

INSTRUCTIONS

BIDDLE HAND TACHOMETER
PHOTOELECTRIC-DIGITAL DISPLAY

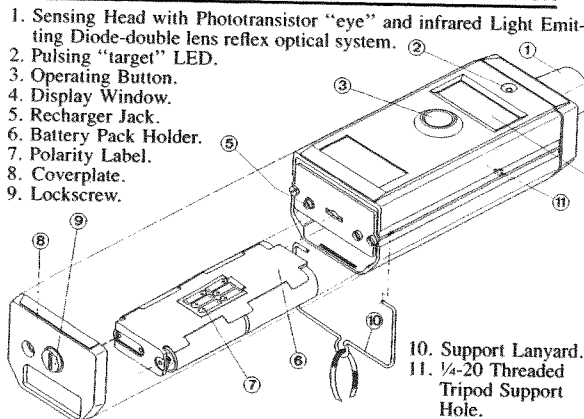
The Biddle Digital Photoelectric Hand Tachometer is an extremely compact, lightweight, solid-state precision speed indicating instrument capable of measuring speeds within ± 1 count by way of an infrared photoelectric beam focusing on the tape marked target area of a rotating surface.

Catalog No. Display System Displayed RPM Ranges

359982	4-digit LCD	100.0-999.9; 1000-9999 then 1000-9999 $\times 10$ (10,000-99,999) 1000-2000 $\times 100$ (100,000-200,000)
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CAUTION: This instrument is not sealed, therefore, do not use in an explosive atmosphere. Usage in high humidity areas could cause shorting of the circuitry.

ITEM IDENTIFICATION AND BATTERY INSTALLATION



SIX ALKALINE 1.5V AA SIZE BATTERIES ARE SUPPLIED IN THE CARRYING CASE; ALREADY INSTALLED AND TESTED IN THE BATTERY HOLDER.

CAUTION: Improperly installed batteries or pack holder could seriously damage the instrument. Refer to pack holder polarity label.

OPERATION PROCEDURE

1. Remove battery compartment *Coverplate* by a quarter-turn of the captive *Lockscrew* and insert *Battery Pack Holder* per diagram on preceding panel. Reinstall *Coverplate*; inserting its bottom projection into the compartment's matching groove, then "hinging" the *Coverplate* into its seating; a quarter-turn of the *Lockscrew* relocks it.

NOTE: Pressing the Operating Button at this time will not activate a digit display. Refer to Steps 2 to 6.

2. Place a 1" to 2" length of Special Marker Tape on surface to be measured. The $\frac{1}{2}$ " width should be no more than one-half the available area or circumference. (See *Tape Placement Illustrations* on panel 4 of this manual).

WARNING: Use extreme care in making measurements close to rotating machinery.

3. Hold firmly and point Tachometer at tape marked target area. Maintain a 2 to 6-inch distance, or up to 18-inches if firmly supported. The *Support Lanyard*, attached to the instrument and looped around the neck, can assist in a firm support.
4. Depress and hold the *Operating Button*, located at the forward section of the instrument.
5. The sensing system utilizes an invisible infrared beam that "illuminates" the target area and a phototransistor that "sees" each rotation of the marker through that area.
6. Each marker response is indicated by the Pulsing "target" LED, by either a steady slow speed pulse or a constant glow when speeds exceed approximately 1500 RPM.

NOTE: At this time, check battery condition. Properly installed new batteries will produce a steady display that updates each second. No display indicates either improperly installed batteries or extremely low voltage. Recheck their polarity in the holder. Low battery condition is signaled by a flashing display; the speed is displayed, but the display repeatedly flashes on and off. Change batteries at first opportunity.

7. The digital display will indicate the speed and will continue to indicate any change in that speed each second, as long as the *Operating Button* is kept depressed and the Tachometer is properly aligned with the tape marked area.

8. Displayed readings should stabilize after two seconds with a consistent speed measurement. Stability and accuracy of ± 1 count is subject to maintaining alignment with the tape marked target area.

9. Extremely erratic readings could be due to the tested equipment's own speed variations or abuse to the instrument's Quartz Crystal controlled system. If in doubt, verify the instrument's speed reading against a constant RPM source; such as a 1800 RPM synchronous motor.

