

ALTRONIC RESEARCH, INC.

P. O. BOX 249

YELLVILLE, ARKANSAS 72687-0249

U.S.A.

MODEL 77450

COAXIAL LOAD RESISTOR



MODEL 77450
450KW AIR-COOLED
COAXIAL RESISTOR

LIMITED WARRANTY

We take pride in manufacturing products of the highest quality and we warrant them to the original purchaser to be free from defects in material and workmanship for the period of one year from date of invoice. Additionally, products of our manufacture repaired by us are warranted against defects in material and workmanship for a period of 90 days from date of invoice, with the provisions described herein.

Should a product, or a portion of a product of our manufacture prove faulty, in material or workmanship, during the life of this warranty, we hereby obligate ourselves, at our own discretion, to repair or replace such portions of the product as required to remedy such defect. If, in our judgment, such repair or replacement fails to be a satisfactory solution, our limit of obligation shall be no more than full refund of the purchase price.

This warranty is limited to products of our own manufacture. Equipment and components originating from other manufacturers are warranted only to the limits of that manufacturer's warranty to us. Furthermore, we shall not be liable for any injury, loss or damage, direct or consequential, arising out of the use, or misuse (by operation above rated capacities, repairs not made by us, or any misapplication) of the equipment. Before using, the user shall determine the suitability of the product for the intended use; and the user assumes all risk and liability whatsoever in connection therewith.

The foregoing is the only warranty of Altronic Research Incorporated and is in lieu of all other warranties expressed or implied.

Warranty returns shall first be authorized by the Customer Service Department and shall be shipped prepaid. **Warranty does not cover freight charges.**

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PRECAUTIONS

⚠WARNING⚠

Do not attempt any service or parts replacement without first disconnecting all AC power and RF power. Failure to do so may result in serious or *fatal electrical shock*.

CAUTION

Do not block air grills or restrict airflow when ducting inlet and discharge air. Restrictions in airflow limit the load's ability to dissipate RF power and could damage and/or cause the unit to fail.

CAUTION

Do not apply more than rated power to unit. Damage will occur before thermal protectors can activate interlock circuit if large overloads are applied.

☠CAUTION☠

When using any cleaning solvents or solutions, assure that there is adequate ventilation to protect personnel from breathing any irritable or possibly toxic fumes.

OPERATING TEMPERATURE WARNING

**CARE SHOULD BE TAKEN TO OPERATE UNIT BELOW
STATED MAXIMUM AMBIENT OPERATING TEMPERATURE.**

**OPERATION ABOVE RATED AMBIENT
TEMPERATURE MAY CAUSE MOTOR
THERMAL PROTECTION TO SHUT OFF FAN,
WHICH MAY CAUSE DAMAGE TO UNIT.**

**PROVISIONS ARE MADE TO TRIP THE INTERLOCK
IN THE EVENT OF OVERHEAT, BUT THE INTERLOCK
MUST BE PROPERLY CONNECTED TO THE RF SOURCE
FOR THIS FUNCTION TO OPERATE.**

**NEVER OPERATE WITH INTERLOCK
BYPASSED OR MALFUNCTIONING.
TO DO SO WILL VOID THE WARRANTY.**

INTRODUCTION

This handbook was prepared for technical personnel as an aid in understanding and performing installation, service and maintenance procedures for the OMEGALINE® Model 77450 Air-Cooled Coaxial Load. Personnel are considered to be skilled if they have the necessary knowledge and practical experience of electrical and radio engineering to appreciate the various hazards that can arise from working on radio transmitters, and to take appropriate precautions to ensure the safety of personnel.

