULER is turned on, only the scheduled programs can be used during the programmed time periods unless SCHEDULER is turned off or overridden.**

VIEW PROGRAM - MENU FUNCTION 02

This function allows a lane conditioning program (01 to 20) to be viewed. Viewing a program allows you to review the settings without the ability to make changes.

Note

The message **'DISABLED'** at the bottom of a program screen indicates that the program section is deactivated because an associated program section has been turned OFF. For example, turning **BUFFER** operation OFF deactivates **OILING** during the same pass because the machine cannot apply oil to the lane unless the buffer is operating.

```
VIEW
PROGRAM:  _ _
```

When you select this function, this message is displayed:

```
XX BUFFER      P1
MODE : YYYYYY
```

Enter the program number to be viewed and press the **ENTER** key. This program screen is displayed:

Where **XX** is the program number being viewed, and **YYYYYYY** is the buffer mode selected for that program.

The Program Screen

There are four fields within this screen:

```
① PGM#      ② PGM SECTION      ③ PASS#
                ④ DATA/MODE SECTION
```

Refer to your Programming Record Sheet to view all data entry fields and options.

The Prompt will be in the **Program Section** field. To view different Program Sections, use the **SCROLL** keys. To view the Data or Mode setting for each pass within a **Program Section** (when available), press the **NEXT** key to move the prompt to the Pass Number field (**Pass#**), and use the **SCROLL** keys to advance through the passes. The **Data/Mode Section** is updated and automatically displays the current settings as the Pass Number is changed.

To view other Program Sections, return the prompt to the Program Section field by pressing the **ENTER** key, and use the **SCROLL** keys to advance to the desired option.

To exit to the **Ready Display**, press the **MENU** key from the Program Section field.

The following is a description of each Program Section with details of screen layouts and program options available in the **VIEW** Menu Function. All distances are in feet and tenths of feet.

Buffer Program Section

XX	BUFFER	P#
	MODE :	YYYYYYY

The *Buffer* Program Screen is displayed in this manner:

Where **YYYYYYY** is one of the following: **OFF**, **FORWARD**, **REVERSE**, or **DOUBLE**.

The *Buffer* Program Section defines buffer usage in each pass.

- **OFF** means there will be no oiling or buffing during the pass.
- **FORWARD** means buffing in the forward direction only.
- **REVERSE** means buffing in the reverse direction only.
- **DOUBLE** means buffing in the forward and reverse directions.

Move the Prompt to the Pass field, and scroll to view the Mode setting for each pass.

Press the **ENTER** key to return the prompt to the Program Section field, and scroll to view other Program Sections.

Buff Distance Program Section

XX	BUFF DISTANCE	P#
	BUFFER DIST:	ZZ.Z

The *Buff Distance* Program Screen is displayed in this manner:

Where **ZZ.Z** is the buffer brush operating distance.

The *Buff Distance* Program Section defines the buffer distances for the forward and reverse portions of pass one and pass two.

To view the buffer distances for each pass, move the prompt to the pass number field (**P#**), and scroll to view the settings for each pass.

Press the **ENTER** key to return the prompt to the Program Section field, and scroll to view other Program Sections.

Oil Program Section

XX OIL P#
MODE : YYYYYYY

The *Oil* Program Screen is displayed in this manner:

Where YYYYYYY is either: **OFF**, **FORWARD**, **REVERSE**, or **DOUBLE**.

The *Oil* Program Section defines the application of conditioner to the brush. Each pass has its own settings.

- **OFF** means no conditioning will be done on that pass (forward and reverse).
- **FORWARD** means oil is applied to the brush only in the forward direction.
- **REVERSE** means oil is applied to the brush only in the reverse direction.
- **DOUBLE** means oil is applied to the brush in both directions.

To view the conditioning settings for each pass, move the prompt to the Pass Number field (**P#**), and scroll to view the settings for each pass.

Press the **ENTER** key to return the prompt to the Program Section field, and scroll to view other Program Sections.

Oil Distance Program Section

The *HVO Summit S-Series* lane machines are capable of programming the six oil tanks to operate completely independent of each other. Each oil tank can be set to a different oiling distance for each of the four possible pass components (P1F, P1R, P2F, & P2R) of the lane conditioning program.

XX OIL DISTANCE P#
YYYYY YYY DIST:ZZ.Z

The *Oil Distance* Program Screen is displayed in this manner:

Where:

YYYYY YYY is the specific oil tank (**LEFT OUT**, **LEFT TRK**, **LEFT CNT**, **RIGHT CNT**, **RIGHT TRK**, or **RIGHT OUT**), and **ZZ.Z** is the distance from the foul line along which oil is applied to the brush from the selected tank(s).

The *Oil Distance* Program Section defines the conditioning distances for each of the tanks during each pass.

Move the prompt to the Tank field, and scroll to view the settings for each tank for the pass and direction indicated.

To view the tank settings for each pass, move the prompt to the Pass Number field (**P#**), scroll to select a different pass, move the prompt back to the Tank field, and scroll to view the settings for each tank. Repeat the process to review the oil tank distance settings for the remaining passes.

Press the **ENTER** key to return the prompt to the Program Section field, and scroll to view other Program Sections.

Transfer Rate Program Section

XX TRANSFER RATE P#
PERCENTAGE: %%%

The *Transfer Rate* Program Screen is displayed in this manner:

Where %%% is a percentage of the maximum transfer rate from 1% to 100%.

The *Transfer Rate* Program Section defines the rate of conditioner transfer to the buffer for the forward and reverse components of passes one and two. This is measured as a percentage of the fastest rate possible, from 1% to 100%.

To view the conditioner transfer rates for each pass, move the prompt to the Pass Number field (P#), and scroll to view the settings for each pass.

Press the **ENTER** key to return the prompt to the Program Section field, and scroll to view other Program Sections.

Strip Program Section

XX STRIP
MODE:YYYY

The *Strip* Program Screen is displayed in this manner:

Where YYYY can be one of the following: **OFF**, **FULL**, or **BACK**.

The *Strip* Program Section defines stripper usage or mode.

- **OFF** means no stripping.
- **FULL** means strip the entire lane from the foul line to the end of the lane or to the turnaround point if SHORT RUN is turned on.
- **BACK** means strip the back end of the lane starting at a selected distance from the foul line to the end of the lane.

XX STRIP
MODE:BACK DIST:ZZ.Z

If the strip mode is **BACK**, this screen is displayed:

Where **ZZ.Z** is the distance from the foul line to the point where the lane machine starts stripping the lane.

If you want to strip the entire lane surface but not the pin deck, set the Strip Mode to **FULL** and turn on **SHORT RUN** (see page 4-8), setting the turnaround point just short of the pin deck.

There is no option to view data other than what is initially displayed on the Strip Screen.

Press the **ENTER** key to return the prompt to the Program Section field, and scroll to view other Program Sections.

Vacuum Program Section

```
XX VACUUM
MODE:YYYYYYY
```

The *Vacuum* Program Screen is displayed in this manner:

Where YYYYYYY can be one of the following: **ON START** or **ON PLUG**.

The *Vacuum* Program Section defines when the vacuum motor starts and stops.

ON START means the vacuum motor will **start** when the machine’s START switch is pressed, and will **stop** after the first pass of the program.

ON PLUG means the vacuum motor will **start** when the machine START switch is pressed, and will **stay on continuously** until the lane machine is powered down.

There is no option to view data other than what is initially displayed on the Vacuum Screen.

Press the **ENTER** key to return the prompt to the Program Section field, and scroll to view other Program Sections.

Cleaner Pad Program Section

```
XX CLEANER PAD
CLEAN PAD DIST:ZZ.Z
```

The *Cleaner Pad* Program Screen is displayed in this manner:

Where **ZZ.Z** is the distance from the foul line where the cleaner pad is lifted from the lane. 60.0 feet is the recommended distance.

The *Cleaner Pad* Program Section defines the distance from the point where the start switch is pressed to the point where the cleaner pad is lifted off the lane and cleaning solution is shut off. The factory programmed setting is 61.5 feet.

There is no option to view data other than what is initially displayed on the Cleaner Pad Screen.

Press the **ENTER** key to return the prompt to the Program Section field, and scroll to view other Program Sections.

Cleaner Flow Program Section

```
XX CLEANER FLOW
YYYYYYY %%%
```

The *Cleaner Flow* Program Screen is displayed as shown at the left.

Where:

1. If the program is set up to both strip and condition, YYYYYYYY is either **IN OIL** or **BACK LANE** indicating the lane area to be stripped. The IN OIL distance is equal to the maximum programmed buff distance for all passes in all directions within the selected lane conditioning program.

2. If it is a strip-only program, **YYYYYYYY** is **FLOW RATE** (the strip-only mode uses a single flow rate for all lane areas).

In either case, **%%%** is the percentage of the maximum cleaner flow rate available. This program section defines cleaner usage for the front and back areas of the lane. The rate is adjustable from 0% to 100%. Typically, stripping the back of the lane requires a lower cleaner flow rate than for stripping the rest of the lane. However in Spray mode both In Oil and Back or Out of the oiled areas, are both defaulted to 100% but can be adjusted at your convenience. In the Spray mode the % Flow is measured as a fraction of a 2 second window, where in the drip mode it is a fraction of a 1/3-second window.

To view the cleaner flow rates, move the prompt to the lane area data field, and scroll to view the selected flow rate.

Press the **ENTER** key to return the prompt to the program section field, and scroll to view other Program Sections.

Short Run Program Section

```
XX  SHORT RUN
    MODE:YYY
```

The Short Run Program Screen is displayed in this manner:

Where **YYY** can be **ON** or **OFF**.

