ORDER

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

6031.1A

21 Apr 1972

SUBJ: FAA DEPOT SERVICING LEVELS FOR GROUND EQUIPMENT

1. PURPOSE.

   a. To provide basic guidance governing the FAA Depot repair and overhaul of equipment used in FAA's system of aids to air navigation, traffic control and communications, and related supporting ancillary facilities.

   b. To provide the basis for a common understanding between those concerned, including field personnel and Depot, regarding the work to be accomplished during the Depot servicing of ground equipment.

2. DISTRIBUTION. This order is distributed in FAA headquarters to the division level in Airway Facilities Service; to the Regional Airway Facilities Divisions; to the branch level in the FAA Depot; and to the Airway Facilities Field Offices.

3. CANCELLATION. 6031.1, FAA Depot Servicing Levels for Ground Equipment, is canceled.

4. GENERAL. To provide effective, efficient, economical service which is responsive to facility needs, the FAA Depot servicing criteria identified in this order have been developed. The determination of the appropriate servicing level is the responsibility of the FAA Depot within the guidelines contained herein.

5. APPLICATIONS.

   a. Servicing Levels. The various FAA Depot servicing functions have been divided into three levels in order to cover all situations involving repair of ground equipment items which have been shipped to the Depot for servicing; i.e., major equipment items, test equipment items, printed circuit boards and modules, etc. These servicing levels and their applications are given below:

      (1) Level A. Normal servicing level. This level will be used to service items which will be returned to serviceable assets of shelf stock, ready for issue. This level does not require an appearance and performance equivalent to that of a new item. Specific functions to be accomplished under Level A are:

(a) Disassembly. Removal of one or more, but not necessarily all, of the subassemblies of an item and/or dismantling necessary to permit access to all electronic and/or mechancial parts of the subassembly(ies).

(b) Repairing. Troubleshoot, visually and with the aid of test equipment. Replace obviously defective or questionable parts necessary to correct reported problems, deficiencies revealed by a partial disassembly of the item, and/or to incorporate required modifications.

(c) Cleaning. Remove obvious dust, grease, or corrosion residue from the main chassis and subassemblies removed and/or dismantled for troubleshooting and modifications.

(d) Refinishing. Sand, prime, and touch-up all marred surfaces revealed by a partial disassembly, closely matching the original color. Touch-up silk screening, engraving, diagrams, etc., to a readable condition.

(e) Electroplating. Apply plating finishes to parts, surfaces, or contacts revealed by partial disassembly only as necessary to stop pitting or corrosion of base metal and to meet the item performance requirements.

(f) Modifying. Incorporate all standard approved modifications. Remove all nonstandard modifications revealed by partial disassembly.

(g) Adjusting and Calibrating. Make the mechanical and electronic adjustments and calibrations required by the current specifications or other authorized documentation for item tune-up or alinement that are permitted by partial disassembly.

(h) Inspecting and Testing. Inspect the item visually, to the extent allowed by partial disassembly, for conformance with current specifications or other authorized documentation and test as necessary to assure compliance with the item performance requirements; or, if covered by an Airway Facilities Handbook, the listed "Initial" standard requirements.

(2) Level B. Essential (limited) servicing level. This level will be used to service repairable items when no serviceable asset shelf stock (ready for issue item) is available and the item is urgently needed by a facility in order to restore a vital function, i.e., a Priority 1 or 2 condition. Specific functions accomplished under Level B are:

(a) Disassembly. Minimum removal or opening of any of the shielding devices of an item such as panels, covers, doors, or lids necessary to permit access to protected electronic and/or mechanical parts.

(b) Repairing. Troubleshooting, visually and with the aid of test equipment, replacing obviously defective parts with minimum item disassembly as necessary to correct reported troubles.

(c) Cleaning. Remove obvious dust, grease, or corrosion residue with minimum item disassembly.

(d) Refinishing. Sand, prime and touch-up all surfaces accessible with minimum item disassembly, closely matching the original color, only if necessary to stop the inroads of corrosion. Touch-up silk screening, engraving, diagrams, etc., to a readable condition.

