



# Knights-Trak II Tunnel-Relay Programming Manual

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**CAUTION: Wear protective clothing and eyewear when dispensing chemicals or other materials. Observe safety handling instructions (MSDS) of chemical mfrs.**



**CAUTION: To avoid severe or fatal shock, always disconnect main power when servicing the unit.**



**CAUTION: When installing any equipment, ensure that all national and local safety, electrical, and plumbing codes are met.**

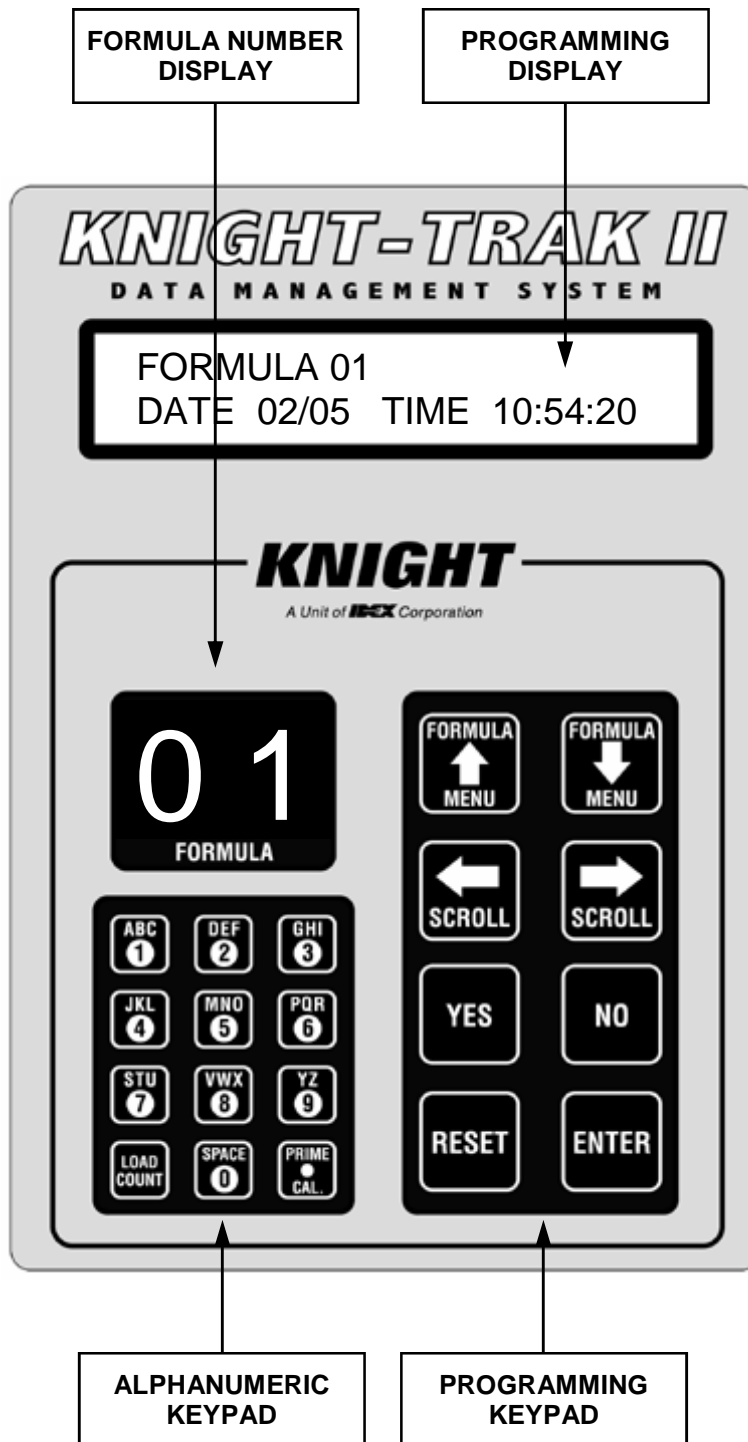
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## MENU MAP

<b>1</b> *** <b>DISPENSER</b> *** <b>MEMORY FUNCTIONS</b>	<ul style="list-style-type: none"><li>• Clear pump run times</li><li>• Clear sum/cycle report memory</li><li>• Clear load counter</li><li>• Clear setup information</li><li>• Load setup file</li></ul>
<b>2</b> *** <b>DISPENSER</b> *** <b>SETUP ROUTINES</b>	<ul style="list-style-type: none"><li>• Change ID and main access code</li><li>• Set date and time</li><li>• Select unit of measure</li><li>• Setup auto formula select</li><li>• Select load count pump</li></ul>
<b>3</b> *** <b>DISPENSER</b> *** <b>REPORT SETUP ROUTINES</b>	<ul style="list-style-type: none"><li>• Change user access code</li><li>• Setup report name</li><li>• Change chemical names and costs</li><li>• Change formula names and weights</li><li>• Set shift times</li><li>• Set washer capacity</li><li>• Set number of modules</li></ul>
<b>4</b> *** <b>DISPENSER</b> *** <b>MAINTENANCE SCHEDULE</b>	<ul style="list-style-type: none"><li>• Date dispenser installed</li><li>• Date tubes last changed</li><li>• Date tubes last lubed</li></ul>
<b>5</b> *** <b>DISPENSER</b> *** <b>PROGRAMMING ROUTINES</b>	<ul style="list-style-type: none"><li>• Calibrate pumps</li><li>• Prime pumps</li><li>• Set pump flow rates</li><li>• Program pump run times</li></ul>
<b>6</b> *** <b>DISPENSER</b> *** <b>PRINTING FUNCTIONS</b>	<ul style="list-style-type: none"><li>• Print reports on-site</li><li>• Save files to RM-6000</li></ul>
<b>7</b> *** <b>DISPENSER</b> *** <b>PUMP TEST ROUTINES</b>	<ul style="list-style-type: none"><li>• Prime pumps</li></ul>
<b>8</b> *** <b>DISPENSER</b> *** <b>DIAGNOSTIC ROUTINES</b>	<ul style="list-style-type: none"><li>• Test SIB/LMIB signal inputs</li><li>• Perform SIB noise test</li></ul>

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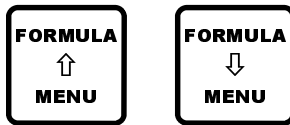
## LFP-6000 KEYPAD DIAGRAM



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## LFP-6000 KEYPAD DESCRIPTIONS

The LFP has been designed "USER FRIENDLY". The only two (2) keys you need to know are the MENU ↓ and ENTER. Pressing either key will advance you through the screens. Read the screens and respond with one of the buttons below.