HAZARD ANALYSIS

1. The Model 77450 Indoor/Outdoor load is designed to dissipate 450KW of power in the frequency range of 540 to 1750 KHz.
2. The hazards presented by the load includes:
 - electrical hazards envisioned by the Low Voltage Directive;
 - mechanical hazards envisioned by the Machinery Directive;
 - high voltage shock/burn hazard presented by the radio frequency energy which the load is designed to dissipate. This hazard is not directly addressed by any standard, but we have chosen to comply with the requirements of IEC 215/EN60215.
 - An additional hazard may present itself only in case of abnormal operation of the load. When the load has RF energy present and the fans are not operating, the fiberglass pultrusion which is used as an electrical insulator may emit smoke and fumes. The manufacturer of the material specifies the emitted materials as “Carbon monoxide and other organic compounds”. (See Material Safety Data Sheet in Appendices.) Emission will cease and the pultrusions will self-extinguish shortly after removal of the input energy. Personnel should not remain in the area and firefighters should use Self-Contained Breathing Apparatus until all visible smoke has dissipated.
3. The electrical hazards arise from the connection of the equipment to 230/400 volts AC, 3 phase, 50/60Hz mains. The following measures were incorporated into the design to minimize the exposure of personnel to the mains voltage:
 - All AC Mains power enters through the user-supplied safety switch which is mounted on the end of the load. By operating this switch and placing a padlock on the operating lever, a worker is assured that lethal voltage is not present during maintenance;
 - The AC Mains power enters the control box and is immediately connected to a guarded terminal block;
 - AC Mains power is routed to a minimum of locations;
 - All control voltages are 28 volts AC or less;

- Exposed terminals which carry voltages greater than 28 volts AC are protected from accidental contact by polycarbonate panels which are not removable without tools;
 - Users are not required to remove any guard for normal system operation and adjustments;
 - Local control of the system is provided, lessening the chance that other personnel may accidentally start the fans or energize other components of the circuit.
4. The mechanical hazards arise from the operation of the fans, motors and, in the case of an outdoor model, the motorized louver assemblies. The following measures were incorporated into the design to minimize exposure of personnel to these hazards:
- There is a Safety Switch located at the control box on the end of the load. This switch will remove all AC Mains power from the load;
 - The panels which protect personnel from contact with the rotating elements are not removable except with tools.
 - The louvers and grill assemblies are guarded with limit switches which break the control circuit when opened, preventing accidental operation of the motors/fans;
 - There are no operating controls or routine adjustments required within the fan compartment of the load;
 - The fans are mounted in the load with the blades as far from personnel as is possible.
5. The high voltage shock/burn hazards arise from the connection of the load to the transmitter. The following measures were incorporated into the design to minimize exposure of personnel to these hazards:
- The panels which protect personnel from contact with the high voltage elements are not removable except with tools.
 - The louvers and grill assemblies are guarded with limit switches which break the interlock circuit when opened, preventing accidental operation of the transmitter;
 - There are no operating controls or routine adjustments required within the high voltage compartment of the load;
 - The energized components are mounted in the load as far from personnel as is possible;
 - A manual grounding stick is provided at the entrance to the interior of the high voltage compartment. Maintenance personnel are instructed to use this device to ground the high voltage components prior to work in the compartment.

AIR FLOW VS TEMPERATURE ANALYSIS

Minimum airflow calculations are based on worst-case steady-state conditions, and air being an ideal gas. These values were used to determine dissipation of the required power while keeping the outlet air temperature safe for anyone coming in contact with it.

The specific heat for air was found at the average operating temperature for the worst case allowable. The maximum ambient temperature is 40°C. The maximum allowable exhaust temperature is 121°C.

Specific Heat Air "C_p"

$$40 + 121 = 161$$

$$161 / 2 = 80.5^{\circ}\text{C}$$

$$= 353.65\text{K}$$

From Properties of Gases at 1 atm

$$C_p = 1008 \text{ J/kg} \cdot ^{\circ}\text{C}$$

Heat loss to the frame will not be considered for these calculations. It would decrease the outlet air temperature by a small amount if calculated. The heat to be dissipated is 450 kW. This can be used to calculate the mass airflow "m•".

