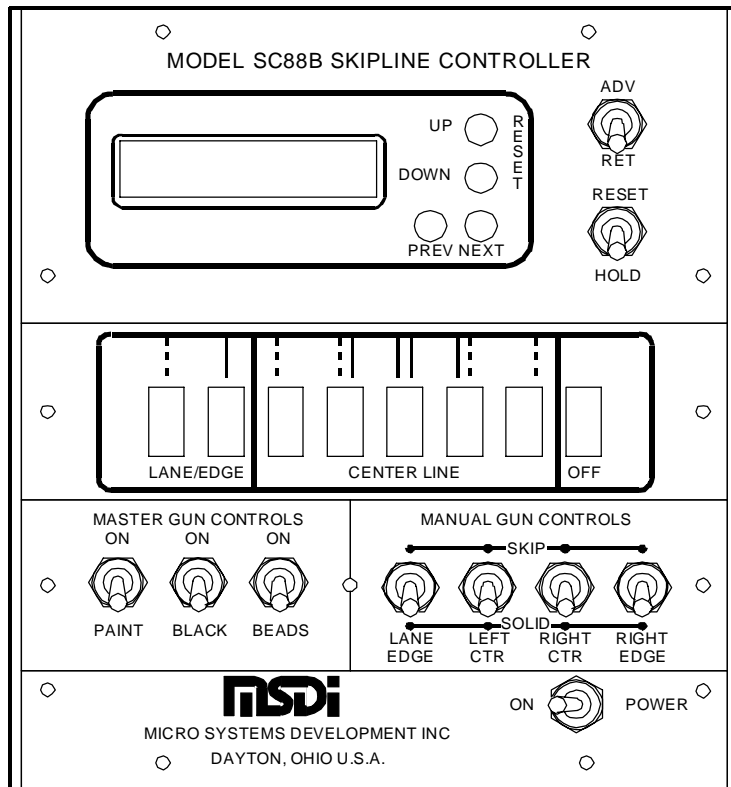


Instruction Manual..

MODEL SC88B SKIPLINE CONTROLLER Version 2.2



Micro Systems Development Inc.
46 Marco Lane
Dayton, Ohio 45458

This page intentionally left blank.

Table of Contents


1	Introduction	5
2	Operation	6
	How to use the Menus.....	6
	Setting Display Contrast	6
	Menu Lockout	6
	Controls	8
	Trigger Options	10
	Pendant Switch.....	10
	Basic Striping.....	11
	Skipline Setup.....	11
	Selecting Lines.....	11
	Intersections	11
	Edgelines and the Remote Control	12
	Repainting Old Work.....	12
	Using CycleLock.....	12
	Using CycleTrack.....	13
	Quick Cycle Change.....	15
	Black Paint and CycleLock	15
	Fast Advance/Retard.....	15
3	Calibration and Set Up	16
	Enabling the Machine Setup Menu	16
	Programming the Toggle Switches.....	16
	Programming the Pattern Selector	17
	Calibrating the Sender (Pulse Generator)	17
	Setting Timers and Delays	19
	Paint Delay Timer.....	20
	Beads Delay Timer.....	20
4	Installation	23
	Mounting the System Components	23
	Output Module Settings.....	24
	Choosing Line Numbers.....	24
	Four Line Module Settings.....	25
	Six Line Module Settings	25
	Setting the Module Switches.....	26
	Solenoid Connections	26
	Initial Testing.....	27
	Electrical Precautions.....	28
5	Menu Charts, Timing Charts and Wiring Diagrams	29
	Master Menu.....	29
	Gun Delay Setting Charts - English	41
	Gun Delay Setting Charts - Metric.....	43
	General Wiring Diagram	45
	Solenoid Wiring for Four Line Standard.....	46
	Solenoid Wiring for Six Line Standard (MUTCD)	47
6	In Case of Difficulty	48

This page intentionally left blank.

INTRODUCTION **1**

Congratulations! You have purchased the most advanced skipline controller available. You will find that the many features and the superb accuracy of this control system will help you be more productive and competitive. We will be happy to answer any questions you may have as you install, calibrate and use your new controller. You might find that you can do a better job of installing your control system if you read through the Operation Instructions as well as the Installation Instructions before you actually begin mounting parts and wiring things together.

While the organization of this manual may seem backwards, it is actually arranged for your convenience in finding the information you need when operating the controller, with the most commonly used information at the front. You will actually begin your installation with Section 4, Installation, then go to Section 3, Calibration, then finally to Section 2, Operation.

Look for the  symbol in the left margin. This symbol indicates that there is an important message that you need to read carefully. The first of these messages is directly below — one of the most important of all!



WARNING

NEVER Arc Weld anywhere on your machine with the controller wired in or mounted! **SEVERE** damage to the controller can result!

2

OPERATION

HOW TO USE THE MENUS

The SC88B has many user-settable parameters (such as Delay Timer Values) and selectable modes of operation (such as English or Metric). You can set all of these parameters and modes from the front panel of the Control Unit without opening the unit up to change wires, switches or jumpers. To make it convenient and easy to set these parameters, the SC88B is designed with a series of connected menus that you use by pressing the four small, round pushbuttons on the front panel labeled UP, DOWN, PREV(ious) and NEXT. The Liquid Crystal Display Screen (LCD) shows you where you are in the menus, so you can't get lost.

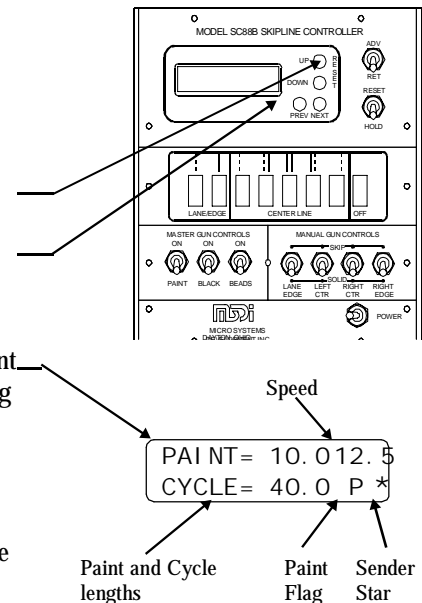
The LCD always shows the "Main Display" if you aren't using a menu. The Main Display shows the current SKIP and CYCLE lengths, the current speed, and the condition of the "Paint Flag" (whether the guns are painting or skipping). There is a star in the lower right corner of the display that blinks on and off to indicate that signals are arriving from the sender (vehicle motion sensor.)

The menus are arranged so that the most commonly changed numbers (like paint and cycle length) are located closest to the Main Display. Other settings, like the Pattern Selector Reset Options, that are seldom changed are further from the Main Display, and items such as timers and calibration are not even accessible unless you take special steps to gain access.

With a few exceptions, the PREV and NEXT buttons are used to move from one menu to the next and the UP and DOWN buttons are used to adjust values.

Refer to Chart 1A, a chart of the Master Menu. Starting at the top, reading downward, are the first level menus. Press NEXT and the Main Display will be replaced by **READ COUNTERS?**. Press NEXT again, and the display will read **SETUP SKI PLI NE?**. Now, just wait a few seconds without pressing anything. The Main Display will automatically come back to the LCD after a few idle seconds.

Press NEXT to show **READ COUNTERS?** and then press UP to answer **YES**. The Total Distance Footage Counter displays. While the footage counter is displayed, a message **PRESS UP AND DOWN TO RESET** occasionally flashes on the display to remind you that you can reset the counter by pressing the UP and DOWN buttons simultaneously. Press NEXT again to display the Line 2 footage counter. Press PREV to go back to the Line 1 footage counter. The PREV button works just like the NEXT button, but moves you in the opposite direction through the menu. Now, wait a few seconds without pushing any buttons. The footage counter stays on the screen...and stays, and stays. This is because the automatic return to the Main Display is disabled when you view the footage counters. This gives you all the time you need to copy the numbers. To get back to the Main Display, simply press PREV (or NEXT) a few times.





IMPORTANT! When you change a value using the UP and DOWN buttons, the new value is not stored and does not take effect until you press either PREV or NEXT to leave the menu. If you allow the menu to return to Main Display on its own (in other words, allow it to “time out”), the new value that you set will be lost and the old value retained. This is a good thing to remember if you accidentally adjust something by mistake and don’t remember the old value. Just stop right there, wait a few seconds, and the old value will be restored when the Main Display reappears.



VERY IMPORTANT!

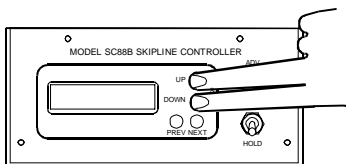
When you reset a footage counter, there is no way to recover its previous value. The counter is reset to zero immediately whether or not you press the PREV or NEXT buttons..

SETTING DISPLAY CONTRAST

The LCD display contrast may be set anytime that the Main Menu is displayed and the RESET/RUN/HOLD Switch is set set to HOLD simply by pressing the UP or DOWN button. Note that if the RESET/RUN/HOLD switch is set to the RUN (center) position, the UP and DOWN buttons will adjust the Cycle Length, rather than set contrast.

MENU LOCKOUT

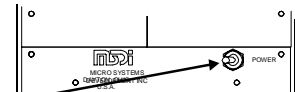
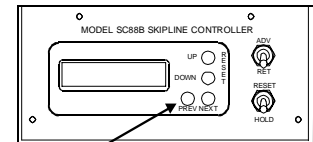
Since you use the same menu system to set the values for the skipline lengths as you use to set the timing and delays for your particular truck installation, there is a lockout on the Machine Setup portion of the menu to prevent the operator from accidentally changing something that shouldn’t be changed. Under normal conditions, the **SETUP MACHI NE?** block of the menu never appears, so all of the timer values and switch programming values are inaccessible. When you want to set these values, you must specifically enable the Machine Setup menus. To do this, hold down BOTH the UP and DOWN buttons at the same time while you turn the POWER switch ON. Continue to hold the buttons until the display gives you a confirmation **SETUP MENU ENABLED**. The Machine Setup menu remains enabled until you turn the controller off. The SC88B works just the same as always whether the setup menus are enabled or not. The only change when the Machine Setup is enabled is that the **SETUP MACHI NE?** menu block will appear as you move through the Master Menu and you are able to use this menu to set timers, set operating modes and program the panel switches.



All of the Menu Blocks are shown in Chart 1A through Chart 1K.

CONTROLS

The SC88B has four small round menu pushbuttons, several toggle switches and, optionally, a pushbutton pattern selector switch on the panel. The menu pushbuttons are used for setting up the skipline lengths, reading the footage counters, and setting timers and operating modes. The toggle switches and pattern selector are used for normal painting operation. The menu pushbuttons are used to select menu items and to change the values that are stored in the SC88B. You are probably already familiar with the menu pushbuttons from the Menu Navigation discussion above.



POWER

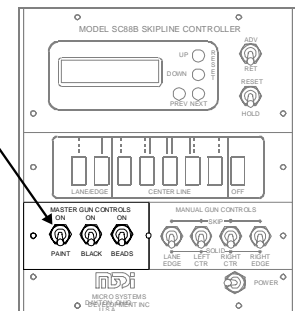
This switch turns the controller on and off. The guns are automatically locked off when power is first turned on to prevent unwanted painting. This lock-off is released by momentarily pushing the RESET/RUN/HOLD switch to RESET or HOLD position. As soon as you return the switch to the center RUN position painting will start (assuming that you have the toggle and/or pattern selector switches set to a painting position.)

MASTER GUN CONTROLS

PAINT - The PAINT switch turns the paint guns on. It also controls black and tandem paint if these are installed. It does not control beads.

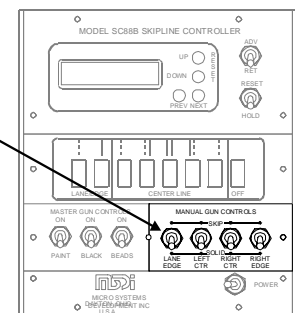
BLACK - The optional BLACK switch controls the black contrast paint guns. The PAINT switch must also be on for black to paint, and black paint guns will not paint on any line that is set for SOLID. The black guns can paint any of Centered, Leading, Trailing or Split contrast lines. You choose the pattern in the **SETUP MACHINE** menu (Chart 1J), and you can select different patterns for each of the two skip clocks.

BEADS - The BEADS switch turns the bead guns or dispensers on. The bead guns are delayed according to the **SETUP DELAYS** menu to assure accurate alignment of the beads with the paint line. The bead spacing (distance) delays are disabled if the machine is not moving, so you can test the bead guns without manually turning the sender wheel.



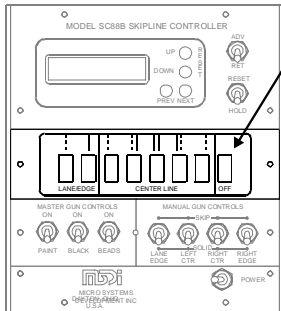
SKIP/OFF/SOLID (Manual Gun Controls)

These switches are marked with their line name or number. Each switch has three positions. The Center position is OFF; no paint, tandem paint, black paint or beads will be applied. The upper position is SKIP, and the paint gun(s) will paint a skipping line according to the PAINT and CYCLE lengths. The lower position is SOLID, the paint gun(s) will paint a continuous line. You may re-program these switches to operate up to two different guns in each position, with your choice of skip clock and choice of SOLID or SKIP. This programming is done in the **SETUP MACHINE** menu, Chart 3J.

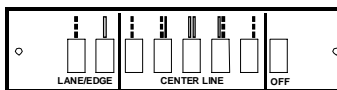


One of these switches will be mounted on the left hand panel (with the Paint and Beads Switches) if you have ordered switches for six-line MUTCD patterns.

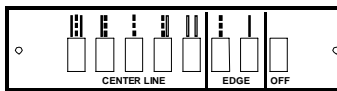
PATTERN SELECTOR SWITCH



The interlocked Pattern Selector switch instantly selects any of seven painting patterns with greater ease and accuracy than the SKIP/OFF/SOLID toggle switches. Note that the SKIP/OFF/SOLID switches override the Pattern Selector. If you select a pattern using the Pattern Selector that includes a right center skip, for instance, and then turn on the right center solid toggle switch, the right center gun will paint a solid line. For the Pattern Selector Switch patterns to be correct, all SKIP/OFF/SOLID switches must be OFF. The Pattern Selector remembers the last pattern selected while you change from one pattern to another, even during the time that all of the buttons are released. The old pattern is replaced when another button is pressed. To stop all paint from the Pattern Selector, press the OFF button.



2-Line Pattern Selector



3-Line Pattern Selector

The Pattern Selector switch has two permanent programs for 2-line or 3-line patterns. These patterns are shown at the left. There is also one user-settable program for the Pattern Selector that can be programmed for any other set of seven patterns (User Patterns). You choose what these patterns are in the **SETUP MACHINE** menu.

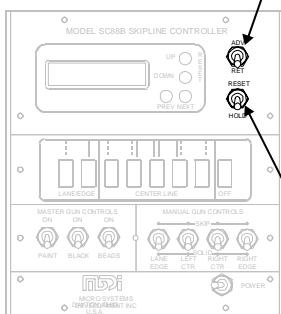
The Pattern Selector can be programmed to automatically reset the Main Skipclock, the Alternate Skipclock, or both. This reset will occur whenever the previous pattern has no skips and the newly selected pattern does have skips. For instance, changing from OFF to Double Solid will not reset the clock, but changing from Double Solid to Right Skip will reset the clock. There is no reset if both the old and the new patterns contain skips.

ADV / RET

This switch adjusts the skipline position to match a previously painted line. Pressing the switch to the ADV (Advance) position moves the skipline farther out in front of you, while RET (Retard) brings it in closer.

If CYCLE-TRACK is turned on, the ADV / RET switch will also adjust the SKIP and CYCLE values stored in the controller. See CYCLE-TRACK below for more details.

If CYCLE-LOCK is turned on, the ADV / RET switch controls the measurement of the old lines. See CYCLE-LOCK below for details.



RESET / RUN / HOLD

This three position switch locks in either HOLD or RUN position, but has

a spring return from RESET position. The center position is RUN, and in this position all selected guns will paint normally. The HOLD position stops all guns and resets the cycle counter. When the HOLD switch is returned to the RUN (center) position, the cycle counter will start at the beginning of a cycle, and all guns set to SOLID will begin painting immediately. The guns set to SKIP will also begin painting if **BEGIN PAINT ON HOLD RELEASE** in the **SETUP MACHINE** menu is set. If **BEGIN SKIP ON HOLD RELEASE** is set, the guns set to SKIP will not paint, but will skip until the skip length has been measured off and will then begin painting. The RESET position of this switch is identical to HOLD, except that it does not affect those guns painting SOLID lines. The guns painting SKIP lines will be stopped while the switch is held in RESET position, and will start a new cycle when the switch is released.

TRIGGER OPTIONS

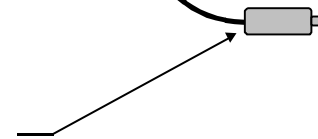
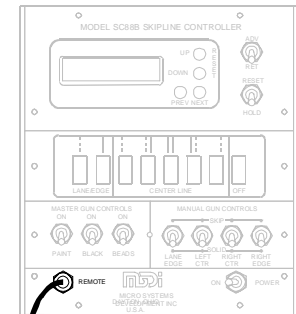
There is an additional control feature that allows you to perfectly align the ends of solid and skipping lines. In the **OPTI ONS SETUP** Menu, you may select **TRI GGER OPTI ONS** to either **NONE** or **START OF PAI NT**. If you chose **NONE**, your new switch settings will take effect immediately. If you choose **START OF PAI NT**, the new settings will take effect upon the beginning of the next skipline.

