

**ENGINEERING TEST REPORT**

**NPX 138 TRANSCEIVER**

**IN ACCORDANCE WITH:**

**FCC PART 15, SUBPART B VERIFICATION  
RADIO RECEIVERS**

**PROJECT NO. 5NO240-1C**

**TESTED FOR:**

**NORTHERN AIRBORNE TECHNOLOGY LTD.  
1925 KIRSCHER ROAD  
KELOWNA, BRITISH COLUMBIA  
V1Y 4N7**

**TESTED BY:**

**CERTELECOM LABORATORIES, INC.  
3325 RIVER ROAD AT LIMEBANK ROAD  
R.R. NO. 5  
OTTAWA, ONTARIO  
K1G 3N3**

**DATE: MARCH 1995**

EQUIPMENT: VHF TRANSCEIVER

MODEL NO.: NPX 138

SERIAL NO.: 1001

## GENERAL:

These test were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15, Subpart B requirements for Radio Receivers.

The equipment was tested for radiated emissions from 30 MHz to 1000 MHz in accordance with the requirements of FCC Part 15, Subpart B. Frequencies were initially identified in a large shielded room. Amplitude measurements were made on an outdoor Open Area Test Site. Details of the outdoor site are on file with the FCC.

## ABSTRACT:

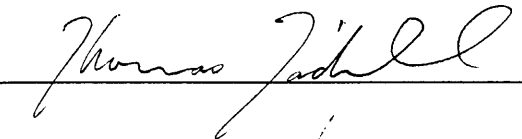
| <u>NAME OF TEST</u>           | <u>PARA. NO.</u> | <u>RESULTS</u> |
|-------------------------------|------------------|----------------|
| Powerline Conducted Emissions | 15.107(a)        | N/A            |
| Radiated Emissions            | 15.109(a)        | COMPLIES       |

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE. None.

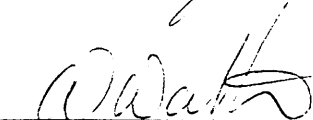
**Conducted Emissions test was not performed since the E.U.T. does not interface the AC Power Mains.**

TESTED BY:



DATE: 22 March 1995

APPROVED BY:



DATE: 22nd March 1995

EQUIPMENT DETAILS

Type of Equipment: VHF Transceiver

Manufacturer: Northern Airborne Technology Ltd.  
1925 Kirscher Road  
Kelowna, British Columbia  
V1Y 4N7

Model No.: NPX 138

Serial No.: 1001

Frequency Range: 138-173.95 MHz

Operating Frequency(ies) of Sample: 139.6 MHz, 155.1 MHz, 173.6 MHz

Crystal Frequency(ies): 20.945 MHz

Primary Power Requirement: +27.5 Vdc

Bandwidth and Emission Designator: 16KOF3E

Intermediate Frequency(ies): 21.4 MHz, 455 kHz

|                                  |                      |
|----------------------------------|----------------------|
| NAME OF TEST: Radiated Emissions | PARA. NO.: 15.109(a) |
| TESTED BY: Tom Tidwell           | DATE: March 16, 1995 |

TEST CONDITIONS: Standard Temperature and Humidity: +12°C, 50%  
Standard Test Voltage: 27.5 Vdc

MINIMUM STANDARD:

| <u>Frequency(MHz)</u> | <u>Field Strength(dB<math>\mu</math>V/m @3m)</u> |
|-----------------------|--------------------------------------------------|
| 30 - 88               | 40.0                                             |
| 88 - 216              | 43.5                                             |
| 216 - 960             | 46.0                                             |
| Above 960             | 54.0                                             |

TEST RESULTS: Complies  
The worst-case emission level is 34.0 dB $\mu$ V/m @ 3m at  
195 MHz. This is 9.5 dB below the specification limit.

MEASUREMENT DATA: See attached table.

The equipment was prescanned in a shielded room using a spectrum analyzer and broadband antenna. A list of frequencies was compiled for investigation in the open field. The equipment was then moved to an open area test site where amplitude measurements were made at a distance of 3 meters. The bandwidth was set to 120 kHz and the detector function was CISPR Quasi-Peak. Any emission within 6 dB of the specification limit is re-measured using a reference tuned dipole antenna per ANSI C63.4.

**NOTE:** The Spectrum was searched up to 1 Ghz.

Search was also made for the guard receiver local oscillator and harmonics.  
These were not detectable.

NOTES: Tuned to 155.100 MHz

() Denotes failing emission level.

[illegible]

\* Includes cable loss when amplifier is not used.

