

Lasers show manual

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System Overview

The system consists of a single ball equipped with 12 lasers. These lasers are controlled by scripts embedded within the ball, offering great flexibility in programming and managing dynamic light effects.

When the ball is clicked, an interactive menu appears, providing various control options. Access to this menu can be restricted to the owner or group, depending on your preferences.

The lasers properties — length, angle, and color — can be adjusted in real time to create vibrant and dynamic animations. Additionally, the ball itself can be set to rotate its lasers in both directions at variable speeds, enabling even more complex visual effects.

The 12 lasers can be controlled either globally as a whole or separately in two groups of 6 lasers each. This allows for synchronized effects or differentiated animations between the two groups.

Setup Instructions

The first step is to rez (create) the ball and position it high above the ground to maximize the visibility and impact of the laser effects.

Programming the Effects

Laser behavior is programmed through notecards using a specific language. You can place as many notecards as you like inside the ball, each representing a different sequence of effect.

An interactive menu lets you select which notecard to activate, making it easy to manage and switch between effects in real time.

Example Usage

To better understand how it works, we will look at several examples demonstrating how to program and trigger various laser animations.

Additional Resources

A detailed description of the notecard syntax is provided at the end of this guide, enabling you to create your own custom sequences and effects.

Let's go

Getting Started with Notecards

We'll start slowly so you can get comfortable with the syntax used in the notecards. Follow these steps to create your first laser animation sequence:

1. **Create a new notecard** and enter the following code:

```
TIME_FRAME 4
GROUP12
  LENGTH INIT 0.2 SMOOTH 5 2
  ANGLE INIT 60
  COLOR INIT 10,0,0 1
END
```

1. **Save the notecard** with the name "red story".
2. **Place this notecard inside the ball.**
3. **Click the ball to open the menu**, select the "Sequences" option, and then choose your "red story" notecard.

When you run this sequence, you will see the lasers smoothly extend from an initial length of 0.2 meters to 5 meters over 2 seconds, set at a 60-degree angle, and glowing with an intense red color.

Detailed Explanation of the Syntax

1. TIME_FRAME

- Defines a segment of the animation with a specific duration in seconds.
- Syntax:

```
TIME_FRAME <duration_in_seconds>
```

- In the example, TIME_FRAME 4 means this sequence will last 4 seconds.

2. GROUP12

- Specifies that the following commands apply to all 12 lasers simultaneously.
- You can also use GROUP61 or GROUP62 to control two separate groups of 6 lasers each.

3. LENGTH

- Controls the length of the lasers.
- Syntax:

LENGTH [INIT <initial_length>] <MODE> <target_length> <duration>

- In the example:

LENGTH INIT 0.2 SMOOTH 5 2

- INIT 0.2 sets the starting length to 0.2 meters.
 - SMOOTH means the length will change with smooth acceleration and deceleration.
 - 5 is the target length in meters.
 - 2 is the duration in seconds over which the change happens.

4. ANGLE

- Sets the angle of the lasers in degrees.
- Syntax:

ANGLE [INIT <initial_angle>] <target_angle>

- In the example:

ANGLE INIT 60

- INIT 60 initializes the angle at 60 degrees. Since no transition mode or duration is specified, the angle is set immediately.

5. COLOR

- Controls the color of the lasers using RGB values (each between 0 and 10) and an alpha transparency value (between 0 and 1).
- Syntax:

COLOR [INIT <r,g,b> <alpha>]

- In the example:

COLOR INIT 10,0,0 1

- Sets the color to bright red with full opacity.

6. END

- Marks the end of the current time frame block.

Summary

- The **TIME_FRAME** defines how long the animation segment lasts.
- **GROUP12** applies commands to all lasers.
- **LENGTH**, **ANGLE**, and **COLOR** define the visual parameters of the lasers.
- The **INIT** keyword sets starting values; modes like **SMOOTH** or **LINEAR** define how values change over time.
- The **END** keyword closes the time frame.

By mastering these basics, you can create smooth, dynamic laser animations tailored to your needs. Feel free to experiment by changing values and adding more time frames to build complex sequences!

