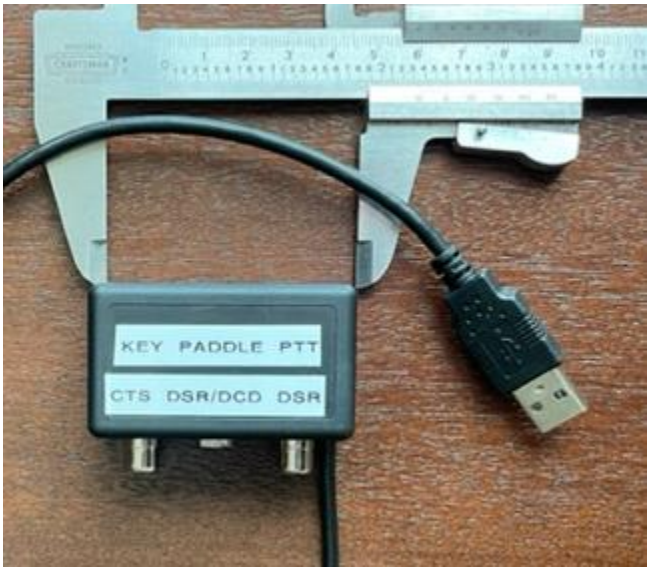
EZ Connections to RCForb Client for Remote Operations

PTT, Key, Keyer, and Paddles

(Includes the New Mark 2 Design for Portable Ops)



By K5PA, Gene Hinkle

4/2/2022

K5PA Design Concepts

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Tech Note - EZ Connections to RCForb PTT, Key, Keyer, Paddles - Mark2 (MK2)

Introduction

This USB/TTL breakout box that is very useful to access the control pins of the serial adapter when using programs like RCForb Client. My prior version dated 8/24/2022, was built into a small box with connectors and PTT switch added. This served me well while using on the ham radio desktop attached to my computer. I was able to operate Morse code using my iambic, dual paddle, straight key for SKCC events, and plain PTT for controlling the transmit/receive sequence of my radios. During 2022, I have been taking by radio to the field to operate POTA type activities but also while on vacations to operate my remote radios from afar. This current document keeps the original content of the interface box but adds a new section on the Mark 2 variant. This can be found at the end of the next section.

Original EZ Connect Interface for RCForb Client

What follows is the original content from the EZ breakout box interface giving RCForb Client settings options and the design for the breakout box.

Inside the box is just the USB/TTL circuit board with the wires connecting to the toggle switch, 1/8" jack, or phono plug. EZ and functional. Great for doing functional testing.

Figure 1. Original Breakout Box Interface

By assigning the **DSR** / **DCD** / **CTS** control pins to various connectors, you can use the breakout box to connect straight key, WinKeyer, PTT inputs, or Paddle Inputs. Very handy for quick access to the remote functions without needing a lot of adapter cables. The cable that is shown leaving the box is the USB2 connector to the computer.

1/8" TRS is connected to DSR=**Dit,** DCD=**Dah**

Phono Jack is connected to CTS=**Key**

PTT-Switch is connected to CTS =**External PTT**

RCForb Client Settings

The settings for the different functions in the RCForb Client are shown in the figures below.