**\*\* Includes cable loss.**

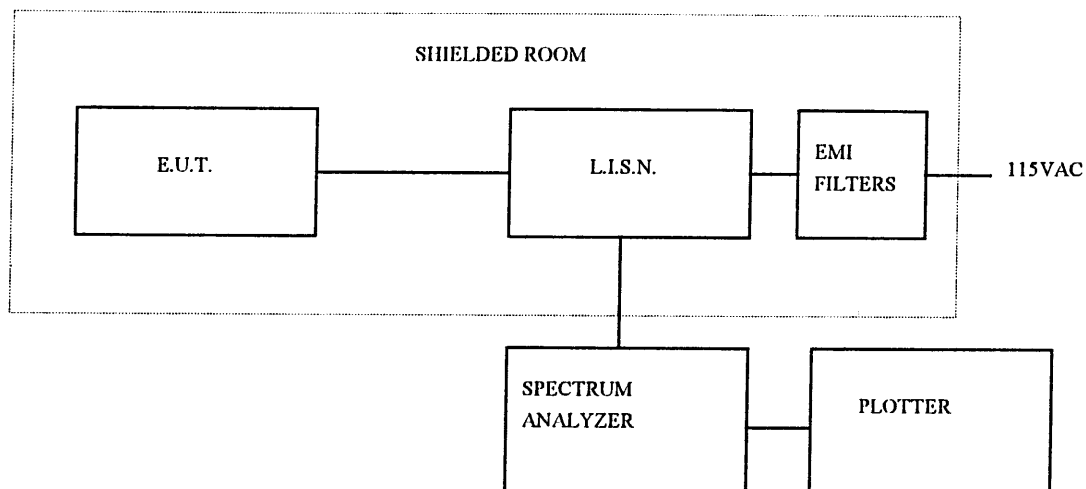
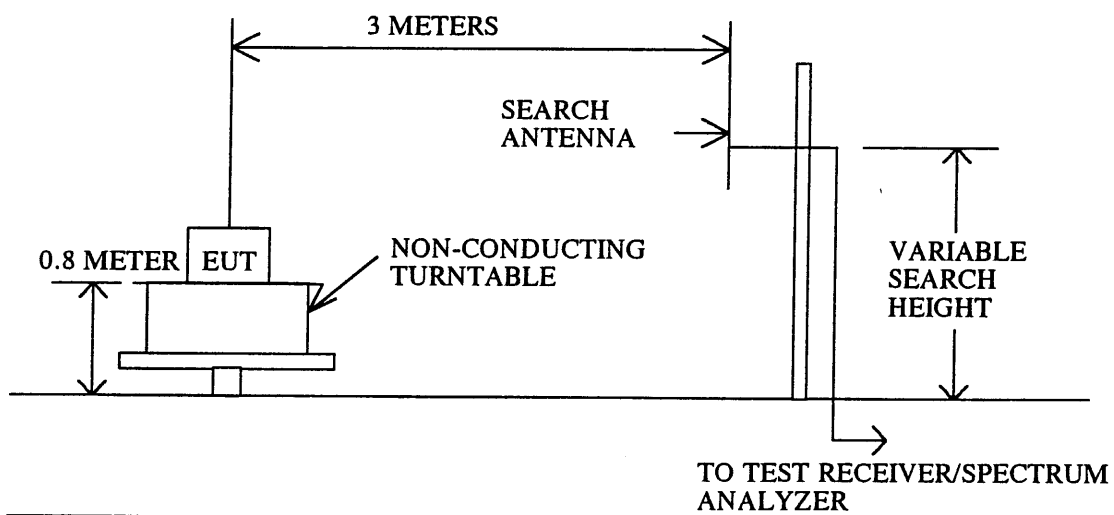
() Denotes failing emission level.