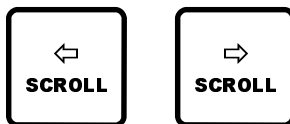
The MENU (DOWN) and MENU (UP) buttons allows you to move down and up through the menu selections and pick what you want to do. Operators can use them to select formulas as well.



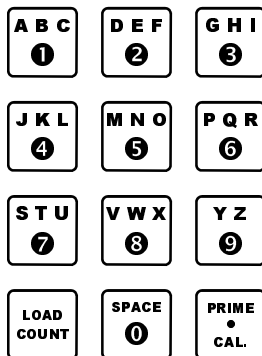
The ENTER key acknowledges input data and logs it into memory. It also takes you into a menu for programming.



The YES and NO keys allow you to pick whether you want to do something or not in the various menu prompts that you will see when programming the system.



The SCROLL keys allow you to move through a particular menu screen, and pick one of several items to change (like characters on a screen, etc).



The alphanumeric keys allow you to input numbers and letters. By repeatedly pressing any key, any of the letter characters (as well as the numeric character) can be entered into the menu selection you are working on. The PRIME/CAL key (lower right corner) can be used to switch units of measure between ounces and gallons when in U.S. or Imperial units, or between milliliters and liters when in metric units, when auto-calibrating or manually setting flow rate (only). Its also used for priming/calibrating functions. The LOAD COUNT key (lower left corner) shows how many times the load count pump was signaled.



The RESET key performs a number of functions. From any main menu selection, pressing the RESET key LOCKS YOU OUT and returns the screen to the main display. From any screen *within* a main menu that allows you to adjust something (i.e. setting a flow rate), pressing the RESET key takes you back to *that* main menu selection. **Subsequently, RESET can be used to halt pump operation; as desired or in an emergency situation.**

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## USER DISPLAY DESCRIPTIONS

### KNIGHT-TRAK II TUNNEL RELAY SYSTEM

When the LFP is powered up, the display will initially show the image at the left. After a few seconds, the display will change to the example shown below.

### FORMULA 01 DATE 02/05 TIME 10:54:20

The “main display” screen shows the current formula selected (by name) as well as the date and time.

### FORMULA 01 \ PUMP-01

When there is pump activity, the display will show which pump is running.

When the pump is finished, the display will return to its previous appearance.

## OPERATION

- The tunnel washer programming controls all chemical dosages. Each chemical pump will run for as long as its respective trigger signal is energized by the washer's controller.
- The Knight-Trak II LFP monitors the dispensing duration of each chemical pump and records cumulative totals in the cycle tracking memory. Product usage can then be calculated based on the flow rate for each individual pump.
- Load counts are tallied for each formula based on the number of times the load count pump was signaled for each wash formula chosen during operation.

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## GETTING STARTED

Knight Trak II programming is done through the use of menu selections. Any menu can be entered by pressing the ENTER button, or exited by pressing RESET (or in some cases MENU ↓ or ↑). Its that simple! Each of the main menu headings give an idea of what information can be found, entered, or changed. Within each main menu selection are several screen "prompts" that walk you through the complete programming process step-by-step.

Below is an example of the main display when you are not in the programming menus. The main display is more commonly referred to as the *default display*, and appears when the system is in normal operating mode.

<b>FORMULA 01</b> <b>DATE 05/11</b> <b>TIME 14:32:54</b>	The default display shows the formula name on the top line. The bottom line of the display will show the current date and time.  From the default display, you must enter the main access code (following) to begin programming.
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## ACCESS CODES

The Knight Trak II system has two access codes for protection:

- The "main" access code, allows entry into ALL of the menus and functions of the system.
- The "user" access code allows entry into menus 6 — 8 ONLY, without the ability of changing programmed information.
- Systems are shipped from the factory with both access codes set to zero. Only a person with the "main" access code can change the "user" access code. (changing codes is explained later in this manual). If desired the two access codes can be the same, however the user will then have access to ALL of the functions of the system, including the ability of changing programmed information.

## TO PROGRAM DISPENSER PRESS "ENTER" ...

<b>ENTER ACCESS CODE THEN PRESS ENTER</b>	From the default display shown above, press the ENTER button. The screen at left should appear. If the screen at left does not appear, wait 2 seconds, press RESET, then press ENTER.  When you see the screen at left, type in the access code and press ENTER. Remember, for a new system, the access code will be zero (until you change it later).  Follow the programming steps for each section, starting on the next page.
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## IMPORTANT NOTES:

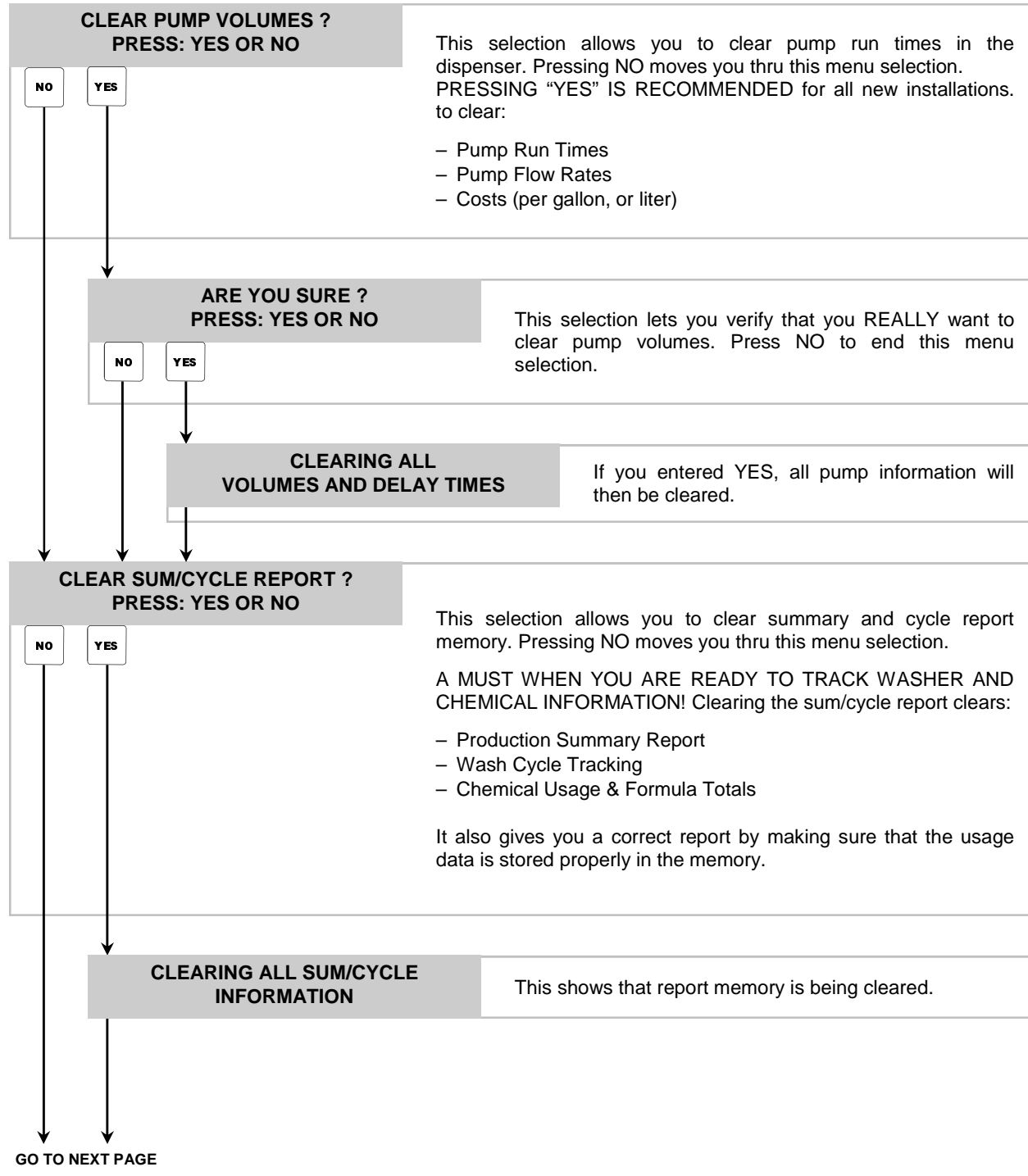
- Its recommended to clear memory prior to initial programming. See MEMORY FUNCTIONS [menu 1] for details.
- Its recommended to print the setup report each time its changed. See PRINTING FUNCTIONS [menu 6] for details.
- If at any time you get lost in the programming and are not sure what to do, press the RESET button until the section menu heading appears, then proceed.

# 1

## \*\*\* DISPENSER MEMORY FUNCTIONS \*\*\*

- Clear pump run times
- Clear sum/cycle report memory
- Clear load counter
- Clear setup information
- Load setup file

IMPORTANT: Dispenser memory must be cleared when programming a new dispenser. Press ENTER to enter the menu or MENU ↓ to skip to the next main menu.

