Blue Point Engineering

Wizard - I Interface Board

Application Examples

Talking / Eye Moving Skull

Animatronic Head

Motion Puppet

Eyeball Jar
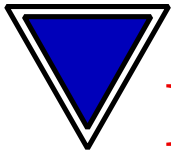

Dragon Wall
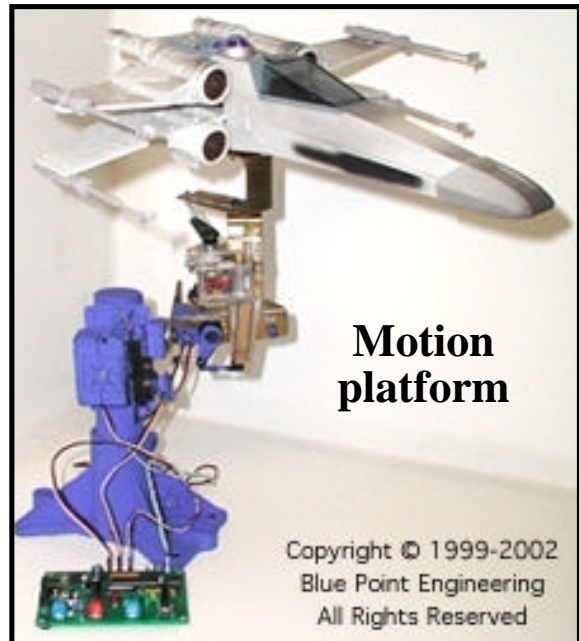
Motion platform

Wizard - I Board Ideas

Wizard Board Interface

Sensors

Light Sensor OR Motion Sensor OR

Switch
- Push Button
- Mat Switch
- Toggle Switch

Wizard Board Power Supply

9 Vdc 2 Amp

OR OR OR

Servo 4
Position Servo

A B C

CW
CCW

Speed Control

Servo 3
Rotational Servo

5 Vdc Devices
- Relay
- LED's

Servo 2
2 way switch

Sw 1 - Sw2
OF F
Sw1 ON
Sw 2 ON

Servo 1
Push and Pull

Level 1
A B C

N.O
Com.
N.C

Device Electrical Connections

OR

Level 2
B A C

Sound Card

Servo 1
Pneumatic Valve

Position Servo

A C B

Low Pressure System

Pneumatic Cylinder
A B

Relay Module

12 Vdc Power Supply
AC Power

Channel - 4

Relay Module

OR

High Pressure System

12 Vdc Devices
- Motor
- Sound Unit
- Light Effects

12 Vdc Pneumatic Valve or Solenoid

Compressed Air

Pneumatic Cylinder

Optional Output for 2nd Wizard Board Activation

AC Power

DC/AC Solid State Relays

Channel - 3
Channel - 2
Channel - 1

AC Devices (110 VAC)
- Motors
- Lights
- Strobes
- Fog Unit
- Effects Equipment

Wizard - I Controller Board

Controller

The **WIZARD-1 BOARD** is a small 9 Vdc @ 2 Amp powered interface board that will record and playback up to 5 minutes of servo motion for 1-4 standard +5 Vdc Hobby R/C type servos and control 4 digital switched ON and OFF outputs at +5 Vdc (100 mA) per channel.

The Wizard -1 board incorporates many features such as looping playback servo motion with variable delay between loops. An auto start-up on power option and on board connector for remote activation switching such as a PIR sensor, contact switch or mat pressure pad to initiate playback.
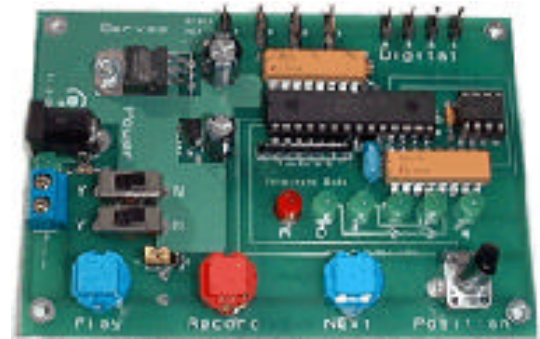
Recording sessions are built up on a channel by channel process - no complex programming is required. During recording, all previously recorded channels are re-played to aid synchronization the current channel being programmed. Programming is easily done, with a set of push button keys and control potentiometer built onto the board. No host computer or other programming device is needed to operate the Wizard - 1 board.

The Wizard -1 board is an excellent product for Animatronic applications, where ease in set-up and programming control is needed. The digital +5 Vdc outputs (100 mA) with the addition of optional relays make adding control of other devices such as special effects equipment, or mechanical units easy to add. Using the optional DC/AC Solid State Relay with the Wizard -1 board digital outputs makes control of AC power devices such as lighting, fog machines, and other 110 VAC systems an easy set-up also.

WIZARD - 1 BOARD FEATURES:

- 4 Servo output channels, each capable of recording and playback of up to 5 minutes of action.
- 4 Digital switched ON/ OFF channels with +5 Vdc at 10 mA outputs per channel recorded action.
- On board Potentiometer to adjust servo positions during recording or to determine the time delay between playback loops during automatic loop play - adjustable between 5 and 65 seconds.
- On board NEXT, PLAY and RECORD push buttons
- Record enable/disable jumper block to help safe guard programmed actions.
- AUTO-PLAY and LOOP-PLAY selection switches for configuring board functions / operation.
- Remote activation switch connection.
- Programming and operation status green and red LED's
- The servo outputs provide standard pulse coded signals of between 1 msec and 2 msec duration repeated every 20 msecs making it suitable for all standard hobby +5 Vdc R/C type servos.
- EEPROM - containing the programmed data, can easily be removed and copied to other Wizard boards.
- On board support for other optional control boards (Relays, AC Controller, Motor Bridge, etc.).
- On board connectors and configuration jumper for battery or wall power operation.
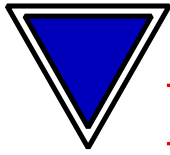
Wizard - 1 Controller Board

Controller

Wizard Board Function / Programming / Operation

1

FUNCTIONS

PLAY- key:
Replays a set of recorded SERVO moves and DIGITAL switched ON and OFF actions.
Acts as the switched ON and OFF control when recording the DIGITAL output channels.

NEXT- key:
Changes the current active channel and LED's for manual movement and recording.
Each time the key is pressed the next SERVO channel "1-4" is selected.
(indicated by the green channel LED "1-4" being turned ON for that selected channel)
In DIGITAL mode, each time the key is pressed the next DIGITAL channel "1-4" and the "D" LED
 is selected. *(indicated by the green "D" LED being turned ON along with the green channel LED's "1-4"for
that selected channel being turned ON)*

POSITION- Move-control:
Moves the servo motion for the current channel selected when in the recording mode.
When not in playback mode or recording mode, the POSITION- control changes the position of the servo arm
for the current channel selected as a manual controller.
When the Wizard board is set to looping playback, the length of the pause between repeated playback may be set
by rotating the POSITION- control to a delay rate.
(Turn the POSITION - control counter clockwise (CCW) for the minimum delay 5 seconds).
(Turn the POSITION - control clockwise (CW) for the maximum delay approx. 65 seconds).
(Turn the POSITION - control anywhere between the min. and max. values for other various delay rates).

*Note: during the recording mode for DIGITAL channels 1-4, the POSITION- control is inoperative and
will not operate any SERVO channels "1-4".*

Enable link or Disable- link:
If the jumper block is set at the (**E**) enabled position, recording will be permitted.
If the jumper block is set to the (**D**) disable recordings, no recording will be permitted.
Removing the jumper block will prevent the Wizard board from becoming accidentally re-programmed or the
EEPROM erased.

LOOP-Play-switch:
To make the Wizard board playback the recorded moves repeatedly, move the LOOP switch to the 'Y' position.
The SERVO and DIGITAL channel actions will start to play when the PLAY-key is now pressed.

*Note: There will be a pause at the end of playback (Delay rate is determined by the position of the
POSITION- control) after which the moves will re-start again.*

AUTO-Play-switch:
If the AUTO switch is in the 'Y' position, then the SERVO and DIGITAL channel actions will
be replayed automatically on any Power-On or board Reset.
If a REMOTE switch is attached and activated ON, the SERVO and DIGITAL channel actions will
start playback automatically with the AUTO switch in the "Y" position.

*Note: The play back actions will sequence only once, with the AUTO switch in the "Y" position then
wait for the next PLAY-key or REMOTE switch activation to occur. When the switch is re-activated the
playback will start all over again. This method allows for the play, wait, switch activate cycle process.
"Green LED "1" wil turn ON indicating board is waiting for switch action between playback.*

Note - Switch positions
If the LOOP switch is set to the "Y" position, and the AUTO switch is to the "Y" position, and power to the Wizard card has not been power-on or reset, then the REMOTE switch will act as an initial one time start trigger.

If the LOOP switch is set to the "N" position, the AUTO switch is to the "Y" position and a jumper wire between the REMOTE connector has been installed, then the SERVO and DIGITAL channel actions will start automatic playback repeatedly with no pause between sequences.

RECORD-key:
The RECORD- key is used to record SERVO channel motions and DIGITAL channel output switched ON and OFF action into the EEPROM memory.
The RECORD- key has no effect unless the Enable jumper block is set at the (**E**) enabled position for recording.
The Wizard board must be enabled (**E**) to do any recorded programming
The LOOP switch and the AUTO switch must also be in the "N" position to enable any program recording.
Press and release the RECORD- key to start recording.
Press and release the RECORD- key to stop recording.
During long (5 min.) recordings the green LED's "1-4" will form a count down bargraph indicating the amount of recording time available. *(Approx. LED 1=4 sec., LED 2=3 sec., LED 3=2 sec., LED 4=1 sec. of time remaining until the EEPROM memory is filled.)*
During long 5 min. recordings, when all the SERVO and DIGITAL actions have finished recording the count down bargraph-LED's "1-4" will turn OFF automatically and turn back ON the current selected channel LED.

Note: The recording on SERVO channel "1" will set the maximum available recording time for all other SERVO channels "2-4" and DIGITAL channels "1-4" during programming.
(Maximum recording time for the EEPROM memory is 5 minutes per channel)
Always record SERVO channel "1" first to set the total programming time needed.
Recording periods for SERVO channels "2-4" and DIGITAL channels "1-4" cannot be longer than that initial total time set for SERVO channel "1".

