

THE HomeWall Manual



**BUILD
A HOME
WALL FOR
LESS THAN
\$200**

*Step-by-step
instructions*

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Plus

HOW TO TRAIN ON TWO SHEETS OF PLYWOOD

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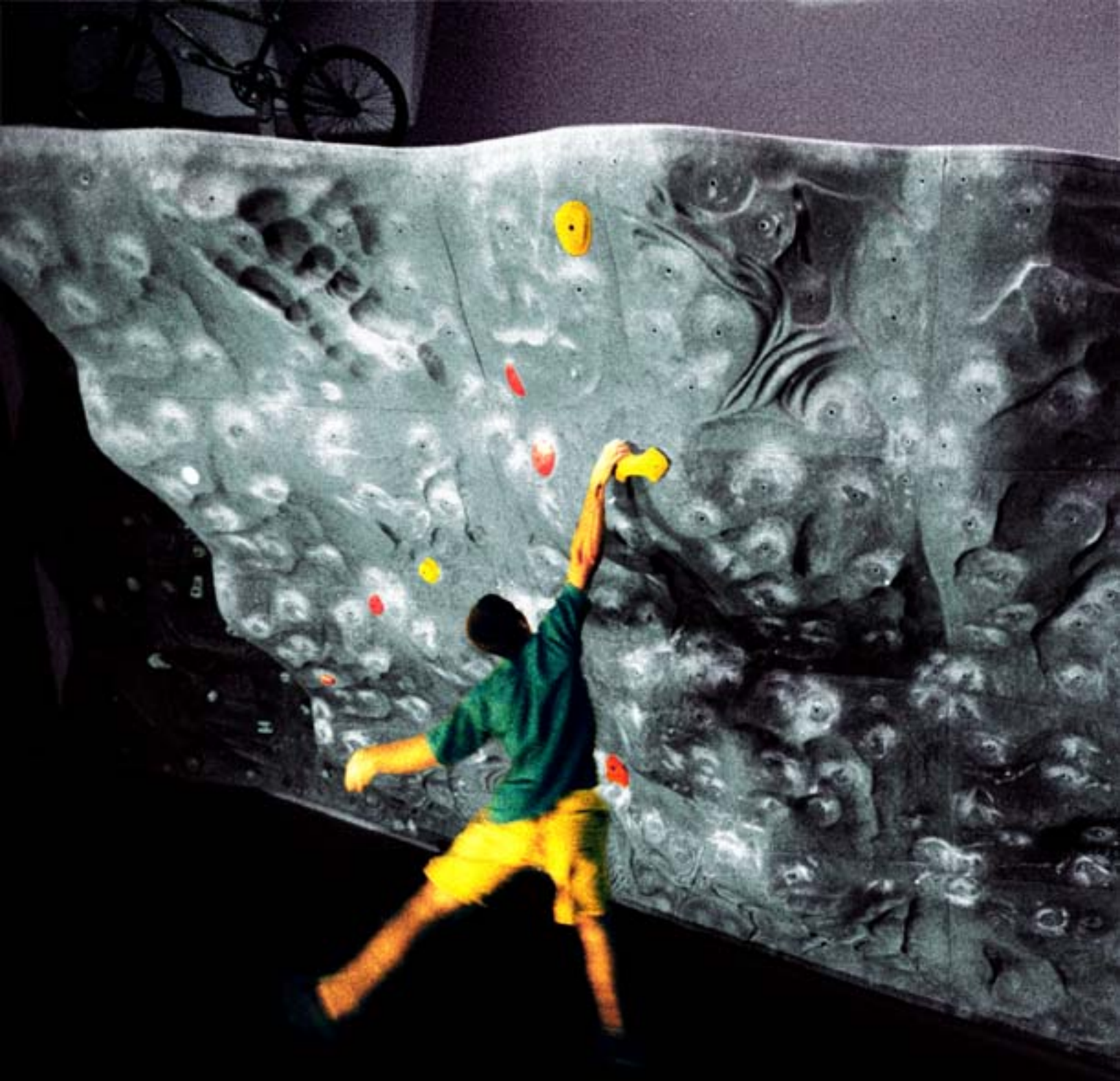
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Above: Chris Sharma flying between two holds on the Nike wall in Beaverton, OR. Lance Armstrong's first BMX racer is displayed on top of the wall, upper left. Boone Speed photo

Two Sheets, Some Plastic and a Pump!

by Jeff Leads | photos by Mike Hill

Overworked? Under-played? Want to climb harder? You need a woodie!

