

REAL TIME DATA COMPRESSION FOR RAE-B SPACECRAFT CAMERA

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ABSTRACT: A real time data compression unit was designed and fabricated for the Radio Astronomy Explorer Lunar Mission Antenna Aspect Camera. The camera takes a panoramic view of spacecraft, moon, etc. of ± 35 degrees by 360 degrees. This data compressor combined information reduction and redundancy reduction. The information reduction was accomplished by subsampling (used every fourth line); and the redundancy reduction was accomplished by an adaptive run-length encoder. The adaptive run-length encoder used a zero-order predictor. Two different maximum run-lengths were used with two different data formats. Selection of the operating format depended on the sampled gray level compared to a fixed threshold.

Statistical data and images indicate that the redundancy reduction technique yields a compression ratio of 8:1. Thus a combined compression ratio of 32:1 was obtained on an entire panoramic view.