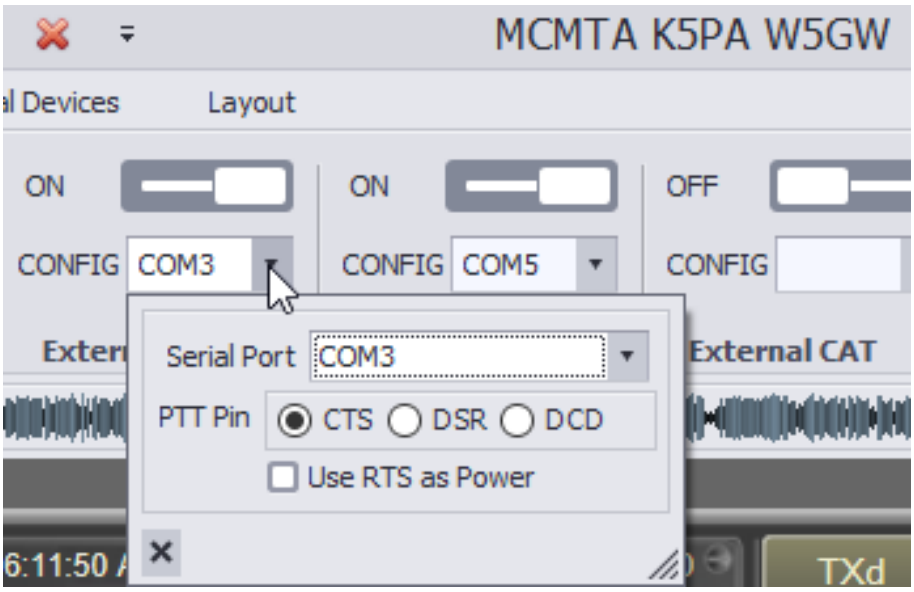


Figure 2. RCForb Client: **Control Devices** > **External PTT** settings

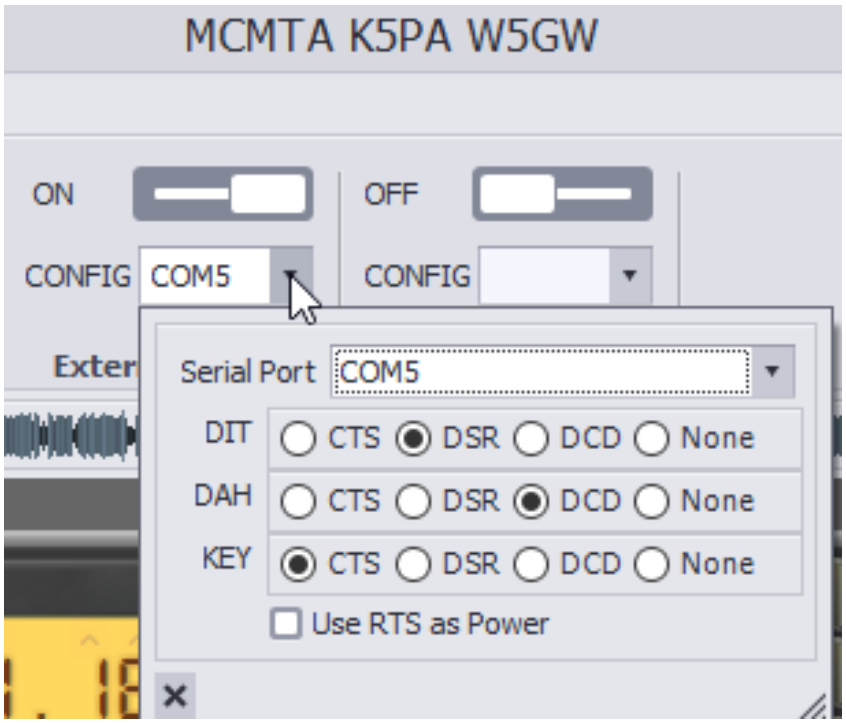


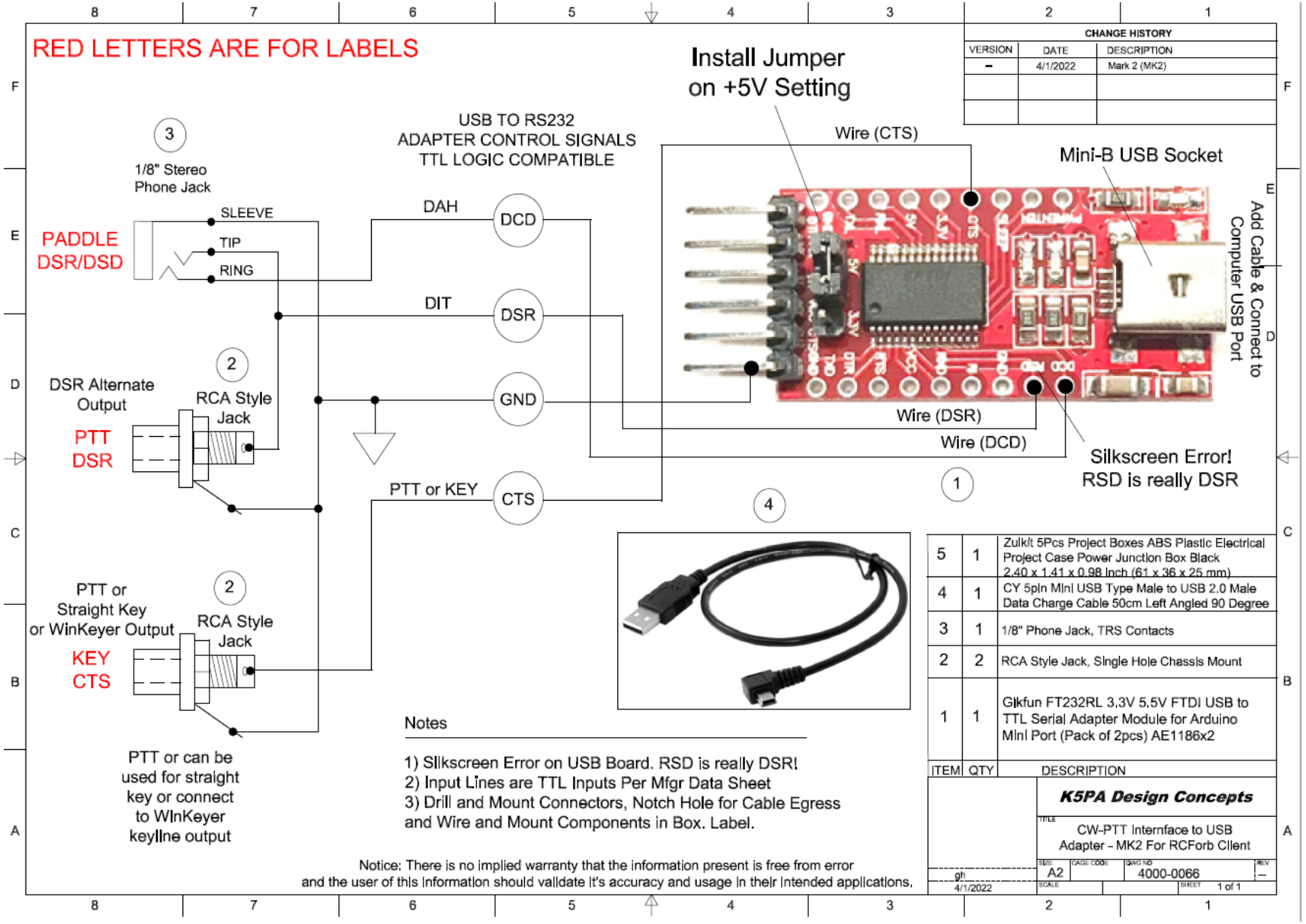
Figure 3. RCForb Client: **Control Devices** > **External CW** settings

Original Schematic

The schematic for the USB-TTL breakout box is shown on the next page. A small plastic box is used to mount the SPST switch for the PTT and the 1/8” TRS jack and RCA phono jack to the box.

