Ghostbusters PKE Electronics Upgrade Board
Hyperdyne Labs, © 2002-2004

*** DO NOT HOOK UP THE WING SERVOS INCORRECTLY ***
READ BELOW FIRST!!

OVERVIEW

This board is for installing into a PKE meter. The kit includes the controller board and the display board. When you apply power to the board, the 2 wing servos will reset. The LEDs come on and the display sequences. A pinging sound is also played out. When you press the "up" button, the servos will raise the wings and the LEDs will sequence faster. The pinging sound cadence will also increase. When you press the down button, the servos will lower the wings and the LEDs will sequence slower. This automatically mimics how the PKE meter worked in the first GB movie.

The PKE kit comes with:
- Controller board with headers for servos and wing LEDs
- Dual display board w/ 14 LEDs wired to controller board
- on/off switch and wires.
- 5 body LEDs
- DPDT switch to toggle between screen modes
- Speaker for pinging sound
- Ribbon cabling to connect up to wing LEDs
- PC wing boards w/ wing LEDs (optional – separate kit)

The PKE will run off any 9V battery. You can also get a rechargeable 9V battery to make your PKE rechargeable.

Here is a picture of the board installed in a PKE shell. Note where the major pieces are installed, which will help you in your own installation:
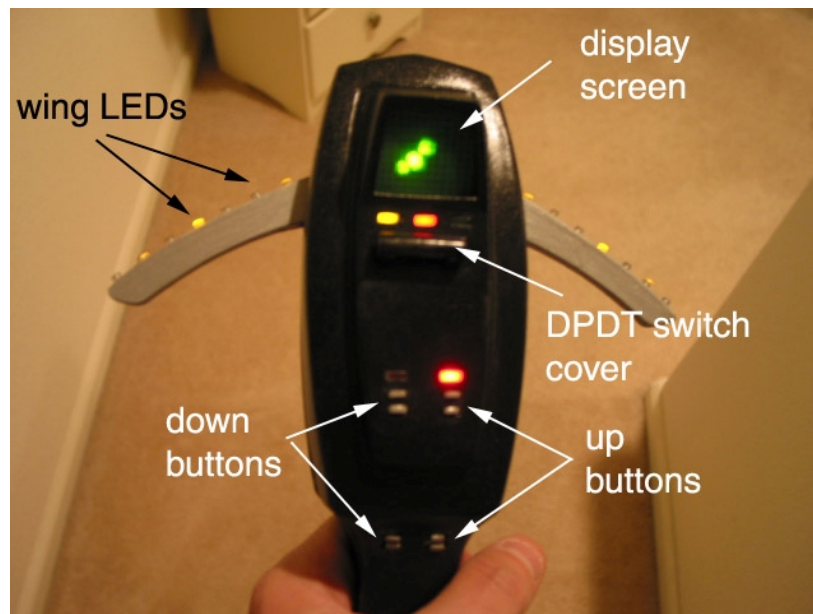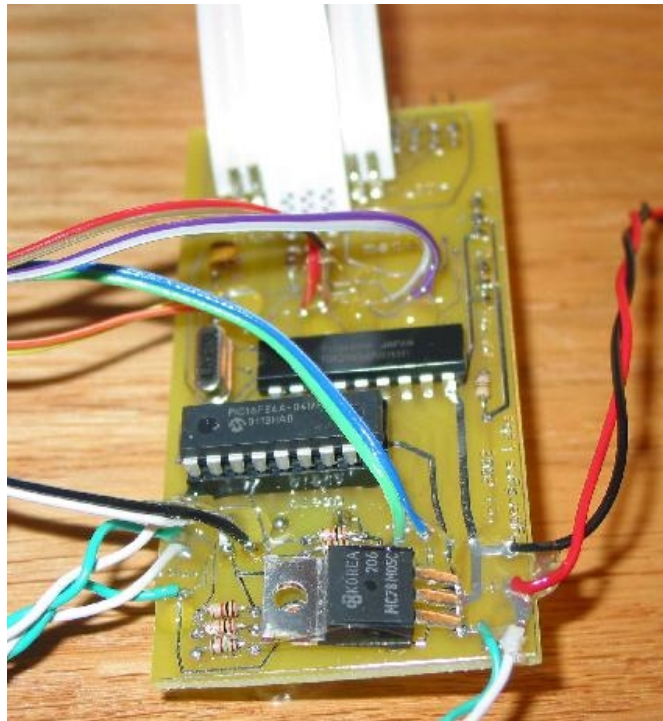
WIRING DESCRIPTION

