

I N S T R U C T I O N B O O K
F O R
M O D E L S 8 5 7 0 / 7 1 / 7 4
T E R M A L I N E[®] L O A D R E S I S T O R

BIRD
Electronic Corporation

30303 Aurora Road, Cleveland, Ohio 44139-2794

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SAFETY PRECAUTIONS

The following are general safety precautions that are not necessarily related to any specific part or procedures and do not necessarily appear elsewhere in this publication.

Keep away from live circuits.

Operating personnel must at all times observe normal safety regulations. Do not attempt to replace parts or disconnect a RF transmission or any other high voltage line while power is applied. When working with high voltage always have someone present who is capable of rendering aid if necessary.

The following will appear in the text of this publication and is shown here for emphasis.

```
*****
*                               C A U T I O N                               *
*                               *                                           *
* Before any RF operation of the Model 8570/71/74                       *
* TERMALINE® is attempted the transmitter interlock and                 *
* ac line attachment to the equipment must be made. At-                 *
* tach the transmitter interlock connections to the two                   *
* binding posts on the control panel first and then con-                 *
* nect the power cable.                                                  *
*****
```

```
*****
*                               W A R N I N G                               *
*                               *                                           *
* Do not insert a screwdriver or any thin metal objects                 *
* through the perforated cooling air grilles while the                   *
* load is in operation. The power within the unit could                 *
* arc over and cause serious injury to personnel and                   *
* damage to the unit.                                                  *
*****
```

Continued

SAFETY PRECAUTIONS

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*****
*                                     *
*                   C A U T I O N   *
*                                     *
* Do not apply more than the rated RF power to the load *
* Resistor failure could result.         *
*                                     *
* Do not block the air flow. Air enters the housing *
* through perforated grilles at the top of the unit and *
* exhausts through the unit's lower grilles. Blocking *
* these grilles could cause unit failure. *
*****
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*****
*                                     *
*                   W A R N I N G   *
*                                     *
* When using dry cleaning solvents, provide adequate *
* ventilation and observe normal safety precautions. *
* Many dry cleaning agents emit toxic fumes that may be *
* harmful to your health if inhaled. *
*****
```

