



# VISION FEEDBACK

How to enter the zone and gain heightened states of concentration with visual and auditory biofeedback training

by David Hampton

Professional and elite amateur athletes have been using it for more than two decades to train and improve their peripheral awareness, concentration, and eye focusing skills. It's a vision biofeedback device called the Accommotrac Vision Trainer and it's the central piece of training equipment you'll find at the Columbia, South Carolina-based Vision and Athletic Performance Enhancement Center, more commonly known as VAPEC.

"We work with athletes from the high school level to professional and Olympic levels to improve their athletic performance," says sports vision optometrist Dr. Jeff Magun, founder and director of VAPEC.

"Athletes who've undergone training with the Accommotrac have developed a faster reaction time, a more in-the-zone mindset and enhanced peripheral awareness," says Magun. "It can even help athletes to achieve a slow motion phenomenon in which actions during a sport performance appear to be significantly slowed down."

Through a biofeedback process involving sight and sound, the Accommotrac teaches athletes how to voluntarily control the eye's focusing muscle. Magun says it takes a lot of practice and a great deal of motivation to learn to control the focusing muscle of the eye. But, once an athlete has acquired this skill, it can be instrumental in reaching heightened states of concentration, otherwise known as being in-the-zone.

Magun speaks from personal experience. He has a long history of participation in competitive athletics starting as a shot putter in high school, a swimmer in college and a long distance runner after his optometric education. Three years ago, Magun began an experiment of sorts using the Accommotrac as part of his training regime as he studied and competed in American freestyle karate. In December 2007, he received his First Degree Black Belt and credits much of his success in competitions to vision biofeedback training.

**Background.** The Accommotrac was invented by optometrist Dr. Joseph Trachtman and is based on vision research performed by NASA's Ames Research Center and a special optometer developed for the Ames program by Stanford Research Institute.

Researchers were looking for a way to overcome an aviation phenomenon known as "empty field myopia"; the potentially dangerous tendency of pilots to absently focus on the windscreen instead of scanning the sky for hazards.

Stanford researchers developed an optometer to measure visual accommodation, which is the eye's ability to adjust in order to maintain a sharp image of objects at various distances. While running experiments with the optometer on pilots, they discovered that humans could learn to control their eye focusing. By adding auditory biofeedback, researchers created an effective learning system to train pilots to improve their concentration and guard against empty field myopia—daydreaming.

NASA considers the Accommotrac Vision Trainer to be one of its greatest technological spinoffs.

**How it works.** In a darkened room, the athlete puts on earphones and places his head on the chin rest. He looks into the optical part of the Accommotrac and a harmless infrared light is directed into his eye. The focusing status of his eye is measured 40 times per second. As the athlete opens and closes the eye, an audible tone tells him how well he is controlling the focusing muscle.

As the athlete relaxes the muscle, the tone goes higher and the eye's focus goes to a farther distance. Conversely, as the athlete tenses the eye's focusing muscle, the tone goes lower and the focus draws nearer.

"The purpose of the training is to drive the relaxation of the athlete's accommodative mechanism to eventually trigger an increased visual awareness both centrally and peripheral-



**Distinguished athlete:** Hammer thrower Lisa Misipeka poses above with her bronze medal (and in competition; inset photo). She received vision biofeedback training at VAPEC and is a graduate of the VAPEC sports enhancement program.

Misipeka was the 1998 NCAA Champion in the hammer throw and won the bronze medal at the 1999 IAAF World Championships in Athletics. She is also a three-time Olympian and was the flag bearer for American Samoa at the 2004 Olympic Games in Athens, Greece.

ly," says Magun. "It causes an aggressive stimulation of the athlete's visual system that results in what you might call a hypersensitivity to everything surrounding the athlete."

Ironically, Magun says this hypersensitive awareness actually creates the relaxed alpha brain wave state of being in the flow or the zone, and facilitates an altered state of elite performance. In his experience, Magun says the results of vision biofeedback training include:

- Faster reaction times (an average increase of about 0.08 seconds).
- Increased peripheral awareness.
- Greater concentration and the ability to block out distractions.
- More efficient relaxation allowing for better athletic performance under pressure and in competition. ■

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