Termaline® RF Coaxial Load Resistor

Operation Manual

Model 8072A-1 & 8072A-2

Instruction Book Part Number 920-8072A Rev. D

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.

WARNING

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.

WARNING

Shock Hazard

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

WARNING

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.

WARNING

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.

WARNING

Resuscitation

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

WARNING

Remove Power

Observe general safety precautions. Do not open the instrument with the power on.

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.

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

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

See pages 2 and 5.

WARNING

This product contains a resistor substrate made of beryllium oxide. This is a potentially toxic ceramic and may be harmful to your health. Beryllium Oxide must be disposed of in accordance with the legal statues dealing with hazardous material.

See page 4.

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 PROZIONE 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 HACERIO.

WARTUNG

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

ZUR VERMEIDUNG GEFÄHRLICHE, ELEKTRISCHE SCHOCKS, SIND WARTUNGSARBEITEN AUSSCHLIEßLICH VON QUALIFIZIERTEM SERVICEPERSONAL DURCHZUFÜHREN.

ENTRENTIEN

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 EFFETTUARRE ALCUNA RIPARAZIONE A MENO CHE QUALIFICATI A FARLA.

About This Manual

This manual covers the operating and maintenance instructions for the following models:

8072A-1 8072A-2

Changes to this Manual

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

Chapter Layout

Introduction — Describes the features of the Load Resistor, lists equipment supplied and provides connection instructions.

Maintenance — Lists routine maintenance tasks as well as troubleshooting for common problems. Specifications and parts information are also included.

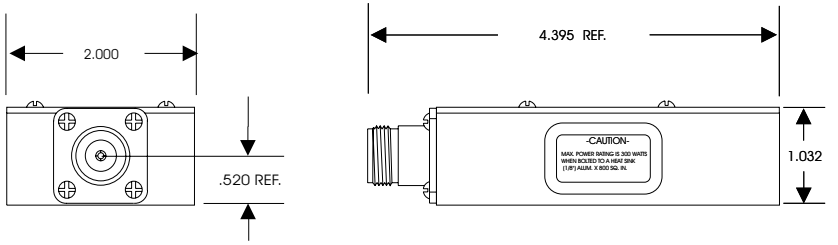
Table of Contents

Chapter 1 Introduction

Description

The Bird Model 8072A-1 and 8072A-2 Termaline Coaxial Load Resistor is a dry (air dielectric), conduction cooled (needs heat sink), type 50-ohm RF (Radio Frequency) line termination. It is capable of dissipating 300 W of continuous power when properly mounted to a suitable heat sink. The load is designed for a reflection-free termination of a transmission line and is efficient in any position. The Model 8072A-1 and 8072A-2 is normally supplied with an N-Type Female connector.

Figure 1 Outline Drawing



Unpacking and Inspection

1. Carefully inspect shipping container for signs of damage.
   - If the shipping container is damaged, do not unpack the unit. Immediately notify the shipping carrier and Bird Technologies.
   - If the shipping container is not damaged, unpack the unit. Save shipping materials for repackaging.
2. Inspect unit for visual signs of damage.

   Note: *If there is damage, immediately notify the shipping carrier and Bird Technologies.*

Installation

Connections

A suitable heat sink is required. It must be of such capacity that at 300 W of continuous input, the temperature on top of the load body will not exceed 155°C (311°F). Use an aluminum plate of at least 800 sq. in. by 1/8 in. thick (5200cm² x 3mm) or equivalent.

1. Apply a thin film of heat transfer compound over the entire mating surface.

   Note: *The film, when flattened, must not exceed a thickness of 0.001 inch.*

2. Mount the load to the heat sink using six mounting screws, preferably stainless steel, and of suitable length to include the 1-1/32 inch load body, heat sink thickness, washer and nut.

