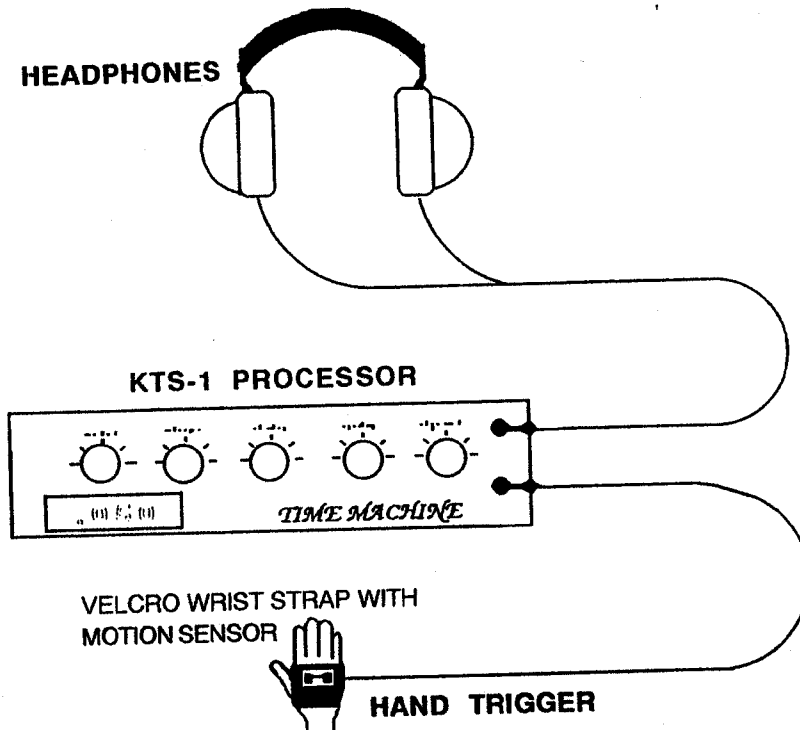


The **TIME MACHINE**

PROFESSIONAL SERIES MODEL KTS-1

AUTONOMIC TIMING ANALYZER & TRAINING SYSTEM



**AUTONOMIC TIMING • EYE-TO-HAND COORDINATION
MOTOR PLANNING
CONCENTRATION EXTENSION • SENSORY INTEGRATION**

Patents Pending
© **KINESTHETIC TRAINING SYSTEMS**

The KTS-1 Time Machine is the world's only interactive metronome. The original purpose of this learning tool was to help serious musicians master their artistic craft. However, its profound human developmental, rehabilitation and sensory integration capabilities have propelled the patented KTS-1 far beyond its original intent.

The Time Machine provides health care professionals with a high tech, numerically explicit (to 1 millisecond), yet simple to use means of accurately assessing a person's timing and motor planning proficiency. It also provides an expeditious, cost effective and enjoyable method of correcting existing psychomotor timing deficiencies and improving timing related motor skills. Learning on the KTS-1 is surprisingly rapid and improvements are retained indefinitely.

When the user "taps" their hand or foot along with the "beat" heard in the headphones, a motion sensing trigger worn on that limb sends a signal to the KTS-1 Processor. The KTS-1 transposes the timing information of each user tap into an easily recognizable sound. When a tap is early the user will hear its sound on the left side of the phones and it will be lower in pitch. When it is late it will be on the right and higher in pitch. When it's within an adjustable "right on" range (from 250 to 1 millisecond) the user hears a special sound in the center.

The Time Machine allows a person to hear exactly where in time her movements are occurring, as opposed to where she intends them to be. Recognizing one's own faulty timing habits through actual real-time experience has a profound, immediate and lasting impact on the user's mode of perception, motor planning ability and physical movements.

The user quickly learns that the more she relaxes and mentally flows, the more accurate she becomes. The exact spatial related KTS-1 sounds "hold" her physical motions progressively nearer to the center of time. The user systematically learns to maintain mental self-control for increasingly longer periods of time and to instantaneously make exact timing corrections without conscious effort.

