INSTRUCTION BOOK

OPERATING INSTRUCTIONS

TERMALINE® LOAD RESISTOR MODEL 8578A100GIG

This is a preliminary manual. Specifications, limits, and text are subject to change without notice. The information within this manual was as complete as possible at the time of printing. Bird Electronic Corporation is not liable for errors.

Electronic Corporation
Cleveland (Solon) Ohio USA

Instruction Book Part Number 920-8578A100GIG Preliminary

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 throughly understood and applied to all phases of operation and maintenance.

Keep Away From Live Circuits

Operating personnel must at all times observe normal safety regulations. Do not replace components or make adjustments to the equipment with the high voltage supply turned on. To avoid casualties, always remove power.

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.

Shock Hazard

Do not attempt to remove the RF transmission line while RF power is present. Radiated RF power is a potential health hazard.

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
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 will cause serious injury to personnel and damage to the unit.

WARNING
Disconnect this unit from RF power sources before any disassembly for repair or replacement procedures. The potential for electrical shock exists.

WARNING
Surface can reach temperatures in excess of 100°C when maximum power is applied to load.

WARNING
Limit the interlock terminal to less than 30 Vrms. Although the interlock terminal is rated to 230 Vac, the potential for electrical shock exists.

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
Connect interlock before RF operation.

CAUTION
Do not apply more than the rated RF power to load. Excessive RF power will damage the load resistors.

CAUTION
Do not block airflow. Air enters the housing through perforated grilles at the side of the unit and exhausts through the opposite grille of the unit. Blocking these grilles could cause unit failure.

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.

CONNECT INTERLOCK TO TRANSMITTER BEFORE OPERATING.

BRANCHER LE VERROUILLAGE À L'ÉMETTEUR AVANT EMPLOI.

CONECTE EL INTERBLOQUEO AL TRANSMISOR ANTES DE LA OPERACION.

VOR INBETRIEBNAHME VERRIEGELUNG AM SENDER ANSCHLIESSEN.

PRIMA DI METTERE IN FUNZIONE L'APPARECCHIO, COLLEGARE IL DISPOSITIVO DI BLOCCO AL TRASMETTITORE.

About This Manual

This instruction book covers the model 8578A100GIG Termaline Load Resistor.

This instruction book is arranged so that essential information on safety appears 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. At the beginning of each chapter, a general overview describes the contents of that chapter.

Operation

First time users should read Chapter 1 - Introduction, Chapter 2 - Theory Of Operation, and Chapter 3 - Installation, to get an overview of equipment capabilities and installation. An experienced operator can refer to Chapter 4 - Operating Instructions. All instructions necessary to operate the equipment appear in this chapter.

Maintenance

All personnel should be familiar with preventative 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 5.

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 comment 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.

Table of Contents

Safety Precautions. i

Warning Statements.. ii

Caution Statements ii

Safety Statements. iii

About This Manual. v

Introduction 1

General 1

Description. 1

Unpacking and Inspection 3

Site and Shelter Requirements 3

Theory Of Operation 5

General 5

RF Section Description. 5

Heat Transfer 5

Interlock Control Circuit 5

Installation 7

Mounting Location 7

Placement 7

Interlock Connections 7

Connecting RF Line. 8

Swivel Flange Coupling 9

Unflanged Coupling 9

Operating Instructions 11

General 11

Load Power 11

Operation Under Normal and Abnormal Conditions 11

Shut Down 11

Measurement and Monitoring of RF Power 12

Maintenance 13

Troubleshooting 13

Cleaning 13

Outside Surfaces 13

Interior Surfaces 14

Diagnosing the RF Assembly 14

Replacing Resistors 15

Replacing the Thermoswitch 15

Customer Service 16

Preparation for Storage or Shipment 16

Storage 16

Shipment 16

Replacement Parts List 17

Chapter 1

Introduction

General

The Model 8578A100GIG is an air cooled, high powered Termaline Load resistor designed to be efficient, rugged and trouble free. It is designed to be forced air cooled and is capable of dissipating RF line power up to 10 kW, with 1000 ft^3/min (28.32 m^3/min) or more of externally supplied cooling air through it. Virtually maintenance free and simple to operate, this unit should provide years of trouble free operation yet is field repairable in the event of failure of the load resistor or other components. The RF section is composed of a parallel combination of resistors.