A standard USB cable is used to connect the circuit board assembly (Mini-B USB Socket) to the computer.

Wiring is not critical but use precaution when soldering to the small circuit card assembly. Do not overheat soldering pads when attaching the fine wires and follow ESD guidelines to keep static away from the work area.


RED LETTERS ARE FOR LABELS
Install Jumper on +5V Setting
USB TO RS232 ADAPTER CONTROL SIGNALS TTL LOGIC COMPATIBLE
Wire (CTS)
Mini-B USB Socket
Add Cable & Connect to Computer USB Port
3
1/8" Stereo Phone Jack
SLEEVE
TIP
RING
PADDLE DSR/DSD
DAH
DIT
DCD
DSR
GND
CTS
2
DSR Alternate Output
RCA Style Jack
PTT
DSR
PTT or KEY
Wire (DSR)
Wire (DCD)
Silkscreen Error! RSD is really DSR
1
4
2
PTT or Straight Key or WinKeyer Output
RCA Style Jack
KEY
CTS
PTT or can be used for straight key or connect to WInKeyer keyline output
Notes
1) Silkscreen Error on USB Board. RSD is really DSR!
2) Input Lines are TTL Inputs Per Mfgr Data Sheet
3) Drill and Mount Connectors, Notch Hole for Cable Egress and Wire and Mount Components in Box. Label.
Notice: There is no implied warranty that the information present is free from error and the user of this information should validate it's accuracy and usage in their intended applications.
CHANGE HISTORY
VERSION DATE DESCRIPTION
– 4/1/2022 Mark 2 (MK2)
5 1 Zulkit 5Pcs Project Boxes ABS Plastic Electrical Project Case Power Junction Box Black 2.40 x 1.41 x 0.98 Inch (61 x 36 x 25 mm)
4 1 CY 5pin Mini USB Type Male to USB 2.0 Male Data Charge Cable 50cm Left Angled 90 Degree
3 1 1/8" Phone Jack, TRS Contacts
2 2 RCA Style Jack, Single Hole Chassis Mount
1 1 Glkfun FT232RL 3,3V 5,5V FTDI USB to TTL Serial Adapter Module for Arduino Mini Port (Pack of 2pcs) AE1186x2
ITEM QTY DESCRIPTION
K5PA Design Concepts
CW-PTT Internface to USB Adapter - MK2 For RCForb Client
gh 4/1/2022
A2
4000-0066
1 of 1

EZ Connect Interface for RCForb Client – MK2

Introduction to Mark 2

This section describes a similar interface but designed to be smaller and more versatile than the original. Most, if not all, components should be available from Amazon including the USB to TTL serial board, connectors, cables, and small enclosure. This project takes about 4 hours from mechanical assembly, wiring, setup, and test.

The design goal was mainly to provide a smaller interface box that could be taken in my *GO Kit* that would be rugged and not take up much space. Plus, it had to be versatile just like the original EZ Connect design. By using common connectors on the box (USB-A, RCA jacks, and 1/8” TRS phone jack it is very easy to interface to a number of devices in the shack including computer, telegraph keys and paddles, and push-to-talk button switches. The length of the box is only 2-3/8 inches, tiny indeed.

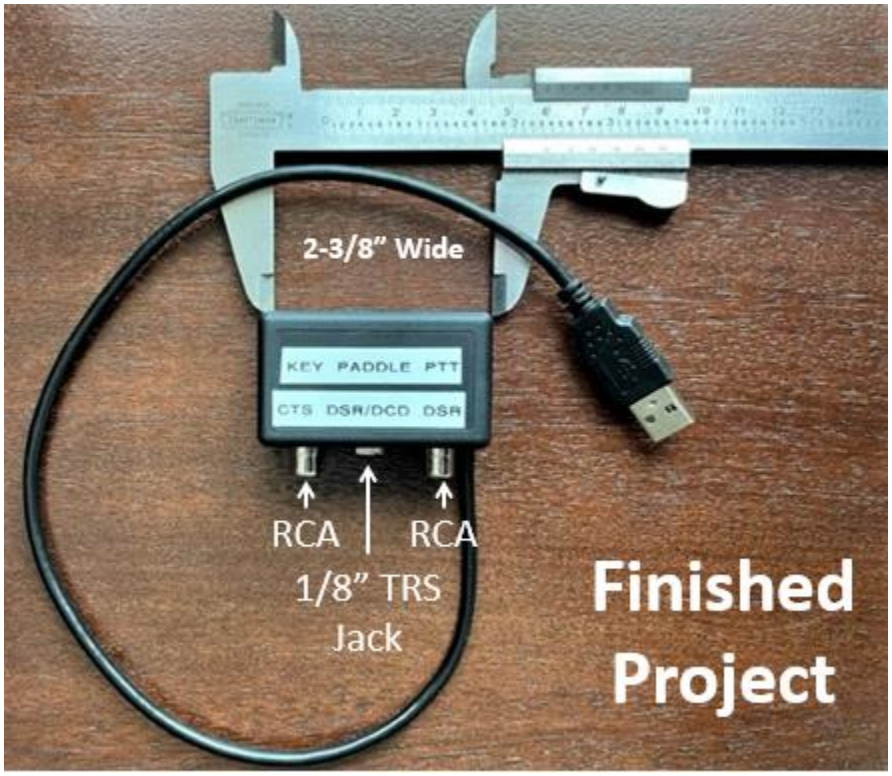


Figure 4 Photograph of the EZ Connect Interface – MK2

Mark 2 Schematic

The schematic diagram for Mark 2 is shown on the next page. It is very similar to the original with the addition the RCA phone jack to allow easy access to the DSR signal.

