

# TEST REPORT

## Wireless Mouse

Model Name    **TM2701-3 (for Tx)**  
                  **TM2701-5 (for Tx)**  
                  **RM2700 (for Rx)**  
                  **Netscroll Wireless Receiver PS2 (for Rx)**

Tested at September 6, 2000

According to **47CFR Part, 15B / 15C (15.227)**

Issued for

## **KYE SYSTEM CORPORATION**

No. 492, Sec. 5, Chung Hsin Rd., San Chung,  
Taipei Hsien, Taiwan, R.O.C.

PREPARED BY:            **ADVANCE DATA TECHNOLOGY CORPORATION**



Accredited Laboratory

11F, NO.1, SEC.4, NAN-KING EAST RD.,  
TAIPEI, TAIWAN, R.O.C.

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**REPORT NO** : RF89082518  
**PRODUCT** : Wireless Mouse  
**MODEL NO** : TM2701-3 / TM2701-5  
**BRAND NAME** : Genius  
**SERIAL NO** : N/A  
**CLIENT** : KYE SYSTEM CORPORATION  
**ADDRESS** : No.492, Sec.5, Chung Hsin Rd., San Chung, Taipei Hsien, Taiwan R.O.C.  
**ISSUED BY** : Advance Data Technology Corporation (Adt Corp.)  
**OFFICE ADDRESS** : 11F, No. 1, Sec. 4, Nan-King East Rd., Taipei, Taiwan, R.O.C.  
**LABORATORY ADDRESS** : No. 13-1, Lane 19, Wen Shan 3<sup>rd</sup> St., Kweishan, Taoyuan, Taiwan, R.O.C.  
**TEST STANDARD** : 47CFR Part 15, Subpart C (15.227)  
**TEST DATE** : Sep. 6, 2000  
**TEST RESULT** : Pass

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CERTIFICATION

Issue Date: September 27, 2000

**PRODUCT** : Wireless Mouse  
**MODEL NO** : TM2701-3 / TM2701-5  
**FCC ID** : FSUGMZG7  
**SPEC.** : Operating at 27 MHz, 2 Channels,  
FSK modulation  
**CLIENT** : KYE SYSTEM CORPORATION  
**TEST STANDARD** : FCC 47CFR Part 15, Subpart C (Section 15.227)  
ANSI C63.4-1992

We, **ADVANCE DATA TECHNOLOGY CORPORATION**, hereby certify that one sample of the designated sample has been tested in our facility. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate representation of the measurements of the sample's EMI characteristics and the energy emitted under the conditions herein specified.

**TESTED BY:** Ellis Wu **DATE:** Sep. 27, 2000  
Ellis Wu  
**PREPARED BY:** Demi Chen **DATE:** Sep. 27, 2000  
Demi Chen  
**APPROVED BY:** Alan Lane **DATE:** Sep. 27, 2000  
Dr. Alan Lane, Manager



## 2 GENERAL INFORMATION

### 2.1 General Description of EUT

<b>Product</b>	:	Wireless Mouse
<b>Model No</b>	:	TM2701-3 / TM2701-5
<b>Power Supply</b>	:	3VDC (Battery 1.5V x 2)
<b>Modulation Type</b>	:	FSK
<b>Operating Frequency</b>	:	27 MHz
<b>Number of Channel</b>	:	2
<b>Channel BandWidth</b>	:	10 KHz
<b>Carrier Frequencies</b>	:	27.045 MHz, 27.095 MHz
<b>Antenna Type</b>	:	Integral Antenna, No Antenna Connector
<b>Rated RF output power level</b>	:	Max. 8mW
<b>Others</b>	:	N/A



## 2.2 Description of Test mode

1. Two channels are provided in this EUT.

Channel	Frequency	BandWidth
1	27.045 MHz	5 KHz
2	27.095 MHz	5 KHz

2. Two types of wireless mouse are covered in this test report. One with 3 buttons, the other with 5 buttons. Both of them are completely the same at circuit design and PCB layout. And 5 buttons mouse was chosen for testing.

