FINAL TEST REPORT

MAXR 100 PERFORMANCE TEST
TEST UNIT: ONE FIVE TON ROOFTOP AIR CONDITIONER UNIT

TEST AND TEST REPORT AUTHORIZED BY:

COLD AIR, LLC
MIDLOTHIAN, VA
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MAXR 100 ENERGY CONSUMPTION TEST ON ONE FIVE TON ROOFTOP AIR CONDITIONER

I. PURPOSE

The purpose of this document is to present and summarize the results of the data collected and analyzed from the Pre and Post Treatment operation of one five ton rooftop air conditioner located on the roof of a race track. **Pre treatment** refers to the operation before treatment with the proprietary metal conditioner and super-lubricant MAXR 100 and **Post treatment** refers to the operation following the MAXR 100 treatment.

II. TEST OBJECTIVES

The basic objective of the test is to measure the electrical kWh consumption and BTU-Hr per kWh cooling performance of the test unit both before and after treatment with the metal conditioner and super lubricant MAXR-100. When the cooling burden is maintained relatively constant, past treatment of such units with MAXR 100 has shown a 10 to 30 percent reduction in the long term, average electrical kWh consumption, along with a substantial improvement in cooling capacity. Units with improved cooling capacity do not require as much electrical energy to cool the same space.

III. RESTRICTIONS ON PRE AND POST TREATMENT COMPARISONS

As shown in figure 1 on page 3 below, the design of these roof top air conditioners is such that the outside air mass is used as the heat sink that absorbs the heat removed from the interior of the structure where each is installed. The air conditioner condenser coil transfers the heat that is removed from the building into the outside air mass. To facilitate this task, two or three electric fans move outside air through the condenser coil.

The coil on the upper left in figure 1 below is the condenser, and from this figure the following is clear:

- The high pressure discharge side of the compressor is deposited into the condenser coil
- As the refrigerant condenses in the condenser coil, it releases the heat collected from the evaporation process in the evaporator coil
- The outdoor air flows through the condenser coil to remove the heat collected from the building
- Two or three electric fans (not shown) move the outside air through the condenser coil

Because the outdoor air temperature is a variable quantity it has an effect on the cooling capacity of the air conditioner units. On any typical summer day, the outdoor air temperature rises from about 60 degrees to a peak of 95 plus degrees in the early afternoon. In late afternoon and evening the outdoor air mass cools. When the air temperature rises, the cooling capacity is normally reduced**.**

