Lemon Rx LM0086 DSMP 10 Channel Telemetry Stabilizer Receiver User Guide

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Lemon 7 and 10-channel Stabilized Receivers (LM0086, LM0087)
See Essential Instructions **[LINK]** for much more detailed discussion and more options. This guide assumes use of a Generation 2 Spektrum transmitter (DX6, DX8G2, NX, iX, etc.) to control an electric powered model. Instructions for earlier Spektrum or other transmitters are coming.

To use receiver without stabilization

- Power is supplied by the throttle connection on CH1, as is usual for electric models.1
- To bind, either use a bind plug before applying power, or Button B after applying power.2
- Put the transmitter into Bind mode (see transmitter instructions).

- Red Status LED on receiver must be flashing during bind and must be solid when completed.
- Check that all servos and throttle work correctly.
- Adjust servo directions, throws, control rates, and any required mixes in the transmitter.
- By default, the receiver will use No-Pulse Failsafe. The green Setup LED will be OFF.

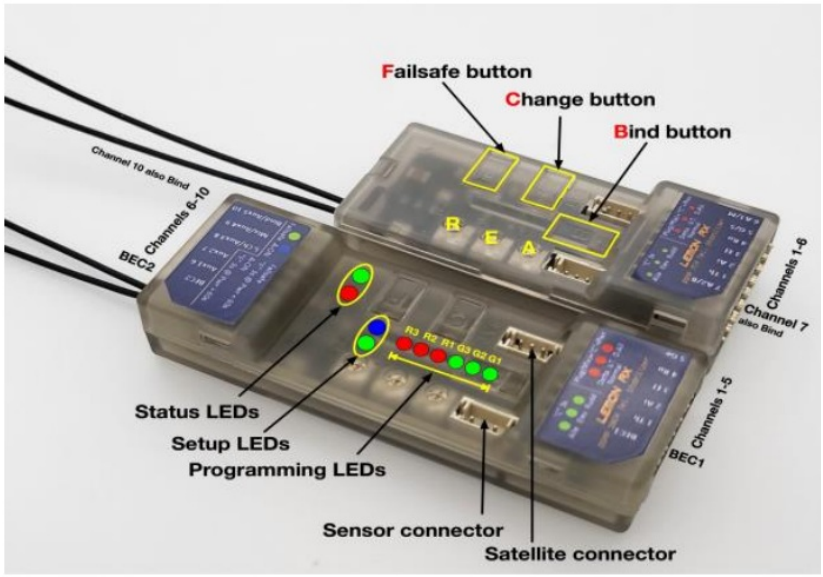
To use optional Pre-set Failsafe

- Set transmitter controls in the positions desired in case of signal loss.
- Power cycle the receiver. After 3 seconds but within 60 seconds, press and hold the F (Failsafe) button. Release F when the green Setup LED turns ON. This indicates all channels are set.

To use receiver with stabilization (seven or more channel transmitter)

- Set up the receiver as above. Note that with stabilization any Elevon or V-Tail mixing MUST be done in the receiver. See Essential Instructions.
- Activate one of following five options as indicated by illumination of red LEDs (R1, R2, R3).
  A: Delta Wing (Elevons) – R1
  B: V-Tail – R2
  C: Normal wing, normal tail – R1+R2
  D: Dual Aileron, normal tail – R1+R2+R3
  E: Dual Aileron, V-Tail – R2+R3

Figure 1: Lemon 7 and 10 channel stabilizers. LEDs, buttons and adjustment pots are identical on both.



- **To select an Option:**
  1. With receiver OFF, place a Bind Plug on channel 9 (10 channel Rx) or 6 (7 channel Rx).
  2. Press Button C and hold while powering ON the receiver.
  3. Release Button C when all six programming LEDs flash (three red, three green).
  4. Red LEDs now show each option for 3 seconds in the following sequence: R1, R2, R1+R2, R3.
  5. When the desired option is reached, tap Button C twice in quick succession.
  6. Allow the receiver to exit from Option mode.
  7. If required, repeat the process to set dual aileron channels (R3) in the same manner.