Like "balancing" on a bicycle, after autonomic (correct) "timing" is experienced for a relatively short period of time it becomes imprinted on the kinesthetic motor memory and automatic. Recognizing and correcting a person's fundamental timing deficiencies dramatically improves their performance in all motor planning related activities. It also improves their self-image and overall quality of life.

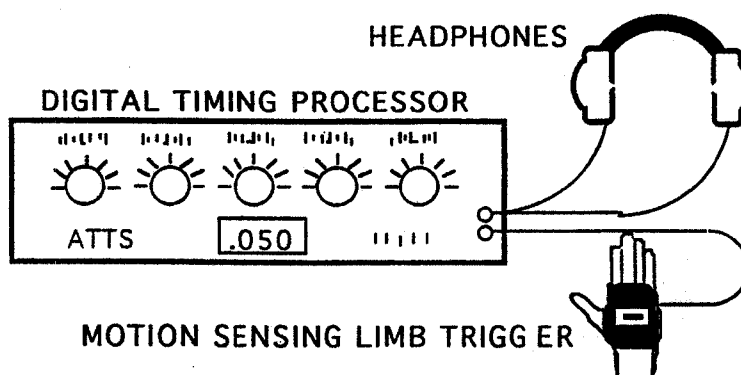
For information contact: Jim Cassily • Kinesthetic Training Systems
Wyoming MI (616) 538-6243

CHILDREN CALL IT "THE TIME MACHINE"

A Sensory Integrative, Fundamental Body Control
and Sequential Training Tool for 21st Century Quality Education

THE AUTONOMIC TIME TRAINING SYSTEM

Breakthroughs in computer chip and digital audio technology led to the development of the first physically and aurally interactive metronome by Kinesthetic Training Systems of Grand Rapids, Michigan. The original purpose of the patented Autonomic Time Training System (ATTS) was to help musicians and dancers master the rhythmic timing critical to their artistic craft. However, it quickly became obvious to experts, educators and users alike, that this simple to use, yet high tech, learning tool has "profound" human training and diagnostic capabilities that go far beyond its original limited intent.



Patents Pending

© Kinesthetic Training Systems, 1995

THEORY OF OPERATION

The ATTS uses the "tapping" of a limb (or movement of another body part) as a fundamental motor skill catalyst. When the user physically "taps" or moves a limb in time with a metronome type reference beat heard in the headphones, the trigger attached to that limb sends a signal to the Base Processor which:

- 1) analyzes exactly when in time the tap occurred in relation to the reference Beat,
- 2) transposes this timing information into an easily recognizable "pitch" sound that precisely changes according to its exact placement in time, the earlier the tap the higher the pitch, the later the tap the lower the pitch, and a special tone when it is "right on" beat* with it,
- 3) moves that sound to a right to left "location" that also represents the tap's exact spatial location in time; left for before, right for after and center for "right on",
- 4) instantaneously amplifies the sound and its location and feeds it back to the user in the headphones, and
- 5) in real-time, this exact aural representation of the user's timing is perceived simultaneously by the user's conscious mind and autonomic hearing mechanism.

A REAL-TIME TEACHING EXPERIENCE

The best way to teach someone to "balance" on a bicycle is to hold their seat so they can actually experience "balancing" near the center of gravity. Similarly, the ATTS's temporal and aural feedback help the user hold their physical motions and senses near the center of correct time so they can actually experience precise fundamental body control. Apparently, this real-time, interactive and repetitive experience causes the user's brain to correctly re-calibrate the circuits that control the timing of their motor and sensory functions. It is theorized that the resulting integrative and task sequencing improvements become imprinted on the kinesthetic motor memory in incremental stages during REM sleep following each of the four to eight 20 to 40 minute training sessions. Follow up testing indicates that, like "balancing" on a bicycle, after precise fundamental body control and synchronization is learned in this manner it is not forgotten.

Other References

Paper entitled "Improving Student Motor Integration by Use of an Interactive Metronome", presented at the Annual Meeting of the American Educational Research Assoc., Mar. 24, 1997, by Paul M. Stemmer, Jr.

Clinical Guide entitled "T.O.V.A.® Test of Variables of Attention", published in 1996, by Lawrence Greenberg.

Paper entitled "Keyboard Magazine Review, Nov. '90", Jeanius Electronics Russian Dragon.