Clearing Memory to start a new program.
The Enable jumper must be set at the (**E**) enabled position.
The LOOP switch and the AUTO switch must be in the "N" position.
The RECORD - key is held down during Power Up, and released after power is applied.
The LED's "1-4" will form a count down bargraph indicating that current programmed EEPROM memory is being cleared. (This will takes approximately 20 seconds).
After the initial 20 seconds all green LED's "1-4" will turn OFF and the current selected channel LED "1" will turn ON, indicating the board is now ready for programming.

OPERATING GUIDE

RECORDING A SHORT PROGRAM. (4 second - minimum recording time)
Example 1: Short Program
Note: Sometime's it's possible that the program recording process may stall, or quit. To correct simply remove then apply power and re-program that channel.

(Programming Short Sequence- Steps 1-10)
(1) Clear Memory to start a new program. *(See Clearing Memory)*

(2) **SERVO CHANNEL "1"**
If green LED "1" is not already ON, press the NEXT-key until green LED "1" is ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Adjust the POSITION-control to move SERVO "1" for 4 seconds. SERVO "1" will move depending on rotation of POSITION-control. *(Other servos may move, following moves previously recorded).*
Press and release the RECORD-key at the end of the 4 seconds to stop recording.

Hint: the 4 seconds can be counted out by saying "1-1,000", "2-1,000", "3-1,000", "4-1,000", "END".
Note: Start to Stop recorded time on servo channel "1" sets the available recording time for all SERVO channels "2-4" and DIGITAL channels "1-4". The max time is 5 min and the min. is 4 sec. per channel).

(3) **SERVO CHANNEL "2"**
Select SERVO channel "2" by pressing NEXT-key until green LED "2" is ON.
Press and release the RECORD-key.   (The red "R" LED will light, indicating record mode is active)
Adjust POSITION-control to move SERVO "2" until green LED "2" turns ON and red "R" LED turns OFF automatically. (Approx. 4 sec.)

Note: servo "1" will move from previous recorded positions to aid in synchronization, and servo "2" will move as POSITION- control is rotated.) (The recording ended automatically after 4 seconds because Start to Stop recorded time on servo channel "1" initially set the available recording time for SERVO channels "2-4" and DIGITAL channels "1-4".

(4) **SERVO CHANNEL "3"**
Select SERVO channel "3" by pressing NEXT-key until green LED "3" is ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Adjust POSITION-control to move SERVO "3" until green LED "3" turns ON and red "R" LED turns OFF automatically. (Approx. 4 sec.)

Note: servo "1-2" will move from previous recorded positions to aid in synchronization, and servo "3" will move as POSITION- control is rotated.) (The recording ended automatically after 4 seconds because Start to Stop recorded time on servo channel "1" initially set the available recording time for SERVO channels "2-4" and DIGITAL channels "1-4".

(5) **SERVO CHANNEL "4"**
Select SERVO channel "4" by pressing NEXT-key until green LED "4" is ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Adjust POSITION-control to move SERVO "4" until green LED "4" turns ON and red "R" LED turns OFF automatically. (Approx. 4 sec.)

Note: servo "1-3" will move from previous recorded positions to aid in synchronization, and servo "4" will move as POSITION- control is rotated.) (The recording ended automatically after 4 seconds because Start to Stop recorded time on servo channel "1" initially set the available recording time for SERVO channels "2-4" and DIGITAL channels "1-4".

This completes the short SERVO Channel programming.

Programming the DIGITAL Output Channels.

(6) **DIGITAL CHANNEL "1"**
Note: PLAY-key when used now will act as a ON and OFF switch. When pressed ON will send a +5 Vdc output to DIGITAL channel connection pins (+,-) of selected channel and a 0 Vdc to DIGITAL channel connection pins when the PLAY-key is released.

Select DIGITAL channel "1" by pressing NEXT-key until the "D" LED is ON and LED "1" is also ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Press the PLAY- key ON and OFF as needed to switch DIGITAL output channel "1" ON (+5 Vdc) and
OFF (0 Vdc) until "D" LED and LED "1" turns ON and red "R" LED turns OFF automatically (Approx. 4 sec.).
NOTE: servo "1,2,3,4" will move from previous recorded positions to aid in synchronization. The recording ended automatically after 4 seconds because Start to Stop recorded time on servo channel "1 initially set the available recording time for SERVO channels "2-4" and DIGITAL channels "1-4".

(7) **DIGITAL CHANNEL "2"**
Select DIGITAL channel "2" by pressing NEXT-key until the green"D" LED is ON and green
LED "2" is also ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Press the PLAY- key ON and OFF as needed to switch DIGITAL output channel "2" ON (+5 Vdc) and
OFF (0 Vdc) until green "D" LED and green LED "2" turns ON and red "R" LED turns OFF automatically.
(Approx. 4 sec.)

NOTE: servo "1,2,3,4" will move and digital channel "1" will be active from previous recorded positions to aid in synchronization. The recording ended automatically after 4 seconds because Start to Stop recorded time on servo channel "1 initially set the available recording time for SERVO channels "2-4" and DIGITAL channels "1-4".

(8) **DIGITAL CHANNEL "3"**
Select DIGITAL channel "3" by pressing NEXT-key until the green "D" LED is ON and green
LED "3" is also ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Press the PLAY- key ON and OFF as needed to switch DIGITAL output channel "3" ON (+5 Vdc) and
OFF (0 Vdc) until green "D" LED and green LED "3" turns ON and red "R" LED turns OFF automatically.
(Approx. 4 sec.) *NOTE: servo "1,2,3,4" will move and digital channel "1,2" will be active from previous
recorded positions to aid in synchronization. The recording ended automatically after 4 seconds because Start
to Stop recorded time on servo channel "1 initially set the available recording time for SERVO channels "2-4"
and DIGITAL channels "1-4".*

(9) **DIGITAL CHANNEL "4"**
Select DIGITAL channel "4" by pressing NEXT-key until the green "D" LED is ON and green LED "4"
is also ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Press the PLAY- key ON and OFF as needed to switch DIGITAL output channel "4" ON (+5 Vdc) and
OFF (0 Vdc) until green "D" LED and green LED "4" turns ON and red "R" LED turns OFF automatically.
(Approx. 4 sec.)
*NOTE: servo "1,2,3,4" will move and digital channel "1,2,3" will be active from previous recorded positions to
aid in synchronization. The recording ended automatically after 4 seconds because Start to Stop recorded time
on servo channel "1 initially set the available recording time for SERVO channels "2-4" and DIGITAL channels
"1-4".*

This completes the short DIGITAL Channel output programming.

(10) **Operating / Playback**
Set the Enable jumper block to the (**D**) disabled position.
Set the LOOP switch and the AUTO switch to the "Y" position.
Press the PLAY-key and watch your programming sequence in action.
You can adjust the POSITION-control to set a delay between 5 sec. to 65 sec. for the looped playback.

NOTE: you can also activate the playback sequence manually with the REMOTE or PLAY-key by moving the
LOOP switch to the "N" position, and then pressing the PLAY- key or activate the REMOTE switch to start
playback.green LED "1" will turn ON indicating a waiting status for the next switch activation and turn OFF
during playback.

RECORDING A LONG PROGRAM

Example 2: Long (5 min.) Program
*Note: During long recordings, LED's "1-4" will form a count down bargraph indicating the amount of
recording time available. (Aprox. LED 1=4 sec., LED 2=3 sec., LED 3=2 sec., LED 4=1 sec. of time
remaining until the EEPROM memory is filled.) When the current SERVO or DIGITAL actions have finished
recording the count down bargraph- LED's "1-4" will turn OFF automatically and turn ON the current
selected channel LED "1-4"*
*NOTE: It's possible that the recording process may stall during programming, simple remove then apply
power and re-program that channel. Sometimes servos may also chatter and shake during large EEPROM
program writing sessions, this is normal during some programming.*

(Programming Long Sequence- Steps 1-10)
(1) Clear Memory to start a new program. *(See Clearing Memory)*

(2) **SERVO CHANNEL "1"**
If LED "1" is not already ON, press the NEXT-key until LED "1" is ON. Press and release the
RECORD-key. (The red "R" LED will light, indicating record mode is active) Adjust the POSITION-control
to move servo "1". The servo will move depending on rotation of POSITION-control. After approximately a
minute LED's "1-4" will start a count down bargraph indicating the amount of available time for recording.
Continue the servo motion control as needed. When the total allowable time is completed (Approx. 5 minutes)
the bargraph-LED's "1-4" and "R" LED will turn OFF automatically and the current selected channel
LED "1" will turn back ON. *Note: other servos and digital channels may operate, following actions
previously recorded . This can help in synchronizing the current motion being programmed with those
previously recorded motions.*

3) **SERVO CHANNEL "2"**
Select SERVO channel "2" by pressing NEXT-key until LED "2" is ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Adjust the POSITION-control to move servo "2". The servo will move depending on rotation of POSITION-control. After approximately a minute LED's "1-4" will start a count down bargraph indicating the amount of available time for recording. Continue the servo motion control as needed. When the total allowable time is completed (Approx. 5 minutes) the bargraph-LED's "1-4" and "R" LED will turn OFF automatically and the current selected channel LED "2" will turn back ON.

NOTE: servo "1" will move from previous recorded positions to aid in synchronization. The recording ended automatically after 5 minutes because Start to Stop recorded time on servo channel "1 initially set the available total 5 min. recording time for SERVO channels "2-4" and DIGITAL channels "1-4".

(4) **SERVO CHANNEL "3"**
Select SERVO channel "3" by pressing NEXT-key until LED "3" is ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Adjust the POSITION-control to move servo "3". The servo will move depending on rotation of POSITION-control. After approximately a minute LED's "1-4" will start a count down bargraph indicating the amount of available time for recording. Continue the servo motion control as needed. When the total allowable time is completed (Approx. 5 minutes) the bargraph-LED's "1-4" and "R" LED will turn OFF automatically and the current selected channel LED "3" will turn back ON. *NOTE: servo "1","2" will move from previous recorded positions to aid in synchronization. The recording ended automatically after 5 minutes because Start to Stop recorded time on servo channel "1 initially set the available total 5 min. recording time for SERVO channels "2-4" and DIGITAL channels "1-4".*

(5) **SERVO CHANNEL "4"**
Select SERVO channel "4" by pressing NEXT-key until LED "4" is ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Adjust the POSITION-control to move servo "4". The servo will move depending on rotation of POSITION-control. After approximately a minute LED's "1-4" will start a count down bargraph indicating the amount of available time for recording. Continue the servo motion control as needed. When the total allowable time is completed (Approx. 5 minutes) the bargraph-LED's "1-4" and "R" LED will turn OFF automatically and the current selected channel LED "4" will turn back ON. *NOTE: servo "1-3" will move from previous recorded positions to aid in synchronization. The recording ended automatically after 5 minutes because Start to Stop recorded time on servo channel "1 initially set the available total 5 min. recording time for SERVO channels "2-4" and DIGITAL channels "1-4".*
This completes the SERVO Channel programming

Programming the DIGITAL Output Channels.

