What to do if you buy a model with a Magic Timer

Preliminary Version 0.8

December 2012

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1. Purpose

The purpose of this document is to help people get started when they buy a model, typically a F1A or F1B that is fitted with a Magic Timer. Under these circumstances it is assumed that the timer is already mounted in the model and everything that is necessary for the model to fly is there. It is also assumes that the model is either in flying trim or has been set up on the bench very close to flying trim.

The person who built the model will have made some decision on how to mount the timer, what servos and batteries to use and what way to control the flying of the model. The new owner of the model will need to know the result of these decisions as well as basic information about the Magic timer that has been used.

Note that there are a number of different models Magic Timer so you need to know what timer is installed in the model.

2. Questions to Ask

Before you take delivery of the model as the supplier, if it is a new model or previous owner for a second hand model the following questions.

Timer
What Model Magic Timer?
How servos?
What is the timer version number?

Model battery
What type of battery is in the model?
How many cells?
What capacity in maH?
What cable is required to charge the battery? Is it included?
What battery charger do you recommend?

Servos
How many servos are in the model? Note that the number of servos in the model may be less than the number that the timer will support.
What make and model or servo is used.

Other equipment
Does the model include a device e.g. Palm Pilot to program the model?
Does the model include a cable to go from the model to the programming device?
If not what kind of programming cable is needed?
What kind of tow hook is used? F1A only
Does the Tow Hook have a relatch servo?

If it is a relatch hook, what kind of line tension sensor is in the model?
Is it an M&K style Impulse hook?
Is the model fitted with a Radio D/T? If so what make?
If there is no Radio D/T fitted does the timer used support it? Note all recent Magic timers support some forms of RDT.
If not RDT fitted is there wiring for one? This is because wires may be needed to go from the timer to the RDT. These might need to be built into the model.

3. What you need and what you do first?

What you need

So you have the model?
A way to charge the battery?
A way to program the model

First thing with the person you got the model from:

Make sure the timer battery is fully charged
Assemble the model.
Connect all the control lines
Put the model through a flight sequence on the ground.

For a F1A model do all of this on the ground in your workshop.

Assemble the model including the Radio DT and tracker
Get a screw driver or similar to open and close the tow hook.
Close (also known as latch) the hook
Turn the timer on.
Move the hook back and forward and make sure the auto rudder, wing wiggler, etc. work
Pull the hook forward and holding the hook forward unlatch the hook.
Let the hook swing into a backward position.
This is the launch position and the timer should take the model through the launch sequence. This is probably a bunt sequence
Let the timer run for length of the flight and watch the model D/T

If that worked and the model has a Radio DT repeat the above sequence until the model "launches"
Wait for 10 seconds then press the Radio D/T button and watch the model D/T

If you do not know how to do any of these things or they do not work as the person you bought the model from.

For a F1B model do all of this on the ground in your workshop.

Assemble the model including the Radio DT and tracker
Do not wind the rubber motor
Turn the timer on.
Push the timer start button
A buzzer should sound and LED comes on.
Release the start button and the timer will start
Watch it go through the flight sequence, typically
Start prop
VIT
Wing Wiggler
Glide Rudder
Some model may have more functions.
Let the timer run for length of the flight and watch the model D/T

If that worked and the model has a Radio DT repeat the above sequence until the model "launches"
Wait for the glide rudder to kick in then press the Radio D/T button and watch the model D/T

If that worked, fully wind a rubber motor, load it into the model and repeat the above sequence until the model "launches". Be sure to hold the model firmly when the rubber motor starts as it will try and fly in you workshop! Make sure the prop will not hit anything.

If you do not know how to do any of these things or they do not work ask the person you bought the model from.

Save the initial timer settings.

Now that you have shown that the timer and airplane basically work together you need to save a copy of the timer program. This is in case you make changes to the program and mess something up and need to return to a point where things worked.