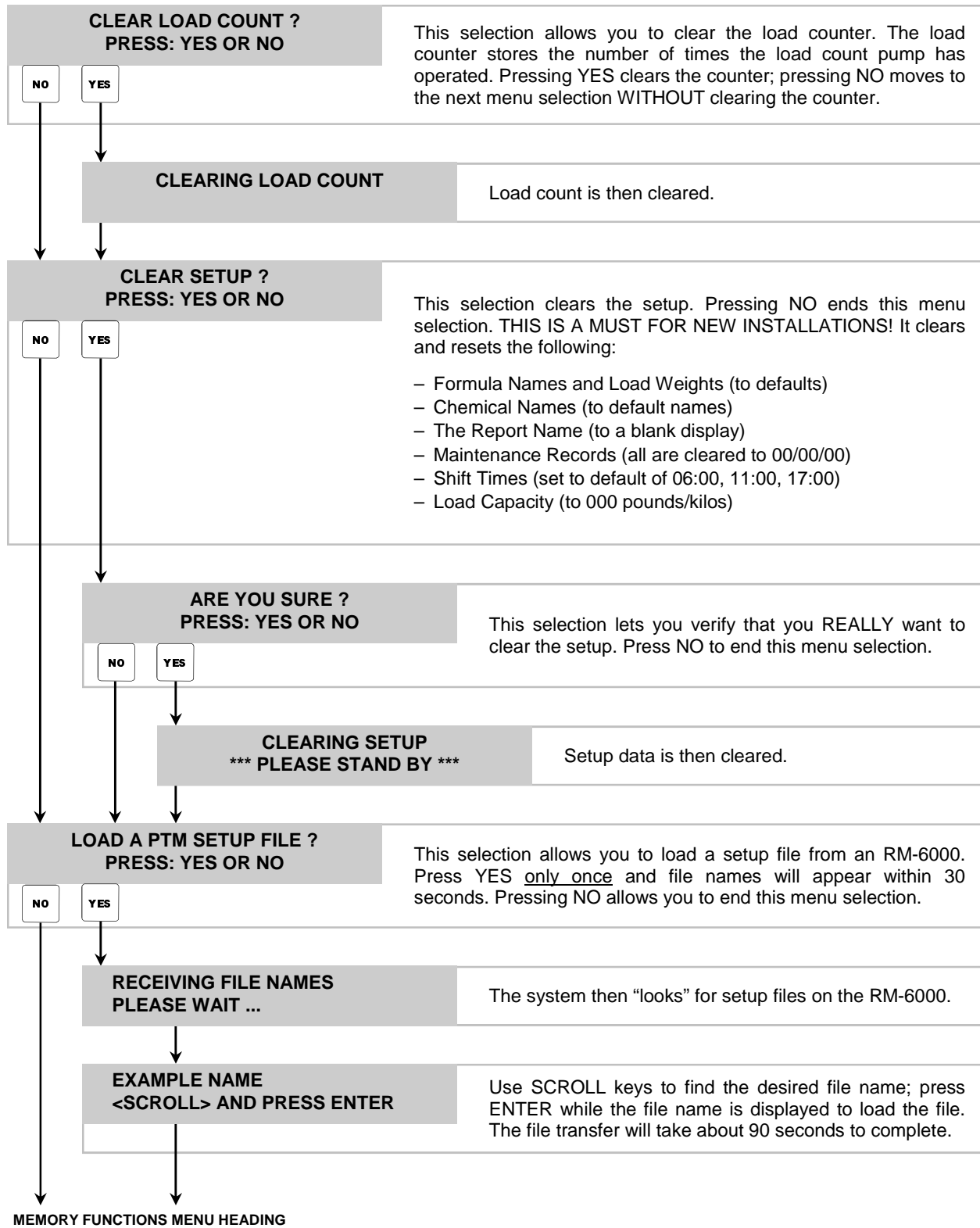




# 1

## \*\*\* DISPENSER \*\*\* MEMORY FUNCTIONS

• Continued



## 2

### \*\*\* DISPENSER SETUP ROUTINES \*\*\*

- Change ID and main access code
- Set date and time
- Select unit of measure
- Setup auto formula select
- Select load count pump

#### CHANGE DISPENSER ID# ? PRESS: YES OR NO

NO YES

This selection allows you to change the ID of the dispenser you are presently communicating with. Set your dispenser ID's so that they correspond with the washer numbers. Pressing NO allows you to move through the menu selection.

In a "multilink" where several dispensers at the same installation site are connected together, be sure that each dispenser has its own unique ID number. IF MORE THAN ONE SYSTEM HAS THE SAME ID NUMBER, COMMUNICATION ERRORS WILL RESULT. Before multilinking, give EACH dispenser a separate ID number. More details on multilinking can be found in the Knight-Trak II System Installation Manual.

#### NEW DISPENSER ID# 00 THEN PRESS ENTER

If you entered YES, the LFP will ask for the new ID number of the dispenser. Use the number keys to enter the new data, and press ENTER when done. Press MENU ↵ to move through the menu selection.

#### CHANGE MAIN ACCESS CODE ? PRESS: YES OR NO

NO YES

This selection allows you to change the main access code. The main access code allows access to ALL menu selections and functions of the Knight-Trak II System. Pressing NO allows you to move through the menu selection.

#### MAIN ACCESS CODE = 000 THEN PRESS ENTER

If you entered YES, the LFP will ask for the new main access code. Use the number keys to enter the new data, and press ENTER when done. Press MENU ↵ to move through the menu selection.

TIP: If access codes are changed, keep a record of the changes in a safe place in the event that access codes are forgotten. If the record of the code changes becomes misplaced, contact Knight Technical Service for assistance at 1-800-854-3764.

GO TO NEXT PAGE

**SET DATE & TIME ?  
PRESS: YES OR NO**

NO

YES

This selection allows you to change the current date and time for the dispenser (as shown on the main display screen). Pressing NO allows you to move through the menu selection.

NOTE: All multilinked dispensers will change their clocks when any one of them are set. This allows you to "synchronize" the date and time settings for an entire dispenser network in one step.

HOUR 00	MINUTE 00
MONTH 00	DAY 00
	YR 00

If you entered YES, you can set the current date and time. Use the keys to enter the new data, and press ENTER when done. Actual time of day is entered on a 24 hour clock cycle, just like military time. Press MENU ↓ to move through the menu selection.

An example of 24 hour (military time) is shown below:

11:45 A.M. = HOUR 11 MINUTE 45

12:00 P.M. = HOUR 12 MINUTE 00 (Noon)

1:01 P.M. = HOUR 13 MINUTE 01

11:59 P.M. = HOUR 23 MINUTE 59

12:00 A.M. = HOUR 00 MINUTE 00 (Midnight)

Always press ENTER after entering a new time of day.

**UNIT OF MEASURE = US**  
1=US 2=METRIC 3=IMPERIAL

This selection allows you to choose between US, Metric, or Imperial units of measure. Use the keys to choose the correct setting, then use MENU ↓ to move through this menu selection.

NOTE: For auto-calibrating or manually entering flow rates, default units are GALLONS or LITERS respectively (changing from gallons to ounces, or liters to milliliters is done by pressing the PRIME/CAL button).

GO TO NEXT PAGE

**AUTO FORMULA SELECT OFF**  
1 = OFF 2 = ON

1 2

This selection enables the Automatic Formula Select feature. This feature allows the washwheel controller to send signals to the Knight-Trak II dispenser and automatically select the correct wash formula. Washroom personnel no longer select formulas, thereby eliminating potential mistakes. Press 1 or 2 for the operation of your choice, then press MENU ↓.

**AUTO FORMULA MODE = MICRO**  
1 = CHART 2 = MICROPROCESSOR

1 2

Press 2 to ensure "micro" is the chosen machine type. Disregard "chart" option, as it does not apply to tunnel relay applications. Press MENU ↓ to continue.

**AFS TIME = 1 SEC**  
1=1SEC 2=2SEC 5=5 SEC

1 2 5

This selection allows you to select the AFS qualifying time for MICRO mode. For a 1 second qualifying time, a 1 second signal equals formula 1, 2 seconds equals formula 2, 3 seconds equals formula 3, etc. For a 2 second qualifying time, a 2 second signal equals formula 1, 4 seconds equals formula 2, 6 seconds equals formula 3, etc. For a 5 second qualifying time, a 5 second signal equals formula 1, 10 seconds equals formula 2, 15 seconds equals formula 3, etc.