Unless the local crag or climbing gym is just around the corner, it's extremely difficult to maintain top climbing fitness without a home wall. And although elaborate, multi-faceted walls are nice if you have the bucks and the space, you don't need the home version of a commercial climbing gym to get in shape. The step-by-step instructions below will help you build a simple, free-standing wall that costs less than \$200 (holds not included) and occupies half a room. With this wall, you can maximize your climbing potential with minimum impact on your wallet.

Of course, you can always build a more complex wall later. For example, you can easily add a short, vertical "kicker board" at the base, to maximize an overhanging wall's usable space. But this is enough to get you started. Don't wait for a rainy day — get your mojo going and you can build a great little wall and start training in one weekend.

BUDGET Since most of us would rather spend money on a trip or bigger rack than on our home wall, we want the most for the least. The biggest variable is the number and type of holds used. Though you will install 234 T-nuts (save money by buying these at a hardware store) for bolting on holds, you won't need that many holds. You can start with 30 to 40 (about \$150 to \$200) and add more as your budget permits.

The basic components for constructing your wall can be found at any hardware store or lumberyard. Below are estimated prices, though you can expect some fluctuations depending on where you live and shop.

MATERIALS

- (2) ½" ACX Plywood
- (4) 2" x 4" x 8' kiln-dried
- (6) 2" x 4" x 92½" studs
- (2) 2" x 4" x 10' kiln-dried
- (2) 2" x 4" x 12' kiln-dried
- (2 lbs.) 2½" drywall screws
- (2 lbs.) 16d vinyl sinkers (a.k.a. 16-penny nails)
- (240) ½" T-nuts
- (1) ½" Allen wrench
- (1) ¾" Allen wrench



- (4) ¾" x 4" bolts (2) washers/nuts
- (2) ¾" x 5" bolts (2) washers/nuts
- (1) six-pack Avery Red Point Ale

Total

TOOLS You probably own most of the tools needed to build your wall. If not, some tools can be purchased cheap or borrowed from a friend. You're not building the Taj Mahal and thus won't need a lot of special tools that have limited uses. In fact, this wall was designed to be constructed with minimal measuring and no cutting — thus reducing the number of tools and amount of skill and experience required. The wall in the following photographs was built with just the tools listed below.

- 13 oz. standard claw hammer
- 3/8" chuck electric drill
- Tape measure (20')
- 7/16" wood bit
- Phillips head screwdriver bits
- Friendly assistant (optional)

LOCATION Where you put your wall must be considered before you start construction. The wall will be roughly an 8 foot by 8 foot structure, with some additional bracing for adjustability. The best location will be easily accessible and have

a pleasant environment, making the training experience as enjoyable as possible.

A garage is probably the most popular place because it is usually attached to your house and has electricity for lighting, a cooling fan, heater and tunes. You can train in the garage regardless of the weather or the time of day — two important considerations. The wall we build will still allow for two cars to be parked inside. Another bonus is most garages have open framing (exposed wood studs) that are easy to tie into the wall for additional support.

You could also consider a carport in an apartment complex, but this may not be as secure as you would like, and you may need to get the landlord's permission.

Outside is doable, but you have no control over the weather. If it's hot or cold, you may not want to train. Water from rain or snow can cause problems by warping the frame or causing the plywood panels to delaminate; apply an industrial coating for protection. Use the more expensive plated T-nuts for outdoors, or the bolts will inevitably rust light.

Basements are usually cool in the summer and warm in the winter, and they are out of the way yet accessible. However, they can be dark or dank. And I live in California and don't know a single soul with a basement!

