How to Get the Best Performance from Your Futaba® 2.4GHz FASST™ Aircraft Receivers

Every R/C pilot learns by experience what methods work well for installing and maintaining radio equipment. At the same time, we also want our aircraft to have the advantage of up-to-the-minute technology...which means that every now and then, we must master some new techniques.

Spread spectrum radio technology offers the perfect example. When Futaba introduced 2.4GHz FASST radio equipment, R/C hobbyists quickly jumped to the front of electronic technology’s cutting edge. Not surprisingly, those new, state-of-the-art 2.4GHz receivers have significant differences compared to old 72MHz units. So it’s time to change a few old habits.

Below are some recommendations for updating the way you install and maintain radio gear. Make them a part of your routine, and you’ll enjoy the best performance from your 2.4GHz FASST radio gear.

1. **Don’t wrap your FASST receiver in foam.**

   Protecting your receiver from vibration by wrapping it in foam used to be a “must”. Not so with 2.4GHz FASST receivers. Unlike 72MHz equipment, they’re not as vulnerable to vibration. Using less foam lets them operate cooler — which is a plus for all electronics.

   **Tip:** To keep the receiver cooler use small foam blocks (like standoffs) so that there is an air channel around the receiver.

2. **Shade your model from sunlight when not flying.**

   Clear canopies expose the radio compartment to direct sunlight which results in additional heat in the model interior. This causes no problems during flight, but makes shading your model on the ground very important. Cover the canopy with a white towel; or better yet, park your airplanes in the shade. This will help keep the electronic components cool.

   **Tip:** It is important to note that lighter covering colors will absorb less heat whereas darker colors will absorb more heat.

3. **Mount your FASST receiver away from heat sources.**

   We had to avoid mounting 72MHz receivers near anything that might produce RF noise. That’s not as much of a concern with 2.4GHz FASST receivers — you should instead make sure that you’re mounting the unit in the coolest part of the radio compartment.

   Stay away from the muffler exhaust, battery packs, regulators or any other heat source. We also recommend that you use the receiver’s long, narrow side as its base
(rather than mounting it with the bottom flat against the radio compartment floor). Secure the receiver using a Velcro® strap or gel tape.

We hope that these tips help you with your 2.4GHz FASST receiver installation and maintenance. If you have any questions, please let us know. Just contact us at the Futaba Service Center, by e-mail at: service@futaba-rc.com.
Important: The 2.4GHz band offers different characteristics than that of the conventional 50MHz and 72MHz. As such, we strongly encourage you to read this manual carefully prior to utilizing the TM-14 and R6014FS FASST system.

Thank you for purchasing the TM-14 2.4GHz FASST transmitter module and R6014FS receiver. This system is designed for use only with the Futaba transmitters indicated elsewhere in this manual. In order to use the TM-14 transmitter module, you will need to carefully remove the existing transmitter module and replace it with the TM-14 transmitter module. The receiver R6014FS, as the model number indicates, is capable of controlling models up to 14 (fourteen channels)-12(twelve) proportional and two digital. Please note: The installation of the R6014FS differs slightly from that of a typical receiver. Please pay special attention to the information contained within this manual in order to have a pleasant flying experience.

Features:
- 2.4GHz Spread Spectrum radio communication system.
- Exclusive ID code to avoid interference from other FASST systems.
- Fail Safe (F/S) function, Battery F/S
- Dual antenna diversity (R6014FS)

Usage Precautions:
1) Prior to utilizing any radio control system, it is strongly recommended that you read and abide by the Safety Code created by the Academy of Model Aeronautics as well as any site specific rules and regulations that might exist. Doing so will greatly increase your enjoyment of the hobby.
2) In order to maintain complete control of your aircraft it is important that it remains visible at all times. Flying behind large objects such as buildings, grain bins, etc. is not suggested. Doing so may result in the reduction of the quality of the radio frequency link to the model.
3) Please do not grasp the transmitter module’s antenna during flight. Doing so may degrade the quality of the radio frequency transmission.

