

INSTRUCTION BOOK

for

Model 8841 TERMALINE

DUMMY LOAD

MODEL 8841 DUMMY LOAD

SECTION I - GENERAL DESCRIPTION

The Model 8841 TERMALINE Dummy Load is designed as a low-reflection and non-radiating termination for coaxial RF transmission lines, to aid in the tuning and trouble-shooting of transmitting equipment within its rating. Below are the electrical specifications pertaining to the Model 8841 Dummy Load:

Characteristic Impedance	50 ohms nominal
Power Rating	1000W continuous duty
VSWR	1.1 max dc-1000 MHz 1.3 max 1 GHz to 3.5 GHz
Ambient Temperature.	-40° to +45°C
Input Connector.	Female LC (Bird "QC")
Weight	34 pounds
Operating Position	Horizontal only

The Model 8841 Dummy 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. Attached to the front and rear fins are mounting flanges. These flanges act as supports for free standing use or mounting brackets for optional fixed mounting. Mounting holes are provided for this purpose, see Installation, Section III.

The RF input connector is located on the face of the conical reducer section on the front of the unit. The connector is of a special Quick-Change design, see Section IV, MAINTENANCE.

The Load unit is filled with specially selected dielectric coolant. There is a vent hole at the top of the unit to relieve internal pressure. See Section III, INSTALLATION & OPERATION.

SECTION II - THEORY OF OPERATION

The Model 8841 equipment consists essentially of a carbon film-on-ceramic resistor immersed in a dielectric coolant. The resistor, which is individually selected for its accuracy, is enclosed in an exponentially tapered housing. This construction provides a linear reduction in surge impedance, directly proportional to the distance along the resistor. When the resistor and housing are surrounded by the dielectric coolant, the characteristic impedance is therefore 50.0 ohms at the front (connector end), 25 ohms at the mid-point 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 uniform, practically reflectionless line termination over the stated frequencies of the load resistor.

The dielectric coolant is chosen for its desirable dielectric properties and thermal characteristics, to which the diameters of the resistor housing are matched.

A synthetic rubber O-ring around the outside of the resistor housing mount furnishes a seal for the radiator opening. A beveled flange retains the O-ring. This flange, with the O-ring between, is pressed against the radiator face by the resultant action of the drawing up of the radial V-band clamp around opposing beveled flanges of the radiator bezel and the resistor housing.

When input power is applied, the resistor generates heat in the adjacent dielectric coolant. By convection, the heated oil flows through 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 coolant into the surrounding air. When the coolant oil is heated, thermal expansion would cause an increase in internal pressure. A vent hole is provided in the top of the radiator tank to relieve this pressure.

SECTION III - INSTALLATION & OPERATION

1. Installation

The Model 8841 Coaxial Load is intended for operation in a horizontal position only. Do not operate in any other manner. 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 radiator.

C A U T I O N

The solid shipping plug must be removed and replaced with the vent plug #24381 before operating the Load Resistor. The receptacle for the shipping and/or vent plug is on top of the coolant tank at the input end of the Attenuator. Failure to do this could result in damage to the unit and endanger the operator's safety. Use the O-ring respective to each plug when they are screwed into place. Do not interchange O-rings. The shipping plug should be replaced whenever the unit is to be shipped.

It is possible to manage power loads greater than 1 KW by use of auxiliary ventilation on the equipment. An effective fan or blower placed transverse to the radiator should permit an increase in the input power. The load power may be doubled by use of the Bird Model BA-88 Blower Unit. This blower is specifically designed for equipment of the Model 88 type- consult with the company.

The Model 8841 may be obtained with a closed circuit thermostwitch #245040 for protection of the Load Resistor against possible overheating. The Thermostwitch should be wired in series with the transmitter interlock. The switch is immersed in the resistor coolant, and will open when the coolant temperature reaches 155°C, cutting off the output power of the transmitter.

To make the interlock connection, unscrew (counter clockwise) the large knurled nut at the face end of the female type plug and pull off the Plug Assembly #245018. Unscrew cable clamp at the back of plug and thread over interlock cable. Solder wires to prongs, and reassemble plug securely, tightening clamp to cable with the two transverse screws.