Press 1, 2, or 5, for the qualifying time of your choice, then press MENU ↓.

**SELECT AUTO FORMULA**  
INPUT # 00 PRESS ENTER

This selection allows you to select an available signal input that will be used to enable the Automatic Formula Select feature. Enter the input signal number and press ENTER. Press MENU ↓ to move through the menu selection.

Auto formula inputs 1-15 correspond as follows:

- Inputs 1 thru 10 are the pump signal inputs on the SIB
- Input 11 is the door interlock signal on the LMIB
- Input 12 is the steam signal on the LMIB
- Input 13 is the drain signal on the LMIB
- Input 14 is the cold water signal on the LMIB
- Input 15 is to the hot water signal on the LMIB

GO TO NEXT PAGE

**AUTO FORMULA SELECT — HOW IT WORKS**

■ *MICRO MODE*: This is used for Automatically Selecting Formulas with washwheels that have microprocessor controllers.

To operate Micro Mode Automatic Formula Select, choose an available signal output from the microprocessor that will be dedicated to selecting formulas. Connect the signal from that output to the Automatic Formula Select input you designated using the LFP. Any unused SIB or LMIB input can be designated for Micro Mode Automatic Formula selection.

For a micro processor controlled machine, to change formulas, the FIRST signal to come from the controller must be on the Automatic Formula Select input line. The length of time this signal is applied will determine the selected formula.

**CHOOSE LOAD COUNT  
PUMP # 00 PRESS ENTER**

This selection shows which pump is being used to count loads. ALWAYS enter the first pump in the system that will receive a signal. When a cycle is run, the load count pump “stamps” the formula data into memory (for reports and other information). Enter the number of the load count pump (only pumps 1 – 9 can be selected) and press ENTER. Press MENU ↓ to continue.

The load count pump must be signaled on every formula for proper wash cycle tracking info and load counts.

SETUP ROUTINES MENU HEADING

### 3

## \*\*\* DISPENSER \*\*\* REPORT SETUP ROUTINES

- Change user access code
- Setup report name
- Change chemical names and costs
- Change formula names and weights
- Set shift times
- Set washer capacity
- Set number of modules

#### CHANGE USER ACCESS CODE? PRESS: YES OR NO

This selection allows you to change the user access code. The user access code allows access to a limited number of menu selections within the Knight-Trak II system. Pressing NO allows you to move through this menu selection.

#### USER ACCESS CODE = 000 THEN PRESS ENTER

If you entered YES, the LFP will ask for the new user access code. Use the keys to enter the new data, and press ENTER when done. Press MENU ↓ to move through the menu selection.

#### CHANGE REPORT NAME ? PRESS: YES OR NO

The report name is what is printed on the report heading. Pressing NO allows you to move through this menu selection.



If you entered YES, you can change the report name (use the SCROLL and lettered keys to enter the new data, and press ENTER when done). Press MENU ↓ when finished to move through this menu selection.

TIP: Entering the report name in the center of the display window will center it at the top of the report.

#### CHANGE CHEMICAL NAMES PRESS: YES OR NO

This is the type of chemical for each pump on the dispenser. Pressing NO allows you to move through this menu selection.

PUMP 01  
PUMP-01

If you entered YES, you can change the chemical name for each pump (using the SCROLL and lettered keys to enter the new data). Press MENU ↓ to move through this menu selection.

TIP: First select the pump number on the top line and press ENTER...the current name for the pump you selected will be displayed on the bottom line. Then change the information on the bottom line and press ENTER again to lock-in the new pump name.

GO TO NEXT PAGE

**CHANGE PRODUCT COSTS ?  
PRESS: YES OR NO**

This menu selection allows you to change costs for each product. Pressing NO allows you to move through this menu selection.

NO

YES

**PUMP 01    \$00.00 /GALS**

If you entered YES, you can change the cost for each chemical (using the SCROLL and lettered keys to enter the new data). Press MENU ↓ to move through this menu selection.

TIP: First select the pump number on the left side of the display and press ENTER...the product cost for the pump you selected will be displayed on the right side. Then change the information on the right side and press ENTER again to lock-in the new product cost.

**CHANGE FORMULA NAME AND  
WEIGHT? PRESS: YES OR NO**

This menu selection allows you to change the formula names and load weight for each formula. Giving each formula a descriptive name makes the system more user-friendly. Load weights are used for data-tracking purposes to generate reports. Pressing NO allows you to move through this menu selection.

NO

YES

**FORMULA 01  
FORMULA 01**

If you entered YES, you will first change the formula names. When finished changing all formula names, press MENU ↓ to move on to the next display for changing load weights.

TIP: First select the formula number on the top line and press ENTER...the current formula name will be displayed on the bottom line. Then change the information on the bottom line and press ENTER again to lock-in the new formula name.

**FORMULA 01  
LOAD WEIGHT 000 LBS**

Now enter the load weight for each formula used. When finished changing load weights, press MENU ↓ to move on to the next menu selection.

TIP: First select the formula number on the top line and press ENTER...the current load weight will be displayed on the bottom line. Then change the information on the bottom line and press ENTER again to lock-in the new load weight.

GO TO NEXT PAGE

**3**

**\*\*\* DISPENSER \*\*\*  
REPORT SETUP ROUTINES**

• Continued

**WANT TO SET SHIFT TIMES ?  
PRESS: YES OR NO**

This selection allows you to enter the shift times (the start time for each work shift in the washroom) for the report. Pressing NO allows you to move through this menu selection.

**NO**

**YES**

**START TIMES**            **#1 06:00**  
                                 **#2 11:00**            **#3 17:00**

If you entered YES, you can change the start time for each washroom work shift. Use SCROLL and the numbered keys to enter the new data, then press ENTER. Shift times are entered on a 24 hour clock cycle (like military time). Press MENU ↓ to continue.

**WASHWHEEL LOAD CAPACITY  
000 LBS**

This selection allows you to enter the load capacity for the wash wheel that the dispenser is presently connected to. Use the keys to enter the new data, and press ENTER when done. Press MENU ↓ to continue.

