# Heated Riding Gear Comparison by Moshe K Levy



than gear which heated up quickly in the lab from Brand Y. As usual, the right purchasing decision should be based on an amalgam of both objective and subjective data.

In The Lab: Liner Performance Analysis

For this test, temperature probes were attached to the lower front sides, the back, the collar, and each sleeve of the liners. The liners were then worn in a seated position (as one would sit on a standard motorcycle), and a winter riding

road experiences. For example, Brand X gear that heats up slowly in the lab may also boast superior insulation properties, so that in real-world conditions, it actually feels warmer overall

attached to the lower front sides, the back, the collar, and each sleeve of the liners. The liners were then worn in a seated position (as one would sit on a standard motorcycle), and a winter riding jacket (a first generation FirstGear Kilimanjaro model) was worn over the liner while the measurements were recorded. The temperature rise of each liner was recorded over a 15-minute period. The Aerostich, FirstGear Warm & Safe (FGW&S) and Gerbing's all provided similar levels of heat, though the Gerbing's reached the highest overall peak temperatures in the least amount of time.

Thanksgiving marks the end of the riding season, and the beginning of a notoriously depressing winter condition known as PMS—Parked Motorcycle Syndrome. However, those in the know have long understood that with the addition of heated garments, a riding season can be dramatically extended through the coldest conditions. Heated gear envelopes the rider in a cozy warmth despite below-freezing ambient temperatures, without the movement-constricting effects of heavy multi-layered clothing. As a satisfied user of heated gear purchased a decade ago, it was time to see what technological advancements have been made in the interim, and whether replacement of my perfectly good 10 year old Gerbing's jacket liner and gloves is advisable.

For the purposes of this test, we rounded up some of the top contenders in heated vests, jacket liners, gloves, and temperature controllers from Aerostich, EXO<sup>2</sup>, FirstGear, Gerbings and Tourmaster. We then subjected all of the gear to months of rigorous testing in winter commuting conditions, as well as lab testing for objective data collection. For sizing reference, the author is 5'8" and 160 lbs., and the test rig used throughout is a 2004 BMW R1150RT. The following is a compilation of our findings at first glance, in the lab, and on the road.

#### Lab Testing Protocol

This being MCN, objective data was harvested in a controlled laboratory environment to allow readers the opportunity of direct comparison. In a temperature-controlled test chamber, the gear was powered at 13VDC by a freshly calibrated Sorensen DCS60-18E power supply, and its heating profile recorded using a Slim-Kic 2000 Temperature Profiler. Readers should note that such lab data does not always translate perfectly into corresponding on-

## In The Lab: Vest Performance Analysis

To test the vests, temperature probes were attached to the lower front sides and the back of each. Like the liners, they were then worn in a seated position with the Kilimanjaro jacket over them. We then measured the temperature rise of each vest over a 15-minute period. The Bodywarmer clearly had the advantage, cresting much higher temperature peaks in very little time compared to the Tourmaster, which stablized at around 100° F toward the end of the 15-minute window.

#### In The Lab: Glove Performance Analysis

For the glove test, we used the right hand glove for each subject pair tested, by wiring each finger and the back of the palm with its own individual temperature probe. Once inserted into the glove, the hand was closed around a motorcycle grip to simulate its typical position while riding. The thumbs invariably heated the quickest.

As a fundamental analysis, the FGW&S, Gerbing's and EXO<sup>2</sup> gloves all essentially reached similar recorded levels of heat, with the EXO<sup>2</sup> Stormshields holding a slight lead in achieving peak temps in the shortest amount of time—quite impressive, considering they draw only half the wattage of the other gloves. The Tourmaster gloves lagged behind in peak heat generation.

#### Road Testing

On-road testing was conducted in the New Jersey/New York/Pennsylvania area, in temperatures ranging from +15° F to +45° F—but mostly freezing. In these types of conditions, any weaknesses in design or construction became quickly apparent. The same Kilimanjaro jacket used in the lab was worn over the liners while on the road. Read on to see how our test gear fared.