PENDANT SWITCH

If you have ordered your SC88B controller with the Pendant Remote Control Switch, an additional group of settings will appear in the **TRI GGER OPTI ONS** menu. The Pendant Switch allows several additional ways to control the skipclock and the application of your new switch settings. If you choose **REMOTE LOAD**, your new switch settings will begin immediately when you press the Pendant Switch. This applies to both the Toggle Switches and to the Pattern Selector settings. If you choose **LOAD AND RESTART**, the new settings will load when you press the button, but the Main Skipclock will be reset to the beginning of a cycle. If you choose **SI NGLE DASH**, you will paint one dash each time you press the button. The dash will be exactly the length set in the Paint Length menu. The Cycle Length setting is ignored. This setting is useful for repainting very poorly spaced old lines. Solid lines will paint as normal. If you set **FULLY MANUAL**, any guns set to skip will paint just as long as you hold the button down. Both Skip Length and Cycle Length are ignored, and Solid Lines will paint as normal.

IMPORTANT - If you have set any of the above options, the switches will not turn off the guns. The guns will be controlled only when the trigger occurs. The HOLD switch will always stop any painting guns, regardless of the options you have set.

Also, if any of the options are set, Black Paint is turned off as the controller cannot calculate the position of the black paint without a defined cycle length. Any clock resets that are programmed into the Pattern Selector switch are ignored, and are performed by these options instead.



BASIC STRIPING

The SC88B is easy and intuitive to operate. You will find that you have no trouble adapting the controller to the most challenging striping jobs.

SKIPLINE SETUP

The SC88B has two separate skip clocks, one called "MAIN" that is generally used for the centerlines, and one called "ALTERNATE" that is generally used for edgelines. Determine the skip and cycle values you need for your job. Set these values into Main Skip and Cycle in the **SETUP SKI PLI NE** menu. If you need a different set of skip and cycle values for the edgeline, set these values in the Alternate Skip and Cycle. There are two ways you can choose to use the alternate set of skip and cycle values for the edgeline. You may program one or more toggle switches to paint on the Alternate Clock, or, for edgelines, you may select ALT on the Edgeline Remote Control panel. Generally, if you have a Remote Control panel, you will want to allow that panel to choose the clock, but if you are controlling the edgeline from the Main Panel, you might want to program the edgeline Skip switch to paint on the alternate clock. See "Programming the Toggle Switches" for details.

SELECT THE LINES

Set the RESET/RUN/HOLD switch in HOLD position to prevent painting. Set the PAINT and BEADS switches for the appropriate material to be painted. Set the SKIP-OFF-SOLID switches (or the pattern selector switch) for the desired pattern. If you use the Pattern Selector, be sure the SKIP-OFF-SOLID switches are OFF.

Move to the beginning of the line to be painted and set the RESET/RUN/HOLD switch to RUN. The selected pattern will begin painting. On new work, leave the CYCLE-TRACK system off and do not use the ADV/RET switch so you will paint perfectly measured lines that are easier to repaint in the future.

INTERSECTIONS

The HOLD position of the RESET/RUN/HOLD switch is used to stop all lines, such as when moving through an intersection. When you return the RESET/RUN/HOLD switch to RUN after you have moved through the intersection, the controller will instantly begin a new cycle with full-length skip lines. The RESET position of the RESET/RUN/HOLD switch is used to stop only the skipping lines and a quick flip of the switch will restart the skip cycle. When leaving an intersection, move the RESET/RUN/HOLD switch to RUN at the beginning of the line and you will immediately begin painting a new full-length skip pattern.

Both the HOLD and RESET positions reset the skip clock, so the next cycle will always be full length. Use the menu option (**SETUP OPTI ONS** menu) to select whether you want to begin your cycle with a skip or with paint.

EDGE LINES AND THE REMOTE EDGE LINE CONTROL

If you have the Remote Edgeline Control, the action of the RESET/RUN/HOLD switch is a little more complicated. If the Remote Edgeline Controller is set to paint a skipping edgeline on the Main Clock, the RESET/RUN/HOLD switch will also hold the edgeline, but if the edgeline is skipping on the Alternate Clock, the RESET/RUN/HOLD switch will not affect the edgeline and HOLD on the Remote Controller will not affect the centerline. Just keep in mind that the Remote Edgeline Control is turned on whenever it is set to paint a Skip or Solid line. Otherwise, it is turned off and none of its switches have any effect.

REPAINTING OLD WORK

The SC88B features the CYCLE-LOCK™ system to measure old lines “on-the-fly”. This eliminates the need to stop the truck and tape off the old lines before you paint. You can even repaint while measuring. The system works by using the ADV/RET switch to tell the controller when you pass over the ends of the first line and the first skip of the old lines. You can start measuring at the beginning of the old paint line by setting the **BEGIN PAINT ON HOLD RELEASE** option, or you can start measuring at the end of the old paint line by setting the **BEGIN SKIP ON HOLD RELEASE** option.

While you can paint while you measure using CYCLE-LOCK, it is probably a good idea to practice a few times without painting until you get a feel for the response of the controller. You can measure without painting if you set all SKIP/OFF/SOLID switches to OFF, and the Pattern Selector to OFF. Any guns that are turned on will paint normally, even while you are measuring, so when you decide to paint while measuring, be sure that you turn on the correct guns. Note that Black Paint will not be applied when CYCLE-LOCK is turned on.

Using CYCLE-LOCK™

To enable Cycle-Lock, go to the **SETUP OPTI ONS** menu and then to the **SET CYCLE-LOCK** menu. If you must always paint a certain line length, choose the **CYCLE ONLY** option. If you want to match both the length of the paint line and the length of the cycle, choose the **PAI NT AND CYCLE** option.

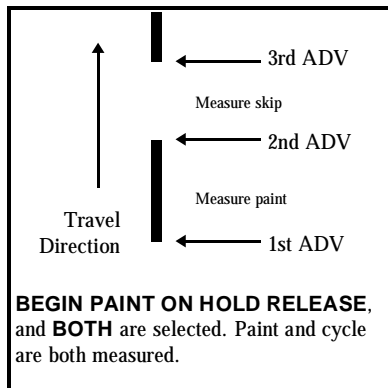
As soon as you make your selection, the display will return to the Main Display screen. The cycle length will be set to 0.0 feet, and the paint length will be either 0.0 (if you chose **PAI NT AND CYCLE**) or your desired paint length (if you chose **CYCLE ONLY**.)

Set the RESET/RUN/HOLD switch to the RUN (center) position. Painting will not begin until you start measuring, but CYCLE-LOCK will not work if this switch is in HOLD position.

What you do next depends on the combination of the choices that you have made about whether or not to adjust the paint length, and whether to begin your cycle with a paint line or with a skip.

MEASURE: PAINT AND CYCLE
BEGIN WITH: PAINT

If you will be measuring both paint length and cycle length, and you begin your cycle with a paint line, do the following:



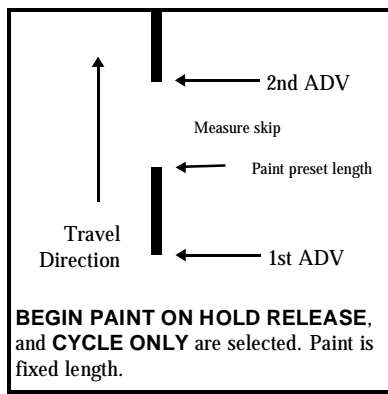
Drive your truck to the beginning of the old line that you are going to measure and press the ADV switch just as the starting end of the line passes under the paint gun. If you have any guns turned on, they will begin painting. The Cycle display and the Paint display both start counting up as the controller measures the paint and cycle length.

At the end of the old line, press ADV a second time. Cycle length continues to count up, but paint length stops counting — you have measured the paint line length. If you are painting at the same time, the skipping paint guns turn off, but solid guns continue to paint. At the start of the next old paint line, press ADV a third time to measure the cycle length. If you are painting, the skipping guns come on again. At this time, CYCLE-LOCK automatically turns off and normal operation of the controller resumes, using the Paint and Cycle lengths you have just measured.

MEASURE: CYCLE ONLY
BEGIN WITH: PAINT

If you must paint a set line length, and your cycle begins with a paint line, do the following:

Be sure that the correct paint line length is displayed on the Main Display. If not, go to the **SETUP SKI PLI NE** menu and set it. Don't worry about the cycle length that is displayed.



Drive your truck to the beginning of the old line that you are going to measure and press the ADV switch just as the starting end of the line passes under the paint gun. If you have any guns turned on, they will begin painting. The Cycle display starts counting up as the controller measures the cycle length.

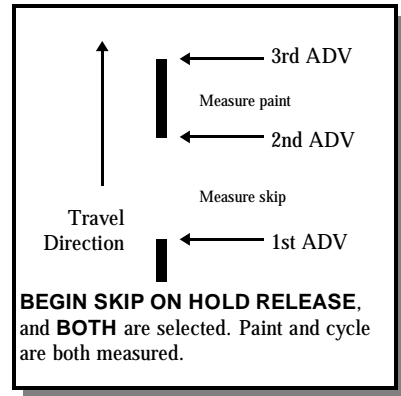
When the correct line length has been painted, the skipping guns automatically turn off, but solid guns continue to paint. At the start of the next old paint line, press ADV a second time to measure the cycle length. The skipping guns come on. At this time, CYCLE-LOCK automatically turns off and normal operation of the controller resumes, using the Cycle length you have just measured.

MEASURE: BOTH PAINT AND CYCLE
BEGIN WITH: SKIP

If you start your cycle with a skip and measure both paint and skip, set **BEGIN SKIP ON HOLD RELEASE** option and the **PAINT AND CYCLE** option on **CYCLE-LOCK**.

Drive your truck to the end of the old line that you are going to measure and press the ADV switch just as the end of the line passes under the paint gun. Solid guns will paint but skipping guns will not, even if they are turned on. The Cycle display will start counting up as the controller measures the cycle length.

At the beginning of the next old line, press ADV a second time. Cycle will continue to count up, and paint will begin to count up as you measure the paint line length. If you are painting at the same time, the skipping guns will turn on. At the end of the old paint line, press ADV a third time to end the measurements. If you are painting, skipping guns stop painting. At this time, **CYCLE-LOCK** automatically turns off and normal operation of the controller resumes, using the Paint and Cycle lengths you have just measured.

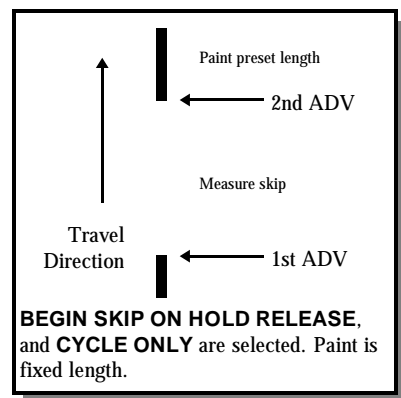


MEASURE: CYCLE ONLY
BEGIN WITH: SKIP

If you must paint a set line length, and your cycle begins with a skip, be sure that **BEGIN SKIP ON HOLD RELEASE** is set and that the correct Paint Length is shown on the **MAIN DISPLAY**. If not, go to the **SETUP SKI PLI NE** menu and set it. Don't worry about the cycle length that is displayed.

Drive your truck to the end of the old line that you are going to measure and press the ADV switch just as the end of the line passes under the paint gun. Skipping guns will not paint, solid guns will begin to paint. The Cycle display starts counting up as the controller measures the skip length.

At the start of the next old paint line, press ADV a second time to measure the skip length. Skipping guns come on. At this time, the controller adds the measured skip length to the paint length to get the cycle length, **CYCLE-LOCK** automatically turns off and normal operation of the controller resumes, using the Cycle length you have just measured.



*Using **CYCLE-TRACK™***

The SC88B includes the **CYCLE-TRACK** system that is especially useful for repainting old roadway lines. The **CYCLE-TRACK** system automatically adjusts the length of the cycle and (optionally) the length of paint to match old repainted lines. You choose what you want to

automatically adjust. If you are required to maintain your lines at a certain length, set CYCLE-TRACK to **CYCLE ONLY**. When you set Cycle Only, the paint line length will not change, but the cycle will shorten 0.1 feet whenever you operate the RET switch three times without operating the ADV switch. Likewise, the line will lengthen 0.1 feet if you operate the ADV switch three times without a RET.

If you have set CYCLE-TRACK to **PAINT AND CYCLE**, you will adjust the paint length if you operate the ADV/RET switch while in the skip portion of the cycle, and you will adjust the cycle length if you are in the paint portion of the cycle.

Depending on how often you operate the ADVANCE or RETARD switches, the length change can take place over several cycles. This avoids 'hunting', or rapid changes in the paint or cycle lengths that never hit the right length. With some practice, you will be able to judge exactly how many times to operate the switch to correct the line perfectly.

To enable or disable CYCLE-TRACK, go to the **SETUP OPTI ONS** menu, select the **CYCLE - TRACK** submenu, and use UP or DOWN to choose **OFF**, **CYCLE ONLY**, or **PAINT AND CYCLE**. It will remain the way you set it until you change it.

CYCLE-TRACK can be used in conjunction with CYCLE-LOCK. The CYCLE-LOCK system will measure the lines and automatically shut off. The CYCLE-TRACK system will take over to make the 'fine adjustments' to the line and cycle lengths that you measured with CYCLE-LOCK.

QUICK CYCLE CHANGE

You can easily change the length of the Cycle without calling up the skipline setup menu. Pressing the UP or DOWN menu buttons while painting will change the Cycle length by 0.1 foot per push. This only works when RESET/RUN/HOLD is set to RUN position.

BLACK PAINT AND CYCLE-LOCK

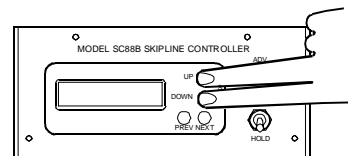
If you are using black contrast paint and choose to paint while using Cycle-Lock, the black paint will be disabled until the old line has been measured. This is because the controller must know the current cycle and paint lengths to calculate the black lines, and it doesn't have those lengths until Cycle-Lock has measured them. If you have the Main Clock Black set to 'LOCKED', the black guns will work even with Cycle-Lock turned on.

FAST ADVANCE/RETARD

Two speeds are available for the ADV/RET Switch. Normal speed adds or subtracts 1 foot per second from the cycle length regardless of truck speed. When **FAST ADV/RET** is turned **ON**, the sender pulses are either doubled or stopped in response to the ADV/RET Switch, resulting in much faster action. Set the **FAST ADV/RET** to **ON** or **OFF** in the **SETUP OPTI ONS** Menu.

3 CALIBRATION

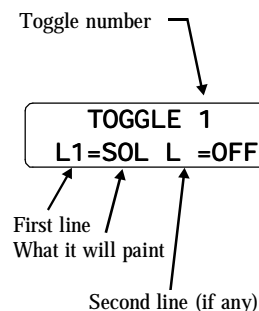
Before you can calibrate your Controller, you must enable the **SETUP MACHINE** menu. To do this, turn the Controller OFF. Depress and hold *BOTH* the UP and DOWN buttons or *BOTH* the NEXT and PREV buttons. While holding the buttons down, switch the power ON. Continue to hold the buttons until the “Sign On” message appears on the display. Release the buttons. After the “Sign On”, an additional message **MACHINE SETUP MENU ENABLED** will appear. When the Setup Menu is enabled, all of the calibration, delay, switch programming and units setup menus will be accessible.



PROGRAMMING THE TOGGLE SWITCHES

The front panel toggle switches (Skip/Solid) are normally programmed to paint one line in each position, according to the panel line designations. To accommodate special gun arrangements or unusual line specifications, they can be user programmed to paint up to two lines each, with each line selected to be solid, main clock skip or alternate clock skip.

To program the switches, go to the SETUP MACHINE menu, and then to the SET TOGGLES menu. Refer to Chart 1J to determine the number identifying the toggle that you want to program, and choose this toggle number in the menu. Press the UP button for yes, and the display will indicate the Line Number(s) that this switch will paint. One of the lines is indicated on the left side of the display, and the other line number is indicated on the right side of the display. If only one line is to be painted, a line number will appear on one side of the display, and the other side of the display will have a blank space instead of a line number.



There is a flashing block on the “equals sign” of the line that is to be changed. The NEXT button will move block to the right side, the PREV button will move the block to the left side. If the block is already on the right and you press NEXT, you will move to the next toggle switch. If the block is on the left and you press PREV, you will move to the previous toggle switch.

Use the UP button to change the Line # that this switch will paint or choose OFF for the Line # if you don't want this switch to paint.

Once you have chosen the line number to paint, use the DOWN button to choose whether this line will paint solid (SOL.), or skipping on the Main Clock (MAIN) or skipping on the Alternate Clock (ALT.).

The new values that you have entered are stored in the controller memory whenever you move from one toggle to the next. If you don't press any button for about 15 seconds, the “Main Display” will return and any change you made to the switch will be lost. Other switches that you changed previously will be saved, however.

PROGRAMMING THE PUSHBUTTON PATTERN SELECTOR

The Pushbutton Pattern Selector switch allows fast, accurate selection of one of several pre-programmed patterns. The SC88B includes two standard fixed patterns, one for two-line centerlines, and one for 3-line centerlines. There is also a custom pattern area in memory that is user programmable. Virtually any pattern can be stored in any of the seven available buttons.

To choose the patterns to be used for the Pattern Selector, go to the SETUP MACHINE menu, then to the SET PATTERNS menu (Fig 3K).

The display will show **2-LINE PATTERNS SELECTED?** If you push UP for **YES**, the built-in 2-line patterns will be enabled. If you choose DOWN for **NO**, the display will show **3-LINE PATTERNS SELECTED?** If you choose UP for **YES**, the built-in 3-line patterns will be enabled. If you choose DOWN for **NO**, the display will show **CUSTOM PATTERNS SELECTED?** If you choose down for **NO**, all patterns will be disabled, and the Pattern Selector switch will be inoperative. If you choose UP for **YES**, the display will say **MODIFY CUSTOM PATTERNS?** This is where you can choose to change the custom patterns to your special requirements. To modify the patterns, press UP for **YES**. To use the patterns already stored without changing them, press DOWN for **NO**. In either case, the custom patterns will be enabled.