**NUMBER OF MODULES 000**

This selection allows you to enter the total number of modules on the tunnel washer. Use the keys to enter the new data, and press ENTER when done. Press MENU ↓ to continue.

**REPORT SETUP ROUTINES MENU HEADING**



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**4****\*\*\* DISPENSER \*\*\*  
MAINTENANCE SCHEDULE**

- Date dispenser installed
- Date tubes last changed
- Date tubes last lubed

**DISPENSER INSTALLED  
00/00/00**

This selection allows you to enter the date that the dispenser was installed. (Use the SCROLL and number keys to enter the new data, and press ENTER when done). Press MENU ↓ to move thru this menu selection.

**SQUEEZE TUBES CHANGED  
PUMP 01 00/00/00**

This selection allows you to enter the date that the squeeze tubes were last changed. (Use the SCROLL and number keys to enter the new data, and press ENTER when done). Press MENU ↓ to move thru this menu selection.

**SQUEEZE TUBES LAST LUBED  
PUMP 01 00/00/00**

This selection allows you to enter the date that the squeeze tubes were last lubricated. (Use the SCROLL and number keys to enter the new data, and press ENTER when done). Press MENU ↓ to move on to the next menu.

↓  
MAINTENANCE SCHEDULE MENU HEADING

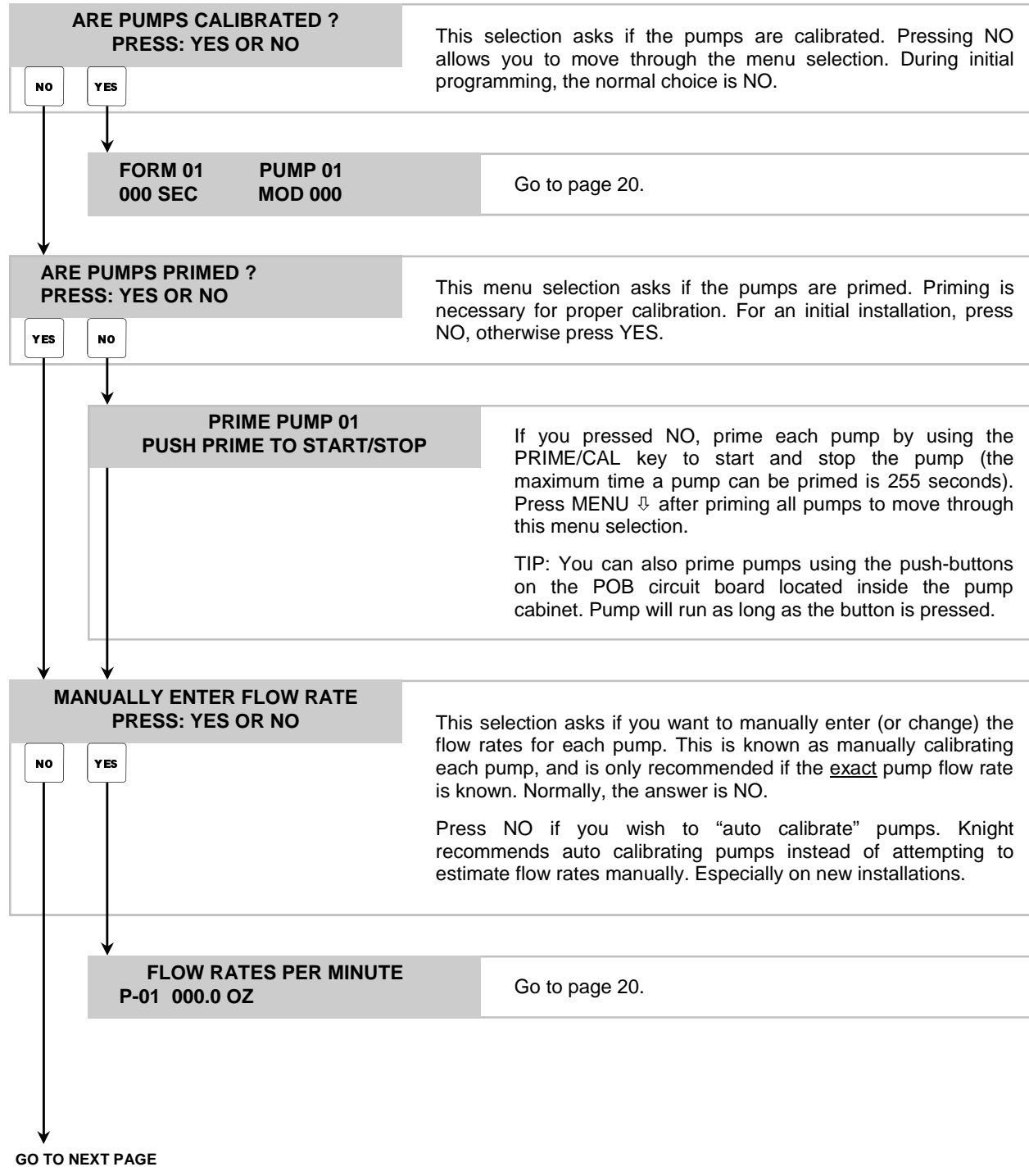
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# 5

## \*\*\* DISPENSER \*\*\* PROGRAMMING ROUTINES

- Calibrate pumps
- Prime pumps
- Set pump flow rates
- Program pump run times

IMPORTANT: Pump 10 cannot be used as a normal pump output. It is used to store load weight data in the cycle tracking memory for generating reports.



**CALIBRATE PUMP 01  
PRESS CAL. TO START/STOP**

This selection allows you to automatically calibrate each pump. Auto calibrate "teaches" the system the actual flow rate of the pump. Correct flow rates are important for accurately tracking the amount of chemical used.

Follow the steps below to auto calibrate the pumps. Use the **LARGEST** container possible (larger containers result in more accurate pump calibrations).

Place your empty container under the discharge tube of the pump you wish to calibrate.

