

# **Channelized Amplifier Installation Instruction**

## 1. INTRODUCTION

This document provides installation instructions for the Midway Airport Air Interface System (MAAIS). This system shall be used as an air interface for the new Midway Airport Terminal Development Program, Passive Radio Support System.

## 2. EQUIPMENT

### 2.1 Channelize Amplifier Racks

The engineers/technicians must read the RF Radiation Hazard section before they proceed any installation work. Install both channelize amplifier racks in the MDF room of area 10–153. Each equipment rack has been pre-assembled the internal cabling among all the modules and there are four interconnect RF cables between these two racks and Figure 1, 2, 3 and 4 have indicated. The interconnections are listed in the following:

- a. The first cable is from the bottom of rack #1's combiner (VHF Downlink Port) to rack #2's VHF D/L Combiner (Downlink Port).
- b. The second cable is from the bottom of rack #1's combiner (VHF Uplink Port) to rack #2's VHF U/L Splitter (Uplink Port).
- c. The third cable is from the rack #1's UHF Duplexer/CBC (Downlink Port) to rack #2's UHF D/L Combiner (Downlink Port).
- d. The fourth cable is from rack #1's UHF Duplexer/CBC (Uplink Port) to rack #2's UHF U/L Splitter (Uplink Port).

The bottom floor panel of raise floor beneath the rack will need to be removed for routing the six (6) antenna feeder cables. The cable connecting ports are shown in Figure 1, 2, 3 and 4. The cable connections between the antenna and equipment racks are listed in the following:

- a. The UHF 1 antenna's downlink cable will connect between the UHF 1 D/L outdoor antenna and rack #1's UHF D/L Splitter.
- b. The UHF 1 antenna's uplink cable will connect between the UHF 1 U/L outdoor antenna and rack #1's UHF U/L Combiner.
- c. The UHF 2 antenna's downlink cable will connect between the UHF 2 D/L outdoor antenna and rack #2's UHF D/L Splitter.
- d. The UHF 2 antenna's uplink cable will connect between the UHF 2 U/L outdoor antenna and rack #2's UHF U/L Combiner.
- e. The VHF antenna's downlink cable will connect between the VHF D/L outdoor antenna and rack #2's VHF D/L splitter.

- f. The VHF antenna's uplink cable will connect between the VHF U/L outdoor antenna and rack #2's VHF U/L Combiner.

The existing passive combiners currently in place shall be relocated into the channelize amplifier equipment rack so all cable feeding these units shall also be relocated to the new equipment rack.

***Note, there will not be access to the equipment rack from above so all cable will need to enter the rack from below.***

## 2.2 Transmission and Jumper Cable Installation

Install six (6) cable runs; one for each antenna to the MAAIS channelized amplifier equipment racks. At the output of each antenna install a 3 ft. 1/2" jumper. From each jumper, install 7/8 " Heliac cable from the antenna to the MDF room in area 10-153. The 7/8 " Heliac shall not exceed a bend radius of 10 inches. If the bend radius need to exceeded 10 inches, install a 3 ft. of 1/2" jumper. The first transmission line interconnection, after entering the building shall be at the Ground Bar Assembly housing the surge arrestors. At the junction install a 3 ft. of 1/2" jumper between each run of 7/8" Heliac and surge arrestor. At the output of each surge arrestors install a 3 ft. 1/2" jumpers. From the jumper route the transmission line from the over to the channelized amplifier equipment racks. Reference Figure 3 and 4 for cable installation.

## 2.3 RF Radiation Hazard

RF radiation, (especially at UHF frequencies) arising from transmitter outputs connected to AFL's equipment, must be considered a safety hazard.

This condition might only occur in the event of cable disconnection, or because a 'spare' output has been left unterminated. Either of these conditions would impair the system's efficiency. No investigation should be carried out until all RF power sources have been removed. This would always be a wise precaution, despite the severe mismatch between the impedance of an N type connector at 50? , and that of free space at 377? , which would severely mitigate against the efficient radiation of RF power. Radio frequency burns could also be a hazard, if any RF power carrying components were to be carelessly touched!