If you chose to modify the patterns, the display will read **SET BUTTON 1**. Button 1 is the leftmost button on the panel. To change this button's program, press UP. The display will then indicate the status of Line 1, that is, whether this particular button will paint on Line 1. You can change the status by pressing UP or DOWN, cycling through OFF, SOL., MAIN and ALT. Press NEXT to set Line 2, (still on button 1). Likewise, press NEXT to advance forward through all six lines, and press PREV to go backwards through the lines. At Line 6, pressing NEXT will take you to the next button. At Line 6, Button 7, NEXT will take you out of the SETUP MACHINE menu. Likewise, pressing PREV when programming Button 1, Line 1 will take you back to the Toggle Switch menu.

If you are painting on four lines, any settings you make for Lines 5 and 6 will be ignored.

CALIBRATING THE SENDER (PULSE GENERATOR)

Calibration of the SC88B is simple since the internal computer does most of the work. In the following instructions, if you are using metric units, simply substitute 'meters' for 'feet'. When the SC88B is set for metric operation, it automatically calculates the speedometer and footage counter values based on 1000 meters per kilometer, rather than 5280 feet per mile as in English units.



IMPORTANT! Before beginning calibration, be sure you have chosen your Units, either English or Metric. If you later decide to change units, you must also re-calibrate the SC88B.

If you know approximately how many pulses your sender puts out for each foot or meter of travel, set the SENDER RATIO now. If your sender provides between 5.1 and 50 pulses per foot, go to the **SET SENDER RATIO** menu and set it to **X1**. If your sender puts out between 2.6 and 5.1 pulses per foot, set the ratio to **X2**. If you aren't sure how many pulses your sender supplies, set the ratio to **X1**, and the SC88B will count the pulses when you calibrate. The SC88B will tell you if you must change the ratio.

The first step is to measure off exactly 1000 feet of roadway or parking lot. The SC88B counts the sender pulses it receives while you drive over this measured 1000 feet, and then calculates its internal calibration factor and saves it in memory. The SC88B expects between 5.1 and 50 pulses from the sender per foot (or meter) of travel when the Sender Ratio is set to X1. It adjusts itself during calibration to the actual number of pulses received during the measured 1000 foot run. During this run, it will expect to count from 5100 pulses to 50000 pulses assuming a ratio of X1.

Drive the vehicle to the start of the 1000 foot run. If you have a fifth-wheel sender on the gun carriage, lower the carriage or otherwise engage the wheel. Navigate through the menu to **CALIBRATE SENDER?**. Press UP for **YES**. In response to **ADJUST VALUE?**, press DOWN for **NO**. The "Adjust Value" will allow you to make fine adjustments to the calibration later, if necessary. The display now says **TO START PRESS ADVANCE SWITCH**. Switch the ADV/RET switch momentarily to ADV position and release. The display indicates **ROLL 1000 FEET AND PRESS ADVANCE**. (If you are calibrating in metric units the display will indicate **ROLL 1000 METERS AND PRESS ADVANCE**).

Now, drive the truck over the 1000 foot course. As you drive, the controller will count the pulses from the sender. Slow down and stop carefully at the end of the 1000 feet, don't let the truck roll backwards. Now press ADV again. The display will indicate the number of pulses received. The controller will then calculate the new calibration information and save it in memory. If too many or too few pulses are received in the 1000 foot drive, the display indicates that the calibration is bad, displays the actual number of pulses received, and that the calibration is canceled.

If you received too few pulses, under 5100, go to the **SET SENDER RATIO** menu and set the ratio to **X2**. Then repeat the calibration run.

If the pulses were under 2550, you will need to review the sender installation to be sure that the drive ratios are correct, that you have the correct sender, that the drive wheel is not slipping, etc.

If you don't have enough room to drive 1000 feet, measure off some distance that you do have available. Using the above procedure, drive this distance instead of 1000 feet. The calibration routine may or may not indicate a bad calibration, but since you didn't drive 1000 feet you will have to manually adjust the calibration anyway. Write down the number of pulses displayed at the end of the run. Divide 1000 feet by the number of

feet you actually drove. Multiply the result by the displayed number of pulses. This is your actual calibration value. Now, press UP for **YES** when the display asks **ADJUST CALIBRATION?** and, using the UP and DOWN buttons, set the display to your new calibration value. Then press PREV or NEXT to save the value. When you calculate your calibration value, the value must be between 5100 and 50000 pulses. If it isn't, you will have to check out your sender as above.

Record the count reading you obtained above on the SC88B SETUP RECORD sheet supplied in this manual. As you use the system, you may want to adjust the calibration slightly to "trim up" the value. If you find that your skip patterns are consistently too long, you can lower the calibration pulse count slightly to shorten them up. Likewise, if your patterns are too short, increase the count value slightly to lengthen them. To change the count, enter the Calibrate Sender menu and press UP for **YES** to the **ADJUST VALUE?** question. The current pulse count will be displayed. Use the UP and DOWN buttons to adjust the value. In order to store the new value, you must press either PREV or NEXT. If you allow the menu to return to the Main Display on its own, the new value will be lost and the old value will be kept.

SETTING TIMERS AND DELAYS

There are a number of timers in the SC88B. Some of these timers cause an action to be delayed in time, others cause an action to be delayed in distance. We will set the distance timers first, as they depend only on the relative position of the various paint and bead guns. All of the distance delays are based on the point at which the primary paint strikes the roadway. The positions of all guns are referenced to this point. Note that all paint guns share the same time and distance delay values, so you must align the paint guns so that they all paint the same point along the roadway. The same is true of the bead guns. For instance, suppose your left centerline paint gun strikes the road 3 inches ahead of the right centerline paint gun. There is no way to correct this sort of misalignment. You must mechanically adjust the guns so their patterns line up.



ALL OF THE DISTANCE SETTINGS REFER TO THE POINT AT WHICH THE PAINT OR BEADS STRIKE THE ROADWAY, RATHER THAN THE ACTUAL DISTANCE BETWEEN THE NOZZLES.

SETTING THE BEAD DISTANCE DELAY

To set the bead distance delay, measure the distance between the point at which paint strikes the roadway to the point at which the beads strike the roadway in tenths of a foot. Enter the Setup Menu, go to **SETUP DELAYS**, and go down to **BEAD GUN DIST.** Enter the value that you just measured.

To set the tandem and black guns, measure their distances from the main paint guns. The distance setting menus for these guns are under the **SET TANDEM PAINT** and **SET BLACK PAINT** menus

respectively. If you are installing these guns, be sure to set their distance values.

PAINT DELAY TIMER

Setting the on- and off-delay timers requires actually painting lines. Many people choose to 'paint' with water for this calibration if possible. Timer setting may be done at any speed, but it's usually better to do it at the same speed you normally use for painting.

Re-enter the **SET DELAYS** menu and make sure that all four timers are set to zero (but not the **BEAD GUN DIST.**)

Go to the **SETUP SKI PLINE** menu and set the **PAINT** for 10 feet and the **CYCLE** for 20 feet. Set the **HOLD/RESET** switch to **HOLD**, the **BEADS** switch to **OFF** and set one of the paint gun switches to **SKIP**.

Start the compressor and set all the pressures to their normal values.

Switch the **HOLD** switch to **RUN** (center) position and paint three paint/skip cycles at your normal painting speed. While you are painting, take note of the speed on the speedometer.

Measure the length of the second paint/skip cycle from the beginning of the second paint line to the beginning of the third paint line. This distance must be 20 feet. If it isn't, recheck the Sender Calibration as described above. If the Sender Calibration checks out OK, you should check your paint gun to make sure that the mechanism is not sticking or operating sluggishly, that the orifice is clean, and that any pressure regulator that you may have in the control air line is large enough to activate the valves and guns quickly.

Now, measure the length of the second paint line. The goal here is to make the paint line exactly 10 feet long. If the line is too long, you must insert some paint-on delay, and if the line is too short, you must insert some paint-off delay.

Look at the Timer Table. There are actually four tables, two for English and two for metric, one of each for lower speeds and one of each for higher speeds. Use the table appropriate for your painting speed and units of measure.

The table will convert a length error into a timer value to be inserted into a timer. Read down the left column for the speed you were moving. Then look across the top for the distance error in inches or centimeters. From this distance error, drop down to the line with your speed and read the delay time to be inserted.

For instance, suppose that your paint line came out to ten feet six inches (10'6") and you drove your machine at 8.2 MPH. Since the paint line should have been exactly ten feet, the error is $10'6" - 10' = 6"$. Look down the left column of TABLE 1 for 8.2 MPH, then look across the top row of the table for the distance error, which is six inches. Now look down

the six inch column until you get to the row of numbers to the right of 8.2 MPH. The number at that intersection is 0.042 seconds.

Since the paint line was too long, you must enter a 0.042 second delay into the Paint-On Delay timer. If your paint line had been too short, you would enter a Paint-Off Delay instead, to make the line longer.

In Summary, measure your distance error and look up the timer value that is needed to correct the error, then insert this value into the appropriate timer.

Use the pushbuttons to enter the **SETUP MACHINE** menu. If your line was too long, go to the **PAINT ON DELAY** screen, but if your line was too short, go to the **PAINT OFF DELAY** screen. Use the UP and DOWN buttons to set your timer value on the display. Then press NEXT to save the value in memory.

Check your new timer value by painting another three cycle pattern and measuring the paint length. It should be very close to 10 feet. If you want, you may try adjusting the timer up or down a little to "fine tune" the timer and get an even more exact line length.

BEADS TIMER DELAY

The BEADS timer can be adjusted now to align the beads precisely with the paint. Because the SC88B controller includes a beads distance delay, the beads timing and alignment will be accurate at any speed.

The first thing to do is to get the beads line adjusted to ten feet long. Then you will align the paint and the beads lines. If you use blow-off nozzles, you should turn them off so you will not blow the beads away.

Turn the BEADS switch ON and paint another 3 cycle pattern as before. This time, look at the second paint line and measure the length of the bead pattern. If the bead line is over ten feet long, look up the error in the Timer Table as you did for the paint line. Then set the time from the table into the **BEADS ON DELAY** timer. If the bead line is too short, set the time from the table into the **BEADS OFF DELAY** timer. Don't forget to press NEXT to save the values.

Now paint another set of lines as before and measure the distance between the point where the paint line starts and the point where the bead line starts. Look up the timer value needed in Timer Table where the speed row crosses the distance error column, just as you did before. Write this number down.

If the paint line starts first, you must delay the paint to align with the beads. By adding the same delay to both the Paint-On Delay timer and the Paint-Off Delay timer, the paint line length will not change, but the line will be delayed just enough to match the beads. To insert the delays, read the current value in the Paint-On Delay timer. Add the value you got from the table to the current Paint-On Delay timer value and change the timer to

this new value. Go to the Paint-Off Delay timer, read the current value. Add the value you just got from the table to the current value of the Paint-Off Delay timer and enter the new value into this timer. Be sure to press NEXT after each new value is entered to save the value.

If the bead line starts before the paint line, we must delay both the Beads On Delay and Beads Off Delay times to delay the bead line without changing its length. Don't change the Bead *Distance* Delay by mistake.

Read the current **BEADS ON DELAY** value, add the number you got from the table, and enter this new value into the timer.

Repeat for the **BEADS OFF DELAY**. Be sure to press NEXT after entering the values to save the new values.

Now scan through all four timers. One of the timers should be zero. If there is some value greater than zero in all of the timers, pick the smallest one, and subtract it from all of the timers. If we remove the same delay from all of the timers, the lines will still line up correctly, but at least one of the timers will be zero. This step insures that the controller will respond as quickly as possible to the panel switches.

This completes the calibration of the SC88B Skipline Controller.

INSTALLATION 4

The Installation and Setup instructions are intended to guide you as you install the SC88B system on your paint truck. Read through these instructions carefully before you begin.

First, check all of the items received and identify the various components. There may be differences depending on the specific options you ordered. Refer to the figures at the left for help in identifying these parts.

The MAIN CONTROL UNIT with the display screen will be mounted next to the operator. A yoke is provided to support the unit and allow adjustment of the panel angle for most convenient operation.

The REMOTE EDGELINE CONTROL UNIT is used by the right edgeline operator. This control gives the edgeline operator independent control of the alternate skip clock that is commonly used when painting short-skip exit ramp markings. Like the Main Control Unit, a yoke is provided to allow adjustment of the panel for most convenient operation.

The POWER UNIT is mounted wherever convenient, usually near the solenoid cabinet. It can be mounted in any position, but keep in mind that you will need easy access to the top of the unit to connect the solenoids, and be sure to allow access so you can attach the connector at the end. The unit is mounted by four 1/4x20 bolts through the baseplate. Modules are mounted inside the power unit, each module controls two solenoids on the same paint line.

The SENDER (ENCODER) is supplied to match your application. For the most general applications, the sender is supplied with a bearing and a small steel knurled disc to ride on a fifth-wheel in contact with the ground or in contact with one of the truck tires.

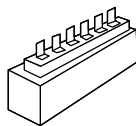
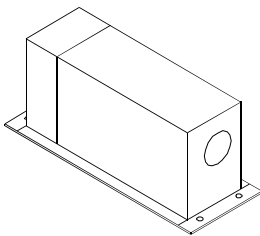
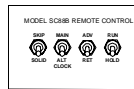
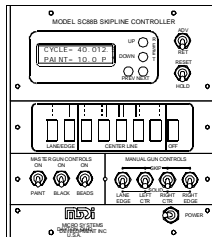
The sender may be a pickup unit and a drive-shaft wrapper for those applications where vehicle motion will be sensed from the driveshaft.

The sender may be supplied to mount on the speedometer hub of the vehicle transmission. In this case, the sender will either be attached to a gear unit to provide a connection for your speedometer cable, or the sender will provide a "pass-through" drive for your speedometer.

For newer trucks with electronic speedometers, there will be NO sender. Instead, there will be a small adapter box with push-on terminals to connect to the wire leading from your transmission to the speedometer. The adapter box may be mounted near the transmission or under the dash near the instrument panel. You will have to refer to the service manual for your truck to locate the speedometer signal wire in your truck's wiring harness.

CABLES are provided to connect all of these parts.

The SC88B Controller requires 12 Volts DC negative ground for operation. The Power Unit end of the System Interconnect Cable has a wire branch with two wires, one red and one black, for power input.



Ground the black wire to the vehicle frame, and connect the red wire through a master switch to the positive side of the 12 volts. You may connect to the vehicle battery or to the compressor battery, but be sure the power supply is reasonably "clean", that is, not subject to abrupt changes in voltage.

Install the SENDER. The specifics of this installation will depend in large part on the type of sender you are installing.

One lead of each solenoid connects to the + 12 volts from the master switch and the other lead connects to an output module in the Power Unit. The solenoid connection is made by a simple "push-on" lug. All of the modules are the same, and any module can drive any solenoid. For convenience, connect the solenoids in some reasonable order. It is usually convenient to connect a paint gun and its associated bead gun to the same module, and to connect all of the guns in a sensible left-to-right order. Remember that both of the solenoid outputs on a module must paint on the same line. The modules will be set up for each solenoid later by setting the small "piano switch" on each module.

After mounting the system and connecting the cables, you are ready to set up the modules.

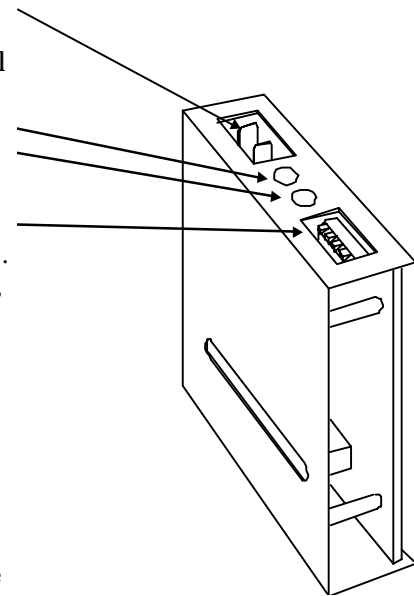
OUTPUT MODULE SETUP

The Output Modules provide the high-current 12 volt switching for two solenoids. Each of modules has two output terminals that act like a switch which closes to ground. The two outputs will control two solenoids, both on the same paintline. In all modules, Solenoid #1 connects to the terminal nearest the edge of the module, and Solenoid #2 connects to the terminal nearest the LEDs. The Red LED comes on when Solenoid #1 is on, the Green LED comes on with Solenoid #2.

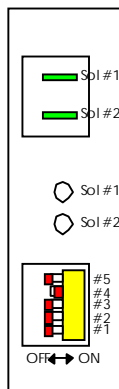
The Output Modules are configured by a small "piano switch" visible through a hole in the metal case. The switches are labeled 1, 2, 3, 4 and 5. The switches are OFF when the "key" is lifted away from the circuit card, and are ON when the "key" is pressed down toward the card.

CHOOSING LINE NUMBERS

The Output Module switches must be set appropriately so that the proper lines are painted according to the front panel and remote skip/solid switches. The normal factory setting of the skip/solid switches is for Line #1 to be the left-most centerline, and Line #4 to be the right edgeline. The standard front panel labels assume this arrangement. Note that the Remote Edgeline Control Skip/Solid switches are NOT programmable, so if you are using a Remote Edgeline Control in your system, you must choose Line #4 for the right edgeline. Likewise, if you are painting in Six-Line mode, you must choose Line #5 for the second (wide) right edgeline.



FOUR-LINE MODULE SETTINGS

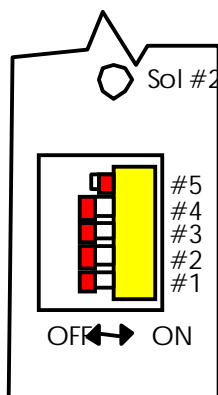


Output module shown set for Paint and Beads on Line #3.

