

## TAPE PLACEMENT APPLICATION NOTES

For accurate readings, Digital Photoelectric Tachometers require a larger target marker, and marker tape having greater reflective qualities than markers and tapes used with standard analog-style instruments. For the best performance, the reflective tape supplied with your new Biddle Tachometer should be used rather than smooth surface types.

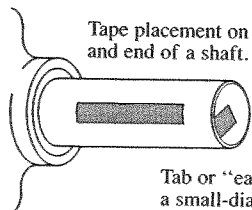
As with any other tape application, prepare the selected target surface area with a degreasing agent prior to marking the area.

A 1" to 2" length of tape should be used, placing it along the axis of the shaft or radiating from the center to the outside edge of the shaft. The 1/2" width should be no more than one-half the available area or circumference.

An "ear" or tab should be used on small diameter shafts; the objective is to "look over" the shaft to "see" the tab marker as it comes around.

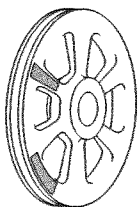
**NOTE:** Aim at an angle to the surface to avoid any reflected signals into the instrument's "eye."

## TAPE PLACEMENT ILLUSTRATIONS



Tape placement on the side; and end of a shaft.

Tab or "ear" wrapped around a small-diameter shaft.



Tape placed on a spoked pulley or wheel can radiate from the center or be placed parallel with outside edge.

## SUPPLIED ACCESSORIES

Cat. No.	356528	Card of 1/2" Reflective Squares (30).
	356529	Roll of Aluminized Reflective Tape (1/2" x 36")
	35001.5	Alkaline Battery 1.5V AA size (3).
	T-28	Carrying Case.

**Do not attempt to use or repair a defective or damaged instrument; return it to us for examination and repair, with a written explanation of the trouble.**

## WARRANTY

All products supplied by Biddle Instruments are warranted against all defects in material and workmanship for a period of one year following shipment. Our liability is specifically limited to replacing or repairing, at our option, defective equipment. Equipment returned to the factory for repair will be shipped Prepaid and Insured. The warranty does not include batteries, lamps, or tubes, where the original manufacturer's warranty shall apply. **WE MAKE NO OTHER WARRANTY.**

The warranty is void in the event of abuse or failure by the customer to perform specified maintenance as indicated in **CAUTION** notations in this manual.

## REPAIRS

Biddle Instruments maintains a complete instrument repair service. Should this instrument ever require repairs, we recommend that it be returned to the factory for repair by our instrument specialists. When returning instruments for repairs, either in or out of warranty, they should be shipped Prepaid and Insured, and marked for the attention of the Instrument Service Manager.

*For complete list of accessories and other Speed Measuring Instruments, please contact:*

**BIDDLE INSTRUMENTS**  
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15 10/86W

## INSTRUCTIONS 35-J-83 BIDDLE HAND TACHOMETER LCD DIGITAL PHOTOELECTRIC STYLE

The Biddle Digital Photoelectric Hand Tachometer is a Microprocessor controlled precision speed indicating instrument in a compact, lightweight, drawn aluminum body; capable of measuring speeds of rotating objects to **99,999 RPM** by way of a special infra-red type electronic sensing system focusing on the reflective tape marked target area and eliminating influence from fluorescent lighting on shiny surfaces. A visible targeting light beam is coupled with this system to assist in alignment with the target.

Catalog No.	Display System	Measuring Ranges
359983	5 digit 5/16" (8 mm) 7-segment LCD; leading zero suppression. Locks and indicates the word UNDER at 10.00; OVER at 99999.	Automatic selection: 10.00 to 99.99 100.0 to 999.9 1000 to 99999

**CAUTIONS:** This instrument has a splash-proof fitted case and display lens, however, it is not a sealed unit. Do not use in an explosive atmosphere; IT IS NOT CLASSIFIED AS INTRINSICALLY SAFE. Usage in high humidity areas could cause shorting of the internal circuitry. The Microprocessor controlled electronic system is guarded against electromagnetic field influence and the metal body assists in guarding normal electrostatic discharges from fabric, pulp and paper processing equipment. Grounding and bonding of the machinery against electrostatic discharge is the responsibility of the user.

Refer to Page 6 for **WARRANTY** and **REPAIRS** statements.

## OPERATION FEATURES

1. Measuring Accuracy:\* (See Page 2)
  - from 10.00 to 99.99 ± 0.01
  - from 100.0 to 999.9 ± 0.1
  - from 1000 to 99999 ± 1.0
2. Sensing Period (Gate Time):\* (See Page 2)
  - from 10.00 to 50.00 within 6-seconds.
  - from 50.00 to 99.99 within 1-second.
  - from 100.0 to 99999 within 0.7 second.

