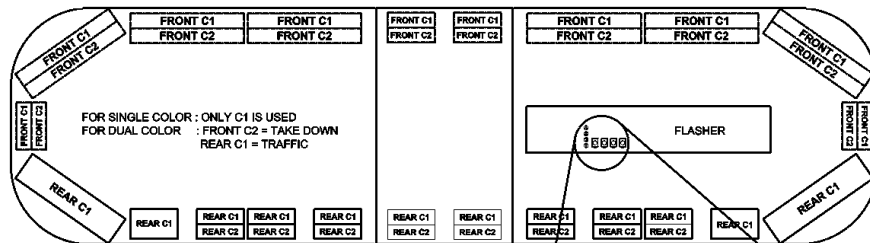# STAR PHAZER™ STARLASER® X

REV. 001

Optional Advanced Programming

Advanced Programming is optional. Most users will probably NOT need to program any of these features. Basic Pattern Programming is covered in the *Installation, Basic Programming, and Operation* manual shipped with the lightbar (also on website). This manual provides information on how to reprogram many additional complex functions available with this lightbar.

This lightbar has been designed to allow for an extremely wide variety of options that can be programmed. Because there are so many different options, Advanced Programming of this lightbar can be very complex. Please read through the entire manual to familiarize yourself with all of the options and the programming steps you need to take, before attempting to reprogram the lightbar.

Advanced Programmable features include the following:

- Head Enable (which heads activate with each function)
- Phase Selection (which heads alternate and which flash simultaneously)
- Changing the Wire Functions
- TD/Warning Pattern Cycling
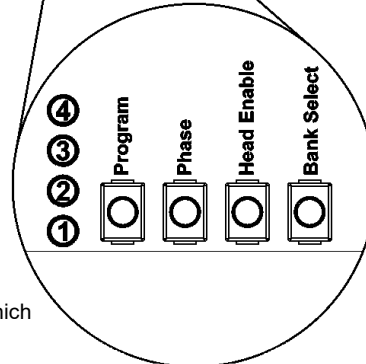- Resetting to Factory defaults
- Title 13 Programming

Advanced programming of this lightbar is done using four (4) pushbuttons and 4 LEDs located on the circuit that is installed on the right side of the lightbar (facing front).

Program: Used to program various options. Details about it can be found later in this manual.

Phase: Changes which heads turn on together or which heads alternate from one another for each function.

Head Enable: This button is used to determine which heads flash during each function.

Bank Select: This button will be used to select which "bank" of lights you wish to program.

Reprogramming any of the functions can be broken down into a few basic steps:

- Connect your POWER and GROUND wires.
- Activate the function you wish to reprogram by connecting the corresponding wire to +12VDC.
- Select which "bank" of lights you wish to reprogram.
- Reprogram the Pattern (if desired).
- Enable or disable the heads you want to be active for that function (if desired).
- Reprogram the Phase Setting (if desired).
- Repeat for the other banks (if applicable)

Review the following sections for details on performing each of the above steps.
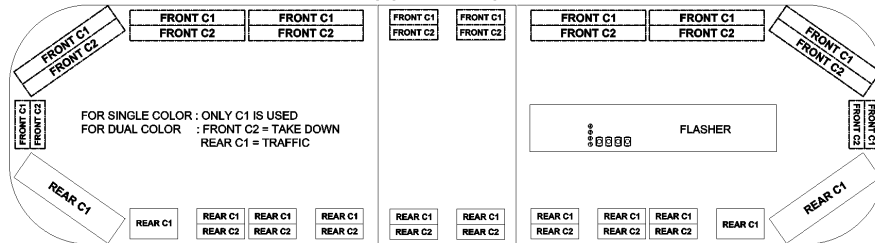
Bank Select

Advanced programming of this lightbar is typically done by selecting the function you wish to reprogram and then separately programming each "bank" of lights. The bar is divided into four (4) banks:
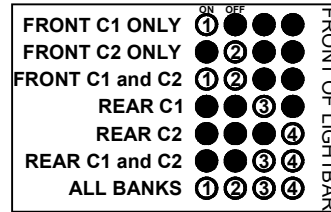
- Front Color 1 (FRONT C1)
- Front Color 2 (FRONT C2)
- Rear Color 1 (REAR C1)
- Rear Color 2 (REAR C2)

Many lightbars may only have single color heads. If your bar only has single color heads, you will not need to program the FRONT C2 or REAR C2 banks.
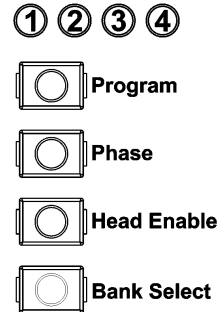
PROGRAMMING MAP

After activating the particular function you wish to reprogram, determine which bank(s) you wish to reprogram. Some functions (by default) may only utilize only one bank (e.g. takedowns use only FRONT C2, traffic director uses only REAR C1, etc.). Others may use all banks (e.g. Priority 3 Warning). Select the appropriate bank(s) based upon whether you wish to add, subtract, or modify heads from that bank.

