SELECTION N -- ELECTROSTATIC DISCHARGE (ESD)

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TABLE N-1 – SUMMARY OF CHANGES IN SECTION N

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1. GENERAL

1.1. Introduction

1.1.1 The Installation Supplier shall ensure, as part of the evaluation of the installation, that all equipment added, rearranged or modified is properly installed and in conformance with AT&T installation specifications. Refer to ATT-TP-76306 (Electrostatic Discharge Control)

1.1.2 The Installation Supplier shall ensure, as part of the evaluation of the installation, that all work has been done in accordance with the detail specifications or approved changes to the detail specifications.

1.1.3 This section covers requirements to protect equipment from Electrostatic Discharge (ESD).

1.1.4 Changes in this issue of Section N are summarized in Table N-1.
1.1.5 The term circuit pack is equivalent to terms such as plugs, plug-ins, plug-in units, printed wiring boards, circuit boards, packs, cards, etc.

1.1.6 All equipment containing solid state electronic components is considered ESD-sensitive.

1.2. General Requirements

1.2.1 The Installation Supplier shall provide the necessary anti-static devices to prevent Electrostatic Discharge (ESD) damage to sensitive devices.

1.2.2 Static generating material shall be kept out of work areas where circuit packs are handled.

2. ESD CONTROL HARDWARE - PLACEMENT AND USE

2.1. Wrist Straps

2.1.1 A grounded wrist strap shall be worn at all times when handling a circuit pack that is not inserted in equipment or its protective storage/shipping container. A wrist strap may also be required by an equipment vendor's documentation when performing installation and/or maintenance operations.

2.1.2 To maintain continuity between the wearer's skin and the wrist strap ground point, the band of the wrist strap shall be properly adjusted.

2.2. Wrist Strap Testing and Testers

2.2.1 At minimum, the wrist strap assembly shall be tested each day it is used to assure proper operation. It shall be replaced or repaired when found defective.

2.2.2 The Installation Supplier shall test the integrity of the wrist strap assembly. A Go/No-Go type wrist strap tester using both audible and visual indicators shall be used for testing the wrist strap assembly. In the absence of a wrist strap tester, the wrist strap assembly shall be tested with a volt-ohm meter (VOM). The reading shall be greater than 750 kilo-ohms and less than 1.2 meg-ohms.

2.2.3 When a wrist strap assembly is tested, the band shall be properly adjusted to the wrist, and then the cord shall be stressed from side to side and subjected to a pulling stress to discover intermittent conditions. This dynamic test helps detect open cords or improperly adjusted or dirty bands.

2.3. Wrist Strap Grounding Points

2.3.1 The wrist strap shall be connected to the bay mounted grounding jack, if the bay is so equipped. An alligator clip shall be used to connect a wrist strap to an effective grounding point in equipment not equipped with a grounding jack. Any unpainted screw, nut, bolt, equipment mounting plate, etc., is considered an effectively grounded point. An ESD ground jack, incorporated on a network element equipment shelf, grounded per ATT-TP-76416 and installed per ATT-TP-76300, shall be considered an approved ESD Ground Point.

2.3.2 If a new or existing equipment rack, frame or cabinet equipped with or intended to be equipped with electronic equipment has no ESD grounding jack(s) on the installed shelves,
one shall be installed on the front right framework upright. The ESD jack and label shall be
installed on the upright between 36" and 60". This requirement does not apply to Power
Distribution Racks/Bay or any equipment rack, frame or cabinet, such as a fiber distribution
bay, that does not have or will not have any electronic equipment or circuit packs either
powered or stored.

Frame mounted ESD jacks shall be assembled per the figure below. It is preferred that the
area surrounding the hole for the jack be masked to provide an unpainted surface for the jack
that is visible after installation. An external tooth lockwasher, flat washer and nut shall be
installed in that sequence to the back side of the assembly. The flat washer is required in all
applications to ensure that the teeth of the external tooth lockwasher properly engage with the
framework since the nuts provided with the jack assemblies do not have sufficient diameter to
apply pressure to the lockwasher teeth. See ATT-E-00174-E on the Woodduck site for
additional information.

Previously installed ESD jacks utilizing an uninsulated # 8 AWG ring type crimp connector
shall be grandfathered.

