



DIY PROJECT

CS520 Wireless Headset to Cell Phone or Tablet *Adapter Box*

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8/16/2017

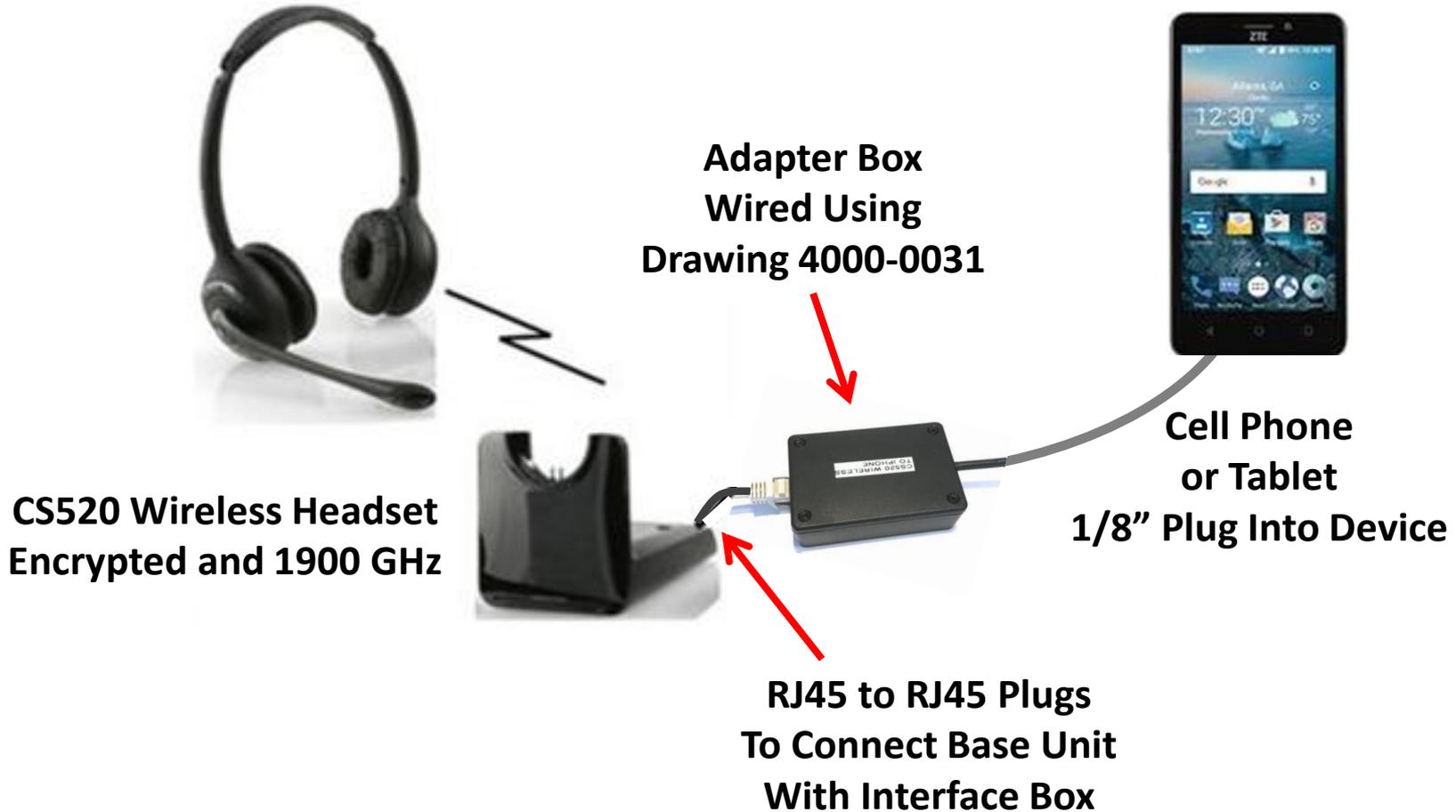
Also Check Out the CS520 Resource Page

<http://cs520hams.k5pa.com>

Rationale for Using CS520 With Your Cell Phone

- What is the Purpose for a Wireless Headset to a Wireless Phone?
 - Many wireless phones operate poorly in rural areas due to poor cell tower coverage
 - If a sweet spot in the home is found for phone placement, why not leave the phone there and you roam?
 - CS520 is perfect and allows roaming within a 350 foot radius of optimal phone placement
 - Headset provides comfort, great listening focus and transmit audio on your phone call
 - Bonus feature of simultaneously conferencing of up to 3 additional headsets for family calls
- CS520 Cabling With Your Cell Phone is an Easy DIY Project

