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ANSI B175.2-2000

American National Standard

for Power Tools -

Hand-Held and Backpack Gasoline-Engine-Powered Blowers

ANSI American National Standards Institute
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10036

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American National Standard
For Power Tools –

Hand-Held and Backpack, Gasoline-Engine-Powered Blowers

Secretariat
Portable Power Equipment Manufacturers Association

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American National Standards Institute, Inc.

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Foreword (This foreword is not part of the American National Standard B 175.2-2000.)

This standard sets forth sound-level test procedures and labeling requirements for the sound level of gasoline-powered backpack and hand-held blowers.

This standard was developed by the ANSI B175 Accredited Standards Committee. The Committee is comprised of several organizations and individuals interested in these products. The Committee's membership includes representatives from the following groups: accredited testing laboratories, component manufacturers, dealer associations, federal government agencies, individuals, and original equipment manufacturers.

The initial standard was developed in 1990 in response to the needs expressed by various county and municipal governments and professional and consumer users. It was revised in 1996 to reflect changes to several clauses, namely Scope and Purpose, Definitions, Measurement of Noise in Sound Room, Test Data to be Recorded, Labeling, and Operator Manual Recommendations.

Since 1996, the Committee has focused on the need to revise the test procedures to improve the accuracy and repeatability of the sound level measurements and to clarify labeling requirements. Continuing regulation of leaf blowers by local governments demonstrates a need for the uniform sound level test procedures that this standard provides. The revised labeling requirements are intended to clarify sound level measurements for interested communities and product users.

The year 2000 revisions to this standard are found in the following clauses: Definitions, Measurement of Sound in a Free Field, Measurement of Sound Level in Sound Room (Alternate Method), Blower Operation, Measurements, Test Data to be Recorded, Labeling, and Operator Manuals.

Suggestions for improvement of this standard are welcome. They should be sent to Secretariat, ANSI B 175 Accredited Standards Committee, 4340 East West Highway, Suite 912, Bethesda, MD 20814.

This standard was processed and approved for submittal to ANSI by the Accredited Standards Committee on Safety of Portable Hand-Held Chain Saws, B175. Committee approval of this standard does not necessarily imply that all Committee members voted for its approval. At the time it approved this standard, the B175 Committee had the following members:

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Ron Loyd
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Government Agencies:
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U.S. Department of Agriculture – Forest Service
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Original Equipment Manufacturers:
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John Deere Consumer Products
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American National Standard for Power Tools –

Hand-Held and Backpack Gasoline-Engine-Powered Blowers

1 Scope and Purpose

1.1 Scope

The requirements of this standard apply to new portable, backpack and hand-held, gasoline-engine-powered blowers, including those blowers that accept vacuum attachments.

1.2 Purpose

The purpose of this standard is to establish bystander sound level test procedures and labeling requirements for hand-held and backpack, gasoline-engine-powered blowers. This standard also includes requirements for operator manual(s) instructions.

NOTE: Metric units are included for information only.

2 Definitions

2.1 Blower. A device that propels an airstream in a directed manner.

2.2 Blower Tubes. Devices that direct the blower airstream.

2.3 Category. Group designation of measured sound levels according to decibel range (for example, low, medium, high). The sound categories are as follows: Category I dB(A) ≤ 65, Category II 65 < dB(A) ≤ 70, and Category III dB(A) > 70.

2.4 Handle(s). Hand grip(s) on unit.

2.5 May. The term that indicates a permissive condition.

2.6 Muffler. Device for reducing engine exhaust noise and directing the exhaust gases.

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2.7 Nozzle. The opening at the end of the blower tube from which the airstream exits.

2.8 On/Off Control. A control to allow the engine to run or to stop the engine.

2.9 Shall. The term that indicates a mandatory requirement.

2.10 Throttle. A control that adjusts the volume of air and fuel delivered to the engine.

2.11 Throttle Control. A part of the unit actuated by the operator to regulate the throttle.

2.12 Vacuum Attachment. A device(s) that converts the blower from the blowing mode to the vacuuming mode.

3 Sound-Level Test Procedure

3.1 Scope.

This test procedure establishes the instrumentation, test site, blower operation, and measurement method for determining the bystander sound level of blowers.

3.2 Instrumentation.

The following instrumentation shall be used:

a) A microphone. Suitable measuring devices are sound level meters meeting or exceeding the requirements of a Type 1 instrument in accordance with IEC Publication 651. It is recommended that a microphone with a diameter not greater than ½ inch (13 mm) be used for the measurements. A wind screening attachment to the microphone may be used, provided that this is allowed for, if necessary, in the calibration and does not alter the measured sound level by more than ± 0.5 dB(A) as a consequence of its effect on the omnidirectional characteristics of the microphone.

b) Either of the following systems may be used:

1) A precision sound level meter that meets the Type I requirements of ANSI S1.4 for direct measurements.