(e) Electroplating. Apply plating finishes to parts, surfaces, or contacts only as necessary to stop pitting or corrosion of base metal and to meet the item performance requirements, where such can be accomplished with minimum item disassembly.

(f) Modifying. Incorporate any standard approved modifications, where such can be accomplished with minimum item disassembly. Remove obvious, nonstandard modifications not requiring a partial disassembly.

(g) Adjusting and Calibrating. Make the mechanical and electronic adjustments and calibrations required by the current specifications or other authorized documentation for item tune-up or alinement that can be accomplished with minimum item disassembly.

(h) Inspecting and Testing. Inspect the item visually, to the extent allowed with minimum items disassembly, for conformance with current specifications or other authorized documentation and test as necessary to assure compliance with the item performance requirements, or, if covered by an Airway Facilities Handbook, the listed "Operating" standard requirements.

(3) Level C. Special servicing level. This level will normally be limited to situations involving a customer's specific instruction on a reimbursable work order. It may also be applied by the Depot in exceptional cases where under extenuating circumstances, such as items severly damaged in shipment, an item could not be

restored to acceptable service under the normal servicing level (Level A). A cost versus benefit determination must be made in this instance. Specific functions to be accomplished under Level C are:

(a) Disassembly. Removal of all the subassemblies of an item and/or any dismantling necessary to permit access to all electric and/or mechanical parts of the item where such disassembly does not result in damage to the item.

(b) Repairing. Repair or rework all the reparable parts. Replace all irreparable parts and parts subject to deterioration while in storage, as identified by current Depot Shelf Life program documentation.

(c) Cleaning. Remove all dust, grease, or corrosion from the item chassis, subassemblies, and parts.

(d) Refinishing. Strip, prime, and refinish all surfaces as necessary to stop corrosion and/or where the original finish is scratched, chipped, peeled, or discolored. Do not refinish any surface for the sole purpose of restoring the original luster, gloss, or sheen unless specifically required by the customer to do so. Reengraving and resilk screening will be accomplished as necessary.

(e) Electroplating. Apply plating finishes to all parts, surfaces, or contacts as necessary for adequate protection and to meet item performance requirements.

(f) Modifying. Incorporate all standard approved modifications. Remove all nonstandard modifications.

(g) Adjusting and Calibrating. Make the mechanical and electronic adjustments and calibrations required by the current specifications or other authorized documentation for item tune-up or alinement.

(h) Inspecting and Testing. Inspect the item, its subassemblies, and parts visually for conformance with current specifications or other authorized documentation and test as necessary to assure compliance with the item performance requirements; or, if covered by an Airway Facilities Handbook, the listed "Initial" standard requirements.

b. Requirements Common to all Levels.

(1) Preservation and Packing. Adequate physical, mechanical, and environmental protection as specified in AC 4650.1, FAA Depot Materiel Management Handbook, should be provided so as to prevent damage or deterioration of repaired items with type and level of preservation and packing to be determined for each item based on its dispositon, whether for immediate use, immediate shipment, or for transfer to shelf storage.

(2) Workmanship. The details of each level of servicing work are accomplished in accordance with all applicable provisions of MIL-STD-454C, Requirement 9, Workmanship on Electronic Equipment, dated 14 November 1969, with the exception of the last two sentences of Paragraph 3.1. (See Appendix 1)

(3) Quality Assurance. MIL-STD-105D or MIL Handbook H106, as appropriate, shall be used for acceptance of serviced items where a sampling plan in lieu of 100% inspection is utilized.

(4) Identification. An external sticker will be provided for each item serviced by the Depot to be used for recording: (a) the level of servicing, (b) Depot organizational element and, where feasible, initials of technician responsible for service performed, and (c) the date completed.

J. W. COCHRAN
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REQUIREMENT 9

WORKMANSHIP

1. Purpose. The purpose of this requirement is to establish the acceptable workmanship criteria for electronic equipment intended for use by the Department of Defense. This requirement will define those workmanship requirements not normally covered in subsidiary specifications or drawings. It is not intended to supersede any of the provisions of the contract or applicable specifications and drawings considered a part of the contract. Where actual conflict exists, the provisions of the contract or applicable specification or drawing shall take precedence over the requirements herein.