Here is a pic of the PKE display dual screen. The screen is switched between the 2 displays by using the wired up DPDT slide switch. The display screen resides in the top area of the PKE.

dual
display
screen
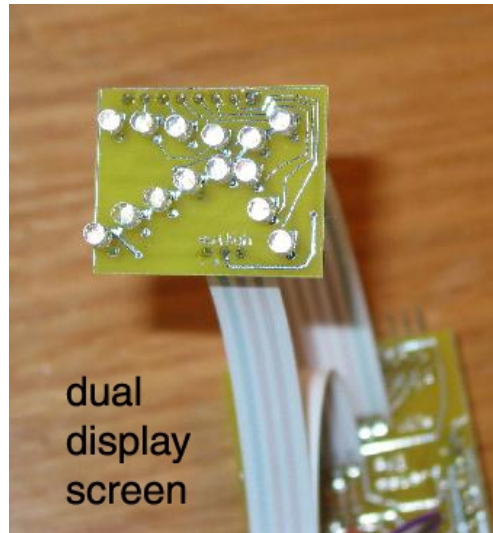
And here is a pic of the PKE controller board:

The top dual 10-pin headers in the next picture are for the optional wing LED connections. You can see the pin numbers next to each header. The below pic shows the bottom of the PKE mainboard.
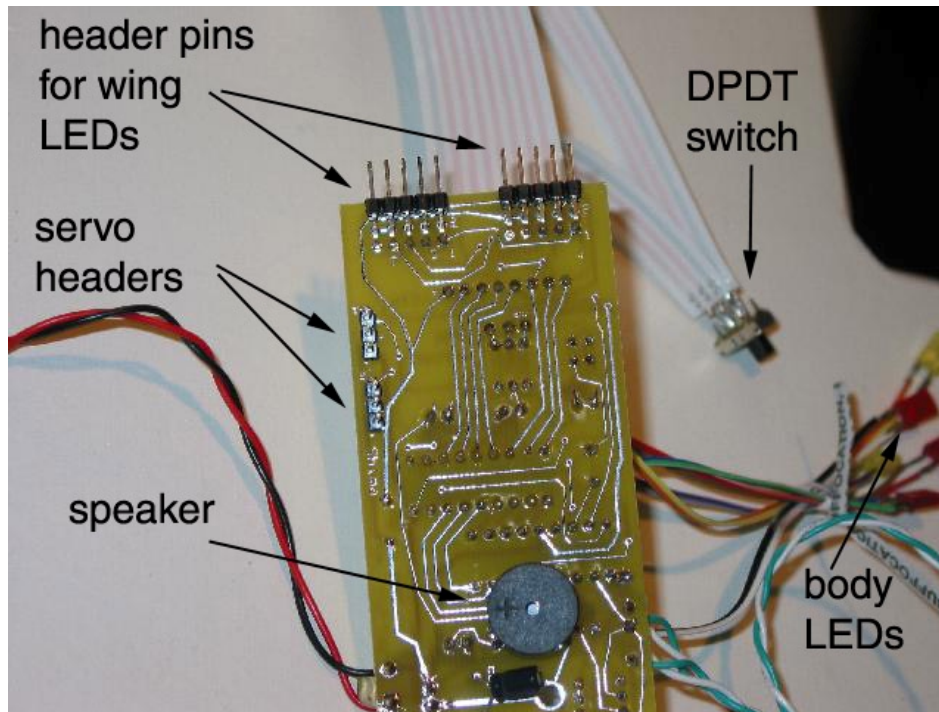
The wing header pins are assigned as follows (for each header):

