ALTRONIC RESEARCH, INC.

P.O. BOX 249
YELLVILLE, ARKANSAS 72687-0249
U.S.A.

MODEL 640105
COAXIAL LOAD RESISTOR

MODEL 640105
RF COAXIAL AIR COOLED LOAD

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.**

TABLE OF CONTENTS

MODEL 640105

SECTION **PAGE**

SECTION **PAGE**

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.

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*.

WARNING

This unit is designed to operate safely when the ground lug on the panel is attached to station or system ground. Ensure that a proper ground connection is made before applying line or RF power.

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 connect the unit to an RF power source without first ensuring that the load is connected to the proper line voltage and that the interlock circuit is properly attached to the transmitter. The interlock circuit is designed to indicate a fault and prevent operation when line voltage is not present. Do not apply more than rated power to unit. Damage will occur before thermal protectors can activate interlock circuit.

☠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.

INTRODUCTION

This handbook was prepared for technical personnel as an aid in understanding and performing installation, service and maintenance procedures for the OMEGALINE® Model 640105 Air-Cooled Coaxial Load.

SECTION I

DESCRIPTION AND LEADING PARTICULARS

1-1. Purpose and Application of Equipment. The OMEGALINE® Model 640105 Coaxial Load is a multiple resistor, forced air cooled, dual section dummy load. It has a nominal impedance of 50 ohms and is designed to safely dissipate a maximum of 6000 watts of electrical energy over a frequency range of DC to 220 Mhz. This load has two sections. The "Visual" section is rated at 5000 watts. The "Aural" section is rated at 1000 watts. This load may be furnished with a fan assembly or cooled with user-supplied air flow.

1-2. Equipment Supplied. The Model 640105 Coaxial Load is supplied with standard RF connectors. Their designations are:

1-5/8" EIA Swivel flange:	"Visual" section
Type "N" female:	"Aural" section

Fan equipped units are designed for use on 50 or 60 Hz mains. The standard power supply voltages and their designators after the Model # are:

-115: 110-120VAC, single phase
-230: 220-240VAC, single phase

The standard power supply cord has a CCE-22 approved receptacle end to connect to the mating receptacle on the unit.

-115 units have a NEMA 5-15P male plug
-230 units have 2" stripped and tinned ends

1-3. Equipment Required But Not Supplied. The Model 640105 Coaxial Load is complete as supplied, but the user must furnish RF input, interlock control cable and ground cable appropriate to each installation.

1-4. General Description. The Model 640105 Coaxial Load is enclosed in a single aluminum case. Two RF connectors are located on the front of the unit. A

thermoswitch is located inside of the unit and is connected to the twisted pair of wire (with Molex connector) found on the underside of the unit. This switch is designed to close at 120°F and is used to activate the fan on fan equipped units. It has no function on units not equipped with a fan.

1-5. Electrical Description. The Model 640105 contains two 50 ohm non-reactive resistor assemblies capable of dissipating a total of 6,000 watts of applied electrical energy at frequencies between DC and 220 Mhz with a maximum VSWR of 1.2 to 1. No provisions are made for tuning the resistor assembly and all operating controls relate to the operation of the optional fan assembly. The fan control circuit consists of two switches wired in parallel to control the fan motor. Power is supplied to the fan and to the "Blower On" lamp whenever the equipment is attached to the correct power supply and the main power switch is "ON" or when the fan thermostat senses a temperature equal to or greater than 120° (± 7°) F. The transmitter interlock circuit consists of one normally closed 140°F thermal switch wired to two terminals on the interlock terminal strip located on the front panel of the unit.

1-6. Mechanical Description. The Model 640105 RF Coaxial Load contains two 50 ohm non-reactive resistor assembies which are cooled by forced ambient air. The blower moves air from floor level through the resistor assembly and discharges it vertically from the top of the unit. This places the RF input connector at the coolest point in the air stream and affords exceptionally quiet operation.

1-7. General Principle of Operation. After ascertaining that the Model 640105 is connected to the correct power supply, connect the transmitter interlock circuit and RF source(s). Turn the main power 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, followed by the main power switch on the Model 640105. The fan may continue to run for some time. This depends upon the power level at which the load was operating and upon the ambient air temperature. This feature is necessary to prevent damage to the load. The Model 640105 can be operated in a "Standby" or "Reject" mode with the blower off. To operate in this mode, connect the unit as before and leave the main power switch on the front panel "Off".

1-8. Operating and Adjustment Controls. The only operating control is the main power switch. No field adjustments are necessary or possible.

SECTION II

TEST EQUIPMENT AND SPECIAL TOOLS

2-1. <u>Test Equipment Required.</u> No test equipment is required for routine maintenance. In some circumstances it may be necessary to determine the temperature differential (outlet air minus inlet air) and ambient air temperature which the equipment is experiencing. We recommend the John B. Fluke Mfg. Co. Model 52 or equivalent instrument for this function.