This document has guidelines for people who got an F1B model fitted with a Magic timer. There are a number of different models of Magic Timers that support different numbers of servos, different feature sets and have different interfaces. However the principle of using the timers is the same. Here we are talking about a single servo Magic timer in a F1B model that controls the functions of the model by releasing a number of levers in sequence. In this document we will not show every possible Magic F1B but will illustrate the important principles.

What you need. The in airplane there will be a Magic timer, battery, servo and control levers. To program a Magic timer you need a Palm Pilot loaded with the Super Magic Software, programming cable and battery charge cable. If these did not come with your F1B you can get them from Magic timers [magictimers@yahoo.com].

With some Magic timers there is a single cable that serves for both programming and charging. This cable has a mini or micro USB connector.

Other timers have separate programming and charge cables. The programming will be a 2.5mm stereo connector and the charge a 3.5/1.3mm positive center dc power cable [some timers have a smaller DC power cable – check.]

For F1B and F1G application the servo will be a small micro servo typically weighing 3 to 5 grams. Also most times the battery will be a single cell LiPo battery of 80 to 200 MA check on the exact size with model provider.

You maybe tempted to pull the timer out of the airplane to check how it works. Resist this temptation. The timers and associated parts can be removed but before doing so make sure that everything is working properly as it was delivered to you. There are a lot of small parts crammed into the confined space of a F1B/G pylon and it may require some patience to remove them and more importantly put them back properly.

Magic timers permit the user have 10 steps of timer movement, to control the time to 1/100 of a second and have full control where the servo is positioned at each step. Some effort is required to set the timer and servos up appropriately and typically the person who built the F1B will have put typical times into the timer and made the servo movements match up. So the first thing that you should do is save a copy of the flight program that is stored in the timer. To do this you need a Palm Pilot with Super magic. Then follow the steps below.

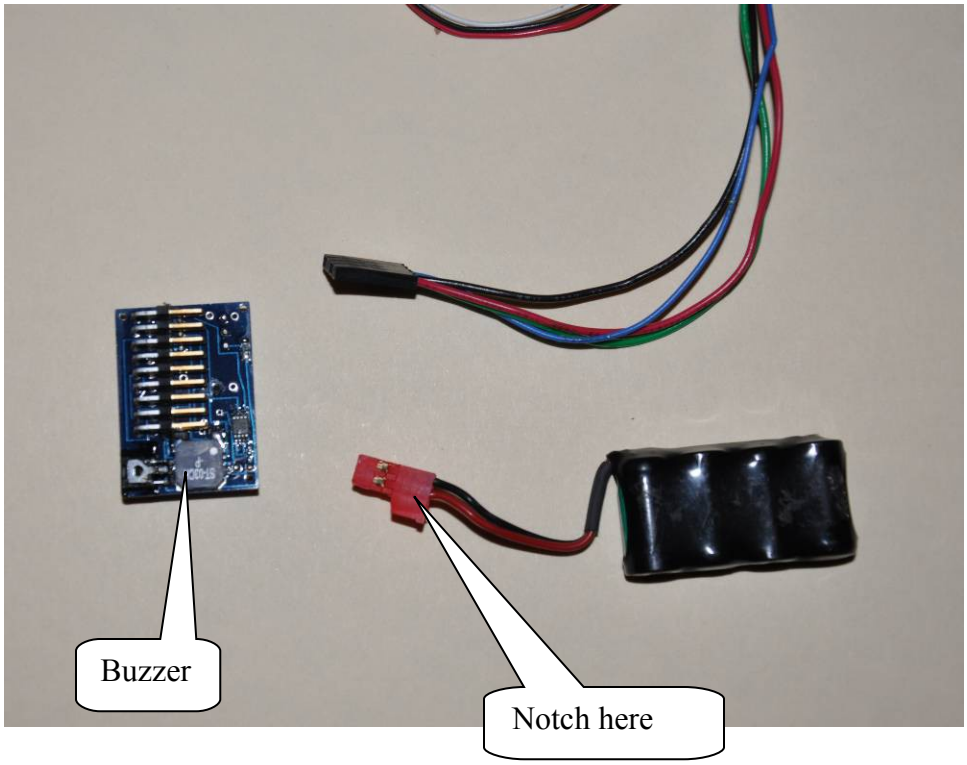
Before you start this process make sure that you have a clean working space with no dirt and in particular NO metal filings or carbon dust. These conduct electricity and can damage the timer.

