


TRACKER[®]

Maxima Receiver





Congratulations! The Tracker Maxma Receiver System will provide you with state of the art radio-location technology for hunting dogs, pets, wildlife research, people tracking and law enforcement applications. This User's Guide is intended to provide you with information on the functions of the equipment as well as the basics of radio-location techniques in order to get the most out of your system.

IMPORTANT:

READ ALL INSTRUCTIONS CAREFULLY before operating the receiver.

Warnings:

1. Never connect the unit to a power source (through external power jack) without employing the Tracker External Power Adapter (sold separately). Never connect the receiver to an AC power source or reverse the polarization on a DC source.
2. Never operate the unit with a headset at high volume levels
3. Be careful to keep the receiver dry and minimize exposure to rain, snow or other liquids.
4. Changes or modifications to this receiver, not approved by Tracker Radio Systems, Inc. could void your authority to operate this receiver under FCC regulations.

FCC ID: MWBFTV-466

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: 1) This device may not cause harmful interference, and 2) this device must accept any interference that may cause undesired operation.

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Tracker Maxima Models:

Models	Number of Frequencies/channels 1 kHz steps	Memory locations
Duo	1000	2
1000/5	1000	5
2000/15	2000	15
5000/25	5000	25

Feature Summary:

- Fully synthesized receiver with programmable EEPROM memory
- Available in 4 Frequency ranges (150Mhz through 157Mhz, 164Mhz, 213Mhz through 223Mhz, and 433Mhz through 434Mhz).
- Fully programmable with up to 100 Memory locations
- Manual and Automatic gain control modes
- Large custom-designed Liquid Crystal Display (LCD)
- Microprocessor controlled functions, supervises synthesizer
- Backlit screen-with automatic light sensor to automatically activate backlighting when required
- Low battery indicator
- Automatic shut-off
- External power jack (for use with optional 9 V adapter)
- Headphone jack
- Patented, virtually unbreakable antenna elements with 10 year warranty incorporating steel hinges
- External antenna capable, either using bracket with external antenna jack or upgrading receiver with external antenna jack (SMA)
- Rugged body, CNC milled from a solid aluminum bar and powder coated
- Splash proof design



Base Frequency, model number and serial number are indicated on left rear antenna.

Receiver upgrades:

Any Maxima receiver is upgradeable to monitor additional frequencies and memory locations (up to 100) by sending the unit to Tracker. Charges are assessed for upgrading and shipping.

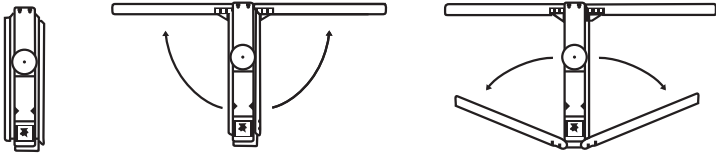
MAXIMA RECEIVER

The Tracker MAXIMA is a Directional Receiver for numerous applications. The receiver is programmable within a frequency range that matches the integrated antenna. The receiver body is precision CNC milled from a solid aluminum bar and powder coated. The antennas fold alongside the body of the receiver to create the most easily transportable receiver/antenna combination available anywhere in the world.

Below is a review of the important features of the Maxima receiver.

Integrated Antenna:

A key feature of the Tracker Maxima receiver is the integrated folding antenna. Tracker antennas feature steel hinges connecting the antenna elements to the receiver. You will notice that the antennas are made of virtually unbreakable circuit board material. The patented design allows the mechanical length of the antenna to be significantly shorter than the required electrical length.



Operating the receiver:

To utilize the receiver, first unfold the antennas before activating the receiver. The receiving antennas are located to the front of the receiver and when fully extended are perpendicular to the axis of the receiver. The reflecting antennas are located to the back and when fully extended form a 75 degree angle to the axis of the receiver. All four elements need to be extended when tracking.

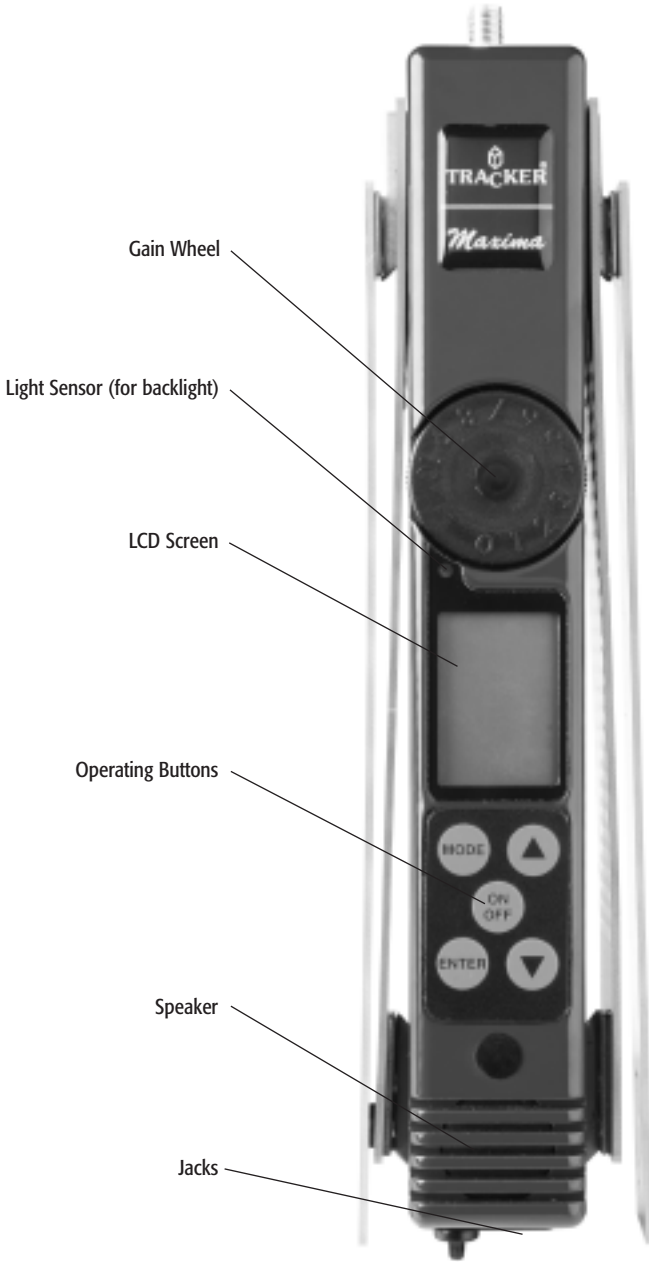
Grasp the receiver in one hand with your thumb close to the gain wheel. For best results, be careful not to touch the antenna as you track. In particular, do not allow the rear antennas to rest on your wrist or forearm, as this can affect the bearing accuracy.