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INITIAL FIELD RESEARCH

Consultations with scientists, therapists, teachers and professional sports trainers revealed that the Time Machine's analytical and training capabilities are unprecedented. Although most were aware of fundamental body control and coordination problems in many of their patients, students and trainees, they stated that they had no way of accurately testing for, or effectively correcting, the observed deficiencies. With their help and consultation, Kinesthetic Training Systems developed and implemented a beta training and field testing program. First, over three hundred individuals, with differing backgrounds and motor skill capabilities, were given the ATTS timing analysis test battery of all limbs to establish preliminary numerical (in milliseconds) timing norms.

BETA TRAINING AND TESTING PROGRAM

A representative sampling of children and adults have completed the training program developed for the ATTS. The trainees included "normal" individuals, as well as those with a diversity of developmental and motor planning impairments. In addition, a number of individuals with highly developed motor specialty skills, such as professional athletes and musicians, were also trained. Regardless of the trainee's impairment, highly specialized skill or age level, the ATTS training results were consistent. "All" trainees "rapidly" demonstrated significant improvements in their timing, coordination and overall body control. Follow up testing indicates full retention of the improvements.

SENSORY INTEGRATION, TASK SEQUENCING and FUNDAMENTAL MOTION AUTOMATION

The exact neurophysiological process causing the positive ATTS training results, or the rapidity of such results cannot be fully explained. However, the real-time "aural and physical experience" of achieving precise mental self-control over fundamental motions of their limbs apparently triggers positive self-realizations and automating processes that are rarely learned through "words" or the visual feedback usually associated with body movement. These self-discoveries theoretically are also responsible for the rapid improvements in an ATTS trainee's overall mental self-control, self-image and sequential learning abilities.

The mind, body and emotion each play an important integrative role in the human learning process. Neuroscientists suggest that most children learn to walk before they can talk. They theorize that our ability to speak and write -hallmarks of intellectuality- evolved as a by product of a more primitive specialization of the left hemisphere for handling sequences of motions that combine together to form complex motor tasks, such as killing a wild animal with stones and spears. When a child is born it can basically only suckle and cry. Almost every other physical and cognitive human skill must be learned, and such learning requires emotional desire, repetitive practice, sensory feedback and automation.

High tech brain scanning equipment now allows scientists to visually see (in real time) the electromagnetic activity that is taking place in the brain and body during the learning process involved in movement. It clearly shows that parts of the brain are very active while a particular skill sequence is being learned, and then become quiet after the skill is learned enough to become automatic. Apparently, this process allows more of the brain to concentrate on each new learning task.

Humans subconsciously break complex motor tasks down into a series of simple movements that are easier to learn. After each basic movement is correctly learned it is then automated and interlinked with the other sequences that make up the whole task. This segmented learning process allows us to gain precise automatic control over extremely complex movements. It is believed that the ability of children to master precise sequential control over fundamental body movements is critical to their forming positive self-images and the positive desire to learn other complex tasks such as reading, writing and mathematics.

The Time Machine (as children call it) is only the first of many 21st century integrative and sequential teaching tools that will result from the ongoing scientific research during the 1990's; the "Decade of the Brain".

A TYPICAL ATTS TRAINING SEQUENCE

The trainees first session starts with a quick demonstration of the sounds and an explanation of how the ATTS learning process is meant to be "fun". Then a simple test battery is given to determine the numeric timing accuracy of each of the trainees limbs and get them familiar with the ATTS's changing sounds. It includes: 1) both hands clapping together, 2) left hand, 3) right hand, 4) both toes alternately tapping on a floor trigger, 5) right toe, 6) left toe, 7) both heels alternately tapping on a floor trigger, 8) right heel, and 8) the left heel.

NOTE: The average timing accuracy of the initial 330 test subjects has been approximately 85 milliseconds, and 99.7% of them have been consistently ahead of the beat. Severe motor planning impaired children initially averaged above 200 milliseconds while gifted professional athletes and studio musicians typically averaged below 30 milliseconds.