Switches #1, #2 and #3 determine the gun type for each of the two outputs. The switch combinations are as follows:

#1	#2	#3	Solenoid 1	Solenoid 2
OFF	OFF	OFF	Paint	Beads
OFF	OFF	ON	Paint	Tandem paint
OFF	ON	OFF	Paint	Black paint
OFF	ON	ON	Beads	Tandem paint
ON	OFF	OFF	Beads	Black paint
ON	OFF	ON	Tandem paint	Black Paint
ON	ON	OFF	(not used)	
ON	ON	ON	(not used)	

Notice that these switch combinations allow you to set up any possible arrangement of guns. For a full complement of 16 guns, set four modules with Switches #1, #2 and #3 OFF to control Paint and Beads. Set the other four modules with Switches #1 and #3 ON, and #2 OFF to control Tandem and Black. In all of the modules, set Switches #4 and #5 as described below.



Switches #4 and #5 determine which line the module will respond to. The following table shows the relationship:

#4	#5	LINE
OFF	OFF	Line 1 or Left Edgeline
OFF	ON	Line 2 or Left Centerline
ON	OFF	Line 3 or Right Centerline
ON	ON	Line 4 or Right Edgeline

The switch locations are illustrated at the left.

SIX-LINE MODULE SETTINGS

When the Six-Line mode is selected, there is no tandem paint and no black paint. In this case, the switches must be set differently to select lines 5 and 6. When setting the switches for Six-Line mode, keep in mind that the Remote Edgeline Controller Switches are not programmable, and always control lines 4 and 5. You should plan your gun layout so that the right edgelines are controlled by the modules that are set for these two lines.

For six lines, the switches are set as follows:

#1	#2	#3	#4	#5	Solenoid 1	Solenoid 2
OFF	OFF	OFF	OFF	OFF	Paint #1	Beads #1
OFF	OFF	OFF	OFF	ON	Paint #2	Beads #2
OFF	OFF	OFF	ON	OFF	Paint #3	Beads #3
OFF	OFF	OFF	ON	ON	Paint #4	Beads #4
ON	OFF	ON	OFF	OFF	Paint #5	Beads #5
ON	OFF	ON	OFF	ON	Paint #6	Beads #6

Other switch combinations are not used, and will not operate any guns.

SETTING THE MODULE SWITCHES

Examine your gun layout and figure out a good arrangement to connect your guns. In many cases, where you have four guns for paint and beads only, select switches #1, #2 and #3 OFF, so that each output module controls the paint and beads gun on each line. Then set switches #4 and #5 on each module, for the specific paint line for those guns.

Never set two modules so that all five switches are in the same position, as the system will be unable to detect gun circuit failures.



Set the switches on your modules now, referring to the above tables. For instance, if you are about to set a module that is connected to the Line #2 Paint and Beads guns, turn switch #5 ON (press it down) and switch #4 OFF (lift it up away from the circuit board). Set switches #1, #2 and #3 to OFF so the outputs will be for paint and beads. The Solenoid #1 output will be connected to the Line #2 Paint solenoid, and the Solenoid #2 output will be connected to the Line #2 Beads solenoid.

The SC88B computer will read these setup switches whenever you turn the power on, but will not read them again. If you change a switch with the power on, the SC88B will no longer be able to control that module until you turn the power off then back on to force the computer to read your new switch setting.

Leave the cover off of the Power Unit for the time being. That way, you will be able to see the lamps (LEDs) on each module that indicate that the solenoids are on. Solenoid #1 is indicated by the Red LED, and Solenoid #2 by the Green LED.

SOLENOID CONNECTIONS

Connect the low sides of the solenoids to the Output Modules using 0.250" push-on connectors. The high sides of all of the solenoids are connected together and tied to 12 volts through the Master Power Switch. Most solenoids are not sensitive to polarity, so the choice of which lead to call the "High Side" and which lead to call the "Low Side" is arbitrary. But, if your solenoids are polarity sensitive (they have a "+" and a "-" marked on them), be sure to connect the "+" lead to the 12 volt connection and the "-" to the module terminal.

Be sure to include a fuse of an appropriate rating in the master switch wiring. To determine the fuse rating, add the currents drawn by each of the solenoids, then add 0.5 amp. for the controller. The proper fuse is the next higher available rating. Generally, one ampere per solenoid is a reasonable value. The fuse is needed primarily for wiring protection for the power lines going to the solenoids and to the controller. The controller will protect the solenoid circuits and itself from shorts. Use wiring that is heavy enough to carry the current rating of the fuse, as a general rule, use #16

wire for up to 8 solenoids, and # 12 or #14 for over 8 solenoids.

Connect power to the controller through the power cable on the Power Unit connector. This cable has only two wires in it. One of the wires is black and **MUST** connect to vehicle ground. The other wire may be red or white, and connects to 12 volts through the Master Power Switch and its fuse.

INITIAL TESTING

Turn the SC88B power switch OFF and the system master power switch ON. If any solenoids operate, or if the fuse blows, check for shorts to ground in the solenoid wiring. Especially check for wires that are pinched by gun carriage drag links or that are cut through by sharp edges on sheet metal. Correct the problem before proceeding.

Assuming that no solenoids operated, turn the SC88B power switch ON. The LCD screen on the Control Unit will light up and sign on with the model and revision level, then will display the "Main Display". No solenoids should operate.

Use the UP and DOWN buttons to adjust the display contrast for best readability. Note that the UP and DOWN buttons adjust contrast only when the "Main Display" is showing. They do other things on other displays. The UP and DOWN buttons are also used while painting to quickly adjust the Cycle Length. You must have the RESET/HOLD Switch in HOLD position to adjust the display contrast.

On the control panel, set the Paint Switch ON, the Beads Switch OFF, and the Gun Switches (skip-off-solid) all OFF. Press the OFF button on the Pattern Selector Pushbutton. Press the Reset/Hold Switch to RESET position and release it to the RUN (center) position. When you release the Reset switch, check that no solenoids come on. If a solenoid comes on, there is a problem with one of the Gun Switches or the Pattern Selector Pushbutton.

Set the Line #1 (Lane/Edge) Gun Switch to SOLID. Its solenoid should operate and the red light on the output module should come on. Set the Line #1 Gun Switch to OFF. The red light should go off and the solenoid should drop out. Repeat for the other Gun Switches. This will verify that the correct switches operate the correct solenoids. If the solenoids don't come on with the correct switches, carefully re-check the settings of the "piano switches" on the output modules. If you have programmed the toggle switches, recheck the programming. Some possible problems are:

1. More than one solenoid comes on with a switch: Check that you don't have two output modules with the same "piano switch" settings. If you have programmed the Skip/Solid Switches, the switch may be programmed to operate more than one gun.
2. No solenoid comes on with a switch: Be sure that "piano switches" #1,#2 and #3 are all OFF (which sets the module to paint.) Recheck your programming for that toggle to be sure that it is supposed to

paint a line. Remember, if you change a switch on an Output Module, turn the SC88B power off and then on so it will recognize the change, otherwise the gun may not work at all. The SC88 locks all guns OFF when you turn power on. You must press and release the RESET or HOLD switch before any guns will work.

Now, turn the Gun Switches to OFF, and turn the Beads switch on. Repeat the above test of each switch, checking the beads solenoids associated with each paint gun. Note that if the truck is not moving, the bead distance delay is automatically disabled so that you can check your bead guns to make sure they are working before you begin painting. Any problems here are just like the problems with the paint guns above. Check them the same way.

We will now test the footage sender to make sure that pulses are getting to the controller. The "Sender Star" is a star in the lower right corner of the "Main Display" on the LCD Screen (see page 4). If you are using a fifth-wheel to drive the sender, simply have someone rotate the wheel while you watch to see if the star blinks on and off. If it blinks, the sender is working. If you have any other type of sender system, you will have to drive the vehicle while watching the star. The star will blink on and off whenever the vehicle is moving. When the sender pulses stop, the star may be left either on or off. It's important is that the star blinks when the vehicle is moving. If the star doesn't blink, make sure that the sender wiring is OK and that the sender is being driven by the transmission or the fifth wheel. If the sender is not being driven, sometimes a missing drive key is the culprit. If you are using a drive shaft wrapper, check the clearance between the pickup and the magnet wrapper.

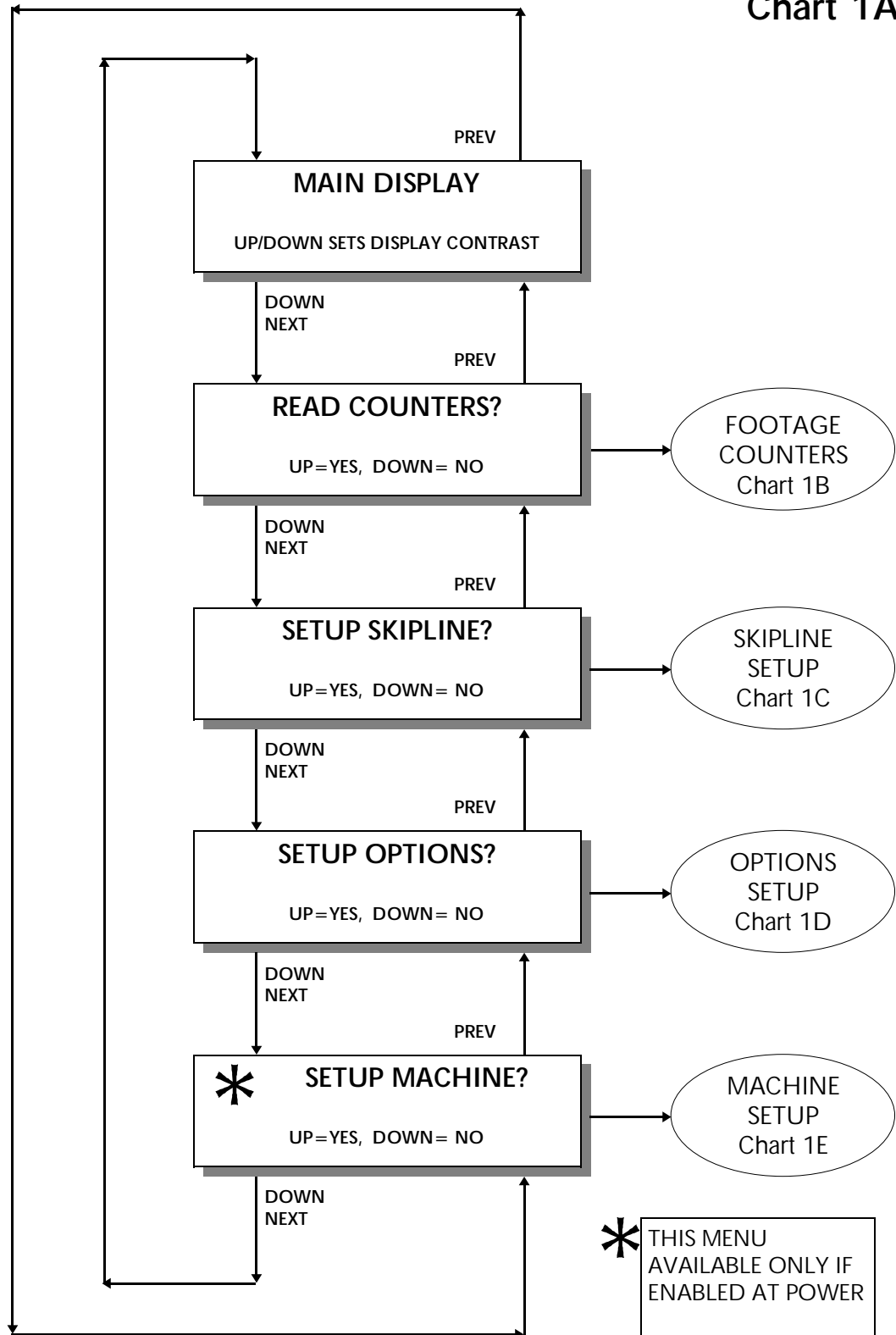
If everything above checks out, the SC88B is ready to calibrate.

ELECTRICAL PRECAUTIONS

1. **Be sure to turn the SC88B Controller OFF before connecting a battery charger to your battery.** The protective circuits in the SC88B will usually prevent damage to the controller, but may cause the fuse to blow.
2. It is good practice to turn the SC88B OFF when starting the engine. The drop in voltage during cranking may incorrectly trip the low battery sensor in the SC88B which can prevent proper storage of your accumulated footage counters.
3. **NEVER ARC WELD** on your machine while the controller is connected. Always completely remove all controller connections, including solenoid wires, before arc welding. Whether you are arc welding or gas welding, protect all wiring from sparks that may burn through the insulation.