Continuing Your Notecard Animation

Let's enhance your notecard by adding the following code to create more dynamic laser effects:

```
TIME_FRAME 20
GROUP12
    LENGTH YOYO SMOOTH 0.5 1
    ROTATION -4
END
```

Instructions:

1. **Add this block to your existing notecard** (after the first **TIME_FRAME** block).
2. **Save the notecard again.**
3. **Click the ball to open the menu**, select the "Sequences" option, and choose your updated notecard.

What to Expect:

- Initially, the lasers will behave as before, smoothly extending to 5 meters with a 60-degree angle and intense red color, as defined in the first time frame.

- Then, for the next 20 seconds, the lasers will enter a new behavior phase:
 - The laser length will **yo-yo** (oscillate back and forth) smoothly between **5 meters** (the previous length) and **0.5 meters**, completing one full cycle every second.
 - Simultaneously, the lasers will **rotate in reverse** at a constant speed of **-4 units**, creating a captivating spinning effect.

Detailed Explanation of the New Commands:

1. LENGTH YOYO SMOOTH 0.5 1

- **YOYO** mode makes the laser length oscillate between two values.
- The reference length is the last length set, which is 5 meters from the previous time frame.
- The lasers smoothly transition (using the SMOOTH interpolation) between 5 meters and 0.5 meters.
- The full oscillation cycle (from 5 to 0.5 and back) takes **1 second**.

2. ROTATION -4

- Sets the lasers to rotate continuously at a speed of -4 units.
- The negative value means the rotation is in the opposite direction to the default.
- This rotation runs concurrently with the length oscillation, adding dynamic motion.

Summary

By adding this second time frame, you create a layered animation where the lasers first extend and then pulsate in length while spinning in reverse. This combination adds depth and interest to your laser show.

Feel free to experiment by adjusting the oscillation speed, rotation rate, or laser groups to customize your effects even further!

Adding Dynamic Angle Animation

Let's take your notecard to the next level by introducing angle animation. Add the following block to your notecard:

TIME_FRAME 30

GROUP12

ANGLE YOYO SMOOTH 80 1

END

Instructions

1. **Insert this block after your previous time frames** in the notecard.
2. **Save the notecard.**
3. **Open the menu on the ball**, go to the "Sequences" option, and select your updated notecard.

What Happens in This Time Frame?

- For **30 seconds**, all 12 lasers will animate their angles.
- The command

ANGLE YOYO SMOOTH 80 1

causes the lasers to **oscillate (yo-yo)** their angle between the previous angle (set in the earlier time frame, e.g., 60 degrees) and **80 degrees**.

- The transition between angles uses the **SMOOTH** mode, meaning the movement will accelerate and decelerate gently rather than changing at a constant speed.
- The **1** at the end specifies the **period**: the lasers will complete a full back-and-forth cycle (from the previous angle to 80 degrees and back) every **1 second**.

Visual Effect

- The lasers will appear to “swing” or “wave” smoothly between two angles, creating a dynamic and eye-catching motion.
- This effect can be particularly striking when combined with previous animations, such as changing length or rotation, resulting in a complex and engaging laser show.

Detailed Syntax Explanation

- **ANGLE YOYO SMOOTH 80 1**
 - **YOYO**: oscillates between two angles.
 - **SMOOTH**: uses a sinusoidal (ease-in/ease-out) transition for natural movement.

- **80**: the target angle in degrees.
- **I**: the period in seconds for a complete oscillation cycle.

Customization Tips

- Try changing the target angle (e.g., 120 for a wider swing) or the period (e.g., 0.5 for faster motion) to see how it affects the animation.
- Combine angle animation with other effects (length, color, rotation) in the same or overlapping time frames for even more impressive visuals.

Transition and Subgroup Control

Now that you've mastered basic group commands, let's add a transition phase and explore how to control subgroups of lasers independently for more complex effects.

Transition Phase

First, we introduce a short **transition time frame** to reset and prepare the lasers for the next sequence:

```
TIME_FRAME 2
GROUP12

    LENGTH INIT 3

    ANGLE INIT 30

    ROTATION 5

END
```

What Happens Here?

