



**F-S ELECTRONICS USA**  
 FAIL-SAFE PRODUCTS, FAIL-SAFE SUPPORT

*X-treme Series*



# FSCZH-05B RANGESTAR

**FAIL-SAFE CONTENTS:**

- 1- FS CZH-05B FM TRANSMITTER
- 1- GVE 12V 2.0A POWER SUPPLY
- 1- RUBBER DUCK WHIP ANTENNA
- 1- INSTRUCTION MANUAL

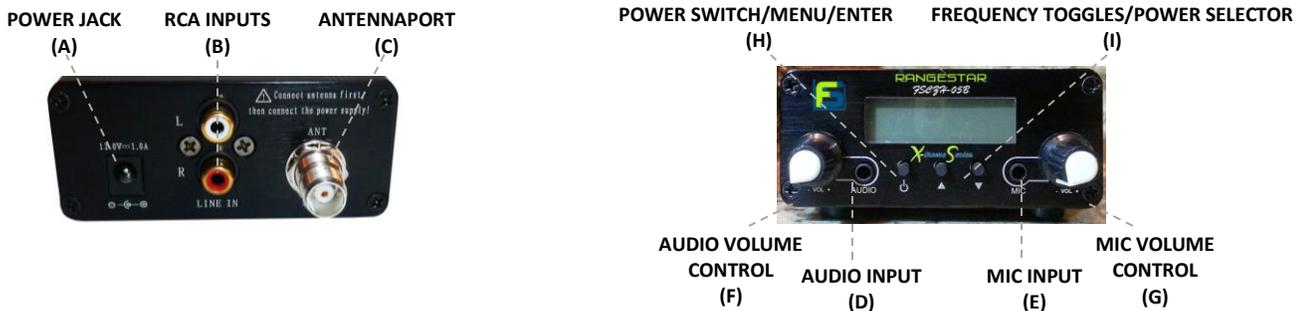
**OPTIONAL ACCESSORIES:**

- PHIHONG 12V 1.25A POWER SUPPLY
- ECONOMY TELESCOPIC ANTENNA
- RANGEBOOSTER 1.0 GRD PLANE ANTENNA
- RANGEMAX 1.0 GRD PLANE ANTENNA
- RANGEBOOSTER 2.0 GRD PLANE ANTENNA
- RANGEMAX 2.0 GRD PLANE ANTENNA
- 3.5 MM MALE X 3.5 MM MALE AUDIO CABLE
- 3.5 MM MALE X RCA MALE AUDIO CABLE
- RCA MALE X RCA MALE AUDIO CABLE
- 10 FT TO 100 FT BROADCAST CABLE

Power Output:	100mW/ 500mW ±20%
FM Transmitter Frequencies:	76-108Mhz
Tuning Step:	100Khz/0.1Mhz
Power Supply:	9-12V DC (The current load of power supply ≤ 1A)
Stability of Frequency:	±0ppm (-10°C~+50°C)
Frequency Response:	100 - 15000Hz
Signal to Noise Ratio:	>70dB
Pre-emphasis	75 µ
Distortion:	< 0.5%
Operation Time:	True 24 / 7 / 365
Antenna Design:	Rubber Antenna
Antenna Connector:	TNC type
Output Impedance:	50 ohm
Audio Input Connector:	Stereo 3.5mm headphone connector, Rear RCA
MIC Input Connector:	Stereo 3.5mm headphone connector
Tuning Design:	Stable PLL Technology
Size of Transmitter Unit:	L:113mm, W:88mm, H:39mm (6 1/4" x 3 1/2" x 2")
Weight of Transmitter Unit:	270 grams (10oz)
Transmission Signal:	FM Stereo

## Step by Step Instructions:

1. Connect antenna to Antenna Port (B). If using upgraded antenna, connect the antenna to the cable and the cable to the transmitter Port (B).
2. Connect power adapter to the Power Jack  $\ominus \oplus$  (A).
3. Connect to source device using 3.5mm male x 3.5mm male or RCA x 3.5 mm male audio cable or RCA Male x RCA Cable. Connect one end to Audio Input (D), RCA Inputs (B), or both (B&D) on the transmitter and the other end of the cable to device's RCA/3.5mm output jack e.g. MP3 player, iPod, PC, MAC, PDA, DVD player, etc. Please note that both B&D are controlled by Audio Volume Control (F).
4. Optional – transmitting from a microphone: You may transmit audio from a microphone by connecting a stereo plug-type microphone to the MIC Input (E). This transmitter is equipped with a MIC Preamp—one of the best MICs is one used for your PC/MAC.
5. Pre-scan your local FM frequencies on FM radio to find vacant frequencies or refer to [www.radio-locator.com](http://www.radio-locator.com) for best unused frequencies.
6. Optional – Tune your antenna upgrade by referring to Antenna Tuning Section--Proceed to Step 8 if purchased with stock black rubber duck antenna.
7. Power unit ON using by pressing Power Switch  $\psi$  (H). LCD Display will light up.
8. Set transmitting frequency according to Step 5's selected frequency using the  $\blacktriangle/\blacktriangledown$  Frequency Toggle Buttons (I).
9. Set volume level on the audio source device (ie: MP3 player, iPod, PC, MAC, PDA, DVD player, etc.) Optimal audio level varies for each type of device and recorded audio volume. Generally you should set audio level on input device and transmitter at about 50% and slowly increase to optimal level
10. Set volume level on FM transmitter using Audio and MIC Volume Controls (F&G) and then on radio receiver: When the source audio level is optimized you should be able to have full audio level range with the FM receiver radio without any distortion and crystal clear audio. If audio sound is distorted you should lower the volume level at the source device, step 9.



