MIL – STD – 1472D
Checklist

Lockheed Missiles & Space Company, Inc.

Human Engineering
Design Criteria for
Military Systems,
Equipment and
Facilities

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This is a checklist for recording human factors engineering evaluations of how well military systems, equipment, software, and facility characteristics comply with human factors engineering design criteria. It is a sequential listing of all major MIL-STD-1472D Section 5.0 paragraph headings. The main paragraph headings serve as easy reminders to make sure no area of concern is overlooked. Besides allowing the user to make direct compliance checks of criteria to hardware, software, or facility characteristics, the checklist can serve as a vehicle for making other types of comparisons between different systems or to identify subsets of requirements for testing.

Subject Terms:
human factors, human engineering, human performance, man-machine interface, operator interface, military standards, design criteria, workspace design, controls and displays, anthropometry
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- Distribute ergonomic technologies and publications.
- Perform customized bibliographic searches and reviews.
- Prepare state-of-the-art reports and critical reviews.
- Conduct specialized analyses and evaluations.
- Provide workshop administration support.

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The MIL-STD-1472D

Checklist

Lockheed Missiles & Space Company, Inc.
This MIL-STD-1472D checklist was developed by the **Lockheed Human Factors Engineering** group. It is a job aid we use every day on programs, proposals, and out in the field. Since 1959, our group has delivered products like this one, plus software guidelines and graphical user interfaces (GUIs), task analyses, facility layouts, part-task training simulations, and many other diversified products to both military and commercial customers.

One resource which has helped Lockheed win major contracts in the past 3 years is our GUI software development lab. It has the latest workstations and software running in a X Windows/Motif environment for developing prototypes and testing their usability. This Open Systems approach has enabled us to merge commercial off-the-shelf applications, such as signal processing, modules, expert systems, and mapping databases with GUI Builder Toolkits. It provides a single programming environment for developing high quality user interfaces, which will satisfy your design, cost, and schedule requirements.

To obtain further information about our services, please contact:

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Sunnyvale, CA 94088-3504  
(408) 742-4383
THE MIL-STD-1472D CHECKLIST

This booklet is a checklist for recording human factors engineering evaluations of how well military systems, equipment, software, and facility characteristics comply with human factors engineering design criteria. It is a sequential listing of all major MIL-STD-1472D Section 5.0 paragraph headings. You can use it with or without MIL-STD-1472D, depending on how familiar you are with the detailed criteria.

The sequential listing shows you at a glance the breadth of coverage necessary for a complete human engineering evaluation for any selected topic. The main paragraph headings serve as easy reminders to make sure no area of concern is overlooked.
OTHER APPLICATIONS

Besides allowing you to make direct compliance checks of criteria to hardware, software, or facility characteristics, the checklist can serve as a vehicle for making other types of comparisons between different systems or to identify subsets of requirements for testing.

For instance, it can be used to identify the critical MIL-STD-1472D design characteristic of an existing system, which, if altered in an upgraded system, would severely affect human performance of cross-trained operators. It can be used to identify only those directly testable design requirements that, if not satisfied, would critically degrade system performance.

Thus, the checklist is a convenient format for organizing different types of evaluations. You may find other uses for it, too.
CHECKLIST FORMAT

The numbered paragraph headings are presented in a legal display format. Both the first and second levels are flush left to consolidate space. Most checklist entries can be made at the second, third, and fourth levels.

Not all paragraph headings are underlined as in MIL-STD-1472D; instead, capitalizing, bolding, and underlining are used to direct the readers’ attention through the five levels of requirements.

Specifics references to Tables and Figures, per MIL-STD-1472D, are included in the applicable line item.

First-level section headings in section 5.0 (Detailed Requirements) are on each of the gray tab pages.

Note pages are inserted at the end of each chapter for recording comments, drawing diagrams, etc.

Ten yellow discrepancy report (DRs) forms are provided at the end of the checklist.

The typeface is Helvetica, 9 pt.
**HOW TO USE THIS CHECKLIST**

Check the Satisfactory (SAT) column across from the criteria if the characteristic complies.

Check the Not Satisfactory (N/S) column if a characteristic is not immediately applicable.

Check the column marked Discrepancy Report (DR) if you decide that the particular hardware, software, or system design characteristic severely violates MIL-STD-1472D criteria and standards. Fill out a yellow color coded DR form.

Use the checklist as often as space allows, or use it for “one shot” test and evaluations; record the item and date, and place on the back cover for easy reference.
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GENERAL REQUIREMENTS
4.0 GENERAL REQUIREMENTS

Make your final assessment using section 4.0 (General Requirements) after you have analyzed the software package, hardware, equipment, facility layout, or system using the Detailed Requirements section (5.0).

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DETAILED REQUIREMENTS
DETAILED REQUIREMENTS

This section is divided into 15 detailed requirements subsections. Note pages are provided at the end of each subsection.

The 15 detailed requirements are:

5.1 Control/Display Integration
5.2 Visual Displays
5.3 Audio Displays
5.4 Controls
5.5 Labeling
5.6 Anthropometry
5.7 Workspace Design
5.8 Environment
5.9 Design for Maintainer
5.10 Design of Equipment for Remote Handling
5.11 Small Systems and Equipment
5.12 Operational and Maintenance Vehicles
5.13 Hazards and Safety
5.14 Aerospace Vehicle Compartments
5.15 User-Computer Interface
5.1

CONTROL/DISPLAY INTEGRATION
5.1 CONTROL/DISPLAY INTEGRATION

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   Consistency

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VISUAL DISPLAYS
5.2 VISUAL DISPLAYS

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5.2.1.2 Display Illumination and light distance

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  - Night vision compatible
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- Format
- Redundancy
- Combining operations/maint info
- Display failure clarity
- Display circuit failure
- Unrelated markings
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- Timeliness
- Advisory and alerting

5.2.1.4 Location and arrangement

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SAT N/S DR N/A
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CONTROLS
5.4 CONTROLS

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  Grouping ............................................................................
  Sequential operation ..........................................................
  Location of primary controls ..............................................
  Consistency .........................................................................
  Remote controls ...................................................................
  Maintenance and adjustment .............................................
  Spacing ................................................................................
  (See Table VII)

5.4.4.4 Coding
  Methods and requirements ..................................................
  (See Table VIII)
  Location coding .................................................................
  Size coding .......................................................................... 
  Shape coding ........................................................................
  Color coding ........................................................................
  Choice of colors ...................................................................
  Immediate action controls ..................................................
  Relation to display ..............................................................
  Control panel contrast ........................................................
  Ambient lighting ...................................................................