Antenna positions should be chosen to comply with requirements (both local & statutory) regarding exposure of personnel to RF radiation. When connected to an antenna, the unit is capable of producing RF field strengths, which may exceed guideline safe values especially if used with antennas having appreciable gain. In this regard the use of directional antennas with backscreens and a strict site rule that personnel must remain behind the screen while the RF power is on, is strongly recommended. The minimum distance between the antennas and nearby personnel requirement is 2meters.

"This equipment complies with part 90 of the fcc rules. Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment."

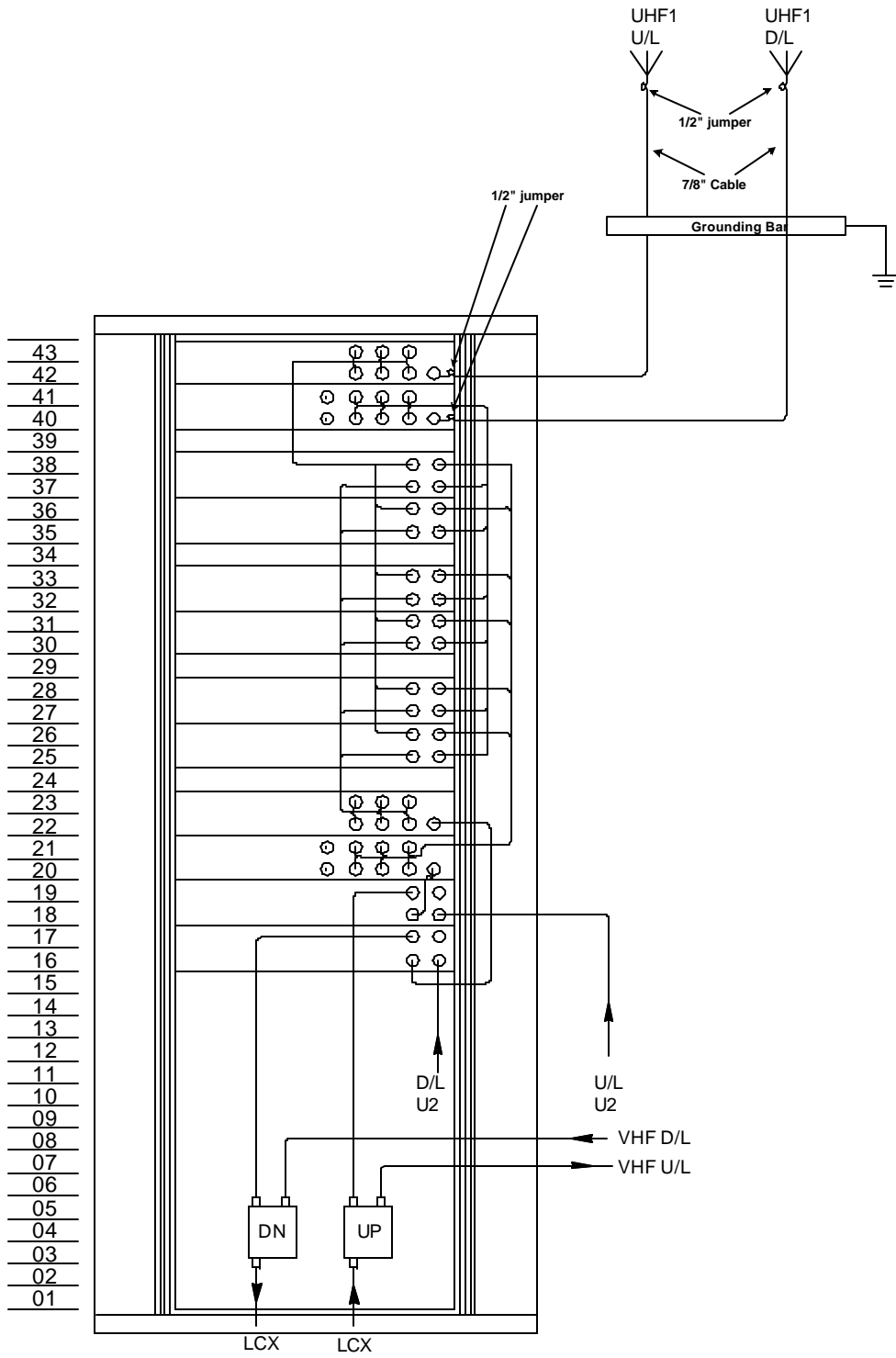
Where the equipment is used near power lines, or in association with temporary masts not having lightning protection, the use of a safety earth connected to the case-earthing bolt is strongly advised.