## Power Adjustment Menu – Toggle from 0.5 Watts to 0.1 Watts

Applies to all 2010 V1.2 versions or later with two level power adjustment: High power (H):> 0.5W/500mW(**Default**); Low-power (L): <0.1W/100mW

**NOTE:** The power switch  $\psi$  (H) is actually like an Enter button when in the Power Adjustment Menu. Proceed through all steps, if you have any issues after toggling the power level, please refer to these steps and set to the defaults and try again.

1. First press and hold the Power Switch/MENU  $\psi$  (H) while inserting the power adapter into the Power Jack  $\ominus \oplus$  (A).
2. Release the power switch  $\psi$  (H) after LCD screen displays the "H" or "L". Use the Frequency Toggles  $\blacktriangle/\blacktriangledown$  (I). Press  $\blacktriangle$  or  $\blacktriangledown$  to toggle the LCD screen display between H or L. Again, "H" is the output power > 500mW; "L" is the output power <100mW.
3. Press the Power Switch/ENTER  $\psi$  (H).
4. The LCD screen displays the default setting of "108.00MHz" and the Mute Symbol  $\times$  will be displayed meaning it is not transmitting and this will be displayed through Step 7. This is the Highest Frequency the transmitter will display. Through the  $\blacktriangle/\blacktriangledown$  (I) it can be changed from 0.10 – 153.00 MHz.
5. Press the POWER SWITCH/ENTER  $\psi$  (H).
6. Now the LCD screen displays the default setting of "76.00MHz". This is the lowest frequency the transmitter will display. Again, through the  $\blacktriangle/\blacktriangledown$  (I) it can be changed from 0.10 – 153.00MHz.

**NOTE the lowest frequency high-end cannot be higher than the highest frequency selected in Step 4.**

7. Press power switch  $\psi$  (H). Wait 3 seconds to exit the Power Adjustment Menu and LCD screen will display "OFF".
8. Again press the power switch  $\psi$  (H) and the transmitter will power on and transmitter will begin transmitting. Now reselect the broadcast frequency. If the broadcast frequency is locked and you cannot toggle, repeat all steps and reset the High and Low Frequencies to defaults!

## Tips & Tricks:

1. Antenna: Always operate the transmitter with a suitable antenna or 50 Ohm dummy load to the output. Failure to comply may cause serious danger or destruction to the output stage of the transmitter and void warranty coverage.

2. **Power Supply:** Do not exceed 12V 6A power supply. For best results use a Fail-Safe supplied power supply.
3. **MIC:** Do not use a MONO plug-type microphone, doing so may cause permanent damage and void warranty coverage.
4. **Sound:** When using most FM transmitters with a PC or MAC computer the volume level will need to be optimized at devices: (1) transmitter (2) computer sound card, (3) Media player software, and (4) FM receiver radio. If necessary, you may consult the instructions of the audio device to toggle the Equalizer. If Bass is distorted, or static is heard, minimize bass levels in the input device.

### **Troubleshooting:**

1. **Distortion/Static:** Make sure to set the volume level of audio source device and the transmitter at MOST at the 50% and adjust up from there. When using transmitter with PCs or devices with Bass Boost or higher bass settings, you will want to minimize the levels for the transmitter does have a built in pre-amp which further amplify the bass and it will be broadcast as static or crackle. Also note that this transmitter's sound output level will not match local radio station's volume levels.
2. **Transmit range is weak:** The transmit range will vary as per your environment, antenna type, power setting, and/or frequency setting. You may need to upgrade the antenna. Placing the antenna on the highest altitude inside or outside of a building with the least amount of obstacles will give you the optimum range. Please note that the average broadcast range with the stock rubber duck antenna is around 300 feet to a vehicle stereo. Receiver units with weaker strength antennas, may not get even half of this range. For best results, check out our other antennas, transmitters, or contact us.
3. **Constant hum on radio/when broadcasting:** Most likely cause is the audio cable or MIC but it can also be the power supply, input device, or antenna. **HUM IS RARELY CAUSED BY THE ACTUAL TRANSMITTER!**

Proceed with the following steps to attempt correcting the hum:

- 1) To attempt to correct please start by assuring all cables are isolated from all power sources and that nothing is coming in contact with the Antenna or Antenna port.
  - 2) If the hum persists, remove the audio cable and MIC from the transmitter so that all that is connected to the transmitter is the power supply and antenna.
  - 3) If the hum ceases, it is either a bad audio cable, the audio cable is resting on another wire that is causing the hum, or the input device is causing the hum. You may also have to separate your transmitter from your input device. We do have Audio Cables in lengths up to 100 ft. Also, use of input devices with battery chargers has been known to cause issues with hum/feedback.
  - 4) If the hum persists ensure the antenna pieces are snug. In addition the antenna should remain in an 90° position. If it easily tips over, the antenna may be the issue.
  - 5) If hum persists, the only thing left is the power supply. Contact us if through this troubleshooting leads you to believe that it is the power supply or antenna.
4. **Transmitter will not power on:** Please test with either another 12 V power supply briefly with the transmitter. If you do not have another power supply, try the transmitter power supply with another device that accepts 12 V of power, or test it to see if it is still functional. If you find that the power supply is the issue, or if you do not have the means to test it, please contact us and we can make arrangements.
  5. **Transmitter powers on, but not transmitting:** Please ensure the ~~F~~ is not displayed to the right of the frequency. If it is, please refer to the Power Adjustment Menu Instructions. If it does not transmit still and the ~~F~~ is not displayed, then please contact us.

## A BRIEF INTRODUCTION TO THE RULES OF THE FCC AND YOUR FM TRANSMITTER

It is the policy of FS Electronics, that knowing and observing the lawful use of all transmitters is a first responsibility of our end users. We do not endorse any unlawful use of any of our transmitters. This is only a guide to offer as much common sense help about normal and lawful use. Further, it is the policy of FS Electronics to cooperate with all applicable federal regulations in the design and marketing of our electronic devices. In all instances, compliance with FCC rules in the operation of what the FCC terms an "intentional radiator" is always the responsibility of the user of such an "intentional radiator".

FS Electronics only offers this information to make the user aware of the full impact a transmitter can have. In no way should this brief discussion be construed as a definition of the FCC rules, it is the users obligation to obtain a copy of the rules and operate legally according to them. *FS Electronics makes no representation as to the following discussion being legally correct - it is simply offered as an introduction to the responsibilities that a user must realize.* To order your copy of the FCC rules part 15, call the US Government, Superintendent of Documents, at 202-512-1800, or fax at 202-512-2250. To order the correct document, ask for "CFR Title 17: Parts 1 to 199." The cost is \$24.00. Master Card and Visa are accepted.

The present edition of Part 15 of the FCC rules provides detailed guidance on ALL aspects of using a low-power transmitter. The main points to consider are; to remain within the field strength limitations, that you may not cause any interference whatsoever to licensed broadcast services, and that you must be willing to put up with any interference that you may experience. Remember, the FCC doesn't need to be bothered by policing a privilege given to unlicensed operators. If the rules are flagrantly violated, they might just revoke the privilege altogether!

### **Lawful use suggestions:**

- Follow instructions.
- Use the stock antenna supplied within the case.
- Do not modify your transmitter in any way.
- Check your intended operating frequency very carefully, to ensure you will not cause interference to reception of licensed broadcasting.
- If you receive ANY complaint about your transmissions interfering with broadcast reception, stop or change your operation IMMEDIATELY.
- If you are contacted by the FCC regarding use of this device, cooperate fully and promptly.
- Do your own homework and research to understand and comply with present and future FCC rulings concerning devices of this kind. Do not rely only upon this short discussion.
- Do not use made-up "station call signs" to identify your transmissions. Only the FCC has the authority to issue such call signs. Use some other way to identify your transmitting activity, such as "This is Stereo 90.5, Seabreeze School Student Music Radio," and so forth.
- Identify the location and purpose of your transmissions from time to time. This is common courtesy toward other persons who may hear your signal. The FCC is toughest about clandestine transmission which cost time and money to track down.
- Do not assume that the mere fact that you purchased this transmitter gives you any specific right to use it for any purpose beyond generating a low-level RF signal which is barely detectable beyond the perimeter of your personal dwelling space.

Finally, the FCC Rules call for the posting of printed notices on devices intended for non-licensed operation under Part 15 Rules. You will find such notices written up for the front or back of the instruction manual for nearly any computer or video accessory that you have seen in recent months. A thorough study of Part 15 of the FCC Rules, which is completely beyond the purpose of this brief discussion, will show you many legal uses of radio transmitting devices which do not require licensing, either amateur or commercial. To provide more personal and club radio learning opportunities, and to cut down on administrative costs, today's FCC permits far more non-licensed activity than at any time in previous history. On the other hand, today's FCC enforcement actions get bigger fines and real prison terms for scofflaws! From CB radio to easy entry-level Amateur Radio with long-term licensing, to numerous unlicensed Part 15 operations, the FCC is beginning to look out for the interest and good plans and intentions of private citizens and school-community groups as never before in radio communications history.

Consult the Part 15 Rules for the exact wording of such notices. Following is a text for such a notice which responds to FCC rule making intentions:

### **NOTICE:**

The individual users of this device assume responsibility for lawful uses conforming to FCC Part 15 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.

**For questions and troubleshooting contact us at [failsafeco@gmail.com](mailto:failsafeco@gmail.com) or 260-255-6622.**