

A4 TECH mice JUDGE help your making money from mouse!

Prologue for mice JUDGE

Why?

- **X7 series Mouse won over 12 awards in 2 month from China. (Since Oct.~ Nov. 2005)**
- **A new mouse market revolution is beginning since X7 series Mouse and mice JUDGE on board. It changed market territory with MS, Logitech...**
- **mice JUDGE flush a new mouse market ranking for A4 TECH 7 series.**
- **mice JUDGE created a new knowledge for mouse quality test.**
- **X7 series! The Gamer favors from now on.**

How?

- **First, try the mice JUDGE with your mouse to taste the testing process.**
- **After a roughly journey in mice JUDGE, you shall start to learn more thing about it.**
- **Compare with other brand of mouse with mice JUDGE.**
- **Post mice JUDGE and test result on board to the Press and Media.**
- **Teach your people knowing and using mice JUDGE.**

INDEX

- 1. What is “mice JUDGE”?**
- 2. Download and Install mice JUDGE in your computer**
- 3. Run the mouse with mice JUDGE**
- 4. Testing method and result**
- 5. Make a comparison for mouse**
- 6. Penetrate into the mice Judge**
- 7. The theory of mice JUDGE**
- 8. Conclusion**

1. What is “mice JUDGE”?

- Most of people will use “Mouse Rate” to measure the USB Optical mouse quality, but it just show you mouse sampling rate only. Unfortunately, a lot of people could not clearly understand the meaning of test result.

mice JUDGE clarify real mouse movement to users, it can show you the performance and score to tell you that mouse quality and what is wrong when mouse is moving.

mice JUDGE convert the cursor movement from display and formed it as a curve. It is useful and easy way to understanding when people try to figure out a result from testing program. Not only by the simple numbers or data. The score was born from curve’s composite error; it is an equitable reference for user.

mice JUDGE is a testing standard and software belong to A4 TECH, and it’s from A4 TECH R&D Dept for years. A4 TECH presents this share software for all people in the world.

Go try it and find a right mouse!

2. Download and Install mice JUDGE in your computer

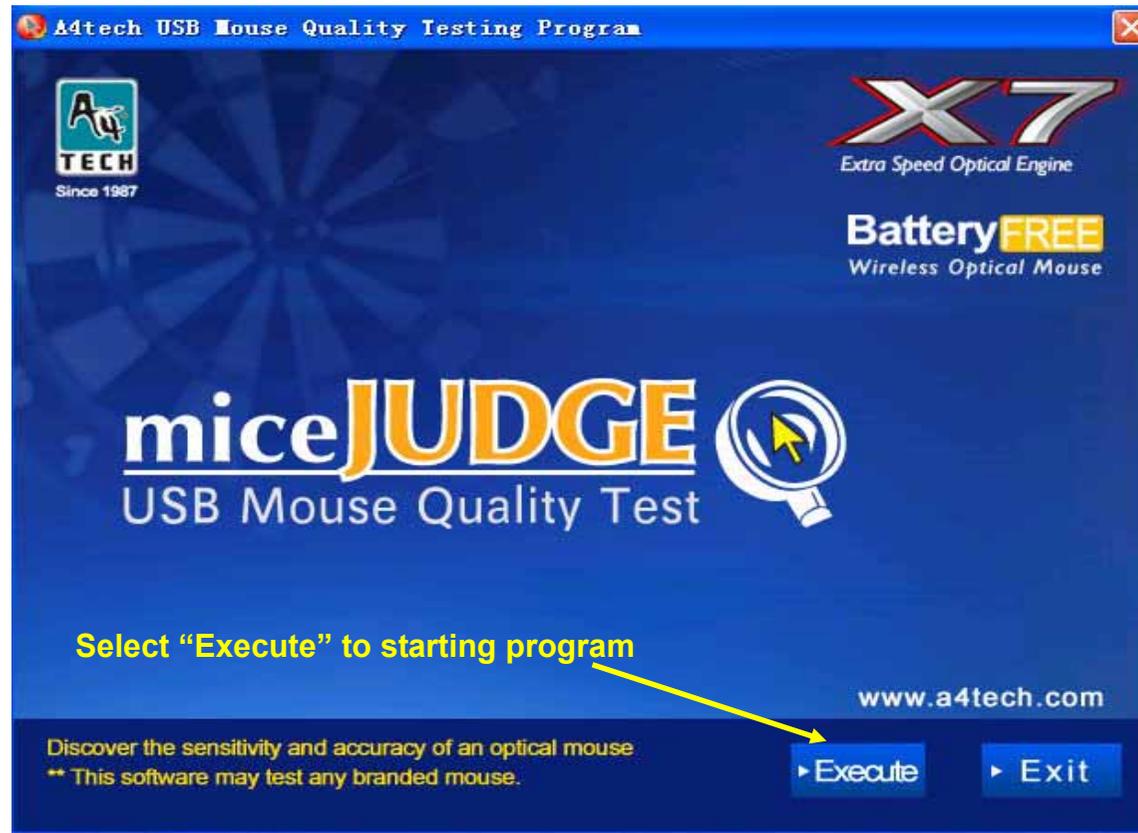
- Where you can download the mice JUGDE?
 - [Click to downloda mice JUDGE](#) (MiceJUDGE-En-V4.0.exe, 1.44 MB)
 - Visit A4 TECH Global website <http://www.a4tech.com>
- Before you install mice JUDGE, you shall **remove your any mouse driver** and **do not connect your USB mouse with 2.0 USB HUB**. Therefore, the fair testing base will provide you a justice result.

Please just plug your mouse with computer USB slot directly.
Fasten your seat belt; the journey will be fast and exciting....

