
INSTRUCTION BOOK

OPERATING INSTRUCTIONS

TERMALINE[®]
COAXIAL LOAD RESISTOR
MODEL 8251D208

BIRD
Electronic Corporation
Cleveland (Solon) Ohio USA

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Safety Precautions

The following are general safety precautions that are not necessarily related to any specific part or procedure, and do not necessarily appear elsewhere in this publication. These precautions must be thoroughly understood and apply to all phases of operation and maintenance.

Keep Away From Live Circuits

Operating Personnel must at all times observe general safety precautions. Do not replace components or make adjustments to the inside of the test equipment with the high voltage supply turned on. To avoid casualties, always remove power.

Shock Hazard

Do not attempt to remove the RF transmission line while RF power is present.

Do Not Service Or Adjust Alone

Under no circumstances should any person reach into an enclosure for the purpose of service or adjustment of equipment except in the presence of someone who is capable of rendering aid.

Safety Earth Ground

An uninterruptible earth safety ground must be supplied from the main power source to test instruments. Grounding one conductor of a two conductor power cable is not sufficient protection. Serious injury or death can occur if this grounding is not properly supplied.

Resuscitation

Personnel working with or near high voltages should be familiar with modern methods of resuscitation.

Safety Symbols

WARNING

Warning notes call attention to a procedure, which if not correctly performed, could result in personal injury.

CAUTION

Caution notes call attention to a procedure which if not correctly performed, could result in damage to the instrument.



This symbol appears on the equipment indicating there is important information in the instruction manual regarding that particular area.

 Note: Calls attention to supplemental information.

Warning Statements

The following safety warnings appear in the text where there is danger to operating and maintenance personnel and are repeated here for emphasis.

WARNING

The vent plug must be used at all times when the unit is in operation or cooling. Failure to do this could result in damage to the equipment and endanger the operator's safety. Be sure to check this plug.

WARNING

Using this load in the upper end of its power dissipation range will cause the housing to become hot! Care should be exercised in touching it.

WARNING

Never attempt to connect or disconnect RF equipment from the transmission line while RF power is being applied. Leaking RF energy is a potential health hazard.

Caution Statements

The following equipment cautions appear in the text whenever the equipment is in danger of damage, and are repeated here for emphasis.

CAUTION

This equipment is designed for operation in a horizontal position only, with mounting brackets down. Do not operate in any other manner.

CAUTION

Do not operate this equipment over the rated 1000 watts continuously. Damage to the resistive element will result.

CAUTION

The unit is factory filled to the proper level with 1.1 gallons (4.2 liter) of Bird P/N 5-1070. No other coolant should be used

CAUTION

Do not leave out the O-Ring seal, P/N 5-504 when interchanging the vent and shipping plugs.

Safety Statements



USAGE

ANY USE OF THIS INSTRUMENT IN A MANNER NOT SPECIFIED BY THE MANUFACTURER MAY IMPAIR THE INSTRUMENT'S SAFETY PROTECTION.

USO

EL USO DE ESTE INSTRUMENTO DE MANERA NO ESPECIFICADA POR EL FABRICANTE, PUEDE ANULAR LA PROTECCIÓN DE SEGURIDAD DEL INSTRUMENTO.

BENUTZUNG

WIRD DAS GERÄT AUF ANDERE WEISE VERWENDET ALS VOM HERSTELLER BESCHRIEBEN, KANN DIE GERÄTESICHERHEIT BEEINTRÄCHTIGT WERDEN.

UTILISATION

TOUTE UTILISATION DE CET INSTRUMENT QUI N'EST PAS EXPLICITEMENT PRÉVUE PAR LE FABRICANT PEUT ENDOMMAGER LE DISPOSITIF DE PROTECTION DE L'INSTRUMENT.

IMPIEGO

QUALORA QUESTO STRUMENTO VENISSE UTILIZZATO IN MODO DIVERSO DA COME SPECIFICATO DAL PRODUTTORE LA PROIZIONE DI SICUREZZA POTREBBE VENIRNE COMPROMESSA.



SERVICE

SERVICING INSTRUCTIONS ARE FOR USE BY SERVICE - TRAINED PERSONNEL ONLY. TO AVOID DANGEROUS ELECTRIC SHOCK, DO NOT PERFORM ANY SERVICING UNLESS QUALIFIED TO DO SO.