5.4.4.5 Labeling of controls ..................................................

5.4.4.6 Compat w/ handwear ..................................................

5.4.4.7 Blind operation .........................................................

SAT N/S DR N/A
5.4.4.8 **Prevention of accidental actuation**

<table>
<thead>
<tr>
<th>Location and design</th>
<th>Internal controls</th>
<th>Rapid operation</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recess/shield</td>
<td>Cover/guard</td>
<td>Interlocks</td>
<td>Resistance</td>
</tr>
<tr>
<td>Interlocks</td>
<td>Resistance</td>
<td>Lock</td>
<td>Resistance</td>
</tr>
<tr>
<td>Resistance</td>
<td>Lock</td>
<td>Rotary action</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dead Man controls</td>
<td></td>
</tr>
<tr>
<td>Foot-operated controls</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Use**
- Greater force
- Hands occupied
- Population stereotype
- Safety shutdown

**Avoidance**
- Sensitive balancing
- Precise control
- Many controls

**Operation (avoid following)**
- Frequent, max reaching
- Awkward positions
- Twisted positions
- Frequent, max force
- Operator search
- Inadvertent activation
5.4.5 **Rotary Controls**

5.4.5.1 **Discrete rotary controls**

**Rotary selector switches**

<table>
<thead>
<tr>
<th>Use</th>
<th>Moving pointer</th>
<th>Shape</th>
<th>Positions</th>
<th>Contrast</th>
<th>Parallax</th>
<th>Dim, res, displ, sep</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(See Fig. 4)

**Key operated switches**

<table>
<thead>
<tr>
<th>Use</th>
<th>Dim., Displ., Res.</th>
<th>Color, Shape, and Size Coding.</th>
<th>Marking, labeling</th>
<th>Other requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(See Fig. 5)

**Discrete thumbwheel**

<table>
<thead>
<tr>
<th>Application</th>
<th>Shape</th>
<th>Coding</th>
<th>Direction of movement</th>
<th>Numerals</th>
<th>Internal illumination</th>
<th>External illumination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

(See Fig. 6)

**Continuous adjustment rotary controls**

**Knobs**

<table>
<thead>
<tr>
<th>Use</th>
<th>Dimension, torque, separation</th>
<th>Knob style</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

(See Fig. 7)
### Continuous adjustment rotary controls (cont.)

<table>
<thead>
<tr>
<th>Ganged control knobs</th>
<th>SAT</th>
<th>N/S</th>
<th>DR</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimension, separation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(See Fig. 8)</td>
<td></td>
<td></td>
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<tr>
<td>Resistance</td>
<td></td>
<td></td>
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<tr>
<td>(See Fig. 8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marking</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Knob/display relationship</td>
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<td></td>
</tr>
<tr>
<td>(See Fig. 8)</td>
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<tr>
<td>Inadvertent operation</td>
<td></td>
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<tr>
<td>(See Fig. 8)</td>
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<table>
<thead>
<tr>
<th>Continuous adjustment thumbwheel</th>
<th>SAT</th>
<th>N/S</th>
<th>DR</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orientation and movement</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>(See Fig. 9)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Turning aids</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimension, separation, resist</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(See Fig. 9)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Labeling and visibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OFF position</td>
<td></td>
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<table>
<thead>
<tr>
<th>Cranks</th>
<th>SAT</th>
<th>N/S</th>
<th>DR</th>
<th>N/A</th>
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</thead>
<tbody>
<tr>
<td>Use</td>
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<td></td>
</tr>
<tr>
<td>Grip Handle</td>
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<tr>
<td>Dimension, resistance, sep</td>
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<tr>
<td>(See Fig. 10)</td>
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<tr>
<td>Folding handle</td>
<td></td>
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<tr>
<td>Crank handle</td>
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</table>

<table>
<thead>
<tr>
<th>Handwheels</th>
<th>SAT</th>
<th>N/S</th>
<th>DR</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turning aids</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Spinner handles</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Direction of movement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimension, resistance, sep</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(See Table IX)</td>
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<td></td>
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</tr>
<tr>
<td>Steering wheel shape</td>
<td></td>
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<tr>
<td>Power steering failure</td>
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<tr>
<td>(See Table IX)</td>
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<td></td>
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<tr>
<td>Steering ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>(See Table IX)</td>
<td></td>
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</table>
### 5.4.3 Linear Controls

#### 5.4.3.1 Discrete linear controls

**Pushbutton**

<table>
<thead>
<tr>
<th>Use</th>
<th>Shape</th>
<th>Positive indication</th>
<th>Guard</th>
<th>Dimension, resistance, displ.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td>(See Fig. 11)</td>
</tr>
</tbody>
</table>

**Interlocks/barriers**

<table>
<thead>
<tr>
<th>Use</th>
<th>Operation</th>
<th>Dimension, resistance, displ.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(See Fig. 12)</td>
</tr>
</tbody>
</table>

**Foot operated switches**

<table>
<thead>
<tr>
<th>Use</th>
<th>Operation</th>
<th>Dimension, resistance, displ.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(See Fig. 11)</td>
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</tbody>
</table>

**Keyboards**

<table>
<thead>
<tr>
<th>Use</th>
<th>Layout/configuration</th>
<th>Numeric keyboard</th>
<th>A/N keyboard</th>
<th>Dimension, resistance, displ.</th>
<th>(See Table X)</th>
</tr>
</thead>
</table>

**Feedback**

**Toggle switch**

<table>
<thead>
<tr>
<th>Use</th>
<th>Accidental activation</th>
<th>Dimension, resistance, displ.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(See Fig. 13)</td>
</tr>
</tbody>
</table>

**Legend switch**

| Dimension, resistance, displ. |
| (See Fig. 14) |
| Barrier height |
| (See Fig. 14) |
| Other requirements |

| SAT | N/S | DR | N/A |
### 5.4.3.1 Discrete linear controls (cont.)

