LT-12 Controller Description

The LT-12 Controller provides timed switch control for various applications. Twelve outputs can be used to drive lamps, relay coils or inputs to Museum Technology Source control units. Simultaneous compact disc player control capability enables the user to coordinate a lamp sequence with a CD selection. Programming requires only a personal computer and modem software.

The LT-12 controls two functions, the Button Function and the Idle Function. The Button Function is executed when Button #1 of the controller is pressed. The Idle Function is executed when the Button Function is finished and the controller is waiting for the button to be pressed.

Both functions have a lamp program and a CD selection. When either the Button or Idle function is executed, the LT-12 begins a sequence of output on/off patterns which can be viewed on the front panel button lamps. If a CD player is connected, the controller can play a CD selection at the same time. Both the output sequence and the CD selection can be programmed by the user.

When programming the LT-12, a CD selection (track and time duration) must be specified for the lamp program to be executed properly, even if a CD player is not connected. The final lamp event time must be less than the CD selection time for all the events to be displayed.

If "No Player" is chosen as the CD player type, no CD player commands are issued by the controller and no delay time exists between the end of one function and the beginning of the next. This feature is specifically for LT-12 applications in which only the lamp program is used, and transition time between functions is important.

LT-12 Programming

Programming the LT-12 requires the use of a personal computer loaded with a communications program of the type normally used to communicate with an external modem. Pressing the rear panel "Program" button will cause a menu to appear on the computer's screen.

The LT-12 communicates with the computer via standard RS-232C transmission. The format is 1200 baud, 8 bit, no parity. Programming the controller requires an RS-232 connector cable. One end of the cable has a 5-pin DIN connector, which plugs into the RS-232 port on the back of the LT-12. The 5-pin DIN connector on the LT-12 is wired as follows:

pin 1	=	ground
pin 2	=	data transmitted from LT-12
pin 3	=	data received by LT-12

As far as the computer is concerned, the LT-12 looks like a modem. The computer merely serves as a "dumb" terminal. All programming information is contained in the LT-12's read-only memory.

Setting Up The Programming Connection

1.) Supply power to the computer and the LT-12. The green power indicator on the LT-12 will be lit.

2.) Load your computer with a communications package (such as Red Rider, Microsoft Works, Microphone, Mock Terminal, ProComm or Windows 3). Set the following parameters:

Baud Rate:	1200 baud
Number of bits:	8
Stop bits:	1
Parity:	None
XON/XOFF:	Disabled (Off)

3.)   Press the red "Program" button on the back panel of the LT-12. The red light above the button will go on, indicating the unit is ready to be programmed. The computer screen now fills with the programming menu.

Menu Commands

Main Menu

The Main Menu gives the user the option of viewing or editing the CD selection (track and playing time) assigned to the Button or the Idle function, checking the pushbutton wiring, or calling up the Options or Lamp Menus. The Main Menu choices are:

B   **Button.** The computer displays the current CD selection for the Button function, and gives the user the option of keeping or changing it.

I   **Idle.** Displays the current CD selection for the Idle function, and gives the user the option of keeping or changing it.

T   **Test.** This command provides a means of checking the pushbutton wiring. In this mode, pressing any of the buttons on the front panel (or remote connections) will cause that button to light as long as it is held down. The light indicates that the button is active.

L   **Lamp Menu.** Allows the user to program the lamp program of either the Idle or Button functions. The Lamp Menu appears on the screen.

Lamp Menu

The Lamp Menu allows the user to view or edit the lamp program of the Button or Idle functions. The following definitions explain the terms used in the menu:

The _selection_ is the track and playing time of the CD which the LT-12 will play when it is connected to a CD player.

An _event_ is a lamp pattern which occurs at a certain time during the selection.

The <u>lamp program</u> is the series of events programmed for the Button or Idle functions.

The Lamp Menu choices are:

S   **Show.** Displays the current lamp program for the Button or Idle functions. Lamps on during an event are indicated by "ON", while lamps off are indicated by "--".

A   **Add.** Adds a new event to the current lamp program. The user is first directed to enter the time at which the new event is to take place. Then the user selects the desired lamp pattern with the front panel buttons.

T   **Time.** Allows the user to change the time of an event.

L   **Lamps.** Allows the user to change the lamp pattern of an event.

D   **Delete.** Allows the user to delete an event from the current sequence.