For the remainder of the first session following the initial test battery, the trainee is helped to deliberately force herself to tap way before and after the beat so she can clearly hear her tap moving back and forth from side to side and she can recognize its changing sound in the headphones. The first day's session is kept to approximately 40 minutes maximum.

The beginning of the second session is used to break the users incorrect timing tendency. After the user remembers how to make her tap go to both sides, she is taught to deliberately keep it on the side opposite of where her "tendency" is. After a short period of time, she learns to relax her "aim", allowing her tap to automatically move toward the center of the Beat. If her Tap goes past center and ends up back on her "tendency" side, she simply learns to move it back to the opposite side and repeats the process.

The trainee works on their limbs that have the highest timing errors first, in order to synchronize their movement abilities and control. As the user learns to relax and "not" aim, her autonomic hearing and motor capabilities begin to use the ATTS sounds to correctly direct her physical timing. The *adjustable "right on" range (within 250 to 1 milliseconds of exact center) is systematically narrowed as the user's accuracy and consistency improves.

The user quickly learns to recognize and maintain the exact "state of mind" and physical control that allows her to stay close to the Beat and to make quick, smooth adjustments in her timing. The goal is for the user to learn to "sense" when she's wavering from exact center and make very minor adjustments without "falling off" center.

After correct internal "timing" (below 27 milliseconds) is aurally and physically experienced on the ATTS for a relatively short period of time it apparently becomes permanently imprinted on the user's kinesthetic (permanent) motor memory. Mastering fundamental body control and timing results in improved complex task sequencing, sensory and hemispheric integration, mental self-control, self-image and emotional desire to learn.

BRIEF HISTORICAL BACKGROUND OF KINESTHETIC TRAINING SYSTEMS

The ATTS was developed by Kinesthetic Training Systems' partners, Jim Cassily and Jim Lagerkvist. As former partners in EXR Corporation, they internationally pioneered psychoacoustic audio processing in the professional recording and broadcast fields. Their unusual combined experience in audio synthesis, psychoacoustics, audiology, computer programming, recording engineering and musical production enabled them to develop and manufacture unique audio products which "enhance" how audio information is perceived by the human hearing mechanism. The Time Machine is a result of their dedication to "live" music.

For additional information contact Jim Cassily at (616) 538-6243

Train Your Brain to Focus

Grand Rapids "Metronome Training, LLC"

Providing Interactive Metronome® Training for Children and Adults

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ADVANCED TRAINING FOR THE BRAIN

Provided by Dr. Andrew D. Atwood, CIMT
and David S. Atwood, IMTA/IMPI
in Grand Rapids, MI

Theory of Sequentially Timed Learning

by James F. Cassily, Inventor of the Interactive Metronome

During the last decade our understanding of the human brain has increased by quantum leaps. We now know that, although the brain's neural roadmap is laid out by nature, the environment is also a key player in the human development process. Regardless of how much is caused by which, human learning is a paradox: "Our ability to correctly learn is a learned ability."

The human brain is the most complex data processing; storage and operations control system in the known universe, yet it comes without even the most fundamental User's Manual. The following theory is intended to help us begin the process of teaching our children how to efficiently operate their own brains.

The sequential learning process

Learning and memory are interdependent functions by which our brains acquire and store new data in a way that makes it retrievable later on. The storage takes place as a pattern of connections among neurons, the nerve cells that serve as the brain's basic building blocks. A person's cognitive, physical and emotional capabilities are closely related and share many of the same neurons.

An efficiently functioning normal brain begins the process of learning a new complex task by subconsciously breaking it down into simple subcomponents that are easier to learn and store. Data, which represents the resulting data subtasks, is stored in the brain for future use.

All information critical to each subtask in the sequence is stored among the brain's neurons in the form of unique connections. This stored information includes content and action related messages that must be sent to all body and brain parts involved in each subtask. Timing information, critical to the reproduction of each subtask and to connecting together the sequence string, is also stored. The extremely accurate internal timekeeper that all human brains inherently possess generates this timing information.