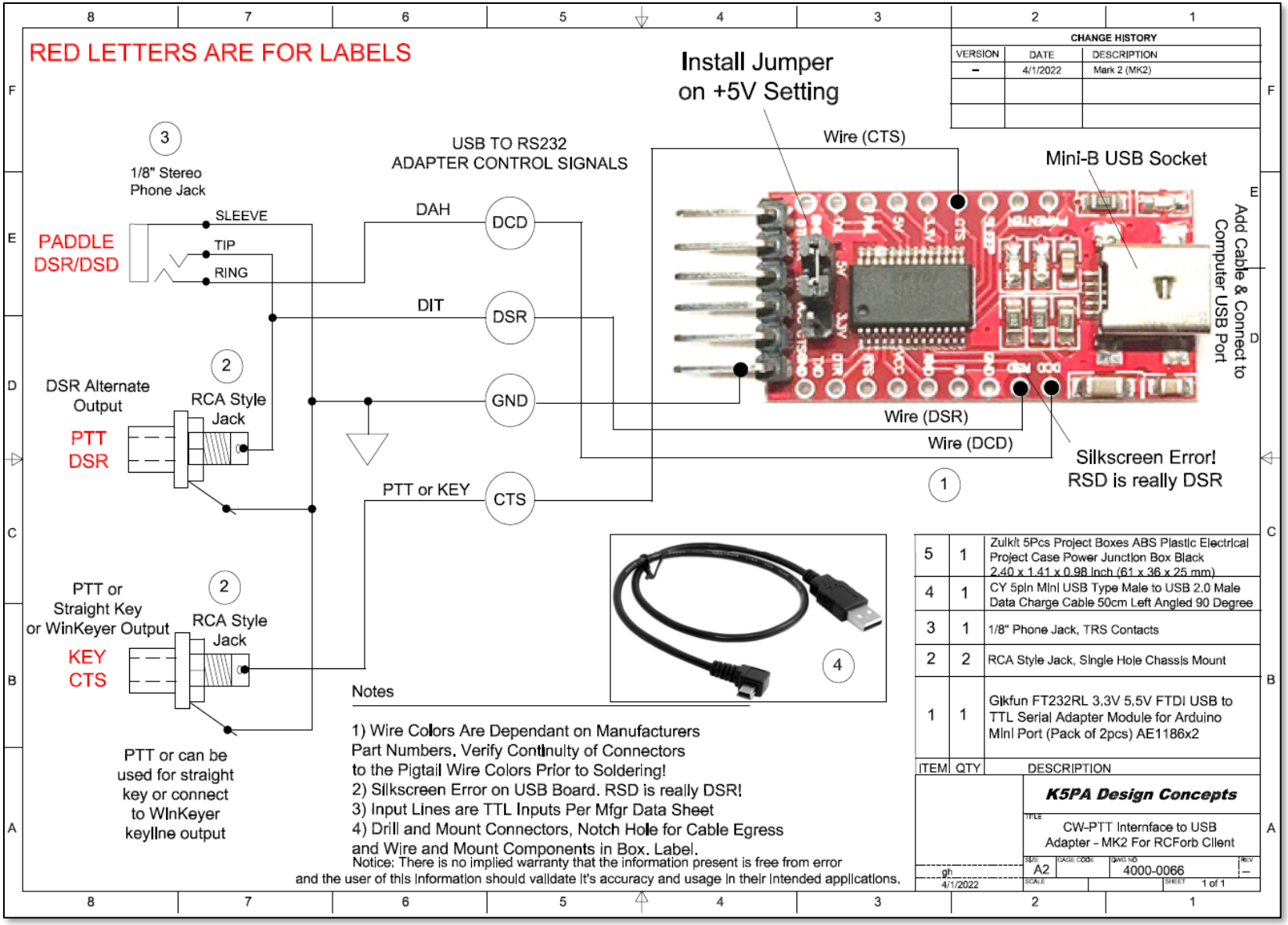
The material lists include the small box designation and the right angle Mini USB cable as listed on Amazon.

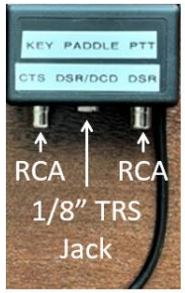
Mark 2 RCForb Client Settings Diagrams

After the schematic, a diagram is provided to ease the setup of the **External PTT** and **External CW** settings found in the RCForb Client. The goal was to provide simple setups for the 4 cases.

Table 1. Use Cases for Mark 2 Design

Use Case	**Attributes**
Push-to-Talk Switch	Hand or foot switch interfacing for CW/SSB/FM modes
Straight Key	Slow CW, SKCC, POTA activations
Twin Paddle (Iambic Key)	Home or field use, working DX, rag chew, no external keyer needed (RCForb Client has a keyer built-in)
WinKeyer	Use WinKeyer messages, easy speed control, familiar keyer interface


