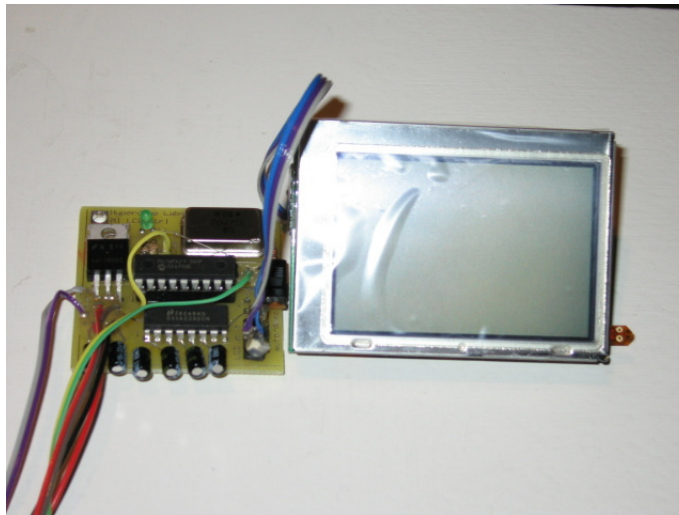


**Aliens Motion Tracker LCD Controller Board**  
**Optional MT Sound Board**  
Hyperdyne Labs, © 2004-12  
<http://www.hyperdynelabs.com>

**Overview**

This kit includes an LCD to replicate the motion tracker. Once powered up, the LCD displays a bootup screen, then plays out simulated sonar pings with target blobs and ranging digits. The target blob can be automatically displayed on the LCD screen using a manual pushbutton or an IR motion detection module (when used with our optional sound board).

Video board and LCD kit picture (sound board not shown):



Here is a picture of the LCD mounted inside the Hama viewer.



The LCD package comes with

- Programmed and assembled MT video controller board
- LCD board with screen (wired to controller board)

The add-on sound board includes:

- Programmed sound board with speaker
- Manual pushbutton for target recognition
- Optional IR motion detector for automatic target recognition

## Power supply

The sound board runs on batteries. You can use a 9V battery, a 6AA battery pack, or any other DC source in the range of 8-12V. The 6AA battery pack will last much longer than a single 9V. If you do use a 9V, consider a lithium or rechargeable nickel-metal hydride battery.

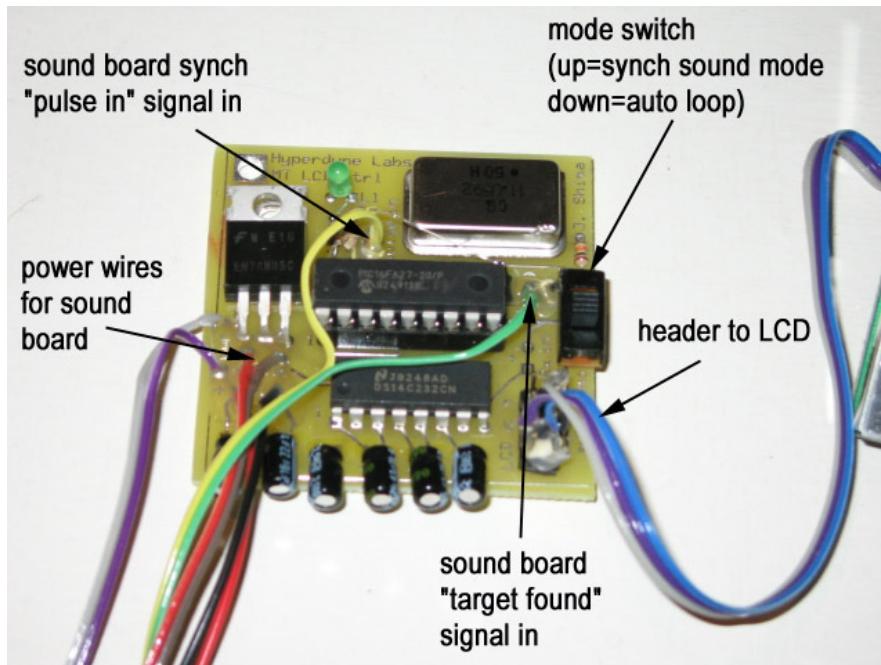
## Modes of Operation (with and without a sound board)

The video controller board has 2 modes, for those with and without our additional sound board. These modes are chosen by flipping the slide switch on the video controller board.