## Liners: 1st place, FirstGear Warm & Safe

FGW&S's Thailand-made jacket liner has a nylon shell and heated fleece collar, as well as two YKK zippered storage pockets. Lycra panels on the sides and sleeve backs ensure a snug fit. It also features an "access zipper" that allows easy admission to the internal alloybased resistance wiring, should any repairs need to be made. A pouch is included for storage of the liner when not in use. Main power entry is via coax connector stored in the left front pocket. The liner is wired such that the gloves and liner can be powered through one input coax, or independently through two coax connectors. The glove coax connector is hidden in its own pocket when not in use. Power connection wire length for the gloves is a generous 12" from its wire pouch to the coax tip. The integrated glove power wires exit the jacket through sewn buttonholes, and can be stored in zippered pockets on the sleeves when not in use. An additional accessory plug for pants or another item is also provided. Overall construction is very good, and the size L tester weighed in at 1.9 lbs.

The FGW&S uses three coax connectors. One is for additional garments, another is for separate glove control, and a third is the main liner power input. All store in dedicated pockets within the liner.

The FGW&S liner trails the other two liners in overall build qual-



ity, styling and fit. Yet it held such an advantage in convenience that it was able to obtain top honors in the jacket liner comparison. Convenience in this case is exemplified by the main power and accessory coax connections which are all hardwired into the jacket liner, with generously long cable leads, and dedicated, zipped storage pouches for all. In a practical sense, this means no dangling wires when off the bike, but no need to ever undress to access connections while on the road—the best of both worlds in one liner! Indeed, when in use, the lead lengths for the liner are long enough to leave on the outside of the jacket within plain sight of a full-face helmeted rider. Same with the glove power wires, which are long enough to connect outside of the gauntlets. In this way, both liner and glove connections are unstressed, but if anything ever disconnects, it can be reattached in seconds without any disrobing required. In fact, there is such adequate input cable length provided that getting off the bike to refuel could be accomplished without dis-

connecting anything—a very big plus, and impossible with either the Aerostich or Gerbing's, unless separate input cable extensions are purchased separately for them. Overall functional performance of the liner was very good, with quick warm up, even coverage (including the collar), effective insulation and no cold or hot spots.

## Liners: 2nd Place, Gerbing's Microwire

\$199.95

Gerbing's new "Microwire" line of heated clothing replaces the 0.075" copper resistance wire used for many years prior with bundles of hundreds of microscopic stainless steel strands, each about 12 microns thick, twisted and wrapped in a thin Teflon-derived coating. Both the gloves and liner tested here feature this new technology, which was developed for the Department of Defense. The gloves and liner tested were made in China.

The 77W Microwire jacket liner has a teflon-coated nylon shell and heated micro denier collar, two non-zippered external pockets, and two internal pockets (one is YKK zippered). Power entry is via a Power Distribution Unit, which is basically three coax connectors in a rubberized housing sewn into the lower left front section of the liner. Power connection wire length for the gloves is a rather short 6" from its wire pouch to the coax tip. The integrated glove power wires exit the jacket through metal grommets, and can be stored in zippered pockets on the sleeves when not in use. Overall construction is

excellent. The cuffed sleeves and elastic band at the bottom, as well as the Gerbing's logo and company color swatch on the collar, make for a classy appearance. The size 42/32 (chest/sleeve) tester weighed in at 1.5 lbs., or 0.22 lbs. lighter than my original 1999 model Gerbing's liner, and is advertised at 135° F surface temperature. Gerbing's PDU has three connections: White-tip plug closest to the zipper is main input, middle plug is for separate glove control (if desired), and the outside plug can be used for additional garments.



Compared to my 10-year-old original Gerbing's liner, the new Microwire liner certainly is an improvement in many ways. Its build quality is excellent, and it fits as though custom tailored. The heating element wiring is not easily felt, as on the FGW&S. Functionally, the Gerbing's delivered as well, with the quickest warm-up (especially welcome on the soft collar.) Indeed, the Gerbing's liner would have stolen this competition by a good margin, were its PDU connection point not such an exercise in pure frustration. Advertised as a cure for dangling wires, the PDU instead subjects the rider to making the coax connections for all gear and the controller on the inside of the jacket liner itself. Unlike the Aerostich's similarly positioned SAE input connector, the Gerbing's coax is far more likely to come loose, and, in fact, did so on some longer, more energetic test rides. To deal with this, the rider has to stop, take off the gloves, unzip the outer jacket and any inner layers, unzip the liner, repair the connections, and layer up again. Although this PDU connection issue is a matter of personal