RED LETTERS ARE FOR LABELS
Install Jumper on +5V Setting
CHANGE HISTORY
VERSION | DATE | DESCRIPTION
– | 4/1/2022 | Mark 2 (MK2)
3
1/8" Stereo Phone Jack
SLEEVE
TIP
RING
PADDLE DSR/DSD
USB TO RS232 ADAPTER CONTROL SIGNALS
DAH
DIT
PTT or KEY
DCD
DSR
GND
CTS
Wire (CTS)
Mini-B USB Socket
Add Cable & Connect to Computer USB Port
Wire (DSR)
Wire (DCD)
Silkscreen Error! RSD is really DSR
1
2
DSR Alternate Output
RCA Style Jack
PTT
DSR
2
PTT or Straight Key or WinKeyer Output
RCA Style Jack
KEY
CTS
PTT or can be used for straight key or connect to WInKeyer keyline output
4
Notes
1) Wire Colors Are Dependant on Manufacturers Part Numbers. Verify Continuity of Connectors to the Pigtail Wire Colors Prior to Soldering!
2) Silkscreen Error on USB Board. RSD is really DSR!
3) Input Lines are TTL Inputs Per Mfgr Data Sheet
4) Drill and Mount Connectors, Notch Hole for Cable Egress and Wire and Mount Components in Box. Label.
Notice: There is no implied warranty that the information present is free from error and the user of this information should validate it's accuracy and usage in their intended applications.
5 | 1 | Zulkit 5Pcs Project Boxes ABS Plastic Electrical Project Case Power Junction Box Black 2.40 x 1.41 x 0.98 Inch (61 x 36 x 25 mm)
4 | 1 | CY 5pin Mini USB Type Male to USB 2.0 Male Data Charge Cable 50cm Left Angled 90 Degree
3 | 1 | 1/8" Phone Jack, TRS Contacts
2 | 2 | RCA Style Jack, Single Hole Chassis Mount
1 | 1 | Gikfun FT232RL 3.3V 5.5V FTDI USB to TTL Serial Adapter Module for Arduino Mini Port (Pack of 2pcs) AE1186x2
ITEM | QTY | DESCRIPTION
K5PA Design Concepts
CW-PTT Internface to USB Adapter - MK2 For RCForb Client
gh 4/1/2022
A2
4000-0066
1 of 1

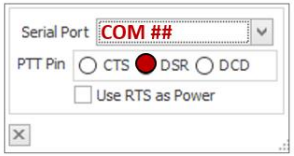


Push to Talk Switch

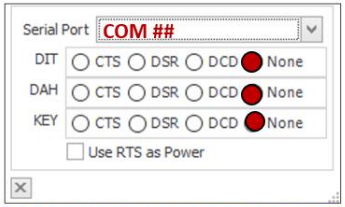
- SPST Switch Contacts (n.o.) to RCA plug connects to RCA Jack (DSR)
- Adjust COM ## to Appropriate USB COM Port for Your Interface

PTT Switch
(n.o. contacts)

External PTT



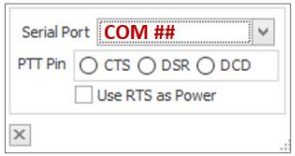
External CW



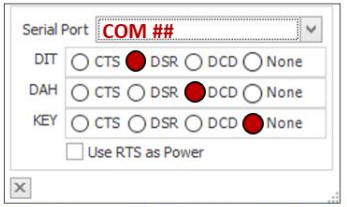
Twin Paddle (Iambic) Key

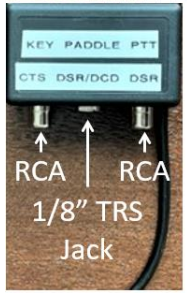
- Paddle Contacts Connects to **1/8" TRS Plug**
  Connects to **DSR/DCD Input**
- The Iambic Keyer is Built Into the RCForb Client Software Program!
- Adjust **COM ##** to Appropriate USB COM Port for Your Interface
- A

External PTT



External CW

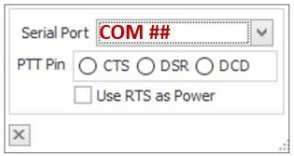




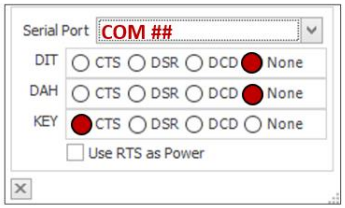
Straight Key

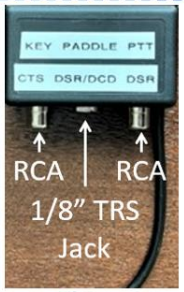
- Key's Contacts with RCA plugs Connects to **CTS** RCA Jack
- Adjust **COM ##** to Appropriate USB COM Port for Your Interface

External PTT



External CW

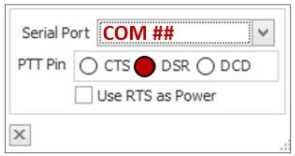




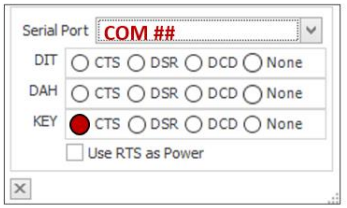
WinKeyer

- Uses WinKeyer's PTT1 & KEY1 Outputs
- **WinKeyer PTT1** RCA Plug Connects Into **DSR** RCA **Input**
- **WinKeyer KEY1** RCA Plug Connects Into **CTS** RCA **Input**
- Adjust **COM ##** to Appropriate USB COM Port for Your Interface

