

## TIMER SUMMARY

The various Brodak Power systems rely on numerous timers each suited to role they are asked to play. Our timers are all designed and built by Wil Hubin, a pioneer and innovator in electric power systems for Control line flying. Here's a summary of our timer applications and functionality.

### TIMERS PROGRAMMED FOR NON-GOVERNING ESC's

The following timers are designed to be used with simple non-governing ESC's in Aircraft Mode. They are the simplest to set-up and use and are part of any of the Brodak Power Systems described as "Sport" systems:

<b>TIMER Model</b>	<b>DELAY</b> Time between pushing the start button, to when the flight time starts.	<b>FLIGHT TIME</b> Duration of the flight	<b>RPM ADJUST</b> Setting the RPM using the timer	<b>REMARKS</b>
<b>FM-0e (BH-1868)</b>	7 seconds (fixed)	3 minutes (fixed)	100% (fixed)	Used on 1/2A systems including the Baby Clown. Intended to mimic the running profile of a Cox 049.
<b>FM-Combat (BH-1876)</b>	0 seconds (fixed)	3:30 (fixed)	Fixed However, adjusts throttle setting during flight to compensate for battery discharge.	Special timer used with the Gladiator Combat model to assure equal airspeeds. Could be used in other similar 1-design efforts.
<b>FM-FF1 (BH-1873)</b>	3 seconds (fixed)	10-73 seconds (adjustable via potentiometer)	Approx 68% - 100% throttle position	Originally requested by Free Flight modelers seeking short duration motor runs and adjustable power. It has also been successfully used for Control Line Training flights where adjustable speed & short duration are valued.
<b>FM-0c (BH-1869)</b> <b>FM-0c Remote (BH-1872)</b>	15 seconds (fixed)	1:45 – 6:00 (adjustable via potentiometer)	Approx 65% to 88% of throttle signal. Adjusts throttle setting during flight to compensate for battery discharge.	Used with all SPORT systems including the Super Clown. Can also substitute into the 1/2A system.  BH-1872 adds remote located start switch – good for full fuselage models with timer mounted internally; only the on-off switch exposed.
<b>FM-eTC (BH-1867)</b>	0	Pilot Controlled	Throttle adjustable by pilot using 3-line Brodak control	Primary application in CL Scale modeling

### TIMERS PROGRAMMED FOR BRODAK ESC's w/GOVERNOR

The following timers are designed to work **ONLY** with Brodak F2B Hornet 40A (BH-1866) and 60A (BH-1865) ESC's with programmed-in governors.

TIMER Model	DELAY Time between pushing the start button, to when the flight time starts.	FLIGHT TIME Duration of the flight	RPM ADJUST Setting the RPM using the timer	REMARKS
<b>FM-Hornet (BH-1883)</b>	2-30 seconds (adjustable via potentiometer)	1:45 – 6:00 (adjustable via potentiometer)	Direct RPM setting with coarse adjust & a remote fine adjust pots. Has remote start switch.	Use with PRO Systems & Brodak F2B ESC's
<b>FM-P-Hornet (BH-1831)</b>	2-30 seconds (adjustable via potentiometer)	1:45 – 6:00 (adjustable via potentiometer)	Direct RPM setting with both the coarse adjust & fine adjust pots on timer board. Used with Profile models or full fuse models with access to timer. Has remote start switch.	Use with PRO Systems & Brodak F2B ESC's

### TIMERS PROGRAMMED FOR CASTLE ESC's

The following timers are designed to work **ONLY** with Castle Phoenix. ICE, Talon & Edge ESC's programmed for governing in either High Gov mode or Set RPM mode

TIMER MODEL	DELAY Time between pushing the start button, to when the motor starts.	FLIGHT TIME Duration of the flight	RPM ADJUST Setting the RPM using the timer	REMARKS
<b>FM-2SR (BH-1870)</b>	2-30 seconds (adjustable via potentiometer)	1:45 – 6:00 (adjustable via potentiometer)	Selects 1 of 3 speeds programmed into ESC	Tightest RPM governing, but requires foresight & experience to program RPMs <b>SET RPM mode</b>
<b>FM-2 EST (BH-1871)</b>	2-30 seconds (adjustable via potentiometer)	1:45 – 6:00 (adjustable via potentiometer)	Direct RPM setting with coarse adjust and fine adjust pots.	Flexibility to adjust RPM without fore thought <b>HIGH GOV mode</b>

## FM-9 PROGRAMMABLE TIMERS

The FM-9 family of programmable timers are can programmed to work with any ESC. Instead of potentiometers the FM-9 uses direct digital selection of Delay, Flight Duration and RPM settings. They can be programmed with “throttle-up” sequences to work with non-governing ESC’s and also can be used with several popular governing ESC’s. The FM-9’s require the Programming box to set and reset the timers. FM-9 Timers that are programmed for one ESC & configuration can also be reprogrammed to work with a different ESC & Configuration. ALL of the preprogrammed timers listed above can be replaced by a single FM-9 with the programmer.

The FM-9 Retract Timer has extra output circuits that can be used to drive electric retractable landing gear.

<b>TIMER Model</b>	<b>DELAY</b> Time between pushing the start button, to when the flight time starts.	<b>FLIGHT TIME</b> Duration of the flight	<b>RPM ADJUST</b> Setting the RPM using the timer	<b>REMARKS</b>
<b>FM-9 w/ Remote Start (BH-1853)</b>	Almost Unlimited (adjustable via programmer)	Almost Unlimited (adjustable via programmer)	Almost Unlimited (adjustable via programmer)	Use for most applications. Has remote start switch
<b>FM-9 w/o Remote Start (BH-1854)</b>				Start switch on timer board, use on profiles or other models with direct access to timer
<b>FM-9 Retract (BH-1855)</b>				Has additional outputs to drive electric retractable landing gear. Has remote start.
<b>FM-9 Programmer (BH-1875)</b>	n/a	n/a	n/a	Required for programming the FM-9 Timers