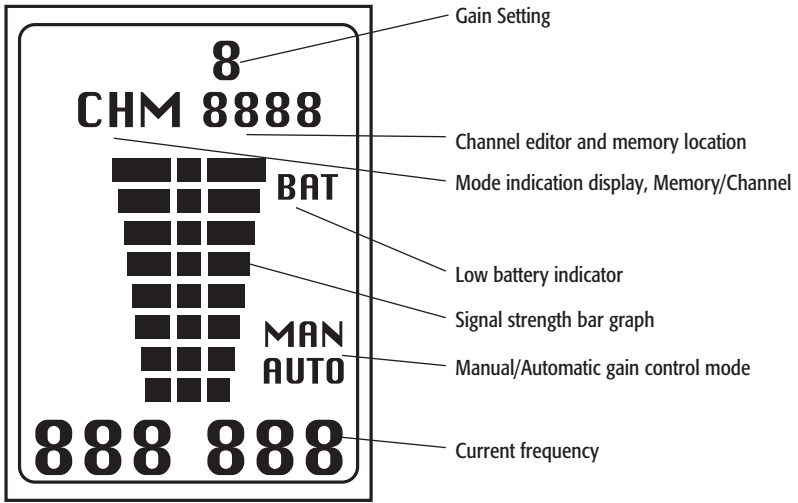
Correct way to hold Receiver

Controls:

front



back



Operating the Maxima Receiver:

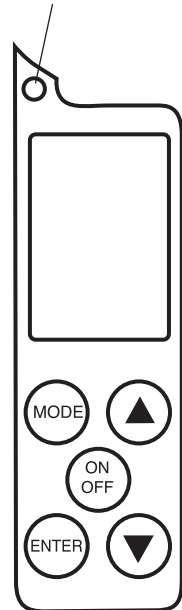
Turning the receiver ON:

Press and hold the ON/OFF switch for approximately 1- 2 seconds. On power up the receiver will perform a Self Test. The Backlight on the Liquid Crystal Display (LCD) will illuminate for one second and the display will appear as in above illustration. Following self-test the unit will be ready for use. Current settings (frequency, gain mode, gain setting) will be displayed.

Turning the receiver OFF:

Press and hold the ON/OFF switch for approximately 1 - 2 seconds. When the LCD displays no information the unit is off.

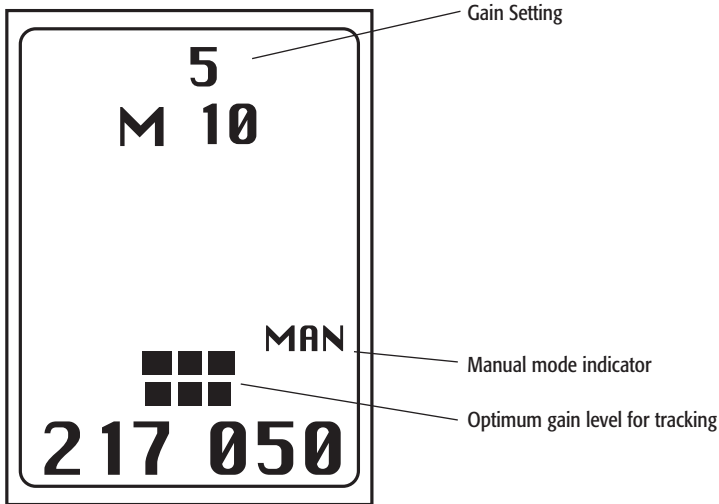
Light sensor to activate backlight.



Selecting Memory location:

Use the ▲ and ▼ buttons to move between Memory locations that have programmed frequencies saved. The programmed frequencies are displayed at the bottom of the Display. During programming, use the ▲ button to change to a higher number and the ▼ button change to a lower number.

Automatic/Manual Gain modes:



The gain should be set carefully in order to detect the transmitter and to help in direction finding. A gain setting that is too high will make it difficult to determine a bearing to the transmitter.