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2) A data acquisition system that meets the requirements of the ANSI/SAE J184.
3) A sound level calibrator. (See 3.6.2.3(d))

3.3 Test Site

3.3.1 Measurement of Sound in a Free Field

3.3.1.1 The test area shall be a flat, open space with natural ground cover (such as grass) of at least 1 inch (25 mm), but not to exceed 3 inches (76mm) and free of any large reflecting surfaces, such as signboards and buildings, for a minimum distance of 100 feet (30m) from the blower and the microphone.

3.3.1.2 The ambient sound level at the point of measurement (including wind effects) coming from sources other than the blower being tested shall be at least 10 dB(A) lower than the sound level of the blower.

3.3.1.3 Measurements shall be made only when the wind is less than 5 miles per hour (2.25 m/s), with gusts less than 12 miles per hour (5.4 m/s), with the wind in the direction away from the microphone toward the blower being tested.

3.3.1.4 Ambient conditions. The ambient air temperature shall be 41°F (5°C), or greater at the time of test.

3.3.2 Measurement of Sound Level in Sound Room (Alternate Method)

3.3.2.1 An anechoic or semianechoic chamber may be used for conducting sound level tests, provided that if the variation exceeds ± 0.5 dB(A) from the free-field test results, the correlation between the sound room measurement and free-field sound measurement shall be applied to the result obtained from the sound room. The correlation shall be confirmed with tests in free field conditions and tests in the anechoic chamber on the basis of identical machines and under equivalent conditions as specified in the applicable sections of this standard.

3.3.2.2 Sound levels for distances exceeding the dimensions of the chamber may be calculated from measurements taken in the chamber, provided sufficient data is available to substantiate such calculations. A floor covering in the chamber, which has sound attenuating qualities similar to grass, such as artificial grass or carpeting, shall be used.

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3.4 Blower Operation

3.4.1 The blower shall be adjusted in accordance with manufacturer's instructions, including the operating speed or carburetor setting.

3.4.2 Operator. The blower shall be operated by a person of medium height and build, in the manner recommended by the manufacturer. The operator shall wear typical and appropriate working clothes without acoustical absorbent or reflecting surfaces. (See Figures 1, 2, and 3.)

3.4.3 The blower shall be evaluated with each of the attachments that are shipped with the unit.

3.4.4 The attachments shall be mounted in accordance with the manufacturer's instructions.

3.4.5 All readings shall be taken with the blower running at wide open throttle and in a normal operating position with the lowest part of the nozzle at least 2 inches (51mm) but no more than 12 inches (30.5cm) above the ground cover. To insure consistency in readings, a support may be attached to the end of the nozzle, provided the support is demonstrated not to affect the sound level readings.

3.4.6 Prior to the test, the blower shall be run-in and warmed up per the manufacturer's instructions.

3.5 Measurements

3.5.1 The sound level meter shall be set for slow response and the A-weighting network.

3.5.2 Measurements shall be taken at every 45 degrees (a total of 8 different positions) with the microphone 50 feet (15m) from the operator and 4 feet (1.2m) above ground (See Figures 1- 4). The microphone shall be positioned with its axis of highest sensitivity generally parallel to the ground and pointed toward the blower operator. Five readings should be taken at each position at least 5 seconds apart. Each reading may be an average of minimum 2 seconds duration. The arithmetic average of the five readings is to be used in the calculation of the reported sound level. If the test data at each position vary more than 3 dB(A), the test shall be repeated until five sequential readings are within 3 dB(A) at each

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measuring position. If an analog sound level meter is used, the average of the highest and the lowest indicated readings shall be used.

NOTE: It is important that the operator stand straight at all times with shoulders square to the eight positions.

3.5.3 The individual reading the meter shall be at least 8 feet (2.4m) behind the microphone. Not more than one person other than the individual reading the meter and the operator shall be within 58 feet (17.7m) of the blower, and that person shall be directly behind the individual reading the meter, on a line through the microphone and the individual reading the meter. All other observers should be no closer that 100 feet (30.5m) to the blower or microphone.

3.5.4 The operator and blower shall rotate 360 degrees with respect to the microphone in a fixed position.

3.5.5 The reported sound level shall be the arithmetic average of the eight averaged readings taken as provided in 3.5.2 and rounded to the nearest whole decibel (ASTM E29).