(6) **DIGITAL CHANNEL "1"**
Select DIGITAL channel "1" by pressing NEXT-key until the "D" LED is ON and LED "1" is also ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Press the PLAY- key ON and OFF as needed to switch DIGITAL output channel "1" ON (+5 Vdc) and OFF (0 Vdc). After approximately a minute LED's "1-4" will start a count down bargraph indicating the amount of available time for recording. Continue the DIGITAL control as needed. When the total allowable time is completed (Approx. 5 min.) the bargraph-LED's will turn OFF automatically and the current selected channel LED "1" and "D" LED will turn back ON and the "R" LED will turn OFF.

NOTE: servo "1-4" will move from previous recorded positions to aid in synchronization. The recording ended automatically after 5 minutes because Start to Stop recorded time on servo channel "1 initially set the available total 5 min. recording time for SERVO channels "2-4" and DIGITAL channels "1-4".

(7) **DIGITAL CHANNEL "2"**
Select DIGITAL channel "2" by pressing NEXT-key until the "D" LED is ON and LED "2" is also ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Press the PLAY- key ON and OFF as needed to switch DIGITAL output channel "2" ON (+5 Vdc) and OFF (0 Vdc). After approximately a minute LED's "1-4" will start a count down bargraph indicating the amount of available time for recording. Continue the DIGITAL control as needed. When the total allowable time is completed (Approx. 5 min.) the bargraph-LED's will turn OFF automatically and the current selected channel LED "2" and "D" LED will turn back ON and the "R" LED will turn OFF.

Note: Servo "1- 4" and Digital output "1" will be active from previous recorded positions to aid in synchronization. The recording will end automatically because Start to Stop recorded time on servo channel "1 initially set the available recording time of 5 minutes for all other SERVO channels "2-4" and DIGITAL channels "1-4".

(8) **DIGITAL CHANNEL "3"**
Select DIGITAL channel "3" by pressing NEXT-key until the "D" LED is ON and LED "3" is also ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Press the PLAY- key ON and OFF as needed to switch DIGITAL output channel "3" ON (+5 Vdc) and OFF (0 Vdc). After approximately a minute LED's "1-4" will start a count down bargraph indicating the amount of available time for recording. Continue the DIGITAL control as needed. When the total allowable time is completed (Approx. 5 min.) the bargraph-LED's will turn OFF automatically and the current selected channel LED "3" and "D" LED will turn back ON and the "R" LED will turn OFF.

Note: Servo "1-4" and Digital outputs "1-2" will be active from previous recorded positions to aid in synchronization. The recording will end automatically because Start to Stop recorded time on servo channel "1 initially set the available recording time of 5 minutes for all other SERVO channels "2-4" and DIGITAL output channels "1-4".

(9) **DIGITAL CHANNEL "4"**
Select DIGITAL channel "4" by pressing NEXT-key until the "D" LED is ON and LED "4" is also ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Press the PLAY- key ON and OFF as needed to switch DIGITAL output channel "4" ON (+5 Vdc) and OFF (0 Vdc). After approximately a minute LED's "1-4" will start a count down bargraph indicating the amount of available time for recording. Continue the DIGITAL control as needed. When the total allowable time is completed (Approx. 5 min.) the bargraph-LED's will turn OFF automatically and the current selected channel LED "4" and "D" LED will turn back ON and the "R" LED will turn OFF.

Note: Servo "1-4 and Digital outputs "1-3" will be active from previous recorded positions to aid in synchronization. The recording will end automatically because Start to Stop recorded time on servo channel "1 initially set the available recording time of 5 minutes for all other SERVO channels "2-4" and DIGITAL output channels "1-4".

This completes the long DIGITAL Channel output programming.

(10) **Operating / Playback**
Set the Enable jumper block to the (**D**) disabled position.
Set the LOOP switch and the AUTO switch to the "Y" position.
Press the PLAY-key and watch your programming sequence in action.
You can adjust the POSITION-control to set a delay between 5 sec. to 65 sec. for the looped playback.
NOTE: you can also activate the playback sequence manually with the REMOTE or PLAY-key by moving the LOOP switch to the "N" position, and then pressing the PLAY- key or activate the REMOTE switch to start playback. LED "1" will turn ON indicating a waiting status for the next switch activation and turn OFF during playback.

MAKING A PROGRAM CHANGE TO A SINGLE SERVO CHANNEL

Example 3: Making a programming change for SERVO Channel 4.
The Enable jumper block must be set at the (**E**) enabled position.
The LOOP switch and the AUTO switch must be in the "N" position.

SERVO CHANNEL "4"
Select SERVO channel "4" by pressing NEXT-key until LED "4" is ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Adjust POSITION-control to move SERVO "4" until LED "4" turns ON and "R" LED turns OFF automatically.
Move the Enable jumper block to the (**D**) disabled position.
Set the LOOP switch and the AUTO switch to the "Y" position.
Note: Servo "1-3" and Digital outputs "1-4" will be active from previous recorded positions to aid in synchronization, and servo "4" will move as POSITION- control is rotated.)
(The selected channel (4) recording will end automatically based on the Start to Stop recorded time entered for servo channel "1" initially).

MAKING A PROGRAM CHANGE TO A SINGLE DIGITAL CHANNEL

7

Example 4: Making a programming change for Digital Channel 2.
The Enable jumper block must be set at the (**E**) enabled position.
The LOOP switch and the AUTO switch must be in the "N" position.

DIGITAL CHANNEL "2"
Select DIGITAL channel "2" by pressing NEXT-key until the green "D" LED is ON and green LED "2" is also ON.
Press and release the RECORD-key. (The red "R" LED will light, indicating record mode is active)
Press the PLAY- key ON and OFF as needed to switch DIGITAL output channel "2" ON (+5 Vdc) and
OFF (0 Vdc) until green "D" LED and green LED "2" turns ON and red "R" LED turns OFF automatically.
Move the Enable jumper block to the (**D**) disabled position.
Set the LOOP switch and the AUTO switch to the "Y" position.

*Note: Servo "1-4" and Digital outputs "1","3","4" will be active from previous recorded positions to aid in
synchronization, and digital "4" will activate as PLAY- control is pressed ON and OFF.) (The selected channel (2)
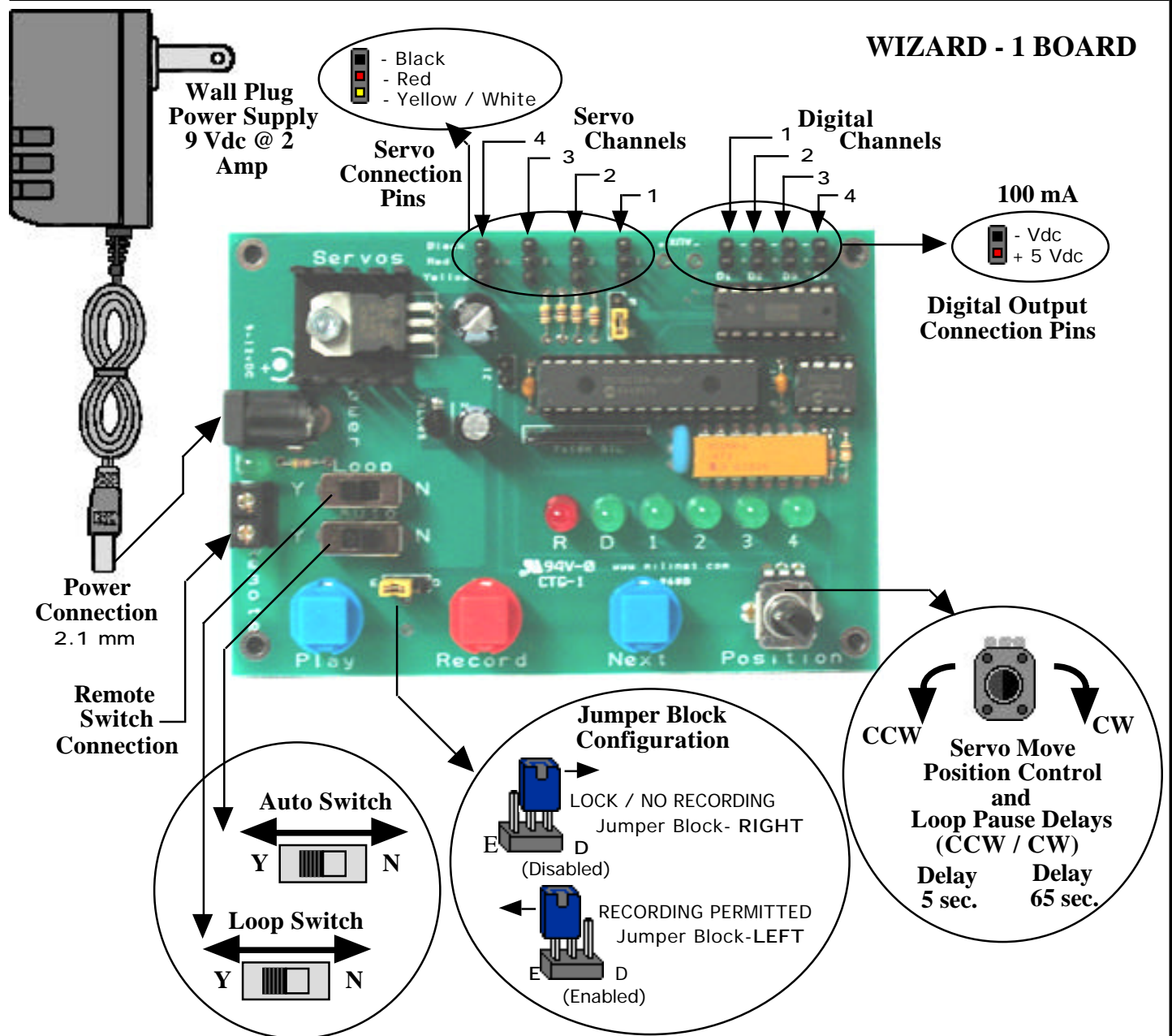recording will end automatically based on the Start to Stop recorded time entered for servo channel "1" initially.)*
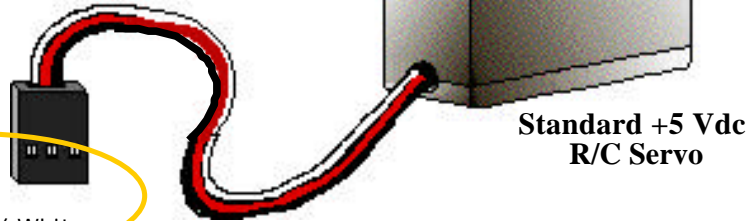

