Application Note: Assembling 50M Pistol Target

CAUTION

The flatpack is made from unfinished wood.

- Wear eye protection
- Use caution when assembling to avoid splinters

When using freeTarget:

- Wear eye protection
- Maintain a safe distance
- Do not shoot into any areas except the open target areas.

The freeETarget project or contributors will not be responsible for any injuries when using this target of it's components.

Target shooting can be dangerous so apply caution in everything you do.

SUMMARY

This document provides the instructions for assembling the freeETarget 50M pistol target.

A detailed discussion of the use of the target and settings can be found in the FreeTarget Service Manual which is available at https://free-e-target.com/service-documents/#ServiceManual

REQUIRED

- Flatpack
- Wood Glue
- Neoprene rubber mat, 600x600x5 mm nominal (available at Tractor Supply Company)
- Hand tools
    - 3mm Allen key
    - Small and large Philips screw driver
    - Electric drill with 5mm drill bit

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- Patience

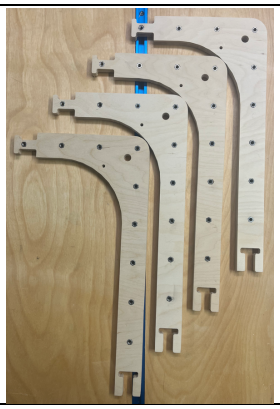
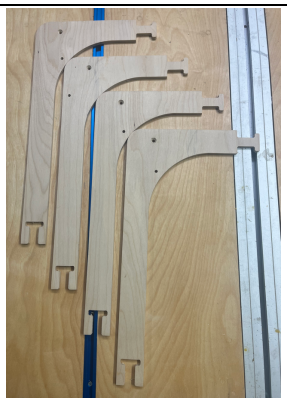
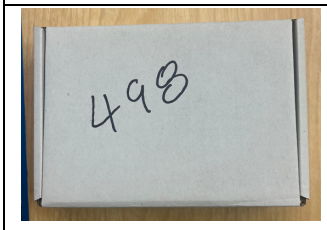
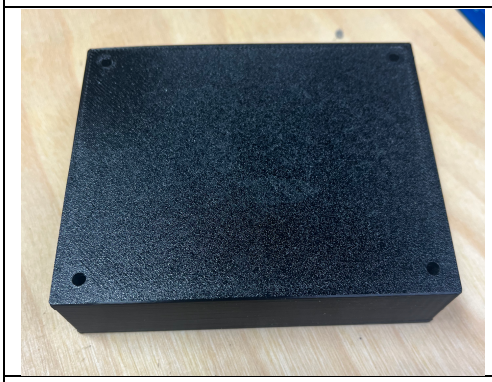
INTRODUCTION

These instructions describe the assembly of a 50m pistol target for freeETarget. Assembly is in five steps

- Build the target frame
- Install the rubber sound mat
- Install the sensors
- Attach the target frame
- Setup the target and connect to the PC

PACKING SLIP

Item	Description	Quantity
	Frame	
1	Main frame	4
2	Clamp frame	4
3	Target face frame	4
4	Side Panels	4
	Piece Parts	
4	Clamping Bolts	38
5	Sensor mounting bolts and crews	8
6	Target Guides	4
7	Signal Processing Circuit	1
8	Cable Harness	1
9	Sensors	4

		
Target Frame Note sensor mounts	Clamp Frame Note captive nuts	Target Frame 6mm. thick
		
Side Panels	Target Stops	Corner Covers
		
Circuit, Sensors, Cable Harness, Sensor Covers	Fastener Kit	Neoprene Rubber Sound Surface Sample shown, not supplied with the kit
		
Circuit Case		

Assembling the Frames

The three frames, Main, Clamp, and Target all assemble using the lock and key connectors

1	Arrange the Main frame parts in a square.	
2	Lap the lock and key connectors together Tap the pair together	
3	Repeat for the Clamp and Target frame assemblies	