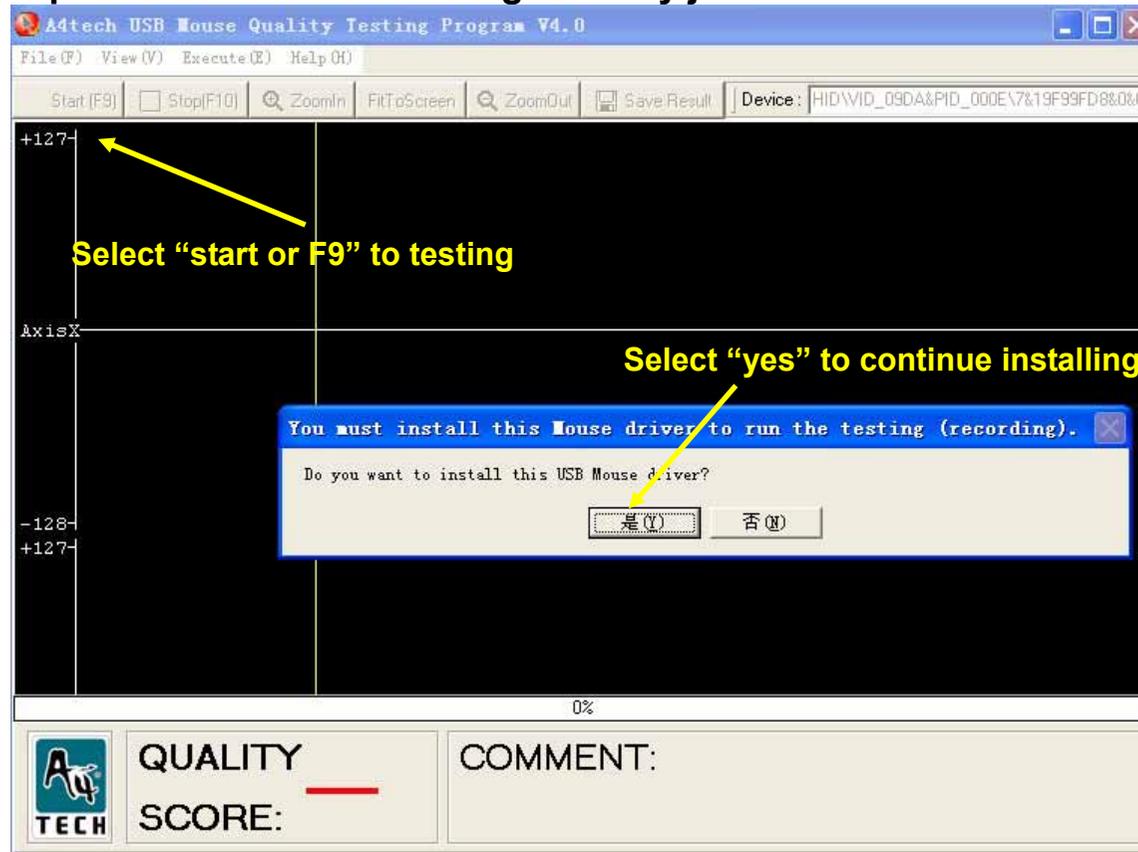
3. Run mice JUDGE with your mouse

■ Step1: Excute

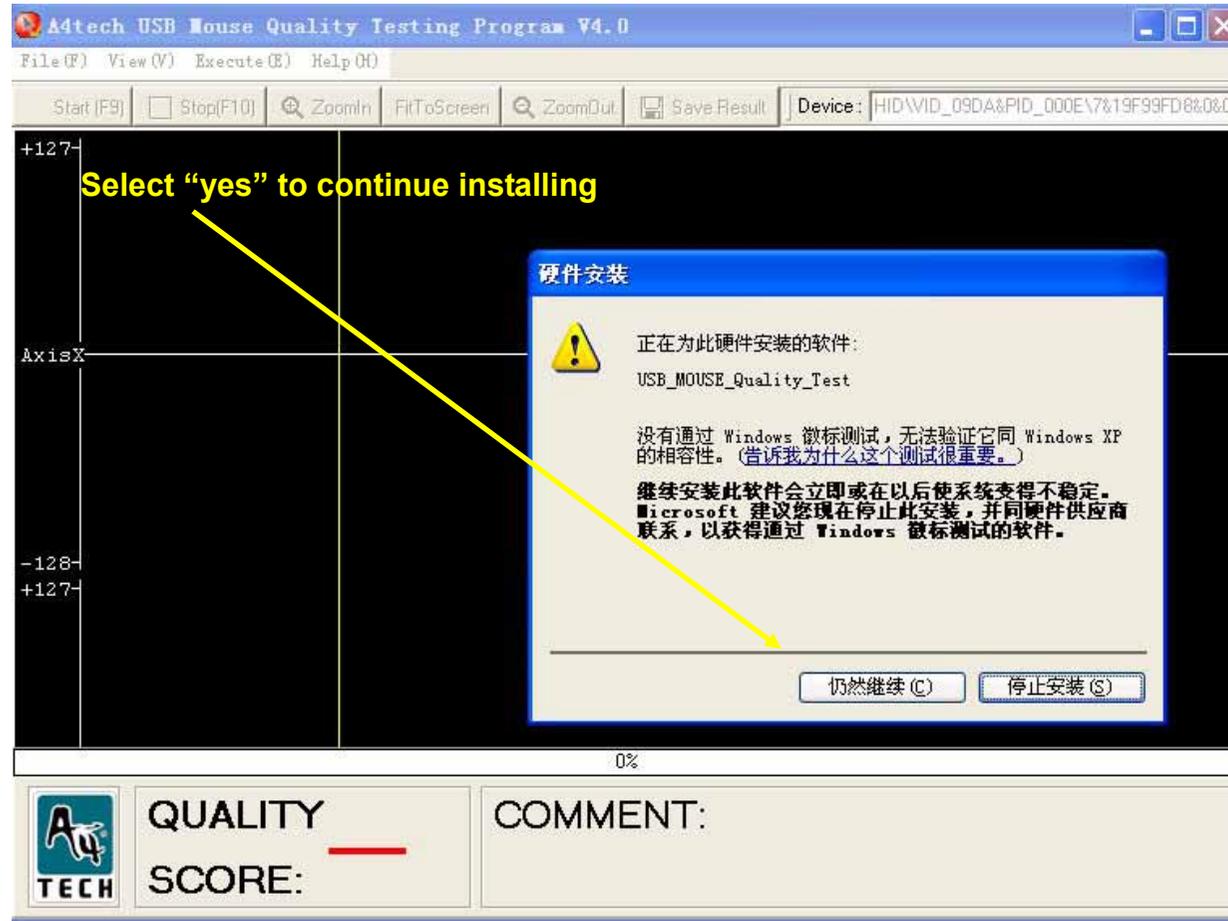
When after installed mice JUDGE, double click mice JUDGE will jump out program picture. Just click Execute icon to start it.



