1. The force (F) produced by a magnetic (B) or electric (E) field on a charged particle (q) with velocity “v” are defined by:

   F = qv x B F = Eq

2. Equating them to each other:

   qv x B = Eq and: vB = E

3. Define the vector field “V” that translates into the vector field “W”:

   a. $V = xj + yk + zl$, j , k l operators “ , , ”
   b. W = A + B + C.

4. The curl of vector field “V” translates into the vector field (A, B, C) according to:

$$\nabla x V \quad \left(\frac{\partial z}{\partial B} - \frac{\partial y}{\partial C}\right) j \quad \left(\frac{\partial x}{\partial C} - \frac{\partial z}{\partial A}\right) k \; + \; \left(\frac{\partial y}{\partial A} - \frac{\partial x}{\partial B}\right) l \qquad +$$

5. Let the operators be functions of the velocity variable of the Lorentz Transformation Equation:

   a. $j_v \; : \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}$, the Lorentz operator, where: v = v

   b. $k_v = 1 \quad l_v = 1$, Where: v = 0.

Following the rules of the special theory and its definition of the frame of reference, the Lorentz operator (j_v) can only be used in a single frame of reference (xj in “V”). Any operat j (k , l ,or) can be a Lorentz operator as long as the other two operators have Lorentz values of 1; v = 0.

6. “V” defines the condition of vector space before application of the Lorentz equation. “W” defines the condition of vector space after the application of the Lorentz equation. Apply the operators in Eq. 5 to the partials in Eq. 4, and group like terms of “W” :

$$\left(\frac{\partial z}{\partial B} \frac{c}{\sqrt{c^2 - v^2}} \quad \frac{\partial x}{\partial B}\right) \quad \left(\frac{\partial y}{\partial C} \frac{c}{\sqrt{c^2 - v^2}} \; - \; \frac{\partial x}{\partial C}\right) \qquad -$$

$$+ \quad \left(\frac{\partial y}{\partial A} \qquad \frac{\partial z}{\partial A} \right)$$

7. Let: a. " ∂B " an ∂C " = Relativistic space (S);
b. " ∂z " and ∂y " = Non-relativistic space (s);
c. x = x in "V".

8. Propose a general equation that describes the relationship between the "W" partials and the "V" partials for the Lorentz groups in Eq. 6:

a. $\dfrac{\partial B}{\partial z} = Y \dfrac{c}{\sqrt{c^2 - v^2}}$ $\dfrac{\partial C}{\partial y}$ 1 b. $\dfrac{c}{\sqrt{c^2 - v^2}}$ -Y =

c. Where: $Y = \dfrac{S}{s}$, the ratio of increased space (S) to rest (v = 0) space (s)

in a relativistic frame of reference, defined by Lorentz as: $S = \dfrac{cs}{\sqrt{c^2 - v^2}}$.

Assume that the vector field "V" describes the effects of a charged particle as it moves through space. Let: x = the direction (momentum) of the particle; y = the direction of its magnetic field; z = the direction f its electric field.

Relativistic and Fourth Dimensional Aspects of Maxwell's Equations

4. Define two 4 dimensional coordinate systems:

a. (w, x, y, z); b. .

5. Propose a 4 dimensional vector field :

$V = wi + xj + yk + zl$ i, j, k, l , Where: " " are operators.

The curl of the vector field (V) translates into another vector field (A, B, C, D) according to:

$$\nabla x V \quad \left(\frac{\partial x}{\partial A} - \frac{\partial w}{\partial B} \right) \quad \left(\frac{\partial y}{\partial B} - \frac{\partial x}{\partial C} \right) \quad + \left(\frac{\partial z}{\partial C} - \frac{\partial y}{\partial D} \right) \qquad +$$

$$\left(\frac{\partial w}{\partial C}-\frac{\partial y}{\partial A}\right) \quad \left(\frac{\partial x}{\partial D}-\frac{\partial z}{\partial B}\right) \quad \left(\frac{\partial w}{\partial D}-\frac{\partial z}{\partial A}\right) \quad +$$

Let the operators equal

“i, j, k, l $\qquad \dfrac{1}{\sqrt{1-\dfrac{v^2}{c^2}}}$

Let (arbitrarily) “z” and “D” represent the 4th dimensional terms in the vector fields, and assign velocities (v) to the operators according to:

a. v < c, for: “i, j, k “ b. v = c, l ɔr: “ ”