SERVICIO

LAS INSTRUCCIONES DE SERVICIO SON PARA USO EXCLUSIVO DEL PERSONAL DE SERVICIO CAPACITADO. PARA EVITAR EL PELIGRO DE DESCARGAS ELÉCTRICAS, NO REALICE NINGÚN SERVICIO A MENOS QUE ESTÉ CAPACITADO PARA HACERLO.

WARTUNG

ANWEISUNGEN FÜR DIE WARTUNG DES GERÄTES GELTEN NUR FÜR GESCHULTES FACHPERSONAL.

ZUR VERMEIDUNG GEFÄHRLICHER, ELEKTRISCHER SCHOCKS, SIND WARTUNGSARBEITEN AUSSCHLIEßLICH VON QUALIFIZIERTEM SERVICEPERSONAL DURCHZUFÜHREN.

ENTRETIEN

L'EMPLOI DES INSTRUCTIONS D'ENTRETIEN DOIT ÊTRE RÉSERVÉ AU PERSONNEL FORMÉ AUX OPÉRATIONS D'ENTRETIEN. POUR PRÉVENIR UN CHOC ÉLECTRIQUE DANGEREUX, NE PAS EFFECTUER D'ENTRETIEN SI L'ON N'A PAS ÉTÉ QUALIFIÉ POUR CE FAIRE.

ASSISTENZA TECNICA

LE ISTRUZIONI RELATIVE ALL'ASSISTENZA SONO PREVISTE ESCLUSIVAMENTE PER IL PERSONALE OPPORTUNAMENTE ADDESTRATO. PER EVITARE PERICOLOSE SCOSSE ELETTRICHE NON EFFETTUARE ALCUNA RIPARAZIONE A MENO CHE QUALIFICATI A FARLA.

About This Manual

This instruction book covers the model 8251D208 Termaline Coaxial Resistor.

This instruction book is arranged so that essential information on safety is contained in the front of the book. Reading the Safety Precautions Section before operating the equipment is strongly advised.

The remainder of this instruction book is divided into Chapters and Sections.

Operation

First time operators should read Chapter 1 - Introduction, Chapter 2 - Theory of Operation, and Chapter 3 - Installation to get an overview of equipment capabilities and how to install it. An experienced operator can refer to Chapter 4 - Operating Instructions. All instructions necessary to operate the equipment, are contained in this chapter.

Maintenance

All personnel should be familiar with preventive maintenance found in Chapter 5 - Maintenance. If a failure should occur, the troubleshooting section will aid in isolating and repairing the failure.

Parts

For location of major assemblies or parts, refer to the parts lists and associated drawings in Chapter - Maintenance.

Changes To This Manual

We have made every effort to ensure this manual is accurate. If you should discover any errors, or if you have suggestions for improving this manual, please send your comments to our factory. This manual may be periodically updated. When inquiring about updates to this manual refer to the part number and revision level on the title page.

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Chapter 1

Introduction

This publication covers the Termaline Coaxial Load Resistor Model 8251D208. The Termaline Coaxial Load Resistor will generally be referred to as a load throughout this manual.

This chapter contains introductory information including product specifications; items supplied; and accessory items available.

Purpose and Function

The Bird Termaline Coaxial Load Resistor is a portable, general purpose 50 ohm coaxial transmission line termination. The load is a low reflection, nonradiating termination for coaxial transmission lines operating in the UHF (470 - 860 MHz) band.

The load is rectangular in shape with transverse fins enclosing a dielectric coolant cylinder. A retractable handle is recessed in the radiator fins. The front and rear fins are made of heavier gauge material and are bent 90° to form bottom mounting flanges. These flanges are supports for free standing use, or brackets for fixed mounting. Holes are provided in the flanges for fixed mounting.

Applications

Use these loads:

- ♦ As a substitute antenna for tuning transmitters under nonradiation conditions or making routine test and adjustments.
- ♦ As a substitute for any circuit loading element.
- ♦ To measure, with a suitable indication device, the power output of any coaxially transmitted signal within their range.