I or B   **Idle** or **Button.** Switches between Idle or Button functions without having to return to the Main Menu.
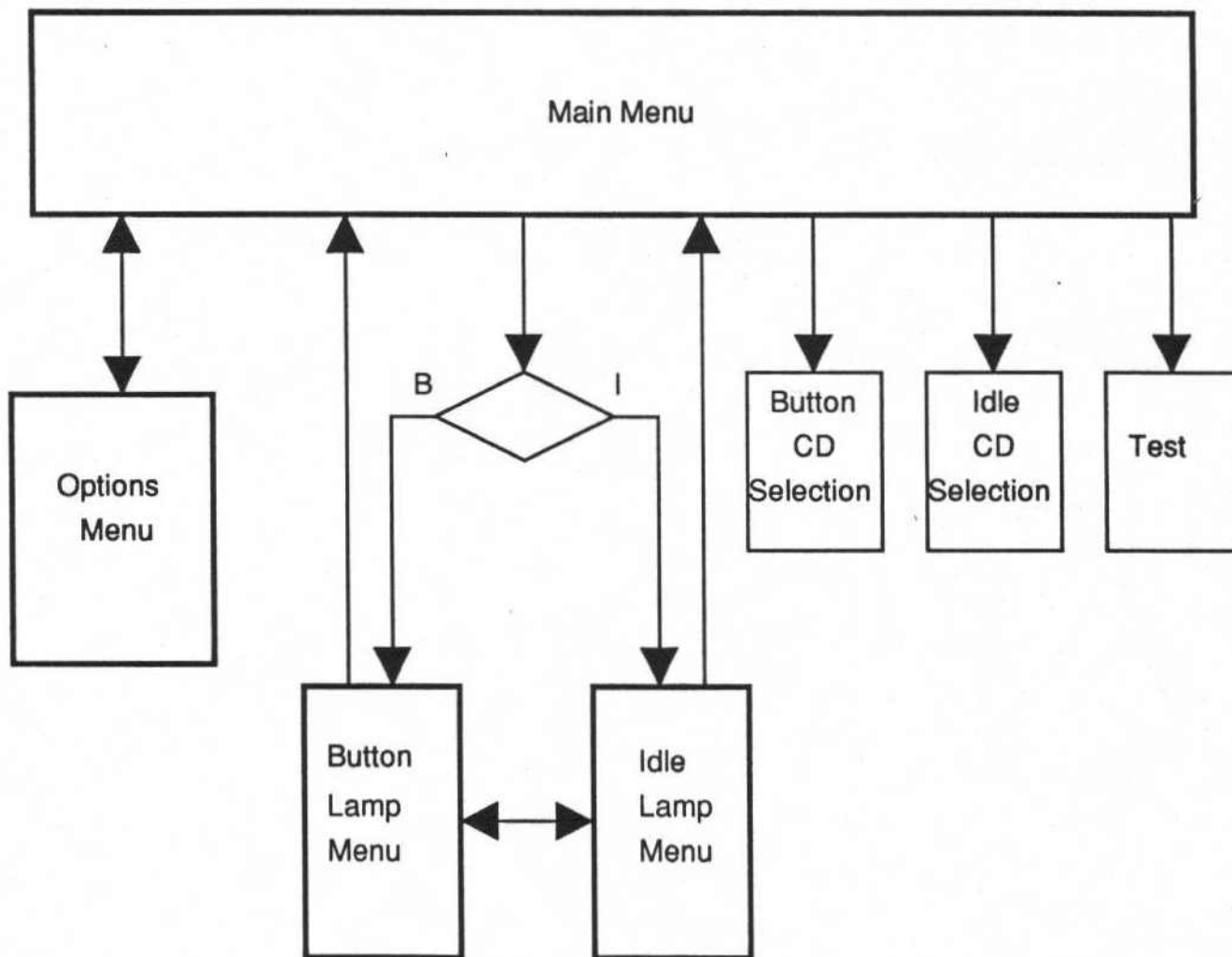

Options Menu

The Options Menu lists the following additional commands:

P   **Player.** Select the type of CD player being used.

I   **Interruptibility.** Normally, when a pushbutton is pressed, the LT-12 will ignore any further button presses until the selection has finished playing. If the buttons must always be active, you may specify this using the "I" command.

R   **Reset.** This is a special purpose command that allows button #12 to serve as a reset button. When pushed, button #12 will cause the program to stop playing. If the LT-12 has been programmed for an Idle selection, the system will immediately revert to this selection.

T   **Test.** Tests link between controller and CD player by sending continuous "STOP" commands to the player.

C   **Clear.** This command clears all the user programmable memory.

LT-12 Menu Map

Main Menu

Options Menu

B   I

Button CD Selection

Idle CD Selection

Test

Button Lamp Menu

Idle Lamp Menu

LT-12 Programming Example

The following is an example of a typical LT-12 programming session. The actual computer display is on the left; instructional comments are on the right.

