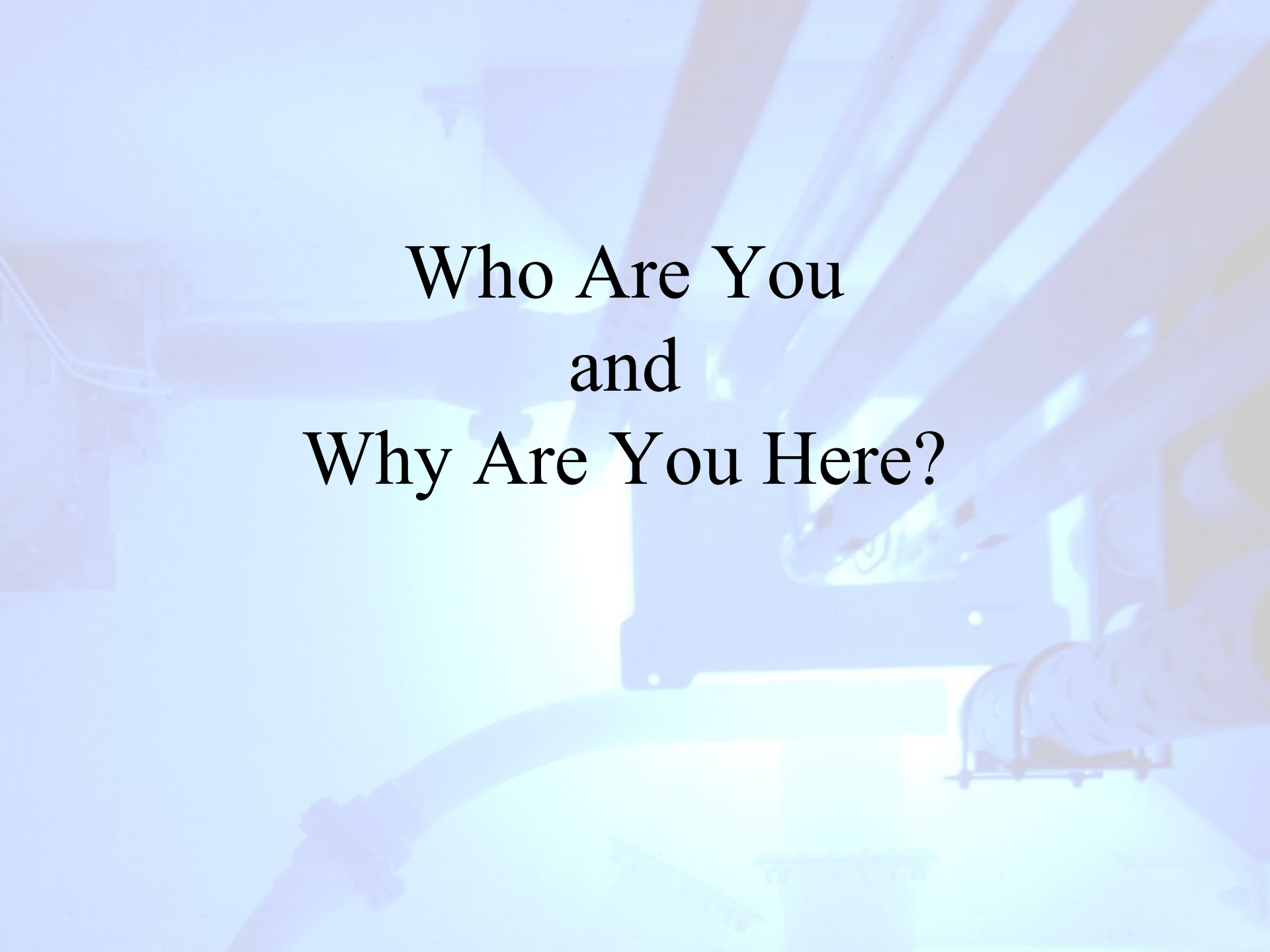




Long-Term Experience  
Operating With LEU At Up-rated  
Power



Who Are You  
and  
Why Are You Here?