Take the Palm Pilot and cables.

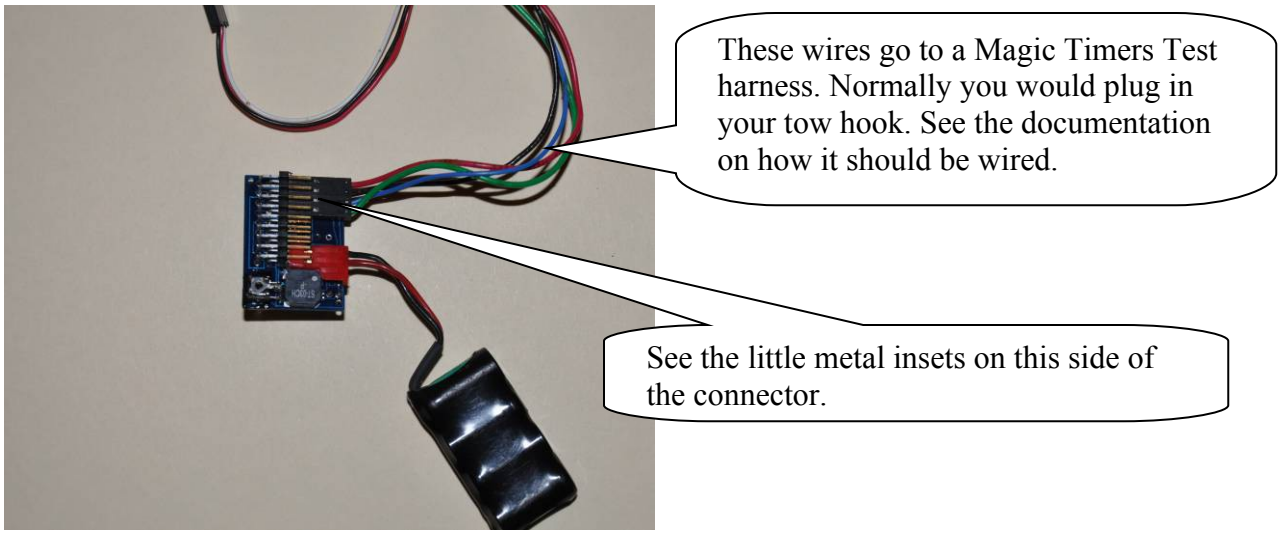
Connect them together as seen below

Start up the Super Magic Program on the Palm. To get the latest version make sure you select the one with M on the icon if there are 2 on your Palm.

Now connect the battery and tow hook or start switch to the timer. In this example we are using a test harness instead of the hook. You can get these from Magic Timers. Note also how the battery has a notch cut out of the connector. That's so it is easier to put on the right way around. The notch goes around the buzzer. That's that square piece on the bottom of the timer in the picture. The battery connects to the pins closest to the circuit board at the buzzer end. The hook connects to the pins, also closest to the circuit board at the other end on the back.