Pin 1) Wing LED 1
Pin 2) Wing LED 2
Pin 3) Wing LED 3
Pin 4) Wing LED 4
Pin 5) Wing LED 5
Pin 6) Wing LED 6
Pin 7) Wing LED 7
Pin 8) + Power
Pin 9) Unused
Pin 10) Unused

You can hook up the wing LEDs using wire or with the optional wing PC boards. The wing LEDs should all share pin 10 as common power. So, you can hook up the longer lead of each LED to pin 8. The shorter lead of each LED gets hooked up to each pin listed above. Here is a small pic of LED polarity.
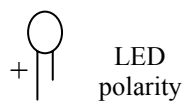

Also, you can use the included ribbon cable to ease the wiring of the wing LEDs. The one end will slide right over the header pins. The other end of the cable can be cut and spliced to connect up to each wing LED (or connected to the wing boards if you have them). The ribbon cable is easily cut with a sharp exacto knife.

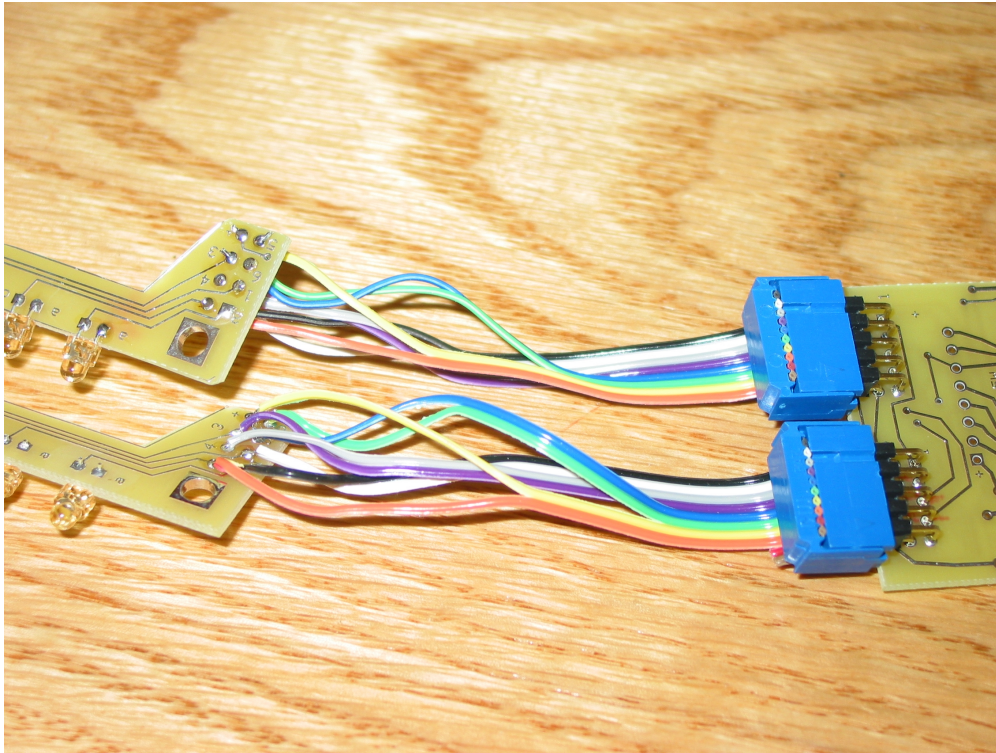Here is a close up of the pin header showing the pin numbers:
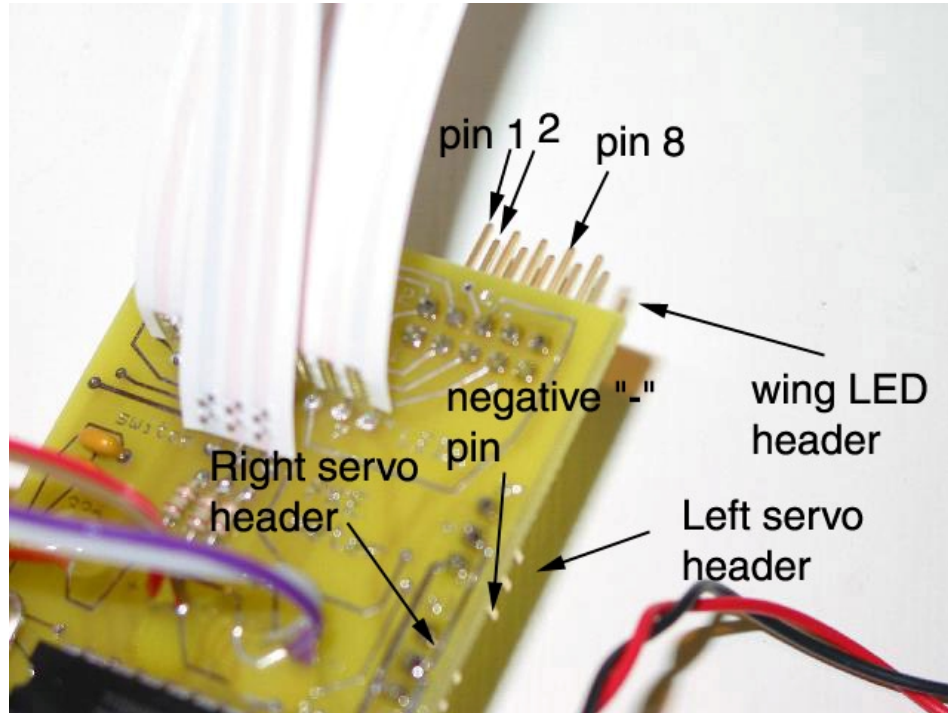
And here is a pic of the ribbon cable that slides over each header. Just match the wires to the above pins and hook up the LEDs as stated in the above pin mapping.

