

TECHNICAL NOTE # 470

MODEL 336-33464 HIGH SECURITY STACKED LINK

This note is written as a guideline for proper installation of the Model 336-33464 High Security Stacked Link. This note is intended as a general guideline and specific settings will depend upon actual site conditions. The stacked link configuration can be effectively utilized for ranges up to 600 feet (183m). Most high security applications limit the distance to 328 feet (100m). The minimum range should not be less than 100 feet (30.5m).

1.0 EQUIPMENT REQUIRED

- 1.1 **Two Model 336-33464T Transmitters (per zone).**
- 1.2 **Two Model 336-33464R Receivers (per zone).**
- 1.3 **Installation Service Tool (IST) software installed on a laptop PC.**
- 1.4 **One RM83 Performance Monitor (optional).**
- 1.5 **Two each Model LF215 Line Filters (optional).**
- 1.6 **Two each BA30 Rechargeable Standby Batteries (optional).**
- 1.7 **Two each BX20 NEMA 4X Stainless Steel Weatherproof Enclosures (optional).**

2.0 APPLICABLE DOCUMENTS

- 2.1 **Model 336 Technical Manual.**

3.0 INSTALLATION

In general, follow the precautions as outlined in the installation manual. Install the stacked link as shown in Figure 1. The height of each unit is the nominal starting point and may need adjusted to provide optimum coverage for both crawling and jumping intruders.

Depending upon surface conditions, the lower Model 336-33464 may have to be adjusted slightly higher in elevation to provide optimum alignment voltage. At the corners, an overlap of 25 feet (7.62m) is recommended, and along an axis, an overlap of 50 feet (15.2m) with 18 inch (457mm) maximum offset. A special transient, suppression circuit/line filter that is installed within a junction box is required in areas where excessive line transients or lightning strikes are prevalent. Ensure that the wires within the flexible conduit are shielded with a trimmed braided cable such as Alpha 2174.

4.0 ALIGNMENT

The alignment and setup of each link should be done using the (IST) software provided. The Model RM83 Performance Monitor can be used later for quick reference checks. Align the 336-33464 links independently. The following steps should be performed first to the lower 336-33464 and then to the upper 336-33464. *Refer to the Technical Manual, Section 10.4 for information on Alignment.*

1. With radomes removed, apply power to the Transmitter and Receiver.
2. Be sure the identical modulation frequency, channel A through F, is being used on the Transmitter and Receiver.
3. Check for transmitter and receiver operation by monitoring the "POWER" LED on transmitter circuit board and "PULSE" LED on the receiver board. The LED's must be illuminated.

4. After checking wire connections and step 2 and 3, replace radome on Transmitter using all six screws.
5. Visually aim the Transmitter and Receiver for “bore-sight” alignment. Aim the transmitter and receiver at each other. Make sure the transmitter and receiver are parallel and perpendicular to the ground plane that is being secured.
6. Using the IST software program monitor the alignment signal while performing steps 7, 8 and 9. Select the “Clear Max Hold” button to clear the maximum voltage level found from any previous alignment. The Max Peak is the maximum voltage level that has been found during the current alignment process and is shown with a value and a red arrow indicator. The “Current Alignment” is the current alignment voltage that the link is set to and is shown with a value and a red arrow indicator. The gray and blue graphs on the IST will also track the alignment signal.
7. Swivel Transmitter up and down and side to side, to obtain maximum voltage reading on IST. Tighten locking nut on mounting bracket to secure sensor in this position.
8. Raise or lower mounting height of receiver and/or transmitter, as required, to obtain maximum voltage reading on IST. The transmitter and receiver may also need to be moved left and right of the mounting poles depending on the dynamic multipath signals being received.
9. Swivel Receiver up and down and side to side, to obtain maximum voltage reading on IST. Tighten locking nut on mounting bracket to secure sensor in this position. The minimum alignment voltage for the Model 336 is 0.5VDC. Although this is the minimum voltage, with proper alignment and mounting height the voltage will typically be greater. The Max Peak alignment voltage should range between 0.5 and 3.3 VDC depending upon link distance. The further apart the units the smaller the alignment voltage. Always try to achieve 1.0 VDC or greater alignment.
10. Once the alignment process has been completed select the “Stop Alignment” button to return to the alignment screen.

Once each link has been aligned independently, one link will need to be rotated 90° to change it from a vertical polarization (E-plane) to a horizontal polarization (H-plane) to minimize potential interference. It does not matter which link is chosen. The following steps should be done to change the polarity:

- Turn power off on the link that is not being rotated.
 - Set the link that will be rotated in alignment mode. Note the alignment voltage.
 - Observe the alignment signal and slowly rotate the transmitter until the alignment signal drops to 0 or the lowest voltage possible.
 - Rotate the corresponding receiver until the alignment voltage has returned to the previous value.
 - Turn power back on the link that was not rotated.
 - If any interference is still noticed, the two links will need to be set to different modulation channels.
11. Replace Receiver radomes using all six screws.