Connectivity



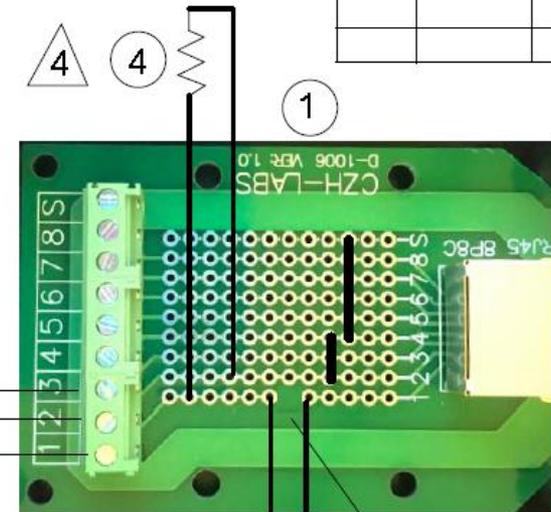
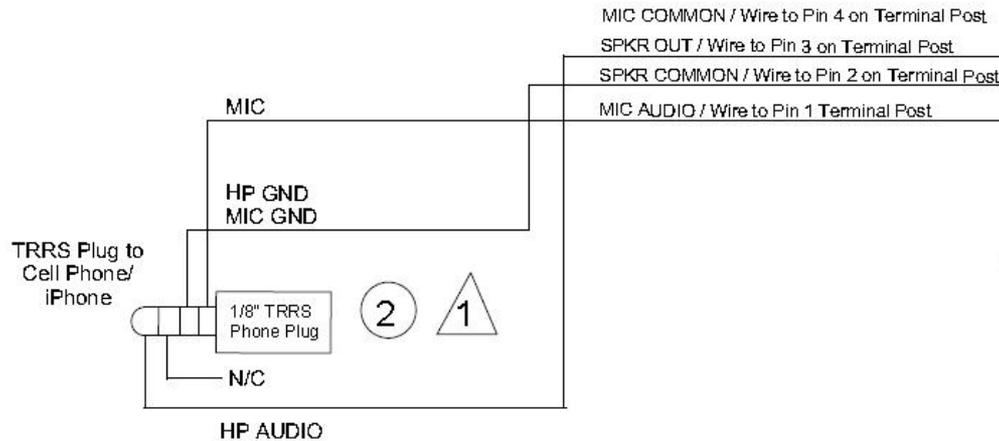
Schematic 4000-0031 Rev-A

NOTES

- Item 2 can be from a TRRS plug on cable cut to length
- Pin 1 wire printed circuit trace must be cut so capacitor can be soldered in series with Pin 1. Cut through the trace on upper AND lower side of PCBA!
- Add 2 jumpers wires to connect grounds together on circuit board, Pins 2-4-S (Shield)
- Resistor connects to Pin 1 (TRRS Plug Side) and Pin 2 (GND)

CHANGE HISTORY

VERSION	DATE	DESCRIPTION
A	7/18/2017	Initial release



RJ45 Socket.
 Use RJ45 Male to RJ45 Male Cable to plug into CS520 Base Unit

If Polarized Capacitor Selected, Positive Lead Here (+)

BIAS BLOCK
 0.47 uF, 50 VDC

ITEM	QTY	DESCRIPTION
5	1	Case, ABS, Economical Type 3.3x2.2x0.9" Black Hammond 1591XXMSBK Mouser 546-1591XXMSBK
4	1	Resistor, 4700 OHM, 1/4 W, 5% Ohmite OD472JE, Mouser P/N 588-OD472JE
3	1	Capacitor, 0.47 uF 50V, X7R, 10% Source: Jameco 544948, AVX SR305C474KAA
2	2	1/8" TRRS (3 Conductor and Ground) Phone Plug
1	1	RJ45 Shielded Breakout Board. Electronics Salon P/N MD-D1006R-1, Amazon.

