

Product Description for "Tracer"

Summary

The Boost "Tracer" product consists of an aftermarket modification to a component of the GP9450 system ("Acrobat") manufactured by Gyration, Incorporated. The GP9450 is a wireless computer mouse. Outlined below are the physical characteristics of the "Tracer" system, including an enumeration of the differences between the final Boost product and the previously tested GP9450-H (the "HANDSET", FCC ID JJ4GP9450-H).

Physical Specs

Tracer Specifications			
	Receiver*	Handset	Visor
Size (inches)	2.6W X 5.5L X 2.7H	2.2W X 6.7L X 1.7H	5.5W X 8.5L X 2H
Weight (ounces)	6	6.5	6
Cable Length (feet)	6	-	6
Operating Range	-	Up to 15 feet (4.57 m) from receiver (not limited to line of sight)	-
Radio	Multi-channel (7) FM (US 49 MHz), 16 addresses		
Operating Temperature	+10° to 40°C (+50° to 104° F)		
Storage Temperature	-30° to 70°C (-22° to 158° F)		
Power Supply	120V AC/ 6V DC adapter included	Rechargeable NiMH battery included (minimum 9 hours continuous use on full charge)	
Input Jacks	-	1. Two 1/8 inch (3mm) mono audio jacks (for external buttons) 2. One RJ11 jack (for Visor input)	-
Hardware Compatibility	<ul style="list-style-type: none"> ◆ IBM PS2, PC/AT, and compatibles <ul style="list-style-type: none"> • PS/2 Mouse Port • DB-9 Serial Port • USB Port (optional adapter required) ◆ Apple Macintosh <ul style="list-style-type: none"> • USB Port (optional adapter required) • ADB Port (optional adapter AND software required) 		
OS compatibility	<ul style="list-style-type: none"> ◆ MS-DOS 3.x or later ◆ Windows 3.1, 95/98, NT, 2000 (with Microsoft, Logitech, or compatible mouse driver) ◆ Macintosh OS 8 or later ◆ Any other OS with HID device support 		

* Previously submitted as JJ4-GP9450-R

Theory of Operation

Positional data are gathered by one of two means: the default Gyro Engine, which responds to analog voltages induced by Pitch and Yaw of a gyroscopic

sensor; or from a Standard Mouse Engine, detecting counts from ball-driven X / Y encoders on the transmitter. This data is passed to microcontroller-based Interface Logic, which formats the Positional Data as packets and passes it to a 49MHz radio transmitter, which modulates the 49MHz signal as ON-OFF keying to encode and transmit the data.

The "Tracer" is designed to be used in two different configurations-

- 1) Use as a hands-free computer mouse: The transmitter will be attached to the users chair, with the gyro module connected via cable tether and worn on the users head.
- 2) Use as a "normal" wireless mouse: The handset will be placed upon the table top and used as a regular mouse. This is possible both with and without the cable tether attached.

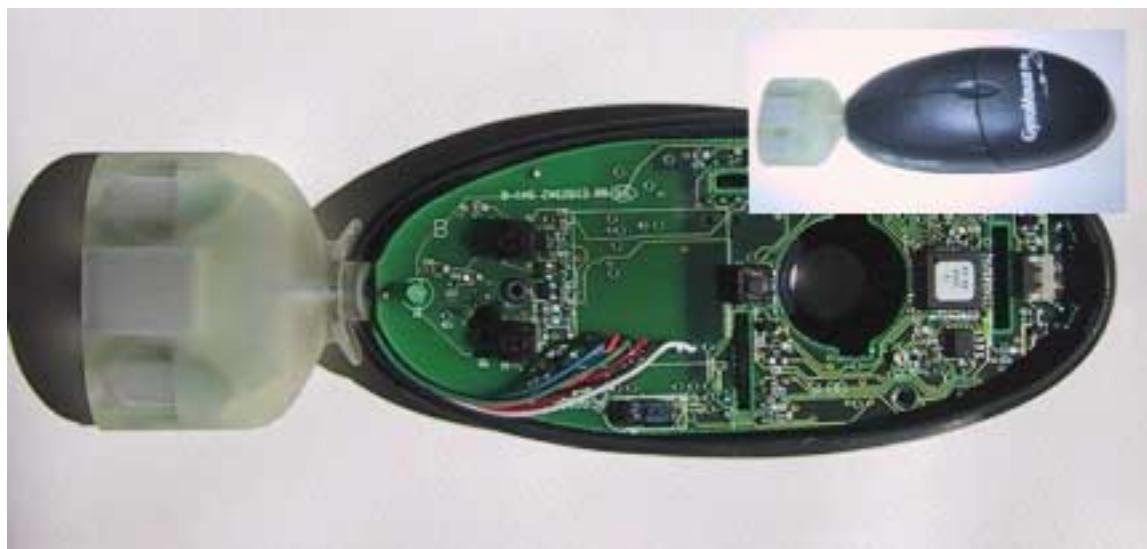
Modifications to GP9450

As previously stated, aftermarket modification of the Gyration GP9450 Acrobat system, FCC ID JJ4GP9450-H yields the Transmitter and Visor devices mentioned above. Details of the modifications are given below:

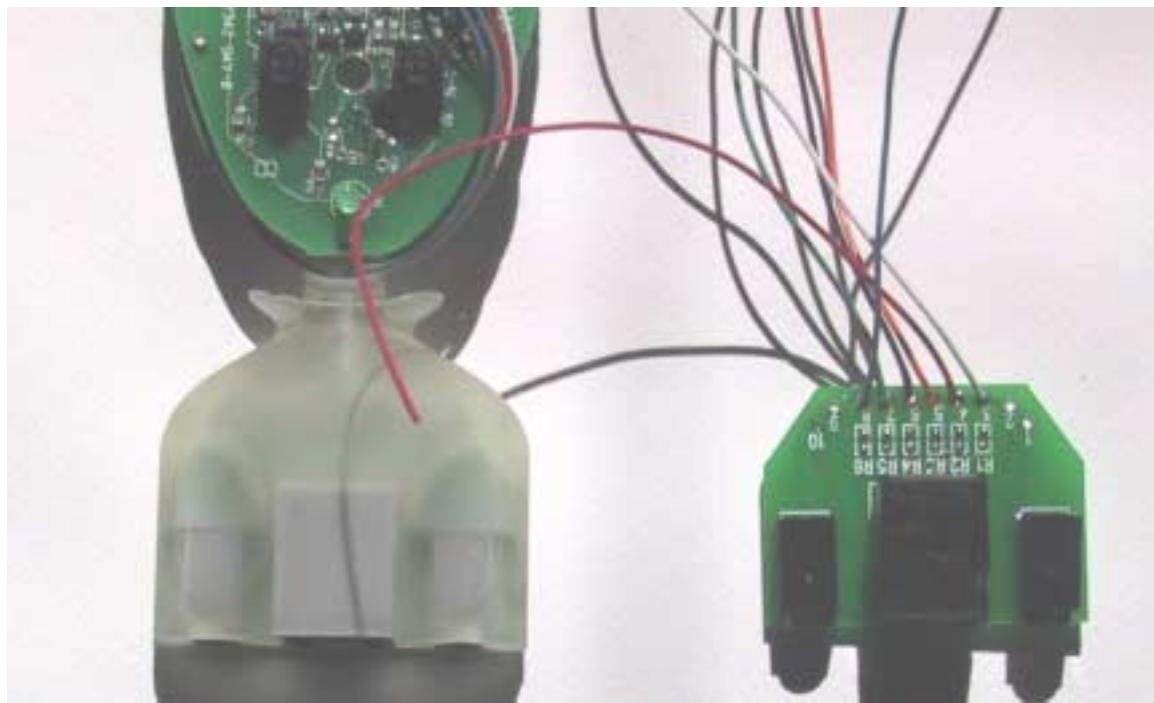
- The original device is shown here with a portion of the housing removed. The gyroscopic sensor, the cubic metal can seen protruding here, is removed and enclosed in a separate housing (see below).



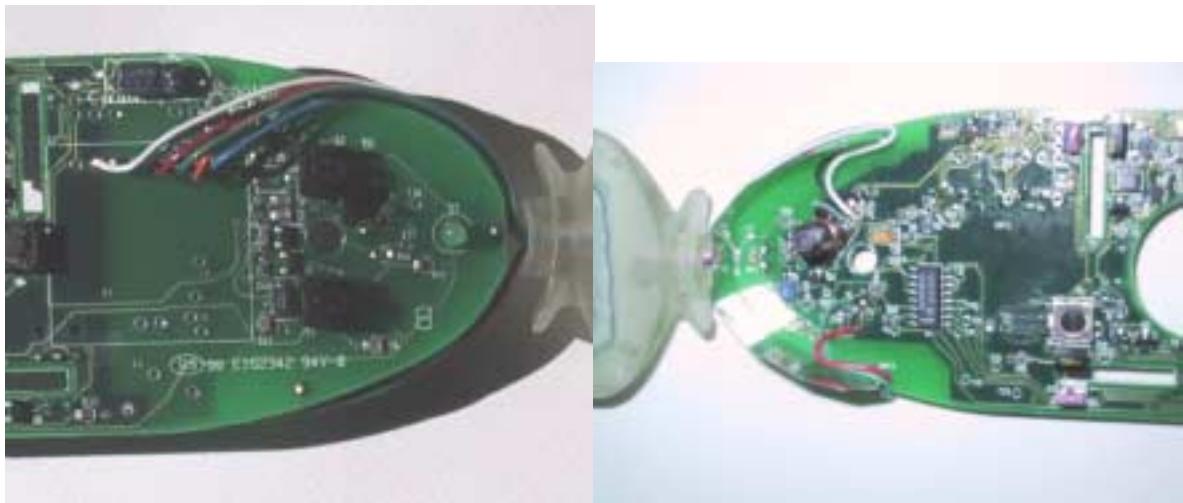
- A connector is attached to the front of the original PVC housing. The connector will be PVC with a PET core. The assembly is seen below with the top half of the original housing removed. The complete unit is shown in the inset.



The PET core protects an internal PCB supporting two audio and one RJ-11 jack, as well as a six SMT jumpers. Wires will lead from the rear of the connector to the various solder contacts on the original PCB. The following picture shows the connector PCB in its uncoated form, as well as in a prototype overmold.



Below the 10 connections to the various locations on the PCB are shown. Note the antenna (the curved metal plane) in the right hand image:



The wire connections above as well as details regarding two component changes are shown on the attached schematics. C37 has been added (a shunt capacitor for Switch 2), which has no effect on the antenna system, and inductor L2 (seen above as the copper coil in the right hand picture) has been changed from a variable inductor with 2.56-3.8uH range to one with a 0.9-1.9uH range.

- The gyroscope sensor module is mounting in a remote housing made of ABS. This is connected to the handset via a six-foot long cable tether, a six conductor (28AWG, 7/32) cable with a capacitance of <23pF/ linear foot. The assembly is shown here with the cover on and off:



The gyroscope is installed on a PCB board that amplifies the output voltage to overcome line resistance and maintain a clean analog signal at the transmitter. The PCB also supports SMT bead core inductors to filter RF introduced into the cable from the transmitter antenna. Cable is terminated with a molex connection at one end (header shown below), and an RJ-11 plug at the other.