The Short Run Program Section is an optional stop-and-turnaround distance for both forward passes. This is primarily used to program a run that is shorter than the current program. An example of when this feature might be used is when you are not stripping the lane and only need the machine to travel to the buff line, that is, to fill in. When turned on, this feature overrides the distance settings of the current program.

```
XX  SHORT RUN
    MODE: ON@ DIST:ZZ.Z
```

If the short run mode is ON, this screen is displayed:

Where **ZZ.Z** is the turnaround point (distance from the foul line).

There is no option to view data other than what is initially displayed on the Short Run Screen.

Press the **ENTER** key to return the prompt to the Program Section field, and scroll to view other Program Sections.

Speeds Program Section

```
XX  SPEEDS      P#
    YYYYYYYYYYYY L/M/H
```

The Speeds Program Screen is displayed in this manner:

Where **YYYYYYYYYYYY** is **STRIPPING, TRAVEL, or CONDITIONING**, and **L/M/H** stands for **Low (L), Medium (M), or High (H)**.

The Speeds Program Section allows the user to set the speed of the machine to the Low, Medium, or High setting for the different machine functions of stripping, conditioning, and traveling. Doing this allows the machine to perform optimally under all conditions and gives the user more flexibility to achieve the desired effect in less time. Table 4-1 provides a comparison of the *SUMMIT*'s speeds with the speeds of other machines.

Machine	Stripping	Conditioning	Traveling
Gemini Silver Bullet®	1.5 fps	1.5 fps	1.5 fps
Chairman	2.3 fps	2.3 fps	2.3 fps
Silver Bullet® MAGNUM	H - 5.0 fps M - 3.2 fps L - 2.2 fps	H - 3.2 fps M - 2.2 fps L - 1.2 fps	H - 6.2 fps M - 5.0 fps L - 3.7 fps
HVO Summit & HVO Summit S-Series	H - 4.8 fps M - 3.7 fps L - 2.1 fps	H - 3.7 fps M - 2.1 fps L - 0.7 fps	H - 6.2 fps M - 5.6 fps L - 4.8 fps

Table 4-1, Comparison of Machine Speeds

To view the speed selected for a machine function, move the prompt to the Pass Number field, and scroll to select the desired pass. Next, move the prompt to the machine function data field and scroll to view the selected speed associated with the displayed machine function. Not all functions are available for all passes. For example, if the machine is programmed to strip-only during the first pass forward (P1F) and the stripping mode is FULL, only the stripping speed can be viewed for that pass. **Whenever the machine is simultaneously stripping and conditioning, the machine will travel at whichever selected speed (either stripping or conditioning) is slowest.**

Press the **ENTER** key to return the prompt to the Program Section field, and scroll to view other Program Sections.

EDIT PROGRAM - MENU FUNCTION 03

This function creates a new program, or edits a program that is already stored in one of the 20 lane conditioning program files.

Note: The message ‘DISABLED’ on the bottom line of a program screen indicates that the current mode (OFF) of an associated Program Section has deactivated the displayed Program Section. For example, selecting OFF for the Strip Mode deactivates Cleaner Pad and Vacuum operation.

EDIT PROGRAM: __

When you select this function, this message is displayed:

PROGRAM FUNCTIONS

XX	BUFFER	P1
	MODE:YYYY	

Enter the program number to be edited and press the **ENTER** key. The displayed message changes to:

Where **XX** is the program number being edited, and **YYYY** is the Mode or Data Option that corresponds to the selected Program Section. A list of all **Program Sections** and their corresponding **Modes** and **Data Options** follows:

Program Section	Pass	Mode	Data Option
BUFFER	P1 P2	OFF, DOUBLE, REVERSE, FORWARD OFF, DOUBLE, REVERSE, FORWARD	
BUFFER DISTANCE	P1F P1R P2F P2R		0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET
OIL	P1 P2	OFF, DOUBLE, REVERSE, FORWARD OFF, DOUBLE, REVERSE, FORWARD	
OIL DISTANCE	P1F P1R P2F P2R	LEFT OUT (OUTSIDE) LEFT TRK (TRACK) LEFT CNT (CENTER) RIGHT CNT (CENTER) RIGHT TRK (TRACK) RIGHT OUT (OUTSIDE) LEFT OUT (OUTSIDE) LEFT TRK (TRACK) LEFT CNT (CENTER) RIGHT CNT (CENTER) RIGHT TRK (TRACK) RIGHT OUT (OUTSIDE) LEFT OUT (OUTSIDE) LEFT TRK (TRACK) LEFT CNT (CENTER) RIGHT CNT (CENTER) RIGHT TRK (TRACK) RIGHT OUT (OUTSIDE) LEFT OUT (OUTSIDE) LEFT TRK (TRACK) LEFT CNT (CENTER) RIGHT CNT (CENTER) RIGHT TRK (TRACK) RIGHT OUT (OUTSIDE)	0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET 0-60.0 FEET
TRANSFER RATE	P1F P1R P2F P2R		1%-100% 1%-100% 1%-100% 1%-100%
STRIP		OFF FULL BACK @	0-60.0 FEET
VACUUM		ON START ON PLUG	
CLEANER PAD			0-63.0 FEET
CLEANER FLOW		IN OIL BACK LANE	0 - 100% 0 - 100%
SHORT RUN		OFF ON @	0-60.0 FEET
SPEEDS	P1F P1R P2F P2R	STRIPPING - CONDITIONING - TRAVEL CONDITIONING - TRAVEL CONDITIONING - TRAVEL CONDITIONING - TRAVEL	L-M-H L-M-H L-M-H L-M-H

Program Section Description

For a description of the function of each of the Program Sections, see View Program - Menu Function 02, starting on page 4-3.

Notes

When entering settings, use actual on-lane distances. No corrections are necessary for mechanical offsets for machine components.

Different oil distances and buffer distances can be entered for the forward and reverse directions of each pass of the HVO Summit S-Series, and the six oil tanks can be programmed to operate completely independent of each other. Before entering the Oil Distance data, first set the Buffer Mode and Buffer Distance for all passes. This is necessary because the *Summit S-Series* uses Buffer Distance as the controlling parameter. Any time the Buffer Distance is set to less than the current Oil Distance setting for the corresponding pass, the Oil Distance setting changes to equal the Buffer Distance setting.

The variety of different programming options could result in the user attempting to enter incompatible program data. The operating software does not allow incompatible choices. For example, if the *Summit S-Series* is programmed to apply oil to 35.0 feet, but only buff to 30.0 feet, it will use the Buffer Distance as the control, and buff and oil to 30.0 feet.

In another case, the user could enter 20.0 feet of forward oil in pass 2, but also elect for the buffer to be OFF during the forward travel of the machine. This setting is obviously not compatible since the lane machine cannot apply oil to the lane unless the buffer is engaged against the lane. With the buffer programmed OFF for pass 2, the Buffer Distance, Oil, Oil Distance, and Transfer Rate displays for that pass will state “DISABLED”, and the Summit S-Series will not make an automatic second pass run. If the Buffer Mode for pass 2 is double, forward, or reverse, the machine *will* make an automatic second pass run.

Note that all of the settings shown in the table on the previous page are program-specific and can be set differently for each lane conditioning program.

To Edit a Program:

1. Press the **NEXT** key to move the prompt to, and toggle between, the Pass, Mode, and Data Option fields of the Program Section being displayed.
2. **SCROLL** through the options or enter a number to make the desired setting for that Program Section.

3. Repeat selecting options or entering settings for each available pass.
4. Press **ENTER** to save the settings and return to the Program Section field.
5. Do **NOT** press **MENU** with the prompt in the Program Section field unless you want to stop editing and return to the main menu.
6. Scroll to select the next Program Section to be edited.
7. Repeat Steps 1 through 6 until all desired Program Sections have been edited.

SAVE PROGRAM?
0 = NO 1 = YES

8. With the prompt in the Program Section Field, press the **MENU** key. This message is displayed giving you the option to save or not to save the edit:
9. Enter “**1**” to exit and save the changes, or “**0**” to exit without saving any changes.

PROGRAM NOT SAVED

Pressing “**0**” displays this message, and then the screen returns to the **Ready Display**:

SAVE AS
PROGRAM: XX

Pressing “**1**” displays this message:
Where **XX** is the number of the program that was edited.

You may save the changes under this program number or under any other program number from 01 to 20. **If another program number is entered, then the program corresponding to that number will be overwritten by the edited changes**, and the program that was originally called up to be edited will remain unchanged. This feature can also be used to make **a duplicate of a program** by calling up the program to be copied, and saving it (without making any changes) under a different program number.

Enter the desired program number.

PROGRAM SAVED

Press **ENTER**. The screen displays this message:

The changes are saved, and the screen returns to the **Ready Display**.

To run a program after editing and saving the program using Menu Function 03, use Menu Function 01, Retrieve Program, to make it the current program.

While creating or changing a lane conditioning program, complete a Programming Record Sheet for future reference.

CLOCK FUNCTIONS

One of the features of the *HVO Summit* control system is that it has an embedded real-time clock. This clock stays active even if the lane machine is powered off. The real-time clock may be used to view the current date and time and is also used by Scheduler to determine when scheduled programs are to be executed.

There are two clock functions:

Display Clock, which allows the user to see the current date, time, and day-of-the-week.

Set Clock, which allows the user to set the current date, time, and day of the week.

DISPLAY CLOCK - MENU FUNCTION 10

When you select this function, the current time is displayed in the following format:

<p>DAY-OF-THE-WEEK MM-DD-YY HH-MM-SS</p>

Where:

DAY-OF-THE-WEEK = (Monday, Tuesday, Wednesday, etc.)

