Intelligence Gathering Using Enhanced Anomalous Cognition

ABSTRACT: The capability to gather and correctly interpret hidden information is a critical resource to gaining and maintaining an advantage in any highly competitive environment. Methods are described which employ trained operators utilizing objective electronic equipment to obtain information that is hidden or not inferable from known data. The equipment contains quantum mechanical elements, which respond directly to the operators' visualized outcome, producing a type of machine-enhanced cognition. The cognition is *anomalous* because it is not limited by the classical constraints of sensing equipment or direct observation.

KEYWORDS: Anomalous Cognition, Intelligence Gathering, Enhanced, Quantum Mechanics, Psycho-Responsive, Remote Viewing, Competitive.

INTRODUCTION

Throughout history, having just a scrap of information could often make the difference between putting a meal on the table or going hungry, or in a larger context, the information could tip the balance between victory or defeat for an entire army[*]. In today's world, having timely and appropriate "intelligence" may be more important than ever. This is due to a number of factors, but primarily to the huge and growing world population, accompanied by ever-dwindling resources of fossil fuels, primary food sources such as fish, and other natural resources. These factors, along with dramatic changes in technology, make the world seem smaller, and increase competitive pressures[1].

This of course is a vastly simplified view of the underlying causes of conditions we all face, but it seems clear the result of increased competition for limited resources on a planetary scale is increased stress, intolerance and a greater tendency toward belligerent or even violent behavior[2]. This applies at all levels of human organization, from the individual trying to gain an edge in his investment portfolio or just support his family, to a corporation vying for market share, to a nation attempting to increase both prosperity and security for its citizens.

From the earliest recorded times, man has relied primarily on direct observation or the observations of those close by to obtain information necessary for survival and to establish some level of security. This provided knowledge of immediate surroundings and was of limited scope. As technology and cultures evolved, so did the reach, breadth and types of

---

[*]"Thus, what enables the wise sovereign and the good general to strike and conquer, and achieve things beyond the reach of ordinary men, is foreknowledge." Sun Tzu, 6th century BC, *The Art of War*.

information that we desire and are able to gather. Today we have networks of satellites, intelligence agencies, massive computer systems and analysts, and of course the Internet, to provide information to individuals, companies and governments[3, 4].

The US Intelligence Community spent 44 billion dollars[5] in 2006 to support approximately 100,000 employees, required technologies and other assets so we – that is, they – could gather and analyze information about crucially important events and carry out other intelligence-related or secret operations[6]. This figure does not include direct military expenditures for intelligence-related operations. Neither does it include the enormous expenditures of corporations and other businesses for programs like Competitive Intelligence (CI), nor information gathering efforts at the personal level, whose cost may be primarily measured in time expended. Even so, such efforts are clearly inadequate in many situations. Critical errors in judgment are made due to faulty or incomplete information, or to incorrect interpretation of available information[7, 8]. The consequences of these errors can range from personal inconvenience to incalculable damage to life and property.

Substantial investments of time, money and human resources have been made by various groups attempting to confirm the possibility of using anomalous cognition to obtain useful intelligence[9]. Programs were established that employed various protocols to actually accomplish this unique type of information gathering or spying[10]. Meanwhile, research was ongoing to find ways to increase the scope and accuracy of these methods. A number of approaches have been tried including the use of psychotropic drugs, sleep deprivation, hypnosis, types of meditation and mental discipline, and operator selection and training programs. In addition various types of devices for measuring physiological signals, and emitting or detecting electromagnetic fields, as well as direct electrical stimulation of the brain have been employed.

Many attempts are made to gain information that might provide personal or corporate advantage. Examples include predictions related to business or the stock market, personal health issues and any number of other categories. Some businesses claim to use remote viewing to accomplish a number of civilian objectives[*]. In fact, the use of psychic, intuitive or "spiritual" guidance is extremely widespread. The pervasiveness of such practices is an indication of the general belief in the reality, or at least the possibility that they may actually work, although it is by no means a measure of their success rate.

The enormous potential for harm or defensive advantage has been a primary driving force behind past efforts to obtain intelligence through non-classical means. In his book, *The Psychic Battlefield*, W. Adam Mandelbaum[11] details a long history of the use of psychics to spy on potentially or actively hostile governments, military operations, groups and individuals. The US government funded a series of programs for more than 20 years, ending with the Star Gate Program[12], which attempted to use anomalous cognition, or so-called remote viewing to obtain operational intelligence. Perhaps due to expediency or cultural differences, programs in some other countries have been larger, and may be

[*] For example, Probable Future Corp. (among several others) offers what they describe as, "Professional Remote Viewers and Remote Viewing Services."

ongoing today. In any case, public funding in the US for research and operations of anomalous cognition programs ended in 1995, although there is the possibility that some classified units are currently operational.