Next, select the pump number and press the PRIME/CAL button to start the pump. Let the pump run for about 60 seconds, then press the PRIME/CAL button again to stop the pump. You will then see the following display...

**ENTER CALIBRATION  
VOL PUMPED = 000.0 OZS**

Check to see how much chemical was actually pumped and enter this amount as the VOL PUMPED (in OZ or ML only depending on the unit of measure selected in setup menu #2) then press ENTER. You will then see the following display...

GO TO NEXT PAGE

**5****\*\*\* DISPENSER \*\*\*  
PROGRAMMING ROUTINES**

• Continued

**FLOW RATES PER MINUTE  
P-01 000.0 OZ**

(*auto calibration continued*) The resulting flow rate from the previous step will be displayed. If you wish to re-calibrate the pump, or to calibrate other pumps, press MENU ↑ and repeat the auto calibration steps. Otherwise, press MENU ↓ to move on to the next menu selection.

NOTE: If you had entered YES to the “*manually enter flow rate*” prompt, use the SCROLL and numbered keys to enter the new data. Make sure the correct unit of measure is displayed; if it is not, use the PRIME/CAL key to change the unit of measure (OZS/GAL or MILS/LTRS). Press ENTER to lock-in the new flow rate. Press MENU ↓ to continue.

**FORM 01      PUMP 01  
000 SEC      MOD 000**

This menu selection allows you to enter pump run times and module assignments for the formulas you will use. The pumps will run for as long as the signal is present from the washer (relay operation) therefore entering run times in this menu is optional and for reference only. When finished programming, press MENU ↓ to move on to the next menu.

TIP: This selection can be used to *simply review* programmed formula settings. By entering the formula number and pump number, then pressing ENTER, the programmed run time and module assignment will be displayed.

TIP: To *change* the programmed information, first select the formula number and pump number on the top line then press ENTER (as mentioned above)...the current settings will be displayed on the bottom line. Then move the cursor to the bottom line and change the information, then press ENTER again to lock-in the new data.

NOTE: Each pump will inject chemical into a specific module, therefore, when a module assignment is programmed for a pump, the pump will always reference the same module. Multiple pumps can share the same module number.

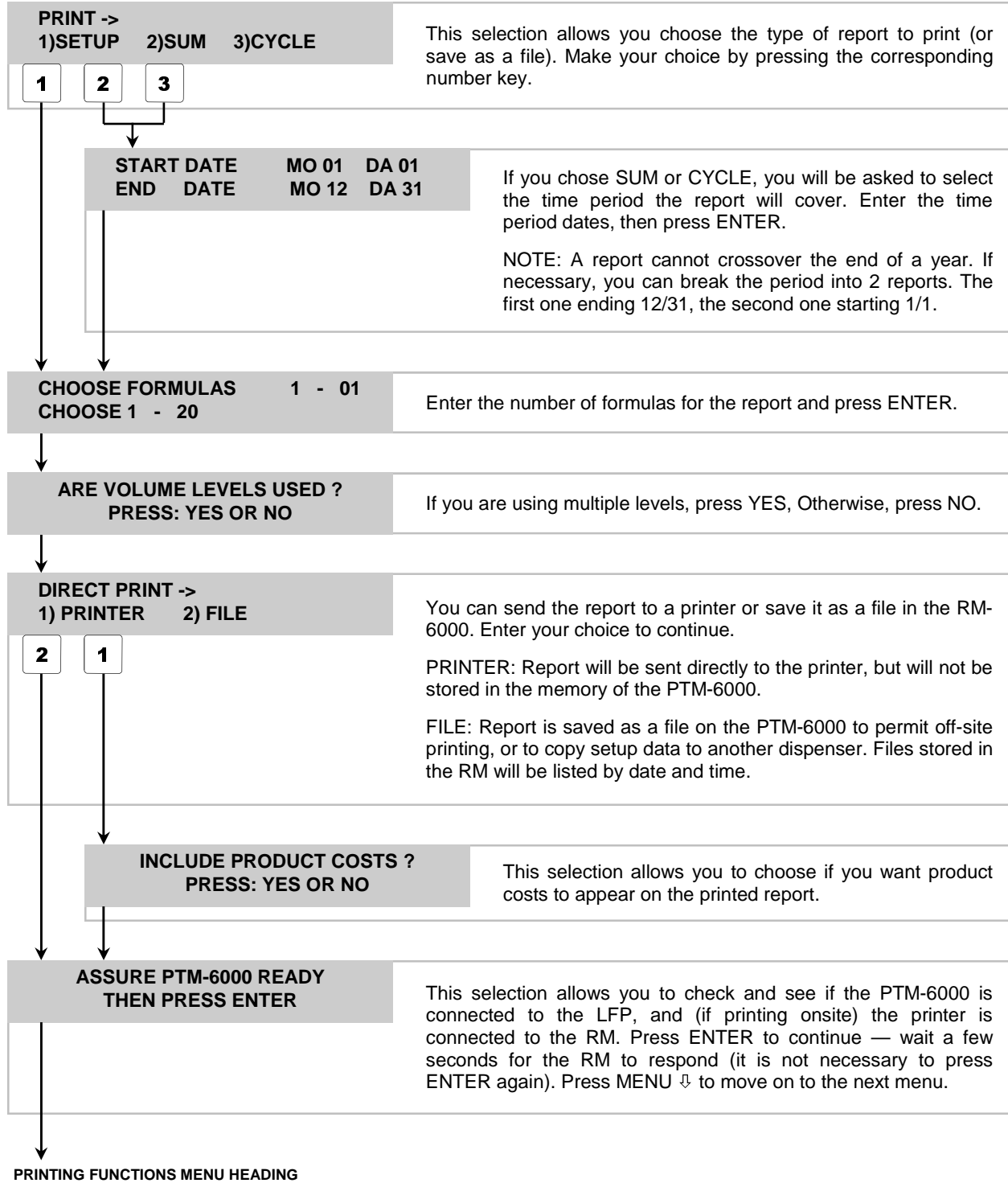
PROGRAMMING ROUTINES MENU HEADING

# 6

## \*\*\* DISPENSER \*\*\* PRINTING FUNCTIONS

- Print reports on-site
- Save files to RM-6000

**IMPORTANT:** Before entering this menu, make sure that your RM-6000 module is connected to the LFP. If printing on-site, make sure that your printer is connected to the RM-6000 as well.