- For **2 seconds**, all 12 lasers are set to:
 - **Length:** 3 meters (immediately, with INIT 3)
 - **Angle:** 30 degrees (immediately, with INIT 30)
 - **Rotation:** Rotating at a speed of 5 units
- This acts as a visual “reset” or a calm transition, preparing the audience for the next, more intricate effect.

Using Subgroups for Complex Animations

Next, we use two subgroups — **GROUP61** and **GROUP62** — to create simultaneous but distinct behaviors for each half of the lasers:

```
TIME_FRAME 40
12
```

GROUP61

LENGTH INIT 4

ANGLE YOYO SMOOTH 60 1

COLOR RANDOM RED 8

GROUP62

LENGTH INIT 4

ANGLE INIT 60 YOYO SMOOTH 30 1

COLOR RANDOM RED 4

ROTATION 10

END

What Happens in This Sequence?

- **Duration:** 40 seconds of complex, layered animation.

GROUP61 (First 6 lasers):

- **Length:** set to 4 meters.
- **Angle:** oscillates smoothly (YOYO SMOOTH) between the previous angle and 60 degrees, completing a cycle every 1 second.
- **Color:** randomly jumps in various red colors every 8 seconds.

GROUP62 (Second 6 lasers):

- **Length:** set to 4 meters.
- **Angle:** starts at 60 degrees, then oscillates smoothly (YOYO SMOOTH) between 60 and 30 degrees, completing a cycle every 1 second.
- **Color:** randomly jumps in various red colors every 4 seconds, creating a more rapid color change than GROUP61.

Global Command:

- **ROTATION 10:** all lasers (both groups) rotate together at a speed of 10 units, adding dynamic motion to the entire setup.

Visual Impact

- **Transition:** the brief 2-second phase helps the audience visually reset and builds anticipation.

- **Subgroup Animation:** by controlling each half of the lasers separately, you create a rich, multi-layered effect — one group swings between angles and changes color slowly, while the other swings differently and changes color more rapidly.
- **Unified Rotation:** despite the subgroup differences, a strong sense of unity is maintained by rotating all lasers together.

Syntax Highlights

- **GROUP61 / GROUP62:** allow you to script different behaviors for each half of the lasers within the same time frame.
- **INIT:** used to set starting values for length and angle.
- **YOYO SMOOTH:** creates smooth, oscillating motion between two angles.
- **COLOR RANDOM RED <frequency>:** randomly alternates each group's color with independent timing.
- **ROTATION:** placed outside the subgroup blocks, it applies globally to all lasers.

Experimentation Tips

- Try changing the angles, lengths, or color frequencies for each group to see how the visual interplay evolves.
- You can also experiment with different rotation speeds or even alternate rotation directions for dramatic effects.

Creating a Strobe Effect with Fast Rotation

Let's push your laser show to the next level by introducing a high-speed rotation and dynamic color and angle changes for a dramatic strobe-like effect.

```
TIME_FRAME 30
GROUP12

  LENGTH INIT 10

  COLOR INIT 10,0,0 1 YOYO LINEAR 10,5,0 .5 .04

  ANGLE INIT 60 MESS 80 1

  ROTATION 60
```

```
END
```

What Happens in This Sequence?

- **Duration:** 30 seconds of intense, high-energy animation.
- **All 12 lasers (GROUP 12) are controlled together** for maximum impact.

LENGTH INIT 10

- Sets all lasers to a fixed length of 10 meters.

COLOR INIT 10,0,0 | YOYO LINEAR 10,5,0 .5 .04

- **INIT 10,0,0 |** starts with a vivid red color at full opacity.
- **YOYO LINEAR 10,5,0 .5 .04:**
 - Lasers oscillate (yo-yo) between red (10,0,0) and orange (10,5,0) using a linear transition.
 - Each full cycle (red to orange and back) lasts **0.5 seconds**.
 - The .04 parameter (likely the step or update interval) ensures extremely rapid color changes, adding to the strobe effect.