CAUTION: Carefully observe the display to determine correct RPM. Positive speed readings start at 100.0 RPM and automatically progress through four levels of displayed digits. RPM in tenths are displayed from 100.0 to 999.9; then whole numbers from 1000 to 9999 RPM. Speeds of 10,000 to 99,999 RPM are displayed as 1000 to 9999 with a $\times 10$ multiplier appearing to the right of the digits. A $\times 100$ multiplier appears for speeds of 100,000 to 200,000 RPM.

10. The displayed speed reading is held by simply releasing the *Operating Button*. This *Hold Feature* maintains the display for approximately 3-minutes, then cancels the display and automatically shuts off power to the instrument's system.

OPERATIONAL FEATURES

1. Low RPM readings below 100.0 RPM can be obtained by using multiple markers, equally spaced on the surface to be measured. Divide reading by number of markers.
2. Operating temperature: 32°-113°F (0°-45°C).
3. Battery life of supplied Alkaline batteries is approximately 15-hours under continuous operation.
4. **Optional Recharger Feature** allows usage of NI-CAD batteries and charging while in the instrument via the built-in *Recharger Jack*. A complete description of this feature is on the reverse side of this manual.

(Instructions continued on reverse panel)

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. Smooth surfaces reflect ac lighting which could cause false readings. A special reflective paint is listed as an Optional Accessory on the next panel of this manual.

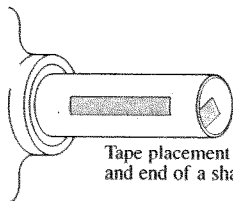
As with any other tape or paint application, prepare the selected target surface area with a degreasing agent prior to marking the area.

A 1" to 2" length of tape or paint 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.

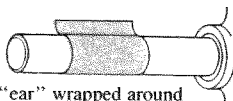
An "ear" or tab should be used on small diameter shafts; the objective is to "look over" the shaft to "see" the tab marker as it comes around.

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

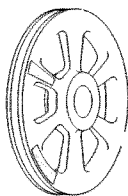
TAPE PLACEMENT ILLUSTRATIONS



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.

INSTRUCTIONS

OPTIONAL RECHARGER ADAPTER AND NI-CAD BATTERIES

CAUTION: DO NOT ATTEMPT TO USE RECHARGER ADAPTER WITH, OR TRY TO CHARGE, THE SUPPLIED ALKALINE BATTERIES!

1. Remove **Battery Pack Holder** from the instrument and remove the six Alkaline batteries.
2. Install six NI-CAD batteries, Biddle #35001.2 or their equal, into the **Battery Pack Holder**, observing polarity as per label decal. *Improper installation could seriously damage the batteries and/or the instrument.*
3. Reinstall **Battery Pack Holder** per diagram on first panel of this manual and reinstall **Coverplate**.
4. Insert Recharger Adapter output cable plug **fully** into recessed area in **Coverplate** and into **Receptacle Jack**. There should be a slight "click" as the tip firmly seats itself.
5. Insert the Recharger Adapter into ac outlet.
6. Recharging time is 2 to 6-hours and duty life is approximately 9-hours under continuous operation.

CAUTION: These are "fast charge" type NI-CAD batteries and excessive charging hours are not recommended.

ACCESSORIES

Supplied:

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|-----------------|------------------------------------|
| Cat. No. 356529 | Reflective Tape Roll (1/2" x 36"). |
| 356531 | Support Lanyard. |
| 35001.5 | Alkaline Battery 1.5V AA size (6). |
| T-26 | Carrying Case. |

Optional:

- | | |
|-----------------|--|
| Cat. No. 356530 | Reflective Paint (one ounce bottle). |
| 359982-10 | Recharger Adapter 120 VAC 60 Hz/9 VDC. |
| 359982-20 | Recharger Adapter 220 VAC 50 Hz/9 VDC. |
| 35001.2 | NI-CAD Rechargeable Battery 1.2 V AA size, Eveready #CF-15 or equal (6-req'd). |

CAUTIONS: When storing the instrument for a long period of time, we suggest removal of the **Battery Pack Holder**. Discharged batteries could corrode the instrument's terminal contacts.

Dropping the instrument could cause internal damage to the Quartz Crystal resulting in extremely erratic readings.

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 the James G. Biddle Co. 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

The James G. Biddle Co. 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:

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