#### Rocker switch
- **Use**
- Accidental activation
- Positive indication
- Dimension, resistance, displacement
  - (See Fig. 15)
- Orientation
- Color and illumination

#### Slide switch
- **Use**
- Accidental activation
- Dimension, resistance, separation
  - (See Fig. 16)
- Orientation
- Positive indication

#### Push-pull
- **Application**
- Dimension, displacement, clearance
  - (See Table XI)
- Rotation
- Detents
- Inadvertent activation
- Direction of control motion
- Resistance

#### PC switch controls
- **Use**
- Dimension, resistance, separation
- Shape

### 5.4.3.2 Continuous adjustment linear controls

#### Levers
- **Use**
- Coding
- Labeling
- Limb Support
- Dimensions
  - (See Fig. 17)
- Resistance
  - (See Fig. 17)
- Displacement and separation
  - (See Fig. 17)
5.4.3.2 Continuous adjustment linear controls (Cont.)

Displacement Stick
Hand operated
Use……………………………………………………………………
Dynamic characteristics………………………………………
Dimension, resistance, clear……………………………………

Finger operated
Use……………………………………………………………..
Dynamic characteristics………………………………………
(See Fig. 18)
Dimension, resistance, clear…………………………………

Thumbtip/fingertip operated
Use…………………………………………………………….
Dynamic characteristics………………………………………
Dimension, resistance, clear…………………………………
(See Fig. 18)

Isometric joystick
Use……………………………………………………………..
Dynamic characteristics………………………………………
Dimension, resistance, clear…………………………………

Finger operated
Use……………………………………………………………..
Dynamic characteristics………………………………………
Dimension, resistance, clear…………………………………
(See Fig. 18)

Thumbtip/fingertip operated
Use……………………………………………………………..
Dynamic characteristics………………………………………
Dimension, resistance, clear…………………………………
(See Fig. 18)

Ball control (track ball)
Use……………………………………………………………..
Dynamic characteristics………………………………………
Limb support……………………………………………………
Dimension, resistance, clear…………………………………
(See Fig. 19)

Grid & Stylus
Application……………………………………………………
Dynamic characteristics………………………………………
Dimensions, mounting………………………………………..
5.4.3.2 **Continuous adjustment linear controls (Cont.)**

Free-moving XY controller (mouse)
- Application
- Dynamic characteristics
- Dimensions, shape

Lightpen
- Use
- Dynamic characteristics
- Dimensions, shape

Pedals
- Use
- Location
- (See Fig. 20)
- Control return
- Pedal travel path
- High force application aids
  - Seat backrest
  - Normal reach
- (See Fig. 22)
- Double-width pedal
- Non-slip pedal surface
- Dimension, resist, displ, sep
- (See Fig. 20)

5.4.4 **High Force Controls**

5.4.4.1 Use

5.4.4.2 Arm, hand, thumbfinger

5.4.4.3 Foot controls
- (See Fig. 22)

5.4.5 **Miniature Controls**

5.4.5.1 Use

5.4.5.2 Dim, resist, displ, sep

5.4.5.3 Other requirements

5.4.6 **Touch-screen Controls for Displays**

5.4.6.1 Use

5.4.6.2 Luminance transmission

5.4.6.3 Positive indication

5.4.6.4 Dimensions/separation
- (See Fig. 14)

5.4.6.5 Resistance
- (See Table X)
5.5

Labeling
5.5 LABELING

5.5.1 General
5.5.1.1 Application
5.5.1.2 Characteristics, consistent with
   Accuracy
   Time available to recognize
   Reading distance
   Illuminant level and color
   Criticality
   Consistency
5.5.1.3 Proto/prod eqpt. labels

5.5.2 Orientation and location
5.5.2.1 Orientation
5.5.2.2 Location
5.5.2.3 Standardization

5.5.3 Contents
   Equipment functions
   Abbreviations
   Irrelevant information

5.5.4 Qualities
5.5.4.1 Brevity
5.5.4.2 Familiarity
5.5.4.3 Visibility, legibility
5.5.4.4 Access
5.5.4.5 Label life
5.5.4.6 Label background

5.5.5 Design of Label Characters
5.5.5.1 Black characters
5.5.5.2 Dark adaptation
5.5.5.3 Style
5.5.5 **Design of Label Characters (cont.)**

5.5.5.4 **Capital versus lower case**

<table>
<thead>
<tr>
<th>Labels</th>
<th>Legends</th>
<th>Signs</th>
</tr>
</thead>
</table>

5.5.5.5 **Letter width**

5.5.5.6 **Numeral width**

5.5.5.7 **Wide characters**

5.5.5.8 **Stroke width, normal**

5.5.5.9 **Stroke width, dark adapt**

5.5.5.10 **Stroke width, transillumin**

5.5.5.11 **Character spacing**

5.5.5.12 **Word spacing**

5.5.5.13 **Line spacing**

5.5.5.14 **Label size versus lumin**

(See Table XII)

5.5.5.15 **Char height/view distance**

| SAT | N/S | DR | N/A |

5.5.6 **Equipment Labeling**

5.5.6.1 **Units, assemblies, subassemblies, and parts**

<table>
<thead>
<tr>
<th>General requirements</th>
<th>Location, so that</th>
<th>Not obscured</th>
<th>Flattest, uncluttered surface</th>
<th>On main chassis</th>
<th>Minimum wear/tear</th>
<th>No accidental removal</th>
</tr>
</thead>
</table>

Terms

| Other criteria |

5.5.6.2 **Controls and displays (C/D)**

<table>
<thead>
<tr>
<th>General requirements</th>
<th>Simplicity</th>
<th>Functional labeling</th>
<th>No similar names</th>
<th>Considers user &amp; purpose</th>
<th>Indicates functional result</th>
<th>Indicates functional relations</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>Ease of operation primary</th>
<th>Above C/Ds normally</th>
<th>Includes units of measure</th>
<th>Indicates functional groups</th>
<th>Uniform and consistent</th>
<th>Size graduation</th>
</tr>
</thead>
</table>
NOTES
5.6

ANTHROPOMETRY
5.6 **ANTHROPOMETRY**

5.6.1 **General**

(See Figs. 23-28; Tables XIII-XVIII)

