SUPER MAGIC 6 AND THE MAGIC DONGLE

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Introduction

Super Magic 6 is a program for setting Magic Timers. It replaces Super Magic 4 (Palm) and Super Magic 5 (Windows 10). It runs on an Android phone and/or tablet. It uses Bluetooth Low Energy (BLE) to communicate between the Android device and the timer. The BLE specification came in with Bluetooth 4.1; it is not the same as Bluetooth Classic. Virtually all new Android devices support it. There is an additional box (aka the Magic Dongle) to connect to existing Magic Timers and potentially small future Magic Timers that may not have BLE radio for reasons of size, cost, or weight. This has been tested on several Android tablets and phones running Android 4.4 and onwards.

Because using the Magic Dongle to work with existing Magic Timers is a little more involved with some extra steps this document has extra information, especially on that.

How it works with current Magic Timers that do not have a BLE radio:

Android Device
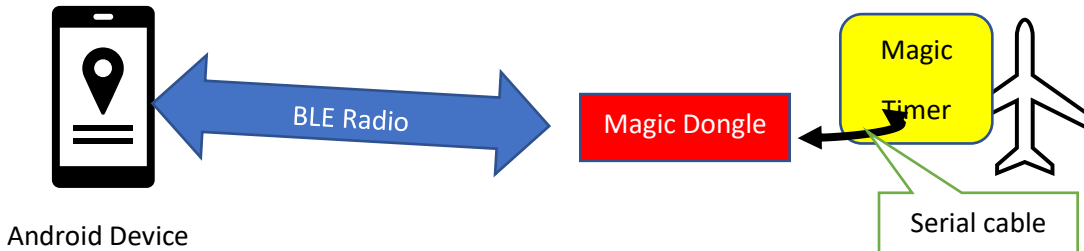
The Dongle is used on the ground to program the timer and is removed before flight. One Dongle will do all your timers. There is a BLE radio in the dongle so it can connect with Super Magic 6 on the Android. The Dongle has a 2.5mm socket and a male to male cable connects the Dongle to the timer.

The current version of the Dongle at the time of writing is version 0.90.

The intent with Super Magic 6 is not to render obsolete current Magic timers. This is done using the Magic Dongle. The Magic Dongle has been released ahead of the first Magic Timer than connects directly to Super Magic 6.

This version of the Magic Dongle can be powered either by an internal single cell LiPo battery or by plugging the dongle into a USB power source.

What Super Magic 6 does

As with previous version of Super Magic you can read and write flight programs to and from the timer. New programs can be created, and existing programs modified and renamed to suit new timers and requirements. Unlike Super Magic 4 the flight programs can be exported and imported to enable the sharing of flight programs.

The structure of Super Magic 6 is like Super Magic 4 in that there are separate screens for performing the major functions such as Servo setting, Timer Step setting, Start and Hook setting, etc. There are additional screens for configuring the BLE connection and for some new functions that we have used for some time on our own airplane but not yet provided to our timer users.

Some of the screens hold more information that can be easily displayed on the screen of some phones, but these screens can be scrolled vertically and horizontally to see any missing information.

Androids versions and sizes

The program has been tested with phones and tablets from a 6 inch diagonal to a 9 inch. These were made by Redmi, Huawei, Lenovo, and Samsung with Android versions 4.4, 7, 8.1, 9 and 10. Because of the amount of information needed by some versions of Magic Timer we would not recommend anything smaller than a 6 inch, preferably a little bigger.

We know that there many companies that make Android devices with varying quality and idiosyncrasies. For our testing we chose Wi-Fi (not mobile phone) versions from well-known manufacturers and Super Magic 6 performed satisfactorily. None of these were expensive. If you have question whether it will run on your Android, download the program and try it.

The Android BLE functionality requires both location and storage permissions; these are requested automatically by Super Magic 6. From Android 8 these were considered important from a security point of view and cannot be granted automatically. So, if your Android version falls in this category, after Super Magic 6 is installed, you will need set these permissions. In many cases the first time Super Magic 6 is used you will be prompted to permit file and location access. If not prompted, you will have to use Settings/ Apps to turn on these permissions. Some Android implementations may require the Dongle or Timer to be paired or additional Bluetooth rights granted.

First Steps with the Magic Dongle

1. Load Super Magic 6 on your Android device. Initially this done by a process called "side loading", this means you get an APK file from a like Magic Timers provide, download it onto you Android and tap it. It will then install it. You will get some warning message because it did not come from Google Play, if you wish to continue with this version of Super Magic 6 you must ignore these messages.
2. Tap on the Super Magic Icon to start the program.
3. When you use Super Magic 6 and the Magic Dongle for the first time, we recommend that you do it in your workshop and power the Dongle from a USB power connection. So, plug it into a USB power source.
4. Plug the 2.5mm cable into both the Magic Dongle and a Magic Timer. Make sure the cable is plugged in the whole way.

5. Turn on the Dongle with the power switch, on is in the direction away from the USB connector. LEDs will flash.
6. Turn on the Magic Timer.
7. Follow instructions below.