$$m\bullet = 450 \text{ kW} / (C_p(T_{\text{out}} - T_{\text{in}}))$$

$$= 450 \text{ kJ/S} / (1008 \text{ J/kg} \cdot ^{\circ}\text{C} * (121^{\circ}\text{C} - 40^{\circ}\text{C}))$$

$$= 330.688 \text{ kg/min}$$

Pressure at sea level 101 kPa

In the worst case, the exhaust air will be 121°C. Then the density of the air and the volume flow rate become

$$\rho = P / (R * T)$$

Where ρ = density,

P = Pressure

R = Gas Constant Air

T = Max. Air Temp. Exhaust

$$\rho = 101 \text{ kPa} / (.287 \text{ kPa} \cdot \text{m}^3/\text{kg} * 121^{\circ}\text{C} + 273)$$

$$= .893 \text{ kg/m}^3$$

$$V\bullet = m\bullet / \rho$$

Where V• = the volumetric flow rate

$$V\bullet = (330.688 \text{ kg/min}) / (.893 \text{ kg/m}^3)$$

$$V\bullet = 370.3 \text{ m}^3/\text{min}$$

$$\underline{\underline{V\bullet = 13,077 \text{ ft}^3/\text{min}}}$$

The two 42" fans used will produce 14,040 ft³/min each at .625 inches of water static pressure. This gives a total of 28,080 ft³/min through air to the resistors. This reduces the average exhaust temperature well below 121°C, the maximum acceptable exhaust temperature.

Electromagnetic Compatibility (EMC) Analysis

This device is a finished product and is NOT EMC passive, therefore it is subject to conformity with the EMC Directive (89/336/EEC) amended by directives 91/263/EEC, 92/31/EEC, 93/68/EEC and 93/97/EEC.

This device has been determined to be immune to electromagnetic energy which is radiated or conducted by the associated transmitting apparatus. It will accept without malfunction the entire output of the transmitter for which it is designed.

The design of the control circuitry and the components thereof has been optimized for immunity from electromagnetic disturbances and will accept disturbances on the AC Mains without malfunction.

This device may introduce disturbances upon the AC Mains during starting and stopping events. These disturbances are not expected to last longer than 25 cycles (1/2 second) and are of a normal nature for motor-driven machinery.

No special measures have been taken to reduce or to mitigate these effects.

SECTION I

DESCRIPTION AND LEADING PARTICULARS

1-1. Purpose and Application of Equipment. The OMEGALINE® Model 77450 Coaxial Load is designed to safely dissipate a maximum of 450,000 watts of electrical energy over a frequency range of DC to 1750 KHz.

1-2. Equipment Supplied. The Model 77450 Coaxial Load is supplied with standard RF connectors. Their designations are:

6-1/8" Fixed Flange: Model 77450E6

9-3/16" Fixed Flange: Model 77450E9

The Model 77450 is for indoor service. The Model 77450 is fitted with louvers and a roof for outdoor service. The standard power supply voltages and their designators after the model # are:

-230: 200-240VAC, three-phase, 50/60 Hz

-460: 380-460VAC, three-phase, 50/60 Hz

1-3. Equipment Required But Not Supplied. The Model 77450 Coaxial Load is complete as supplied, but the user must furnish AC Mains input, RF input, interlock control cable, transmitter emergency stop, and ground cable appropriate to each installation. An alarm circuit is provided but the user must supply the alarm and control cable to this circuit. Where ordered with an RF Ammeter assembly, it is necessary for the installer to furnish conduit space for the RF Ammeter instrumentation cable.

1-4. General Description. The Model 77450 Coaxial Load is enclosed in a single aluminum case which is painted with a durable acrylic finish. For exterior installations, a three-piece roof assembly and four louvered side panels are provided. These assemblies are shipped knocked down and must be installed at the final use site. Power connection is made through the bottom of the control enclosure which is located on the end of the load near the RF connector. Figure 1-2 shows the load without the louvered fan panels. The enclosure contains two belt-driven 3 HP 42" diameter fan assemblies.