MM-DD-YY = Current Month, Day, and Year.

HH:MM:SS = Current Hour (in 24 hour format), Minute, and Second

This function allows you to view the clock only. Pressing **any key** returns the screen to the **Ready Display**.

SET CLOCK - MENU FUNCTION 11

When you select this function, the time is displayed in the following format:

DAY-OF-THE-WEEK MM-DD-YY HH-MM-SS

Where:

DAY-OF-THE-WEEK = (Monday, Tuesday, Wednesday, etc.)

MM-DD-YY = Current Month, Day, and Year.

HH:MM:SS = Current Hour (in 24 hour format), Minute, and Second

The Prompt indicates which **field** is selected to be edited.

Press the **NEXT** key to advance to the next field that can be edited.

At DAY-OF-THE-WEEK, **scroll** to select the day .

At MM-DD-YY, enter a number in each of the fields.

At HH:MM:SS, enter a number for the hour and minute.

Note: The seconds cannot be set.

To exit without setting the clock, press the **MENU** key.

SAVING DATA

To save the entire setting, press the **ENTER** key. The following message is displayed for approximately two seconds:

The screen then returns to the **Ready Display**.

SCHEDULER FUNCTIONS

One of the major features of the *HVO Summit S-Series* is the Scheduler. This allows you to schedule any lane conditioning program to be automatically executed, on any lane, in any one of three definable daily ‘timezones’, any day of the week. With 7 days in the week, up to 3 timezones per day, and a maximum of 255 lanes available, Scheduler has up to 5,355 time slots in which to schedule any one of 20 programs! With the built-in software, scheduling the entire range can be done in just a few steps.

Scheduler consists of eight functions as well as its own operating mode:

SET TIMEZONES - This function allows you to define up to 3 ‘timezones’ for any day of the week, and can be different from day to day.

SET MAXIMUM NUMBER OF LANES - This function allows you to set the number of lanes in the bowling center up to a maximum of 255 lanes.

SCHEDULE PROGRAM RANGE - This function allows you to schedule a program over any range of day, timezone, and lane combinations. It also has **Automatic Validation**, which automatically checks if you have every time slot scheduled, and informs you of the next available time slot to be scheduled.

VIEW SCHEDULE - This function allows you to view the program schedule for each day, timezone, and lane.

CLEAR PROGRAM RANGE - This function allows you to clear a time slot over any range of day, timezone, and lane combinations. It also has **Automatic Validation**, which automatically checks if you have every time slot cleared, and informs you of the next available time slot to be cleared.

SCHEDULER OVERRIDE - This function allows you to temporarily override Scheduler for one day if Scheduler is ON. When you override Scheduler, it marks the currently running schedule as complete. Scheduler will automatically re-enable itself the following day when the lane machine is

turned on. You can manually re-enable Scheduler if it is overridden by using Menu Function 28.

SCHEDULER SECURITY - This function allows you to view the security level for Scheduler operation. The security for each Scheduler function can be set independently of the others to any of three levels: none, mechanic, or owner using Menu Function 30, Set Security.

SET SCHEDULER ON / OFF - This function turns the Scheduler Mode ON or OFF.

SET TIMEZONES - MENU FUNCTION 21

This function defines the timezones for each day. Scheduler uses these timezones to determine the schedule to be executed.

There can be up to three timezones per day: Timezones A, B, and C.

MONDAY	A>00:00
B>HH:00	C>HH':00

When you select this function, this message is displayed:
Where **HH** and **HH'** are numbers between 00 and 24. The screen displays the beginning time for each timezone in a 24-hour format (00:00 to 24:00).

There are three **fields** you can edit:

- Day-of-the-Week
- Beginning of Timezone B
- Beginning of Timezone C

Notes

The beginning time for Timezone A is 00:00, or midnight, the beginning of the day, and cannot be changed.

The beginning time for a timezone is the ending time for the previous timezone.

If Timezone B is set to start later than the start time of Timezone C, an error message (ERR->) is displayed. If this is not corrected by changing the start time of either Timezone B or Timezone C, the start time of Timezone C will automatically be set equal to the start time of Timezone B when the prompt is returned to the Day-of-the-Week field. The control module beeps once to alert the user that an autocorrection has been made.

Initially, the Prompt will be in the Day-of-the-Week field. Scroll to select the desired day. To change the timezones for that day, press the **NEXT** key. You may then edit the beginning time for Timezone B. To move to Timezone C, press the **NEXT** key. To save the changes to Timezones B and C, press the

NEXT key again. The prompt returns to the Day-of-the-Week field, and the entries are saved. You can now select another day of the week and set the timezones for that day. They can be the same as the previously set timezones or each day's timezones can be different. Continue until all the timezones for the desired days are set. If you do not wish to save your changes, press the **MENU** key from a timezone field. The screen returns to the **Ready Display**.

When you are finished setting the timezones, press the **MENU** key from the Day-of-the-Week field. The screen returns to the **Ready Display**.

SET MAXIMUM NUMBER OF LANES - MENU FUNCTION 22

This function allows you to tell the *HVO Summit S-Series* the number of lanes in the bowling center. This information is used by the Scheduler and Lane Tracker to keep track of the lane number currently being maintained.

ENTER NUMBER OF
LANES IN CENTER: _ _ _

When you select this function, this message is displayed:

At the Prompt, enter the number of lanes in the bowling center. The maximum number of lanes the unit will accept is 255.

SAVING DATA

When you are finished and wish to save the information, press the **ENTER** key. The screen displays this message:

The screen then returns to the **Ready Display**.

If you do not wish to save the information, press the **MENU** key, and the screen will return to the **Ready Display**.

SCHEDULE PROGRAM RANGE - MENU FUNCTION 23

Use this function to schedule a single program or a number of programs. With this function you can schedule a single lane or timezone or multiple lanes, timezones, and programs.

FROM: MON / A / _ _ 1
TO: MON / A / _ _ 1

When you select this function, this message is displayed:

If the screen does not display this message, but instead scrolls through the days and timezones and returns to the Ready Display, then all of the days, timezones, and lanes are already scheduled. To reschedule days, timezones, or lanes that have already been scheduled, clear the applicable section of the schedule using Menu Function 25, Clear Program Range, and then perform the steps shown below.

SCHEDULER FUNCTIONS

To schedule a program range, proceed as follows:

Use the **NEXT** key to position the Prompt in the desired field. Scroll to the correct day and timezone, and enter the lane numbers. Do this for the beginning (**FROM**) and end (**TO**) of the range. When the display shown is correct, press **ENTER**.

PROGRAM __

This message is then displayed:

Enter the program number to be run during the schedule range programmed above.

STORING: DDD T

Press **ENTER**. The display scrolls through the schedule and displays this message:

Where:

DDD is the Day-of-the-Week and **T** is the timezone.

FROM: DDD / T / __ L
TO: DDD / T / __ L

If there are unprogrammed time slots and/or lanes, the screen displays:

Where **DDD**, **T**, and **L** are days, timezones, and lanes that have not yet been programmed into Scheduler.

Schedule the remaining days, timezones, lanes, and programs as above. Press **ENTER** when finished.

CHECKING: DDD T

The display scrolls through the data that was just entered and indicates as shown here as it verifies the information.

When all information has been stored, the screen returns to the **Ready Display**.

VIEW SCHEDULE - MENU FUNCTION 24

This Menu Function allows the existing program schedule to be viewed.

```
MONDAY  TIMEZONE :A
LANE: __1  PROGRAM:XX
```

When you select this function, this message is displayed:

Use the **NEXT** key to move between the Day-of-the-Week, Timezone, and Lane fields, then use the **SCROLL** keys to view the information within a field. When you use the scroll keys to view the different days, timezones, and lanes, the Program Number changes to indicate the lane conditioning program that has been scheduled for that day, timezone, and lane.

Press the **MENU** key to return to the **Ready Display**.

CLEAR PROGRAM RANGE - MENU FUNCTION 25

This Menu Function is used to clear the program range that is already in Scheduler memory. You can then reschedule using **Menu Function 23, Schedule Program Range**.

```
FROM: DDD / T / __ L
TO: DDD / T / __ L
```

When you select this function, this message is displayed:

Where **DDD**, **T**, and **L** are the days, timezones, and lanes to be cleared from the scheduled program range.

If the screen does not display the above message, but instead scrolls through the days and timezones and returns to the Ready Display, then all of the days, timezones, and lanes are already cleared.

To clear a program range, continue as follows:

Use the **NEXT** key to change fields and the **SCROLL** keys to select the day and timezone. Enter the lane numbers to be cleared from the schedule.

```
CLEARING: DDD T
```

Press **ENTER** to clear the selected program range. This message is displayed:

```
FROM: DDD / T / __ L
TO: DDD / T / __ L
```

If more programmed parts of the schedule remain in memory, the screen again displays this message:

Repeat entering information until all desired schedule sections have been cleared, then press the **MENU** key to exit this Menu Function and return to the **Ready Display**.

SCHEDULER OVERRIDE - MENU FUNCTION 26

This function allows the user to override the schedule for one day. Any current schedule will be marked “complete” and Scheduler will remain off for the remainder of the day. Scheduler will turn on automatically the first time the lane machine is energized after the day Scheduler is overridden (For example, if Scheduler is overridden on Monday and is powered up on Tuesday, Scheduler will turn ON. However, if the lane machine isn’t first powered up until the following Monday, Scheduler will still be overridden since it uses the Day-of-the-Week for this function.) Scheduler must be ON to be overridden.

