



Model J Tachometer/Timer

The Model J tachometer/timer is a highly reliable, quartz-accurate, vibration-proof instrument which offers several advanced features not found on other similar products. It is economically priced and available in both single and dual engine versions and is easy to install.

A single pushbutton switch is used to place the instrument in different modes which display engine RPM, time of the last flight, current flight time, total engine time or the current redline setting. These are all viewed on a highly visible liquid crystal display (LCD) which does not washout in bright sunlight as light emitting diodes sometimes do. It has $\frac{1}{2}$ " high characters and is easily readable from a distance.

The unit is first turned on by pressing the multi-function pushbutton switch. It then momentarily illuminates all of the segments of the LCD to verify that all numerals are functioning properly. After about two seconds, the display then continuously alternates between total accumulated engine hours and the duration of the last engine operation (basically, the duration of the last flight). If the engine is not started within the next three minutes, the instrument shuts itself off and will retain and display the same information when turned on again.

If the engine is started, the "last flight time" is cleared to zero and the internal timers start advancing. The display then shows rotational speed in 10 RPM steps to a maximum of 19,990. If the speed exceeds the internal redline setting, the display flashes on and off. The redline is easily set via the pushbutton switch in 50 RPM steps, and is retained in continuous memory until changed to a new value. To prevent accidental changes, the method used to alter it is simple and easy to remember, yet it **must** be done intentionally. If the pushbutton is depressed while the engine is running, RPM is temporarily replaced by the time of the current engine operation (the current flight time) for about two seconds.

Once the engine is shut off, the display alternates between the total/last time format again for about three minutes before shutting itself off. If the pilot forgets to enter the flight time in the log, it's still in memory and can be displayed for another three minutes by pressing the pushbutton again.

The placement of an internal jumper block configures the instrument for 0.5, 1, 2, 3, 4, 5, 6 or 7



Model J1 - Single

pulses per revolution. This is compatible with most single and multi-cylinder 2 or 4 stroke engines and other settings can be provided on special order at no additional cost. Some special order devices have included 1.5 pulses per revolution for a 3 cylinder Subaru engine and 4.5 pulses per revolution for a popular 9 cylinder radial.

The dual engine version (Model J2) incorporates a simple two position toggle switch to select which engine RPM is being displayed. Although only one RPM is displayed at a time, the internal electronics constantly monitors both. If **either** engine goes over redline, regardless of which is being displayed, the LCD flashes on and off to alert the pilot to the potential problem. Also, since it is uncommon to operate only one engine at a time, the dual model still uses only one set of timers, which are advanced if either engine is operating.

For those electronics buffs who have computerized instrument consoles, the unit includes a computer interface which can be used to record data or display it in a custom format on accessory equipment. The current flight time and the RPM of both engines (if a dual model) is output in a standard, serial format at approximately two times a second.

The instrument is powered by a single internal 9V battery. Lifetime is conservatively rated at 400 hours of actual engine operation or 5 years non-operating, or

various combinations of both. A low battery condition is displayed by a flashing "LO BAT" symbol on the LCD. The battery is a standard 9V alkaline model and can easily be replaced by the end user, contrary to some competitive models that must be returned to the manufacturer or distributor. If the old battery is removed and a new one put in its place within 30 seconds, the internal engine times and redline setting are retained. An internal reset switch can be used to clear the total accumulated engine hours to zero.

Interfacing it to the engine is quick and simple. Suitable engine electrical connection points together with the proper settings for internal jumper blocks are provided for most popular engines. The jumper blocks configure the instrument for the proper number of pulses per revolution. On direct orders we will configure units to a specified engine if requested, and many of our dealers will do the same. Alternately, clear instructions are supplied so that the end-user can easily do it. The instrument incorporates a fail-safe design and **will not** shut the engine off as a result of an internal component failure. Optional magnetic or optical senders are also available for special applications where these is no suitable electrical signal. Typical of these are the rotor blade of a gyrocopter or windmill.

It is packaged in a standard 3 1/8" instrument case and will fit into existing aircraft dash cutouts without any modifications. The case is molded of heavy-walled, high impact ABS plastic and will withstand considerable abuse. All units undergo 100% testing to provide the customer with a highly reliable product that will provide years of trouble free service. The device is warranted against defects in material and workmanship for a period of 1 year.

SPECIFICATIONS

• GENERAL

- DISPLAY: 4¹/₂ digit, high contrast, liquid crystal display with 1/2" high characters. All digits and legends visibly tested on power up.
- DISPLAY UPDATE RATE: 0.6 seconds.
- MEMORY: Engine times and redline continuously maintained by internal battery.
- OPERATION: All functions selected by single, front panel, pushbutton switch. Unit shuts itself off after 3 minutes of non-use.
- SERIAL OUTPUT: The current flight time and RPM are output every 0.6 seconds in standard, 5 Volt, RS-232 format at 9600 baud.. Baud rate is not adjustable. Data structure is provided in the Operating Manual.
- TIMING/FREQUENCY REFERENCE: Quartz crystal.
- POWER REQUIREMENTS: Internal 9V alkaline battery, NEDA type 1604A or equivalent.
- BATTERY LIFE: 400 hours operating or 5 years non-operating, or various combinations of both.
- WEIGHT: 9 ounces.
- TEMPERATURE RANGE: Full performance from -10 to +50 °C (+14 to +122 °F).

• TACHOMETER FUNCTIONS

- RANGE: 200 to 19,990 RPM.
- RESOLUTION: 10 RPM.
- ACCURACY: Better than 0.04% of reading, (4 RPM @ 10,000 RPM).
- REDLINE: User settable from 200 to 19,950 RPM in 50 RPM steps via front panel pushbutton.

• TIMER FUNCTIONS

- TOTAL ACCUMULATED ENGINE TIME: 0 to 999.9 hours in 0.1 hour (6 minute) steps. Resettable to zero via internal switch.
- LAST/ CURRENT ENGINE TIME: 0 to 99:59 (99 hours, 59 minutes) in 1 minute increments. Current engine time is temporarily viewable in RPM mode by pressing pushbutton.
- TIMING ACCURACY: Better than 0.04% of reading, (0.1 hour @ 250 hours).



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