```
*****
*                                     *
*                   W A R N I N G   *
*                                     *
* Disconnect the unit from ac and RF power before any *
* disassembly for repair or replacement procedures. The *
* potential for electrical shock exists. Care must be *
* taken to avert the possibility of electrical shock. *
*****
```

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MODELS 8570/71/74 TERMALINE® LOAD RESISTOR

INTRODUCTION

GENERAL

This new series air cooled high power TERMALINE® Load Resistors was designed to be a quiet, rugged and trouble free rigid RF line termination as a dummy antenna or as a standby reject load. They are forced air cooled and are capable of dissipating RF line power up to 15kW from dc to 350MHz. Virtually maintenance free and simple to operate these units should provide years of trouble free operation, yet are field repairable in the event of failure of the load resistor or other components. The RF section is composed of a series/ parallel network of resistors which allows the unit to remain in operation even if one of the resistors fail.

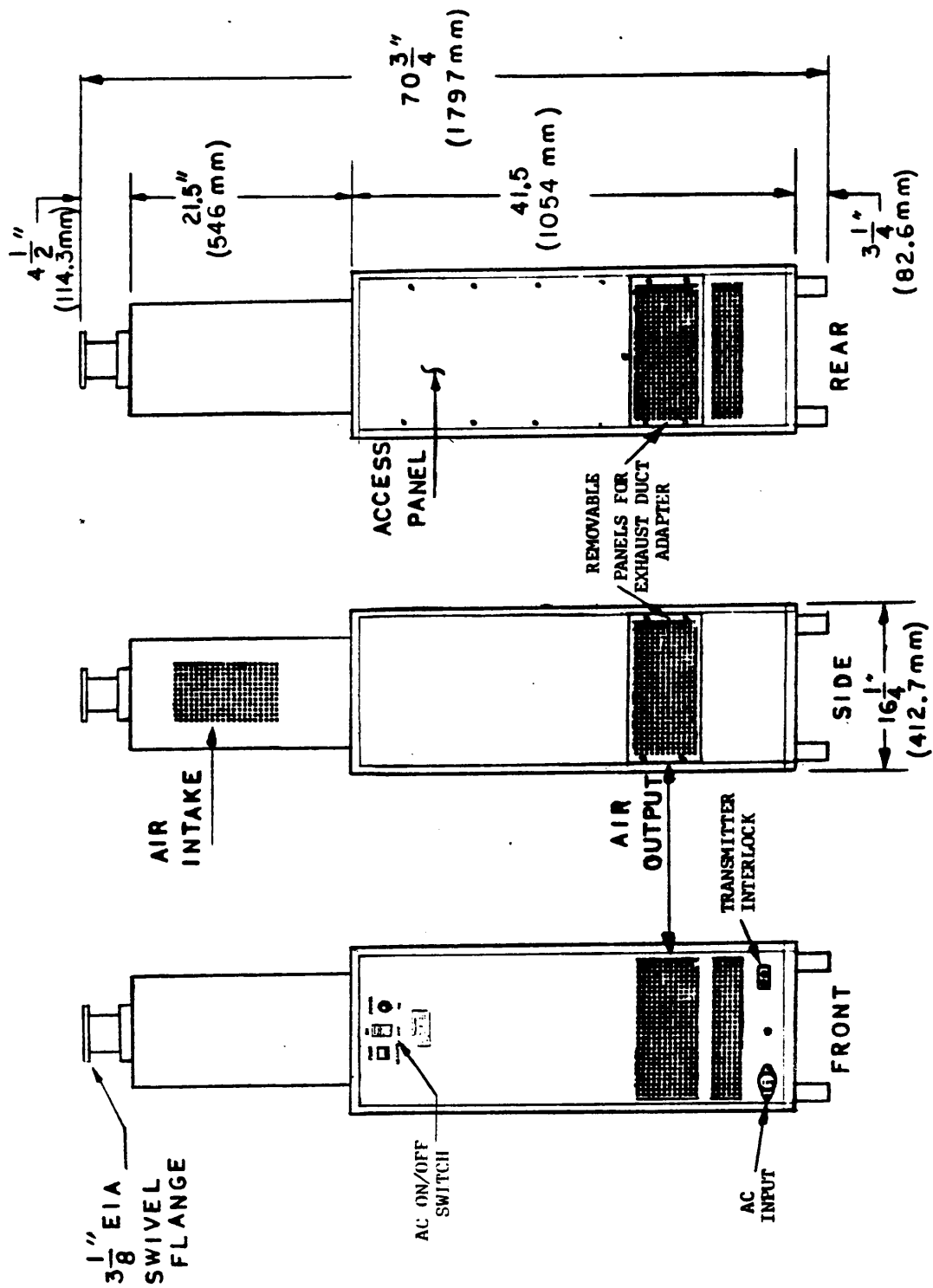
DESCRIPTION

The unit is rectangular in shape and stands approximately six feet high. It is supported on the bottom by four cylindrical shaped feet. The RF input connector is located at the top center of the unit. Perforated side panel grilles at the top and bottom of the unit allow for direct forced air cooling of the resistors. Located on the front panel of the unit or control panel is the ac power receptacle, the ON/OFF switch and the transmitter interlock. The rear panel is removable for service accessibility. Two lower exhaust grilles, on the right side and rear, are removable for installation of an optional exhaust ductwork adaptor.

SPECIFICATIONS FOR MODELS 8570/71/74 TERMALINE® LOAD RESISTOR

Impedance.....	50 ohms nominal
VSWR	
dc-110MHz.....	1.1:1 maximum
110-350MHz.....	1.15:1 maximum
Connectors	
Model 8570.....	3-1/8" EIA Swivel Flanged
Model 8571.....	3-1/8" Unflanged
Model 8574.....	1-5/8" EIA Swivel Flanged
Power Rating.....	15kW continuous duty
Frequency Range.....	dc-350MHz
Dimensions.....	16-1/4"L x 16-1/4"W x 70-3/4"H (412.7 x 412.7 x 1797mm)
Ambient Temperature.....	-40°C to +45°C (-40°F to +130°F)
Cooling Method.....	Forced air cooled
Weight.....	106 lbs. (48kg)
Motor.....	1/3 HP, 1725 RPM prelubricated ball bearing, thermally protected
AC Power Requirements	
115V Model.....	115V ac, 10 amps, 60Hz
230V Model.....	230V ac, 5 amps, 50Hz
Finish.....	Light navy grey and luster- less black baked enamel

Figure I-1. Model 8570/71/74 Outline Drawing.



SECTION I - INSTALLATION

1-1. LOCATION

1-2. The Model 8570/71/74 Load Resistor is forced air cooled, has no intermediate dielectric fluids or coolants, and requires no cooling water hookups. The unit may be placed conveniently anywhere adequate space is available for air circulation and ac power source is handy. Do not enclose the unit in a small room or closet that has no means of ventilation. The heat given off by the unit may raise the ambient temperature to an unacceptable level for sufficient cooling of the resistor.

1-3. Since 15kW is equivalent to over 51,000 Btu/h a sufficient quantity of air must be provided for cooling. Be sure the intake and exhaust grilles are unobstructed. As an optional item, an adapter is available for outside exhaust ductwork. Contact the factory for information.

1-4. MOUNTING

1-5. There are no provisions for permanent mounting of the unit, and the feet must not be removed to mount the unit to the floor. The cooling fan motor derives its cooling air from the bottom of the load. Clearance underneath the load must be maintained.

1-6. INTERLOCK CONNECTIONS