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# What We're Doing Here

- Why We Did It
- How We Did It
- How Is It Going
- Was It Worth It

# Why Bother?

- The Only One Left
- It Was Coming Anyway
- Get Something Out Of It For Ourselves

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- The Only One Left
- It Was Coming Anyway
- Get Something Out Of It For Ourselves  
(other than supporting graduate students  
and faculty release time)

# The Last of a Dying Breed

- Once Many, Now Few



# The Last of a Dying Breed

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  - Battelle RR (2 MW RR)





# The Last of a Dying Breed

- Once Many, Now Few
  - Battelle RR (2 MW RR, RIP)



# The Last of a Dying Breed

- Once Many, Now Few
  - Battelle RR (2 MW RR, RIP)
  - AFIT/WPAFB (10 MW RR)



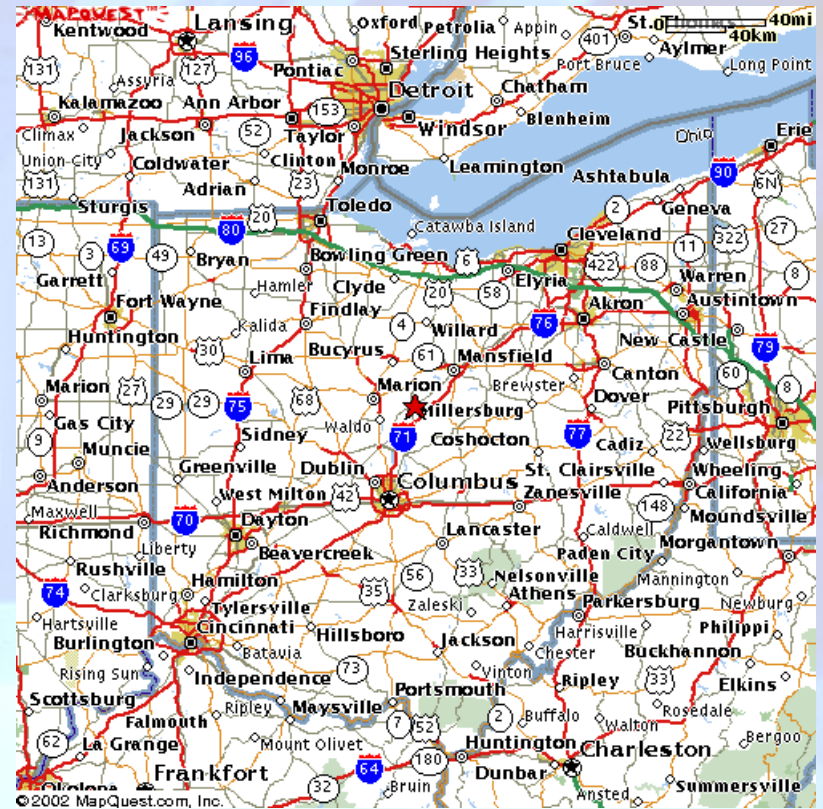
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  - NASA Plum Brook Station (60 MW TR)



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  - OSURR (10 KW RR)



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  - AFIT/WPAFB (10 MW RR, goner)
  - NASA Plum Brook Station (60 MW TR, bit the dust)
  - OSURR (10 KW RR, little guy still around)



# How We Did It

A blue-tinted photograph of an industrial factory floor. The scene is filled with various pieces of machinery, including robotic arms and conveyor belts. The lighting is bright, creating a high-contrast environment. The overall atmosphere is one of a busy, modern manufacturing facility.