preference, for this motorcyclist, anything that forces the rider to get undressed or fumble around with connections in bitter cold is bothersome, to say the least. Another more minor issue was the very short length of the glove power wires, which in some cases (depending on which gloves were used) meant the connections took place under the glove gauntlets, lifting them from their seal against the jacket cuff, and letting in cold air. Gerbing's can solve this by providing another 2" or so of glove power wire per sleeve.

## Liners: 3rd Place, Aerostich Kanetsu

\$297

The American-made Aerostich 75W Kanetsu liner adds a twist to the traditional heated jacket liner by employing an internal air bladder (see photo model's left hand) which the rider can inflate or deflate to adjust the garment's insulation properties. More air equals a tighter fit and greater insulation, while less reduces insulation and results in a looser fit. The exterior of the Aerostich is Gore-Tex Windstopper fabric, but there are no external pockets. However, the nylon interior side has three large YKK-zippered pockets with pulls, three supplemental non-zippered storage areas, and storage for the air inflation tube. There are no provisions for integrating heated gloves with the liner's input power wiring, as on the FirstGear and Gerbing's liners. A detachable coil cord with lighted on/off switch is included and connects to the Kanetsu's integrated SAE connector,

which is sewn into the left front inner zippered pocket. As expected from an Aerostich garment, the Kanetsu's overall build quality is superb.

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The Kanetsu lives up to the Aerostich's reputation and was the best of all liners tested. Also, compared to the other two jacket liners, the Kanetsu did an admirable job of blocking windchill. Its Windstopper exterior and airadjustable insulation allowed for a lower setting on the controllers to achieve the same equivalent feeling of toasty warmth as the other two liners on higher settings. Heat was evenly distributed, with no dramatic cold or hot spots detected. However, its puzzling lack of integrated glove wiring kept it from being considered as a practical alternative to the other two liners. Using it with heated gloves-a common configuration of heated gear use-meant running an unwieldy separate set of glove power wires through the sleeves of the liner or outer jacket, as well as mandatory use of a dual-type controller, two separate single output controllers (one for liner, and one for gloves), or purchasing a

separate splitting cable. Users of the FGW&S and Gerbing's liners are spared from this inconvenience. Likewise, the Kanetsu's lacks the exterior pockets that are standard issue on the other liners.

# Vests: 1st Place, EXO<sup>2</sup> Stormrider Bodywarmer \$134.99 2nd Place, Tourmaster Synergy \$134.99

EXO2's line relies on a new polymerbased heating element made of FabRoc, a rubbery black material less than 1mm thick which is laid throughout the garments. The company claims as one of the main benefits of this material that it can continue to operate even if it is slit or torn, with no possibility of short circuiting, unlike wire-based systems. Its Sri-Lankan-made Bodywarmer vest has a windproof, waterproof AirXtreme shell and 100% polyester lining. The jacket feels very plush, flexible, and crushable. A quartet of FabRoc panels supplies the advertised warmth of 122° F at a total draw of 34W. Two external zippered pockets with large pulls are included.

Tourmaster is the only manufacturer here to include a variable temperature controller with its gear. Each waterproof controller can vary the temperature in 3 steps (low, medium, and high settings). The wiring used is especially stout, and Synergy gear can be interconnected accordingly. The Chinese-made Synergy line relies on carbon fiber elements to provide the requisite heat. Our size M Synergy vest has a nylon exterior and polyester lining, with 100g Polyfill insulation and elastic side panels. Like the gloves, it has its own integrated controller, which has an included belt clip, as well as a Velcro strap the rider can wrap around his left thigh to clip on the controller.





Advertised warmth at the highest setting is 167° F, at a total draw of 52W. Two external zippered pockets are included. The vest weighed 1.32 lbs., including 0.14 lbs. for the integrated controller.