SCHEDULER IS ON
0 = EXIT 1 = OVERRIDE

When you select this Menu Function with Scheduler ON, this message is displayed:

SCHEDULER OVERRIDDEN

Press “1” to override Scheduler. The screen then displays this message:

or

Press “0” to exit and return to the **Ready Display**.

Scheduler can be turned back on after it is overridden by selecting Menu Function 28, Set Scheduler ON/OFF, and turning Scheduler ON.

SCHEDULER SECURITY - MENU FUNCTION 27

This function only allows the user to view the security level assigned to Scheduler operation. The user must possess this security level password to disable Scheduler when Scheduler is ON (see Scheduler Operation on the following page).

SCHEDULER SECURITY =
YYYYYYYY

When you select this function, this message is displayed:

Where YYYYYYYY is either **NONE**, **MECHANIC**, or **OWNER**.

Press **any key** to return to the **Ready Display**.

To set the Scheduler security level, select **Menu Function - 30, Set Security**. At the Menu Function prompt, enter **Menu Function 27, Scheduler Security**, and set Scheduler security to the desired security level.

Note

Setting the security level in Menu Function - 27 does not set security for the remaining Scheduler functions. If these functions are not set separately, they will not have security protection!

SET SCHEDULER ON / OFF- MENU FUNCTION 28

This function is used to turn Scheduler ON or OFF. When Scheduler is set to ON, you must turn the power off and then on again for the *HVO Summit S-Series* to operate in Scheduler Mode.

<p>SCHEDULER IS YYY 0 = NO 1 = YES</p>

When you select this function, this message is displayed:
Where **YYY** is either ON or OFF.

To return to the Ready Display without changing Scheduler status, press the **MENU** key.

<p>SCHEDULER IS OFF</p>

Pressing “0” turns Scheduler **OFF** and the screen displays this message:

or

<p>SCHEDULER IS ON</p>

Pressing “1” turns Scheduler **ON** and displays this message:

The screen then returns to the **Ready Display**.

You must power the machine OFF and then ON again to activate Scheduler.

SCHEDULER OPERATION

This section describes the functions of Scheduler as it controls the operation of the *HVO Summit S-Series* on the lanes.

In order to simplify the setup of the Scheduler, certain functions should be set up before attempting to program Scheduler.

Suggested order of use:

1. Set Maximum Number of Lanes (Menu Function 22)
2. Set Timezones (Menu Function 21)
3. Schedule Program Range (Menu Function 23)
4. Set Scheduler On/Off (Menu Function 28), if Scheduler is desired
5. As Needed:
 - A. View Schedule (Menu Function 24)
 - B. Clear Program Range (Menu Function 25)
 - C. Scheduler Override (Menu Function 26)
 - D. Scheduler Security (Menu Function 27)

Scheduler is in effect after it has been turned on (Menu Function 28), and the lane machine has been powered down and then powered up.

The *HVO Summit S-Series* will automatically scroll through the stored information for each lane in the center to check if the lane has a program scheduled for that day and timezone. The lane machine will also check for a previously interrupted schedule.

At this point, the Scheduler will be in one of 4 scenarios:

- New schedule in the current timezone
- Unfinished schedule in previous timezone
- Unfinished schedule in current timezone
- Finished schedule in current timezone

Scheduler will require different information from the user for each of these four scenarios. While running Scheduler, you may perform two other operations:

- Skipping to a Lane
- Disabling Scheduler

These will be described in the following sections.

New Schedule in Current Timezone

RUN NEW SCHEDULE? 0 = NO 1 = YES

When the lane machine is powered up with Scheduler ON and with no unfinished schedules in memory as well as no completed schedules in the current timezone, this message is displayed:

Enter “**0**” for NO. The lane machine displays the DISABLE SCHEDULER screen (see Disabling Scheduler on Page 6-12).

Enter “**1**” for YES. The lane machine displays the MAINTENANCE screen (see Maintenance Screen on Page 6-10).

Unfinished Schedule in the Previous Timezone

FINISH OLD SCHEDULE?
0 = NO 1 = YES

If the lane machine finds an unfinished schedule that was started in a previous day or timezone, it will ask if you want to finish that schedule by displaying this message:

If “1” is entered, the lane machine displays the MAINTENANCE screen (see Maintenance Screen on Page 6-10).

RUN NEW SCHEDULE?
0 = NO 1 = YES

If “0” is entered, the lane machine marks the old schedule as completed, and then displays this message:

Enter “0” for NO. The lane machine displays the DISABLE SCHEDULER screen (see Disabling Scheduler on Page 6-12).

or

Enter “1” for YES. The lane machine displays the MAINTENANCE screen (see Maintenance Screen on Page 6-10).

Unfinished Schedule in the Current Timezone

FINISH OLD SCHEDULE?
0 = NO 1 = YES

If the lane machine finds an unfinished schedule in the current timezone, the screen displays this message:

If “1” is entered, the lane machine displays the MAINTENANCE screen (see Maintenance Screen below).

**SCHEDULE COMPLETED
TURN POWER OFF**

If “0” is entered, the lane machine marks the old schedule as completed, and then displays this message:

No further operation is allowed without first turning power to the machine off.

Finished Schedule in Current Timezone

RUN SCHEDULE AGAIN?
0 = NO 1 = YES

If the lane machine does not find a previously unfinished schedule, and the schedule for the current day and timezone has been completed, the lane machine will call up the current schedule and ask if you wish to run this schedule again by displaying this message:

Enter “0” for NO. The lane machine displays the DISABLE SCHEDULER screen (see Disabling Scheduler on Page 6-12).

Enter “1” for YES. The lane machine displays the MAINTENANCE screen (see Maintenance Screen below).

Maintenance Screen

MAINTENANCE?
0 = NO 1 = YES

After entering “1” in reply to the RUN NEW SCHEDULE?, RUN SCHEDULE AGAIN? or FINISH OLD SCHEDULE? screens, the machine displays this message:

Enter either “0” for NO, or “1” for YES.

SELECT STARTING
LANE:LLL DIR:YYYY

If “0” is entered, the screen displays this message:

Where:

LLL is the number of the lane that is to be conditioned first, and **YYYY** is either **UP** or **DOWN**, indicating that lane conditioning will be performed in either an increasing lane order (up) or a decreasing lane order (down).

Enter the number of the lane to be conditioned first.

Press the **NEXT** key to move the Prompt to the **DIR** field, and scroll to select either the UP or DOWN direction.

Press **ENTER** to save the information and return to the **Scheduler Ready Display**.

MENU FUNCTION: XX
UNDEFINED FUNCTION

If “1” is entered at the MAINTENANCE screen, the screen displays this message:

Where **XX** is an adjustment Menu Function (80 through 97).

Enter the desired number. For the performance of the specific adjustment, refer to the **Adjustment Functions** section of this manual.

Running Scheduler

HVO SUMMIT
PGM:XX NEXT LANE:LLL

Scheduler directs the lane machine to maintain the lanes according to the program schedule. Prior to beginning, the lane machine displays this message:

Where **XX** is the scheduled program, and **LLL** is the next lane to be maintained. This is the **Scheduler Ready Display**.

To run the schedule, position the *HVO Summit S-Series* at the foul line of the lane indicated on the Scheduler Ready Display, and press the machine's **START** switch twice in rapid succession.

Skipping to a Lane

SELECT STARTING
LANE: LLL DIR: YYYY

To start the program schedule on a lane other than the one indicated on the display, press the **BACKSPACE** key from the Scheduler Ready Display. The screen displays this message:

Where:

LLL is the number of the lane that is to be conditioned first, and **YYYY** is either **UP** or **DOWN**, indicating that lane conditioning will be performed in either an increasing lane order (up) or a decreasing lane order (down).

Enter the number of the starting lane.

Press the **NEXT** key to move the Prompt to the **DIR** field, and scroll to select the desired direction.

Press the **ENTER** key to return to the **Scheduler Ready Display**. The machine can be started by pressing the **START** switch twice in rapid succession.

Once Scheduler has started and has maintained at least one lane, you may skip over one or more lanes, or you may maintain a lane again. To do this during Scheduler operation, press the **BACKSPACE** key. The **SKIP TO LANE** screen is displayed as shown here. Enter the desired lane number.

SKIP TO
LANE: LLL DIR: YYYY

After maintaining this lane, Scheduler goes to the next unfinished lane in the direction you have chosen. If you skipped over a section of lanes, Scheduler returns to those lanes after all others have been completed.

SCHEDULE COMPLETED
TURN POWER OFF

When the schedule has been completed, the lane machine displays this message:

Disabling Scheduler

If you wish to exit Scheduler during its operation, press the **MENU** key. The screen displays this message:

DISABLE SCHEDULER?
0 = NO 1 = YES

Enter “0” to return to the Scheduler operation.

ENTER PASSWORD: _ _ _ _

To disable Scheduler, enter “1”.

If the Scheduler has a security password enabled, this screen is displayed:

WRONG PASSWORD

Enter the four-digit password. If the password is incorrect, this message is displayed:

MENU FUNCTION:XX
UNDEFINED FUNCTION

The lane machine then returns to the DISABLE SCHEDULER? screen.

Upon entering the correct four-digit password that matches the security level of the Scheduler, the lane machine exits Scheduler and displays this message:

You can now execute Menu Functions in the normal way. After executing any function, you will be returned to the select Menu Function screen. To return to running the schedule, press the **MENU** key.

IF SCHEDULER HAS BEEN TURNED OFF, THE LANE MACHINE MUST BE POWERED DOWN AND THEN POWERED UP TO RETURN TO THE READY DISPLAY.