```
*****
*                               C A U T I O N                               *
*                               *                                           *
* Before any RF operation of the Model 8570/71/74                       *
* TERMALINE® is attempted the transmitter interlock and                 *
* ac line attachment to the equipment must be made. At-                 *
* tach the transmitter interlock connections to the two                 *
* binding posts on the control panel first and then con-                 *
* nect the power cable.                                                 *
*****
```

1-7. As a safety precaution always make the connection to the transmitter interlock first in the unlikely event of blower activation switch failure. Applying high RF power to the load without the blower fan running will cause failure of the resistive elements.

1-8. There are three terminals on the interlock connection of the load. One terminal (A) is a common tiepoint and the other two are for normally open (C) or a normally closed (B) contact connection, depending on the requirements of the transmitter used. Check the requirements of the transmitter interlock, and make the connections to the appropriate terminals.

1-9. LINE ATTACHMENT

1-10. AC power, 115 or 230V depending on the unit requirements, is supplied to the 3-wire "Twistlock" panel socket by means of the ten foot, (3.05m) cable and matching plug that is furnished with the load equipment. The third wire in the cable, coded green, is the ground. For proper protection if a 3-wire type plug and outlet is not used, fasten the green wire at the supply end to a satisfactory ground. Do not detach the ac cable, unless absolutely necessary or when disconnection of the RF power supply to the load is definitely assured. Observe the warning label on the front panel. Do not apply RF power to the unit unless the power cord is connected. Even if the ON/OFF switch is in the OFF position the blower will automatically turn on shortly after RF power is applied. This makes the load especially suitable as a reject load for standby operation.

1-11. CONNECTING RF POWER TO LOAD

1-12. After installation, the coaxial RF transmission line may be attached. For the Models 8570, 8571 and 8574 the connections are as follows:

- a. Model 8570, 3-1/8 inch EIA, 50 ohm, with swivel flange.
 1. Use 3-1/8 inch EIA coupling kit, P/N 4600-020, which includes: six each 3/8-16 x 1-1/2 bolt and nut sets, O-Ring, and insulated center bullet.
 2. Insert the center bullet, push in to seat insulator in facing, and install O-Ring in groove.
 3. Connect coaxial input in straight line, push carefully on center contact to close. The swivel flange on the load makes connection independent of a fixed flange on the coaxial input outer conductor.
 4. Insert bolt sets, tighten evenly all around.
- b. Model 8571, 3-1/8 inch unflanged, 50 ohms.
 1. Use coupling kit, P/N 5-726 or RCA MI-27791K-4A, consisting of outer sleeve with two clamping bands, and the center conductor bullet.
 2. Insert the center bullet and bottom it on the midpoint nibs.
 3. Position the outer sleeve with the clamps over the input connector.
 4. Introduce the transmission line and seat it snugly against the coupling stops.

5. Position clamp bands evenly about 3/4 inch from ends of sleeve and tighten.

c. Model 8574, 1-5/8 inch EIA, 50 ohm, with swivel flange.

1. Use 1-5/8 inch EIA coupling kit, P/N 4712-020 which includes: four each 5/16-18 x 1 1/2 bolt and nut sets, O-Ring, and insulated center bullet.

2. Insert the center bullet, push in to seat insulator in facing, and install O-Ring in groove.

3. Connect coaxial input in straight line, push carefully on center contact to close. The swivel flange on the load makes connection independent of a fixed flange on the coaxial input outer conductor.

4. Insert bolt sets, tighten evenly all around.

SECTION II - THEORY OF OPERATION

2-1. GENERAL

2-2. The Model 8570/71/74 is a high power air cooled RF load. For termination of coaxial transmission lines, the RF energy which is converted to heat is transmitted directly to the surrounding area by forced air without any intermediate dielectric transfer fluid or finned heat exchangers.

2-3. RF SECTION DESCRIPTION

2-4. The RF section of the Model 8570/71/74 is composed of a series/parallel array of tubular resistors. These resistors are carefully positioned to provide a reduction in surge impedance proportional to the distance along the array which terminates to the housing forming the return path for the coaxial circuit. This produces a very uniform and almost reflectionless line termination over the stated frequencies of the load resistor.

2-5. An advantage of this series/parallel resistor array design allows the unit to remain in operation in the unlikely event of failure of one of the resistive elements with very little increase in reflected power.

2-6. Consider, if one resistor in a parallel circuit of six would be completely removed. That would mean a 17% increase in resistance. If these resistors are in series with another parallel circuit of six resistors, there would only be an increase of 8.5%. This is an acceptable level and will not effect, to an appreciable amount, the operation of the load or readings if used with a THRULINE® Wattmeter. It is not implied that these should continuously be used this way but merely that it may be used with a defective element until the load can be repaired or the defective element replaced.

2-7. HEAT TRANSFER

```
*****  
*                               W A R N I N G                               *  
*                               *                                           *  
* Do not insert a screwdriver or any thin metal objects *  
* through the perforated cooling air grilles while the *  
* load is in operation. The power within the unit could *  
* arc over and cause serious injury to personnel and *  
* damage to the unit. *  
*****
```

2-8. The resistors used in the Model 8570/71/74 are of a tubular type situated in a vertical position within their housing. When the unit is in operation, a fan located at the bottom of the unit draws air in the top grille openings and directs it over the RF resistor array. The heat devel-

oped in the resistors from dissipation of the RF energy is carried off by the flow of air over the resistors' surface. This hot air is then exhausted through the lower grille openings in the unit. With this forced air entering at the top and being directed downwards, the RF input connector and coaxial line remain cool. This is helpful in maintaining accuracy of a THRULINE®, as well as permitting disconnection of the coaxial line section immediately after the RF power has been turned off, without the discomfort of handling a hot coaxial line connection.

2-9. INTERLOCK CONTROL CIRCUIT

2-10. The interlock control circuit provides fail-safe protection of the transmitter and load resistors in the event of ac power failure to the cooling fan motor. This protection is necessary because dissipation of the heat generated by the RF power is critically dependent upon a required minimum flow of cooling air at all times. Without this air flow, the power handling capabilities of the load is reduced to approximately 1.5kW.

2-11. The interlock system consists of an over temperature switch (thermoswitch) and a relay switch (interlock control). The over temperature switch, is a normally closed contact switch located in the center of the RF section. When ac power is applied to the load the interlock relay is energized and the contacts of the relay actuate for normally open or normally closed operation, and the circuit to the transmitter interlock is completed. This allows the transmitter to turn on. Note - The interlock may be wired for normally open or normally closed operation, see 1-6, Interlock Connections. The RF power then flows into the load and is absorbed by the resistive element which in turn releases the RF power in the form of heat. The blower fan, turned on by either the ON/OFF switch or the automatic mode switch, draws cooling air through the resistor network dispersing the heat into the surrounding air. If the air temperature in the chamber should raise beyond a safe limit, the thermoswitch will open reversing the above process and shutting off the transmitter. The interlock system will not permit reoperation of the transmitter until a safe low temperature within the load is once again attained.

SECTION III - OPERATING INSTRUCTIONS

3-1. GENERAL