Attics will work but can be too hot during the summer, though bearable during the winter months. They also sometimes have limited head space, which may be a factor since the wall will be a little over 8 feet high. Moreover, many attics are not constructed with flooring, thus creating the possibility of crashing spectacularly through the drywall into the living room.

Stairwells are popular with apartment and dorm dwellers who have no alternatives. But they are generally too narrow for a decent wall and are often limited to campus boards. Of course, you could always set up in the living room — but you'd better be a skilled negotiator to win the approval of non-climbing roommates or family members!

DESIGN A fixed-angle wall is not nearly as versatile as an adjustable wall, which takes a little more planning but not a lot of additional money. You will end up with two sheets of plywood (with 2x4's screwed into the back side for structural integrity) that can be tilted to the desired angle by one of two methods.

The option shown in this article is to build a frame on which you can change the angle of the freestanding wall. The frame is to be constructed out of 2x4's and fixed (bolted) on top and bottom. We'll also construct arms out of 2x4's that will allow us to adjust the wall to 90, 75 and 45 degree angles.

For homeowners who don't mind minor

alterations to their property, a semi-permanent option does away with the frame. There are numerous ways to vary the wall angle, and we'll leave that up to your ingenuity (or a skilled friend). Be aware that if something flexible, such as a chain or webbing, is used to support an angled wall, a lunging climber can push the wall inward and then put a very large outward

pull on the anchors.

For a wall of this size, a grid pattern is the best choice for the T-nuts. Though some may consider this limiting, it actually gives you maximum freedom while still allowing the use of matched system holds. Our wall has 117 holes per panel, giving plenty of flexibility in hold placement.

Building your Wall

Follow these simple steps for a sturdy home wall. They will get the job done in only eight to twelve hours.

When shopping for lumber, it pays to take a little time and search through the stacks of wood. Check for straightness by sighting down the studs, and beware of large knots that can weaken the wood. Although you can build a cheaper wall with CDX plywood, it splinters easily and T-nuts can pull through — don't skimp here.

Once back at the work site, unload all of the building materials and lay them out on the floor.



MAKE A GRID First you'll draw a grid on the plywood, so the T-nuts line up and do not interfere with the studs.

- Take a couple of the 2x4's and lay them on edge about five feet apart. Place the two sheets of plywood on top of the 2x4's with the smoother sides face to face. (This is important to minimize splintering on the climbing surface.)

- Line up all four edges of the plywood so they are lying on top of each other exactly (photo 1).

- Grab a tape measure and a pencil, and mark the eight-foot length every seven inches (photo 2) down both edges of the plywood sheet. The last line will be five inches from one end.

- Mark the four-foot edges every five inches. The last line will be three inches from the end.

- Assuming you don't have a carpenter's chalk line, use another 2x4 to act as a straight edge (photo 3). Take a pencil and connect the lines along the narrow side and the long side of the plywood.

INSTALL THE T-NUTS T-nuts are the metal fasteners into which you bolt your hand and footholds. To install them, you first drill holes in the plywood.

- Drill a test hole with the 7/16" wood bit to make sure your T-nuts fit. A few T-nuts require a 1/2" bit.

- Making sure both sheets of plywood still line up square with each other, drill holes where



the grid lines that you drew intersect each other (photo 4). By lining up the plywood, we are able to drill both sheets of plywood with the same grid pattern.

- If you're going to paint or texture the wall, now is the time to do it, so you don't gum up the threads of the T-nuts. Most climbers don't bother.

- Once you've drilled the 117 holes, grab the bag of T-nuts and prepare to beat them into the plywood.

- Place the bad side of each plywood sheet face up. Take a hammer and pound the T-nuts into the plywood, splinters and all. Try to hammer the T-nuts as flat and straight as possible (photo 5); if you pounded them in at an angle, you'll never get the bolts for the holds to line up.

BUILD THE FRAME You and your holds are heavy, so you're going to build a solid frame to hang all that weight from! What you'll end up with is an 8-footer on the bottom running horizontally, six studs running vertically, and finally two 8-footers on the top running horizontally. The frame is a near perfect square, slightly taller than wide.