## 2.3 Test Methodology

These tests were conducted on a sample of EUT for the evaluation in compliance with FCC CFR47 Part 15, Subpart C (15.227)

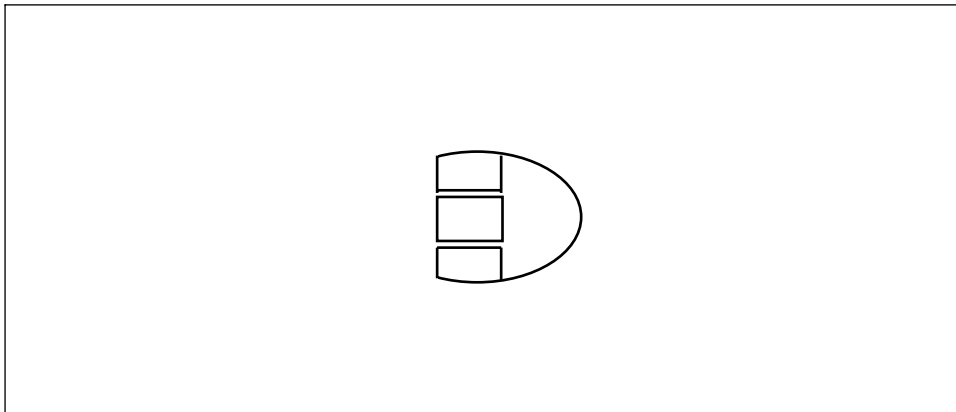
Both conducted and radiated emissions measurements were conducted in accordance with ANSI C63.4:1992.



## 2.4 Support Units List

N/A

## 2.5 Configuration of System Under Test





### 3 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

47 CFR Part 15, Subpart C			
PARAGRAPH.	TEST REQUIREMENTS	COMPLIANCE (YES/NO)	TEST RESULT
15.107,15.109	AC Power Conducted Emissions Spec.: 48 dBuV	N/A	N/A
15.227(a)	Fundamental Frequency Spec.: Table 15.227(a)	Yes	Minimum passing margin is -28.9 dBuV At 27.045 MHz
15.227(b)	Transmitter Radiated Emissions Spec.: Table 15.209	Yes	Minimum passing margin is -13.1 dBuV At 54.09 MHz





## 4 GENERAL INFORMATION OF TEST FACILITY

### 4.1 Test Lab.

**Advance Data Technology Corporation (NVLAP Certified)**  
R & TTE Certification Division

**No. 13-1, Lane 19, Wen Shan 3<sup>rd</sup> St., Kweishan, Taoyuan, Taiwan, R.O.C.**

### 4.2 Calibration Interval

All calibration interval of the test sites and test instruments is 12 months. The calibrations are traceable to NML/ROC and NIST/USA.



## 5 TEST PROCEDURES AND TEST RESULTS

### 5.1 Conducted Emission Measurement

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.



## 5.2 Radiated Emission Measurement

### 5.2.1 Test instruments

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8590L	3544A01176	Apr 18, 2001
HP Preamplifier	8447D	2944A08485	Oct. 23, 2000
HP Preamplifier	8347A	3307A01088	Sep. 09, 2000
HP Preamplifier	8449B	3008A01201	Dec. 15, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 3, 2001
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 25, 2000
CHASE BILOG Antenna	CBL6112A	2221	Aug. 4, 2001
SCHWARZBECK Horn Antenna	BBHA9120-D	D130	Jul. 09, 2001
SCHWARZBECK Horn Antenna	BBHA9170	123	Jan. 31, 2001
EMCO Turn Table	1060	1115	N/A
SHOSHIN Tower	AP-4701	A6Y005	N/A
SCHWARZBECK BICONICAL Antenna	VHBA9123	449	Aug.16, 2001
Open Field Test Site	Site 5	ADT-R05	Aug. 09, 2000

