

KERI SYSTEMS, INC.

PRELIMINARY LRT-1 LONG RANGE VEHICLE SYSTEM

SINGLE LANE INSTALLATION GUIDE

The Keri Systems LRT-1 is a long range vehicle identification system capable of controlling one entrance. It consists of an Antenna Assembly located near the roadway, a transponder attached to the windshield and a receiver that can be located nearby, such as in a guard house. The receiver will output formatted data to the access controller via cabling.

The transponder can be activated and read at up to 25' away from the antenna assembly. The antenna assembly consists of a transmitter housed in an IP67 rated outdoor housing and a yagi antenna.

Drawing 1 shows a block diagram of the system to help in your planning.

#### TRANSPOUNDER INSTALLATION –

The transponder should be located in either the lower right hand corner of the windshield, upper right hand corner of windshield or directly behind the rear view mirror (Check with local vehicle code regulations to determine where it may not be legally mounted.) Different vehicles and situations may require any one of the above. For best performance, transponder should be mounted with longer side parallel to dash of vehicle. It can be attached to windshield with adhesive material furnished, or other less permanent attachments if security requirements permit.

#### ANTENNA INSTALLATION –

The antenna assembly is designed to be mounted along side the vehicle lane. The yagi antenna should be mounted on a pipe support with the transmitter located as close as practical.

This antenna should be near the edge of the road, but far enough removed to prevent vehicles hitting it. Normally 2 – 4 ft. works well. The recommended height of the antenna is 6 – 9 ft. 7 ft is high enough to prevent interference from shrubs, pedestrians, etc. Higher than 9 ft. may reduce range on some vehicles, such as sports cars. If this is to be used only on trucks and other high riding vehicles the height can be increased for optimum performance.

Horizontal orientation should be done so that the center of the pattern is directed a few feet from the right edge of road where the windshield transponder will be located. See Drawing 2.

Vertical orientation should be adjusted to locate center of the pattern at the average height above the road of the windshield transponders, at a distance of 20 – 25 ft/ from the antenna.

The yagi antenna comes with a reverse polarity SMA connector in order to connect it directly to our transmitter.

The antenna can have a gain of no more than 8.1db. For best operation the coaxial cable between the antenna and transmitter should be kept as short as practical. We recommend no more than 10 ft. More coax than this will reduce the operating range of the system.

The following antenna radiation pattern shows that there is a small amount of power being radiated off the rear side of the yagi antenna and minor lobes on each side that should not cause any problems. Parking a vehicle directly behind the antenna within 10 feet may allow the transponder to operate, shortening battery life.

## RECEIVER INSTALLATION –

The Receiver can be located away from the Antenna at any convenient location. This may be on a nearby fence, guard house, etc. It should be located within 100 ft. of the maximum read point of the windshield transponder. If located within a metal building, or other difficult RF read area, an external antenna can be connected to the receiver and mounted outside in a more favorable location. For a single lane installation, no electrical connection is required between antenna and receiver.

## ELECTRICAL HOOKUP –

The Exciter requires a 1A, 12VDC power supply and the receiver requires a 0.5A 12VDC power supply. The receiver can normally be powered by the same supply as the controller, like any other proximity reader. The transponder is powered by an internal replaceable battery with an expected life of 5-7 years. We recommend use of the Keri Power Supply KPS-5. This is a 2 amp supply, but has the provisions for battery backup. If battery backup is not desired, the KPS-7 is suitable.

### Cable Requirements –

#### Power supply cable for Exciter

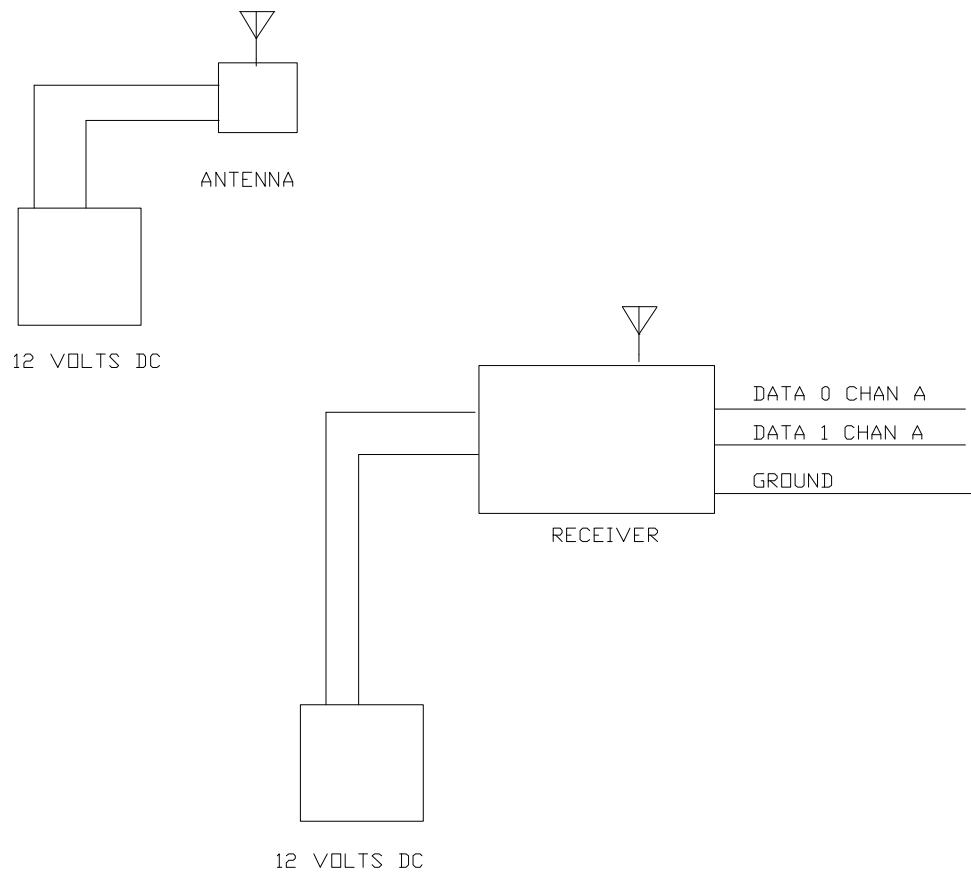
18 Ga wire allows up to 500'  
22 Ga wire allows up to 200'  
24 Ga wire allows up to 100'