KSPA DESIGN CONCEPTS

CS520 to Cell Phone TRRS Plug

Notice: There is no implied warranty that the information present is free from error and the user of this information should validate its accuracy and usage in their intended applications.

gh	A2	4000-0031	REV A
7/18/2017	SCALE	SHEET	1 of 1

Date: 8/16/2017

Bill of Materials iPhone or Tablet to CS520

Item	Part Description	Mfgr	Part No.	Vendor	Vendor P/N	Item Cost	Qty
1	Case, ABS, Economical Type 3.3x2.2x0.9" Black	Hammond	1591XXMSBK	Mouser	546-1591XXMSBK	\$ 3.47	1
2	C2G/Cables to Go 28690 Cat5E Molded Shielded (STP) Network Patch Cable, Black (3 Feet/0.91 Meters)	C2G/Cables to Go	28690	Amazon	28690	\$ 8.99	1
	ALTERNATE SOURCE: Cable Matters 5 Pack, Cat6a Snagless Shielded (SSTP/SFTP) Ethernet Patch Cable in Black 3 Feet	Cable Matters	160012-BLK-3x5	Amazon	160012-BLK-3x5	\$ 3.00	1
3	RJ45 8P8C Right Angle Shielded Jack Breakout Board, Terminal Block Connector.	Electronics-Salon	MD-D1006R-1	Amazon	MD-D1006R-1	\$ 8.79	1
4	Mini to mini 4 cond cbl, 3 ft. (cut and discard one end)	Philmore	44-470	Univ. Radio Inc. (http://www.univers-al-radio.com/)	3624	\$ 3.99	1
5	Resistor, 4700 Ohms, 1/4W, 5%	Ohmite	OD472JE	Mouser	588-OD472JE		
	ALTERNATE SOURCE: Resistor, 4700 Ohms, 1/4W, 5%	Jameco Valuepro	CF1/4W102JRC	Jameco	691024	\$ 0.10	1
6	0.47 uF 50V, X7R, 10%	AVX	SR305C474KAA	Mouser	581-SR305C474KAA		
	ALTERNATE SOURCE: 0.47 uF 50V, X7R, 10%	JVP	SR305C474KAA	Jameco	544948	\$ 0.39	1
7	IF NEEDED FOR CELLPHONE Audio Splitter Cable 3.5mm Male to 2 Female Jack Headphone Splitter Adapter 4-Pole Aux Cable	ARCHEER	LYSB01M315XJT-ELECTRNCS	Amazon	LYSB01M315XJT-ELECTRNCS	\$ 5.99	1

Notes: Item 7 may be needed for cell phones or tablets that have a protective case with very small access holes for the mic/phone plug. This particular Y-cable has a very small diameter plug making it easier to insert the phone plug through the case. One of the two jacks can be cut and removed if it is not wanted on the cable.