ANGLE INIT 60 MESS 80 |

- **INIT 60:** all lasers start at a 60-degree angle.
- **MESS 80 |** each laser randomly jumps to a new angle up to 80 degrees, independently, every 1 second. This creates a chaotic, scattered beam pattern.

ROTATION 60

- All lasers rotate at a very high speed (60 units), rapidly sweeping the beams around the space.
- This fast rotation, combined with the color and angle changes, mimics a classic strobe light effect.

Visual Impact

- **Strobe Effect:** the rapid rotation and fast, oscillating color changes create a powerful, pulsating strobe effect that energizes the environment, perfect for climactic moments in a show or dance event.
- **Chaotic Angles:** the independent angle changes (MESS) scatter the beams unpredictably, enhancing the sense of movement and intensity.

- **Color Pulsing:** the lasers quickly alternate between red and orange, adding to the visual excitement.

Syntax Breakdown

- **LENGTH INIT 10**
Sets the starting length for all lasers.
- **COLOR INIT 10,0,0 | YOYO LINEAR 10,5,0 .5 .04**
 - `INIT 10, 0, 0 1`: start color (red, full opacity)
 - `YOYO LINEAR 10, 5, 0 .5 .04`: oscillates linearly between red and orange, with a 0.5-second period and rapid updates.
- **ANGLE INIT 60 MESS 80 1**
 - `INIT 60`: start angle
 - `MESS 80 1`: each laser randomly jumps to a new angle up to 80 degrees every second.
- **ROTATION 60**
 - Fast rotation for all lasers.

Tips for Customization

- **Increase or decrease the rotation speed** for different strobe intensities.
- **Adjust the color values** for different strobe color schemes (e.g., blue/white for a cold strobe, red/yellow for a warm effect).
- **Change the MESS interval** for more or less chaotic beam scattering.

Presentation of syntax

This system enables you to design captivating laser animations for clubs by using sequences structured into precise time frames. Each time frame can include a variety of commands to control laser properties such as length, angle, color, and rotation. By combining these commands, you can create dynamic and synchronized visual effects that enhance the atmosphere of any event.

This guide provides a comprehensive overview of the syntax and available commands, empowering you to:

- **Define time-based sequences:** Organize your animation into discrete time frames for precise control.
- **Customize laser parameters:** Adjust length, angle, color, and rotation to achieve the desired visual impact.
- **Combine effects:** Layer multiple commands within a single time frame to produce complex animations.

Whether you are a beginner or an experienced lighting designer, this guide will help you master the system and unlock the full creative potential of laser animation.

Basic concepts

Understanding the core elements of the laser animation system is essential for creating effective and synchronized light shows. Below are the fundamental concepts you need to know:

Laser Groups

Lasers are organized into groups to simplify control and enable synchronized effects:

- **GROUP12:**
Controls all 12 lasers simultaneously, allowing you to apply commands that affect the entire setup at once—ideal for unified, dramatic effects.
- **GROUP61 and GROUP62:**
Divide the lasers into two groups of 6 each.
 - **GROUP61:** controls the first set of 6 lasers.
 - **GROUP62:** controls the second set of 6 lasers.

This grouping allows for more complex and dynamic animations, such as alternating patterns or mirrored effects between the two groups.

Time Frames

A **time frame** defines a segment of your animation, specifying which commands are executed and for how long:

- Each time frame starts with the keyword `TIME_FRAME`, followed by the desired duration in seconds (e.g., `TIME_FRAME 2.5` for a 2.5-second frame).
- Within a time frame, you can include multiple commands to control laser properties such as length, angle, color, and rotation.
- The time frame ends with the keyword `END`, signaling the system to move to the next segment.