Problems and limitations of past efforts arise from the total subjectivity of the methods used. Results were sporadic, with amazing successes interspersed at times with equally stupendous failures. Human factors have always played a predominant role in the reliability of any information obtained, and findings are difficult and often impossible to replicate or confirm by other means[9, 13]. There is little doubt among the people who actually participated in some of these remote viewing programs that real and significant intelligence was obtained at times. Also, certain of the participants were consistently more prolific and accurate than most others[9].

Traditional intelligence gathering and analysis methods have produced enormously valuable results; nevertheless, there are inherent limitations that have allowed numerous missteps and occasionally some dramatic failures. To complement classical intelligence assets, we propose methods that provide the significant potential advantages of remote viewing or anomalous cognition, and also allow more objective and repeatable results.

The purpose of this paper is to outline an objective electronic system that utilizes principles of quantum mechanics in conjunction with trained human operators to produce a type of machine-enhanced anomalous cognition. This system can be used to obtain information that is hidden from direct observation or not inferable from currently known data. The information obtained can relate to past, present or future events, and to remote or inaccessible locations. Such characteristics are explicitly not achievable by classical sensors, i.e., those which utilize electromagnetic or other known forces of nature, or by known methods of electronic computing machines. These capabilities are not disallowed by the principles of quantum mechanics[14], and have been demonstrated repeatably in laboratory experiments and real-world tests.

PSYCHO-RESPONSIVE DEVICES

The machine for enhancing anomalous cognition is based on the observation that mental intention can affect the statistical outcome of truly random events such as quantum mechanical measurements[15]. This effect has been observed, tested and studied for decades by laboratories around the world resulting in overwhelming evidence of its existence[16, 17]. Until recently the observed perturbation in statistical measurements has been too small to allow any useful application[18].

In 1992, I embarked on what turned out to be a long-term research project to find a means of increasing the responsitivity or effect size (ES) of this quantum mechanical mind-matter interaction to a usable level. In 2001 a series of breakthroughs began which finally led to a level of responsitivity that is required for rudimentary, but usable machine-enhanced anomalous cognition. The devices are generally referred to as psycho-responsive devices

(PRD's), and some of their fundamentals are described in more detail in *Machine-Enhanced Anomalous Cognition*[18].

A PRD, at its most fundamental level, is a device that measures quantum mechanical events to determine a sequence of resultant states. Measurements are typically made of electronic shot noise with a thermal noise component to produce binary electronic states[19]. There are several other potential noise sources with outputs that are either analog or digital. However, the combined shot and thermal noise source, and the binary output form seems to be most compatible with readily available and easy to use high-speed logic elements and microprocessors. Binary measurements are usually made at regular intervals at high speed, producing a sequence of random binary bits. The raw binary bits always contain a residual statistical defect* of bias and autocorrelation, which must be reduced to acceptable levels – typically below 100 ppb – by a form of randomness correction or "whitening" filter.

The basic PRD generator is a nondeterministic or "true" random number generator. This or similar type of device, sometimes called a random event generator (REG), has been used by various laboratories for about the past 45 years[17] in their mind-matter interaction research programs. To increase the responsivity of the basic PRD required discovering some statistical property of its output bits that is uniquely characteristic of being influenced by mind. We discovered that runs of bits (consecutive bits of the same value) that matched the mentally intended outcome, tended to be more frequent and of longer length than runs of non-matching bits. This pattern was found to exist at all levels from streams of unprocessed bits to the final outcomes of trials, or even whole sets of research data. Figure 1 is a plot of the fraction of total runs versus run length for hits (red, upper), misses (blue, lower) and the theoretical fraction (black), produced by a series of trials. This illustrates the runs effect where significant mental influence has occurred. Note the crossover for runs of length 1 – a typical pattern for this type of data.

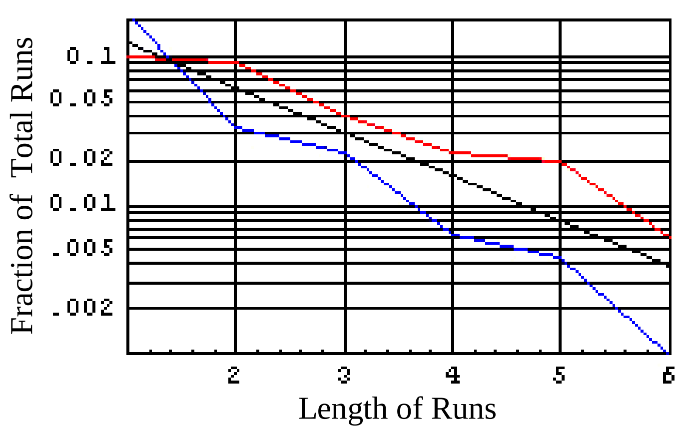

Figure 1

* Autocorrelation defects in unprocessed bits can be reduced to extremely low levels by proper, albeit inefficient design, but we know of no real measuring device or method that produces acceptably low levels of bias for raw, unprocessed bits.

