BAKU 858D SMD - STATION

Autor:
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Schematic and teardown of BAKU 858D SMD Rework station
General description

If you're familiar with SMD soldering, you probably know about the 858 series of chinese-made, el-cheapo SMD rework stations. There are probably tens of small companies manufacturing these stations (Atten, Baku, Scotle, YOUYUE, KADA, W.E.P, Saike, YIHUA, BEST, Quick, etc.). Of course, on the exterior they almost all look the same. The internals are quite different though, some of them use the Mikkon MK1841D3 microcontroller (which according to a thread over at eevblog is a clone of Samsung S3F9454), a Holtek HT46R23 or an AVR MCU.

The AVR-based ones are much better value since they're reprogramable, but there's no way to tell which station uses which MCU based on their looks. One model known to use an Atmega8 MCU is the Youyue 858D+.

BAKU 858D SMD rework station

Unfortunately mine (BAKU 858D) uses the MK1841D3 which is an OTP (one-time programmable) MCU so there is no way to tinker with it or write my own firmware. On the more positive side, it works quite well as-is, except for some minor quirks, like the temperature overshoot when turning it on and the overall quality of the components.

Recently the power button from my unit has broken off so I opened it up to replace it and also made some pictures of the interior. Hopefully these will help someone make a general idea of this model's quality and also help compare it with other "brands".

PCB reverse. Please note the crapacitors.

Front of the PCB. Nothing fancy over here either

The main transformer. 2 windings, one for the fan (25V) and one for the controller (10V)

One nice thing about these units is that they use a centrifugal fan instead of the membrane air pump like the older stations from Gordak. There is much less noise and vibration, not to mention they're more reliable. There's no heat generated inside and they can provide good airflow, up to 120 l/min (compared to 24 l/min for diaphragm pumps).

The blower fan

Both the heater and the fan are located in the hot air wand, an improvement over the older stations. This way the unit case is smaller since it only hosts the control circuitry and the transformer.

Wiring in the hot air wand

The heating element connections and the reed switch

The schematic

I had a little bit of free time so, as an exercise of patience I have reverse engineered the PCB and made a schematic for this unit. At the time of writing this, this is the only complete schematic for this model (Baku 858D, 858D04.PCB from 2014.06.09). The main reason for drawing it is for future troubleshooting. An interesting idea would be to modify the schematic to work with an AVR instead of the Mikkon MCU. The rest of the circuit seems to be well designed, no modifications are required.

Note that the schematic drawing might have mistakes. It comes without any warranty of any kind, use it at your own risk.

858D schematic part 1

858D schematic part 2

858D schematic parts list

Conclusion

All in all, this type of rework station is quite decent, I recommend it over the old Gordak stations which were noisy and bulky. What I don't recommend is getting this exact model. If you want to buy an 858D, find one which is better built by looking at the comments on the seller's site. Maybe a Youyue 858D+ would be the best choice (since it uses an Atmega8 MCU).

Posted by Alex at 5:35:00 PM
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Labels: 858d, reversing schematics, smd, soldering stations, teardown

26 comments:

rocketman221 October 13, 2016 at 9:41 AM

Apparently not all of the Youyue 858D units are the same. I just bought one, but it has the exact same board as your 858D.
With the help of your schematics, I will make an adapter board so I can run some custom firmware on it.

Reply

Replies

AlexDecember 3, 2016 at 4:51 PM

Interesting... A bit of consistency would be great from the factories. I would expect that boards are different between the "brands", but it seems they copy each other out. Good luck with the adapter. You might want to also look here: https://github.com/madworm/Youyue-858D-plus

Reply

AAOctober 21, 2016 at 11:17 PM

Do you know the maximum voltage the magnetic reed switch can take?

Reply

Replies

AlexDecember 3, 2016 at 4:52 PM

Hi. I have no idea because it has no markings on it. It also looks kind of fragile. In the soldering station it works with logic level voltage (5 volts), so I wouldn't trust it with more power than that.

Reply

LklunderOctober 29, 2016 at 1:50 AM

Thanks for sharing this info.
Recently I bought one unit identical, but when I turned it on for first time, the hot air station started it to work, and then I setting the temp at 200 degrees, then, when I remove the hot air gun from the station, the fan started work but never had flow hot air, and the display goes up imediatly at 892 number (I think are degrees) and after several seconds the display goes at H-E. I guess is an error of the signal from the temp sense or microcontroller or whatever.
Do you have some idea from this failure and if is possible to repair it?
Thanks in advance.