Instruction Manual

Applicable systems:
T12FG, T12Z and T14MZ

Each of the aforementioned transmitters includes a region specific code. This code varies depending upon the region in which the transmitter was purchased. If the region specific code within the transmitter does not match that of the TM-14 module an error message will be displayed on the screen. For example, when using an incorrect module in either the T14MZ or T12Z, the error message will indicate "MISMATCHED RF MODULE". With the T12FG, the on-screen message will be as follows: "INCORRECT RF MODULE". In either situation, we suggest that you contact the Futaba Service Center at the address provided elsewhere within this manual.

Reprint Services (in U.S.A.)

If any difficulties are encountered while setting up or operating your TM-14 transmitter module and R6014FS receiver, please consult this instruction manual first. For further assistance you may also refer to your hobby dealer, or contact the Futaba Service Center at the web site, fax or telephone number below:

Fax (217) 398-7721, Tel (217) 398-0007

If you are unable to resolve the issue, pack the system in its original container with a note enclosed and a thorough, accurate description of the difficulty. Include the following in your note:
- Symptoms (including when the problem occurred)
- System (Transmitter, Receiver, Servos and model numbers)
- Model (Model name)
- Model numbers and quantity
- Your Name, Address and Telephone number

Send the respective items to the authorized Futaba Service Center address below:

Futaba Service Center
3002 N Apollo Drive Suite 1
Champaign, IL 61822

FCC Information
To assure continued FCC compliance:
(1) Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

FCC Label Compliance Statement:
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.

Repair Service (in U.S.A.)

If you are unable to resolve the issue, send us the transmitter module, receiver and the parts of this manual that are indicated by the following marks.

Special Markings:
Pay special attention to the safety at the parts of this manual that are indicated by the following marks.

[Symbol] Prohibited
[Symbol] Mandatory

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FUTABA CORPORATION Phone: (043) 296-5118 Facsimile: (043) 296-5124 Makuhari Techno Garden Bldg., B6F 1-3 Nakase, Mihama-ku, Chiba 261-8555, Japan

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Installing the TM-14 Module and R6014FS Receiver

Attachment of the Module

Be sure to turn off the power of the transmitter before you install or replace the module. Prior to attaching the module to the transmitter, it is important that the transmitter's software is updated accordingly. To obtain the software update, please follow the instructions that accompanied your respective transmitter. Update the transmitter as per the instruction manual. Additionally, this update will also include written instructions on the operation and use of the TM-14 module and R6014FS receiver. As such, we strongly suggest that you read them carefully before proceeding.

Ensure that the two receiver antennas are kept as straight as possible. This will allow you to obtain the maximum effective range from your model.

With the two antennas positioned so that they exit the fuselage. Additionally, do not attach the antenna itself to this fuselage.

Additionally, it is imperative to note that the servo grouping in the FASST system differs from that of the standard G3 PCM receivers. Futaba's FASST system data is transmitted in packets of four channels. Therefore, when utilizing the FASST system, channels 1-4, 5-8 and 9-12 are grouped together. Please refer to the instructions that were included with the software download for information on how to optimize your set-up for peak performance and satisfaction.

Antenna of TM-14

As with all radio frequency transmissions, the strongest area of signal transmission is from the sides of the TM-14 transmitter module's antenna. As such, the antenna should not be pointed directly at the model. If your flying style creates this situation, easily move the antenna to correct this situation.

Additionally, it is important to note that this TM-14 and R6014FS receiver set has already been linked by the factory. Should you wish to re-link them, or if you have purchased a separate receiver and would like to link it to this TM-14, please adhere to the following procedure.

After the TM-14 module has been installed into the transmitter, using the aforementioned steps, turn on the transmitter and activate the RF transmission according to the transmitter's instruction manual. The LED, located on the rear of the TM-14 transmitter module, should begin to blink momentarily before turning to a solid green light. If not, power down the transmitter and turn it on again.

2. With the transmitter on, and the green LED illuminated, turn on the receiver.

3. With the receiver on, the LED on the receiver start green blinking. This means the receiver is detecting the TM14's RF signal but the ID code is not linked yet.