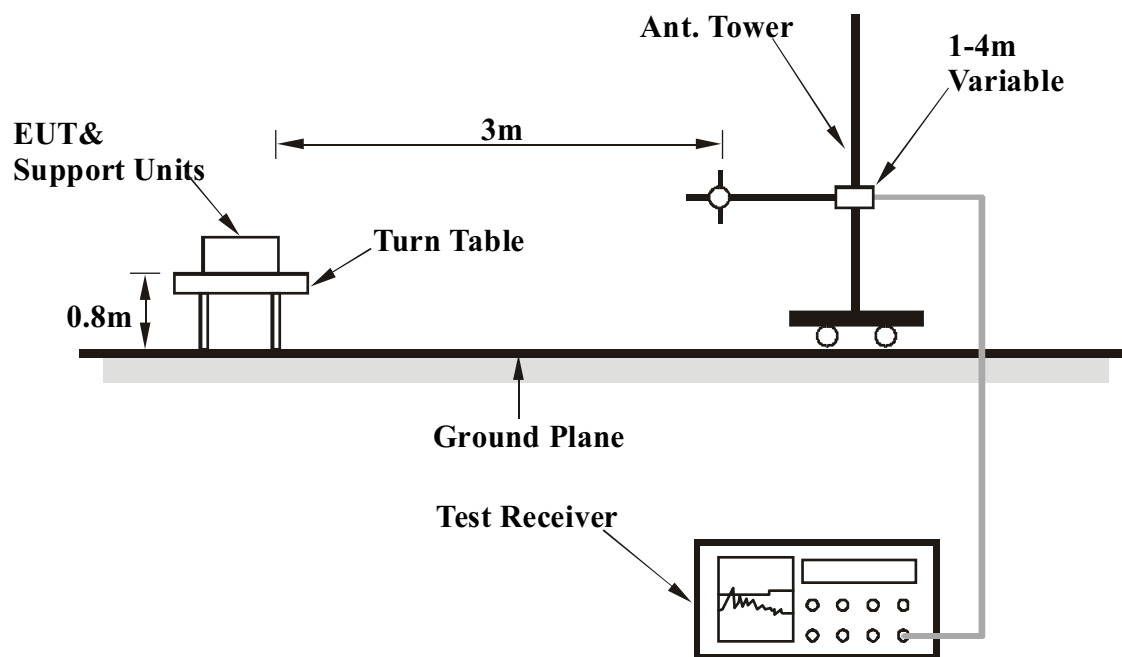
The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMAS document NIS81.