External PTT



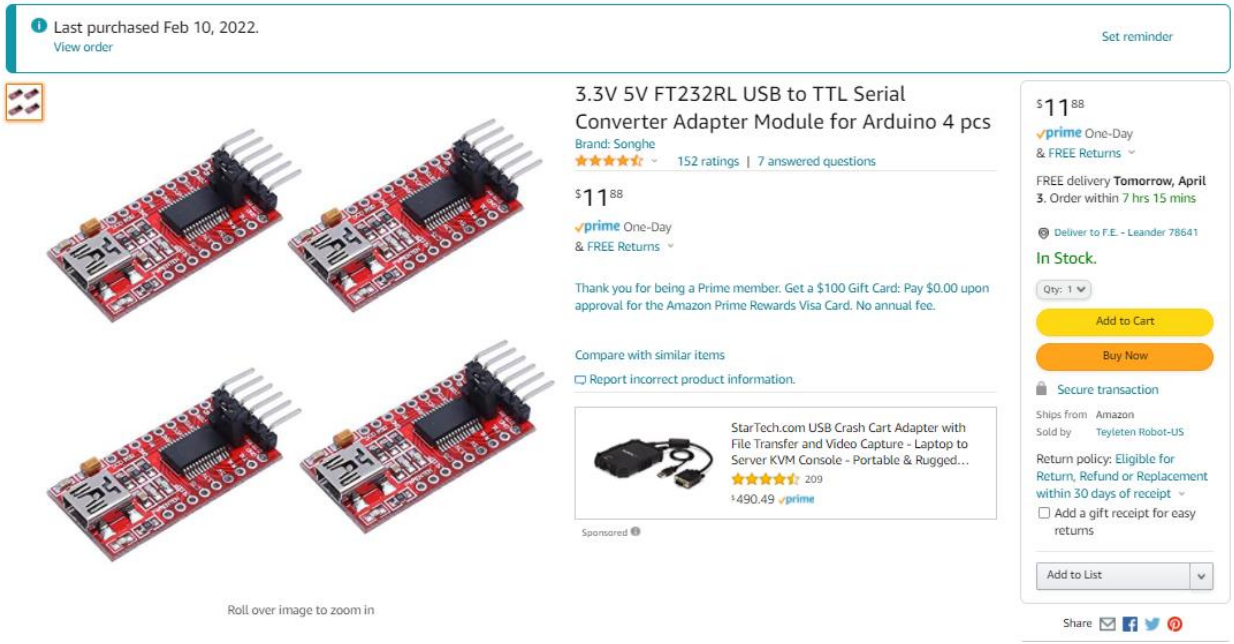
External CW



Parts List Amazon Link and Descriptions

Parts List Item #1, USB to TTL Converter Module

https://www.amazon.com/dp/B07XF2SLQ1?psc=1&ref=ppx_yo2_dt_b_product_details



Parts List Item #2, RCA Phone Jack

https://www.amazon.com/RuiLing-Nickel-Plated-Chassis-Adapter/dp/B07QWWJWB1/ref=sr_1_3?crid=3PA600G17D6HZ&keywords=rca+phono+jack+panel+mount&qid=1648897569&sprefix=rca+phono+jack%2Caps%2C75&sr=8-3

Roll over image to zoom in

RuiLing 20PCS Nickel Plated RCA Phono Chassis Panel Mount Female Socket Adapter (10PCS Black + 10PCS Red)

Visit the RuiLing Store

4.4 ★★★★☆ 60 ratings

Amazon's Choice for "rca phono jack panel mount"

$8.59

prime Same-Day & FREE Returns

Thank you for being a Prime member. Get a $100 Gift Card: Pay $0.00 upon approval for the Amazon Prime Rewards Visa Card. No annual fee.

- Type: Small type RCA Female Outlet
- Product material: Zinc alloy nickel plating
- Product size: approx.23 x 17 x 8mm/0.9*0.67*0.31in
- Application: Audio & Video, Lighting
- Packages: 10 x Red RCA Female Connector + 10 x Black RCA Female Connector

Specifications for this item

Brand Name	RuiLing
Connector Type	RCA
Ean	0713871351910
Part Number	RCA-Female-20
UNSPSC Code	26121600
UPC	713871351910

$8.59

prime Same-Day & FREE Returns

FREE delivery **Today** **5 PM - 10 PM** if you spend $25 on qualifying items. Order within 4 hrs 8 mins

Deliver to F.E. - Leander 78641

In Stock.

Qty: 1

Add to Cart

Buy Now

Secure transaction

Ships from Amazon

Sold by RuiLing

Return policy: Eligible for Return, Refund or Replacement within 30 days of receipt

Add a gift receipt for easy returns

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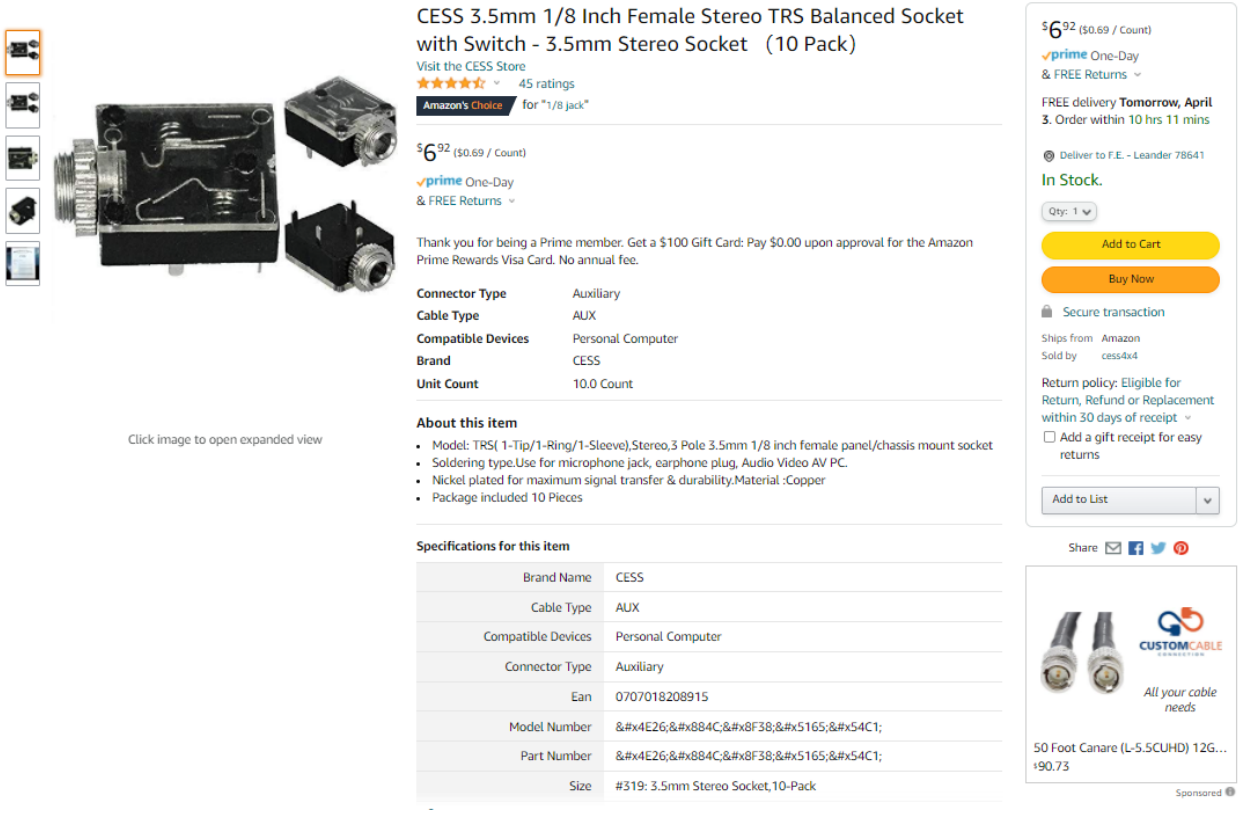
Parts List Item #3, 1/8 Inch TRS Phone Jack