Design & sizing considers the following by user population:

- Accommodation
- Compatibility
- Operability
- Maintainability
- 5th female to 95th male
- Nature of task
- Frequency of task
- Safety of task
- Difficulty of task
- Body position
- Mobility/flexibility requirements

Compensation for:

- Protective clothing
- Projections
- Obstacles
- Packages
- Lines
- Padding

5.6.2 **Anthropometric Data**

(Consult the detail tables in MIL-STD-1472D)

5.6.3 **Use of data**

- **Data limitations**
- **Clearance dimensions**
- **Limiting dimensions**
- **Adjustable dimensions**
- **Clothing/personal equipt**

5.6.4 **Special populations**

Special populations
NOTES
5.7

WORKSPACE DESIGN
5.7 **WORKSPACE DESIGN**

5.7.1 **General**
- 5.7.1.1 Kick space
- 5.7.1.2 Handles
- 5.7.1.3 Work space
  - Depth of work area
  - Lateral work space
  - Space between rows of cabinets
  - Storage space

5.7.2 **Standing Operations**
- 5.7.2.1 Work surface
- 5.7.2.2 Display placement, normal
- 5.7.2.3 Display placement, spcl.
- 5.7.2.4 Control placement, normal
- 5.7.2.5 Control placement, spcl.

5.7.3 **Seated Operations**
- 5.7.3.1 Work surf, width/depth
- 5.7.3.2 Work surface height
- 5.7.3.3 Writing surface
- 5.7.3.4 Seating
  - Compatibility
  - Vertical adjustment
  - Backrest
  - Cushion
  - Armrests
- 5.7.3.5 Knee room
  - Height
  - Width
  - Depth
- 5.7.3.6 Display placement, normal
- 5.7.3.7 Display placement, spcl.
- 5.7.3.8 Warning displays
- 5.7.3.9 Control placement, normal
- 5.7.3.10 Control placement, spcl.

5.7.4 **Common Working Positions**
- 5th female to 95th male
  (see Tables XIX & Fig. 29)
5.7.5 **Standard Console Design**

5.7.5.1 **Dimensions**

(See Table XX & Fig. 30)

5.7.5.2 **Configurations**

(See Table XX & Fig. 30)

5.7.5.3 **Variable, consider:**

Visibility over top

Operator mobility

Panel space

(See Table XX)

Volume below writing surface

5.7.5.4 **Console selection**

(See Table XX)

5.7.6 **Special-purpose Console Design**

5.7.6.1 **Horizontal wrap-around design**

(See Fig. 31)

Panel width

Panel angle

Dimensions (vision over top)

Dimensions

Viewing angle

(See Fig. 2)

5.7.6.2 **Vertical/stacked segments**

(See Fig. 32)

Panel division

Height

5.7.6.3 **Sit-stand consoles**

(See Table XX)

5.7.7 **Stairs, Stair-ladders, Ramps**

5.7.7.1 **General criteria**

Selection

(See Fig. 33)

Provision for hand-carrying

Handrails and guardrails

5.7.7.2 **Stairs**

(See Fig. 34)

5.7.7.3 **Stair ladders**

(See Fig. 35)

5.7.7.4 **Fixed ladders**

(See Fig. 36)
### 5.7.7 Stairs, Stair-ladders, Ramps (cont.)

#### 5.7.7.5 Ramps
- Cleating
- Mixed traffic

#### 5.7.7.6 Personnel platforms

#### 5.7.7.7 Elevators, hydraulic work platforms
- Maximum load signs
- Guards
- Limit stops
- Automatic failsafe brake
- Manual lowering device
- Properly treated surfaces

### 5.7.8 Ingress and Egress

#### 5.7.8.1 Doors

#### 5.7.8.2 Hatches
- Configuration
- Force requirements
  - (See Table IX)
- Dimensions
  - (See Fig. 37)

### 5.7.9 Surface Colors

#### 5.7.9.1 Army

#### 5.7.9.2 Navy

#### 5.7.9.3 Air Force
- Console, rack and cabinet exterior
- Panels
- Non-critical pads
- Interior walls, ceilings
- Uninhabited interiors
- Standard commercial equipment
- Conductive surfaces
- Lettering colors
- Non-painted surfaces
  - Commercial equipment
NOTES
5.8

ENVIRONMENT
5.8 ENVIRONMENT

5.8.1 Heating, Ventilating and Air Conditioning
5.8.1.1 Heating
(See Fig. 38)
- Mobile facilities
- Permanent facilities
- Semi-permanent facilities

5.8.1.2 Ventilating
(See Fig. 39)
- Small enclosures
- Large enclosures
- Air velocity
- NBC conditions
- Exhaust pipes

5.8.1.3 Air Conditioning
(See Fig. 38)
- Detailed, extended work
- Cold air discharge

5.8.1.4 Humidity
(See Fig. 40)

5.8.1.5 Temperature uniformity

5.8.1.6 Pers equip thermal control

5.8.1.7 Thermal tolerance/comfort
(See Fig. 39)

5.8.1.8 Ltd thrm tolerance zone

5.8.2 Illuminance
(See Table XXII)
- Enclosures, no blackout
- Dimming capability
- Task compatibility

5.8.3 Acoustical Noise
5.8.3.1 General

5.8.3.2 Hazardous noise

5.8.3.3 Non-hazardous noise
(See Fig. 41)
- General workspaces
- Operational workspaces
- Large work areas
- Small office spaces/special area
- Extreme quiet areas
- Shipboard areas
5.8.3 Acoustical Noise (cont.)