3.6 General Comments

3.6.1 Recommendations

3.6.1.1 Technically trained personnel should conduct the test.

3.6.2 Precautions

3.6.2.1 Proper use of all test instrumentation is essential to obtain valid measurements.

3.6.2.2 Operating manuals and other literature furnished by the instrument manufacturer should be referenced.

3.6.2.3 Specific items to be considered are described as follows:

a) Instrumentation. The type of microphone and its orientation relative to the source of noise should be considered. The microphone shall be positioned with its axis of highest sensitivity generally parallel to the ground and pointed toward the blower operator.

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b) Weather. The effect of ambient weather conditions on the performance of all instruments should be taken into consideration.

c) Equipment Installation. Proper signal levels, terminating impedances, and cable lengths on multi-instrument measurement systems should be checked.

d) Calibration:

1) Proper acoustical calibration procedures shall be observed.

2) Field calibration shall be made immediately before and after each test sequence. Either an external-calibrator or internal-calibration means is acceptable.

3) All test results shall be considered invalid if the recheck by external calibration is not within 0.5dB(A) of the initial calibration.

3.7 Test Data to be Recorded.

The recorded test data should include the following:

(1) Geographical location.
(2) Date and time.
(3) Names of blower operator, sound-level meter reader and observer.
(4) Weather conditions, including ambient temperature and wind velocity.
(5) Make, type, and serial number of measuring equipment.
(6) Make, model, displacement, and serial number of blower being tested.
(7) Type of blower (hand-held or backpack) and all attachments.
(8) All sound level readings taken (see Table 1).
(9) Engine speed (rpm).
(10) Documentation of microphone, blower, and attachment orientation. (For example, see Fig. 1.)
(11) Ambient sound level.
(12) Date of most recent calibration of the acoustical calibrator.

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Table 1

Measuring Position	Individual test reading at each position [dB(A)]					Arithmetic Average [dB(A)] of readings
	1	2	3	4	5	
0°						
45°						
90°						
135°						
180°						
225°						
270°						
315°						
Reported Average of the measuring positions:						

4 Labeling

4.1 The power unit shall be clearly and durably marked with the following or suitably paraphrased statements (pictorial or graphic illustrations may be used in lieu of, or in addition to, written statements):

(1) The sound level, as reported in section 3.5.5, shall be clearly and durably marked on the unit and identified as decibels (dB(A)) using simple block characters at least 0.25 inches (6mm) high.

(a) If a power unit is shipped with more than one attachment, the highest sound level per section 3.5.5 shall be marked.

(b) Sound levels with other attachments may also be marked on the power unit.

(c) The wording "measured at 50 feet (15 m) per ANSI B175.2" shall accompany the numerical noise level.

(d) The label shall also include a designation of the sound level category - Category I, Category II or Category III.

(2) WARNING! Read and follow all safety precautions in the operator's manual. Failure to follow these instructions could result in serious injury.

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(3) Advise the operator to always wear hearing protection.

5 Operator Manuals

5.1 Safety Precautions

The safety precautions set forth in 5.1.1 through 5.1.7 may be used verbatim or suitably paraphrased in the operator manual(s) (pictorial or graphic illustrations may be substituted in lieu of, or used in addition to, the written statements):

5.1.1 To reduce the risk of hearing loss associated with sound level(s), hearing protection is required.

5.1.2 To reduce the risk of injury associated with thrown objects:

(1) Always wear eye protection and foot protection. Eye protection should meet the requirements of ANSI Z87.1.
(2) Do not allow bystanders in work area.
(3) Do not point the blower nozzle in the direction of people or pets.

5.1.3 To reduce the risk of injury associated with objects being drawn into rotating parts, do not wear loose clothing, scarves, neck chains, unconfined long hair, and the like.

5.1.4 To reduce the risk of injury associated with the inhalation of dust, use a face filter mask in dusty conditions.

5.1.5 To reduce the risk of injury associated with contacting rotating parts, stop the engine before installing or removing attachments. Do not operate without guard(s) in place. Always disconnect the spark plug before performing maintenance or accessing movable parts.

5.1.6 To reduce the risk of injury associated with exhaust fume inhalation, do not operate in unventilated area.

5.1.7 To reduce the risk of fire and burn injury:

(1) Handle fuel with care. It is highly flammable.
(2) Do not smoke while handling fuel.
(3) Do not refuel a hot engine.

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(4) Do not refuel a running engine.
(5) Avoid spilling fuel or oil. Always wipe unit dry before using.
(6) Move at least 10 ft. (3 meters) away from the fueling point before starting engine.
(7) Always store gasoline in a container approved for flammable liquids.
(8) Make sure the unit is properly assembled and in good operating condition.