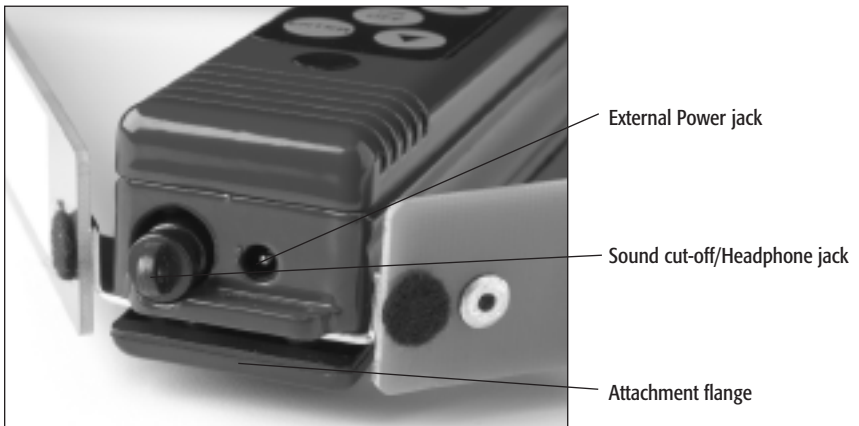
IMPORTANT NOTE: When the receiver is turned on, it will always return to the last Memory location and Modes as when it was shut off, i.e. M1, (automatic or manual) and gain level (in Manual). For example, if you were monitoring 217.050 MHz frequency in Manual mode at gain setting 8 when you turned the unit off, it will return to 217.050, Manual mode and gain setting 8 when turned on again, if the Gain control Knob was not moved. Automatic Mode will always have the gain go to maximum then adjust.

A unique feature of the Maxima receiver is the automatic gain control mode. The “smart electronics” contained in the receiver will automatically set the gain control based on the strength of the signal. Note that automatic is good to help find a signal; Manual is best for precise direction finding.

Manual mode allows the operator to set the gain level. Turn the gain wheel to the lowest level where an audible beep is heard and one or two bars are displayed on the LCD (see photo on pg. 6). This will provide the most precise indication of bearing to the transmitter.

Pressing the ENTER key when in memory selection mode, toggles receiver between Automatic and Manual gain control modes. MAN or AUTO will indicate the current mode and displayed on the right side of the LCD screen. When in Automatic mode, the AUTO will flash when adjusting gain. Current gain setting is displayed top center (0 through 9).

Plug ins:



IMPORTANT NOTE: Do not attach a ring or other attachment to plastic plug for purposes of a safety strap. This may cause the plug to break off requiring factory service. Use metal flange adjacent to the DC power jack to attach receiver to holster, belt, etc.

Sound cut-off/Headphone Jack:

There is a plastic Mute plug that has three positions:

In: Sound on

Out ($\frac{1}{8}$ "): Sound off

Removed: For headphones (internal speaker off when headphones/external speaker is used)

The Headphone Jack takes a standard mini ($\frac{1}{8}$ ") headphone plug (headphones sold separately) Note that the speaker is OFF when the headphones are plugged in. The signal is audible in both headphone speakers. When removing the plug to allow the use of headphones, pull straight out. A string fed through the hole in the plug may help with removal.

External power Jack:

Used to power unit from a car's cigarette lighter (accessory sold separately). Use only the 9 volt DC regulated adaptor available from Tracker.

Automatic Shut-off:

The Tracker receiver features an automatic shut-off circuit that will guard against running down the batteries if the receiver is inadvertently left on. Most receivers are set to shut down after 15 minutes if no button is pressed.

External Antenna/Connector:

Maxima receivers may be purchased with an SMA connector for use with an external antenna (for example a roof-mounted or hand-held Yagi). Additionally, most units can be retrofitted with this adapter by sending the receiver directly to Tracker.



External antennas are commonly employed when tracking from a vehicle or aircraft. Moreover, a multi-element directional antenna can provide greater range when tracking a very weak transmitter. Most Tracker transmitters are powerful enough to not require an external antenna except in specialized circumstances.

PROGRAMMING

Adding a frequency:

1. Turn ON the receiver.
2. Press MODE button, M changes to CH in mode indication display line and memory number is replaced by 4 numbers with the first digit (left) blinking. Note that the current frequency is displayed at the bottom of LCD. These four numbers will be added to the base frequency (listed on antenna label) of your receiver. For example: if you have a 216 MHz receiver, the base frequency is 216.000. Some examples:

Example #1

The four digits read:	CH 0155
The base frequency:	216.000
Added together equal:	216155 or 216.155

Example #2

The four digits read:	CH 2450
The base frequency:	216.000
Added together equal:	218450 or 218.450

NOTE: Note that the actual frequency will show at the bottom of your Display. The decimal point is understood between the 3rd and 4th digits.

If the blinking digit requires changing, use ▲ or ▼ button to select correct number. Press ENTER to save the number and move on to the next digit (right). Again use ▲ or ▼ button

to select correct number. Note that pressing the ENTER key moves the editor 1 digit to the RIGHT and pressing the MODE key moves the editor 1 digit to the LEFT.

3. Repeat until frequency at bottom of display matches desired frequency. Note: that if an active transmitter is within range, it should be audible. You can adjust the frequency to optimize the sound by using the ▲ or ▼ button furthest to the right before saving the frequency.
4. With the last digit blinking, press ENTER to save the frequency. A suggested location number will blink. If the desired memory location is not displayed use the ▲ or ▼ button to selected the desired location number.
5. Press ENTER to save the frequency in the displayed memory location register. This will end the programming mode and return you to memory location mode

HINT! It is best to note the memory location you want to store your frequencies in before initiating the programming mode. After you key in the desired frequency, the receiver will designate the lowest available (empty) memory location to store the frequency. If you have keyed in the desired frequency but forgot the intended location, press the ON/OFF button for ½ second, this will put you back into memory selection mode. Then identify the memory location you want to store the frequency in and start over.

