USER MANUAL

The RF-Compass™ is the world’s first automatic antenna tracking product for wireless microphones and IEM equipment, offering a truly unparalleled and optimum transmitter to receiver link.

The RF-Compass keeps your directional paddle or circular polarized antennas or IEM helical transmit antenna trained on the performer no matter where he or she moves. As the performer moves upstage, down stage, out on a runway, into the audience, or out into the sanctuary, your directional antenna will track their every move, maintaining an ideal radio link.

The RF-Compass™ is a servo controlled, automatic panning device which follows a 5.8GHz, multichannel, mini transmitter. The main receiving and panning unit is called the Servo and mounts to a standard microphone stand (adapter included). The Servo unit needs a beacon signal to track and the system includes a pocket sized transmitter device called the RF-Beacon™. The RF-Beacon’s transmitter uses a standard 9V alkaline battery and is housed in a plastic case which can be mounted to a belt pack or simply carried in the performer’s pocket.

For technical clarification: A mini 5.8GHz transmitter is used as the tracking signal (Beacon). The RF-Compass Servo biangulates to the signal (like triangulation) and pans around following the 5.8GHz signal. Mounted to the servo unit is your UHF directional antenna.

The RF-Compass servo unit can be mounted to a standard mic stand and any paddle or flat panel directional antenna can be fitted to it. The servo unit rotates up to 360 degrees (we recommend positioning for 270-300 degrees max) and tracks with great precision. The RF-Beacon to servo operating distance is over 200 hundred feet.

GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>RF-Beacon™</th>
<th>RF-Compass™ Servo Unit</th>
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<tbody>
<tr>
<td>5.8GHz 40 channel transmitter</td>
<td>5.8GHz 40 channel receivers (2)</td>
</tr>
<tr>
<td>Power: 25mW</td>
<td>5.8GHz Helical tracking antennas – RH</td>
</tr>
<tr>
<td>Battery: 9V Alkaline battery / 400mAH</td>
<td>Circular (2)</td>
</tr>
<tr>
<td>Battery Run Time: Typical 2.5 hours</td>
<td>360 degree rotation</td>
</tr>
<tr>
<td>Range: &gt;200 feet without external antenna</td>
<td>Auto frequency scanning</td>
</tr>
<tr>
<td>External SMA Antenna connection: 50</td>
<td>User defined configuration &amp; tuning</td>
</tr>
<tr>
<td>Ohms (if desired for extended range)</td>
<td>12volts DC, 750mA (AC adapter included)</td>
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<tr>
<td>Operating Temperature: -10~85°C</td>
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INITIAL SETUP

Proper Positioning
Locate the RFCompass Servo unit away from reflective walls and large surface areas (allow at least 1.2 feet). This is because reflections may interfere with the tracking capabilities.

Position the Servo unit so it will track no more than 270 - 300 degrees. The RF-Compass can rotate a full 360 degrees but you do not want to allow ‘coax cable twist’, allowing the cable to wrap around the unit at full rotation. Typical application use is 180 degrees or less.

Once the RF-Compass Servo unit is properly located, and provided it is not in the RUN mode, you can manually rotate the Servo head into the desired initial position.

WARNING: DO NOT ROTATE THE SERVO HEAD WHILE IN RUN MODE AS THIS WILL DAMAGE THE INTERNAL SERVO MOTOR!

Tracking Accuracy
Even if the RF-Compass is out of direct alignment by several degrees it is still offering an optimum situation, especial considering the alternative of a fixed antenna with the performer being 30, 60, 120+ degrees off center. And if the RF-Beacon or Servo unit are temporally blocked and not tracking, this is also assumed as an acceptable situation provided it can recover and start tracking again. The bottom line... don’t be overly concerned if the RF-Compass antenna alignment is not always a perfect.

Total Loss of Tracking
If the Servo unit has completely lost the beacon signal yet is now in a recoverable range, it may become necessary for you to manually rotate and reposition the Servo unit head to orient it into the correct starting direction. One possible scenario is that the RF-Beacon was turn Off while the Servo head was point in one direction, and now the RF-Beacon is turned back On while now located on the opposite, backside of the Servo unit.

WARNING: DO NOT ROTATE THE SERVO HEAD WHILE IN RUN MODE AS THIS WILL DAMAGE THE INTERNAL SERVO MOTOR!

RF-Beacon Battery Power
You must use an Alkaline 9V battery or a 9V battery of at least a 400mAH rating. At 25mW transmit power, the battery should last 2+ hours.

Note: Sometimes the 9V battery negative contact prongs are too tight/small and it is hard to snap the battery onto the RF-Beacon battery compartment contacts. Simply spread the battery’s contacts a little for an easy snap-in fit (do not force the battery, as you may break the battery contact frame).

Note: The RF-Beacon runs warm to the touch and this is normal
RF-BEACON CHANNEL SETTING

Key Function:
1. Long press the key for 2 seconds to enter channel setting mode.
2. Short press the key once to switch the channel from 1 to 8.
3. Long press the key for 2 seconds to enter channel Group setting mode.
4. Short press the key once to switch channel Group from 1 to 5.
5. Long press the key for 2 seconds to quit setting mode. LED display window will show present group and channel alternately.