By chaining multiple time frames, you can create intricate and evolving laser shows

Example syntax

```
TIME_FRAME 10
  GROUP12
    LENGTH INIT 1 SMOOTH 5 10
  END
```

Laser Length Control Syntax

The `LENGTH` command allows precise control over laser beam length, enabling dynamic animations. Below is a detailed breakdown of its syntax, parameters, and effects:

Command Structure

`LENGTH [INIT <value>] <MODE> [<parameters>] <target_length> [<duration/frequency>]`

- `[INIT <value>]` (Optional): Sets the initial length (in meters). If omitted, the system uses the previous length value.
 - `<MODE>`: Defines the interpolation style (e.g., `LINEAR`, `SMOOTH`, `RANDOM`).
 - `<target_length>`: The final length (in meters) to reach or fluctuate around.
 - `<duration/frequency>`: Time-based parameter (in seconds) dependent on the mode.

Modes and Usage

1. INIT

Initializes the laser length to a fixed value.

- **Syntax:** `LENGTH INIT <value>`

Example: `LENGTH INIT 3`

Effect: All lasers reset to 3 meters.

2. LINEAR

Transitions length from the current/initial value to the target length linearly over a specified duration.

- **Syntax:** LENGTH [INIT <value>] LINEAR <duration> <target_length>

Example: LENGTH INIT 3 LINEAR 5 10

Effect: Lasers smoothly grow from 3m to 10m over 5 seconds.

3. SMOOTH

Transitions length using a sinusoidal curve for natural acceleration/deceleration.

- **Syntax:** LENGTH [INIT <value>] SMOOTH <duration> <target_length>

Example: LENGTH INIT 3 SMOOTH 5 10

Effect: Lasers expand from 3m to 5m over 10 seconds, easing in/out.

4. RANDOM

Randomly fluctuates length between the current/initial value and target length at a specified frequency.

- **Syntax:** LENGTH [INIT <value>] RANDOM <frequency> <target_length>

Example: LENGTH INIT 3 RANDOM 5 10

Effect: Lasers chaotically jump between 3m and 5m every 10 seconds.

5. YOYO

Creates a pulsating effect by oscillating between the current/initial value and target length.

- **Syntax:** LENGTH [INIT <value>] YOYO <interpolation_type> <period> <target_length>

Example: LENGTH INIT 3 YOYO LINEAR 10 5

Effect: Lasers alternate between 3m and 10m every 5 seconds using linear motion.

- **<interpolation_type>:** Choose LINEAR (constant speed) or SMOOTH (sinusoidal easing).

6. MESS

Assigns a unique random length to each laser within the defined range.

- **Syntax:** LENGTH [INIT <value>] MESS <frequency> <target_length>

Example: LENGTH INIT 3 MESS 5 10

Effect: Each laser independently fluctuates between 3m and 5m every 10 seconds.

Key Notes

- **Optional Parameters:** use INIT to ensure consistent starting points for complex sequences.
- **Combining Commands:** layer LENGTH with other commands (e.g., ROTATE, COLOR) within a TIME_FRAME for multidimensional effects.
- **Music Sync:** Match <duration> or <frequency> to beat intervals (e.g., 0.5s for a 120 BPM track).

Laser Angle Command Syntax

The ANGLE command allows you to control the direction of the lasers by adjusting their angles. The reference value for each mode is either the last set angle or the value initialized with INIT (if provided). Here is a breakdown of the syntax and effects:

Syntax Overview

ANGLE [INIT <initial_angle>] <MODE> <target_angle> <duration_or_frequency>

- **INIT <initial_angle>** (optional): sets the starting angle (in degrees) for the sequence. If omitted, the last value used is taken as the starting point.
 - **<MODE>**: the transition or animation mode (LINEAR, SMOOTH, RANDOM, YOYO, MESS).
 - **<target_angle>**: the angle in degrees to reach or fluctuate around.
 - **<duration_or_frequency>**: time in seconds (duration for most modes, frequency or period for others).

Modes Explained

1. INIT

Initializes the laser angle to a fixed value.

- **Syntax:**

```
ANGLE INIT 30
```

- **Effect:**

Sets all lasers to an angle of 30 degrees.

2. LINEAR

Changes the laser angle linearly from the initial or last value to the target value over the specified duration.

- **Syntax:**

```
ANGLE INIT 30 LINEAR 90 10
```

- **Effect:**

The lasers angle changes from 30 degrees to 90 degrees over 10 seconds, at a constant rate.