Getting started

This is the first screen that comes up, it is referred to as the Main Menu. It shows the choices. What you need to do first is find the Dongle or airplane you want to work with.
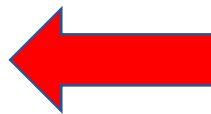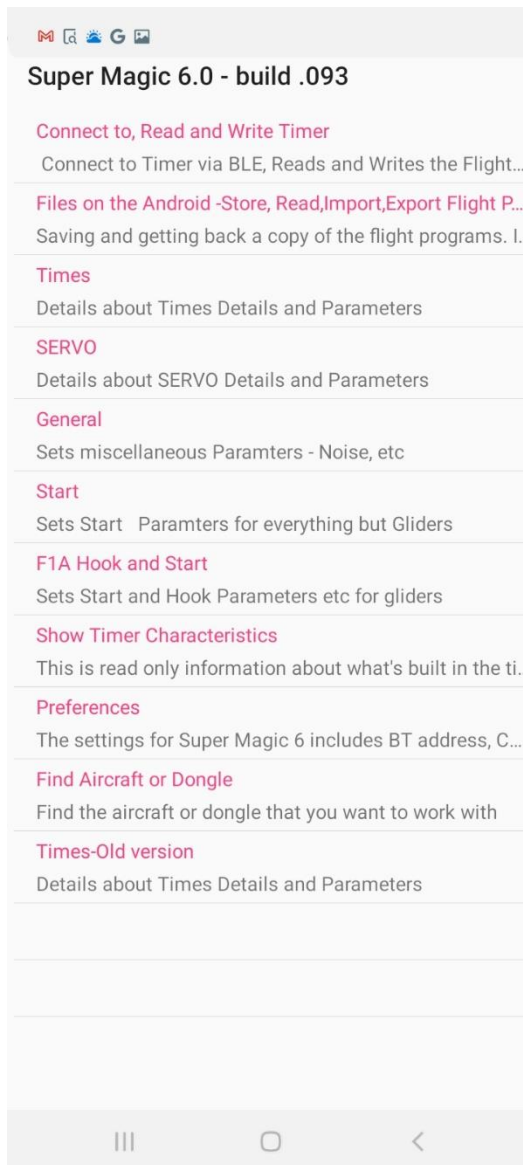
Finding your Dongle or Aircraft
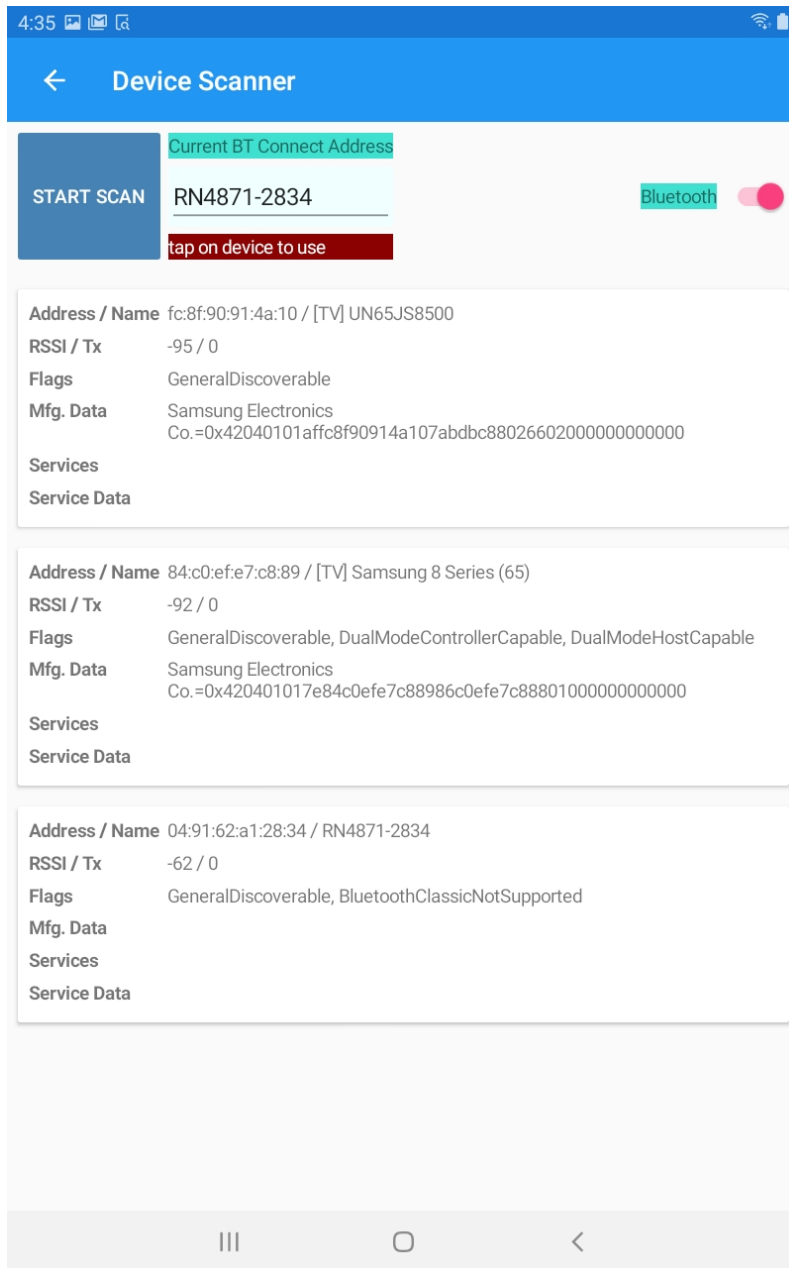
This screen looks for the BLE devices withing range. You tap on the START SCAN button and it will search.

For this scan to work your Timer or Dongle mist be turned on.

The Bluetooth toggle on the right shows that Bluetooth isturned on on this Android device and is available to this program.

When you tap on START SCAN it will search and list devices. It only shows devices that have a name. When you look at this list you will see it found 3 devices, two TVs and one whose name started with RN. That latter one is the Dongle we are looking for. Tap on it to select it. You will see a slight change in color when you do this.

Sometimes if there are many Bluetooth devices in range it may take a second or even third scan to find it. With this version of Super Magic 6 all BLE devices start with RN.

Wait until the scan is finished then leave this screen by tapping the <- that is in the top left hand corner.

Making the connection

Now take the Top menu choice to connect to a Magic time This shows the Timer (or Dongle) ID in the top right that we selected. At this point your timer or Dongle is turned on. If you are using a dongle make sure it is pluggd into the timer and turn the timer on.At this point you will see the "traffic light" LED combo on the Domgle with RED, Yellow and Green turned on.
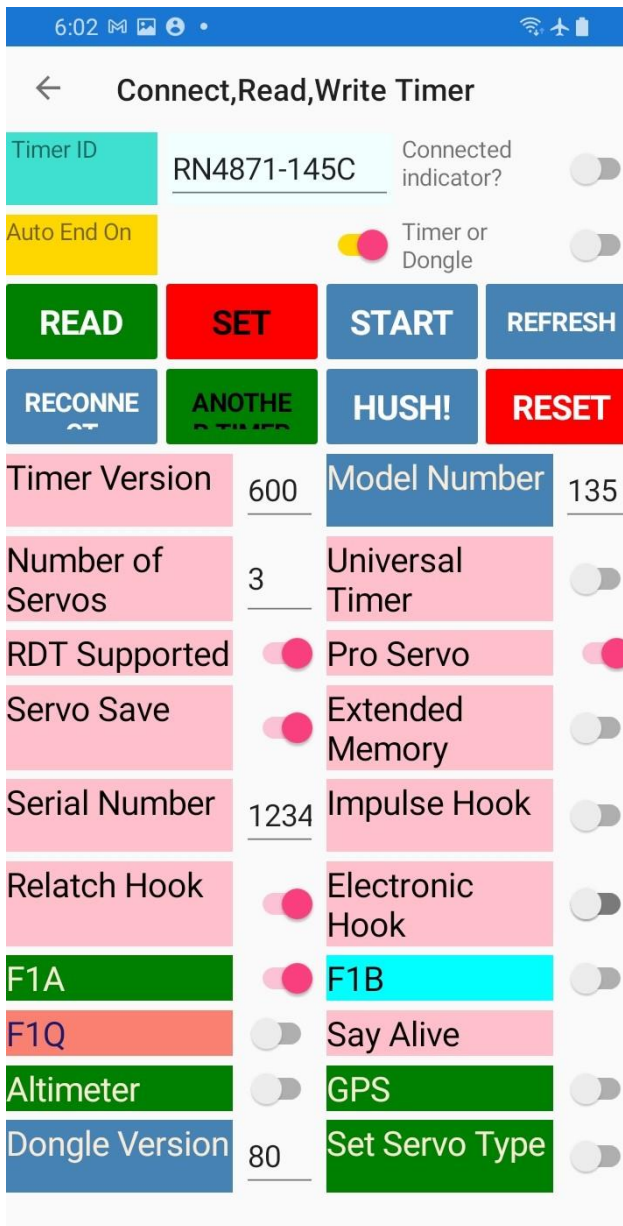
Then you tap on the **START**. Super Magic 6 will then make a BLE connection to the Timer or Dondle and read the basic information from the timer.