Different areas of the brain become very interactive while the task is being

learned, and multi-sensory feedback signals are simultaneously sent back and forth between the brain, senses and the parts of the body involved. As the subtasks in the sequence string are memorized, fewer and fewer two-way feedback signals are sent between the brain and body parts. Eventually, each of the component subtasks becomes fully automated, correct neuro-synaptic connections between brain cells are created for each subtask in the complex task sequence. Thereafter, fewer two-way feedback signals between the brain parts and body parts are needed in order to recall and accomplish that particular complex task.

Thus an efficiently functioning human brain has the amazing ability to subconsciously break down, sequentialize and store all data pertinent to complex tasks that a person deliberately decides to learn. Then, to automatically carry out that complex task in the future, the brain will instantaneously select and sequence each of the stored subtasks that make up the entire task. It will utilize the incredibly accurate timing information also stored with each subtask to seamlessly string them all together in a manner to accurately replicate the original task.

This unique interactive brain area multi-tasking and neural function automating ability dramatically increases the human brain's overall capabilities and allows us to learn extremely complex mental and physical tasks that would otherwise be impossible. This highly efficient multi-tasking process also frees up important parts of the brain so that they are continually available to creatively alter our own future, as well as the environment we live in.

The Learning-How-To-Correctly-Learn paradox

Many of the above sequential learning process functions automatically take place within every 'normal' human brain according to yet unknown genetic instructions. However, the degree of accuracy and efficiency that each individual human brain carries out these functions varies dramatically among individuals.

To discover why some genetically normal brains are able to learn more efficiently than others, we need only ask the deceptively simple correct question: "What single learning related attribute do the world's greatest scientists, athletes, CEOs, artists, astronauts, philosophers, mathematicians, musicians, etc. all have in common?" One must logically conclude that such highly successful individuals tend to have excellent focus, the ability to selectively concentrate for extended periods of time without interruption.

Concentration, like consciousness, is such a fundamental human ability that western cultures, for some reason or another, have long assumed that it is just something we are born with, it isn't something that is learned. Therefore, unlike many oriental societies, there has been little effort to understand exactly what concentration is, or to find ways to teach it to our children.

Concentration, door to the brain's super-computer

Concentration interruptions, "flow" breaks during the conscious learning

process, unnaturally separate the occurrence of subtasks with gaps and disrupt their sequential order. These breaks also generate timing and content information related to whatever stimuli or thought was involved in the interruption, rather than the task being learned. The resulting erroneous information is stored along with the correct timing information that is directly related to the task being learned. This erroneous and/or conflicting information prevents the sequence string from being correctly reassembled by the brain when called up from memory in the future. As a result, the original task cannot be correctly duplicated.

The more the habitual concentration interruptions that occur when a person is trying to learn a new task, the more timing and content errors that are generated and stored during the learning process. The brain can and often does correct such stored errors, but to do so the task must be relearned through multiple repetitions. Therefore, the more concentration breaks, the more errors, and the longer it takes to learn any new complex task, regardless of whether the new tasks are cognitive, physical or emotional based.

Evolution of the brain's information filtering gatekeeper

Prior to the development of conscious reasoning or awareness, the human brain had already evolved the ability to accurately process massive amounts of sensory and neurological information. It was able to make instantaneous multiple-decisions and send precisely timed chemical and electrical commands to all parts of the human body. Without this autonomic capability the human species wouldn't have survived. The capabilities of today's most sophisticated super-computers, which can process multi-billions of information bits per second, are paled by comparison to the human brain's unconscious data processing capabilities.

At some point in time, humans also developed conscious reasoning and thus obtained a fundamental creative advantage over all other creatures on earth. However, the information processing capacity of the conscious human mind is very limited, estimated to be about 100-200 bits per second. This is a very small processing capability, considering that just to understand words being spoken during a normal conversation uses up nearly 30% of our conscious mind's total capacity.

In order to avoid conscious overloading and confusion, humans had to also evolve the ability to limit and filter the massive amount of information that continually bombards our conscious senses. This automatic information filtering ability gave the human species the special ability to be deliberately inventive. Humans thereby flourished and eventually dominated over all other creatures on Earth.

Our conscious gatekeeper also gave us the ability to ignore and override many of our natural instincts and unconscious data processing capabilities when shaping our own future. We have the conscious freedom to choose to use our 126 bps conscious processor, instead of our multi-billion bps autonomic super-computer. Consequently, our species makes a lot of unnecessary and very costly mistakes. One need only examine what we have

done to our own habitat and our societal problems to realize just how costly this ability to consciously override our natural instincts and unconscious capabilities has been.