3. SMOOTH

Transitions the laser angle from the initial or last value to the target value over the specified duration, following a sinusoidal (ease-in/ease-out) curve.

- **Syntax:**

```
ANGLE INIT 30 SMOOTH 90 10
```

- **Effect:**

The lasers angle changes smoothly from 30 degrees to 90 degrees over 10 seconds, with acceleration and deceleration.

4. RANDOM

Randomly changes the laser angle between the initial/last value and the target value, at a given frequency.

- **Syntax:**

ANGLE INIT 30 RANDOM 90 10

- **Effect:**

The lasers angle randomly jumps between 30 degrees and 90 degrees every 10 seconds, creating a chaotic effect.

5. YOYO

Oscillates the laser angle back and forth between the initial/last value and the target value, with a given period. You can specify the interpolation type (LINEAR or SMOOTH).

- **Syntax:**

ANGLE INIT 30 YOYO LINEAR 90 10

- **Effect:**

The lasers angle alternates between 30 degrees and 90 degrees, completing a full cycle every 10 seconds, with a linear transition.

6. MESS

Like RANDOM, but each laser changes its angle independently, creating a disordered effect.

- **Syntax:**

ANGLE MESS 10

- **Effect:**

Each laser randomly changes its angle independently every 10 seconds, creating a chaotic and disordered visual.

Notes

- The INIT parameter is optional and only required if you want to explicitly set the starting angle for the sequence.
- If INIT is omitted, the last used angle is taken as the starting value.
- The duration or frequency is always in seconds.
- You can combine these commands within a TIME_FRAME to create complex and evolving laser animations.

Laser Color Command Syntax

The COLOR command allows you to control the color of the lasers, either by specifying RGB values (each between 0 and 10) and an alpha (transparency) value (between 0 and 1), or by using named colors. The reference color for each mode is either the last set color or the one initialized with INIT (if provided). Here's how the syntax works:

Syntax Overview

text

```
COLOR [INIT <r,g,b> <alpha>] <MODE> <target_r,target_g,target_b> <target_alpha> <duration_or_frequency>
```

- **INIT** <r, g, b> <alpha> (optional): sets the starting color (red, green, blue values between 0 and 10; alpha between 0 and 1). If omitted, the last used color is the starting point.
 - <MODE>: the transition or animation mode (LINEAR, SMOOTH, RANDOM, YOYO, MESS).
 - <target_r, target_g, target_b> <target_alpha>: the color to reach or fluctuate around.
 - <duration_or_frequency>: time in seconds (duration for most modes, frequency or period for others).

Modes Explained

1. INIT

Initializes the laser color to a fixed value.

- **Syntax:**

```
COLOR INIT 5,5,5 1
```

- **Effect:**

Sets all lasers to a color with RGB values (5,5,5) and full opacity (alpha 1).

2. LINEAR

Changes the laser color linearly from the initial or last value to the target value over the specified duration.

- **Syntax:**

```
COLOR INIT 5,5,5 1 LINEAR 10,10,10 1 10
```

- **Effect:**

The lasers color changes from (5,5,5) to (10,10,10) with alpha 1 over 10 seconds, at a constant rate.

3. SMOOTH

Transitions the laser color from the initial or last value to the target value over the specified duration, following a sinusoidal (ease-in/ease-out) curve.

- **Syntax:**

```
COLOR INIT 5,5,5 1 SMOOTH 10,10,10 1 10
```

- **Effect:**

The lasers color smoothly changes from (5,5,5) to (10,10,10) with alpha 1 over 10 seconds, with acceleration and deceleration.

4. RANDOM

Randomly changes the laser color at a given frequency. You can also use named colors like RED, GREEN, BLUE, CYAN, MAGENTA, YELLOW. In this case, the color is changed to a random color from the specified color.

- **Syntax:**

```
COLOR RANDOM RED 10
```

- **Effect:**

The lasers color randomly change for a RED color.

5. YOYO

Oscillates the laser color back and forth between the initial/last value and the target value, with a given period. You can specify the interpolation type (LINEAR or SMOOTH).

