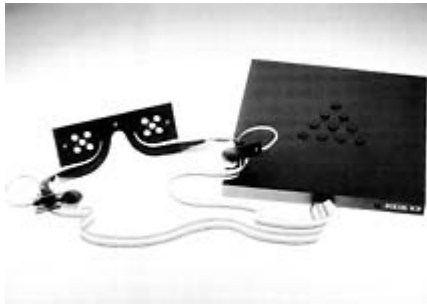


MIND, MAN, MACHINE

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An Approach to Mind Machines



The Mind Machine

Mind Machines are one part of that contemporary technology that is oriented towards Man's welfare. Mind Machines are immediate manifestations of the encounter between mind and electronics.

Audiovisual Mind Machines are electronic devices that produce signals with certain frequency patterns. These signals are transformed into light and sound pulses via light emitting diodes and loudspeakers. The frequency patterns thus produced are the basis for individual experience. Their effect is based upon the vibration resonance establishing itself between the exactly timed signals and the attention. The new focus of attention thus created allows for access to many states of consciousness and realities beyond our everyday experience.

At the center of a Mind Machine Session there is always the individual experience of the user and the quality of his experience. While for the creators of "virtual realities" the newly produced worlds and contents as such bear importance, Mind Machines do not focus on these contents, but rather on the process of design as such, on the observation of perception. The raster upon which the experience is made, is influenced and thus shifted to the center of attention. This allows for an enlarged understanding of what "perception" is, and consequently enhances the quality of perception.

Mind Machines thus permit one to perceive and experience one's own basic rasters of reality and the internal spaces. The introduction of the additional states of knowledge and consciousness into environment design corresponds to the intentions of the fast growing worldwide ecological movement interested in global solutions. The use of Mind Machines may be divided into two general aspects: First, there is some kind of "donning-switching-consuming". This kind of use is passive. A minimum of readiness to loosen will lead to a state of deep relaxation, if not to sleep.

The second variation prerequisites that in the moment of application the user is well aware of what he or she wants to think about or view in the course of the session. By bringing along a definite intention, his attention will be drawn upon the desired topic during the relaxation phase. Thus, an observation from an inner point-of-view is achieved. Through spontaneous associations the existing connections on the emotional, unconscious and value-free levels within each of us are made clear.

In our openly-performance-oriented system of society, an orientation on the inside is often equalled to a lack of productivity. Similarly, an enhanced experience of inner spaces is interpreted as an increasing rejection of responsibility for the outside world. In both cases, it is ignored that in different states of consciousness different rules and laws apply. You find

yourself in very abstract and imaginative spaces. These spaces with all their extraordinary possibilities have a great experiential value for our everyday world.

Now, the use of Mind Machines does offer certain advantages over other ways of voyaging into the inner spaces.

Basically, the experiences expected are similar to those evoked through meditation, religious trance, autogenic training, or modern methods of suggestion. One important difference, though, in the use of Mind Machines, is that the latter lead to experiences and states of consciousness by simultaneously renouncing the conveyance of any experiential contents. Neither language nor associative acoustic contents such as music, the rolling of the sea, or the twittering of birds are used, nor are pre-defined images or videos, such as in Brain Disco. The stimulation the FOCUS 101 offers, is merely catalytic through association-free optical and acoustic frequency patterns.

Another point for the Mind Machines is the very limited time expenditure compared to other methods. The duration of the program varies between five and fifty minutes. Longer or shorter programs are possible, although our experiences of the past two and half years show that best results are achieved with a program duration of about thirty minutes. The factors determining a successful stimulation are the internal disposition (motivation), the environment (setting) and the inner goals (intention).

Repeated use of Mind Machines leads to various stages. Primarily, physical and spiritual relaxation is experienced. After some training, certain mechanisms of perception are built up, allowing the evaluation of the degree of consciousness, recognition of the direction of attention, and judgement of the activity level of the brain. After an intense discussion of various procedures of consciousness, finally the willful induction of desired states becomes possible even without the Mind Machine.

Research, Science and Models of Function.