Changing a frequency:

The process of changing a frequency is similar to adding a frequency. Most users store the new frequency in the old memory location.

1. Turn ON the receiver.
2. Press MODE button, M changes to CH in mode indication display line and memory number is replaced by 4 numbers with the first digit (left) blinking. Note that the current frequency is displayed at the bottom of LCD.

3. If blinking digit requires changing, use ▲ or ▼ buttons to select correct number. Note that pressing the ENTER key move the editor 1 digit to the RIGHT and pressing the MODE key moves the editor 1 digit to the LEFT.
4. Press ENTER to move and edit next digit (right). Note that it is blinking. Use ▲ or ▼ buttons to select correct number.
5. Repeat until frequency at bottom of display matches desired frequency. Note: that if an active transmitter is within range, it should be audible. You can adjust the frequency to optimize the sound by using the ▲ or ▼ button on the rightmost digit before saving the frequency.
6. Press ENTER to save the frequency. The memory location number will blink. If the desired memory location is not displayed use the ▲ or ▼ button to selected the desired location number.
7. Press ENTER to save the frequency in the displayed memory location register.

Deleting a frequency:

1. Turn ON the receiver.
2. Use ▲ or ▼ to select the frequency (memory location) you want to delete.
3. Press MODE button, M changes to CH in mode indication display line and memory number is replaced by 4 numbers with the first digit (left) blinking. Note that the current frequency is displayed at the bottom of LCD.
4. With the first digit (left) blinking, press ▼ button until you see four blinking dashes on the Mode indication display line.
5. Press ENTER, Note that the receiver automatically selects the location that you started with in step one.
6. Press ENTER again and the memory location is now empty and you are returned to memory selection mode.

Changing the Batteries:



Retaining screw

1. Start by turning the receiver upside down to allow access to battery compartment.
2. Loosen the retaining screw on the battery cover and remove the cover exposing the two 9 Volt batteries.
3. Replace BOTH batteries with 9 Volt batteries of same type and equal strength. New 9 Volt Alkaline batteries are recommended.
4. Replace the battery compartment cover - start by inserting forward edge in slot at the front end of the compartment.
5. Tighten the retaining screw.

TIP: When removing batteries hold the battery clip in one hand and remove first battery then reverse for second battery. This protects possible loosening of battery wires. Do not allow batteries to dangle from battery wires.

Maintenance

The MAXIMA receiver is designed to be relatively trouble free. You can prolong the life of your system by following these simple suggestions:

1. Store the unit in a dry place at room temperature when not in use.

2. Minimize the contact with water. Tracker receivers are among the most water resistant on the market but no unit is water-proof. Do not store receiver in a wet holster. If unit is submerged in water or becomes soaked, immediately remove the batteries and ship unit to Tracker where it can be chemically cleaned and dried. **WARNING:** If a receiver is stored wet and left to dry, pockets of water may be left under components. This will cause corrosion and damage, even though unit may work.
3. When batteries are weak, replace BOTH at the same time. Both batteries should be identical type (9V - non rechargeable, etc.). Good quality alkaline batteries are recommended. Rechargeable batteries may be used but, if employed, the low battery indicator may not provide much, if any, warning.
4. If the receiver becomes soiled, the body and antenna can be cleaned with alcohol or damp cloth.
5. If the antennas fold in and out with difficulty, DO NOT lubricate. Lubrication requires a special non-penetrating conductive lubricant and is best accomplished by sending the unit to Tracker for service.
6. Do not try to adjust the forward/front antennas as it may cause damage to the circuit board, If forward/front antennas are loose (will not stay in the open position), send unit in for service.

TIP: Your Maxima receiver will fit into a one gallon plastic zip lock bag with the antennas open.

USING YOUR SYSTEM

GETTING STARTED

It is important to acquaint yourself with the features of the receiver before taking it in the field. While your system is simple yet powerful, you will need a little practice to become proficient in its use and

be able to “read” the signal in different locations. It is highly recommended that you practice first before taking your dog hunting, searching for a lost individual or tracking stolen property.

A tracking transmitter broadcasts a distinctive beeping sound in all directions in a manner similar to an FM Broadcast station. The Maxima receives the signal and provides an indication of the signal strength. The signal strength of the transmitter detected by the receiver will depend on many factors such as distance to the transmitter, obstacles, signal bounce and antenna polarization. The unique antenna of the Tracker Maxima is designed to favor reception from one direction. When the Maxima is pointing in the direction of the transmitter, the signal will be stronger.

HINT: Make sure you take the time to familiarize yourself with the controls before tracking a transmitter in the field. With a little practice you will become a proficient tracker.

The observed strength of the signal depends on the amplitude of the wave detected by the receiver. The higher the signal amplitude, the greater the signal indicated by the Tracker receiver. Radio waves spread in all directions from the source of the transmission. As the spreading signals travel away from the source their amplitude decreases and the indicated signal level is reduced. The antenna's function is to receive the waves for the receiver to process.

The degree of difficulty in locating a transmitter can vary considerably. Key factors include, landscape, natural and man-made obstructions (trees, buildings, power lines, etc.) and weather conditions. These factors influence the strength of the signal received either by attenuating (reducing the strength of the signal) or creating a reflection that will indicate a “false position” where the signal will “bounce off” an object. Understanding how the signal is influenced by these factors will vastly improve your ability to locate a dog, wild animal, lost individual or property.