For a particular function, if you wish to have more than one bank programmed identically, then you can program multiple banks at once.

Press the Bank Select button once to show the current setting. Select the bank(s) you wish to program by pressing and releasing the Bank Select Button. The pattern shown by the 4 blinking LEDs will indicate which bank or banks are selected.
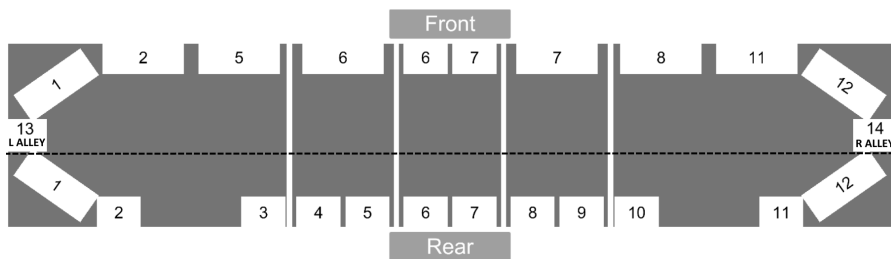
Please note that each function is basically a memory slot. You program that slot by telling it both which heads you wish to have activated with that function and which you do NOT want to activate.

Head Enable

Through Advanced Programming, the installer can select which heads are active or NOT active for any given function. You may wish to activate several FRONT heads in your Priority 1 Pattern (which is "rear only" by default). Or you may wish to de-activate heads for a given function to indicate less urgency. This option can be programmed for any of the functions.

Your lightbar will come with a diagram, similar to the one pictured below, that numbers each of the heads. This diagram can be used as a reference when enabling or disabling heads, or when programming the Phase setting. The numbers in this diagram correspond to the Head Number shown in the chart on the following page.

1. Connect the Red wire to power and the Black wire to Ground.

2. Activate the function you wish to program by connecting the corresponding wire to +12VDC.

3. Press the Head Enable button to scroll through the 30 optional variations. When the Head Enable button is pressed down, the heads in the enabled bank(s) will light up in a dim steady burn pattern.

   The chart on the following page shows which heads will be active (ON) and which heads will not flash (illuminate). Options 16-30 are identical to 1-15, but also have the alley lights activated.

   If you want a particular function to flash only to the front or only to the rear, during programming select the opposite bank and set it for Option 30 which de-activates the entire bank for that particular function.

4. Repeat for each bank and for each function you wish to program.

DEFAULTS: To "shortcut" to any of the Defaults, hold the Head Enable button for the time indicated on the right side of the chart.

Exceptions: A few of the functions have specific requirements for their specific functionality such as multiple heads or single heads. The following functions do not utilize the standard patterns shown in the Head Enable chart on the following page:

Traffic Director Functions	Only options 3, 4, or 30 are available, the other options are "locked out" (skipped).

L Alley, R Alley, Tail, R Turn, L Turn, CAL T13, Emitter	These functions require only a single head. When programming these functions, the Head Enable button will scroll a single active head through all of the various locations in the selected bank.

Head Enable (CONT'D)

