Shown above is an extruder mounted to an electric stepper motor. An extruder is an extruding device that is used to extrude metals like copper, steel, aluminum and plastics. In our case, it is extruding solder. Our extruder is 3D printed with acrylonitrile butadiene styrene (ABS) type material. It consists of two parts. The black piece is designed to mount to the stepper motor by screwing into piolet holes. A problem we ran into was the fit of the black piece onto the motor. The screw pattern matched up but the inner diameter was too small. After making modifications to the inventor file, the black part now fits. The red piece is mounted with a dowel pin in the top left corner. This makes it possible for it to pivot. There is a spring that is between the black and red piece that applies tension to the red piece. The tension is needed to push the solder against the motor shaft and drive the solder without slipping. The solder is fed up through the bottom of the black piece, by the motor shaft, and up through the red piece.
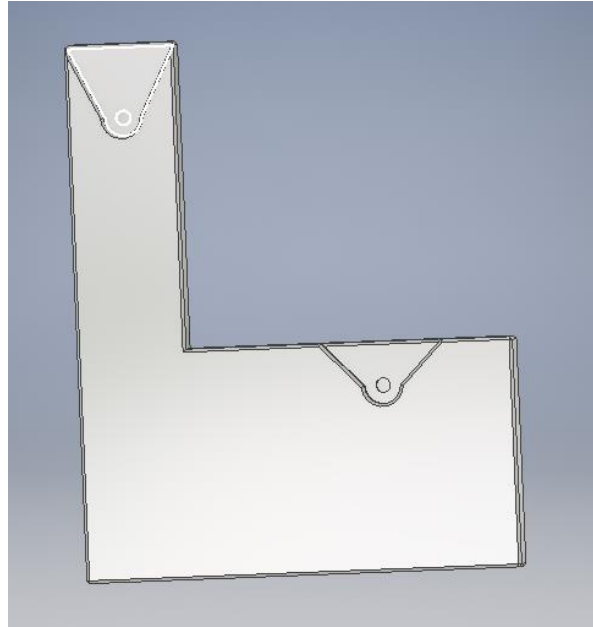
Shown above is a spool bracket. The spool bracket is designed to hold four solder spools in two stages. The first stage holds two solder spools and is on the lower level. The second stage holds two solder spools and is on the upper level. In the solder dispenser enclosure, there will be two of the spool brackets that run parallel to one another with two spindles between them that are holding the solder spools. The spool brackets will be milled out of aluminum and mounts to the inner walls of the enclosure.
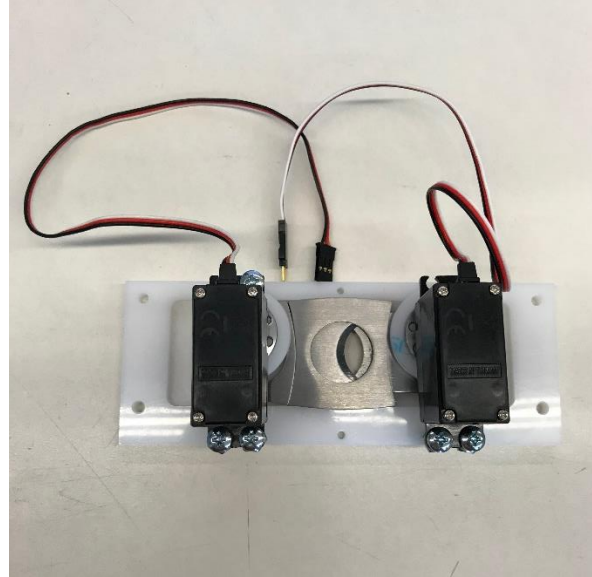
Shown above is an assembly of two servo motors and a cigar cutter. This mechanism is designed to cut the solder automatically by controlling the servo motors with a raspberry pi. By using servomotors, the position of the motor shafts can be monitored and controlled. The shafts of the motors are in the slots of the cigar cutter, where fingers are originally designed to be placed to operate the cutter. So to cut, one servo will move to 0 degrees and the other 180 degrees. And vice versa to open. The servomotors are mounted to a flat piece of plastic by using 4 philip screws on each motor. The cigar cutter has more resistance than the servomotors could drive. This problem was solved by lubricating the surfaces where the blades rub against each other.

