



Overview of Locus, Inc. Loran Receivers for Navigation and Time/Frequency Applications

There are different models of Locus receivers currently in use. This overview is meant to provide an introduction to each receiver model. More detailed information on each receiver model is included in the three technical bulletins accompanying this summary, but here is general information that should be useful to all users.

Receiver Models

LRSIIID: this receiver is customized to meet USCG requirements for monitoring and control of the United States Loran system. The LRSIIID uses a high performance SC-cut ovenized oscillator, and has special hardware inputs/outputs for use in Loran monitoring and control operations.

The LRSIIID also uses a special antenna that can provide an additional 36 dB of attenuation for operation close to transmitters. Other Locus receiver models cannot access this additional attenuation, and LRSIIID antennas should not be used with other Locus receiver models.

SatMate 1000: this early model can only be used with an E-field antenna. It contains an ovenized oscillator and is appropriate for timing and navigation. The SatMate 1000 is no longer being produced and cannot be upgraded to a SatMate 1030.

SatMate 1020: this early model can be used with either E-field or H-field antennas. It uses the same ovenized oscillator as the SatMate 1000 and is appropriate for timing and navigation. The SatMate 1020 is no longer being produced and cannot be upgraded to a SatMate 1030.

SatMate 1030: this model can be used with either E-field or H-field antennas. It has a TCXO rather than an OCXO, and is appropriate for navigation.

CsSync 1030: this model can be used with either E-field or H-field antennas. It has a TCXO rather than an OCXO, and is appropriate for time/frequency applications. Locus will produce a CsSync 1030 with an OCXO, but the model is not yet available.

Receiver Software

Each receiver model operates differently. Although the syntax of Locus receiver commands is similar between models, each receiver model might respond differently to identical commands, depending on how and when the commands are issued. Therefore, do not use setup software developed for one model receiver on another model receiver.

Each receiver model has a latest version of software. As of July 2003, that version is indicated in the other technical bulletins on Locus' website www.locusinc.com (Tech Support – Downloads and Documentation – Technical Bulletins). If your model does not utilize the latest version of software, you can download it from the website or contact Chad Schweitzer, and he will send you the latest version.



Receiver Setup

Note that some receiver settings are not stored after power down, and therefore we recommend using a batch file to set the receiver up before each test or if an event (e.g. power failure) has disrupted a test. Receiver settings not stored on power down are: antenna orientation, phase lock, and antenna channel (for antenna type). Be sure to include these settings in your batch setup file so they are issued each time the receiver is powered on.

For time and frequency applications, note that each receiver “expects” to be phase locked to a station only after the station is being tracked. Therefore, issuing a phase lock (PLL) command before a station is locked will be ineffective, and receiver setup software should take this into account.

Maximizing crossrate cancellation will maximize navigation and timing performance, so it is advantageous to track even very distant stations on Locus receivers. All Locus receivers allow the user to specify the chains to be tracked for crossrate cancellation. In North America, eight (8) chains should be tracked simultaneously, and in other parts of the world, all chains with a transmitter located within 1000 to 1500 miles (1600 to 2400 km) should be tracked, at a minimum.

Finally, Locus receivers enable the user to select the Loran chains used for the navigation solution. The chains to be used for navigation can be a subset of the chains tracked for cross rate cancellation (e.g. 3 chains can be used for navigation while the receiver is tracking 8 chains).

Antenna Placement

First, we strongly recommend that antennas be placed as far away as possible from metal objects and trees. Nearby objects (e.g. HVAC units) can distort the field and also cause re-radiation. It is best to move well away from these objects and also to elevate antennas as much as possible (e.g. we use tripods on Locus’ roof).

Second, it is important to ensure that E-field antennas are well grounded and that the grounding cable is as short as possible. Be sure to check grounding and minimize cable length during installation.

Last, be sure to use Locus antennas with Locus receivers. Locus antennas are precisely matched to our receivers, and Locus cannot guarantee operation with any other antennas.

Locus Contact

If you have applications questions about Locus products, please contact Chad Schweitzer, Engineering Manager, at 608-270-0500x223 or Schweitzer@locusinc.com.