HEAD ENABLE CHART

	L Alley	Head 1	Head 2	Head 3	Head 4	Head 5	Head 6	Head 7	Head 8	Head 9	Head 10	Head 11	Head 12	R Alley	
1		ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON		(Def 1) 3 sec/1 Flash
2			ON	ON	ON	ON	ON	ON	ON	ON	ON	ON			
3				ON	ON	ON	ON	ON	ON	ON	ON				
4					ON	ON	ON	ON	ON	ON					
5						ON	ON	ON	ON						
6							ON	ON							
7		ON											ON		ICL default
8		ON	ON									ON	ON		
9		ON	ON	ON							ON	ON	ON		
10		ON	ON	ON	ON					ON	ON	ON	ON		
11		ON	ON	ON	ON	ON			ON	ON	ON	ON	ON		
12			ON	ON							ON	ON			
13					ON	ON	ON		ON	ON	ON				
14			ON	ON	ON	ON			ON	ON	ON	ON			
15	ON													ON	(Def 2) 6 sec/2 Flash
16	ON		ON	ON	ON	ON	ON	ON	ON	ON	ON	ON		ON	
17	ON		ON	ON	ON	ON	ON	ON	ON	ON	ON			ON	
18	ON			ON	ON	ON	ON	ON	ON	ON				ON	
19	ON				ON	ON	ON	ON	ON					ON	
20	ON					ON	ON	ON	ON					ON	
21	ON						ON	ON						ON	
22	ON	ON											ON	ON	Flashing Alleys Default
23	ON	ON	ON									ON	ON	ON	
24	ON	ON	ON	ON							ON	ON	ON	ON	
25	ON	ON	ON	ON	ON					ON	ON	ON	ON	ON	
26	ON	ON	ON	ON	ON	ON			ON	ON	ON	ON	ON	ON	
27	ON		ON	ON							ON	ON		ON	
28	ON				ON	ON			ON	ON				ON	
29	ON		ON	ON	ON	ON			ON	ON	ON	ON		ON	
30															(Def 3) 9 sec/3 Flash

(Applies to Priority 1-5, Takedowns, Pursuit, Alley Flash, and ICL functions only)

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Phase Selection *(Programmable for Patterns 1-21 only)*

Each flashing head has two Phases, an "On" phase and an "Off" phase. All of the heads set for Phase 1 will illuminate at the same time and flash opposite from all of the ones set for Phase 2.

There are 10 different Phase options, allowing you to customize which heads flash On together and which are Off together.

Prior to changing the Phase for any functions, please note the following limitations:

- The Phase Enable option is only programmable for the various "warning" functions (Priority 1-5, Pursuit, Intersection Clearing, Flashing Alleys).
  It is not programmable for the Traffic Director functions (Left, Right, or Center Out) or the Steady Burn functions (Takedown, Work, L Alley, R Alley, Tail, R Turn, L Turn, CAL T13, Dim, or Emitter).
- The Phase Enable option is only compatible with Warning Patterns 1-21. You cannot alter the Phases for patterns 22-39 (the pre-set phase is crucial to the pattern).
- Phase Settings 6-10 are mirror images of Phase Settings 1-5.

1. Connect the Red wire to power and the Black wire to Ground.

2. Activate the function you wish to program by connecting the corresponding wire to +12VDC.

3. Press the Phase button to scroll through the 10 optional Phase variations.

4. Repeat for each bank and for each function you wish to program.

Note: To program multiple functions for the same Phase, activate the functions together, then use the Phase button to set them all to one of the Defaults, then scroll to the desired Phase Setting.

Phase Layout Chart

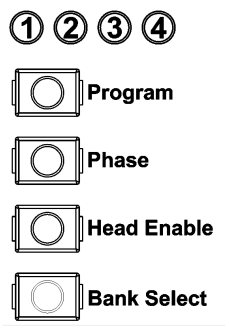|	L Alley	Head 1	Head 2	Head 3	Head 4	Head 5	Head 6	Head 7	Head 8	Head 9	Head 10	Head 11	Head 12	R Alley	
1	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	(Def 1) 3 sec/1 Flash
2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	
3	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	
4	Phase 2	Phase 2	Phase 1	Phase 1	Phase 2	Phase 2	Phase 1	Phase 1	Phase 2	Phase 2	Phase 1	Phase 1	Phase 2	Phase 2	
5	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 1	Phase 1	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	
6	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	(Def 2) 6 sec/2 Flash
7	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	
8	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2	
9	Phase 1	Phase 1	Phase 2	Phase 2	Phase 1	Phase 1	Phase 2	Phase 2	Phase 1	Phase 1	Phase 2	Phase 2	Phase 1	Phase 1	
10	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 2	Phase 2	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	

Input Wires

Besides the Power and Ground wires, there are 12 different function wires. These functions will be preset at the factory based upon the way it was configured when ordered. Six (6) of the wires can each be reprogrammed to several alternate functions, if desired. Typically though, this should not be necessary.

Listed below are the "Default" functions for each of the wires. Depending upon the design of your lightbar and its functions, you may already have some of the reprogrammable wires programmed for one or more alternate functions. The documentation enclosed with your lightbar should contain a wiring legend specific to your lightbar.