To become proficient with the operation of the receiver, you should consider activating a transmitter, and have someone in your family or group place it in an open area free from obstructions (where it can be relocated, if necessary). A good distance to start would be at least several hundred yards. Turn on the receiver, switch to the correct frequency, set gain control to Manual, and reduce the gain setting so that only 2 to 3 bars shows on the LCD screen in the direction of the strongest signal. Once this is completed, keep the receiver on and walk toward the strongest signal sweeping continuously in a 180 degree arc that contains the strongest signal. As you approach the transmitter (indicated by the signal becoming stronger) continue to reduce the gain (turn knob counter-clockwise) so that only 2 to 3 bars are displayed in the direction of the strongest signal. You should quickly locate the transmitter after a little practice. After you become proficient in locating the transmitter in a flat area (line-of-sight), you are ready to practice in more challenging landscape.

The speed of the sweep is important. If you sweep too fast, it will be difficult to get an accurate reading. A steady sweep is best to start in order to get an initial reading. Once you have an initial bearing indication, verify that your bearing is correct by making a few sweeps in other directions. Practice will provide you with the correct technique.

HINT: Pay particular attention to the gain control setting. It is much easier to track a transmitter when the gain is set at the lowest setting that yields an audible signal. If you are using MANUAL gain control mode, adjust the gain downward until the signal is barely audible (2 to 3 bars on the LCD screen).

In the line-of-sight exercise, you should have noted several characteristics of the signal:

- The bearing of strongest signal was fairly consistent.
- The signal strength diminished in a consistent pattern as you varied 30 or more degrees right or left of the true bearing to the transmitter.

It is important to remember the characteristics of a line-of-sight situation as it will aid in "reading" the signal in the field.

Next repeat the practice procedure in an area similar to your search area (open fields, forested area, etc.). By this point, you should have mastered the few controls that are required on the Tracker receiver. This is important as your attention should be focused on analyzing the signal rather than operating the receiver. If the frequency is set correctly, the gain mode is in MAN and the gain level is set correctly, your attention can then be focused

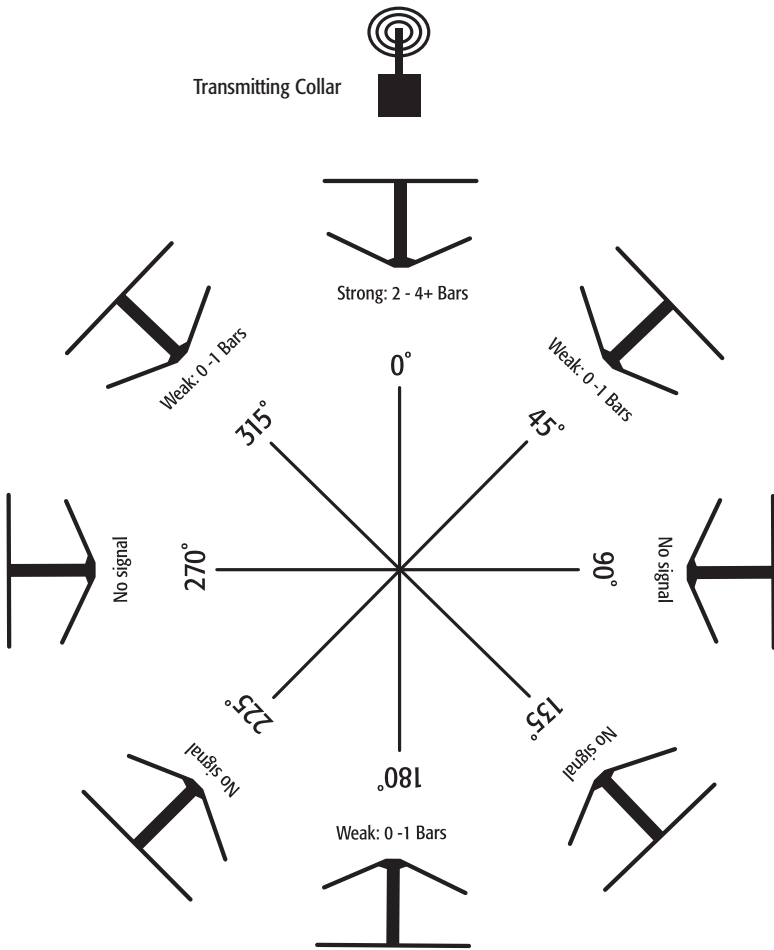


Figure 1: Typical receiver behavior in line-of-sight situations

on interpreting the signal. As you proceed with more complicated searches, it is important to keep moving as you are processing new data at each new location rather than re-sampling the same data when stationary.

Follow a similar procedure as in the previous example. Have someone from your family or unit hide the transmitter in an area that will provide a range of obstructions (physical and/or man-made) and special situations (inside a building, adjacent to metal equipment, etc.) to the location team. Unfold the antennas, activate the receiver, select the correct channel and determine if a signal is present. If the signal is heard, slowly sweep 360 degrees to ascertain the direction of strongest signal. You may notice that you receive a relatively similar strength signal from two or more directions. Under these circumstances, first try to ascertain whether a metal building, hillside or other obstruction is the source of the "bounce" signal. While there is no universal method for analyzing multiple strong signals, try the following when encountering a "bounce signal candidate:"

- Move to another location some distance away and repeat the procedure. Try to remember the bearing that you received strong signals at the first location and note if a new signal comes from a common point.
- If you can easily reach a higher elevation (increasing the odds for a line-of-sight signal), take another reading.
- If the object at the source of the bounce is small, try moving perpendicular to a line between you and the source of the signal. Often if the angle is changed the strength of the signal will change significantly. If this occurs, review the initial angle to create a possible candidate bearing to the transmitter or eliminate this bearing (bounce signal).