   Note: *A tapped heat sink can be used instead of using a washer and nut.*

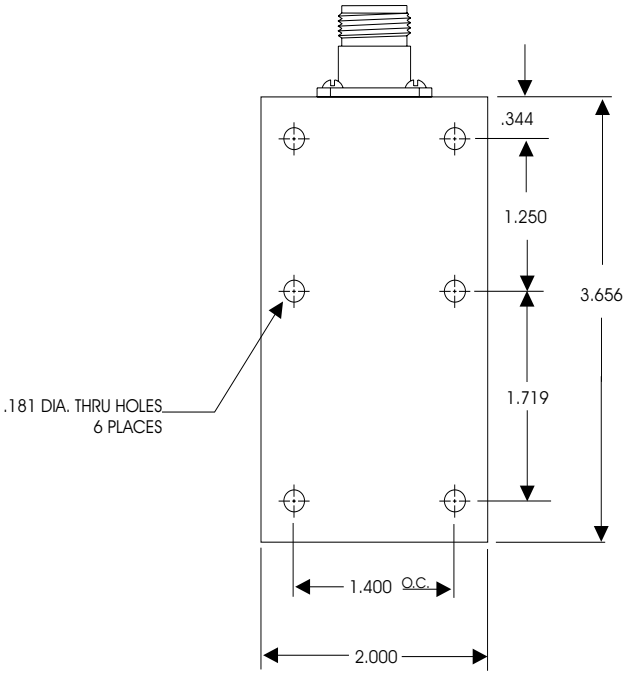
3. To ensure a proper thermal contact, torque the mounting screws to 25 to 30 inch-pounds.

WARNING

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

4. Using a suitable cable, as short as convenient, attach the RF power source to the load with a mating connector.
5. Tighten all connections.
6. Ensure the heat sink has ventilation adequate to maintain the loads body temperature to a maximum of 155°C (311°F) on top.

Figure 2 Mounting Template



Chapter 2 Maintenance

WARNING

This product contains a resistor substrate made of beryllium oxide. This is a potentially toxic ceramic and may be harmful to your health. Beryllium Oxide must be disposed of in accordance with the legal statues dealing with hazardous material.

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

All instruments returned for service must be shipped prepaid and to the attention of the Customer Service Group.

Cleaning

1. Gently remove loose dirt and grime using a soft clean cloth dampened detergent and water. Do not use paint thinner or other solvents that may cause damage to the finish.
2. RF Connectors - Clean RF connectors with a cotton swab dampened with alcohol, or any acceptable dry cleaning solvent.

Note: *Keep the RF connectors covered when not in use. This will prevent dust and dirt from accumulating in the connectors.*

Measure DC Resistance of Load

Items required:

Multimeter or ohmmeter with accuracy of ±1% @ 50 ohms.

Temperature of the load @ 20° to 25° C (68° to 77° F).

VSWR and RF Impedance are the true benchmark of a quality dummy load. 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 the equipment from a transmission line while RF power is applied. Leaking RF energy is a potential health hazard.

1. Disconnect RF Coaxial Line.
2. Do one of the following:
   - Connect multimeter with a short length of low resistance cable equipped with a Male N (or applicable) connector.
   - Connect multimeter test leads across center and outer conductor of the load resistor.
3. Record the value of the resistance before the load is put into service.
4. Compare subsequent values with the latest reading.

Note: *If the values vary more than 2 ohms this could be an indication of a failing resistive element.*

Specifications

Power Rating w/ Heat Sink	300 W Continuous when mounted to suitable heat sink.
Frequency Range & VSWR Model 8072A-1 Model 8072A-2	 DC to 1 GHz at 1.10 Max. 1GHz to 2.5 GHz at 1.20 Max. 2.7 to 2.9 GHz at 1.15 Max
Ambient Temperature Model 8072A-1 Model 8072A-2	 -40° to +55°C (-40° to 131°F) -40° to +70°C (-40° to 158°F)
Heat Sink Required	800 sq. in. plate x 1/8" (5200cm² x 3.2mm) or equivalent
Input Impedance	50 ohms
Connector	N-Type Female
Finish	Semi-Gloss black enamel
Load Coolant	Dry, Conduction cooled
Operating Position	Any
Nominal Size	4-25/64" x 2" x 1-1/32" (110 x 51 x 26mm) (Includes connectors)
Weight Nominal	12 oz. (.34kg)
Mounting	Six screws, Torqued to 25 to 30 in/lb

Customer Service

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

If the unit needs to be returned for any reason, request an Return Material Authorization (RMA) through the Bird Technologies website. All instruments returned must be shipped prepaid and to the attention of the RMA number.

Bird Service Center
30303 Aurora Road
Cleveland (Solon), Ohio 44139-2794
Fax: (440) 248-5426
E-mail: *bsc@birdrf.com*

For the location of the Sales Office nearest you, visit our Web site at:

http://www.birdrf.com

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. Routine (regularly required) calibration is not covered under this limited warranty. 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.