FCC Certification Report for the **LA3021-500** WLAN PC Card Class II Permissive Change

EXHIBIT 2.1

TEST REPORT 2

Antennas:
IEC PC-LP
6146

ITS Intertek Testing Services
ETL SEMKO

Radiated Emissions in Restricted Bands
Permissive Change Test Report
FCC Part 15.247 (c)
for
Symbol Technologies
on the
Spread Spectrum Frequency Hopping Radio
Model: H9PLA3021-500

Test Report #: 202567862
Date of Report: September 27, 2000

Job #: J200256786
Date of Test: September 20-21, 2000

Total No. of Pages Contained in this Report: 11 + Data Pages

NVLAP®

Lab Code: 200201-01

	Barry E. Smith, Test Engineer
	David Chernomordik, Ph.D., EMC Site Manager

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Symbol Technologies,
Model No. H9PLA3021-500

Date of Test: September 20-21, 2000

1.0 Summary of Tests

Symbol Technologies Inc. - Model No. H9PLA3021-500

TEST	REFERENCE	RESULTS
Radiated Emission in Restricted Bands	15.247(c)	Passed

Test Engineer: _____ Date: 9/28/00
Barry E. Smith

EMC Site Mgr.: _____ Date: 9/28/00
David Chernomordik

2.0 General Description

2.1 Product Description

The Symbol Technologies model H9PLA3021-500 is 2.4 GHz Spread Spectrum radio in the form of a PCMCIA card that is used for wireless communication from a computer to a LAN.

Overview of the EUT

Trade Name & Model No.	Symbol Technologies, Model No. H9PLA3021-500
Frequency Range (MHz)	2402 – 2480
Antenna(s)	IEC PC 60-20926-01 6146 10-35305-02
Manufacturer name & address	Symbol Technologies 6480 Via Del Oro San Jose CA 95119

2.3 Test Methodology

This report is designed to show that 2 new antennas, added to the previously certified device, complies with FCC regulations. Only radiated emissions in restricted bands were tested because the transmitter itself has not been modified.

Radiated emissions measurements were performed according to the procedures in ANSI C63.4 (1992). Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Data Sheet"** of this Application.

2.4 Test Facility

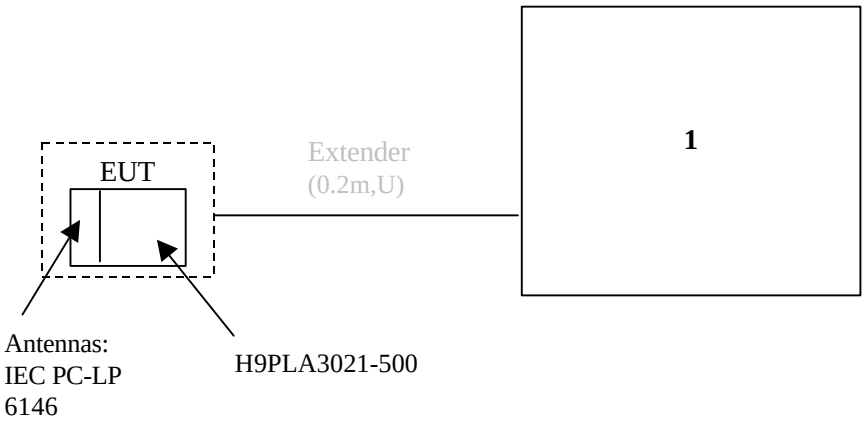
The open area test site facility used to collect the radiated data is located at 1365 Adams Court, Menlo Park, CA 94025. This test facility and site measurement data have been fully placed on file with the FCC.

3.0 System Test Configuration

3.1 Support Equipment

Item #	Description	Model No.	Serial No.	FCC ID
1	Compaq Notebook Computer	2860A	7448HJJ53R518	CNT75MB2CA

3.2 Block Diagram of Test Setup



m: Length in meters
U: Unshielded

3.3 Justification

For emission testing, the equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, all cables were manipulated to produce worst case emissions.

For radiated emission measurements, the EUT is attached to a cardboard box (if necessary) and placed on the wooden turntable. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). The EUT is wired to transmit full power.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

3.4 Software Exercise Program

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

3.5 Mode of Operation During Test

For emissions testing, the unit was setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

3.6 Modifications Required for Compliance

The following modifications were installed during compliance testing in order to bring the product into compliance (Please note that this list does not include changes made specifically by Symbol Technologies Inc. prior to compliance testing):

No modifications were made to the EUT by Intertek Testing Services.

