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.

Battery F/S function

The TM-7 transmitter module and R607FS receiver also provides you with a second safety system, the Battery F/S (failsafe). When the airborne voltage drops below 3.8V, the battery failsafe function moves the throttle to a pre-determined position. If this happens, you should land immediately! If you need to increase the throttle for your landing approach, you may temporarily reset the failsafe function by moving the throttle stick to the predetermined position, after which you'll have about 30 seconds of throttle control before the battery function reactivates.

* Please note: It is suggested that you utilize a 4-cell NiCD or NiMH receiver battery pack as it allows the effective use of the battery F/S function. Additionally, we do not suggest using dry cell batteries for the receiver pack as they may cause difficulties.

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 as it should and to obtain maximum enjoyment from your time flying. The TM-7 transmitter module incorporates a system that reduces its power output and allows you to perform such a range check.

1 Turn on the transmitter.

2 After the radio frequency link has been established (as indicated by either a solid green LED or a blinking green LED), press and hold the "F/S, Range" switch located on the rear of the TM-7 transmitter module. As indicated by the blinking red LED, the radio frequency power has been reduced to allow for the range check.

* Note: Do not press and hold the "F/S, Range" switch prior to turning on the transmitter. This will alter the status of the F/S settings as noted previously. In order to avoid this situation, please wait for a short time after turning on the transmitter to activate the low power setting on for range checking.

3 Walk away from the model while simultaneously operating the controls. Have an assistant stand by the model to confirm that all controls are completely and correctly operational. You should be able to walk approximately 30-50 paces from the model without losing control.

4 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.

⚠ WARNING

Please make sure that you do not push and hold the F/S, Range switch when flying as this reduces the power output of the transmitter and reduces the overall range of your transmitter.

Other precautions

When utilizing the trainer function of the transmitter as an instructor, please do not switch to the student's control unit until the RF is active after turning the transmitter on. Failure to adhere to this procedure may result in a malfunction.

FASST transmitter module, system and receiver compatibility

Transmitter	Receiver	
	R606FS	R607FS
TM-7 Module	—	*Okay*
T6EX 2.4G System	*Okay*	*Okay*
T7C 2.4G System	*Okay*	*Okay*

* Please note: The TM-7 module is NOT compatible with the R606FS receiver!

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 any difficulties are encountered while setting up or operating your TM-7 transmitter module and R607FS 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:

www.futaba-rc.com, www.2.4gigahertz.com
Fax (217) 398-7721, Tel (217) 398-8970 (option 2)

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

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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Futaba

FUTABA ADVANCED SPREAD SPECTRUM TECHNOLOGY 2.4GHz FASST

FASST Air System
TM-7 RF Module and R607FS Receiver

Instruction Manual

Applicable systems:
T7U, T8U, T9C and T9Z

CE

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-7 and R607FS FASST system.

Thank you for purchasing the TM-7 2.4GHz FASST transmitter module and R607FS receiver. This system is designed for use only with the Futaba transmitters indicated elsewhere in this manual. In order to use the TM-7 transmitter module, you will need to carefully remove the existing transmitter module and replace it with the TM-7 transmitter module. The receiver R607FS, as the model number indicates, is capable of controlling models up to seven channels. Please note: The installation of the R607FS 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:

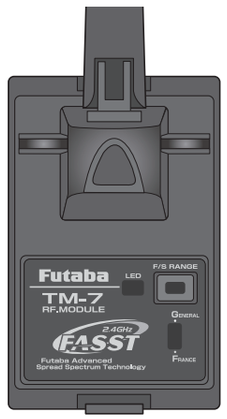
- 2.4GHz Spread Spectrum radio communication system.
- Exclusive ID code to avoid interference from other FASST systems.
- Fail Safe (F/S) function (for throttle channel)-F/S, Battery F/S
- Dual antenna diversity (R607FS)

Usage Precautions:

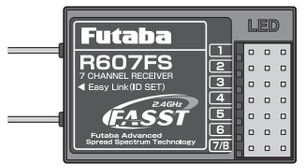
1) Prior to utilizing any radio control system, it is strongly recommended that you read and abide by the Safety Code created by the Academy of Model Aeronautics as well as any site specific rules and regulations that might exist. Doing so will greatly increase your enjoyment of the hobby.
2) In order 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.

