

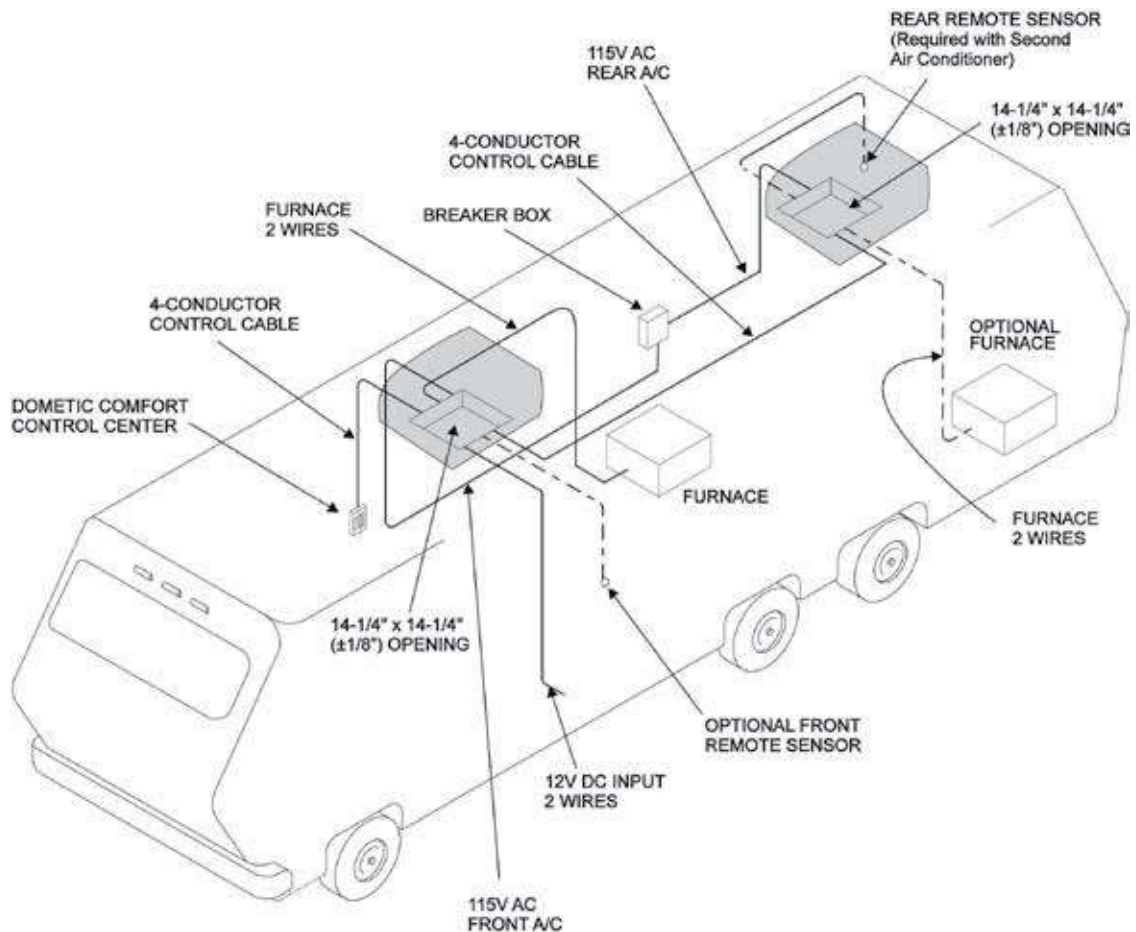
# Air Conditioning System

## ZONES

Each air conditioner is considered a separate Zone although there may be other zones without an A-C. My