43					
42		UHF U/L COMBINER	Ⓜ		479.2-480.8MHz
41		50-030510			
40		UHF D/L SPLITTER	Ⓛ		476.2-477.8MHz
39		50-030507			
38					
37		UHF DUPLEX CM	Ⓚ		476.3125MHz
36		50-030512			
35		UHF DUPLEX CM	Ⓝ		476.5625MHz
34		50-030512			
33					
32		UHF DUPLEX CM	Ⓜ		476.7875MHz
31		50-030512			
30		UHF DUPLEX CM	Ⓝ		477.0875MHz
29		50-030512			
28					
27		UHF DUPLEX CM	Ⓧ		477.4125MHz
26		50-030512			
25		UHF DUPLEX CM	Ⓧ		477.6375MHz
24		50-030512			
23					
22		UHF D/L COMBINER	Ⓧ		476-478MHz
21		50-030508			
20		UHF U/L SPLITTER	Ⓝ		479-481MHz
19		50-030511			
18		UHF DUPLEXER/CBC	Ⓚ		466/480MHz
17		50-030509			
16		UHF DUPLEXER/CBC	Ⓜ		460/477MHz
15		50-030509			
14					
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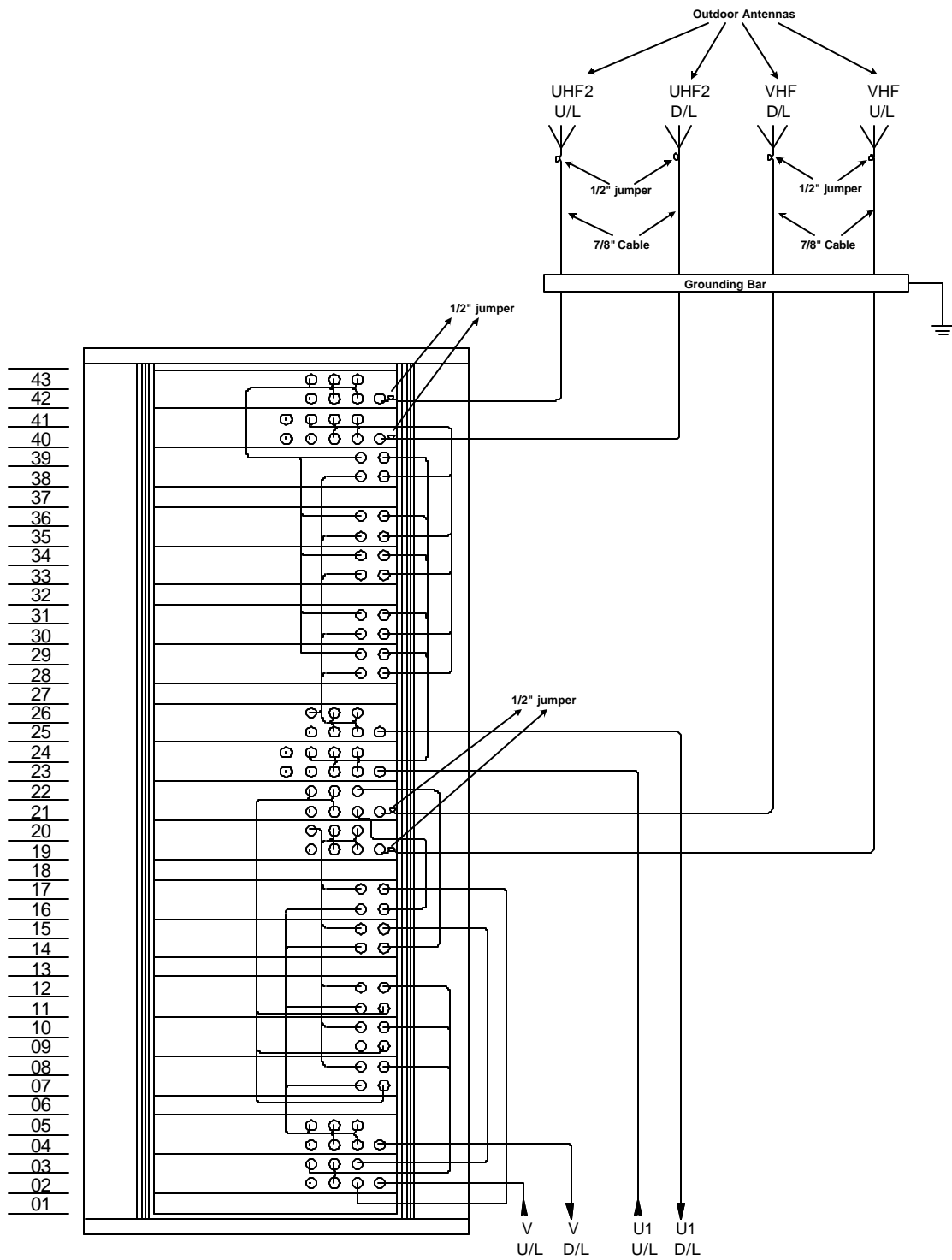
**Figure 1 – Rack #1 Layout**