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**7****\*\*\* DISPENSER \*\*\*  
PUMP TEST ROUTINES**

- Prime pumps

**PRIME PUMP 01  
PUSH PRIME TO START/STOP**

This selection allows you to prime a pump. Use the numbered keys to select the desired pump, then push PRIME /CAL to start the pump. Push PRIME/CAL again to stop the pump. Press MENU ↵ to move on to the next menu.

NOTE: The maximum time that a pump can run while priming is 255 seconds. After beginning to prime a pump, if the PRIME/CAL button is not pushed again to stop the pump, it will simply "time-out" after running for 255 seconds.



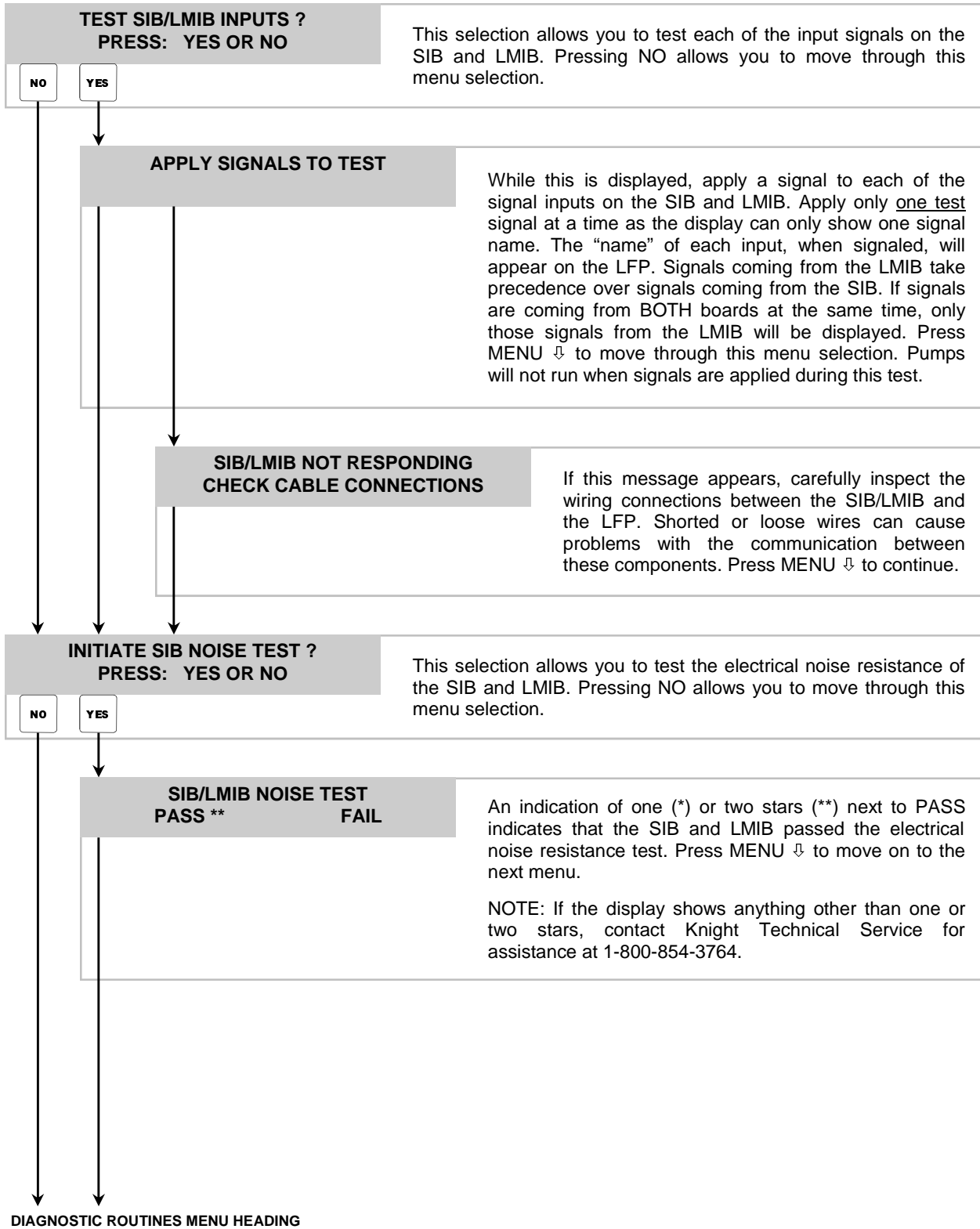
TEST ROUTINES MENU HEADING

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# 8

## \*\*\* DISPENSER \*\*\* DIAGNOSTIC ROUTINES

- Test SIB/LMIB signal inputs
- Perform SIB noise test



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## DISCLAIMER

Knight LLC does not accept responsibility for the mishandling, misuse, or non-performance of the described items when used for purposes other than those specified in the instructions. For hazardous materials information consult label, MSDS, or Knight LLC. Knight products are not for use in potentially explosive environments. Any use of our equipment in such an environment is at the risk of the user, Knight does not accept any liability in such circumstances.

## WARRANTY

All Knight controls and pump systems are warranted against defects in material and workmanship for a period of ONE year. All electronic control boards have a TWO year warranty. Warranty applies only to the replacement or repair of such parts when returned to factory with a Knight Return Authorization (KRA) number, freight prepaid, and found to be defective upon factory authorized inspection. Bearings and pump seals or rubber and synthetic rubber parts such as "O" rings, diaphragms, squeeze tubing, and gaskets are considered expendable and are not covered under warranty. Warranty does not cover liability resulting from performance of this equipment nor the labor to replace this equipment. Product abuse or misuse voids warranty.

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