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

1 Tee handle hex key, 5/32" bit
1 Tee handle torx T-15 bit
1 Power screwdriver with T-15 torx bit

SECTION III

PREPARATION FOR USE AND RESHIPMENT

3-1. Unpacking Equipment. The unit should be handled and unpacked with care. Inspect outer carton 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 domestic shipments and the unit should not rattle when being unpacked.

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

- Screws in place and tight.
- All panels and grills free of dents and scratches.
- AC input receptacle visually OK.
- Interlock terminal strip visually OK.
- RF connector visually OK.

While inspecting RF connector, measure DC resistance of the unit by reading from the center conductors to the outer conductors. Compare this reading to that on the specification sheet at the end of this manual. Reading should be ± 1 ohm. If not, consult factory.

3-3. Pre-installation Tests. Prior to installation, connect the unit to a suitable source of AC power. Turn main switch on and check for quiet fan operation. Connect an ohmmeter or a battery operated test lamp across the normally closed terminal pair on the interlock terminal board and check for less than 1 ohm of indicated resistance.

3-4. Installation. 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. The location selected for the Model 640105 should be dry, free of excessive dust and have an ambient temperature below 110°F (40°C). The room should be well ventilated to prevent excessive temperature rise and consequent derating of the unit. The maximum heat dissipation of the unit is 6,000 watts. This is equal to 20,478 Btu/hr., which must be considered part of the equipment/heat load.

3-6. Mounting. The Model 640105 is designed to be a free-standing device. It has mounting brackets attached to both ends. They are provided with holes which will clear ¼" screws. These holes may be used to bolt the unit in place. It may be mounted in any position when fan cooled. When convection air is the only cooling medium, the unit should be mounted in an upright position, with no restrictions of the air openings on the top and bottom of the unit. When cooled by forced air provided by the host equipment, provide for a free flow of approximately 75CFM of ambient air. If this air is already heated by cooling other portions of the host equipment, satisfactory operation may require larger amounts of air.

CAUTION!

THE UNIT MUST BE ATTACHED TO THE PROPER AC POWER SUPPLY WITH INTERLOCK CONNECTED WHENEVER THE RF CONNECTOR IS ATTACHED TO THE SOURCE. INADVERTENT APPLICATION OF RF POWER TO THE UNIT WITHOUT AC POWER MAY DAMAGE OR DESTROY THE RESISTOR ASSEMBLY.

3-7. Connections. There are four connectors on the Model 640105: two RF connectors, the AC power supply and the transmitter interlock (2 terminal, captive screw terminal strip).

a. The RF connector is on the top panel of the unit. Connect to the appropriate RF line from the transmitter.

b. The AC power supply connector is on the front panel. Connect with supplied cord.

c. The transmitter interlock is attached to the normally closed terminals of the terminal board. The terminals are closed whenever no overheat condition exists.

3-8. Ducting. In many installations it will be necessary to duct the discharge air from the Model 640105 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. Design of the ducting and wall or ceiling penetrations should be referred to a competent heating and air conditioning firm.

3-9. Adjustments. No field adjustments are necessary or possible.

3-10. Preparation for Reshipment. No special measures are required to prepare the Model 640105 for reshipment. Care must be taken to protect the RF connectors. Packaging should provide protection against abrasion and impact. Special containers are available from the factory. Please inquire.

SECTION IV

THEORY OF OPERATION

4-1. General. The Model 640105 contains two 50 ohm non-reactive resistor assemblies (6 @ 300 ohms in parallel plus 2 @ 100 ohms in parallel) which are cooled by forced air supplied by a four-bladed fan assembly or by an alternate air supply. Control of the fan and of the transmitter interlock circuit is accomplished with a single rocker switch and two thermal switches.

4-2. Control Circuits. The transmitter interlock circuit is not powered, but operates as a medium-duty switch closure connected to the front panel terminal strip. This terminal pair is normally closed when the thermal switch mounted on the fan bracket senses a temperature at or below 140°F.

SECTION V

MAINTENANCE

≈≈WARNING≈≈

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 640105 is finished with a durable chromic acid conversion coating system. It should be cleaned with a neutral plastic and glass cleaner such as Windex or Miller-Stephenson MS-260. The RF connector should be cleaned with a non-residue contact cleaner such as Miller-Stephenson MS-230. Remove dirt accumulations from the fan and motor by vacuuming. Do not use solvents or an air jet, as these can damage the motor. Remove dirt and dust accumulations from the grills and resistor assembly with an air jet and a soft brush.

5-2. Lubrication. No lubrication is required.

5-3. <u>RF Circuit.</u> 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.