NOTE: As you search with the receiver on, you may note that after 15 minutes of continuous use where no key is pressed, the receiver automatically turns off (you may need to turn the receiver on again).

- Implement a "process of elimination" strategy. If the signal is difficult to "read" remove from consideration all line-of-sight locations that you do not receive a strong signal.

You will notice that the signal in the open field led you directly to the transmitter while in hilly area the direction changes slightly as you move around obstacles and hills. This signal "bounce" is completely normal and eventually, with practice, you will be able to "read" the signal in relation to the terrain.

A signal is not required to be line-of-sight to yield a good bearing. In gentle rolling topography with few obstructions, radio waves can follow the contour of the ground and provide a good bearing. However, distance estimation is complicated as the signal is attenuated (strength reduced) while following ground contours. Often the bearing will change slightly as you approach the transmitter across rolling landscape.

EFFECTIVE RANGE

Transmitter and receiver location will affect the range we can detect the signal from the transmitter. On flat open country with few obstructions (trees, large rocks, homes, etc.) we will get maximum range out of our system. In steep hilly terrain or in a large city, the range can be reduced significantly.

Distance can be estimated after you have gained experience tracking in the same terrain using the same transmitter. You may note that a signal received at a gain level of 6 is much farther away than one received on a gain level of 5 in the same terrain. The gain

HINT! It is generally helpful to know the relative distance and bearing of the transmitter. To become proficient at judging distance, note the gain setting either on the top of the LCD display or on the wheel. Remember that gain is a logarithmic scale so a setting of 8 or 9 may indicate that the transmitter is 8 to 10 miles away OR the signal is obstructed by topography or buildings. With practice, you will quickly be able to accurately judge distance under most circumstances.

scale is logarithmic not linear. This means the change in gain from 1 to 2 is very small as compared to the change in gain from 5 to 6, i.e. gain at 1 to 2 is for 50 to 100 ft. while gain at 5 to 6 is for ½ mile to 2 miles. This is not an exact measure, the ranges will be different depending on all of the factors involved. NOTE - If the signal is not line-of-sight, distance estimation is not reliable.

Obstacles

Think about what happens to the signal strength of your favorite radio signal when your vehicle enters a tunnel? It gets very faint or you lose it altogether. The same effect can be experienced when searching for a cell phone signal in a deep canyon. Radio waves at certain frequencies have great difficulty penetrating rock and other solid objects. Therefore, it is generally more challenging to locate an object in rugged terrain rather than on a flat plain.

Signal Bounce

The term that professionals use to describe the behavior of radio waves deflecting and reflecting off objects is "signal bounce." Many different types of substances reflect radio waves including rock (particularly sheer cliffs), water and wet vegetation. "Bounce" has a tendency to complicate radio-location as the signal will be effected by the composition and shape of the reflecting object. This phenomenon has the potential to create strong signals in several discrete directions. Signal bounce should not be intimidating - we just need to learn how to manage it.

Polarization

The signal will be strongest when the orientation of the receiver antenna matches the orientation of the transmitting antenna. For

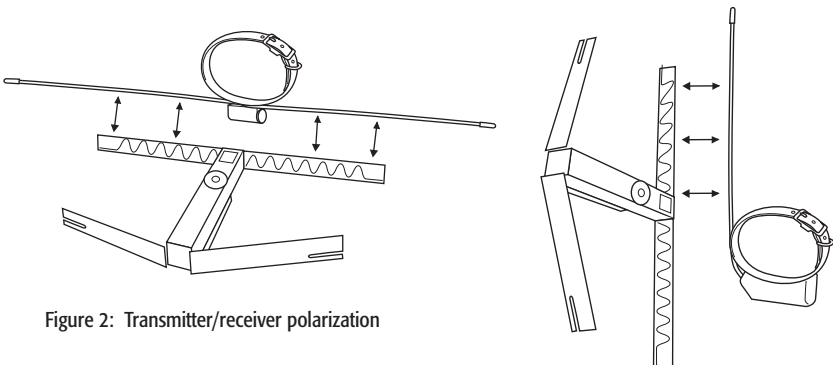


Figure 2: Transmitter/receiver polarization

example, if the transmitting antenna is perpendicular to the ground, the signal strength detected by the receiver will be greatest when the antennas are positioned vertically. You can test this for yourself by activating a transmitter and orienting the antenna on the transmitter parallel to the ground. Then turn on the receiver and test the signal strength with the antennas parallel and perpendicular to the antenna on the transmitter. Knowing the orientation of the antenna in advance greatly aids in radio location. However, it is often unknown and the best procedure is to try both vertical and horizontal antenna orientations when tracking.

Overhead Utilities

Power lines are excellent re-radiators of radio waves and can complicate radio-location. Like signal bounce, it is all very manageable once you understand the limitations of tracking near power lines especially high voltage transmission lines.

Use in and around a vehicle

The receiver can be operated from a motor vehicle, however, many older vehicles produce considerable interference and make signal reception difficult (particularly a weak signal) when the engine is running. When using the receiver without an external antenna it is best to shut off the vehicle and move at least 20 feet away. Be cautious of reflected signals off the vehicle. It might be necessary to take readings from different points from around the vehicle to get a good bearing.

Location of transmitter

There is a reason why TV and radio transmitters are located on hilltops and towers - it provides maximum range for the signal. Conversely, the closer to the ground the transmitter is situated, the shorter the effective receiving range. Locating an object that has fallen into a well or is flat on the ground is more difficult given the reduced effective range of the signal.

