

Martin 16 Power-Assist System – Mk IV

Self-contained, portable, power-assisted steering and sail sheeting system



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...Gone Sailing!

The vision of the Martin 16 Power-Assist System is to get everyone out sailing. Men, women and children with significant disabilities use a Power-Assist System to enjoy the freedom of independent sailing, by providing power-assisted steering and sheeting for any tiller-steered sloop, through a familiar joystick or sip & puff interface.



The Martin 16 Power-Assist System is used by Martin 16 sailors around the world. As well, the Martin

16 Power-Assist System has been adapted to other tiller-steered sloops including the Sonar, Freedom 20, Cal 20 and Catalina 22.

Detailed information and Price List for the Martin 16 Power-Assist System modules can be found on www.martin16.com, as well as a full Operator's Manual.



Each year, I refine the function and capability of the system through feedback from sailors. Please provide us with your feedback and help us make the Martin 16 Power-Assist System even better.

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Power-Assist System – a Brief History

The idea for sip & puff controls for a sailboat came from Sam Sullivan, a quadriplegic and founder of the Disabled Sailing Association. Sam had seen high-quads operate their wheelchairs by sip & puff, and envisioned that this technology might be used to control a sailboat. The world's first sip & puff control system for a sailboat was designed by the Neil Squires Foundation (Vancouver, Canada) and installed on a Sunbird sloop the "Royal Spirit". The Royal Spirit debuted at the Mobility Cup regatta in 1994.

The sip & puff technology was refined and adapted to the new Martin 16 sloop in 1998 under the "Royal Bank Project". The Disabled Sailing Association of Alberta with the financial support of Royal Bank Financial Group managed this project. Steve Alvey brought a volunteer Project Team together, several companies donated parts and equipment, and a robust, self-contained system was designed and hand-manufactured to meet the needs of high-quad sailors. Steve Alvey and Mark Isaak continued development of the system in 1999 and advanced the design, functionality and reliability, culminating in the current Mk IV Power-Assist System.



Power-Assist Systems are now in service at DSA programs and on private boats in Canada, USA, UK, Japan, Greece, Australia and Puerto Rico. The Power-Assist System design is modular and versatile, and also used on the Sonar, Freedom 20, Catalina 22, Tripp 40, Cal 20, 2.4mR and Challenger Tri-maran, as well as Martin 16s.



Sailors with high-level disabilities use Power-Assist Systems to compete on the same starting line with able-bodied sailors. The Power-Assist System has changed the lives of these sailors, and more like them each new season.

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Power-Assist Joystick Module



Self-contained, portable, weatherproof system components are intended for outdoor use in marine environment. The Power-Assist System can be installed in minutes on any standard Martin 16 sloop, or any other tiller-steered sloop (Freedom 20, Sonar, Catalina 22, etc.).

- ❑ **Power-Assist Joystick Module** contains the main control computer and a joystick control in a weatherproof enclosure. The Joystick Module is light and can be positioned comfortably beside the sailor – to the left or right – or on the sailor’s lap if necessary. Built-in “armrest” provides support for the sailor’s arm for familiar wheelchair-like operation.
- ❑ **L.E.D. battery meter** provides battery state indicator before and during your sailing session
- ❑ **Any 12V power source** can provide power to the Joystick Module: 1) the portable Power-Assist Battery Module or 2) a “house battery” on boats equipped with 12V DC power.
- ❑ **Emergency Disengage** of the drive motor in the case of system malfunction is provided via a “quick-release” pin that can be operated from the rear seat of the Martin 16. (Note: Emergency Disengage is NOT accessible to helmsperson).
- ❑ **Auxiliary motor control** (option at the time of order). The Mk IV Joystick Module will control up to three additional bi-directional DC motors, via the “y” axis of the joystick. These auxiliary functions may be used to control the jib trim, boom vang, or outhaul, for example.
- ❑ **Wireless Remote Control** (option) provides wireless control of all functions of the Power-Assist System, using a convenient and compact “key fob” remote control (automotive style). The Remote Control may be used by a person sailing with a sip & puff sailor, or an Instructor in a motor boat.



