#### EFFECT OF MICROGRAVITY ON THE VISUAL NEAR POINT

#### Visual Function Tester - Model 4 (VFT-4)

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### BACKGROUND

- Duntley Study (GEMINI)
  - No Significant Changes in (Far) Vision
  - EXCEPT Complaints by 2 Astronauts of Blurred Vision While Reading (Anecdotal)
- Reports of Blurred Near Vision Continue
  - 25 40% of Shuttle Astronauts
    - CR Gibson, FK Manuel (NASA-Contracted Optometrists)
    - MP Caputo (KRUG Life Sciences)

#### BACKGROUND

- Potpourri of Blurred Near Vision Reports
  - No Concurrent Blurred Far Vision (Duntley Studies, VFT1, VFT2)
  - Immediate Upon Orbit
  - Attenuates After Several Days
  - Normal Upon Return To Earth
  - 40 and Older

## PROBLEM

- Anecdotal Reports Without Supporting Data
- Possible Etiology
  - Loss of Accommodation
    - Parasympathetic Nervous System
  - Shift Towards Hyperopia
    - Physiological Cause (Choroidal Swelling)
    - Vegetative Cause (Water Balloon)
      - Flatter in Gravity
      - More Circular in Space
- Course Unknown

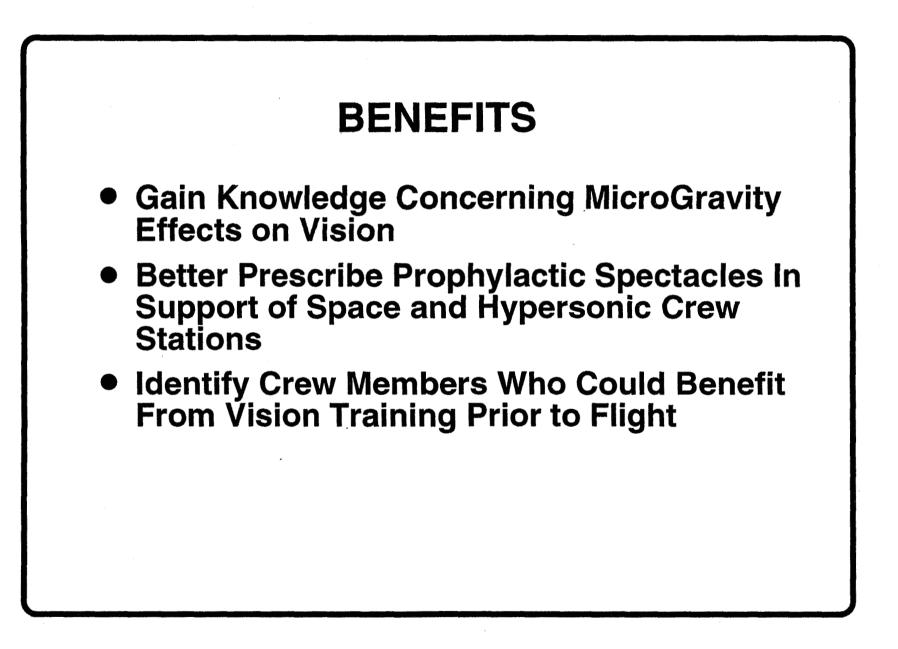
### OBJECTIVES

- Near Term Verify Astronaut's Complaints
- Determine Category of Cause
- Provide Data Base Concerning Extent and Range of Effects
- Long Term

Determine Specific Cause Develop a Quantitative Model that Predicts On-Orbit Visual Changes

## APPROACH

- VISION FUNCTION TESTER Model 4 (VFT4)
  - Investigate Ground Space Differences:
    - Far Point of Vision
    - Near Point of Vision
    - Speed (Facility) of Accommodation



# STATUS

- Software Completed
- Hardware
  - 3 Units
    - 2 Units are Fully Functional & Validated Optically
    - 1 Unit Near Completion
  - All Units Will Be Converted from Battery Power to Orbiter Power
  - DOS Computer with RS-232 Serial Port (NASA-Supplied PGSC)
  - Half-Locker (VFT4 Unit & 2 Floppy Disks)