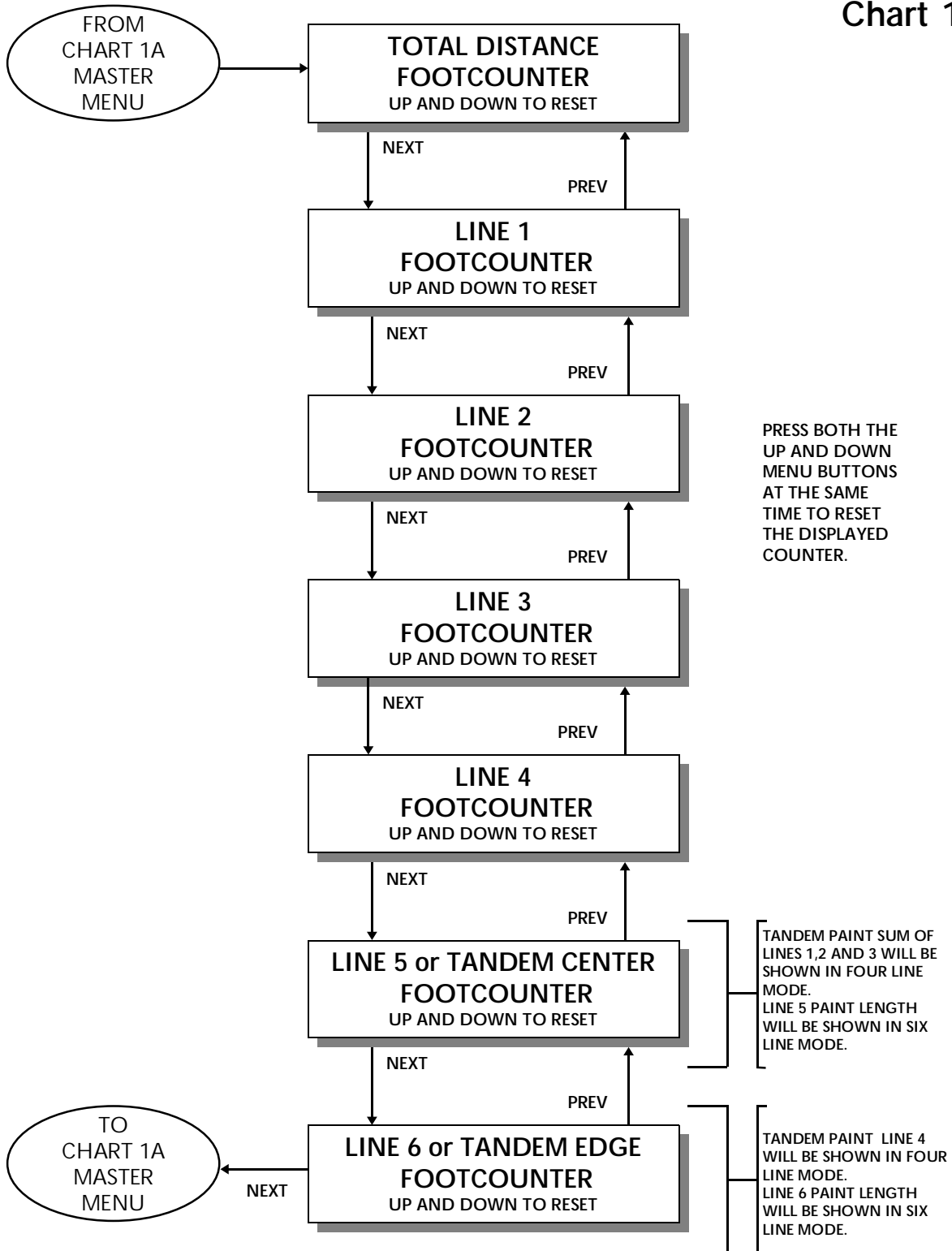


Chart 1A



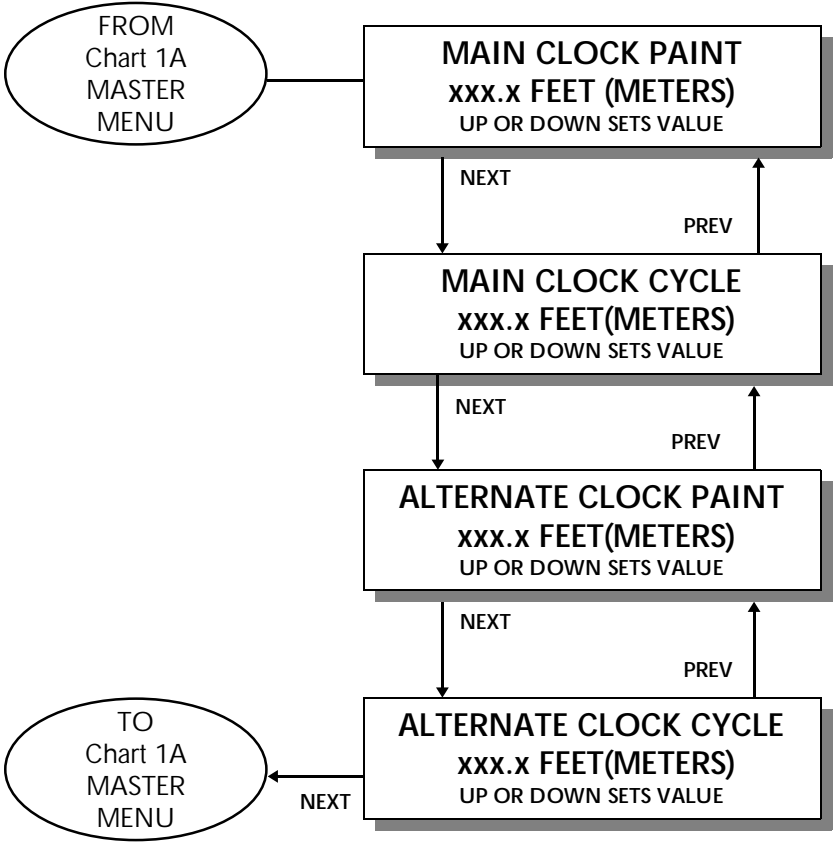
Footage Counters

Chart 1B



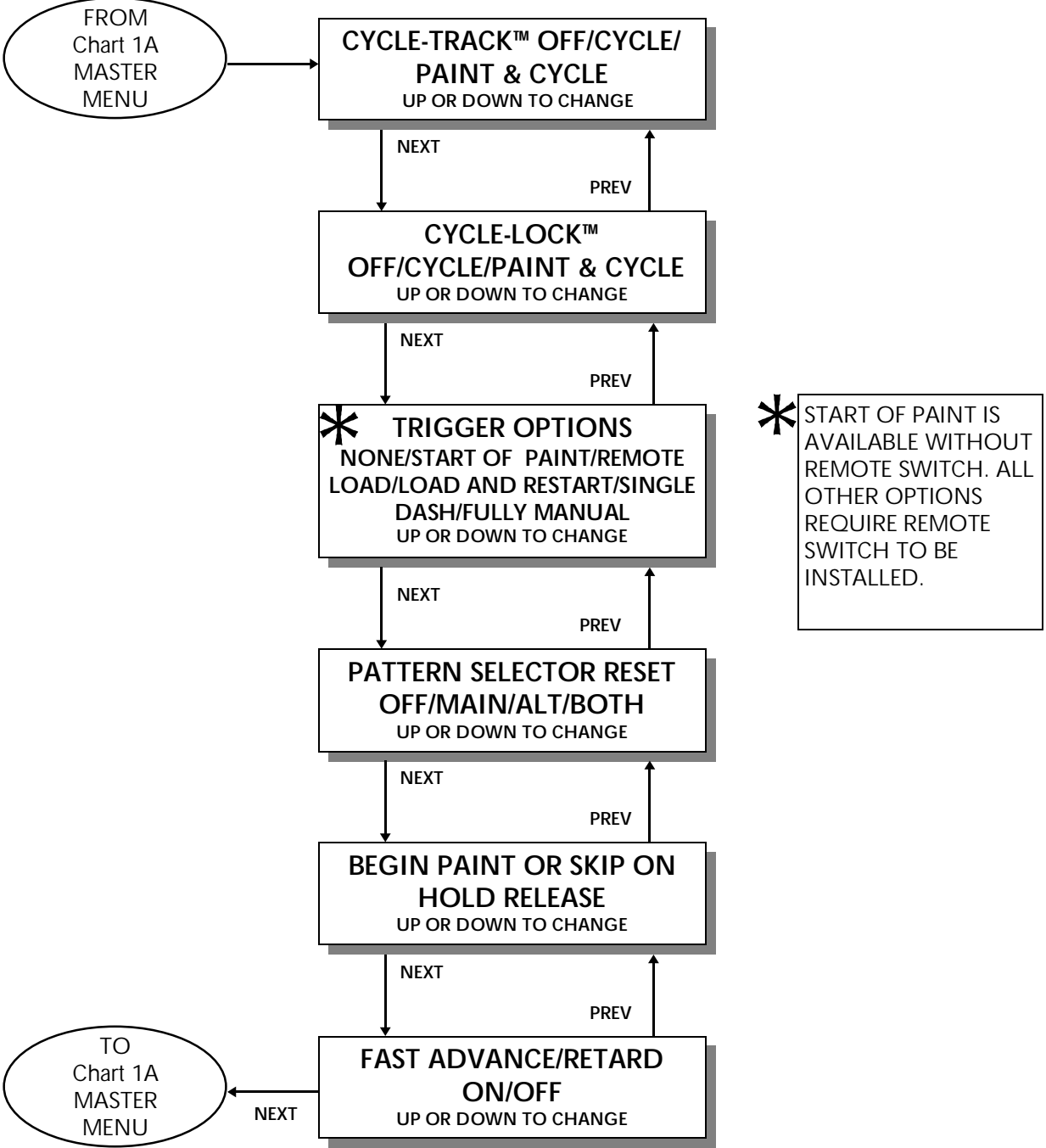
Skipline Setup

Chart 1C



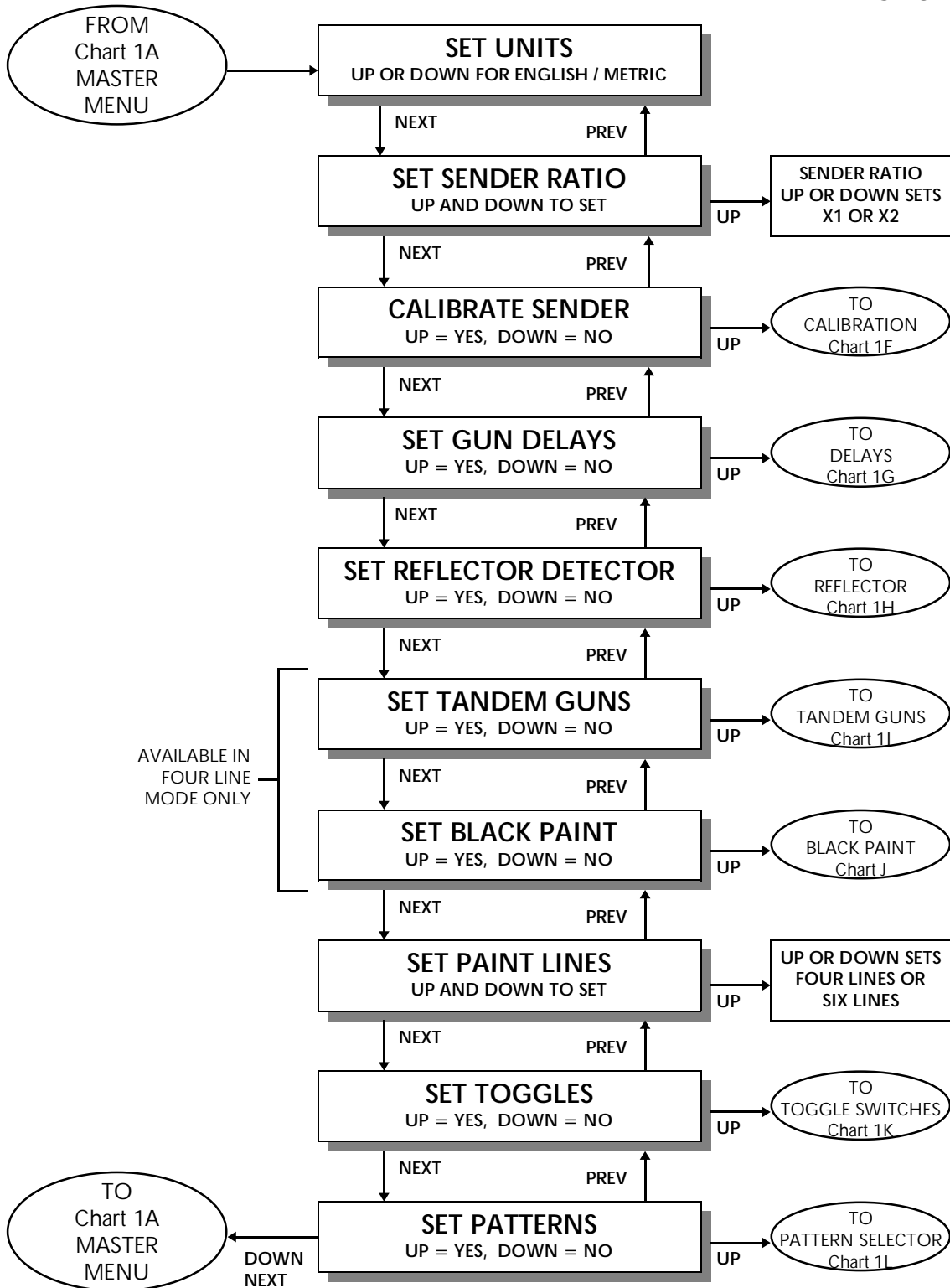
Options Setup

Chart 1D



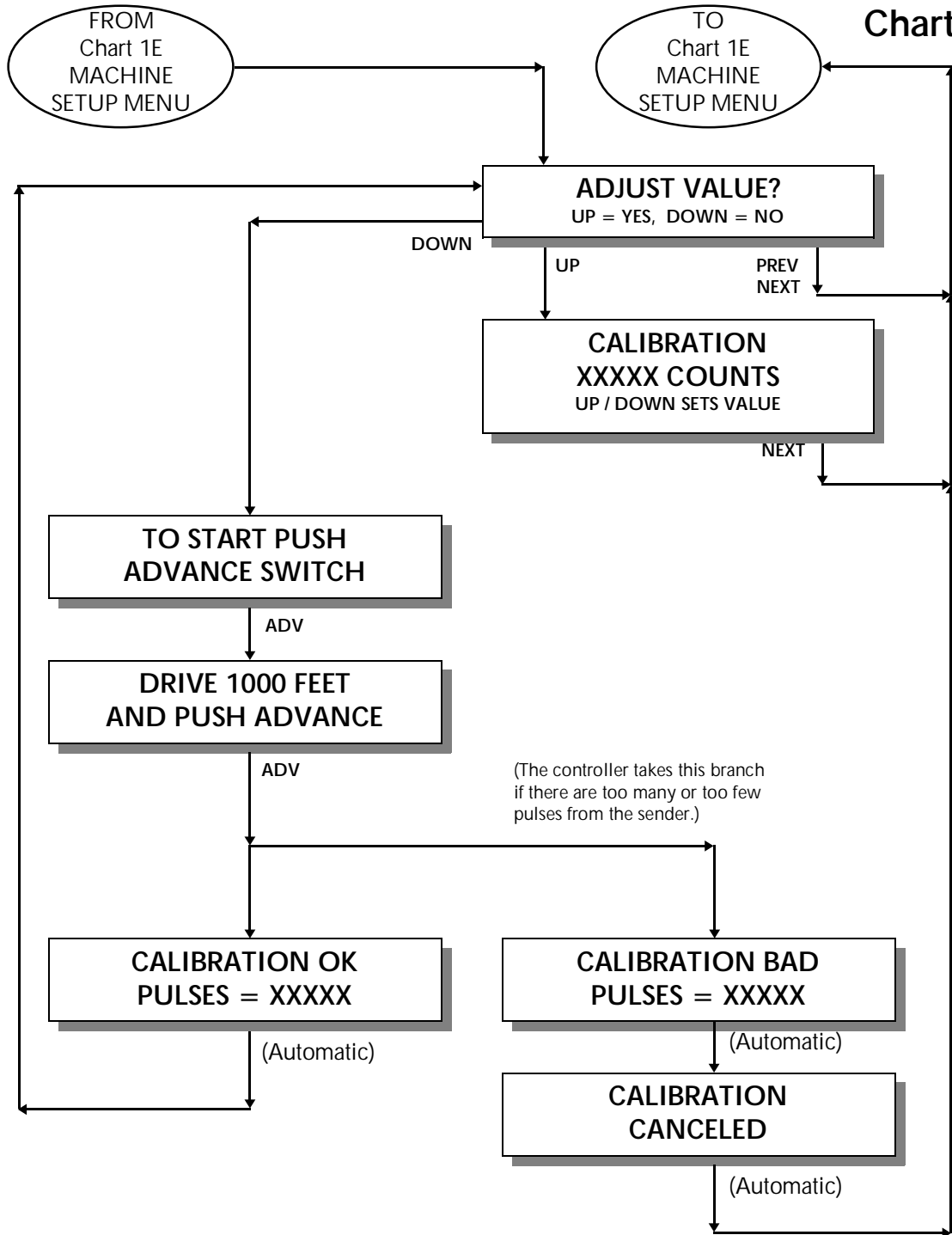
Machine Setup Master Menu

Chart 1E



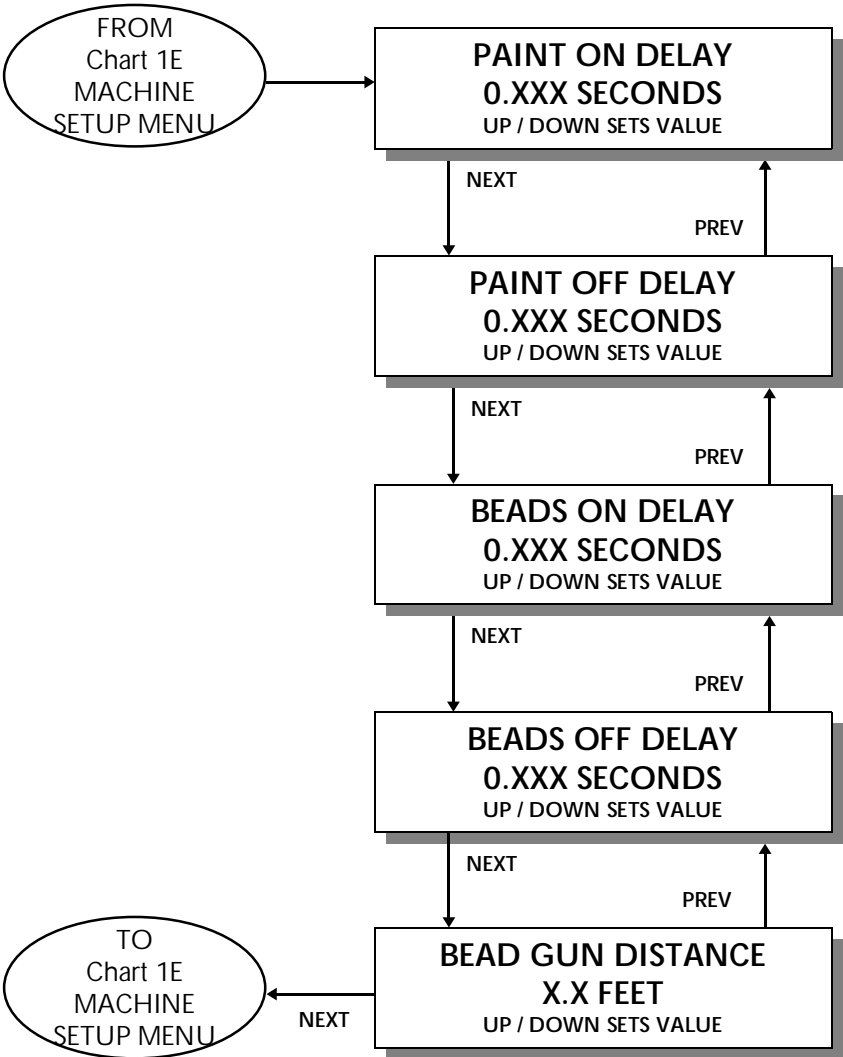
Sender Calibration

Chart 1F



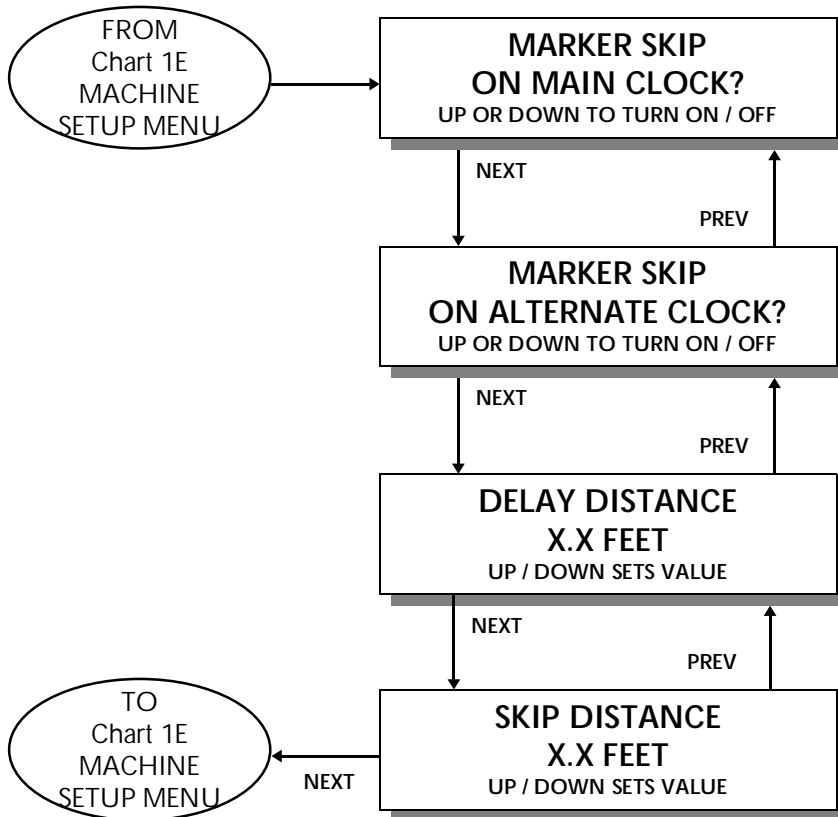
Set Gun Delays

Chart 1G



Raised Pavement Marker Detector Setup

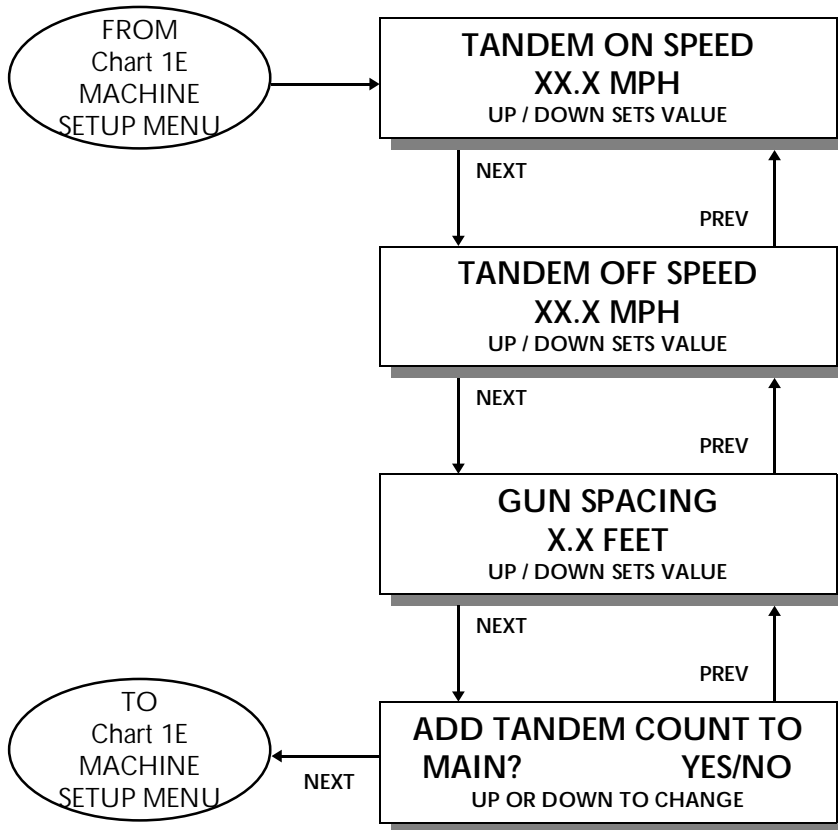
Chart 1H



Tandem Gun Setup

(Available on four line setup only)