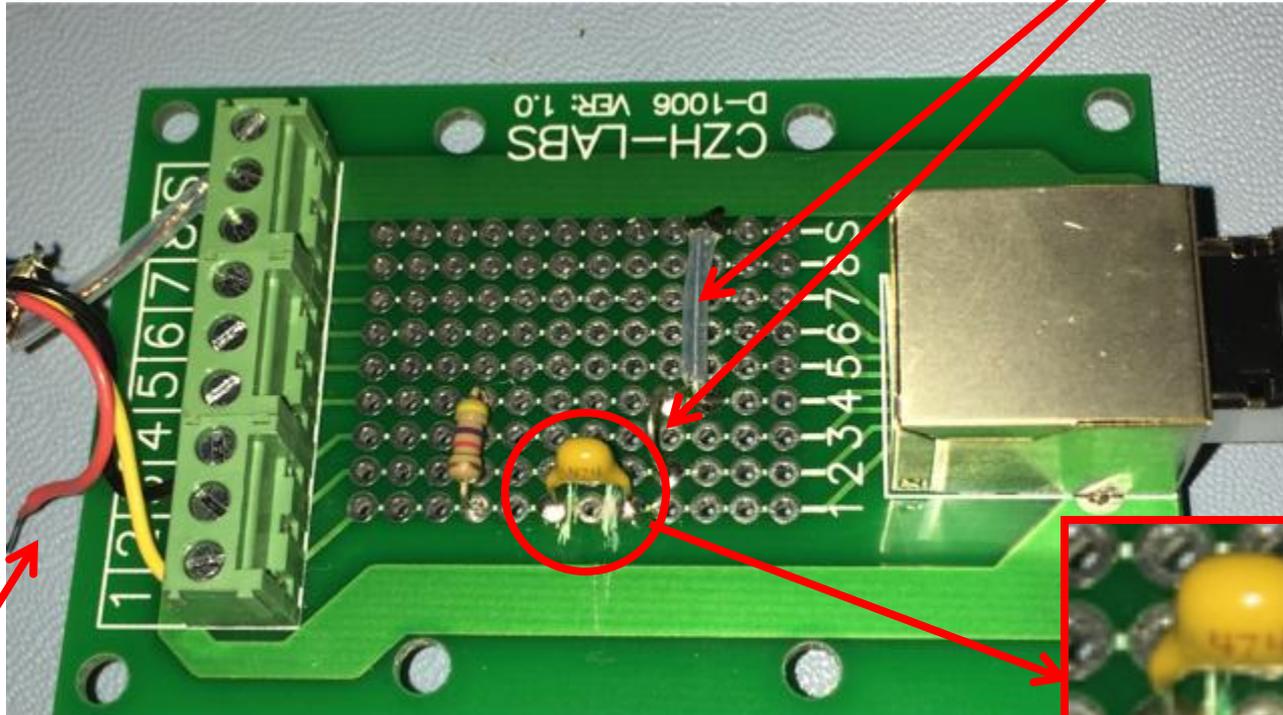
Board Construction

(Shielded Breakout With Terminals)

Notes:

- 1) This is an RJ45 SHIELDED cable breakout to circuit board with screw terminals. It has holes to solder components.
- 2) TRRS means Tip-Ring-Ring-Sleeve, 4-pin connector.

**Jumpers Added
To Connect Grounds and
Shield Lines Together**



Red Wire Not Used on TRRS connector.
It is normally the other sound channel in a stereo audio connection. CS520 is MONO only.



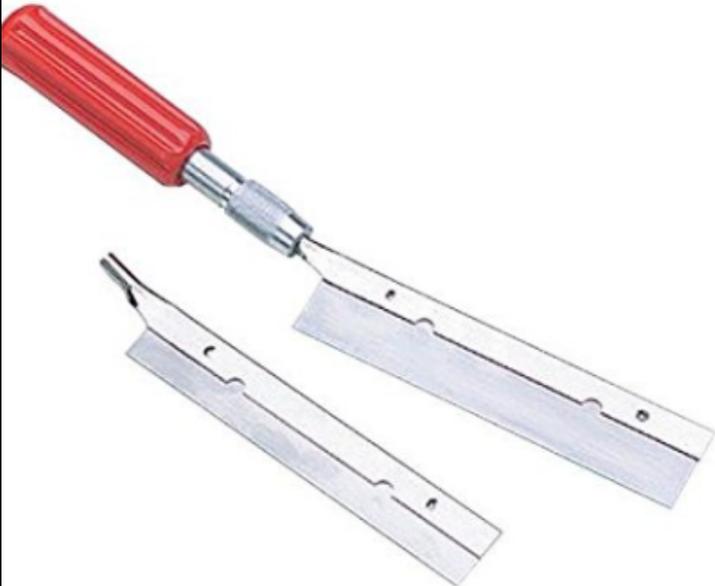
**Cut Trace by Scribing Circuit Board
With EXACTO Type Knife.
YOU MUST CUT TOP AND BOTTOM OF BOARD!**

Helpful Tool: Xacto X75300 Razor Saw Set

(Available at All Hobby Stores and Amazon)

https://www.amazon.com/Xacto-X75300-Precision-Razor-Saw/dp/B00004Z2U4/ref=sr_1_1?ie=UTF8&qid=1502015797&sr=8-1&keywords=xacto+x75300

Click Picture for Link



Elmer's Products
Xacto X75300 Precision Razor Saw Set
★★★★★ 164 customer reviews | 16 answered questions

Price: **\$10.88** ✓prime

i Use your **\$10.42** Amazon.com Gift Card balance and only pay an additional **\$0.46** for this item. [Learn More.](#)

Note: Available at a lower price from [other sellers](#), potentially without free Prime shipping.

Only 5 left in stock - order soon.

Want it Tuesday, July 18? Order within **3 hrs 13 mins** and choose **Two-Day Shipping** at checkout. [Details](#)

Sold by [BestSource OfficeSupplies](#) and [Fulfilled by Amazon](#). Gift-wrap available.

