

TheDogSA (StandAlone) - Instructions

These are the instructions for the Outdoor version of the Crystal Phaser. For instructions for the Indoor Real Time scoring Arena System see the AtriumSL help file.

Storage

The phasers are packed in stackable containers. Phasers can be pulled in for charging whether or not they are switched on or off, but will charge at a faster rate if switched off. For charging the containers can be daisy-chained. For car connect to a dash-board cigar-lighter socket. For mains charging use the mains charger provided.

Start-up

The phasers are switched on using the switch located under the phaser body and just behind the butt. Move the switch dolly forward to switch the phaser on.

On power-up, once initialised, the phaser will show either the Unit number (if set to solo games) or Red/Green plus the Unit number. A pair of asterisks on the bottom line of the display will toggle back and forth to show that the unit is active and in standby mode. Between the asterisks will appear an 'R' if the Phaser is radio-enabled, and either 'O' or 'I' depending on whether the unit is switch to outdoor or indoor play.

To keep things simple, setting of phasers to red or teams is automatically done if Team mode is selected. Odd numbered phasers become red phasers, even numbers become green phasers. This simplifies phaser programming for different numbers of phasers and also the playing of games with less than a full quota of any set.

All Phasers can hit each other, regardless of team.

Inter-Phaser diagnostics

If the grenade button is held down while the unit is powered up, then the phaser enter a diagnostics mode, testing IR reception and transmitting to other phasers. On power-up the display will show the test routine title 'IR+RF Testing'. To put the phaser back to normal operation, switch off and switch back on without pressing the grenade button.

- 1) IR reception - any code received will be displayed in decimal form. The second line of the display will show the number of IR packets received during the current test session. After 5 seconds, unless another IR packet is received, the display will revert to the test routine title.
- 2) RF testing - Further presses of the grenade button will cause the phaser to output a GOOD SHOT signal with an ID that will be processed by ALL phasers. The display will show GOOD HIT SEND. Note: For this test, phasers do not have to be playing a game.

The above two Routines run side by side. Any IR code received in between Radio (RF) sends will be reported on the display, with the same 5 second timeout as described above.

Battery and Revision information

If the front trigger is pressed while there is no game playing, the display lights and then the battery voltage and firmware revision # number are displayed in sequence along with the number of watch dog timer resets (i) since the value was last cleared.

If the battery voltage falls below an 11 volt threshold then (while there is no game playing), then every ten seconds the voltage will be displayed along with a warning beep. The beep can be cancelled by pressing the grenade button. If the battery voltage rises above the threshold and then falls again the beep will start once more.

Setting up the phasers

Global parameters

Global values will probably be assigned to all phasers, so to make this easier, and to minimise problems due to other IR codes impinging, access to this code-set is gained by first zapping with hexadecimal (v) code \$FD. The display will light and 'Set Vals \$FE = Quit' will be displayed.

If a code is accepted the new value will be displayed for three seconds along with a 'Shuuuup' sound to show a successful operation. To make life easier when blanket zapping, the display will flash to show that the new setting is saved. The zapper puts out one code packet every second, so you will find that holding the button down and passing through the phasers will result in all phasers being programmed successfully. Wait for the display to stop flashing before zapping with a new code.

Once the phaser has been zapped with \$FD, you may then apply any of the codes listed below. Zapping with codes outside the range of each section will produce a warning beep. Zapping with a code that is outside any of the code groups (currently a code of \$70 or greater) will prompt a buzz warning.

To exit the 'Game Settings' mode, zap with code \$FE.

The following codes apply:

Code	Value
Number of Clips	\$01 : 1
	\$02 : 2
	\$03 : 3
	\$04 : 4
	\$05 : 5
	\$06 : 6
	\$07 : 7
	\$08 : 8
	\$09 : 9
Shots Per Clip	\$10 : 20
	\$11 : 25
	\$12 : 30
	\$13 : 40
	\$14 : 50
	\$15 : 60
	\$16 : 70
	\$17 : 80
	\$18 : 90
	\$19 : 99
Number of Lives	\$20 : Unlimited
	\$21 : 10
	\$22 : 15
	\$23 : 20
	\$24 : 25
	\$25 : 30
	\$26 : 35
	\$27 : 40
	\$28 : 45
	\$29 : 50

LaserVenture

Length of Game \$30 : Unlimited
 (Mins) \$31 : 10;
 \$32 : 20;
 \$33 : 30;
 \$34 : 40;
 \$35 : 50;
 \$36 : 60;
 \$37 : 70;
 \$38 : 80;
 \$39 : 90;
 \$3A : 100;
 \$3B : 110;
 \$3C : 120;

Team/Solo Setting: \$40 : Team
 \$41 : Solo

Gameplans: \$50 : Load Set 0;
 \$51 : Load Set #1
 \$52 : Load Set #2
 \$53 : Load Set #3
 \$54 : Load Set #4
 \$55 : Load Set #5
 \$56 : Load Set #6
 \$57 : Load Set #7
 \$58 : Load Set #8
 \$59 : Load Set #9
 \$5A : Load Set #10
 \$5B : Load Set #11
 \$5C : Load Set #12 (Low values for test purposes)

The sets are allocated as follows:

	(Def)											(Test)	
	0	1	2	3	4	5	6	7	8	9	10	11	12
Clips	9	9	9	9	9	9	9	9	9	9	9	9	2
Shots	99	99	99	99	99	99	99	99	99	99	99	99	10
Lives	9	10	20	25	30	40	U/L	1	3	4	5	6	2
Time	9	5	20	25	30	40	U/L	20	20	20	20	20	2
Team	Solo	Solo	Solo	Solo	Solo	Solo	Solo	Solo	Solo	Solo	Solo	Solo	Solo
Countdown	60	60	60	60	60	60	60	60	60	60	60	60	10

Remember to zap with code \$FE to exit the Global Parameters section.