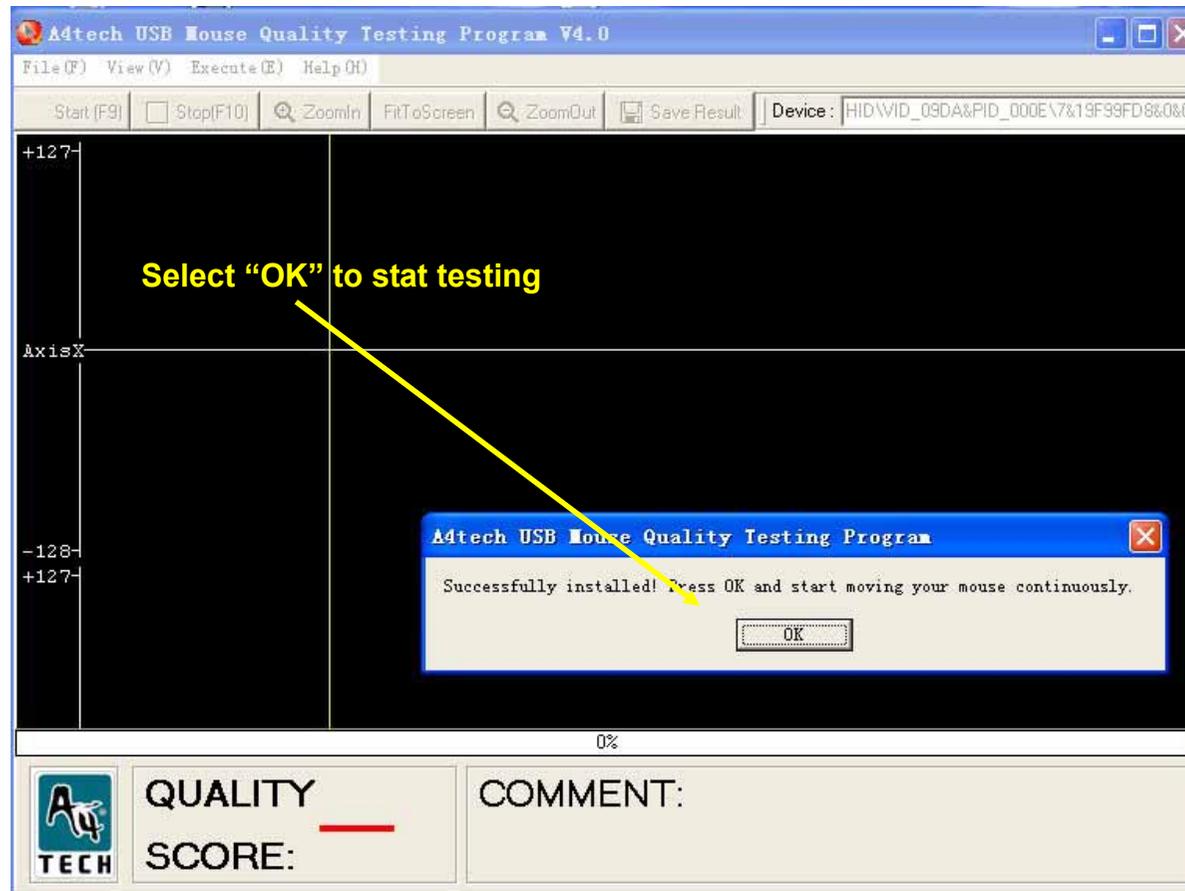
- **Step2: Click “Start” to begin mouse testing (or F9).**
When you start it in the same time, mice JUDGE program will notify you to install a USB mouse driver, just click “yes” and it will install the driver for testing, it is all for the fair testing base and provide you an equitable result. No cheating but only justice!



