

# Marstech Limited

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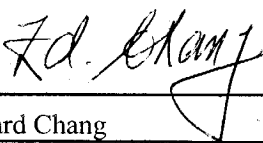
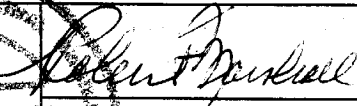
Engineering &  
Administrative



Testing For FCC  
Submissions/Verifications

Industry Canada  
Industry Canada  
Approved Test Facility



| TEST REPORT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                        |                                                                                       |                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------|
| REPORT DATE:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 08 December 2003                                                                                                                                                                                                       |                                                                                       | REPORT NO: 23372D                              |
| CONTENTS:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | See Table of Contents                                                                                                                                                                                                  |                                                                                       |                                                |
| SUBMITTOR:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ATLINKS USA, Inc.<br>101 West 103 <sup>rd</sup> Street<br>Indianapolis, IN<br>46290-1102 USA                                                                                                                           |                                                                                       |                                                |
| SUBJECT:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Model No:                                                                                                                                                                                                              | 26976XXX-A                                                                            |                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | FCC ID:                                                                                                                                                                                                                | G9H2-6976A                                                                            |                                                |
| TEST SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | FCC 47 CFR Part 15<br>NOTE: Tests Conducted Are "Type" Tests.                                                                                                                                                          |                                                                                       |                                                |
| DATE SAMPLE RECEIVED:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 27 October 2003 and<br>24 November 2003                                                                                                                                                                                | DATE TESTED:                                                                          | 04 & 12 November 2003<br>01 & 02 December 2003 |
| RESULTS:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Equipment tested complies with referenced specification <b>with the following modifications on the handset unit.</b> Also, the Model 26976XXX-A meets the new rules (150kHz to 30MHz) FCC Power Line Conducted Limits. |                                                                                       |                                                |
| ALTERATIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1. C21, 1500p capacitor was deleted.<br>2. C31, 33N capacitor was changed to 15N.                                                                                                                                      |                                                                                       |                                                |
| Tested by:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                     |  |                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Edward Chang                                                                                                                                                                                                           | Approved by:                                                                          | Robert G. Marshall, P. Eng.                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                        | Date:                                                                                 | Dec 22/03                                      |
| <b>THIS REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF MARSTECH LIMITED.</b> This report was prepared by Marstech Limited for the account of the "Submitter". The material in it reflects Marstech's judgement in light of the information available to it at the time of preparation. Any use which a Third Party makes of this report, or any reliance on decisions to be made based on it, are the responsibility of such Third Parties. Marstech accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report. |                                                                                                                                                                                                                        |                                                                                       |                                                |

TECHNICAL REPORT - FCC 2.1033(b)

Applicant

ATLINKS USA, Inc.  
101 West 103<sup>rd</sup> Street  
Indianapolis, IN  
46290-1102 USA

FCC Identifier

G9H2-6976A

Manufacturer

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(Shenzhen) Co., Ltd.  
Block 21, Chentian Industrial Village, Xixian Town  
Bao An District, Shenzhen City, CHINA

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| B              | Description of Circuit Functions<br>Statement of Security Code         | 2.1033(b)(4)    | Exhibit B<br>Exhibit B(1)-1 to -2<br>Exhibit B(2)                                 |
| C              | Block Diagram<br>Schematic Diagram                                     | 2.1033(b)(5)    | Exhibit C<br>Exhibit C(1)-1 to -3<br>Exhibit C(2)-1 to -5                         |
| D              | Report of Measurements                                                 | 2.1033(b)(6)    | Exhibit D                                                                         |
| E              | Photographs<br>Label<br>Equipment - External Photos<br>Internal Photos | 2.1033(b)(7)    | Exhibit E<br>Exhibit E(1)-1 to -5<br>Exhibit E(2)-1 to -2<br>Exhibit E(2)-3 to -9 |
| F              | Verification Report (Not Part of Certification Package)                |                 | Exhibit F(1)-1 to -3                                                              |

EXHIBIT D

[FCC Ref. 2.1033(b)(6)]

"Report of Measurements"

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TEST REPORT CONTAINING:

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| Exhibit D(6)         | Frequency List Table                               |
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| Exhibit D(8)         | Test Setup Diagram for AC Conducted Line Testing   |
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**PRODUCT DESCRIPTION**

The Model 26976XXX-A is a single-line 900MHz cordless telephone with caller ID, speakerphone, answering machine and AM/FM radio/handset charge cradle that operates from 902 MHz to 928 MHz. The antenna used for the base and the handset is permanently attached to the EUT. Its actual frequency range is:

|                           |                          |
|---------------------------|--------------------------|
| Base - ANT1 (Spacemaker): | 902.80 MHz to 904.75 MHz |
| Base - ANT0 (Handset):    | 902.80 MHz to 904.75 MHz |
| Handset:                  | 925.30 MHz to 927.25 MHz |
| Spacemaker:               | 925.30 MHz to 927.25 MHz |

Refer to Exhibit D(6) for complete frequency list.