4.0 Measurement Results

4.1 Transmitter Radiated Emissions in Restricted Bands, *FCC Ref: 15.247(c)*

Radiated emission measurements were performed from 30 MHz to 25000 MHz. Analyzer resolution is 100 kHz or greater for frequencies from 30 MHz to 1000 MHz and 1 MHz for frequencies above 1000 MHz.

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection and average detection (above 1 GHz) unless otherwise specified.

On the following pages, the emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter is in full radiated power. Duty cycle correction was not used.

For the test results, refer to the following radiated emission data sheets.

Note : It was verified that radiated emission data from digital portion of the EUT is not worse than the data previously measured and presented in the original report.

4.2 Radiated Emission Test Results

See attachment test data sheets.

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Radiated Emissions Test Data

Company:	Symbol	Model #:	60-20926-01
EUT:	Frequency Hop Radio LA3021-500	S/N #:	
Project #:	J200256786	Test Date:	Sep 20, 2000
Test Mode:	Xmit with antenna IEC PC	Engineer:	Barry S.

Standard_	FCC § 15.247 (R.B.)	
Limits	11	
Test Distance_	3	meters
Duty Relaxation	0	dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	2	8	21	8	12	13	21	0	0	0
Model:	EMCO 3143	EMCO 3115	3160-9	CDI_P1000	ACO/180	ACO/400	G-n_M+L	None	None	None

Frequency	Reading	Detector	Ant	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	D. C. F.	Net	Limit @3m	Margin
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(µV/m)	dB(µV/m)	dB
2402	89.5	Peak	8		H	29.1	0.0	2.3	0.0	120.9		
4804	41.1	Peak	8	8	H	33.9	28.1	3.2	0.0	50.1	74.0	-23.9
4804	39.9	Ave.	8	8	H	33.9	28.1	3.2	0.0	48.9	54.0	-5.1
12010	36.5	Peak	8	12	H	42.1	32.4	5.9	-9.5	42.6	74.0	-31.4
12010	31.8	Ave.	8	12	H	42.1	32.4	5.9	-9.5	37.9	54.0	-16.1
19216	39.1	Peak	21	13	H	40.2	23.3	7.7	-9.5	54.2	74.0	-19.8
19216	30.3	Ave.	21	13	H	40.2	23.3	7.7	-9.5	45.4	54.0	-8.6
2440	88.7	Peak	8		H	29.1	0.0	2.3	0.0	120.1	74.0	
4880	42.6	Peak	8	8	H	33.9	28.1	3.2	0.0	51.6	74.0	-22.4
4880	40.7	Ave.	8	8	H	33.9	28.1	3.2	0.0	49.7	54.0	-4.3
7320	45.8	Peak	8	8	H	36.8	28.0	4.3	0.0	58.9	74.0	-15.1
7320	43.6	Ave.	8	8	H	36.8	28.0	4.3	0.0	56.7	54.0	2.7
12220	36.8	Peak	8	10	H	42.1	39.1	5.9	-9.5	42.9	74.0	-31.1
12220	31.3	Ave.	8	10	H	42.1	39.1	5.9	-9.5	37.4	54.0	-16.6
19520	39.2	Peak	21	13	H	40.3	23.3	7.7	-9.5	54.4	74.0	-19.6
19520	30.0	Ave.	21	13	H	40.3	23.3	7.7	-9.5	45.2	54.0	-8.8
2480	88.2	Peak	8		H	29.1	0.0	2.3	0.0	119.6		
4960	41.9	Peak	8	8	H	33.9	28.1	3.2	0.0	50.9	74.0	-23.1
4960	40.4	Ave.	8	8	H	33.9	28.1	3.2	0.0	49.4	54.0	-4.6
7440	42.6	Peak	8	8	H	36.8	28.0	4.3	0.0	55.7	74.0	-18.3
7440	40.2	Ave.	8	8	H	36.8	28.0	4.3	0.0	53.3	54.0	-0.7
12400	39.1	Peak	8	12	H	42.1	32.4	5.9	0.0	54.7	74.0	-19.3
12400	35.2	Ave.	8	12	H	42.1	32.4	5.9	0.0	50.8	54.0	-3.2
19840	41.2	Peak	21	13	H	40.3	23.3	7.7	-9.5	56.4	74.0	-17.6
19840	32.0	Ave.	21	13	H	40.3	23.3	7.7	-9.5	47.2	54.0	-6.8
22320	43.8	Peak	21	13	H	40.3	23.3	7.9	-9.5	59.2	74.0	-14.8
22320	33.7	Ave.	21	13	H	40.3	23.3	7.9	-9.5	49.1	54.0	-4.9

Subtract 9 dB for all readings to account for duty cycle

DCF of -9.5 were taken at 1 meter with RBW at 300kHz

Notes:

a) D.C.F.:Distance Correction Factor

b) Insert. Loss (dB) = Cable A + Cable B + Cable C .

c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Transducer Loss - Duty Relaxation (transmitter only).

d) Negative signs (-) in Margin column signify levels below the limits.

e) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.