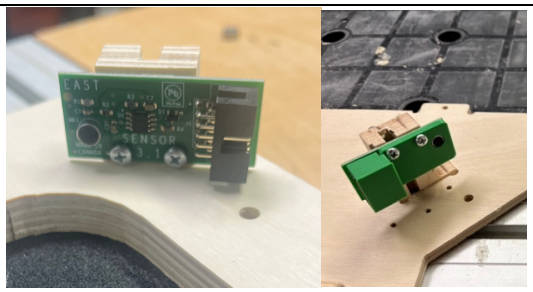
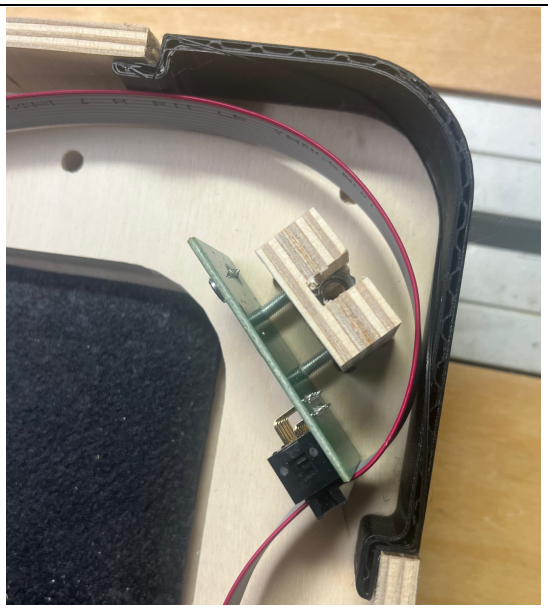
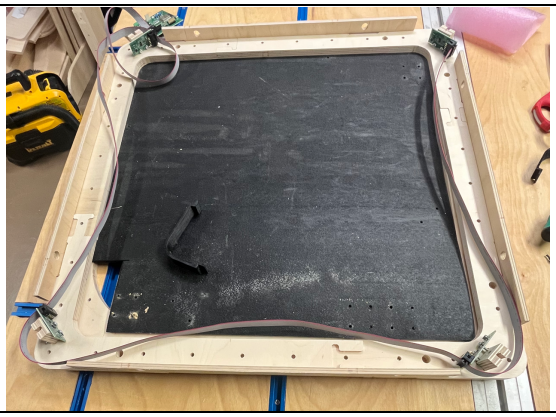
Sound Surface

The sound surface is a piece of thick neoprene rubber (or similar) that makes a loud noise when the bullet penetrates the target.

1	Roll the rubber mat flat onto a disposable surface.	
2	Lay the assembled target frame on top of the mat	
3	Drill the holes into the mat using a 5mm drill Recommendation • Start in one of the corners and drill the first two corner holes • Hold the mat and frame in alignment by pushing two of the large 5mm screws from the frame into the rubber mat • Press down on the frame to flatten the mat and frame • Drill the two diagonally opposite hole • Hold the mat and frame by the opposite holes • Verify that the frame and mat are flat and well aligned • Drill the remainder of the holes	
4	Locate the clamping frame behind the sound surface and assemble the frame, sound surface, and clamping frame using the 38 5 mm screws and washers. Recommenendation • Start in one corner and work towards the opposite corner • As much as possible ensure that the frames and sound surface are not warping.	

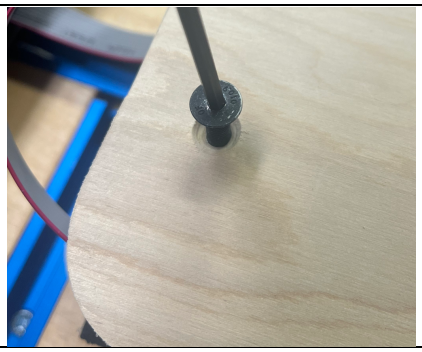
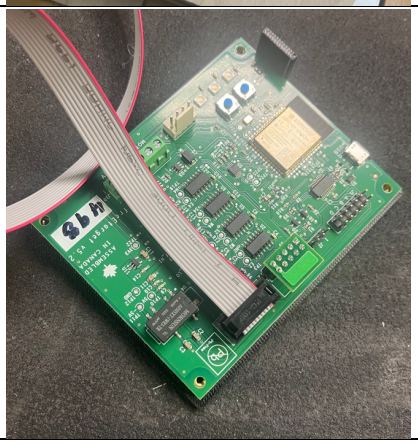
Sensor Assembly

The sensors are assembled onto the frame and the side panels put in place.

1	Install the sensors onto the mounts The sensors are located NORTH. EAST WEST SOUTH The sensor covers are held in place by the two mounting screws Note cover illustration taken from Competition Target instructions.	
2	Test fit the side panels and corner covers The side panels have a short and long side, the short side is marked with an S. Attach the side panels and install the corner covers. If everything is correct, glue the side panels one-at-a-time. Wait for the glue to harden and drop the corner covers in place.	
3	Lace the flat cable between the sensos. Begin with the short cable to the NORTH sensor and then connect NORTH-WEST-SOUTH-EAST. The corner covers may be removed to gain access to the connector on the sensor	

Final Assembly

The final step is to attach the target frame and mount the target

1	Make sure that the short sensor cable is outside of the target frame Drop the target frame onto the top of the sensor mounts and attach using the countersunk screws.	
2	Test fit the target and backer board onto the target frame. Make sure that the target is centered on the frame.	
3	Glue the target stops in place to locate the target and backer board to the frame everytime it is replaced	
4	Connect the end of the cable to the freeETarget circuit	
5	Install the circuit into the cover box	

Installation on the Firing Line

The final step is to attach the target frame and mount the target.

In practice, the target is designed to be powered from a USB power supply (or USB battery) and communicate to the PC using the target WiFi. Instructions for setting up the target can be found at https://free-e-target.com/service-documents/#ServiceManual.

IMPORTANT

The circuit delivered with the target kit has been configured for operation on the 50M target, but is not configured for your WiFi network

The target is intended to be mounted on a target carrier with a bullet trap behind it. To facilitate installation on a variety of locations, the target is equipped with large 10mm holes on the top, sides, and back of the target. The user is free to locate the target as needed.

