

HH1 Complete Board - Installation Instructions (Revision 1)

Revised 1/20/04

The HH1 Complete Board gets its name from the fact that the board contains the PIR circuit and the PIC micro controller all as one complete unit. The completely assembled board is all-inclusive for a homemade trail camera controller board and sensor.

The HH1 Complete Board features:

- 9 selectable time delays w/ delay check.
- Double picture mode in all time delays.
- Automatic return to normal mode from test mode.
- LED signal in test mode when sensor is triggered.
- LCD digital event counter w/ reset.
- Manual sensitivity adjusts from 0 to 70 feet.
- Day / night / both selectable settings with onboard DPDT switch.
- Power supply control switch.
- Delay and test function push button switches.
- 2.5mm stereo jack camera connector.
- 9-volt battery holder.
- Soldering pads for alternate remote control of delay and test functions, and camera wiring.
- Adaptable to an "on-off " camera controller with modifications.
- Idle current power drain measured at 95uA.
- Choice of PIC Chips to run different cameras.
 - [674 \(HH1\) PIC Chip](#)
 - [674/P32 \(HH1/P32\) PIC Chip](#)

Single 9-volt battery will power the HH1 Complete Board for 4 months +



Finish size: 4 1/8" (L) by 1 7/16" (H)

The HH1 Complete Board comes with installation hardware, board standoffs, drilling template, fresnel lens, carpet tape, 2.5mm stereo camera connector, remote camera disarm switch w/ cover, wiring harness and exterior camera labels.



HH1 Complete Board Install Procedure: (Items in **Red** are not included with the HH1 Complete Board.)

1. Locate the paper template included within the parts bag.
2. Cut the template out with a **scissors** on the outline of the board.
3. **Tape** the template to the exterior of the enclosure with the printed side of the template up.

*(This is the side of the enclosure that will be the front of your trail camera and which the IR sensor will face.)

4. **Center punch** the 4 corners and fresnel lens center, marked on the template.



5. **Drill** pilot holes at punch marks and increase the hole sizes to the following.
 - a. (4) Corner holes finish size = (1/8")
 - b. Fresnel lens hole finish size = (1")



*(Be certain the enclosure's interior surfaces around the holes are flat and level with the edge of the holes - grind the surface if needed.)

- Center the fresnel lens over the 1" hole from within the enclosure.

*(Groove side of fresnel lens towards the inside of enclosure. Circle pattern of lens aligned to edge of 1" hole.)

- Temporarily **tape** the fresnel lens for testing.
- Locate (4) 4-40 by 7/8" Al. standoffs and (4) 4-40 by 3/8" machine screws.
- Install the standoffs inside the enclosure at the four corners.



*(Take care to not over tighten the screws. The standoffs are aluminum so the threads are easily stripped.)

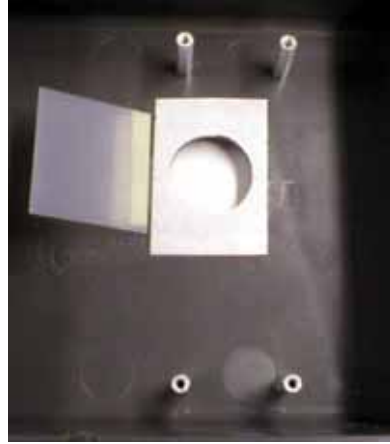
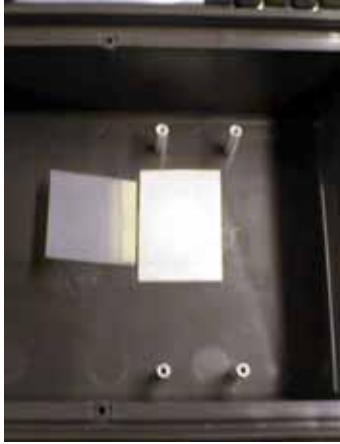
- Locate (4) 4-40 by 3/8" machine screws.
- Screw the HH1 Complete Board to the top of the standoffs with (4) 4-40 by 3/8" machine screws.

*(Make sure the IR sensor is located behind the fresnel lens.)



- Install a **9 volt battery** in the battery holder and test the board for functionality and sensor alignment to the fresnel lens using the appropriate PIC chip instructions:
 - [674 \(HH1\) PIC Chip](#)
 - [674/P32 \(HH1/P32\) PIC Chip](#)

13. Carefully lift the tape and reposition the fresnel lens if the lens focus is in need of adjustment.
14. Once satisfied with the lens placement, remove the corner screws from the HH1 complete board and lift the board from the enclosure.
15. Firmly **tape** one edge of the fresnel lens in place and remove all remaining tape around lens.
16. Flip the lens using the taped edge as a hinge and apply the double-sided heavy-duty carpet tape over the 1" fresnel lens hole from inside the enclosure.
17. Cut the 1" circle center free of carpet tape using a **single edge razor** or an **Exacto Knife**.