Input Wire Reprogramming Functions

Wire Color	"Default" Function
Permanently Programmed	
White/Orange	Takedown / Work
White/Yellow	Priority 1
White/Red	Priority 2
Blue	Left Alley
Gray	Right Alley
White/Pink	Pursuit and Alley Flash
Reprogrammable	
Brown	Priority 3
Yellow	Traffic Left
Green	Traffic Right
Purple/White	Intersection Clearing (ICL)
Purple	Dim
Red/Green	Pattern Select *(please note that if you reprogram this wire, you will not be able to change any of the flash patterns)*

```
                          ON  OFF
"DEFAULT" FUNCTION  ①  ● ● ●
         CRUISE  ● ② ● ●
      LEFT TURN  ① ② ● ●         F
     RIGHT TURN  ● ● ③ ●         R
           TAIL  ① ● ③ ●         O
   CAL T13 STEADY  ● ② ③ ●       N
     PRIORITY 4  ① ② ③ ●         T
     PRIORITY 5  ● ● ● ④         O
        EMITTER  ① ● ● ④         F
          DIM 2  ● ② ● ④         LIGHTBAR
        TD WARN  ① ② ● ④
```

① ② ③ ④

[○] **Program**

[○] **Phase**

[○] **Head Enable**

[○] **Bank Select**

1. Connect the Red wire to power and the Black wire to Ground.

2. Activate the function you wish to change by connecting the corresponding wire to +12VDC. ***Please note that only the*** *Priority 3*, *Traffic Left*, *Traffic Right*, *ICL*, ***and*** *Dim*, ***and*** *Pattern Select* ***wires are reprogrammable.***

3. Press the Program button once to display the current function setting for that wire. Compare the flickering LED display on the circuit board with the diagram above to determine which function is currently tied to that wire. The "Default" Function for each wire is listed in the chart above.

4. While the LEDs are still flickering, press the Program button again to scroll the list of optional functions above (Cruise, Left Turn, Right Turn, etc.). As you program the function, it will instantly display on your lightbar.

   Holding the button for 3 seconds (until the entire light blinks once) will reset the wire to its Default function.

5. Once the new function is selected, disconnect the wire you were programming.

6. Repeat for each wire/function you wish to reprogram.

<u>*TD/Warning Pattern Cycling*</u> *(dual color heads only)*

Normally most lightbars with dual color heads will be programmed such that when you activate one of the Traffic Directing patterns (Left, Right, or Center-Out) at the same time as one of the Warning patterns (Priority 1, 2, or 3) the Traffic Directing pattern will override the warning pattern.

<u>You may skip the rest of this section if the above settings are acceptable.</u>

Traffic Director Cycle Count refers to the number times the Traffic Directing Pattern (Right, Left, Center-Out) will repeat before alternating to the Warn/Flashing Pattern.
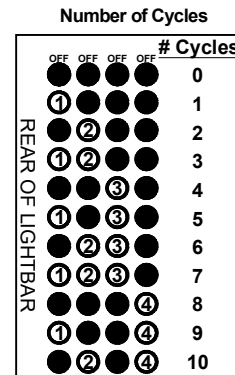   <u>***Note:***</u> *If TD is set for "0" cycles, it will always override the warning patterns.*

Warn Cycle Count refers to the number times the warning pattern will repeat before alternating to the Traffic Directing Pattern.
   <u>***Note:***</u> *If Warn is set for "0" cycles, it will cycle once (same as setting "1").*

To allow your lightbar to alternate the Traffic Directing pattern with the Priority 1-3 Warning patterns, proceed below:

1. Connect the Red wire to power and the Black wire to Ground.

2. Program the **Traffic Director Cycle Count**:
   A. Activate the Left or Right Alley Light.
   B. Press the Program button once and compare the LED display on the circuit board with the diagram to the right to determine the current **Traffic Director Cycle Count**.
   C. Press and release the Program button to scroll through the different Cycle Counts (up to 10).