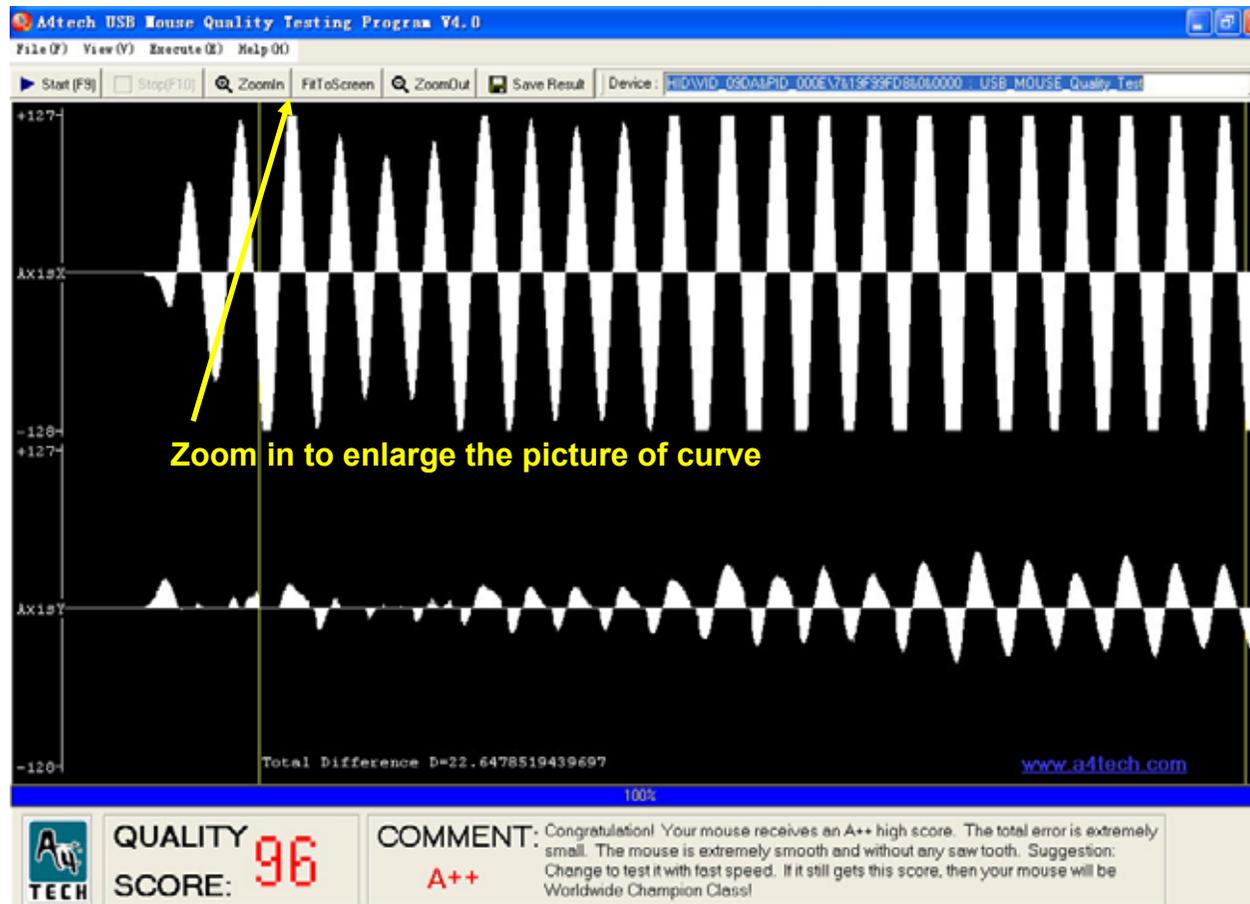
- Step3: The first time testing, it will require you install the driver for mouse. Click “Yes”



- **Step4: After installation completed Click “OK” and..... JUST ROCK YOUR MOUSE!!!**



- Step5: The result will show you mouse score and you may enlarge the picture of curve.



4. Testing method and result

- It just takes you about 9 seconds, quickly and efficiently. The testing method is as below:

- Same speed test

Put the mouse on a rotating disc.

It read constant speed of movement and presents the mouse performance from the screen.



- Freedom moving test

- Move the mouse from side to side as natural movement
- Move the mouse as circle motion (not too large motion)

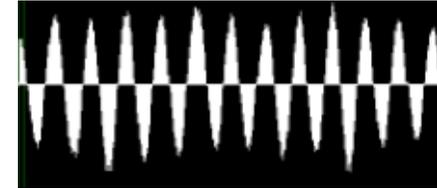


- Testing speed

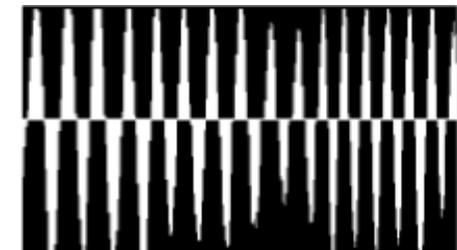
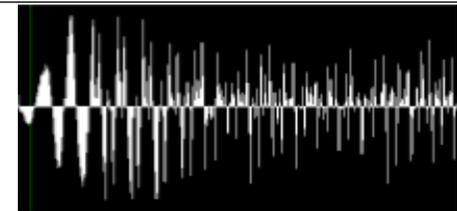
- Natural speed
Moving side by side or circle at regular speed
(Approximately 70times/mins)
The performance of curve will form as this figure



- **Faster speed**
Moving side by side or circle at regular speed
(Approximately 150times/mins)
The performance of curve will form as this figure



- **Extremely Fast speed**
 - 1) For low FPS (Frame Per Second) mouse
Move the mouse in extremely fast speed, will form the figure as this, it caused by signal dropout (lost in count), It's not good for gamer.
 - 2) For high FPS(Frame Per Second) mouse
Move the mouse in extremely fast speed, will form the figure as this, this one is better than lower FPS mouse and without dropout situation. Pro-Gamer shall be own it!