Developing efficient concentration filtering habits

At a recent meeting of the American Association for the Advancement of Science a team of researchers announced that the internal timing mechanism within the human brain had been discovered. They reported that: "We believe timing is the foundation for learning and memory." They were on the right track, but all evolved creatures have natural autonomic timing. The foundation of the special learning and memory advantage that humans have over other creatures more likely has to do with our unique stimulus filtering related concentration abilities.

Concentration during the human learning process allows our relatively limited conscious minds to tap into our more powerful autonomic data processing potential, including our inherently accurate internal timing capabilities. Therefore, the unique ability to selectively filter out the unnecessary information and thoughts that continually bombard our conscious concentration is more likely to be the true foundation of human learning and memory.

Genetically similar human brains significantly differ in their ability to concentrate efficiently. Therefore, the human ability to deliberately filter out unnecessary information and unrelated thoughts during conscious concentration process must be, to some extent, a learned ability.

This automatic filtering ability is so foundational to the human learning process that must be learned very early in each brain's development. Significant others and environmental factors must therefore play important roles in the development of efficient filtering habits. Inadvertently repeated activities and trial and error experiences contribute to the earliest stages of the learning to learn process, thereby adding a strong element of chance and/or chaos to the concentration ability development equation.

It is likely that a child's earliest information filtration related learning experiences begin while still in their mother's womb, and initially involve emotional and tactile information. As the embryo develops, the sense of touch and the simple movement of the different body parts become involved in the brain's information processing development. During the third trimester hearing is developed and sounds from the outside environment begin to play a role. (Sight comes along much later than hearing, and therefore may play a less influential in the brain's foundational learning-how-to-learn process.)

Conclusion

During its early development a child's brain inadvertently forms the deeply embedded foundational habits that control how it filters information and internally generated mental thoughts. It is upon these filtering habits that their overall future learning abilities are built.

Poor stimuli and mental thought filtering habits interfere with a child's ability to concentrate without interruption. This fundamental inability prevents many children from learning new tasks as quickly and accurately as other children with more efficient concentration habits. It negatively impacts their learning progress and self image in school.

Our rapidly expanding understanding of the human brain is helping us to recognize that many of our children's most detrimental cognitive, motor and emotional problems may simply be the result of bad habits; and thus are not written in stone. To the contrary, the more fundamental these acquired habits are, the easier and faster they may be to correct. Early diagnosis and corrective intervention may thereby quickly bring about dramatic changes in a child's learning abilities, productivity and self-image related conduct. Such successful early intervention would likely have as long lasting positive impact on the individual's overall quality of life.

All children deserve the opportunity to reach their full cognitive, physical and emotional potential. Therefore, early diagnosis and corrective intervention are absolutely critical to providing them with a more equal opportunity to do so. By making high tech concentration and stimuli filtering training a fundamental part of every child's early education, society as a whole will strongly benefit.

Final note by Jim Cassily, the author

The rarity of professionals who are able to consistently excel in sciences, arts, sports, music and other lucrative high skill related careers supports the theory that few humans are currently capable of performing at their peak genetic potential level of concentration.

In his landmark book, Flow, The Psychology of Optimal Experience, Mihaly Csikszentmihalyi recognized that: "People who learn to control inner experience will be able to determine the quality of their lives, which is as close as any of us can come to being happy. Although in its present state the human mind cannot do what some people would wish it to do, the mind has enormous untapped potential that we desperately need to learn how to use."

However, it was J.S. Mill who long ago prophesied just how to do it: "No great improvements in the lot of mankind are possible, until a great change takes place in the fundamental constitution of their modes of thought."

What once seemed impossible, human creativity is now helping us to achieve. By helping us unlock the mysteries within the human brain that created them, new computer based technologies will soon help mankind take a positive quantum leap forward. Years of research relating to observations made during field training with one such new technology led to my developing the above theory.

High tech application of a time honored training tool.