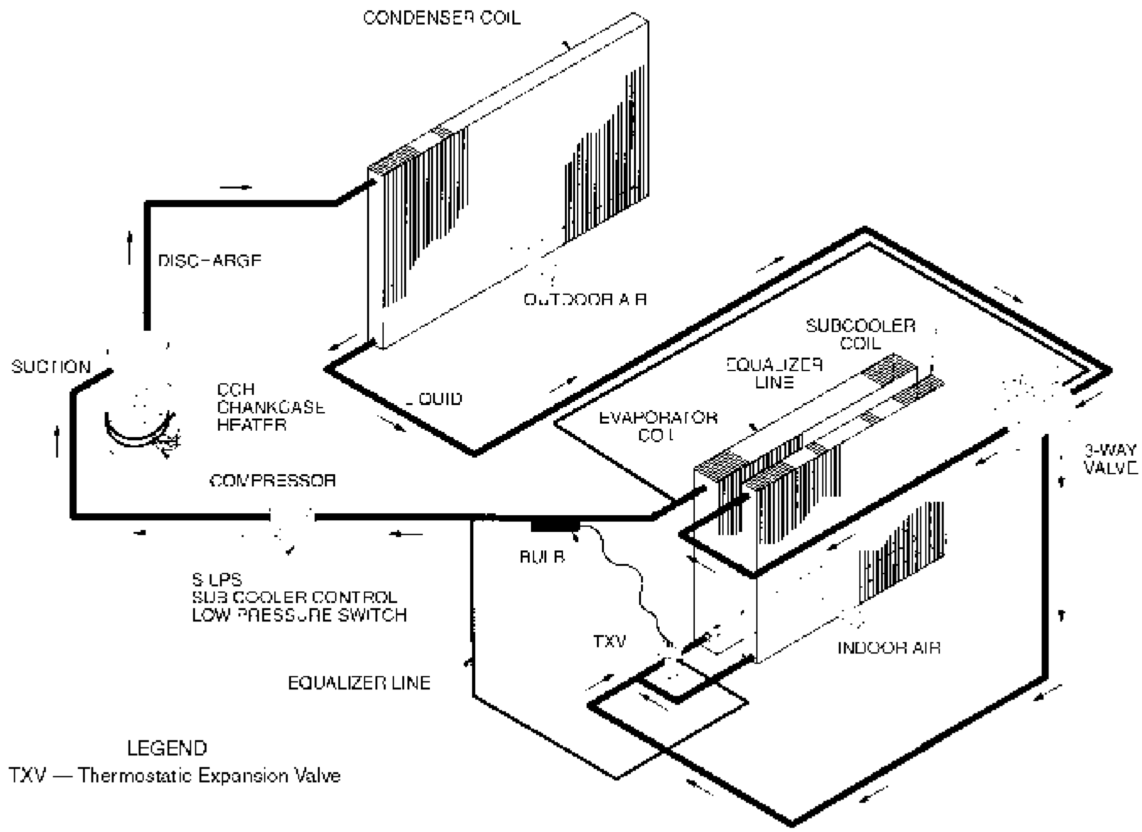

Figure 1
Relationship of Compressor, Evaporator and Condenser Coils

III-A TEST PROCEDURE AND DATA ANALYSIS DETAIL

1. Metering Equipment Installation

Prior to the treatment of this test unit, it was instrumented with an Integrated Metering Systems (IMS) three phase, three element kWh meter to monitor the electrical energy consumption. Three, 2000 to 1 ratio current transformers were installed to monitor the current consumption of all three phases of the power input of the air conditioner.

The IMS meter provides a kWh pulse output that is connected to the input of an Austin International SENTRY 300 EG pulse recorder with internal telephone modem for remote pulse data collection. Each full pulse delivered by the meter represents the consumption of 0.01 kWh (10 watt-hours) of electricity. The metering error of the entire metering installation is less than one percent.

To monitor the cooling performance of the test unit a model H21-002 HOBO Microstation, equipped with two model S-THA-M017 combination temperature and humidity sensors, all from ONSET COMPUTER Corporation, were used. A companion model C-001 Remote

Modem was also used so that the temperature and humidity data for the supply and return air ducts could be obtained remotely using the public switched telephone network. The accuracy of the temperature data is within one degree and the Relative Humidity data is within 4 percent.

The local daily outdoor ambient rooftop air temperature data was measured by a third S-THA-M017 probe and recorded every 5 minutes by the HOBO Microstation.

The equipment was installed on July 7 of 2006, and the test unit was treated with MAXR-100 on July 19 at 10:30 in the morning.

Electric energy pulses, temperature and humidity data for the supply and return air ducts of the test unit were continuously recorded for the entire pretreatment period and for a two week post treatment period. Rooftop ambient air temperature data was also collected for this entire period.

2. Test Data Analysis

The temperature and relative humidity data was used to obtain the enthalpy data for the supply and return air ducts. All of the enthalpy data was obtained from a psychometric software program and was averaged for every hour of operation in the test report. These values were used to calculate the BTU cooling capacity per kWh, for every hour of operation. The hourly kWh values were obtained by adding all of the five minute interval kWh consumption values for each hour.

The equation used to calculate the hourly BTU cooling capacity is as follows:

BTU = 4.5(enthalpy difference between return and supply air ducts)CFM

The factor 4.5 represents the weight in pounds of one cubic foot per minute of air for one hour and the enthalpy units are BTU per pound of air.

An air flow figure of 1600 CFM was used for the pretreatment and post treatment periods. This figure was obtained from a manufacturer's data for five ton rooftop air conditioners. Absolute accuracy is not important here, since we are comparing pretreatment and post treatment periods, and the same CFM value is used in each.

IV. EXECUTIVE SUMMARY of TEST RESULTS

The test was conducted for a little over four weeks, beginning July 8 and ending August 9 of 2006. The pretreatment period ran from July 8 to July 19, and the Post treatment period from July 19 to August 9. The test results are obtained from identical 86 hour operating time periods from the July 8 to 13 pretreatment period to the August 4 to 9 Post Treatment period.