When some three or four years ago Mind Machines became more and more public, the explanatory models for their manifold effects were mostly based upon newer findings in neuro-scientific and brain research.

For the explanation of the Machines' functions, the following models are most often used :

—Frequency Following Response (FFR)

With its activity rendered visible in the EEG, the brain responds to the frequency input of the senses, and thus tunes in on the lower, slower frequencies; a very simple, linear-causalistic model that could not be proved in practice.

—Hemisphere Synchronization (Hemi-Sync):

This model is based on the notion that the two hemispheres do not cooperate synchronously, and thence a need for "synchronization" exists; this model had practically lost its theoretical basis when Ornstein, the founder of the "Hemisphere Lateralization Theory" revised his rigid model of dominance in 1989, and published a "Multi-Mind" model with many different "Minds" instead.

— Changes in the anatomy of the brain:

The idea of an "Enriched Environment" as a stimulant for growth and multiplication of neurons in the brain, for the recreation of synapses and similar, was proved in the tabs by "Rosenzweig's Rats"; no proof has been available for humans for centrifuging the brain of humans as a method of measurement encountered only limited support.

— Neurotransmitter distribution:

In Acupuncture and electro-stimulation, the increased distribution of endorphines connected to stimulation has become a central model of explanation; porting this model to Mind Machines seems to be plausible, but lacks proof.

— Sensorial deprivation and stimulus overflow:

Just as a total sensorial deprivation in the Samadhi-Tank may lead to a deep relaxation and consequently to a very comfortable change of consciousness in direction of an "oceanic feeling", it is hoped that the seclusion from exterior stimuli can induce similar effects with Mind Machines; a well determined overdose of Stimuli on certain senses (eye, ear) is said to overflow the mind and thus change its state of activation.

— Retino-hypothalamic adduction of energy:

Through strong light stimulation of the eyes, besides the visual center also the hypothalamus — regulating biorhythms and hormones as well as neurotransmitter control — is stimulated into a level of increased activity through a channel of its own.

— Dissipative structures in the brain:

Through very high adduction of energy and information into the brain, the latter shall be induced to leave its present state of energy and information processing and to move up to a higher processing capacity via an intermediary chaos state; here, I. Prigogine's model of "dissipative structures" in physics is transferred in analogy to the brain.

The few scientific data collected hitherto on and about Mind Machines very often show that these simple models (and above all FFR) cannot be sufficient. All these models of explanation for the manifold effects are limited to neuronal, cerebral processes, the exploration of which is only at an early stage at present. Many of these "speculations" have been transformed into quasi proved facts in the course of media reporting, and the models used were simultaneously more and more simplified.

Upon closer analysis of these neuroscientific explanatory models, an old Cartesian brain model appeared, which combined strict linearity and causality. Only the model of the brain a "dissipative structure" has a useable explanatory value compared to the modern analyses and to chaos theory approaches.

What seems to be important in neuropsychological considerations, is the fact that you can measure only what is already present, and what is recognized as being present. Then, we have to develop adequate measuring devices and models in order to be able to actually research these phenomena. Generally, what can be measured is the neurobiological correlates, i.e. the accompanying apparitions, and not the substrates, i.e. the actual basic phenomena. The cellular level of the brain with some 13 billion neural cells is doubtless of great interest, and, without question, the latest results are fascinating and exciting. But this cellular level must not be confused with the level of consciousness, where the structure is important. In order to understand the architecture of the Chartres cathedral it would be senseless to start exploring the bricks.

Furthermore, we had to note that in the neuro-scientific paradigm prevailing today there is generally uncertainty about whether something like "consciousness" actually exists. Rather, there is the predominant notion that from a neurological point-of-view, there is no necessity for the appearance of consciousness.

Prior to a systematic research of the Mind Machines functional principles therefore, we need a substantial and clear criticism of science: A science, declaring any states of consciousness that go beyond the common ones to be pathological or even non-existent, will never be able to produce a relevant research of the manifold phenomena appearing in connection with Mind Machines. Only when a basis for a scientific discipline will be found, that accepts the fact of various states of consciousness as an integral part of its themetical concept and paradigms, Mind Machines may be explored as a complex phenomenon.

