

# FCC TEST REPORT

**REPORT NO.:** RF89062202-1

**MODEL NO.:** KB-16M Wireless

**RECEIVED:** May 9, 2001

**TESTED:** May 18, 2001

**APPLICANT:** KYE SYSTEM CORP.

**ADDRESS:** No.492, Sec. 5 Chung Hsin Road, San Chung,  
Taipei Hsien, Taiwan, R.O.C.

**ISSUED BY:** Advance Data Technology Corporation

**LAB LOCATION:** 47, 14<sup>th</sup> Lin, Chiapao Tsuen, Linkou,  
Taipei, Taiwan, R.O.C.

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0528



Lab Code : 200102-0

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# 1 CERTIFICATION

**PRODUCT :** Wireless Keyboard  
**BRAND NAME :** Genius  
**MODEL NO. :** KB-16M Wireless  
**APPLICANT :** KYE SYSTEM CORP.  
**STANDARDS :** 47 CFR Part 15, Subpart C (Section 15.227),  
ANSI C63.4-1992  
**SITE REGISTRATION** 90422 (FCC)  
**NO. :** IC 3789-5 (Canada IC)

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation (model: KB-16M Wireless) has been tested in our facility on May 18, 2001.

The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

Tested by : Gary Chang , Date: May 21, 2001  
Gary Chang  
Prepared by : Demi Chen , Date: May 21, 2001  
Demi Chen  
Approved by : Harris W. Lai , Date: May 23, 2001  
Harris W. Lai

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
STANDARD PARAGRAPH	TEST REQUIREMENTS	Compliance (Yes / No)	REMARK
15.107	AC Power Conducted Emissions Spec.: 48dBuV	N/A	N/A
15.227	Transmitter Radiated Emissions	Yes	Minimum passing margin is -16.4dBuV at 541.88 MHz

**NOTE:**

The EUT is also considered as a PC peripheral, because the connection to computer is necessary for typical use. The test has been verified to comply with FCC Part 15, Subpart B, Class B – Computing Devices (FCC DoC). The engineering test report can be provided upon FCC requests.

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Wireless Keyboard
<b>MODEL NO.</b>	KB-16M Wireless
<b>POWER SUPPLY</b>	6VDC from battery
<b>MODULATION TYPE</b>	FSK
<b>TRANSFER RATE</b>	NA
<b>FREQUENCY RANGE</b>	27.145MHz, 27.195MHz
<b>NUMBER OF CHANNEL</b>	2
<b>CHANNEL SPACING</b>	50kHz
<b>ANTENNA TYPE</b>	Wired Antenna
<b>OUTPUT POWER</b>	8mW
<b>ASSOCIATED DEVICES</b>	NA

Note: This report is prepared for FCC class II permissive change. The difference compared with original design is only antenna length.

The KB-16M Wireless with original design has been approved by FCC under FCC ID:FSUGKZG6.

#### 3.2 DESCRIPTION OF TEST MODES

Two channels are provided in this EUT.

Channel	Frequency	Channel	Frequency
1	27.145 MHz		
2	27.195 MHz		

The channel 1, the worst one, was chosen for final test.

### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Wireless Keyboard, according to the specifications of the EUT, it must comply with the requirements of the following standards:

**FCC CFR 47 Part 15, Subpart C. (15.227)**

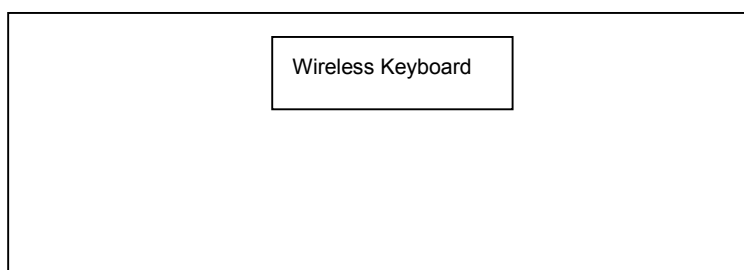
**ANSI C63.4 (1992)**

All tests have been performed and recorded as per the above standards.