1-5. Electrical Description. The Model 77450 contains a 50-ohm non-reactive resistor assembly capable of dissipating 450,000 watts of applied electrical energy at sea level at frequencies between DC and 1750 KHz with a maximum VSWR of 1.15 to 1. No provisions are made for tuning the resistor assembly and all operating controls relate to the operation of the blower assembly. The blower control circuit consists of three switches wired in parallel to control the

blower motor contactors. Power is supplied to these contactors whenever the equipment is attached to the correct power supply, the user-supplied Safety Switch is "ON" and the "OFF/ON" switch is placed in the "ON" position. The transmitter interlock circuit consists of four thermal switches, four limit switches, and motor starter auxiliary contacts wired in series to control the interlock relay. Power is supplied to this relay whenever the equipment is attached to the correct power supply, the louver/grill assemblies are all properly installed and none of the overtemperature thermal switches sense a temperature equal to or greater than its specified temperature ($\pm 7^{\circ}\text{F}$), and all motor starter contacts are closed.

1-6. Mechanical Description. The Model 77450 RF Coaxial Load is a 50-ohm non-reactive resistor assembly which is cooled by forced ambient air. The two fan assemblies are 3 HP belt-driven, 42 inch diameter devices. Air is drawn in through removable louvers or grill assemblies, enters the resistor assembly, flows horizontally through it and then out of the enclosure via louvered or perforated panels. When ordered for exterior operation, a roof assembly and louvered side panels are provided.

1-7. General Principle of Operation. After ascertaining that the Model 77450 is connected to the correct power supply, connect the transmitter interlock circuit and RF source. Close the Safety Switch and turn the "OFF/ON" switch "ON" to start the fan and enable transmitter. Operate transmitter as desired. To stop operation it is necessary to first turn off the transmitter, allow the load to cool for 10 minutes, then turn the "OFF/ON" switch "OFF". You can damage the load if you do not allow it to cool itself before stopping the fans.

1-8. Operating and Adjustment Controls. The only operating control is the main power switch. The motors and fans require periodic maintenance and the drive belts must be adjusted to maintain proper tension. The differential pressure switch will need to be adjusted during installation. See instructions in Section 3-9. Further adjustment should not be necessary.

1-9. Operator Training. The operator of this equipment must have the following skills/knowledge:

- An understanding of the purpose of the equipment;
- An understanding of the principles of operation of the equipment;
- An understanding of the normal operating procedures for the equipment;
- An understanding of the normal and abnormal indications which may be presented at the control point;
- The proper procedures for starting, using and stopping the equipment under normal conditions;
- The proper procedure for stopping the equipment under abnormal or emergency conditions;

- The proper procedure to lock out and mark controls prior to allowing or commencing maintenance on the equipment;
- The proper procedure to obtain clearance to remove lockouts and out-of-service marks and return the equipment to normal service.

SECTION II

TEST EQUIPMENT AND SPECIAL TOOLS

2-1. Test Equipment Required. No test equipment is required for routine maintenance.

2-2. Special Tools Required. Although no non-standard tools are required for routine maintenance, we recommend the technician have the following specialized tools available:

Torx T-15 driver

Tee handle hex key, 7/32" bit

Power screwdriver with 7/32" hex key & torx T-15 bit

2-3. Materials Required. One type of grease is required for routine servicing of fans. Use any quality lithium-based grease to lubricate the pillow-block bearings.

SECTION III

PREPARATION FOR USE AND RESHIPMENT

3-1. Unpacking. The units should be handled and unpacked with care. Inspect outer cartons for evidence of damage during shipment. Claims for damage in shipment must be filed promptly with the transportation company involved. No internal packaging or bracing is used for shipments and the units should not rattle when being unpacked.

3-2. Pre-installation Inspection. Conduct a thorough inspection of the units, paying particular attention to the following items:

- All screws in place and tight.
- All panels and grills free of dents and scratches.
- Base assembly visually OK.
- Individual louver/grill assemblies visually OK.
- RF connector visually OK.

While inspecting RF connector, measure D.C. resistance of the unit by reading from the center conductor to the outer conductor. Compare this reading with that listed in the specification sheet at the end of this manual. Reading should be ± 1 ohm. If not, consult factory.

3-3. Pre-installation Tests. No tests are necessary or possible prior to installation, except resistance test specified in 3-2.