Performance Characteristics and Capabilities

The Model 8251D208 load can absorb up to 1000 watts continuously and dissipate it harmlessly as heat over a frequency range of 470 to 860 MHz. The actual VSWR, "voltage standing wave ratio", will not exceed 1.065:1 over the frequency range stated.

Power and Utility Requirements

This load is a passive device that is self-contained and requires only RF input to function.

Environmental Requirements	The load should be operated in a dust and vibration free, dry environment. Allow at least 6 inches (153 mm) of clearance around the unit to permit adequate heat dissipation.
Items Supplied	<ul style="list-style-type: none">♦ Load Resistor♦ Instruction Book
Items Required	Matching connector on the coaxial transmission line to which the load will be attached.
Tools and Test Equipment	<p>Screwdriver and an adjustable wrench will be necessary for disassembly of this equipment.</p> <p>A resistance bridge or ohmmeter with an accuracy of one percent or better at 50 ohms is useful for checking the resistance value of the RF section assembly.</p>

Specifications

Impedance, Nominal	50 ohms
VSWR:	1.065:1
Connector:	1-5/8" EIA flanged
Power Range:	1000 watts continuous
Frequency Range:	470 to 860 MHz
Ambient Temperature:	-40°C to +45°C (-40°F to +133°F)
Cooling Method	Oil dielectric and convection currents
Dimensions:	17-29/32"L x 5-15/16"W x 8-1/2"H (455 x 151 x 216 mm)
Weight:	
Net	25 lb. 8 oz. (11.6 kg)
Shipping	30 lb. (13.6 kg)
Operating Position:	Horizontal only - vent plug up
Finish:	Grey Powder Coat
European Safety:	Meets European Standard EN 61010-1:1993 - Safety, Group II. In accordance with Council Di- rective 73/23/EEC and 93/68/EEC.

This load consists essentially of a carbon film resistor on a ceramic substrate immersed in a dielectric coolant. The resistor, individually selected for its accuracy, is enclosed in a special exponentially tapered housing. This provides a linear reduction in surge impedance directly proportional to the distance along the resistor. When surrounded by the dielectric coolant, the characteristic impedance is therefore: 50 ohms at the front (connector end), 25 ohms at the midpoint (to compensate for the resistance already passed over), and zero ohms at the rear where the resistor joins the housing, forming the return conductor of the coaxial circuit. This produces a uniform, practically reflectionless line termination over the stated frequencies of the load resistor.

Cooling The dielectric coolant was chosen for its desirable dielectric and thermal characteristics. Cooling of the load is accomplished by natural fluid and air convection currents. The 1.1 gallons (4.2 liters) of dielectric coolant carries the electrically generated heat from the resistor to the walls of the cylindrical cooling tank. This tank is encased in a set of radiating fins, constructed from heavy gauge aluminum alloy, and firmly pressed into the cylinder. The heat from the dielectric oil is transferred to the surrounding air by the fins.

Expansion of the coolant, caused by the rise in its temperature, is allowed for by the use of an expansion tank located on the upper rear of the load. The expansion tank is equipped with a spring loaded vent for relief of the internal pressure.

Figure 1
Shipping Plug

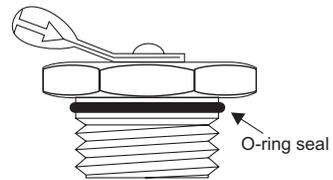
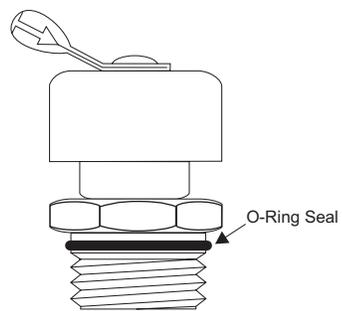


Figure 2
Vent Plug



Chapter 3

Installation

CAUTION

This equipment is designed for operation in a horizontal position only, with mounting brackets down. Do not operate in any other manner.

The load is to be installed, and operated in a horizontal position. The load is shipped horizontal, and normally stands on its base brackets.

The load may be used for portable operation and stand free, or it may be secured to a bench top or other flat surface for a fixed installation. Mount the load with four screws of up to 1/4 inch diameter. Fasten the screws through the four 9/32 inch holes in the mounting brackets that arranged in a 5-1/8 inch x 15 inch (130.2 x 381 mm) rectangle.