ITS Intertek Testing Services

Radiated Emissions Test Data

Company:	Symbol					**Model #:**	Ant 10-35305-02	**Standard_**	**FCC § 15.247 (R.B.)**	
EUT:	LA3021-500 Freqency Hopper					**S/N #:**		**Limits**	11	
Project #:	J200256786					**Test Date:**	SEP 21, 2000	**Test Distance_**	3	meters
Test Mode:	Xmit with antenna 6146					**Engineer:**	Barry S.	**Duty Relaxation**	0	dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	8	21	0	8	12	13	21	0	0	0
Model:	EMCO 3115	3160-9	None	CDI_P100 0	ACO/+30	ACO/400	Grn_M+L	None	None	None

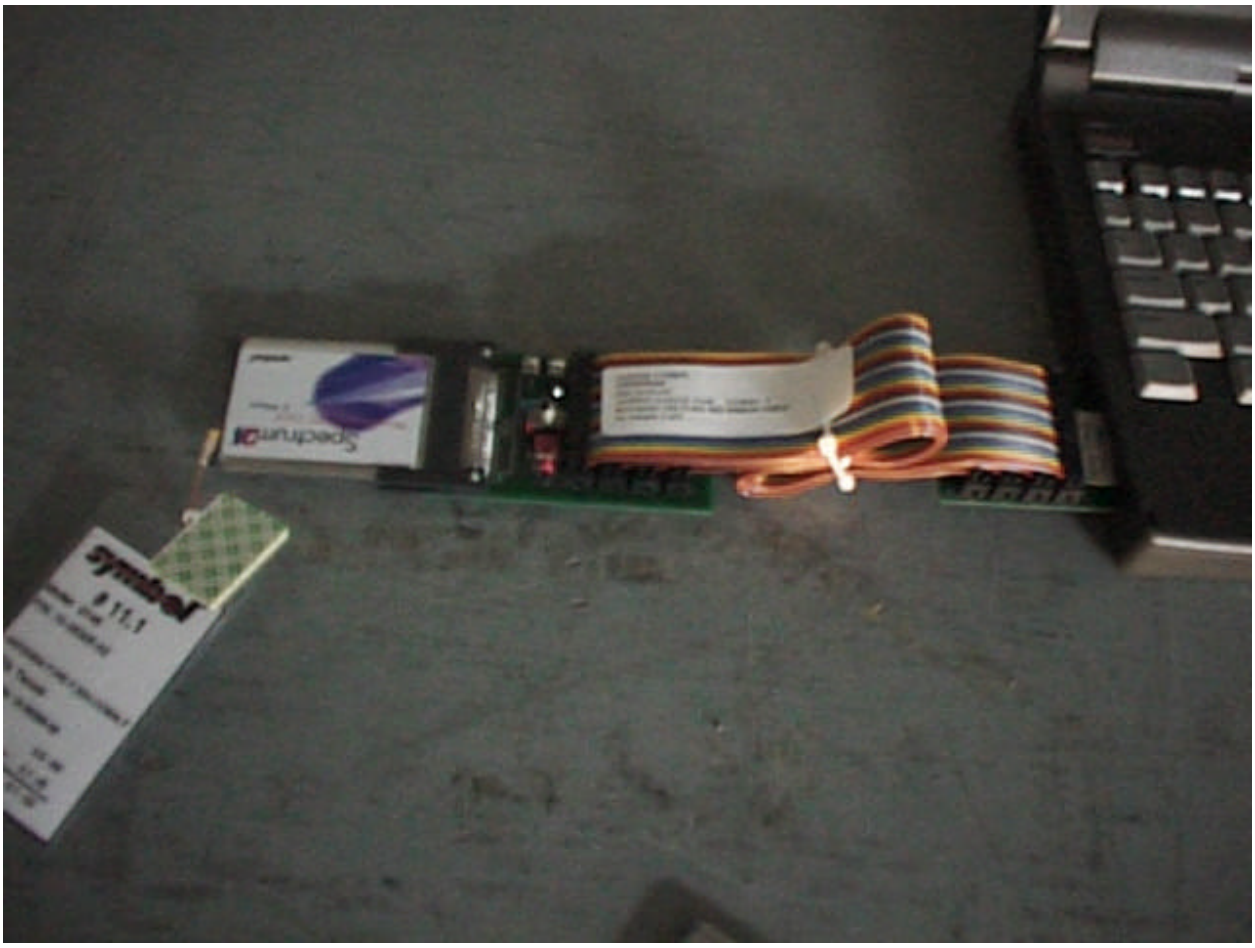
Frequency	Reading	Detector	Ant.	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	D. C. F.	Net	Limit @3m	Margin
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(µV/m)	dB(µV/m)	dB
2402	81.6	Peak	8		H	29.1	0.0	2.3	0.0	113.0		
4804	41.1	Peak	8	8	H	33.9	28.1	3.2	0.0	50.1	74.0	-23.9
4804	39.5	Ave.	8	8	H	33.9	28.1	3.2	0.0	48.5	54.0	-5.5
12010	38.6	Peak	8	12	H	42.1	32.4	5.9	0.0	54.2	74.0	-19.8
12010	34.8	Ave.	8	12	H	42.1	32.4	5.9	0.0	50.4	54.0	-3.6
19216	41.1	Peak	21	13	H	40.2	23.3	7.7	-9.5	56.2	74.0	-17.8
19216	32.3	Ave.	21	13	H	40.2	23.3	7.7	-9.5	47.4	54.0	-6.6
2440	85.3	Peak	8		H	29.1	0.0	2.3	0.0	116.7		
4880	43.1	Peak	8	8	H	33.9	28.1	3.2	0.0	52.1	74.0	-21.9
4880	41.9	Ave.	8	8	H	33.9	28.1	3.2	0.0	50.9	54.0	-3.1
7320	44.9	Peak	8	8	H	36.8	28.0	4.3	0.0	58.0	74.0	-16.0
7320	42.7	Ave.	8	8	H	36.8	28.0	4.3	0.0	55.8	54.0	1.8
12220	38.9	Peak	8	12	H	42.1	32.4	5.9	0.0	54.5	74.0	-19.5
