

Please scan into
TEST REPORT 3

FA 92585

AMENDMENT TO TYPE ACCEPTANCE APPLICATION

For

AMTECH SYSTEMS DIVISION
INTERMEC TECHNOLOGIES CORPORATION
8600 Jefferson Street, NE
Albuquerque, NM 87113
Phone: (505) 856-8054

MODEL: AH1101-010
HAND HELD READER

FREQUENCY: 909.75-921.75 MHz
FCC ID: FIH11010533401

Test Date: April 9, 1999

Certifying Engineer:

Scot D Rogers
Scot D. Rogers
ROGERS LABS, INC.
4405 W. 259th Terrace
Louisburg, KS 66053
Phone: (913) 837-3214
FAX: (913) 837-3214

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For

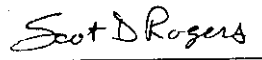
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Amended report. In accordance with the Federal Communications Code of Federal Regulations, dated October 1, 1997, Part 2 Subpart J, Paragraphs 2.905, 2.911, 2.913, 2.925, 2.926, 2.981 through 2.999, 2.1003, Part 90, Subpart M, Paragraphs 90.201 through 90.217, and 90.350 through 90.363; the following is submitted:

2.983 Application for Type Acceptance

- a. Manufacturer: AMTECH SYSTEMS DIVISION
INTERMEC TECHNOLOGIES CORPORATION
8600 Jefferson Street, NE
Albuquerque, NM 87113
- b. Identification: Model: AH1101-010 HAND HELD READER
FCC I.D.: FIH11010533401
- c. Plan to produce quantity production.
- d. (1) Emission Type:
 420KPON
- (2) Frequency Range:
 909.75-921.75 MHz
- (3) Operating Power Level:
 1.0 Watt
- (4) Max P_o :
 1 Watt.
- (5) Power into final amp:
 4.96 Vdc @ 0.296 amps (1.4 Watts)
- (6) Refer to Appendix of Original Report for function of semiconductors and other active devices.
- (7) Refer to Appendix of Original Report for Circuit Diagrams.
- (8) Refer to Appendix of Original Report for Preliminary Instruction Manual.
- (9) Tune Up Procedure: Refer to Appendix of Original Report.

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- (10) Frequency Stabilizing: Refer to Appendix of Original Report.
 - (11) Spurious and Harmonic Suppression: Refer to Appendix of Original Report.
 - (12) Modulation: Refer to Appendix of Original Report.
- e. Measurement Procedure: Standard Engineering Practices were used in collecting the test data.
- Reference Material: ANSI - 63.4-1992.
- List of Test Equipment used: Refer to Appendix of Original Report for Test Equipment List.
- f. Refer to Appendix of Original Report for Identification plate data.
- g. Refer to Appendix of Original Report for photos of equipment.

2.985 RF Power Output

Measurements Required:

Measurements shall be made to establish the radio frequency power delivered by the transmitter into the standard output termination. The power output shall be monitored and recorded and no adjustment shall be made to the transmitter after the test has begun, except as noted below:

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Test Arrangement:



The r.f. power output was measured with a spectrum analyzer and antenna. Since the unit has no removable antenna, access to an antenna port is not available. A HP 8562A Spectrum Analyzer was used to measure the r.f. power. The data was taken in dBμV/m and converted to watts as shown in the following Table. Data was taken per Paragraph 2.985(a) and applicable parts of Part 90.

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$$E(V/m) = 10^{\frac{(dB_{\mu V/m} - 120)}{20}}$$

$$E = 10^{\frac{(134.7 - 120)}{20}}$$

$$\text{Then } E = 5.43$$

$$P(W) = \frac{E^2}{49.2}$$

$$P(W) = 0.993 \text{ Watts}$$

$$NO, P.W) = \frac{(E d)^2}{49.2} \quad (FAR)$$

$$YIELDING P.W = 5.4 W$$

Results:

FREQUENCY	P _{dBμV/m @ 3m}	P _{Watts}
916.7	134.7	0.99

The specifications of Paragraph 2.985(a) and 90.205 are met. There are no deviations to the specifications.

2.993 Field Strength of Spurious Radiation

Measurements Required:

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. The integral antenna was installed on the reader for all spurious radiation measurements.

Test Arrangement:



The transmitter was placed on a wooden turntable 0.8 meters above the ground plane and at a distance of 3 meters from the FSM antenna. The transmitter was activated and the frequency spectrum of the fundamental was observed. The turntable was rotated through 360 degrees to locate the position registering the highest amplitude emission. The amplitude of the fundamental frequency was measured and recorded. The frequency spectrum was then searched for spurious emissions generated from the transmitter. The amplitude of each spurious emission was

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maximized by raising and lowering the FSM antenna and rotating the turntable before data was recorded. A log periodic antenna was used for frequencies of 200 MHz to 5 GHz and pyramidal horn antennas were used for frequencies of 5 GHz to 40 GHz. Emission levels were measured and recorded from the spectrum analyzer in dB μ V. This level was then added to the antenna factor less the amplifier gain to calculate the field strength at 3 meters. Data was taken at the ROGERS LABS, INC. 3 meters open area test site (OATS). A description of the test facility is on file with the FCC, Reference: 31040/SIT, 1300F2, dated February 6, 1998. The testing procedures used conform to the procedures stated in the ANSI 63.4-1992 document.