When it makes the BLE connection you will see the steady Blue light on the Timer or Dongle begin to flash. And in the case of the Dongle you will see/hear a noise and Timer LED flash when the program information is read.

That information is displayed on the bottom table on the screen. Besides basic information about the timer this screen also displays the Dongle version number

Reading all the Information from the Timer. You will get a message on the screen indicating the success of the connection. You MUST connect before any other operation such as reading the timer.

Once you are connected to the Timer you then tap on the READ [TIMER]* button on the previous screen . This will read all the flight program from the timer.

The various sectoions of the timer info are available to you from the main menu choices. So go back to the main screen and select the part you want to see.

* Note the words on the screen and the size of the font may vary slightly depending on the size of your Android screen. This particular screen image was taken from phone with a smaller screen .

Read Timer detailled Information

Buttons

Read

This reads the timer flight program after the timer has been connected to Super Magic and possible the Dongle with the **Start** button.

Set

This put the current Flight program in the timer.

Start

This connects to the Timer and/or Dongle and reads back the basic characteristics of the timer. It does NOT read the Flight program. That is done with the **Read** button.

Refresh

This reads the basic timer information from the Timer. This is generally used when working with a Dongle if the Dongle remains connected while swapping the timer that is connected to the Dongle.

Another

Similar to Refresh

Hush

This is used when connecting to a timer via the dongle and the timer does not stop buzzing.

Reset

This is used if you think the timer and/or the Dongle is out of sync or confused. It will try and reset the Dongle/Timer and disconnect same. Use the START Button after using this .

Reconnect

This is used to reconnect Bluetooth if you get accidently dropped during a session. It should not be used if the timer has been disconnected for any significant length of time.

Servo Settings

This screen shows the servo parameters. You then tap on the ones that you want to change and a keyboard will come up and you can make the change.

On some screens like this one some data validation/checks cannot be done until all the information is entered. On those screens there is a Finish button on the top of the screen. Tap on that and the complete screen will be validated. If there are errors you will get a message and an opportunity to fix any errors.

If the only change you needed to make was on this screen you would leave the screen, go back to the main menu, then select the Read/Write screen and select the Set Timer button to send the changed flight program back to the timer.

This screen ha some new field that do not apply to most users of current Magic timers. The Servo Type applies on to Magic Timers that include abrushed electric motor controller.

The Park delay is the time in seconds that the Servos move to park position after D/T. Ths only applies to Magic Timers with a version number greater than 6.20

Servo Screen Detailled Information

Base Point

This sets the 0 end of the servo's travel. Typical number is 18. 20 is the value to generate a 1 ms pulse.

Multiplier

This sets the physical position of high end of the servo's travel equivalent to a value of 255. It can be a single digit for the basic Universal timers or a 3 digit number 450 with an implied decimal point = 4.50 for the more advanced timers. The values should be 4 or 5. A value of 4 will generate an upper end pulse width of 2 ms.

Speed

This controls the servo PWM cycle time. It should be 1 or 2.

Not used on timers with version Greater than 4.5

Reverse

This will cause the servo to rotate the other way around. **

Park

This is where the servo will go after D/T. A value from 1 to 255. **

Screen Label

This is custom screen label that will replace the digit in the default label. Note that this value is stored in the timer flight program. It is not supported by some older timers. If not supported servo number will be used. **

Servo Type

This applies only to the Pico Magic E-20 and similar timers and specifies the type of Electric motor and D/T activation

Park Delay

This specifies the delay between the D/T Activation and the servo being parked in seconds. Only on timer with a version number greater than 6.1

** Not on all timers.

Changing the timer steps = setting the times

step	Mins	Secs	Huns	Total	Action	Servo1 S	Servo2 W	Servo3 r	Servo4 4
Straight						160	55	90	0
Circle						170	105	108	0
Go						180	180	108	0
S 1	0	0	5	0.05	Jum	185	105	108	0
S 2	0	0	20	0.25	Jum	110	105	108	0
S 3	0	0	90	1.15	Jum	5	105	108	0
S 4	0	1	10	2.25	Jum	140	110	85	0
S 5	0	0	5	2.30	Jum	145	155	90	0
S 6	0	10	1	12.31	Jum	250	120	0	0
S 7	3	1	0	193.31	D/T	250	120	50	0
S 8	0	0	0	-	D/T	250	120	50	0
S 9	0	0	0	-	D/T	250	120	50	0
S 10	0	0	0	-	D/T	230	95	0	0

One of the most important and complex changes is on the timer's steps. This screen shows all the steps and the times for the step, servo action and each servo position for that step. This screen has a lot of information.

This screen has been changed from that in the earlier versions of Super Magic 6.

To change values, you select the on to change and enter the value. Note that in each timer step the value is entered for that step in the minutes, seconds and hundredths of a second fields. The running total or total flight time is calculated and put in the Red Total column. You cannot enter times into this column. There is not running total for the steps after the first D/T step.

The first 3 lines of the table are the steps taken during the tow phase of a glider or the on to armed to launch phase of a non-glider model.

Once finished the <- will take you back to the main menu. **Do not forget that the timer is not updated until you write your flight program back.**

The second screen image shows part of a F1B screen shot with different names for the initial steps.

step	Mins	Secs	Huns	Total	Action	Servo1 S	Servo2 R	Servo3 W	Servo4 F
Initial						50	0	200	0
Armed						50	0	20	0
Go						50	0	200	0
S 1	0	0	0	-	Jum	50	250	220	0

Servo positions

There are 4 columns for servo values at each step. The top 3 are for before the timing starts and the rest for once the timer has started. This is a list of 10 positions or steps for the flight.