The first mode is an auto-loop mode, where the tracker will continuously play out the sonar pings with a closing target blob. This mode is self-contained and does not need the optional sound board.

The second mode only works with our optional sound board. In this mode, the sound board connects up to the video controller board to synchronize the sonar pinging as the target gradient “whining” sounds. You need 2 wires to run from the sound board to the video controller board to enable this mode.

Here is a picture of the MT video controller board connections:



## Optional IR motion module (for sound board)

The IR motion module can detect motion up to 10-15 feet. Once the module detects motion for more than ¼ sec., the tracker will begin to “whine”, denoting it has “spotted” a target. As motion is subsequently detected, the tracker will increase its pitch over time to emulate the target getting closer. The tracker will increase its whine for every 3 seconds of motion that has been detected. Once motion is not detected, the tracker goes back to search mode state (just play out the pinging sound).

## Synchronized LCD and sound board operation

If you have the sound board and video board connected, you can now enable the synchronized light and sound mode. In this mode, the tracker ping and target sound effects will be synchronized with the video sonar pings and the video target blobs. Also, you can manually recognize a target using the manual button trigger on the sound board or even use the optional IR motion detector module.

### Operation of synchronized LCD/sound board combo

As stated above, if you use the manual target trigger this will start the gradient “whining” sounds and show a target blob on the LCD screen. The ranging digits will also count down. As long as trigger the target blob, it will continue to become closer and closer, increasing the target whining sounds.

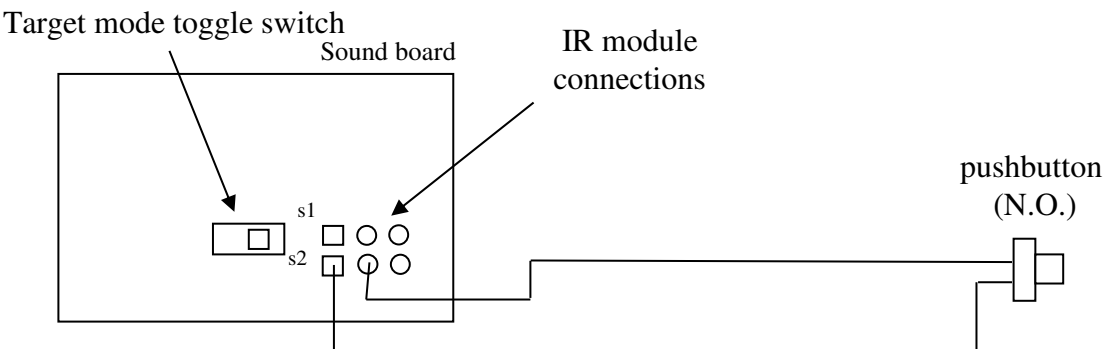
You can let off the target trigger to manually “lose” the target. This operates similarly if you are using the optional IR motion module. If the target disappears for a short time (if somebody stops moving or is no longer detected with the IR module), the tracker will remember its last tracking state for up to 2 seconds. If subsequent motion is detected within 2 seconds of losing the target, the sound board will continue “whining” from its last known tracker state. If motion is not detected within 2 seconds, the tracker resets to the lowest pitch when subsequent motion or a target is detected. The LCD screen will also reset and the last seen ranging digits will be erased. This gives you the realization that you are truly tracking different targets, which is very similar to what is seen in the movie! After 2 seconds of no motion activity, you can “track” another target.

The sound board includes the pinging sound and 5 gradient pitch whines. The whining sounds increase from low pitch to high pitch. Since the IR module cannot accurately “range” distance to a target, the pitch increases as a function of how long the target has been detected. The IR motion module is sensitive to human motion. Targets that stand still may not be detected. However, if you are moving with the tracker in hand, then still targets would be able to be detected since the IR module only cares about detecting motion (from a still target with the tracker moving or from a moving target with the tracker still).

### Selecting the targeting mode (manual pushbutton or auto IR module)

The onboard switch on the sound board enables/disables the IR sensor monitoring (if you have the IR module). If you don’t want the IR module active, flipping the switch will turn it off. ***Turning off the IR module activates the manual target button – so you can still activate a target by pressing the button at any time!***

If you want to trigger the sound board to whine without the use of the IR module, **move the onboard toggle switch to the location shown below. This will turn on the “manual” whining mode using the pushbutton.** Moving the toggle switch to the other position turns on the IR tracking mode using the sensor.



