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Report No. 131500-620
12 August 1977

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SALT FOG TEST REPORT
FOR THE
AN/TRN-41 TACAN NAVIGATIONAL SET

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Department of the Air Force, Headquarters Electronic
Systems Division (AFSC), Hanscom Air Force Base,
Massachusetts 01731, Attention: PPG.

Prepared for:
Department of the Air Force
Headquarters Electronic Systems Division(AFSC)
Hanscom Air Force Base
Massachusetts 01731

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1. REPORT NUMBER ESD-TR-77-317	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
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7. AUTHOR(s) None		8. CONTRACT OR GRANT NUMBER(s)
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11. CONTROLLING OFFICE NAME AND ADDRESS Electronic Systems Division (AFSC) Hanscom AFB, Ma 01731		12. REPORT DATE 12 August 1977
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18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) AN/TRN-41 TACAN NAVIGATIONAL SET		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report describes the salt fog test as defined in the Equipment Test Plan for Navigational Set, TACAN, AN/TRN-41.		

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

SALT FOG TEST REPORT
for the
NAVIGATIONAL SET, TACAN, AN/TRN-41

This report describes the salt fog test as defined in the Equipment Test Plan for Navigational Set, TACAN, AN/TRN-41, 131500-415.

1. **Test Identification.** Salt fog test as defined in Appendix IV-F (salt fog test procedure) of the Equipment Test Plan for Navigational Set, TACAN, AN/TRN-41.
2. **Functional Purpose of Test.** This test forms a part of the AN/TRN-41 system qualification tests.
3. **Test Objectives.** To demonstrate that the AN/TRN-41 will meet the salt fog requirements of paragraphs 3.2.5.1.5 and 4.2.1.4.3.6 of Specification No. 404L-701-5017A, Part I of 2 parts (20 August 1976).
4. **Description of Test Article.** The AN/TRN-41 system consisting of the following was used for the tests:

Receiver-Transmitter	RT-1202/T
Antenna	AS-3132/T
Antenna Support	AB-1237/T
Filter, DC Power	F-1439/T
Interconnecting Cables	
5. **Summary of Test Results.** The AN/TRN-41 showed no functional degradation during the salt fog test. Some parts showed rust during the test. This was further degradation from the humidity tests.
6. **Description of Test Facilities and Procedures.** The test facilities and test procedures are described in Appendix IV-F of the Equipment Test Plan.
7. **Test Setup Diagrams.** The test setup diagrams are provided in Appendix IV-F of the Equipment Test Plan.

13 23
OK

ATTACHMENT 1
TEST EQUIPMENT

TEST EQUIPMENT

<u>Description/Manufacturer</u>	<u>Model</u>	<u>Calibration Due Date</u>
Oscilloscope, Tektronix	465	7/6/77
Signal Generator, RF, H.P.	612A	6/23/77
Peak Power Meter, Boonton	8900B	9/19/77
Pulse Generator, Data Pulse	110B	5/12/77
Counter, Fluke	1953	8/12/77
Half-Ampl. Det. Montek	131500-702	N/A
RF Detector, Montek	135203-100	N/A
Monitor Ant., Montek	006300	N/A
Test Box - Interconnection - Montek	131500-703	N/A
Power Supply HP	6274B	1/16/78
Power Supply Acopian		12/9/77
Power Supply, Sorensen	QR4075A	9/19/77
Directional Coupler 20 dB, Narda	3042B	N/A
Directional Coupler 10 dB, Microlab	CBA-78	N/A
Variable Attenuator, Weinschel 0-10 dB	905	N/A
RF Attenuator, Weinschel	10 dB	N/A
Multimeter, Fluke	8120A	8/2/77
Salt Fog Chamber, Industrial Pump	CA-1	N/A

ATTACHMENT 2
DATA SHEETS

APPENDIX IV-K
DATA SHEET
ENVIRONMENTAL TEST

131500-415

June 30, 1976

TEST Salt Fog
SYSTEM 003

from 2 May 1977
DATE to 4 May 1977
ACCEPTABLE X
NOT ACCEPTABLE _____

RE MARKS At the conclusion of the salt fog test, the system operated properly. There was no degradation in performance based upon comparison of test data. Listed are the noted mechanical discrepancies observed during visual inspection. Mechanical Engineering is presently evaluating the parts for corrective action and resolution prior to production.
Note: The items noted as discrepant on the tripod had deteriorated during humidity, and acceleration or further degradation occurred during salt fog testing.

DISCREPANCIES Tripod--The spring pin, P/N MS16562-216, shows evidence of rust.
The thumb screw, P/N 910569-001, shows evidence of rust.
The 1/4 turn fastener D-Ring, P/N 930048, used for mounting the receiver-transmitter to the tripod is rusted.
DC Filter--The MS35650-304 nut used for mounting clamp 919594-001 shows evidence of rust.
The mounting clamp 910594-001 shows minor evidence of rust at the spot welds.