Museum Technology Source, Inc.
Compact Disc Lighting Controller model CD212/LC
Firmware version 1.01
Firmware and menu structure Copyright (c) 1993
by Museum Technology Source, Inc.
All Rights Reserved

[Introduction]

For further information on this and other museum media products, contact

Museum Technology Source, Inc.
P.O. Box 306
Winchester, Massachusetts, 01890
Phone: (800) 729-6873
or (617) 729-5895
Fax: (617) 729-0839

Current CD player type: none

[Player type status]

------- Main Menu -------
B = view or edit the Button's selection
I = view or edit the Idle selection
T = Test the buttons and lamps
L = view or edit a selection's Lamp program
O = go to Options menu
Please choose a command: B

[Edit Button function CD selection]

Button 1 starts at track 1
  and plays for 0:08.
Do you want to change this (Y/N)? Yes

Enter the start track for the button
  and press RETURN: 2
Enter the play time for the button
  and press RETURN: 7

[New track and playing time]

*** Programming: done ***
Button 1 starts at track 2
  and plays for 0:07.

------- Main Menu -------
B = view or edit the Button's selection
I = view or edit the Idle selection
T = Test the buttons and lamps
L = view or edit a selection's Lamp program
O = go to Options menu
Please choose a command: L

Do you want to view the Idle or the Button lamp
  program? Press I or B: Button

------ Lamp Menu -----
S = Show button lamp program's events
A = Add events to button lamp program
T = change Time of button lamp program event
L = change Lamps of button lamp program event
D = Delete button lamp program event
I = switch to Idle lamp program
M = go back to Main menu
Please choose a command: S

The button lamp program is:

Event	Time	Lamp 1	2	3	4	5	6	7	8	9	10	11	12
1	0:00	--	--	--	--	--	--	--	--	--	--	--	--
2	0:01	ON	--	--	--	--	--	--	--	--	--	--	--
3	0:02	ON	ON	--	--	--	--	--	--	--	--	--	--
4	0:03	ON	ON	ON	--	--	--	--	--	--	--	--	--
5	0:04	ON	ON	ON	ON	--	--	--	--	--	--	--	--
6	0:05	ON	--	ON	--	ON	--	ON	--	ON	--	ON	--
7	0:05.2	--	ON	--	ON	--	ON	--	ON	--	ON	--	ON
8	0:05.4	ON	--	ON	--	ON	--	ON	--	ON	--	ON	--
9	0:05.6	--	ON	--	ON	--	ON	--	ON	--	ON	--	ON
10	0:05.8	ON	--	ON	--	ON	--	ON	--	ON	--	ON	--
11	0:06	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON

------ Lamp Menu -----
S = Show button lamp program's events
A = Add events to button lamp program
T = change Time of button lamp program event
L = change Lamps of button lamp program event
D = Delete button lamp program event
I = switch to Idle lamp program
M = go back to Main menu
Please choose a command: A

Enter time for new event and press RETURN (enter
  'Q' to quit): 4.5
*** Adding new event... done ***

Use the front panel buttons to toggle the lamps to
  the desired state. When done, press any key.

*** Programming: done ***

Button lamp program's event 6 at time 0:04.5 now has this lamp state:
    1 2 3 4 5 6 7 8 9 10 11 12
    ON ON ON ON ON -- -- -- -- -- -- --

Enter time for new event and press RETURN (enter
  'Q' to quit): q   [Done programming
                                                                     Button function
                                                                     lamp program]

------ Lamp Menu -----
S = Show button lamp program's events
A = Add events to button lamp program
T = change Time of button lamp program event
L = change Lamps of button lamp program event
D = Delete button lamp program event
I = switch to Idle lamp program
M = go back to Main menu
Please choose a command: M   [Go to Main Menu]

------- Main Menu -------
B = view or edit the Button's selection
I = view or edit the Idle selection
T = Test the buttons and lamps
L = view or edit a selection's Lamp program
O = go to Options menu
Please choose a command: O   [Go to Options Menu]

------ Options Menu -----
P = view or edit Player type
I = view or edit Interruptibility
R = view or edit button 12 Reset
T = Test player link
C = Clear program memory
M = go back to Main menu
Please choose a command: I   [Set Inter-
                                                                     ruptibility]

Button selections can be uninterruptible (they
always play to the end) or interruptible (they can
be interrupted by pressing another button). If
interruptible, a safe time can be set, specifying
the minimum amount of time before a selection can be
interrupted.