|                                  |       |                |               |                           |                |                      |            |                |          |        |
|----------------------------------|-------|----------------|---------------|---------------------------|----------------|----------------------|------------|----------------|----------|--------|
| STANDARD: FCC Part 15, Subpart B |       |                |               | E.U.T. S/N.: 1001         |                | DETECTOR: CISPR QPK  |            |                |          |        |
| TESTED BY: Tom Tidwell           |       |                |               | TEST DISTANCE(metres): 3m |                | ANTENNA: Dipole      |            |                |          |        |
| DATE: March 16, 1995             |       |                |               | TEST RECEIVER: ESVP       |                | ANTENNA MODEL: 3121C |            |                |          |        |
| E.U.T. MODEL NO.: NPX 138        |       |                |               | RECEIVER BW: 120 kHz      |                | ANTENNA S/N.: 1029   |            |                |          |        |
| FREQ.                            | POL.  | ANTENNA HEIGHT | TABLE AZIMUTH | RECEIVED SIGNAL           | ANTENNA FACTOR | AMP GAIN             | DUTY CYCLE | FIELD STRENGTH | LIMIT    | MARGIN |
| (MHz)                            | (V/H) | (m)            | (Degrees)     | (dBuV)                    | (dB)*          | (dB)**               | (dB)       | (dBuV/m)       | (dBuV/m) | (dB)   |
| 195.0                            | V     | -              | -             | 18.7                      | 14.7           | -                    | -          | 33.4           | 43.5     | 10.1   |
| 195.0                            | H     | -              | -             | 19.3                      | 14.7           | -                    | -          | 34.0           | 43.5     | 9.5    |
|                                  | V     |                |               |                           |                |                      |            |                |          |        |
|                                  | H     |                |               |                           |                |                      |            |                |          |        |
|                                  | V     |                |               |                           |                |                      |            |                |          |        |
|                                  | H     |                |               |                           |                |                      |            |                |          |        |
|                                  | V     |                |               |                           |                |                      |            |                |          |        |
|                                  | H     |                |               |                           |                |                      |            |                |          |        |
|                                  | V     |                |               |                           |                |                      |            |                |          |        |
|                                  | H     |                |               |                           |                |                      |            |                |          |        |
|                                  | V     |                |               |                           |                |                      |            |                |          |        |
|                                  | H     |                |               |                           |                |                      |            |                |          |        |
|                                  | V     |                |               |                           |                |                      |            |                |          |        |
|                                  | H     |                |               |                           |                |                      |            |                |          |        |
|                                  | V     |                |               |                           |                |                      |            |                |          |        |
|                                  | H     |                |               |                           |                |                      |            |                |          |        |
|                                  | V     |                |               |                           |                |                      |            |                |          |        |
|                                  | H     |                |               |                           |                |                      |            |                |          |        |
|                                  | V     |                |               |                           |                |                      |            |                |          |        |
|                                  | H     |                |               |                           |                |                      |            |                |          |        |
| NOTES: Tuned to 173.6 MHz        |       |                |               |                           |                |                      |            |                |          |        |

\* Includes cable loss when amplifier is not used.

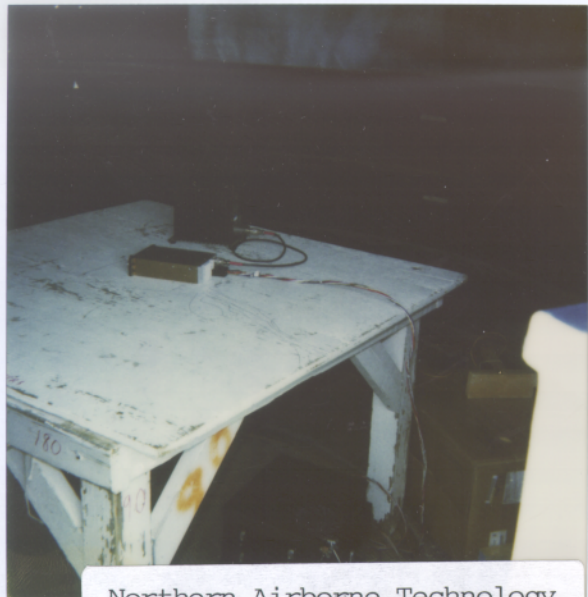
\*\* Includes cable loss.

() Denotes failing emission level.

BLOCK DIAGRAMSPOWERLINE CONDUCTED EMISSIONSTEST SITE FOR RADIATED EMISSIONS

**TEST EQUIPMENT LIST**

| <b><u>Equipment</u></b>   | <b><u>Manufacturer</u></b> | <b><u>Model</u></b> | <b><u>Serial</u></b> | <b><u>Last Cal.</u></b> | <b><u>Next Cal.</u></b> |
|---------------------------|----------------------------|---------------------|----------------------|-------------------------|-------------------------|
| Spectrum Analyzer         | Hewlett Packard            | 8566B               | 2311A02238           | Jan. 5/95               | July 5/95               |
| Spectrum Analyzer Display | Hewlett Packard            | 8566B               | 2314A04759           | Jan. 5/95               | July 5/95               |
| Dipole Antenna Set        | EMCO                       | 3121C               | 1029                 | May 21/94               | Nov. 21/95              |
| Test Receiver             | Rohde & Schwarz            | ESVP                | 879962/021           | Jan. 6/95               | Jan. 6/96               |
| Waveguide Antenna         | EMCO                       | 3115                | 4336                 | Aug. 1/94               | Feb. 1/96               |



Northern Airborne Technology  
Project No. 5NO240-1C  
Model: NPX138  
Worst-Case Test Set-Up On The  
Outside Range - Radiated