2. Operation

Connect the Model 8841 to power source under test by means of an applicable 50-ohm coaxial power cable (such as RG-8A/U or RG-9B/U). Check that all coaxial power line connections are properly tightened. Avoid use of extraneous adapters and elbows where possible. Proceed according to instructions pertaining to specific equipment involved.

SECTION IV - MAINTENANCE

1. General

The Model 8841 TERMALINE is rugged and simple. It should require only nominal routine attention. The 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 trichlorethylene, on a cotton swab stick. Take special care to clean the metallic contact surfaces and the exposed faces of the teflon insulator. Provide adequate ventilation and observe normal precaution when using dry cleaning solvents.

2. Load Resistor

Accurate measurement of the dc resistance between the inner and outer conductors of the input coupling will provide a good check of the condition of the 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 ample 50-ohm cable attached to a plug which mates the input connector of the Dummy Load. When the resistor is checked at room temperature, the measured resistance should be within a range of 49.0 to 52.5 ohms. If the value obtained materially exceeds this allowance, the load resistor may need replacement. The measured resistance should not deviate more than one ohm from the value stamped on the blue tag attached to the load.

If the Resistor Housing Assy #811202 should need replacement, proceed as follows: To avoid the possibility of coolant spillage, replace Vent Plug #24381 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 is fitted on the telescope 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 good condition.

When replacing the resistor housing, check that the telescoping ring arrangement is properly set - i.e., with thin section of the step shoulder fitted inside the radiator nosepiece, 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, replace the Vent Plug, and if deemed necessary recheck the coolant level - see Coolant Section below.

3. Coolant

The level of the dielectric coolant should remain constant in the unit after prolonged usage under normal operating conditions. Inspect occasionally

around lower portion of the clamping band for possible coolant leakage. Tighten clamping screw if required. Under very unusual conditions it might become necessary to replace the resistor seal O-ring. Proceed as described in Paragraph 2, Load Resistor.

Check coolant height with the unit level and vent plug #24381 removed from filler socket on the top surface of the unit. Coolant level should be within 2-1/4 to 2-1/2 inches below the top surface of the filler socket. The unit is factory-filled to the proper level with 1.7 gallons #5030 dielectric Oil. NO OTHER COOLANT MAY BE USED.

4. RF Input Connector

The input connector is of a special Quick-Change "QC" design which permits facile interchange of connectors with only simple tools. This process does not in anyway disturb the coolant seal or interfere with the essential coaxial continuity of the load resistor RF input.

If replacement of the RF input connector J-701 becomes necessary, proceed as follows;

- (1) Remove the four #8-32 x 5/16 round head machine screws from the corners of the RF connector.
- (2) Pull connector straight out.
- (3) Reverse above procedure to install new connector, making certain that the projecting center contact pin of the QC connector is carefully engaged and properly aligned with the mating socket of the load resistor.

The "QC" connector may be readily replaced, as above, with other AN Standard Type connectors if specially obtained. Other "QC" connector types may be obtained from the manufacturer as follows

Female N 424062	Female LC 424031	Female C 424100
Male N 424063	Male LC 424025	Male C 424110
Female HN 424073	Female LT 424018	Female UHF (SO-239) 424050
Male HN 424049	Male LT 424012	Male UHF (PL-259) 424173
	7/8" EIA-Airline 424002	

List of Replaceable Parts

<u>Qty.</u>	<u>Part No.</u>	<u>Description</u>
1	245003	Radiator
1	5131	O-Ring, Vent Plug
1	245049	Plug, Shipping
1	24381	Plug, Vent
1	24316	Ring, Telescoping
1	24355	Band, Clamping and Screw
1	81139	O-Ring, Resistor Hsg.
1	811202	Resistor Housing Assy
-	5030	Type B Coolant, 1.7 Gal.

ADDITIONAL SPARE PARTS - Optional

1	245040	Thermoswitch Assy
1	245018	Connector Assy, Thermoswitch