MEMORANDUM

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TO: R. M. Wood, A-830

FROM: J. M. Brown/D. B. Harmon, A-830

SUBJECT: CURRENTLY PREFERRED PROPULSION CONCEPT

COPIES TO: C. P. Thomas, A-830; File

REFERENCE:

INTRODUCTION

In a previous memorandum, Reference 1, a broad spectrum of propulsion concepts was listed and discussed. Certain general directions of effort which could lead to a propulsion concept were outlined in this reference. The purpose of this memorandum is to review the efforts of the past six months, indicate the presently preferred propulsion concept, point out the various degrees of confidence felt for each parameter or portion of the propulsion concept, and indicate the direction of future effort.

BACKGROUND

The propulsion concepts spectrum listed in Reference 1 essentially consisted of a generic listing of all known possibilities. For various reasons of flexibility, efficiency, and funding the concepts were screened so that three generic types remained for consideration:

1. External sources - a. Earth Magnetic Field
   b. Earth Electrostatic Field
   c. Earth Gravitational Field

2. Stored Energy - Nuclear Annihilation

3. Free Field Energy - a. Brutino Field
   b. Air Molecules

Furthermore, for space propulsion, types 1 and 3b are eliminated. Thus, efforts during the past six months have been directed along the general approach of nuclear annihilation and brutino free field energy.

Nuclear annihilation consists of converting the individual (orbital) electrons (and nuclear particles) into photons (neutrinos and/or brutinos). Since the nuclear binding forces as well as the forces which hold individual nuclear particles together are presumed to be due to brutino fields (i.e., brutino flow patterns), by sufficiently rearranging the fields it should be possible to break up matter. Matter annihilation requires high intensity fields and the degree of intensity may depend somewhat upon the individual matter particle being annihilated. When technology has advanced so that sufficiently high fields are obtained, matter annihilation undoubtedly will be discovered as a matter of course, and in a very short time after achievement of adequate field intensity. Analytical work could be performed with the goals of defining the required field strength and optimum characteristics for annihilation as well as with the goal of achieving high intensity fields. Efforts along these lines have not been pursued directly since the chance of beating current established methods of physics is deemed not as good as for the free field energy concept.

One free field energy concept using brutinos basically is a scheme for beating the second law of thermodynamics. The statistical mechanics interpretation of the second law implies that assemblages of particles must have configurations which either remain static or must pass to a more uniform state. This free field energy concept is based on taking particles (brutinos) from a uniform population into a vehicle (or propulsion subsystem) then releasing them in a particular direction. The propulsive force results from the recoil of the directional release of the particles. Energy and linear momentum are conserved in the process. The conservation of angular momentum has not been examined and may be a problem. Such organization processes are generally believed to exist, but are not understood. Another free field energy concept consists of forming neutrinos from free brutinos, both groups of which travel in the same direction, which results in a thrust throughout the vehicle in a direction opposite the neutrino flow. Work in this area is judged to have a greater chance of success than on nuclear annihilation.

EFFORTS DURING THE PAST SIX MONTHS

The primary efforts during the past six months have been approximately half on the general kinetic particle equation of continuity and half on the relativity observations.

The general kinetic particle equation of continuity is believed to be the general equation which mathematically represents all configurations of matter and radiation in the universe. (There is a possibility that an added "equation of state" may be necessary.) Thus, everything in the universe is uniquely determined as a solution to this equation with the appropriate boundary conditions. The present status of the paper containing the equation derivation is that there is an uncertainty in one section of the probability analysis. Once this is cleared up the paper would be complete and accurate. Future work should be directed toward finding solutions. For example, the easiest one to find is the particle distribution which is constant with the three space coordinates, the two directional coordinates, and time, and varies with speed -- i.e., the Maxwell-Boltzmann distribution. Achievement of the Maxwell-Boltzmann distribution from this formulation, if realized, should be regarded as a significant accomplishment.