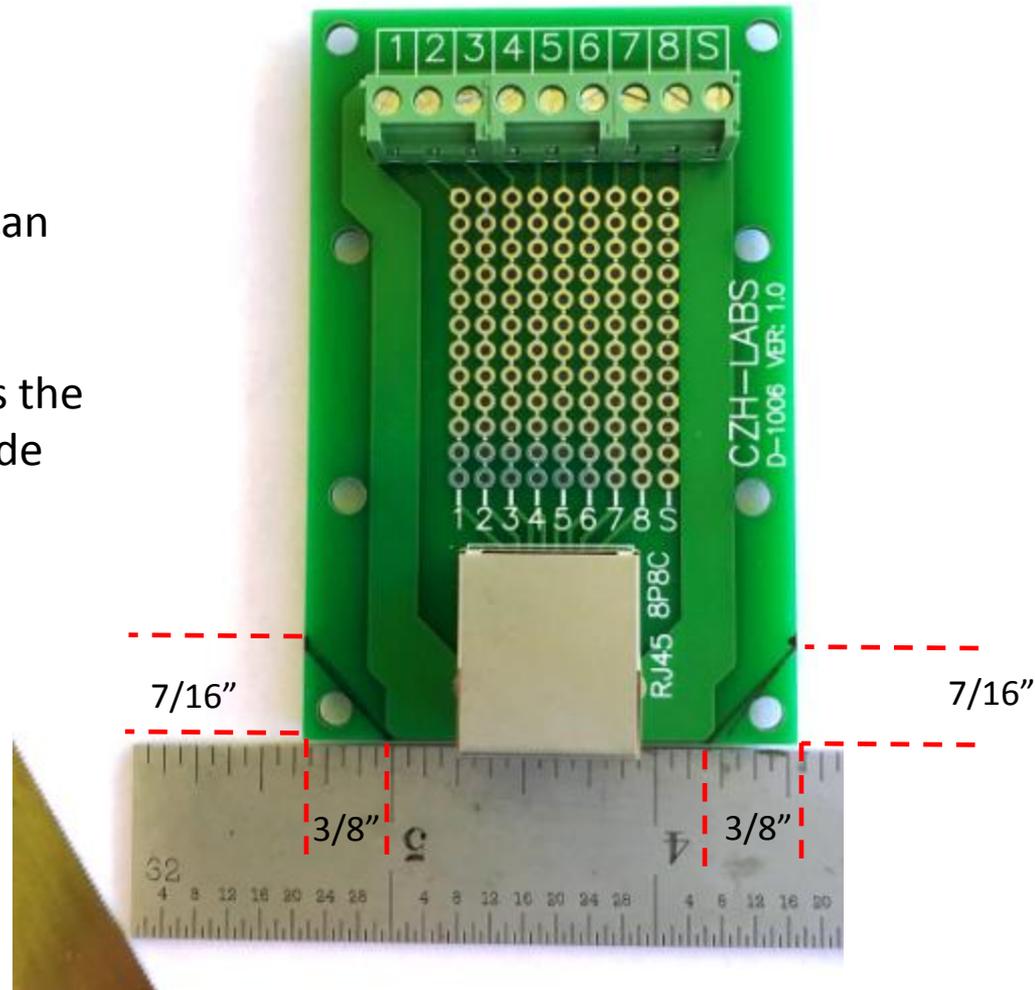
Eligible for [amazon smile](#) donation.

- Precision Razor Saw Set
- Delicate Sawing of Models and Railroad Tracks
- Great For Cutting Metal, Balsa Wood and Plastic
- Comes With Different Blades Types See Description For More Details
- This is an aftermarket of generic part
- Precision Razor Saw Set
- Delicate Sawing of Models and Railroad Tracks