Location For operation above 300 watts allow at least six inches (153 mm) of clearance on each side. Operate the load in a horizontal position only, with the handle on top.

Shipping and Vent Plugs

WARNING

The vent plug must be used at all times when the unit is in operation or cooling. Failure to do this could result in damage to the equipment and endanger the operator's safety. Be sure to check this plug.

CAUTION

Do not leave out the O-Ring seal, P/N 5-504 when interchanging the vent and shipping plugs.

Before placing the unit into operation, remove the shipping plug on the top of the radiator and replace with the vent plug supplied. Refer to figures 1 and 2 for identification of the plugs. Don't forget to use the O-Ring seal, P/N 5-504. The shipping and vent plugs are connected with a short length of bead chain to prevent the mislaying or loss of the unused plug.

Connecting to the Transmitter

Connect the load to the transmitting equipment under test with 50 ohm coaxial cable (RG-8A/U, RG-9/U, RG-213/U or equivalent). After the transmitter has been connected to the load, proceed according to the transmitter manufacturer's instructions. When reconnecting the antenna, it may be necessary to slightly readjust the transmitter due to possible differences in VSWR between the load and the antenna system.

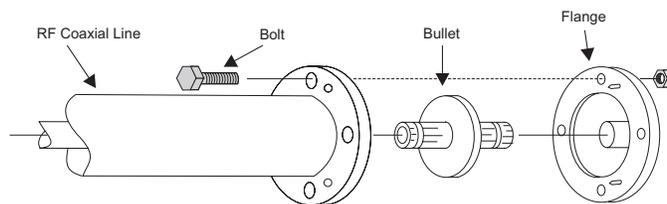
The 1-5/8 inch EIA flange connector is fastened to the transmission line by four 5/16-18 x 1-1/2 bolt sets. The center conductors must be joined with a bullet for 50 ohm 1-5/8 inch coaxial lines. Bird P/N 4712-020 Bullet Kit includes the bolt sets, O-Ring, and center conductor bullet.

 Note: Avoid the use of adapters and elbows whenever possible.

Refer to figure 3 while following the instructions below.

1. Seat the bullet so that half of the thickness of the insulator is nested in the counterbore of each connector flange.
2. Place the load resistor so that it will be aligned with the coaxial input line.
3. Push in on the center contact.
4. Tighten the flange nuts evenly all around (finger tight).
5. Tighten the nuts evenly with wrenches.

Figure 3
Connection to
Transmitting
Equipment



Chapter 4

Operating Instructions

Normal Operation

CAUTION

Do not operate this equipment over the rated 1000 watts continuously. Damage to the resistive element will result.

The load has no indicators or operating controls, therefore it requires no special operating procedures or surveillance when the stated performance limits are not exceeded. Follow the instructions pertaining to the specific transmitting equipment.

Operation Under Abnormal Conditions

WARNING

Using this load in the upper end of its power dissipation range will cause the housing to become hot! Care should be exercised in touching it.

These units will sustain an input moderately greater than 1000 watts for short periods of time. Such loading must be spaced at reasonable intervals to allow sufficient time for the load to cool to a safe temperature. The load can, for instance, sustain an input of 1200 watts for a maximum of five minutes with an interval of at least 30 minutes between each power application.

Shutdown

These loads, being passive devices, have no way of being turned off. Their source of RF power must be turned off instead.

**Emergency
Shutdown**

WARNING

Never attempt to connect or disconnect RF equipment from the transmission line while RF power is being applied. Leaking RF energy is a potential health hazard.

Turn off RF power at the source.

Chapter 5

Maintenance

This chapter contains information for cleaning, inspection, troubleshooting, and performance of this load.

Troubleshooting

Refer to this table when troubleshooting the load for aid in isolating the problem, and for possible causes and remedies.