IV-A Comparison of PRE and POST Hourly kWh and Ton-Hr per kWh Cooling Capacity vs OAT

Figure two below is a bar chart that shows the limited temperature range kWh consumption for both 86 hour pretreatment and post treatment periods. Two rooftop temperature ranges of 78 to 82 degrees F and 93 to 97 degrees F were used. The pretreatment and post treatment values for the 78 to 82 degree temperature range are shown. A 15 percent pre to post treatment kWh reduction is obtained.

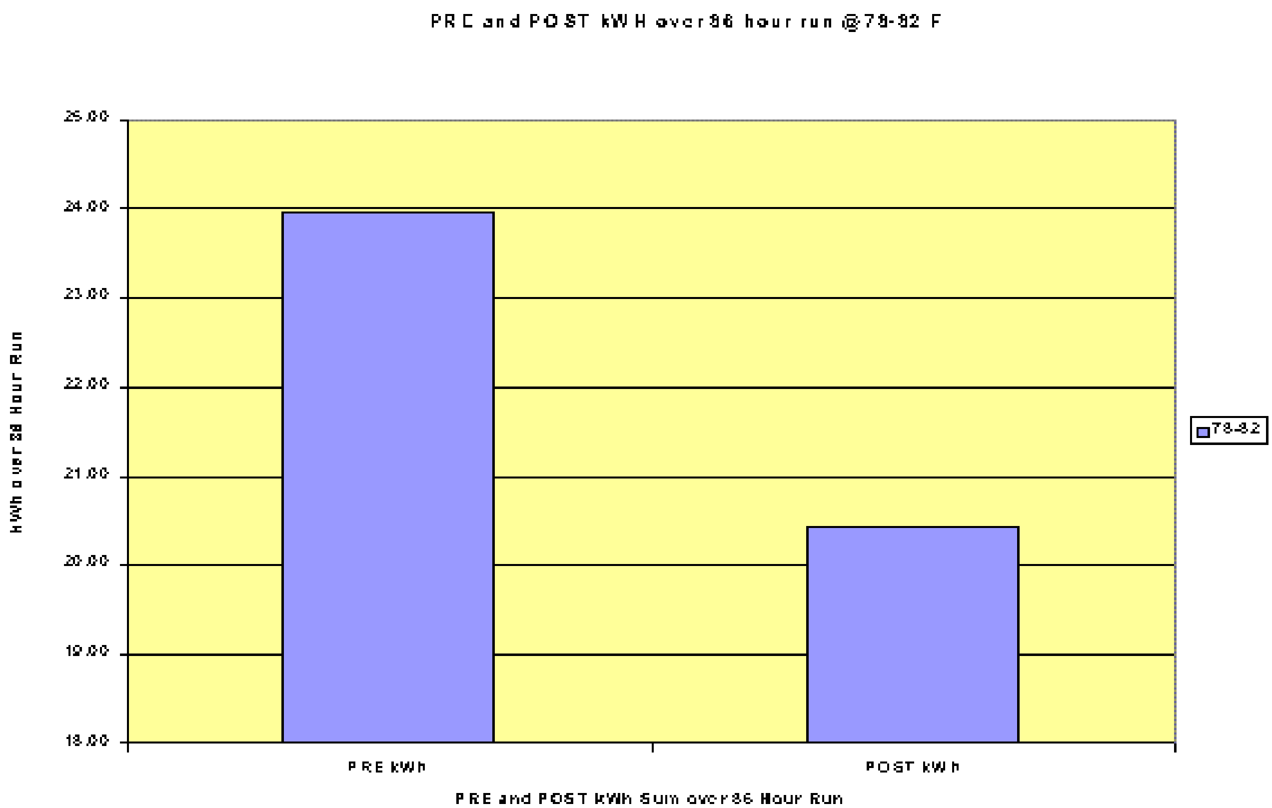

FIGURE TWO

Figure 3 below compares the pre and post kWh consumption over the rooftop temperature range of 93 to 97 degrees F. A pre to post reduction of 23.4 percent is obtained.