Click to open expanded view

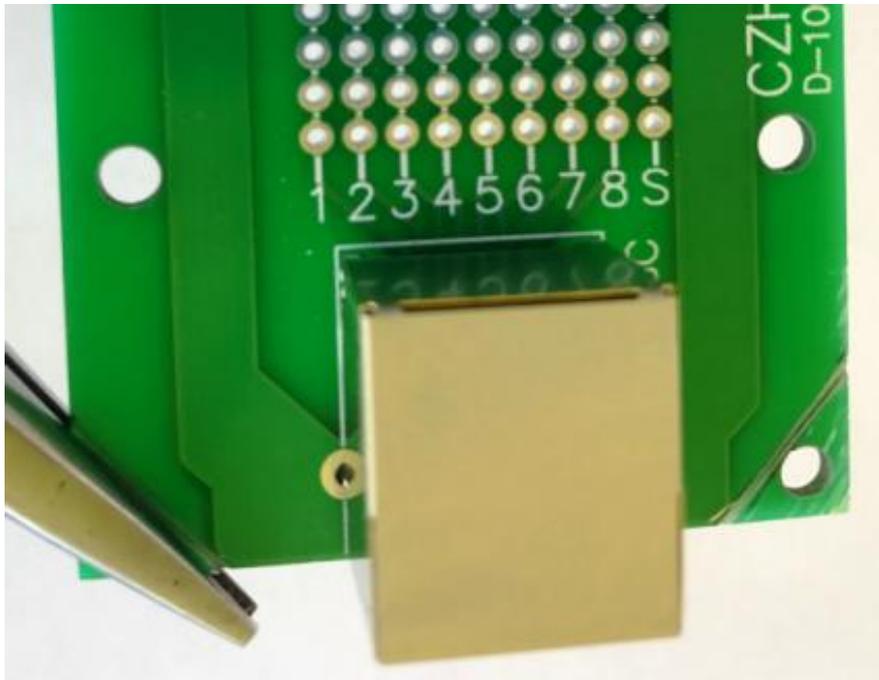
Must Notch Board Edges To Allow Fit Within Width of Box

- Place Ink Lines Where Cut is to Occur
- Mark Front and Back Side
- Where Eye Protection! Cut Fiberglass Can Get Into Eyes!
- Use the Razor Saw to Saw a Line Across the Ink Guide Marks, Both Front and Back Side



Snap Off at Saw-Grooved Lines

- Grab the Corners with Needle Nose Pliers and Snap Off
- Use File to Clean Edges and Check for Fit
- File Additional Amount if Needed for Perfect Fit



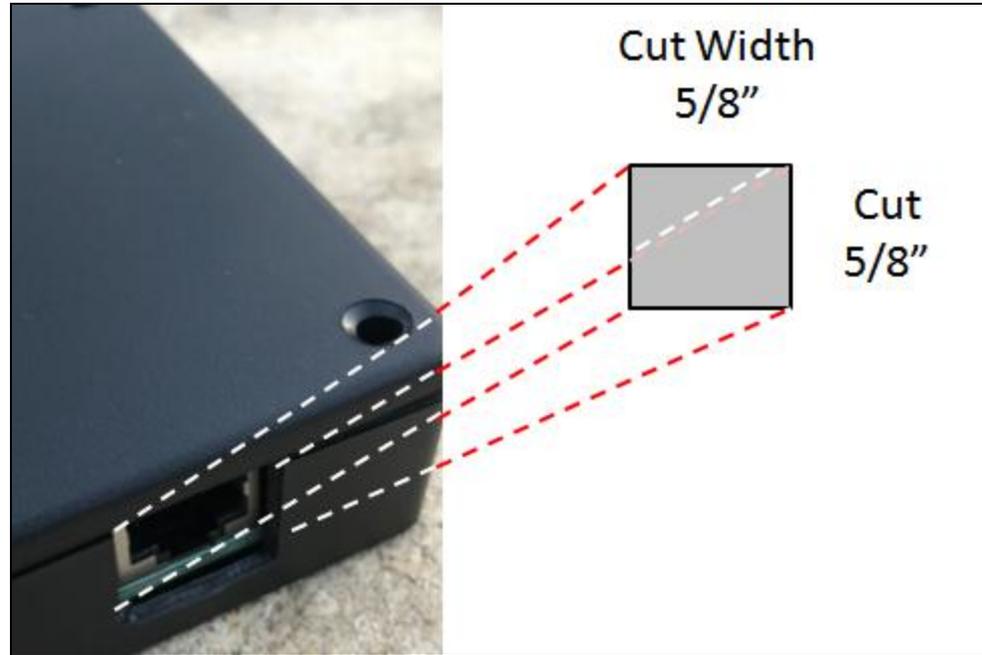
RJ45 Square Cut Out (5/8" Square)