3-4. Installation. The Model 77450 must be installed in a location convenient for servicing. Consideration should be given to adequate accessibility for maintenance and unit replacement. No attempt is made in this handbook to present complete installation instructions, since physical differences in plant will determine the installation procedure. General guidelines are outlined in subsequent paragraphs.

3-5. Location.

a. Interior Installations. The location selected for the Model 77450 should have an ambient temperature below 104°F(40°C). The room should be well ventilated to prevent excessive temperature rise and consequent derating of the unit. The maximum dissipation of the unit is 450,000 watts. This is equal to 1,535,850 Btu/hr, which ordinarily will be ducted out of the building envelope. The unit should be oriented to provide a short, direct duct run in order to avoid high static pressure and loss of cooling efficiency.

b. Exterior Installations. When ordered for exterior installation, special motors, wiring and weatherproofing measures are incorporated at the factory. In addition, a roof assembly is provided. The load is designed to operate in ambient conditions without further modification.

3-6. Mounting. The Model 77450 is designed to be floor-mounted and should be securely attached to the floor. The enclosure rests on a fixed steel base which should be level when installed.

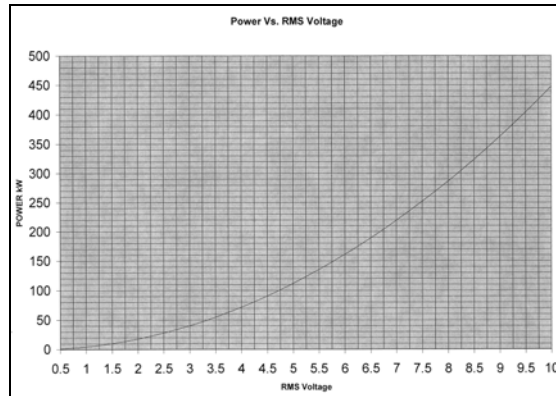
NOTICE!

The frame of this load is subject to racking. This may interfere with removal and installation of louver assemblies. When installing the unit, it should be leveled and adjusted to allow easy installation of the louvers.

3-7. Connections. There are seven connections on the Model 77450: the RF connector, the AC power supply, the remote control terminal strip, the transmitter interlock terminal strip, the alarm circuit terminals, the transmitter emergency stop terminals and the ground terminals. When supplied with voltage measuring port option, there is an additional connection point for an oscilloscope.

- a. The RF connector is on the end panel of the unit. Connect to the appropriate RF line from the transmitter.
- b. The AC power supply connector is a pressure-style female receptacle located in the Control Box on the RF connector end panel of the enclosure.
- c. The remote control terminal strip is attached to a pair of normally open terminals. This 2-pole terminal strip is mounted in line with the transmitter interlock strip. This connection is used for remote operation of the load.
- d. The transmitter interlock is attached to one set of the normally closed terminals of the 4-position terminal strip located on the inner panel of the control box which is mounted on the RF connector end of the enclosure. The terminals are closed whenever AC power is supplied to the unit and no overheat condition exists. The spare set of normally closed terminals is isolated and is provided for a remote alarm circuit.
- e. The alarm circuit has a pair of normally open contacts located on a 2-pole terminal strip and labeled TB3 (alarm). Connect the terminals in series with a self-powered alarm. If an overheat condition exists, the pair will close and complete the alarm circuit.
- f. The transmitter emergency stop circuit has normally closed terminals labeled TB4 (transmitter emergency stop) on a 2-pole terminal strip in the control box. This pair should be connected to the transmitter emergency stop circuit. In the event of an overheat, this pair will open and cause the transmitter to shut down.

- g. A set of ground terminals is located on the front of the load. Ground the load to the facility ground at this point.
- h. When ordered with a voltage measuring port, a BNC connector is located on the RF end of the load. Connect an oscilloscope to measure voltage at this port, and use the chart provided below to determine applied power.



3-8. Ducting. It will be necessary to duct the discharge air from the Model 77450 to the exterior of the building. In some installations it will also be necessary to supply inlet air from outside of the climate-controlled portion of the building. The discharge airflow is approximately 28,080 SCFM at a maximum temperature of 250° F.