- Go back to the wood pile and grab two 8-foot 2x4's. Lie them on edge, parallel to one another, approximately eight to nine feet apart.

- Then grab two 92 1/4-inch studs and place them so they complete the square, with the two 8-footers on the top and bottom (photo 6).



- Grab the hammer and bag of 16d vinyl-coated sinker nails. You can also use wood screws at this step, but this is more difficult and expensive. The advantage is it makes disassembly easier when it's time to move your wall.

- Place the 8-foot boards flat on the ground and start two nails on each end. Then stand the boards on edge. Place studs between the 8-footers to form corners and nail them together.

- Mark the 8-foot boards in 24-inch increments.

- Locate the other studs at the center of each mark (photo 7) and nail them in place (photo 8). I like to use two center studs next to each other for added strength, but it is not totally necessary.

- You should now have an 8-footer on top and bottom with six studs nailed in between at 24-inch intervals.

- Take another 8-footer and nail it to the top of one of the other 8-footers, using a 16d nail every foot (photo 9). This stiffens and strengthens the climbing wall.

ATTACH THE PANELS Time to complete the climbable surface. Once you're finished, the 64-square-foot wall should hardly flex.

- Place the two plywood sheets on the frame horizontally (photo 10) with the good side of the plywood facing upward and the 3-inch T-nuts at the top of each sheet, so you don't have a big gap in the middle of the wall.

- Square all of the corners (photo 11) using the plywood as a guide; you don't need a carpenter's square.





- Then grab the drill and install a Phillips head bit. Get the box of drywall screws and screw down all four corners of the plywood sheet to the frame (photo 12).

- Double-check that the wall is square. Then put a drywall screw about every six inches around the plywood panel and down the center of each stud.

- Now you are ready to add the second sheet of plywood. The first sheet will act as a guide for the second sheet. Again put screws in the corners, and once you are sure everything is in the right place, put screws every six inches along the edges of the plywood as well as into the studs.

- If you have two large jug holds handy, you can attach them in the center to make moving the structure easier.

CREATE THE BASE Now the wall needs legs to hold it up without tipping over when you dyno. These legs will be splayed outward to add stability and to keep you from bonking your head if you come off.

- Place the two 12-foot 2x4's along both sides of the climbing wall. This is when an assistant comes in handy to keep the wall from falling over.

- Make a mark 36 inches from each end of the 12-footers (photo 13). This will become the pivot point for the wall when you adjust the angle. Measure down 1½ inches and mark here (photo 14).

- Adjust the boards so they are seven feet apart at the back end and 13 feet apart in the front to achieve the proper angle.

- Get out the drill with the 7/16" bit and drill a hole through the frame and all the way through the climbing wall with one push (photo 15), being careful not to alter the angle of the boards.

- Insert a 5-inch 3/8" bolt with a washer (photo 16) and install a washer and nut on the other side. Replicate this whole procedure on the other side of the wall. Do not tighten up the bolts.

- Going to the back of the wall, make another mark six inches from the ends of both 12-footers.

- Using the claw end of your hammer to lift the structure, slide an 8-foot 2x4 underneath (photo 17) to the edge of the marks. This will anchor the legs and lift the bottom of the wall off the ground, allowing it to pivot without moving the entire frame.

- Angle the 12-footers so that the short ends are five inches from the end of the 8-footer. Toe nail (photo 18) the legs to the 8-footer.

MAKE THE SUPPORT ARMS Now you're ready to add the arms that support you and the wall. To adjust the angle of your wall, you'll simply move the bolts that attach these arms to the wall.

- Go to wall and measure down each side 8



inches from the top. Drill through the center of the frame boards with the 7/16" bit (photo 19).

- Measure 12, 18 and 24 inches in from one end of the 10-foot boards. Drill 7/16" holes through the center of the

board (photo 20). You can add more holes in two-inch increments for different angles, but three should suffice for most climbers.

- Using the outermost holes, bolt the 10-foot adjustable braces to the frame with a washer on each side (photo 21). Don't tighten the nuts yet.