8. Remove Bind Plug.

- Transmitter channel 7 is assigned to Stabilizer ON/OFF. 3 Set up a switch on that channel.
- Stabilizer ON is indicated by the green Status LED.
- Channel 8, if available on the transmitter, is assigned to Master Gain. Put a knob or slider on that channel.

1. BEC1 and BEC2 on the 10-channel are used to supply power for more complex setups. See the Essential Instructions.
2. If you have attached a satellite receiver and are using Button B for bind, power cycle the receiver at this point.
3. This solves the issue with earlier stabilized receivers that channel 5 was not available for use as the gear channel.

To use stabilization with a six-channel transmitter
Change Stabilization ON/OFF to CH 5. See Essential Instructions for details.

To set stabilization directions (THIS IS VERY IMPORTANT)

When the plane is disturbed (rotated sharply) the surfaces MUST move momentarily in the direction that will counteract the disturbance. For example, if the right wing drops, the right aileron should go down briefly to lift the wing. If the nose drops, the elevator should go up briefly to lift the nose. If the plane's nose yaws right, the rudder should go left momentarily.

To reverse stabilization response on a control axis:

1. Test stabilization on all three axes and note any that need to be reversed.
2. With the receiver powered ON, press and hold Button C for about 3 seconds.
3. Release Button C when all six programming LEDs flash (three red, three green).
4. Each green LED will now turn on in this sequence: G1 (Ail), G2 (Ele), G3 (Rud).
5. When the LED for a surface to be reversed flashes, tap Button C twice in quick succession.
6. Allow the receiver to exit from Stabilization Direction mode.
7. Repeat as required for other surfaces.
8. Check that green LEDs are illuminated for axes to be reversed.
9. Test that stabilization directions are correct on all axes. Check again to be sure!

Configuration for Various Model Types (Programming Options)												
Model Type	**Channel Assignments**								**Wing Type**	**Stabilizer LEDs**		
Conventional (one Ail channel)	1	2	3	4	5	6	7	8	Normal	R1	R2	R3
Conventional (two Ail channels)	Thr	Ail	Ele	Rud	*	LAil	On/Off	Master Gain	Dual Ail/ Flaperon	✓	✓	X
Delta Wing (Elevons)	Thr	RAil	Ele	Rud	*		On/Off	Master Gain	Normal	✓	✓	✓
V-Tail (one Ail channel)	Thr	Ail	LElev	Rud	*		On/Off	Master Gain	Normal	✓	X	X
V-Tail (two Ail channels)	Thr	RAil	RTail	LTail	*	LAil	On/Off	Master Gain	Dual Ail/ Flaperon	X	✓	✓

Used for Stabilization On/Off on 6 channel transmitters; otherwise, it's available as a normal servo output.

To adjust stabilization response
See Essential Instructions for details, but the following should be enough for most models.

- Set the three receiver gain pots to 10 o'clock. Set Master Gain (if available) to center (0%).
- Switch stabilization (green Status LED) OFF to start test flight. Only turn ON at safe altitude.
- Watch for oscillation on any of the three axes. If it occurs, land and reduce gain on that axis.
- This setup is adequate for basic stabilized flying.
- To optimize gain settings, adjust each gain pot (A, E, R) to give response just short of oscillation.
- Increase the sensitivity of each in turn until oscillation in that axis occurs – then back off a bit.
- Master Gain (channel 8), if available, can be used to adjust gain in-flight. Center position (Ch8 = 0%) leaves gains unchanged. Clockwise increases all three gains, CCW reduces them.
- Note that these receivers support rate stabilization5 only. They do not support self-levelling.

The receiver makes momentary corrections to compensate for turbulence and thus to smooth out flight.

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References

- **RC Groups**