- **Syntax:**

```
COLOR INIT 5,5,5 1 YOYO LINEAR 10,10,10 1 10
```

- **Effect:**

The lasers color alternates between (5,5,5,1) and (10,10,10,1), completing a full cycle every 10 seconds, with a linear transition.

6. MESS

Like RANDOM, but each laser changes its color independently, creating a disordered effect.

- **Syntax:**

COLOR MESS 10

- **Effect:**

Each laser randomly changes its color independently every 10 seconds, creating a chaotic and disordered visual.

Notes

- The INIT parameter is optional and only required if you want to explicitly set the starting color for the sequence.
- If INIT is omitted, the last used color is taken as the starting value.
- The duration or frequency is always in seconds.
- You can combine these commands within a TIME_FRAME to create complex and evolving laser animations.

Laser Rotation Command Syntax

The ROTATION command controls the rotational movement of the lasers by specifying a rotation speed. This allows you to create spinning or sweeping effects for your laser beams.

Syntax Overview

ROTATION <speed>

- <speed>: The rotation speed, expressed in degrees per second (or another unit, depending on your system).
 - Positive values rotate in one direction.

- Negative values rotate in the opposite direction.
- A value of 0 stops any rotation.

-

Usage and Effects

1. Positive Speed

- **Syntax:**

ROTATION 2

- **Effect:**

The lasers rotate at a constant speed of 2 units per second in the default direction.

2. Negative Speed

- **Syntax:**

ROTATION -2

- **Effect:**

The lasers rotate at a constant speed of 2 units per second in the opposite direction.

3. Zero Speed

- **Syntax:**

ROTATION 0

- **Effect:**

The lasers stop rotating and remain fixed in their current orientation.

Notes

- The ROTATION command can be used within a TIME_FRAME alongside other commands (like LENGTH, ANGLE, or COLOR) to create complex and synchronized laser effects.
- Adjusting the speed dynamically in different time frames allows for varied and engaging motion patterns.
- The direction and speed can be fine-tuned to match the rhythm or mood of your event.

Other commands

Beyond the core animation commands, the system offers a few special commands to enhance your scripting experience and facilitate debugging.

LOOP

- **Purpose:**

The LOOP command causes the entire notecard sequence to repeat indefinitely. This is useful for creating continuous laser shows without manual intervention.

- **How to Use:**

Place the LOOP command at the very beginning of your notecard, before any TIME_FRAME blocks.

- **Example:**

```
LOOP
```

```
TIME_FRAME 6
```

```
GROUP12
```

```
    COLOR INIT 0,0,10 1 LINEAR 10,0,0 1 6
```

```
END
```

```
TIME_FRAME 6
```

```
GROUP12
```

```
    COLOR INIT 10,0,0 1 LINEAR 0,0,10 1 6
```

```
END
```

Effect: The lasers smoothly transition from blue to red and back, repeating this cycle forever.

- **Tip:**

If you want your show to run continuously until stopped, always start your notecard with LOOP.

COMMENT

- **Purpose:**

The COMMENT command allows you to send an instant message (IM) to the owner when a specific frame is activated. This is especially useful for debugging, monitoring sequence progress, or leaving notes for yourself or collaborators.

- **How to Use:**

Place the COMMENT command inside a TIME_FRAME block. The message you provide will be sent to the owner each time that frame runs.

- **Example:**

```
TIME_FRAME 10
GROUP12

COLOR INIT 10,10,0 1 YOYO LINEAR 0,10,10 1 2

COMMENT COLOR INIT 10,10,0 1 YOYO LINEAR 0,10,10 1 2

END
```

Effect: For 10 seconds, all lasers oscillate between yellow and cyan. Simultaneously, the owner receives an IM with the text of the COMMENT command, which can help confirm that the frame is running as intended.

- **Best Practices:**

- Use COMMENT for debugging, progress tracking, or reminders.
- Remove or disable COMMENT lines in your final show scripts if you don't want to receive notifications during live performances.