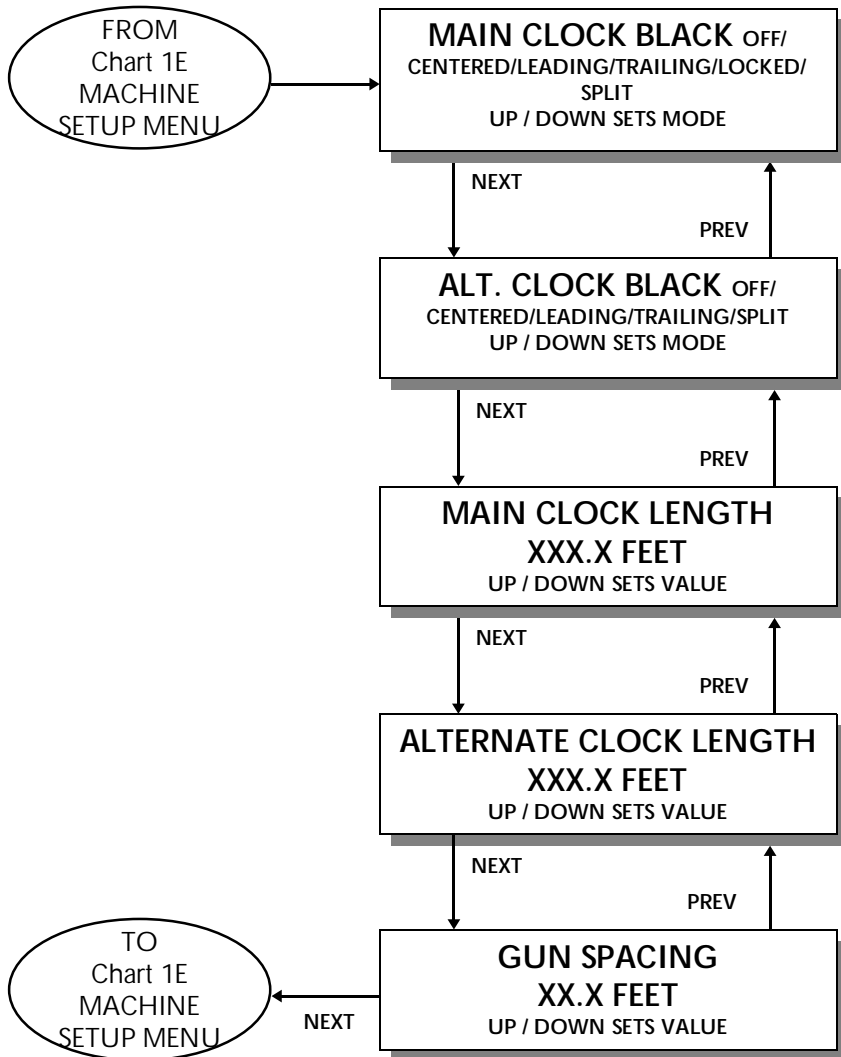
Chart 11



Black Paint Setup

(Available on four line setup only)

Chart 1J



Locked mode ties the black outputs to the paint clock so that the black outputs can be used for side-by-side contrast markings, or for secondary beads, or for secondary non-speed-controlled painting.

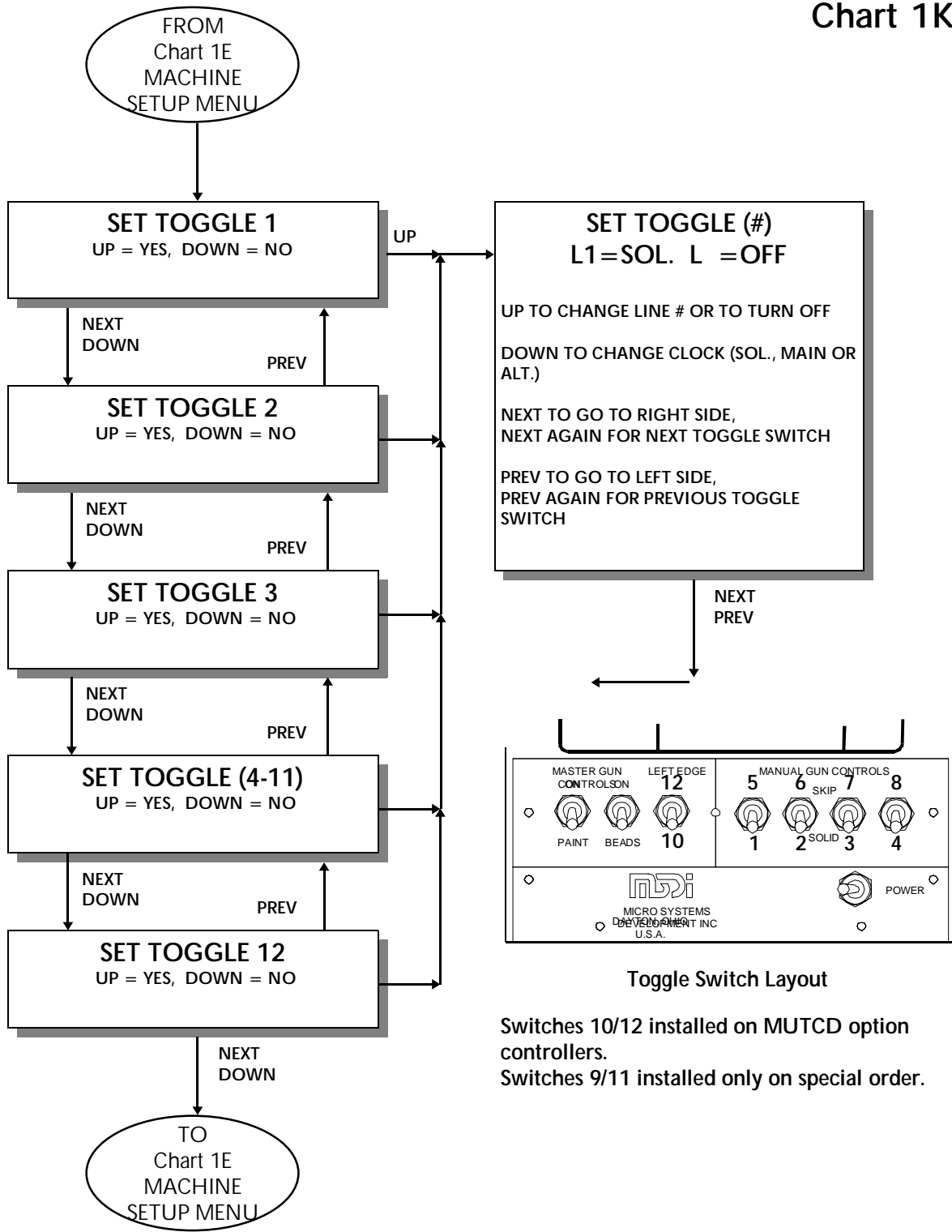
If Main Clock Black is locked, Alt. Clock Black will also be locked, regardless of its setting.

When locked mode is selected, length measurements are taken from the Main and Alt. skipclocks and the measurements set in this menu are ignored.

When locked mode is selected, gun spacing is used as set here. Gun delay timing is identical to the settings used for the paint guns.

Toggle Switch Programming

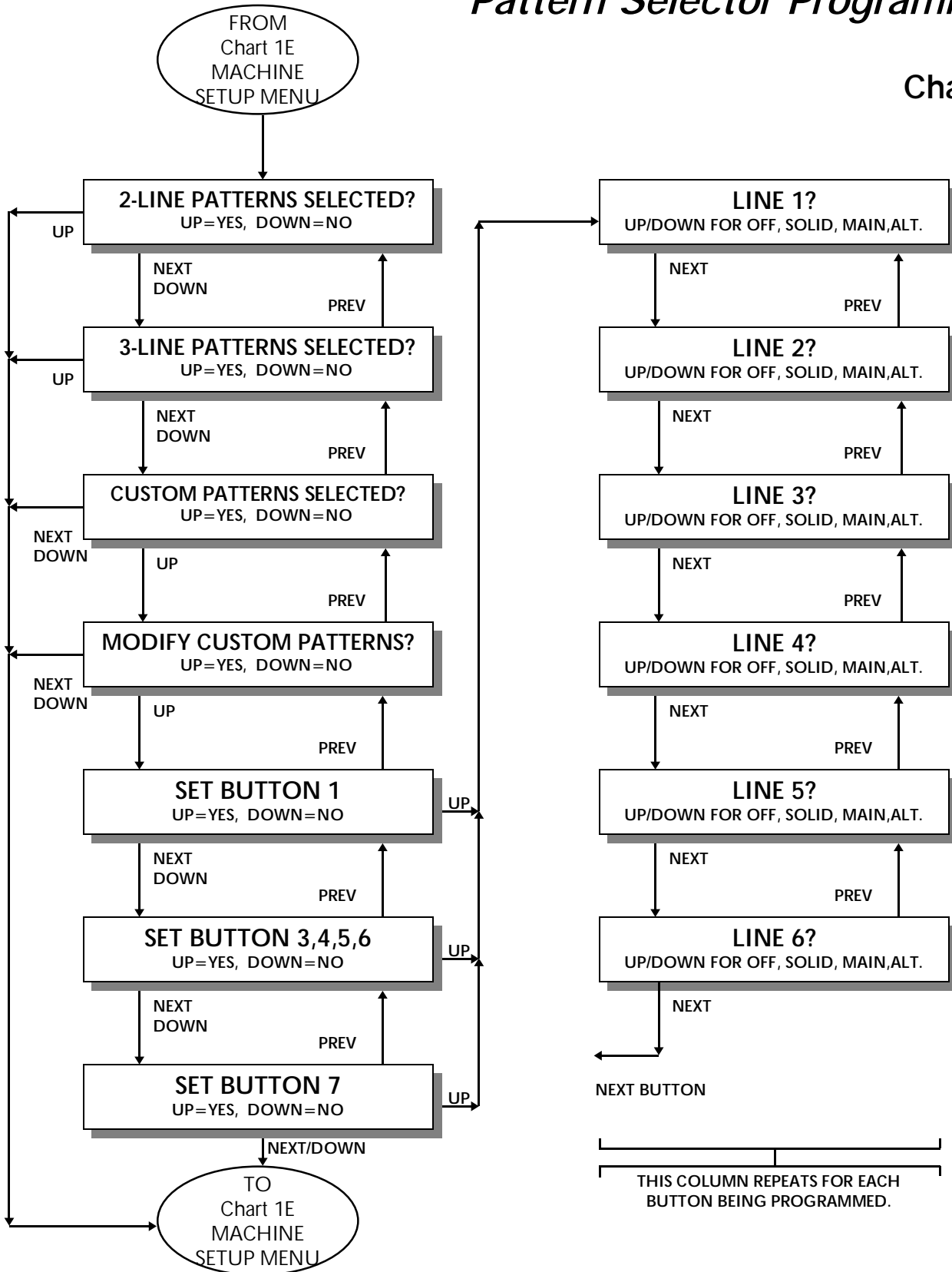
Chart 1K



Switches 10/12 installed on MUTCD option controllers.
Switches 9/11 installed only on special order.

Pattern Selector Programming

Chart 1L



LOWER SPEED TIMING-ENGLISH-Chart 2

		DISTANCE ERROR IN INCHES									
		1	2	3	4	5	6	7	8	9	10
SPEED											
	1.0	0.056	0.114	0.170	0.228	0.284	0.340	0.398	0.454	-	-
	1.2	0.048	0.094	0.142	0.190	0.236	0.284	0.332	0.378	0.426	0.474
	1.4	0.040	0.082	0.122	0.162	0.202	0.244	0.284	0.324	0.366	0.406
	1.6	0.036	0.072	0.106	0.142	0.178	0.214	0.248	0.284	0.320	0.356
	1.8	0.032	0.064	0.094	0.126	0.158	0.190	0.220	0.252	0.284	0.316
	2.0	0.028	0.056	0.086	0.114	0.142	0.170	0.198	0.228	0.256	0.284
	2.2	0.026	0.052	0.078	0.104	0.130	0.154	0.180	0.206	0.232	0.258
	2.4	0.024	0.048	0.072	0.094	0.118	0.142	0.166	0.190	0.214	0.236
	2.6	0.022	0.044	0.066	0.088	0.110	0.132	0.152	0.174	0.196	0.218
	2.8	0.020	0.040	0.060	0.082	0.102	0.122	0.142	0.162	0.182	0.202
M	3.0	0.018	0.038	0.056	0.076	0.094	0.114	0.132	0.152	0.170	0.190
	3.2	0.018	0.036	0.054	0.072	0.088	0.106	0.124	0.142	0.160	0.178
I	3.4	0.016	0.034	0.050	0.066	0.084	0.100	0.116	0.134	0.150	0.168
	3.6	0.016	0.032	0.048	0.064	0.078	0.094	0.110	0.126	0.142	0.158
L	3.8	0.014	0.030	0.044	0.060	0.074	0.090	0.104	0.120	0.134	0.150
	4.0	0.014	0.028	0.042	0.056	0.072	0.086	0.100	0.114	0.128	0.142
E	4.2	0.014	0.028	0.040	0.054	0.068	0.082	0.094	0.108	0.122	0.136
	4.4	0.012	0.026	0.038	0.052	0.064	0.078	0.090	0.104	0.116	0.130
S	4.6	0.012	0.024	0.038	0.050	0.062	0.074	0.086	0.098	0.112	0.124
	4.8	0.012	0.024	0.036	0.048	0.060	0.072	0.082	0.094	0.106	0.118
	5.0	0.012	0.022	0.034	0.046	0.056	0.068	0.080	0.090	0.102	0.114
	5.2	0.010	0.022	0.032	0.044	0.054	0.066	0.076	0.088	0.098	0.110
P	5.4	0.010	0.022	0.032	0.042	0.052	0.064	0.074	0.084	0.094	0.106
	5.6	0.010	0.020	0.030	0.040	0.050	0.060	0.072	0.082	0.092	0.102
E	5.8	0.010	0.020	0.030	0.040	0.048	0.058	0.068	0.078	0.088	0.098
	6.0	0.010	0.018	0.028	0.038	0.048	0.056	0.066	0.076	0.086	0.094
R	6.2	0.010	0.018	0.028	0.036	0.046	0.054	0.064	0.074	0.082	0.092
	6.4	0.008	0.018	0.026	0.036	0.044	0.054	0.062	0.072	0.080	0.088
	6.6	0.008	0.018	0.026	0.034	0.044	0.052	0.060	0.068	0.078	0.086
	6.8	0.008	0.016	0.026	0.034	0.042	0.050	0.058	0.066	0.076	0.084
H	7.0	0.008	0.016	0.024	0.032	0.040	0.048	0.056	0.064	0.074	0.082
	7.2	0.008	0.016	0.024	0.032	0.040	0.048	0.056	0.064	0.072	0.078
O	7.4	0.008	0.016	0.024	0.030	0.038	0.046	0.054	0.062	0.070	0.076
	7.6	0.008	0.014	0.022	0.030	0.038	0.044	0.052	0.060	0.068	0.074
U	7.8	0.008	0.014	0.022	0.030	0.036	0.044	0.050	0.058	0.066	0.072
	8.0	0.008	0.014	0.022	0.028	0.036	0.042	0.050	0.056	0.064	0.072
R	8.2	0.006	0.014	0.020	0.028	0.034	0.042	0.048	0.056	0.062	0.070
	8.4	0.006	0.014	0.020	0.028	0.034	0.040	0.048	0.054	0.060	0.068
	8.6	0.006	0.014	0.020	0.026	0.034	0.040	0.046	0.052	0.060	0.066
	8.8	0.006	0.012	0.020	0.026	0.032	0.038	0.046	0.052	0.058	0.064
	9.0	0.006	0.012	0.018	0.026	0.032	0.038	0.044	0.050	0.056	0.064
	9.2	0.006	0.012	0.018	0.024	0.030	0.038	0.044	0.050	0.056	0.062
	9.4	0.006	0.012	0.018	0.024	0.030	0.036	0.042	0.048	0.054	0.060
	9.6	0.006	0.012	0.018	0.024	0.030	0.036	0.042	0.048	0.054	0.060
	9.8	0.006	0.012	0.018	0.024	0.028	0.034	0.040	0.046	0.052	0.058
	10.0	0.006	0.012	0.018	0.022	0.028	0.034	0.040	0.046	0.052	0.056
	10.2	0.006	0.012	0.016	0.022	0.028	0.034	0.038	0.044	0.050	0.056
	10.4	0.006	0.010	0.016	0.022	0.028	0.032	0.038	0.044	0.050	0.054