Calculations made are as follows:

CFS = Calculated Field Strength

FSM = Field Strength Measurement

CFS = FSM + Antenna Factor - Amplifier Gain

CFS = 111.3 + 23.4

CFS = 134.7

The limit for emissions are defined by the following equations:

Limit = Amplitude of spurious emission must be attenuated by this amount below the level of the fundamental.

$$\begin{aligned}\text{Attenuation} &= 55 + 10 \log_{10}(P_w) \\ &= 55 + 10 \log_{10}(1.0) \\ &= 55 \text{ dB}\end{aligned}$$

$$\begin{aligned}\text{Limit} &= 134.7 - 55 \\ &= 79.7\end{aligned}$$

Results:

FREQUENCY (MHz)	FSM HOR. (dB μ V)	FSM VERT. (dB μ V)	ANTENNA FACTOR (dB)	AMPLIFIER GAIN (dB)	CFS, dB μ V/m @ 3 M HOR.	CFS, dB μ V/m @ 3 M VERT.
916.7	111.3	95.2	23.4	0	134.7	118.6
1833.4	45.6	46.3	26.3	25	46.9	47.6
2749.5	42.6	43.5	33.5	25	51.1	52.0
3666.0	37.6	39.8	38.4	25	51.0	53.2
4582.5	39.3	39.1	40.8	25	55.1	54.9

Specifications of Paragraph 2.993, 2.997 and 90.211 are met. There are no deviations to the specifications.

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April 9, 1999

Federal Communications Commission
Equipment Authorization Division
7435 Oakland Mills Road
Columbia, Maryland 20146

Re: Amtech Systems Division of Intermec Technologies Corp.
Amendments to the Application for Equipment Authorization
FCC I.D. No. FIH11010533401

To Greg Czumak:

Hello Greg, I have completed the retesting of the Amtech Systems AH1101 (FCC ID: FIH11010533401) unit. Enclosed with this letter is the amendment to the test report. The output power of the unit was measured and found to be .99 Watts. Please note also we wish to have the frequency band of 909.75 MHz to 921.75 MHz for operation, stated in the Grant. If you have any questions please feel free to contact me at (913) 837-3214 or Wes Mays at (505) 856-8054.

Thank you for your help and all your efforts involved in this matter.

Sincerely,

A handwritten signature in black ink that reads "Scot D Rogers". The signature is written in a cursive, flowing style.

Scot Rogers
President
Rogers Labs, Inc.

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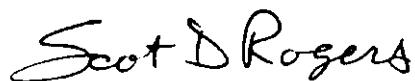
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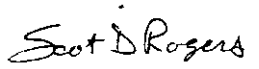
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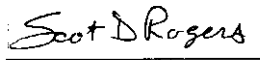
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Test to: FCC Parts 2 and 90

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Test #: 990509 FCC ID#: FH11010533401
Test to: FCC Parts 2 and 90

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maximized by raising and lowering the FSM antenna and rotating the turntable before data was recorded. A log periodic antenna was used for frequencies of 200 MHz to 5 GHz and pyramidal horn antennas were used for frequencies of 5 GHz to 40 GHz. Emission levels were measured and recorded from the spectrum analyzer in dBμV. This level was then added to the antenna factor less the amplifier gain to calculate the field strength at 3 meters. Data was taken at the ROGERS LABS, INC. 3 meters open area test site (OATS). A description of the test facility is on file with the FCC, Reference: 31040/SIT, 1300F2, dated February 6, 1998. The testing procedures used conform to the procedures stated in the ANSI 63.4-1992 document.

Calculations made are as follows:

CFS = Calculated Field Strength

FSM = Field Strength Measurement

CFS = FSM + Antenna Factor - Amplifier Gain

CFS = 111.3 + 23.4

CFS = 134.7

The limit for emissions are defined by the following equations:

Limit = Amplitude of spurious emission must be attenuated by this amount below the level of the fundamental.

$$\begin{aligned}\text{Attenuation} &= 55 + 10 \log_{10}(P_w) \\ &= 55 + 10 \log_{10}(1.0) \\ &= 55 \text{ dB}\end{aligned}$$

$$\begin{aligned}\text{Limit} &= 134.7 - 55 \\ &= 79.7\end{aligned}$$

Results:

FREQUENCY (MHz)	FSM HOR. (dBμV)	FSM VERT. (dBμV)	ANTENNA FACTOR (dB)	AMPLIFIER GAIN (dB)	CFS. dBμV/m @ 3 M HOR.	CFS. dBμV/m @ 3 M VERT.
916.7	111.3	95.2	23.4	0	134.7	118.6
1833.4	45.6	46.3	26.3	25	46.9	47.6
2749.5	42.6	43.5	33.5	25	51.1	52.0
3666.0	37.6	39.8	38.4	25	51.0	53.2
4582.5	39.3	39.1	40.8	25	55.1	54.9

Specifications of Paragraph 2.993, 2.997 and 90.211 are met. There are no deviations to the specifications.

April 9, 1999

Federal Communications Commission
Equipment Authorization Division
7435 Oakland Mills Road
Columbia, Maryland 20146

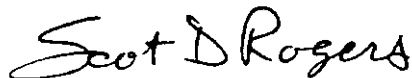
Re: Amtech Systems Division of Intermec Technologies Corp.
Amendments to the Application for Equipment Authorization
FCC I.D. No. FIH11010533401

To Greg Czumak:

Hello Greg, I have completed the retesting of the Amtech Systems AH1101 (FCC ID: FIH11010533401) unit. Enclosed with this letter is the amendment to the test report. The output power of the unit was measured and found to be .99 Watts. Please note also we wish to have the frequency band of 909.75 MHz to 921.75 MHz for operation, stated in the Grant. If you have any questions please feel free to contact me at (913) 837-3214 or Wes Mays at (505) 856-8054.

Thank you for your help and all your efforts involved in this matter.

Sincerely,

A handwritten signature in black ink that reads "Scot D Rogers". The signature is written in a cursive, flowing style.

Scot Rogers
President
Rogers Labs, Inc.

April 9, 1999

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