The perturbation in runs statistics, although slight, was eventually developed into a basic processing method called a "bias amplifier." A bias amplifier performs a simple logic operation on non-overlapping pairs of randomness-corrected PRD generator bits: if the bits are both 1's or both 0's, output 1 or 0 respectively; if the bits are not the same, produce no output. No patterns can be inferred from runs of one bit, and runs of two bits occur most frequently after runs of one. These factors taken together imply optimal efficiency for this bias amplifier design. In fact, the statistical efficiency (Eff_{stat}) is above 99.5% for biases up to 0.1:

$$Eff_{stat} = \frac{B_{out}}{B_{in}} \sqrt{\frac{br_{out}}{br_{in}}} \, , \tag{1}$$

where B_{out} and B_{in} are the output and input biases respectively, and br_{out} and br_{in} are the output and input bit rates respectively. Stationary bias is assumed to be a defect in the PRD generator raw output, which is effectively reduced to zero prior to beginning the bias amplification. Influences of mind are non-stationary, resulting in short-term fluctuations in runs statistics and bias; a fundamental property of this phenomenon. The range of bias (or ES) is: $-1.0 \le B \le 1.0$.

Any number of bias amplifiers can be "connected" in series with each one approximately doubling the bias and quartering the bit rate, because the "runs effect" persists in the processed data at all levels of measurement. Eventually a more computationally efficient and flexible bias amplifier was developed. The second-generation algorithm consists of a bounded binary random walk with an equal number of steps in the positive and negative directions. The random walk is initialized to the middle and then is incremented one step in the positive direction for each binary "1" input, and decremented one step for each "0" input. A "1" or "0" output is generated when a boundary is reached, depending on whether it was the designated positive or negative boundary respectively; then the walk is reinitialized. The advanced bias amplifier increases the bias by a multiple equal to the number of steps to a boundary and reduces the number of bits by the square of the number of steps. For numbers of steps that are powers of two, such as 2, 4 or 8, the random walk algorithm produces output sequences that are identical to those produced by 1, 2 or 3 of the original bias amplifiers in series.

It was immediately obvious that the bias amplifier would consume prodigious amounts of slightly perturbed bits to produce a final output with significant ES. Assume, for example, the initial perturbation caused by mental influence is on the order of 1 ppm, and the desired ES is 10%, which is equivalent to getting a "hit" (an output that matches the intended result) 55% of the time. Further assume a statistical efficiency of 1.0*, and that a single output is produced in 0.2 seconds, Equation 1 can be used to calculate the necessary generator bit rate. Solving for br_{in} and substituting the assumed parameters:

* The statistical efficiency is 0.99875 for an output ES of 10%, resulting in a fractional error of only 0.0013 by making this assumption.

$$br_{in} = br_{out}(\frac{B_{out}}{B_{in}})^2 = 5 \cdot (\frac{0.1}{.000001})^2 = 5 \cdot 10^{10} \text{ bps (50 GHz).} \qquad (2)$$

The first meaningful PRD contained an array of 64 generators with a combined bit rate of 1.024 Gbps. Each trial was initiated by the operator by a single keypress. Feedback was provided by a graphic display of a slider with $\pm$ 10 positions, representing a binary random walk starting in the middle. An output was produced from the PRD array by combining all the bit streams and passing them through 15 levels of bias amplification. This resulted in an average output bit rate of $1.024 \cdot 10^9/4^{15} = 0.9537$ bps. The bias-amplified output was used to move the slider right for a "1" output or left for "0" output. The trial ended when the slider reached the right or left bound resulting in a "1" or "0" output respectively. Trials were run in blocks of 5 of one intended outcome, and then the intention was reversed to prevent any systematic hardware or software bias from biasing the results. The average number of steps needed for a bounded binary random walk to terminate is exactly the square of the number of steps to the bounds. Therefore, the average time to completion in these trials was 100/0.9537 = 105 seconds.

The 10-step bounded random walk served as an additional bias amplifier with an amplification factor of 10. The results of hundreds of these trials was an approximate hit rate (HR) of 0.64 in an average time per trial of 105 seconds. This is equal to a bias of 0.28 at a bit rate of 0.009537 bps. It is interesting to use these numbers to calculate the theoretical input bias:

$$B_{in} = B_{out}\sqrt{br_{out}/br_{in}} = 0.28\sqrt{0.009537/1.024 \cdot 10^9} = 0.85 \cdot 10^{-6} \text{ (0.85 ppm).} \quad (3)$$

The speed of the PRD generators was increased until a 1 THz bit rate was achieved. At this speed, a hit rate of about 0.65 was achievable at about 1 second per trial. Using equation 3 indicates a theoretical B_{in} of about 0.3 ppm. This is quite close to the 0.85 ppm calculated for the 1 GHz array, especially considering the statistical nature of the results and consequent difficulties of precisely quantifying both the hit rate and the output bit rate. An estimated error bracket for these values is plus 100% to minus 50%; a 4-to-1 range.

