

# Review of the BT-8U Portable USB Soldering Iron

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Do you need to make a few simple soldered connections when not at your bench, or outdoors, or perhaps whilst hanging off the side of a tower? Sure, you could use a fiddly little butane-powered iron – I have one! – or a small “pencil” type 120 VAC iron that you need to breakout the long extension cord for – I have three of those too!

But here is something much more convenient – a USB 5-volt, 8-watt soldering iron and you can put the power pack in your shirt pocket!

The left side of Figure 1 shows the BT-8U 5-volt, 8-watt soldering iron that I found online. On the right you can see my trusty, beaten-up and glued back together 10,000 mAh power bank that I used recently while soldering some #18 AWG wires near one of my antenna towers.

At 8 watts, the BT-8U would only consume 1.8 amps max, so most any 5V USB power pack should give plenty of time to get the work done. Note that it may also be powered from just about any typical 120V/5V/2A USB adapter – similar to what you got with your last cellphone!

On the model I have there is no temperature adjustment, just an on-off button. It has worked like a charm for me.

Figure 2 shows the circuit board and components inside my unit.

## Features

It is lightweight and portable and easy to hold and control and has a click on/off button.

It is also well-suited to soldering surface mount devices (SMD) and other small components or wires.

The replaceable soldering tip uses a ceramic heater element.

There is a pull-off tip protective cover so you don't stab yourself.

## Specs

Model BT-8U, inside printed circuit board (PCB) marking YM-LT-1 V1.1.

Tip temperature 380-400°C (measured at 385°C, @ 5.0 V, 0.98 amp)

Heats up in 15 seconds. Auto shut-off after 25 seconds (this did not work on my unit)

**Power:** USB 5V either from a USB Power Bank, or from an AC powered USB adapter.

**Price:** ranges from \$4 to \$15 or more

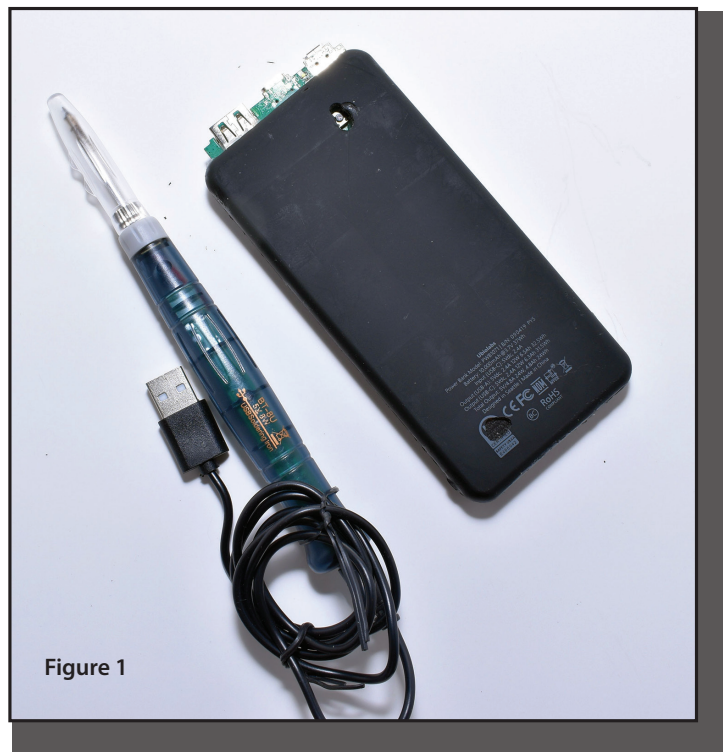


Figure 1

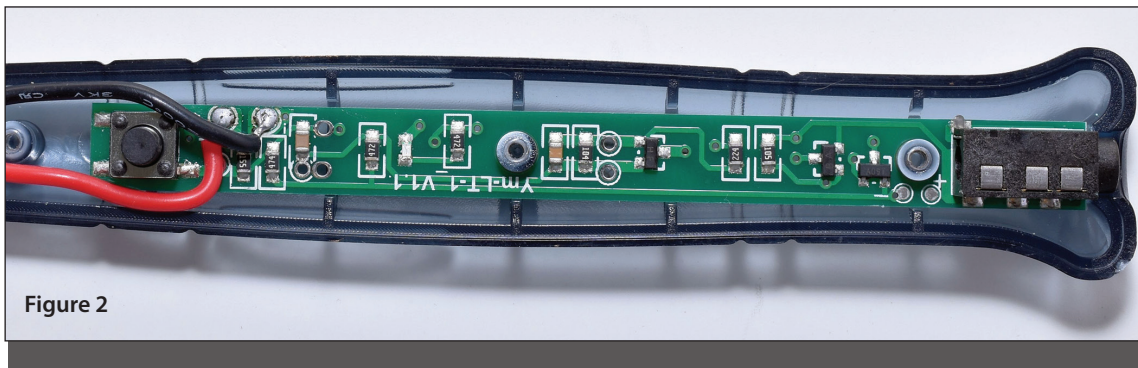


Figure 2

## Research

I was surprised to find a YouTube video by BigClive called “USB Soldering Iron Test and Teardown”, which was published in 2016 but had the same part number (BT-8U) and the same appearance as my recently purchased unit.

Inside the soldering iron, the on/off switch and other components and circuitry were different and more complex than in my unit. It was easy to find a number of identical looking units online that varied in accessories supplied and in other options like high and low temperature and, of course, in price and shipping costs. Caveat Emptor!

The author did a great job of showing how well the device soldered everyday PCB pads, components etc.

I concur with all the examples he shows and add to them the soldering of twisted stranded copper wires up to 18 AWG. However, large mass components like a PL-259 connector are beyond what you can do with 8-watts – although with perseverance I managed to solder the centre pin of a female BNC to a PC board plated-through hole.

You can find the BigClive video at:  
[www.youtube.com/watch?v=o-8D5t6TJYU](https://www.youtube.com/watch?v=o-8D5t6TJYU)

I also found a video by Dan Maloney at [hackaday.com](http://hackaday.com), called “USB Soldering Iron Is Surprisingly Capable”, which expands upon the first video and includes comments on the device including:

*“The teardown and analysis reveal a circuit that looks like it came right out of a Forrest M. Mims III book. We won’t spoil the surprise for you – just watch the video.”*

See: <https://hackaday.com/2016/04/25/usb-soldering-iron-is-surprisingly-capable/>

## Caveats

There is one important caveat you need to be aware of if you choose to operate your BT-8U version device from an AC-powered USB adapter. The +5V DC connection to the soldering tip is made to the outer shell of the tip. Many, if not most, of all AC USB adapters which employ switching technology use a “Y” capacitor – nominally 2.2nf – connected from the AC to the DC ground planes, which results in a small amount of AC leakage current at the tip.

Measuring from the soldering tip of my unit to mains ground (??), I measured 52.6 VAC. When measured using the “standard” 10k ohm resistor (as per IEC 60601-1 ??), this drops to less than one volt.

I measured 0.642 volts AC. This equates to an actual leakage current of 64 uA. Note for comparison that the leakage current limit for Medical Devices is 100 uA. Still, if used this way, it is possible that any voltage or electrostatic-sensitive device (ESD) components might be damaged.

## Conclusion

The BT-8U Portable USB Soldering Iron is a very cleverly designed device overall.

I recommend it, subject to the one caveat about leakage current if used from AC operated 5-volt sources.

When used as a portable soldering iron powered by a portable USB power bank, it is a useful addition to the Amateur Radio operators toolbox.

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