Location of receiver

Similar to the location of the transmitter, any given signal can be received at greater distance if the receiving antenna is high in the air, therefore, a stronger signal may be obtained by positioning the receiver higher off the ground. NOTE: It is much worse for the receiver to be in a low terrain than the transmitter.

Triangulation

Consider the process of triangulation before embarking on a cross-country search if any of the following conditions apply:

- If the transmitter is stationery
- Transmitter is located in difficult terrain
- Transmitter is at a great distance from the receiver.

This practice may be of limited utility for a fast moving transmitter (hunting dog, vehicle, etc.) as the procedure may take some time and the transmitter may have moved a great distance.

It is best to triangulate the transmitter from several locations (3 to 5 are best). Ideally, the locations should be widely dispersed to allow plotting on a map. Use of a GPS receiver to pinpoint locations and a compass to determine bearing of strongest signal will improve the accuracy of the triangulation. In addition, a set of headphones will allow the operator to detect minute changes in the signal to assist narrowing the band of maximum signal strength. With the correct equipment and technique the operator should be able to narrow the search to a small area.

Suggested procedure is as follows:

1. Select 3 to 5 "listening" points that are widely dispersed (ideally separated 30 to 120 degrees from each other). Locations at higher altitude or where obstructions are at a minimum are preferred.
2. Travel to each listening point, unfold the antenna, turn on the receiver and carefully adjust the gain so a strong signal can only be detected in a narrow arc (for example 30 to 60

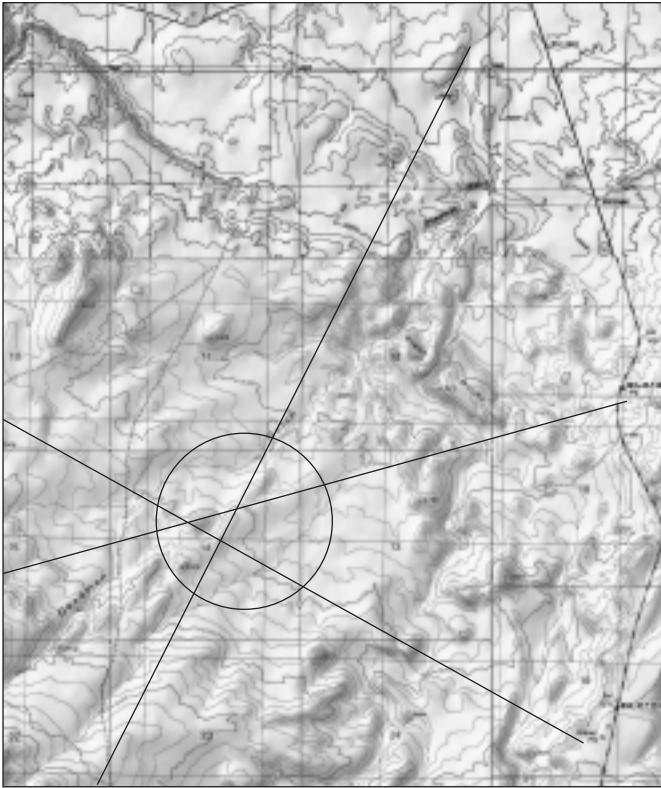


Figure 3: Plotting triangulation bearings on a topo map. The circle defines the most likely location of transmitter

degrees). Note that, other things being equal, the arc may be greater the closer you are to the transmitter. Listen for small changes in the signal strength (headphones can be very helpful to detect the bearing of maximum signal strength). If you know the orientation of the transmitter antenna, rotate the receiver antenna in the same axis. If you are not sure of the transmitter antenna orientation, experiment with various antenna orientations (parallel to ground, perpendicular to ground, 45 degrees from perpendicular, etc.) to determine which provides the more precise bearing.

3. If the arc of received signal is, say 30 degrees, note the bearing of the "break" in signal (where the signal drops off) on each side and choose the mid-point of the arc as the most likely bearing to the transmitter.
4. With a compass record the bearing, then using the GPS coordinates of the listening location, draw a line representing the bearing on a map. Add lines 10° on either side of the initial line.
5. Repeat this procedure at 2 to 4 additional locations, plotting the bearings that comprise the intersection of the lines on the map.
6. Determine the best path and commence the ground search.

The size of the search area may vary depending on terrain, radio interference and other factors that impedes precise bearing. Under most circumstances, an experienced user should be able to define a bearing that is within 10 degrees of true. This will result in a very small search area to undertake a thorough ground search

Use from a Vehicle

The optional SMA connector (or bracket for older receivers), omni directional antenna and 9 volt power adapter (for power points or car cigarette lighters) can be employed to search for a signal from a moving vehicle (assuming that interference is not too great). This can be a time efficient approach if the exact location of a transmitter is not known and a road network is available. Drive until a signal is heard and then remove the receiver from the bracket, unfold the antennas and take a bearing. Be careful to move away from the vehicle to minimize signal reflection. Once a signal is received, you can elect to triangulate on the signal or follow the road network toward the source of the signal, repeat as necessary or desired. The omni-directional antenna will not provide signal direction data but a strengthening signal will indicate that the vehicle is approaching the transmitter.

ACCESSORIES (Sold Separately):

In some cases the use of accessories can facilitate the location of a transmitter particularly from a vehicle. Tracker markets accessories including an omni-directional antenna, mounting bracket, headphones and DC power adapter. The omni-directional antenna features a magnetic base, which attaches to the roof of the vehicle and a coax cable with BNC connector that connects to the mounting bracket, or adaptor for direct connection to the receiver.