Testing at several generator and output bit rates indicated a strong relationship between the rate at which PRD bits are processed and the rate and accuracy at which intended results can be obtained. There are a number of ways of quantifying the relationship, but simply stated: the effect size of output bits is approximately proportional to the square root of the number of PRD bits processed to produce each output bit. Or, formally:

$$ES \approx C \cdot \sqrt{N}, \qquad (4)$$

where C is a constant of proportionality and N is the number of PRD bits processed during the production of an output bit.

C can be approximated from the two examples given above. From the 1 GHz example, C is $0.28 \big/ \sqrt{105 \cdot 1.024 \cdot 10^9} = 0.85 \cdot 10^{-6}$; exactly the same number as the calculated input bias. The 1 THz example is slightly different. In the 1 GHz trials, data was processed continuously from the initial keypress until the trial ended an average of 100 outputs later. For the 1 THz trials, output bits were produced in a constant 0.25 seconds after a keypress – the rate of trial generation, up to 4 per second, was left up to the operator. Therefore, the actual number of bits processed was only 250 Gigabits, and the calculated C is $0.30 \big/ \sqrt{250 \cdot 10^9} = 0.60 \cdot 10^{-6}$. The average for C is $0.73 \cdot 10^{-6}$, and effect size for this type of PRD data processing can be estimated:

$$ES \approx 0.73 \cdot 10^{-6} \cdot \sqrt{N} \, . \tag{5}$$

It must be noted that a wide range of C values are to be expected depending on the abilities of the particular operator. Based on a large data collection, a range of about 5:1 may exist between best and average operators*. Also note, this estimate of C only applies to the type of PRD and processing described above. More advanced PRD systems and processing methods can be expected to increase the value of C.

The most dramatic interpretation of equation 5 is that effect size can seemly be increased at will by simply increasing the PRD generation rate. While this is true to a large extent, ES cannot exceed 1.0, and the effectiveness of the bias amplifier decreases as the effect size increases.

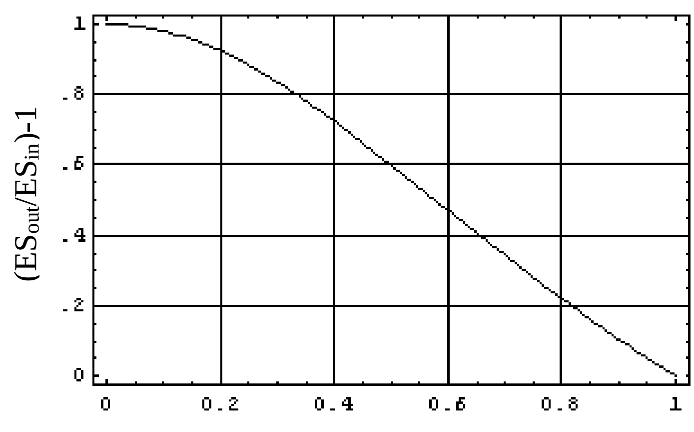

Figure 2

Figure 2 is a plot of (ES_{out}/ES_{in})-1 versus ES_{in} for a simple 2x bias amplifier. This illustrates the relative loss of effectiveness of the bias amplifier as effect size increases. Above an ES_{in} of about 58%, which is equivalent to a hit rate of 79%, the amplifier becomes relatively inefficient. PRD data is always statistically distributed, and while this example shows why

* This estimate uses the data from Jahn & Dunne[16] and tabulated in Wilber[18], Table 1. Effect sizes were calculated from the data in Table 1 for the most effective operator, No. 10, and for all other operators. The average of the ratios of effect sizes for both “positive” and “negative” intentions is 5.1:1.

a “perfect” answer with probability of 1.0 cannot be achieved, the *output* effect size for ES_{in} of 58%, is 87%. This equates to a hit rate, or correct data rate, of 93%. At this level of signal-to-noise it is expected that error correction algorithms that do not assume a priori knowledge of a specific error correction code, can be used to bring the accuracy effectively to 100%.

An estimate of the number of PRD bits that need to be processed to achieve an ES_{in} of 58% can be calculated using equation 4:

$$N \approx (ES/C)^2 = (0.58/0.73 \cdot 10^{-6})^2 = 0.63 \cdot 10^{12} \text{ (0.63 Tbits).} \qquad (6)$$

Taking into account the loss of bias amplifier efficiency, a worst-case estimate of 1.5 times this number, or about 1 Tbits (one trillion bits) processed would be required for each output bit.

A 1 THz PRD is readily attainable using techniques already tested. However, a number of factors affect the actual rate and accuracy of usable information that is obtainable. Our experience indicates that a trained operator can reach a trial rate of about five trials per second during practice sessions, but this rate cannot be sustained for more than a few minutes. A more sustainable rate is one-half to two trials per second, depending on the operator’s level of experience. We have also determined by experience that it is somewhat easier to achieve higher hit rates when each trial is completed in about 0.2-0.25 seconds. These factors would indicate a PRD generator rate of 5-10 THz. This rate is also within the reach of current technology by combining the outputs of an array of 1 THz devices.