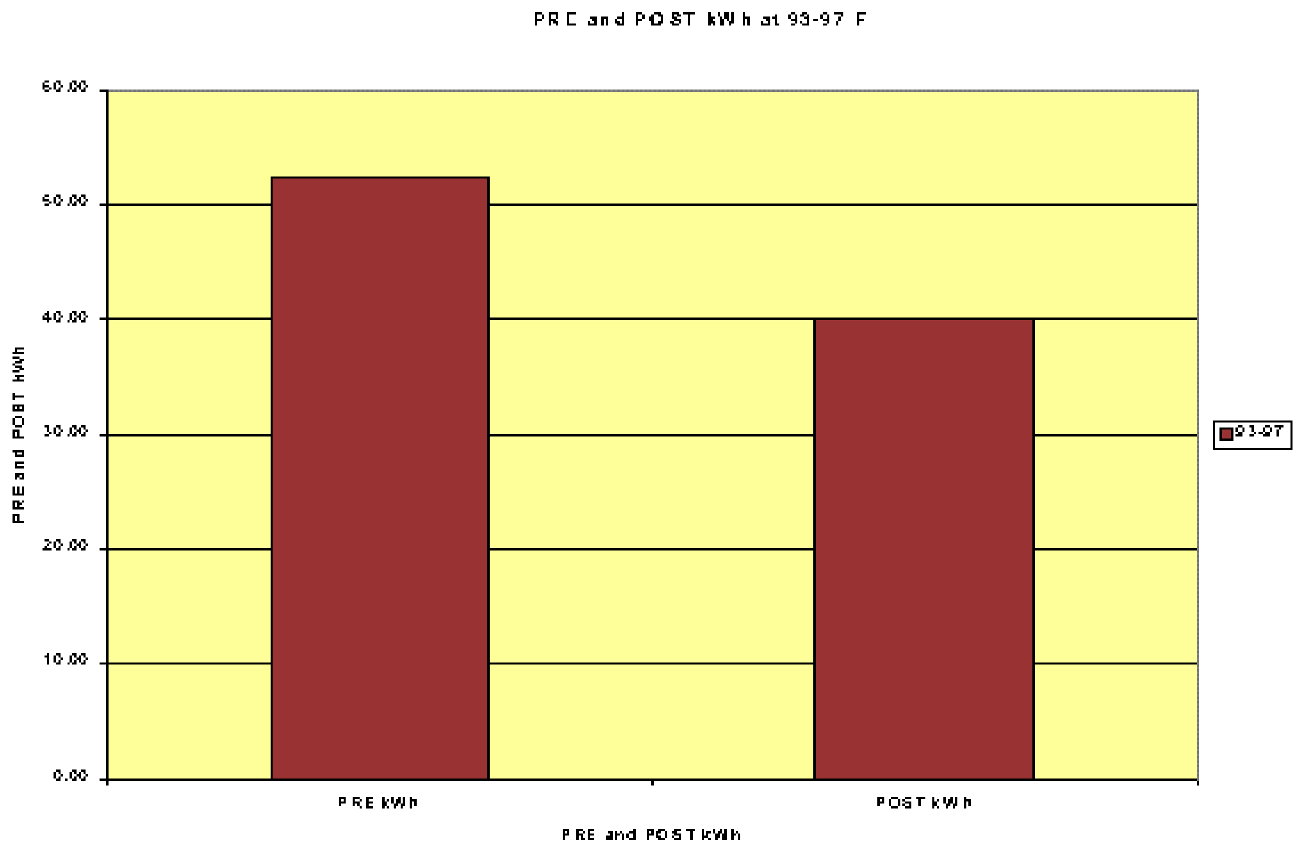

FIGURE THREE

Cooling capacity (ton-hr per kWh) values, as you would expect, are up in the post treatment period when compared to the corresponding pretreatment period. Figures four and five show the pre to post treatment cooling capacity comparisons over the same two rooftop temperature ranges as in figures two and three. Figure 4 shows an approximate 6 percent increase in cooling capacity over the 78 to 82F rooftop temperature range, and figure 5 shows an approximate 17 percent increase over the 93 to 97 degree F temperature range.