Summary Table

Command	Placement	Purpose	Example Usage
LOOP	Start of notecard	Repeat the entire sequence indefinitely	LOOP
COMMENT	Inside TIME_FRAME	Send IM to owner for debugging or reminders	COMMENT This is Frame 1

Advanced Tips

- Combine LOOP with multiple time frames to create seamless, endless laser shows.
- Use COMMENT to log specific events or parameter values, making it easier to fine-tune your animations.

FAQ

What is the system described in the manual?

The system is a programmable device consisting of a single ball equipped with 12 lasers. These lasers are controlled by scripts inside the ball, allowing users to create and manage dynamic lighting effects.

How do I set up the system?

Follow the setup instructions in the manual. Generally, you need to rez the ball, access the menu (by clicking the ball), and configure the owner or group permissions as needed.

How do I program lighting effects?

Effects are programmed using notecards with a specific syntax for commands such as LENGTH, ANGLE, COLOR, and ROTATION. The manual provides detailed explanations and examples for each command and mode (INIT, LINEAR, SMOOTH, RANDOM, YOYO, MESS).

What are notecards and how do I use them?

Notecards are text files where you write the commands that define your lighting sequences. The system reads and executes these commands to animate the lasers.

What is a Time Frame in the syntax?

A Time Frame defines a segment of the animation during which certain commands are applied. You can chain multiple time frames to create complex effects.

What are Groups and Subgroups?

Groups (e.g., GROUP12) allow you to control specific sets of lasers together. Subgroups enable more complex animations by dividing the 12 lasers into smaller sets with different behaviors.

What do the different command modes mean?

- INIT: Sets an initial value.
- LINEAR: Changes a value linearly over time.
- SMOOTH: Smoothly transitions between values.
- RANDOM: Assigns random values within a range.
- YOYO: Alternates values back and forth.
- MESS: Applies chaotic or irregular changes.

Can I combine different effects?

Yes, you can combine multiple commands and modes in a single notecard to create sophisticated animations, including transitions, color changes, and rotations.

How do I create a strobe or fast rotation effect?

Use the ROTATION command with a high value or set up a short time frame with rapid changes. The manual includes step-by-step examples for these effects.

What if my commands are not working?

Check for syntax errors in your notecard, ensure you are using the correct command structure, and refer to the summary tables and notes in the manual for troubleshooting tips.

Where can I find more examples or help?

The manual contains example notecards, advanced tips, and a summary table. For further assistance contact the creator.

Can I restrict access to the control menu?

Yes, access to the interactive menu can be limited to the owner or a specific group according to your preferences.

If you have additional questions not covered here, refer to the detailed sections in the manual or consult the troubleshooting and advanced tips pages.

Glossary of technical terms

ANGLE: This command controls the angle or direction of the lasers.

COLOR: This command sets the color of the lasers. Colors are typically defined using RGB (Red, Green, Blue) values.

COMMENT: This command allows you to add comments within your notecard to launch IM for owner.

END: This command marks the end of a time frame.

GROUP12: Refers to all 12 lasers being controlled together as a single group. Other group configurations (e.g., GROUP61, GROUP62) allow you to control subsets of 6 lasers.

INIT: A mode that sets the initial value for a property (like length, angle, or color) at the beginning of a time frame.

LENGTH: This command controls the length or reach of the lasers.

LINEAR: A mode that changes a property (like length, angle, or color) in a straight, consistent progression over time.

LOOP: A command that makes the animation repeat from the beginning.

MESS: A mode that applies chaotic or irregular changes to a property, creating a random or unpredictable effect.

Notecard: A text file used to write the commands that define lighting sequences. The system reads and executes these commands.

RANDOM: A mode that assigns random values within a specified range to a property.

ROTATION: This command controls the rotation speed and direction of the lasers.

SMOOTH: A mode that creates smooth transitions between values of a property over time.

Subgroup: A division of the 12 lasers into smaller sets of 6 lasers, which allows for more complex animations by controlling different groups of lasers differently.

Time Frame: A segment of the animation timeline during which certain commands are applied. Multiple time frames can be chained together to create complex effects.

YOYO: A mode that makes a property alternate back and forth between values.