# How We Did It

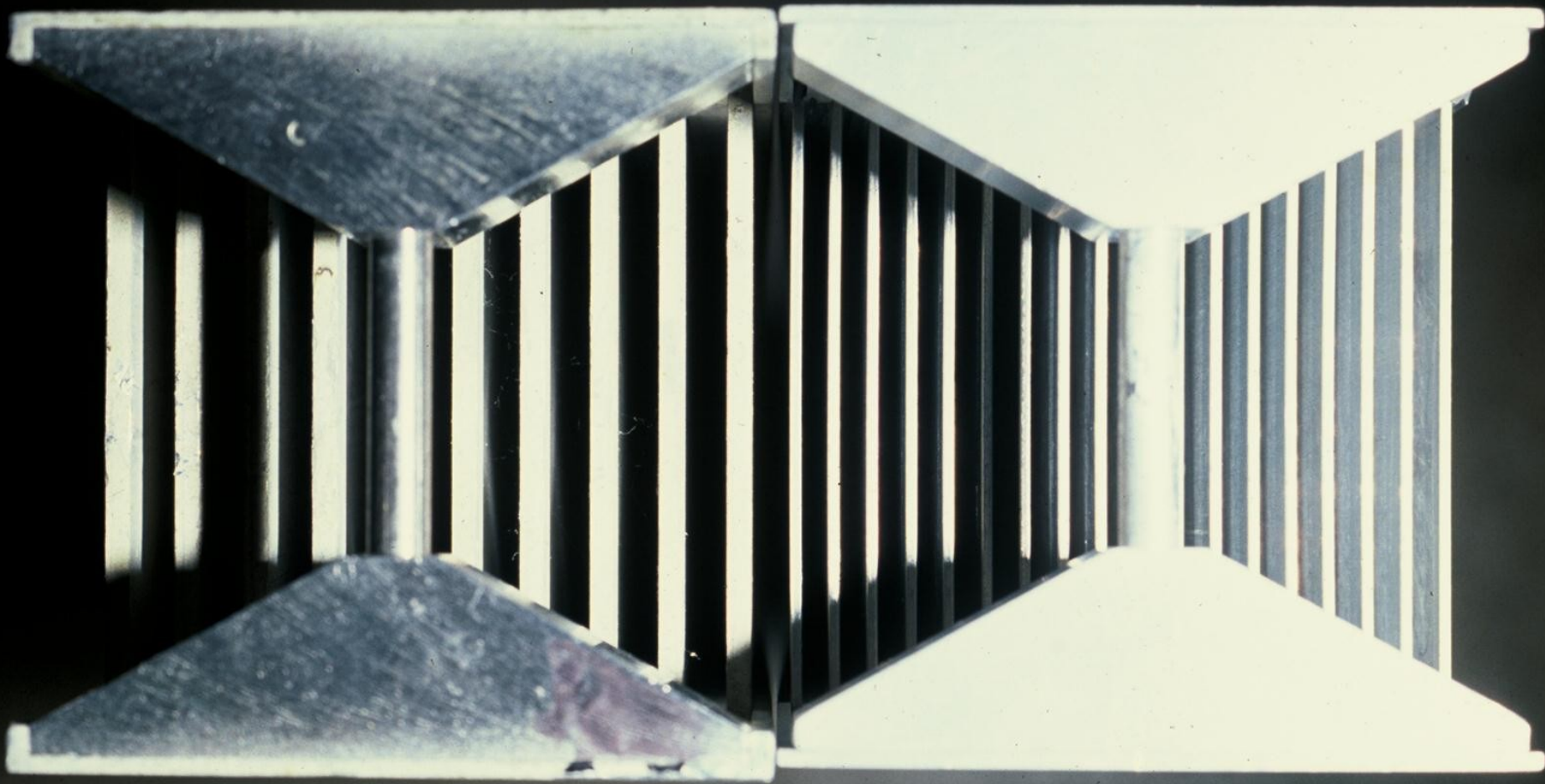
- A Stepwise Process

# How We Did It

- A Stepwise Process
  - Analyze Fuel Conversion

# How We Did It

- A Stepwise Process
  - Analyze Fuel Conversion
  - Analyze Power Change



Fat Man and Little Boy

# Timeline

- 1961-late 1988 10 KW HEU
- Late 1988-Early 1989 Installed First LEU Core, Initial Tests
- 1989-late 1991 10 KW LEU, Work On Upgraded Power Tasks
- Late 1991-Early 1992 Initial Testing At Upgraded Power
- 1992-Present 500 KW LEU

# How Is It Going

A blue-tinted photograph of an industrial factory floor. The scene is filled with various pieces of machinery, including robotic arms and conveyor belts. The lighting is somewhat dim, creating a moody atmosphere. The text "How Is It Going" is overlaid in the upper center of the image in a black, serif font.