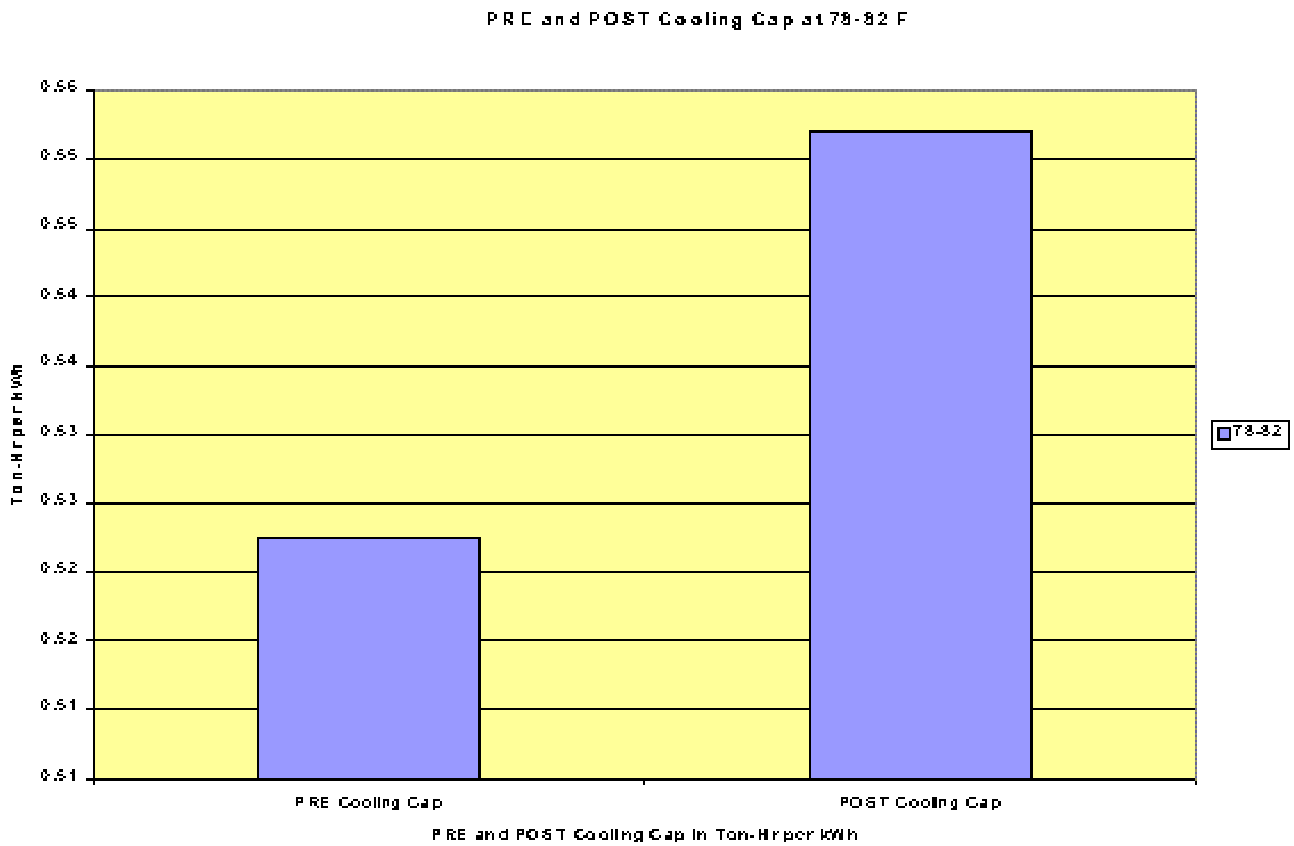
PRE and POST Cooling Cap at 78-82 F
Ton-Hr per KWh
PRE Cooling Cap
POST Cooling Cap
PRE and POST Cooling Cap in Ton-Hr per KWh
78-82

