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SOME COMMENTS ON FIREPOWER SCORING

WHPease

This transmits descriptions of the systems used for Firepower Scoring and a comparison of our target value method with these systems.

1.0 FIRE POWER SCORING SYSTEMS

1.1 Umpire Manual FM 105-5

This is a scoring system derived from military judgment. The system dates back to pre-World War II. Under the Manual's procedure the rifle equals 1. Other weapons are equivalents of the rifle, i.e., Machine Gun = 4, 81-mm Mortar = 12, 105-mm Howitzer = 20.

1.2 RAC Firepower Score System

RAC developed a firepower score system about 1962 (?) for its "Quick Game" and theater battle model. As with FM 105-5, above, the rifle equals 1. Other weapon's values are based on a rate of application of lethality against standard targets (e.g., a collection of personnel, 50% standing, 50% prone). The application is essentially lethal area times lethality within area times rate of fire. The same factor applies for range. An equivalence between flat-trajectory and area weapons was established from World War II Italy data, (4 times direct fire). For Tanks they used an artillery value arbitrarily factored for mobility, etc. The resultant general values for typical weapons are: Rifle = 1, Machine Gun = 10, 81-mm Mortar = 12, 105-mm Howitzer = 50, 155-mm Howitzer = 100, and tank = 900.

1.3 CORG Modification

CORG took the RAC system and using similar ground rules and reduced the exaggeration of artillery and tanks. Tank value is thought to be 300.

2.0 COMPARISON WITH MAN-DAY VALUE SYSTEM

2.1 Specific

There appears to be some correlation between our weapon channel value (W) and the FM 105-5 scoring system. That correlation is:

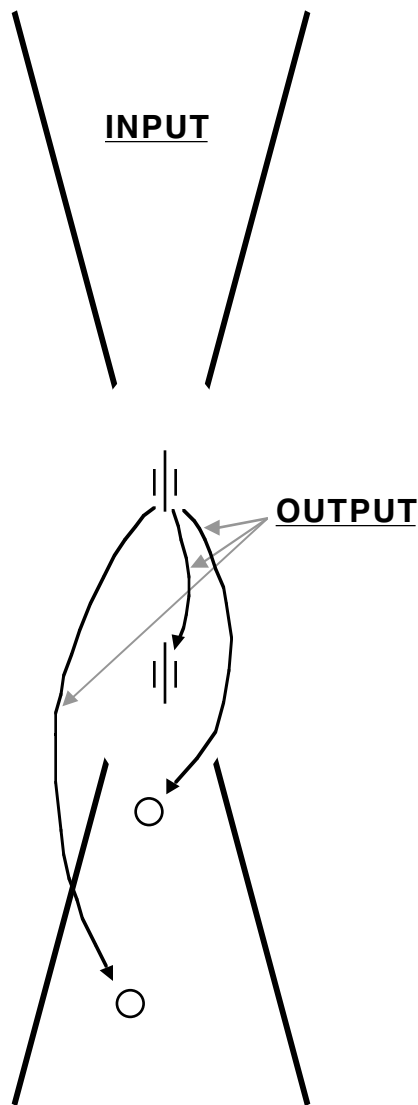
$$K = \frac{W}{\text{Weapon Score per FM 105-5}}$$

However, the correlation is good only to the battalion level.

2.2 General

Firepower scoring systems attempt to measure the output from a given weapon by expressing the rate at which it can destroy some standard target or targets. In some systems, one fire power score is given for personnel targets, a different score for materiel targets.

It is recognized (witness the JWGA RFP for "modifying factors") that the standard target approach results in only at best an average value for the output utility of any weapon. To find a situation-dependent value for the weapon one might say the actual Output (O) is $O = \eta \bar{O}$ where \bar{O} is the "average" or standard output and η is an efficiency factor dependent on the retraction. (Note that both O 's represent rates)

*Sketch*

On the other hand, our method expresses an input W , measured in manpower. We then say Output (0) is: $0 = W(t_2 - t)$, where 0 is not a rate but a quantity. We recognize also that true output valuation depends on an ability to quantify a situation-dependent η .

Neither system is "correct"; from either system one can conceivably get to a good measure of Output. If one wishes to choose between the two approaches, the choice should be made on the basis of utility of the undeveloped system and relative ease of further development. I believe our system has the advantage in these regards; however, the better choice is to work on both and let the two systems interact with each other.