Both vests were comfortable down to about +30° F, at which point the jacket liners become preferable because of their heated sleeves, collars, and (in the case of FGW&S and Gerbing's) integrated glove wiring. The EXO<sup>2</sup> Stormrider Bodywarmer is a much more luxurious vest, softer to the touch and of an overall higher build quality. Its price (with a controller factored in) is more than twice what the Tourmaster Synergy vest (with its included controller) costs, but in fairness, it feels twice as expensive when worn. Despite the lab performances, the Synergy actually felt just as warm as the the EXO2 under all tested conditions, making the price differential very difficult to justify on the basis of primary function alone. Overall, it should be noted that the vests are not as versatile as their liner counterparts, which can be used in far lower temperatures due to their greater area of coverage (notably the neck and sleeves). (Note: Tourmaster offer heated jacket liners based on the vests tested herein.) Nevertheless, for those who need some extra warmth for their riding seasons between freezing and about +50° F, a vest is just the ticket.

## Gloves: 1st Place, Gerbing's G3

\$139.99

Our Gerbing's G3 tester gloves exuded robust quality, with even stitching and no loose threads. The gloves feature an "Aqua-Tex" windproof/waterproof membrane between its outer leather surface and the inner lining. 3M Thinsulate insulation is also included, and this size M pair weighs 0.68 lbs, 0.04 lbs. heavier than my original 1999 model Gerbing's gloves. Each glove is secured via elastic wrist and one hook and loop type adjustable strap on the gauntlet, and the palms have gel padding. These gloves are advertised at 135° F surface temperature and rated at 13.5W each.

Of all the gloves tested, none delivered the winning combination of quality, performance, fit, comfort, and value as well as the Gerbing's. The G3 gloves were incredibly comfortable under all conditions, from the moment they were donned. They are very well put together, properly insulated with seemingly no wind permeation, and have a timeless styling that is universally appealing. They also competently performed their primary function of keeping the hands warm for extended periods of time in the lowest temperatures tested, without any negatives to report.



## Gloves: 2nd Place, EXO2 Stormshield

\$229.99

The Pakistani-made EX0² Stormshield gloves are rugged yet handsome, with the main Cordura fabric accented with cowhide leather and white stitching. There are also faux carbon-fiber knuckle protectors and a matching weave "Carbo-Leather" on the pinky-side outer material, as well as the gauntlets. A Porvair Porelle windproof/waterproof membrane and 3M Thinsulate insulation are also included. Overall weight is 0.66 pounds for size L. Each glove is secured via elastic wrist and two hook and loop type adjustable straps on the gauntlet. The palm area has a grippy Amara synthetic leather material, as well as reinforcement on the outer palm area. Visor wipes are included in both left and right thumbs. The gloves are advertised at 124° F and rated at only 7W each.

Based purely on heating element performance, the Stormshields are the gloves to beat. They warmed up quickest and were the most efficient, with a draw of around half of all the other gloves tested. The interior of the glove is somewhat less "cushy" than the others, but insulation is excellent, and the FabRock heating elements are less detectable than all the other gloves tested. These gloves certainly feel as though they would offer excellent crash protection, but the price is a whopping 1.6 times more than the Gerbing's G3.



## Gloves: 3rd Place, FirstGear Warm & Safe

\$129.95

FirstGear's Warm & Safe (FGW&S) Pakistani-made gloves demonstrated solid construction, with tight seams and no loose threads on our test examples. This model features a Porvair Porelle windproof/waterproof membrane between its outer leather surface and the inner lining, supplemented with 3M Thinsulate insulation. The size XL test pair weighs a relatively light 0.58 pounds. The left glove has a rubber face shield wiper, and each glove is secured via elastic wrist and two hook and loop type adjustable straps on the gauntlet. The fingers are pre-curved as well, for a comfortable, broken-in feel the moment you put them on. Oddly, FirstGear advertises the gloves to have reflective piping, though there was none on the test set. These gloves are rated at 15W each.

The FGW&S gloves have a classic style and are very comfortable, second only to the Gerbing's in that regard. They were warm, though when temps dipped below +25° F, the fingertips of the gloves were noticeably cooler than the rest of the hand. With some more heating material or better insulation at the fingertip region, this glove's showing would have improved.