WIZARD - 1 BOARD

Wizard - I Interface Board
Board Overview

Wizard Board Functions

positions

A
B
C

R/C Servo Connection

- Black
- Red
- Yellow / White

Standard +5 Vdc R/C Servo

Power Connection 9 Vdc @ 2 Amp

+ Vdc center
- Vdc outside

Servo Channels 4 3 2 1

Digital Channels 1 2 3 4

Digital Output Connection (+5 Vdc)

- Vdc
+ 5 Vdc

100 mA
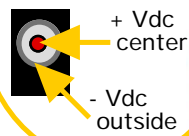
EEPROM Module

Power ON LED

Remote Switch Connection

Servo / Digital Channel 1-4 LED's

R D 1 2 3 4

Digital Channels ON LED

RECORD ON LED

Play Key and Digital Switch ON/ OFF Key

Record Key

Next Key

Auto Switch

Y N

Loop Switch

Y N

Jumper Configuration

LOCK / NO RECORDING
Jumper Block- **RIGHT**

E D
(Disabled)

RECORDING PERMITTED
Jumper Block-**LEFT**

E D
(Enabled)

C A B
CCW CW

Servo Move (ABC) Position Control and Loop Pause Delay (CCW/CW)

Delay 5 sec.
Delay 65 sec.
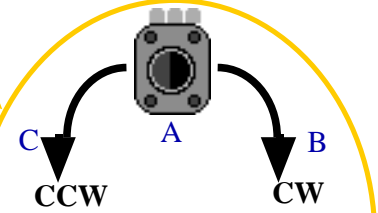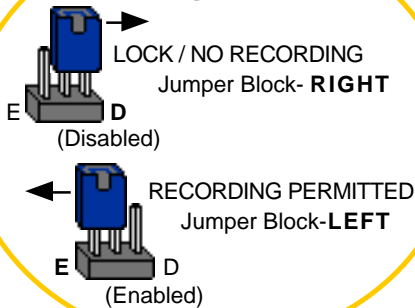
Wizard - I Interface Board
Playback Mode

REMOTE SWITCH
- **Floor Mat Switch.**
- **PIR Sensor.**
- **Manual Operated Switch.**
- **Relay Contact Switch, etc.**

In AUTO mode the LED-"1" Will turn ON indicating end of the program sequence and OFF with start of the sequence.

(Switch or PLAY key activated LED)

Remote Switch Connection

Remote Switch Jumper Wire
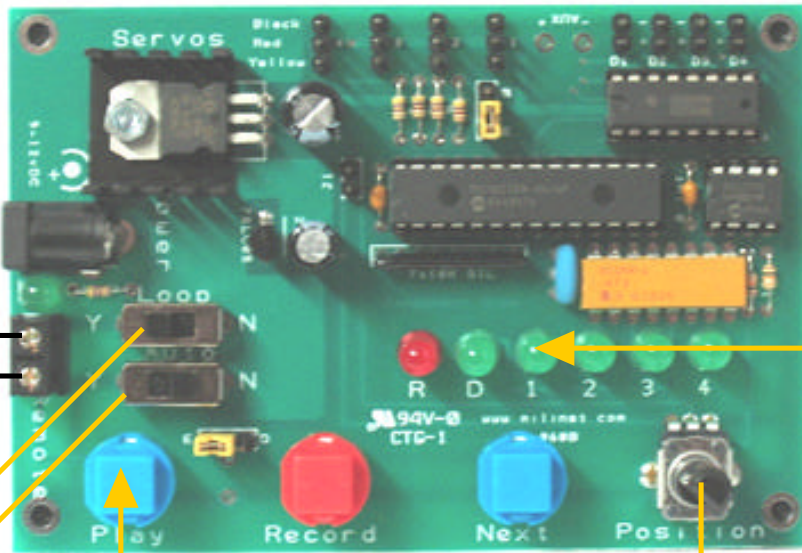
PLAY-key

To replay the recorded moves / action repeatedly, the LOOP switch must be in the "Y" position.

The PLAY key or REMOTE switch must be pressed once to start the playback action or if The AUTO switch is set to the "Y" position, then the start playback action will begin automatically on power-up.

Y [====] **N**
LOOP Switch

Y [====] **N**
AUTO Switch
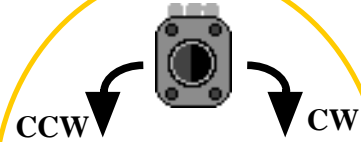
CCW | **CW**

Servo Move Position Control and Loop Pause Delays (CCW / CW)

Delay 5 sec. | **Delay 65 sec.**

The length of the pause between repeated playback is set by the Move POSITION control, CCW (5 sec.) or CW (65 sec.) in rotation and LOOP switch set to "Y".

Y [====] **N**
LOOP Switch

Y [====] **N**
AUTO Switch
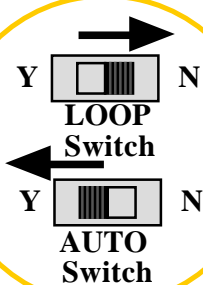
Note: For a "0" pause delay between playback, set the LOOP switch to "N" and the AUTO switch to "Y". Place a jumper wire across the Remote Switch connection.

Wizard - 1 Interface Board
Power Set-up 1
(Regulated Wall Power Operation)

Wizard Board

Power
Jumper

(Set to R)

B   **R**

Jumper
OFF

Power Select
Jumper
(J1)

**Power
ON LED**

+ Vdc
center

- Vdc
outside

9 Vdc @ 2 Amp

**Wall Power
Connection**
2.1 mm

BEST set-up
for stable use.

**Regulated Wall
Power Adapter**

9 Vdc @ 2 Amp
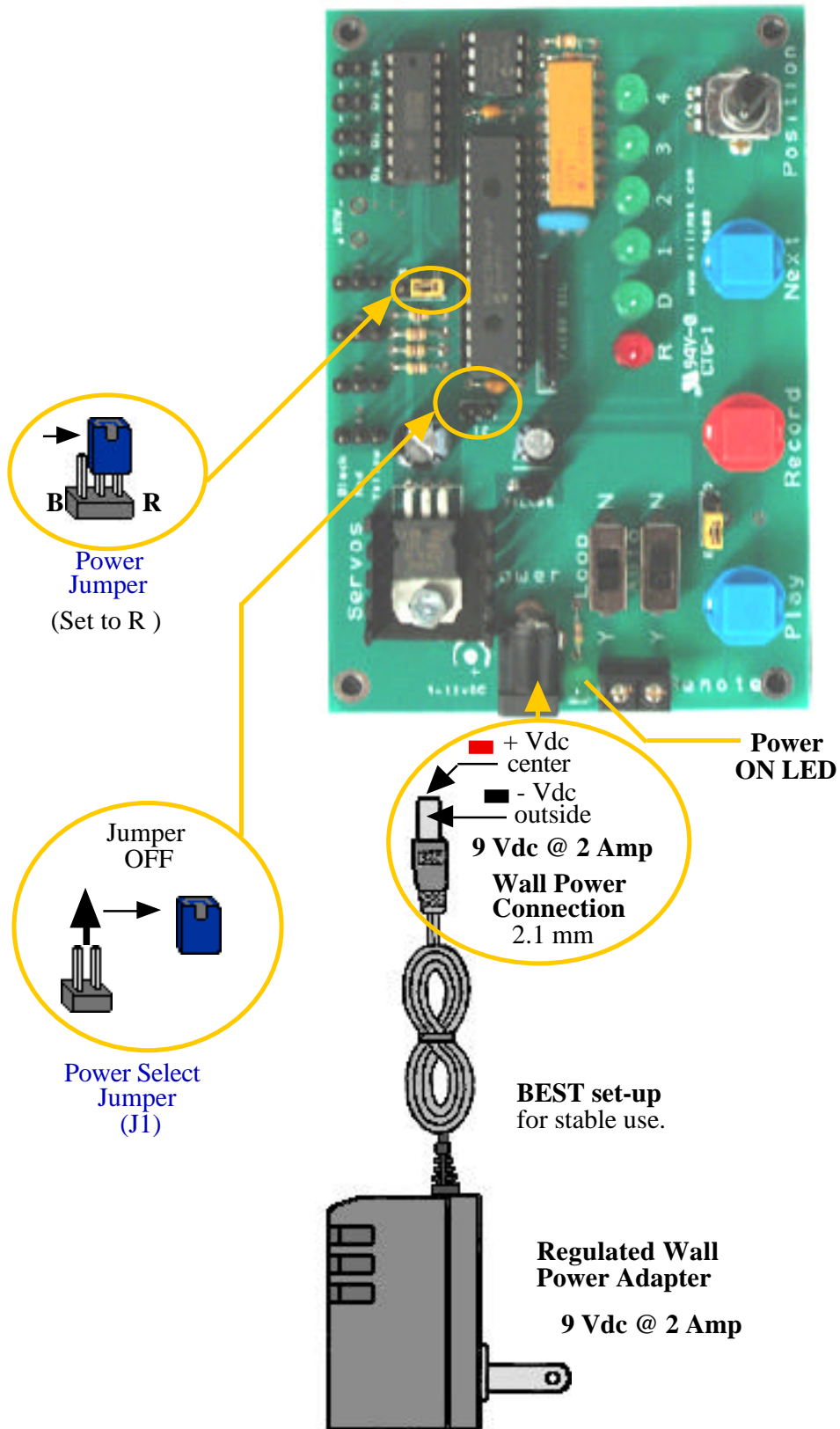
Wizard - 1 Interface Board
Power Set-up
(Regulated Wall Power or Battery Power)

