

TACTICAL HAPTICS'S NEWLY CREATED SABERGRIP WILL BRING THE PHYSICAL IN-HAND EXPERIENCE OF VIRTUAL FISHING, SWORD FIGHTING, AND TOOL TRAINING ONE STEP CLOSER TO REALITY

Union City, California, USA – August 20, 2020 – While the Covid-19 pandemic has affected us all, we at Tactical Haptics wish you the very best through these difficult times. Like you, we have been hard at work, and despite the downturn in the location-based VR industry, have continued to innovate and hope we can play a part in physically reconnecting people back together in the current remote Zoom-based reality that we now live in.

Our update picks up from the [review that Tested.com did on our Modular haptic controllers](https://youtu.be/pLIROeV8BFw) last year at the Augmented World Expo (AWE 2019) (<https://youtu.be/pLIROeV8BFw>). We took the feedback we received this last year and focused our latest development on embodying it in new hardware and focused VR experiences that are designed to go beyond simple tech demos to show the true potential of our unique haptic feedback.

Key developments covered below:

- Multi-Pose™ magnet sockets for Quest
- New cylindrical form factor controller, SaberGrip™
- Modular actuator modules for embedding in custom devices
- Sword fighting experience
- 2-Handed SaberGrip™
- Fishing hardware and sim experience

Multi-Pose™ magnet sockets for Quest

In the comments of the [review that Tested.com did on our Modular haptic controllers](https://youtu.be/pLIROeV8BFw) last year at AWE (<https://youtu.be/pLIROeV8BFw>), we noted that people responded equally well to our magnet sockets for forming new game peripherals on-the-fly as they did to our shear feedback. Given that, we decided to make a version of our ([Multi-Pose™ magnet sockets](https://youtu.be/xtJzy0zJm5I) (<https://youtu.be/xtJzy0zJm5I>)) that could be used directly with standard Oculus Quest controllers. This work included considering the human ergonomics for different sized people to ensure a relatively universal design and was supported, in part, by our National Science Foundation (NSF) Phase IIB grant ([IIP-1632341](#)).

The resulting Multi-Pose™ magnet socket design for Quest is a sleeve that slides over the handle of the Quest controller with a second part that hooks onto the Quest controller's tracking hoop and clips back to the sleeve. The prototype shown in the neighboring figure shows how the controllers can be configured to resemble the following poses: machine gun, gamepad, handle bar, and shotgun/ rifle. We're still considering next steps, as much of our time has been focused on bringing a new form factor of the haptic controller to production.

New cylindrical form factor controller, SaberGrip™

The design of our new cylindrical form-factor controller, SaberGrip™, is also an offshoot of the research from our NSF Phase IIB grant ([IIP-1632341](#)), where we designed a lower-cost, cylindrical, single-board version of our modular controller for the toy industry. After one of our VR arcade partners made it clear they were more interested in this form factor, we upgraded the design to add internal battery charging and tracking support for Oculus, SteamVR, Vicon, and OptiTrack. For reference, we show our modular controller next to SaberGrip™, with the modular controller configured with a Vive tracker and [Multi-Pose™ magnet sockets](#) (the only feature that isn't available on SaberGrip™).

The resulting SaberGrip design includes the same haptic actuation drivetrain as our modular haptic controllers for moving the controller's sliding plates. And before the pandemic shuttered the doors of most location-based VR arcades, these controllers were selling quite well for both VR arcade and VR training applications (e.g., heavy industry, construction, etc.), despite the design being new and just being available as 3D-printed prototypes. The sales into VR training was in-part bolstered by a new VR training tech demo that we had put together that includes a ratcheting wrench, screw driver, drill driver, hammer, nail gun, handsaw, winch, jack, and bike pump.

Modular actuator modules for embedding in custom devices

When talking with potential partners this last year many asked about making their own device and embedding our [shear feedback](https://youtu.be/kCN3w-3UUrU) (<https://youtu.be/kCN3w-3UUrU>) within it. While SaberGrip was an opportunistic result of such discussions, we recognize that now that we have 2 form factors of controllers that we also have 2 form factors of actuators (in-line and right angle actuator designs). Hence, we can work with partners that are interested in integrating [shear feedback](#) into devices that are radically different than our 2 controller form factors (and de-risk their new product introduction by providing our haptic actuators).

For illustration we show an example of our in-line and right angle actuators integrated into the handle of a light saber and M4 Machine Gun grips, respectively. We show both of these examples with the same rubberized sliding "tactor" plates as our current controllers. However, in the case of the light saber we show that the sliding plates themselves could be an actual part of the device our shear actuator is embedded within (see sliding grips in light saber concept image). Hence, we welcome inquiries from partners interested in integrating [shear feedback](#) into their devices.