```
*****
*                               C A U T I O N                               *
*                               *                                           *
* Do not apply more than the rated RF power to the load *
* Resistor failure could result. *
*                               *                                           *
* Do not block the air flow. Air enters the housing *
* through perforated grilles at the top of the unit and *
* exhausts through the unit's lower grilles. Blocking *
* these grilles could cause unit failure. *
*****
```

3-2. The Model 8570/71/74 has only one operating control, the ON/OFF switch. When installed according to Section I - Installation, all that is required is for the ON/OFF switch to be placed in the ON position, except when used as a standby load. Notice that the red power light comes on when the blower motor is running; the unit is now ready to accept RF power. Once the unit is set there is no need for the presence of an operator.

3-3. LOAD POWER

3-4. It is advised that the unit not be operated above the rated capacity; i.e., 15kW of power. The unit will handle a small percentage of overload until the interlock system's thermoswitch opens due to over temperature and turns off the transmitter. If a large amount of overloading occurs, resistor failure is eminent before the interlock system reacts.

3-5. OPERATION UNDER NORMAL AND ABNORMAL CONDITIONS

3-6. At normal power operation the unit operates at temperatures very warm to the touch. However, no danger of burns is present when touched by operating personnel.

3-7. When the unit is used in a confined area or a small room, it will cause the ambient temperature to rise considerably. This can be avoided by the addition of an optional ductwork adapter kit and venting the exhaust air to the outside. This is recommended only when absolutely necessary. Ductwork must be of a proper design and elbows and length held to a minimum, no 90° bends, as to not create excessive back pressure. Ductwork may exceed dimensions but must not be smaller than the adapter. Included with the ductwork adapter, P/N 8572-078, are two exhaust grille plates to stop the air flow of the hot exhaust air from the front and left side grilles. Without these plates installed only about 50% of the warm air will be vented to the ductwork and 50% directed back into the room. The exact amount of exhausted air vented into the room will depend on the amount of back pressure created by the installed ductwork. Consult with the factory for further information.

3-8. SHUTDOWN

3-9. When operation of the load has been completed always turn off the transmitter first. Allow the fan motor of the Model 8570/71/74 to run a few minutes without RF power applied before turning it off. Normally, the blower activating switch will keep the fan motor running as long as the power cord has not been disconnected. This allows the resistive elements to cool. Disconnection of the coaxial RF line may be made immediately after the RF power has been turned off even though the cooling fan is still running.

3-10. MEASUREMENT AND MONITORING OF RF POWER

3-11. The Model 8570/71/74 Load Resistor may be used in conjunction with any one of the various 3-1/8 inch or 1-1/8 inch coaxial line THRULINE® Wattmeters. When fitted with the appropriate line section and wattmeter, the Model 8570/71/74 becomes a useful tool for tuning and adjusting a transmitter, as well as monitoring RF power directly in watts. Consult with the factory for available THRULINE® Wattmeters and other pertinent information.

SECTION IV - MAINTENANCE

4-1. GENERAL

4-2. Since the Model 8570/71/74 is of a relatively simple yet rugged design, only a moderate amount of preventative maintenance is required. Use reasonable care in handling; do not subject the unit to hard blows or jarring. The unit is designed for use in a vertical position, do not operate on any surface that is not relatively horizontal. The load is designed to operate for long periods of time without failure if care is taken not to exceed its power handling capabilities.

4-3. CLEANING

```
*****  
*                               W A R N I N G                               *  
*                               *                                           *  
* When using dry cleaning solvents, provide adequate                       *  
* ventilation and observe normal safety precautions.                       *  
* Many dry cleaning agents emit toxic fumes that may be                 *  
* harmful to your health if inhaled.                                       *  
*****
```

4-4. A main factor in effective preventative maintenance is cleanliness. For optimum performance and service life, the load must be kept in a clean and dust-free condition. During periods of inaction or if the unit is to be stored for a period of time, keep the unit covered with a cloth or plastic sheet to prevent the intrusion of dust, dirt or moisture, especially on the RF input connector.

4-5. The outside surface of the unit should occasionally be wiped free of dust and dirt. When necessary the inner RF housing and the outside housing may be cleaned with a mild detergent solution on a cloth. The back and right side panels may be removed for cleaning purposes without difficulty, see Paragraphs 4-10 and 4-14. Pay particular attention to the air intake and exhaust grilles. These grilles must be kept clear of dust, lint or any matter that may restrict the air flow.

4-6. Occasionally check the condition of the RF coaxial connection. If required, disconnect the unit from the transmission line and clean the RF connector parts, both metallic and insulator surfaces. When cleaning these parts and all other electrical parts, use an aerosol cleaner or any dry cleaning solvent. Use a cloth to wipe the surfaces; a swab stick is also useful for this purpose.

4-7. RF LOAD RESISTORS

4-8. Measurement of the dc resistance between the inner and outer conductors of the RF input connector will provide a relative check of the condition of the load resistors. Use an accurate ohmmeter or resistance bridge equipped with clip leads for this measurement. The resistance should be close to a nominal 50 ohms. It is recommended that this resistance check be performed before and after each time the load is put in operation, at room ambient temperature and recorded for future reference. If at any time a drastic change in resistance is noticed, or if you have reason to believe one or more resistors have been damaged, the unit will have to be opened and each resistor checked individually to determine which, if any, are defective, see 4-9, Enclosure Disassembly and Resistor Replacement.

4-9. ENCLOSURE DISASSEMBLY AND RESISTOR REPLACEMENT