3. Repeat step 2 activating Priority 1 instead of the alley light to program the **Warn Cycle Count**. *(Please note that Priority 1-3 will all have the same Cycle Count.*

4. Deactivate all functions.

Number of Cycles

	# Cycles
● ● ● ●	0
① ● ● ●	1
● ② ● ●	2
① ② ● ●	3
● ● ③ ●	4
① ● ③ ●	5
● ② ③ ●	6
① ② ③ ●	7
● ● ● ④	8
① ● ● ④	9
● ② ● ④	10

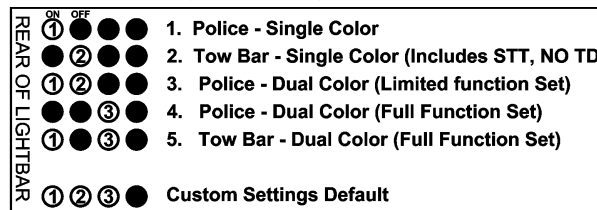(OFF OFF OFF OFF — REAR OF LIGHTBAR)

<u>*Resetting to Factory Defaults*</u>

The Program button allows you to return the lightbar to the factory default settings when shipped. It also allows you to choose several other default configurations, if desired.

Factory Default Setting Memory Locations

1. Connect the Red wire to power and the Black wire to Ground.

(ON OFF)	
① ● ● ●	**1. Police - Single Color**
● ② ● ●	**2. Tow Bar - Single Color (Includes STT, NO TD)**
① ② ● ●	**3. Police - Dual Color (Limited function Set)**
● ● ③ ●	**4. Police - Dual Color (Full Function Set)**
① ● ③ ●	**5. Tow Bar - Dual Color (Full Function Set)**
① ② ③ ●	**Custom Settings Default**

(REAR OF LIGHTBAR)

2. DO NOT ACTIVATE ANY FUNCTIONS!!

3. Press the Program button once and compare the flickering LED display on the circuit board with the diagram to the right to determine which default was last used (note: the user may have reprogrammed some options).

4. Press the Program button again to scroll the list of default settings.
   - Holding the button for 3 seconds (until the entire light blinks once) will reset the bar to the first setting (#1 Police - Single color).
   - **Holding the button for 9 seconds (until the light blinks 3 times) will reset the bar to the original factory setting that your bar shipped with (Custom Settings Default).**

Advanced Pattern Programming *(Applies to Priority 1-5, Pursuit, and ICL functions only)*

Basic Pattern Programming is described in the manual that shipped with the lightbar. Please be aware that by selecting/deselecting different banks *PRIOR TO* pattern programming, for each individual function, you have the ability to set different patterns between the front and back (if both banks are active for that function), as well as between Color 1 and Color 2 (bars with dual color heads that are both active for that function).

1. Connect the BLACK wire to GROUND and connect the RED wire to POWER (+12VDC).

2. Activate the feature that you wish to program by touching the corresponding wire for it to power.

3. The Bank Select is defaulted for "All Banks". Following the instructions in the **Bank Select** section of this manual, select or deselect bank(s) based upon which ones you would like to change the pattern for.

4. Use the Pattern Select Wire to set the desired pattern.

5. Repeat steps 2-4 for each additional bank(s) and/or functions you wish to program.

6. Once your programming is complete, tape the end of the red w/green stripe wire so that it does not come into contact with +12VDC.

> ⚠️ Please note: All California Title 13 and SAE J595 approved patterns need to be configured properly to ensure compliance with those specifications.

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Patterns for Warning Lights

California Title 13 SAE J595 Approved Patterns

1 Flicker *
2 Slow Singleflash
3 Fast Singleflash
4 Slow Doubleflash
5 Fast Doubleflash
6 Slow Tripleflash
7 Fast Tripleflash
8 Quadflash
9 Quintflash *(Priority 2 default)*
10 Tripleflash w/Post Pop
11 Quadflash w/Post Pop
   (Priority 1 default)
12 Quintflash w/Pre Pop
13 ECE Doubleflash
14 ECE Quadflash
15 Singleflash Flicker **
16 Doubleflash Flicker
   (Dual Color Front Priority 3 default)
17 Single, Quad w/Post Pop, Flicker
18 Dual Color Single Quad Flicker
19 Dual Color Quad Post Pop Quint
20 Dual Color Flicker
21 Delta-Omega
22 Random 1
23 Random 2 *** *(Single Color Priority 3 and Dual Color Rear Priority 3 default)*
24 Random 3
25 Flashing Bounce
26 Full Bounce
27 Split Bounce
28 Half Bounce
29 Bounce w/End Pop
30 Search Lights
31 Eyeballz
32 Fade Invert
33 Moving Out
34 Triple In/Triple Out
35 Two Speed *(Pursuit default)*
36 Random 4
37 Dual Color Full Circle
38 Rotator
39 Sparkle

*   Shortcut Pattern #1 (3 sec/1 flash)
** Shortcut Pattern #2 (6 sec/2 flashes)
***Shortcut Pattern #3 (9 sec/3 flashes)