Reply

Replies

AlexDecember 3, 2016 at 5:00 PM

Hi. H.E. probably means heater error. I would check these:

1. Open the wand and check if the heater coil is not broken. It should read 60 ohms or more with multimeter

2. Check if the wires from the thermocouple are not broken. Use continuity check of multimeter and check them from wand to the pcb of the station. I think this is what makes the error. The MCU can't read the temperature because the sensor wire is interrupted.

3. Make sure the MCU is well inserted on the board and that there are no cold solder joints

4. If everything fails, replace the triac (BTA12-800B)

Good luck.

Reply

UnknownDecember 11, 2016 at 4:43 AM

Hi,

I had the same problem... first, "892", then "H-E"

It turned out to be a bad ground connection between the two pushbuttons. I soldered a wire between the outer ground pins of the pushbuttons, and it's now working perfectly.

The reason you get the "892" is because the negative lead of the thermocouple lead is grounded via the pushbuttons. If there is a break in the ground, the thermocouple is pulled to a higher voltage (via R31) and the opamp goes into saturation trying to amplify it.
The saturation voltage is about 4V, which the MCU interprets as ~892 deg. Then, after a couple of seconds it goes into error mode.

Anyway, check that the black thermocouple wire is properly grounded. In my case, the problem was intermittent, and showed up when the board flexed (due to pushing buttons).

Reply

Replies

AlexDecember 18, 2016 at 11:13 PM

Thank you for sharing your experience. Bad solder joints seem to happen much more often since the ROHS directives were implemented and lead was taken out of the solder.

Reply

UnknownDecember 11, 2016 at 4:44 AM

BTW: Thanks for putting all this info online!

Without it I would have never been able to fix my 858!

Reply

Replies

AlexDecember 18, 2016 at 11:14 PM

Thanks for the kind words, glad it helped :).

Reply

driftmanSeptember 23, 2017 at 10:43 AM

ciao la mia ha un problema:non parte la ventola e nel display mi scrive s-e.cosa puo' essere?

Reply

freddy rafael sanchezDecember 28, 2017 at 10:27 PM

muy buen info gracias y, saludos y prosperidad en este nvo año saludos freddy sanchez mga nicaragua

Reply

UnknownDecember 30, 2017 at 4:18 PM

hi
I had the same problem... first, "100", then "C-H I"

Reply

SamAugust 2, 2018 at 1:33 PM

Bought Gordak 958d. Unfortunately the arm got wrecked. Usually have 8 holes. I got an arm for 858d which was available worked through and is functional. The only issue is that the thermocouple doesn't work. I have to drop the temperature manually to a hundred then switch off via the main switch. This may not give a long time for the coil anyone who can help me to fix this I'll highly appreciate. WhatsApp +254728623063.thanks

Reply

AnonymousSeptember 9, 2018 at 3:13 AM

thank you it's so helpful

Reply

GalaxyFebruary 16, 2019 at 2:21 PM

This comment has been removed by the author.

Reply

GalaxyFebruary 16, 2019 at 2:22 PM

some segments of the display do not work in the first few minutes after switching on. then after a while the unit is switched on, the display segments begin to appear. what can it be? I have already changed the resistances to 51 ohms (R14-15-16). it seemed to work, but then it started again to give problems.

Reply

AnonymousFebruary 25, 2019 at 11:29 PM

ALGUIEN QUE TENGA PLANO ESQUEMÁTICO DE UNA ESTACIÓN YIHUA Modelo:YH-853AAA

Reply

AnonymousFebruary 25, 2019 at 11:31 PM

SOMEONE WHO HAS A SCHOOL MAP OF A YIHUA STATION Model: YH-853AAA

Reply

AnonymousAugust 17, 2019 at 10:25 AM

Do you have measurement or graph of amplified voltage vs temperature of the thermocouple or at least at 80c, 200c,300c? I want to make manual control using it.

Reply

jhontaba7May 26, 2020 at 2:50 AM

Hola saludo especial desde Colombia, una inquietud tengo una Quick 858D y el ventilador no proporciona el caudal de aire que debería de entregar, cuando se aumenta el aire del potenciometro sube pero algo muy mínimo, la parte de temperatura funciona muy bien.

Reply

Sid723June 17, 2020 at 3:25 AM

I have an 8586 combo soldering iron and heater. The soldering iron works, but the blower/heater will start then immediately stop with all dashes on the LEDs. Any ideas? I checked the heater and thermocouple and they seem to be fine.