Some F1A timers have servos on the tow hook. These servos are processed differently than flight servos that may be used to control flight surfaces. There is not a line for a hook servo on this screen. Their action is controlled on the Hook screen.

Initial servo positions

These are the positions for the servo or servos before the flight starts. The use of the servos depends on the type of timer.

Glider timers

Circle is the position of the servos when the tow hook is back i.e., the model is circling.

Straight is the position of the servos when the hook is forward, i.e., straight tow position?

Go is the position of the servo when model when launch is detected.

Non-Glider Timer

Start is the position if the servo when the timer is powered up and at rest.

Armed is the position of the servos when the start button is pushed.

Go is the position when the start button is released.

Action

The white Action column specifies how the servo moves and if there is any special action.

Jump means that the servo moves at the end of the elapsed time.

Step means that the moved moves to the position in a linear fashion throughout the step.

D/T means that the servo moves at the end of the elapsed time and the D/Ts the model which stops the flight. Special actions such s beeping, parking the servos and turning off the time can be carried out after the D/T. Note that is the sportsman's responsibility to have the appropriate mechanical linkage and move the servo in conjunction with that to ensure that the model does D/T.

Time settings

The time is set for timer step. The cumulative flight time is accumulated and shown in the red column. You cannot enter data into this column You will also not that no accumulated time after D/T is shown in this column. The time is set in minutes, seconds and 100th of a second. The cumulative time is shown in decimal seconds.

RDT. EL Timeouts etc

The are 10 steps in your flight program. In a normal flight program not all of these will be used. But sometimes the "extra" steps are used for other actions. An example is Radio D/T. In the General parameters screen you specify the RDT Step. Typically, the would be a step further don than your D/T step. This could be just a single line with zero or 1 1/100 of second time that moved all the appropriate servos to stop the motor and D/T the model. The Action would be D/T. Some people like to have 2 steps, the first immediately stops the motor and the second waits for a second or two and them D/Ts the model.

Hook Parameters = F1A starting settings
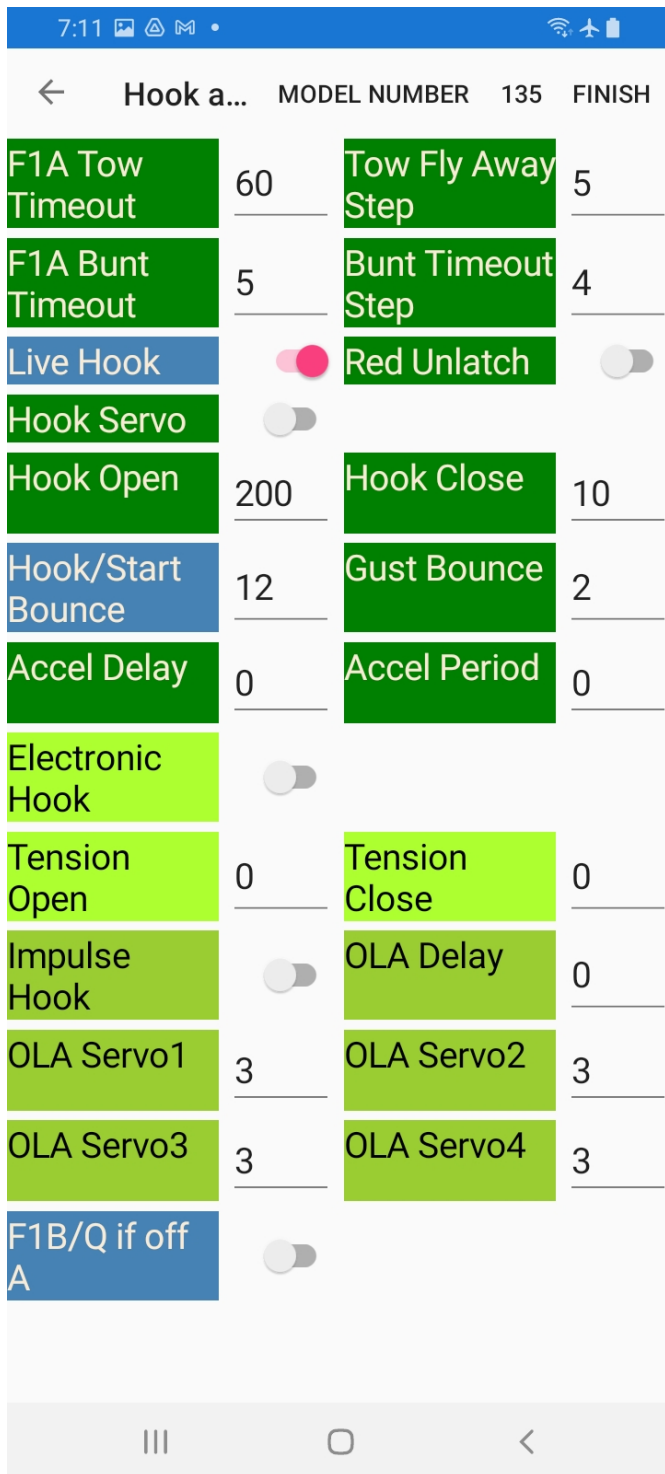
This screen is mainly concerned with the hook management features of F1A timers.

Field	Value	Field	Value
F1A Tow Timeout	60	Tow Fly Away Step	5
F1A Bunt Timeout	5	Bunt Timeout Step	4
Live Hook	⬤ (on)	Red Unlatch	◯ (off)
Hook Servo	◯ (off)		
Hook Open	200	Hook Close	10
Hook/Start Bounce	12	Gust Bounce	2
Accel Delay	0	Accel Period	0
Electronic Hook	◯ (off)		
Tension Open	0	Tension Close	0
Impulse Hook	◯ (off)	OLA Delay	0
OLA Servo1	3	OLA Servo2	3
OLA Servo3	3	OLA Servo4	3
F1B/Q if off A	◯ (off)		

Screen header: 7:11 — Hook a... — MODEL NUMBER 135 — FINISH

Hook Screen details

General

This screen supports 4 types of F1A, glider hook configurations.

Standard Hook.

This is a Circle tow hook with a hook forward and an unlatch sensor. There is no servo on the hook.

Mechanical relatch hook.

This is a circle tow hook with a hook forward sensor and an unlatch/relatch tension switch sensor. There is a servo on the hook that is controlled by the timer. The unlatch tensions is controlled outside of the timer and the sensor indicates if that tension has been reached or not.

Electronic Relatch Hook.

This is s circle tow hook with a hook forward sensor and a strain gage hook tension sensor on the hook. There is a servo on the hook. The unlatch tension is set in the timer. This includes a REN SA hook

M&K Style Impulse Hook

This is an Impulse hook as made by M&K. It requires an extra input line from the hook and cannot be used with a hook with a servo.