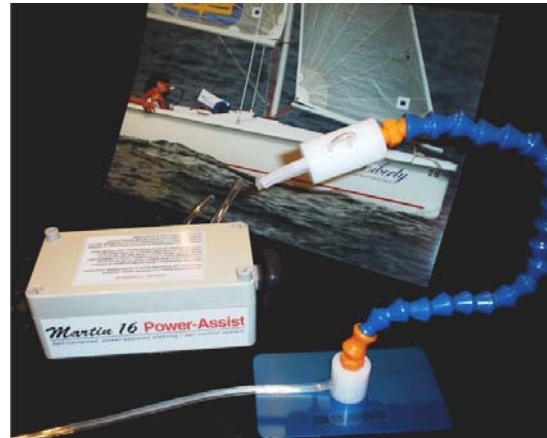
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Sip & Puff Module

- ❑ ***Sip & Puff Module** provides a sensitive pneumatic control interface, allowing high-quadruplegic sailors to control the Power-Assist System functions using their breath.*

The sip & puff interface is a chest-mounted control “stalk”. The stalk positions two pneumatic “straws” within reach of the sailor’s lips: one to control the HELM and one to control the WINDLASS.



- ❑ ***Any 12V power source** can provide power to the Sip & Puff Module: 1) the portable Power-Assist Battery Module or 2) a “house battery” on boats equipped with 12V DC power.*
- ❑ ***Wireless Remote Control** (option) provides control of all functions of the Power-Assist System, using a convenient and compact “key fob” remote control (automotive style). The Remote Control may be used, for example, by a person sailing with a sip & puff sailor, or an Instructor in a motor boat.*



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M16 Windlass

- ❑ **Martin 16 Windlass** is a self-contained, portable power winch system for the main and jib sheets of any standard Martin 16 sloop. The Windlass may be used stand-alone or in conjunction with the Power-Assist Joystick or Sip&Puff Control Module. The Windlass installs in minutes on top of the Martin 16 keel, and main and jib sails are trimmed in unison via either a large toggle switch on the rear panel of the Windlass enclosure, or remotely by the joystick or sip & puff stalk (or Remote Control key fob).
- ❑ **Emergency Release** of the sheets in the case of system malfunction is provided on both winch drums via a “quick-release” pin that can be operated with minimum manual dexterity.
- ❑ **Any 12V power source** can provide power to the Sip & Puff Module: 1) the portable Power-Assist Battery Module or 2) a “house battery” on boats equipped with 12V DC power.



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Challenger Windlass

A self-contained, portable power winch system for the Challenger Trimaran. Weatherproof system components can be quickly mounted on any Challenger Trimaran, and are intended for outdoor use in marine environment. The Windlass and Battery Module are removed and stored when not in use. The Windlass is controlled via a large toggle switch on the Relay Control Module.

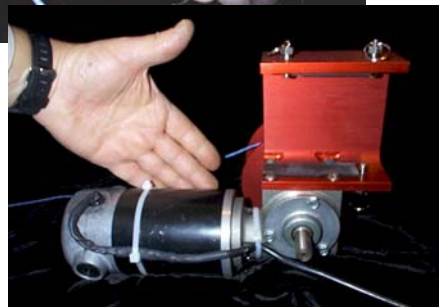


- ❑ **Challenger Windlass** is based on a powerful, weatherproofed right-angle gearmotor. When the Windlass is in use, the Challenger main sheet can be rigged 1:1, with a maximum sheet tension of over 60 kgs!

The Windlass Module has a simple “C”-shaped mounting bracket that will suspend the Windlass under the forward end of the Challenger main boom section. It can be mounted (and removed) in seconds, via three quick-release spring-loaded pins.