3-9. Adjustments.

The drive belts for the fans must be periodically adjusted to maintain proper tension. It is important not to overtension the belts.

Tension belt to require a force of 6.1 pounds (~ 2.75 kg) to deflect center of belt 13/64 inch (0.503 cm).

The differential pressure switch/switches are located inside the main control box. They are adjusted by starting all fans and adjusting the set point adjusting screw clockwise to increase the set point pressure or counterclockwise to decrease the set point pressure. When ordered with mechanical louvers, two switches are provided. We recommend the lower pressure switch be turned clockwise until it stops for initial set up. Adjust the top pressure switch until the set point pressure is appropriate. Then adjust the lower pressure switch by closing or blocking louver assemblies. After blocking louver assemblies, turn the lower switch set screw clockwise until the low flow lamp lights. Open the louver and make sure the low flow light goes out. Readjust the switch until the light comes on and goes out in approximately 1 minute. The low flow light is an indication of the interlock circuit. When the light is on, the interlock circuit is open. When the light is off, the circuit is closed.

SECTION IV

THEORY OF OPERATION

4-1. General. The Model 77450 contains a 50-ohm non-reactive resistor assembly (480 @ 1900 ohms in series-parallel) which is cooled by forced air supplied by a dual belt-driven fan assembly. Control of the fans and of the transmitter interlock circuit is accomplished with an OFF/ON switch, eight thermal switches, four micro switches and one differential pressure switch.

4-2. Control Circuits. There are 2 control circuits in the Model 77450. One circuit controls the fans and the other controls the transmitter interlock circuit. The fan control circuit derives its power from the 24-26VAC-control transformer. The main ON/OFF switch is connected to the Control Transformer (T1) and to Terminal A2 of the Fan Motor Contactors. (The Model 77450 signal line passes through the louver/grill interlock switches prior to Terminal A2.) Contactor Terminal A1 connects to Differential Pressure Switch (S20) Common and to the other terminal of the control transformer. When there is a fault condition, i.e. no fan operation, the signal passes through the differential pressure switch Normally Closed terminal and illuminates the "Low Pressure" lamp. When both fans are operating, the differential pressure switch transfers and the signal passes through all of the overtemperature thermal switches (S21, S21A, S22 and S22A) before terminating at coil terminal 14 on the Interlock Relay (K30). This extinguishes the Low Pressure lamp and provides operating voltage to the "Overheat" lamp. As long as all of the overtemperature switches are closed, the Overheat lamp is shorted out and dark. When any overtemperature switch opens, the short is removed, the interlock relay coil is opened and the Overheat lamp illuminates. The interlock relay (K30) closes when the load is ready to accept RF power. It will open, indicating a fault, whenever one of the following events occur:

1. AC power is disconnected,
2. Overtemperature switch S21, 21A, 22 or 22A is open,
3. Differential pressure switch S20 senses a fault, or
4. The motor starter overload has tripped.

The Interlock Relay furnishes 2 pairs of terminals which are isolated and rated for 1 ampere @ 30VDC or 120VAC resistive. Terminal pairs are numbered 1+2 and 3+4. The relay contacts are gold-diffused to provide reliable switching of low signal voltages.

The logic of operation is:

1. If AC power is applied to the load, both motor starters are engaged, the overtemperature thermal switches sense normal temperatures and the differential pressure switch is closed, the interlock relay will close and enable the transmitter.
2. If AC power is not applied to the load, or the overtemperature thermal switches sense excessive temperatures, or the differential pressure switch is open, or the louver/grill limit switches sense the absence of a panel, or a motor starter overload has tripped, the interlock relay will open, disabling the transmitter.

SECTION V

MAINTENANCE

WARNING!!