F1A Time out - Tow

This is the time in seconds, known as the tow timeout and the step to go to if during the tow period the hook does not come forward in that time out period. For example, if the timeout period is 120 seconds if the hook does not come forward in 120 seconds, then the timer will go to the specified step. This generally means that the sportsman has dropped is towline and the model is flying away. If the timeout happens the flight program will go to the associated step.

This applies to all types of F1A hooks.

F1A Timeout – Bunt

For a Standard Hook this is a time in seconds measured between when the hook unlatches and then the hook swings back, i.e., is not sensed as forward. A typical value is 2 or 3 seconds. If the timeout happens the flight program will go to the associated step.

For a Relatchable Hook this is the delay time in tenths of a seconds before the hook relatches, once the relatch criteria is reached. A typical value is 3 to 5 for .3 to .5 of a second.

This is not used for an Impulse Hook.

Hook Bounce -

This is an arbitrary number between 1 and 15. It applies to all hook and start switches [sensors]. 12 is a good number.

Hook Close and Open

This is a servo position number [0 to 255] and is the position of the hook servo when the hook is closed and open. The hook servo uses servo base point and servo multiplier of the first servo and is found on the servo screen.

This applies to all timers with a hook servo.

Tension and Relatch.

This specifies the unlatch and relatch hook tensions. It is a number between 0 and 1200. Typically, around 50 is a good number. The relatch value should be lower than the unlatch. This applies only to electronic relatch timers.

Gust Bounce

This is a number in tenths of a second and it is the delay once the unlatch tension is reach before the hook starts to open. So, if the number was 3 for three tenths, then the unlatch tension would have to be applied for 3 tenths of a second before it was considered to be 'good', and the hook would open. If it dropped back below the unlatch tension during that time the unlatch point would not consider having been attained and the hook will not unlatch. Note that 0 is a valid number; this effectively turns this feature off.

This applies to all timers with a hook servo.

M&K Impulse Hook

The Gust Bounce is also used by M&K Impulse timers with a version number 5.71 or greater.

This is a number in tenths of a second and it is the delay once the OLA is signaled before OLA servo positions are executed. So, if the number was 3 for three tenths, then the OLA signal would have to be applied for 3 tenths of a second before it was considered to be 'good', and the servos would move the OLA positions.   Note that 0 is a valid number; this effectively turns this feature off.

Accel delay and period

This applies to some F1A timers: Hook Servo and Impulse Hook (from 5.60 on). Normally when the unlatch point has been attained on a F1A timer the servos move to the launch position. The delays the move of servo 1, usually the stabilizer servo. The delay number is the time in tenths of a second for the servo to start moving. So, if it was 4, them 4 tenths of a second after unlatch the stabilizer servo will start moving. Note that if there was a gust bounce it comes into effect after the gust bounce. Given the above two examples the timer would wait 3 tenths for the gust bounce to pass. This is the unlatch point. The timer would then wait another 4 tenths before moving the stabilizer servo.

The period is the time in tenths of a second for the servo to attain the maximum launch deflection. So, if this was 5 then after the servo started moving it would take 5 tenths of a second to attain maximum defection.

Zero is a valid number for either or both parameters. Setting it to zero effectively turns this feature off.

Electronic Hook

This must be used in conjunction with the Hook Servo and indicates that the timer is one with a hook servo and strain gage sensor on the hook.

Hook Servo

This means that the timer has hook servo.

Live Hook*

This means that the D/T time can be adjusted from the tow hook or start switch. Pull the hook forward or push the start button and power the timer up. When a continuous noise sounds the d/t length can be set.

Red Unlatch

This applies to glider timers only. The normal mode for the unlatch sensor is switch closed indicated to the timer that unlatch has been attained. Checking this box reversed the sense of this, meaning that open indicates that unlatch has been attained. Name attributed to Victor Stamov as the hooks of origin in the former Soviet Union worked, the other way around from those in the West.

Impulse

This means that the hook is an Impulse style hook.

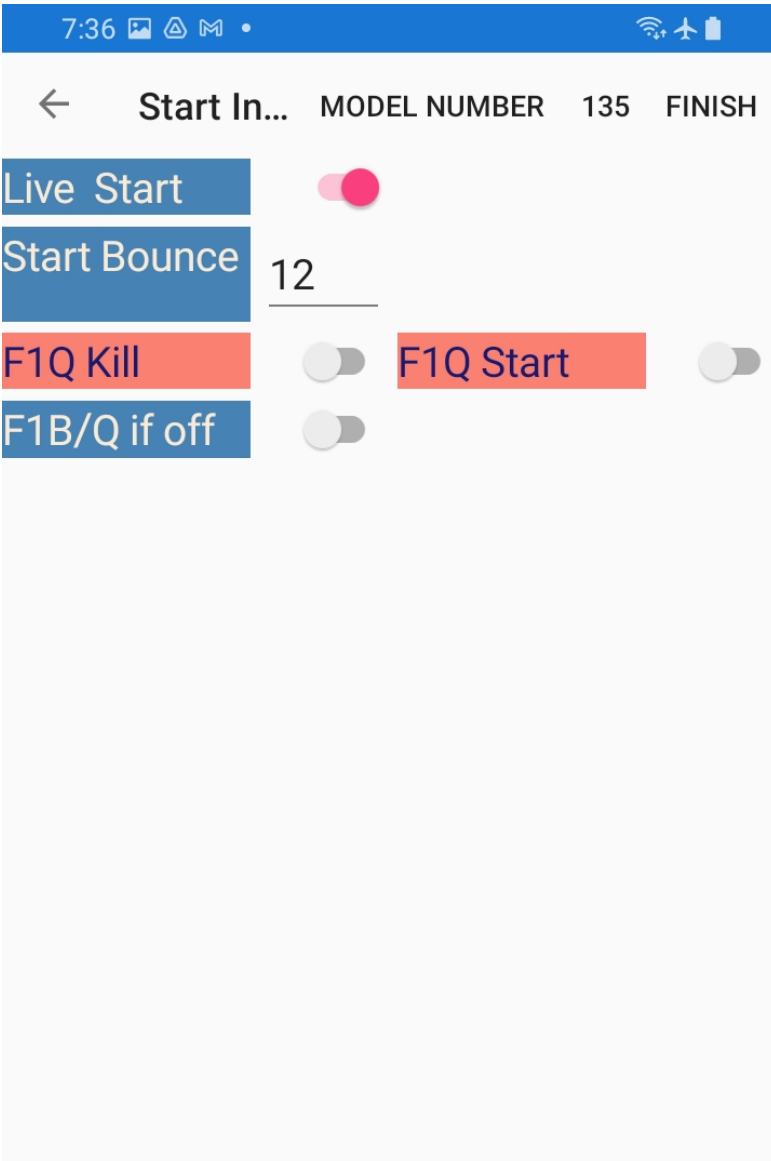## OLA

These features apply to impulse hooks only.