Selections are now uninterruptible.
Do you want to change this (Y/N)? Yes   [Make Button function
                                                                     interruptible after
Do you want button selections to be   3 seconds into CD
  interruptible (Y/N)? Yes   selection]
How many seconds before interruptions
  will be allowed (a suggested value
  is 6)? 3

*** Programming: done ***

Selections are now interruptible
after 3 seconds.

------ Options Menu -----
P = view or edit Player type
I = view or edit Interruptibility
R = view or edit button 12 Reset
T = Test player link
C = Clear program memory
M = go back to Main menu
Please choose a command:

[End of programming
session; press
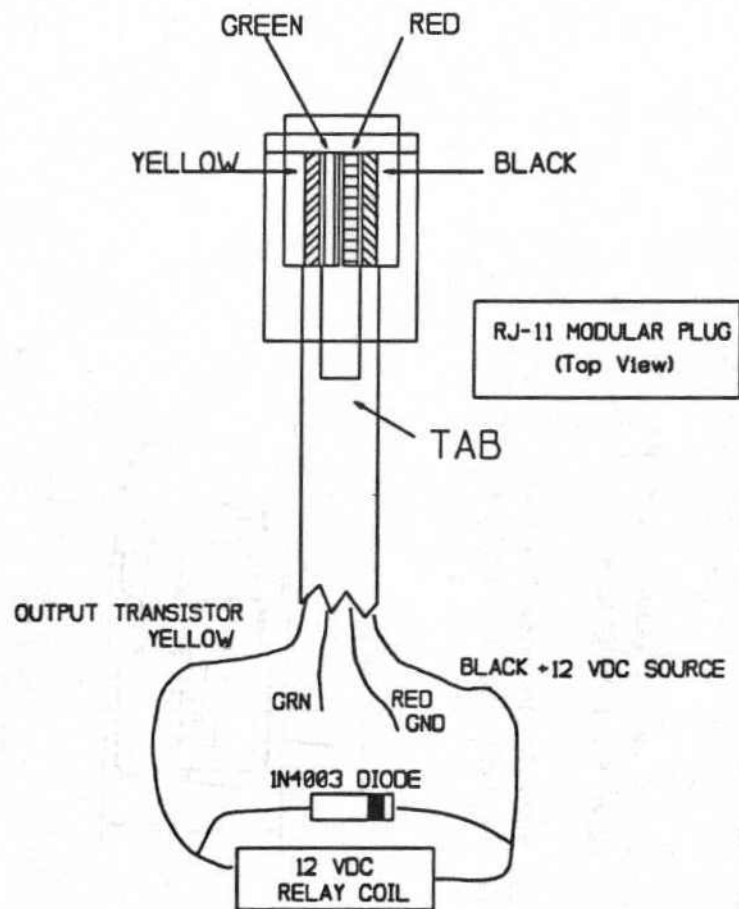Reset button on rear
panel of controller]

LT-12 Setup Instructions for use with VDC-212 units

1.) Program the LT-12 and VDC-212s to the desired selections according to their respective programming instructions.

2.) Place the LT-12 and VDC-212s where they will be when the system is connected and running.

3.) Connect the VDC-212 units to the laser disc players according to the VDC-212 setup instructions.

4.) Connect the LT-12 to the VDC-212 units with the provided patch cords. Plug the "CONTROLLER" end of a cord into a jack in the rear panel of the LT-12 and the "VDC-212" end into a jack in the rear panel of a VDC-212. Make sure that the correct LT-12 output is connected to the correct VDC-212 according to the lamp program, and the correct button on the VDC-212.
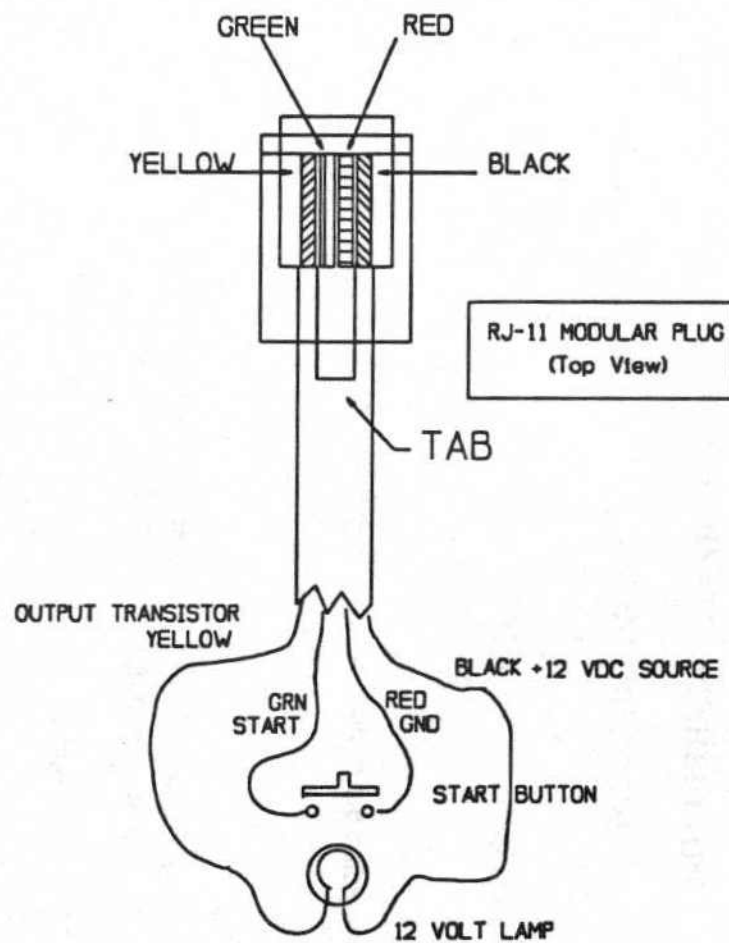
5.) Power up the system.