https://www.amazon.com/CESS-Female-Stereo-Balanced-Socket/dp/B077D1NY4T/ref=sr_1_77?crid=2QGEH1F2KCR81&keywords=1%2F8+inch+trs+phone+jack&qid=1648899190&s=electronics&sprefix=%2Celectronics%2C61&sr=1-77



CESS 3.5mm 1/8 Inch Female Stereo TRS Balanced Socket with Switch - 3.5mm Stereo Socket (10 Pack)

Visit the CESS Store

45 ratings

Amazon's Choice for "1/8 jack"

$6.92 ($0.69 / Count)

prime One-Day & FREE Returns

Thank you for being a Prime member. Get a $100 Gift Card: Pay $0.00 upon approval for the Amazon Prime Rewards Visa Card. No annual fee.

Connector Type	Auxiliary
Cable Type	AUX
Compatible Devices	Personal Computer
Brand	CESS
Unit Count	10.0 Count

Click image to open expanded view

About this item

- Model: TRS(1-Tip/1-Ring/1-Sleeve),Stereo,3 Pole 3.5mm 1/8 inch female panel/chassis mount socket
- Soldering type.Use for microphone jack, earphone plug, Audio Video AV PC.
- Nickel plated for maximum signal transfer & durability.Material :Copper
- Package included 10 Pieces

Specifications for this item

Brand Name	CESS
Cable Type	AUX
Compatible Devices	Personal Computer
Connector Type	Auxiliary
Ean	0707018208915
Model Number	並行輸入品
Part Number	並行輸入品
Size	#319: 3.5mm Stereo Socket,10-Pack

$6.92 ($0.69 / Count)

prime One-Day & FREE Returns

FREE delivery **Tomorrow, April 3**. Order within 10 hrs 11 mins

Deliver to F.E. - Leander 78641

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Qty: 1

Add to Cart

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Return policy: Eligible for Return, Refund or Replacement within 30 days of receipt

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CUSTOMCABLE

All your cable needs

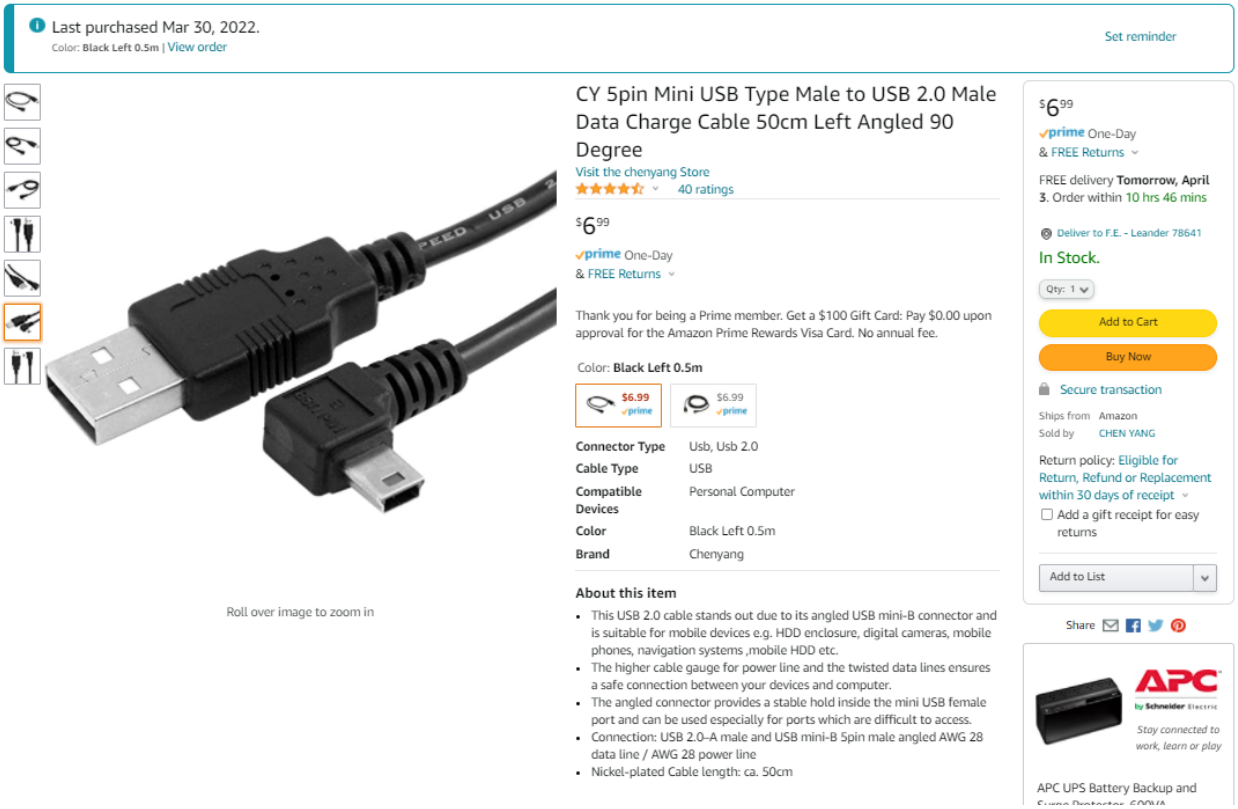
50 Foot Canare (L-5.5CUHD) 12G...