OLA Delay

This is the delay in tenths of a second after the Impulse signal is lost and before the servos are moved from the OLA positions.

OLA Serv1 2 3 4

This is the position that servos 1, 2, 3 and 4 are moved to after the Impulse signal is received and the Gust Bounce is passed

Start Parameters = for anything but gliders

This screen has the parameters that control the start or launch process of non-towline glider timer.

7:36	

Start In... MODEL NUMBER 135 FINISH

Live Start

Start Bounce 12

F1Q Kill   F1Q Start

F1B/Q if off

Start Detailed Information

Live Start

This means that the D/T time can be adjusted from the start switch. Push the start button and power the timer up. When a continuous noise sounds the d/t length can be set.

Start Bounce -

This is an arbitrary number between 1 and 15. It applies to all hook and start switches [sensors]. 12 is a good number.

F1Q Start

This enables the F1Q start features; this applies to all non-glider timers.

This requires the start button to be held for 1 second, rather than .3 second before the timer is armed.

F1Q Kill

This enables the F1Q motor stop features; this applies to all non-glider timers.

This re-enables the start button and pushing it after the 'flight' has been started will cause an action similar to RDT to stop the motor.

General Parameters = Noises, RDT and more

This screen contains noise, RDT, and other similar features.

It also has the Program Name field. This is information that is not held in the timer but is held in the copy of the flight program that you save or export. Typically, in the place you would put some information about a particular flight program, may be the type of weather or an event where the programs was used. In this example we show it was used in the World Champs fly off.

This the screen you would use to change the model number.

Detailed Information

RD/T

This specifies what step number is executed if a radio d/t or similar device connected to the timer is activated.

Alternate D/T

This is the D/T step that will be used if the alternate D/T switch is on. Only on timers with a 3 position DIP switch.

Servo Save

When checked this is turned on the servo power saver feature. This turns off power to the servo after one second before the start of the flight and two seconds afterwards. Before the flight includes while on tow. The servo is not turned off during the launch processing on an F1A and at any time if the step servo function is active.

The mechanical design must be such that the control surface will not move if the servo is not powered.

This should not be used on a F1Q Timer.

Say Alive Enabled

This is a beep and/or LED flash every 8 to 10 seconds to indicate that the timer is alive and working. Not on all Timer and on some timers, it cannot be disabled. This started when the timer is tuned on.

RDT Enabled

For timers where there is a choice between alternate D/T and External Interrupt i.e., radio D/T checking this activates the radio D/T feature. The timer does not include the Radio D/T receiver, but this means that it will accept input from one.

Noise on Fly

When checked there is a beep every second when the flight has started. This means after launch for a F1A timer.

Noise Before Launch

When checked this causes a beep every second while the model is circling under tow. The noise stops when the hook is forward and the model is in 'straight tow' mode.

Note that always there is a continuous tone when the hook is unlatched on a F1A model timer. There is also a continuous tone when the start button is depressed and before it is released on a F1B mode timer.

Noise On D/T

When checked the buzzer will beep after D/T. The noise can be stopped when the model is retrieved by pushing the start button or hook forward.

D/T Count

When checked this means the timer will "beep out" the D/T time. This uses 2 different tones. Whole minutes are beeped in one tone then the remaining seconds in 15 second increments using a high/lower pitched tone.

Q EL Step

This feature applies to F1Q timers only. The value is step to go to if the Energy Limiter indicates that the motor is about to be cut.

F1Q Kill enabled

Enables the F1Q Kill which will stop the F1Q motor if the start button is pressed after the start. It must be pressed more than 1/3 of a second after the start.

QKill Step

The value is the step that the timer goes to if the Qkill feature is used. That is the start button is pushed again after the timer is started.

Beep on Command

This enables the Beep on Command Feature. The Beep on Command feature makes the Magic Timer beeper beep after the model has been D/Ted when it receives an RDT signal. For this to work the timer must be attached to an RDT receiver.

What happens is about 5 seconds after the D/T is operated, either by regular D/T or radio D/T the beeper will beep 15 times. That is for about .1 of second each second for 15 seconds. After that, each time the timer gets a RDT signal it will repeat the 15 second beep cycle.

In addition the timer will repeat the 15 beep cycle approximately once an hour after the model first D/Ted.

This will stop a timer with a soft switch that is normally tuned off after D/T from being turned off after D/T.

Model Number
Where you can set the model number. Especially important to do this .