Here are 2 pics of fully assembled wing boards showing the proper wiring:
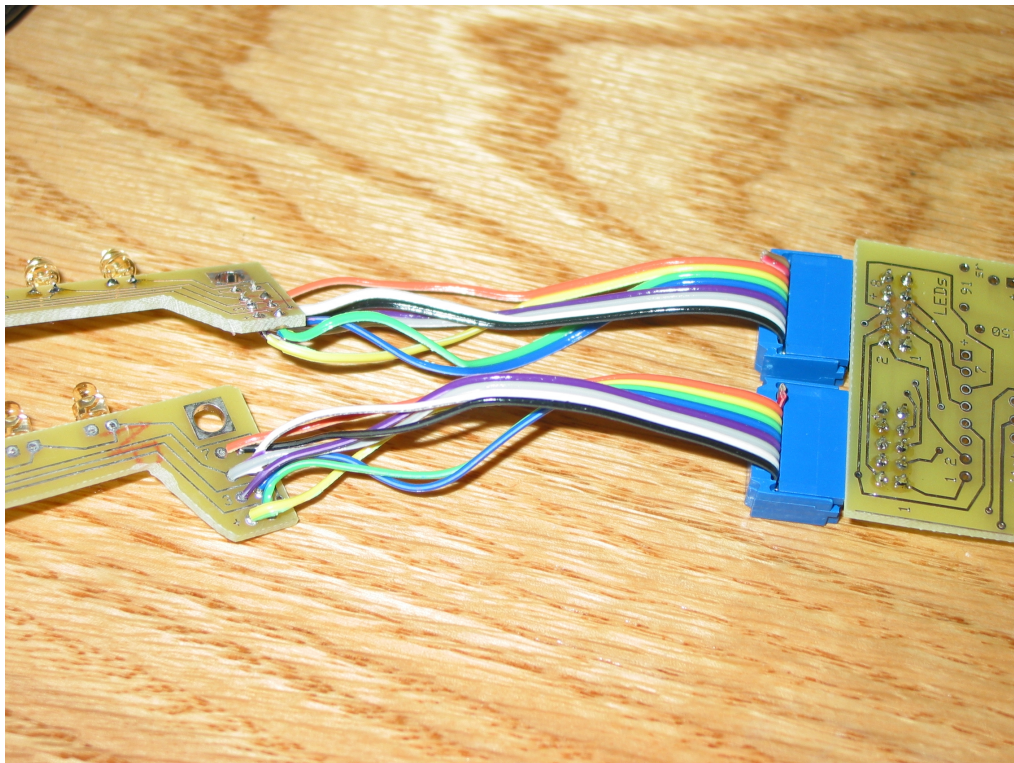
assembled and wired wing boards – top side of PKE board

