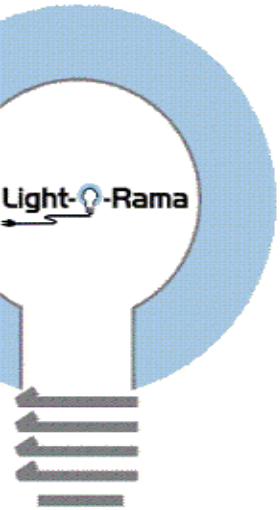


Light-O-Rama

Welcome to LOR-202 Advanced LOR

LOR Training

Objectives

- Know the basic LOR strategy for implementing light control and animation.
- Show how to control inductive loads such as motors, bubble machines and fog machines.
- Understand the different ways that Servos can be controlled.
- Know the new hardware available in 2006.
- Understand how to use some advanced features of the LOR Software suite.
- Understand how input triggers can be used to provide an interactive show.

LOR Basics (The Sequence)

- The Sequence Editor is used to build Sequences.
- A Sequence is the basic building block of LOR.
  - It contains a series of instructions for the hardware to follow.
  - They can be combined together to create a Show.
- Musical Sequences
  - Sequences that have a media file (usually MP3 or MIDI) associated with them.
  - Musical Sequences are the basis of Music/Light synchronization.

LOR Basics (The Sequence)

- Animation Sequences
  - Sequences that do not have associated media files.
  - Can optionally be downloaded into standard controllers for standalone operation.
- Channel Configurations
  - Additional information contained in a Sequence File.
  - Provides a mapping between a row in the sequence and a physical device in the network.
  - Allows attributes such as descriptive names and colors to be assigned to rows in the sequence.

LOR Basics (The Show)

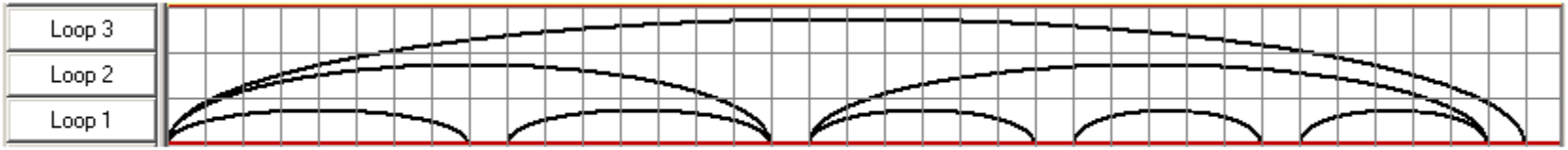
- A Show is a group of Sequences.
- The Show Editor is used to build Shows.
- Shows define the triggers or cues that control the flow of sequences.
- Multiple shows can be defined.
- Only one show can be playing at a time.

LOR Basics (The Schedule)

- The Schedule determines when Shows will be presented.
- The Schedule Editor maintains the Schedule.
- Different Schedules can be made for weekdays or weekends or particular days of the year.

Sequence Editor (Loops)

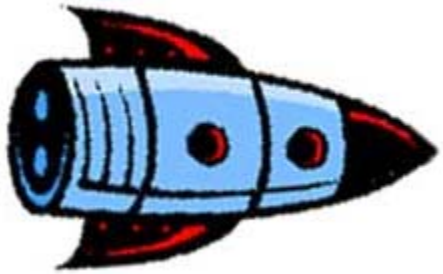
- Loops simplify the building of Animation Sequences containing repetition – like chases.
- A loop repeats a section one or more times.
- Nested loops are loops within loops.
- Nesting loops makes downloads much smaller.
- Up to 10 levels can be used (some controllers can not handle all 10 levels).



Nested Loops -- Three levels represented

Sequence Editor (Loops)

- Loops can change speed as they are executing.
  - Like the rocket, loops change speed once per repeat.
  - With each iteration the loop goes faster or slower.
- Perform sanity check on last loop time!!
- Not all controllers support speed changes within loops.



Building Shows (The Show Editor)

- The Show Editor is used to combine Animation and/or Musical Sequences into shows.
- There are multiple sections within a show – most sections are optional.
- The Show's sections are executed in a preset sequence.
- A show runs as long as it is scheduled to run – It will repeat sections or shorten sections to ensure that it ends on schedule.