5.8.3.4 Facility design

<table>
<thead>
<tr>
<th>General provision</th>
<th>Attenuation by materials</th>
<th>Attenuation by layout</th>
<th>Reduction of reverberation time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td>(See Fig. 42)</td>
</tr>
</tbody>
</table>

5.8.4 Vibration

5.8.4.1 Whole body vibration

<table>
<thead>
<tr>
<th>Vehicular vibration</th>
<th>Safety level</th>
<th>Proficiency level</th>
<th>Comfort level</th>
<th>Motion sickness</th>
<th>Building vibrations</th>
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<td>(See Fig. 43)</td>
<td>(See Fig. 43)</td>
<td>(See Fig. 43)</td>
<td>(See Fig. 43)</td>
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5.8.4.2 Equipment vibrations

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(See Fig. 43)
5.9

DESIGN FOR MAINTAINER
## 5.9 DESIGN FOR MAINTAINER

### 5.9.1 General
- **5.9.1.1** Standardization
- **5.9.1.2** Special tools
- **5.9.1.3** Modular replacement
- **5.9.1.4** Separate adjustability
- **5.9.1.5** Malfunction identification
- **5.9.1.6** Assembly/disassembly
- **5.9.1.7** Clothing constraints
- **5.9.1.8** Error-proof design

#### Error-proof design
- Interchangeability
- Improper mounting
- Facilitate identification
- Facilitate mounting
- Cable/connector alignment

### 5.9.2 Mounting of Items Within Items
- **5.9.2.1** Stacking avoidance
- **5.9.2.2** Similar items
- **5.9.2.3** Delicate items

### 5.9.3 Adjustment Controls
- **5.9.3.1** Knob adjustments
- **5.9.3.2** Blind screwdriver adjs
- **5.9.3.3** Reference scale for adjs
- **5.9.3.4** Control limits
- **5.9.3.5** Critical controls
- **5.9.3.6** Hazardous locations

### 5.9.4 Accessibility
- **5.9.4.1** Structural members
- **5.9.4.2** Large items
- **5.9.4.3** Use of tools & test equip
- **5.9.4.4** Rear access
- **5.9.4.5** Relative accessibility
- **5.9.4.6** High-failure-rate items
- **5.9.4.7** Skills

### 5.9.5 Lubrication
- **5.9.5.1** General
- **5.9.5.2** Labeling

#### Labeling
- Type and frequency

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5.9.11  **Unit Design for Efficient Handling**

5.9.11.1  **Rests and stands**

5.9.11.2  **Extensions**

5.9.11.3  **Weight**

<table>
<thead>
<tr>
<th>Lifting limits (18”h x 18”w x 12” d)</th>
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<td>Lift &amp; place 5” above floor</td>
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<td>Lift &amp; place 3” above floor</td>
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<td>Carry object 33 ft or less</td>
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<th>Lifting frequency</th>
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5.9.11.4  **Push and pull forces**

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<th>Vertical</th>
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5.9.11.5  **Handles and grasp areas**

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SAT N/S DR N/A
### 5.9.12 Mounting
- 5.9.12.1 General
- 5.9.12.2 Tools
- 5.9.12.3 Removal
- 5.9.12.4 Alignment
- 5.9.12.5 Coding
- 5.9.12.6 Rollout rack, slide, hinges
- 5.9.12.7 Limit stops
- 5.9.12.8 Interlocks
- 5.9.12.9 Hinged mounting
- 5.9.12.10 Layout
- 5.9.12.11 Covers or panels

### 5.9.13 Conductors
- 5.9.13.1 Coding
- 5.9.13.2 Cable clamps
- 5.9.13.3 Length
- 5.9.13.4 Cable routing
- 5.9.13.5 Access
- 5.9.13.6 Susceptibility to abuse
- 5.9.13.7 Cable protection
- 5.9.13.8 Identification

### 5.9.14 Connectors
- 5.9.14.1 Quick disconnect plugs
- 5.9.14.2 Keying
- 5.9.14.3 Identification
- 5.9.14.4 Alignment
- 5.9.14.5 Aligning pins and keyway
- 5.9.14.6 Orientation
- 5.9.14.7 Coding
- 5.9.14.8 Spacing
- 5.9.14.9 Testing and servicing
- 5.9.14.10 Drawer modules
- 5.9.14.11 Electronic modules
- 5.9.14.12 Disassembly/adaptors
- 5.9.14.13 Dust covers

### 5.9.15 Test Points
- 5.9.15.1 Adjustment
- 5.9.15.2 Troubleshooting
- 5.9.15.3 Marking and color coding
## Test Equipment

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## Failure Indication & Fuse Requirements

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<td>Markings</td>
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<td>Circuit breaker controls</td>
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<td>Dimensions and separations</td>
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<td>(See Fig. 13 &amp; Table XI)</td>
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(SAT N/S DR N/A)
5.10

DESIGN OF EQUIPMENT FOR REMOTE HANDLING
5.10 DESIGN OF EQUIPMENT FOR REMOTE HANDLING

5.10.1 Characteristics of Equipment
5.10.1.1 Alignment.................................................................
5.10.1.2 Disconnect..............................................................
5.10.1.3 Fasteners...............................................................
5.10.1.4 Lock/latching mechanism...........................................

5.10.2 Feedback
Visual....................................................................................
Kinesthetic...............................................................................
Tactual..................................................................................
Auditory................................................................................

5.10.3 Manipulators
5.10.3.1 Safety........................................................................
5.10.3.2 Characteristics.........................................................
5.10.3.3 Power Assist............................................................

5.10.4 Viewing Equipment
5.10.4.1 General.................................................................
5.10.4.2 Viewing angle........................................................
5.10.4.3 Coding.....................................................................
5.10.4.4 Lettering.................................................................
5.10.4.5 Stereo viewing.........................................................

5.10.5 Illumination
5.10.5.1 Reflected light.........................................................
5.10.5.2 Threshold viewing.................................................

SAT N/S DR N/A
5.11

SMALL SYSTEMS AND EQUIPMENT
5.11 SMALL SYSTEMS AND EQUIPMENT

5.11.1 Portability and Load Carrying
(See Table XXVI)
Distributed load through muscles............................
Stress on sensitive areas...........................................

5.11.1.3 Portability
Weight........................................................................
Lifting aids..................................................................
Configuration
Length of step.............................................................
Head movements.........................................................
Raise/lower over obstacles.........................................
Visibility to feet........................................................
Ability to squat...........................................................
Body temperature regulation......................................
Normal posture maintenance......................................
Carrying by two persons............................................
Standardization.........................................................

5.11.1.2 Transportability by personnel
Weight........................................................................
Load carrying............................................................
Lifting aids
Handles......................................................................
Placing load...............................................................!
Back packing aids......................................................
Projections..................................................................
Standardization.........................................................