■ The testing result

Grade	Rank	D= $\Sigma[X_{n+1}-A/A]$ (error score)	Conclusion
90~100	A++	30~0	Congratulation! Your mouse received an A++ high score; the total error is extremely small. The mouse extremely smooth and without any saw tooth. Suggestion: Change to test it with fast speed. If it still gets this score, then your mouse will be Worldwide Champion Class!
90~94	A+	40~31	Congratulation! Your mouse received an A+ high score; the total error is extremely small. The mouse extremely smooth and without any saw tooth. Suggestion: Change to test it with fast speed. If it still gets this score, then your mouse will be Top Gamer choices!
85~89	A	50~41	Your mouse has a few errors and a little saw tooth structure, but still smooth. Suggestion: Change to test it with fast speed. If it still gets this score, then your mouse will be not Top Gamer choices!
80~84	A-	60~51	Your mouse has a few errors and a little saw tooth structure, but still smooth under slow movement. Suggestion: Change to test it with fast speed. If you still receive this score, then your mouse isn't a choice for playing games. For gamers, might need to seek for another mouse.
75~79	B+	70~61	Your mouse has an obvious error and saw tooth structure. Totally not suggested for gamers.
70~74	B	80~71	Your mouse has an obvious error and saw tooth structure. Totally not suggested for gamers.
60~69	C	100~81	Your mouse has an obvious error and saw tooth structure. Totally not suggested for gamers.
000		~101	This mouse is not recommended for any purpose usage.

- To recognize a good quality mouse is important thing for user (especially for Gamer). Most of peoples had typical image with expensive products as their favor like, but it is beyond a reasonable cost sometimes! mice JUDGE make you feel more confidence to

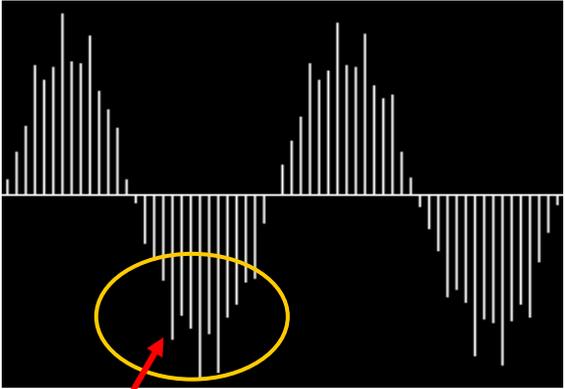
choice a worthy favor one. No matter what an expensive mouse but just a good quality you need.

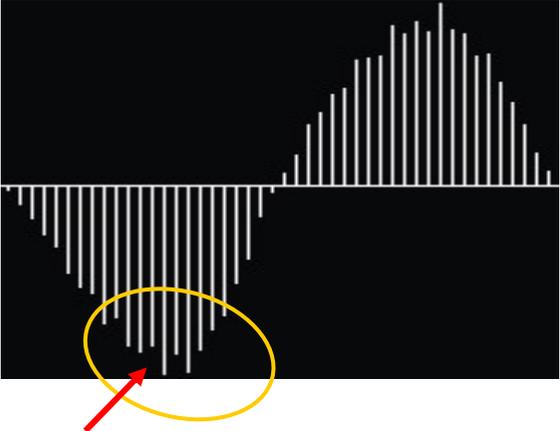
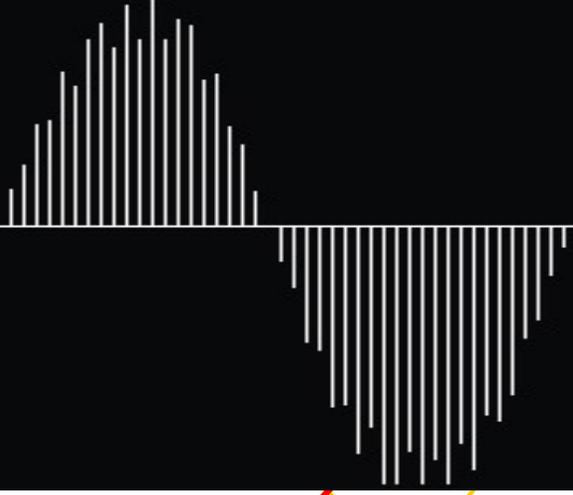
5. Make a comparison for mouse

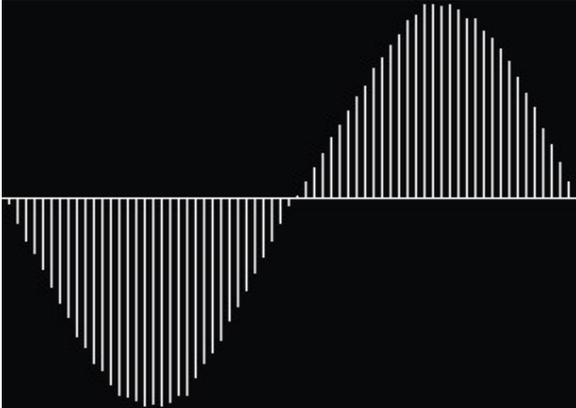
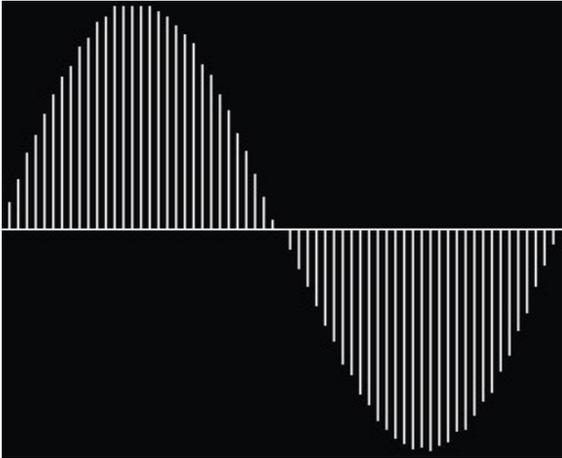
Now, the mystery of mouse world is opening...here is a test record for gaming mouse. mice JUDGE will prove the real fact by performance curve and score.