SIGN OFF INFORMATION

ENVIRONMENTAL TEST ENGINEER _____ DATE _____

REPRESENTATIVE ENGINEER B.D. Taylor DATE 5-11-77

QA REPRESENTATIVE M. B. Hunt DATE 5-11-77

DCASD OR AF CONCURRENCE [Signature] DATE 5-11-77

June 30, 1976

DATA SHEET
OPERATIONAL TESTS
AN/TRN-41 (Continued)

SALT FOG

Para. No.	Description	5/2/77 Pre Test m87	54-77 Test	5/6/77 Post Test m87	Requirements	Units
6.4.5.3	Correct north Burst - 12 pulse pairs spaced 30 ± 0.1 μs	✓	✓	✓	Check if OK	
6.4.5.5	Delay 60 ± 10 μs - 105 Hz trig to first burst pulse	✓	✓	✓	Check if OK	
6.4.5.6	Correct Aux burst - 4 pulse pairs spaced 24 ± 0.1 μs	✓	✓	✓	Check if OK	
6.4.6.5	RT replies to 3300 interrogations	2750 2155	2544	2556	≥ 2310 (Counts/Sec)	
6.4.6.7	Demand only mode - Times to switch from ON to STBY within 70 seconds	✓	✓	✓	Check if OK	
6.4.6.8	STBY mode	✓	✓	✓	Check if OK	
6.4.6.9	Demand Only mode - Times to switch from STBY to ON	✓	✓	✓	Check if OK	
6.4.6.10	ON AIR mode	✓	✓	✓	Check if OK	
6.4.7.1	DME ONLY mode	✓	✓	✓	Check if OK	
6.4.7.2	Switch from DME to VACAN	✓	✓	✓	Check if OK	
6.4.8.1	Antenna Alarm - Within four seconds	✓	✓	✓	Check if OK	
6.4.8.2	Alarm Reset	✓	✓	✓	Check if OK	
6.4.8.3	RT Alarm - Within five seconds	✓	✓	✓	Check if OK	
6.4.8.4	Alarm Reset	✓	✓	✓	Check if OK	

June 30, 1976

DATA SHEET
OPERATIONAL TESTS
AN/TRN-41

Test ~~PRE~~ SALT FOG

Date 5-2-77

System 003

001 Tripod

D.L. FURCH 001

004 Antenna

001 RT

Time 1:00 PM

Tech

Para. No.	Description	5-2-77 Pre Test mBh	5-4-77 2:30 PM Test	5/6/77 Post Test mBh	Requirements	Units
6.1	Calibrated RF insertion loss $P_L = 31.5$ Used in determining peak power.	N/A	N/A	N/A	N/A	N/A
6.2	System turn on normal operation	✓	✓	✓	Check if OK	N/A
6.3.1	Antenna radiated signal 15 Hz	✓	✓	✓	Check if OK	N/A
	135 Hz	✓	✓	✓	Check if OK	N/A
6.3.2	Antenna Speed	66.668	66.667	66.667	66.667 ± .133	ms
6.4.1.1	Correct identity code	✓	✓	✓	Check if OK	N/A
6.4.1.2	Identity period	37.0	37.0	38.3	37.5 ± 3.75	Seconds
6.4.2	Peak power (1) Reading of peak power meter $P_m =$ (2) Convert to dBm - 10 log $P_m \times 10^3 = P_m \text{ dBm}$ Total power output in dBm $P_{m \text{ dBm}} + P_L =$ *Insertion loss see 6.1 above.	75mw 18.75 dBm 50.25 dBm	84mw 19.24 dBm 50.74 dBm	80mw 19.03 dBm 50.50 dBm	N/A N/A 50 dBm	Volts dBm dB
6.4.3.3	Pulse count	7188	7204	7191	7200 ± 180	Counts
6.4.4.2	Pulse shape Width (50%) Rise time (10-90%) Fall time (90-10%)	3.6 μs 2.1 μs 2.5 μs	3.6 μs 2.1 μs 2.4 μs	3.6 μs 2.0 μs 2.5 μs	3.5 ± 0.5 2 ± 0.25 2.5 ± 0.5	μs μs μs
6.4.4.4	Pulse spacing	12.0 μs	12.0 μs	12.0 μs	12.0 ± 0.1	μs
6.4.5.2	Delay - 60 ± 10 μs 15 Hz trig to first burst pulse.	✓	✓	✓	Check if OK	

FACILITY:

ENVIRONMENTAL DATA SHEET
ENVIRONMENTAL LABORATORY — DEPT. 330

TEST SCHED.

TEST COMPLETED

TEST REMOVED

TOTAL UTILIZATION	
1960	100%
1961	100%
1962	100%
1963	100%
1964	100%
1965	100%
1966	100%
1967	100%
1968	100%
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2099	100%
2100	100%

BY:

L. A. Black
SIGNATURE

1. Conduct Test per procedure I
 - A. 50% solution
 - B. 48 hr Test period
 - C. Ph range 6.5 - 7.2

DATE _____

INITIALS
(PRINT)

DuB

DWB

DWB

DWB

D L L B

COGNIZANT ENGINEER