Description

The unit is rectangular in shape. It is supported on three sides by four bumper feet on each side. The RF input connector is located on the front panel of the unit. Perforated side panel grilles on two sides of the unit allow for direct forced air cooling of the resistors. The transmitter interlock is located on the front panel of the unit. The rear and side panels are removable for servicing. Refer to Figure 1, Outline Drawing.

> WARNING
> 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 will cause serious injury to personnel and damage to the unit.

Specifications

Impedance	50 ohms nominal
VSWR	1.15:1 maximum 88-108 MHz
Connectors	Standard— 1-5/8" Diameter Swivel Flange Optional— 3-1/8" Diameter Unflanged
Power Rating	10 kW continuous duty @ 1000 ft^3/min (28.32 m^3/min) of air (externally supplied)
Frequency Range	88 - 108 MHz
Dimensions: with connector: without connector:	 27-5/8"L x 16-15/32"W x 19-11/16"H (702 x 418 x 500 mm) 25-5/32" x 16-15/32" x 19-11/16" (639 x 418 x 500 mm)
Ambient Temperature	-40°C to +40°C (-40°F to 104°F)
Interlock contact rating	10 Amp @ 120 Vac 5 Amp @ 250 Vac
Cooling Method	Forced air cooled @ 1000 ft^3/min (28.32 m^3/min) (externally supplied)
Weight, Nominal	34 lbs (15.3 kg)
Finish	Grey Powder Coat
Environmental Specificaiton Safety:	 In conformity with European Standard EN-61010-1:1993 - Safety, Group II in accordance with Council Directive 89/336/EEC (May 3, 1989), on Electromagnetic Compatibility, as amended by Council Directive 92/31/EEC (April 28, 1992).

Unpacking and Inspection

1. Carefully inspect the shipping container for signs of damage. If damage is noticed, do not unpack the unit. Immediately notify the shipping carrier and Bird Electronic Corporation of the damage.

2. If the container is not damaged, unpack the unit. Save the packing materials for repacking.

3. Inspect all of the components for visual signs of damage. Immediately notify the shipping carrier and Bird Electronic of equipment damage or missing parts.

Site and Shelter Requirements

The equipment is not intended for exposed outdoor use, or use in areas of condensing humidity. The surrounding air must be free of contaminants or particles that could be drawn into the air intakes. These load resistors have no intermediate dielectric fluids or coolant and require no cooling water hookups. The unit should be placed where adequate space is available for air circulation.

Do not enclose the unit in a small room or closet without proper ventilation. In small rooms or restricted areas, the heat given off by the unit may increase the ambient temperature to an unacceptable level for sufficient cooling of the resistors.

Figure 1
Model 8578A100GIG
Outline Drawing

Chapter 2

Theory of Operation

General

The 8578A100GIG is a high powered, air-cooled, RF load used for termination of coaxial transmission lines. The RF energy, when converted into heat, is transmitted directly to the external area by a forced air system.

RF Section Description

The RF section of the 8578A100GIG is composed of a parallel combination of tubular resistors. These resistors are carefully positioned to provide a reduction in surge impedance proportional to the distance along the resistive system, which finally 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.

Heat Transfer

The resistors used in the 8578A100GIG are of a tubular ceramic type, situated in an angled position within their housing. When the unit is in operation, externally forced air is blown into the side grille opening and directed over the RF resistor network. The heat, developed in the resistors from dissipation of the RF energy, is carried off by the flow of air over the resistors surface. The hot air is then exhausted through the opposite side grille openings in the unit.

Interlock Control Circuit

The interlock control circuit provides fail-safe protection of the transmitter and load resistor in the event of an overload situation. This protection is necessary because dissipation of the heat generated by the RF power is critically dependent upon a required minimum flow of external cooling air at all times. If the airflow over the resistor array should stop or be restricted and the temperature in the RF chamber should rise beyond a safe limit, the heat sensor unit will sense the change and actuate the interlock relay to reverse the process and turn off the transmitter. The interlock system will not permit re-operation of the transmitter until the air flow is restored and a safe low temperature in the RF housing is once again attained.

Chapter 3

Installation

This chapter provides information for on site requirements, unpacking, inspection, and preparing the Model 8578A100GIG for use.

