

Instruction Sheet
for

INSTALLATION - OPERATION - MAINTENANCE
Bird Model 883
TERMALINE LOAD RESISTOR

GENERAL

This Load Resistor is a general purpose coaxial line termination for use with 51.5 ohm radio frequency transmission lines. It has a continuous load capacity of 1000 watts in normal ambient temperatures (up to 45°C) and a frequency range from 0 to about 2500 megacycles per second. Under these conditions the Model 883 therefore provides a very low reflection (non-radiating) line termination. This is useful as a substitute antenna to assist in tuning RF transmitter within its range, and for other routine maintenance or special checks on coaxial transmission equipment. The Model 883 is equipped with Female Type LC input connector.

ELECTRICAL CHARACTERISTICS

The Model 883 is designed to match the most common high frequency transmission media; i.e., 50 or 51.5 ohm coaxial lines. The impedance, in the VSWR (voltage standing wave ratio) language of such transmission, is quite independent of frequency and almost purely resistive. VSWR values are maintained below 1.1 up to 1000 Mc. and the calibration results of this particular resistor are tabulated below. In the frequency region 1000 to 2500 Mc, calibration is not normally performed. However, tests on typical units of this equipment show VSWR's to be less than 1.25 in this range. Below 50 Mc, the input impedance of the Dummy Load is very nearly a pure resistance to equal to the DC resistance. The production tolerance on DC resistance is $\pm 3\%$ from the nominal 51.5 ohms, and exact values for this particular resistance are given below. Below 30 Mc, power output measurements are most conveniently made by the E^2/R method, using a vacuum tube voltmeter across the Dummy Load. Thermo-ammeters may also be used, usually with less convenience and accuracy.

RESISTANCE and VSWR on Model 883, Serial No. _____

DC Resistance _____ ohms.

Frequency	100 Mc.	300 Mc.	500 Mc.	700 Mc.	1000 Mc.
VSWR	_____	_____	_____	_____	_____

VSWR is below 1.25 at frequencies up to 2500 Mc.
All VSWR measurements with 51.5 ohm slotted line.

Max. continuous load power - 1000 watts.
Max. load for 1/2 hour only - 1200 watts.

DESCRIPTION

The Model 883 equipment consists essentially of a carbon film-on-ceramic resistor immersed in dielectric coolant. The resistor, particularly selected for its uniform accuracy, is enclosed in a specially tapered housing. This provides a reduction in surge impedance directly proportional to the distance along the resistor. When surrounded by the dielectric coolant, the characteristic impedance is therefore 51.5 ohms at the front, and zero ohms at the rear - where the housing joins the resistor forming the return conductor. This produces the uniform, practically reflectionless line termination over stated frequencies of the load resistor.

The dielectric oil is chosen for chemical inactivity (to prevent damage to the resistor), high flash point, and its dielectric constant, to which the diameters of the resistor housing are matched. The input connector is constructed with a compressed teflon insulator surrounding the center contact. This connector body, and the resistor housing are both pressed on synthetic rubber O-Ring seals, preventing coolant leakage at the front end of the unit. The resistor housing is kept in place by the resultant action of drawing up the radial V-clamp band.

When input power is applied, the resistor generates heat in the adjacent coolant oil. By convection, the heated oil flows thru slotted openings in the coaxial shell to the walls of the fabricated metal tank. The series of radiating fins brazed to the tank transmit the heat of the dielectric oil into the surrounding air.

INSTALLATION

The Termaline Resistor is intended for operation in a horizontal position only. It may be placed loose on an appropriate surface, or permanently fastened in a level position by means of its base mounting flanges. The flanges have four 3/8-diam. holes on a 21-1/4 by 5-3/8 base rectangle, for use with screws up to 5/16-inch size. Position the unit for ample air circulation with at least 6 inches of free air space all around the unit.

SPECIAL CAUTION

Do not apply any electrical power (rf load) to the Model 883 Load Resistor until the Vent Plug is removed. It is very essential to do this to allow for expansion of the heated dielectric oil. The Vent Plug is screwed directly inside the filler plug at the top and front of the radiator tank. It is painted red on top face and has a hex socket. The plug is unscrewed by use of the 3/16-in. Allen key that is taped to the front handle of the radiator. If the equipment should be moved, replace the plug to prevent oil spillage during transit.

It is possible to manage power loads greater than 1 KW by use of auxiliary ventilation of the equipment. If an effective fan or blower is placed transverse to the radiator, it may be permissible to increase the load power to 2 KW under the proper conditions.

Instruction Sheet (cont)
Model 883 Load Resistor

MAINTENANCE

This equipment is rugged and simple, and should require only nominal routine care. Keep the radiator dusted off and the electrical parts free of dirt and grime. If the connector contacts or faces should become dirty, wipe off with a little dry solvent on a cotton swab stick. When using carbon tetrachloride, exercise caution to avoid fumes.

If the Resistor Housing Assy #811203 should need replacement, proceed as follows: To avoid the possibility of coolant spillage, replace Vent Plug #245006 before proceeding. Place the radiator #245003 on its back end (connector up). Then loosen and remove the screw on the clamping band #24343 at the base of the front cone. Remove clamping band and carefully lift out the Resistor Housing unit in a vertical direction, allowing the oil to drip back into the tank (be sure the radiator unit is properly held). The O-Ring #81139 if fitted on the telescoping ring #24316 which will probably remain nested in the cylindrical facing of the radiator tank. Do not re-use the O-Ring unless it is in fine condition. Before replacing the resistor housing, check that the telescoping ring arrangement is properly set - i.e., with the thin section of the step shoulder fitted inside the radiator nose-piece, and the O-Ring #81139 outside on the thick section, pushed snugly against the adjacent face. Before reassembling the equipment, check the coolant level - it should be four inches below the bare edge of the cylindrical flange when the radiator is on end. Replace the Resistor Housing Assy by reversing the procedure described above, and tighten the #10-32 clamping screw securely - making sure that the clamping band is on evenly. Then restore the Load Resistor to a horizontal position, and inspect carefully for oil leakage. Before using equipment, reopen the Vent Plug, and if deemed necessary recheck the coolant level - see Coolant Section below.

COOLANT

The Dummy Load is factory filled to the proper coolant level (with G.E. 10C Transformer Oil) at room temperature. Expansion of the coolant with rise in temperature is taken care of by means of the vent plug previously discussed. The oil level should be about 2-1/4 to 2-1/2 inches below the top face of the filler hole. Reasonable amounts of oil loss will not seriously reduce the capacity of the equipment.

List of Replaceable Parts

Qty.	Part No.	Name	
1	245003	Radiator	
1	245004	Gasket, Vent Plug	
1	245005	Plug, Filler	
1	245006	Plug, Vent Plug	
1	24316	Telescoping Ring	
1	24343	Clamping Band	
1	81139	O-Ring	Linear #11-242
1	811203	Resistor Housing Assy.	
-	5030	1.7 Gal. Type B Coolant	GE Trans. Oil

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