5.2 Operating Techniques -- Operator Manual Recommendations

5.2.1 Operate power equipment only at reasonable hours--not early in the morning or late at night when people might be disturbed. Comply with times listed in local ordinances.

5.2.2 To reduce sound levels, limit the number of pieces of equipment used at any one time.

5.2.3 Operate power blowers at the lowest possible throttle speed to do the job.

5.2.4 Check your equipment before operation, especially the muffler, air intakes and air filters.

5.2.5 Use rakes and brooms to loosen debris before blowing.

5.2.6 In dusty conditions, slightly dampen surfaces or use mister attachment when water is available.

5.2.7 Conserve water by using power blowers instead of hoses for many lawn and garden applications, including areas such as gutters, screens, patios, grills, porches and gardens.

5.2.8 Watch out for children, pets, open windows or freshly washed cars, and blow debris safely away.

5.2.9 Use the full blower nozzle extension so the air stream can work close to the ground.

5.2.10 After using blowers and other equipment, CLEAN UP! Dispose of debris in trash receptacles.

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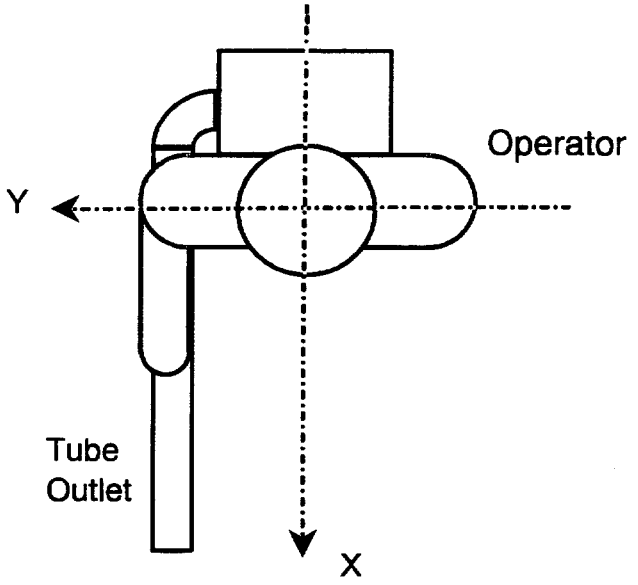


Figure 1: Backpack Blower (Top View)

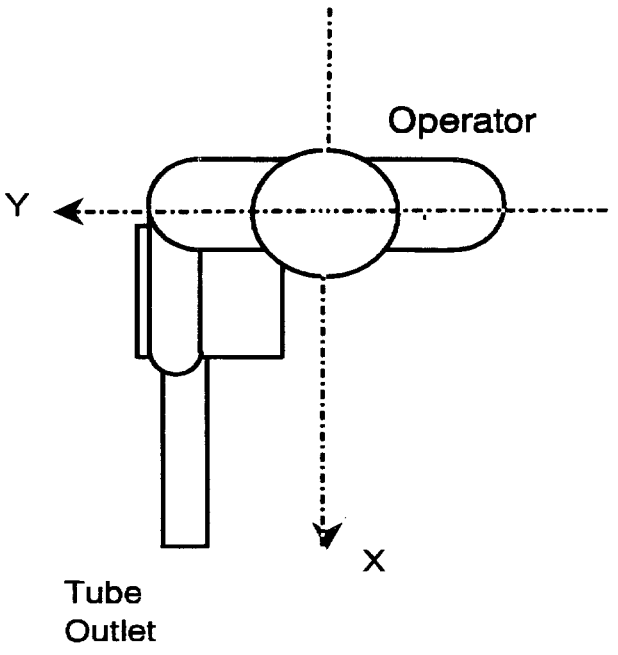


Figure 2: Hand-held Blower (Top View)

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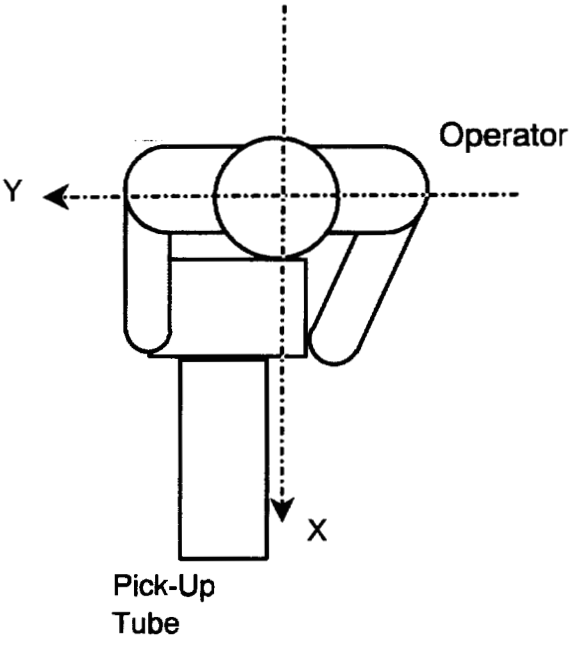