Table 1
Troubleshooting

Problem	Possible Cause	Remedy
Coolant oil leak around clamping bands or radiator housing	Clamping bands not tight	Tighten screw slightly with a screwdriver
	Faulty O-Ring (front)	Replace O-Ring
	Faulty O-Ring (rear)	Replace O-Ring
Overheating of the radiator	Transmitter power too high	Reduce transmitter power
	Coolant oil level too low	Add more coolant oil to the radiator
	Accumulation of dirt on cooling fins	Clean cooling fins
	Faulty RF section assembly, check dc resistance	Replace if needed

Cleaning

The outside surface of the load should be wiped free of dust and dirt when necessary. The principal maintenance required by the operator will be to periodically wipe off the accumulated dust and lint from the radiator fins. Excessive collection of dust and lint on the cooling fins will interfere with the efficient dissipation of heat. If the teflon insulator or metallic contact surfaces of the connector should become dirty, wipe them off with a soft cloth. If it becomes necessary to use a cleaner, use a contact cleaner that is self-drying and leaves no residue on the inaccessible internal parts of the connector.

Inspection

With the rugged and simple construction of the loads, periodic inspection will be necessary at only about six month intervals. Inspection should include the items listed below:

1. Oil Leakage - check for coolant oil leaking around the radiator tank, particularly at the front and back around the underside of the clamping band. If leakage is observed, refer to the troubleshooting section and, check tightness of the front and rear clamping bands.
2. Inspect the load for dirt or dust buildup.
3. Inspect the load for completeness and general condition of the equipment.

Preventive Maintenance

Due to the basic simplicity of construction, the major requirement for preventive maintenance is to keep the equipment clean, particularly the radiator fins. It is important to maintain the heat transfer efficiency of the cooling fins. Also, occasionally check the coolant level in the radiator tank.

CAUTION

The unit is factory filled to the proper level with 1.1 gallons (4.2 liter) of Bird P/N 5-1070. No other coolant should be used

Checking Coolant Level

1. Remove the vent plug from the socket on the top surface of the expansion tank. Unscrew the vent plug using a 3/4 inch wrench.

 Note: The coolant level, at room temperature, should not be more than 1/8 inch above the bottom surface of the expansion tank.
2. Check the coolant level by carefully lifting the front end of the load and noting presence of coolant on the bottom surface. The coolant quantity should be sufficient to fill the radiator cylinder. The inner housing, for the resistor element, is specially shaped to match the dielectric properties of the recommended coolant.

3. Replace vent plug. If coolant needs to be added, refer to the RF Load Resistor section.

DC Resistance Measurement

Preparation and Tools Required

Be sure that the vent plug is installed.

Preparation:

- ♦ Tools: Common hand tools
- ♦ Ohmmeter with an accuracy of $\pm 1\%$ at 50 ohms.
- ♦ Temperature of the load between 20°C to 25°C (68°F to 77°F)

Accurate measurement of the dc resistance between the inner and outer conductors of the RF input connector will provide a good check of the condition of the load resistor. Checking the dc resistance is simply used to measure a change in the condition of the resistor over time. The tracking of the dc resistance must start *before* the resistor is first put into service. Perform the following steps and record the value for future comparison. Check and record the resistance of the load periodically according to use.

WARNING

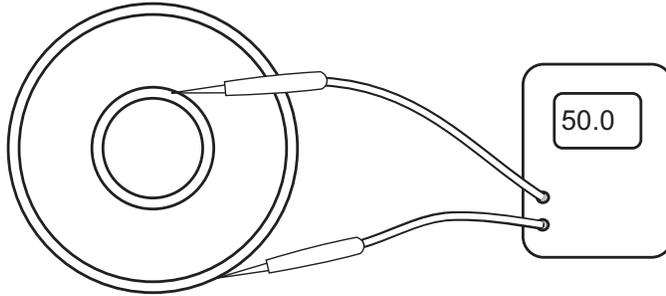
Never attempt to connect or disconnect RF equipment from the transmission line while RF power is being applied. Leaking RF energy is a potential health hazard.

Checking the DC Resistance

Measure the dc resistance. Follow the instructions below.

1. Turn off RF power and interlock circuitry before any electrical disconnection's are made.
2. Disconnect the RF coaxial line.
3. Connect the multimeter test leads across the center and outer conductor of the load resistor. Refer to figure 4 for placement of the leads.
4. Record the value of the resistance *before* the load is put into service. Compare subsequent values with the latest reading. If the values vary more than 2 ohms this could be an indication of a failing resistive element.

Figure 4
Measuring DC
Resistance



These tests are by no means a necessity to the operation of the load but merely guidelines for the users information.

Disassembly

There are no special techniques required for the repair or replacement of components in this Termaline Load Resistor.