FIGURE FOUR

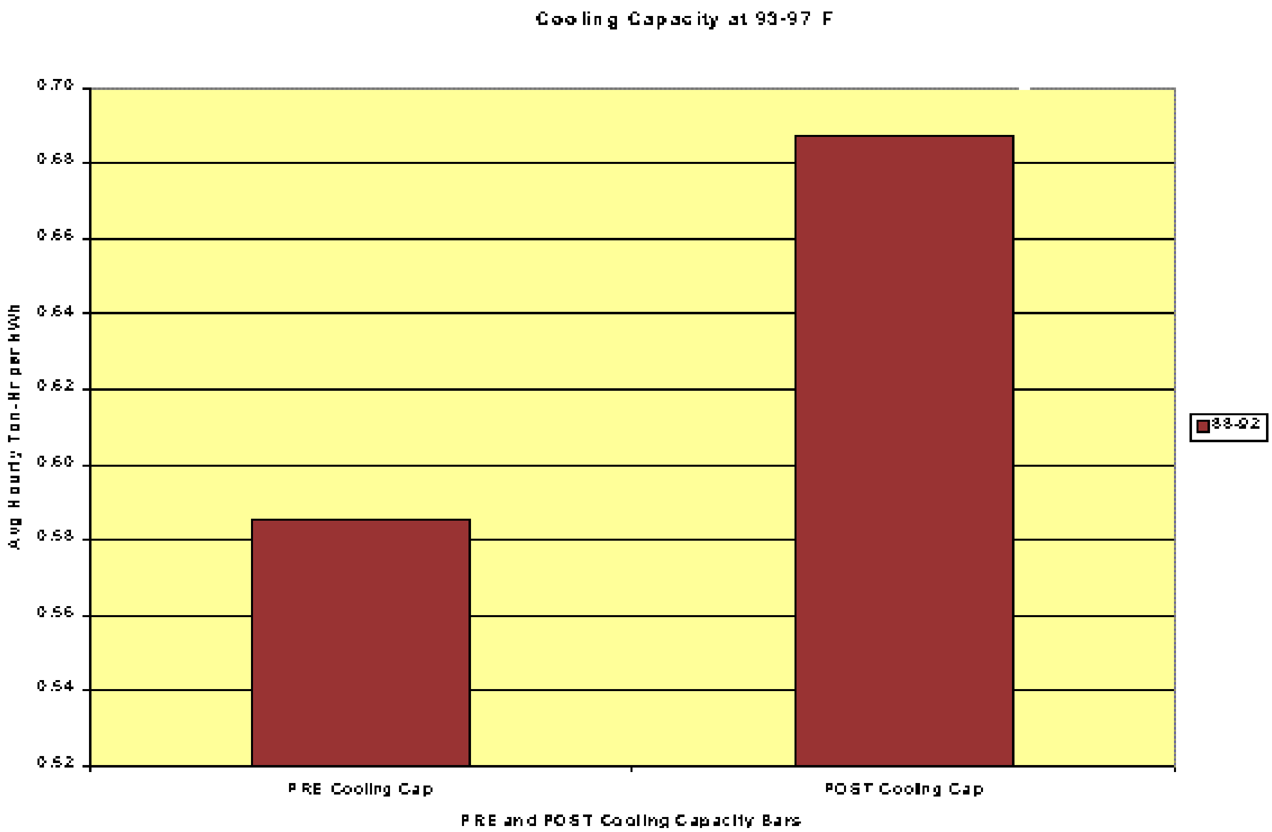
Cooling Capacity at 93-97 F
0.70
0.68
0.66
0.64
0.62
0.60
0.58
0.56
0.54
0.52
Avg Hourly Ton-Hr per kWh
88-92
PRE Cooling Cap
POST Cooling Cap
PRE and POST Cooling Capacity Bars

FIGURE FIVE

Figure 6 below compares the total pre and post period kWh consumption of unit #6 over the entire 86 hour period. In this comparison, the post period kWh consumption is 17 percent higher than the pretreatment period There are two main reasons for this. First the average hourly outdoor rooftop temperature is almost three degrees higher in the post treatment period than in the pretreatment period. Secondly, the cooled apartment is in more intense use in the post treatment period than in the pre treatment period.