EXAMPLE

Wizard Board

2.1 mm connector

■ + Vdc center
■ - Vdc outside

Battery Power Connection

5-6 Vdc
8 Amp

Battery Cells

Optional Battery- 2 Connection

B/R Jumper

J1 Jumper

Fuse

POWER Regulator

Battery Clip Connector

POWER Connection

Power ON LED

Mobile Battery Operation

■ + Vdc center
■ - Vdc outside

9 Vdc @ 2 Amp Wall Power Connection

2.1 mm

Regulated Wall Power Adapter

BEST set-up for stable use.
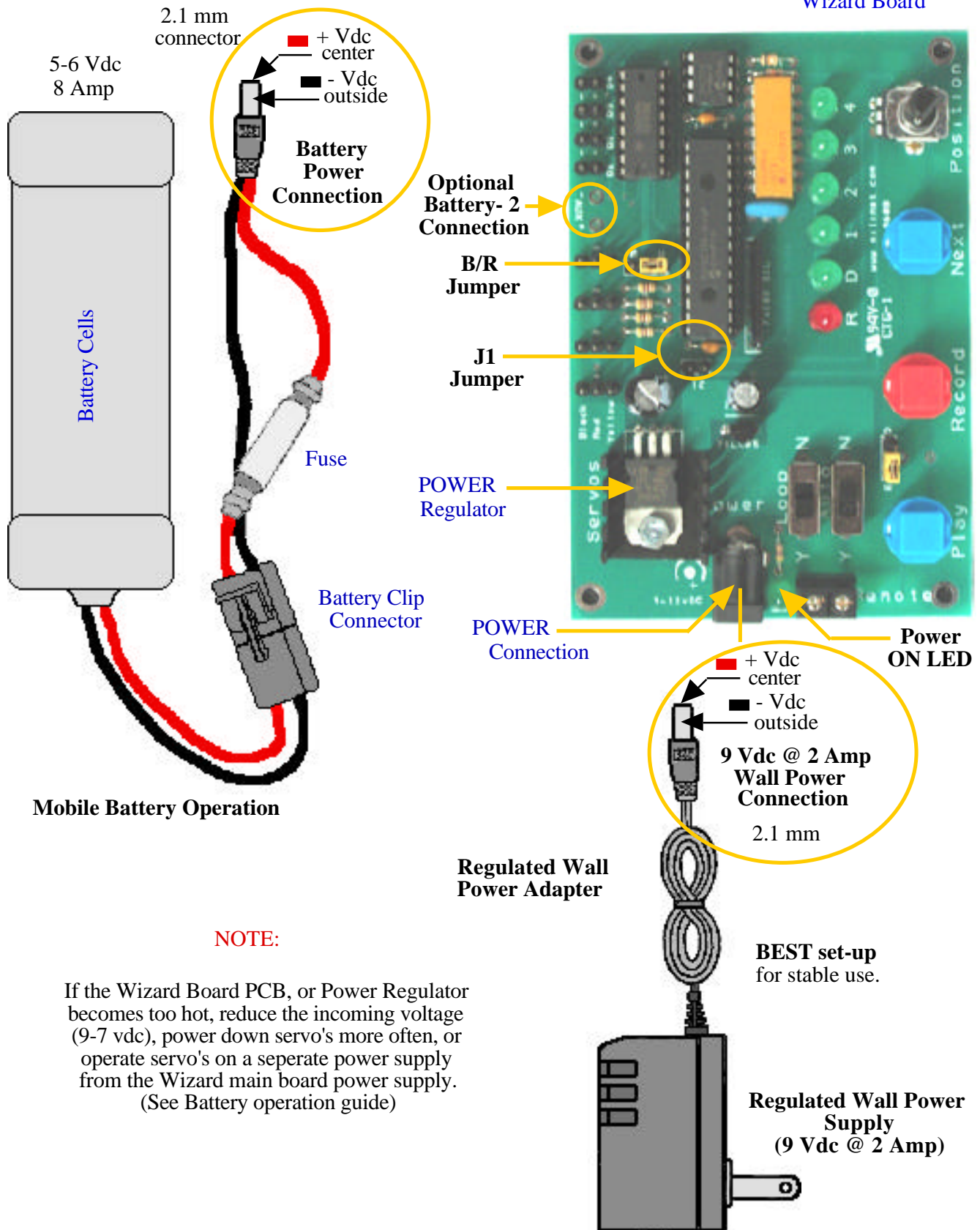
NOTE:

If the Wizard Board PCB, or Power Regulator becomes too hot, reduce the incoming voltage (9-7 vdc), power down servo's more often, or operate servo's on a seperate power supply from the Wizard main board power supply. (See Battery operation guide)

Regulated Wall Power Supply (9 Vdc @ 2 Amp)

Wizard - 1 Interface Board
Digital Output Set-up

EXAMPLE

Digital Output Set-up
Example - Micro SS Relay Control

Eyeball Jar

LED's

LED's

Switched Output Connections to Device

Lighting Effects
Effect Devices
Motors
Relays
Solenoids
Air / Water Valves
Other Controllers

(-)

Micro SS Relay

(+)

Digital Output Connection (+5 Vdc)

- Vdc
+ 5 Vdc

Power Connection

9 Vdc @ 2 Amp

+ Vdc center

- Vdc outside

Wizard - 1 Controller

Servos

Loop

R D 1 2 3 4

Play   Record   Next   Position

Wall Plug Power Supply 9 Vdc @ 2.0 Amp
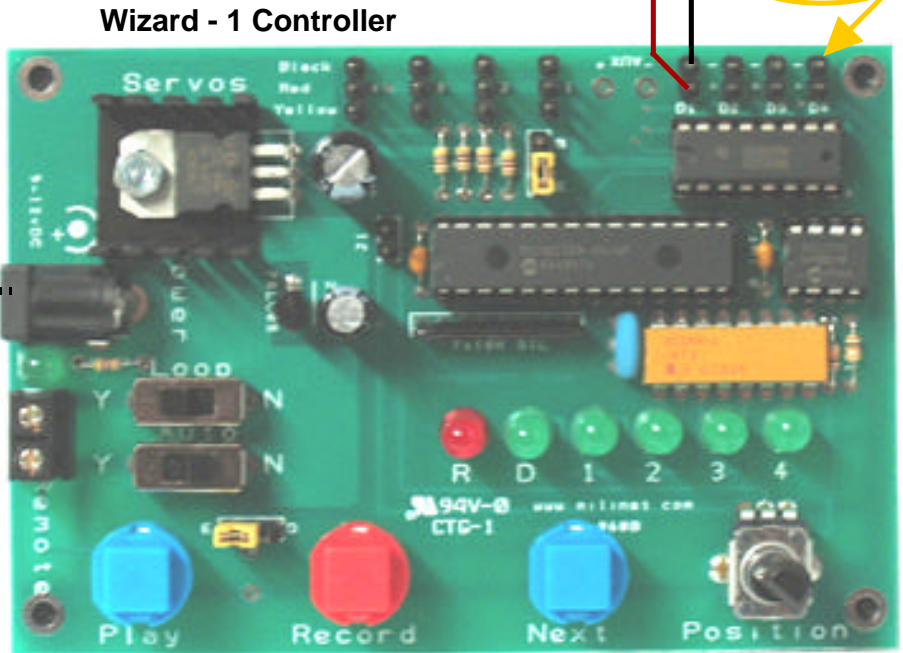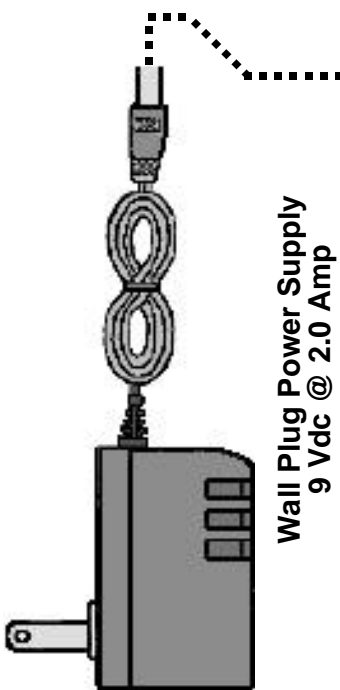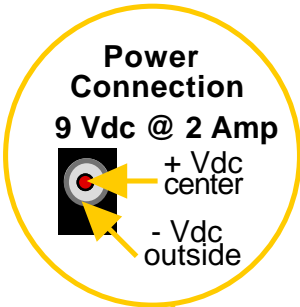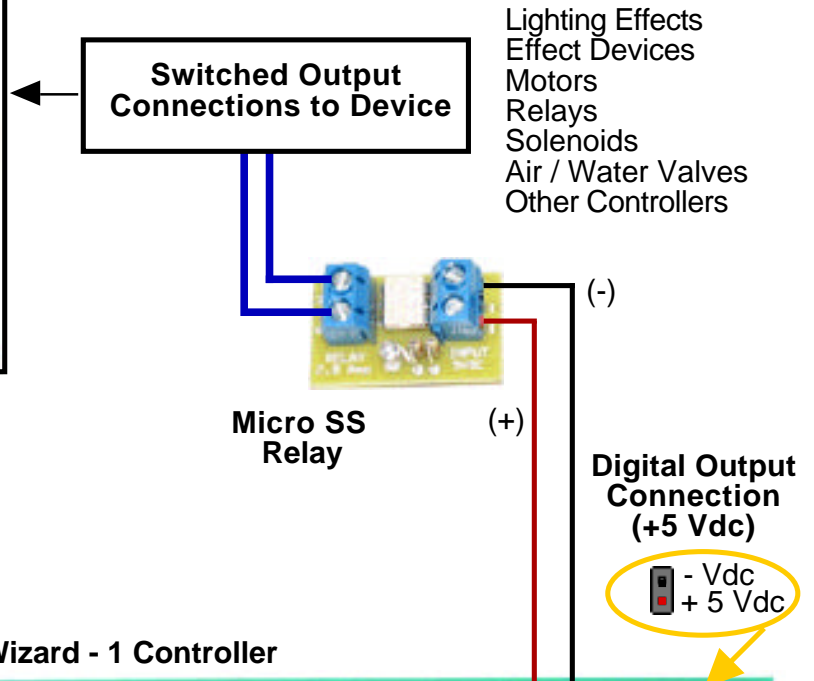
Wizard - 1 Interface Board
Digital Output Set-up

Optional Water / Air Valve Effect

Water Source IN

Fountain Heads

Water / Air Valve

Tissue Paper

Water Valve

(+)

12 Vdc Power Supply

(-)