5.11.2 Tracking
5.11.2.1 Gunner environment........................................
5.11.2.2 Crank size.....................................................
(See Fig. 10)
5.11.2.3 Two-dimensional tracking.............................
5.11.2.4 Supports.......................................................!
5.11.2.5 Compatibility.................................................

5.11.3 Optical Instruments and Related Equipment
5.11.3.1 General.........................................................
5.11.3.2 Visual accommodation....................................
5.11.3.3 Viewing angle..............................................
5.11.3 Optical Instruments and Related Equipment (cont.)

5.11.3.4 Magnification
- General
- Unstabilized handheld sights
- Multiple magnification requirement

5.11.3.5 Field of view

5.11.3.6 Entrance pupil

5.11.3.7 Exit pupil
- General
- Daylight
- Low light levels

5.11.3.8 Eye relief

5.11.3.9 Eyepiece adjustments
- 4-power and less
- Over 4-power

5.11.3.10 Optical quality
- Axial resolution
- Luminous transmission

5.11.3.11 Reticles
- Line thickness
- Patterns
- Format
- Parallax

5.11.3.12 Illuminated sights and reticles
- Night operations
- Color
- Dimming
- Illumination level
- Uniformity
- Reticle lines

5.11.3.13 Binoculars/bioculars
- Biocular viewing
- Eyepiece separation
- Magnification differences
- Luminous transmission differences
- Matched oculars
- Weight
- Size and configuration

5.11.3.14 Eyecups and headrests
- Eyecups
- Headrests/browpads
- Compatibility w/clothing/equipment
5.11.3.15 **Accessories**

- **Filters**
  - General
  - Use
  - Shutters
  - Positioning aids

5.11.3.16 **Environmental conditions**

5.11.3.17 **Lighting**

5.11.3.18 **Maintenance**

- Modular design
- Positioning aids
- Quick release
- Collimation
- Purging and charging
- Component replacement

**Boresighting**

- Positive locks
- Lock-unlock resistance
- Adjustment operation

SAT N/S DR N/A
5.12

OPERATIONAL AND MAINTENANCE VEHICLES
5.12 OPERATIONAL & MAINTENANCE GROUND,
SHIPBOARD VEHICLES

5.12.1 General

5.12.2 Seating
5.12.2.1 Dimension/Clearances
(See Fig. 50 & 51)
5.12.2.2 Vertical adjustment
5.12.2.3 Horizontal adjustment
5.12.2.4 Backrest angle
5.12.2.5 Seat pan
5.12.2.6 Seat padding
5.12.2.7 Seat belts

5.12.3 Controls
5.12.3.1 Design
5.12.3.2 Steering
(See Fig. IX)
5.12.3.3 Pedals
5.12.3.4 Control of haz. Operations

5.12.4 Operating Instructions
5.12.4.1 Provision of operating instr
5.12.4.2 Format
5.12.4.3 Speed notice
5.12.4.4 Shift handle positions
5.12.4.5 Control movements
5.12.4.6 General labeling criteria

5.12.5 Visibility
5.12.5.1 Night operation
5.12.5.2 Visual field
5.12.5.3 Ground view
5.12.5.4 Rear view (vehicle)
5.12.5.5 Rear view (road)
5.12.5.6 Glare
5.12.5.7 Windshields & windows
5.12.5.8 Windshield wiper/washers
5.12.5.9 Fork lifts
### 5.12.6 Heating and Ventilation

- **5.12.6.1 Heating**:  
- **5.12.6.2 Ventilation**:  
- **5.12.6.3 Visibility**

### 5.12.7 Trailers, Vans, and Interverhicular Connections

- **5.12.7.1 Trailers**
  - Brake controls
  - Positioning controls
  - Tie downs
  - Landing gear lock

- **5.12.7.2 Vans**
  - Ceiling height
  - Personnel opening
  - Steps, stairs, ladders
  - Access doors
  - Inclinometers

### 5.12.8 Cranes, Materials Handling and Construction

- **5.12.8.1 General**
- **5.12.8.2 Control labels**
- **5.12.8.3 Control placement**
- **5.12.8.4 Foot-operated controls**
- **5.12.8.5 Load capacity**
- **5.12.8.6 Visibility**
- **5.12.8.7 Access**
- **5.12.8.8 Handholds & footholds**

### 5.12.9 Automotive Subsystems

- **5.12.9.1 General**
  - Drain valves
  - Filters
  - Adjustment and access
  - Battery terminals

- **5.12.9.2 Tires**
  - Dual tires
  - Spare tires

- **5.12.9.3 Turn signal & flashers**

- **5.12.9.4 Winches**
  - Instruction plates
  - Operation
  - Cable unwinding
  - Control location
  - Clothing compatibility
5.13

HAZARDS AND SAFETY
5.13 **HAZARDS AND SAFETY**

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<td>Hand grasp areas</td>
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<td>Pipe, Hose, &amp; Tube line ID</td>
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</tbody>
</table>
5.13.7 **Electrical, Mechanical, Fluid, Toxic & Radiation Hazards**

5.13.7.1 **Electrical hazards**
- Insulation of tools
- Plugs and receptacles
- Voltage exposure
- Dangerous voltage or current
- Ground potential
- Electronically-operated hand tool
- Electronic equipment
- Vehicle batteries

5.13.7.2 **Mechanical hazards**
- Guards
- Telescoping ladders

5.13.7.3 **Fluiding hazards**
- Connectors
- Fluid & fuel servicing equipment

5.13.7.4 **Toxic hazards**
- General
- Carbon monoxide

5.13.7.5 **Radiation**
5.14

AEROSPACE VEHICLE COMPARTMENTS
### 5.14 AEROSPACE VEHICLE COMPARTMENTS

#### 5.14.1 General

- **Windows, canopies and windshields**
  - Visual performance
  - Multi-layered performance
  - Angle of incidence
  - Unobstructed vision
  - Head-up displays
  - General
  - Symbol brightness
  - Legibility
  - Field of view
  - Exit pupil
  - Symbol line width

#### 5.14.1.2 Instrument location

#### 5.14.2 Crew stations & passenger compartments

- **Aircrew stations**
- **Layout for shared work space**
  - General
  - Location & arrangement group
  - Effects of crew size
  - Standing operations
  - Effects of variable gravity

#### 5.14.2.3 Work space dimension

(See Figs. 23-29 & Tables XIII-XIX)

