

## TECHNICAL NOTE # 403A

### SETUP OF TRIPLE STACK MICROWAVE LINKS

In high security applications, such as nuclear power plants and Department of Energy facilities, the triple stack microwave link configuration is used to increase detection capability of belly crawling, breaching, jumping, walking, running and assisted team penetration intrusion attempts by incorporating a single 310B-33259 link and two 300B-33257 links for each zone.

A typical installation drawing of a triple stack link is shown in Figure 1. The bottom link is the Model 310B-33259 which is nominally mounted at 12 inches (30cm) above ground level. The mounting range adjustment for this link is 9 to 18 inches (23 to 46cm). This link is responsible for hands-and-knee crawl and "commando" belly style crawl. The middle link is a Model 300B-33257 nominally mounted 36 inches (91cm) above ground level. The mounting range adjustment for this link is 20 to 48 inches (.51 to 1.2m). This link will provide for both walk and run detection. The top link is also a Model 300B-33257 nominally mounted between 6 and 8 feet (1.8 to 2.4m) above the ground. This link provides detection for jumping targets and potential bridging intrusion attempts. The actual mounting height of this link will depend on site requirements and type of perceived threat. This link is also rotated 90° from the middle link to eliminate mutual interference. This is rotating the link to an H-plane from the E-plane polarization.

For setting up the triple stack link, please refer to the Technical Manuals for both the Model 300B and 310B microwave intrusion links. Prior to applying power to the microwave sensors, ensure that the long range antenna elements are installed on the Model 300B receiver and transmitter. Initially, power will not be applied to any of the 3 links.

Remove the radomes of all receiver and transmitter units. Apply power to the Model 310B-33259 and align the link as specified in the Model 310B Technical Manual under Alignment and Testing.

Apply power to the middle Model 300B-33257 link and align the link as specified in the Model 300B Technical Manual under Alignment and Testing.

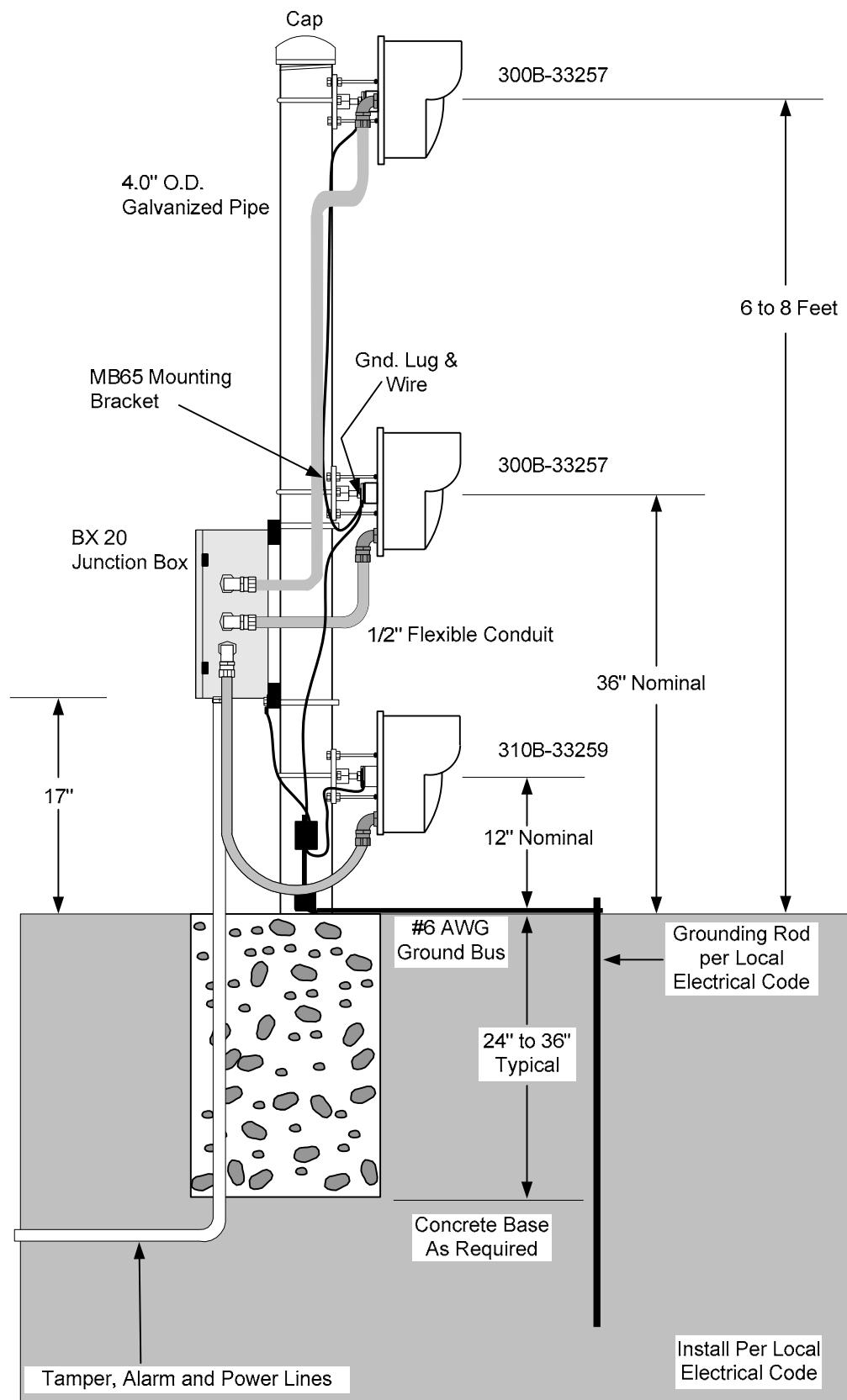
Apply power to the top Model 300B-33257 link and align the link as specified in the Model 300B Technical Manual under Alignment and Testing. Note the value of the alignment signal. Once the link is properly aligned rotate the top link receiver while monitoring the alignment signal on the RM82 or RM83 Performance Monitor or with a voltmeter. Continue to rotate the receiver head until the Performance Monitor or voltmeter indicates 0 or the lowest reading value. At this point, the transmitter of the top link should be rotated until the Performance Monitor or voltmeter indicates the alignment signal prior to rotating both heads.

It is not necessary to rotate the heads of the middle link. Once the top link has been aligned, verify that the Wrong Channel, Jamming and Alarm LED's on all three receivers are not illuminated.

To test the triple stack link, refer to Testing Document 702 – Microwave Sensor Testing at Nuclear Generating or DOE Facilities.

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**Figure 1**  
**Typical Triple Stack Microwave Link Installation**