***PERSONNEL WORKING ON THIS LOAD MUST BE
CONSIDERED SKILLED AS DEFINED BY
EN60215 SECTION 3.1 AND APPENDIX D***

BEFORE PERFORMING ANY MAINTENANCE:

- 1. DISCONNECT POWER AND ALLOW MOTOR TO COME TO A FULL STOP.**
- 2. DISCONNECT RF CONNECTOR ASSEMBLY AND LOCK OUT TRANSMITTER OPERATING CONTROLS.**
- 3. DISCONNECT TRANSMITTER INTERLOCK LINE.**

**FAILURE TO FOLLOW THESE DIRECTIONS
MAY CAUSE FATAL ELECTRICAL SHOCK!**

5-1. Cleaning. The enclosure of the Model 77450 is finished with an acrylic finish or other durable coating system. It should be cleaned with a neutral plastic and glass cleaner such as Windex or Glass Plus. The RF connector should be cleaned with a non-residue contact cleaner such as Miller-Stephenson MS-171/CO2. Remove dirt accumulations from the fans, enclosure and motors by vacuuming. Do not use solvents to clean the motors or fan pillow block assemblies. Remove dirt and dust accumulations from the grills and resistor assembly with an air jet and a soft brush.

5-2. Lubrication. The fan pillow blocks are lubricated at the factory with a quality lithium-based high temperature grease. Each pillow-block assembly has a bearing which must be lubricated periodically with ordinary lithium-based grease designed for ball-bearing lubrication. The motors are factory lubricated and are not designed to be relubricated in the field except under severe conditions.

5-3. RF Circuit. The RF circuit does not require any periodic maintenance and the only repairs possible are the replacement of parts in the connector, quick-step or support portions of the resistor assembly or the replacement of resistors.

Resistor Replacement

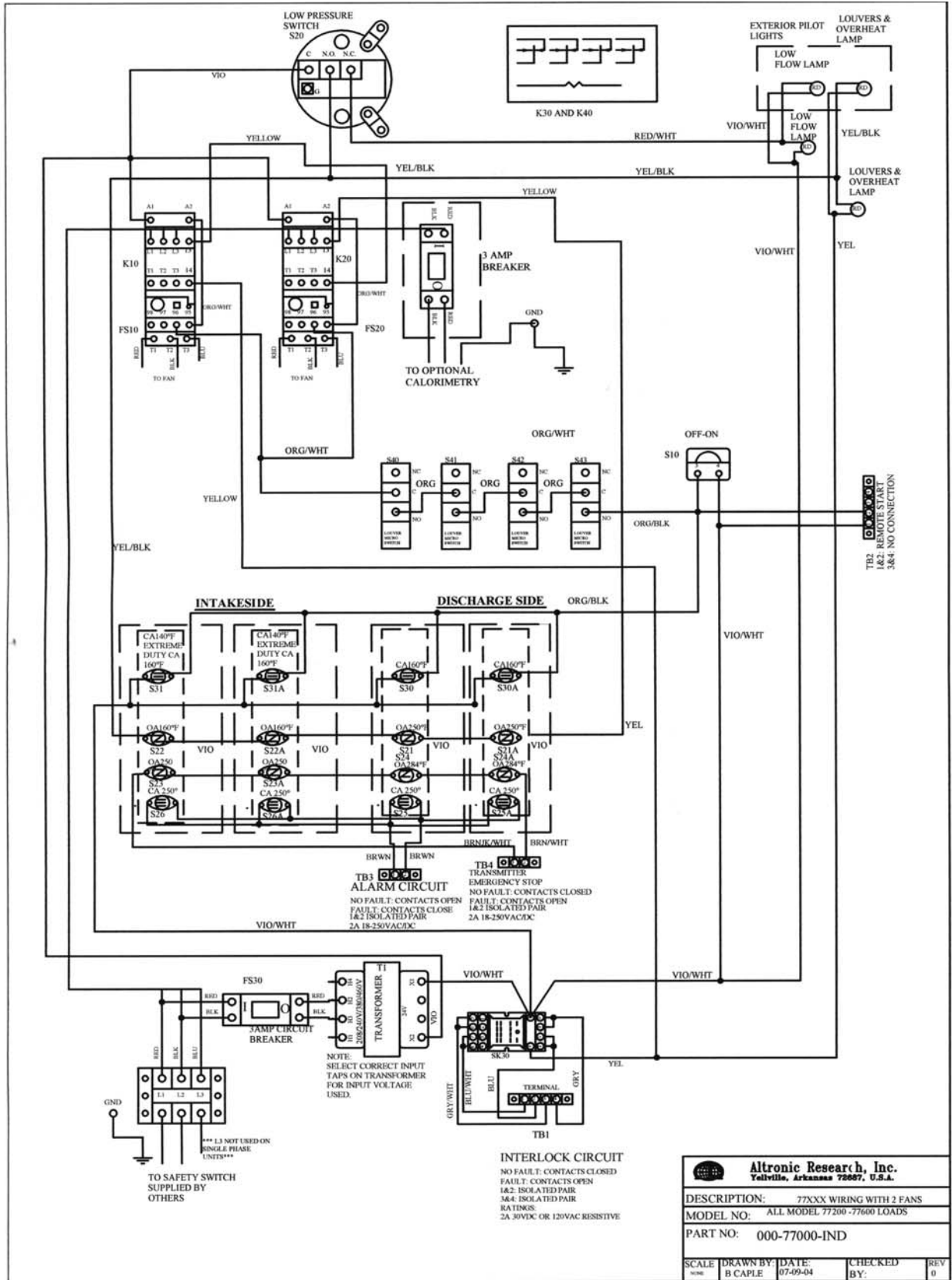
Prior to attempting resistor replacement, you must make the load safe for servicing. Begin by placing the Safety Switch in the OFF position and locking the handle with a padlock. Next, remove all power from the transmitter and exciter and lock them out.