### 3.4 DESCRIPTION OF SUPPORT UNITS

NA

### 3.5 CONFIGURATION OF SYSTEM UNDER TEST



## 4 TEST PROCEDURES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.45 – 30	48	-

Notes:

- 1.The lower limit shall apply at the transition frequencies.
- 2.All emanations from a class B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESHS30	828109/007	July 6, 2001
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	839135/006	July 9, 2001
ROHDE & SCHWARZ 4-wire ISN	ENY41	837032/016	Nov. 28, 2001
ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/016	Dec. 3, 2001
EMCO-L.I.S.N. (for peripheral)	3825/2	9204-1964	July 9, 2001
Software	Cond-V2e	NA	NA
RF cable (JYEBAO)	RG-58A/U	Cable-C02.01	July 9, 2001
HP Terminator (For EMCO LISN)	11593A	E1-01-298	Feb. 20, 2002
HP Terminator (For EMCO LISN)	11593A	E1-01-299	Feb. 20, 2002
Shielded Room	Site 2	ADT-C02	NA
VCCI Site Registration No.	Site 2	C-240	NA

#### Notes:

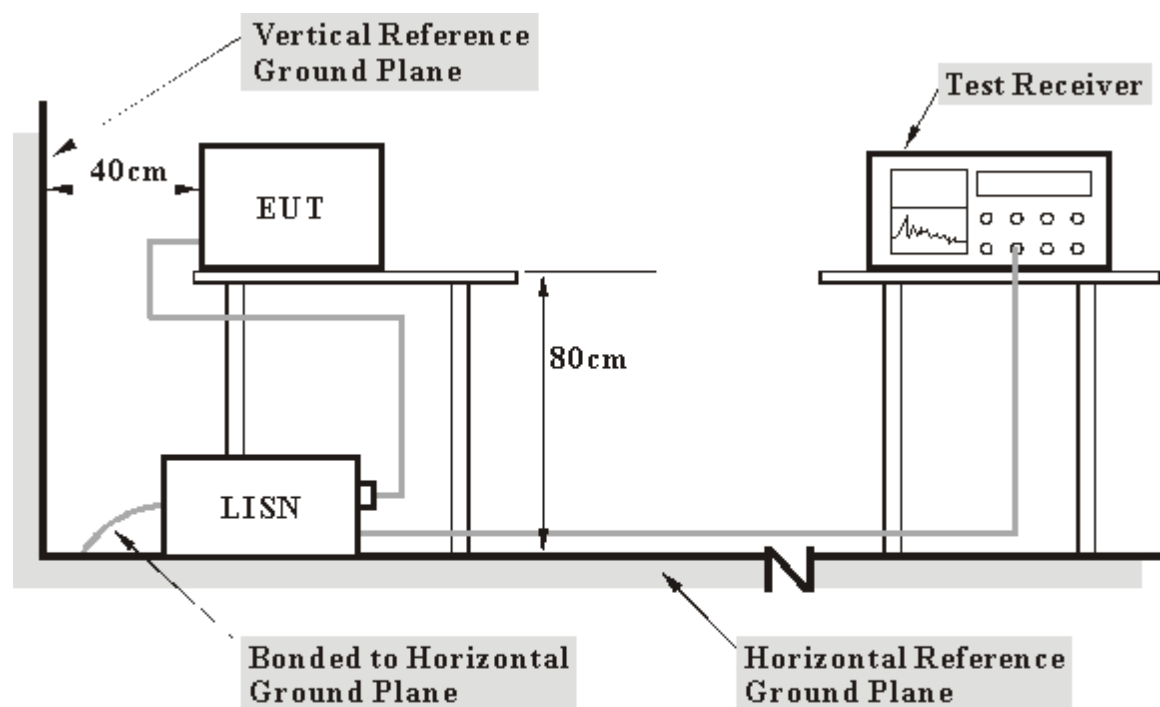
- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2.The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.



#### 4.1.3 TEST PROCEDURES

1. Place the EUT at 0.4 meter away from the conduction wall of the shielded room.
2. Connect the EUT to the power mains through a Line Impedance Stabilization Network (LISN).
3. Connect the other support units to the other LISN too.
4. Make sure the  $50\Omega/50\mu\text{H}$  coupling impedance is provided to the measurement instrument by the LISNs.
5. Measure the maximum conducted interference on both lines of the power mains connects to the EUT, within frequency range 450KHz ~ 30MHz.
6. The emission level under limit by 10dB is not needed to be reported.

#### 4.1.4 TEST SETUP



- Note:** 1. Support units were connected to second LISN.  
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

For the actual test configuration, please refer to the related Item in this test report ( **Photographs of the Test Configuration**).

