

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: FH11010533401

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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2.983 Application for Type Acceptance

- a. Manufacturer: AMTECH SYSTEMS DIVISION
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8600 Jefferson Street, NE
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- 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.
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2.985 RF Power Output

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

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

Then E = 5.43

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

P(W) = 0.993 Watts

NO, P.W) = (E d)² / 49.2 (F.M.F.)
Yielding P.W = 5.4 W
S.M.A.

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.

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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 though 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 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.

$$\begin{aligned} \text{Attenuation} &= 55 + 10 \text{Log}_{10}(P_w) \\ &= 55 + 10 \text{Log}_{10}(1.0) \\ &= 55 \text{ dB} \\ \text{Limit} &= 134.7 - 55 \\ &= 79.7 \end{aligned}$$

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.

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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.
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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 Intermecc 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 style with a large, prominent "S" at the beginning.

Scot Rogers
President
Rogers Labs, Inc.

April 9, 1999

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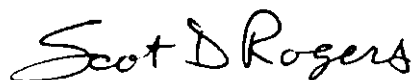
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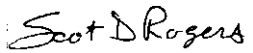
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$$\begin{aligned} \text{Attenuation} &= 55 + 10 \text{Log}_{10}(P_w) \\ &= 55 + 10 \text{Log}_{10}(1.0) \\ &= 55 \text{ dB} \\ \text{Limit} &= 134.7 - 55 \\ &= 79.7 \end{aligned}$$

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

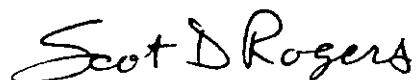
Re: Amtech Systems Division of Intermec Technologies Corp.
Amendments to the Application for Equipment Authorization
FCC I.D. No. FIH11010533401

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 style with a large, stylized 'S' and 'R'.

Scot Rogers
President
Rogers Labs, Inc.

April 9, 1999

Federal Communications Commission
Equipment Authorization Division
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Columbia, Maryland 20146

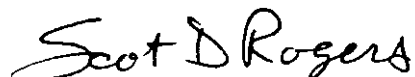
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