HIGHER SPEED TIMING-ENGLISH- Chart 3

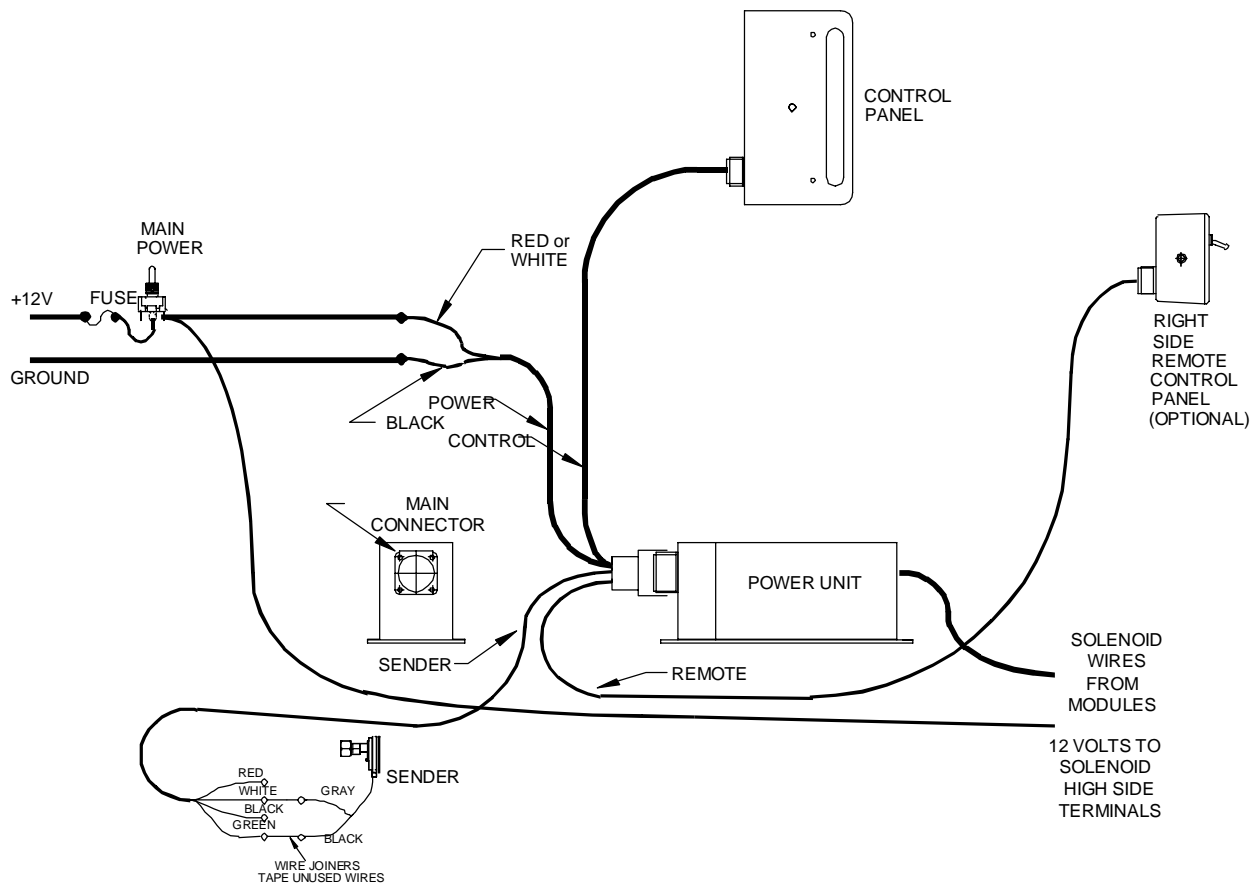
		DISTANCE ERROR IN INCHES									
		1	2	3	4	5	6	7	8	9	10
SPEED											
	10.6	0.006	0.010	0.016	0.022	0.026	0.032	0.038	0.042	0.048	0.054
	10.8	0.006	0.010	0.016	0.022	0.026	0.032	0.036	0.042	0.048	0.052
M	11.0	0.006	0.010	0.016	0.020	0.026	0.030	0.036	0.042	0.046	0.052
	11.2	0.006	0.010	0.016	0.020	0.026	0.030	0.036	0.040	0.046	0.050
I	11.4	0.004	0.010	0.014	0.020	0.024	0.030	0.034	0.040	0.044	0.050
	11.6	0.004	0.010	0.014	0.020	0.024	0.030	0.034	0.040	0.044	0.048
L	11.8	0.004	0.010	0.014	0.020	0.024	0.028	0.034	0.038	0.044	0.048
	12.0	0.004	0.010	0.014	0.018	0.024	0.028	0.034	0.038	0.042	0.048
E	12.2	0.004	0.010	0.014	0.018	0.024	0.028	0.032	0.038	0.042	0.046
	12.4	0.004	0.010	0.014	0.018	0.022	0.028	0.032	0.036	0.042	0.046
S	12.6	0.004	0.010	0.014	0.018	0.022	0.028	0.032	0.036	0.040	0.046
	12.8	0.004	0.008	0.014	0.018	0.022	0.026	0.032	0.036	0.040	0.044
	13.0	0.004	0.008	0.014	0.018	0.022	0.026	0.030	0.034	0.040	0.044
	13.2	0.004	0.008	0.012	0.018	0.022	0.026	0.030	0.034	0.038	0.044
P	13.4	0.004	0.008	0.012	0.016	0.022	0.026	0.030	0.034	0.038	0.042
	13.6	0.004	0.008	0.012	0.016	0.020	0.026	0.030	0.034	0.038	0.042
E	13.8	0.004	0.008	0.012	0.016	0.020	0.024	0.028	0.032	0.038	0.042
	14.0	0.004	0.008	0.012	0.016	0.020	0.024	0.028	0.032	0.036	0.040
R	14.2	0.004	0.008	0.012	0.016	0.020	0.024	0.028	0.032	0.036	0.040
	14.4	0.004	0.008	0.012	0.016	0.020	0.024	0.028	0.032	0.036	0.040
	14.6	0.004	0.008	0.012	0.016	0.020	0.024	0.028	0.032	0.036	0.038
	14.8	0.004	0.008	0.012	0.016	0.020	0.024	0.026	0.030	0.034	0.038
H	15.0	0.004	0.008	0.012	0.016	0.018	0.022	0.026	0.030	0.034	0.038
	15.2	0.004	0.008	0.012	0.014	0.018	0.022	0.026	0.030	0.034	0.038
O	15.4	0.004	0.008	0.012	0.014	0.018	0.022	0.026	0.030	0.034	0.036
	15.6	0.004	0.008	0.010	0.014	0.018	0.022	0.026	0.030	0.032	0.036
U	15.8	0.004	0.008	0.010	0.014	0.018	0.022	0.026	0.028	0.032	0.036
	16.0	0.004	0.008	0.010	0.014	0.018	0.022	0.024	0.028	0.032	0.036
R	16.2	0.004	0.008	0.010	0.014	0.018	0.022	0.024	0.028	0.032	0.036
	16.4	0.004	0.006	0.010	0.014	0.018	0.020	0.024	0.028	0.032	0.034
	16.6	0.004	0.006	0.010	0.014	0.018	0.020	0.024	0.028	0.030	0.034
	16.8	0.004	0.006	0.010	0.014	0.016	0.020	0.024	0.028	0.030	0.034
	17.0	0.004	0.006	0.010	0.014	0.016	0.020	0.024	0.026	0.030	0.034
	17.2	0.004	0.006	0.010	0.014	0.016	0.020	0.024	0.026	0.030	0.034
	17.4	0.004	0.006	0.010	0.014	0.016	0.020	0.022	0.026	0.030	0.032
	17.6	0.004	0.006	0.010	0.012	0.016	0.020	0.022	0.026	0.030	0.032
	17.8	0.004	0.006	0.010	0.012	0.016	0.020	0.022	0.026	0.028	0.032
	18.0	0.004	0.006	0.010	0.012	0.016	0.018	0.022	0.026	0.028	0.032
	18.2	0.004	0.006	0.010	0.012	0.016	0.018	0.022	0.024	0.028	0.032
	18.4	0.004	0.006	0.010	0.012	0.016	0.018	0.022	0.024	0.028	0.030
	18.6	0.004	0.006	0.010	0.012	0.016	0.018	0.022	0.024	0.028	0.030
	18.8	0.004	0.006	0.010	0.012	0.016	0.018	0.022	0.024	0.028	0.030
	19.0	0.002	0.006	0.008	0.012	0.014	0.018	0.020	0.024	0.026	0.030
	19.2	0.002	0.006	0.008	0.012	0.014	0.018	0.020	0.024	0.026	0.030
	19.4	0.002	0.006	0.008	0.012	0.014	0.018	0.020	0.024	0.026	0.030
	19.6	0.002	0.006	0.008	0.012	0.014	0.018	0.020	0.024	0.026	0.028
	19.8	0.002	0.006	0.008	0.012	0.014	0.018	0.020	0.022	0.026	0.028
	20.0	0.002	0.006	0.008	0.012	0.014	0.018	0.020	0.022	0.026	0.028

LOWER SPEED TIMING-METRIC- Chart 4

		DISTANCE ERROR IN CENTIMETERS									
		2	4	6	8	10	12	14	16	18	20
SPEED											
	1.0	0.072	0.144	0.216	0.288	0.360	0.432	-	-	-	-
	1.2	0.060	0.120	0.180	0.240	0.300	0.360	0.420	0.480	-	-
	1.4	0.052	0.102	0.154	0.206	0.258	0.308	0.360	0.412	0.462	-
	1.6	0.046	0.090	0.136	0.180	0.226	0.270	0.316	0.360	0.406	0.450
	1.8	0.040	0.080	0.120	0.160	0.200	0.240	0.280	0.320	0.360	0.400
	2.0	0.036	0.072	0.108	0.144	0.180	0.216	0.252	0.288	0.324	0.360
K	2.2	0.032	0.066	0.098	0.130	0.164	0.196	0.230	0.262	0.294	0.328
	2.4	0.030	0.060	0.090	0.120	0.150	0.180	0.210	0.240	0.270	0.300
I	2.6	0.028	0.056	0.084	0.110	0.138	0.166	0.194	0.222	0.250	0.276
	2.8	0.026	0.052	0.078	0.102	0.128	0.154	0.180	0.206	0.232	0.258
L	3.0	0.024	0.048	0.072	0.096	0.120	0.144	0.168	0.192	0.216	0.240
	3.2	0.022	0.046	0.068	0.090	0.112	0.136	0.158	0.180	0.202	0.226
O	3.4	0.022	0.042	0.064	0.084	0.106	0.128	0.148	0.170	0.190	0.212
	3.6	0.020	0.040	0.060	0.080	0.100	0.120	0.140	0.160	0.180	0.200
M	3.8	0.018	0.038	0.056	0.076	0.094	0.114	0.132	0.152	0.170	0.190
	4.0	0.018	0.036	0.054	0.072	0.090	0.108	0.126	0.144	0.162	0.180
E	4.2	0.018	0.034	0.052	0.068	0.086	0.102	0.120	0.138	0.154	0.172
	4.4	0.016	0.032	0.050	0.066	0.082	0.098	0.114	0.130	0.148	0.164
T	4.6	0.016	0.032	0.046	0.062	0.078	0.094	0.110	0.126	0.140	0.156
	4.8	0.016	0.030	0.046	0.060	0.076	0.090	0.106	0.120	0.136	0.150
E	5.0	0.014	0.028	0.044	0.058	0.072	0.086	0.100	0.116	0.130	0.144
	5.2	0.014	0.028	0.042	0.056	0.070	0.084	0.096	0.110	0.124	0.138
R	5.4	0.014	0.026	0.040	0.054	0.066	0.080	0.094	0.106	0.120	0.134
	5.6	0.012	0.026	0.038	0.052	0.064	0.078	0.090	0.102	0.116	0.128
S	5.8	0.012	0.024	0.038	0.050	0.062	0.074	0.086	0.100	0.112	0.124
	6.0	0.012	0.024	0.036	0.048	0.060	0.072	0.084	0.096	0.108	0.120
	6.2	0.012	0.024	0.034	0.046	0.058	0.070	0.082	0.092	0.104	0.116
	6.4	0.012	0.022	0.034	0.046	0.056	0.068	0.078	0.090	0.102	0.112
P	6.6	0.010	0.022	0.032	0.044	0.054	0.066	0.076	0.088	0.098	0.110
	6.8	0.010	0.022	0.032	0.042	0.052	0.064	0.074	0.084	0.096	0.106
E	7.0	0.010	0.020	0.030	0.042	0.052	0.062	0.072	0.082	0.092	0.102
	7.2	0.010	0.020	0.030	0.040	0.050	0.060	0.070	0.080	0.090	0.100
R	7.4	0.010	0.020	0.030	0.038	0.048	0.058	0.068	0.078	0.088	0.098
	7.6	0.010	0.018	0.028	0.038	0.048	0.056	0.066	0.076	0.086	0.094
	7.8	0.010	0.018	0.028	0.036	0.046	0.056	0.064	0.074	0.084	0.092
	8.0	0.010	0.018	0.028	0.036	0.046	0.054	0.064	0.072	0.082	0.090
H	8.2	0.008	0.018	0.026	0.036	0.044	0.052	0.062	0.070	0.080	0.088
	8.4	0.008	0.018	0.026	0.034	0.042	0.052	0.060	0.068	0.078	0.086
O	8.6	0.008	0.016	0.026	0.034	0.042	0.050	0.058	0.066	0.076	0.084
	8.8	0.008	0.016	0.024	0.032	0.040	0.050	0.058	0.066	0.074	0.082
U	9.0	0.008	0.016	0.024	0.032	0.040	0.048	0.056	0.064	0.072	0.080
	9.2	0.008	0.016	0.024	0.032	0.040	0.046	0.054	0.062	0.070	0.078
R	9.4	0.008	0.016	0.022	0.030	0.038	0.046	0.054	0.062	0.068	0.076
	9.6	0.008	0.016	0.022	0.030	0.038	0.046	0.052	0.060	0.068	0.076
	9.8	0.008	0.014	0.022	0.030	0.036	0.044	0.052	0.058	0.066	0.074
	10.0	0.008	0.014	0.022	0.028	0.036	0.044	0.050	0.058	0.064	0.072
	10.2	0.008	0.014	0.022	0.028	0.036	0.042	0.050	0.056	0.064	0.070
	10.4	0.006	0.014	0.020	0.028	0.034	0.042	0.048	0.056	0.062	0.070
	10.6	0.006	0.014	0.020	0.028	0.034	0.040	0.048	0.054	0.062	0.068
	10.8	0.006	0.014	0.020	0.026	0.034	0.040	0.046	0.054	0.060	0.066

