

# **TB-1202B**

## **Installing a Mobile Tracking System for Airborne, Marine Use**

*by Cam Grant, M.Sc. P.Eng., Sigma Eight Inc.  
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Many researchers have found it effective to have two fixed Yagi antennas pointed 45 degrees left and right off the forward direction when mobile tracking. By steering the aircraft or boat, they can get a good sense of direction to the transmitter. If this is inconvenient, antennas could be pointed directly port and starboard (left and right) if flying swaths across a terrain or lake, or forward and aft (backward) if flying a river. In all cases, it is helpful to point the antenna downward by about 30 degrees so that half the beamwidth is not lost on the sky and more sensitivity is provided below, closer to the aircraft. The antenna should always be about 1 metre away from any conductor unless the conductor is behind the rear element. If metal encroaches on the antenna the direction and efficiency will be altered.

In some cases, it may be possible to get by with a single antenna. In this case, the second antenna and associated combiner may be eliminated.

The system utilizes two types of receivers, a narrow band receiver and a wide band receiver. Each receiver type has unique advantages and disadvantages.

A narrow band receiver is one that monitors a single channel at a time. The channel width is normally about 5 or 6 kHz wide. These types of receivers have the advantage of speakers allowing the operator to listen directly to the signal. Audio verification helps the operator validate the signal even among significant noise. Sometimes audio may also give clues when the system is not working. In addition, narrow band receivers are more sensitive.

A wide band receiver, on the other hand, is one that monitors a large bandwidth at one time. This range may be up to 1MHz and include hundreds of 5kHz channels. Wide band receivers do not have speakers since the range of frequencies is far beyond the range of the human ear. However, since they listen to such a large number of channels at once, there is no overhead in scanning or stepping the receiver from one channel to the next. Detection on separate channels is instant and, in better receivers, may occur at the same time. As a result, these receivers are much faster at picking up activity which is especially useful if the transmitter is likely to pass by the receiver quickly.

By using a system with both narrow and wide band receivers for mobile tracking, the operator can benefit from the advantages of both. He can directly try tuning in and listening for weak signals and/or listen for noises that may be affecting the sensitivity of the receivers. The operator can also watch the a computer screen for any activity that may pop up on a channel that is not currently tuned in.

In order to install this dual receiver, dual antenna system, the components in the table below are required (part numbers for 150 MHz). Some components, such as combiners or attenuators, may have long lead times. If it is too long you might find them on ebay.

After installation, the system should be balanced as discussed in TB-1201C.

Quantity	Component	Make	Model	Supplier
2	3 element Yagi	Sigma Eight Inc.	ANT-YAG-3	Sigma Eight Inc <a href="http://www.sigmaeight.ca">www.sigmaeight.ca</a> 905-833-0061
2	Amp	Advanced Receiver Research	P150VDG	ARR <a href="http://www.advancedreceiver.com">www.advancedreceiver.com</a> 860-485-0310
2	Combiners	Minicircuits	ZFSC-2-1	Minicircuits <a href="http://www.minicircuits.com">www.minicircuits.com</a> 718-934-4500
1	Attenuator	Minicircuits	HAT-10	Minicircuits <a href="http://www.minicircuits.com">www.minicircuits.com</a> 718-934-4500
1	Attenuator	Minicircuits	HAT-6	Minicircuits <a href="http://www.minicircuits.com">www.minicircuits.com</a> 718-934-4500
1	Narrow Band Receiver	Icom (or Lotek)	IC-R20 (or SRX400)	Universal Radio <a href="http://www.universal-radio.com">www.universal-radio.com</a> 800-431-3939
1	Broad Band Receiver	Sigma Eight Inc.	Orion	Sigma Eight Inc <a href="http://www.sigmaeight.ca">www.sigmaeight.ca</a> 905-833-0061
5	Coax Jumpers	Generic		
1	12 V Battery	Generic		
	Hookup Wire	Generic		
1	Laptop	Generic		
1	GPS	Generic		
1	Mic or Voice Recorder	Generic		

# Mobile Tracking Wiring Diagram