Besides scientific theory and scientific criticism, FOCUS also started a series of studies of this topic. These studies underlined that the often mentioned linear frequency following responses and hemispherical synchronizations could not be verified. Instead, some other most surprising data appeared, that were difficult to integrate into the prevailing paradigm. As an example, we want to explain the exploration of Mind Machines in connection with the Direct Current EEG.

The DC-EEG is a part of the electroencephalogram (a recording of cerebral activity) very difficult to measure. Neuro-psychological research has shown that changes in Direct Current in the EEG have to do with attention, wakeness, and general activity. The DC potential of the human brain was found to move within a certain range over the day.

Now, during the application of Mind Machines (and similar to ecstatic trance), a significant and hitherto unexplainable change of the DC potential was measured — towards a state of "highly attentive" and "highly awake". Normal values were exceeded by up to a hundred times — within a few minutes only! These results cannot be inserted into the traditional neuro paradigm, as they reach the limits of what a traditional brain researcher can imagine.

Now, there are hypotheses assuming a connection between these EEG parameters and various states of consciousness. The DC-EEG could be a neuro-physiological correlate for shifts of attention in the sense of a change in consciousness states.

With Mind Machines, instruments have been developed, allowing not only new experiences of areas of consciousness and states of knowledge, but also demanding of the established sciences to introduce the much talked-about change of paradigms at last, and to make models of probable realities and individual "Dream/Space-Times" the basis of their theoretical conception.

This paradigm jump, long overdue, must necessarily include also the findings of quantum mechanics and of chaos research. Therefore, models like "dissipative structures (Prigogine), the theory of non-linear systems with Autopoiesis and self referentiality (Maturana), and synergetics with information as the ordering input (Haken), have the best perspectives for the future.

In short, Mind Machines open possibilities to unleash real cascades of structural stimulation processes within our brain that might lead to a completely new information structure of our mind. Under these aspects, the information fed into the brain has about the same value as the nourishment we feed into our bodies: We are what we have eaten, and we become as is the quality and structure of information we take in, as well.

For exactly these notions and findings, we have stressed quality and structure of the program stimuli of FOCUS 101, knowing that exactly this information structure is the key to consciousness itself.

The Psychology of Mind Machines

As with neurosciences, there is no psychology at present accepting other than everyday states of consciousness or would even take such into consideration. If ever, there is some talk about "extraordinary states of awake consciousness" or similar, which implies that the everyday state is "normal" and all the others are special, strange, rare and extraordinary.

In general, there should be enough scientific evidence by now that a deep state of relaxation can be achieved with Mind Machines. One side-effect closely connected to this, is that relaxation cannot be accompanied by fear (this principle is the basis for the whole behavioral therapy). Besides relaxation, also a release of aggression is an effect, so a comfortable physical feeling is obtained. A deep relaxation, besides, is a rarely attained state for many people, so, many therapeutic applications could be deduced from these effects.

The development of a psychology of Mind Machines would require a registration of the Phenomena appearing with Mind Machines in the first place. As said, basically these phenomena are similar to those of Autogenic Training, of Meditation, of religious exceptional states and ecstatic trances. Above all, a remarkable change of individual perception can be observed. Furthermore, there are changes in the ability to perform, in personal experience and selfexperience, and experiences described in literature in connection with consciousness-altering drugs.

The first step leading to a psychology of Mind Machines would be the exploration of the special states of perception emerging with Mind Machines. In this, light and sound stimuli are applied such as do not happen in everyday experience.

First, a situation is created, that has something of a sensorial deprivation, which is, besides the stimuli by the Mind Machines, nothing or practically nothing is perceived. Then the light and sound stimuli are offered stereoscopically and stereophonically (separated in "right" and "left"), so that the attention wanting to follow selected stimuli is not able to do so any more. Consequently, the attention is separated from external stimuli and shifted to the "middle" between the stimuli, where it goes to rest.

The rhythmical pulses are continuously repeated, which leads to an effect of habituation, to an internal shutting down of the pulses, within a short time. From then on, nothing relevant is left to the inner attention (which has already been triggered by the stimuli); it is thus induced to move inwards into what we call the "Inner Space(s)".