The required generation rate is strongly affected by the operator’s abilities. As indicated previously, there is an estimated 5:1 range between best and average operators. This translates into a 25:1 range in PRD generator rate. This would argue for using only highly skilled operators, since a 125-250 THz array, while possible, would be unwieldy and expensive using current technology. As stated above, the estimated value of the proportionality constant, *C*, could cause the required generation rate to increase or decrease by a factor of 4. This potential factor was not included in the generation rate calculations because of the large range already considered. Combinations of independent factors tend to combine as the square root of the sum of the squared individual factors, so the other, larger factors would tend to overwhelm the contribution from variations in *C*.

A 1 THz PRD was designed and implemented in an Altera FPGA, part number EP2C70F672C7. This is a medium speed device with 68,416 programmable logic elements. Random bits were derived from complex combinations of free-running ring oscillators with frequencies of about 400 MHZ. The entropy (H) content of a basic generator design was carefully modeled and tested to produce bits with $H \cong 0.99$ bits/bit. Entropy manifests as timing jitter in the quasi-linear period during high/low and low/high transitions. The source of the jitter is shot noise and a small thermal noise component in the transistors of the gates making up the oscillators. A very large number of these basic generators were programmed into the FPGA to produce the required aggregate generator rate. The physical layout of the logic elements and their interconnection were precisely specified and locked for each generator to achieve consistent results. The basic random number generator was designed to minimize the number of logic elements and maximize the entropy produced. Even so, the core logic consumed about 6 watts, necessitating active cooling of the FPGA.

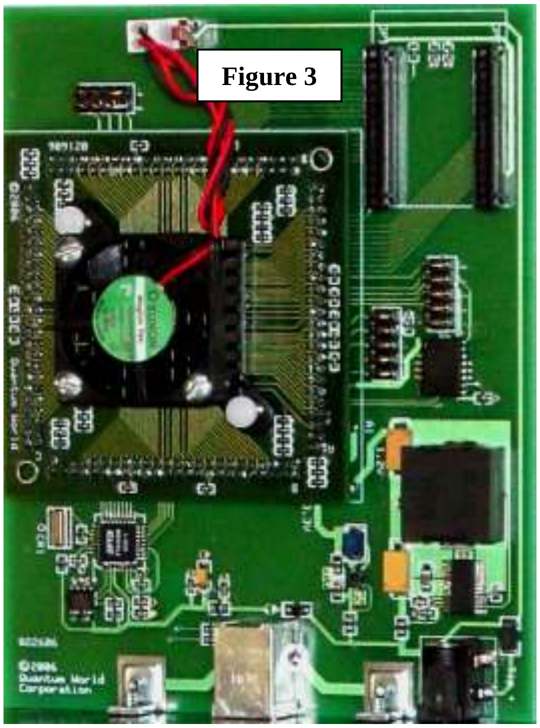

Figure 3 is a photograph of the 1 THz PRD board showing the power section in the lower right, USB interface in the lower left and the FPGA daughterboard (FPGA is hidden by the cooling fan and heat sink). The FPGA is mounted on a removable daughterboard to facilitate prototyping and design changes.

PRD's of various generation rates have been used since the initial 1 GHz array as tools for both testing and training operators. A computer connected to a PRD served as an input for signaling initiation of trials by a keypress or mouse click, and as a visual and/or auditory feedback device. The first feedback consisted of a monitor showing a horizontal linear slider with 21 possible positions, including the initial position in the middle. When the operator was ready, he or she pressed a key and attempted to cause the slider, whose movements were controlled by the PRD output bits, to move to the pre-selected goal of the left or right bound. Movements to the right were produced by outputs of "1" bits and to the left by "0" bits. These outputs were the result of providing 1 billion bits to a bias amplifier that resulted in about 1 bps. A "1" output was generated when the bias-amplified input bits produced a positive bias, and a "0" when the bias was negative.

As PRD's rates increased to 1 THz, training and feedback modalities also evolved to the current version of what we call the PsiTrainer™. PsiTrainer* is a simple graphical and auditory interface that displays results in a number of time-scale and success-rate formats. These include time scales of one trial, moving window of 41 trials and cumulative from start of session, and a wide range of statistical and symbolic outputs representing success rates.