#### 5.14.2.4 Seating & restraint

- General
- Vertical & horizontal adjustment
- Swivel adjustment
- Height
- Access to foot control
- Backrest
- Armrest
- Legroom
  - Height
  - Width
  - Depth
- Passenger seats
5.14.3 Personnel ingress and egress
5.14.3.1 Hatches for normal exit and entrance
   Exit markings
5.14.3.2 Handhold & foothold
5.14.3.3 Tunnels
   Diameter
   Personal equipment space
5.14.3.4 Doors
   Jamming
   Latches
5.14.3.5 Incline, stairs, and ladders
   Angle of incline
   (See Fig. 33)
   Hand & foot surface
5.14.3.6 Floors

5.14.4 Emergency Evacuation
5.14.4.1 General criteria
   Simplicity
   Evacuation time
   Cutaway areas
   Movable articles
   Exterior protrusions
   Evacuation aids
   Handholds
5.14.4.2 Escape exits
   Emergency lighting
   Escape openings
   Ease of operation
   Latch-handle actuation
   Control protection
5.14.4.3 Ejection systems
   Clearance
   Safety harnesses
   Ejection control
   Control protection
   Safety pins & streamers
   Automatic sequencing
   Survival requirements
5.14.4.3 **Ejection systems (cont.)**

- Survival requirements
- Escape capsule
- Capsule provision
- Pressurization
- Alighting impact
- Flotation

SAT N/S DR N/A
5.15

USER-COMPUTER INTERFACE
5.15  USER-COMPUTER INTERFACE

5.15.1  General

5.15.1.1  Standard procedures

5.15.1.2  Computer response

5.15.1.3  On-line guidance

5.15.1.4  System status

5.15.1.5  Log-on procedures

5.15.1.6  Log-on off procedures

5.15.1.7  Computer failure

5.15.1.8  Interaction

5.15.2  Data Entry

5.15.2.1  General

User pacing-manual

Positive feedback

Processing delay

Explicit action

Validation

Software-available data

Input units

Cursors

Control

Display

Home position

Explicit actuation

Consistent positioning

Keyboard cursor control

Movement relationship

Abbreviations, mnemonics, codes

Explicit delete action

Change of data

Single method of data entry

Data entry display
### 5.15.2.2 Keyboard

Use

Configuration

Timely display

(See Table XXVIII)

Length

Justification

Numeric keypads

Minimization of keying

Minimization of shift keying

Data change

### 5.15.2.3 Fixed-function (dedicated) keys

Use

Standardization

Functional consistency

Availability

Non-active keys

Grouping

Actuation

Feedback

Function labels

### 5.15.2.4 Variable-function keys

Use

Status display

Reprogrammable default function

Relabeling

Shifted characters

Easy return to baselevel function

### 5.15.2.5 Lightpen

Use

Dimensions and mounting

Actuation

Feedback

Position of lightpen

Lightpen activated/input revd

### 5.15.2.6 Directional controllers

Use

Actuation/deactuation

### 5.15.2.7 Touch Screen

Use

Luminance transmission

Positive transmission

Dimensions and separation

Resistance
5.15.3 **Data Display**

5.15.3.1 **Display format**

Consistency
- Input and output
- Match source documents
- Computer, not user control

Criticality

Readily usable form

Order and sequence
- Data grouped by importance
- Data grouped by function
- Data grouped by frequency

Data separation

Recurring separation

Extended alphanumerics

Comparative data fields

Labels and titles
- Display title
- Command entry, prompts

Data group labels

Scrolling

Page numbering

Frame Identification

5.15.3.2 **Display content**

Standardization

Information density
- Crowded displays
- Related data on same page
- Page labeling

Abbreviations and acronyms

Data entry/display consistency

Context for displayed data

5.15.3.3 **Display coding**

Use

Flash

Brightness

Pattern and location

Underlining

Symbol and size
- Special symbols
- Markers close to words

Color

Shape

Brightness inversion
5.15.3.4 **Dynamic displays**
- Changing values
- Update rate
- Display freeze
- Freeze feedback

5.15.3.5 **Tabular data**
- Use
- Standard formats
- Arrangement
- Titles
- Horizontal extension
- Lists
  - List lines
  - Vertical extension
  - Marking multiline items
  - Arabic numerals
  - Vert. order in multiple columns
  - Hierarchic struct. for long lists
- Numeric punctuation
- Alphanumeric grouping
- Distinctive/informative grouping
- Justification of numeric entry
- Labeling unit of measurement
- Consistent column spacing
- Column scanning cues
- Row scanning cues

5.15.3.6 **Graphic displays**
- Use
- Recurring data
- Refresh rates
- Graph axes
- Trend lines
- Pointing
- Distinctive cursor
- Precise positioning
- Confirming cursor position
- Selecting graphic elements
- Select from displayed attributes
- Displaying current attributes
- Easy storage & retrieval
- Automatic data registration
- Predefined graphic format
- Comp derivation of graphic data
- Drawing lines
5.15.3.6 **Graphic displays (cont.)**
- Drawing figures
- Changing size
- Highlighting critical data
- Reference index
- Data annotation
- Normal orientation for labels
- Pictorial symbols
- Display of scale
- Consistent scaling
- Single scale only
- Unobtrusive grids
- Direct display of differences
- Bar graphs
  - Bar spacing
- Histograms

5.15.3.7 **Text/program editing**
- Buffer
- Presentation mode
- Display window
- Editing commands
  - Text edit columns
  - Program edit command
  - Tab controls
- Editing commands
- Highlighted text
- String search
- Automatic line break
- Format control
- Predefined formats
- Frequently used text
- Text displayed as printed
- Control annotations
- Flexible printing option
- Head & foot of file

5.15.3.8 **Audio displays**
- Uses
- Other requirements
- Supportive function-audio
- Signal characteristics
- Frequency
  - Audibility
  - Alarm setting

