Careers at Apple

# HID, Firmware Quality Engineer

San Diego, California, United States
Hardware

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## Summary

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Role Number:**200409038**

Be part of the iOS Device QE team, focused on testing firmware and ensuring ultra-high quality for Apple's next generation human interface devices. You will be a motivated individual who cares and thinks about user experience, able to collaborate with other engineers to problem solve and understand the basics of firmware, including algorithms.

## Key Qualifications

- Have a real passion for quality, enjoy breaking things through creative testing

- Thrive in uncertain, early prototype stages of a project when not all features are working yet, and enjoy putting energy into identifying/classifying issues as a way to improve quality

- Enjoying learning and teaching

- Have skill in building new processes or fixing old processes to improve quality of Apple products and efficiency of team

- Experience with embedded systems, microcontrollers and sensors

- Excellent written and verbal communication skills

## Description

You will be a motivated individual who independently follows up on bugs, collaborates with developers to resolve low-level issues and can understand and discuss technical problems with other Quality engineers, development partners and program managers.

CORE RESPONSIBILITIES INCLUDE:

-  Understanding microcontroller based embedded systems, including algorithms
-  Partnering with a development team to quickly understand an architecture, break it into functional parts, come up with a plan to test/validate, and identify and target weaknesses
-  Crafting creative ways to exercise embedded subsystems, communication protocols (SPI, I2C, etc) and high-level features of embedded devices
-  Devising and building test fixtures, building tools and authoring automated scripts
-  Executing manual and automated test plans on early prototypes, typically at the "grey box" level
-  Helping to craft quality from a very early stage, ushering the product from early prototype to production
-  Documentation of test cases and code used for test execution
-  Coming up with ideas for custom tools and methods to exercise firmware features
-  Tracking performance, reporting results to management, driving issues to closure
-  Partnering with Human Factors / User Study Group to validate the customer experience and learn about how humans use new input devices

## Education & Experience

BS or MS in EE/CE/ME/CS or related degrees

## Additional Requirements

HELPFUL/USEFUL EXPERIENCE:

- Experience writing and/or testing firmware, building embedded systems

- Algorithm analysis and validation

- Knowledge of Mac systems and MacOS/iOS or UNIX variant

- Track record of shipping great consumer products

- Testing automation using Python or similar

- Use of hardware debugging tools

– USB and Bluetooth CATC, protocol analyzer, logic analyzer, oscilloscope

- Familiarity with C/C++ or object-oriented programming

- Test tool development

- Continuous integration systems

## Pay & Benefits

At Apple, base pay is one part of our total compensation package and is determined within a range. This provides the opportunity to progress as you grow and develop within a role. The base pay range for this role is between $109,000 and $189,500 annualized, and your base pay will depend on your skills, qualifications, experience, and location.

Apple employees also have the opportunity to become an Apple shareholder through participation in Apple's discretionary employee stock programs. Apple employees are eligible for discretionary restricted stock unit awards, and can purchase Apple stock at a discount if voluntarily participating in Apple's Employee Stock Purchase Plan. You'll also receive benefits including: Comprehensive medical and dental coverage, retirement benefits, a range of discounted products and free services, and for formal education related to advancing your career at Apple, reimbursement for certain educational expenses — including tuition. Additionally, this role might be eligible for discretionary bonuses or commission payments as well as relocation. Learn more about Apple Benefits.

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