# GREAT SCOTT GADGETS

Throwing Star LAN Tap Kit Instructions

The Great Scott Gadgets Throwing Star LAN Tap is a small, simple device for monitoring Ethernet communications. These instructions will help you assemble and use your Throwing Star LAN Tap.

Assembly

1. Gather the components. You should have one Throwing Star LAN Tap printed circuit board, four Amphenol RJHSE-5080 modular connectors, and two 220 pF capacitors with 0.1 inch lead spacing such as the Xicon 140-50P2-221K-RC. You will also need a soldering iron, some electrical solder, and a pair of wire cutters.

2. Insert the four modular connectors (J1, J2, J3, and J4) into the printed circuit board. Be careful that each of the leads extends through the circuit board before snapping the connector fully into place.

3. Solder the eight leads of each connector.

4. Insert the two capacitors (C1 and C2) through the circuit board. It is helpful to slightly bend the leads on the underside of the board so that the capacitors stay in place when the board is turned over.

5. Solder both leads of each capacitor and clip off the excess with wire cutters.

6. Clean the flux from the board. Depending on the type of solder used, you might need water, alcohol, or other solvents. A toothbrush can make this job easier. Allow the board to dry before use.
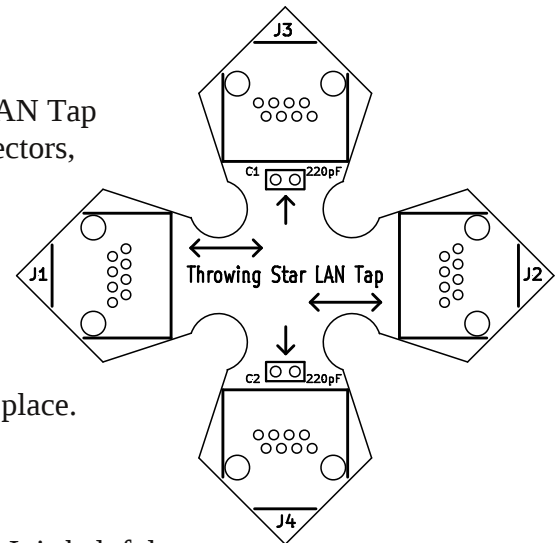
Soldering Tips

The Throwing Star LAN Tap Kit is an excellent starter project if you have never soldered before!

1. Keep your soldering iron tip clean with a wet sponge or brass sponge.

2. Apply a small amount of solder to the tip of your hot iron to promote heat transfer.

3. Hold the side of the iron near the tip against the joint to be soldered.

4. Feed solder into the joint, not into the iron

Usage

1. Use Ethernet cables to connect the Throwing Star LAN Tap (J1 and J2) in line with a target network to be monitored.

2. Use Ethernet cables to connect one or both of the monitoring ports (J3 and J4) to ports on one or two monitoring stations. Each port monitors traffic in one direction only.

3. Use your favorite software (e.g., tcpdump or Wireshark) on the monitoring station(s) to capture network traffic.
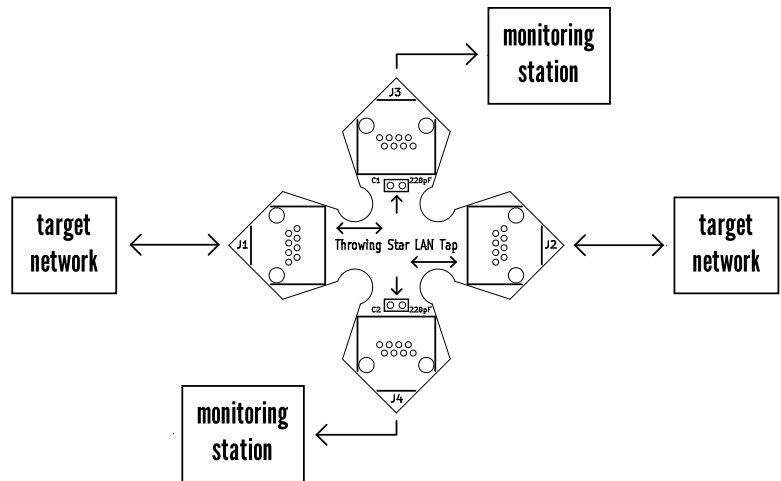
Theory of Operation

The Throwing Star LAN Tap is a passive Ethernet tap, requiring no power for operation. There are active methods of tapping Ethernet connections (e.g., a mirror port on a switch), but none can beat passive taps for portability. To the target network, the Throwing Star LAN Tap looks just like a section of cable, but the wires in the cable extend to the monitoring ports in addition to connecting one target port to the other.

The monitoring ports (J3 and J4) are receive-only; they connect to the receive data lines on the monitoring station but do not connect to the station's transmit lines. This makes it impossible for the monitoring station to accidentally transmit data packets onto the target network.

The Throwing Star LAN Tap is designed to monitor 10BASE-T and 100BASE-TX networks. It is not possible for an unpowered tap to perform monitoring of 1000BASE-T (Gigabit Ethernet) networks, so the Throwing Star LAN Tap intentionally degrades the quality of 1000BASE-T target networks, forcing them to negotiate a lower speed (typically 100BASE-TX) that can be passively monitored. This is the purpose of the two capacitors (C1 and C2).

Like all passive LAN Taps, the Throwing Star LAN Tap degrades signal quality to some extent. Except as described above for Gigabit networks, this rarely causes problems on the target network. In situations where very long cables are in use, the signal degradation could reduce network performance. It is a good practice to use cables that are not any longer than necessary.

More Information

For open source design files and additional information, including the most recent version of this document, visit:

http://greatscottgadgets.com/throwingstar/