Building Shows (The Show Editor)

- The ***Background*** section
  - Used to turn on lights and sequences that should be running constantly from Show start to Show end.
  - This section is optional and may remain empty .
  - Only Animation Sequences are permitted.
  - If you want to simply turn on a group of lights:
    - Create an Animation Sequence with the required channels.
    - Make the Sequence a single Event at least 1 minute long.
    - Turn the lights on for the full duration of the Sequence.
    - Do not make the sequence very short, they do run constantly and loop at the end.

Building Shows (The Show Editor)

- The ***Startup*** section
  - This section contains a list of Sequences to start the show.
  - This section is optional and may remain empty.
  - Can contain both Animation and Musical Sequences.
  - Will execute the sequences in the order listed
  - The next section will not begin until the last Sequence is completed.
  - A good place to put a special song to start the Show.

Building Shows (The Show Editor)

- The ***Animation*** section
  - Begins after the ***Startup*** section completes.
  - This section is optional and may remain empty – If it is empty the ***Musical*** Section should not be empty.
  - Any number of Animation Sequences may be listed.
  - Sequences can be played one at a time OR all at once.
  - When the scheduled end of the show is reached, all sequences will terminate immediately OR when any running Musical sequence completes.

Building Shows (The Show Editor)

- The ***Musical*** section
  - Runs at the same time as the ***Animation*** section.
  - This section is optional and may remain empty – If it is empty the ***Animation*** section should not be empty.
  - Contains a list of 0 or more Musical Sequences.
  - List may be played in order or random shuffle.
  - A delay between songs may be specified.
  - An animation sequence can be specified to run between the songs.
  - At Show end, currently playing song completes.

Building Shows (The Show Editor)

- The ***Shutdown*** section
  - This section contains a list of Sequences to end the show.
  - This section is optional and may remain empty.
  - Can contain both Animation and Musical Sequences.
  - Will execute the sequences in the order listed.
  - The show will not end until the last Sequence is completed.
  - A good place to put a special song to end the Show.

Schedules *(The Schedule Editor)*

- The Schedule determines when your shows will be automatically performed.
- Two basic categories of schedules: (Day of Week Schedule) and (Day of Year Schedule).
- Day of Week Schedule
  - Each day of the week has its own schedule.
  - Schedules repeat every week of the year.
  - Multiple/different shows can be scheduled each day.
  - Shows can be scheduled down to the minute.

Schedules *(The Schedule Editor)*

- Day of Year Schedules
  - Particular days of the years can have “special” schedules.
  - Day of Year Schedules supersede any Day of Week schedules.
  - Can be used to play different show(s) on particular days of the Year.
  - Can be used to extend or shorten shows on particular days of the Year.

Schedules *(The Schedule Editor)*

- Why multiple shows per day?
  - Different shows (with and without music) can be scheduled such that the music stops at specific time.
    - Create one show with Musical Sequences and optionally Animation Sequences – Call it “ShowM”.
    - Create one show without any Musical Sequences – Call it “ShowA”.
    - Schedule ShowM to run from 6PM to 9:30PM.
    - Schedule ShowA to run from 9:30PM until 11:00PM.
    - Lights will start at 6PM with music – music stops at 9:30 display remains running.

Schedules (The Schedule Editor)

Why multiple shows per day? (cont'd)

- Play MP3 files (and optionally broadcast them FM) prior to starting the display
  - Create a series of Musical Sequences with no channels – When played, the sequences will output music but not control any lights.
  - Create a Show made of the "empty" Musical Sequences – Call it ShowE.
  - Create a "regular" show – Call it ShowR.
  - Schedule ShowE to run from 1:00 PM to 6:00 PM.
  - Schedule ShowR to run from 6:00 PM to 11:30 PM.
  - Your music will start playing (without lights) at 1:00 PM and then at 6:00 PM the display will come to life.

Controllers (Standalone)

- Standalone mode allows a controller to operate without a connection to the host computer.
- The Hardware Utility is used to configure controllers for standalone mode.
- A LOR controller operating in standalone mode can control other controllers as well as itself.
  - Additional controllers are connected as if the Standalone controller was the PC.
  - Up to 239 controllers can be connected BUT a practical expectation is to support a total of 100 to 200 channels depending on sequence complexity.

Controllers (Standalone)

- Best Supported by Deluxe models.
  - Deluxe models have more memory for sequence storage.
  - Only deluxe models can control other controllers.
- Sequencing Considerations.
  - Only Animation Sequences can be downloaded.
  - Use of ‘Loops’ can saves space in downloads.
  - Multi-Track Sequences are not supported.
  - 1/10 sec resolution – Automatically adjusted.
  - Maximum of 255 loops – Higher counts are ignored.

