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AIR FORCE CRYOCOOLER
DEVELOPMENT FOR SPACECRAFT

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ABSTRACT

This presentation is an overview of Air Force sponsored cryocooler development for long duration spacecraft missions. Alternate approaches are being pursued to ensure eventual success. The types of closed cycle cryocoolers that are now in advanced development include Vuilleumier (VM), turbo-Brayton, and rotary-reciprocating refrigerators. Linear Stirling coolers with magnetic bearings have also been jointly sponsored by NASA and the Air Force. Technology is also being explored for future coolers using magnetic materials at low temperatures and for refrigerators with sorption compressors. All of these cryocoolers are presently configured primarily for use with infrared sensor systems, but the design could be adapted to use with cryogenic fluid storage systems or other applications. There are no "off the shelf" space qualified, long-life cryocoolers, and they are expensive.

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SPEAKER: WILLIAM L. HASKIN/AF WRIGHT AERONAUTICAL LABORATORIES

Walter F. Stewart/Astronautics Corporation of America:

Do you have a list of the power consumption and cooling load capability of the coolers you discussed?

Haskin:

I haven't made up a list exactly, however, I can give you the information if you want it.