SPECIAL NOTES

In this case, program the LT-12 for no Idle selection and set the CD player type to no player. Program the VDC-212 units to be interruptible after 0 seconds. This will enable the LT-12 to keep them all in sync with each other.

Connect the enclosed timer to the Button 1 jack of the LT-12. When the LT-12 powers up, the timer will count down 45 seconds before closing the Button 1 contacts. This gives the laser disc players time to get their discs up up to speed. The LT-12 button contacts will remain closed and the Button function lamp program will repeat continuously until power down.
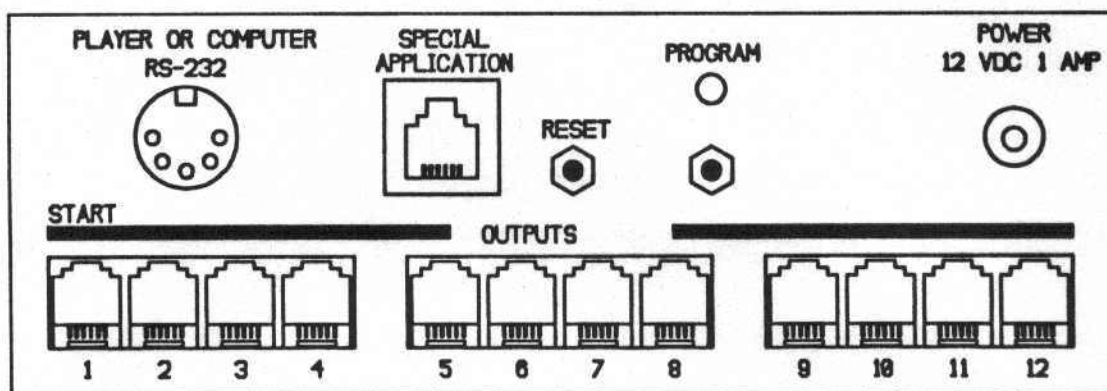
TYPICAL OUTPUT WIRING

START BUTTON WIRING

LT-12 OUTPUT AND START BUTTON CONNECTIONS

LT-12 REAR PANEL CONNECTIONS

PLAYER OR COMPUTER: RS-232 connects to computer for programming cues and times. Settings are 1200 baud, 1 stop bit, no parity. Also, this connector, using a different cable, is used to connect to the CD player (if used) Pin 1 = Ground, Pin 2 = Transmit Data, Pin 3 = Receive Data, Pin 5 = Control Data to CD player

SPECIAL APPLICATION: Does nothing unless specially configured at factory.

RESET Resets controller. Does not affect data stored in memory. Used to exit programming mode.

PROGRAM BUTTON AND LED: Pushing this button will place the LT-12 in Program Mode, allowing communication with an external computer, for entering cues and times. Red LED will be on while in Program Mode. When in normal mode, LED will flash when command is sent to CD player.

POWER: Connects to 12 Volt DC @ 1 Amp power supply. Center pin is positive.

OUTPUTS: RJ-11 6-position, 4-conductor modular telephone style connectors for connection to external devices. Viewed left to right, contact pins are: (1) Output Transistor Collector; (2) Not Used; (3) Common Ground; (4) +12 VDC voltage source

START: Same pin configuration as OUTPUTS except (2) is START contact. Pushbutton connected between (2) and (3) Common Ground will start LT-12. Note that (1) OUTPUT pin is available for use.

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