```
*****  
*                               W A R N I N G                               *  
*                               *                                           *  
* Disconnect the unit from ac and RF power before any                    *  
* disassembly for repair or replacement procedures. The                  *  
* potential for electrical shock exists. Care must be                     *  
* taken to avert the possibility of electrical shock.                      *  
*****
```

4-10. As mentioned previously, the Model 8570/71/74 RF Load is field repairable. To change the resistive elements proceed with the following steps. Photographs are provided after procedure for assistance before and during disassembly.

- a. Remove the (11) 8-32 x 5/16 pan head machine screws from the edges of the back access panel and the single 1/4-20 pan head screw from the lower center, just above the removable grille of the back panel. The back panel is now free to be removed.
- b. Remove the four 8-32 pan head screws from the mid-back exhaust grille work and remove this grille.
- c. With the outer housing, upper, and mid-back panels removed, the RF section housing is exposed. The back panel of this housing must now be taken off.
- d. Remove the (19) 8-32 x 9/32 pan head screws from the sides and top edges of this panel.
- e. Remove the three 8-32 x 9/32 pan head screws from the outer edge of the rear small rectangular plate on the top step of the outer housing. Also remove the 8-32 screw from the lower lip of the RF housing. Remove it from underneath the inside of the fan blade shroud.

f. Remove two 1/4-20 x 2-3/4 round head screws located on the lower section of the inner panel, just above the bottom flange. These 1/4-20 x 2-3/4 screws project through the RF housing panel and through the lower resistor support bracket and are captivated by a 7/16, 1/4-20 nut. When removing these screws, it is necessary to put your hand into the RF section through the fan propeller, and hold these 7/16 nuts from turning. Withdraw the nuts through the propeller blade opening when loose.

g. The RF housing panel is now loose and ready to be taken off. The top of the panel must be pulled out slightly to clear the top supporting rail. The panels may then be lifted upwards to clear the top frame work of the outside housing.

h. With the rear RF housing panel removed, you are now ready to test and replace the load resistors. The resistors are held very firmly by their clips. The possibility of their chipping or cracking upon removal is eminent, unless reasonable care is taken. Do not force the resistors out of the clips. It is advised to use some sort of tool to spread the clips somewhat when removing the resistors. We recommend retaining ring pliers, spreader type, as a very useful tool for this purpose.

i. Remove one end of the resistor at a time. Removal of the exposed bank of resistors should present no problem; however, the rear bank of resistors may be more difficult since they are facing away from you in a confined space. The lower inside resistors must be removed by first detaching the top of the resistors from the center resistor support, then lifting the resistor up and sliding it out of the lower clamp. It may be necessary to remove all the outer, or exposed resistors before removing the opposite inner resistors.

j. To reassemble the resistors and panels simply reverse the disassembly procedure above.

Figure 4-1. Model 8570/71 Back Panel Removal.
Remove Screws marked "X" for rear panel removal.

Figure 4-2. Model 8570/71 RF Housing Panel Removal.
Remove Screws marked "X" for rear panel removal. Remove screws shown by lines marked "X" to take off RF section rear panel.

Figure 4-3. Model 8570/71 Inside View. Inner and outer back panels removed showing RF load resistor array.

Figure 4-4. Model 8570/71 Inside View. Close up of center resistor support and resistor clips.

4-11. DIAGNOSING THE RF ASSEMBLY

4-12. The RF section is comprised of a series/parallel configuration. There are two networks of parallel resistors in series. Each network has two branches with three 150 ohm resistors in parallel. These two branches are in parallel with each other resulting in a 25 ohm network. When one of these networks is in series with a similar network, the total resistance is a nominal 50 ohms.

4-13. If there is a drastic change in the resistance of the load or if there is reason to suspect a resistor has failed, the following procedure may be helpful in finding a faulty resistor.

