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INSTRUCTION SHEET

FOR

8340 SERIES

TENULINE® ATTENUATORS

Series 8340 TENULINE® Attenuators are low reflecting resistance networks designed to reduce RF power by known and controlled amounts. Each is a self-contained, dry, air-cooled device that is useful for lowering RF power to a level suitable for an oscilloscope or frequency counter. There are three basic models available for maximum RF powers of 25, 40, and 100 watts and each model can be supplied with 3, 6, 10, or 20 dB of attenuation. Models 8340 and 8343 are convection air cooled with built in radiators while Model 8341 is conduction cooled and must be bolted to a suitable heat sink. Details on the dimensions, weights, and operating parameters are given in the table of specifications.

TENULINE® Attenuators are electrically symmetrical "T" pads with the power distribution on the legs being different. A "T" configuration is used to provide equal input and output impedance for a 50 ohm line. The input resistor is joined to the "T" leg joint in a housing designed to produce the proper input impedance, and the output resistor is so enclosed as to return the characteristic impedance to 50 ohms.

```
**********************************************************
*                      C A U T I O N                     *
*                                                        *
* If the Model 8341 is used without heat sink, its maxi- *
* mum power rating is reduced from 40 W to only 15 W.  Do *
* not exceed this!                                       *
**********************************************************
```

These attenuators do not require any external source of power or additional equipment to function. The exception to this is the 8341 group. They must be bolted to a flat aluminum heat sink of at least 400 square inches and 1/8 inch thickness. Prior to mounting the unpainted side of the attenuator to the heat sink, both surfaces should be carefully cleaned of any burrs or foreign particles. Then coat the joining surfaces with a thin and uniform layer of a high conductivity heat transfer compound such as Wakefield "120" compound. The heat sink must be previously bored with four 13/64 to 7/32 inch diameter holes set in a 1-45/64 x 1-1/4 inch rectangle. Fasten the attenuator tightly to the heat sink with 10-32 x 1-1/2 inch machine screws, nuts and lockwashers.

```
**********************************************************
*                      C A U T I O N                     *
*                                                        *
* Do not connect the attenuator in the reverse direction; *
* destruction of the output resistor will result.        *
**********************************************************
```

Connect the RF power source to the input connector with suitable cables, and the load to the output connector.

```
**********************************************************
*                      W A R N I N G                     *
*                                                        *
* Never attempt to disconnect the equipment from the     *
* transmission line while RF power is being applied.     *
* Leaking RF energy is a potential health hazard.        *
**********************************************************
```

The attenuator itself cannot be shut off; turn off the RF source instead.

Series 8340 TENULINE® Attenuators are rugged in construction and relatively simple in design. They should need only nominal routine attention and should operate faultlessly for long periods of time if their maximum power handling capabilities are not exceeded.

The outside surfaces, particularly the radiator fins, should be kept free of dust and lint accumulation. Wipe them off periodically with a clean dry cloth. Do the same for the connectors. Use a self-drying contact cleaner that leaves no residue on the internal parts of the connector that are not readily accessible.

Accurate measurement of the dc resistance between the input to ground, the output to ground, and the input to output will provide a good check on the performance of the attenuator. Use a resistance bridge or ohmmeter with an accuracy of 1 percent or better, to make these measurements. It is advisable to use low resistance leads like 50 ohm cable (RG-8A/U or RG-9B/U) equipped with connectors to mate with those on the attenuator. The measured resistance values at room temperature should be made and recorded upon receiving the unit and thereafter at periodic intervals. Any noticeable deviation of any of these three values from the initial reading should be cause to suspect the attenuator of malfunctioning.

```
**************************************************************
*                        W A R N I N G                       *
*                                                            *
*  This product contains a resistor substrate made of        *
*  beryllia oxide.  This is a potentially toxic ceramic      *
*  and may be harmful to your health.  Beryllia oxide        *
*  must be disposed of in accordance with the legal          *
*  statutes dealing with hazardous material.                 *
*                                                            *
*  Do not attempt to repair this unit, but return to         *
*  BIRD ELECTRONIC CORPORATION.                              *
**************************************************************
```

In case such a deviation is noted, check to be sure the "QC" connectors are not loose. Tighten the four mounting screws of each connector and then remeasure. If the deviation remains, the unit should be returned to Bird Electronic Corporation for repair.