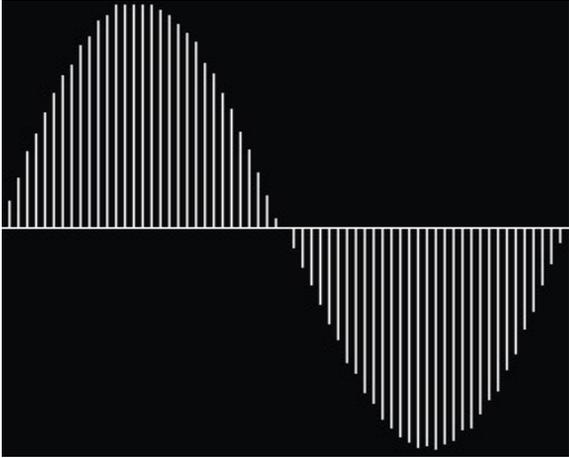
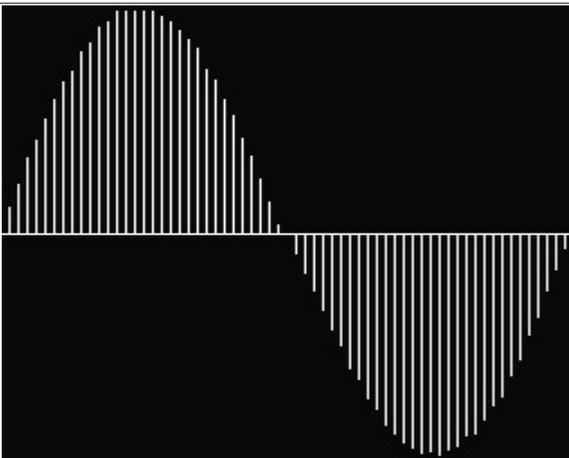
The best optical engine of game mouse must have two excellent modules. First is a good Microprocessor (MCU), another is Agilent chip 3060 or 3080 (DSP).

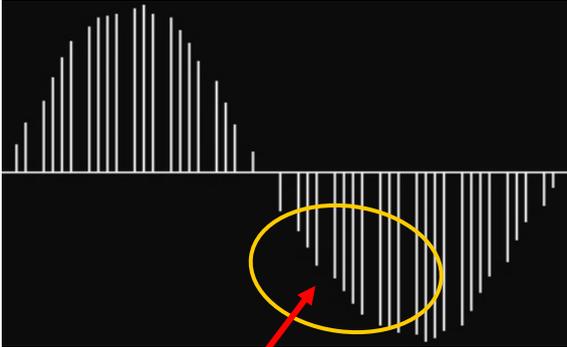
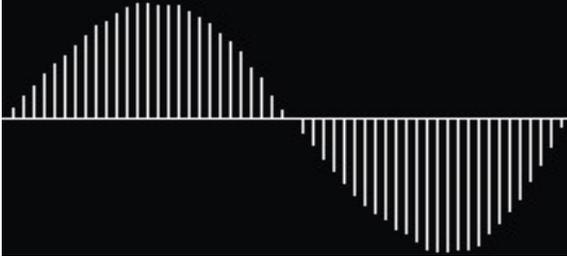
Gaming Mouse Test Record

Model	Mouse orbit analysis figures in "mice JUDGE " Quality Test	Test Score Results			Hardware Specification
 Logitech		natural speed	faster speed	fast speed	Resolution: 800 DPI FPS: 6500 frames/ sec. Speed: 40 in / sec. Image Processing: 5.8 mega pixels/second Acceleration : 15G
		62	66	68	

MX-510	Microprocessor design mistake Irregular movement Obvious saw tooth				
 <p>Logitech MX-518</p>	 <p>Microprocessor design bug Smoothly line</p>	85	87	87	Resolution: 1600-dpi native, adjustable to 400 and 800dpi (without software) FPS: 6500 frames/ sec. Speed: 40 in / sec. Image Processing: 5.8 mega pixels/second SPI time : 2.4 millisecond Acceleration : 15G
 <p>Razer</p>		73	73	74	Resolution: 1600 DPI FPS: 6500 frames/ sec. Speed: 40 in / sec. Image Processing: 5.8 mega pixels/second Acceleration : 15G

	Microprocessor design mistake Obvious error and saw tooth structure				
 <p>A4tech X-708</p>	 <p>Excellent Microprocessor Extremely smooth and without any saw tooth</p>	95	96	96	<p>Resolution: 800 DPI FPS: 6500 frames/ sec. Speed: 40 in / sec. Image Processing: 5.8 mega pixels/second SPI time : 1 millisecond Acceleration : 15G</p>
 <p>A4tech 4 Speed Game Mouse X-710</p>	 <p>Excellent Microprocessor Extremely smooth and without any tooth</p>	95	96	95	<p>Adjustable 400、 600、 800、 1000DPI Simply with the Scrolling Wheel and No Driver Needed Resolution: 1000 DPI FPS: 6500 frames/ sec. Speed: 40 in / sec. Image Processing: 5.8 mega pixels/second SPI time : 1 millisecond Acceleration : 15G</p>