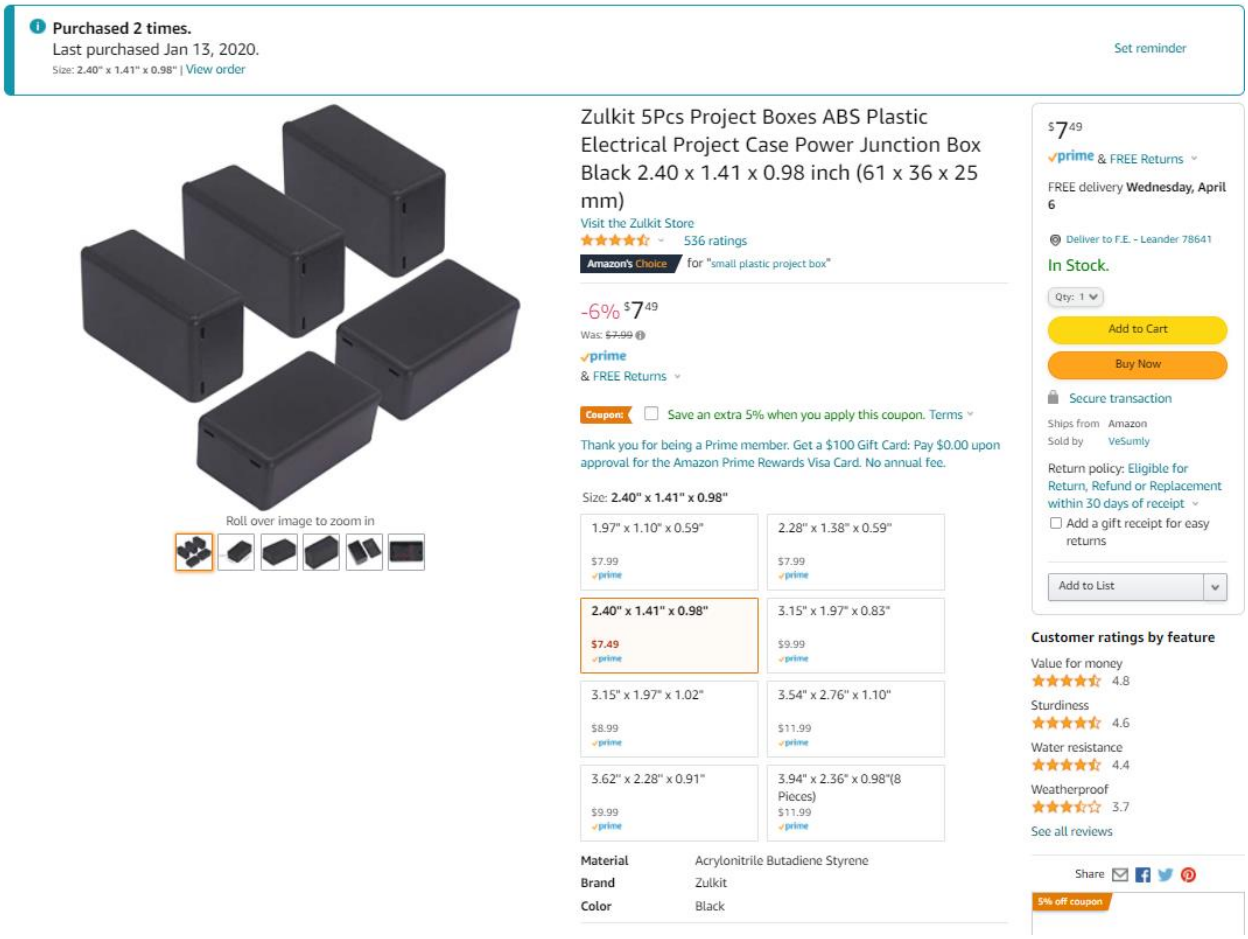
$90.73

Sponsored

Parts List Item #4, Mini USB Male Rt. Angle to USB-A

https://www.amazon.com/dp/B07JZ952ZQ?psc=1&ref=ppx_yo2_dt_b_product_details



Parts List Item #5, Project Box

https://www.amazon.com/Zulkit-Project-Plastic-Electrical-Junction/dp/B07Q11F7DS/ref=sr_1_16?crid=26UU8NX32D2LV&keywords=project+boxes+for+electronics&qid=1648898861&sprefix=project+box%2Caps%2C94&sr=8-16