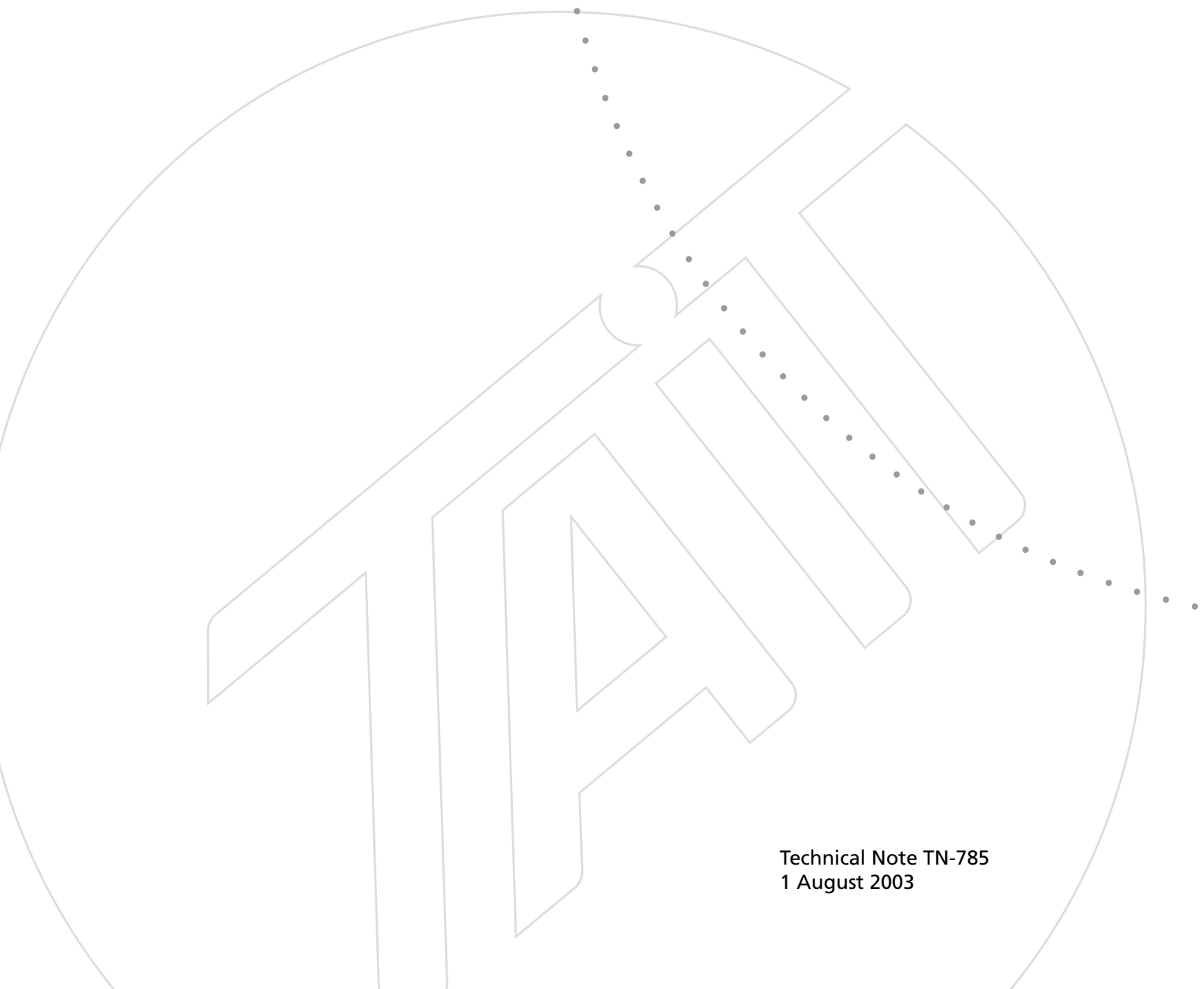




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**TB8100** base station

TB8100 Power  
Amplifier  
Ruggedness



Technical Note TN-785  
1 August 2003

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## Applicability

This Technical Note applies to TB8100 50 and 100 W power amplifiers.

## Introduction

This Technical Note has been issued in response to concerns about the ruggedness of the TB8100 PAs. **However, it is important to note at this time that no PAs have failed in field trials.** Also, if the PAs are operated correctly, and in accordance with the recommendations below, they will continue to provide trouble-free service.

## Description

One of the inherent characteristics of 28V LDMOS technology is its relatively low breakdown voltage. Tait Electronics, and most other major base station manufacturers, have adopted this technology to benefit from its superb wide band performance and high efficiency.

The MRF9060 LDMOS FET is used as the final power device in the TB8100 50 and 100 W PAs. In these PAs, the MRF9060 device is protected from reverse voltages by the design of the circuitry. This circuitry makes it impossible to damage the device by keying the PA into a mismatched load, or if the load deteriorates over even a short period of time (milliseconds).

However, it is possible to damage the device if **all** the following conditions happen **at the same time**:

- there is a step change in the PA load (i.e. the load is removed)
- the PA is transmitting
- the feed line loss between the PA and the mismatch is < 1 dB.

The effect of such conditions is variable: some devices will not be destroyed, some may fail after repeated load interruptions, and others will fail immediately.

5 W PAs will not fail due to a highly mismatched load. They do not use the 60 W PCB with the MRF9060 device.

**No PA will fail if it is keyed while connected to a mismatched load.**



**Note** Ice on the antenna, or a broken antenna, is unlikely to cause damage to the PA. There should be enough coaxial cable between the antenna and PA to protect it from high VSWR.

## How to Identify an MRF9060 Failure

If an MRF9060 has been damaged, the PA output power will be reduced, or there will be no output power at all.

Verify the condition of the MRF9060 by checking the RGS (in circuit) with an Ohm meter:

Rgs Value	MRF9060 Condition
>5k $\Omega$	good
<5k $\Omega$	faulty
<300 $\Omega$	failed

## Recommendations

1. **Do not remove the load from the PA while it is transmitting.**
2. Inspect all cables and equipment connected to the TB8100 base station system for defects.
3. You may fit an external isolator at the PA RF output to provide isolation between the PA and load.

## Issuing Authority

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