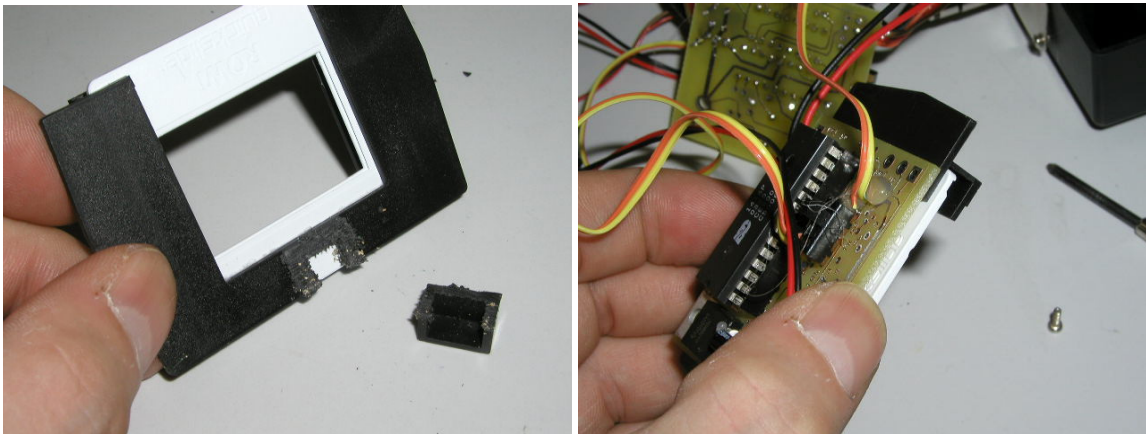
### Board Installation (in a Hama viewer only)

Here are some pics of how to install the video and sound board into a Hama viewer. These pics are for reference only, you can mount the boards anyway you see fit.

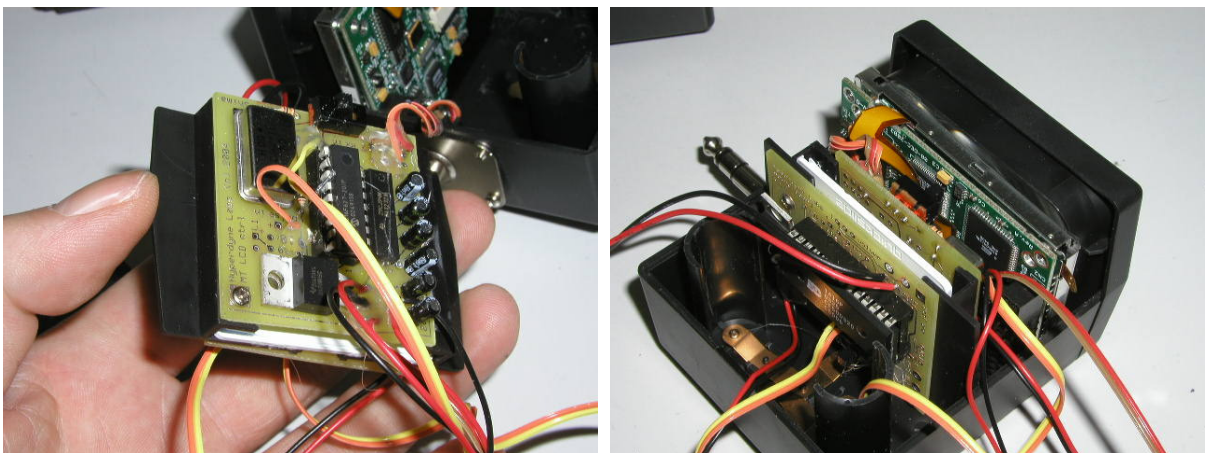
First you will have to thin the walls of the Hama viewer to fit the LCD screen. You can use a dremel or scraping tool to take off some of the plastic. Repeat until the LCD sits flush with the inside of the viewer.



If you still have the Hama guts, you can use the center piece to hold both the sound board and video controller board. Cut off the center plastic and then attach the sound board to one side.