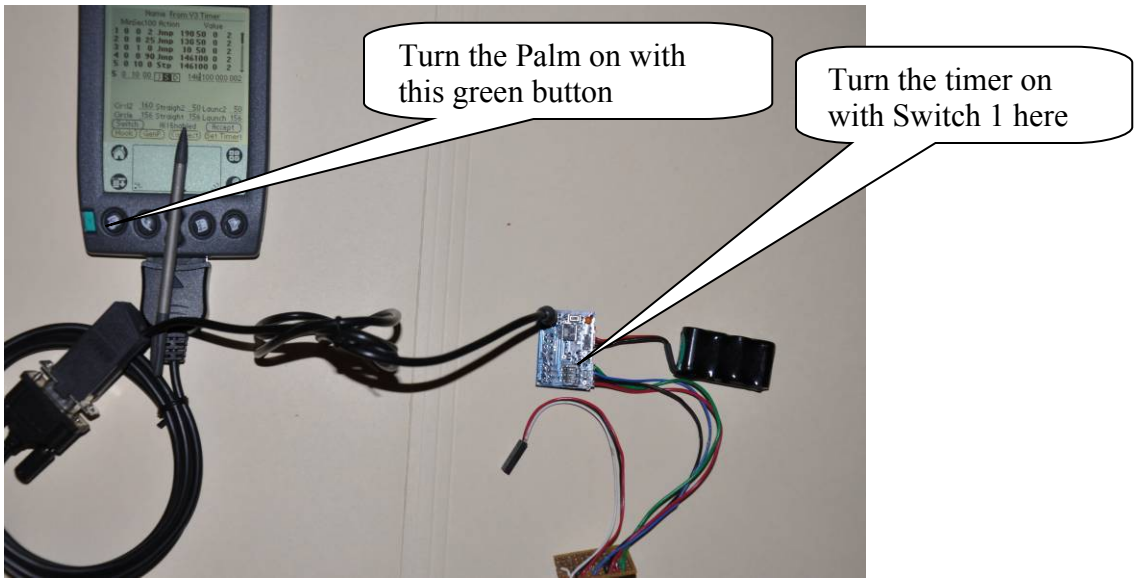


Here they are plugged on. Notice that the little metal flutes or tags on the connectors are visible. You can see here they are on the row if timer pins nearest to the circuit board.



Now turn the timer and plug in the programming connection. It is a round plug with 3 segments shown on the previous page. Make sure that you push it right in.

Also make sure the timer is turned on. There are 3 switches on the timer, numbered 1, 2 and 3. One should be on and 2 and 3 off.



The timer will beep few times then will be quiet. Find the Connect button on the Palm. This transfers the program that is in the timer to the Palm.

Every magic timer is shipped with a program in it. What we are going to do here is copy it to the Palm to save it in case we need to go back to it later. You will probably need to change this program to suit your own airplane.

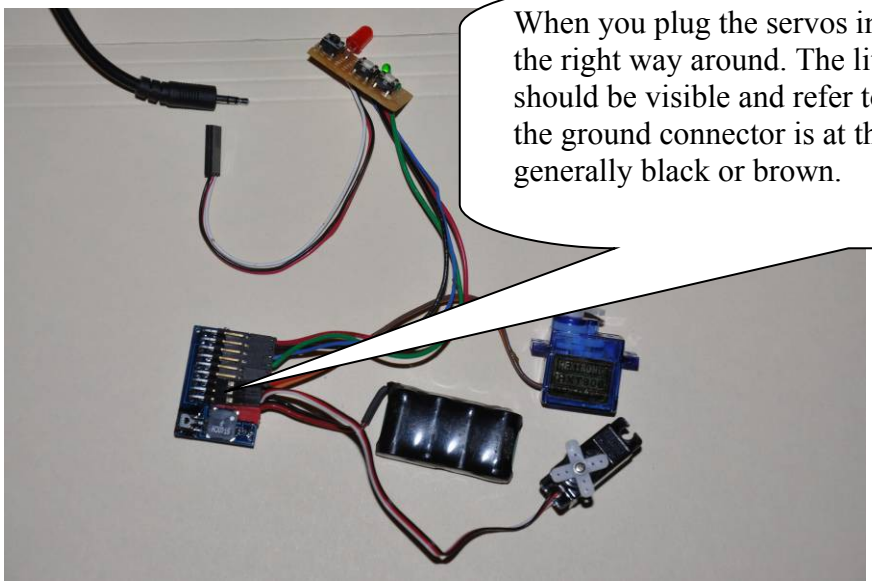
Tap on Connect and you will get a dialog box on the Palm asking if you want to Create or Overwrite the program on the Palm. Select Create.

The Timer LED will now flash and the buzzer will give a low pitched sound. This means the program is being moved from the timer to then Palm.

When this is finished there will be a notification message, tap on OK and the noise will stop and the timer will beep. You have now moved the program to the Palm.

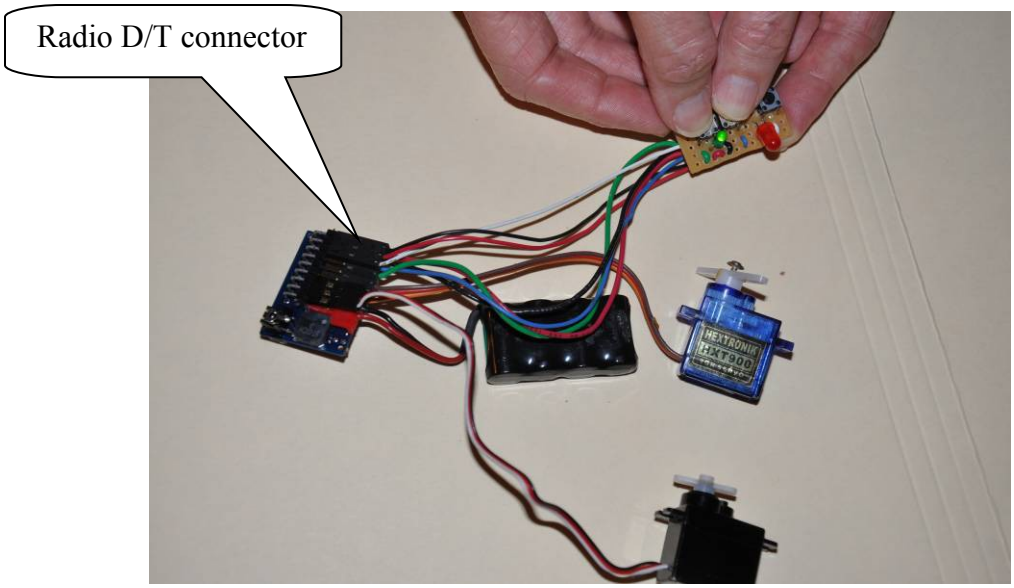
Save the program on the Palm by tapping on the bottom left Palm button. This will bring up a pull don file menu. Tap on Save and the program will be saved on the Palm.

Now you are going to see how the timer work on the bench before you put it in your airplane. The timer that we have here is a 2 servo timer. In the picture you can see that we have unplugged the programming connector and plugged in the 2 servos. Servo 1 goes between the battery and hook connector in the middle of the back row and servo 2 is on the outside row at the end near the buzzer. Depending on the servo it might be necessary to trim a little off the edge if the servo connector so it will fit. Note that was with the other connectors the little metal parts are visible.



When you plug the servos in make sure you have the connector the right way around. The little metal part in the connector should be visible and refer to the attached diagram to make sure the ground connector is at the correct end. The ground wire is generally black or brown.

Now all parts are connected. If you have a tow hook move the hook back and forward and see the servos move. In the example you can see the sportsman pushing on the buttons on the test harness. These are the same as the hook switches. Pushing on the hook forward switch and letting it go will show what happens when the F1A circles. Pushing on the hook forward switch and unlatch switch at the same time will simulate the launch of the model. When they are both held down together the buzzer will sound. Releasing the switches together is the launch condition and the timer will start running.



Note that in the above picture we have plugged in the other wire from the Magic test harness. It goes on the 3 outside connectors at the opposite end from the buzzer. This will simulate a Radio D/T. When you push on the D/T button the Red LED will come on the model will D/T.

The Picture below show an Airtek Radio D/T Unit connected to the timer. This needs a female to female cable that Magic Timers can supply.