Contents and Technical Specifications

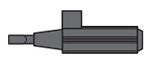
Your 2.4GHz system includes the following components:



TM-7 RF Module



R607FS Receiver



Mini screwdriver

Specifications:

TM-7 RF Module-

- Communication system: one-way communication
- Antenna: 1/2 wavelength di-pole
- Current consumption: 150mA maximum
- Setting switch for Fail Safe (F/S) setting and range check
- LED (light emitting diodes) indicate the operational status

R607FS Receiver-

- Dual antenna diversity
- Power requirement: 4.8V or 6.0V battery or regulated output from ESC, etc.
- F/S and Battery F/S function for throttle channel (channel three)
- Size: 1.64 x 1.08 x 0.36 in. (41.6 x 27.5 x 9.2 mm)
- Weight: 0.34 oz. (9.8g)

Special Markings;

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

[Symbol] ⃠ ; Prohibited ❗ ; Mandatory

Mark	Meaning
⚠DANGER	Procedures which may lead to a dangerous condition and cause death or serious injury to the user if not carried out properly.
⚠WARNING	Procedures which may lead to a dangerous condition or cause death or serious injury to the user if not carried out properly, or procedures where the probability of superficial injury or physical damage is high.
⚠CAUTION	Procedures where the possibility of serious injury to the user is small, but there is a danger of injury, or physical damage, if not carried out properly.

Installing the TM-7 Module and R607FS Receiver

Attachment of the Module

⚠ CAUTION

Be sure to turn off the power of the transmitter before you install or replace the module.

1 Ensure that the transmitter is set to the PPM (pulse position modulation) mode. Please consult the respective owner's manual for your particular transmitter for information on how to do so.

2 While it is unlikely that the existing transmitter will interfere with the radio frequency transmission of the TM-7, we suggest removing it from the transmitter if possible as a precaution.

3 Next, with the transmitter's power off, remove the existing transmitter module and install the TM-7 module with care so that the connector pins of the transmitter won't be damaged.

Antenna of TM-7

1 As with all radio frequency transmissions, the strongest area of signal transmission is from the sides of the TM-7 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.

2 Please do not grasp the transmitter's antenna during flight. Doing so may degrade the quality of the RF transmission to the model

Easy Link

Each TM-7 transmitter module has an individually assigned unique ID code. In order to start operation, the receiver must be linked to the respective TM-7's ID code. Once the linking is done, the ID code is stored in the receiver and the re-linking is not necessary unless the receiver is to be used with a different TM-7 module.

Additionally, it is important to note that this TM-7 and R607FS 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-7, please adhere to the following procedure.

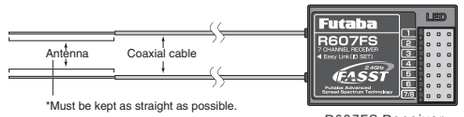
1 After the TM-7 module has been installed into the transmitter, using the aforementioned steps, turn on the transmitter. The green LED, located on the rear of the TM-7 transmitter module, should begin to blink. If not, power down the transmitter and turn it on once again.

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

3 With the receiver on, press and hold the Easy Link button, located on the receiver between the two antenna exits, for approximately one second. When the linking process has been completed, the LED on the receiver will change to a solid green.

Receiver Installation

You will note that the R607FS differs in appearance from the standard Futaba receiver. The R607FS 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.



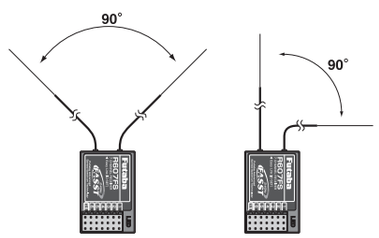
R607FS Receiver

To obtain the best results from the R607FS receiver, please refer to the following instructions and precautions:

1 Install the receiver in the aircraft using the same methodology as you would a standard receiver. That is, make sure that you wrap the receiver in foam rubber or other such material to make it less susceptible to vibration, etc.

2 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.

3 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.



4 If your 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.

5 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.

