White House Communications Agency (WHCA)
Presidential Voice Communications Rack Mount System Mechanical Drawing Package

by Steven P Callaway

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**Abstract:**
The White House Communications Agency (WHCA) Presidential Voice Communications Rack Mount System served as an update and refurbishment of an existing system. WHCA wanted to update the radios being used in this communications system and looked to the US Army Research Laboratory to accomplish this task. The new system uses 40% less space and is packaged in a single chassis, resulting in vast improvements over the previous system.

**Subject Terms:**
Rack Mount, Harris, 117G, communications, White House Communications Agency

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Contents

List of Tables iv

1. Introduction 1

2. Mechanical Requirements 1

3. Drawing Package 2

4. Conclusion 3

Appendix. WHCA Presidential Voice Communications Rack Mount System Drawings 5

Distribution List 45
List of Tables

Table 1  WHCA Presidential Voice Communications Rack Mount System
drawing index.........................................................2
1. Introduction

The White House Communications Agency (WHCA) Presidential Voice Communications Rack Mount System served as an upgrade of older equipment previously used by WHCA. The customer desired to upgrade their comms equipment from Harris 117F radios to 117G radios. These radios offer a smaller package with increased capabilities. With the decreased size of the radios paired with a more efficient use of space in the units, the new Rack Mount System used 40% less rack space. The Rack Mount System was contained in a single chassis, an improvement over the previous system. This allows for easier transportation, installation, and cabling of the system.

2. Mechanical Requirements

The WHCA Presidential Voice Communications Rack Mount System was designed in 2 versions: an 11 rack unit (11U) chassis that included a fiber optic modem and fiber optic output for network communications, and a 9 rack unit (9U) chassis that did not use a fiber optic modem and instead used direct radio frequency (RF) output from the Harris 117F radio. The version used depended on the customer site requirements where the chassis were installed.

Both 11U and 9U were required to accept 120 VAC power input with a switched outlet, in order to accommodate the installation site. A 24 V AC-to-DC power supply was then required to supply 24 V power to the equipment. Four 117F Harris radios were required to be mounted in the system. The radios needed to be secured in a way that they could be removed and replaced by the user without the use of hand tools. Both 11U and 9U chassis also required a 4-port network switch for operation. A cooling fan was used in the rear of each chassis to enhance equipment cooling.

The 11U chassis required additional equipment to support the fiber optic capability. Two fiber modems were required, mounted in a way that they could be removed and replaced by the user without the use of hand tools. Each radio also required a diplexer to be able to communicate with the fiber modem. The rear panel of the 11U chassis contained the interface connections for the system. Four DB-9 and 4 DB-25 ports were required for radio fill and radio data connections, respectively. Four RJ-45 ports for audio and 1 for a network connection were also required. Four fiber optic feedthroughs were also required for the output of the fiber modem.

The 9U chassis had a shorter required equipment list because of the lack of a fiber optic capability. The same DB-9, DB-25, and RJ-45 requirements held for the 9U
chassis, though 4 N-Type RF connections were required in place of the fiber optic connections.

3. Drawing Package

The following drawing package (Table 1) was used for the fabrication and modification of parts for the WHCA Presidential Voice Communications Rack Mount System. The package was also consulted by US Army Research Laboratory (ARL) technicians for system assembly. The individual drawings are provided in the Appendix.

Table 1  WHCA Presidential Voice Communications Rack Mount System drawing index

<table>
<thead>
<tr>
<th>SK549530</th>
<th>Title</th>
<th>Dash No.</th>
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<tbody>
<tr>
<td>11U Chassis - Side Panel, Right</td>
<td>–12001</td>
<td></td>
</tr>
<tr>
<td>11U Chassis - Side Panel, Left</td>
<td>–12002</td>
<td></td>
</tr>
<tr>
<td>11U Chassis - Radio Tray</td>
<td>–12003</td>
<td></td>
</tr>
<tr>
<td>11U Chassis - Front Panel</td>
<td>–12004</td>
<td></td>
</tr>
<tr>
<td>11U Chassis - Rear Panel</td>
<td>–12005</td>
<td></td>
</tr>
<tr>
<td>11U Chassis - Fiber Modem Tray</td>
<td>–12006</td>
<td></td>
</tr>
<tr>
<td>11U Chassis - Fiber Modem Latch</td>
<td>–12007</td>
<td></td>
</tr>
<tr>
<td>11U Chassis - Fiber Modem Mounting Pin</td>
<td>–12008</td>
<td></td>
</tr>
<tr>
<td>11U Chassis - Rear Hinge</td>
<td>–12009</td>
<td></td>
</tr>
<tr>
<td>9U Chassis - Side Panel, Right</td>
<td>–11001</td>
<td></td>
</tr>
<tr>
<td>9U Chassis - Side Panel, Left</td>
<td>–11002</td>
<td></td>
</tr>
<tr>
<td>9U Chassis - Radio Tray</td>
<td>–11003</td>
<td></td>
</tr>
<tr>
<td>9U Chassis - Front Panel</td>
<td>–11004</td>
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<tr>
<td>9U Chassis - Rear Panel</td>
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<tr>
<td>9U Chassis - Rear Hinge</td>
<td>–11006</td>
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<tr>
<td>11U/9U Chassis - Bottom Panel</td>
<td>–13001</td>
<td></td>
</tr>
<tr>
<td>11U/9U Chassis - Radio Tray Rear Support</td>
<td>–13003</td>
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</tr>
<tr>
<td>11U/9U Chassis - Radio Guide, Right</td>
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<td>11U/9U Chassis - Radio Guide, Center</td>
<td>–13010</td>
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<td>11U/9U Chassis - Radio Locating Pin</td>
<td>–13012</td>
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</tr>
<tr>
<td>11U/9U Chassis - Radio Latch 3</td>
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</table>
4. Conclusion

In order to upgrade the WHCA Presidential Voice Communications Rack Mount System, the next-generation Harris radio was installed, the 117G. With the new system, a 40% size reduction was realized, and installation was simplified. A single chassis was used for each system, allowing the majority of cabling to be completed before installation. To date, the systems continue to be deployed in order to keep the entire system current.
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Appendix. WHCA Presidential Voice Communications Rack Mount System Drawings
NOTES

1. MAIZE MODIFIED TO STAINLESS STEEL, FURNO HINGE, MONASTER
   CASE PART NUMBER 7822A

2. REMOVE ALL BURRS AND BREAK SHARP EDGES
1. Make modifications to prevent tear in side panel.
2. Remove all burrs and sharp edges.
1. MATERIAL: 6061 ALUMINUM ALLOY GR5 ROD STOCK, .25 DIAMETER
2. REMOVE ALL BURRS AND BRUSH SHARP EDGES
3. CHEMICAL CONVERSION COATING PER MIL-C-1541
1. Make modifications to prototype 3U front panel.
2. Remove all burrs and sharp edges.
1. Make modifications to stainless steel journal, monomer.
   Component: part number 77624

2. Reparature all burrs and break sharp edges.
1. Make modifications to front side panel.
2. Remove all burrs and break sharp edges.
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