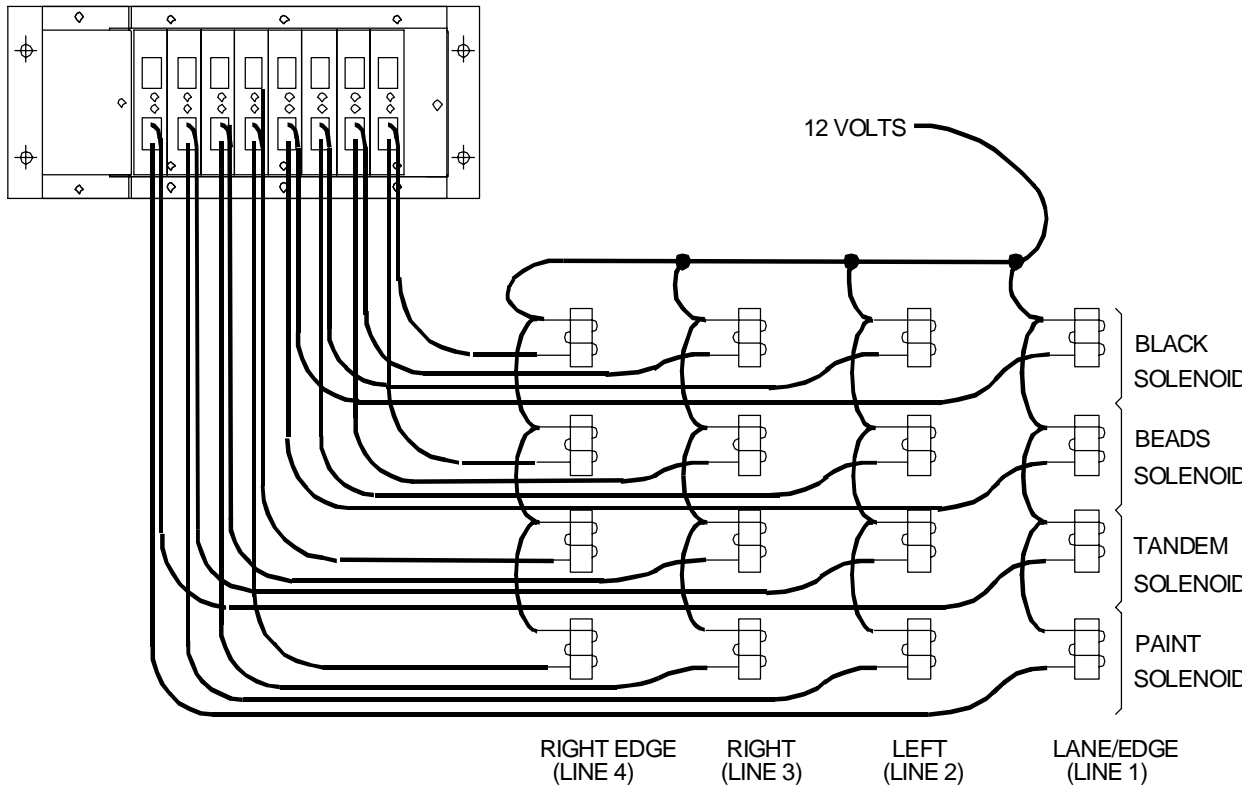
HIGHER SPEED TIMING-METRIC- Chart 5

		DISTANCE ERROR IN CENTIMETERS									
		1	2	3	4	5	6	7	8	9	10
SPEED											
	11.0	0.006	0.014	0.020	0.026	0.032	0.040	0.046	0.052	0.058	0.066
	11.2	0.006	0.012	0.020	0.026	0.032	0.038	0.046	0.052	0.058	0.064
	11.4	0.006	0.012	0.018	0.026	0.032	0.038	0.044	0.050	0.056	0.064
	11.6	0.006	0.012	0.018	0.024	0.032	0.038	0.044	0.050	0.056	0.062
	11.8	0.006	0.012	0.018	0.024	0.030	0.036	0.042	0.048	0.054	0.062
	12.0	0.006	0.012	0.018	0.024	0.030	0.036	0.042	0.048	0.054	0.060
K	12.2	0.006	0.012	0.018	0.024	0.030	0.036	0.042	0.048	0.054	0.060
	12.4	0.006	0.012	0.018	0.024	0.030	0.034	0.040	0.046	0.052	0.058
I	12.6	0.006	0.012	0.018	0.022	0.028	0.034	0.040	0.046	0.052	0.058
	12.8	0.006	0.012	0.016	0.022	0.028	0.034	0.040	0.046	0.050	0.056
L	13.0	0.006	0.012	0.016	0.022	0.028	0.034	0.038	0.044	0.050	0.056
	13.2	0.006	0.010	0.016	0.022	0.028	0.032	0.038	0.044	0.050	0.054
O	13.4	0.006	0.010	0.016	0.022	0.026	0.032	0.038	0.042	0.048	0.054
	13.6	0.006	0.010	0.016	0.022	0.026	0.032	0.038	0.042	0.048	0.052
M	13.8	0.006	0.010	0.016	0.020	0.026	0.032	0.036	0.042	0.046	0.052
	14.0	0.006	0.010	0.016	0.020	0.026	0.030	0.036	0.042	0.046	0.052
E	14.2	0.006	0.010	0.016	0.020	0.026	0.030	0.036	0.040	0.046	0.050
	14.4	0.006	0.010	0.016	0.020	0.026	0.030	0.036	0.040	0.046	0.050
T	14.6	0.004	0.010	0.014	0.020	0.024	0.030	0.034	0.040	0.044	0.050
	14.8	0.004	0.010	0.014	0.020	0.024	0.030	0.034	0.038	0.044	0.048
E	15.0	0.004	0.010	0.014	0.020	0.024	0.028	0.034	0.038	0.044	0.048
	15.2	0.004	0.010	0.014	0.018	0.024	0.028	0.034	0.038	0.042	0.048
R	15.4	0.004	0.010	0.014	0.018	0.024	0.028	0.032	0.038	0.042	0.046
	15.6	0.004	0.010	0.014	0.018	0.024	0.028	0.032	0.036	0.042	0.046
S	15.8	0.004	0.010	0.014	0.018	0.022	0.028	0.032	0.036	0.042	0.046
	16.0	0.004	0.010	0.014	0.018	0.022	0.028	0.032	0.036	0.040	0.046
	16.2	0.004	0.008	0.014	0.018	0.022	0.026	0.032	0.036	0.040	0.044
	16.4	0.004	0.008	0.014	0.018	0.022	0.026	0.030	0.036	0.040	0.044
P	16.6	0.004	0.008	0.014	0.018	0.022	0.026	0.030	0.034	0.040	0.044
	16.8	0.004	0.008	0.012	0.018	0.022	0.026	0.030	0.034	0.038	0.042
E	17.0	0.004	0.008	0.012	0.016	0.022	0.026	0.030	0.034	0.038	0.042
	17.2	0.004	0.008	0.012	0.016	0.020	0.026	0.030	0.034	0.038	0.042
R	17.4	0.004	0.008	0.012	0.016	0.020	0.024	0.028	0.034	0.038	0.042
	17.6	0.004	0.008	0.012	0.016	0.020	0.024	0.028	0.032	0.036	0.040
	17.8	0.004	0.008	0.012	0.016	0.020	0.024	0.028	0.032	0.036	0.040
	18.0	0.004	0.008	0.012	0.016	0.020	0.024	0.028	0.032	0.036	0.040
H	18.2	0.004	0.008	0.012	0.016	0.020	0.024	0.028	0.032	0.036	0.040
	18.4	0.004	0.008	0.012	0.016	0.020	0.024	0.028	0.032	0.036	0.040
O	18.6	0.004	0.008	0.012	0.016	0.020	0.024	0.028	0.030	0.034	0.038
	18.8	0.004	0.008	0.012	0.016	0.020	0.022	0.026	0.030	0.034	0.038
U	19.0	0.004	0.008	0.012	0.016	0.018	0.022	0.026	0.030	0.034	0.038
	19.2	0.004	0.008	0.012	0.016	0.018	0.022	0.026	0.030	0.034	0.038
R	19.4	0.004	0.008	0.012	0.014	0.018	0.022	0.026	0.030	0.034	0.038
	19.6	0.004	0.008	0.012	0.014	0.018	0.022	0.026	0.030	0.034	0.036
	19.8	0.004	0.008	0.010	0.014	0.018	0.022	0.026	0.030	0.032	0.036
	20.0	0.004	0.008	0.010	0.014	0.018	0.022	0.026	0.028	0.032	0.036
	20.2	0.004	0.008	0.010	0.014	0.018	0.022	0.024	0.028	0.032	0.036
	20.4	0.004	0.008	0.010	0.014	0.018	0.022	0.024	0.028	0.032	0.036
	20.6	0.004	0.006	0.010	0.014	0.018	0.020	0.024	0.028	0.032	0.034
	20.8	0.004	0.006	0.010	0.014	0.018	0.020	0.024	0.028	0.032	0.034

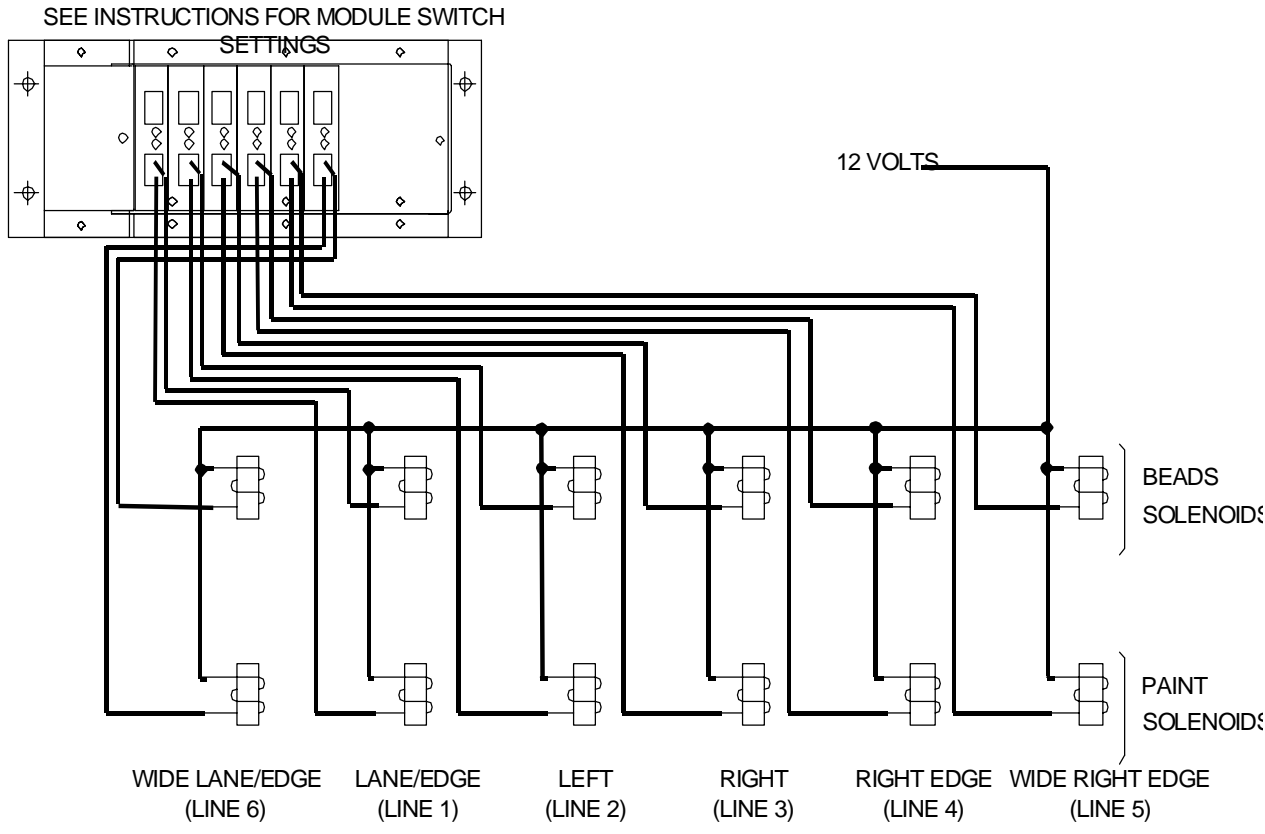


INSTALLATION DIAGRAM FOR MODEL SC88B SKIPLINE CONTROLLER

SEE INSTRUCTIONS FOR MODULE SWITCH SETTINGS



SOLENOID WIRING - FOUR LINES - 16 GUNS



SOLENOID WIRING - SIX LINES - 12 GUNS

IN CASE OF DIFFICULTY **6**

The following hints may help if you are having trouble with your system:

No data on display	Is battery connected? Is the polarity correct? Is battery charged? Check or replace the fuse.
One Gun reads Open Circuit	Is the solenoid connected? Check solenoid for continuity. If solenoid is OK, check cable for cuts or abrasions.
All guns read Open Circuit	Look for a break or bad connection in the common + 12 wire that feeds all of the solenoids. Check the solenoid fuse.
Gun reads Short Circuit	Check solenoid for internal short. If OK, check cable for cuts or abrasions. Some intermittent duty solenoids draw enough current to trip the overload circuitry in the SC88B. Use only recommended solenoids.
Solids paint, Skips don't	Look for the blinking star in the lower right corner of the display. Manually rotate the sender, move the truck, or some way get pulses to the SC88B. If the star doesn't blink, check the sender drive tang to make sure that it is not broken or worn. Check sender wiring. Try another sender if possible.
Can't set Paint or Cycle length to the desired value	The SC88B won't allow you to set the paint length longer than Cycle, or the Cycle length shorter than paint. Try using the PREV or NEXT buttons to move to a different menu, then come back to the one you couldn't set.
The panel switches don't work	<p>If you have selected one of the remote TRIGGER OPTIONS, the panel switches won't take effect until there is a trigger event, like a push of the remote button, or a start of a new paintline. Set NONE in the TRIGGER OPTIONS menu to have your switch changes take effect immediately.</p> <p>Check the programming of the switch to be sure that it is supposed to paint a line.</p>

SC88B SETUP RECORD

Installation date _____ Truck _____

We recommend that you fill out this form as you set up your SC88B settings in the event that your controller must be serviced or your settings are inadvertently disturbed.

SKIPLINE MENUS

Menu C.1 Main Clock Paint _____(feet/meters)
Menu C.2 Main Clock Cycle _____(feet/meters)
Menu C.3 Alt. Clock Paint _____(feet/meters)
Menu C.4 Alt. Clock Cycle _____(feet/meters)

OPTION MENUS

Menu D.1 CycleTrack _____(Off,Cycle,Both)
Menu D.2 CycleLock _____(Off,Cycle,Both)
Menu D.3 Button Trigger Options _____(None, Start Paint,Remote Load
Load/Restart, Single Dash, Manual)
Menu D.4 Pattern Selector Reset _____(Off, Main, Alt, Both)
Menu D.5 Paint/Skip First _____(Paint/Skip)
Menu D.6 Fast Adv/Ret _____(On/Off)

MACHINE SETUP MENUS

Menu E.1 Units of Measure _____(English/Metric)
Menu E.2 Sender Ratio _____(X1 or X2)
Menu E.8 Number of Lines _____(Four or Six)

Menu F.1 Sender Counts _____(counts)

Menu G.1 Paint On Delay _____(seconds)
Menu G.2 Paint Off Delay _____(seconds)
Menu G.3 Beads On Delay _____(seconds)
Menu G.4 Beads Off Delay _____(seconds)
Menu G.5 Bead Gun Distance _____(feet/meters)

Menu H.1 Reflector Skip Center _____(yes/no)
Menu H.2 Reflector Skip Edge _____(yes/no)
Menu H.3 Reflector Delay _____(feet/meters)

- Menu H.4 Reflector Skip Size _____(feet/meters)
- Menu I.1 Tandem Gun On Speed _____(MPH/KPH)
- Menu I.2 Tandem Gun Off Speed _____(MPH/KPH)
- Menu I.3 Tandem Gun Spacing _____(feet/meters)
- Menu J.1 Black Paint Main Clock _____(off/lead/trail/center/split)
- Menu J.2 Black Paint Alt. Clock _____(off/lead/trail/center/split)
- Menu J.3 Black Length Main _____(feet/meters)
- Menu J.4 Black Length Alt. _____(feet/meters)
- Menu J.5 Black Gun Spacing _____(feet/meters)

Mark Toggles with the Line # and Clock (**Off**, **Solid**, **Main**, or **Alt.**) for each.

- | | | Left Line | Right Line | |
|-----------|-----------|-----------|------------|------------------------|
| Menu K.1 | Toggle 1 | _____ | _____ | (Line number; O,S,M,A) |
| Menu K.2 | Toggle 2 | _____ | _____ | (Line number; O,S,M,A) |
| Menu K.3 | Toggle 3 | _____ | _____ | (Line number; O,S,M,A) |
| Menu K.4 | Toggle 4 | _____ | _____ | (Line number; O,S,M,A) |
| Menu K.5 | Toggle 5 | _____ | _____ | (Line number; O,S,M,A) |
| Menu K.6 | Toggle 6 | _____ | _____ | (Line number; O,S,M,A) |
| Menu K.7 | Toggle 7 | _____ | _____ | (Line number; O,S,M,A) |
| Menu K.8 | Toggle 8 | _____ | _____ | (Line number; O,S,M,A) |
| Menu K.9 | Toggle 9 | _____ | _____ | (Line number; O,S,M,A) |
| Menu K.10 | Toggle 10 | _____ | _____ | (Line number; O,S,M,A) |
| Menu K.11 | Toggle 11 | _____ | _____ | (Line number; O,S,M,A) |
| Menu K.12 | Toggle 12 | _____ | _____ | (Line number; O,S,M,A) |

- Menu L.1 2-Line Patterns _____(yes/no)
- Menu L.2 3-Line Patterns _____(yes/no)
- Menu L.3 Custom Patterns _____(yes/no)

(If Custom selected, mark buttons with **Off**, **Solid**, **Main** or **Alt.** for each line)

- Menu L.3.1 Button 1: L1__ L2__ L3__ L4__ L5__ L6__ (O,S,M,A)
- Menu L.3.2 Button 2: L1__ L2__ L3__ L4__ L5__ L6__ (O,S,M,A)
- Menu L.3.3 Button 3: L1__ L2__ L3__ L4__ L5__ L6__ (O,S,M,A)
- Menu L.3.4 Button 4: L1__ L2__ L3__ L4__ L5__ L6__ (O,S,M,A)
- Menu L.3.5 Button 5: L1__ L2__ L3__ L4__ L5__ L6__ (O,S,M,A)
- Menu L.3.6 Button 6: L1__ L2__ L3__ L4__ L5__ L6__ (O,S,M,A)
- Menu L.3.7 Button 7: L1__ L2__ L3__ L4__ L5__ L6__ (O,S,M,A)

Record Your Output Module Switch Settings Here (ON = down, OFF = up)

	Line Name	S1	S2	S3	S4	S5
Line 1	_____	_____	_____	_____	_____	_____
Line 2	_____	_____	_____	_____	_____	_____
Line 3	_____	_____	_____	_____	_____	_____
Line 4	_____	_____	_____	_____	_____	_____
Line 5	_____	_____	_____	_____	_____	_____
Line 6	_____	_____	_____	_____	_____	_____

Warranty

Products manufactured by MICRO SYSTEMS DEVELOPMENT INC. (MSDI) are warranted against defects in material and workmanship for a period of ONE YEAR from date of delivery. During the warranty period, MSDI will, at its option, either repair or replace products which prove to be defective. Defective equipment must be returned prepaid. Repaired equipment will be returned to purchaser shipping charges collect. Accessories supplied by MSDI but manufactured by others are covered by their respective manufacturers' warranties.

LIMITATION OF WARRANTY

This warranty excludes normal consumables including, but not limited to, printer ribbons and paper. **Damage caused by Acts of God, improper application of the equipment, improper or reversed power supplies, or incorrect wiring is excluded from warranty coverage. Damage to R10 Sensor Heads is specifically excluded from this warranty.**

Inasmuch as the application of this equipment is beyond the control of MSDI, all warranties as to performance, merchantability, or fitness for any particular purpose, whether expressed or implied, are hereby disclaimed. The proper application of this equipment is the sole responsibility of the user.

IN NO EVENT SHALL MSDI BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES.



Micro Systems Development, Inc. 46 Marco Lane Dayton, Ohio 45458, USA