



PROJECT MANAGER
FIREFINDER
U.S. ARMY ELECTRONICS RESEARCH
AND DEVELOPMENT COMMAND
FORT MONMOUTH, NEW JERSEY 07703

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GROUND SYSTEMS GROUP

MAINTENANCE BULLETIN

AN/TPQ-36	FILE NO. 137	REVISION:
SUBJECT Procedures for Checking Waveguide Leakage on AN/TPQ-36 RADARS	DATE: 10/02/90	CATEGORY: D-Safety
	SYSTEMS AFFECTED: AN/TPQ-36	

1. The following information is provided to assist in detecting possible radio frequency (RF) leakage problems in AN/TPQ-36 radars. During a regularly scheduled (every 3 years) inspection by the Environmental Hygiene Agency, (EHA) Microwave Branch, Baltimore, MD., a crack was discovered in the flexible waveguide (see TM 11-5840-354-20P, fig 18, sheet 1, item 2). This crack emitted what is considered by EHA to be high levels of RF radiation which caused both a health hazard and degraded system performance. This condition was noted in the Target Acquisition Update (Number 2-90), May 1990) United States Army Field Artillery School, Target Acquisition Department, Ft. Sill, OK.

- a. The crack was across the width of the waveguide, 1/2 inch from the mounting flange.
- b. Although the crack widens as the waveguide is flexed, it is difficult to detect and requires close visual inspection.
- c. There is a hot spot in the crack area.
- d. Although the crack itself may not be visible from the outside, the rubber covering was separated from the mounting flange.
- e. The degraded system performance was not detected as a fault by the radar HI VSWR circuit.

2. The following procedure will identify RF emissions from a faulty waveguide. These procedures are recommended by EHA, Microwave Branch.

- a. Required equipment is available in the authorized Direct Support (DS) Test Measurement Devices and Equipment (TMDE) with FIREFINDER systems:

APPROVED BY CHIEF LMD:

Paul E. Hoffmann LTC PMFF

DATE:

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| 1. Power Meter
w/sensor cable | Hewlett Packard
Model 436A or Boonton AN/USM 491 |
| 2. Power Sensor | Hewlett Packard
Model 8481A or Boonton model 51100 (9E) |
| 3. Waveguide Adapter | Hewlett Packard Model X281A |

b. Procedure:

1. Connect the dummy load to the radar. This test equipment should not be used for measuring antenna (radome) RF. Personnel should not be permitted in front of the antenna when it is radiating.
2. Assemble the equipment components by connecting the waveguide adaptor to the power sensor and then to the power meter. Zero and calibrate the power meter as per meter operating instructions. Set the CAL FACTOR % to 96.
3. With radar radiating into the dummy load, move the probe along the waveguide at a distance of from one to two centimeters away. The adaptor opening should be facing the waveguide.
4. If a reading is obtained on the power meter indicating an emission (leakage), rotate and tilt the probe until the highest reading is found.
5. Record the results in milliwatts. Convert this result by multiplying a .385 factor to obtain mW/cm². Use the following table to determine what action to take:

<p>If converted reading is:</p> <ol style="list-style-type: none"> a. less than 1.0mW/cm² b. 1.0 - 9.9 mW/cm² 	<p>Action:</p> <p>None</p> <p>Stop Radiating</p> <p>Remove waveguide</p> <p>Visual Inspection</p> <p>Clean Seals/Flange</p> <p>Replace Waveguide</p> <p>Re-measure *</p>
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c. Replace with NSN 5985-01-091-7765

* NOTE: If the levels are 10.0 mW/cm² or higher, a serious health hazard exists for personnel working in the vicinity of the radar.

3. This check shall be incorporated as a Quarterly Inspection procedure. CECOM will take appropriate action to provide new Quarterly procedures as available.