SECURITY FUNCTIONS

The HVO Summit S-Series Security System is built on four features:

- User control (security is set by the user, not by QubicaAMF).
- Hierarchical Security Levels (none, mechanic, owner) and Password Scheme (no Manager's Key).
- Individual Security Level Control for each Menu Function
- One-time Password Entry (in most cases).

The Security System is made up of three functions:

Set Security - This function allows certain users to set any of the valid Menu Functions to one of the three security levels.

Set Passwords - This function allows certain users to change the passwords.

Enter/Exit Security Mode:

Enter Security Mode - This function allows users to enter a valid password to put the lane machine into a "Security Mode". This allows the user access to secured Menu Functions.

Exit Security Mode - This function is displayed when the lane machine is already in a "Security Mode" and Menu Function 32 is entered. The function provides for exiting and changing the security mode without shutting down the machine.

Security Hierarchy

The three Menu Functions that make up the security system are interrelated through the security hierarchy. There are three user security levels. From Highest to lowest they are: OWNER, MECHANIC, and NONE as depicted below.

	Set Security (30)	Set Password (31)	Security Mode (32)
Highest	OWNER	OWNER	OWNER
	MECHANIC	MECHANIC	MECHANIC
Lowest	NONE	-----	NONE

The user can set passwords for the OWNER and MECHANIC security levels, and can set any Menu Function’s security, except those assigned a permanent security level (see below), to OWNER, MECHANIC, or NONE.

Default and Permanent Security

The factory default DISTRIBUTOR password is 2222.
 The factory default OWNER password is 3333.
 The factory default MECHANIC password is 4444.

The functions, Set Security (Menu Function 30), and Set Password (Menu Function 31), have the permanent security level of OWNER and cannot be changed! These functions require you to enter a valid OWNER password in Enter Security Mode (Menu Function 32) before they can be accessed. Therefore, changing the security level assigned to a Menu Function, or changing the OWNER or MECHANIC password, requires OWNER-level security access.

The functions, Scheduler Security (Menu Function 27) and Enter/Exit Security Mode (Menu Function 32), have a default security level of NONE and cannot be changed. However, Menu Function 32 requires you to enter a valid password to enter a specific level of Security Mode. The password you enter in this menu function gives you access to other menu functions that have been assigned this level, or any lower level, of security.

All other menu functions have a default security level of NONE, which means that anyone can access these functions without a password or without entering a Security Mode. These functions can be set to any of the three security levels.

SET SECURITY - MENU FUNCTION 30

Note

You must enter the Security Mode at the OWNER level to access this function!

SECURE FUNC: __
UNDEFINED FUNCTION

Use this function to set the security level for any of the Menu Functions. When you select this function, the screen displays this message:

The Prompt will be at SECURE FUNC. Enter the Menu Function number for the function you want to set. The function name corresponding to the number will be displayed on the second line of the screen.

To exit and return to the **Ready Display** without changing the security level for that function, press the **MENU** key.

SECURITY: YYYYYYYY
<FUNCTION NAME>

To continue to set the security for the chosen function, press the **ENTER** key. The screen displays the security level of the chosen function with the name of the function:

Where **YYYYYYYY** is NONE, MECHANIC, or OWNER.

SAVING SECURITY

The Prompt will be at SECURITY. Scroll to select the desired security level for the function. When finished, press the **ENTER** key to save the setting. The screen displays this message for two seconds before returning to the SECURE FUNC: screen (see above).

To continue setting security levels for other functions, scroll to or enter the function number to be set, and repeat the above.

When finished, press the **MENU** key to return to the **Ready Display**.

SET PASSWORDS - MENU FUNCTION 31**Note**

You must enter the Security Mode at the OWNER level to enter this function!

CHANGE MECHANIC
ENTER PASSWORD: ----

Use this function to set the passwords for the various levels of security. When you select this function, the screen displays this message:

The Prompt will be at the MECHANIC option. You can scroll between MECHANIC and OWNER. **This indicates which password you are changing.**

When you have selected the password level you wish to change, press the **NEXT** key. The Prompt will be at ENTER PASSWORD. Enter the new four-digit password.

CHANGE MECHANIC
ENTER IT AGAIN: ----

As a further safeguard, the screen displays an asterisk (*) in place of each number when you enter the password. When you are finished entering the password, press the **ENTER** key. The screen displays this message for verification of the new password:

NEW PASSWORD
ACCEPTED

Enter the same password again. If the four digits match the first entry exactly, the new password for that security level will be accepted and this message is displayed:

PASSWORD MISMATCH
NO CHANGE

If the four digits do not match exactly, the new password is not accepted and this message is displayed for two seconds:

The screen then returns to the **Ready Display**.

ENTER / EXIT SECURITY MODE - MENU FUNCTION 32

The Security Mode is entered to allow access to secured Menu Functions. Once the lane machine is in Security Mode, it will remain in that state until:

- The lane machine is powered down.
- The user explicitly exits the Security Mode by using Menu Function 32.

Menu Function 32 has the dual purpose of entering and exiting the Security Mode. The Security Mode level is identical to the password levels: OWNER, MECHANIC, or NONE. When the Security Mode is NONE, the display states: ENTER SECURITY MODE. If the Security Mode is either OWNER or MECHANIC, the display states: EXIT SECURITY MODE.

Enter Security Mode

ENTER PASSWORD: _ _ _ _

When the Security Mode is NONE and you select this function, the screen displays this message:

SECURITY MODE =
YYYYYYYY

At this prompt, enter a valid four-digit password and then press **ENTER**. If the entered password is valid, the screen displays the Security Mode that corresponds to the password as shown here:

Where YYYYYYYY is either **OWNER** or **MECHANIC**.

WRONG PASSWORD

If the entered password is not valid, the control module beeps three times and the screen first displays this message:

SECURITY MODE =
NONE

Then this screen is displayed:
And then the screen returns to the **Ready Display**.

Exit Security Mode

EXIT SECURITY MODE?
0 = NO 1 = YES

When the Security Mode is OWNER or MECHANIC and you select this function, the screen displays this message:

SECURITY MODE =
YYYYYYYY

If you enter “0”, the screen displays the current Security Mode:
Where YYYYYYYY is either **OWNER** or **MECHANIC**.

SECURITY MODE =
NONE

If you enter “1”, the lane machine exits Security Mode and displays:
The screen then returns to the **Ready Display**.

This page intentionally left blank

LANE FUNCTIONS

The *HVO Summit S-Series* has two features to help you keep track of the number of lanes that have been conditioned and which lane is due to be conditioned next.

Lane Tracker - This function tracks the lane you have just completed, and displays the next sequential lane to be maintained. You can also set the direction you are going: up the lanes (that is 1,2,3...), or down the lanes (60,59,58...). The lane machine saves all the information when you power down, and recalls it at power up.

Lane Odometer & Tripmeter - This function displays the number of lanes completed by the lane machine. The odometer and tripmeter are displayed together. The odometer can only be reset by QubicaAMF trained personnel, and returns to zero automatically at 100,000 lanes. The tripmeter is resettable by anyone having access to this function, and automatically resets to zero every 1,000 lanes. These features can be very helpful in scheduling machine maintenance.

LANE TRACKER - MENU FUNCTION 40

LANE TRACKER IS YYY
0 = OFF 1 = ON

This function displays and changes the mode of the **Lane Tracker** to either ON or OFF. When you select this function, the screen displays this message:

Where **YYY** is the current mode, either ON or OFF.

To exit without changing the **Lane Tracker** mode, press the **MENU** key.

To turn **Lane Tracker** ON, enter “1”.

To turn **Lane Tracker** OFF, enter “0”.

LANE TRACKER IS YYY

The screen then displays this message for about 1 second:

Where **YYY** is the mode selected.

HVO SUMMIT
PGM:XX NEXT LANE:LLL

If Lane Tracker is OFF, the screen returns to the **Ready Display**.

If Lane Tracker is ON, the **Ready Display** changes as shown here:

Where **XX** is the program number and **LLL** is the lane number.

This is the **Lane Tracker Ready Display**, which is on while the **Lane Tracker** mode is ON. The display returns to the normal **Ready Display** when the **Lane Tracker** mode is turned OFF.

SELECT STARTING
LANE:LLL DIR:YYYY

To change the displayed lane number, power down the lane machine and power it up again. Upon power-up, this message is displayed:

Where **LLL** is a lane number and **YYYY** is a direction, either **UP** or **DOWN**.

You can enter a different starting lane number and direction. The maximum lane number you can enter is determined by the number entered in Menu Function 22, Set Maximum Number Of Lanes.

To switch between the LANE and DIR fields, press the **NEXT** key.

To select a starting lane, enter a number at the LANE prompt.

To select a starting direction, move to the DIR field and scroll to select the desired direction.

To save your selections and exit, press the **ENTER** key. The screen returns to the **Lane Tracker Ready Display**. Hereafter, the Lane Tracker will keep track of the lane number the machine is on.

EXAMPLES

```
HVO SUMMIT
PGM:16 NEXT LANE: __ 1
```

```
HVO SUMMIT
PGM:16 NEXT LANE: __ 2
```

If you selected Lane 1 as the starting lane, in the UP direction, and the current program number is 16, the display indicates as shown here:

After execution of program 16 on Lane 1, the display will indicate:

... and so on.

```
HVO SUMMIT
PGM:16 NEXT LANE: _ 6 0
```

If you selected Lane 60 as the starting lane, in the DOWN direction, the display will indicate:

```
HVO SUMMIT
PGM:16 NEXT LANE: _ 5 9
```

After execution of program 16 on Lane 60, the screen will now display:

... and so on.