Figure 3: Hand-held Vacuum (Top View)

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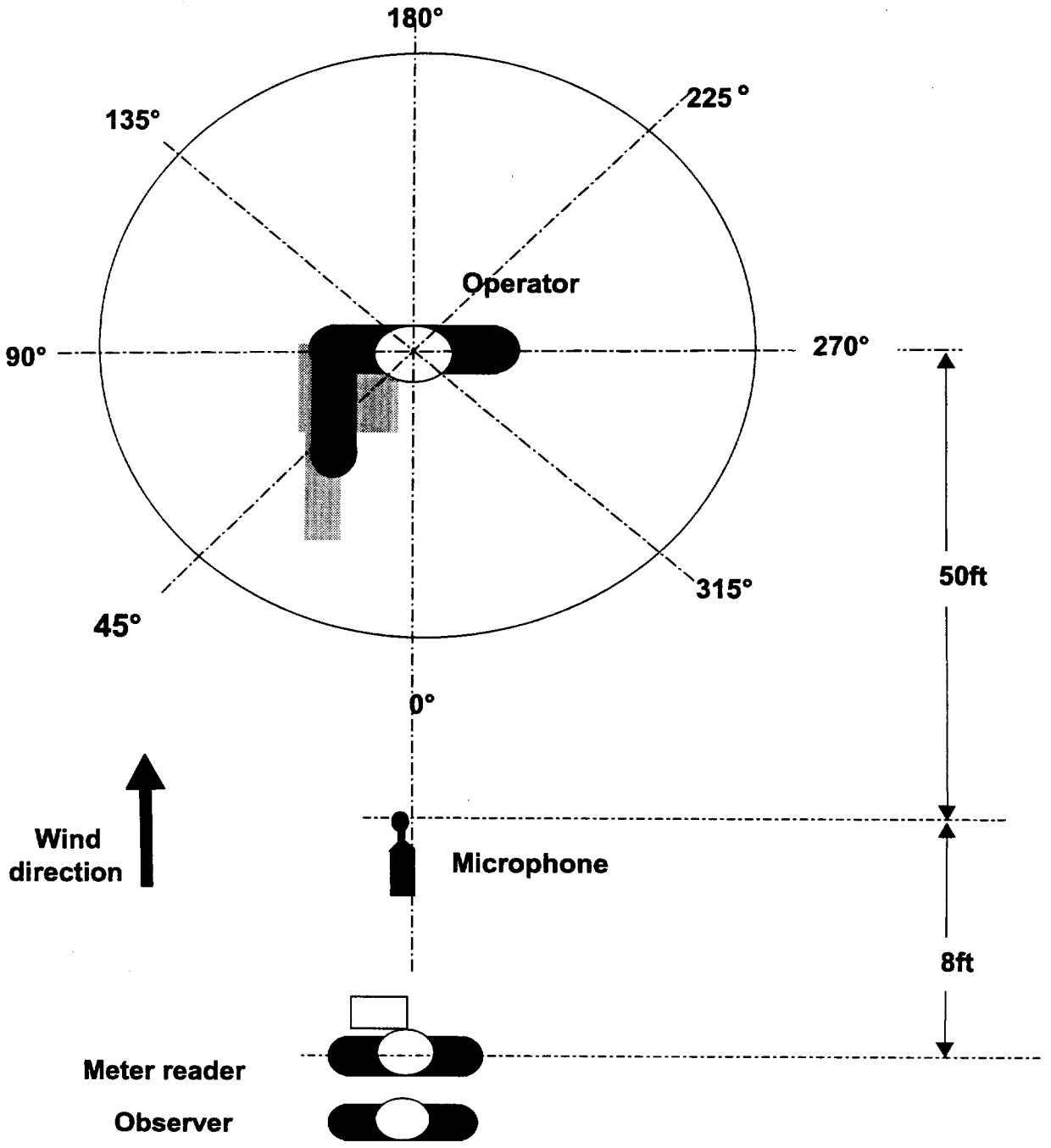


Figure 4: Orientation of the test machine, microphone and personnel for sound level testing at 50 feet

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