#### 4.1.5 TEST RESULTS

This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to paragraph 15.207(a), measurements to demonstrate compliance with the conducted limited are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

According to 15.227 the field strength of emissions from intentional radiators operated under these frequencies bands shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dB $\mu$ V/meter)	
	Peak	Average
26.96-27.28	100	80

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Other Frequencies (MHz)	Field Strength of Fundamental	
	$\mu$ V/meter	dB $\mu$ V/meter
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

#### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*HP Spectrum Analyzer	8590L	3544A01176	May 7, 2002
*HP Preamplifier	8447D	2944A08485	Nov. 4, 2001
HP Preamplifier	8449B	3008A01201	Dec. 13, 2001
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 25, 2002
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2001
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 4, 2001
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Aug. 4, 2001
* TIMES RF cable	LMR-600	CABLE-ST5-01	Aug. 4, 2001
Antenna (Horn)	BBHA9120-D	D130	July 10, 2001
Open Field Test Site	Site 5	ADT-R05	July 28, 2001
VCCI Site Registration No.	Site 5	R-1039	NA

#### NOTE:

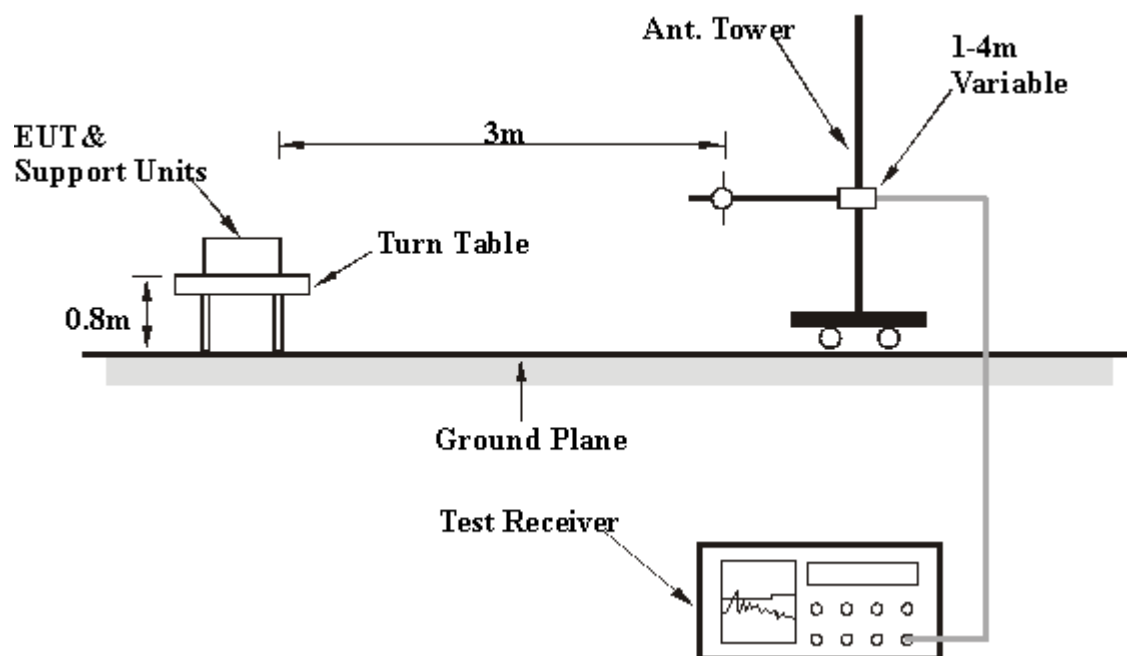
1. "\*" = These equipments are used for the final measurement.
2. Two preamplifiers will not be used when the R&S test receiver is used for test.
3. The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.
4. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

#### 4.2.3 TEST PROCEDURES

1. The EUT was placed on the turn table 0.8 meter above ground in 3 meter open area test site.
2. Set the resolution bandwidth to 120KHz in the test receiver and select Peak function to scan the frequency below 1 GHz.
3. Shift the interference-receiving antenna located in antenna tower upwards and downwards between 1 and 4 meters above ground and find out the local peak emission on frequency domain.
4. Locate the interference-receiving antenna at the position where the local peak reach the maximum emission.
5. Rotate the turn table and stop at the angle where the measurement device has maximum reading
6. Shift the interference-receiving antenna again to detect the maximum emission of the local peak
7. If the reading of the local peak under Peak function is lower than limit by 6dB, then Quasi Peak detection is not needed and this reading should be recorded. And if it is higher than Peak limit, then the test is fail. Others, switch the receiver to Quasi Peak function, set the resolution bandwidth to 100kHz and repeat the procedures 3 ~ 6. If the reading is lower than limit, this reading should be recorded, otherwise, the test is fail.
8. Set the resolution and video bandwidth of the spectrum analyzer to 1MHz and repeat procedures 3 ~ 6 for frequency band from 1 GHz to 10 times carrier frequency.
9. If the reading for the local peak is lower than the Average limit, no further testing is needed in this local peak and this reading should be recorded. If it is higher than Average limit but lower than Peak limit, then set the resolution bandwidth to 1MHz and video bandwidth to 300Hz. Repeat procedures 3 ~ 6. If the maximum reading is lower than Average limit, then this reading should be recorded. If it is higher, then the test is fail.