- With the wall in its vertical position, line up the braces with the feet and drill through both boards (photo 22).

- Insert bolts and washers through the freshly drilled holes. Snug up all the bolts, but don't crank them too tight.

- Optional: I slide an extra sheet of plywood under the climbing structure. This adds nothing structural, but creates a base and helps protect the flooring.

- You should now be looking at a wall with feet that flare for stability and adjustable braces to vary the climbing angle (photo 23).

INSTALL YOUR HOLDS Last but not least, install the holds (photo 24).

You have an almost unlimited assortment of hand- and footholds to choose from. Holds are like people: There are good ones and not-so-good ones. Fortunately, there is an abundance of good hold manufacturers to choose from.

Since this is a "budget" wall, you might be tempted to make your own holds. Although fairly simple and very cheap, homemade holds are often a big mistake. The quality of the climbing

holds, both in style and texture, is far more critical on a tiny wall than in a huge, full-garage project. Make every hold count or your training will be compromised.

A good starting point when shopping for holds is to buy a few from several manufacturers and get a feel for the ones you like. One good way to economize is to mix in screw-on holds for footholds and intermediates, though you do lose ease of rearrangement.

Mimic real rock and don't use all crimps or buckets or side pulls. Remember that many holds are designed for multidirectional use.

Many companies now offer matched sets of system holds that help you isolate and train your weaknesses. These are a very good way to



maximize your training on a small wall. Campus rungs are another option for advanced climbers, but do not work the "core" muscles as effectively.

Throw down a thick crash pad. It's time to pump you up!

Jeff Leads built his own home gym and has helped build a half-dozen walls for friends because he has the tools and experience ... and he can't say "no." He lives on a farm in Vista, California, with his wife and three daughters. ▲

Working your Woodie

How to get the most out of a simple home wall *by Eric J. Hörst*

Congratulations! By building a woodie, you have just made the single best investment in your climbing ability. Nothing beats a home wall for efficient and effective training.

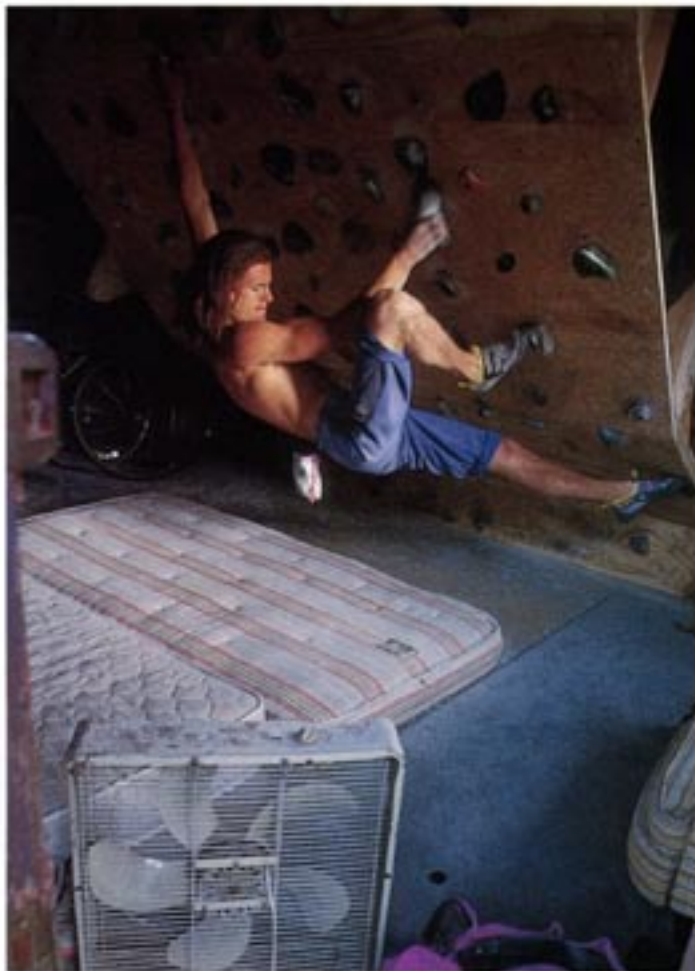
So what's the best way to train on your new wall?