Overview

- Horizontally Center the Area to Be Cut, 5/8" Width Total. Observe Vertical Cut Out Begins at Top Edge of Box (Not the Lid).
- Xacto Brand Saw Used to Cut Vertical Lines for RJ45, 5/8" Depth (see next page)
- Scribe Used to Mark Horizontal Line
- Pliers Used to Wiggle Free the Plastic
- Make a Small Notch for Cable Exit at the Rear of Box Also

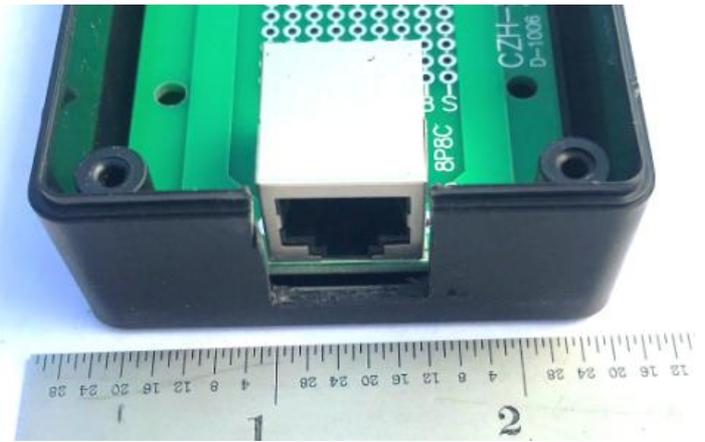
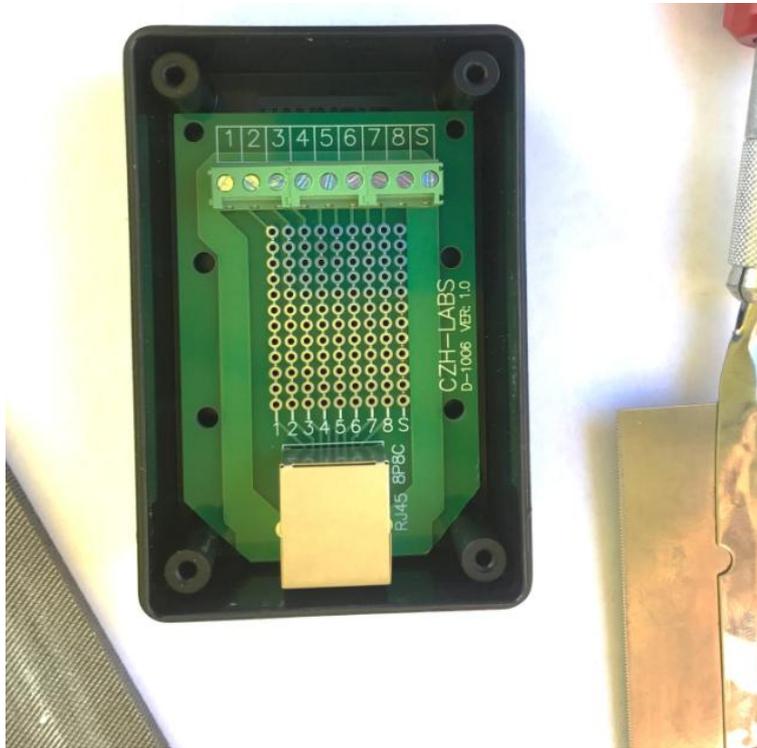


Square Cut Out For RJ45



Horizontally Center the Area to Be Cut, 5/8" Width Total. Observe Vertical Cut Out Begins at Top Edge of Box (Not the Lid).

Mark Lines Where Square Notch Is Needed for RJ45 and Saw Downward



DIY Project Completion

- Populate the Circuit Board with Components and Wiring Per Schematic
- Once the Interface Box is Complete
 - Connect CS520 to Interface Box using an RJ45 plug to RJ45 plug
 - Connect the 1/8" TRRS phone plug (4-conductor) to your cell phone or tablet device
 - If you play music you should hear the sound from the headset
 - If you make a phone call, the audio should be heard by party called
- DIY Project is Complete!
- Find a Good Location to Leave Your Phone While You Roam Around Your Location
- Making or Disconnecting a Call Will Require You to Be at Your Phone Since the Interface Box Only Permits Audio to Pass Back and Forth