4-14. First make a visual inspection of all the resistors. Check for cracks or burned spots on the surface of each resistor. If no visual discrepancies are found to indicate resistor failure, it will be necessary to make resistance measurements. A suggested method is outlined below:

a. Measure the resistance of the top resistor network from the top resistor support to the center or mid resistor support, with an accurate ohmmeter. Record this resistance measurement.

b. Check the lower resistor network by attaching the ohmmeter leads between the center resistor support to a good ground or preferably the lower resistor supports. Record these resistance measurement and compare this data.

1. If the resistance of one network exceeds the other by more than 5 ohms, 20% of a nominal 25 ohm, check each resistor of that network.

2. If one or both networks exceed a +5 ohm limit of a nominal 25 ohms, that is less than 20 ohms or more than 30 ohms, then each resistor of that or both networks will have to be checked. Remove each resistor of each branch and check them individually.

c. None of the resistors should exceed a +20% tolerance. If a resistor is found to exceed 180 ohms or be less than 120 ohms then that resistor should be replaced.

4-15. THERMOSWITCH AND REJECT SWITCH REPLACEMENT

4-16. The over-temperature thermoswitch and the blower actuation switch, "reject switch", are replaced by basically the same procedure.

4-17. The thermoswitch is mounted on the right RF housing panel centered just below the ceramic supports for the center resistor support bracket. The reject switch is mounted on the same panel below the thermoswitch but more to the back of the unit. In case of failure, these switches may be replaced by the following procedure:

- a. Remove the back outer housing panel by unscrewing the (11) 8-32 x 9/32 pan head screws on the perimeter of the panel and also the 1/4-20 x 1/2 pan head at the lower center of the panel. Also, remove the mid or grille panel, see subparagraphs 4-10a. and b.
- b. After the back outer housing has been detached and set aside, remove the RF housing back panel. Unscrew the (19) 8-32 x 9/32 pan head screws on the edges of this panel as described in subparagraph 4-10d.
- c. Remove the three 8-32 x 9/32 pan head screws from the edge of the small rectangular plate on the top step of the outer housing. Next, remove the 8-32 pan head screw that secures the panel lip. Remove it from underneath the inside of the fan blade shroud.
- d. Remove the two 1/4-20 x 2-3/4 screws on the lower section. These screws project through the RF housing panel and through the lower resistor support and are secured by a 7/16 inch 1/4-20 nut. It will be necessary to reach your hand through the propeller and hold these nuts when removing the 1/4-20 screws. Remove these nuts through the propeller when free.
- e. The rear RF housing panel is loose and ready to be taken off. Pull outward slightly at the top edge of the panel to clear a mounting rail. When the top is clear, pull the panel upward to clear the top framework of the outer housing.
- f. Remove the upper section of the right side panel. This is the only side panel made in three sections. To remove this panel simply remove the (11) 8-32 x 9/32 pan head screw around the edges of the panel and one 1/4-20 pan head screws at the lower center of the panel. When these screws are removed, the panel will come right off.
- g. With the right side panel removed, notice the thermoswitch and the reject switch mounted on the wall of the right RF housing panel. The exposed portion is the microswitch with the interlock wires attached. The sensor section mounts through the wall of the RF panel. The thermoswitch is secured by two 3/4 hex nuts directly on the sensor body and the reject switch is secured by one 6-32 screw.
- h. Disconnect the wires leading to the switch to be replaced. Normally these will be the poles marked "common", normally closed, for the thermoswitch or "common", normally open, for the reject switch. Connect the wires to the same poles on reassembly.
- i. Using a 3/4 end wrench, reach inside the RF housing and remove the 3/4 nut holding the thermoswitch sensor in place. In some cases it may be necessary to hold the outside 3/4 nut with another wrench while loosening the inside nut. The reject switch is removed by simply removing the 6-32 screw holding it. The thermoswitch may now be withdrawn from outside the RF housing side panel.

j. To reassemble a new thermostwitch or reject switch, reverse the disassembly procedure above.

4-18. RELAY REPLACEMENT