Humans have always had an incredibly accurate, powerful and ultra-high speed autonomic computer just sitting there, ready to be better utilized.

There is mounting evidence that the patented Interactive Metronome could provide us with a highly accelerated method of establishing a more efficient and consistent link between our limited 126 bit conscious minds and our currently untapped unconscious capabilities.

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Interactive Metronome Rhythmicity Pre-Test Score Indicators

*** Please see the explanation and special notes listed below this recently updated indicator chart.

Pre IM Long Form Test Average ms. Range	Indicators for Non-IM Trained <u>5 to 6 year olds</u> * Combined IM Basic & Advanced Training goal	** Post IM Training Basic Regimen Long Form Test Average ms. Goals
300 or higher	Severe rhythmicity, sequencing and planning, motor control, attention and overall learning deficiencies	90 -165 ms
200 - 299	Very significant rhythmicity, sequencing and planning, motor control, attention and overall learning difficulties	65 - 130
160 - 199	Below Average	40 - 65
90 - 159	Average range (**Note: IM Pre-test averages better than 90 ms. may reflect short term attention only - utilize Optional A-O-T Test)	31 - 39
65 - 89	High Average range	25 - 30
36 - 64	Superior range	21 - 24
Below 35 ms.	Extraordinarily Superior range	17 - 20
Pre IM Long Form Test Average ms. Range	Indicators For Non-IM Trained 7 to 8 year olds * Combined IM Basic & Advanced Training goal	** Post IM Training Basic Regimen Long Form Test Average ms. Goals
280+ ms.	Severe rhythmicity, sequencing and planning, motor control, attention and overall learning deficiencies	70 -125 ms
170 - 279	Very significant rhythmicity, sequencing and planning, motor control, attention and overall learning difficulties	55 - 70
90 - 169	Below average	32 - 54
70 - 89	Average range (**Note: IM Pre-test averages better than 70 ms. may reflect short term attention only - utilize Optional A-O-T Test)	27 - 31
45 - 69	High Average range	21 - 26
33 - 44	Superior range	19 - 23
Below 32 ms.	Extraordinarily Superior range	16 - 18
Pre IM Long Form Test ms. Range	Indicators For Non-IM Trained 9 to 12 year olds * Combined IM Basic & Advanced Training goal	** Post IM Training Basic Regimen Long Form Test Average ms. Goals
215+ ms.	Severe rhythmicity, sequencing and planning, motor control, attention and overall learning deficiencies	55 -105 ms
150 - 214	Very significant rhythmicity, sequencing and planning, motor control, attention and overall learning difficulties	45 - 54
80 - 149	Below average range	29 - 44
55 - 79	Average range (**Note: IM Pre-test averages better than 55 ms. may reflect short term attention only - utilize Optional A-O-T Test)	22 - 28
38 - 54	High Average range	19 - 21
29 - 31	Superior range	16 - 18
Below 29 ms.	Extraordinarily Superior range	14 - 15 ms.

Pre IM Long Form Test ms. Range	Indicators For <u>Non-IM Trained 13 years old to adult</u> <i>* Indicates Combined IM Basic & Advanced Training goal</i>	** Post IM Training Basic Regimen Long Form Test Average ms. Goals
200+ ms.	Severe rhythmicity, sequencing and planning, motor control, attention and overall learning deficiencies	44 - 95 ms
120 - 199	Very significant rhythmicity, sequencing and planning, motor control, attention and overall learning difficulties	35 - 43 ms
75 - 119	Below average range	27 - 34
44 - 74	Average range (**Note: IM Pre-test averages better than 42 ms. may reflect short term attention only - utilize Optional A-O-T Test)	19 - 24
33 - 41	High Average range	17 - 18
23 - 29	Superior range	14 - 16
Below 22 ms.	Extraordinarily Superior range	12 - 13
Below 12 ms.	1 NBA & 1 MLB All Star Team Players & 1 famous recording studio musician are the only the only ones to ever scored below 12 ms. with their hands on their IM pre-test to date.	6 - 9 ms.

Interactive Metronome Rhythmicity Pre-Test Score Chart Notes & Information

* All sessions done after a subject has achieved a below 20 ms. average on 500+ reps are considered "Advanced Sessions".