An alternative solution would be to use a “Keps” nut lock washer assembly equivalent to ¼-
28 part number 90675A215 from the McMaster Catalog
http://www.mcmaster.com/pdf/114/3125.pdf. Use of this device replaces the separate nut, flat
washer, lock washer shown in the above figure

2.3.3 The Installation Supplier shall test for continuity between the ESD jack and the bay ground
lead and record this test on the test record.

2.4. Static-safe Work Station and Field Service Kit
2.4.1 An ESD Field Service Kit provides a portable static-safe workstation well suited for use at all sites and in CEVs and SLC huts not equipped with ESD protective material. An acceptable kit shall include a wrist strap and cord, a grounding cord, and a static dissipative mat that folds out to create a work surface mat. The mat shall include pouches that can be used as a temporary means to transport circuit packs while not in their protective shipping/storage containers.

2.4.2 A static-safe workstation shall be created and used at any location where personnel will handle bare circuit packs. At minimum, the workstation shall be equipped with a wrist strap assembly, a wrist strap grounding point, and a static dissipative surface on which a circuit pack can be placed. A circuit pack’s static-safe shipping/storage container meets the requirement for a static dissipative surface.

2.4.3 Items not allowed at static-safe work stations include:

a) a highly conductive work surface, unless it is covered with a static dissipative material

b) any static-generating material not absolutely required at the work station

3. CIRCUIT PACK STORAGE AND HANDLING

3.1. Circuit Pack Storage

3.1.1 When a circuit pack is removed from an equipment shelf, bank, module, etc., the circuit pack shall immediately be placed in a static-safe container. A circuit pack shall not be removed from its container except for installation into equipment or for maintenance at a static-safe workstation (setting option switches, etc.).

3.1.2 A circuit pack storage container shall be one of the following:

a) The circuit pack’s original static-safe shipping container

b) An approved third party static-safe container

c) An approved static-safe wrapping

Note 1: While static-safe containers are the preferred method of storage, it is acceptable to store bare circuit packs in an existing circuit pack storage frame or cabinet that is a component of an approved equipment system, such as DMS-100F switches.

Note 2: A number of static-safe transport cases for circuit packs have been approved for use in AT&T facilities. The purpose of these cases is to transport circuit packs; they shall not be used in place of storage cabinets.

3.1.3 Metal circuit pack storage cabinets shall be grounded. The requirements below are based on the storage cabinets being one or a combination of the following:

a) Any general purpose type metal storage cabinet (wall locker, etc.) that has been braced per applicable storage unit bracing requirements using a metallic angle secured to the wall and/or floor and the top and/or bottom of the cabinet(s), an enclosure that is a component of an approved for use equipment system, or

b) A storage cabinet that has been approved as a stand-alone type (floor support only)
3.1.4 A single circuit pack storage cabinet or a group of cabinets shall be grounded using minimum #6 AWG conductor. This connection shall be made to the common bonding network or the isolated bonding network as applicable.

3.2. Handling and Transportation Guidelines.

3.2.1 While ESD events can affect working equipment, a circuit pack is most vulnerable while not installed in equipment or in a static-safe shipping/storage container. The following guidelines shall be followed to avoid ESD damage:

a) Wear a properly grounded wrist strap assembly before working on or handling circuit packs.

b) Handle a circuit pack by its edge only; avoid touching contacts of the edge connector.

c) Avoid touching the individual components of a circuit pack.

d) Keep the circuit pack in its original shipping container or static-safe protective container until ready for use.

e) When transporting a circuit pack, place it in static-safe cardboard and/or a static-safe plastic bag or use a protective circuit pack container. The container shall be fire retardant if left in an open area or placed on open shelving to meet local fire codes.

f) Never place static generating material, like documents, inside a static-safe container.

g) Store circuit packs on approved suitable shelving. Avoid storing them in equipment bays not specifically designed as a storage area. Circuit packs stored in non-approved shelving and/or bay shall be kept in a static-safe fire retardant container.

h) Unprotected circuit packs shall only be placed on a static-safe work surface in a single layer; circuit packs shall not be placed on top of each other.

i) A circuit pack shall be accepted only when it is in an approved ESD protective container.

j) Containers are not to be opened unless wearing appropriate wrist strap assembly.
FIGURE N-1 – TWO METHODS FOR GROUNDING CIRCUIT PACK STORAGE CABINETS

- **A**: Steel angle brace bolted to the cabinets and the wall.
- **B**: #6 AWG to nearest effectively grounded metallic object.
- **C**: Crimp type C-tap.

[END OF SECTION]