To replace resistors it is necessary to remove the air discharge louvers from the load and set them aside. Remove five 1/4-20UNC machine screws from the top of one louver assembly. Lift the louver up approximately one inch (2.5 cm) and carry it to an area clear of your walking/working space. Repeat this procedure if necessary to remove the other louver.

Resistor replacement is tedious, but not difficult. It will probably be necessary to remove many resistors in order to replace a few. Therefore, allow at least eight hours to accomplish this task.

During resistor installation at the factory, resistors are selected by resistance value to provide the proper final load impedance. For this reason, it is unwise to move resistors from one bank to another. We recommend that you work in one bank at a time, finishing that bank before commencing another. The resistors are made of a durable ceramic and will withstand normal handling, but they must not be struck with any tool.

6-1. SCHEMATIC DIAGRAM



Altronic Research, Inc. Yellville, Arkansas 72687, U.S.A.			
DESCRIPTION:		77XXX WIRING WITH 2 FANS	
MODEL NO:		ALL MODEL 77200 - 77600 LOADS	
PART NO:		000-77000-IND	
SCALE	DRAWN BY:	DATE:	CHECKED BY:
1/8" = 1"	B. CAPLE	07-09-04	
			REV 0

6-2. REPLACEMENT PARTS LIST

MODEL 77450

(CONSULT FACTORY)

SPECIFICATIONS

MODEL 77450

Impedance..... >50 ohms nominal

VSWR @ DC to 1750 MHz.....>1.15:1 max.

Connectors:

Model 77450E6..... >6 & 1/8" fixed flange

Model 77450E9..... >9 & 3/16" fixed flange

Power Rating @ Sea Level >450 KW

Frequency Range>DC to 2 MHz

Cooling Method.....>Forced Air

Ambient Temperature..... > -30° C to 40° C

Fan Assembly: 2 x 3 hp belt-drive six-bladed cast aluminum

AC Power Requirements:

200-240 VAC @ 20 Amp., 3 phase, 60/50 Hz

380-460 VAC @ 10 Amp., 3 phase, 60/50 Hz

Finish >Beige Splatter

Serial No. _____ Frequency _____ Resistance _____

Model _____ Inspected by _____ Date _____



CRAFTED WITH PRIDE IN ARKANSAS, U.S.A.

APPENDIX A

COMPONENT MANUFACTURER'S DOCUMENTS