First, realize that you don't have a full rock gym, but instead a small woodie that has many limitations. Consequently, you must adopt a different approach to "climbing" at home. Your woodie is simply a training tool, a means to an end, much like a StairMaster or free weights. To view it otherwise guarantees you'll soon burn out on the wall, get injured or both.

Your inaugural workouts will no doubt turn into day-long "route setting" and bouldering sessions. But in a few months, your enthusiasm probably will wane. Never fear. The strategy below will help maximize your wall's effectiveness as a training tool while reducing the risk that you become so bored you'd rather lead an X-rated 5.11.

TRAINING OVERVIEW Face it, you're only going to practice a small range of climbing skills on your woodie (drop knees, body tension, deadpoints, toe-ins, lock-offs, etc.). Climbing outside at a wide range of crags is the only way to develop all the techniques you need to excel. Your woodie's real value is in sport-specific strength training, not improving technique.

First of all, the best fitness training programs are holistic, cyclic (periodized) and planned out weeks in advance. Your woodie facilitates an important part of such a program, namely climbing-specific strength training. Note that there are other key elements, including aerobic and "push muscle" training, that you don't want to overlook. See my Performance articles in *R&I*



CHRISTIAN "VERVE" GRIFFITH DOIN' THE WOODIE.

#91 and #94 for more ideas on incorporating a woodie into a comprehensive training program.

Here, we'll concentrate on the "pull muscles" of the upper body. Even the 8-foot by 8-foot wall described in this supplement is more than enough to train all the important grip positions (crimp, open-hand, sloper, pinch), arm positions (down pull, lieback, undercling, gaston) and basic movements (slow pull, lock-off, lunge). By the way, a set of system holds can greatly improve the efficiency of such a small wall. These give some of the same benefits of no-foot campus

training, but, by forcing you to use your feet, also help train your core abdominal muscles.

Any strength-training program has to encompass all three strength modalities — endurance, anaerobic endurance and max strength (anaerobic). You can roughly gauge which mode you are training by the number of hand/arm movements you make before reaching muscular failure. (Note: This is different from falling off because you couldn't technically do a move.) A single powerful move repeated up to 15 times trains the anaerobic mode. Sustained sets of between

15 and 40 moves before muscular failure train anaerobic endurance. And continuous, low- to moderate-intensity sequences of more than 40 moves primarily train local endurance. As a training strategy, it's best to focus each workout or a group of workouts on a single strength mode.

ENDURANCE Your goal here is long, steady "sets" of more than 40 moves that never produce a major pump, even at the end of the set. If you start getting pumped, reduce the wall angle, start using larger holds or end the set. It may be easier to time your sets, rather than count all the moves. Use a stop watch and climb nonstop for 5 to 15 minutes, then rest until you're completely recovered (usually 10 to 20 minutes).

Unfortunately, you'll soon discover that training endurance on an 8-foot by 8-foot woodie is the real workout from hell! It's mind-numbing and, at home, too easy to get interrupted and quit. Bottom line: Endurance training is best done by lapping moderate routes at a gym or crag.

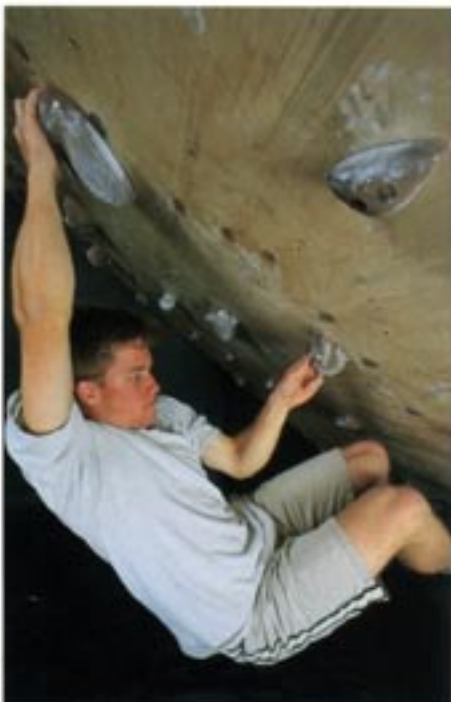
ANAEROBIC ENDURANCE (AE) This is the training mode most people are in on a home wall or gym cave — they climb continuous, moderate- to high-intensity sequences that produce muscular failure in 15 to 30 moves. Such AE sets produce a wicked pump and thus feel like the ultimate workout. And they are — for about six total sessions over two weeks.

