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**Effects of Gender, Load, and
Backpack on Easy Standing
and Vertical Jump Performance
Volume II**

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load (Load 3 plus backpack with 20-lb load); Load 5 - combat gear and 35-lb backpack load (Load 4 plus an additional 15 lb in pack). The men were also tested under a sixth load condition: Load 6 - combat gear and 50-lb backpack load (Load 4 plus an additional 30 lb in pack). The subjects carried Loads 4 through 6 using four different backpack systems. Two of these consisted of Army frames equipped with the standard Army pack. The third was an experimental item, a packboard made of rigid aluminum, used with the Army pack. The fourth backpack was a commercially-available, internal frame system. Analyses of the easy standing data indicated that both men and women demonstrated greater stability with the medium than with the lighter or heavier loads. The internal frame backpack resulted in greater postural stability relative to the three, external-frame systems. Increasing loads produced a systematic, linear decrease in vertical jumping performance. Analyses of the effects of backpacks on the parameters of jumping performance revealed few differences among the packs. However, it was found that height of jump was somewhat better with the internal frame system than with the external-frame backpacks. Additional analyses were carried out on the trial-to-trial reliability of easy standing and on ground reaction force parameters of vertical jumping adjusted for body weight and system weight.

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PREFACE

This is the second of four volumes comprising the final report of research performed under Contract Number DAAK60-79-C-0131 with the Individual Protection Laboratory, US Army Natick Research and Development Laboratories, Natick, Massachusetts. The work was formulated and directed by Drs. Carolyn K. Benael and Richard F. Johnson, Human Factors Group, Individual Protection Laboratory. Dr. Benael was the contract monitor and Dr. Johnson was the alternate.

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