#### Power supply cable for Receiver

22 Ga wire allows up to 500'  
24 Ga wire allows up to 200'

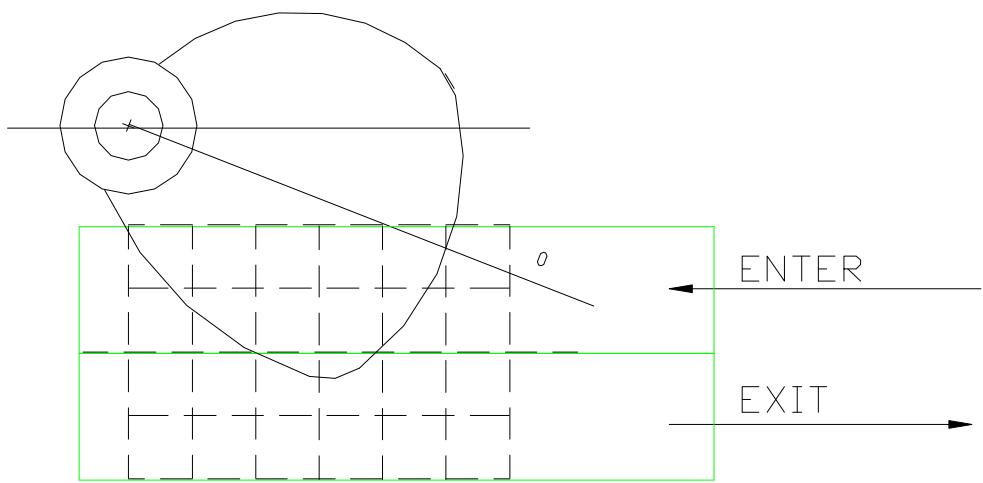
#### Data cable from Receiver to Keri Host Controller

This will be the cabling recommended by Keri for remote readers and will vary depending on communication type. Check controller manual for proper recommendations.



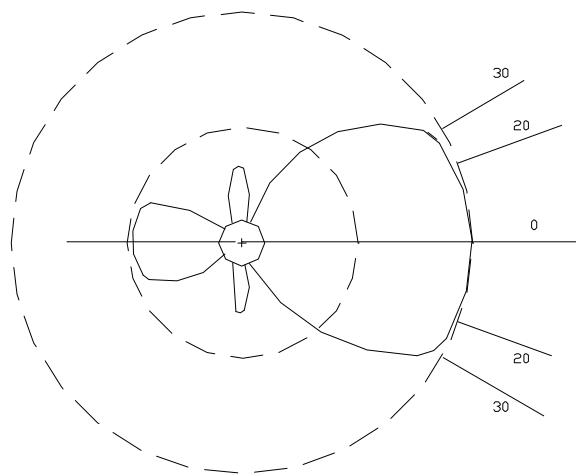
DRAWING 1

BLOCK DIAGRAM OF LRT-1 SINGLE LANE SYSTEM



TOP VIEW

DRAWING 2  
COVERAGE AREA OF ANTENNA ON ROADWAY



DRAWING 3  
YAGI RADIATION PATTERN

## USE OF THE KERI LRT TEST TRANSPONDER –

The Keri LRT Test Transponder is designed to help with proper location and orientation of the antenna as well as the placement of the transponder in the vehicle. There is a window in the housing to allow the LED Test Indicator to be seen.

It is recommended to mount the antenna on a length of pipe that can be temporarily mounted beside the road, in the general area that it must be permanently mounted. Position the antenna horizontally and vertically so that if a line were drawn from the center of the antenna to the road, it would touch about 20 feet away and 2 – 3 ft from the road edge.

Connect power to the receiver and to the transmitter. Hold the transponder in the orientation it will be when mounted in the vehicle. Walk down the road toward the antenna holding the transponder 2 – 3 ft above the road surface. At some point you will see the Indicator LED blinking from red to green. The transponder is now communicating with the rest of the system. You will also see the green LED on the receiver blink off upon receipt of signal and the red LED blink off when data is shipped.

By watching the LED while moving the transponder through the area, you can quickly see the area of coverage and adjust orientation if needed. When you are convinced that the temporary location of the antenna is OK, proceed with the permanent installation. When properly installed, you can fine tune the coverage area with vertical and horizontal adjustment of the antenna.

In some cases it may prove easier to fine tune if the transponder is mounted in the roadway at the approximate place it would be in a car (or mounted temporarily in a car) and then adjust orientations by watching the transponder LED. Do not attach the transponder to metallic surfaces for this test as it will adversely affect its operation.

## FCC NOTIFICATION

Changes or modifications to this product not specifically authorized by FP Wireless could void the user's authority to operate this equipment.