4-19. The fan motor relay and interlock relay replacement procedure is the same. They are similar in configuration and are situated in the same general location inside the bottom of the front control panel. For replacement procedures use following steps:

a. Detach all power connections to the load and carefully lay the entire load on its side.

b. On the inside lower front panel, notice the relays. Determine the one to be replaced and remove the #6-32 screw and nut set securing the relay to the front panel. The screw head is accessible on the front panel.

c. When the relay is free from its mounting, position it so that the connecting wires may be unsoldered easily. Tag each wire with the number that corresponds to the number by each pole on the relay before unsoldering. This will identify the wires when resoldering to the correct poles. Also refer to Figure 5-2.

d. To reassemble, reverse the steps outlined above.

4-20. MOTOR AND PROPELLER REPLACEMENT

4-21. When replacing the motor or propeller, the entire unit must be placed on the left hand side. This is the side with the one piece panel. Place it gently on a padded or cloth covered surface. Remove the bottom and middle right side grille panel to replace the motor and/or propeller. Follow the disassembly procedures below:

a. Remove the four 8-32 pan head screws that secure the middle grille of the right side. With the unit on its side, this panel will be facing up. When this panel is removed, the bottom 2/3 portion of the propeller will be exposed. The propeller must be positioned the same way at reassembly. It may be useful to mark one or two of the blades at the bottom of the propeller shroud for alignment when reassembling.

b. Use a 5/32 Allen wrench, loosen the two 5/16-24 socket head set screws on the propeller hub. The propeller is not removed at this time.

c. Disconnect the ac wires that power the motor/capacitor combination at splice near the motor. Tag each wire to assure correct connection in reassembling.

d. Use a 7/16 socket or box wrench, loosen and remove the four 1/4-20 hex head screws that secure the motor base to the mounting bracket. Support the motor while removing these screws.

e. Hold the propeller and slide the motor straight out the bottom of the unit. The propeller will slide off of the motor shaft as the motor is retracted. If there is any restriction, the set screws may have to be loosened a bit more.

f. With the motor removed the propeller will have to be turned or manipulated to free it from the unit. It may be necessary, especially with the 50Hz propeller, to remove the three 8-32 pan head screws at the base of the pyramid air deflector. This will allow the deflector to be pushed down somewhat in order to free the propeller from its cavity. This may still take some manipulation, but be careful not to bend the blades of the propeller out of shape as this could cause undesirable vibration.

g. When reinstalling the motor/propeller assembly, install the propeller in its cavity first with the hub facing down then replace the three 8-32 screws at the base of the pyramid if removed.

h. With the propeller in its cavity, insert the motor in the bottom of the unit, its shaft going through the hole in the bottom side of the air deflector pyramid. At the same time, hold the propeller so that the shaft enters the hole in the hub. Slide the propeller slightly on the shaft but do not tighten.

i. Insert the 1/4-20 hex screws through the motor base and screw into the motor mounting bracket until snug but not tight. Position the propeller so that about 2/3 of the blades are showing below the shroud, or until the previously made marks are aligned at the bottom of the shroud. Tighten the set screws slightly on the hub.

j. Turn the propeller and notice if it hits the shroud. The motor will possibly have to be repositioned on the mounting bracket until the propeller spins freely without hitting the shroud.

k. When the propeller spins freely without touching the shroud, tighten the motor mounting screws securely and also the socket set screws on the propeller hub. Complete reassembly by reversing the disassembly procedures and test the motor/propeller operation under ac power. It may be useful to test the unit with ac power before the side panel is reattached in case realignment of the motor is required.

4-22. ON/OFF SWITCH, FUSE HOLDER & PILOT LAMP RECEPTACLE REPLACEMENT

4-23. For replacement of the ON/OFF switch, fuse holder or pilot lamp receptacle, the front panel must be removed. Follow the procedure below for front panel removal then the substeps for individual component disassembly. Care must be taken not to draw back the front panel too far as internal connecting wires will restrict its travel.