Three operator-selectable "Psi Modes" was an important addition to the PsiTrainer functionality. Originally only a so-called psychokinesis (PK) mode was available. PK mode, which is the mode typically used by almost all mind-matter interaction researchers, implies a direct interaction between mind and the physical source of entropy that is

* A PsiTrainer PC version is currently available online. This version uses the limited entropy available from components present in every PC to generate true random bits up to 6 Kbps. US Patent No. 6,862,605.

producing the raw random numbers. This interaction supposedly alters* some of the bits as they are produced – *measured*, in a quantum mechanical sense – to match the operator's intention. A "clairvoyance" mode and a "precognition" mode were added to the PK mode. Some new terminology is required to describe these additional modes such as "psi bits" and "target bits." Psi bits are intermediary output bits that are produced by the influence of mind on a PRD. Target bits are bits that are produced independently of psi bits. Ideally target bits are nondeterministic random bits, but at the same time should be very difficult to influence by mind. Target bits are produced in two ways, depending on the number of bits required. When a single bit or just a few bits are required, a special pseudorandom generator (PRNG), which also acts as a randomness corrector, is seeded with a small number (typically 7) of raw, nondeterministic bits. Then a sequence of bits is generated by the PRNG and processed to look for runs of 5 "1's" or "0's." The type of bit that produces the first run of 5 is taken as the target bit. If additional target bits are desired, PRNG output and runs processing are continued until they are generated. If a large number of target bits are needed, a sequence of 32 randomness-corrected bits is used as a seed in a high-quality PRNG such as the Mersenne Twister[20]. Consecutive 32-bit words are generated by the PRNG until the required number of targets is obtained.

In both clairvoyance and precognition modes, psi bits are compared to target bits. A hit is registered when a paired psi bit and target bit are the same, and a miss if they are different. This is contrasted with PK mode where the target bits are implicit and always equal to "1." The timing of target bit generation relative to psi bit generation is crucially important to the proper functioning of clairvoyance and precognition modes. A target bit for clairvoyance mode must be generated, but not revealed, unconditionally before any bits are generated that will be used to produce the psi bit that it will be compared with. In precognition mode, the production of a psi bit must have unconditionally completed before beginning to generate its target bit. In both these modes, only the results of the comparisons are revealed to the operator as hits or misses. In addition to these psi modes, the operator has the option to select whether to call a psi bit/target bit match a hit or a miss. This provides additional flexibility in the training sessions.

Four operators have been trained for a significant period of time (1-4 years). These operators had certain similar experiences during their training. At the beginning, each operator found it difficult to achieve any significant results at all, but after a minimum amount of practice, that always changed so that significant results could be obtained, but with great effort and only at a low trial rate. Eventually both the ease of getting significant results and the trial rate greatly increased. The operators' endurance, or session length without undue fatigue, also increased. When clairvoyance, and especially precognition modes were first tried, they seemed to be much more difficult. So much so that it was suspected for a time that these modes were actually more difficult. Eventually, with much more practice, the hit rates and trial rates for these modes became about the same as those

* Determining or correctly interpreting the actual mechanism of any measured effect of this nature may be beyond our current experimental capabilities. The electronic or photonic events that result in a "1" or "0" output are not directly observable, but rather only some information that is subsequently displayed to a human observer. The nature of, or perhaps our limited understanding of quantum mechanics allows for numerous interpretations of any observed correlation between operator intention and observed outcome.

for PK mode. This is somewhat remarkable since the psi bit in precognition mode seems to be an actual prediction of a future event, i.e., the generation of a particular state of a nondeterministic random bit.

PRACTICE VERSUS PRACTICAL PRD APPLICATIONS

The foregoing is an outline of the development of PRD technology, but the promise of how to obtain useful information may not be easily inferred from this. However, a general understanding of how a PRD is constructed and operates is essential to understanding the detailed description of practical applications that follow. We have shown how an operator can be trained to obtain or predict simple binary information hidden in a computer memory or produced in the future.

There are three fundamental differences between PsiTrainer practice sessions and the use of PRD's to gather operational intelligence or real-world, useful information in general. The first is the availability of immediate feedback of success or failure; something that is almost never available in practical applications.

The PsiTrainer provides the operator with real-time feedback of hits and misses. This greatly increases the ability of operators to enhance their abilities: both in how fast they learn and how much their abilities increase. This process is analogous to, and perhaps the same as, the way biofeedback is used to train subjects to intentionally alter a number of supposedly autonomic or subconscious functions in their bodies. Biofeedback produces readily measurable results, but the subject does not consciously know how he or she is doing what they are doing. Feedback is a necessary condition for biofeedback training to be successful. It has been shown that the feedback must be "real time" for the training to work. From a psychophysiological perspective, "real time" generally means the subject receives feedback in less than one second from occurrence of the underlying function that is intended to be altered. A very important result of biofeedback training, as well as anomalous cognition enhancement training, is that once the subject or operator learns the desired skill and become confident of his or her ability to produce the results at will, feedback is no longer needed.

