

Instruction Manual
for
MODEL 81B TERMALINE
Coaxial Load Resistor

Model 81B TERMALINE Coaxial Load Resistor

Instructions for Installation - Operation - Maintenance

General

The Bird Model 81B Coaxial Load is a liquid cooled RF line termination capable of dissipating 80 watts continuously in 50-ohm coaxial circuits. It furnishes an accurate termination for medium power transmission systems during design, maintenance, and adjustment phases. In conjunction with a Bird Model 43 THRULINE Wattmeter, the Load Resistor may also be used for RF power measurement to 80 watts input.

The Model 81B Load is self-contained. No additional equipment or outside power source is required. The radiator unit is rectangular in shape with transverse cooling fins spaced evenly along the entire length of the unit. The RF input connector mates with any standard Male N Type connector.

Specifications

Characteristic Impedance	50 ohms, nominal
Power Rating	80 watts continuous
Frequency Range	DC to 4000 MHz
VSWR (max.)	1. 1:1 DC - 1000 MHz 1. 2:1 1000 - 4000 MHz
Ambient Temperature Range	-40°C to +45°C
Input Connector	Female N
Weight	4 pounds
Operating Position	Horizontal only

Theory of Operation

This equipment consists essentially of a non-inductive film type cylindrical resistor immersed in a dielectric coolant. The resistor, individually selected for its accuracy, is enclosed in a special tapered housing which provides a linear reduction in surge impedance, directly proportional to the distance along the resistor. This produces the uniform, practically reflectionless line termination over the stated frequencies of the Model 81B Coaxial Load Resistor.

Cooling of the RF Load is accomplished by natural fluid and air convection. The 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 metal, which are tightly pressed on the cylinder. The heat from the dielectric is transferred to the surrounding air by the radiating fins.

A rubber diaphragm (not visible) in the rear dome of the load allows the coolant to expand with a rise in temperature. The breather holes are visible.

Operation

Connect the Model 81B TERMALINE to the transmitter with a short piece of 50-ohm coaxial cable (RG-212/U, RG-213/U or RG-214/U). Make sure the cable plugs mate with the transmitter and Load Resistor connectors.

Provide adequate air circulation around the radiator. Operate the load in a horizontal position only (handle up). Do not exceed the 80 watt continuous power rating of this model.

Maintenance

The Model 81B TERMALINE is rugged and simple, and should require only nominal routine attention. This load is designed to operate for long periods of time if care is taken not to exceed its power handling capabilities.

The outside surface of the instrument should be wiped free of dust and dirt when necessary. Clean the RF input connector with Inhibisol, its equivalent, or trichloroethylene on a cotton swab stick. Make sure the metallic contact surface and the exposed faces of the TFE "Teflon" insulator are clean. Provide adequate ventilation when using dry cleaning solvents.

Load Resistor

An accurate measurement of the dc resistance between the center and outer conductors of the RF input will provide a good check of the condition of the termination Load Resistor. For this measurement, a resistance bridge with an accuracy of one percent or better at 50 ohms (such as the Leeds & Northrop Model 5305 Test Set) should be used. Use low resistance leads, preferably a short piece of 50 ohm cable attached to a plug which mates with the input connector of the load. When the resistor is checked at room temperature, the measured value

should not differ more than 2 ohms from the value stamped on the blue tag. If the figure obtained materially exceeds this allowance, the load resistor may need replacement. To replace the RF Section Assembly, follow the procedure below:

1. Place the Load Resistor on its back (connector end up) and remove the #8-32 x 1" round head machine screws from the radial V-band clamp.
2. Carefully lift the RF Section Assembly (with connector attached) straight up from the case, allowing the oil to drip back into it.
3. Inspect the O-ring seal (Bird #7500-065). Replace if there is any sign of deterioration.

The RF Section is not subject to further disassembly by field personnel. A defective unit must be returned in its entirety to Bird Electronic Corporation for repair.

Coolant

The Model 81B is factory-filled at room temperature with about 2/3 pint of Bird #5-030 dielectric coolant. This quantity of coolant should remain constant under normal operating conditions.

If it becomes necessary to add coolant, position the load with the filler plug (located on the lower surface of the cone) facing up. Tilt the connector end so that the face of the filler plug is level. Remove plug, and add coolant until the tank is

completely full, then replace plug. Use only Bird #5-030 oil.

REPLACEMENT PARTS LIST

<u>Qty.</u>	<u>Name</u>	<u>Part No.</u>
1	RF Load Resistor Assembly	7600-007
1	O-Ring, Seal	7500-065
1	Filler Plug Assy	7500-161
2	Clamping Band Assy	7500-254
1	Cap, Diaphragm	2400-050
1	Diaphragm, Rubber	2400-015
-	Coolant Oil - 1 pint	5-030
1	Radiator	2400-060

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