Thus a step has been made that had to be trained with considerable effort until present. The function of an "anchor" (helping to get back to everyday life after the Mind Machine session) is executed by the continuously running pulses, so that I always have a point to return to.

As the sound and light pulses are faded out because of their regularity, only such information is left as perceivable content as is contained in the constellation, the program structure. This information is the basic grid along which my freed attention moves (comparable with the "story line" in a video game). Depending on the design of this raster, I can experience various depths and layers of attention.

The way the attention follows in these cases, is best described in the terminology of depth psychology: First, the personal subconscious is "visited", where personal recollections,

images and phantasies are stored. In psychotherapy, Mind Machines may be readily used just because of the easy access to the subconscious.

The next step is made towards the collective subconscious. There we find archetypes and elementary symbols. This area is already (or no more) accessible on a verbal, but only on a icon or symbol level. There we experience visions, mythical and dreamlike stories and collective experiences and from there any findings of far-reaching collective importance are made.

The last threshold we can cross without losing recollection of the step, is the area containing the basic elements of human recollection, such as geometric shapes and integers. All realities we know about are rooted in this state, closely related to the "Nil", to "The Eye of the Cyclone". This description of contests of different states of consciousness demands that we come to terms on the acceptance of the fact, that these states do exist. Furthermore, this description should be considered but a map, as a full "cartography" will presumably never be obtained.

Some phenomena can thus be observed with Mind Machines that cannot be explained other than by a model of different states of consciousness. Each state can be attributed a state of knowledge closely related to it, containing different perceptions, thinking processes, feeling, intentions, and completely new abilities. Generally, one might say that all these states of knowledge are readily available within us, but are not accessible to our everyday consciousness. Once you are in another state of consciousness, it is often possible to retrieve this knowledge from other areas very easily. Only when returning to the everyday (or common) state both in consciousness and knowledge, there is usually a fast forgetting of what had been experienced. Many Mind-Machine "beginners" think of this as "falling asleep", but in reality they just cannot remember anymore.

Light and Sound

The part of the electro-magnetic spectrum visible to the human eye is called "light". The wavelengths of light range from some 380 nm (purple) to some 7,50 nm (red).

The maximum sensibility of the human eye is somewhere in the middle of this range, at 555 nm, which is green. The distribution of radiation density of daylight, too, has its maximum in this area. This central position given to "green by nature has been considered by us in our deliberations about the efficiency of optical stimulation. FOCUS 101's LEDs emit green light at 565 nm.

According to the findings of color therapy, the single colors are connected to specific effects. Green is thus accepted unanimously as neutral, in the sense that it takes neither extreme. It is in the middle between a cool blue and a warm red, between a psychical purple and physical infra-red; between the inhibitory signal of blue and the action signal of red; between the blue experienced as "pulling down" (in the pineal gland) and the red "pulling up".

The therapeutic use of green is thus fundamentally indicated for acute nervous disturbances for nervous over-stimulation, stress or physical grief. Green will always be experienced as soothing, as calming, as soft, as relaxing. It moves psychical and physical energy into a calmer rhythm. Green means cationness recreation, regeneration.

Light pulses are transformed into photonic pulses by the retina and are crucial for the unloading pattern of the hypothalamus. From there, rhythmic neuronal signals flood the body and the brain. Simplifying, we may say with J. Downing (USA): The hypothalamus programs our biological rhythm, and light programs the hypothalamus.

The arrangement of the LEDs corresponds to the four directions of the movement of visual attention, as we know from Neuro-Linguistic Programming (NUP). For photo-stimulation experiments we know that visions and hallucinations can be triggered by pulsing light. A light stimulus at a certain frequency is able to create dancing patterns in closed and motionless eyes; these patterns are not reproduced on the retina, but created in the mind. The perception of these patterns and mosaics depends on predisposition and on the setting of the person concerned. The external light stimulus practically acts as a catalyst. Both shape and kind of movement of the light effects are individually created and designed internally. We do not yet have a convincing neurophysiological explanation of these effects.

