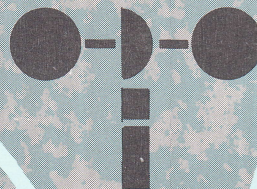


GURLEY WIND INSTRUMENTS

W. & L. E. GURLEY, TROY, NEW YORK • SCIENTIFIC AND SURVEYING INSTRUMENT MAKERS SINCE 1845



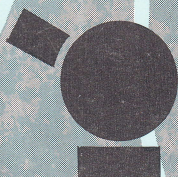
ANEMOMETERS



WIND DIRECTION INSTRUMENTS



WIND RECORDERS



PILOT BALLOON THEODOLITES

GURLEY WIND INSTRUMENTS

BULLETIN No. 6000

NOVEMBER 1968

Established 1845

W. & L. E. GURLEY, Troy, New York

A TELEDYNE COMPANY

Telephone (518) 272-6300

PRODUCTS AND SERVICES

Manufacturers of Engineering and Surveying Instruments, Hydrological and Meteorological Instruments, Paper Testing Instruments, Standard Weights and Measures, Special Optical and Electronic Instruments, Reticles.

COMPLETE INSTRUMENT GROUPS FOR MOST REQUIREMENTS

| INSTRUMENT GROUP | WIND VELOCITY | | WIND DIRECTION | | WIND RECORDER | SUPPORT | SHIPPING WEIGHT (lbs.) |
|---------------------|------------------|-----------|-------------------|-----------|------------------|---------|------------------------------|
| | Transmitter | Indicator | Transmitter | Indicator | | | |
| No. 6110 | 6040 | — | 6541 | — | 6210-6260 | * | 400 |
| No. 6115 | 6040 | 6053 | 6533 | 6553 | 6270 | 6300 | 275 |
| No. 6120 | 6040 | — | 6533 | — | 6270 | 6301 | 265 |
| No. 6125 | 6040 | 6093 | 6533 | 6553 | — | 6301 | 150 |

*Not furnished separately

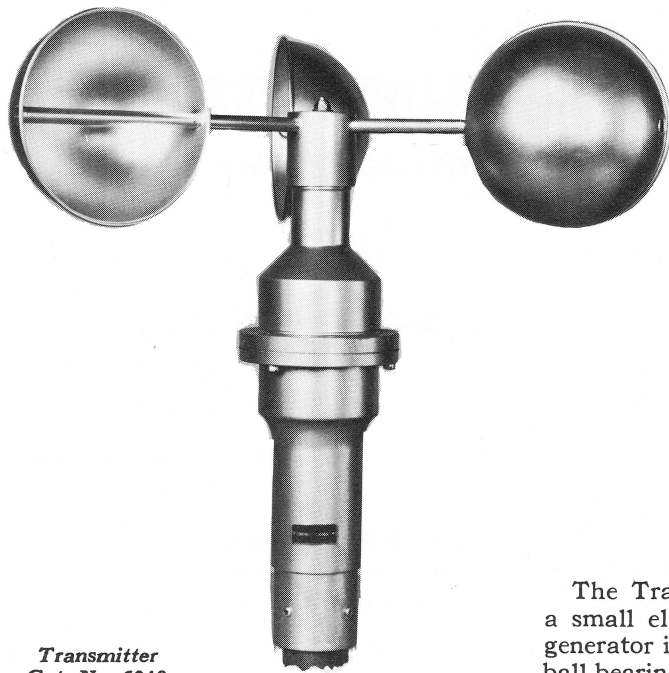
No. 6110 is a Portable Automatic Wind Recording Outfit (see page 11) for recording wind where electric power is not available. No. 6125 is a complete outfit for indicating and recording wind. No. 6120 provides for Wind Recording, but not Indicating. No. 6125 is intended for Wind Indicating but not Recording.

When Recorders are furnished with one of the Instrument Groups listed above, 25 charts and sufficient ink, enough for a year's normal operation, is supplied.