The Windlass has a 70mm winch drum that will easily accommodate 3 – 4 meters of 2mm Spectra line, and sheet at about 300mm per second. (NOTE: a larger diameter drum can be fitted to increase the sheet speed, with no loss of power)

Dimensions: 280mm (L) x 175mm (W) x 125mm (H)
Weight: 4.5 kgs (10 lbs)



- ❑ **Relay Control Module** may be located convenient to the sailor's hand. The large (25mm x 50mm), waterproof “toggle switch” provides sensitive control of the Windlass. The Relay Control Module is a NEMA 4 housing, intended for salt-water environments.



- ❑ **8.0 AH Battery Module** houses a high-technology Pure Lead-Tin battery that delivers high-current bursts for the Windlass, providing 4 - 6 hours sailing time before re-charging. The battery Module is waterproof and can be located anywhere in the Challenger cockpit. When not in use, a compact CE battery charger keeps the battery ready for your next sailing session

Dimensions: 170mm (L) x 170mm (W) x 110mm (H)
Weight: 4 kgs (9 lbs)



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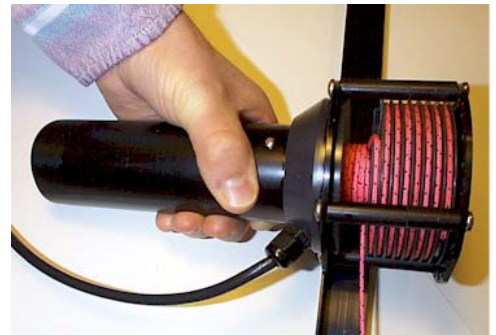
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2.4mR Mk II Windlass

A self-contained, portable power winch system for the 2.4mR sloop. The Mk II Windlass System may be quickly installed on any 2.4mR sloop. The Mk II Windlass uses a “clothesline” sheeting system, which allows the sailor to attach one or both sheets (self-tacking jib boom) to the clothesline “on demand”. Portable, weatherproof system components are intended for outdoor use in marine environment, and removed when not in use. The Windlass is controlled via either a large toggle switch on the DC Control Module, or through a Joystick Control Module to provide variable speed control.

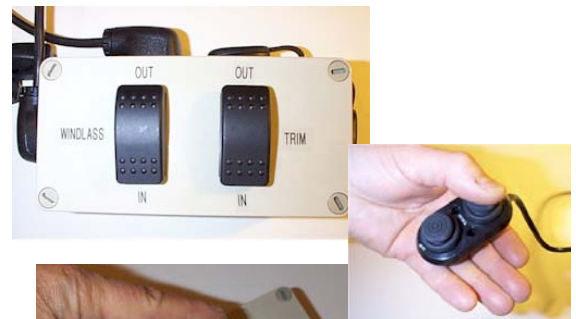


- ❑ **MkII Windlass** is light (1 kg) and based on a powerful (35 kg line tension) medical gearmotor (Faulhaber). The Windlass Module mounts on the aft deck with two ¼” fasteners, and leads a “clothesline” up either the port or starboard sidedeck as required. The 2-speed winch drum sheets from downwind-to-close-hauled in 5 seconds. The last 40cm is sheeted at 33% speed to provide fine trim when close-hauled.



- ❑ **DC Control Module** may be located convenient to the sailor’s hand, to provide “toggle switch” control of the Windlass and Trim Winch Module

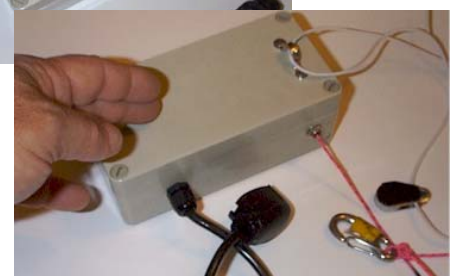
- ❑ **Remote Control Pad** (optional) may be fastened to the joystick or slider, allowing the sailor to control the Windlass without letting go of the helm (requires thumb dexterity)



- ❑ **Joystick Control Module** (optional) may be located convenient to the sailor’s hand, to provide variable speed control of the Windlass and Trim Winch Module through a wheelchair joystick



- ❑ **8.0 or 13.0 AH Battery Module** houses a high-technology Pure Lead-Tin battery that delivers high current bursts for the Windlass as well as provide power for an electric bilge pump, providing from 6 - 8 hours sailing time before re-charging. The battery Module is waterproof and can be located behind the 2.4mR seat or in the bilge area.