**15.107 (a)      POWER LINE CONDUCTED INTERFERENCE**

**Requirements:**

| Frequency of Emission (MHZ) | Conducted Limit (dBμV) |           |
|-----------------------------|------------------------|-----------|
|                             | Quasi-peak             | Average   |
| 0.15-0.5                    | 66 to 56*              | 56 to 46* |
| 0.5-5                       | 56                     | 46        |
| 5-30                        | 60                     | 50        |

\*Decreases with the logarithm of the frequency.

**Test Procedure:**

ANSI STANDARD C63.4-1992. using a 50uH LISN. Both lines were observed with the EUT transmitting. The bandwidth of the spectrum analyzer was 9KHz QP with an appropriate sweep speed. The ambient temperature of the EUT was 24°C with a humidity of 60%.

The spectrum was scanned from 0.15 to 30MHz.

**Test Data:**

The highest emission read for LINE was 52.29 dBμV@ 0.15 MHz.

The highest emission read for NEUTRAL was 52.51 dBμV@ 0.15 MHz.

The graphs on Appendix 1 to 6 represent the emissions taken for this device.

**Test Results:**

Both lines were observed. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

**15.249 (a), (b) and (c) FIELD STRENGTH OF EMISSIONS**

**Requirements:**

| Fundamental Frequency |              | Field Strength of Harmonics | 15.209        |                     |
|-----------------------|--------------|-----------------------------|---------------|---------------------|
| 902-928 MHz           | 94dB $\mu$ V | 54 dB $\mu$ V/m@ 3m         | 30-88 MHz     | 40 dB $\mu$ V/m@ 3m |
|                       |              |                             | 88-216 MHz    | 43.5                |
|                       |              |                             | 216-960 MHz   | 46                  |
|                       |              |                             | Above 960 MHz | 54                  |

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation.

Emissions that fall in the restricted bands (15.205) must be less than 54dB $\mu$ V/m

**Procedure**

The test procedure used was ANSI STANDARD C63.4-1992 and DA-00-705 using an appropriate spectrum analyzer, as listed in the Test Equipment List. The bandwidth (RBW) of the spectrum analyzer was 100KHz/120KHz up to 1GHz with an appropriate sweep speed. The RBW above 1.0GHz was = 1.0MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the EUT was 24°C with a humidity of 60%.

**Test Data:**

Refer to Exhibit D(3)-3 and -6

**FIELD STRENGTH OF EMISSIONS****BASE UNIT - ANT1 (Spacemaker)**

| <b>Emission Frequency<br/>MHz</b> | <b>Meter Reading<br/>@3m<br/>dBμV</b> | <b>Antenna</b> | <b>Cable and<br/>ACF<br/>dB</b> | <b>Field<br/>Strength<br/>dBμV/M</b> | <b>FCC<br/>Limit<br/>dBμV/M</b> | <b>Margin<br/>dB</b> | <b>Detector &amp;<br/>BW KHz</b> |
|-----------------------------------|---------------------------------------|----------------|---------------------------------|--------------------------------------|---------------------------------|----------------------|----------------------------------|
| <b><u>Channel 1</u></b>           |                                       |                |                                 |                                      |                                 |                      |                                  |
| <b>902.80</b>                     | <b>55.00</b>                          | <b>RT4 V</b>   | <b>33.30</b>                    | <b>88.30</b>                         | <b>94</b>                       | <b>-5.70</b>         | <b>PK 100</b>                    |
| 1805.60                           | 13.00                                 | Horn V         | 33.18                           | 46.18                                | 54                              | -7.82                | PK 1000                          |
| 2708.40                           | 9.00                                  | Horn V         | 33.92                           | 42.92                                | 54                              | -11.08               | PK 1000                          |
| 3611.20                           | 8.00                                  | Horn V         | 35.38                           | 43.38                                | 54                              | -10.62               | PK 1000                          |
|                                   |                                       |                |                                 |                                      |                                 |                      |                                  |
|                                   |                                       |                |                                 |                                      |                                 |                      |                                  |
| <b><u>Channel 40</u></b>          |                                       |                |                                 |                                      |                                 |                      |                                  |
| <b>904.75</b>                     | <b>52.80</b>                          | <b>RT4 V</b>   | <b>33.30</b>                    | <b>86.10</b>                         | <b>94</b>                       | <b>-7.90</b>         | <b>PK 100</b>                    |
| 1809.50                           | 15.00                                 | Horn V         | 33.18                           | 48.18                                | 54                              | -5.82                | PK 1000                          |
| 2714.25                           | 11.00                                 | Horn V         | 33.92                           | 44.92                                | 54                              | -9.08                | PK 1000                          |
| 3619.00                           | 8.00                                  | Horn V         | 35.38                           | 43.38                                | 54                              | -10.62               | PK 1000                          |
|                                   |                                       |                |                                 |                                      |                                 |                      |                                  |
|                                   |                                       |                |                                 |                                      |                                 |                      |                                  |