## Gloves: 4th Place, Tourmaster Synergy

\$169.99

The size L Tourmaster Synergy gloves tested feature a goatskin leather exterior with Rainguard waterproof membrane. The thumb and first two fingers have a palm-side Clarino panel for added grip. 3M Thinsulate is included, as are two generous swatches of Phoslite reflective material on the outer wrist area of the gauntlet. The left thumb has an integrated rubber visor wipe. On the highest setting, these gloves are advertised at 161.6° F surface temperature and rated at 12W each. The pair weighed 1.18 lbs., including 0.24 lbs. for the integrated heat controller (see arrow).

The Synergy's last place-finish comes simply down to warmth, or in this case, lack of it. As shown in the lab, tested on the highest setting, these gloves were not in league with the others. Tourmaster deserves credit for innovative ideas like the integrated controller, and features such as the reflective piping sadly missing on all the other gloves. Yet, the primary functional requirement of a heated glove is to keep hands warm in freezing temperatures, and here the Synergy gloves need improvement to compete with the other gloves in this test.



## **Product Comparison**



The EXO<sup>2</sup> Stormrider temperature controller mounts perfectly on our BMW RT test mule using existing handlebar hardware.

MCN tested three temperature controllers during this comparison: the EXO2 Stormrider Controller (MSRP \$53.99), the FirstGear Warm & Safe Dual Portable Heat-Troller (MSRP \$99.95), and the Gerbing's Portable Dual-Temp (MSRP \$99.95).

Unlike either the FGW&S or the Gerbing's controllers tested, the Stormrider has only one output. The controller itself is a small waterproof box with a 0.5" digital readout, and two flush membrane-type buttons to control on/off and temperature level. Temp control varies from 0 (off) to 9 (full power), and tapping the "H/L" button moves the temp readout in increments of 1. A substantial aluminum mounting bracket is included, and its power cord is fused at 10A maximum.

The Heat-Troller is a familiar face to winter riders, a proven design that has seemingly been around forever. In this latest guise, the FGW&S Heat-Troller allows two pieces of gear to be controlled independently, via two separate knobs. Each knob is about 0.65" in diameter, and is marked so its position can be seen, but has no tactile detents to allow the rider to "feel" the knob turning, other than the initial on/off position. Two LEDs (one for each knob) indicate when power is applied on each respective output, and its power cord is fused for 15A maximum.

Like the FGW&S Heat-Troller, the Gerbing's design also allows two pieces of gear to be controlled independently via two separate knobs and corresponding LEDs. The Gerbing's knobs are tapered from their

0.58" tips to 0.68" bases, and are not marked, so the rider cannot tell at a glance where the knobs are set. Also, like the Heat-Troller, the Gerbing's knobs have no tactile detents besides the initial on/off, and its power cord is fused for 15A maximum.

After spending months in below-freezing cold with all three of these designs, it's safe to say there really is no comparison. For motorcycle use, the mounting, ergonomics, appearance and value of the EXO<sup>2</sup> Stormrider controller render the other two designs near obsolete, as follows:

#### Mounting

The Stormrider's included aluminum mounting bracket is extremely well designed, and solidly constructed. Combined with the controller's small size, it allows for very easy mounting on virtually any motorcycle, using the existing hardware in the switch housings or handlebar clamps as the most obvious location. Once mounted, it looks almost OEM, as shown

here in the lead photo. By contrast, both the FGW&S and Gerbing's designs must somehow be mounted with velcro, zip ties, double-sided tape, or some other creative means (none of which are included) to a flat surface on the motorcycle, tank bag, pant leg, or elsewhere. Ultimately, most attempts look relatively slapdash, and are not nearly as stable or secure from theft as the EXO2's sturdy integrated metal bracket.

Unlike most other "permanent" controllers (not tested here, but similar in appearance and function to the FGW&S and Gerbing's models), the EXO<sup>2</sup> requires no drilling or otherwise permanent modifications to the motorcycle to mount it. On the RT test mule and most other bikes, the existing handlebar hardware is all that is required, and the Stormrider controller can be removed for the season or swapped between multiple bikes in just a few minutes.