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Tripp 40 – “B’Quest”

*In 2002, Brian and Suzanne Hull of Coronado Cays CA, gifted their Tripp 40 “TripZ” to the **Disabled Businesspersons Association (DBA)** for use in their “Challenged America” program -- a recreational rehabilitation sailing program for people with disabilities based in San Diego, California.*

*Re-named **B’Quest**, the Tripp 40 is intended to be a testing platform for innovative technologies, designs and products to advance sailing participation by persons with disabilities. During a four-month development project, Alvey designed and fabricated a number of innovative adaptations, to make B’Quest accessible and safe for offshore sailing.*

- ❑ **6-Way Power Helmseat** provides ergonomic, secure seating for any helmsperson, with or without a disability. The seat travels from one tack to the other to accommodate heel of the boat; rotates through 180 degrees; tilts 25 degrees forward or aft; and, can slide up to 8 inches towards the wheel, adapting to any comfort or physical requirement. A four-point safety harness secures and maintains the balance of the sailor in a seaway. At changes of watch, the helmseat is positioned on either side (tank) of the traveler for transfer from or onto the seat.

*The wheel system has a built in mount for an under-deck autopilot access that will allow sailors with high-level disability to steer B’Quest using a **Power-Assist System** joystick, Sip n Puff, optic fiber, or other innovative control interface.*



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- **Portable Crew Seat Module** provides secure, functional seating for sailors with body-balance challenges (paraplegics, quadriplegics, amputees, etc.) when performing typical crew responsibilities in the cockpit of B'Quest.



Based on a competition go-kart seat shell, the Crew Seat Module is light, portable, and can be placed in a standardized mushroom "socket" fastened anywhere on the cockpit sole or deck of B'Quest. (multiple sockets are installed)



The crew seats swivel-and-lock in 16 positions, and tilt forward and aft 30 degrees to accommodate the heel of the boat. A versatile chassis allows the seat to slide fore and aft 8" and pivot either 1) about the sailor's spine or 2) about the sailor's feet. These variables allow the sailor to position him/herself to tail sheets, trim winches or manage the mainsheet or traveler. Crew seats include a two or four-point harness providing the trunk stability required to pull sheets and control lines.



- **Personal Lift System** provides access to the boat's cabin, during all sea conditions. The personal lift comprises a robust lifting platform, mechanically located and stabilized by B'Quest's existing companionway ladder.

When not in use, the platform (seat) lies flush on the cabin sole and does not encumber safe access to the cabin by able-bodied crew-members. A push-button remote control pad, operating the lift winch motor, activates the personal lift. The platform is lifted to seat



height for transfer, and then raised to the level of the companionway access. The personal lift platform also provides seating for a PWD crewmember working the "pit" area -- the companionway crew position where lines (halyards, vang, etc.) from the mast and boom are trimmed and sheeted.



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- **Centerline Transfer Bench** allows sailors to safely transit the cabin length in order to access the boat's head.

When not in use, the transfer bench is spring-loaded to fold up and out of the way. The sailor's weight activates the transfer bench, and a safety lock holds it in the horizontal position until released. In a seaway, grab rails in front of and behind the transfer bench assist the sailor to transit the cabin safely. Similarly, the head is fitted with grab rails and a chest-level locking bar to stabilize the sailor in a seaway.



The B'Quest Project adaptive systems were sea trialed by B'Quest's crew over the summer, and then in the "Little Ensenada" race in October 2002 and then completed the legendary 2003 TransPac Race from Los Angeles to Diamond Head Hawaii. These innovative adaptive systems have proved to be accessible and functional and made offshore competition accessible to this team of elite PWD sailors.



B'Quest crew has acquired critical experience with and confidence in the adaptive seating and personal management systems aboard B'Quest under the most demanding sailing conditions.