IMPORTANT

Since the target installation is not known before hand, the circuit is deliberately mounted in a box with a long flat cable to attach to the target.

The user may locate the circuit case anywhere near the target that is convenient. Ensure that the flat cable is not damaged when fixing the box.

DOWNLOADING AND INSTALLING PC SOFTWARE

Click the link below to go to the downloads page

https://free-e-target.com/downloads/

Look for the PC Software section and download the software (Figure 9)

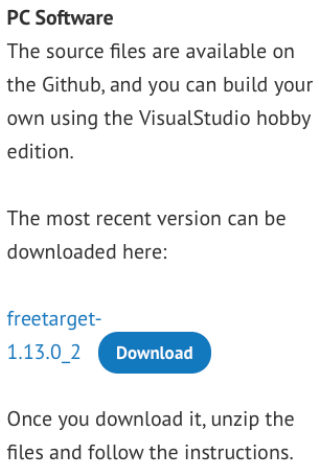


Figure 9: Download Software

Unzip the software and install on your PC.

Connect the USB cable between the target holder and the PC.

STARTING UP

Launch the PC program and look for the setup icon (GEAR WHEEL) in the upper right corner (See Figure 10)

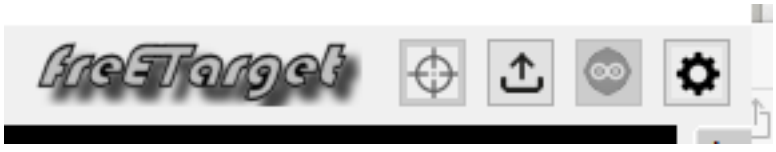


Figure 10: Setup Icon Location

Enter all of the setup information needed in Figures 9, 10, 11, and 12

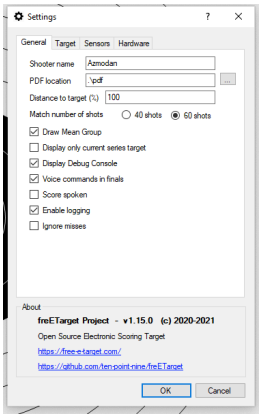


Figure 11: General Settings

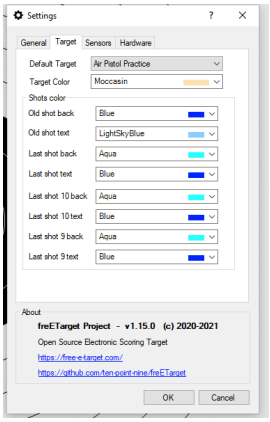


Figure 12: Target Settings

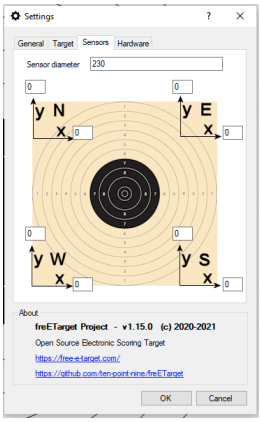


Figure 13: Sensor Adjustment

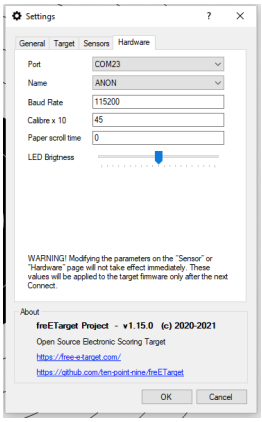


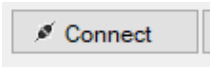
Figure 14: Hardware Interface

Figure 11: This allows you to enter the shooter name and how information will be stored.

Figure 12: Choose the target you will be shooting against and the colours you will be using.

Figure 13: Fine tune the sensor position to adjust for assembly errors

Figure 14: Interface to the target hardware.

Press 

to begin a session.

Refer to the Commissioning Instructions from the web site. This will give you a quick summary of how the system is working

TROUBLESHOOTING

The boards are tested before shipment, but a lot can happen between the last test and the first shot. If your system is not working, please follow the trouble shooing guide below before sending an email to freETarget.com

PC Program complains “Database Check Fails..:	• Security issue with some antivirus software • Try running as administrator • Disabling antivirus
PC Program cannot see target	• The Arduino uses a CH340 which may not have a driver on your PC • Follow the instructions at https://sparks.gogo.co.nz/ch340.html to load in the correct driver
No Shots Registered	• Check that the USB cable is attached

	• Check that the correct Serial port is set in the setup • Check that the wiring harness is attached to all of the sensors • Tap each of the sensors. Do the three LEDs blink?
	•

Shots show up but in the wrong place	• From the firing line, shoot a blank shot
	  ○ Do the three LEDs blink?
	  ▪ Yes, set a new trip point
	  ▪ No, Check all of the wiring
	• Verify that the sensors North – West are in the correct order

The shots show up but rotated 90 degrees	• Verify the order of the sensors and correct
The shots are the mirror image left-right	• The sensors are reversed. Switch the positions of NORTH-EAST and SOUTH-WEST