Sword fighting experience

Our new cylindrical form factor has sparked greater interest from partners in sword fighting (or even light saber) experiences. To show the potential for what shear feedback could add to a VR sword fighting experience, we made a whole new sword-fighting experience (a major upgrade from the passive mannequin from our original sword tech demo). The new sword-fighting experience includes an active robot opponent and options for 5 difficult levels and outfits player and robot-opponent with options for a single sword, sword-shield, or sword-sword. Other melee weapons could also be added in the future, e.g., one could imagine creating a VR gladiator experience and all the corresponding weapons.

As we recognize the growing popularity of "active" VR games like beat saber and boxing, we will also point out that people work up a sweat fighting the robot opponent, so it could be an excellent source of activity, not to mention the potential to be modified as a training tool to teach sword/knife fighting (e.g., fencing or escrima). Future efforts include incorporating sword fighting between two human opponents – first locally, and then over the network, with the goal of using this as the basis for setting up an eSports/tournament system. See the accompanying video to get a sense of current game play (<https://youtu.be/R1NxXIRphjM>).

2-Handed SaberGrip™

More recently, we've prototyped a 2-handed cylindrical SaberGrip™ controller. This was due to combined inquiries and interest in using our haptic controllers for everything from sword fighting, to racket/bat sports and even golfing, as well as applications in VR training to represent a lever, pry bar, shovel, or other tool handle. We made the prototype to make sure our actuators were strong enough and to ensure that the haptic illusions of elasticity, inertia, and impact still worked. The result is a haptic

controller that works great for either 1- or 2-handed interactions and feels great, so we look forward to adding it to our controller lineup. We also plan to investigate using different grip materials to more closely match the activity our partners plan to use the controller with. See the accompanying images showing the controller gripped with 1 or 2 hands.

Fishing hardware and sim experience

Most recently we've created a new fishing simulation as another offshoot of the SaberGrip controller. In this fishing experience, you can feel the tug of a fish with our controller's shear feedback, and the addition of an instrumented fishing reel attachment that includes a programmable brake that provides increased brake resistance when the fish is pulling hard. This experience works great both in VR and in front of a Big Screen TV, which may help with early adoption while concerns with Covid-19 are ever-present.

We continue to add nuances to the fishing experience, to come closer to mimicking reality. In the future, we could go beyond our current fresh-water fishing experience to simulate fly fishing, or even combine our reel with the 2-handed cylindrical controller (discussed above) to simulate deep-sea fishing.

Like the sword fighting experience, we are currently looking at a wide range of business opportunities to pursue with this new development. These include partnering with arcade makers to integrate with their current fishing experiences to get into family entertainment centers, bars, and other venues, and also placing the experience into outdoors stores and potentially augmenting our simulation as a training tool for places like Orvis that currently offer both group and individual fishing lessons. We're also currently looking to partner to use our fishing sim experience for virtual fishing tournaments and other eSports opportunities. See the accompanying video to get a sense of current game play (<https://youtu.be/DpVlcDWx4jg>).

About Reactive Grip™ shear feedback:

The company's advanced touch feedback works by mimicking the friction and shear forces that we feel in the real world when holding an object or touching a surface. The touch feedback system works by tracking the movements of the player's hand (e.g., using a Vive Tracker, Oculus Touch, Windows MR, Vicon, or OptiTrack tracking system) and actuating small sliding plates on the surface of the grip-region of the controller. These plates recreate the friction and shear forces that are naturally experienced when holding an actual object such as a baseball bat, slingshot, or fishing rod (<https://youtu.be/kCN3w-3UHRU>). In addition to gaming, this touch feedback can also be used in augmented reality, telerobotic interfaces for manufacturing and maintenance, industrial and construction operator interfaces, toys (e.g., light saber), pilot training interfaces, automotive navigation and safety systems, computer-aided design (CAD), education, laparoscopic or telerobotic surgery, rehabilitation, swing training, or to guide the blind.

For more information on the company's touch feedback, please visit:

<https://tacticalhaptics.com/products/>

Link to press release: <https://tacticalhaptics.com/sabergrip-sword-fishing-press-release>

Links to high-resolution images: <https://tacticalhaptics.com/pressImages/SaberGrip2020>

Related Links:

Official Website: <http://tacticalhaptics.com/>

Facebook: <https://www.facebook.com/tacticalhaptics>

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YouTube: <http://www.youtube.com/user/TacticalHaptics/videos>

About Tactical Haptics

Founded in 2013, Tactical Haptics is revolutionizing gaming in virtual reality (VR) with haptic game controllers that provide natural and intuitive touch feedback that goes beyond sight and sound and completes the VR experience. Realistic touch feedback is a critical element for creating immersive experiences and is currently missing from virtual reality (VR) and video games. Tactical Haptics has developed innovative touch feedback that can be built into a game controller. The company's unique touch feedback connects users to their gaming experience in a way that was never before possible, creating illusions of elasticity and inertia that aren't possible with industry-standard rumble (vibration) feedback. The company is currently partnering with enterprise and location-based entertainment (LBE) partners as it brings its haptic controllers into production. The company is based in the San Francisco Bay Area.

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