Unfortunately, many climbers train in auto-pilot and end up in the highly stressful AE mode almost every session. Soon, their strength plateaus (or decreases) despite all the "rad" training they're doing. Over-training injuries often follow. Avoiding this downward spiral requires good training awareness,

self-discipline and a master training plan, such as the 10-week "4-3-2-1" workout program described in *R&I* #91.

To train AE on a woodie, begin on the smallest holds possible, then grab progressively larger holds just as they're needed to hang on. Keep making "one more move" until you count up into the 15- to 40-move range. Fight to hang on through another painful, sickening move — AE training is all about stretching your mental and physical boundaries. Now rest 10 to 20 minutes and do two or three more sets. Again, this is not a good every-day strategy — plan 6 to 8 (at most) AE workouts per 10-week cycle.

MAXIMUM STRENGTH Training maximum strength is where a home woodie really rocks, since it takes only a few maximum-intensity moves to produce the desired training effect. The primary focus is on developing greater grip strength, with a secondary focus on arm pull and lock-off strength.



RYAN CORMEY

Optimal training is accomplished via 1- to 15-move sets, where each move is at absolute maximum physical intensity. It's important to distinguish between "maximum physical intensity" and "maximum technical difficulty." Training maximum strength is best done by minimizing technical difficulties and by maximizing the sport-specific stress on the pull muscles.

There are three basic ways to increase the physical intensity of movement: make the wall steeper, move the holds farther apart or make the holds smaller. Do all three and intensity skyrockets!

Unfortunately, there are limits. Wall angles

more than 60 degrees past vertical are too roof-like for focused strength training. Holds too far apart may make moves too difficult, which means you'll fall off before muscular failure. And tiny holds are just too painful to train on maximally and too easy to slip off before muscular failure.

The solution is simple — hypergravity! That is, increase gravity's apparent pull by adding weight to yourself while training. This allows you to keep the holds moderately spaced and of decent, non-painful size (one full "pad" at the smallest). Furthermore, you can set your wall (or permanently fix it) near the "best" training angle of 45 to 55 degrees past vertical.

The maximum strength workout now becomes straightforward. Climb brief, maximum-intensity sets that produce muscular failure in fewer than 15 moves. You can add or subtract weight (use a padded weight belt) and grab slightly larger/smaller holds as needed to accomplish this goal. Rest for about two minutes between sets, and repeat 5 to 15 times. Do no more than nine such workouts over a three-week period. (Again, check out the 10-week schedule in *R&I* #91.)

Hypergravity training is not for novice climbers or anyone with a recent injury. It requires both a mature approach and keen awareness of your limits. Warm up gradually before adding weights to the mix, always tape your fingers, and keep the weights light for the first few cycles (i.e., 5 to 10 percent of body weight). Finally, avoid grabbing any gnarly, treaky or otherwise uncomfortable holds; use only smooth, rounded "training holds".

MOTIVATION

- Get on a training schedule. Maintain a training log with a workout checklist, time line and other details ("weight added," etc.).
- Keep your workouts short — one hour if training by yourself; two to three hours if sharing your wall with others.
- Limit yourself to a maximum of four days per week on the wall — two days, or fewer, if you're climbing outside.
- "Freshen up" the wall each month by rearranging holds or adding new ones. You may also want to consider the economy of adding some system holds to the mix.
- Play good tunes, visualize great climbs and have fun!

Eric J. Hörst is author of Flash Training and How To Climb 5.12. ▲

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