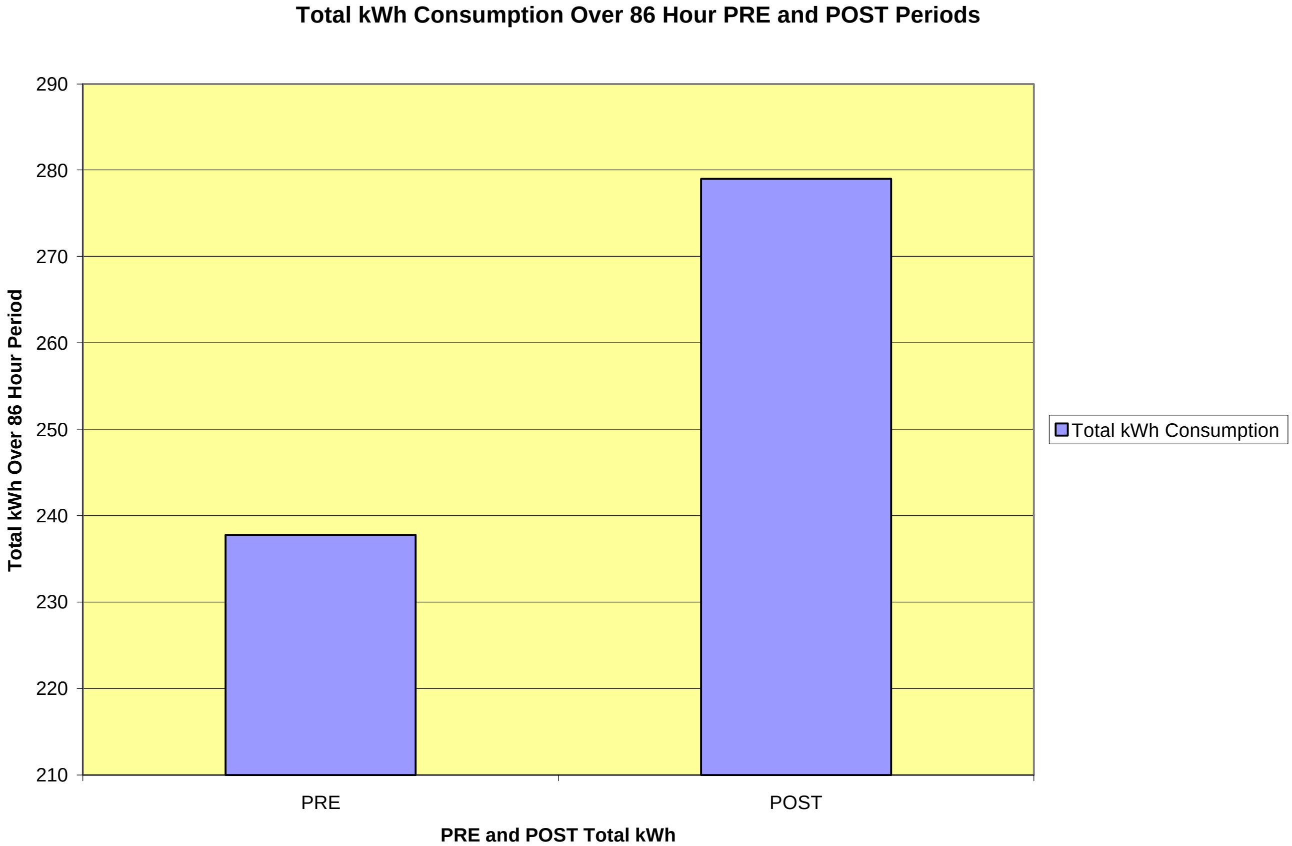

FIGURE SIX

V CONCLUSION

The charts and tables above show that, for properly sized and installed rooftop air conditioners, MAXR treatment will provide significant increases in cooling capacity and operating efficiency, with fifteen to thirty five percent reductions in daily electric energy consumption. MAXR treatment will also reduce internal mechanical friction with associated reductions in operating temperatures and a corresponding increase in reliability and mean time between failure (MTBF).

VI SUPPORTING DATA

In a separate package, the spreadsheets that provide supporting data for this report are available upon request. All can be provided on a CD if requested.

Shown below is a copy of a psychometric chart that can be used to look up enthalpy data from air temperature and humidity data. Enthalpy is a measure of the thermal energy content of a moist air mass.

