

To - Hartman, Schneider, Leestma

Subj. Status of Improved Mass Measurement Development

~~The initial approach encountered several difficulties.~~ A contract was let to LMSC to demonstrate feasibility of one or possibly two ~~new~~ methods of mass measurement that would supersede the current BMMD and allow routine operational use on Shuttle and Space Station as well as provide state of the art support for research. This requires an ~~overall~~ accuracy of $\pm 0.1\%$. While lesser accuracies ~~such as~~ say 1% is adequate ^{roughly} for tracking weight loss on a long flight it has few other applications. & Unfortunately $\pm 0.1\%$ still pushes ~~the~~ ^{the best} available methodology and is ~~an~~ more than an order of magnitude more difficult than 1% .

The first method tried, comparison of acceleration forces from ~~the~~ a sample and a reference mass equally accelerated, encountered a number of problems including lack of ^{adequate} commercial transducers, high overhead costs and inadequate NASA facilities (KC-135 and precision air bearing).

~~An~~ after a simpler alternative was sought and by Damon Smith's ingenious computer processing it was found possible to use ~~simple~~ ~~the~~ velocity increments during acceleration of the unknown mass during acceleration to calculate mass to the requisite accuracy.

Appendix B -

~~The it has not been possible to it~~

This system has been demonstrated in the lab
in 1g, but it has not been possible to demonstrate
humans masses either ^{for} ~~in~~ because of lack of
suitable facilities i.e. air bearing or true zero-g
flight. This method ~~can~~ can be implemented in the
~~it~~ Shuttle and