# How Is It Going

- Higher Loading Means A Smaller Core Compared to the HEU Core

# Looking Down From The Top – Shroud Covers Off





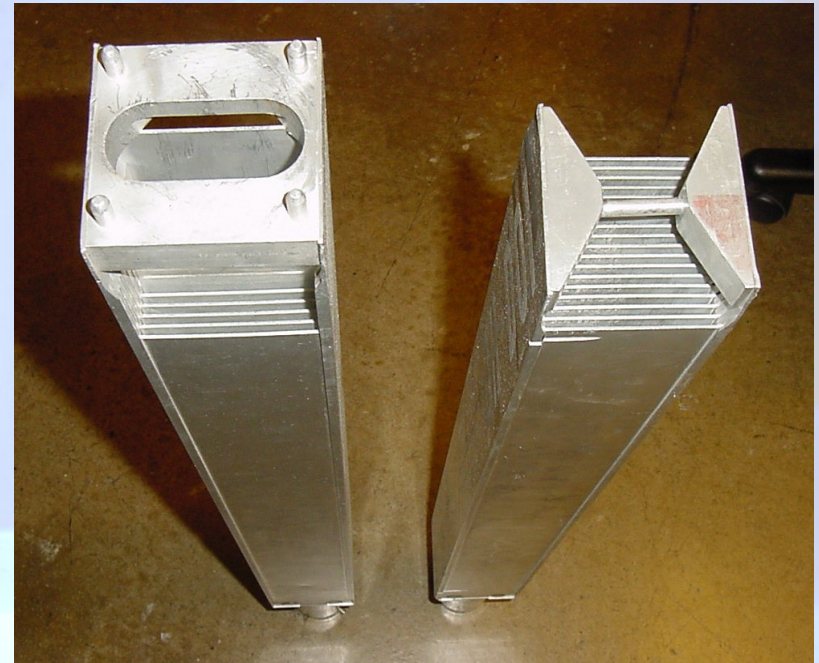


# How Is It Going

- Higher Loading Means A Smaller Core Compared to the HEU Core
- More Neutrons Streaming Out Of The East Core Face
- Less Worth For Experiments In Beam Port
- Fuel Has Been OK (No Leakage)
- A Small Amount Of “Rust” Color On One Fuel Element (Took Element Out)

# LEU Fuel Elements

- Control Rod Fuel Element On The Left
- Standard Fuel Element On The Right



# How Is It Going

- In-Core Neutron Energy Spectrum Is A Little “Harder” (5%-7% Change)

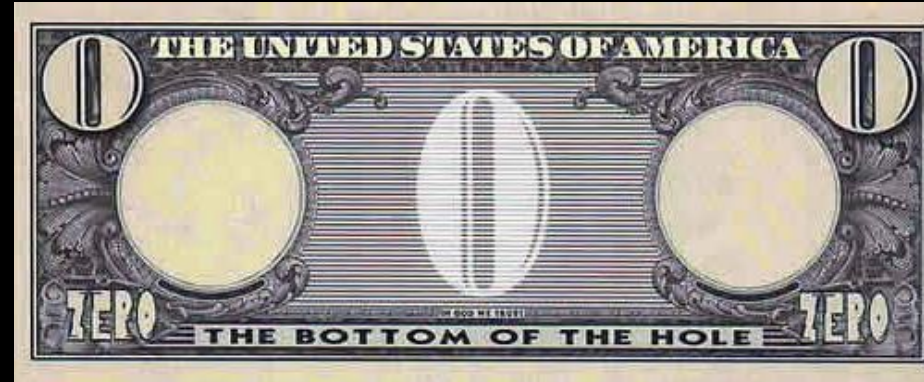
# How Is It Going

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- Experiments Mounted Along The Open Face Of The Core Get More Flux

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- In-Core Neutron Energy Spectrum Is A Little “Harder” (5%-7% Change)
- Experiments Mounted Along The Open Face Of The Core Get More Flux
- Pretty Much Of A Wash On Other Ex-Core Facilities

# The Eternal Questions (How Long and How Much)



DOE Funding Paid For:

- Fuel Conversion Studies
- Core Installation/Testing
- HEU Fuel Shipment

University Funding Paid For:

- Power Upgrading Studies
- Upgraded Power Hardware
- High Power Testing/Modifications

How Long: 1986-1992 (Fuel Shipped in 1995)

How Much: \$350,000 (more or less)

A blue-tinted photograph of an industrial factory floor. In the foreground, a robotic arm is visible on the left, and another one is on the right. The background shows various pieces of machinery, pipes, and structural beams. The lighting is somewhat dim, and the overall atmosphere is industrial and somewhat somber due to the monochromatic color scheme.

**Was It Worth It?**





Our One and Only “Construction Project” Since 1960



# Was It Worth It?

- Do What You Gotta Do

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- Capabilities Have Been Enhanced

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- Do What You Gotta Do
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- Utilization Has Increased

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- Not Getting Rich

# Was It Worth It?

- Do What You Gotta Do
- Capabilities Have Been Enhanced
- Utilization Has Increased
- Inquiries From New Users
- Not Getting Rich (but stayin' alive)



# The 26 Million Dollar Man

(Some Dilution Has Occurred)



20

- THE SIX MILLION DOLLAR MAN

As much as I would like to think I could be Lee Majors as Steve Austin... as Steve Austin...



As much as I would like to  
think I could be Lee Majors  
as Steve Austin...

a more appropriate character  
might be...









“Hello Mr. Gump.”



And that's all I have to say about that...