- Note:
1. The frequency range of verification is either from 30 MHz to 1GHz or from 30 MHz up to 10 times carrier frequency of EUT (whichever is the highest frequency range).
  2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for frequency below 1GHz.
  3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for frequency above 1GHz.

#### 4.2.4 TEST SETUP



For the actual test configuration, please refer to the related Item in this test report (**Photographs of the Test Configuration**).

## 4.2.5 TEST RESULTS

<b>EUT</b>	Wireless Keyboard	<b>Model</b>	KB-16M Wireless
<b>Mode</b>	Channel 1	<b>Detector Function &amp; Bandwidth</b>	Peak/Average 120kHz
<b>Frequency Range</b>	30-1000 MHz	<b>Test Distance</b>	3M
<b>Environmental Conditions</b>	24 deg. C, 60%RH, 1005 hPa	<b>Tested By</b>	Gary Chang

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

No.	Freq. (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)		Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
		PK	AV	PK	AV	PK	AV			PK	AV				
1	27.23	58.0	-	100.0	80.0	-42.0	-	1.00	5	76.2	-	6.80	2.03	27.00	18.17

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

No.	Freq. (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)		Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
		PK	AV	PK	AV	PK	AV			PK	AV				
1	27.16	45.5	-	100.0	80.0	-54.5	-	1.00	179	63.7	-	6.80	2.03	27.00	18.17

- Notes:
- 1 Emission level (dBuV/m) = Reading value (dBuV) - Correction Factor (dB)
  - 2 Correction Factor (dB) = External Preamp. Gain (dB)-Ant. Factor (dB)  
-Cable loss (dB)  
(External Preamp. Gain = 0, when the preamplifier is not used for the test.)
  - 3 The other emission levels were very low against the limit.
  - 4 Margin value = Emission level - Limit value



<b>EUT</b>	Wireless Keyboard	<b>Model</b>	KB-16M Wireless
<b>Mode</b>	Channel 1	<b>Detector Function &amp; Bandwidth</b>	Peak/Quasi-Peak 120 kHz
<b>Frequency Range</b>	30-1000 MHz	<b>Test Distance</b>	3M
<b>Environmental Conditions</b>	24 deg. C, 60%RH, 1005 hPa	<b>Tested By</b>	Gary Chang

#### ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	189.19	24.2 PK	43.5	-19.3	1.00	3	40.00	8.51	2.73	27.0	15.76
2	216.25	23.0 PK	46.0	-23.0	1.00	264	37.72	9.43	2.82	27.0	14.75
3	244.09	26.5 PK	46.0	-19.5	1.06	46	39.52	11.07	2.87	27.0	13.07
4	269.77	20.2 PK	46.0	-25.8	1.00	172	32.13	12.08	2.95	27.0	11.97
5	541.68	27.8 PK	46.0	-18.2	2.23	9	34.01	17.07	3.67	27.0	6.26
6	649.74	28.4 PK	46.0	-17.6	1.12	95	34.04	17.61	3.78	27.0	5.60

#### ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	244.04	22.3 PK	46.0	-23.7	1.00	60	35.39	11.07	2.87	27.0	13.07
2	269.87	22.5 PK	46.0	-23.5	1.00	312	34.52	12.08	2.95	27.0	11.97
3	324.85	24.6 PK	46.0	-21.4	1.26	292	35.20	13.20	3.24	27.0	10.56
4	405.99	25.6 PK	46.0	-20.4	1.63	96	33.71	15.43	3.44	27.0	8.13
5	432.68	23.3 PK	46.0	-22.7	1.00	211	31.13	15.82	3.31	27.0	7.87
6	541.88	29.6 PK	46.0	-16.4	1.91	276	35.85	17.07	3.67	27.0	6.26

- Notes:
- 1 Emission level (dBuV/m) = Reading value (dBuV) - Correction Factor (dB)
  - 2 Correction Factor (dB) = External Preamp. Gain (dB)-Ant. Factor (dB)  
-Cable loss (dB)  
(External Preamp. Gain = 0, when the preamplifier is not used for the test.)
  - 3 The other emission levels were very low against the limit.
  - 4 Margin value = Emission level - Limit value

## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

### RADIATED EMISSION TEST



## 6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

<b>USA</b>	FCC, NVLAP
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>New Zealand</b>	MoC
<b>Norway</b>	NEMKO
<b>R.O.C.</b>	BSMI, DGT, CNLA

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: [www.adt.com.tw/index.5/phtml](http://www.adt.com.tw/index.5/phtml).

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.