Except for replacement of the input and output connectors, no field repairs are possible. Such repairs should be done at the factory. To replace the "QC " connectors proceed as follows:

a. Remove the four round head machine screws from the corners of the connector flange.

b. Pull the connector straight out.

c. Reverse the procedure to reassemble the attenuator. Carefully insert the pin on the rear of the connector into the mating socket and align it before pushing it all the way in.

The "QC" connector can, by the above procedure, be easily exchanged for other AN standard type connectors made by Bird Electronic Corporation as stated below:

Available QC Type Connectors

N-Female	4240-062	BNC-Male	4240-132
N-Male	4240-063	LT-Female	4240-018
HN-Female	4240-268	LT-Male	4240-012
HN-Male	4240-278	C-Female	4240-100
LC-Female	4240-031	C-Male	4240-110
LC-Male	4240-025	UHF-Female (SO-239)	4240-050
BNC-Female	4240-125	UHF-Male (PL-259)	4240-179

If Series 8340 Attenuators are to be shipped, wrap them carefully with padding and securely tape. A suitably sized corrugated paper box is satisfactory as a container. If they are to be stored, it is only necessary to cover them to keep off the dust and to maintain the storage temperature within the -40°C to +45°C (-40F to +113F) operating temperature range.

SPECIFICATIONS FOR SERIES 8340 TENULINE® ATTENUATOR

Impedance	50 ohms nominal
Input VSWR	
All Models	1.20 max. dc-500 MHz
1.25 max. 500-1000 MHz	
Output VSWR	
All Models (except listed below)	1.20 max. dc-1000 MHz
Models 8343-030 & 8343-060	1.25 max. dc-1000 MHz
Connectors	Female N "QC" type normally supplied
Maximum attenuation deviation	±0.5 dB, dc-500 MHz ±0.9 dB, 500-1000 MHz
Temperature range	-40°C to +45°C (-40F to +113F)
Operating position	Any
Finish	Lusterless black enamel (Fed. Spec. TT-E-527)

SPECIFICATIONS FOR SERIES 8340 TENULINE® ATTENUATOR [CONT.]

MODEL	POWER	ATTENUATION	COOLING	DIMENSIONS	WEIGHT
8340-030	25 W	3 dB (50%)	Air	5-3/16"L x 1-3/4" sq. (132 mm x 44 mm sq.)	16-1/2 oz (468 g)
8340-060	25 W	6 dB (75%)	Air	5-3/16"L x 1-3/4" sq. (132 mm x 44 mm sq.)	16-1/2 oz (468 g)
8340-100	25 W	10 dB (90%)	Air	4-11/16"L x 1-3/4" sq. (119 mm x 44 mm sq.)	11-1/2 oz (326 g)
8340-200	25 W	20 dB (99%)	Air	5-3/16"L x 1-3/4" sq. (132 mm x 44 mm sq.)	12-3/4 oz (361 g)
8341-030	15/40 W	3 dB (50%)	Conduction	5-3/16"L x 1-1/4" sq. (132 mm x 44 mm sq.)	13-1/2 oz (383 g)
8341-060	15/40 W	6 dB (75%)	Conduction	5-3/16"L x 1-1/4" sq. (132 x 44 mm sq.)	13-1/2 oz (383 g)
8341-100	15/40 W	10 dB (90%)	Conduction	4-11/16"L x 1-1/4" sq. (119 mm x 32 mm sq.)	12-1/2 oz (354 g)
8341-200	15/40 W	20 dB (99%)	Conduction	5-3/16"L x 1-1/4" sq. (132 mm x 44 mm sq.)	15 oz (425 g)
8343-030	100 W	3 dB (50%)	Air	7-22/32"L x 2-3/4" sq. (195 mm x 70 mm sq.)	44 oz (1.25 kg)
8343-060	100 W	6 dB (75%)	Air	7-22/32"L x 2-3/4" sq. (195 mm x 70 mm sq.)	44 oz (1.25 kg)
8343-100	100 W	10 dB (90%)	Air	7-22/32"L x 2-3/4" sq. (195 mm x 70 mm sq.)	44 oz (1.25 kg)
8343-200	100 W	20 dB (99%)	Air	7-22/32"L x 2-3/4" sq. (195 mm x 70 mm sq.)	44 oz (1.25 kg)

MODELS COVERED IN THIS INSTRUCTION SHEET

8340-030	8341-030	8343-030
8340-060	8341-060	8343-060
8340-100	8341-100	8343-100
8340-200	8341-200	8343-200

The following models are also covered by this instruction sheet and are basically the same except for mounting holes and/or connectors.

8340-125	8343-120
8340-220	8341-210
8340-225	8343-230

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