43	UHF U/L COMBINER 50-030510	(T)	465.4-468.0MHz
42			
41	UHF D/L SPLITTER 50-030507	(S)	460.4-463.0MHz
40			
39	UHF DUPLEX CM 50-030512	(R)	460.400MHz
38			
37			
36	UHF DUPLEX CM 50-030512	(Q)	460.600MHz
35			
34	UHF DUPLEX CM 50-030512	(P)	460.625MHz
33			
32			
31	UHF DUPLEX CM 50-030512	(N)	462.950MHz
30			
29	UHF DUPLEX CM 50-030512	(M)	462.975MHz
28			
27			
26	UHF D/L COMBINER 50-030508	(L)	460-463MHz
25			
24	UHF U/L SPLITTER 50-030511	(K)	465-468MHz
23			
22	VHF D/L SPLITTER 50-030502	(J)	153.5-154.5MHz
21			
20	VHF U/L COMBINER 50-030503	(H)	153.5-154.5MHz
19			
18			
17	VHF SIMPLEX CM 50-030506	(G)	154.220MHz
16			
15	VHF SIMPLEX CM 50-030506	(F)	154.385MHz
14			
13			
12	VHF DUPLEX CM 50-030505	(E)	154.010MHz
11			
10	VHF DUPLEX CM 50-030505	(D)	154.130MHz
09			
08	VHF DUPLEX CM 50-030505	(C)	154.295MHz
07			
06			
05	VHF D/L COMBINER 50-030503	(B)	153.5-154.5MHz
04			
03	VHF U/L SPLITTER 50-030504	(A)	153.5-154.5MHz
02			
01			

Figure 2 – Rack #2 Layou



**Figure 3 – Cable Connection for Rack # 2**



**Figure 4 – Cable Connection for Rack # 2**