assembled and wired wing boards – bottom side of PKE board

SERVOS

You can use any standard 5v servo with the board. The mini servos work the best since they will fit in an Iona or PKE shell with no modifications. Any servo connector should work as long as it has 3 pins and has positive power as the center wire.

Getting the right servo:

The recommended servo model is made by FMR direct. The model # is the PS30 or PS20 mini servo.

Goto www.fmadirect.com and click on the servo link. The PS20 or the PS30 servo is listed on the page. These micro servos are small enough to fit in the PKE shell and will control the wings nicely. You will need 2 servos, one for each wing.

Before you install your servos, **PLEASE NOTE THE POLARITY**!! The servos must be plugged in correctly or they can be damaged. **The black wire on the servo connector is negative**. _Make sure this wire is attached to the servo header pin that is furthest away from the wing LED header pins_. You can see on the controller board that this pin has a "-" next to it. The other top pin will either have an "sl" or "sr" next to it, and this should be connected to the non-black wire (which can be white or yellow on most servos). The red wire coming from the servo is positive, and this is the center pin.

The top servo header (nearest the wing headers) is for the LEFT wing servo, and the bottom 3-pin servo header is for the RIGHT wing servo.

Here is a pic of the servo connected correctly. Note the wire polarity!
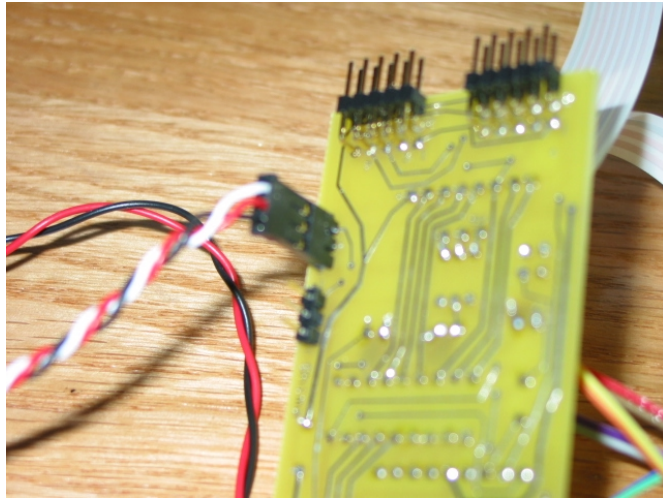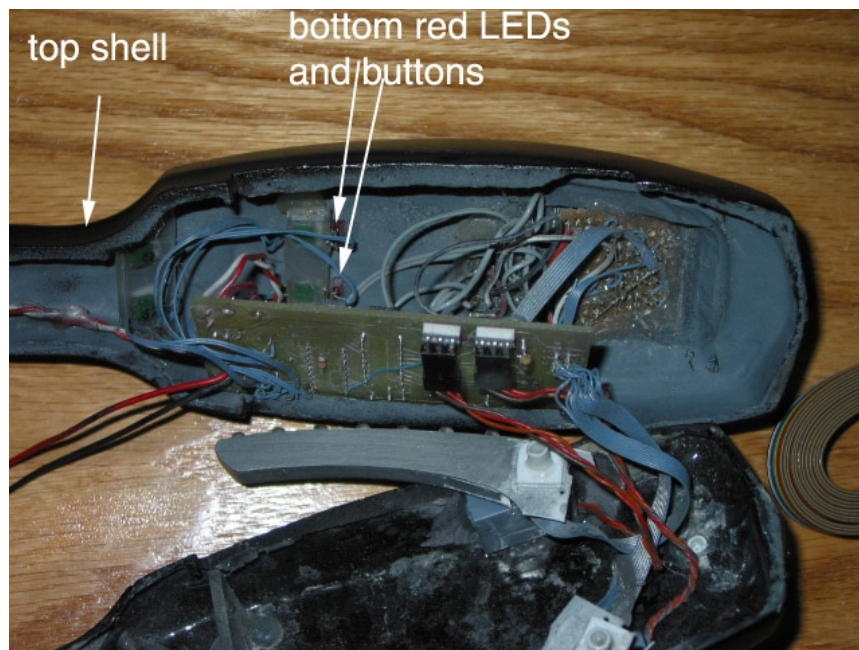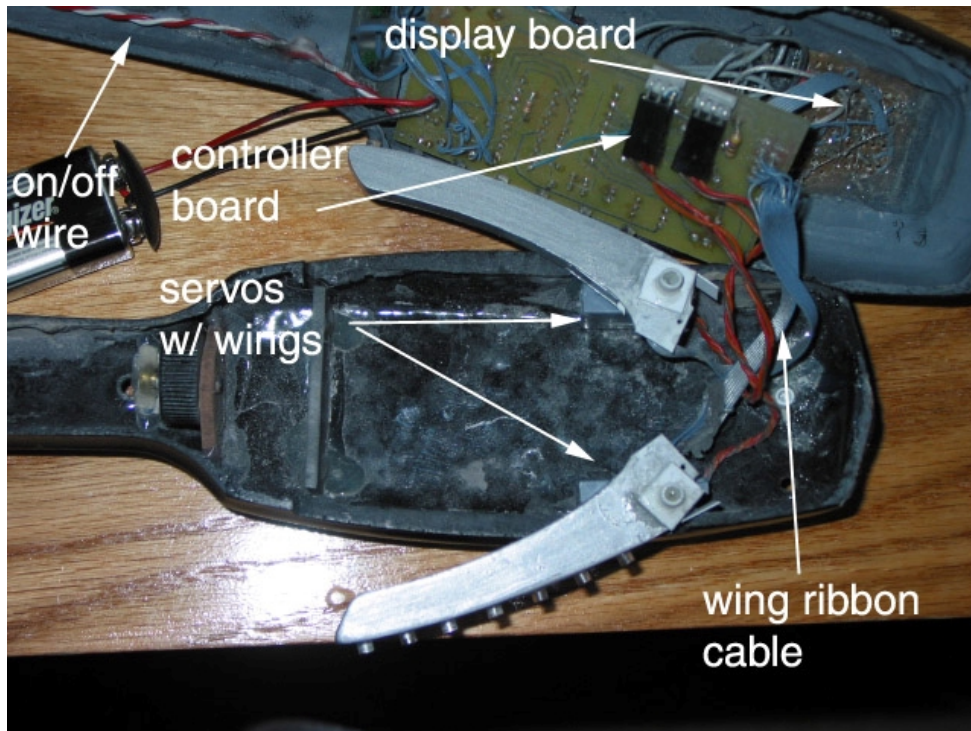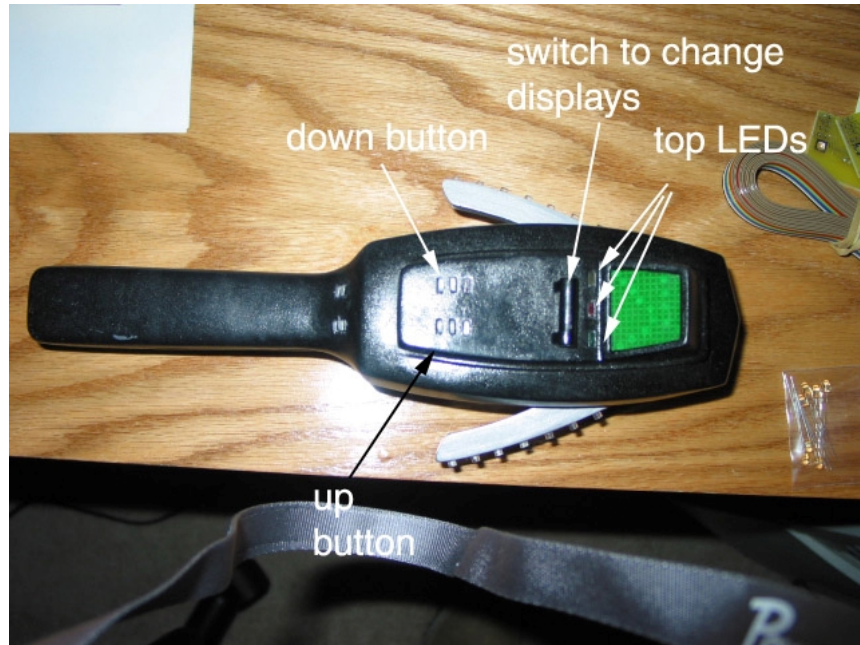
Here is the recommended FMA servo.
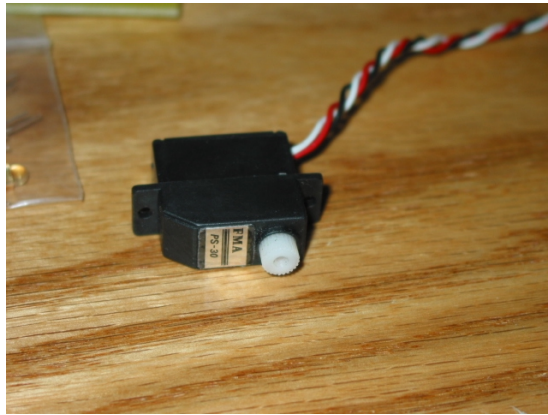
INSTALLATION