Reply

Replies

cyberjbyousedAugust 19, 2020 at 4:13 PM

check the reed switch its inside the gun if i am not mistaken if it showing a steady dashes in the LED meaning its in energy saving mode check reed switch i hope its help

Reply

Sid723June 19, 2020 at 7:45 AM

I reseated the IC and touched up some soldering joints and now the blower works but speed control doesn't have range it used to.

Reply

Replies

Sid723July 20, 2020 at 3:40 AM

I found the problem was a badly soldered resistor. Resoldered it and all is good again.

Reply

FlorahmeldaJuly 9, 2020 at 10:59 AM

Psychology coursework writing services are essential and they have become very popular for those seeking psychology research writing help services since most of them seek Psychology Research Writing Services.

Reply

Modelo

BK-878L

Tipo de

Pistola de aire y soldadora 2 en 1

Característica

Pantalla Digital LED

Consumo de energía

700W

Tensión de entrada

220V / 110V

Ventilador

Ventilador sin escobillas, aire giratorio suave

El volumen de aire

120L/M.

Rango de temperatura

200 ° c ~ 480 ° c

Adaptador de corriente

Enchufe estadounidense 110V/Enchufe europeo 220V

Aplicación

Para teléfonos móviles, electrónica, placa lógica, reparación de BGA

Características:

1. Los productos cuentan con un circuito cerrado de transductor. ¿Pantalla LED Digital? ¿De alta potencia?

2. El flujo de aire puede ser ajustable y el soplado de aire es grande y los componentes de plástico de soplado suave no se deformarán. Como el zumbador y la interfaz externa del teléfono móvil.

3. Es inductancia en el mango. Funcionará rápidamente cuando tomas el mango, cuando el mango vuelva al estante, la máquina se detendrá automáticamente.

4. Automática para soplar aire frío para asegurar el calentamiento. La temperatura aumenta rápidamente y puede alcanzar la temperatura de ajuste solo en 3 o 5 segundos. Volumen pequeño, peso ligero, control de temperatura con precisión.

5. Retire BGA de forma segura, mantenga los pines intactos. Mucho más seguro y confiable. El soplado de PCB no lo hará blister.

Aplicación:

Gama completa de aplicaciones de retrabajo en centros de servicio a escala media y grande;
Reparación de dispositivos de sistemas móviles y de radio;
Teléfonos móviles, PDAs, teléfonos móviles, ordenadores portátiles, ordenadores portátiles y reparación de placas base;
LAN, nodos de red y reparación de equipos de sistemas de comunicaciones militares.

Mantenimiento de la estación de soldadura de hierro

Antes de la soldadura

Debe mojarse la esponja de limpieza primero y exprimir el exceso de agua. Estos pasos ayudarán a que la punta del soldador mantenga un buen efecto de limpieza.
Si no se usa una esponja de limpieza en húmedo, la punta de hierro de soldadura se verá dañada y difícil de planchar.

Después de la soldadura

Por favor, regule la temperatura a 250 grados Celsius, empezando a limpiar la punta del soldador y recubrir una nueva capa de estaño para mayor protección.
Cuando no necesitamos usar el soldador, debemos tapar la punta de hierro con estaño para evitar que se oxide.
Porque una vez que la punta de hierro se oxida, la punta de hierro de soldadura es muy difícil de derretir la lata. Incluso has regulado la temperatura a 450 grados centígrados, aún no se puede derretir. El estaño es muy importante.

Atención

Mejor para soldar con baja temperatura

La alta temperatura acelerará la punta del soldador y acortará su vida útil. Cuando la temperatura de la punta de hierro de soldadura es de hasta 470 grados Celsius, su velocidad de oxidación es dos veces más rápida que 380 grados Celsius.

No pulses mucho la punta de hierro

Al soldar, no pulses mucho la punta del soldador. De lo contrario, la punta se dañará y deformará. Siempre que la punta del soldador pueda acceder completamente al punto de soldadura, el calor puede transferir. Además, la selección de una punta de hierro de soldadura adecuada también es útil para transferir calor.

A menudo mantiene la Estaño

Reducirá la oxidación de la punta de soldadura de hierro y ampliará su vida útil. Después de usarlo, coloque una nueva capa de estaño cuando la temperatura de la punta sea más baja.

Mantenga la punta de hierro de soldadura limpia y limpia el óxido

Si hay óxido negro en la punta del soldador, es probable que no pueda planchar estaño. En este caso, necesita limpieza inmediatamente. Regule la temperatura a 250 grados Celsius, use la esponja de limpieza para limpiar el óxido en la punta de hierro y la placa de estaño finalmente.