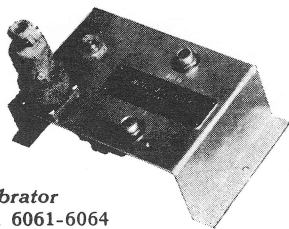
Wind Indicators are mounted in 19-inch steel panel, No. 6314.

Wind Instrument Supports are wired internally.

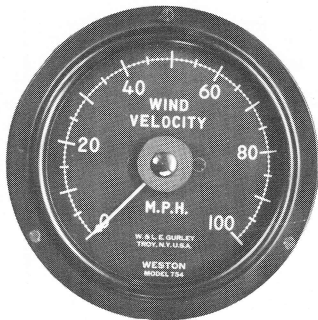
Double Obstruction Light (No. 6302) is supplied unless otherwise ordered with No. 6115 Group. It may be deducted — see Price List.



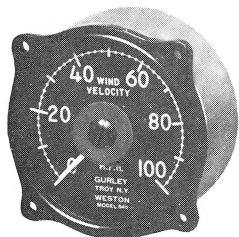
Transmitter
Cat. No. 6040



Calibrator
Cat. Nos. 6061-6064



No. 6053
Wind Velocity Indicator
4 $\frac{1}{8}$ " diam. face
270° scale



No. 6052
Wind Velocity Indicator
2 $\frac{3}{4}$ " diam. face, 270° scale

GURLEY DC ANEMOMETER

The Gurley DC Anemometer requires no outside power to indicate and record wind velocity. It is accurate within 2% at velocities from about 2 to 100 miles per hour. It is designed for use at airports, weather stations, homes, industrial and marine use, sea-shore places, and any place where a continuously operating self-powered wind velocity instrument is needed.

Transmitter

The Transmitter is a 3-cup rotor which turns the armature of a small electric generator mounted in a weatherproof case. The generator is of the highest grade. It is equipped with stainless steel ball bearings and shaft, "Alnico" permanent magnets, silver brushes and commutator, is totally enclosed, and practically moisture-proof. Servicing is needed very infrequently. The housing mounts on a pipe adaptor, which fastens to a standard 1 $\frac{1}{4}$ " pipe support.

All metal parts are treated to resist salt water corrosion. All plastic and organic material parts are impregnated against effects of very high humidity and variable temperature conditions. In addition, parts subject to attack by fungus growth may be treated with fungicide on special order.

Calibrator

A Calibrator is supplied with each Transmitter. It consists of a resistance which has been adjusted and sealed at the Factory to match the Transmitter. Jacks for one or more Indicators and for a Recorder, if desired, are built into the Calibrator.

Indicators

The Indicators are Weston milliammeters, mounted in circular flush-mounting cases, 5 $\frac{9}{16}$ " and 3 $\frac{1}{16}$ " diameter. The scales are 270°, 10 $\frac{1}{4}$ " and 6 $\frac{1}{2}$ " long, respectively, and are easily readable from some distance. Pointers are adjustable by a screw in the center of the glass face for zero setting. The pointers, principal divisions, and numerals are painted with self-luminous paint.

The Calibrator is mounted on the back of the Indicator when only one Indicator is to be used. If more than one Indicator, or a Recorder is ordered, or to be added later, the Calibrator is mounted on a bracket, as illustrated.

The Transmitter and Indicator are connected by two wires. Any reasonable number of extra Indicators can be operated in parallel from the same Transmitter without affecting accuracy, in addition to a No. 6200, 6210, or 6270 Graphic Recorder.

SPECIFICATIONS OF GURLEY DC ANEMOMETER

No. 6040 Transmitter

Twelve inches high, cup assembly 18" diam. Plastic or aluminum cups, light weight tubular aluminum arms. Cast aluminum housing, multi-groove baffle and rain-shield to exclude rain and dust. Housing fastens to pipe adapter to fit on 1 1/4" pipe (1.66" outside diameter). Generator turned by cups. Generator is fully enclosed and weather-proof for all practical purposes; generates about 15 volts direct current at 100 mph. Requires 2 wires to connect to Calibrator (which is furnished with the Transmitter), resistance not exceeding 20 ohms per line.