a. Remove the 22, 8-32 pan head screws from around the perimeter of the front panel.

b. Remove the three 8-32 pan head screws located between the lower and center grille work. Also remove the 1/4-20 pan head screw centered above the top grille work. The front panel is now detached and may be withdrawn sufficiently for parts replacement.

c. Replace the ON/OFF switch, fuseholder and pilot lamp receptacle as individually listed below:

1. ON/OFF switch, Item 12 - Unsolder wires to the switch lugs. Observe their position before unsoldering and return to the same position when reconnecting. Depress the spring clip that holds the switch in place at the top and bottom. This will release the switch and it may be pushed out through the front of the panel. The new switch snaps in through the front of the panel. Resolder the wires to the bottom and center the lug on the same side to complete connection.

2. Fuse holder, Item 13 - The fuse is released by pushing the insert in and slightly downward allowing the fuse cap to spring out. The fuse is replaced in the cap. For protection of the equipment, do not replace the fuse with one of a higher rating than the 15 amp installed. When reinserting the cap, make sure the word "FUSE" reads horizontally, right side up. To remove the fuse holder, unsolder the wires on the fuse holder terminals. Pinch the clamps on each side of the holder and pull it out through the front panel. Note - In replacing this part the word "TOP" on its body should face upward. The fuse holder snaps in through the front panel.

3. Pilot lamp and receptacle, Items 15 and 16 - The NE-51 pilot lamp is replaced by unscrewing the red plastic lens in a counterclockwise direction, pushing in on the lamp and rotating it 1/8 turn in a counterclockwise direction. It will pull straight out. Replace it by aligning the base nibs with the receptacle slot, pushing it in and rotating it 1/8 turn in a clockwise direction. Replace the receptacle by unsoldering the leads to the terminals and removing the 7/8 hex nut and lock washer that secure the receptacle in place. It is now free and may be taken out through the front panel.

d. To reassemble, reverse the above procedure.

SECTION V - PREPARATION FOR RESHIPMENT

5-1. GENERAL

5-2. If the unit is to be reshipped or returned to the factory, secure all loose parts such as the power cord and swivel flange. Pack in a sturdy wooden box or equivalent with sufficient padding to avoid shock damage and seal securely. If possible, keep the original shipping carton for reshipment.

SECTION VI - STORAGE

6-1. GENERAL

6-2. If the unit is to be unused or stored for any length of time, cover with a cloth or plastic film and store in a moisture free, cool, dry place. There is no special preparation to the unit. However, moisture will be the greatest concern. Ambient storage temperatures are not critical but the relative humidity percent should be low.

SECTION VII - REPLACEMENT PARTS LIST

7-1. MODELS 8570/71/74

ITEM	QUANTITY	DESCRIPTION	PART NUMBER
1	12	Load Resistor	8570-032
2	1	Motor, 115/230V, 50/60Hz	8572-037
3	1	Propeller 60Hz 50Hz only	8572-038 8572-077
4	1	Assembly, Motor Shaft	8572-063
5	1	Switch, Blower Actuation	8572-089
6	1	Thermoswitch, Interlock	8572-088-2
7	2	Relay, Motor & Interlock 115V 230V	5-1509 5-1515
8	1	Resistor, Neon Voltage Dropping	8640-081
9	1	Receptacle, 230V	5-748
10	1	Cord, Power 115V 230V	8630-111-1 8630-138-1
11	1	Switch, Power	8640-645
12	1	Holder, Fuse	5-998
13	1	Fuse 115V, 15A, Littlefuse, 3AB 314015 230V, 7.5A, Littlefuse, 3AG 313007	5-721-9 5-721-10
14	1	Receptacle, Pilot Lamp	5-1507
15	1	Lamp, Pilot (Neon NE-51)	5-1508
16	24	Clips, Resistor Holder	8572-091
17	4	Insulator, Ceramic Standoff	8450-052

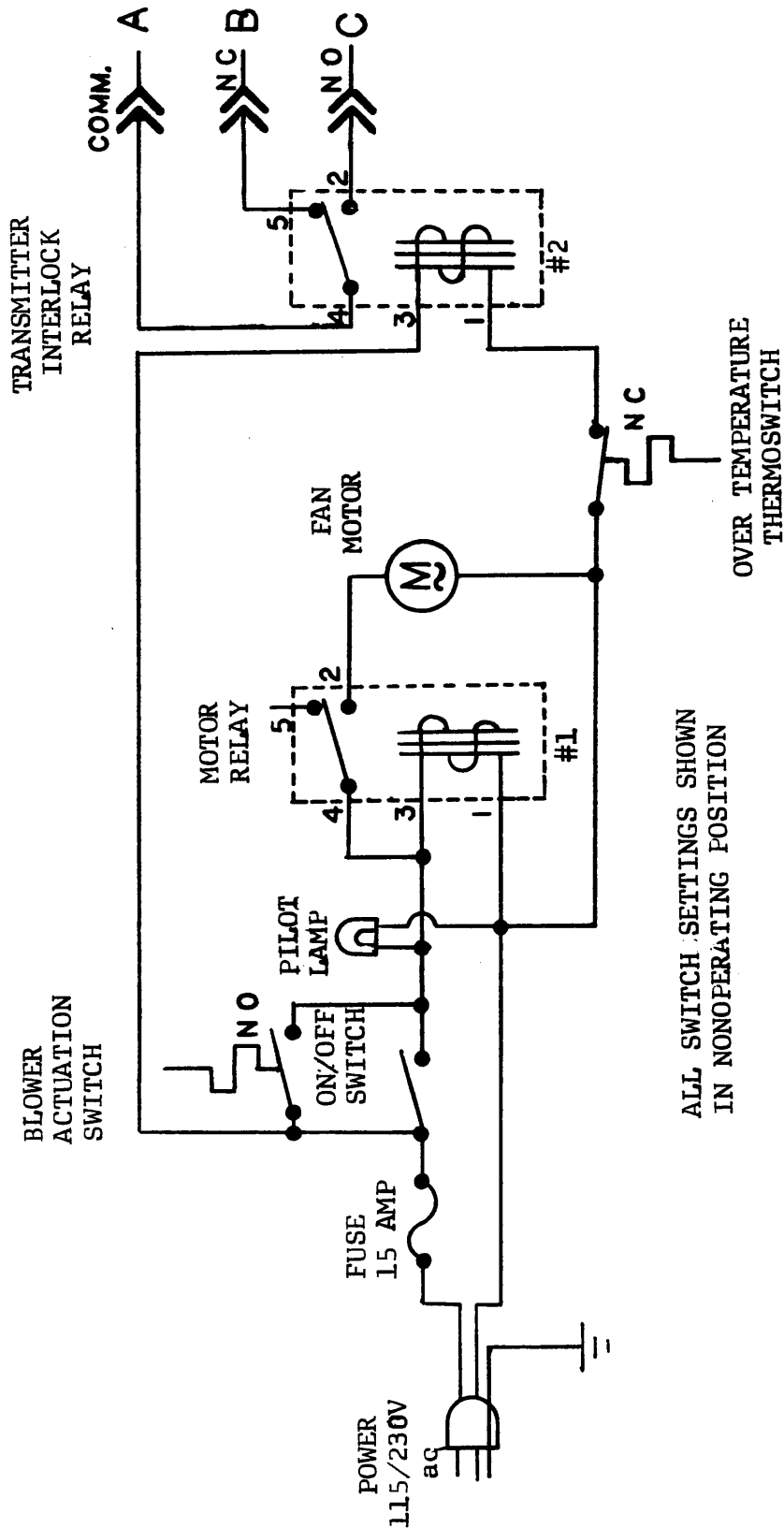
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7-1. MODELS 8570/7/74

<u>ITEM</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
18	1	Connector, RF Input	
		Model 8570 3-1/8" Swivel Flange	8572-006
		Center conductor	8572-005
		Model 8571 3-1/8" Unflanged	8573-006
		Center conductor	8572-005
		Model 8574 1-5/8" Swivel Flange	8574-006
		Center conductor	8574-005
19		Optional Ductwork Adapter, Includes:	8572-078
		Exhaust Grille Plates	8572-087

Figure 7-1. Model 8570/71/74 Motor/Propeller Installed.

Figure 7-2. Model 8570/71/74 Schematic Diagram.



ALL SWITCH SETTINGS SHOWN
IN NONOPERATING POSITION

Models 8570/71/72/73/74
Wiring Diagram

Figure 7-3. Model 8572 With Optional Ductwork Adapter.