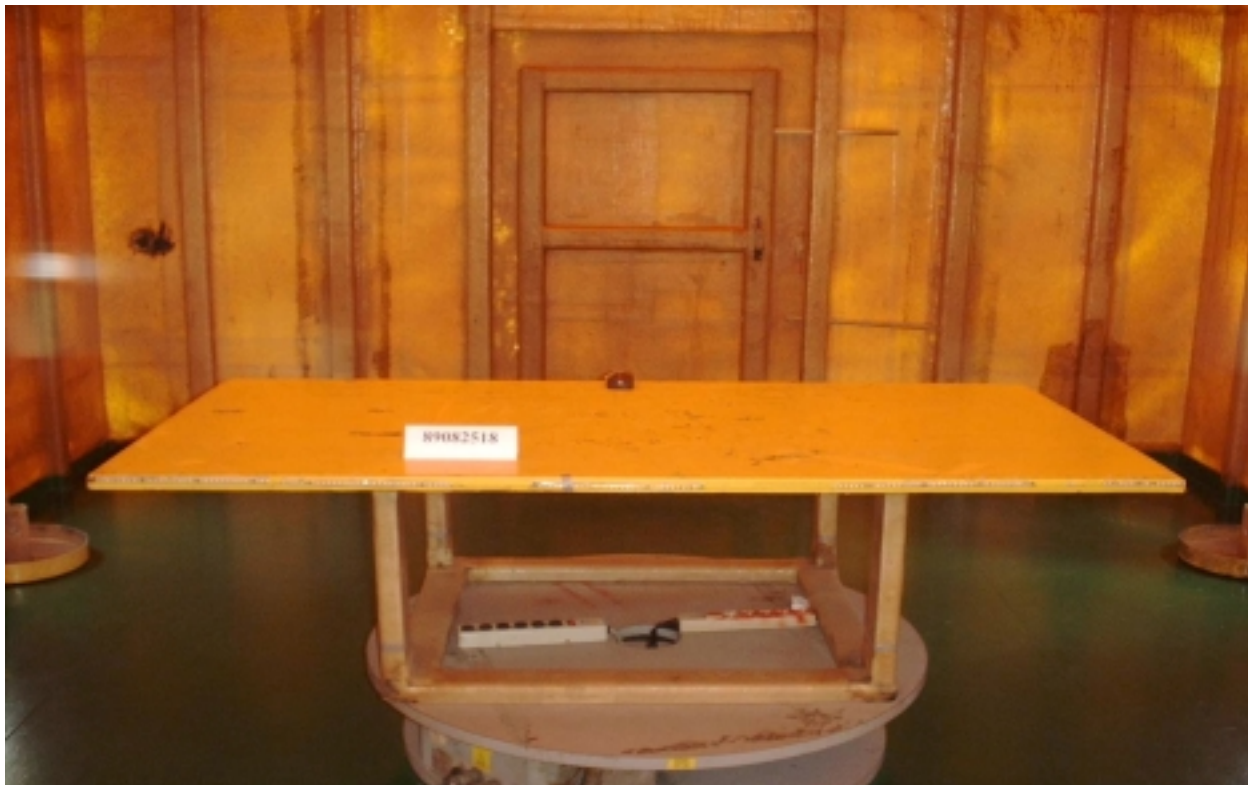
### 5.2.2 Test Procedures

- a. The EUT was placed on the turn table 0.8 meter above ground in 3 meter open area test site.
- b. Set the resolution bandwidth to 120KHz in the test receiver and select Peak function to scan the frequency below 1 GHz.
- c. 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.
- d. Locate the interference-receiving antenna at the position where the local peak reach the maximum emission.
- e. Rotate the turn table and stop at the angle where the measurement device has maximum reading
- f. Shift the interference-receiving antenna again to detect the maximum emission of the local peak
- g. 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 C ~ F. If the reading is lower than limit, this reading should be recorded, otherwise, the test is fail.
- h. Set the resolution and video bandwidth of the spectrum analyzer to 1MHz and repeat procedures C ~ F for frequency band from 1 GHz to 10 times carrier frequency.
- i. 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 C ~ F. If the maximum reading is lower than Average limit, then this reading should be recorded. If it is higher, then the test is fail.

### 5.2.3 Test Setup



### 5.2.4 Photograph of Test Setup





### **5.2.5 EUT Operating Condition**

A special software has been written into the chip of the mouse for continuous transmitting. Keep pressing five buttons and load the battery, then the mouse is under continuous transmitting mode.

### **5.2.6 Climate Condition**

The temperature and related humidity: 26°C and 75%



5.2.7 Test Results

5.2.7.1. Fundamental Frequency

ANTENNA POLARITY: Vertical		Detector Function :				6dB Bandwidth : 120 kHz.				Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
*27.045	8.8	58.1	39.6	66.9	48.4	100	80	-33.1	-31.6	100	282

ANTENNA POLARITY: Horizontal		Detector Function :				6dB Bandwidth : 120 kHz.				Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
*27.045	8.8	62.3	41.3	71.1	50.1	100	80	-28.9	-29.9	166	162





5.2.7.2. Radiated Emission

CHANNEL:1 ANTENNA POLARITY: Vertical		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
54.09	8.2	14.6	22.8	40.0	-17.2	100	20
81.14	8.6	13.8	22.4	40.0	-17.6	113	11
108.18	13.1	8.1	21.2	43.5	-22.3	143	84
135.23	13.4	13.7	27.1	43.5	-16.4	113	202
162.27	11.7	9.6	21.3	43.5	-22.2	129	125
351.59	17.2	-3.5	13.7	46.0	-32.3	123	135

CHANNEL:1 ANTENNA POLARITY: Horizontal		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
54.09	8.2	18.7	26.9	40.0	-13.1	122	9
81.14	8.6	16.1	24.7	40.0	-15.3	147	240
108.18	13.1	11.5	24.6	43.5	-18.9	139	-2
135.23	13.4	1.0	14.4	43.5	-29.1	139	334
162.27	11.7	1.0	12.7	43.5	-30.8	122	311

- Remarks:**
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
  2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. The limit value is defined as per 15.227

## 6 PHOTOGRAPHS OF THE EUT