No. 6052 Indicator

3 1/8" Outside diameter, 2 3/4" face, aircraft instrument type case, flush mounting. Zero adjustment to pointer. Graduated 0-100 Miles per Hour, figured each 20 mph; self-luminous pointer, figures and 10-mile divisions. 270° scale.

6052-M Like No. 6052, but graduated 0-150 Kilometers per hour.

No. 6053 Indicator

5 9/16" Outside diameter, 4 1/8" face, flush mounting case. Zero adjustment to pointer. Graduated 0-100 Miles per Hour, figured each 20 mph; self-luminous pointer, figures, and principal divisions. 270° scale.

6053-M Like No. 6053, but graduated 0-150 Kilometers per hour.

Calibrator

The Calibrator provides means for adjusting the voltage output of the generator (in the Transmitter) to a pre-determined value, in order to match a standard electrical Indicator. It consists of a potentiometer which is adjusted and sealed at the Factory, and one or more fixed resistors which equal the resistance of extension Indicators and Recorder.

Where only one Indicator is ordered, the Calibrator is mounted on the back of the Indicator.

If more than one Indicator, or a Recorder, or both are to be used, the Calibrator consists of a sealed potentiometer with jack outlets for 2, 3, or 4 Indicators, with or without a Recorder, mounted on a separate bracket. When the Indicators or Recorder are plugged into the outlets, the meter or Recorder is automatically substituted for a fixed resistance. Consequently the addition of extra Indicators and Recorder have no effect on the accuracy or calibration of the instrument. This type of Calibrator is designated as Cat. Nos. 6062, 6063, 6064, the last digit indicating the number of Indicator outlets; and if a Recorder is required, the letter "R" is also added, as No. 6062-R.

A service cord is supplied to connect this type of Calibrator to each Indicator and Recorder.

Indicator Numbers with Different Calibrators

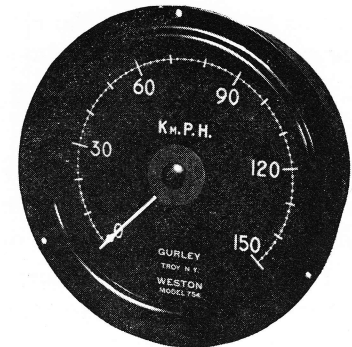
When the Indicator and Calibrator are a single unit, the 3 1/8" Indicator is Cat. No. 6092 and the Calibrator is Cat. No. 6361. The 5 9/16" Indicator is designated Cat. No. 6093, Calibrator No. 6371.

When the Calibrator is not mounted on the Indicator, but is on a separate bracket (No. 6062-R, etc. — see third paragraph for explanation) the Indicators are Cat. Nos. 6052 (3 1/8" diam. size) and 6053 (5 9/16" diam. size).

Summary of Indicators and Calibrators

| Provision for Only One Indicator | Indicator Size | Indicator Cat. No. | Calibrator Cat. No. |
|--|----------------|--------------------|---|
| | 3 1/8" | 6092 - 6092-M | 6361 |
| | 5 9/16" | 6093 - 6093-M | 6371 |
| More Than One Indicator; or Indicator and Recorder | 3 1/8" | 6052 - 6052-M | 6062, 6063, 6064, or 6062-R, 6063-R, 6064-R (R indicates Recorder Outlet) |
| | 5 9/16" | 6053 - 6053-M | |

Customers need only instruct us as to whether one or more Indicators are required, and correct Calibrator will be supplied.



No. 6053-M Indicator with 0-150 Kilometer per Hour graduations.

Complete Instruments

Includes Transmitter, Calibrator and One Indicator

| Cat. No. | | Transmitter | Composed of: Calibrator | Indicator |
|----------|--|-------------|----------------------------|-----------|
| 6010-A | For airports and other use where the large Indicator is desired. | 6040 | 6371 | 6093 |
| 6010-B | For panels and any use where the aircraft type instrument Indicator is wanted. | 6040 | 6361 | 6092 |

Weight of outfits, net 17 lbs., shipping weight, domestic 50 lbs., foreign 90 lbs.