7. Let the “z” and “D” terms of Eq. 6 describe the 4th dimension, and regroup according to:

a. Vector translations in 3 dimensions:

$$\left(\frac{\partial x}{\partial A}-\frac{\partial w}{\partial B}\right) \quad \left(\frac{\partial y}{\partial B}-\frac{\partial x}{\partial C}\right) \quad \left(\frac{\partial w}{\partial C}-\frac{\partial y}{\partial A}\right) \quad +$$

b. Vector translations in 4 dimensions:

$$\left(\frac{\partial z}{\partial C}-\frac{\partial y}{\partial D}\right) \quad \left(\frac{\partial x}{\partial D}-\frac{\partial z}{\partial B}\right) \quad \left(\frac{\partial w}{\partial D}-\frac{\partial z}{\partial A}\right) \quad +$$

8. Assume that Eq. 7b describes the translation from a relativistic frame of reference in “w, x, y, z” coordinates (a), to a post-relativistic frame of reference in the “A, B, C, D” coordinates (b), and that:

a. v < c, for “z” b. v > c, for “D”

9. Define the Lorentz Transformation Equation to accommodate the two conditions of Eqs. 8:

a. b. $X_i = \frac{c}{i\sqrt{v^2 - c^2}}$

The following sequence makes assumptions as to the nature of the proposed translation between the frames of reference defined in Eqs. 8.

10. Take the first term from Eq. 7b:

$$\left(\frac{\partial z}{\partial C} - \frac{\partial y}{\partial D}\right)$$

11. Assume that:

a. if: v > c , then: $\xrightarrow{v} \infty$ b. $\xrightarrow{\partial D} 0$ $\xrightarrow{\partial y} \infty$, and:

12. Assume that:

a. Normalize the "D" partial to unity, the value of "v" at infinity: $\frac{\partial y}{\partial D} = 1$

b. Substitute " X_0 " · ∂z " " and the final equation becomes:

$$\frac{1}{\partial C} \quad X_0 - 1 \qquad)$$

13. Define the "relativistic increase factor" (Y) for mass (m) and distance (s), and equate to Eq. 12b:

$$Y = \frac{m}{m_0} = \frac{s}{s_0} \qquad \frac{1}{\partial C} \quad X_0 - 1 \qquad (\qquad)$$

Eq. 13 describes the nature of the transformation that takes place in one direction ($\frac{1}{\partial C}$) of the faster-than-light coordinate system. It remains to evaluate the results.

V = (w, x, y, z) i^n

5. Define a cyclic field of curl operators by: " i^n "

a. Where: $i = \sqrt{-1}$; n = 1,2,3,...

b. Where one cycle is defined by: $(\sqrt{-1}, -1, -\sqrt{-1}, 1)$ (i, i^2, i^3, i^4) =

c. Where: i^{n+4} i^n

t = t_0 X_0 X_0 $\dfrac{\sqrt{c^2 - v^2}}{c}$

t = t_0 X_i X_i $\dfrac{i\sqrt{v^2 - c^2}}{c}$

9. Define 4 curl operators for real space-time (X_0); 4 for imaginary space-tir X_i):

$j = i^0 x\ (X_{0,i})$ k = $i\ (X_{0,i})$ $l = i^2 x\ (X_{0,i})$ $o = i^3 x\ (X_{0,i})$

10. Define the group of real and imaginary operators as " i^n " :

Where: n = 1, 3, ... Odd numbers = Imaginary operators;
n = 2, 4, ... Even numbers = Real operators.

∇ $= j\dfrac{\partial}{\partial t_1} + k\dfrac{\partial}{\partial t_2} + l\dfrac{\partial}{\partial t_3} + o\dfrac{\partial}{\partial t_4}$ $\dfrac{1}{c}$ $\dfrac{1}{c}$) . Where: " "

11. Group operators " j, k, l, o " according to real numbers (a and b);
imaginary numbers (c and d):

a. (j, l)$_0$ $\dfrac{\sqrt{c^2 - v^2}}{c}$ $\dfrac{\sqrt{c^2 - v^2}}{c}$, - (k, o) $\dfrac{i\sqrt{v^2 - c^2}}{c}$ $\dfrac{i\sqrt{v^2 - c^2}}{c}$ =

c. (k, o) $_i$ $\dfrac{\sqrt{c^2 - v^2}}{c}$ $\dfrac{\sqrt{c^2 - v^2}}{c}$, - j, l $\dfrac{i\sqrt{v^2 - c^2}}{c}$ d. $\dfrac{i\sqrt{v^2 - c^2}}{c}$ =

12. From "a" and "b" in No. 11, let: v = v , for "j" and "k"; let: v = 0, for "l" and "o".
Construct equations:

a. $(j,l\qquad)_0\ \frac{\sqrt{c^2-v^2}}{c}$ - (k,o) b. $\frac{i\sqrt{v^2-c^2}}{c}$ i