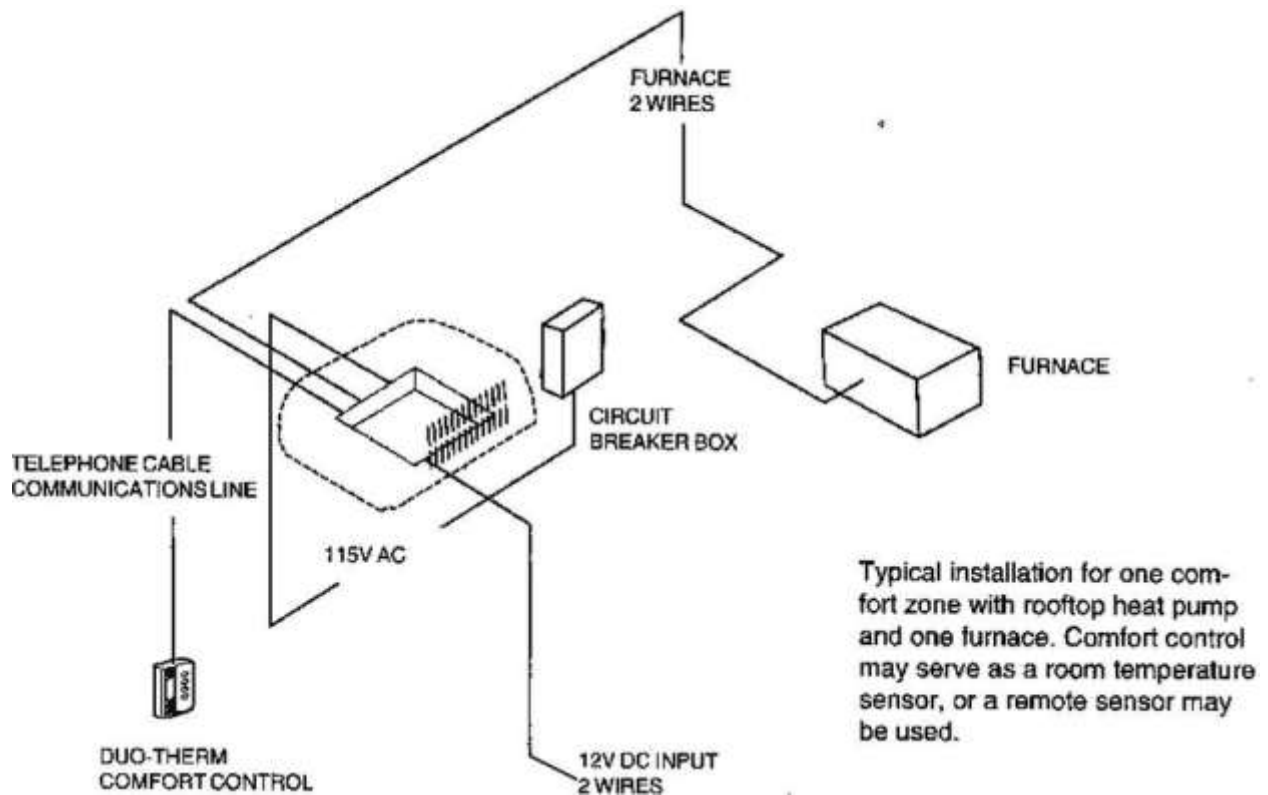
Motor home has four heating zones; Living Room, Bed Room, Bath Room and RV storage area. The Living and Bed Room Areas each have both a furnace and an A-C. The Bath Room has its own furnace with a separate manual thermostat and the storage area (including fresh, grey and black water tanks) has a knob-set fixed thermostat.

Figure (8) illustrates a typical Motor home dual zone layout while Figure (9) shows a Trailer single zone.



**Figure (8) Dual Zone Climate System**

There are two A-C units and two Furnaces. The front units utilize the Comfort Control Center (CCC) sensor which monitors the temperature in this zone. The CCC can control the back A-C and Furnace, however, it requires a rear sensor to monitor the actual temperature in the bed room area. The CCC will control, turn-on and turn-off, all of the A-C's and furnaces. Some high-end 45 foot Motor homes will carry three A-C's for a total of three zones. In fact, on a Florida trip I ran into a 45 foot unit that had 6 Dometic A-C's installed. It was originally built for a movie star and when she died the current owner purchased it for use on his Paradise Park site. How can these all be operated on 115 vac, 50 amp shore power, you might ask. They cannot, however, it also had a 20 KW generator that can easily handle all of the A-C's. Pretty cool you might say. This was actually a seven zone Motor home including the storage area. Since a CCC will only handle 4 zones it required two CCC's. The typical Airstream trailer is a single zone, Figure (9).