GURLEY WIND DIRECTION INSTRUMENT

Alternating-Current Type

Airports, weather stations, yacht clubs, store and office buildings, homes, and industrial concerns can use this instrument to indicate the direction of the wind at any reasonable distance from the Transmitter. It will operate one, two or three Indicators, and will also operate a Recorder and one Indicator at an accuracy of 5°.

Self-synchronous motors are used, one in the Transmitter attached to the wind vane, the other turning the pointer of an Indicator. The position of the rotor of the sending motor is followed instantly by the receiving motor.

Transmitter

The Transmitter has a light wind vane, of modern simple design, which is sensitive at low velocities, and operates with a minimum of oscillation. The sending motor is mounted in a compact weatherproof housing. This motor is fitted with bearings of the highest quality, and is carefully protected against moisture. Servicing should be needed only at infrequent intervals. The housing mounts on a pipe adaptor which fastens to 1 $\frac{1}{4}$ " pipe. The electrical connections are made through a plug and socket.

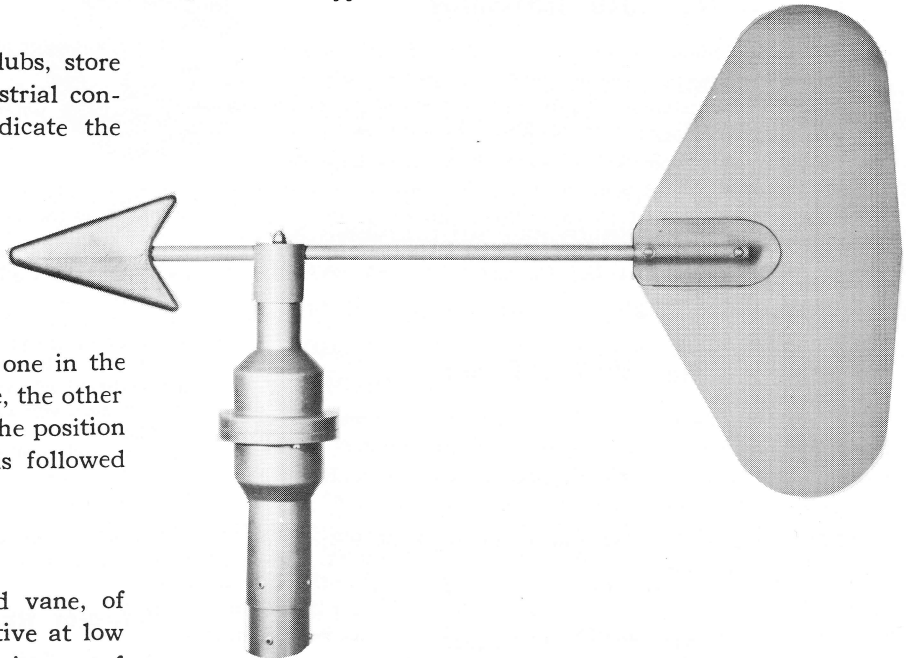
Indicator

The Indicator is a similar self-synchronous motor, which, in following the position of the wind vane, rotates a pointer over a circular dial.

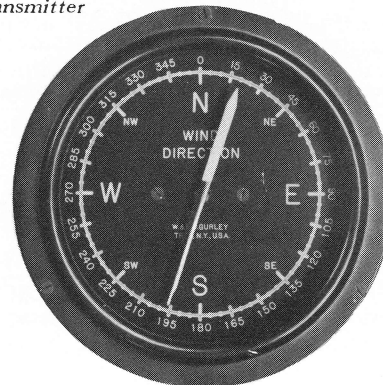
The Indicator is 5 $\frac{3}{8}$ " outside diameter, catalog number 6553. It is regularly made with self-luminous paint on the pointers and principal characters. The dials are graduated each 5° from 0° - 355°, figured each 15°, and lettered at the cardinal and intercardinal points.