Program Name
Where you can set the program name. This will NOT be stored on the model but will be stored in Super Magic . This is an information field where you use a few words to say what is special about this particular flight program.
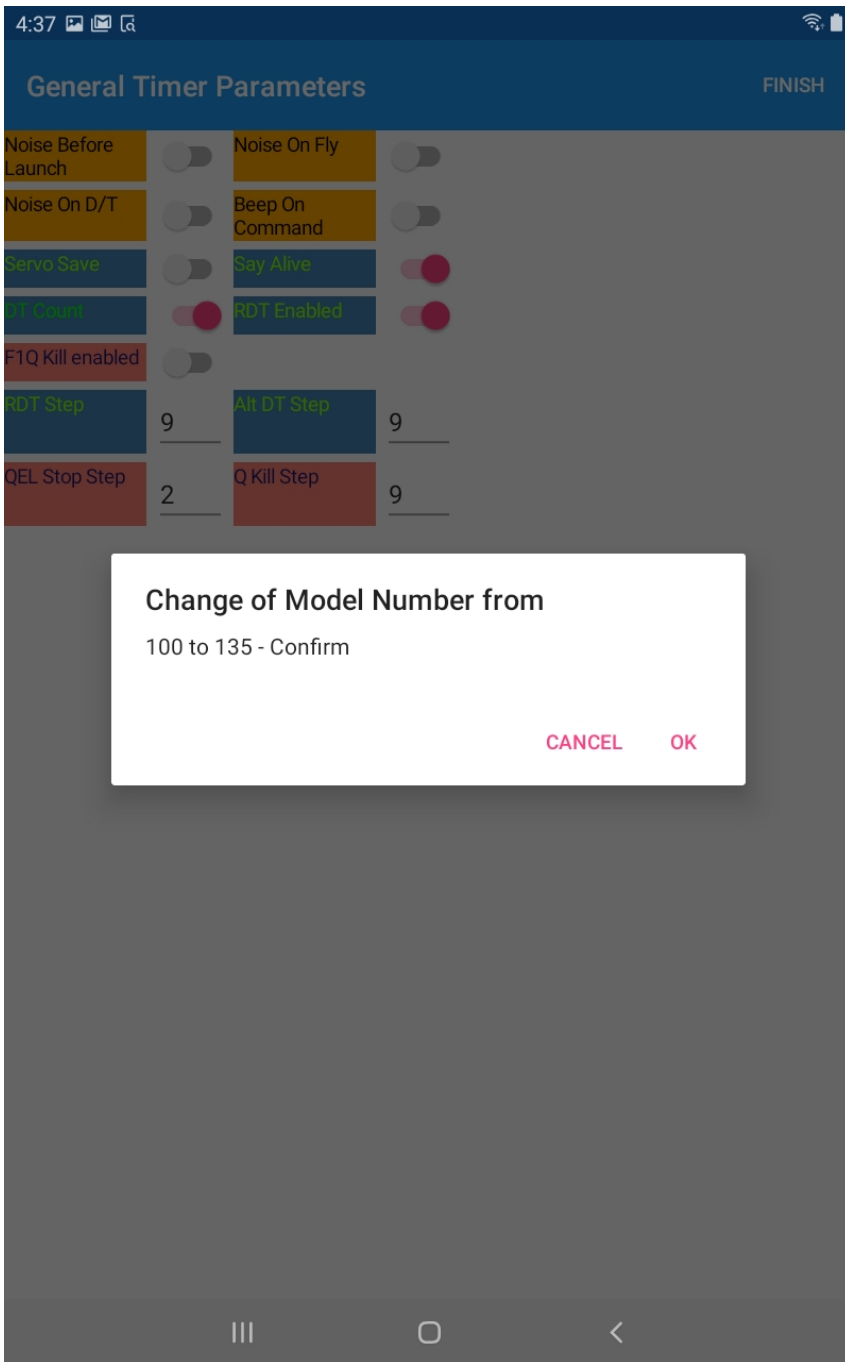
Actions requiring confirmation = do you really want to do this

 Some parameter changes are considered potentially risky, and, in that case, you will be asked to confirm the action.

Here is an example.

This example brings a particularly important subject. Super Magic and the Magic Timers have the concept of a model number. This is a number between 1 and 255. The reason for the number is so you can associate the flight program with a particular model. Super Magic will warn you when you change the model number in a program and if you try and put the program from one model in another. But it is your responsibility to give each of your models a unique number. Putting the wrong program in a model can be an awfully bad thing and you can lose the existing program in the model which is very bad if you have not saved it. These mistakes are easy to make, and Super Magic and the Magic Timers try to help you not to make these mistakes, but you allocated the model numbers to the timer, so it is your responsibility to ensure that they are unique.

Working with saved Flight Programs = saving and swapping flight programs

As with previous Super Magic programs your Flight programs can be saved with Super Magic 6. They are saved on a special part of the Android's storage associated with the App. But a new feature with Super Magic 6 is to import and export programs.

These programs are saved in a special "standard" file format called JSON.

This screen introduces several new ideas and how to label the information about your flight programs that you want to save. The allocation of lanes and names is a matter of personal choice. You need to think of a convention that works for you.

Program Name	no program	
Saved or Not	⬤	
File Name	for Save + Export	newfile
Last File Loaded	newfile	
Choose load file	Select Flight To load	**LOAD**
Choose file to import	Select Flight To Import	**IMPORT**
SAVE	**CREATE**	**EXPORT**
	DELETE	
Backup	and	Restore
Choose load Index	Select Index load	**BULK LOAD**
DUMP ALL	Check Manual First	**LIMITED LOAD**

To Save your current Flight Progam under another name - change the File Name above and pres Save Current

The first is the "filename" this is name that your flight program is stored under. They can be alphanumeric characters, and – or _ but no spaces or other special characters. For example, for a F1A model with a model number of 21 you could call it A-21. Now if you want to keep some copies of that program you could add a date or event to that such as A-21-maxmen-22, meaning the program I used in my model at the MaxMen contest in 2022. Or A-21-5May2023. Pick a system you understand and will remember.

Pushing the yellow button Save Current Program will save the program you are working on.

The Export Current Program will export it to the Download folder on the Android. The name of the file will be the file name shown on the screen, in this case newfile plus the JSON file type = newfile.json

If you want to save a copy of what you are working on you change the file name e.g. make newfile to LostHillsnewfile and press the save Current Program button.

To load a program, you have already stored on the Android you tap on the Select Flight … and you will get a list of saved programs to select from. You may have to scroll down. Tap on the file to select it and then the **Load Select** Button.

Similarly, you chose a file to Import by tapping on the Select File ... and you will see a collection of JSON file that are your Download folder. Make sure the JSON file is really a Magic Timer flight program file before you try and load it.

There are some circumstances where you may want to have a backup copy of you saved plight programs at some external place and be able to bring it back later. This is done with the Dump All and Load All and Limited Buttons. make sure you understand how this works before you used it.

Detailed Information

Selecting Files

This screen uses a select file feature for load and import. In the case of load, it will bring up a list of the saved files. You select the one from the list you wish to load.

Load

This loads a selected saved file into the work area. You can then set it in a connected timer and / or modify it and save it or export, potentially with another name.

Import

This gives you a selection list of all the JSON files in the Download directory. You select the one you want, and the Load button will put it in the work area. Then you can set it in a timer, modify, it, save it or export it. Note that it is NOT save automatically and you can use the filename filed if you want to change the file name when it is saved. If you are putting it in a timer, you will probably want to change the model number to correspond this the model number of where the timer will be used.

Export

This copies the file that is in the work area into the Download directory where you can move or copy it elsewhere .

Back Up and Restore

Starting with Version 10, Android added some more security features to look after your stuff better. These changes have made it more difficult to access and backup the information about your saved flight program. There is no problem in access the data from Super Magic but there might be problem in carrying the information over from one version of Super Magic to the next or you changed your smart phone. The problem is not that the data is different, but that Android 10 or 11 may not let you get at it.. These problems depend on many factors, include the version of Android and the hardware maker.

We investigated various techniques of backing up these files, including Samsung's Smart Switch and their Cloud backup, they did not save or restore App data, i.e. your saved flight programs. . With earlier versions of Android there were ways of making a backup or copy of the Application's data and restoring it. In the interests of protecting, you from bad people it does not seem to be possible in some cases. There are a number of Android file managers that let you get at the files, such as File manager or X-plore, but Android 10 and 11 protects you against using these tools to access an App's data.

