

# SHADOW-1 “CRYSTAL-LESS” RC RECEIVER

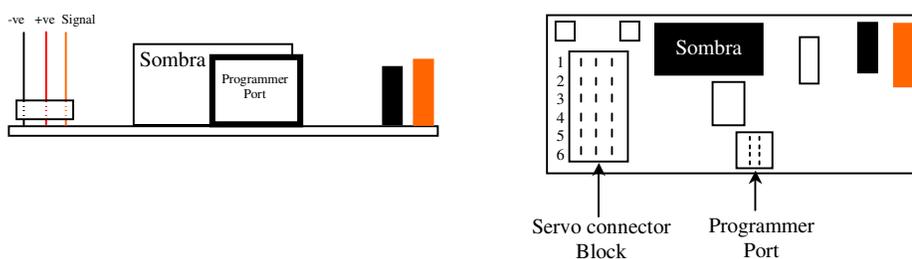
Thank you for purchasing the world’s smallest, lightest and most versatile synthesized RC receiver

We hope that you enjoy our product

Sombra Labs recommend that you read through this guide before you start using your new Shadow-1 receiver

## Shadow-1 Receiver Features

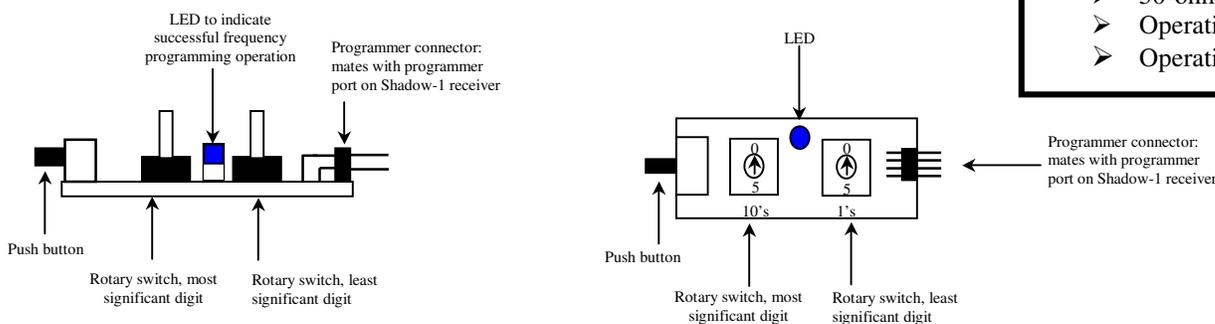
- Dual conversion, full range. Ultra narrowband (5kHz or better)
- Smallest and the lightest 6-channel synthesized receiver in the world
- Excellent sensitivity and IP3 performance
- Synthesized “crystal-less” operation
- Frequency selection through a modular programmer utilizing Sombra Labs' patented technology.
- Frequency programmer included with every receiver. Extremely rugged, reliable and easy to use.
- In-field frequency re-programming can be achieved 100% reliably even in an extremely busy RF environment (RC events, competitions, etc.)
- Compatible with most of the FM/PPM transmitters
- Works with high-rate transmitters (KO Propo, etc.)
- Automatic positive/negative transmitter shift detection
- Reprogrammable channel assignment for servo pins 5 & 6
- Shadow-1 will seamlessly cover 50Mhz (ham), 72Mhz (Air), 75Mhz (Surface) bands; no changes required to the product
- Most advanced DSP signal detection, noise control and glitch suppression algorithms
- Fully FCC/IC (Industry Canada) compliant, meets all AMA guidelines



**Fig A. Shadow-1 Receiver**

**Shadow-1 Technical Specifications**

- 6 channels full range
- Dual conversion FM/PPM
- Microprocessor based decoding and digital frame filtering
- Sensitivity: less than 2uv
- Size: 1.3"x0.8"x0.3"
- Weight: less than 8gms (weight includes antenna & packaging)
- 50-ohm antenna impedance
- Operating voltage: 3.5v .. 9.0v
- Operating temp: -20C .. +80C