When designing the programs for the light and soundtracks, of FOCUS 101, we oriented ourselves at the idea that any natural phenomenon in nature is based upon geometrical and musical basic structures that can be followed back to the relation of whole numbers. Therefore, there is a common denominator for Man and nature, namely Number and Measure (in geometry), and Sound and Interval (in music).

We therefore supposed that through the application of interval laws, some kind of basic raster is created that corresponds to the inner structure of every human, and thus was chosen as the basis for FOCUS 101 programs. So sound design and the definition of sound and light tracks was determined according to harmonical and mathematical rule. Sounds are tuned between each other to integer frequency and the duration of the single program phases are defined to these criteria, the parts of the program and their repetitions are in exact proportions to each other.

Electronics, Software And Design

The first Mind Machines that reached the European market and still populate it, display all the virtues of American garage production. The pulses produced by these devices and their program sequences are often experienced accordingly as invulsive and lacking smoothness, but this is not to curtail the importance of the boom these devices triggered.

Meanwhile, FOCUS in Vicuna have recognized that an important roomturn is: The spirit within the machine is of central importance! This means that the overall conception, from electronics via software to external aesthetics, must be a well-concieved wholeness.

Focus 101 is a Mind Machine of a wholly new generation, developed expressly for the retention of a harmonic entity. The electronics contain a microprocessor with the necessary periphery, allowing a complex control of light and soundtracks through digital signal processing and thus a softly flowing composition of pulses. Two sound processors and high quality audio amplifiers as well as special LED drivers produce the audiovisual signals. Basically, the programmability guarantees — beyond customizing — the option of enhanced systematic research on the effect of Mind Machines, which is of central interest to us. Further developments are possible through a simple exchange of microchips or may be downloaded from floppy disk.

Software with a comfortable user interface allows the experienced user to program the sequence of audiovisual stimulation. The "Mind Editor" for program design includes the following parameters:

— Light pattern, luminosity, sound volume, interrupt frequency, envelope, phase angle, channel address, signal shape, sound filters and filter resonance frequency.

As the machine's inside, also the exterior expresses the fundamental idea of an entity both in the mask and the control unit. The mask with its LEDs is also used as earphones. Through the

integrated loudspeakers, one cable is sufficient for connection. The ergonomic design reduces superficial pressure to a minimum. The box is milled from one piece of aluminum and has a square footprint with a minimal height of only 16 mm. The surface is diamond ground and coated in deep black, numbers and inscriptions are hand engraved.

In its conception, FOCUS 101 is distinguished by its hi-tech hardware, its harmonious structures in program design, and by a clear aesthetics in shape.

Team And Project Description

FOCUS as a seminary center has repeatedly invited international top experts and great thinkers of our time to Vienna in the past decade, in order to advance the most recent knowledge about Man and Cognition both in theory and practice. In 1987, a trans-disciplinary project was started in order to research the many aspects of the "Mind Machine" topic that had become a focus of interest. Still, one of FOCUS' major areas of interest is being an international pool of information and communication about Machines.

Technical, medical, psychological, socio-political, philosophical, and artistic aspects were and are covered by an ever increasing number of collaborators as well as domestic and international cooperation partners, mostly in the university area. Consequently, a series of publications, press releases and books were published, radio and TV programs broadcast, seminars organized and lectures held.

In the psychological area, research was conducted on the collection of experience-psychological parameters of Mind Machines by people writing their dissertations, in the medical field medical effects and indications are explored in cooperation with several Vienna hospitals and the Ludwig Boltzmann Institute. The technical development of our own Mind Machine, based on the experience gained from the analyses of various devices and the integration of the various research results, was achieved in cooperation with the Institute for General Electro-Technology and Electronics of Vienna Technical University. In 1988, Ernst Graf, Michaela and Rudolf Kapellner, Erwin Riedl-Bratengeyer, and Gunnar Scharmuller initiated the foundation of "FOCUS Electronics Research Production and Distribution Society Ltd.", which was sponsored by the "Scientist Found Corporations" fund of the Austrian Federal Ministry for Science and Research.