There are special considerations that need to be made before installing the 835A and this section will help you plan ahead.

The Transmitter consists of three cabinet assemblies, the Exciter Cabinet Assembly and two Amplifier Array Assemblies. The Exciter Cabinet Assembly requires an AC Input of 208/240 VAC, Single Phase with a rating of 20 Amps. Each of the Amplifier Array Assemblies requires an AC Input of 208/240 VAC, Three Phase with a rating of 55 Amps or 208/240 VAC, Single Phase with a rating of 100 Amps . Check that the site has the voltage requirement needed.

The 835A is designed and built to provide long life with a minimum of maintenance. The environment in which it is placed is important and certain precautions must be taken. The three greatest dangers to your Transmitter are heat, dirt and moisture. Heat is usually the greatest problem, followed by dirt and then moisture. Over-temperature can cause heat related problems such as thermal runaway and component failure. Each Amplifier Tray in the Transmitter contains a Thermal Interlock Protection Circuit that will shut down that Tray until the temperature drops to an acceptable level.

To begin to design a suitable environment for your new Transmitter it is imperative that you understand what an "Ideal Environment" is and how it can enhance the overall performance and reliability of your Transmitter, thereby maximizing revenues by minimizing down time. A properly designed facility will have an adequate supply of cool clean air, free of airborne particulates of any kind, and without excessive humidity. An Ideal Environment will require temperature in the range of 40° F to 70° F year round, reasonably low humidity and a dust free room. It should be noted that this is rarely if ever attainable in the real world. However, the closer your environment is to the Ideal Environment the greater the operational elevation. A heat related problem may not surface for many months if the installation is completed during cool weather, but may suddenly appear during the heat of summer.

The fans designed and built into your Transmitter will remove the heat from within the Trays but additional means are required for removing this heat from the building. In doing this a few considerations should be noted. The first step is to determine the amount of heat to be removed. There are generally three sources of heat that must be considered. The first and most obvious is the heat from the Transmitter it self. 'The following example is for a 5kW Transmitter. The heat can readily be determined by subtracting the Average Power to the Antenna (3225 Watts) from the AC Input Power (20000 Watts). These numbers will be different for the 4 kW and 5 kW Transmitters but can be found by referring to the published literature or directly from Axcera. This number in Watts (16775) is then multiplied by 3.41 which gives (57202.75) the BTU's to be removed every hour. 12,000 BTU's per hour equals one ton, so a five ton air conditioner will cool a 5 kW Transmitter. The second source of heat is other equipment in the same room. Calculate this number as you did above. The third source of heat is equally obvious but not as simple to calculate. This is the heat coming through the walls, roof and windows on a hot summer day. Unless the underside is exposed, the floor is usually not a problem. Determining this number is usually best left up to a qualified HVAC Technician. There are far too many variables to even estimate this number without detailed drawings of the site showing all construction details. The sum of these three sources is the total amount of heat that must be removed. There may be other sources of heat, such as personnel, and all should be taken into account.

Now that you know the amount of heat that must be removed we will consider how this can be accomplished. Your options are air conditioning, ventilation or a combination of the two. Air conditioning is always the preferred method and is the only way to approach the Ideal Environment.

Ventilation will work quite well if the ambient air temperature will be below 100° F or about 38° C and the humidity should be at a reasonable level. In addition, the air stream must be adequately filtered to ensure that no airborne particulate of any kind will be carried into the Transmitter. The combination of air conditioning for summer and ventilation during the cooler months is acceptable when the proper cooling cannot be obtained through the use of ventilation alone and air conditioning year round is not feasible for whatever reason. However, **operation of air conditioning and ventilation simultaneously is not recommended** because this can cause condensation in Transmitters. For tube type Transmitters this can be especially serious if the condensation forms in the tube cavity and creates damaging arcs.
A few precautions should be observed concerning an air conditioning system.

1. Air conditioners have an ARI nominal cooling capacity rating. In selecting your air conditioner do not assume you can equate this number to your requirements. Make certain that your contractor uses the actual conditions you wish to maintain in determining the size of the unit. With desired conditioned room temperature under 80° F the unit must be derated, possibly by a substantial amount.

2. Do not have the air conditioner blowing directly onto the Transmitter. Condensation may occur on, or worse, in the Transmitter under certain conditions.

3. Do not isolate the front of the Transmitter from the back with the thought of air conditioning the front only. Cooling air is drawn in the front of all Transmitters and in the front and back of others. Any attempt to isolate the front from the rear will adversely affect the cooling air flow.
4. Interlocking the Transmitter with the air conditioner is recommended to preclude operation of the Transmitter without the necessary cooling.

5. The periodic cleaning of all filters is a must.

When using ventilation alone, the following general statements apply.

1. The Blower with attendant filters should be on the inlet, thereby pressurizing the room which prevents the ingress of dirt.

2. The inlet and outlet should be on the same side of the building, preferably the leeward side. The pressure differential created by wind will be minimized. Only the outlet may be through the roof.

3. The inlet and outlet should be screened with 1/8" hardware cloth (preferred), galvanized hardware cloth (acceptable).

4. Cooling air should enter the room as low as practical but in no case higher than four feet above the floor. The inlet must be located where dirt, leaves, snow, etc. will not be carried in with the cooling air.

5. The exhaust should be located as high as possible. Some ducting is usually required to insure complete flushing of heated air with no stagnant areas.

6. The filter area must be adequate to insure a maximum air velocity of 300 feet per minute through the filter. This is not a conservative number but a never exceed number. In a dusty or remote location, this number should be reduced to 150 CFM.

7. The inlet and outlet(s) must have automatic dampers that close any time the ventilation blower is Off.

8. Where Transmitters are regularly Off for a portion of each day, a temperature differential sensor controlling a small heater must be installed. This sensor will monitor inside and outside temperatures simultaneously. If the inside temperature falls to within 5° F of the outside temperature the heater will come On. This will prevent condensation when the ventilation blower comes On and applies even in the summer.

9. A controlled air bypass system must be installed to prevent the temperature in the room from falling below 40° F during Transmitter operation.

10. The blower should have two speeds, which are thermostatically controlled, and interlocked with the Transmitter.

11. The blower on high speed must be capable of moving the required volume of air into a half inch of water pressure at the required elevation. The free air delivery method must not be used.

12. Regular maintenance of the filters if present can not be overemphasized.

13. Tube Transmitters should not rely on the internal blower for exhausting cooling air at elevations above 4000 feet. For external venting, the air vent on the cabinet top must be increased to an 8" diameter for a 1 kW Transmitter and to 10" for 4, 5 kW, 6 kW & 10 kW Transmitters. An equivalent rectangular duct may be used but in all cases the outlet must be increased in area by 50 % through the outlet screen.

14. It is recommended that a site plan be submitted to Axcera for comment before installation commences.

In calculating the blower requirements, filter size and exhaust size, use the following guide. If the total load is known in Watts, you will need 2000 CFM into 1/2" of water for each 5000 Watts. If the load is known in BTU's you will need 2000 CFM into 1/2" of water for each 17,000 BTU's. The inlet filter must be seven square feet minimum, larger for dusty and remote locations, for each 5000 Watts or 17,000 BTU's. The exhaust must be at least four square feet at the exhaust screen for each 5000 Watts or 17,000 BTU's. The above is a general guide and may need modified for unusually severe conditions.

A combination of air conditioning and ventilation installation should not be difficult to design using the above information. System interlocking and thermostat settings should be reviewed with Axcera. As with any equipment installation it is always good practice to consult the manufacturer when questions arise. Axcera may be contacted at (724) 873-8100.