Five wires are needed to connect Transmitter and Indicator, of a size that the resistance will not exceed 10 ohms. 110-130 volt, 60 cycle single phase power is required at some point in the circuit.

All metal parts are treated to resist salt water corrosion. All plastic and organic materials are impregnated against effects of very high humidity and variable temperature conditions. In addition, all parts subject to fungus growth may be treated with fungicide.



No. 6533 Transmitter



No. 6553 Indicator

COMBINATIONS:

No. 6502-A

No. 6533 Transmitter

No. 6553 Indicator

SPECIFICATIONS OF GURLEY WIND DIRECTION INSTRUMENTS

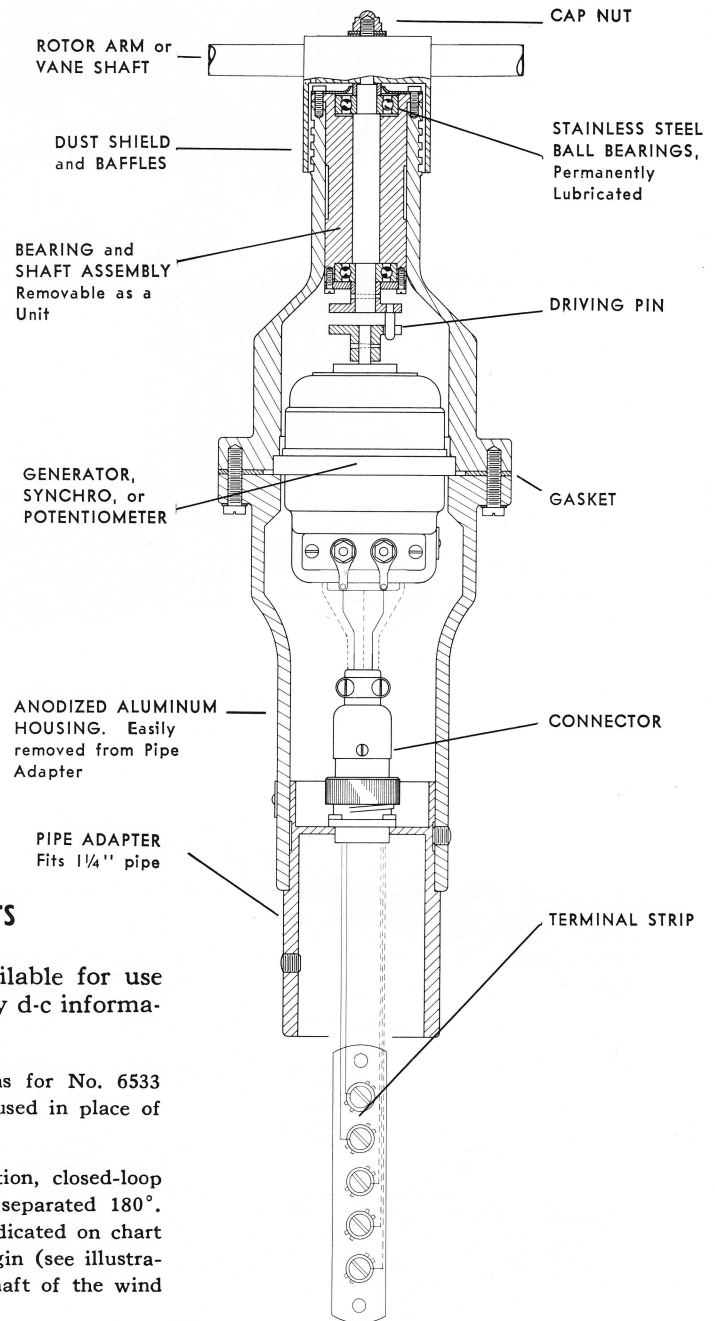
No. 6533 Transmitter

Height 14½", vane 26½", vane clearance diameter 35". Light weight, balanced vane. Cast aluminum housing, multi-groove baffle and rainshield to exclude dust and moisture. Housing fastens to pipe adapter to fit on 1¼" pipe (1.66" outside diameter). Fully enclosed, weather-proof self-synchronous motor operating on 110-120 volts 60 cycle single phase AC, mounted in housing. Wired through plug and socket to pipe adapter (to which the connecting wires are brought). Requires 5 wires to connect to Indicator, resistance not exceeding 10 ohms per line.