The second difference is the relative simplicity of the single binary bits used in a PsiTrainer compared to the typically much more complex information that may be encountered under operational conditions. There are a number of techniques for dealing with the complexity issue. At the simplest level, the desired information may be representable by a binary bit. Examples of this are questions with only two possible answers, such as yes/no, up/down, better/worse, etc. A "1" output from a PRD is selected to represent one of the answers, typically the one that matches best psychologically, such as "yes," "up" and "better," and a "0" output would represent the opposite answer. More complex answers can always be represented by a carefully parsed decision tree with binary decision points. A simple example of this is, 'will a certain market future go up or down tomorrow, and how much?' This can be ascertained with two binary outcome questions: will the market future go up/down; followed by, will the change be large/small. Of course there are nuances to the question and the answer. The market future may turn out to be unchanged. If this eventuality is important, than an additional first question would be required: will the market future be changed/unchanged? More questions may be added to the decision tree to refine the amount of change.

The third difference between practice exercises and operational use of PRD technology relates to the operator's mental focus and visualized outcomes. In order to achieve significant results in practice sessions, for example with a PsiTrainer, an operator is given general instructions on focusing his or her concerted mental intention to produce the desired outcome. Specifically the desired outcome is to cause an increase (or decrease) in hit rate in whatever psi mode is being practiced. Some hints can be given, which have been generalized from the experiences of others, but the operator will eventually learn to accomplish the task in his or her own way. The various psi modes and options in the PsiTrainer eventually become almost unconscious, although this is only because the operator becomes accustomed to the type of focus or concentration required.

OPERATIONAL DESIGN EXAMPLES

Operational applications require both a wide variety of focused intention as well as the ability to form more complex patterns of interrelated images or symbols. The operator must learn to mentally associate the output of the PRD with an internal construct that contains all the elements of the information desired. This mental construct must be maintained and repeated for each "trial" so that an answer with higher-probability of accuracy can be accumulated. Again, some general guidance can be given on how to achieve this, but each individual must learn by long practice and mental discipline which approaches seem to work better and also which ones are more sustainable.

Other methods of retrieving more complex information have been tried as well. These generally involve constructing more complex output forms from one or more PRD's. One approach used successfully for picking lottery[*] numbers was designed as follows:

1) A 1 THz PRD was configured to output bits at about 1 Mbps.
2) Each operator-initiated trial produced a total of 250,000 psi bits.
3) 250,000 precognition target bits were generated.
4) The psi bits were compared to the target bits resulting in 250,000 match or no-match outputs ("1" or "0" respectively).
5) A z-score was calculated from the count of "1's" (n_1) and the total N = 250,000, using the equation:

$$z = (2n_1 - N)\big/\sqrt{N} \ . \qquad (7)$$

[*] The New Mexico Pick 3 lottery requires selecting three integers from 0-9. The order of selection can either be a factor or not, depending on the type of "bet" played. Also, the three integers are drawn with replacement, meaning that duplicate numbers are possible. We chose the Pick 3 lottery for testing because it has the fewest degrees of freedom of any common lottery, i.e., it is the easiest to win using PRD predictive methods.

6) The z-score, which is nearly normally distributed with N so large, was then converted to a (0, 1) uniformly distributed number, *U*, using an empirical equation.
7) *U* was mapped onto 10 equiprobable integers from 0 to 9 (the range of integers used in the “Pick 3” lottery selected.
8) About 100-300 integers were picked using steps 2 through 7 and binned into the 10 corresponding bins from 0 to 9.
9) The integers corresponding to the top 4 bin counts were permuted to create the 4 most probable picks.
10) The 4 picks were purchased in the Pick 3 lottery the same day[21], producing one winning combination (Figure 4).

Figure 4

A lottery was selected as a test because it represents a real and generally recognizable potential value. It requires future information that is not inferable or obtainable by classical means. These characteristics represent the greatest challenge for information gathering, and demonstrate the unique potential of PRD-enhanced anomalous cognition.

A final example will be briefly described to illustrate the utility of this technology. A PRD operating in clairvoyance mode is configured to output a single bit per trial. An operator sits in front of a monitor displaying a map. The objective is to locate an object or person (the target) in the map region. If the operator has or could have conscious or subconscious preconceptions about the target’s location, recognizable features should not be visible on the map to prevent biasing the search procedure. The vertical or horizontal axis is preselected for each search trial and the operator mentally intends the PRD output to indicate the presence of the target in the left/right or top/bottom of the map respectively. A “1” output would indicate the right or top and a “0” output would indicate the left or bottom. Assume for this explanation the horizontal axis is the immediate selection, a “1” output would indicate that the target is located in the top half of the map region. The bottom half of the map could then be removed from the next search iteration. In practice the reliability or absolute accuracy of the PRD output is not 100%. A fraction of the map less than 50% can be excluded from the next iteration based on the estimated hit rate for the operator at that moment, and on the desired probability of the final outcome. This increases the time and effort required, but increases the probability of success. The process of reducing the map area (convergence) is repeated around the vertical and horizontal axes until a sufficiently small region is resolved.