**Figure (9) Single Zone Climate System**

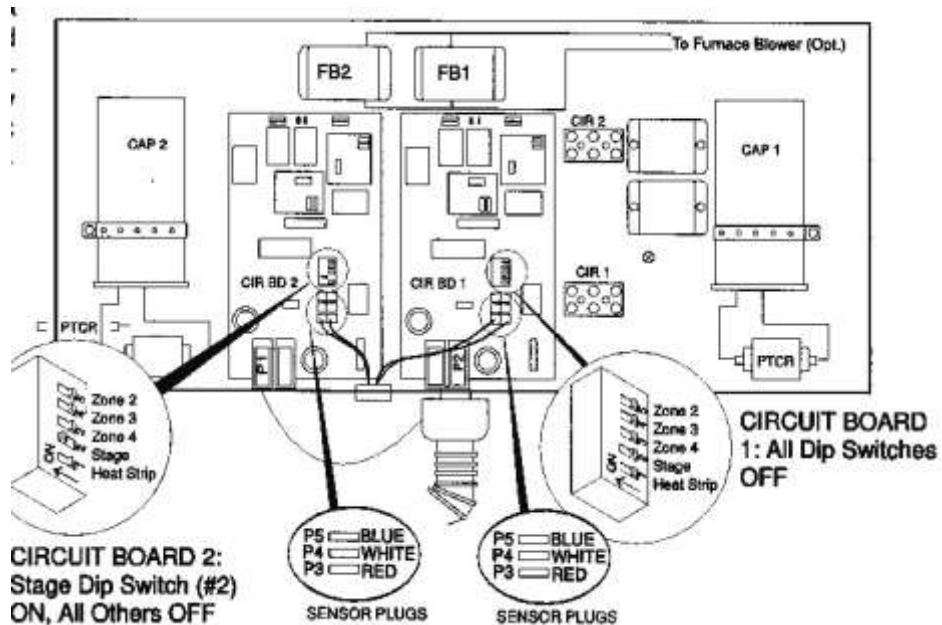
In a typical trailer, we have a single A-C and a Furnace to be controlled with a CCC. The sensor in the CCC is used to monitor the ambient temperature. For the larger 34 foot trailers, which carry two A-C units, there are multi zone capable CCC's just like a Motor home. Notice the Furnace wires going to the A-C. In all Comfort Control Climate installations the temperature is

monitored with the internal sensor and sent to the control board in the A-C. All climate related equipment is turned on or off from the A-C control board.

The wires in Figure (9) labeled 'Furnace 2 wires' send 12 vdc to operate the furnace. The 12 vdc going to the A-C operates the control circuit board. So if I sense the air temperature and send this info to the A-C the control board can control my furnace to keep the heat in the RV where I desire. I can also have the CCC control my heat pump and electrical heating strip if included in my model.

## CONTROL BOARD

Figure (10) illustrates a dual zone board with two start capacitors and two control boards to handle the two A-C units. Dipswitches are used to select the zone number, presence of heat strips, furnaces and a heat pump. If external sensors are used in different zones, they are plugged into the boards in the sensor plug area. Figure (11) shows the Electronic schematic of the circuit board that illustrates the 3-amp fuse. This fuse (automotive type) is used to provide 12 vdc for the CCC thermostat. It is accessed by removing the rooftop A-C cover.



**Figure (10) Dual Zone Board**

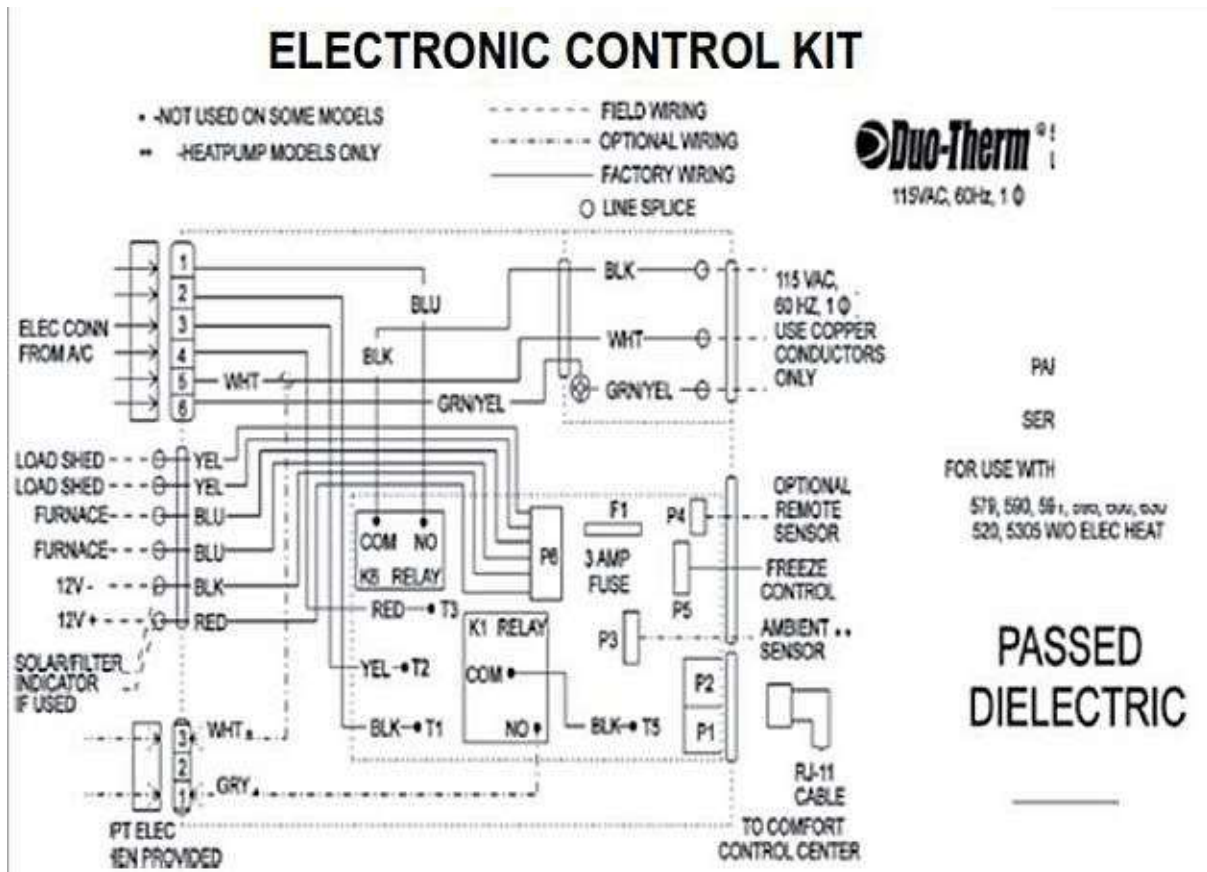
If the Thermostat is not working at all and you have determined that the fuse is blown, you may have a short in the CCC circuit board. So, before you finish on the roof check for the 12 vdc at the phone type plug and then make sure you have a working CCC.