2. General. Workmanship shall be in accordance with the requirements herein and any requirements of the detail equipment specification applicable to soldering, marking of parts and assemblies, wiring, welding and brazing, plating, riveting, finishes, machine operations, screw assemblies, and freedom of parts from burrs, sharp edges, or any other damage or defect that could make the part (or equipment) unsatisfactory for the purpose intended.

3. Mounting of parts. Parts, or hardware shall be assembled, and secured or mounted in the specified manner to satisfactorily accomplish the purpose for which intended, and shall, wherever possible, be mounted such that values and part numbers containing values are visible. Terminal designations of transformers, inductors, relays, etc., shall be visible to facilitate repair. Electronic equipment having missing, inoperative, defective, bent, broken, or otherwise damaged parts will not be acceptable.

3.1 Mounted hardware installation. The installation of hardware parts, such as hinges, catches, handles, or knobs shall be accomplished in such manner as to avoid damaging the hardware or the mounting surface. Hardware or mounting surfaces damaged in this way shall be touched up to provide a continuous protective coating. A color match between the surface touched up and the original finish shall be provided.

4. Cleaning. After fabrication, parts shall be cleaned of smudges; loose, spattered, or excess solder; metal chips; or any other foreign material which might detract from the intended operation, function, or appearance of the equipment. (This would include any particles that could loosen or become dislodged during the normal expected life of the equipment.) All corrosive materials shall be removed. Whenever possible this cleaning shall take place before the parts are assembled into the equipment. Cleaning processes shall have no deleterious effect on the equipment or parts.

5. Threaded parts or devices. Screws, nuts, and bolts shall show no evidence of cross threading, mutilation, detrimental or hazardous burrs.

5.1 Tightness. All screw-type fasteners shall be tight. The word tight means the screw shall be firmly secured and that there shall be no relative movement possible between the attached parts.

6. Riveting. The riveting operation shall be carefully performed in order to assure that rivets are tight and satisfactorily headed with the rivet heads tightly seated against their bearing surface.

7. Gear assemblies. Gear assemblies shall be aligned and meshed and shall be operable without interference, tight spots, loose spots, excessive backlash, or other irregularities that could cause unsatisfactory operation.

8. 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.

9. Insulated wire running between equipments, or subassemblies within an equipment, such as between drawers or chassis and module sub-assemblies, shall be formed into cables or ducted wherever practicable. Wires and cables shall be positioned or protected to avoid contact with rough or irregular surfaces and sharp edges.

9.1 Wire dress or cabling of wires shall not result in improper electrical operation or interference with mechanical operation that will lead to subsequent damage of the wire or cable. Wires and cables subject to flexing shall be protected to prevent abrasion.

9.2 Lacing of cabling shall be neat in appearance. The lacing shall be applied firmly, yet not with excessive pressure which could cut into conductor insulation.

9.3 Cabling or wiring harnesses shall be anchored to avoid damage to conductors or adjacent parts.

9.4 Insulation. There shall be no evidence of burns, abrading, or pinch marks in the insulation that could cause short circuits or leakage.

9.5 Splicing. Wires in a continuous run between two terminals shall not be spliced during the assembly of the equipment, except where a stranded conductor is spliced to a solid conductor and the two are supported at the splice.

9.6 Clearance. The clearance between wires or cables and heat generating parts, such as electron tubes and resistors, shall be such as to avoid deterioration of the wires or cables from the heat dissipated by these parts under the specified service conditions of the equipment.

9.7 Shielding. Shielding on wires and cables shall be secured in a manner which will prevent it from contacting or shorting exposed current-carrying parts. The shielding shall terminate at a sufficient distance from the exposed conductors of the cable to prevent shorting or arcing between the cable conductor and the shielding. The ends of the shielding or braid shall be secured against fraying.

10. Welding. All welds shall be free of harmful defects such as cracks, porosity, undercuts, voids, and gaps. There shall be no burn through. Fillets shall be uniform and smooth. Angular or thickness misalignment, warpage, or dimensional change due to heat from the welding operation shall be within permitted tolerances. There shall be no damage to adjacent parts resulting from the welding.