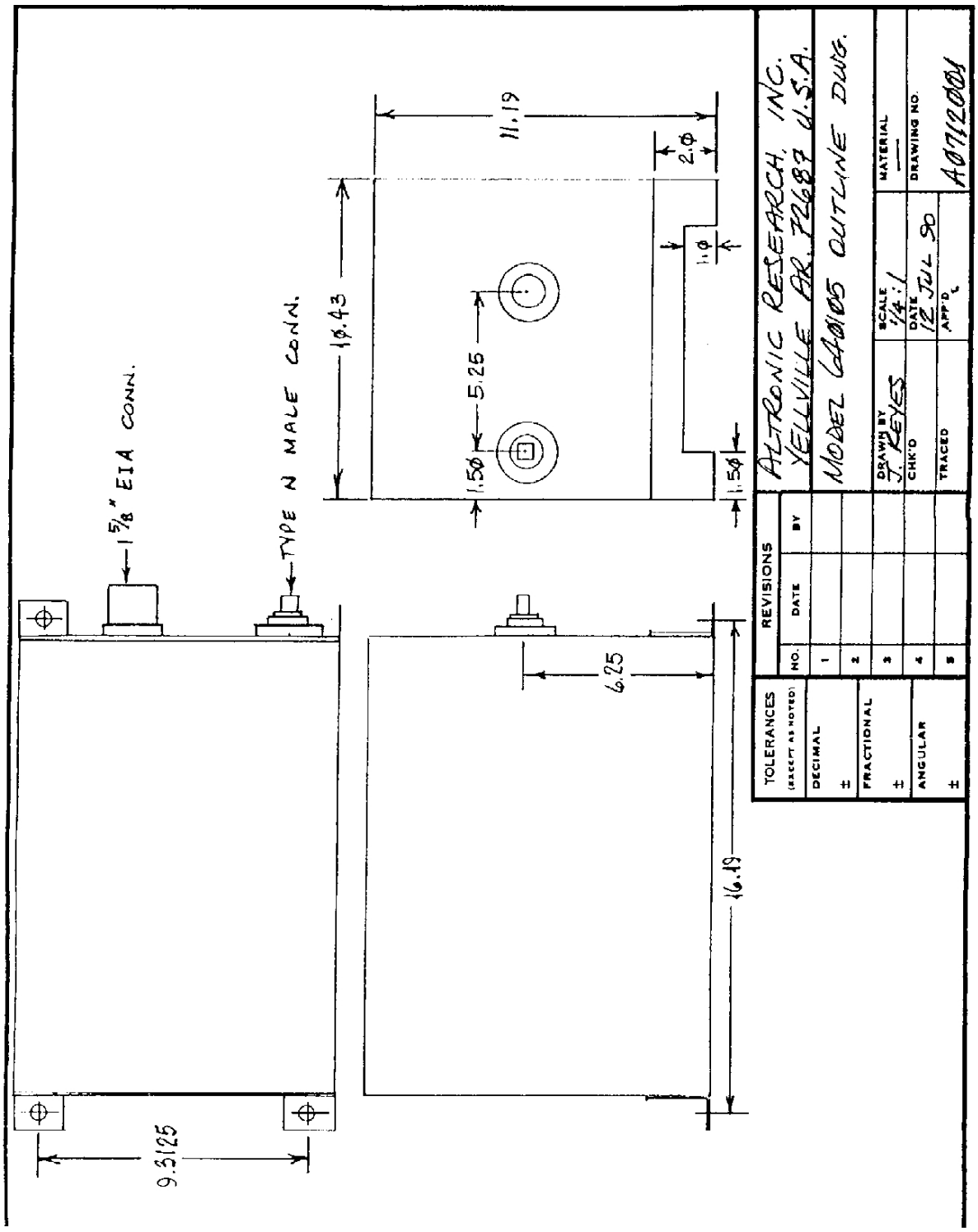
To replace resistors it is necessary to remove the side panels of the unit. Remove the 8-32 x 1/2" screws holding the side panels and then the 10-32 x 2" bolts at the bottom of the panel. With these panels removed, you have access to the resistor banks. Reverse procedure to reinstall.

<u>CAUTION</u>!