18. Remove the backing from the remaining carpet tape and carefully hinge the fresnel lens into the exposed tape.
19. Remove the "hinge tape" and excess carpet tape by cutting along the edges of the fresnel lens.



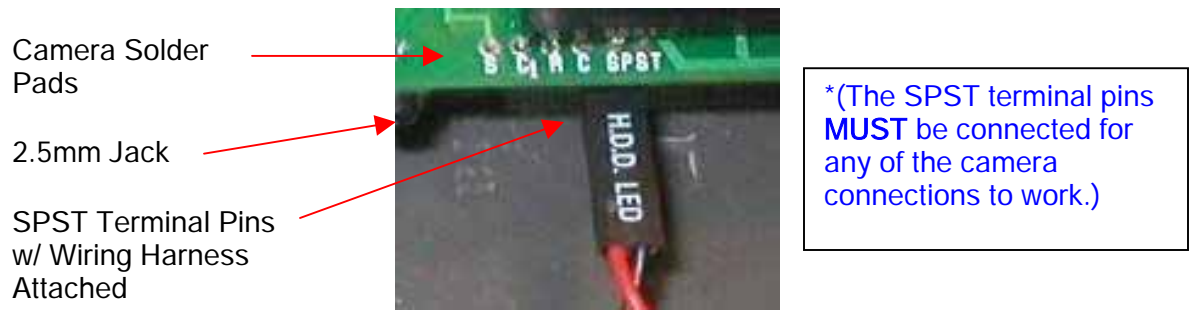
20. Apply **silicone sealant** along the 4 edges of the lens on the inside of the enclosure.
21. Allow sealant time to dry and reinstall HH1 Complete Board with (4) 4-40 by 3/8" machine screws.

*(Be careful not to drip sealant onto lens's center - work around the lens staying to the outside, not across the lens.)



HH1 Complete Board - Camera Connections:

Locate the camera connection solder pads on the HH1 Complete Board.



- For 35mm cameras: Remove the jumper from the SPST terminal pins. Attach the wiring harness to the pins. **Solder** the wire ends to the remote exterior SPST switch. **Drill** a ¼" hole in the trail cam enclosure. Insert the toggle switch thru the hole and secure with the rubber cover. The remote switch will allow you to disarm the camera from behind the sensor, so film is not wasted when you check your camera.
- For digital cameras: Do not remove the jumper from the SPST terminal pins. The remote switch is not needed for digital cameras.
- The HH1 Complete Board is supplied with a 2.5mm stereo jack that can be used with the 2.5mm stereo camera connector supplied with the parts. Wiring for the camera connector to match the jack is as follows:
674 (HH1) PIC Chip = **Tip** (Shutter), **Middle** (Refresh), **Base** (Common)
674/P32 (HH1/P32) PIC Chip = **Tip** (Shutter), **Middle** (Power), **Base** (Common)
- The HH1 Complete Board provides solder pads for alternate camera connectors.
674 (HH1) PIC Chip = **S** (Shutter), **R** (Refresh), **C** (Common)
674/P32 (HH1/P32) PIC Chip = **S** (Shutter), **R** (Power), **C** (Common)

HH1 Complete Board - Modify to "On-Off" Controller:

The HH1 Complete Board can be converted to an "on-off" style controller board. "On-off" controller boards function slightly different than "always active" controller boards. With a converted HH1 Complete Board, the camera is off during idle times and powered up when the IR sensor is triggered. The PIC chip of the HH1 Complete Board controls both the power on and off of the camera and then the shutter press to take the picture. The power is allowed on long enough to record the picture and then the power to the camera is turned off. "On-off" type trail camera configurations usually require a longer time from the trigger of the IR sensor to the shutter of the photo. This can take as long as 3 to 6 seconds and in the incorrect field setup result in "half" pictures or empty pictures. The "on-off" trail camera will however save on battery power since the camera is off during idle times. The "on-off" controller will become more prevalent as digital cameras become faster between startup to shuttering of the picture.

To convert the HH1 Complete Board to an "on-off" controller a reprogrammed PIC chip is required with the proper on-off timing for the particular camera used. The HH1 Complete Board is also modified to separate the camera controls and provide a control set to turn the camera power on and off, and the other control set to activate the shutter press if needed.

To modify the HH1 Complete Board to an "on-off" controller:

- Locate the "CU" trace on the HH1 Complete Board located next to the lower left corner of the battery holder.
- Carefully **cut** the copper trace directly below the "CU" lettering.
- Check continuity between solder pads C1 and C. No continuity should be present after cutting trace "CU".
- Replace the HH1 Complete Board PIC chip with the reprogrammed "on-off" PIC chip.
- Direct wire the camera with "S" and "C1" used for the shutter control of the camera and "R" and "C" used for the power control of the camera.

*** It is not necessary to modify the HH1 Complete Board to an "on-off" controller for the following cameras:**

- Sony DSC-P31, P32, P51 or P52 Digital Cameras.
- Olympus D-370, D-380 Digital Cameras.
- Canon Sure Shot Owl PF 35mm Camera.

Additional Notes: