

- d. Keep all parts of the ignition system at least 15 cm away from any part of the radio control system. The distance between the receiver battery and the ignition battery is crucial here.
- e. Keep the cables between the ignition battery and the ignition system as short as possible and of adequate cross-section (0,5 mm<sup>2</sup>).
- f. Use an ignition cut-off switch which is rated at 10 A minimum. Switch harnesses as designed for receiver power supplies are not suitable for this purpose.

## Checking

### Checking radio range and control systems

The range check is a method of testing which gives reliable information about the ability of your radio control system to function correctly.

We have drawn up a test procedure based on our own experience and measurements which will always keep you on the safe side.

- a. Collapse the transmitter aerial completely.
- b. Set up the model with the tip of the aerial about 1 m above the ground.
- c. Make sure that there are no large metal objects (e.g. cars, wire fences etc.) in the vicinity of the model.
- d. Carry out the check only if there are no other transmitters switched on (even on other channels).
- e. Switch on the transmitter and receiver. At a distance between transmitter and model of about 80 m, check the following carefully:

**with PPM:** ... the control surfaces still respond to stick movements, and do not make any uncontrolled movements at all. Close to the stated range limit it is permissible for the servo output arms to move away from the nominal position by the width of the output arm (jitter).

**with PCM:** ... the servos should respond immediately to stick movements. Close to the stated range limit the PCM interference suppression may lead to delayed response.

- f. Secure the model and repeat the range check with the motor running (full throttle!).

The stated range of 80 m should only be considered a guide value; the actual range may vary considerably in different conditions. For example, in the lee of a mountain, in the vicinity of powerful radio stations or similar transmitters, effective range may fall to half of the stated figure.

### What can you do to find the cause of insufficient radio range?

- a. Change the position of the receiver aerial.  
Adjacent metal parts or carbon fibre reinforced model components will cause a reduction in receiver range.  
The influence of electrical ignition systems and electric motors also alters when you re-position the receiver aerial.

- b. Disconnect the servos from the receiver one by one, and repeat the test each time.  
Servo leads of excessive length without suppressor filters can cause reception problems. Servos also deteriorate with age, producing more interference than when new (brush sparking, motor suppressor capacitors vibrated loose, ...).
- c. If no improvement is visible, remove the complete system from the model and repeat the check with the bare equipment.

This procedure allows you to find out whether the fault is in your system, or whether conditions in your model are the cause of the trouble

## Other points to bear in mind:

Here are a few more points which you should always consider if you want your radio control system to work reliably at all times:

### 1. Battery capacities change over time!

The capacity of the transmitter and receiver battery, and the associated operating periods vary according to many factors. Particularly important are operating temperature (in Winter battery capacity may only be 60% of normal), battery charging methods (memory effect) and deterioration of batteries with age.

Counter-measures: from time to time discharge packs fully down to 1 V per cell (but don't deep-discharge them!), then give them a fast charge; don't store them in cold conditions, and charge them fully before use.

### 2. Current drain in the model may rise!

Stiff or jammed control surfaces can drive current drain to enormous levels. It is also true that badly designed linkages with insufficient leverage can affect current consumption.

Counter-measures: check control surfaces and linkages regularly, use full servo travel wherever possible, re-connect mechanical linkages instead of electronically reducing servo travel.

### 3. Static charges can produce interference!

When the air is extremely dry (up in the mountains, in the lee of high hills, close to storm fronts, ...) static charges can build up in the transmitter and/or the pilot. Dissipating the charge by spark can harm the pilot or cause problems with the transmitter.

Counter-measures: stop flying as soon as possible, walk downhill a little way to reach a less exposed position.

### 4. Be considerate of others!

Consideration for other modellers and spectators is one of those things which should go without saying for all modellers who want to carry on their hobby of radio control with maximum possible safety for themselves and for others.

## Base types (the basic principle)

In this chapter we would like to introduce the principle of base types: what they are for, and how you use them.

Separate sections at the end of this manual (⇒ starting on page 72) tell you the base types which are actually provided, and what they can do. There you will find all the information regarding assignments, mixer inputs etc. that you need to work with base types.

### 1. What are "base types"?

Base types are a form of pattern or template for programming models. You load a template into the new model memory and use it as a **base** (hence the name) which you then modify to match your model exactly.

The base types save you the trouble of:

- assigning transmitter controls, servos and switches
- programming and setting up mixers

### 2. Why "base types"?

The more powerful the transmitter and the greater the "freedom" it offers, the greater the complication when you come to program individual models. As the number and complexity of facilities rises, so does the potential for errors.

The base types are designed to get you out of this trap. The base types give you a basis for programming,

- which cannot be altered by mistake,
- which you can use as often as you like,
- which you can adapt quickly and easily to suit your preferred control methods and your particular model

### 3. What base types are provided?

We have divided the base types into five groups:

- Fixed-wing aircraft with one flight mode
  - Trainer 1xaileron
  - Trainer 2xaileron
  - Delta/flying wing
- Fixed-wing aircraft with up to five flight modes
  - Glider, 2xaileron
  - Glider, butterfly
  - Electric, butterfly
  - Power, 2xaileron
- Helicopter with up to five flight modes
  - Trainer, no mixers
  - Trainer, 120 degree
  - Heli, no mixers
  - Heli, 120 degree
  - Heli, 90 degree
- Multi-function models
  - Boat
  - Car

and in addition...

#### e.) **UNIVERSAL**

##### e.) **UNIVERSAL**

This is the base type with which you really can do **EVERYTHING**, but which forces you to assign and set up everything yourself.

The UNIVERSAL base type also provides you with up to five flight modes.

## 4. What to watch out for?

**You can't operate the system without base types!**

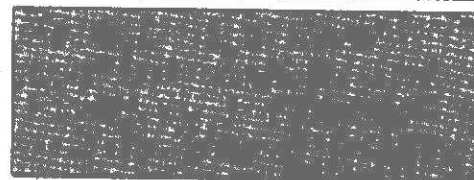
When you want to store a new model in a model memory, the software requires you first to decide on one of the base types. This base type is then copied into the empty memory, where it forms the basis for the new model.

**Can I change the base type for an existing model once it has been stored?**

Straightforward answer: **NO!** If you try it, all the settings and adjustments you have made will be lost. The previously existing model is overwritten by the base type, and is thus erased permanently.

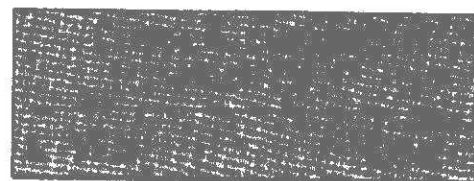
In "Menu 3" you will find the menu point "Base type". You can select this menu point, open the adjust field for the base type, and leaf through the available base types.

Button	Effect
	Enter the menu cycle
	On to "Menu 3"
	On to "Select base type"



	Open select field (flashes) Select a base type with  or the Digi-adjustor
	Confirm selection

For safety's sake the software now asks you again whether you really want to change the base type:



This safety question gives you your last chance to rescue the settings for your existing model. Thus you should only answer YES at this point if you want to start programming all over again. If not, press the button three times, and you are back at the operating display.

takes you back to the "Select base menu"

## Quick start

We have prepared two forms of quick start for you: brief and to the point, but without much in the way of explanation.

**"The first test"** assumes that you have set out the transmitter, receiver and a few servos on the workbench, and just want to get it all working so that you can play around with it.

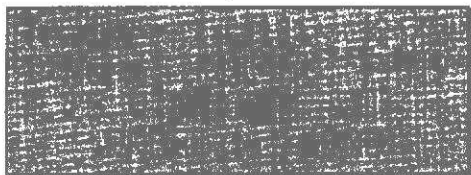
**"The first model"** (⇒ p.9) illustrates how to enter the details of your models into the **PROFI mc 4000**, using an F3B model as an example.

**"The first helicopter"** (⇒ p. 12) illustrates the first steps with a helicopter, using a chopper with 3 servos arranged at 120° around the rotor head.

### 1. The first test

#### a.) Charging the transmitter and receiver batteries

Switch the transmitter on. After about 2 seconds the operating screen will appear. In the third line of the display you will see the voltage of your transmitter battery.



**If the operating screen does not appear**, please refer to section f.).

If your transmitter emits a continuous beeping sound, the battery monitor has tripped, and you will have to charge your transmitter battery before using it.

#### b.) Preparing a receiving system using an RX 12 DS receiver

First plug crystals into the transmitter RF module and receiver (⇒ 23).

You can now connect the receiving system components. The next illustration shows where the jumpers have to be fitted in the RX 12 DS receiver, and where the receiver battery is connected (using a battery harness, of course).

If you are using a **different receiver** for your test, then you must first select the transmission mode appropriate to your receiver. The method is described in section e.).

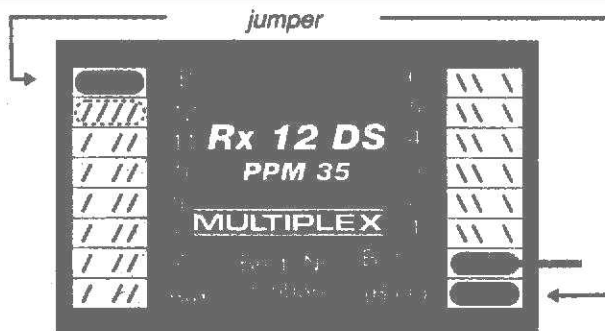


Fig. 1: Rx 12 DS sockets and jumpers

**Receiver battery to socket B (1-6)!**  
**Jumpers in socket B (7-12) and B (HF)!**  
**Jumper in socket 12 (PPM9 active)!**

If you remove the jumper from socket 12, the receiver operates in 12 channel mode (PPM 12). However, the examples and the base types assume the use of PPM 9 mode.

#### c.) Switch on the transmitter

After about 2 seconds the screen should show the operating display (⇒ illustration left). If not, first refer to section f.) then continue with section d.).

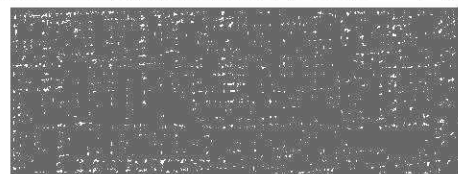
#### d.) Select channel

The monitor receiver in your transmitter must be "told" which channel you wish to use, i.e. what number crystal is plugged into the transmitter RF module and receiver.

**The channel you select must be the same as the crystal channel fitted in the RF module!**

This is how you select the **Channel-Check** channel:

Button	Effect
+ ON	Hold button  pressed in, then switch transmitter on.  Release the  button again after you have switched on.



Switching on in this way takes you to Power-on menu 1. The RF module is switched off when you call up this menu.

	On to the menu "Select channel".
--	----------------------------------