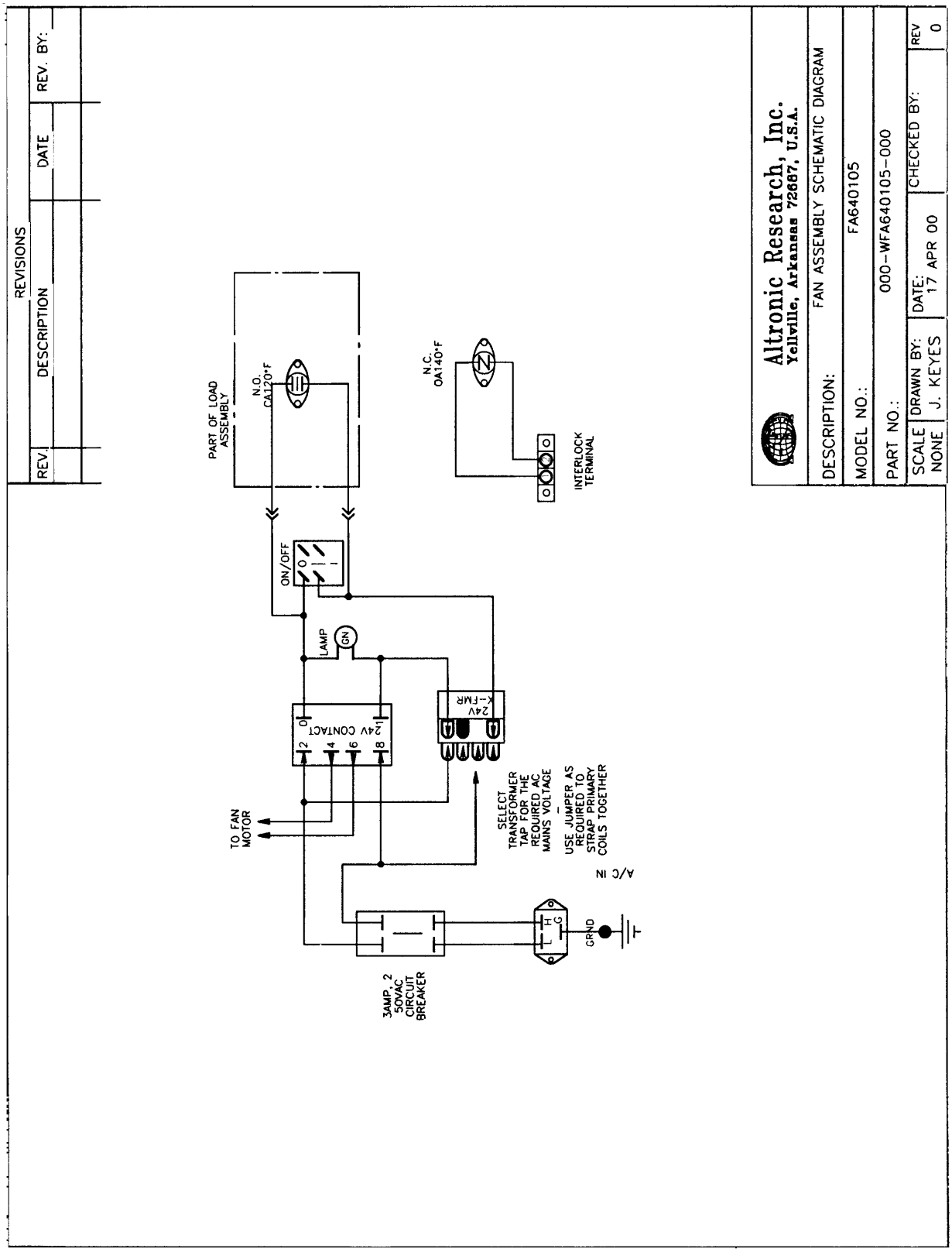
Take care when tightening the ¼-20 x 2" screws securing the lower resistor bracket to the flex panel. Overtightening can fracture the resistors. The resistors are hard, brittle ceramic material. Avoid impact and excessive force when installing or removing them.

SECTION VI

6-1 OUTLINE AND DIMENSIONS



6-2 SCHEMATIC DIAGRAM



6-3 REPLACEMENT PARTS LIST

(CONSULT FACTORY)

SPECIFICATIONS
MODEL 640105

Impedance ---------- > 50 ohms nominal

VSWR @ DC to 220Mhz---------- > 1.20:1 max.

<u>Connectors</u>:
Visual---------- > 1-5/8" Unflanged recessed
Aural---------- > Type N Female

Power Rating (with Fan Assembly)
Visual---------- > 5 KW Continuous
Aural---------- > 1 KW Continuous

Frequency Range ---------- > DC to 220 Mhz

Cooling Method ---------- > Forced Air

Ambient Temperature ---------- > -30°C to +43°C

Fan Assembly ---------- > 10", four-blade, direct-drive

AC Power Requirements:

-115 Models ---------- >115-130VAC, 60Hz, 2 Amp
-230 Models ---------- >220-240VAC,50/60Hz,1 Amp

Finish---------- > Chromic Acid Conversion Coating

Model _____640105_____ Inspected by_____ Date_____

Serial No._____Frequency_____

Resistance: Aural_____ Visual_____

☆☆☆

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