CONCLUSION

We have attempted to describe the development and operation of psycho-responsive devices and the significant advantages to be gained through their use in enhancing anomalous cognition for the purpose of gathering operational intelligence and other valuable information. PRD technology can be used to obtain hidden, non-inferable and future information that is not available through any classical methods. Ironically, information that is considered to be most secure, such as cryptographic keys transmitted using quantum cryptography, is presumed to be so based on assumptions which may fail when the affects of mind and consciousness are included in relevant quantum information theories. The level of technology described in this paper is adequate to begin potentially significant information gathering programs, although we have made substantial advances beyond what is disclosed here.

PRD's are not "mind reading" machines and the human component – the operator – will remain crucially important to the success of any intelligence gathering program. Although talented individuals may seem to be rare, this may only be due to the previous lack of appropriate evaluation and testing methods. We may reasonably infer the distribution of native skill levels in the general population will follow a normal distribution analogous to intelligence quotient. Unlike IQ, which can only be increased a limited amount by education and training, anomalous cognition abilities appear to be more of a talent that can be revealed and greatly enhanced by proper training and practice using PRD technology.

We believe it is appropriate to establish pilot programs to utilize machine-enhanced anomalous cognition methods for beneficial purposes. This will serve a number of important functions including demonstrating the utility of this new technology, encouraging its further development, providing an environment for scientific research of the underlying principles and helping people perceive they possess a dormant ability with significant implication for human evolution and survival.

REFERENCES

1. Adhikari, R. and Yang, Y., (2002), China's Increasing Openness: Threat or Opportunity to Others?, Paper presented at the World Bank's Annual Bank Conference on Development Economics – Europe, 24-26 June, Oslo, Norway.
2. Brune, N. and Garrett, G., (2005), THE GLOBALIZATION RORSCHACH TEST: International Economic Integration, Inequality, and the Role of Government, Annual Review of Political Science, Vol. 8, pp. 399-423.
3. Vriens, D., (2003), Information and Communications Technology for Competitive Intelligence, IGI Global.
4. Herman, M., (1996), Intelligence Power in Peace and War, Cambridge University Press, Cambridge.
5. Pincus, W., (May 28, 2006), Panel Requires Annual Disclosure of Intelligence Budget, Washington Post, p A06.

6. Negroponte, J., (Feb. 2007), The 2006 Annual Report of the United States Intelligence Community (UNCLASSIFIED).
7. PANORAMA, (July 11, 2004), A Failure Of Intelligence, Recorded from Transmission, BBC-1.
8. Congressional Reports, (Jul. 09, 2004), Report of the Select Committee on Intelligence on the U.S. Intelligence Community's Prewar Intelligence Assessments on Iraq.
9. Kress, K., (1999), Parapsychology In Intelligence: A Personal Review and Conclusions (UNCLASSIFIED), Journal of Scientific Exploration, Vol. 13, No. 1, pp. 69-85, (Originally published in the Winter, 1977 issue of the CIA's classified internal publication, Studies in Intelligence.)
10. Puthoff, H., (2001), CIA-Initiated Remote Viewing at Stanford Research Institute, (Originally published in Summer, 2001, Intelligencer: Journal of U.S. Intelligence Studies, vol. 12, No. 1, pp. 60-67).
11. Mandelbaum, W., (2000), The Psychic Battlefield, A History of the Military-Occult Complex, St. Martin's Press, New York.
12. Mumford, M., Rose, A., et al, (Sep. 29, 1995), An Evaluation of Remote Viewing: Research and Applications, Prepared by The American Institutes for Research.
13. Hyman, R., (Sep. 11, 1995), Evaluation of Program on Anomalous Mental Phenomena, Section: General Scientific Handicaps of the SAIC Program.
14. Stapp, H., (2001), Quantum Theory and the Role of Mind in Nature, Foundations of Physics, Vol. 31, No. 10, pp. 1465-1499.
15. Radin, D., (2006), Entangled Minds: Extrasensory Experiences in a Quantum Reality, p. 154, Pocket Books, New York.
16. Jahn, R., & Dunne, B., (1987). Margins of Reality: The Role of Consciousness in the Physical World, Harcourt Brace Jovanovich, New York.
17. Radin, D., & Nelson, R., (2000). Meta-analysis of mind-matter interaction experiments: 1959 to 2000, In Healing, Intention and Energy Medicine, W.B. Jonas and C.C. Crawford, eds., Churchill Livingston, Edinburgh, pp. 40-48.
18. Wilber, S. (2006), Machine-Enhanced Anomalous Cognition.
19. Jahn, R., Dunne, B., et al, (1977), Correlations of Random binary Sequences with Pre-Selected Operator Intention: A Review of a 12-Year Program, Reprint from: Journal of Scientific Exploration, Vol. 11, No. 3, pp. 345-367.
20. Matsumoto, M., & Nishimura, T., (1998), Mersenne Twister: A 623-Dimensionally Equidistributed Uniform Pseudo-Random Number Generator, ACM Transactions on Modeling and Computer Simulation, Vol. 8, No. 1, pp. 3-30.
21. New Mexico Pick 3 Lottery, Find 4/29/06 in Past Winning Pick 3 Numbers.