Tools Required

- ♦ screwdriver
- ♦ small wrench
- ♦ adjustable wrench (for the connector bolts)

RF Connector

The Model 8251D208 has a 1-5/8 inch EIA flanged connector and must be returned to the factory for connector replacement.

Rear Seal and Coolant

Before any disassembly of the rear of the load, if the coolant has not already been drained from the tank, stand the radiator on end with the connector pointed down.

1. Unscrew the four 10-32 screws at the corners of the guard cover.
2. Unscrew the tube nut from the tank nozzle, using a small wrench if necessary, and pull the nozzle free.
3. Loosen the clamp screw with a screwdriver from the bottom of the clamping band, same type as at the front, and remove the clamping band.
4. Remove the rear cover which includes the attached escape tube with captive nut, P/N 2430-088, and the diaphragm seal, P/N 2430-089.

5. Inspect the diaphragm seal and replace it if it is not soft and pliable, or shows signs of surface cracks.
6. Replace the coolant if it appears contaminated, i.e., if it is not clear.

The expansion tank is vented through the vent plug, P/N 2450-094. The unit unscrews from a socket on top of the tank, but is not itself subject to disassembly.

The shipping plug is sealed by compression of an O-Ring, P/N 5-504, which should be included when replacing the vent plug.

**RF Load
Resistor
Assembly**

CAUTION

Do not leave out the O-Ring seal, P/N 5-504 when interchanging the vent and shipping plugs.

1. Replace the vent plug with the shipping plug in the fill hole of the expansion tank to prevent coolant loss. Refer to figures 1 and 2 for plug identification.
2. Stand the unit on its back end, i.e., vertically with the RF connector up. Brace the unit in this position to prevent it from tipping over.
3. Loosen the 10-32 x 1-1/2 inch screw on the clamping band until the band is free. Remove the band.
4. Grasp the RF connector and slowly lift the load resistor assembly out of the radiator tank to allow the excess coolant to drip back in.
5. Before replacing the load assembly check the O-Ring seal to be sure it is properly placed and is in good condition. It should be free of twists and positioned evenly around the beveled flange of the resistor housing. Also, it should still be soft and pliable and not hard or showing signs of surface cracks.

**Radiator
Handle**

The radiator handle slides on and is held in place by the two retaining studs that are riveted to the fins. It may be removed or replaced as follows:

1. Gently pry apart the fins next to each stud just enough to clear the handle thickness.
2. With the fins pried apart sufficiently, slide each leg of the handle off its respective stud.

Assembly

Diaphragm and Coolant Oil

To assemble the unit after replacing the diaphragm or adding coolant, follow the instructions below.

1. Install the diaphragm and the rear cover.
2. Install the clamping band and tighten the clamp screw with a screwdriver.
3. Install the tank nozzle and tighten the tube nut.
4. Install the guard cover with the screws previously removed.

RF Load Resistor Assembly

To assemble the unit after replacing the RF load resistor, follow the instructions below.

1. Grasp the RF connector and slowly lower the load resistor assembly into the radiator tank.
2. Install the clamping band and tighten the 10-32 x 1-1/2 inch screw on the clamping band.
3. Place the load in a horizontal position on a firm surface.
4. Replace the shipping plug with the vent plug in the fill hole of the expansion tank.

To install a new radiator handle, after having removed the defective handle, follow the instructions below.

Radiator Handle

1. Place each leg of the new handle over the studs that the original handle was on.
2. Gently pry the fins until they are in their original position, and the handle will not come off of the studs.

Storage

No special preparations for storage are necessary other than to cover the equipment to keep out dust and dirt. Store the unit in a dry and dust-free environment where the ambient temperature will remain within the -40°C to +45°C (-40°F to +113°F) working range of the load.

Customer Service

Any maintenance or service beyond the scope of those provided in this section should be referred to a qualified service center.

Any equipment returned must be shipped prepaid and to the attention of the Service Group.