** Some individuals are able to maintain excellent focus for very short periods of time but cannot maintain this level of accuracy over extended periods of time. If you suspect an individual's IM ms. score is only short term relevant, have him/her do the Attend-Over-Time Test - Long Form Extension (500 reps, Test Task 1). Make sure you leave the subject alone in the room for most of the 9 minute test. (See Attend-Over-Time Test)

*** The Pre-Test Score *Indicator ms. Completion Goals* (on the right) are often attainable during the Basic IM Rhythmicity Training Regimen which includes 15 one hour sessions over a 3 to 6 week period. However, no two individuals are alike. The actual number of training sessions required to reach the goal listed on the right varies according to each individual's pre-existing capabilities, self & external motivation, medication schedules and many other factors.

Even though a trainee fails to meet the 19 ms. completion requirement goal recommended in the IM Training Manual, the standardized IM 15 session Basic Regimen has been shown to bring about statistically significant functional improvements in both children and adults. However, if a trainee fails to meet a Fundamental IM Rhythmicity Quotient of 27 - 20 ms. avg. (see below) by the end of the IM Basic Regimen, it is highly recommended that additional sessions be administered until he or she does.

Regardless of the number of sessions it takes to achieve an IM Rhythmicity Quotient below 19 ms. goal, the extra overall long term quality of life improvements that result from achieving such exceptional rhythmicity should be considered when making the short term decisions about doing additional IM Training sessions.

Individuals who are considering highly competitive school activities and/or professional

careers that require a very high degree of focus, timing and/or physical coordination may want set the exceptional goals of achieving below 12 ms.. This is an extremely rare level of natural rhythmicity, and would put them in the same natural timing category as *highly* successful professional athletes, musicians, pilots, painters and surgeons.

An individual that has achieved excellent rhythmicity must not expect to be able to just buy a set of golf clubs and immediately be able to compete with Tiger Woods. All highly skilled activities require special techniques that can only be acquired through competent instruction and repetitive practice. However, individuals who achieve excellent rhythmicity typically learn the technique required to excel at timing and focus related activities faster than individuals with a lower level of rhythmicity.

IM Rhythmicity Quotient Goals - The following information should be a helpful when discussing extending an IM Rhythmicity Training program with trainees and/or their parents.

It takes a Fundamental IM Rhythmicity Quotient of 27 - 20 ms. to have the ability to:

1. recognize that rhythmic patterns exist in our surroundings,
2. focus our attention long enough to recognize individual patterns within a group of simultaneously occurring patterns,
3. create patterns (actions and thoughts) that are in sync (entrain) with other patterns,
4. adjust or stop our own patterns so they don't interfere with the patterns of others, and
5. learn from previous experiences.

It takes an exceptional IM Rhythmicity Quotient below 19 ms. avg. to have the ability to:

1. stay focused for extended periods of time without interruption,
2. unconsciously adjust our own personal rhythms when they waver,
3. make faster and more precise corrections,
4. create highly productive rhythm patterns that others follow (entrain with) and learn from,
5. more effectively learn from previous experiences, and
6. have exceptional experiences that can only occur as a direct result of having highly accurate rhythmicity (timing).

For anyone who pretests above 70 ms., it usually requires additional IM Advanced Training to achieve the exceptional IM Rhythmicity Quotient below 19 ms.. The actual number of training sessions required to reach the minimum completion goal varies according to each individual's pre-existing capabilities, habits and the end goals that are set. However, 15 one hour sessions have been shown to bring about statistically significant functional improvements in both children and adults, regardless of the IM Rhythmicity Quotient achieved by the end of the Basic IM Regimen.

Indications:

The above indicators were derived from field experience with less than 1000 subjects. Therefore, Standardized Norms have yet to be documented via strict numerical scientific methodology, and thus the above data is to be considered 'theoretical'.) Also, an individual who has improved his neural timing, planning and sequencing via IM Rhythmicity Training will be able to plan and sequence (learn) better in the future. However, school and job related success is based upon cumulative achievements. IM Trainees will have to re-learn certain previously missed fundamentals correctly before his or her daily school and work related activities can be expected to fully reflect their improved natural timing.