The mounting bracket holds the receiver and provides a BNC connector for an external antenna. One can easily remove the receiver from the bracket for use with its folding directional antennas. Make sure your Maxima is enabled for an external by checking the forward end of the receiver.

Headphones help monitor the strength of the signal particularly when precision is required or signal is very weak.

The DC power adapter permits the user to power the receiver from the vehicle's power point or cigarette lighter.

External antenna enabled for use with mounting bracket



TRANSMITTERS:

For many applications, Tracker markets transmitters with the Maxima receivers, as a package. See the manual for your transmitter type or download off of www.trackerradio.com

TROUBLESHOOTING:

Receiver will not turn on

1. Make sure you are pressing and holding the ON/OFF button for at least 2 seconds.
2. Remove battery cover and check to make sure batteries are connected and battery clip wires are ok. If wires are broken or frayed, send unit in for service.
3. Use a battery tester, not a multimeter/volt meter to assure that both batteries have sufficient strength.
4. Try replacing batteries. If unit still does not turn on, send unit in for service.

Receiver is on but no sound is heard from speaker

1. Make sure gain control is set high enough to be able to activate speaker.
2. Insure the black plastic mute/silencer plug is all the way in the headphone jack.
3. Try removing the plug.
4. If there is still no sound from the internal speaker, send unit in for service.

Distorted Audio or loss of Signal

1. Check backlight operation by turning unit on (backlight should come on for one second). If backlight does not illuminate, send unit in for repair.

2. If audio distorts when backlight comes on, send unit in for repair.
3. If audio is distorted all the time, send unit in for repair.

Antenna/s loose or too tight

1. DO NOT try to tighten or adjust the front antennas, this can damage the circuit board and will void your warranty.
2. Rear antennas can be adjusted with a screwdriver (screws are located under battery retaining cover.) Antennas should be snug but move smoothly in and out. Note: these are steel screws in an aluminum body, so please be careful not to strip the threads. If antennas cannot be adjusted for smooth operation, send unit in for repair. DO NOT oil or try to lubricate the antennas, this can possibly damage the internal electronics and void your warranty.

Direction Accuracy

1. Insure antennas are fully extended.
2. Insure the back/reflecting antennas are not resting on forearm or any part of you body.
3. If rear antennas are loose, adjust with a screwdriver for smooth but snug operation (see above for explanation).
4. Check for corrosion on antenna rotating points/hinges. If present, send unit in for service.
5. If none of the above causes are apparent and the problem persists send unit in for service.

Reduced reception

1. If low battery indicator is on, change batteries in receiver.
2. Replace battery/s in transmitter (collar).

NOTE: DO NOT put any metal or metallic tape or stickers on the antennas.

3. If available, compare receiver with another receiver with same transmitter. If range is considerably less, send unit in for service.

Display screen flashes on and off

1. This is a programmed response; the number of flashes indicates the type of problem the receiver self check system has discovered. Send unit in for service.

Gain control numbers jump in value or change

1. Put unit in manual mode.
2. If problem is still present the gain control potentiometer is defective or the gain program levels are corrupted and required unit to be sent in for service.

Other problems: NOTE: All problems listed below require the unit sent in for service.

1. Missing segment on display or broken display
2. Broken antenna element
3. Buttons that do not operate
4. Broken battery clip
5. Squeal from speaker that sounds like a bomb dropping- need to note frequency this happens on, and send in for service.
6. If the unit is submerged or soaked, remove batteries immediately, and send receiver in for service.

Warning! If you allow a wet receiver to dry, the unit may initially function normally, but there will be areas that will continue to corrode and the unit will eventually fail and require service. When the receiver eventually fails the electronic circuit boards may be so badly damaged they will require replacement, costing \$300.00 to \$500.00 or more, and warranty will be voided. Therefore, it is strongly recommended that you send the receiver in for service if you think the unit may have gotten wet inside.

How to send in a unit for repair:

Package receiver in holster and original box if possible, or box with good padding, and include a note with the following information:

- Name and Address and phone/e-mail address of sender
- Copy of warranty paperwork or receipt
- Brief description of problem.
- Include your e-mail address for notifications of the following:
 - We have received your shipment
 - Estimates of repairs over \$150, and
 - Return shipment of your items

The technicians would appreciate as much information as you can provide in order to reduce repair time so that they can ship your unit back as quickly as possible. The description "it doesn't work" is not particularly helpful.

We recommend that you insure the unit

Send to:

Tracker Radio Systems
800 S. Industry Way
Suite 160
Meridian, ID 83642

MAXIMA RECEIVER SPECIFICATIONS:

Weight with Batteries	13.5 oz (420g)
Dimensions (antenna folded)	8¼" x 2" x 1½" (210 x 48 x 35 mm)
Dimensions (antenna unfolded)	8¼" x 16" x 1½" (210 x 405 x 35 mm)
Spurious emission	< 2 nW
Intercept point	-20dBm > 2 dB
Operating voltage	7 - 10 V DC
Battery types (2 pcs)	9V/6LR61 - 6AM6EU
Current consumptions	50 - 100 mA
Sensitivity	-130 dB / .078°V
Modulation	A1
DAAA (digital automatic amplification adjustment)	>130 dB
Audio frequency power	max. 70 mW
Operating temperature	-14 to 122° F (-10 to + 45° C)
Storage temperature	-27 to +131° F (-30 to + 55° C)
Frequency Bands:	150.000-157.000 MHz 213.000-223.000 MHz 433.000-434.999 MHz



**Tracker Radio Location Systems
800 South Industry Way
Suite 160
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www.trackerradio.com