However, one of the objectives of Super Magic 6 compared with Super Magic 4 is to let you have a way of exporting your flight programs so you could share with others and they could import them. This is done via the Downloads directory. Fortunately, Android has decided that this directory is obviously a public place, so they permit virtually universal access So in version 094 you can export the current saved programs en-mass and load them back a similar fashion same. You can them copy or move them out of Download directory to somewhere safe if you wish.   This provides you with a way of saving somewhere a copy of all of you flight programs.

Dump All

This function copies all your saved flight program files into the Download directory. If the file name was Model-21.json in the save programs it will be named SM-Model-21.json in the download directory. If the file existed already, I will be replaced. A text file with a list of all the files copied , without the pre-pended SM- will be in a like named SMBackup plus a date and time stamp. The Download directory is typically one that the end user may access. It is the sportsman's responsibility to copy or move it to a safe place.

Load All

User the select index load to find the appropriate SMBackup file in the Download directory. Then pressing Load All will copy all the SM- files that on the list back into the saved directory. Any file with the same name will be over-written.

Limited load

This works in a similar fashion to Load All in that you select the SMBackup index file but only the files on the list that tare NOT already in the saved directory will be copied.

User Preferences

Super Magic 6 maintains some user preferences; som of these these will be explained at a later date. Do not use those.

If you go to this screen and just **Finish** it will save the BLE address so don't have to search for it next time.

The Download directory is the default director on most Androids for getting files you want to work with. So do not change it unless your Android device is different.

The Proto Program lets you specify a flight program that you have saved to be the starting point next time you create a new program.

The Label Level lets you specify short on screen labels when you are using a device such as a phone with a smaller scree rather than tablet. Note that for some screens this is automagically.

Other Functions

You will notice that there is a screen for Altimeter. This is for configuring the Magic Timer Altimeter and RDT. We have been using this for quite some time, but it needed Super Magic 6 and some other small items to make it more readily available.

Version 0.94 – June 2021

Annex – Old Times screen

This screen was used in earlier versions of Super Magic 6. It is included to help people transition to the new version of the Times screen . It will be removed in the future.

The Dongle

For working with existing timers there is the Magic Dongle. This is a little box. It has a BLE radio to communicate with Super Magic 6. It has a socket where you plug a serial cable to communicate with the timer.

The Dongle is powered by a single cell LiPo; this is needed for the BLE Radio. There is a microcontroller with custom firmware, a power switch, control button and a USB connector. The purpose of the USB connector is twofold; it can be used as power source and it permits the upgrading of the customer firmware by the customer. This lets you plug the Dongle into a PC and load the latest firmware from Magic Timer. The details of this process will be described later.

Also, in the Dongle is a blue LED; this shows the status of the BLE connection. If the LED is bright and steady on with very widely spaced blips it means it is ready but not connected.   When it flashes it means that something has connected to it. If the LED is lit but not very bright it means that the BLE has power but is not ready or in Reset mode. This can happen at startup when the radio is being initialized or it can happen if power to the Dongle drops below a safe operating voltage of 3.1 volts.

The "Traffic Signal" signal LEDS – Red, Yellow and Green are other status indicators. At startup they will flash for a while and then all will be on together. This means the Dongle has started up and ready to talk with Super Magic 6. There are other status indications, again that will be documented later. But when Super Magic indicates a disconnect it will cycle through flashing all then go out. This means that the session is finished, and you can power off the Dongle. If you need to work with another airplane you should cycle the power.

You will notice that the time spent by the timer buzzing is shorter than when using the Palm Pilot to program; this is normal.

The connection between the Dongle and the timer can be tested off-line before the Dongle is connected to the Android via BLE. When the Dongle is powered up and the "traffic signal" 3 LEDs are all alight before it is connected to the Android, if you push the control button it will connect to the timer in 3 steps then disconnect. To go from each step, it is necessary to push the control button. This verifies that the cable part of the connection is good. Here are the steps

1. Set up, connect Timer to Dongle the cable, then turn Dongle and timer on.
2. Wait for traffic light = Red, Yellow and Green LED all on
3. Push control Button, Dongle will read timer and an LED will come on.
4. Push LED another 3 timers pausing between each for a second or two
5. At the end of a successful test you will have heard the buzzing from the timer start and stop and the Traffic light LED combo will be back. That is good.
6. If there is an issue note which LEDs were on at each step and if there was noise from the timer com communicate with Magic Timers Support.

Bootloader process for the Dongle

Explanatory Note

The Magic Dongle has a microcontroller with software in it. This software plays an important role in converting how information is stored on older Magic Timers and used by Super Magic 4 on a Palm Pilot to what is needed by Super Magic 6 on an Android. It is possible for the Magic Timer user to upgrade the software on the Magic Dongle in the field without having to send the Magic Dongle back to the Magic Timer factory. This upgrade is done by what is called the Bootloader process. This is done on a Windows PC using a USB connection to the Magic Dongle. Magic Timers will make available the new software when and if it is needed. This new software will be in a file of type .HEX. This note explains how you install this software on your Magic Dongle.

You will see some references to CCS. This refers to a company that provides some software tools that Magic Timers used to build the Magic Dongle. You do not need to know about it or buy it. We just mention this in case you wonder what it is.

First time

Create a folder in Documents called **superm**. [Make sure that your Documents folder is actually on your PC and not on OneDrive, i.e. "in the cloud".]

Unzip setup_ccsbootloader.zip to **superm**.

Installing new .hex files

Copy the .hex file into **superm**.

Run **Windows PowerShell** (found in the Windows programs list). You will get a blue screen with a c: > prompt.

Do these three commands:

 cd documents

 cd superm

 dir

You will see several files (the contents of **superm**) including ccsbootloader.exe and the .hex file you put there. [Don't close the Windows shell yet!]

Turn off Magic Dongle (if it is turned on) and unplug the battery (if there is one).

Plug Magic Dongle into a USB port.

Push down and hold the button (recessed into the case) on Magic Dongle; you may need a screwdriver to reach this.

Turn on Magic Dongle. It is important not to turn on the Magic Dongle before it is plugged in and to keep the button pressed while you are turning it on.

Release the button – the Magic Dongle will have green and red LEDs turned on.

Now you need to find out what COM PORT on the PC the Dongle is connected to:

- Use Device manager and expand > PORTS

Let us say you see it is USB Serial Device (COM12)

Go back to the blue Windows shell.

Type the command

.\ccsbootloader PORT=COM12 btdongle1-2.hex

Where btdongle1-2.hex is the file that was sent to you.

You will see a progress line go across the screen as the file is loaded. When it is loaded the Dongle will restart with the new firmware and red, yellow and green LEDs will be on. You may now a) turn off the power on the Magic Dongle and b) remove it from the PC, **in that order!**

Close Windows power shell.

Finished.

End of Document

May 2021