

Instruction  
Hardware Engineering

No. LMS 1-6

**Subject:** Workmanship for Electronic Assemblies

**APPROVED BY** Manager, Hardware Engineering

**STATUS** Maintenance Revision

**PURPOSE** Establish the acceptable workmanship criteria for electronic equipment. Define those workmanship requirements not normally covered in subsidiary specifications or drawings. Requirements of this instruction shall be met by all L-3 Communications Corporation, Link Simulation & Training Division (hereafter referred to as Link) personnel, their Vendors and Suppliers who are involved in the manufacture of equipment.

**AFFECTED FUNCTIONS** Hardware Engineering  
Manufacturing  
Quality Assurance

**REFERENCES** All related LMS standards

**DEFINITIONS** None

#### INSTRUCTION

1. Requirements
  - 1.1 Workmanship for electronic assemblies shall comply with the requirements of the current revision of all related LMS standards.
  - 1.2 **Cleaning.** After fabrication, parts and assembled equipment shall be cleaned of smudges; loose, spattered, or excess solder; weld metal; metal chips and mold release agents; or any other foreign material which might detract from the intended operation, function, or appearance of the equipment.
  - 1.3 **Threaded parts or devices.** Screws, nuts, and bolts shall show no evidence of cross threading, mutilation, or detrimental or hazardous burrs and shall be firmly secured.

- 1.4 Bearing assemblies. Bearing assemblies shall be free of rust, discoloration, and imperfections of ground, honed, or lapped surfaces. Contacting surfaces shall be free of tool marks, gouge marks, nicks, or other surface-type defects. There shall be no detrimental interference, binding, or galling.
- 1.5 Wiring. Wires and cables shall be positioned or protected to avoid contact with rough or irregular surfaces and sharp edges and to avoid damage to conductors or adjacent parts. The installation of wires and cables shall not impede the operation or intended use of mechanical parts or assemblies such as drawer slides, actuation cylinders, control parts or assemblies and the like.
- 1.6 Shielding. Shielding on wires and cables shall be secured in a manner that will prevent it from contacting or shorting exposed current-carrying parts. The ends of the shielding or braid shall be secured to prevent fraying.
- 1.7 Containment. The harness and cable form containment means should be neat in appearance, uniformly applied, and positioned to retain critical form factors and breakout locations. The containment means (lacing, ties, tiedown straps, etc.) should not cause the wire or cable insulation to deform so that performance characteristics are adversely affected.
- 1.8 Insulation. There should be no evidence of burns, abrading, or pinch marks in the insulation that could cause short circuits or leakage.
- 1.9 Clearance. The clearance between wires or cables and heat-generating parts should be sufficient to minimize deterioration of the wires or cables.
2. Quality Assurance Provisions
  - 2.1 The Quality Assurance organization shall be responsible for monitoring the requirements of this instruction.