Bird Electronic Corporation maintains a complete repair and calibration facility at the following address:

Sales/Repair Facility

U.S.A. Sales and Manufacturing

Service Group
Bird Electronic Corporation
30303 Aurora Road
Cleveland (Solon), Ohio 44139-2794
Phone: (440) 248-1200
Fax: (440) 248-5426

Sales Facilities

For the sales office nearest you, call Bird Electronic Corporation at the above telephone number, or visit our Web site at:

<http://www.bird-electronic.com>

Preparation for Shipment

Should you need to return the load, use the original shipping package if possible. Wrap the RF connector with padding and tape securely in place. It is not necessary to remove the coolant to ship the load. Simply replace the vent plug with the shipping plug attached to the bead chain. Be sure the O-Ring seal is mounted on the plug to avoid leakage.

Replacement Parts List

Qty.	Description	Part Number
1	RF Section Assembly	8890-050
1	Radiator Assembly	2430-123
1	Diaphragm Cover Guard	2430-078
1.1 gals (4.1 liter)	Coolant Oil - Dielectric 1 pint container 1 gallon container 5 gallon container	5-1070-1 5-1070-2 5-1070-3
1	Diaphragm Seal	2430-089
1	Diaphragm Cover	2430-088
2	Clamp Band Assembly (2430-043 & screw)	2430-055
1	RF Section O-Ring Seal	5-230
1	Vent Plug	2450-094
1	Shipping Plug	2450-049
1	Radiator Handle	2430-028
1	Chain Assembly	8180-094
2	Vent and Shipping Plug O-Ring	5-504
1	Expansion Tank, part of Radiator	2430-080

Limited Warranty

All products manufactured by Seller are warranted to be free from defects in material and workmanship for a period of one (1) year, unless otherwise specified, from date of shipment and to conform to applicable specifications, drawings, blueprints and/or samples. Seller's sole obligation under these warranties shall be to issue credit, repair or replace any item or part thereof which is proved to be other than as warranted; no allowance shall be made for any labor charges of Buyer for replacement of parts, adjustment or repairs, or any other work, unless such charges are authorized in advance by Seller.

If Seller's products are claimed to be defective in material or workmanship or not to conform to specifications, drawings, blueprints and/or samples, Seller shall, upon prompt notice thereof, either examine the products where they are located or issue shipping instructions for return to Seller (transportation-charges prepaid by Buyer). In the event any of our products are proved to be other than as warranted, transportation costs (cheapest way) to and from Seller's plant, will be borne by Seller and reimbursement or credit will be made for amounts so expended by Buyer. Every such claim for breach of these warranties shall be deemed to be waived by Buyer unless made in writing within ten (10) days from the date of discovery of the defect.

The above warranties shall not extend to any products or parts thereof which have been subjected to any misuse or neglect, damaged by accident, rendered defective by reason of improper installation or by the performance of repairs or alterations outside of our plant, and shall not apply to any goods or parts thereof furnished by Buyer or acquired from others at Buyer's request and/or to Buyer's specifications. In addition, Seller's warranties do not extend to the failure of tubes, transistors, fuses and batteries, or to other equipment and parts manufactured by others except to the extent of the original manufacturer's warranty to Seller.

The obligations under the foregoing warranties are limited to the precise terms thereof. These warranties provide exclusive remedies, expressly in lieu of all other remedies including claims for special or consequential damages. SELLER NEITHER MAKES NOR ASSUMES ANY OTHER WARRANTY WHATSOEVER, WHETHER EXPRESS, STATUTORY, OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS, AND NO PERSON IS AUTHORIZED TO ASSUME FOR SELLER ANY OBLIGATION OR LIABILITY NOT STRICTLY IN ACCORDANCE WITH THE FOREGOING.

DECLARATION OF CONFORMITY

Manufacturer: Bird Electronic Corporation
30303 Aurora Road
Cleveland, Ohio 44139-2794

Product: TERMALINE RF COAXIAL LOAD RESISTOR
Model: 8251D208

The undersigned hereby declares, on behalf of Bird Electronic Corporation of Cleveland, Ohio, that the above-referenced product, to which this declaration relates, is in conformity with the provisions of the following standards;

1. European Standard EN 61010-1:1993 - Safety, Group II.

This standard is in accordance with Council Directive 73/23/EEC and 93/68/EEC.

The technical documentation file required by this directive is maintained at the corporate headquarters of Bird Electronic Corporation, 30303 Aurora Road, Cleveland, Ohio.



Ken DeVore
QA/Metrology Manager
Bird Electronic Corporation