Mounting Location

This unit is designed for use in any of the mounting configurations called out in the outline drawing.

> CAUTION
> Do not block airflow. Air enters the housing through perforated grilles at the side of the unit and exhausts through the opposite grille of the unit. Blocking these grilles could cause unit failure.

Placement

For ease of movement, hold the two handles on each side of the RF input connector, located at the front center of the unit. Move the unit into position, and rest it on the four bumper feet.

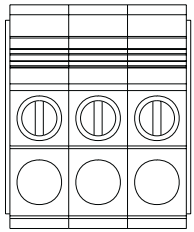
> WARNING
> Limit the interlock terminal to less than 30 Vrms. Although the interlock terminal is rated to 230 Vac, the potential for electrical shock exists.

> CAUTION
> Connect interlock before RF operation.

Interlock Connections

There are three terminals on the interlock connection of the load. One is a ground terminal, the other two a SPST switch connection with a rating of 10 A @ 120 Vac and 5 A @ 250 Vac. Check the requirements of the transmitter interlock and make the connections to the appropriate terminals as required.

Figure 2 Interlock Terminal



1. Attach the transmitter interlock connections to the three binding posts on the control panel. Refer to figure 2.

Connecting RF Line

After installation of the load, the coaxial RF transmission line may be attached using the standard 1-5/8" EIA Swivel Flange Connector or the optional 3-1/8" Unflanged Connector kit p/n 8731A700.

Removal of the 1-5/8" EIA Swivel Flange Connector

While following these instructions, refer to figure 3.

1. Using a Hex Key, remove and retain the four hex screws holding the Swivel Flange Connector to the top of the unit.

2. Remove and retain the Button head screw located in the center of the Inner Conductor.

Attachment of the 3-1/8" Unflanged Conductor

1. Attach the new Inner Conductor using the button head screw.

2. Attach the 3-1/8" Unflanged Connector with two hex screws to the unit by aligning the alignment holes over the two hex screws in the top of the unit.

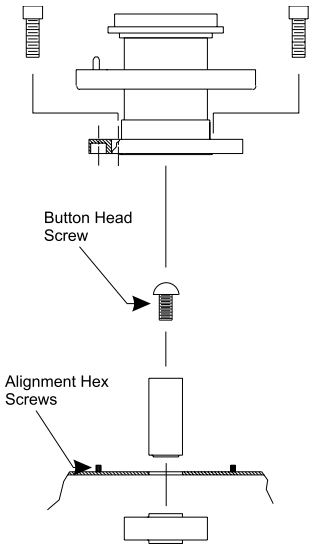


Figure 3 Replacement of Flanged Connector.

☞ Note: The coupling must be fastened with all four of the screws. Tighten evenly all around.

Swivel Flange Coupling

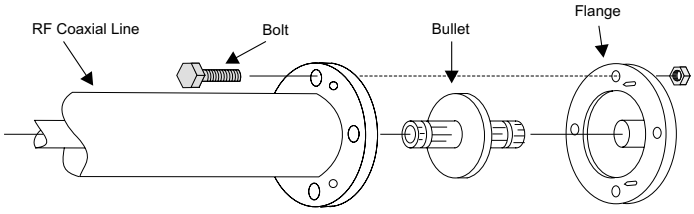
To couple the swivel flange with a flanged RF transmission line, use 1-5/8 coupling kit P/N 4712-020. The kit includes: four 5/16-18 x 1-1/2 bolt and nut sets, O-Ring, and insulated center bullet. Refer to figure 4 while following the instruction below.

1. Insert the center bullet, push it in until it is fully seated.
2. Install the O-Ring in the groove.
3. Connect the coaxial input in a straight line, push carefully on the center conductor to close.

   ☞ Note: The swivel flange on the load makes connection independent of a fixed flange on the coaxial input outer conductor.

4. Insert the bolt sets, tighten evenly all around.

Figure 4 Swivel Flange Coupling



Unflanged Coupling

To couple the 3-1/8" unflanged connector with an unflanged RF transmission line, use 3-1/8 inch unflanged coupling kit, P/N 5-726. The kit includes: an outer sleeve with two clamping bands, and the center conductor coupling bullet. Refer to figure 5 while following the instructions below.