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<tbody>
<tr>
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<tr>
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<td>5752</td>
<td>5771</td>
<td>5790</td>
<td>5809</td>
<td>5828</td>
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<tr>
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<td>5800</td>
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<tr>
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<td>5769</td>
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<td>5843</td>
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SERVO UNIT INTERFACE BUTTONS

Navigation button functions:

![Buttons](image)

Reset  Up  Down  Left  Right  Push/Enter

The three main menu items are:

RUN

CHANNEL

ADVANCED

The sub menu items are:

RUN: [Normal operation - Initiates & tracks]

CHANNEL: > SET > SCAN > BROWSE

ADVANCED: > CALIBRATE > SPEED > CENTER HOLD > FILTER > SERVO CENTER LEFT > SERVO CENTER RIGHT > SERVO REVERSE and VOLTAGE ALARM
SYSTEM SETUP AND CONFIGURATION

The RF-Compass™ is preset up to suit most applications as default. Simply set your channel to match the RF-Beacon™ channel and RUN. It does however pay to become familiar with the various configuration options within the system as these can help you tune the RF-Compass for unique or congested RF environments.

The menu items and associated functions are outlined below:

> RUN

Selecting RUN will start the unit tracking. The only way to exit run mode is to power cycle the tracker. The RF-Compass will always restart in the last settings state (see “Factory Reset” to set back to Factory Default).

> CHANNEL

Select your channel. Frequencies match up to the standard 5.8 GHz channels as listed below.
LEFT/RIGHT will change in values of one
UP/DOWN will search for a transmitting channel

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You can manually set your desired channel.

This auto scan will run through all channels and stop on the strongest signal. The RF-Beacon must be turned On and at least 20 feet away from the RF-Compass Servo unit.

This function will cycle through all channels showing any signals that are found. This is helpful for prescans to check for any potential 5.8GHz interference and hence channels to avoid.

As a general rule you should not need to change any of the advanced values. However, for your benefit we have enabled these functions to allow you the flexibility to finetune your RF-Compass for unique applications.
> CALIBRATE

Calibration of the tracker should only be required if changing the Servo unit antennas or if in a particularly noisy 5.8GHz RF environment.

The calibration process reads the RSSI values from the two discrete 5.8GHz receivers and calculates an offset to cater for differences in receiver RSSI outputs. You can calibrate with the RF-Beacon turned On, however experience has shown better results are achieved with the RF-Beacon turned Off provided you are in a low RF noise environment. If you do calibrate with the RF-Beacon turned On, please ensure the RF-Beacon is over 40 feet away and is positioned/aligned precisely between the two helical receiver antennas.

> SPEED

Default settings should be fine. If you find the RF-Compass Servo unit is not keeping up with the movement of the RF-Beacon, you can increase the speed (ideal for location recording vehicle movement). Likewise reduce speed if the RF-Compass Servo is going too far and/or having to re-correct all the time.

> CENTER HOLD

When the RF-Compass Servo has a ‘lock’ it will pause for a small period of time before moving the servo again. This reduces the amount of wobble. Default is the best setting.

[FILTER]
[FILTER]
> FILTER

The tracker uses a software KALMAN filter to remove jitter and stabilize the RSSI signal. The higher the value, the slower the tracker responds to movement of the RF-Beacon. Default values will be acceptable for most RF environments. If you are using the RF-Compass in a very RF noisy environment (lots of wireless production especially in the GHz ranges) you may need to reduce the filter value to its lowest setting to enable successful tracking. The RF-Compass will oscillate more, but track successfully.

> CENTER LEFT and > CENTER RIGHT

These values are used to define the point at which the servo starts to move left or right. Continuous rotation servos have a dead band in which they do not move. So... 1500 may be center, but they do not move until the value is 1550 or 1450.

By default, your RF-Compass has been tuned to work with the supplied 360 degree servo, so changes to this setting should not be required.

> SERVO REVERSE

This simply reverses the direction of the servo – you should never have to change this for standard applications. Possible customized applications could include using the Servo unit to rotate another tracking head with reversed gearing.
The RF-Compass systems includes an AC adapter (12VDC output) to power the Servo unit. If you are running the Servo unit on a battery power source, and not the supplied adapter there is a low voltage alarm (Beeps).

> FACTORY RESET – CONTROL CALIBRATION

Hold down then press

Should you for any reason wish to reset the RF-Compass back to factory defaults, simply hold down any of the NAVIGATION buttons on the Servo unit while powering up.

The system will enter a calibration routine. This routing prompts you to press and hold each button – essentially storing the values so that it knows which button does what!

When prompted for each button press, simply press and hold the button until the [OK] notice appears.

It is important to ensure you press each button promptly. If you find that you miss a step, or a button does not work after calibration, simply rerun the calibration routine.

> REBOOT / CANCEL TRACKING

If at any point you wish to reboot the system and cancel the tracking function, simply press the reset button located just above the navigation button. This will instantly cancel the tracking function if you need to manually point the tracker.

If you are experiencing difficulties operating your RF-Compass™ or have questions about your application, please contact the Kaltman Creations LLC technical support and applications specialist team at 864-885-0500, or email sales@kaltmancreationsllc.com.