4. Press and hold the Easy Link button, located on the front of the receiver, for approximately two seconds and release it. Then the receiver starts linking procedure. When the linking process has been completed, the LED on the receiver will change to a solid green and the linking is established.

If you model includes metal conductive items which may impact the receiver's ability to clearly receive the radio frequency signal, we suggest mounting the receiver so that the receiver antennas exit both sides of the model. This will allow the best radio frequency signal condition at any flying attitude.

Ensure that the antennas are at least 1/2" away from any conductive materials such as metal and carbon. Please note this is not applicable to the coaxial portion of the antenna. It is important, however, to not bend the coax, or antenna in a tight radius.

If the fuselage is made of conductive materials such as metal and carbon, the antennas part MUST be positioned so that they exit the fuselage. Additionally, do not attach the antenna itself to this fuselage.

Antenna precautions are adhered to strictly.

The main purpose of the photo demonstrates how the antenna should be kept as straight as possible. For actual installation the receiver must be wrapped with a sponge or placed with floating material to protect it from vibration. The receiver contains delicate electronic parts and should be protected from vibration, shock and temperature extremes.

Another noise source is the potential for the receiver to receive signals from other aircraft or other sources. This will also affect the receiver from any fuel or exhaust residue which can work its way into the fuselage.

Receiver Installation and Channel Assignment

You will note that the R6014FS differs in appearance from the standard Futaba receiver. The R6014FS incorporates two separate antennas into its design which enables it to receive the radio frequency transmission at two different locations. Futaba's dual antenna diversity, or DAD, then seamlessly selects the best signal reception between these antennas to ensure that there is no loss of signal.

Ensure that the two receiver antennas are kept as straight as possible. This will allow you to obtain the maximum effective range from your model.

If possible, please make sure that the two antennas are placed at 90 degrees to each other. Please note: This is not a critical figure, however, the most important thing is to keep the antennas away from each other as much as possible.

FS (Fail Safe) setting

The TM-14 allows the modeler to adjust the Fail Safe settings via the transmitter. There are two different operational RF modes offered by the TM-14: "MULTI-CH" and "7-CH mode". The available Fail Safe settings vary depending upon which receiver model and RF model are being utilized.

MULTI-CH Mode: When using the "7-CH mode", Fail Safe is only available for channel three (throttle).

7-CH Mode: When using the "MULTI-CH" mode, as is the case with the R6014FS, Fail Safe settings and operation are identical to that of the fail safe when using the PCM-G3 receivers.

The F/S is suggested for use as it offers a safety factor when controlling your models, and is also possible to cancel the F/S operation if you do not wish to use it.

Range Check the Radio

It is extremely important to range check your models prior to each flying session. This enables you to ensure that everything is functioning properly and to obtain maximum enjoyment from your time flying. The TM-14 transmitter module incorporates a system that reduces its power output and allows you to perform such a range check.

Turn on the transmitter and activate the 'RANGE CHECK' mode through the transmitter's System menu. Please note: if the RF is activated, the 'RANGE CHECK' mode will not be available to utilize. As such, DO NOT activate the RF when the transmitter is turned on.

After the radio frequency has been activated as indicated by a solid green LED and a blink red LED on the TM-14. As indicated by the blinking red LED, the radio frequency power has been reduced to allow for the range check.

Walk away from the model while simultaneously watching the channel indicator. Have an assistant stand by the model to confirm that all controls are completely and correctly operational. You should be able to walk approximately 50-50 paces from the model without losing control.

If everything operates correctly, return to the model. Set the transmitter in a safe, yet accessible, location so it will be within reach after starting the engine or motor. Be certain the throttle stick is in the low throttle position, then start the engine or motor. Perform another range check with your assistant holding the aircraft with the engine running at various speeds. If the servos jitter or move inadvertently, there may be a problem. We would strongly suggest you do not fly until the source of the difficulty has been determined. Look for loose servo connections or binding pushrods. Also, be certain that the battery has been fully charged.