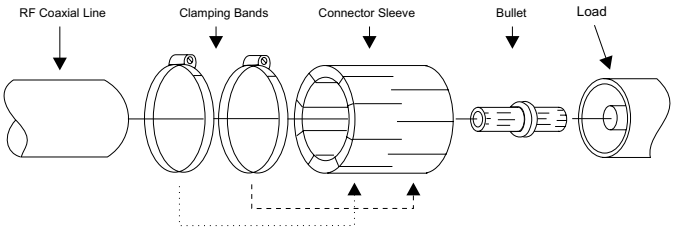
1. Insert the center bullet and bottom it on the midpoint nibs.
2. Position the outer sleeve, with clamps, over the input connector.

3. Snugly set the transmission line against the coupling stops.

4. Position the clamping bands evenly about ¾ inch from the ends of the sleeve.

6. Tighten the clamping bands.

Figure 5 Unflanged Coupling



Chapter 4

Operating Instructions

General

The Model 8578A100GIG has no operating controls. When installed the only requirement is for the interlock switch to be connected to the RF power source. After applying an airflow 1000 ft^3/min (28.32 m^3/min) to the inlet grill the unit is now ready to accept RF power. Once the unit is set, there is no need for the presence of an operator.

Load Power

> WARNING
> Surface can reach temperatures in excess of 100°C when maximim power is applied to load.

> WARNING
> Limit the interlock terminal to less than 30 Vrms. Although the interlock terminal is rated to 230 Vac, the potential for electrical shock exists.

> CAUTION
> Do not apply more than the rated RF power to the load. Excessive RF power will damage the load resistor.

Do not operated above the rated capacity; i.e. 10kW of power. The unit will handle a small percentage of overload until the interlock system's sensor relay 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.

Shortly after load power has been applied, the RF line may be too hot to touch. Disconnect only while following the Shut Down procedure.

Operation Under Normal and Abnormal Conditions

The interlock is for proper operation at the maximum rated ambient condition of 40°C (104°F).
The normally closed relay opens at 86°C ± 3°C (186.8°F ±5.4°F) and closes at 80°C ±3°C (176°F ±5.4°F).

Shut Down

When operation of the load has been completed, follow these steps for shut down.

1. Turn transmitter off.

☞ Note: *Always*, turn transmitter off first.

> WARNING
> Surface can reach temperatures in excess of 100°C when maximum power is applied to load.

2. Allow the unit to cool.

3. Disconnect the RF line.

Measurement and Monitoring of RF Power

The Model 8578A100GIG Load Resistor may be used in conjunction with any one of the various Bird rigid coaxial line Thruline Wattmeters. When fitted with the appropriate line section and wattmeter, either model becomes a useful tool for tuning and adjusting a transmitter as well as monitoring RF power directly in watts. Contact a Bird Sales office for more information about Thruline wattmeters.

Chapter 5

Maintenance

This chapter covers the cleaning, inspection, troubleshooting, and performance information.

Troubleshooting

> WARNING
> Disconnect this unit from the RF power sources before any disassembly for repair or replacement procedures. The potential for electrical shock exists.

For corrections requiring repair or replacement of components refer to the appropriate section. Only those functions within the scope of normal maintenance are listed. This manual can not list all malfunctions that may occur, or corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify a qualified service center.

Problem	Possible Cause	Possible Correction
Interlock is active.	Overheating	Higher power at source.
		Make sure input or output openings for air are not restricted.
		Replace thermoswitch.
		Insufficient air flow. The air flow must be 1000 ft^3/min (28.32 m^3/min).
High resistance	One or more resistors failing.	Replace resistor or resistors.

Cleaning

Outside Surfaces

A main factor in effective preventive 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. Keeping the unit covered prevents the intrusion of dust, dirt

or moisture, especially to the RF connector. The outside surface of the unit should be wiped free of dust and dirt occasionally. When necessary the inner RF housing and the outside housing may be cleaned with a mild detergent solution on a cloth.

Interior Surfaces

The back and top panel may be removed without difficulty for cleaning purposes. Give particular attention to the air intake and exhaust grilles. These grilles must be kept clear of dust, lint or any matter that may cause restriction of airflow. If required, clean the surfaces of the resistors using a soft, damp cloth. 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 a dry cleaning solvent that leaves no residue. Use a cloth to wipe the surfaces.