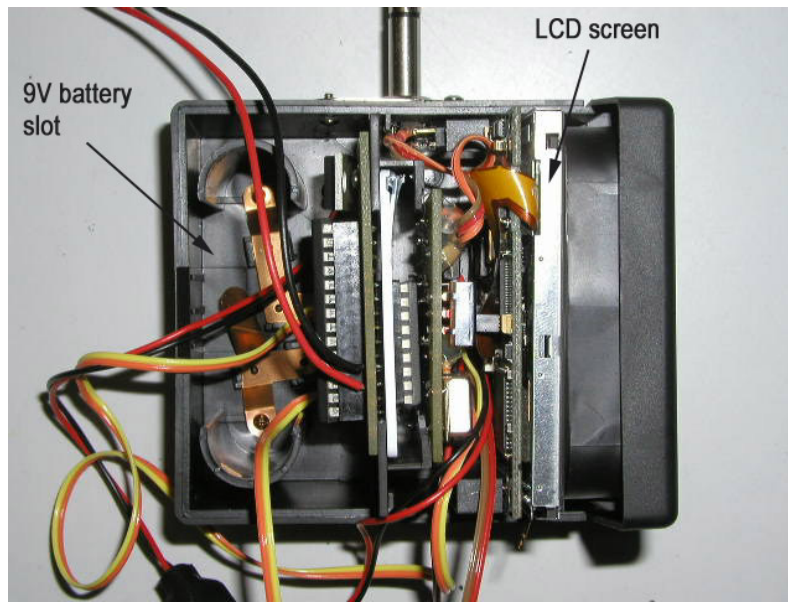


Now mount the video controller board to the other side of the panel. Now just reinstall the panel to the inside of the Hama viewer:



If you are using a 9V battery, you can place it in the battery slot in the Hama viewer. It will fit snugly between the 2 circular posts.

Here is a top view of the boards installed. If you don't have the Hama guts you can still mount the boards inside the Hama viewer vertically as shown below:



The sound board comes with a small speaker which is pretty loud. If you mount everything in the Hama viewer, you can replace the speaker with a small, flat speaker that will also fit inside the Hama viewer. Or, you can disconnect the speaker and run the 2 speaker wires to the MT body and house the larger speaker inside the body. This is up to the installer.

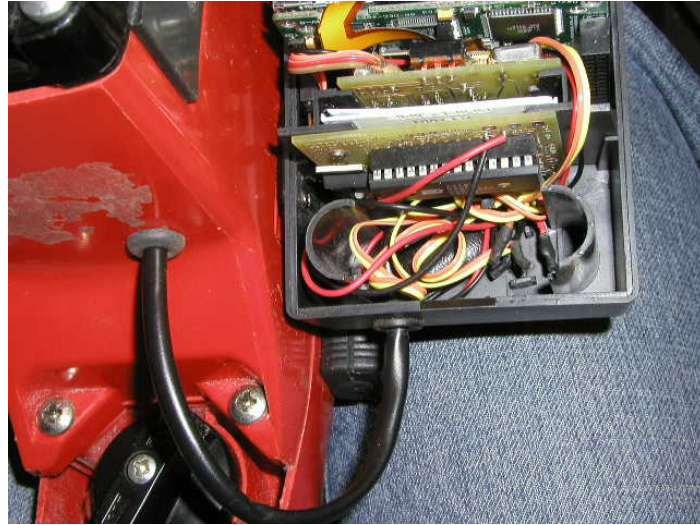
#### **Board Installation (in the Hama viewer and the body)**

If you have the sound board with IR sensor and manual triggering switch and the larger speaker, it will be easier to install the sound board inside the drill body with the video boards installed inside the Hama viewer as shown in the previous section.

This way the only wires you need to run from the Hama viewer to the drill body sound board are the + and - battery wires and the 2 control wires (pulse in and target found wires). This is easily done by sending power through the Hama connection jack as shown below:

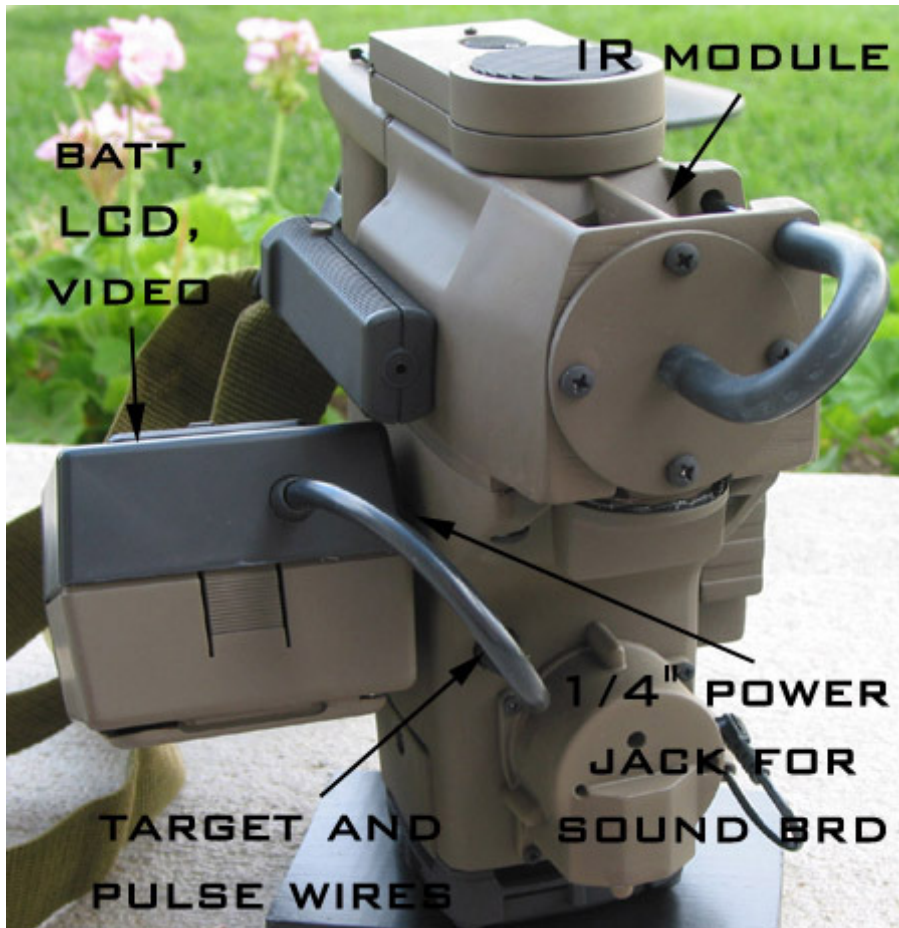


And if you use real video cable (or hollow tubing) you can run the other wires through the other cable attaching the Hama viewer to the body. This cable is shown below.



With this method, the speaker, IR module, manual trigger, sound board all reside inside the large drill body cavity. The video board, LCD, main power switch, and batteries reside inside the Hama viewer. This makes it easier to put everything together with minimal wiring between the units. The installer will have to do the wire splicing to the relevant jacks to make this possible, as the unit comes from our labs fully assembled and wired up.

Below is a pic of how we wired up our own MT using the above tips.





Here is the LCD and sound kit installed in a replica motion tracker.



### Online assembly manual

If you are interested in building up your own motion tracker, we have an online assembly manual to take you through the process. Please visit:

<http://www.hyperdynelabs.com/mt/construct/>

# ADDENDUM

## IR motion detector operation (with optional sound board):

The IR sensor is hooked up to the trigger input. Here is the pic of it:



The IR sensor derives power from the sound board. When the sound board is powered up, it will take the IR sensor a maximum of 30 seconds before it responds to any motion. This is its warm up period. After that, it will activate the sound board if any motion is detected in its field of view.

It would be best to install the IR module facing forward “looking out” of the motion tracker drill case or main body. If the motion detector is facing the operator, you will always detect yourself, which isn’t much fun since the tracker will always whine!

You can remove the fresnel lens from the IR module board if you like. This may make it easier to install into the tracker unit. However, note that without the lens, the detection distance of the module may decrease quite a bit. The field of view in which the IR detector will “see” somebody also decreases without the lens.

## Onboard 1W Speaker Amplifier Circuit (OPTIONAL)

We also offer an optional 1W amplifier board that wires into the sound board for louder output. The board has a similar blue volume pot as shown above. You can use a small screwdriver to increase/decrease the volume of the output sound. Our amp is small enough to be installed inside the MT body. Below is a pic of the amplifier circuit board w/ blue volume pot. You may received the SMT version of the amp, the only difference is the SMT version has a small silver volume pot instead. A jeweler’s screwdriver can be used to change volume.