LANE ODOMETER & TRIPMETER - MENU FUNCTION 41

```
LANES:XXXXX
LANES:XXX
```

This function displays the lane odometer on the top line and the tripmeter on the bottom line as shown to the left.

Where the X's represent the number of respective lanes maintained by the machine.

Pressing the **MENU** key returns you to the **Ready Display**.

```
LANES:XXXXX
LANES:XXX ←RESET?
```

To reset the tripmeter, press the **BACKSPACE** key. The screen changes as shown:

If you decide not to reset the tripmeter at this point, press the **MENU** key. The reset prompt (**←RESET?**) disappears. Pressing the **MENU** key again returns you to the **Ready Display**.

```
LANES:XXXXXX
LANES:XXX RESET
```

To reset the tripmeter, press the **ENTER** key. The screen changes as shown, and is displayed for approximately two seconds. The tripmeter resets to 000 lanes, and then the screen returns to the **Lane Odometer** and **Tripmeter** display.

Press the **MENU** key to return to the **Ready Display**.

This page intentionally left blank

ADJUSTMENT FUNCTIONS

It is necessary to periodically adjust the *HVO Summit* operating components, or to reset performance parameters. This is also required during initial machine setup. The adjustment or setting commands have already been programmed into the lane machine to make these adjustments easier.

There are eighteen adjustment functions:

Pass 2 Start Distance - This sets the distance from the foul line to where the lane machine stops between passes. It prevents the stop switch from making contact with the transition blocks and shutting down the machine.

Adjust Foul Line Stop - This function allows setting the distance from the foul line that the lane machine will stop at the completion of a lane conditioning program.

Reversing Switch Brake Delay - This function determines the time delay between the actuation of the reversing switch and the application of the brake. This helps to ensure that the vacuum head extends past the tail plank after stripping the lane.

Calculate Speed Factor - This function calibrates the machine's speed by timing a multispeed run, comparing the actual run time against a standard, and calculating a speed factor based on the difference between the two.

Edit Speed Factor - This function is used to manually adjust the speed factor to fine-tune the setting to achieve machine speeds that are as close as possible to the design speeds.

HVO Summit or HVO Magnum Select - This function is used to manually select the type of lane machine you have, either HVO Summit (which is the default) or HVO Magnum. Selecting the appropriate machine type is required in order to help obtain accurate oil profiles because the two machines operate at different speeds.

Cleaner Drip Mode or Spray Mode - This function is used to manually select the type of cleaning system that you have, either drip style cleaner or spray nozzles.

Select 1, 2, or 3 VacHead Shakes - This function is used to select the number of shakes that a VacHead does at the end of the lane.

Cleaner Pre-Stop Distance - This function is used to select a distance to stop cleaner (spray system) from being sprayed on pins or into the pit.

Cleaner Pre-Start Distance - This function is used to select a distance to start the cleaner before the pad start distance.

Cleaner Preload - This function is used to start cleaner flowing to the cleaner pad in order to prepare for the next lane to be cleaned (drip system only).

Set Switch Type - This sets the machine Start Switch type, either **HANDLE** or **SIDE SWITCH**. **The HVO Summit S-Series must be set to HANDLE for proper operation!**

Test Function - This function is used to test the various machine components and can aid in checking adjustments or in troubleshooting problems.

Saturate - This function saturates the buffer brush with oil before use. This helps make lane conditioning more consistent from the very first lane.

Adjust Oil - This function allows for measuring and adjusting the wick pressure against the transfer roller.

Adjust Buffer - This function allows for measuring and adjusting buffer brush pressure against the lane.

Adjust Cleaner Pad & Vacuum Head - This function allows for measuring and adjusting cleaner pad and vacuum head pressure against the lane.

Cleaner Presoak - This function allows the user to flow cleaning solution onto the cleaner pad to presoak the pad.

Suggested Order of Use

1. Adjust Cleaner Pad and Vacuum Head (Menu Function 95)
2. Adjust Buffer (Menu Function 94)
3. Adjust Oil (Menu Function 93)
4. Saturate (Menu Function 92)

As necessary:

- A. HVO Summit S-Series or HVO Magnum Select (Menu Function 85)
- B. Pass 2 Start Distance (Menu Function 80)
- C. Adjust Foul Line Stop (Menu Function 81)
- D. Reversing Switch Brake Delay (Menu Function 82)
- E. Calculate Speed Factor (Menu Function 83)
- F. Edit Speed Factor (Menu Function 84)
- G. Test Function (Menu Function 91)
- H. Cleaner Presoak (Menu Function 96)
- I. Set Switch Type (Menu Function 90)
- J. Cleaner Drip Mode or Spray Mode (Menu Function 97)
- K. Set Vacuum Head Shake 1, 2, or 3 (Menu Function 86)
- L. Adjust Cleaner Prestop Distance (Menu Function 87) (Spray Mode)
- M. Adjust Cleaner Prestart Distances (Menu Function 88) (Spray Mode)
- N. Set Cleaner Preload {P1R or P2R} (Menu Function 89) (Drip Mode)

On the following pages is an explanation of each adjustment function.

PASS 2 START DISTANCE - MENU FUNCTION 80

Use this function to adjust the distance from the foul line where the *HVO Summit* will stop and reverse travel between the first and second passes. This is called the turnaround point, and this feature prevents the shutoff arm from contacting the gutter transition blocks causing the machine to shut down. This distance is measured in tenths of a foot. The recommended setting is 0.8, or 8 tenths of a foot.

**TURNAROUND
POINT:ZZ.Z**

When you select this function, this message is displayed:

Where **ZZ.Z** is the turnaround point, as measured from the foul line.

Enter the desired turnaround distance.

If you do not wish to save the turnaround distance entered, press the **MENU** key to return to the **Ready Display**.

SAVING DATA

If you want to save the new turnaround distance, press the **ENTER** key. The screen displays this message while it stores the new setting:

The screen then returns to the **Ready Display**.

ADJUST FOUL LINE STOP - MENU FUNCTION 81

This Menu Function is used to set the distance that the lane machine stops from the foul line at the completion of a lane conditioning program. The proper setting stops the lane machine just before the shut off arm makes contact with the end of the gutter. The recommended initial setting is 0.5, or 5 tenths of a foot. Adjust as necessary to obtain the optimum stopping point.

STOP DIST : ZZ.Z

When you select this function, this message is displayed:

Where **ZZ.Z** is the stopping distance, as measured from the foul line.

Enter the desired stopping distance.

If you do not wish to save the stopping distance entered, press the **MENU** key to return to the **Ready Display**.

If you want to save the new stopping distance, press the **ENTER** key. The screen displays this message:

SAVING DATA

The screen then returns to the **Ready Display**.

REVERSING SWITCH BRAKE DELAY - MENU FUNCTION 82

Use this function to set the time delay between the actuation of the reversing switch and the application of the brake. This helps to ensure that the vacuum head extends past the tail plank after stripping the lane. This is necessary in order to allow the machine to cycle the vacuum head down and up so that any oil/cleaning solution will be shaken off into the pit and not redeposited on the lane surface. This delay is measured in seconds. The baseline setting is 0.10 seconds. An initial adjustment to this baseline setting is made at the factory, but it may be necessary to adjust this slightly to suit your bowling center's conditions. **Be careful! Too much delay will cause the machine to run off into the pit!**

BRAKE DELAY: T.TT

When you select this function, this message is displayed:

Where **T.TT** is the duration of the delay, in seconds, before the brake is applied. The allowable range of this setting is 0.00 to 1.00 seconds.

Enter the desired time delay. Because the conditions are different in each bowling center, the exact number may need to be determined by trial and error.

SAVING DATA

If you want to save the new number, press **ENTER**. The screen displays this message while it stores the new setting:

To exit without saving, press **MENU**.

The screen returns to the **Ready Display**.

CALCULATE SPEED FACTOR - MENU FUNCTION 83

Use this function to determine the speed factor. This speed factor is used to electronically adjust the machine’s speed so that it operates at the design speeds. This is important because it helps to ensure that the actual oil patterns are consistent with the expected oil patterns. **Before using this function, ensure that all cleaner pad and vacuum head adjustments have been made and that the pad is normally wet.** The “drag” created by these components should be as close to normal as possible to ensure accurate results.

**RUN WITH FACTOR?
0-NO 1-YES MENU-QUIT**

When you select this function, this initial screen is displayed:

The first run should be made without a correction factor. During this run the machine monitors the time it takes to make the programmed run and then compares this time with an expected goal that has been determined and programmed at the factory. Depending on the actual time it takes to complete the run, a speed factor of 1.00 ± 0.25 is calculated. This number is factored into the variable speed drive motor’s speed control circuitry so that the machine runs at its rated speeds.

**CURRENT FACTOR: X.XX
PUSH START**

Press “0” to calculate a speed factor. This message is displayed:

Where **X.XX** is a number between 0.75 and 1.25.

Press the machine’s **START** button. The machine will make a single pass in the strip-only mode. The machine will strip at medium speed and then shift to high speed for the return to the foul line. When the run is completed, the screen displays this message:

**GOAL-TT ACTUAL-TT'
NEW FACTOR: X.XX**

Where:

TT is the time, in seconds, that *should* elapse during the run if the machine is traveling at its design speeds,

TT' is the time, to the nearest second, that it actually took to complete the run, and

X.XX is the calculated speed factor based on the just-completed run.

Once the speed factor has been determined, another run with the speed factor inserted in the control circuitry should be made. Pressing any key returns you

to the initial screen. This second run is used to verify that the calculated speed factor is accurate.