Controllers (Standalone)

- Various trigger conditions can be used to start the sequence (not all triggers are supported by all hardware).
  - Run whenever power is supplied.
    - Unit is placed on a manual switch or timer.
  - Run at a scheduled time.
    - Single On / Off time can be specified.
    - Unit must have onboard clock option.
  - Run when input is received.
    - Can be used in conjunction with a Scheduled time.
    - Switches (N/O or N/C) as well as devices such as motion detectors.

Controllers (Standalone)

- Multiple sequences can be downloaded.
  - Up to 10 sequences can be downloaded.
  - Unit ID dials are used to select a sequence.
    - The controller assumes that it is UNIT “01”.
    - User assigns Unit ID numbers to sequences at download time.
  - Special effects can be assigned to Unit IDs.
    - Play all sequences – repeat forever.
    - Random play of all sequences – repeat forever.
    - Up to 4 sequences can be assigned to run concurrently.
    - Random selection of sequence when input received.

Controllers (Special Unit IDs)

- Valid Unit IDs are in the range of ‘01’ to ‘F0’ better known as 1 to 240.
- Unit ID ’00’ is used to reset the unit.
  - Reset if the unit is not responding or is acting abnormal.
  - Reset will clear all settings such as MAX and MIN intensity and remove any Standalone Sequences.
- Unit ID “FF” places the unit in Test Mode.
  - Unit will sequence (flash) each circuit on one at a time in order 1,2,3… It Loops forever.

Controllers (Special Unit IDs)

- To use a special Unit ID take the following steps:
  - Disconnect power from the unit.
  - Set the Unit ID to the desired value.
  - Re-connect power to the unit.
- Once you are finished with the special Unit ID take the following steps:
  - Disconnect power from the unit.
  - Set the Unit ID back to the proper address.
  - Re-connect power to the unit.

Controllers (Upgrading Firmware)

- Firmware is the internal operating system of a controller.
- Upgrades to the firmware are necessary for new features and enhancements.
- The Hardware Utility provides the mechanism to download new firmware.
  - Firmware files are kept in a folder named “Firmware”.
  - Filenames describe the controller type: i.e. A CTB16D would have firmware files named CTB16D_xxxx.lhx.
  - Hardware utility verifies that the firmware selected is valid for the attached controller.

Controllers *(Upgrading Firmware)*

- Living inside the controller is a special, independent program called a Bootloader.
- The Bootloader communicates with the Hardware Utility when downloading Firmware.
- When the Bootloader is in control of the Unit, the LED will blink: long on, short off, long on…
- Emergency Procedure: If the controller does not start downloading after 15 seconds, power it off then on again, WHILE the Hardware Utility is attempting to start the download.

Controllers *(Min/Max Intensity)*

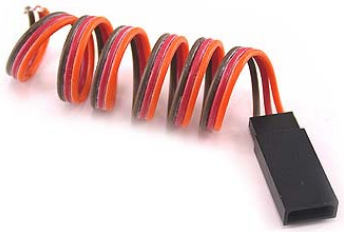
- Hardware Utility allows for the setting of Minimum and Maximum Intensity levels.
- Any commands sent to a Controller that contain intensities that fall outside the limits are adjusted to the limit.
- Why use Minimum and Maximum levels?
  - Setting a Max Level can save electricity and prolong bulb life.
  - Setting a Min Level can make ramp ups start ‘smoother’ – Generally only applies to high wattage bulbs.

Controllers (Direct Connect Servos)

- A servo contains a motor, gearbox and an electronic positioning circuit.
- They are used to animate objects.
- Some Deluxe LOR controllers can support direct connection of 1 or 2 servos.
- The LOR controller provides the positioning signal to the servo.
- The LOR controller does NOT provide the electrical power for the servo.