Wizard - 1 Board

A

- 5Vdc

LOAD

B

+ 5Vdc

Micro SS Relay

Air Tank

Air Valve

Confetti Cannon

- -
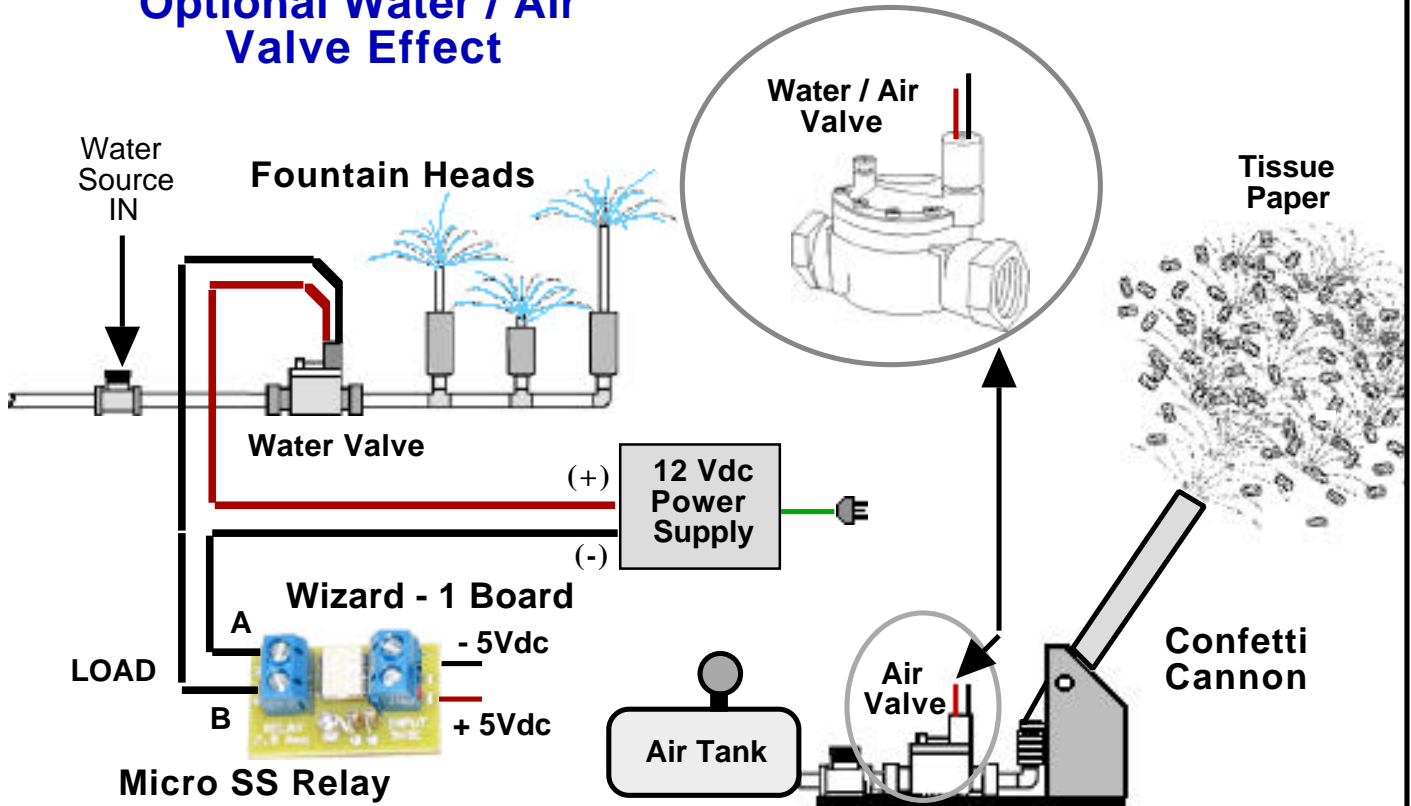
Optional DC Motor Control

LOAD

A

- 5Vdc

B

+ 5Vdc

Digital Signal Input +5Vdc

Micro SS Relay

Wizard - 1 Board

(-)

Black Wire

12 Vdc Power Supply

(+)

Red Wire

Motor

MOTOR POWER

12 Volt 1.5 Amp DC Permanent Magnet Motor

Rotation
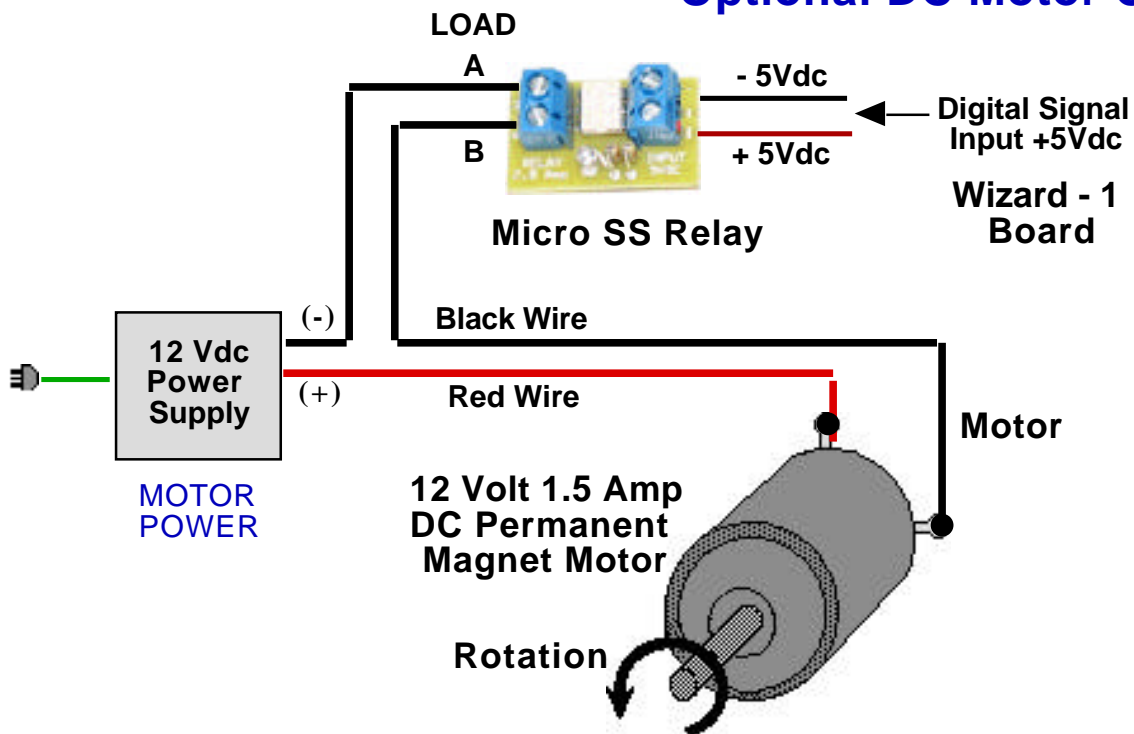
Wizard - 1 Interface Board
Digital Output Set-up

Optional LED Effect Control

Wizard - 1 Board

A

Red Wire

- 5Vdc

Digital Signal Input +5Vdc

B

+ 5Vdc

Micro SS Relay

9 Vdc Battery or Wall Power Supply

Red Wire

Parallel LED Configuration

LED 1

Resistor - 1 **+Anode**

5mm

- **Cathode**

Black Wire

LED 2

Black Wire

Resistor - 2 **+Anode**

5mm

- **Cathode**

Black Wire

LED 3

Resistors = 220 Ohm 1/4 Watt

Resistor - 3 **+Anode**

5mm

- **Cathode**

Black Wire

Power (+)

R   R   R

A   A   A

Power (-)

K   K   K

LED   LED   LED

LED Schematic Circuit

Wizard - 1 Interface Board
Pneumatic Valve Set-up

EXAMPLE

Pneumatic System

Air Compress or

Pressure Gauge

Pressure Regulator

Pressure Gauge

Pressure Gauge

Quick Disconnect Hose Connectors

Pneumatic Tank

Accumulator Tank

Air Hose

Air Filter

Pneumatic Valve

- 12 Vdc Wire

Air Hose

+ 12 Vdc Wire

Air Hose

Air Hose

12 Vdc @ 2Amp Power Supply

Pneumatic Cylinder

+ 12 Vdc Wire

Micro SS Relay

Digital Output Connection (+5 Vdc)

+ 12 Vdc Wire

(-)

- Vdc
+ 5 Vdc

(+)

Wizard - 1 Controller

Servos

Black
Red
Yellow

Loop
Y   N
Y   N

R   D   1   2   3   4

Play   Record   Next   Position

Wizard - 1 Interface Board
Digital Output Set-up
Example - LED & Relay Control

Channel 4

LED

- Digital Channel Tester
- Effects Lighting

Electrical Contacts

A   Normal Open   (N.O)
B   Common   (COM)
C   Normal Closed   (N.C)

POWER SUPPLY Vdc

Channel 1

B   D

C
A   B

A/C   D

Device

(long Lead)
+ (Anode)

- *Black Wire*

+ *Red Wire*

220 Ohm Resistor

+   D1   -

D1 -IN4003

5 Vdc Relay
25 mA

Digital Outputs Ch-"1-4"
(5 Vdc, 100 mA Output)

Red Wire   *Black Wire*

- Vdc
+ 5 Vdc   100 mA

**Digital-Switched
ON / OFF Output
Connection
(+5 Vdc)**

Servos

Black
Red
Yellow

**Digital Channel
1-4 LED's (green)**

Loop

**Digital Channels ON LED's
(green)**

**RECORD ON LED
(red)**

**PLAY Key = Digital
Switch ON / OFF button**

EXAMPLE

Wizard - 1 Interface Board
Digital Output Set-up
110 VAC Solid State Relay

Extension Cord
(5 Amp Rated)

Shrink Tube
Insulation

5 Vdc Solid-State
DC/AC Relay

Enclosure
(metal box)

Ground
attached to
metal box
Green Wire

Heatsink on Relay

DC/AC
Relay

AC

+ 5
Voltage

CAUTION
AC Voltage
White Wire

Shrink Tube

Shrink Tube
Insulation

+   **-**
Red Wire   *Black Wire*

Black Wire

Shrink Tube

Caution:

*** Use caution when working with AC
Voltage. Touching or incorrectly wiring
this circuit could cause serious personal
injury or damage to equipment.**

AC (110 VAC)
DEVICES

250 WATTS

- *Lights*
- *Sound System*
- *Fog Machine*
- *Effects Equipment,*
- *Etc.*

Servos

- Vdc
+ 5

100 mA

**Digital- Switched
On / OFF Output
Connection
(+5 Vdc)**

Wizard - 1 Interface Board
Digital Output Set-up
Higher Voltage Relay / Solenoid Driver Example