#### **Ergonomics**

Likewise, there is no ergonomic comparison between the Stormrider controller and the other two. The EXO2 boasts a huge numerical LED temperature setting readout which the rider can easily see at a glance, and the membrane button to adjust the temperature is very easy to actuate with a gloved finger. By contrast, the other two designs relay their operational status with tiny LEDs which are difficult or impossible to see from the saddle (depending on mounting orientation), and both also utilize small knobs which have no tactile feel when adjusted. At least the FGW&S knobs are marked-with the Gerbing's unmarked knobs, the rider has no means whatsoever to discern what the settings are by looking at the controller. Worse, the Gerbing's tapered knobs are miniscule and placed close together, making them difficult to manipulate with a gloved hand.

Both FGW&S and Gerbing's offer belt-mounted pouches at additional cost in the \$12 range. These allow the controllers to be mounted on pocket lips, clipped to tank bags, and more commonly to the waist-belt of winter jackets. Ergonomically, this is also subpar, usually putting the controller completely out of sight of the rider while seated on the bike, and requiring "feeling around" for the tiny, detentless knobs to adjust.

#### Appearance

The high-tech digital appearance of the Stormrider controller is unquestionably far more aesthetically pleasing than the





FGW&S or Gerbing's controllers, neither of which has changed in years. When mounted, the Stormrider simply looks more at home on a modern motorcycle.

## Value

When considering a Stormrider controller's value, one must know it is only available with one output, and that output is limited to 10A. However, for those who demand dual output, they can simply buy two Stormriders for just a few dollars more than either the tested FGW&S or Gerbing's dual controllers currently cost. As an added bonus, they will gain 5 more amps of capacity (for 20A total) to boot by doing so, since the other dual-controllers are limited to 15A maximum. Clearly, the Stormrider is an outstanding value.

Some riders who cling to habit may find our criticisms of the FGW&S and Gerbing's controllers harsh, but after using them ourselves for many years now, we feel justified in our praise of the Stormrider controller as a genuine game changer. In short, unlike the other two, it feels as though it was designed from the

outset with a serious motorcyclist's convenience in mind. We found plugging the gloves into the jacket liners (or using a splitter on the EXO2 vest and Kanetsu) for single-output control was perfectly comfortable under our test conditions, though some riders who demand dual-control will in this case require two Stormriders. Either way, this controller was far and away the single biggest revelation of this test, and undoubtedly a worthy upgrade for any winter rider.

#### Conclusions

But for lack of space, we did not delve into the myriad of wiring options and connector choices, but suffice it to say that a read through the owner's manual of your heated gear prior to first use is a good idea. Pay special attention to instructions about not layering underneath any heated gear, so as to keep the warm elements close to the body. Some manufacturers frown on "mixing and matching" various brands of gear and controllers, but we did not have any issues doing so during testing - our favorite setup wound up being the FGW&S liner, Gerbing's G3 gloves, and EXO2 controller, which all worked together flawlessly. Don't forget to check the owner's manual of your particular motorcycle to determine its alternator's capacity, to ensure the gear you pick doesn't overload the system.

Once these issues are tackled, you will discover that there are, indeed, changes afoot in the world of heated gear. The wiring so easily felt in the old gear has been replaced by more advanced heating elements which warm up faster, are more resilient, and are infinitely more comfort-

the newer designs. Integrated controllers like Tourmaster's are an example of an ergonomic breakthrough. EXO2's Fab-Roc material proved that heat can be generated much more efficiently than before, allowing riders of smaller or classic motorcycles without much excess alternator capacity to consider heated gear anew. New battery technologies are changing the face of the industry as well -EXO2, FGW&S, and Gerbing's all offer hybrid Lithium powered garments, extending the potential uses of heated gear off the bike as well.

Ultimately, all of these significant improvements mean motorcyclists with old gear should, indeed, consider replacement, if only to take advantage of some of these benefits. Indeed, all of the gear tested here seriously outclassed my decade-old garments in any functional category that matters. Finally, always remember winter riding carries with it a higher set of risks, from the salt which slowly eats away at engine cases to the black ice that can bring even the most skilled rider down in an unexpected instant. Please use extra caution, but at least do yourself the favor of staying warm while doing it!

and hot spots are thankfully absent from