SAT N/S DR N/A
5.15.4 **Interactive Control**

5.15.4.1 **General**

- Question & answer
- Menu selection
- Form filling
- Function keys
- Command language
- Natural/query language
- Graphic interaction
- Response time
- Response time induced keyboard lockout
- Keyboard restoration
- Interrupt to end keyboard, lockout
- Simplicity
- Accidental actuation
- Compatibility with user skill
- Availability of information
- Concurrent display
- Hierarchical process
- User memorization
- Dialogue type
- Number system
- Data manipulation
- Computer processing constraint
- Feedback for correct input
- Feedback for erroneous input
- Control input data display
- Originator ID

5.15.4.2 **Menu selection**

- Use
- Selection
  - Devices
  - Titles
  - Series entry
  - Sequences
  - Active option presentation
  - Format consistency
  - Option sequence
  - Simple menus
  - Option presentation
  - Direct function call
  - Consistency w/command language

<table>
<thead>
<tr>
<th>SAT</th>
<th>N/S</th>
<th>DR</th>
<th>N/A</th>
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</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>
### 5.15.4.2 Menu selection (cont.)
- Option coding
- Keyed codes
- Position in structure
- Back menu
- Return to top level

### 5.15.4.3 Form Filling
- Use
- Grouping
- Format & content consistency
- Distinctiveness of fields
- Field labels
- Cursor
- Entry length indication
- Overwriting
- Unused underscores
- Dimensional units
- User omissions
- Non-entry areas
- Flexible data entry
- Informative labels
- Logical order
- Form filling for control entry

### 5.15.4.4 Fixed function keys

### 5.15.4.5 Command language
- Use
- User viewpoint
- Distinctiveness
- Punctuation
- Abbreviations
- Standardizations
- Displayed location
- Command prompts
- Complexity
- User definition of macro cmd
- Standard tech. for command edit
- Destructive command

### 5.15.4.6 Question & answer
- Use
- Question displayed separately
- Recapitulating prior answer
- Source document capability
5.15.4.7 **Query language**
- Use
- Natural organization of data
- Coherent representation of data
- Task-oriented wording
- Logic to link queries
- Confirming large-scale retrieval

5.15.4.8 **Graphic interaction**
- Use
- Iconic menus
- Supplement verbal labels

5.15.5 **Feedback**
- Use
- Stand-by
- Process outcome
- Input confirmation
- Current modes
- Highlight option selection
- User input rejection
- Feedback message cont
- Time consuming process

5.15.6 **Prompts**
- Use
- Standard display
- Explicit prompts
- Prompt clarity
- Definitions
- Consistent terminology
- User confirmation

5.15.7 **Default**
- Workload reduction
- User selection
- Default substitution
- Default entry

SAT N/S DR N/A
### 5.15.8 Error Management/Data Protection

<table>
<thead>
<tr>
<th>5.15.8.1 Error correction</th>
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<tbody>
<tr>
<td>5.15.8.2 Early detection</td>
<td></td>
</tr>
<tr>
<td>5.15.8.3 Internal software checks</td>
<td></td>
</tr>
<tr>
<td>5.15.8.4 Critical entries</td>
<td></td>
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<tr>
<td>5.15.8.5 Error message content</td>
<td></td>
</tr>
<tr>
<td>5.15.8.6 Error recover &amp; process</td>
<td></td>
</tr>
<tr>
<td>5.15.8.7 Diagnostic info</td>
<td></td>
</tr>
<tr>
<td>5.15.8.8 Correct entry &amp; confirm</td>
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</tr>
<tr>
<td>5.15.8.9 Spelling errors</td>
<td></td>
</tr>
<tr>
<td>5.15.8.10 Error in stack command</td>
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</tr>
<tr>
<td>5.15.8.11 Display of error entry</td>
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</tr>
</tbody>
</table>

#### Help

<table>
<thead>
<tr>
<th>Standard action to request HELP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Multilevel HELP</td>
<td></td>
</tr>
<tr>
<td>Browsing HELP</td>
<td></td>
</tr>
</tbody>
</table>

#### Data security

<table>
<thead>
<tr>
<th>Automated security measures</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Warning of threat to security</td>
<td></td>
</tr>
<tr>
<td>Segregate real from simulated data</td>
<td></td>
</tr>
<tr>
<td>Display of simulated data</td>
<td></td>
</tr>
<tr>
<td>Displayed security classification</td>
<td></td>
</tr>
<tr>
<td>User ID</td>
<td></td>
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<tr>
<td>Choice of passwords</td>
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</tr>
<tr>
<td>Changing of passwords</td>
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</table>

### 5.15.9 System Response Time

(See Table XXIX)

<table>
<thead>
<tr>
<th>Key response</th>
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<tbody>
<tr>
<td>Key print</td>
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<tr>
<td>Page turn</td>
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<tr>
<td>Page scan</td>
<td></td>
</tr>
<tr>
<td>XY entry</td>
<td></td>
</tr>
<tr>
<td>Function</td>
<td></td>
</tr>
<tr>
<td>Pointing</td>
<td></td>
</tr>
<tr>
<td>Sketching</td>
<td></td>
</tr>
<tr>
<td>Local update</td>
<td></td>
</tr>
<tr>
<td>Host update</td>
<td></td>
</tr>
<tr>
<td>File update</td>
<td></td>
</tr>
<tr>
<td>Inquiry (simple)</td>
<td></td>
</tr>
<tr>
<td>Inquiry (complex)</td>
<td></td>
</tr>
<tr>
<td>Error feedback</td>
<td></td>
</tr>
</tbody>
</table>

### SAT N/S DR N/A
5.15.10 **Other Requirements**

5.15.10.1 **Overlays**

5.15.10.2 **Hard copy**

Display print

5.15.11 **Data & Message Transmission**

5.15.11.1 **Functional integration**

5.15.11.2 **Consistent procedures**

5.15.11.3 **Minimal memory load**

5.15.11.4 **Interrupt**

5.15.11.5 **Stored message forms**

5.15.11.6 **Incorp. Existing files**

5.15.11.7 **Addresses**

- Prompt address entry
- Address directory
- Aids for directory search
DEFICIENCY REPORTS
Each deficiency report is two pages.

Left and right hand sides face each other for easy copying.
DEFICIENCY REPORT

Who/What/Where/When/How Information

Name of Item

Part/Model Number

Date of Analysis

Location of Test/Evaluation

Design Engineer

Method of Analysis (inspection, test, drawing review, etc.)
Description of Deficiency

Proposed Change and Rationale

Prepared by
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