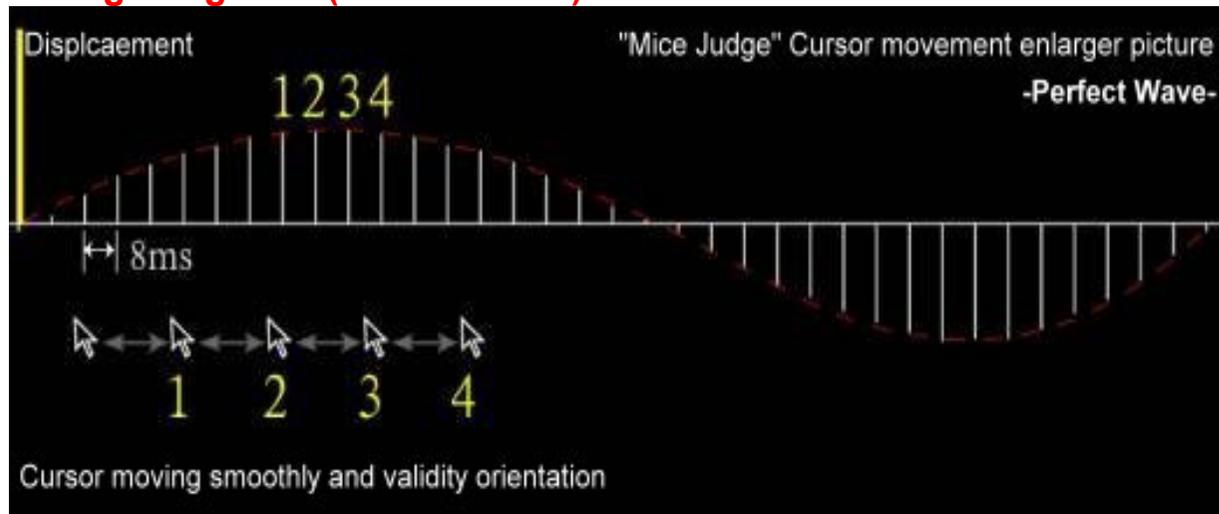
 <p>A4tech 5 Speed Game Mouse X-718</p>	 <p>Excellent Microprocessor Extremely smooth and without any tooth</p>	95	96	95	<p>Adjustable 600, 800, 1200, 1600 、 2000DPI Simply with the Scrolling Wheel and No Driver Needed Resolution: 2000 DPI FPS: 6500 frames/ sec. Speed: 40 in / sec. Image Processing: 5.8 mega pixels/second SPI time : 1 millisecond Acceleration : 15G</p>
 <p>A4tech 3xFire Laser Mouse X-750F</p>	 <p>Excellent Microprocessor Extremely smooth and without any tooth</p>	95	96	95	<p>Adjustable 600, 800, 1200、 1600, 2000 、 2500DPI Simply with the Scrolling Wheel and No Driver Needed Resolution: 2500 DPI FPS: 7080 frames/ sec. Speed: 45 in / sec. Image Processing:6.4 mega pixels/second SPI time : 1 millisecond Acceleration : 20G</p>

 <p>Microsoft IntelliMouse Explorer 4.0</p>		68	69	63	Resolution: 400 DPI FPS: 6000 frames/ sec. Speed: 37 in / sec. Image Processing: 2.9 mega pixels/second Acceleration : 10G
 <p>IntelliMouse Optical</p>		93	94	96	Resolution: 400 DPI FPS: 6000 frames/ sec. Speed: 37 in / sec. Image Processing: 2.9 mega pixels/second Acceleration : 10G
The purpose of the program mice JUDGE is to judge the smoothness and accuracy movement by the data, not words.					

6. Penetrate into the mice Judge Testing result and analysis

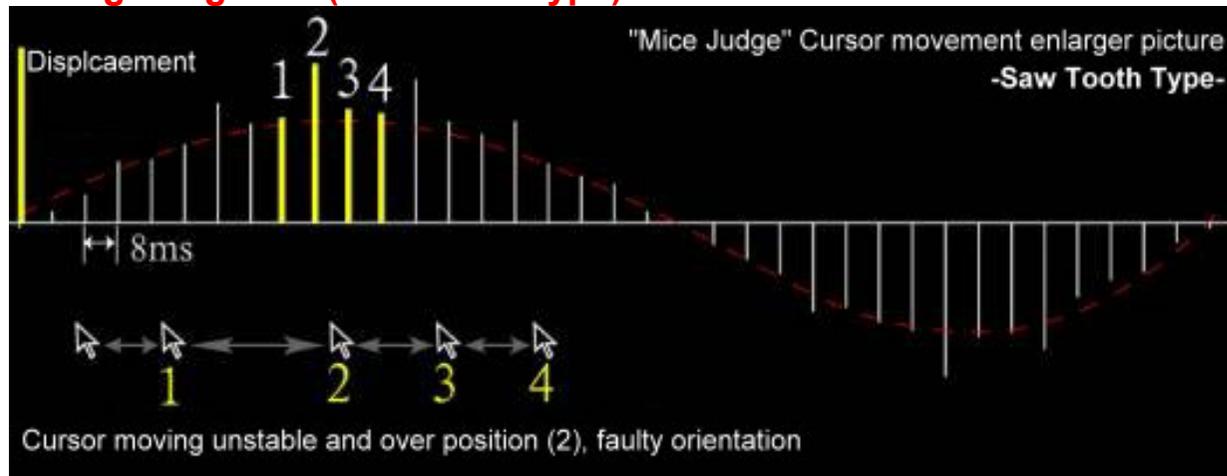
Mice Judge V3.0, which is convert the moving cursor displacement as a wave picture from screen, and it can be easy to judge the design capability of DSP, MCU and optimum matching technology with mouse. Mice Judge will analyze the saw tooth and dropout of composite error to show a mouse performance about validity orientation from an enlarger wave and score.