Shown above is the enclosure used to house all components of the solder dispenser. It is from polycase.com. The top of the case is removable and can be fastened down with 4 philip screws. The dimensions are 14.12 x 7.84 x 5.96 inches. Difficulty lies finding a plastic case this large. This size is needed to hold a 7 inch digital display screen and hold several motors and spools of solder. A clear top was chosen for educational purposes so users can see the components necessary to dispense the solder.
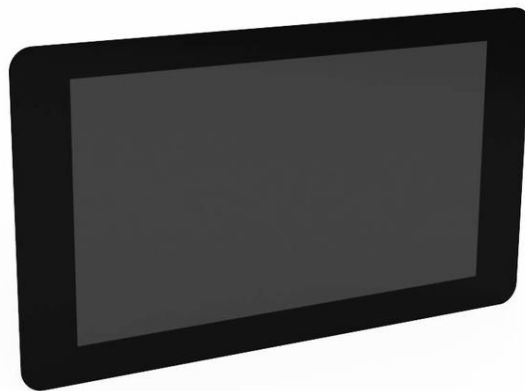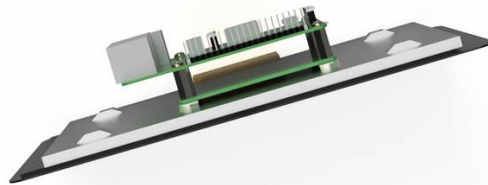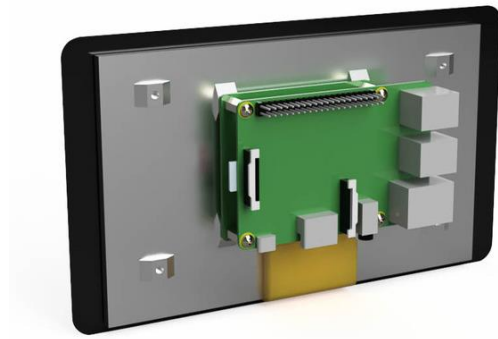
Shown above is a raspberry pi display screen. The 7" Touchscreen Display for Raspberry Pi gives users the ability to select solder type, read solder description, and dispense the solder. The screen is mounted flush to the top of the enclosure. The 800x480 display connects via an adapter board which handles power and signal conversion. The Pi mounts on the backside Only two connections to the Pi are required; power from the Pi's GPIO port and a ribbon cable that connects to the DSI port present on all Raspberry Pi's. Touchscreen drivers with support for 10-finger touch and an on-screen keyboard will be integrated into the latest Raspbian OS for full functionality without a physical keyboard or mouse.
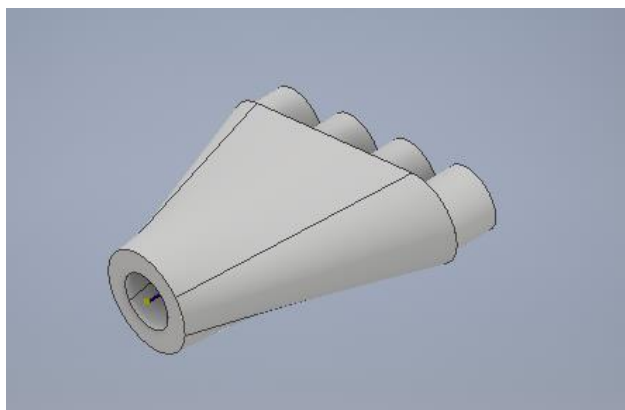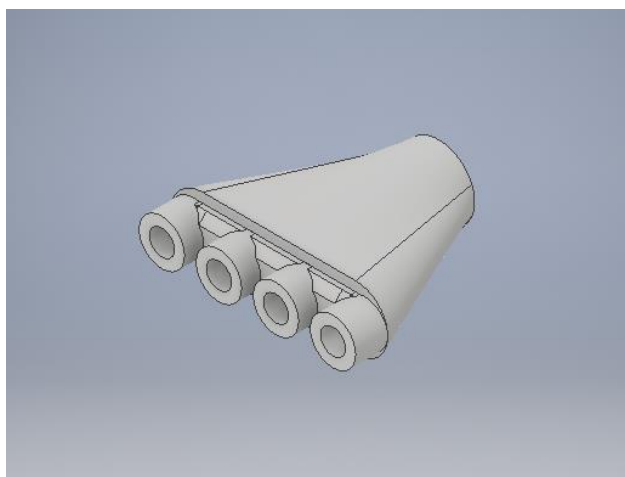
Accumulator. Optional part. Fear jams could happen, thus the reason for the part.