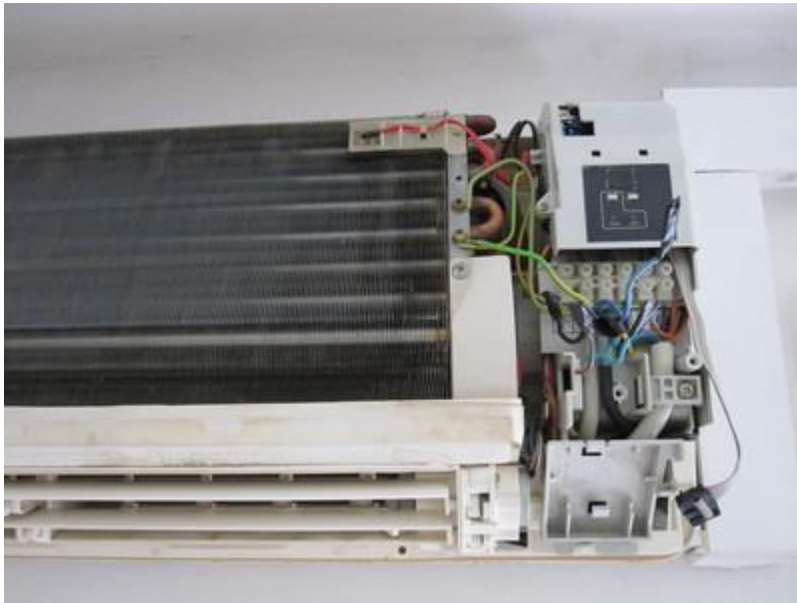


TROUBLES WITH AIR CONDITIONING

Last week the remote on my Airwell air conditioning unit stopped working. In a pure Murphy-inspired coincidence it failed on the exact same day when a service man was scheduled to come perform the yearly maintenance. After some embarrassing moments when I couldn't get the thing to start he got it going with manual controls.

I quickly verified with a camera that the remote control is actually transmitting, so the problem was obviously in the unit itself. He didn't have any spare parts with him so I decided to look into the issue myself before calling the service again and he was kind enough to show me how get the cover off.



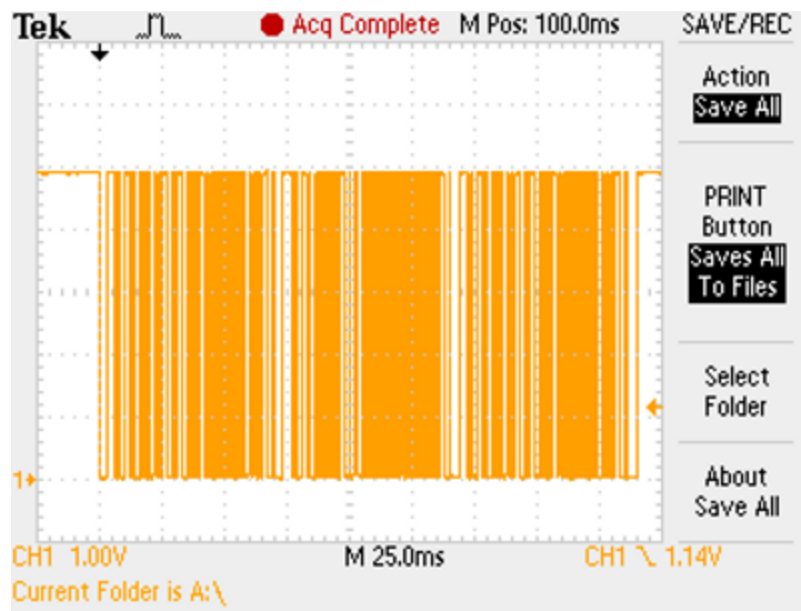
With the cover removed the location of the IR receiver board was immediately obvious. Right next to some shoddy wiring work that made me immediately reach for my soldering iron and shrink-tubing. I know electricians despise using a soldering iron, but you *do not* connect wires on a kilowatt-range equipment by merely twisting them together.



Any way, this is the so-called *receiver board*. In fact it holds four visible diagnostic LEDs, one high-intensity IR LED and one integrated optical receiver module, all on independent circuits. The receiver also has a tank capacitor on its supply line and a common-collector amplifier on its output.

Nothing was obviously broken and after connecting the receiver part to 5 V supply it sort of worked. However the output signal wasn't swinging rail-to-rail as it should be and it seemed to be affected by mechanical stress. None of the soldered joints seemed faulty upon visual inspection, but after reflowing them the problem went away.

I wonder what the IR LED is used for? It can't be for two-way communication with the remote control, because the remote control only has two LEDs and no receivers (at least that's on the model I have). When the unit was working again I checked with the camera and the IR LED is indeed active and seems to transmit something whenever the receiver receives a command from the remote control. Perhaps it is for synchronization if multiple units are installed in the same room?



By the way, the remote control emits a burst of data whenever a key is pressed. The packet is quite large, taking more than 200 ms to transmit. This is several times longer than in ordinary, say TV remotes, so it looks like it transmits the entire state, not just individual commands.

Source :

https://www.tablix.org/~avian/blog/archives/2011/06/troubles_with_air_conditioning/