Enlarger Figure 1 (Perfect Wave)



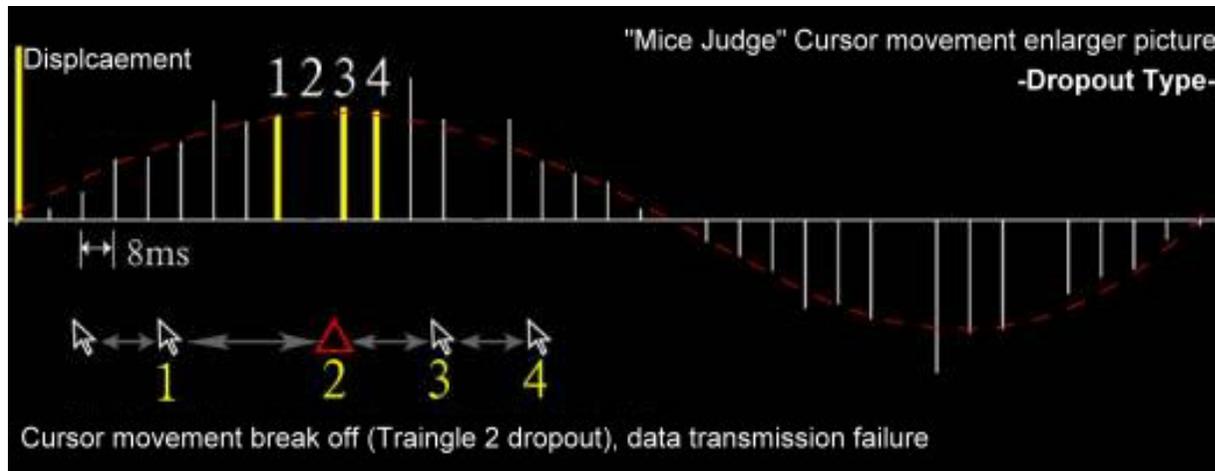
From Figure 1, when Mouse return the displacement of data to pc every 8ms, the white line formed a smoothly shape of curve, likes a stable alternating current curve. Especially it have a same line quality as a pitch cure (when mouse moving in any turn), it means the validity orientation is needed. For example the Mine Swept game, even the mine grid is very closer but it won't make you a wrong click. Don't think you are an excellent shooter, it all because the mouse performance a perfect move. That is what a Top Gamer needed.

Enlarger Figure 2 (Saw Tooth type)



From Figure 2, when Mouse returns the displacement of data to pc every 8ms, the lines formed a saw tooth of curve; each line can not be matching a smooth curve shape. The point 1 from 2 is moving a larger distance of length than 3 and 4 (see left corner pic.). It cause cursor will miss target or over orientation. For example the Mine Swept game, the player will makes failed click on a wrong lattice cause the narrow grid. Don't thinks you are not good enough when you lose in the shooting games; it all because your mouse can't makes a validity orientation in variable movement. That is what a Top Gamer need to replace!

Enlarger Figure 3 (Dropout type)



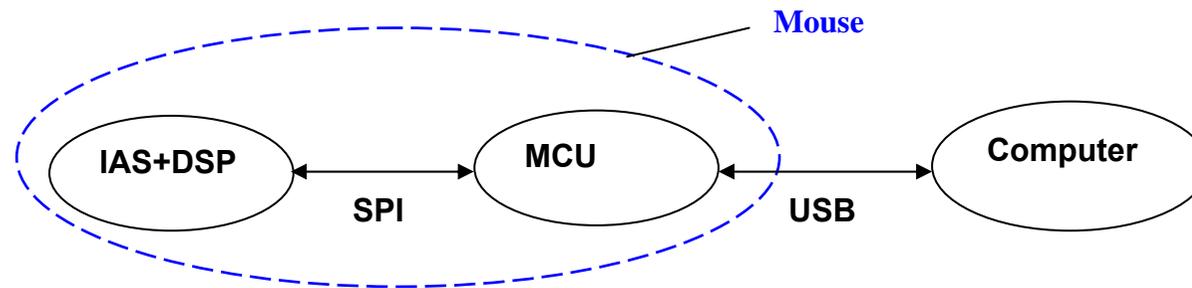
From Figure 3, when Mouse returns the displacement of data to pc every 8ms, the lines formed an incomplete of curve cause periodicity of dropout. It makes cursor move a wrong position when in a fighting shot. Especially the triangle 2 is dropout, (see left corner pic.). All because bugs from DSP and MCU or faulty design.

7. The theory of mice JUDGE

Before narrate the mice JUDGE theory, let us know the mouse major components and see how it works.

IAS: Image Acquisition System DSP: Digital Signal Processor

SPI: Serial Peripheral Interface MCU: Microcontrollers Unit



mice JUDGE quality testing theory is base on detecting a best matching design of MCU and DSP.

The theory jus t as below:

Computer require mouse movement data in every 8ms through by USB interface, in the same time DSP is loading and save the data in memory from IAS, MCU will save the data from DSP in each cycle times. When each 8ms PC require MCU respond the data, unfortunately DSP memory just 8bit only (+127~ -128).

If MCU require of cycle times takes too longer from ISA, then DSP will overflow, especially when mouse moving in a fast speed.

Or, MCU with DSP working time (3ms) can not match PC required cycle (8ms). That's why cursor happen dropout situation. Certainly, its movement can't smoothly and present real active of mouse.

According as above of descriptions, we can find out the technology capability is a core issue with MCU and DSP. mice JUDGE catch cursor moment from display and analyze the result as a curve chart. Testing score is born from curve shape is smoothly, saw tooth or dropout. Justice is all in there.

8. Conclusion

To recognize a good quality mouse is important thing for user (especially for Gamer).

Most of peoples had typical image with expensive products as their favor like, but it is beyond a reasonable cost sometimes! mice JUDGE makes you do the right thing to choice a real worthy favor one. No matter what an expensive mouse but just a good quality you need.