

# AGATE TECHNOLOGY AT-2030 OPERATORS MANUAL

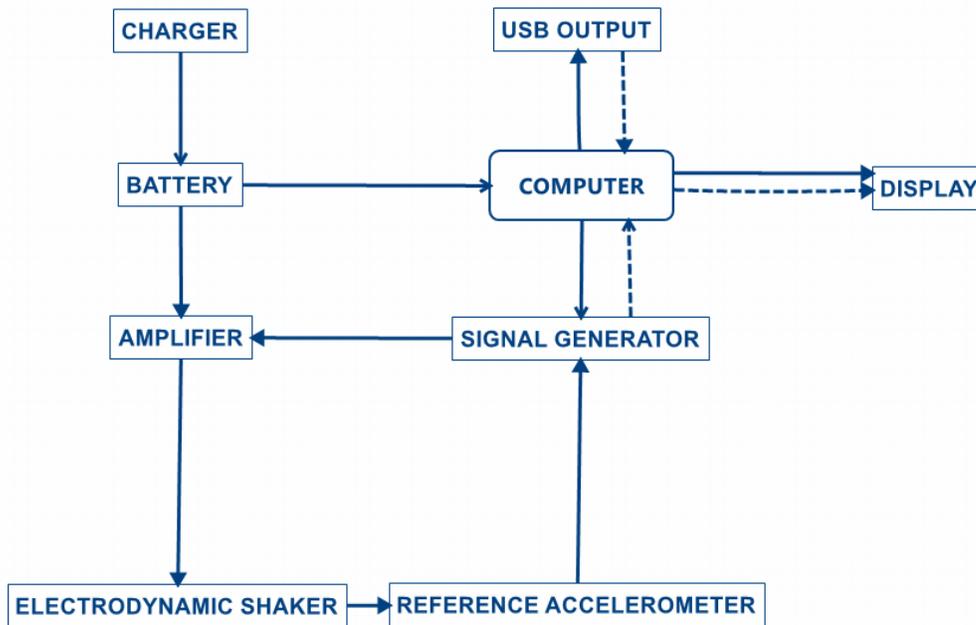
PORTABLE VIBRATION CALIBRATOR

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## Introduction:

This manual is intended to inform the operating user on product specifications, setup, troubleshooting, and operation procedures on the AT-2030 Portable Vibration Calibrator. The AT-2030 is designed as a rugged, battery powered, vibration sensor test set. The AT-2030 is meant for use in the field or laboratory for the verification of control room working conditions or to verify the performance of vibration transducers.

AT-2030 consist of an internal battery charger, battery, main power amplifier, electrodynamic shaker, NIST traceable reference, internal computer, and LCD screen display.



**Block Diagram**

**Charger:** Internal charger which operates between 110v and 220v for worldwide power support.

**Battery:** 5 Amp Hour, Sealed, Lead Acid battery. FAA transport approved.

**Power Amplifier:** Takes the input signal from the Signal Generator and is used to drive the electrodynamic shaker.

**Electrodynamic Shaker:** Produces 4.5 lbf pk of sine force and is made with carbon fiber composite and isolated linear bearings. This provides low distortion when shaking the transducer load.

**Reference Accelerometer:** NIST traceable calibration standard accelerometer with ¼-28 tapped mounting hole.

**Computer:** 1 GHz Cortex-A8 processor, 512 MB DDR3 RAM, 20GB of storage memory included, with USB and network connectivity.

**Signal Generation Board:** Consists amplifiers and selectable channels.

**The Power Amplifier Output:** To control the vibration of the electrodynamic shaker at the amplitude and frequency set by the user.

**LCD Screen:** Color 4.3 inch LCD 480x272 resolution display with resistive touch screen.

## Primary Functions of the AT-2030:

**1) To shake or excite a transducer under test.**

In shake mode, AT-2030 can be used as a variable frequency, variable amplitude shaker. In this mode, the frequency and amplitude are set manually by the user, while the computer provides high accuracy measurement signals.

**2) To verify control room validly.**

By comparing vibration signals sent to the control room, the user should be able to determine if there is any machinery error.

**3) To test wiring and connections.**

Using methods similar to testing control room equipment, the user may also input a known good signal to cabling and connectors. The result on the other end of the connection should be the same as AT-2030.

## Warnings on Shaker Operation

- AT-2030 is designed for vertical use. Operating in the horizontal position is possible as the shaker element has linear bearings for support, but the load should not exceed 400 Grams.
- This instrument may shake violently at high amplitude and low frequency. Always make sure to keep the unit secure and operate on a stable surface.
- When amplitude or frequency has exceeded their acceptable ranges, the unit will issue a warning or shut down depending on the operating conditions.
- Even when closed, this instrument is not waterproof. Never use near water.
- Failure to hold the accelerometer with the short handle wrench when attaching and removing transducers can cause permanent shaker damage.