**FIELD STRENGTH OF EMISSIONS****BASE UNIT - ANT0 (Handset)**

| <b>Emission Frequency<br/>MHz</b> | <b>Meter Reading<br/>@3m<br/>dBμV</b> | <b>Antenna</b> | <b>Cable and<br/>ACF<br/>dB</b> | <b>Field<br/>Strength<br/>dBμV/M</b> | <b>FCC<br/>Limit<br/>dBμV/M</b> | <b>Margin<br/>dB</b> | <b>Detector &amp;<br/>BW KHz</b> |
|-----------------------------------|---------------------------------------|----------------|---------------------------------|--------------------------------------|---------------------------------|----------------------|----------------------------------|
| <b><u>Channel 1</u></b>           |                                       |                |                                 |                                      |                                 |                      |                                  |
| <b>902.80</b>                     | <b>57.50</b>                          | <b>RT4 V</b>   | <b>33.30</b>                    | <b>90.80</b>                         | <b>94</b>                       | <b>-3.20</b>         | <b>PK 100</b>                    |
| 1805.60                           | 19.00                                 | Horn V         | 33.18                           | 52.18                                | 54                              | -1.82                | PK 1000                          |
| 2708.40                           | 13.00                                 | Horn H         | 33.92                           | 46.92                                | 54                              | -7.08                | PK 1000                          |
| 3611.20                           | 9.00                                  | Horn V         | 35.38                           | 44.38                                | 54                              | -9.62                | PK 1000                          |
|                                   |                                       |                |                                 |                                      |                                 |                      |                                  |
|                                   |                                       |                |                                 |                                      |                                 |                      |                                  |
| <b><u>Channel 40</u></b>          |                                       |                |                                 |                                      |                                 |                      |                                  |
| <b>904.75</b>                     | <b>56.30</b>                          | <b>RT4 V</b>   | <b>33.30</b>                    | <b>89.60</b>                         | <b>94</b>                       | <b>-4.40</b>         | <b>PK 100</b>                    |
| 1809.50                           | 19.00                                 | Horn V         | 33.18                           | 52.18                                | 54                              | -1.82                | PK 1000                          |
| 2714.25                           | 14.00                                 | Horn H         | 33.92                           | 47.92                                | 54                              | -6.08                | PK 1000                          |
| 3619.00                           | 9.00                                  | Horn V         | 35.38                           | 44.38                                | 54                              | -9.62                | PK 1000                          |
|                                   |                                       |                |                                 |                                      |                                 |                      |                                  |
|                                   |                                       |                |                                 |                                      |                                 |                      |                                  |