The fuse is in the lower left hand corner of the Control Board, Figure (12). It is a purple 3-amp unit and should not be replaced with a higher rated fuse under any circumstance. Remember the fuse is actually protecting the telephone type wire that is going through the ceiling and down through the walls. If you draw too much current through the small telephone wire you could burn out the wire and be forced to open up the ceiling and walls to replace it.

The board contains several relay's which are used to send signals to the other climate equipment. A relay has switch contacts that can be used to switch high current loads or remotely control something. Your automobile uses a dozen or more relay circuits that provide high current capability for your headlights, heaters, air conditioning and even the engine starter (uses a solenoid type relay).

The Control Board actually uses 12 vdc to turn the various climate systems on and off through relays that receive signals from the computer system. The CCC computer talks to the Control Board Computer and provides complete control of our RV's climate. Actually, a pretty neat system.

The freeze control consists of a thermistor, which monitors the temperature of the evaporator coils and shuts off the compressor if it gets too cold. If the coils freeze the airflow will be blocked which can seriously damage the compressor. This is part of the 5-button CCC modification intended to solve a problem that existed with the 4-button units.



### Figure (11) Electronic Control Circuits

You can see the computer chip in the center of the board in Figure (12), which tells all of the relays what to do. The dipswitch is initially set to let the computer know what is installed in your RV and in you're A-C (heat pump, heat strip, furnace, etc). All of the equipment is registered at setup and only needs to be changed if equipment is added.



Figure (12) Control Board  
**TOP VIEW OF RJ-11  
MODULAR PLUG**

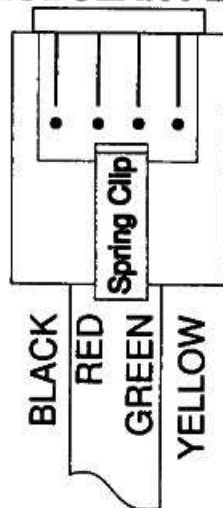
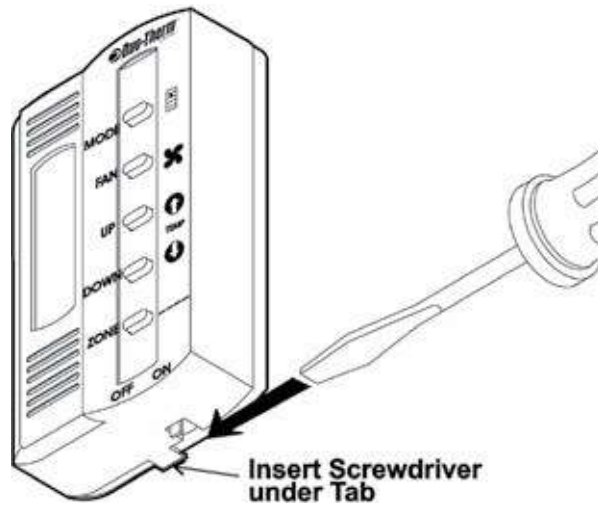


Figure (13) RJ-11 Control board Plug

Figure (13) illustrates the proper wiring color sequence for the CCC to A-C control board cable. There should be enough cable to replace the modular plug if it is defective. You will need a special telephone connector cable mounting tool to change this plug. I purchased mine at Home Depot for less than \$20 (with instructions) in order to replace the broken plug on my CCC. Be sure and get the wire color code in the correct order.



**Figure (14) Removing the CCC Cover**

Figure (14) illustrates how to remove the cover on the 4 or 5 button CCC so you can replace it, fix the cable or run some tests. To re-assemble just push the cover straight back.