Press “1” to run with the speed factor.

Press the machine’s **START** button. The machine will operate as before; running down the lane in the strip-only mode and returning at high speed. The machine then displays this message:

GOAL-TT ACTUAL-TT'

If the actual time differs from the goal by more than \pm one second, repeat this process from the beginning. Once the actual time is within one second of the goal, you can use Menu Function 84, Edit Speed Factor, to adjust the speed factor so that the actual time equals the goal, if desired. **WE RECOMMEND THAT ADJUSTMENTS TO THE SPEED FACTOR BE LIMITED TO INCREMENTS OF A FEW HUNDREDTHS AT A TIME.**

Press the **MENU** key to exit this function and return to the **Ready Display**.

CAUTION



SETTING LARGE SPEED FACTORS CAN RESULT IN THE MACHINE RUNNING OFF THE END OF THE LANE AT HIGH SPEED, DAMAGING THE LANE MACHINE, THE PINSPOTTER, OR BOTH!

EDIT SPEED FACTOR - MENU FUNCTION 84

Use this function to fine-tune the speed factor so that the machine runs as close to the design speeds as possible. Once a speed factor has been calculated and you have completed a run *with* the speed factor, you can use this function to achieve an actual run time that is equal to the goal used to determine the speed factor (see Menu Function 83, Calculate Speed Factor).

CURRENT FACTOR: X.XX
FACTOR: X.XX'

When you select this function, this screen is displayed:

Where **X.XX** is the current speed factor and **X.XX'** is a number that is editable and can be used to manually set the speed factor.

To decrease the speed of the machine because the runtime was less than (faster than) the goal, decrease the new speed factor using the **DOWN ARROW SCROLL** key or enter the number directly from the number keypad. **WE RECOMMEND THAT ADJUSTMENTS TO THE SPEED FACTOR BE LIMITED TO INCREMENTS OF A FEW HUNDREDTHS AT A TIME.**

To Increase the speed of the machine, increase the speed factor using the **UP ARROW SCROLL** key or the number keypad.

The maximum allowable manual setting is 1.25, and the minimum is 0.75.

Press the **MENU** key to exit and return to the **Ready Display** without saving the new speed factor.

Press **ENTER** to save the new speed factor and return to the **Ready Display**.

CAUTION



SETTING LARGE SPEED FACTORS CAN RESULT IN THE MACHINE RUNNING OFF THE END OF THE LANE AT HIGH SPEED, DAMAGING THE LANE MACHINE, THE PINSPOTTER, OR BOTH!

HVO SUMMIT or MAGNUM SELECT – MENU FUNCTION 85

This function is available starting with software version 8.1a. HVO technology and is being made available as an upgrade to Silver Bullet® Magnum owners and is standard on HVO Summit and HVO Summit S-Series, lane machines. Use this function to select the type of machine you have – either the HVO Summit S-Series or the HVO Magnum. The two machines have different operating speeds, and unless the appropriate machine is selected, the actual oil profiles will not match the expected oil profiles. The software’s default selection is HVO Summit S-Series. You should use this function to change the machine type if the Scrolling Marquee on the display does not match your machine type. Note, that the setting is the same for the new HVO Summit S-Series lane machine and the HVO Summit.

**MENU FUNCTION: 85
HVO MAGNUM**

When you select this function for the first time, the message at the left is displayed:

Since the software’s default machine type is HVO Summit S-Series, the alternate selection, HVO Magnum, is displayed. To select HVO Magnum as your machine type, press the **ENTER** key. The display message changes as shown here:

**SPEEDS MIGHT CHANGE
0-NO 1-YES MENU-QUIT**

This screen informs you that the machine speeds will change if you change the current machine type and provides you with the opportunity to either continue or quit without making changes.

To select the HVO Magnum as your machine type, press **“1”**. The Scrolling Marquee on the Ready Display, which initially read *HVO Summit* changes to *HVO Magnum* to indicate the machine type selected.

To quit without making any changes, press **“0”** or the **MENU** key.

The screen returns to the **Ready Display**.

To select HVO Summit S-Series as the machine type, repeat the above steps. Note that HVO Summit is shown but will cover both regular and S Series with 9.0 and higher software.

VACUUM HEAD SHAKE 1, 2, or 3 - MENU FUNCTION 86

With the introduction of version 9.0 software you can now select whether to have your machine shake the Vac Head up to three times. This may be needed if you have excessive cleaner build up due to very high amounts of lane oil. This is a global function for all lane conditioning programs.

MENU FUNCTION: 86
VAC HEAD SHAKE

When you select this function the message at the left is displayed:

VAC HEAD SHAKE
PRESS 1, 2, or 3

Press the **ENTER** key and you will see the menu display as shown to the left. Select either 1, 2, or 3 shakes. This is to allow more shaking if your cleaner usage is high or the cleaner pad stays down through the pin deck, and you find that cleaner drips from the Vac Head on the return pass. The factory default setting is one (1).

CLEANER PRE-STOP DISTANCE - MENU FUNCTION 87

This function was introduced to control the **HVO Summit S-Series** spray cleaning method only. This function is not active when in Drip mode. Since the cleaner sprays 3 to 4 feet ahead of the machine, it could spray the pins or spray cleaner into the pit if the machine sprayed to the same distance that is used to control the action of the cleaner pad. This function inserts an offset from the cleaner pad pickup distance that determines where the machine will stop spraying. For example, if the cleaner pad distance is set at 61.5 feet, and the PRE-STOP distance is set at 6.0 feet, the machine will stop spraying cleaner at 55.5 feet. This is a global function that affects all lane conditioning programs.

MENU FUNCTION: 87
CLEANER PRE-STOP

When you select this function the message at the left is displayed:

CLEANER PRE-STOP
DISTANCE: XX.X

Press the **ENTER** key and you will see the menu display as shown to the left:

Where **XX.X** represents the distance to stop the cleaner spray prior to picking up the cleaner pad. Using the keypad, input a distance from 00.0 to 10.0 feet.

CLEANER PRE-START DISTANCE - MENU FUNCTION 88

This function was introduced to control the **HVO Summit S-Series** spray cleaning Method and in **BACK LANE** cleaning mode only. This function is not active when in Drip mode. Since the cleaner sprays 3 to 4 feet ahead of the machine, you will need to start the cleaner spray prior to the cleaner pad start distance when cleaning the back end of the lane only. For example, if the cleaner pad back lane start distance is 39.5 feet, and the PRE-START distance is 3.0 feet, then the cleaner will turn on at 36.5 feet. This is a global function for all lane conditioning programs.

**MENU FUNCTION: 88
CLEANER PRE-START**

When you select this function the message at the left is displayed:

**CLEANER PRE-START
DISTANCE: XX.X**

Press the **ENTER** key and you will see the menu display as shown to the left:

Where **XX.X** represents the distance to start the cleaner spray prior to engaging the cleaner pad. Using the keypad, input a distance from 00.0 to 10.0 feet.

CLEANER PRE-LOAD - MENU FUNCTION 89

This function was introduced in Software Version 9.0 to assist the HVO Summit Drip cleaning method only. This function is not active when in spray mode. Since there is a greater amount of oil on the lanes these days, you may need to preload the cleaner pad to be ready for the next lane. On the last pass reverse, the cleaner turns on for the last few feet with the In Oil cleaner percentage from the current program. This is a global function for all the 20 programs.

**MENU FUNCTION: 89
CLEANER PRE LOAD**

When you select this function the message at the left is displayed:

**0 - OFF, 1 - ON
MENU - QUIT**

Press the **ENTER** key and you will see the menu display as shown to the left:

Using the Keypad, input ether 0 to turn off the Cleaner Pre-load (default) or Press 1 to turn on the Cleaner Pre-load.

SET SWITCH TYPE - MENU FUNCTION 90

Use this function to set the type of start switch to be used. The *HVO Summit S-Series* is equipped with both a side-mounted start switch and a handle-mounted start switch.

SET START SWITCH
TYPE: YYYYYYYYYY

When you select this function, this message is displayed:

Where **YYYYYYYYYY** is either **HANDLE** or **SIDE SWITCH**. **HANDLE** is the default setting. The *HVO Summit S-Series* must use the **HANDLE** setting. Both start switches will function in this mode. Some earlier models without handle start switches that have been updated with HVO technology have side start switches that differ from the Summit's. These machines must use the **SIDE SWITCH** setting to function properly. Use the **UP** or **DOWN ARROW** keys to toggle between switch types.

To save the new switch type selection, press the **ENTER** key. To exit this function without saving any changes, press the **MENU** key. The following message is displayed briefly before the screen returns to the **Ready Display**.

START SWITCH TYPE IS
YYYYYYYYYY

Where **YYYYYYYYYY** is the current setting, either **HANDLE** or **SIDE SWITCH**.

TEST FUNCTION - MENU FUNCTION 91

Use this function to test individual components and switches. This function can be very valuable in debugging problems that may occur with the machine. Pressing the number or scroll keys on the keypad energizes the associated component. When the key is released, the component deenergizes.

S:YYY R:YYY M:YYY

When you select this function, this message is displayed:

Where **S** represents the **Start** switch, **R** represents the **Reversing** switch, **M** represents the **Manual Reverse** push button, and **YYY** is either **ON** or **OFF**.

To test the **START**, **REVERSING**, and **MANUAL REVERSE** switches, actuate the switch while viewing the display. If the switch is operating properly, the indication for that switch will change from **OFF** to **ON**. Test both **START** switches separately.