Installation of the kit will heavily rely on the shell that you have. Here are some pics of a prototype install into a custom PKE shell. It is recommended that the servos and wings install in the bottom shell, and the controller/display board reside in the upper shell. This should allow everything to fit in the shell.

display board

controller board

on/off wire

servos w/ wings

wing ribbon cable

top shell

bottom red LEDs and buttons

SHELL MEASUREMENTS

If you are creating your own PKE shell out of an Iona shoe polisher, you need to form up the wing bodies, the raised display area, and the raised faceplate. Here are some measurements that will hopefully help those making their own custom shells:
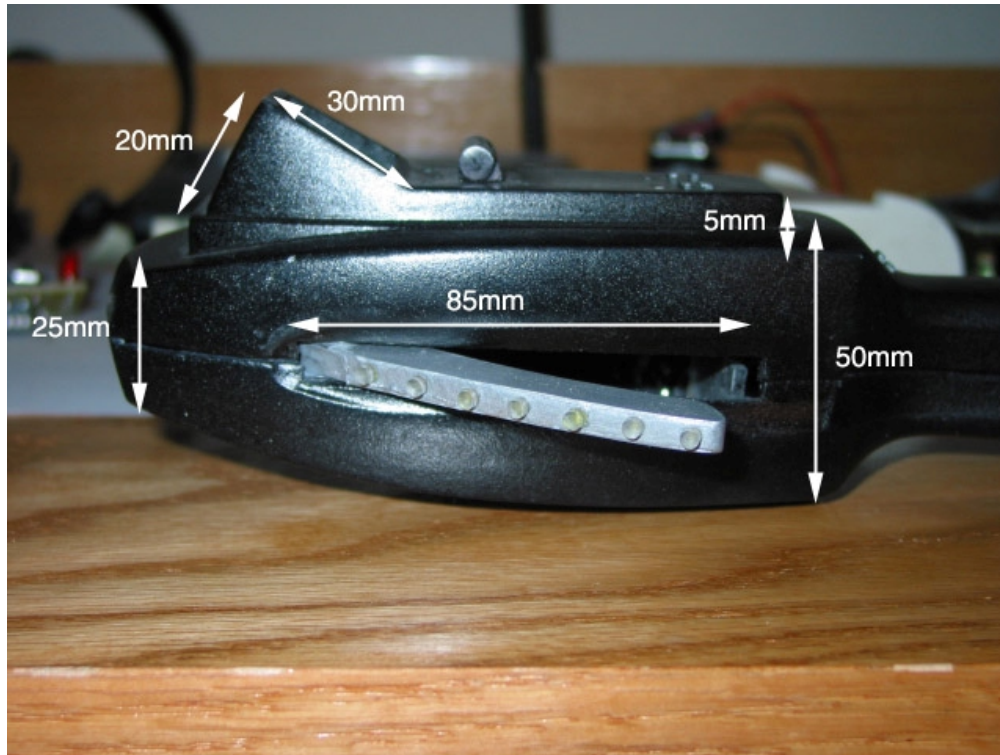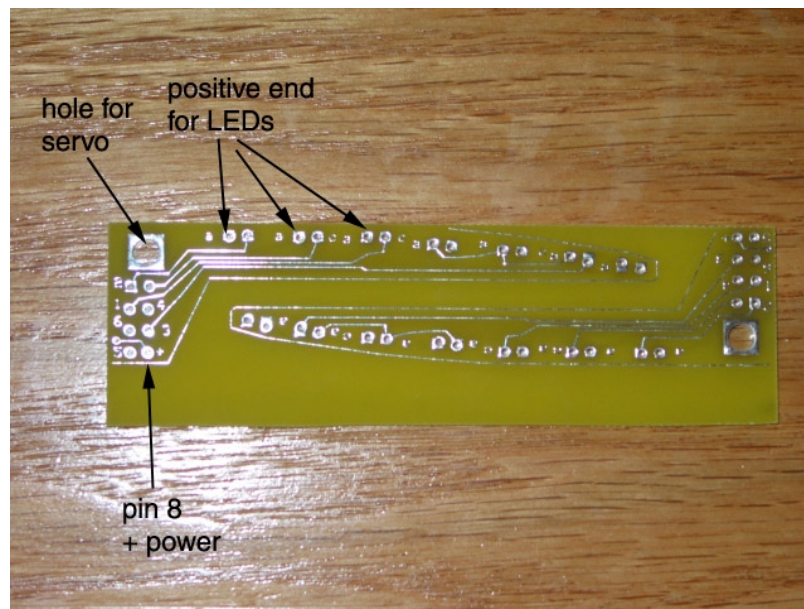
WING BOARDS

If you received the wing boards and are going to use them, you can construct the exterior wing bodies out of styrene, resin, or whatever else you want. The wing boards are a convenient rigid shape to hold the LEDs and to wire up the ribbon cable. They also have a hole to directly glue down to the servo gear so you have a mounting hole for the servo.

Here is a pic of the wing boards (UNCUT PC boards):

You will need to cut the shape of the wing boards out. You can use a dremel tool to do so. When installing the LEDs, the longer positive lead gets connected up to the hole with the "a". The shorter negative lead

gets connected to the hole with the "c" on it. The ribbon cable can be spliced and soldered to the respective header. You can see that the cabling is not in order, since the wing LEDs sequence in a different order. So, ribbon wire 2 gets connected to the first square hole. This mapping says that display LED 2 is connected to the wing LED 1. The numbers next to each hole tell you which ribbon cable wire to connect to that hole.

The screen LED to wing LED mapping goes like this:

Screen LED 2 → Wing LED 1
Screen LED 7 → Wing LED 2
Screen LED 1 → Wing LED 3
Screen LED 4 → Wing LED 4
Screen LED 6 → Wing LED 5
Screen LED 3 → Wing LED 6
Screen LED 5 → Wing LED 7

This mapping was observed in the first GB movie in the library scene. The screen lights and wing lights would sequence together, with a certain screen LED corresponding to a wing LED. If you want to use a different mapping, you can just hook up the ribbon cable to do so.