Enclosure Disassembly

WARNING
Disconnect this unit from RF power sources before any disassembly for repair or replacements procedures. The potential for electrical shock exists.

As mentioned previously, the Model 8578A100GIG is field repairable. To disassemble the enclosure proceed with the following steps:

1. Remove and retain the 18 Phillips head machine screws from the back panel.

2. Remove the back panel.

With the RF housing back panel removed, the resistor assembly can be tested and resistors replaced if necessary.

Diagnosing the RF Assembly

The RF section for the Model 8578A100GIG is comprised of a parallel combination of 9 resistors resulting in a total nominal resistance of 53.3 ohms. It is normal for the total resistance to change by a few ohms from measurement to measurement as this is a characteristic of the type of ceramic resistors used. Wait for the unit to completely cool before measuring the resistance with a digital multimeter. If the unit is not adequately cooled, measurement errors can take place due to the resistors inherent thermocouple characteristic. If there has been a *drastic* change in the resis-

tance of the load or if you have reason to suspect a resistor has failed, the following procedure may be helpful in finding a faulty resistor.

1. 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 take resistance measurements on each resistor individually.

2. Use a digital multimeter or an ohmmeter with an accuracy of 1% at 50 ohms. After removing the resistor from its retaining clips connect the test leads across each resistor end. The individual resistance measurements at 25°C (77°F) should be 480 ohms ±20%.

3. Record the value of the resistance. If resistors are found that greatly exceed the respective ranges, they should be replaced.

Replacing Resistors

The resistors are held very firmly in their clips. Use caution and carefully remove one end of the resistors at a time. Do not use excessive force, as there is the possibility of the resistors chipping or cracking.

Assembly

To reassemble the RF assembly and panels, reverse the disassembly instructions given above. Be sure to install all of the screws in the panels.

> WARNING
> Disconnect this unit from the RF power sources before any disassembly for repair or replacement procedures. The potential for electrical shock exists.

Replacing the Thermoswitch

The thermalswitch is located on the backside of the internal airflow deflector plate closest to the external interlock terminal.

1. Remove the 1-5/8 connector from the front panel.

   ☞ Note: Be sure to remove the two small hex screws holding the inside flange to the panel. Remove the panel and detach the thermalswitch wires from the front panel terminal

2. Remove the thermalswitch by unbolting the two screws holding the bracket to the flow detector plate.

3. Replace the thermalswitch by reversing the procedure in steps 1 and 2.

Customer Service

Any maintenance or service procedure beyond 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.

Service Group

U.S.A. Sales and Manufacturing
Bird Electronic Corporation
30303 Aurora Road
Cleveland (Solon), Ohio 44139-2794
Phone: (440) 248-1200
Fax: (440) 248-5426

Sales Offices

For the location of the sales office nearest you, give us a call or visit our Web site at:

http://www.bird-electronic.com

Preparation for Storage or Shipment

Storage If the unit is to be unused or stored for any length of time, cover it with a cloth or plastic sheet and store it in a moisture free, cool, dry place. There is no special preparation for the unit however; moisture will be the greatest concern. Storage temperatures should remain -40°C to 70°C (-40°F to 158° F) and the relative humidity percentage should remain low.

Shipment To ship or return the unit to the factory, first secure all loose parts such as the swivel flange. Pack and seal securely in a sturdy wooden box or equivalent, with sufficient padding to avoid shock damage. If possible, keep the original shipping carton for reshipment.

Replacement Parts List

Item	Qty.	Description	Part Number
1	9	Ceramic Resistor	5A2453
2	1	Top Panel Assy.	8578A112
3	2	Handle	5-957
4	1	Front Panel Assy.	8578A117
5	1	Thermal Switch	5A2382
6	3	Terminal Block, Feed Thru	5A2447
7	1	Resistor Bracket Assy.	8578A123
8	18	Resistor Clip	5A2443
9	1	1-5/8" EIA Swivel Flange Assy.	5-121-1
10	12	Bumper, Recessed	5A2406
11	1	3-1/8" Flanged Connector Kit	8731A700

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 LOAD RESISTOR
Model: 8578A100GIG

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 89/336/EEC and 92/31/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 ElectronicCorporation