12 Vdc Relay
Electrical Contacts

A Normal Open (N.O)
B Common (COM)
C Normal Closed (N.C)

POWER SUPPLY 12 Vdc

12 Vdc Device
• Solenoid
• Air Valve

RELAY DRIVER

R1, R2   1K Ohm
LED   Red
D1   IN4003
T1   2N2222

B ○ **+ Vdc**

D ○ **- Vdc**

Red Wire +

Black Wire -

- Vdc
+ 5

100 mA

Digital-Switched On / OFF Output Connection (+5 Vdc)
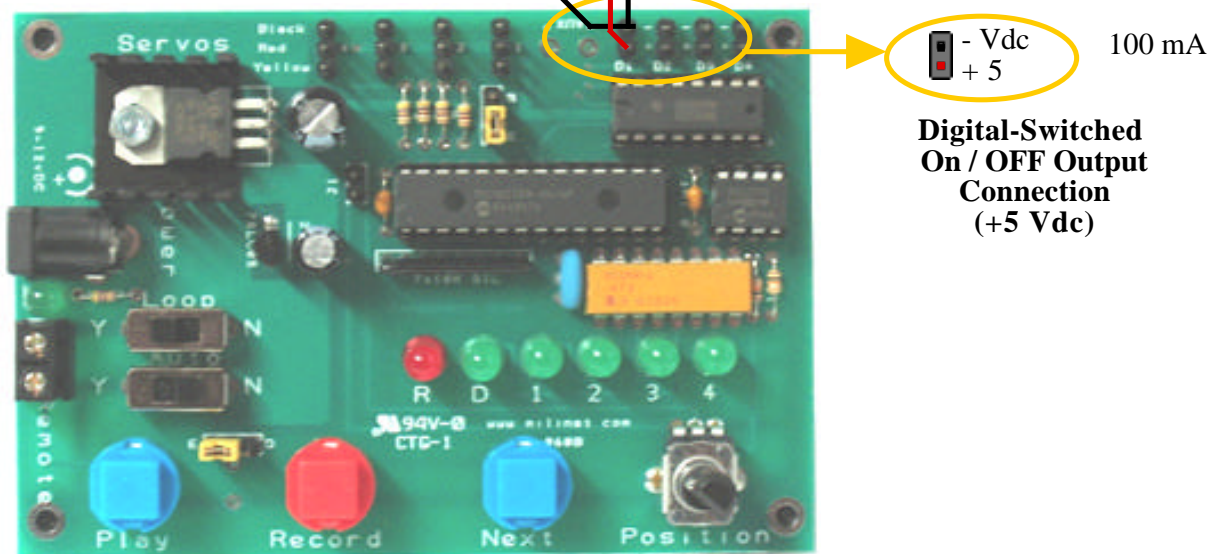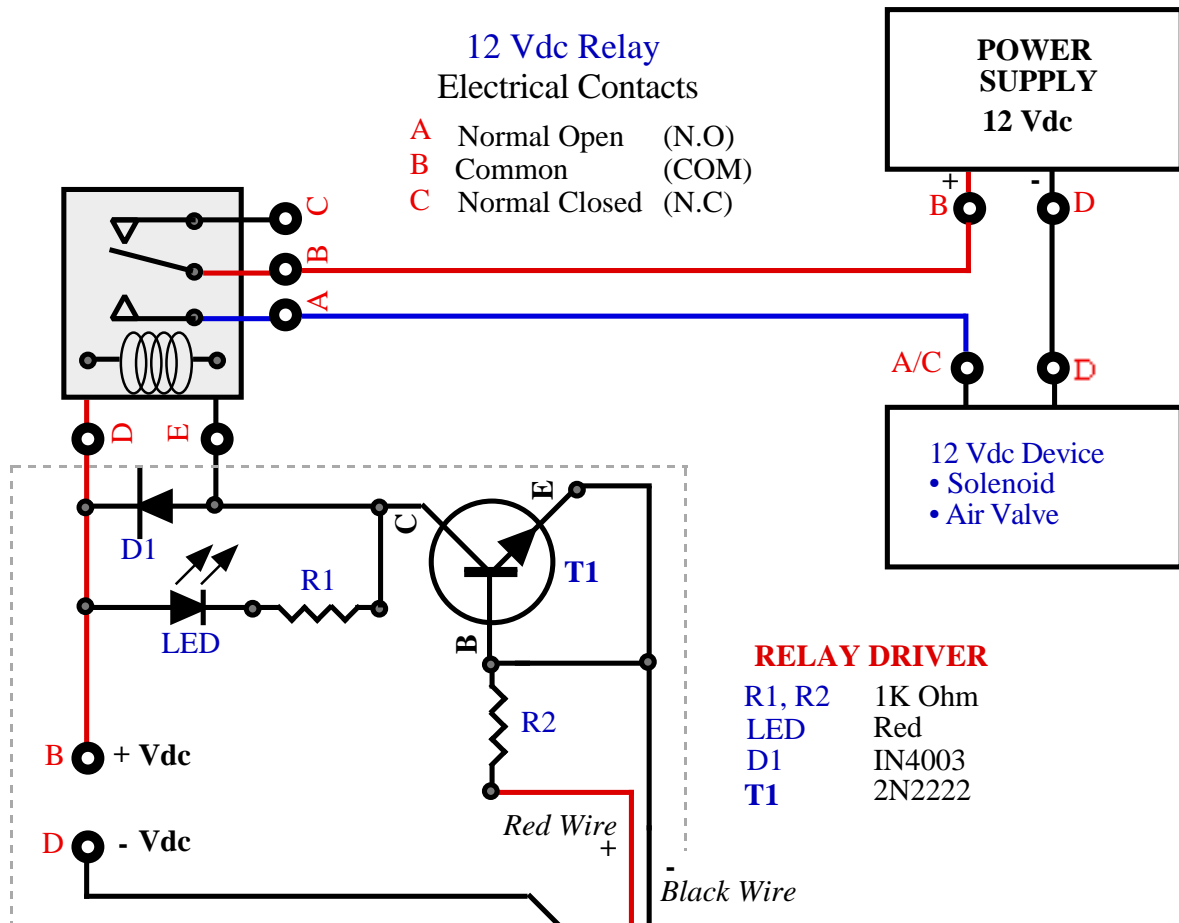
Wizard - 1 Interface Board
Microprocessor - Digital Output Set-up
Microprocessor to Wizard -1 Remote Activation
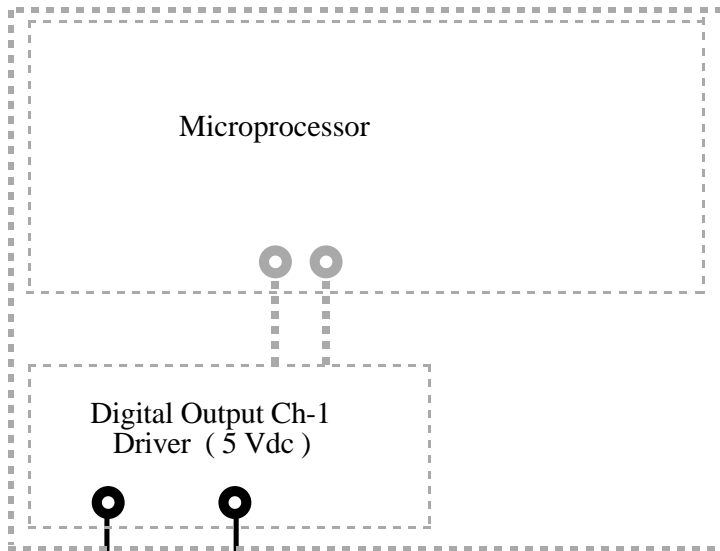
Microprocessor

Operating the Wizard-1 board using the Digital Output Signal from a Microprocessor

Digital Output Ch-1
Driver (5 Vdc)