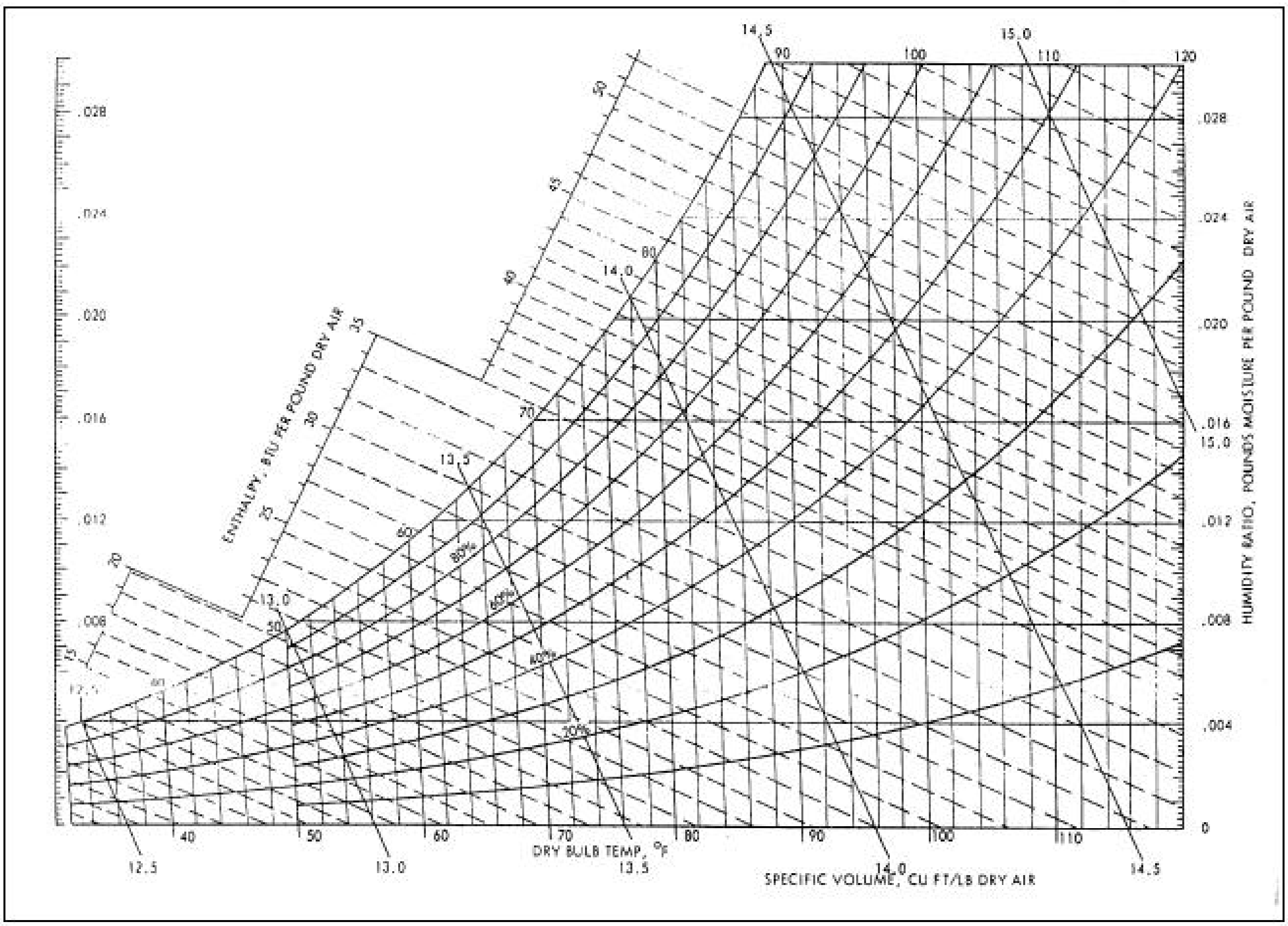

Figure 2. A psychrometric chart.

PSYCHOMETRIC CHART

CERTIFICATION

William Beverly, President of TechniCraft Energy Measurement and Management Services, certifies that the preceding test procedure summary, data collection, analysis and conclusions are true and accurate summaries derived from the actual test procedure and resulting acquired test data.

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