*\*Accuracy and Sensing stability are subject to the care taken in maintaining the alignment of the instrument's sensing and focusing beam with the tape marked target area. Straying away from the tape marked target area loses valuable pulse counts during the Sensing Period. For speeds over 20.00, allow at least one Sensing Period for the system to accumulate data and stabilize its readings.*

3. **Display Indicators UNDER and OVER:**  
Speeds under 10.00 lock the display at 10.00 and the word **UNDER** appears above the display. Speeds over 99999 lock the display at 99999; the word **OVER** appears above the display and the display blinks on and off.
4. **Low Battery Indicator:**  
Battery low voltage will produce the word **BATT** above the digits, in the center of the display, however accurate measuring can continue until the display becomes dim.
5. **Battery Life** of supplied Alkaline batteries is approximately 100-hours under continuous operation.
6. The instrument's **Hold Feature** may be utilized at any time during a speed measurement by simply releasing the **Operating Button**. The displayed number will remain for approximately **One Minute**, when the system shuts off all power. That last measurement stores in the system's **Memory**.
7. A single very brief pressure on the **Operating Button**, recalls and displays the last measurement stored in **Memory** and remains displayed for about one minute.  
A second very brief pressure on the **Operating Button**, would not cancel the stored **Memory**, but should produce a full display of **Indicators** and **888.8.8** within three seconds; verifying that the electronic system is functioning correctly. If faulty, the word **ERROR** appears. Constant pressure proceeds with new measuring.
8. **Operating Temperature:**  
32° to 122°F (0° to 50°C).  
**Storage Temperature:**  
-4° to 140°F (-20° to 60°C).

*CAUTION: Store in dry, well ventilated area, not subject to direct sunlight.*

## OPERATION PROCEDURES

1. Remove battery compartment **Coverplate** by inserting fingernail under forward portion of latch flange, press towards the rear and slightly upward. **Coverplate** will release from its recessed compartment. *No tool or coin required!*
2. Install three (3) supplied 1.5V AA size **Alkaline Batteries**, with polarity as marked in the compartment.  
*CAUTION: Improperly installed batteries will not activate the display and should be immediately corrected to prevent possible damage to the circuitry.*
3. Position rear tab of **Coverplate** into recess and press down on latch end until **Coverplate** "clicks" into place.
4. **The initial display could be incomplete digits and Indicators. A single very brief pressure on the Operating Button**, should produce a full display of **Indicators** and **888.8.8** within three seconds; verifying that the electronic system is functioning correctly. If faulty, the word **ERROR** appears. A continuous display of the word **BATT** indicates **Low Battery**.
5. Prepare the target area surface with a degreasing agent and place a 1" to 2" length of **special Reflective Marker Tape** on that surface to be measured. The tape's 1/2" width should be no more than one-half the available area or circumference. (See **Tape Placement Illustrations** on Page 5.)  
*WARNING: Use extreme care in making measurements close to rotating machinery.*
6. Hold the Tachometer firmly and point its **Sensing Head** at the tape marked target area; maintaining a 2" to 6" operating distance, or up to 18" if firmly supported. *Do not point the Sensing Head directly perpendicular to the target; hold at an angle to prevent bounce-back into the instrument's "eye."*
7. Depress and hold the **Operating Button**. The electronic **Sensing System** and the **Digital Display** are now activated; prepared to receive measuring data.

8. Align the Tachometer with the target area, utilizing the **visible** Targeting Light Beam. Each passing of the marker tape through the **invisible** special infra-red type electronic sensing system is accumulated by the Microprocessor controlled circuitry and displayed within the previously specified **Sensing Period**.

*CAUTION: Measuring below 100.0 RPM requires careful alignment with the marker and a firm support.*

9. Each marker response is indicated by the **pulsing "target" LED**, located immediately behind the sensing nose. The **LED** either pulses at a steady slow speed or constantly glows when speeds exceed approximately 1500 RPM.
10. The digital display will indicate the speed, and will continue to indicate any change in that speed within the specified **Sensing Period**, as long as the **Operating Button** is kept depressed and *alignment of the Sensing System is maintained with the tape marked target area.*
11. **Extremely erratic readings** could be due to the tested equipment's own speed variations or abuse to the instrument's Microprocessor controlled electronic system.
12. If in doubt, verify the instrument's speed reading against a constant RPM source; such as an 1800 RPM synchronous electric motor.
13. The displayed **speed reading is held** by simply releasing the **Operating Button**. This **Hold Feature** maintains the displayed number for approximately **One Minute**, then the system automatically shuts off all power and stores that last measurement in the **Memory**.  
*CAUTIONS: Repeated dropping of the instrument could cause damage to the Microprocessor controlled electronic system or the PC board connections; resulting in extremely erratic readings or the word ERROR to appear on the display. When storing the instrument for a long period of time, we suggest removal of the batteries. Discharged batteries could corrode the instrument's terminal contacts or leak into the PC board area. Keep the instrument clean and stored in the carrying case. Do not use this instrument for any purpose other than its intended use.*