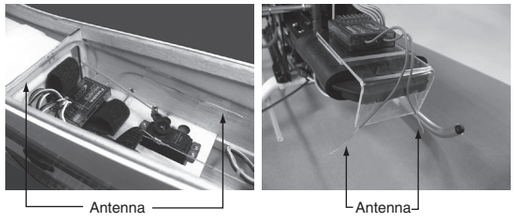
6 If the fuselage is made of conductive materials such as metal and carbon, the antennas part MUST be positioned so that they exit the fuselage. Additionally, do not attach the antenna itself to this fuselage.

* For example, there are many types of gliders which use carbon fuselage. When install the receiver into such models, it is imperative that the antenna precautions are adhered to strictly.

⚠ WARNING

Be very careful when handling the receiver antennas. Repeated bending and flexing of the antennas or excessive force could weaken or compromise the internal antenna connections.

Keep the antennas away from the motor, ESC, and other noise sources as much as possible.



* The main purpose of the photo demonstrates how the antenna should be placed. 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.
* The receiver is not impervious to damage from moisture. If moisture should enter the receiver, intermittent operation or failure may result. To prevent this from occurring, we suggest wrapping the receiver in a plastic bag or similar protective covering. This will also protect the receiver from any fuel or exhaust residue which can work its way into the fuselage.

Area select

The TM-7 transmitter module has been designed to function in many countries. If you will be utilizing this module in a country other than France, please make sure that the switch is set to the "General" position. If, however, this module will be utilized in France, the switch must be set to "France".

Operation of the TM-7

When the transmitter is powered up, the LEDs on the rear of the module will begin to glow or blink accordingly. The chart below provides you with an easy reference as to the meaning of the LEDs.

LED indication

Green	Red	Status	Fail safe (F/S)
Solid	***Solid***	Initializing (When Power Up)	---
Alternate blink		Check RF condition nearby	---
Solid	***Off***	RF power on	Off
Solid	***Blink***	RF power on (Power reduced to perform the range check function)	Off
Blink	***Off***	RF power on	On
Blink	***Blink***	RF power on (Power reduced to perform the range check function)	On

F/S (Fail Safe) mode setting

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

De-activating the F/S (Failsafe)

As noted above, it is also possible to de-activate the failsafe setting of the receiver.

Depress the F/S button on the rear of the transmitter while turning the transmitter's power on. The LEDs should begin to glow. Continue holding the button until the green LED begins to glow solidly and the red LED blinks.

Re-Arming the F/S (Failsafe)

To activate the failsafe once again, depress the F/S button on the rear of the transmitter while turning the transmitter's power on. The LEDs should begin to glow. Continue holding the button until the green and Red LED's begin blinking.

* Please note: re-arming the F/S does not alter the pre-determined throttle servo position. To modify this setting, please follow the F/S position setting procedure.

F/S position setting procedure

The F/S position is stored, or modified, by the position of the throttle stick during the linking procedure. As such, although the TM-7 and R607FS have been linked at the factory, we suggest re-linking them once again to adjust the throttle position to your desired location. Prior to doing so, ensure that the F/S is active. If not, please follow the Re-Arming of the F/S procedure as noted previously.

1 With the transmitter's throttle stick in the desired F/S position, and the receiver located within one (1) meter of the transmitter, turn on the transmitter. The green LED, located on the rear of the TM-7 transmitter module, should begin to blink. If not, power down the transmitter and turn it on once again.

2 With the transmitter on, and the green LED blinking, turn on the receiver. Press and hold the Easy Link button, located on the receiver between the two antenna exits, for approximately one second. When the linking process has been completed, the LED on the receiver will change to a solid green.

3 Turn off the transmitter. The throttle servo should move to the pre-determined F/S position.

⚠ WARNING

When setting the F/S function it is important to make sure that there is no other FASST Air System in the ON position nearby.

* Failure to adhere to this caution could cause your R607FS receiver to link to the incorrect transmitter. If this were to happen your R607FS would be under the control of the other transmitter.

Please refer to the table below for the LED status of the receiver's condition.

Green	Red	Status
Off	***Solid***	No signal reception
Solid	***Off***	Receiving signals
Blink	***Off***	Receiving signals but ID is unmatched
Alternate blink		Unrecoverable failure (EEPROM, etc.)