Digital Pulse

Wizard - I Board

D C

A B
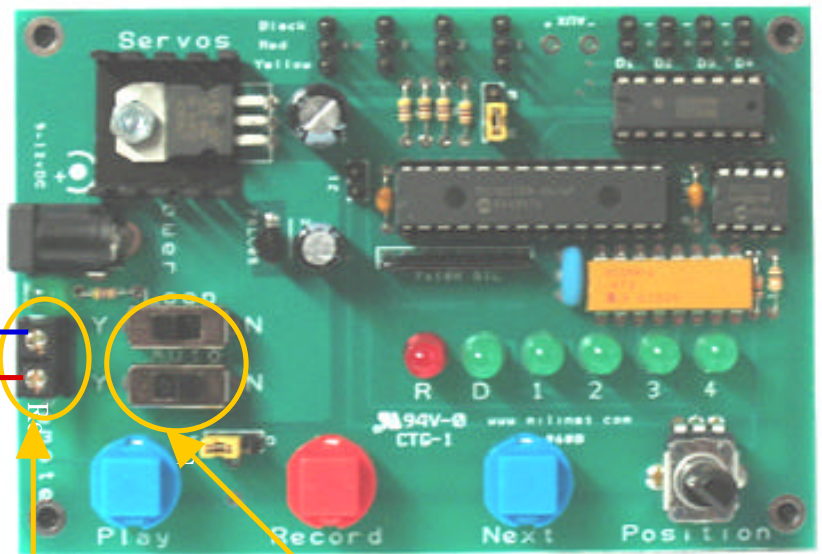
5 Vdc Relay

Electrical Contacts

A Normal Open (N.O)
B Common   (COM)
C Relay Coil   (Coil Input)
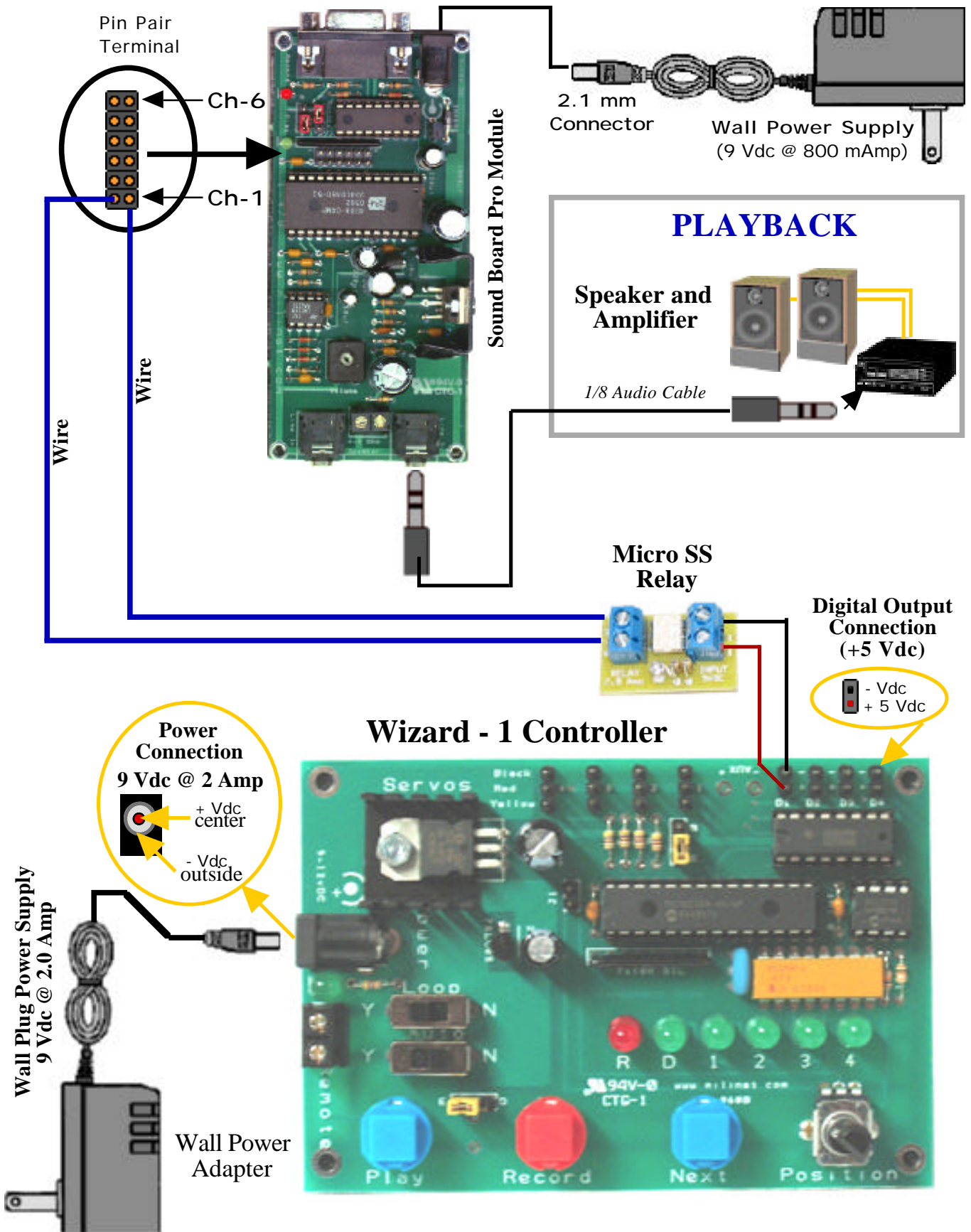D Relay Coil   (Coil Input)
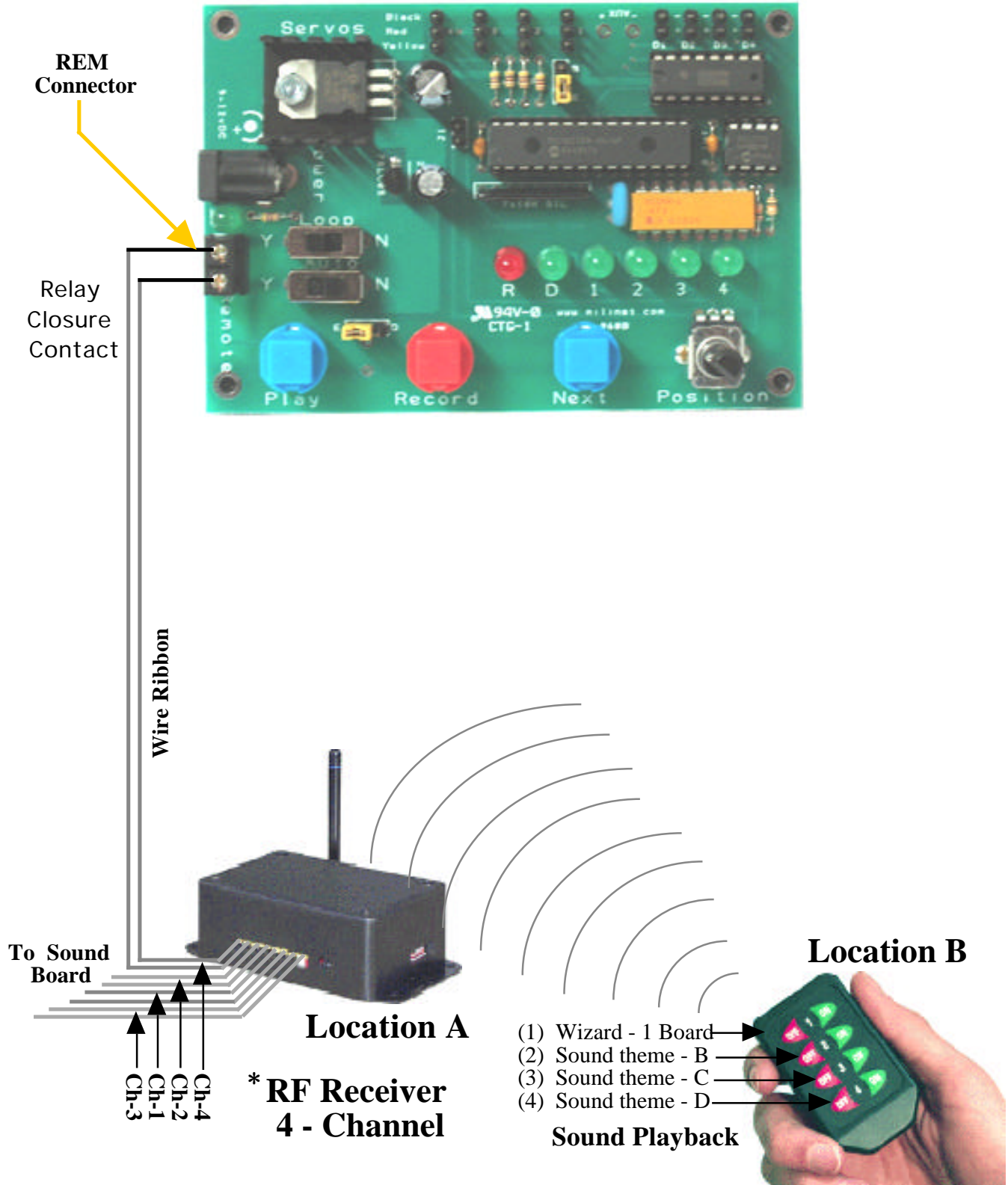
**Remote
Connection**

• **LOOP**
• **AUTO**

**See text for switch
position details**

Wizard - 1 Interface Board
Wizard Board to Sound Board Pro

Pin Pair
Terminal

Ch-6

Ch-1

2.1 mm
Connector

Wall Power Supply
(9 Vdc @ 800 mAmp)

Sound Board Pro Module

Wire

Wire

PLAYBACK

**Speaker and
Amplifier**

1/8 Audio Cable

**Micro SS
Relay**

**Digital Output
Connection
(+5 Vdc)**

- Vdc
+ 5 Vdc

**Power
Connection
9 Vdc @ 2 Amp**

+ Vdc
center

- Vdc
outside

Wizard - 1 Controller

Servos

Black
Red
Yellow

R   D   1   2   3   4

Play   Record   Next   Position

Wall Plug Power Supply
9 Vdc @ 2.0 Amp

Wall Power
Adapter

Wizard - 1 - Remote Control Set-up Example

REM Connector

Relay Closure Contact

Servos

R   D   1   2   3   4

Play   Record   Next   Position

Wire Ribbon

To Sound Board

Location A

Ch-3
Ch-1
Ch-2
Ch-4

*** RF Receiver 4 - Channel**

Location B

(1) Wizard - 1 Board
(2) Sound theme - B
(3) Sound theme - C
(4) Sound theme - D

Sound Playback

Version 1.0

Wizard - 1 Interface Board
Optional Power Set-up
Large Servo Motors 6-12 Vdc

POWER SUPPLY

6-12 VDC
4-6 Amp

- Black (-)
- Red (+)

Fuse

Clip Connector

- Red (+)
- Black (-)

Servo Red wires must not be connected to controller board

Wizard 1 Board

CUT

Optional Servo Power Connection

DO NOT Connect

White / Yellow

- Black

Red No Connection

- Black
- White / Yellow

SERVO 1

SERVO 2

CUT

DO NOT Connect

White or Yellow
Black (-)

SERVO 3

White / Yellow

CUT

DO NOT Connect

White / Yellow
Black (-)

SERVO 4

- Red (+)

CUT

DO NOT Connect
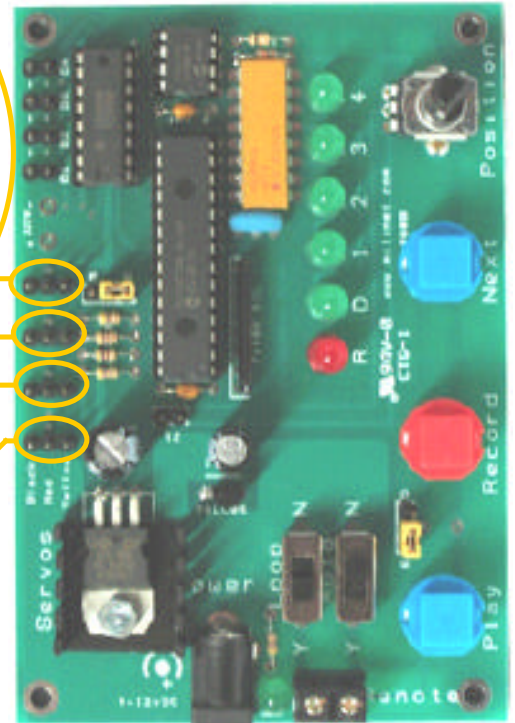
Power Connection

+ Vdc center — Red

- Vdc outside — Black

Battery Power

2.1 mm Power Plug

- Black (-)

White or Yellow
Black (-)

CAUTION
Servo must be able to handle voltage greater than 5 Vdc

Wall Plug Power Supply
9 Vdc @ 2.0 Amp

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