5.0 ALGORITHMS and GAIN (Sensitivity)

Selecting the “Recognition Algorithm” edit button will open a “Cancel” and “Accept” button as well as a pull down menu. *Refer to the Technical Manual, Section 10.3.1 for information on Recognition Algorithms.* The algorithms that can be selected are:

- Off (*no digital signal processing algorithms applied*).
- Standard (*algorithms applied for optimum reliability for industrial applications*).
- Enhanced Vehicle (*operates with algorithms applied to detect fast moving targets*).
- Enhanced Crawl (*operates with algorithms applied to detect slow moving targets such as a prone crawling intruder*).
- Maximum Security (*operates with algorithms to enhance slow and fast moving targets*).

1. For the upper 336-33464 receiver set the Recognition Algorithm to the “**Maximum Security**” position. For the lower 336-33464 receiver set the Recognition Algorithm to “**Enhanced Crawl**” position.
2. Set the receiver sensitivity for the desired coverage, by adjusting the “Gain” (sensitivity) on the Target Screen as unit is being performance tested. Additional adjustment of transmitter/receiver mounting height may be required to optimize detection capability. The systems should be set up to meet all detection requirements at the lowest sensitivity setting possible. *Refer to the Technical Manual, Section 10.5.1 for information on Gain and Section 10.5.2 for information on Threshold to Noise.*
3. Install radomes on receiver and test to ensure that it meets the coverage requirements.

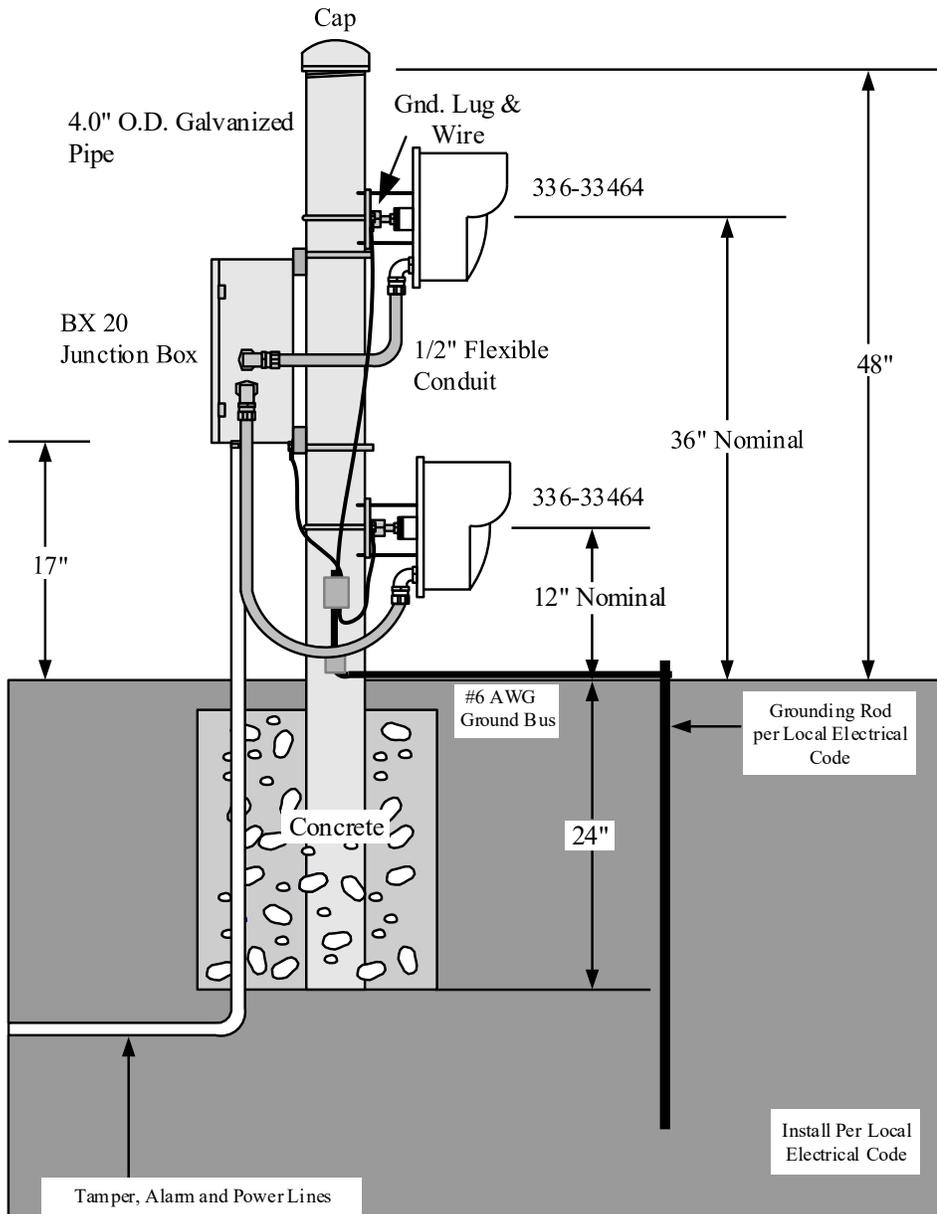


Figure 1

Note: This technical note applies when stacking the Model 336 links.