## Note about battery operation:

AT-2030 is powered by one 5 amp hour, sealed lead acid, rechargeable battery as its primary power source. This battery is designed to be continuously charged at a trickle rate once the battery reaches 100%. Battery life will depend on USB plugins, payload weight, along with shaker driving force. In low power conditions, AT-2030 uses approximately 0.4 amps of power making it possible to achieve 13 hours of battery power. However, the unit will shut down premature to full discharge preventing damage and ensuring long term battery life. During long periods of high power consumption, AT-2030 may only last up to one hour. A battery light indicator is located in the top menu bar and turns from green to red as the battery becomes low on energy. Next to the battery bar, is an approximate percentage of battery remaining based on the following voltage chart:

Voltage	State of Charge
12.6+	100%
12.5	90%
12.42	80%
12.32	70%
12.20	60%
12.06	50%
11.9	40%
11.75	30%
11.58	20%
11.31	10%
10.5	0%

The portable shaker unit may be operated with the power plugged in. The AC charger will supply battery charge when plugged in, however charge rate will be greatly increased when the unit is powered off.

- For best results use the shaker when batteries are fully charged
- Automatic power management will automatically turn off before full battery discharge. This is a protective measure to ensure longer battery operating life.
- If deep discharge occurs, the battery charger is set to recharge over two or more days. This is normal operation to prevent battery damage.

## Accessories:

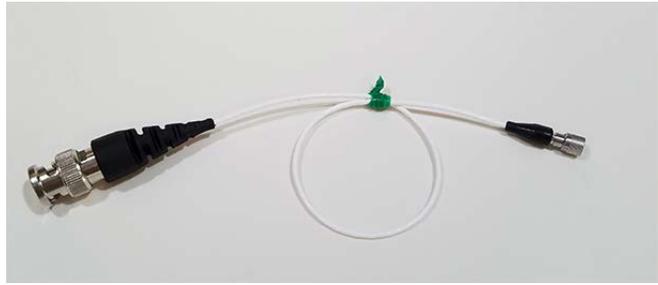
AT-2030 comes standard with the following pictured accessories:



- 1) Universal Velocity Mounting Adapter with 1/4-28 mounting hex screw.....(MNT-112)
- 2) Universal Accelerometer Mounting Adapter with 1/4-28 mounting hex screw.....(MNT-113)
- 3) 2-56 Adapter..... (MNT-106)
- 4) 6-32 Adapter.....(MNT-107)
- 5) 10-32 Adapter.....(MNT-111)
- 6) 10-32 Stud.....(MNT-105)
- 7) 1/4-28 Stud .....(MNT-104)
- 8) Short Handle Aluminum Wrench.....(ACC-100)



5/32 Hex L-Wrench. (ACC-101)  
measurement.



10-32 to BNC adapter cable for sensitivity

(CAB-100)



AC Power Cord 120v (PWR-100)



AC Power Cord 220-240v (PWR-101)

OR

## Optional Accessories Include:

Chadwick-Helmuth Velocimeter .....	(CAB 101)
IEPE Accelerometer 2 pin Mil.....	(CAB-102)
IEPE Accelerometer 3 pin Mil .....	(CAB- 103)
Replacement studs 3 of each 1/4-28, 10-32. Adapters 2-56, 6-32, 10-32	(MNT-100)
1/4-28 Adapter .....	(MNT-108)
Mounting Stud 1/4-28 to 8-32.....	(MNT-109)
Adapter 1/4-28M to 3/8-24F.....	(MNT- 110)
Proximity Probe Adapter Kit.....	(PRX-100)

Proximity Probe Proximity adapters M6 to 3/8 .....(PRX-101)

Steel Target .....(PRX-102)

Custom made cables or platform mounts can be made to your specifications based on transducer sample or datasheet, please contact us for more information.

## Software Update Installation:

AT-2030 features software update support to load in sensor information, custom databases, bug fixes, software add-ons and more.

- 1) To update your unit to the most current software visit [www.agatetechnology.com/upgrade](http://www.agatetechnology.com/upgrade)
- 2) Load the program Agate.up onto your USB drive and insert into the unit with power off.
- 3) Power on the AT-2030 device and wait for the upgrade prompt.
- 4) Select “Yes” to upgrade and the software will begin to unpack and install.
- 5) When completed remove the USB stick and AT-2030 will automatically restart.

## Operations:

- Powering the unit on and off:
  - Press and Hold the red On/Off switch for 1 second, the unit will begin its startup sequence.
  - Press and hold the red On/Off switch for 5 seconds. When the screen turns blank, the unit has powered down.

## Main Menu:



To manually test a transducer or equipment by only using variable frequency and amplitude:

Select your sensor and mount it to the ¼-28 drill hole in the reference accelerometer. Hold the reference accelerometer with the provided short handle wrench and screw in the sensor at the same time. When necessary, use the correct sensor adapter for your size.

From this screen you will be able to adjust frequency and amplitude. Press down on the frequency knob or select from the touch screen to begin.

As the AT-2030 is adjusted the three vertical bars will indicate its status.

**OUT:** The percentage of maximum output supplied by the main amplifier.

**THD:** Total Harmonic Distortion.

**Mils:** Displacement range of the electromagnetic shaker in mils.

## Additional Information

Maximum weight recommendation chart:

Frequency	0-100 Grams	100-250 Grams	250-500 Grams	500-750 Grams
10-100 Hz	10g's	4g's	2g's	1g
100-1000 Hz	7g's	4g's	2g's	1g
1000-10000 Hz	3g's	1.5g's	0	0