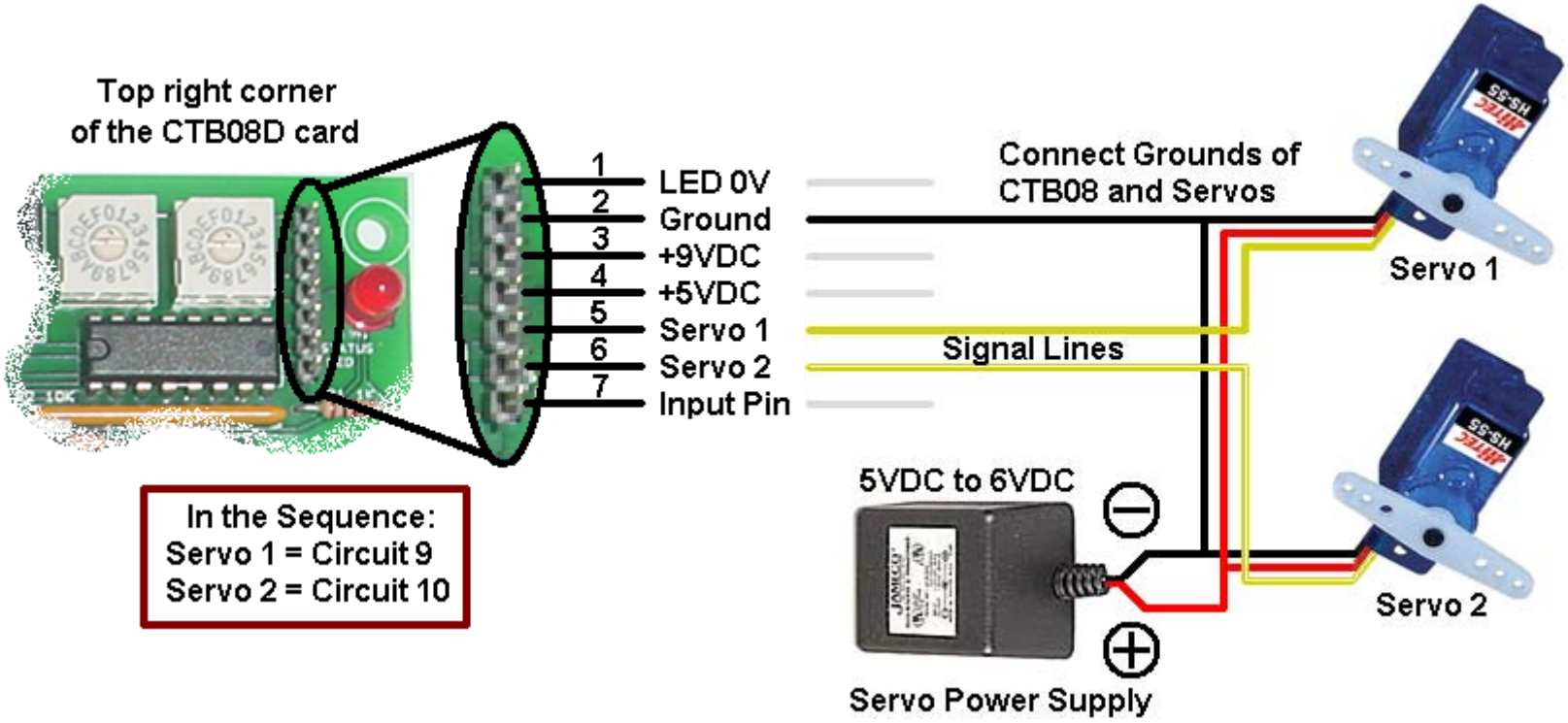
Controllers (Direct Connect Servos)

- A servo has three wires. (Red, Black and another color which will vary).
  - Black is ground.
  - Red is voltage + and is usually 5vdc to 6vdc.
  - The third wire (usually white, yellow or orange) is the signal wire that receives position information from the LOR controller.



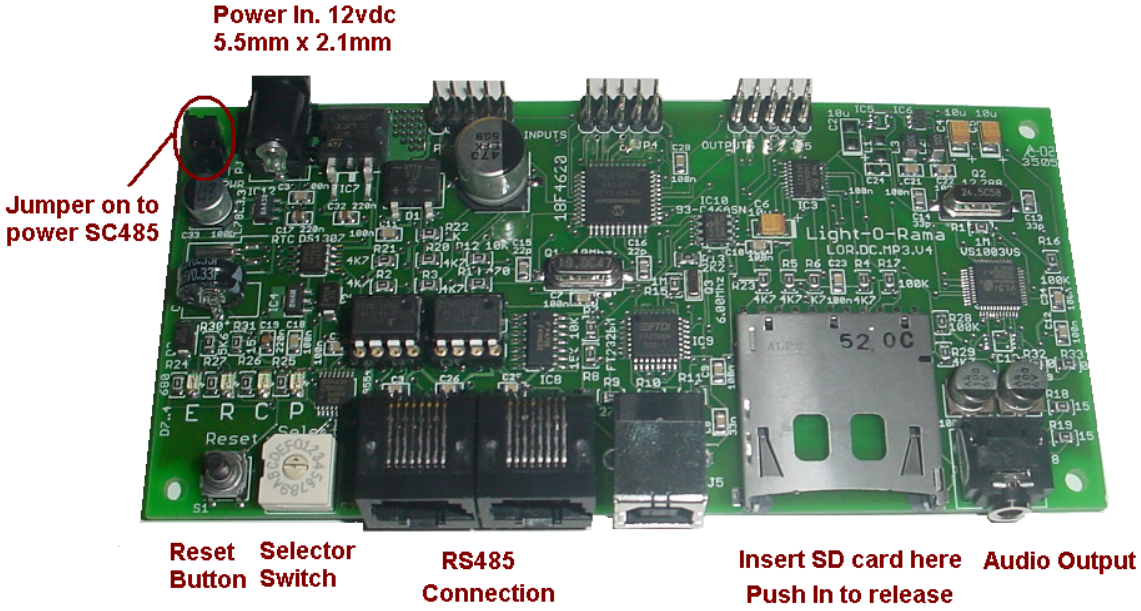
Controllers (Direct Connect Servos)