Whereas code \$FD merely puts the phaser in the Set Up mode, code \$FC can be directly applied to show the clip, shots lives and time values. An extended display of the full Eeprom set up is obtained below.

Individual Parameters

Other Set Up and Test routines are considered likely to be individual for each phaser and so it is not advisable to be able to blanket zap them. Therefore, the following codes are invoked with the grenade button pressed, and after each routine terminates, the program automatically returns to standby operation. The following codes are the same as for the RTSystem and are described in full detail in the AtriumSL help file. The System Test utility is described below.

\$E0 : Test the System I/O
\$E1 : Set the Unit ID
\$E1 : -
\$E3 : -
\$E4 : -
\$E5 : Show Settings - press grenade button to cancel
\$E6 : Sound Test
\$E7 : -
\$E8 : Set Burst Delay (Sound chip compensation)
\$ED : Reset WDT Count (Clear watch dog count)
\$EE : Set Frequency (Do not invoke!)
\$EF : Load Factory Default Settings

System Test (\$E0) :

Rear trigger steps you through the test sequence, Grenade button repeats any step. Press the rear trigger to start the test. Semi-random sound selections will play with each test, excepting the main and grenade IR tests which will play the appropriate sound for that action.

- 1) LEDs - using the grenade button will toggle back and forth between red and green LEDs. Use the rear trigger to step to the next test.
- 2) Main IR - Display will show 'Red Phaser 1'. This test will output code from the main emitter and also operate the muzzle flash. The phaser ID will increment with each repeat test. Each push of the grenade button will switch the phaser between Outdoor and Indoor IR powers. This is intended mainly for bench testing.
- 3) Grenade IR - Display will show 'Grenade 192'. This test will output code from the grenade emitters. For clarity, the emitted code will increment with each repeat test.
- 4) General - This displays the same information that is displayed if the front trigger is pressed - in turn, Battery voltage, version #, and number of Watchdog timer resets (i).

The display will now show the message 'Test Complete'. Press the rear trigger to repeat the test sequence, or the front trigger to exit the routine.

Playing a game

The following codes control gameplay:

- \$F1 : Starts a game
- \$F2 : Use to cancel the countdown if players are in place early
- \$F0 : Stops the game, even during the countdown period

- \$FA : Set to Indoor play (reduced IR power, + laser)
- \$FB : Set to Outdoor play (full IR power, no laser)
- \$FC : Show Basic Set Up - Clips, Shots/Clip, Lives (UL=Unlimited), Game Time
Solo/Team, Count down time in seconds
- \$FD : Set up game parameters

When the game is started any countdown period will first timeout, then the phaser will be heard to load a clip and cock, and then a double whistle will blow. During countdown the phasers will beep at one second intervals. Operating any trigger will cancel the beeping.

The display will show cyclically the phaser ID, clips, shots, lives and time. If either lives or time are unlimited then these will not be shown.

If neither trigger or grenade button is pressed for 5 minutes the phaser will exit the game.

To fire the phaser, both triggers must be pressed. The front trigger may remain pressed so that single taps can be effected with the rear trigger. Holding the triggers down allows burst firing. Bursts of up to 5 shots can be made (ii).

The number of clips shown of the display is the number of full clips left, ie it does not include the current clip. When a clip is empty, an 'empty chamber' sound is heard and a screen message displayed. If a clip is discarded before it is empty then those shots are lost.

The grenade button is dual purpose. If used in conjunction with the front trigger, keeping both pressed, there will be five seconds of 'grenade' warning and then the grenade will be launched, costing the launcher 10 shots, and hit players one life. Attempts to launch a grenade with insufficient shots in the current clip will get the message 'Need 20 Shots!'. There is no limit to the number of grenades that can be launched, but successive launches cannot be closer than 20 seconds. (iii)

Marshal Codes

\$C0 - If a player is out of shots or is dead (has no lives left) the Marshall can come to the player's rescue by zapping the player with code \$C0. This will give a player who has run out of shots one clip of shots, ie the Ammo display will show the maximum number of shots, but zero new clips. If the player is dead, then the player will receive two lives. (iv)

\$F0 - Will stop any or all players.

Mines (Intelligent Targets)

Mine codes are:

\$C1 - TimeKiller - Players get a warning for each second they stay within range. After 5 continuous seconds they are stripped of shots and lives.

\$C2 - WildCard - Players lose one life.

\$C4 - Fatal Mine - Players are killed instantly and are stripped of shots and lives.

Players hit by fatal mines when their lives are set to unlimited will suffer a ten second wait in addition to the usual short single hit down time.

Notes:

(i) The watchdog timer is a software function that restarts the program if it is not reset by the program within a pre-defined period. Normally, failure to reset the WDT would be because of a program hang, either through a bug, or through external interference. A 'soft' reset like this is indicated on the display for a short period. Since this is a new program, any such instances should be reported.

(ii) # shots in a burst could be programmable. On RTS it is done from the PC.

(iii) The grenade warning period, the cost in shots, and the 'damage' done to hit players and the delay between launches could also be programmable.

(iv) Two lives with the \$C0 code, rather than one, because of the wording of the existing sound routine. This could be changed.

(v) Note: The \$ sign indicates a hexadecimal code, as entered on the zapper switch. Hexadecimal codes are used because they are directly related to binary values and thus allow full use of all the values available in a microprocessor. Hexadecimal codes use the base 16 and are represented by digits 0-9 and letters A-F, the letter equating to the values 10-15. So a hexadecimal code \$13 would have the value (1 times 16 plus 3) if expressed as a decimal value.

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