**Fig B. Shadow-1 Programmer**

## Programming Shadow-1

Please follow the following step to program the Shadow-1 receiver to work with your transmitter:

1. Determine the frequency channel assignment of your transmitter. Please note the following channel assignment distribution for the three bands Shadow-1 can cover:
  - a. 50Mhz: Channel 00 – Channel 09
  - b. 72Mhz: Channel 11 – Channel 60
  - c. 75Mhz: Channel 61 – Channel 90
2. Set the proper channel number on the programmer by moving the two rotary switches. For example to set channel 72, set the switch marked “10’s” to 7 (first digit) and the switch marked “1’s” to 2 (second digit)
3. When setting is complete, insert the programmer in the “programmer Port” on Shadow-1 receiver as shown in the Fig. C. The switch knobs should face away from the servo connector block.
4. Press the “Push-Button” switch on the programmer until the LED lights-up
5. Remove the programmer

Please note that the Shadow-1 receiver has to be powered-up for the programming operation to take place.

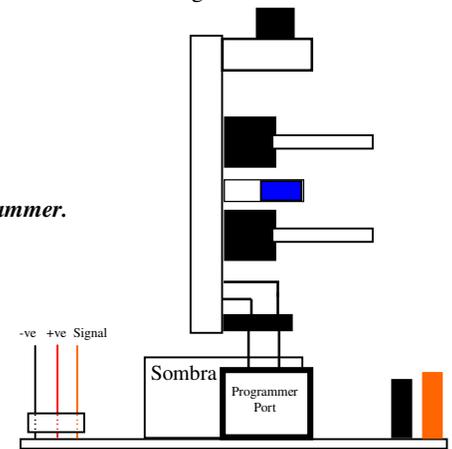
\* *Plugging the programmer in reverse will NOT damage the Shadow-1 receiver or the Shadow-1 programmer.*

### Channel Output Selection for Servo pins 5 & 6

Factory default setting for Shadow-1 output is channel 5 on servo pin 5 and channel 6 on servo pin 6. If desired this channel-servo pin assignment can be reprogrammed using the Shadow-1 programmer. The following three values on the programmer rotary switches will select the corresponding channel assignments:

- Dial setting 91 => 1, 2, 3, 4, 7, 6 [pin5 = channel 7]
- Dial setting 92 => 1, 2, 3, 4, 5, 7 [pin6 = channel 7]
- Dial setting 10 => 1, 2, 3, 4, 5, 6 [Default factory setting]

The above channel-servo pin mapping programming follows the same procedure utilized to select a different operational frequency. However, selecting the above three values will not effect the previously programmed operational frequency selection (channel 10, 91, and 92 are not valid RC channels in North America). Similar to operational frequency selection, the channel mapping will be remembered by Shadow-1 until it is reprogrammed for a different channel-servo pin assignment.



**Fig C. Programming the Shadow-1 Receiver**

### Shadow-1 antenna requirement

The Shadow-1 receiver ships with an antenna optimized for all band operation. The antenna can be shortened to 18” for indoor or surface use.

\* *Always conduct a range check when you first use the product and after any change in the antenna section.*

## Warranty & Service Instructions

Shadow-1 receiver and the accompanying Shadow-1 programmer is warranted against manufacturer defects in material and workmanship for one year from the date of purchase. During this period our warranty liability shall be limited to repairing the unit to our original specification. Sombra Labs will replace or repair, at our discretion, any component that is found to be factory defective at no cost to the purchaser. A copy of sales receipt must accompany any warranty repair. Modifications will void any warranty and is done at owner’s risk. This warranty does not apply to:

- Consequential or incidental losses resulting from the use of this product
- Damage resulting from accident, misuse, abuse, neglect, electrical surges, static electricity, reversed polarity on connectors, improper voltage or current
- Failure to operate the product as specified in this instruction manual

For technical assistance please contact your hobby dealer, or Sombra Labs by e-mail, phone or fax:

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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 received, including interference that may cause undesired operation.