Servo Wiring Diagram for CTB08D



Hardware (LOR Director)

- LOR Director (LOR-DC-MP3) takes the place of the PC when running shows.
- Built-in MP3 player for Musical Sequences.
- Regular Sequences, Shows and Schedules can be transferred to the LOR Director.
- Onboard clock and calendar for show scheduling.



Hardware (DIO Card)

- The new DIO Card (LOR-MCP32) provides 32 configurable channels.
- Up to 16 servo channels can be configured
- Up to 32 DC control channels can be configured
- Up to 32 AC dimming/fading channels can be configured.
- Additional cards are available to provide appropriate interface (Servo, DC, AC, Mechanical Relay…)

Hardware (DIO Card)

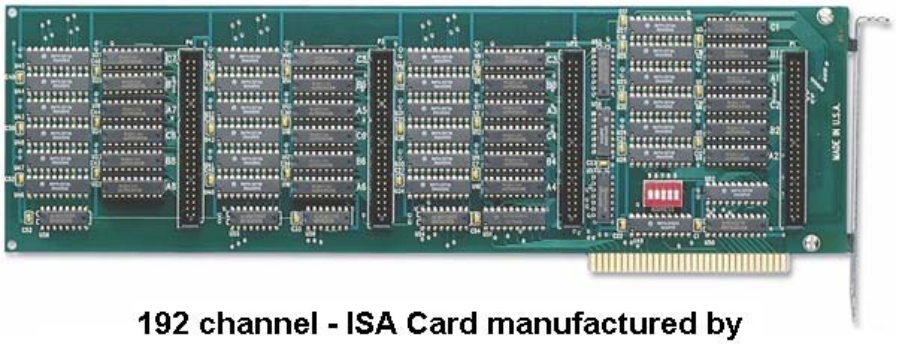
- Can be used to control Solid State Relays (SSR) directly (5VDC up to 20ma).
- Optically isolated Inputs can be used to support multiple motion detectors, pressure mats and other input devices.
- Appears as a standard controller in a LOR sequence.

Hardware (DMX interface)

- Provides a link between a LOR network and a DMX universe.
- Can provide 32 intelligent channels with fading and all standard LOR lighting effects.
- Can be daisy chained into an active DMX universe.

New Hardware (Standard DIO boards)

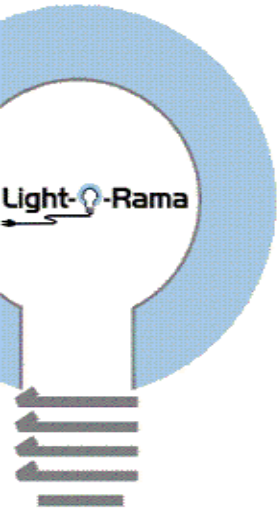
- DIO boards are cards placed inside the PC.
- Usually SSRs are connected to the outputs of the DIO cards to control lights.
- LOR supports Measurement Computing, BSOFT and most ISA cards using 8255.



192 channel - ISA Card manufactured by Measurment Computing

Hardware (X-10 using the CM11-A)

- X10 uses Power Line Communication (PLC) to control lights – no extra cables
- **Good for static control of lights.**
- **Poor choice for active light displays.**
- Runs 1000s of times slower than LOR.
- A serial port is use to attach the CM11A.
- If LOR and X10 are used, two Serial Ports are required.



The End