12220	35.2	Ave.	8	12	H	42.1	32.4	5.9	0.0	50.8	54.0	-3.2
19520	41.2	Peak	21	13	H	40.3	23.3	7.7	-9.5	56.4	74.0	-17.6
19520	32.3	Ave.	21	13	H	40.3	23.3	7.7	-9.5	47.5	54.0	-6.5
2480	83.5	Peak	8		H	29.1	0.0	2.3	0.0	114.9		
4960	25.4	Peak	8	8	H	33.9	28.1	3.2	0.0	34.4	74.0	-39.6
4960	17.0	Ave.	8	8	H	33.9	28.1	3.2	0.0	26.0	54.0	-28.0
7440	40.7	Peak	8	8	H	36.8	28.0	4.3	0.0	53.8	74.0	-20.2
7440	38.4	Ave.	8	8	H	36.8	28.0	4.3	0.0	51.5	54.0	-2.5
12400	38.7	Peak	8	12	H	42.1	32.4	5.9	0.0	54.3	74.0	-19.7
12400	34.1	Ave.	8	12	H	42.1	32.4	5.9	0.0	49.7	54.0	-4.3
19840	39.2	Peak	21	13	H	40.3	23.3	7.7	-9.5	54.4	74.0	-19.6
19840	29.3	Ave.	21	13	H	40.3	23.3	7.7	-9.5	44.5	54.0	-9.5
22320	41.1	Peak	21	13	H	40.3	23.3	7.9	-9.5	56.5	74.0	-17.5
22320	31.5	Ave.	21	13	H	40.3	23.3	7.9	-9.5	46.9	54.0	-7.1
Subtract 9 dB for all readings to account for duty cycle												
DCF of -9.5 were taken at 1 meter with RBW at 300kHz												

Notes:	
	a) D.C.F.:Distance Correction Factor
	b) Insert. Loss (dB) = Cable A + Cable B + Cable C .
	c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Transducer Loss - Duty Relaxation (transmitter only).
	d) Negative signs (-) in Margin column signify levels below the limits.
	e) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.

4.3 Radiated Emission Configuration Photograph

Radiated Emissions Setup
Antenna IEC PC-LP

Radiated Emissions Setup
Antenna 6146



5.0 Document History

Revision/Job Number	Date	Change
1.0 / J200256786	9/27/00	Original document