

For the 2017-2018 Season, it is recommended that Event Supervisors for Optics in both Division B and C retrofit their Laser Shoot Surface (LSS) to include a metal base and add magnets to the bottoms of their mirrors and barriers. This recommendation is being made to address some problems that were experienced at tournaments last year where inadvertent participant contact with the LSS caused mirrors and barriers to change position.

Ward's Science has packaged all the material that you would need to retrofit your LSS as well as instructions together in a convenient kit. This Optics Box Upgrade Kit can be purchased [online](#) for \$66. If you would prefer to source the materials yourself from Ace Hardware, Home Depot, or another home improvement store the following general instructions can guide you in making the described retrofit to a single LSS. If you are working with multiple LSS's please make sure to increase the number of items required to match the number of surfaces that you are retrofitting.

Adding a Metal Base

1. Purchase a 26-gauge 24" x 36" Zinc Metal Sheet.
2. Consider painting the top side of the metal sheet using a dark color metal paint to reduce the chance of an unplanned reflection off of the naked metal surface.
3. Unscrew the bottom wooden plate of the LSS.
4. Affix the Zinc Metal Sheet to the top surface of the wooden plate using a strong glue (i.e. SuperGlue). When aligning the wooden plate and the metal sheet make sure to align two edges of the metal plate with the corresponding edges of the wooden plate to reduce the number of cuts you have to make.
5. Using a pair of metal snips, or scissors, trim the metal plate so no excess metal extends beyond the wooden plate.
6. Screw the wooden plate back into the LSS so the metal sheet is now between the wooden plate and the LSS sidewalls. The above picture shows a completed retrofit with a naked metal sheet.



Adding Magnets to the LSS Mirrors and Barriers

1. Purchase a set of magnets to be affixed to the bottom of the mirrors. There are several different options available for this step. In this example, an 8-pack of rectangular ceramic magnets was used.
2. Affix the magnets to the back edge of the LSS mirrors and barrier using a strong adhesive (i.e. Super Glue) as seen in the picture on the right.
3. Allow the glue to dry for a few minutes. After which the mirrors should be secure enough so that they could be placed on the LSS and the whole device tilted more than 45 degrees. There should be no movement of the mirrors or barriers on the LSS (See picture on the far right).
4. Altogether, this retrofit should take about a half hour to retrofit one LSS.

