Getting a Handle on Improved Telemanipulator Operation

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One Common Component

This handle has been used on manipulator models over the past 70 years, with few changes made to the overall design and construction.

Also available:

Pistol Grip Handle for heavy duty applications
Area of Focus in Recent Years

ERGONOMICS

**ergonomic | ərɡəˈnæmɪk |**

*Adjective.* Relating to or designed for efficiency and comfort in the working environment.
Evolution of the Handle

Current Production Handle

• Developed in the late 1950's
• Basic design has remained unchanged and in production for over 60 years

VR2 - VR3

First attempts at improvement
• Tapered handle with wide Duck Bill for hand comfort
• Grip Ball for second hand stability
• Based entirely on 1950's design with minor changes
• Good ideas, but never made it to Production

VR4 - VR7

Major improvements implemented
• Reduced assembly time and reduced assembly tools
• Common parts throughout
• No-Solder Electrical maintenance
• Additional grip points for increased control
• Backward compatibility with 1950's model

VR8

• Ergonomic Study issues addressed and incorporated
• Removable, Maintainable, Adjustable Design
Ergonomic Handle Assessment

Ergonomics experts from SRI•Ergonomics provided CRL with technical assistance on ergonomics issues surrounding telemanipulator handles.

Three different efforts were conducted in order to evaluate any ergonomics issues surrounding the design and use of telemanipulator handles:

• Ergonomics Design Principles
• Anthropometric Data
• Biomechanics Assessment

Ergonomics Principles were applied and tested on CRL telemanipulator handles.
8 Ergonomic Principles Tested

1. **Grip Type** (power – strength ability) (pinch – precision)

2. **Handle Diameter**

3. **Handle Shape** for optimal gripping and torque-generation

4. **Handle Length**

5. **Handle Surface** can make difference on required grip forces

6. **Handle Material**

7. **Sharp Edges**

8. **Function** ambidexterity for all users
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**VR8**
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This new system met all of the parameters for ergonomic operation in different wrist positions:

- Neutral
- Palmer Flexion
- Dorsiflexion
- Radial Deviation
- Ulnar Deviation

As well as the versatility that makes it usable by operators with:
Varying hand sizes | Dominant-hand orientations | Hand-strength levels
VERSA Handle System

**Finger Loops**
Adjustable, swivel

**Handle**
Longer length, tang (hilt) shape

**Shroud**
Protection from moving parts

**Two-handed Operations**
Reinforced grip strength

**Activation Buttons**
No sharp edges
Quickly Detachable Controls

- Requires No Tools to Remove
- Allows for Each Operator to Have a Perfectly Fitted Handle
- Allows for Change Between Handle Types
- Maintenance can be Easily Completed Off the Manipulator
Answer to Industry Need

The result of this commitment is the

VERSANCEL HANDLE SYSTEM

which stands ready to be a next-generation solution to all telemanipulator user and operations concerns.
THANK YOU!

QUESTIONS?