S:YYY R:YYY M:YYY
RATE: _20%

To set the rate at which the drive motor, transfer roller motor, and cleaner flow are to be tested, press the **Next** key. The screen now displays:

Twenty percent is the default setting. Use the scroll keys or the number keys to set the desired rate. When the drive motor, transfer motor, or cleaner flow is tested, they will operate at this percentage of full speed or flow. When the

ADJUSTMENT FUNCTIONS

drive motor is tested, it does not start at full speed, but ramps up to prevent spinning the wheels on an oiled surface. **It is important to note that the Shut Off Arm will not function to stop the drive motor in the reverse direction during testing! To stop the drive motor while testing it in either direction, remove your finger from the UP or DOWN Arrow key.**

The following list shows the association between the keypad keys and the machine components when being tested in this menu function.

KEY	COMPONENT
1	Buffer Motor
2	Outside Oil
3	Track Oil
4	Center OIL
5	Transfer Motor
6	Vacuum Motor
7	Vacuum Head
8	Cleaner Pad
9	Cleaner Pump
0	Alarm Speaker
▲	Drive FWD _0.0
▼	Drive REV _0.0

S:YYY R:YYY M:YYY
YYYYYYYYYYYYYY

When a key is pressed, the display changes as shown here:

Where YYYYYYYYYYYYYY is the description of the component being tested. When the scroll keys are used to test the drive motor, an additional indication is displayed. This indication shows the distance (in feet) that the machine travels while the drive motor is being tested. This additional indication allows testing the encoder (counter wheel) simultaneously with the drive motor.

When component testing is complete, press the **MENU** key.

The screen returns to the **Ready Display**.

SATURATE - MENU FUNCTION 92

It may be necessary to saturate the buffer brush with conditioner prior to each use of the *HVO Summit S-Series*. After each use, the buffer brush should be

ADJUSTMENT FUNCTIONS

cleaned with a cloth that has been dampened with the same lane dressing being used to dress the lanes.

Prior to making this adjustment:

- The buffer brush and dressing tanks must be installed in the machine.
- The buffer brush pressure should have been adjusted properly.
- The calibration and tank alignment for the dressing tanks should have been completed.
- The *HVO Summit S-Series* should be at the foul line in the normal operating position.

RATE: %%%

When you select this function, this message is displayed:

Where %%% is the percentage of the maximum oil transfer rate.

PUSH START

Enter the desired transfer rate and press **ENTER**. The display changes to read:

PUSH STOP TO END

To proceed with saturation, press the machine's **START** button twice. The machine remains at the foul line while oil transfers from the dressing tank felts to the transfer roller and onto the buffer brush. At the same time, this message is displayed:

The saturation time is determined by the operator. To stop saturation move the **Shut Off Arm** forward.

The screen returns to the **Ready Display**.

ADJUST OIL - MENU FUNCTION 93

This adjustment command is used to align the dressing tanks in the machine as well as to "rough" calibrate the dressing tanks for the desired oil pattern.

Prior to making this adjustment:

- The buffer brush should be installed in the machine *and properly adjusted*.
- Lane dressing should be in the dressing tanks.
- The dressing tank felts should be wet with lane dressing.
- The *HVO Summit S-Series* should be at the foul line in the normal operating position.

PUSH START

When you select this function, the screen displays this message:

PUSH STOP TO END

To proceed with the oil adjustment, press the **START** button twice. The *HVO Summit S-Series* does not travel down the lane. It remains in position with the buffer brush engaged and rotating against the lane surface and the oil tanks engaged against the oil transfer roller. During this time the lane machine displays this message:

For adjustment specifics, refer to the adjustment section of the Summit's Operating, Maintenance, and Parts Manual.

After making the necessary adjustments, move the **Shut Off Arm** forward. This deactivates the machine components, and the screen returns to the **Ready Display**.

ADJUST BUFFER - MENU FUNCTION 94

Prior to making this adjustment:

- The buffer brush should be installed in the *HVO Summit S-Series*.
- The buffer brush should be normally oily.

If the buffer brush is adjusted while dry, recheck the adjustment after the buffer brush has been used to oil several lanes.

PUSH START

When you select this function, this message is displayed:

ADJUSTMENT FUNCTIONS

DWN KEY:ENGAGE BUFF
MAN REV=RTN TO HOME

To proceed with the buffer adjustment, press either **START** button twice. The *HVO Summit S-Series* will begin to travel down the lane. At a distance of 12 feet from the foul line, the machine will stop and display this message:

DWN KEY:ENGAGE BUFF
UP KEY: RELEASE BUFF

Press the **DOWN ARROW** key to engage the buffer brush against the lane surface. At this time the message displayed on the screen changes to read:

The user may press the **UP** or **DOWN ARROW** keys as desired while making adjustments or taking measurements. The displayed message will alternate between the two shown here as the buffer brush is raised or lowered.

For adjustment specifics, refer to the adjustment section of the Summit's Operating, Maintenance, and Parts Manual.

RTN TO FOUL LINE

After making the necessary adjustments, or to cancel this adjustment at any point in the cycle, press the **Manual Reverse** push button. The machine then displays this message:

The buffer brush disengages from the lane surface (if it is in contact with it), the lane machine returns to the foul line at slow speed, and the screen returns to the **Ready Display**.

ADJUST CLEANER PAD & VACUUM HEAD - MENU FUNCTION 95

Prior to making this adjustment:

- The vacuum head and the cleaner pad must be installed in the *HVO Summit S-Series*
- The cleaner pad should be normally wet with the cleaner being used.
- The *HVO Summit S-Series* should be positioned at the foul line in the normal operating position.

PUSH START

When you select this function, the screen displays this message:

MAN REV = RTN HOME

To proceed with the cleaner pad adjustment sequence, press either machine **START** button twice. The screen changes to display this message:

The *HVO Summit S-Series* will begin to travel down the lane. At a point 35 feet from the foul line, both the vacuum head and the cleaner pad will engage against the lane surface, and the machine will travel an additional two feet from that point before stopping. The extra travel ensures that both the vacuum head and cleaner pad are engaged against the lane as they would be during forward travel of the machine during a stripping cycle.

For adjustment specifics, refer to the adjustment section of the Summit's Operating, Maintenance, and Parts Manual.

RTN TO FOUL LINE

After making the necessary adjustments, or to cancel the adjustment, press the **Manual Reverse** push button. The screen displays this message while the lane machine returns to the foul line:

The screen then returns to the **Ready Display**.

CLEANER PRESOAK - MENU FUNCTION 96

This function is applicable to both the spray and drip Summit machines. For the drip system, the cleaner pad is presoaked for 30 seconds. This function is not to be used in place of storing the cleaner pad in the storage container when not in use. For the spray system, cleaner is sprayed on the lane for 30 seconds and is used to adjust the spray nozzles.

RATE: %%%

When you select this function, this message is displayed:

Where %%% is the percentage of the maximum cleaner flow available.

To change the cleaner flow rate to be used for the presoak, use the **SCROLL** keys to scroll to the desired number, or enter the number directly from the number keypad. The available range is 0 to 100%.

PUSH START

When the desired number has been entered, press **ENTER**. The display changes as shown here:

TT SECONDS LEFT
PUSH STOP TO END

To start cleaner flow, press the **START** button twice. The message on the display changes as shown at the left.

Cleaner flows at the selected rate for 30 seconds and then stops. The time remaining is displayed and counted down on the screen. At the end of 30 seconds, the screen returns to the **Ready Display**.

CLEANER DRIP or SPRAY - MENU FUNCTION 97

This Function was introduced in Version 9.0 to select between the new improved *HVO Summit S-Series* (Spray Cleaner) or older machines as in the HVO Summit (Drip cleaner), Magnum (Drip Cleaner), or Silver Bullet V⁴ (Drip Cleaner). The default is the SPRAY mode. The customer with an *HVO SUMMIT S-Series* or an upgrade machine with the new spray system will not have to adjust this setting if the control box has version 9.0 or higher software.

This function will need to be set if you received an EPROM with Version 9.0 or higher software as part of an upgrade to an existing machine.

MENU FUNCTION: 97
CLEANER DRIP/SPRAY

When you select this function, the message at the left is displayed:

0 - DRIP, 1 - SPRAY
MENU - QUIT

Press the **ENTER** key and you will see the menu display as shown to the left. Using the keypad, input ether 0 to select the DRIP mode or 1 to turn on the SPRAY mode. Pressing the MENU button will quit the function.



LANE RECOVERY

The *HVO Summit S-Series* has an automatic **LANE RECOVERY** feature that covers two situations: **POWER FAILURE** and **DRIVE TIMEOUT**.

POWER FAILURE

If power to the machine is disconnected for any reason during operation, the *HVO Summit S-Series* recalls the program it was running as well as where it was on the lane when power was disconnected.

0 = RTN TO FOUL LINE

Upon power-up following a power failure, this message is displayed:

Enter “0” to return to the foul line and repeat the lane that was being maintained when the power failed. After entering “0” there is a delay of approximately two seconds before the machine begins to move so that the operator can move out of the way.

When the lane machine reaches the foul line, the screen returns to the **Ready Display**.

DRIVE TIMEOUT

DRIVE/ENCODER ERROR!
PRESS ANY KEY

If the lane machine becomes stuck on the lane for any reason while the drive motor is engaged, the *HVO Summit S-Series* will stop (*timeout*), beep three times, and display this message:

1 = RESTART
0 = RTN TO FOUL LINE

Pressing any key results in a second message being displayed. Enter “1” to continue with the program, or “0” to return to the foul line and repeat the lane that was being maintained when the lane machine became stuck. When the lane machine is finished, the screen returns to the **Ready Display**.

This page intentionally left blank

NOTES

NOTES