**FIELD STRENGTH OF EMISSIONS****HANDSET UNIT**

| <b>Emission Frequency<br/>MHz</b> | <b>Meter Reading<br/>@3m<br/>dBμV</b> | <b>Antenna</b> | <b>Cable and<br/>ACF<br/>dB</b> | <b>Field Strength<br/>dBμV/M</b> | <b>FCC Limit<br/>dBμV/M</b> | <b>Margin<br/>dB</b> | <b>Detector &amp;<br/>BW KHz</b> |
|-----------------------------------|---------------------------------------|----------------|---------------------------------|----------------------------------|-----------------------------|----------------------|----------------------------------|
| <b><u>Channel 1</u></b>           |                                       |                |                                 |                                  |                             |                      |                                  |
| <b>925.30</b>                     | <b>55.00</b>                          | <b>RT4 V</b>   | <b>33.40</b>                    | <b>88.40</b>                     | <b>94</b>                   | <b>-5.60</b>         | <b>PK 100</b>                    |
| 1850.60                           | 7.00                                  | Horn V         | 33.06                           | 40.06                            | 54                          | -13.94               | PK 1000                          |
| 2775.90                           | 12.00                                 | Horn V         | 34.08                           | 46.08                            | 54                          | -7.92                | PK 1000                          |
| 3701.20                           | —                                     |                |                                 |                                  |                             |                      |                                  |
|                                   |                                       |                |                                 |                                  |                             |                      |                                  |
|                                   |                                       |                |                                 |                                  |                             |                      |                                  |
| <b><u>Channel 40</u></b>          |                                       |                |                                 |                                  |                             |                      |                                  |
| <b>927.25</b>                     | <b>57.00</b>                          | <b>RT4 V</b>   | <b>33.40</b>                    | <b>90.40</b>                     | <b>94</b>                   | <b>-3.60</b>         | <b>PK 100</b>                    |
| 1854.50                           | 7.00                                  | Horn V         | 33.06                           | 40.06                            | 54                          | -13.94               | PK 1000                          |
| 2781.75                           | 11.00                                 | Horn V         | 34.08                           | 45.08                            | 54                          | -8.92                | PK 1000                          |
|                                   |                                       |                |                                 |                                  |                             |                      |                                  |
|                                   |                                       |                |                                 |                                  |                             |                      |                                  |

FIELD STRENGTH OF EMISSIONS

## SPACEMAKER

| Emission Frequency MHz | Meter Reading @3m dBμV | Antenna | Cable and ACF dB | Field Strength dBμV/M | FCC Limit dBμV/M | Margin dB | Detector & BW KHz |
|------------------------|------------------------|---------|------------------|-----------------------|------------------|-----------|-------------------|
| <u>Channel 1</u>       |                        |         |                  |                       |                  |           |                   |
| 925.30                 | 52.00                  | RT4 V   | 33.40            | 85.40                 | 94               | -8.60     | PK 100            |
| 1850.60                | 9.00                   | Horn V  | 33.06            | 42.06                 | 54               | -11.94    | PK 1000           |
| 2775.90                | 11.00                  | Horn V  | 34.08            | 45.08                 | 54               | -8.92     | PK 1000           |
| 3701.20                | —                      |         |                  |                       |                  |           |                   |
|                        |                        |         |                  |                       |                  |           |                   |
|                        |                        |         |                  |                       |                  |           |                   |
| <u>Channel 40</u>      |                        |         |                  |                       |                  |           |                   |
| 927.25                 | 52.50                  | RT4 V   | 33.40            | 85.90                 | 94               | -8.10     | PK 100            |
| 1854.50                | 9.00                   | Horn V  | 33.06            | 42.06                 | 54               | -11.94    | PK 1000           |
| 2781.75                | 9.00                   | Horn V  | 34.08            | 43.08                 | 54               | -10.92    | PK 1000           |
| 3709.00                | —                      |         |                  |                       |                  |           |                   |
|                        |                        |         |                  |                       |                  |           |                   |
|                        |                        |         |                  |                       |                  |           |                   |

**15.249 (d)     BAND EDGES**

**Requirements:**

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

**Measurement:**

The base was attenuated by 50 dB. The handset was attenuated by 50 dB.

**Test Data:**

The Bandedge was measured at the Low end of the band for the base (ANT0/ANT1), and the High end of the band for the handset/spacemaker. See Plots [Appendix 7 and 8].

**2.202    BANDWIDTH**

**Measurement:**

The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 30KHz [Base (ANT0/ANT1) and Handset/Spacemaker] and the video bandwidth (VBW) = NONE and the span set as shown on plot.

**Test Data:**

**Base (ANT0/ANT1):**

Channel 1:      **0.094 MHz** [Refer to Appendix 9]  
Channel 40:     **0.095 MHz** [Refer to Appendix 10]

**Handset/Spacemaker:**

Channel 1:      **0.117 MHz** [Refer to Appendix 11]  
Channel 40:     **0.112 MHz** [Refer to Appendix 12]

BANDWIDTH =        **0.095 MHz** [Base (ANT0/ANT1)]  
                             **0.117 MHz** [Handset/Spacemaker]