During the last three months efforts were directed toward the relativity observations (gravitational deflection of light, gravitational red shift, rotation of perehelia, Michelson-Morley experiment, particle accelerator performance, Compton effect, and abberation of light). Two significant reasons for analyzing these observations are: 1) to obtain insight into the solution of the general kinetic particle equation, and 2) to establish the credibility of the general approach; i.e., to the postulated kinetic particle universe. Two papers have been completed on the relativity observations: 1) A Kinetic Particle Analysis of The Gravitational Deflection of Light, and 2) A Newtonian Analysis of Compton Scattering. The first paper was based on very simple mathematical assumptions, which appear to be consistent with the kinetic particle postulates, and predicts a result which is very near the observed result and which is much closer than the generally accepted relativitistic prediction. The second paper obtains a prediction of Compton scattering using Newtonian mechanics which is indistinguishable from the relativistic prediction. Newtonian mechanics results rigorously from the kinetic particle postulates and, the significance of this second paper, is that relativistic theory is not necessary to explain the observed effect. Current efforts are being directed toward particle

accelerator performance and to the more basic problem of "force" definition in terms of brutinos and various types of brutino field arrangements.

FREE FIELD ENERGY PROPULSION CONCEPT

Only three brutino free field concepts are known. All three collect brutinos from an omnidirectional field and emits directionally. One concept emits these brutinos in the form of neutrinos (and/or antineutrinos), another emits in the form of photons, and another emits in the form of free brutinos. The brutino capture-neutrino release is believed to be the mechanism of gravitation and thus, a process known to exist. However, a mechanism for directional release must be obtained for this concept. In addition, in order to achieve an acceleration level of 1 g, many orders of magnitude increase in emission rate must be obtained. Both of these problems are considered to be challenging. The brutino capture-photon release mechanism may be the basic mechanism which produces the energy of a star. If so, then a brutino to photon production mechanism exists. Directional release of photons can be achieved using reflectors and is no problem. Thus, if the mechanism actually exists then the speed-up (by a factor of many orders of magnitude for 1 g) problem is the challenging problem. All the portions of the third free field energy concept, brutino capture-brutino directional release, appear at least as uncertain and difficult as the worse of either of the other two concepts and, as such, is not considered further.

The attached table presents a summary of the factors currently believed to be pertinent to achievement of the brutino to neutrino, and brutino to photon free field propulsion concepts. In addition, an indication of the confidence felt for each parameter is presented.

FUTURE EFFORTS

The immediate problem is to start performing experiments. Just as soon as an appropriate technician, or research scientist, is available the experiments will be initiated. Further work on the relativistic observations will continue, as defined earlier in this memorandum. These efforts will continue as long as they are fruitful. Work on the kinetic particle equation of continuity also will be accomplished on a lower priority basis. Evening efforts will be directed generally toward a revision of Advanced Physics.

J. M. Brown, A-830

D. B. Harmon, A-830

References:

1. "Space Propulsion Concepts", memorandum to R. M. Wood from J. M. Brown, dated 8-14-67.

2. "Proposal for Electrostatic/Magnetic Experiments", memorandum to R. M. Wood from J. M. Brown and D. B. Harmon, dated 12-20-67.

TABLE I

FREE FIELD ENERGY PARAMETERS AND ASSOCIATED UNCERTAINTIES

	CONFIDENCE (BETTING ODDS)
GENERAL	
Galilean Reference System	0.99
Brutinos Can Unify Known Physics	0.99
Kinetic Particle Eq. of Cont. Represents All Entities	0.9 or 0.99
PARTICLE DEFINITION	
Photon Description	0.01 or 0.5
Neutrino Description	0.01 or 0.1
Electron Description	0.5
PARTICLE INTERACTIONS	
Photons and Electrons Interact as Indicated by Grav. Defl. of Light and Compt. Scattering Anal.	0.99
Matter Particles Collect Free Brutinos and Emit Neutrinos (thus causing gravitation)	0.9
We Can Find Mech. for Speeding Up ν Production	0.2
We Can Find Mech. for Directing ν 's	0.05
We Can Find γ Prod. Mech.	0.05
We Can Speed Up γ Prod. (Given Above)	0.2
EXPERIMENTS	
At Least One Experiment in Reference 2 Will Succeed (Electrostatic/Magnetic Experiments)	0.2
Velocity of Light Will Be Affected By Magnetic Field	0.5
Compton Wavelength Can Be Determined Accurately (Utilizing Laser or Moessbauer)	0.9
High Magnetic Field Can Be Generated With Counter-Rotating Charges	0.5