No. 6553 Indicator

Outside diameter 5⁹/₁₆", face 4¹/₈", flush mounting metal case. Pointer turned by self-synchronous motor to show position of the Transmitter wind vane. Dial graduated 0° — 355° each 5°, numbered clockwise each 30°, and having cardinal and inter-cardinal letters. Self-luminous pointer and principal letters. Six foot lead with plug for connection with AC source of power.

NOTE: If other than 60 cycle AC power is to be used, order should designate frequency available.



DIRECT - CURRENT WIND DIRECTION INSTRUMENTS

Two models of Wind Direction Transmitters are available for use in recording wind direction, where the Recorder accepts only d-c information, or where alternating current is not available:

Specifications: The construction and dimensions are the same as for No. 6533 Wind Direction Transmitter (above). However, a potentiometer is used in place of the self-synchronous motor. The output is direct-current.

No. 6541 Wind Direction Transmitter contains a continuous-rotation, closed-loop potentiometer, having 2 taps, separated 180°, and a double-wiper, separated 180°. Recorder pen reverses direction at 0° and 180°. East, or West is indicated on chart of Recorder by an additional pen, making a trace on the chart's margin (see illustration on page 7). The marginal pen is activated by a cam on the shaft of the wind vane, which actuates a microswitch through each 180°.

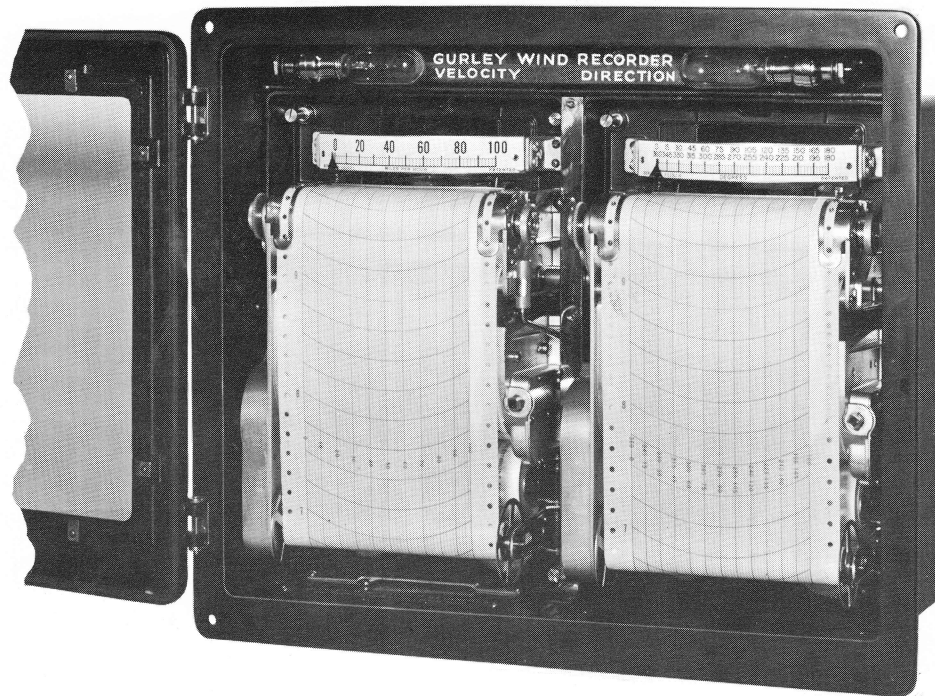
Power Requirement, 12 volts. Electrical output to specification.

No. 6542 Wind Direction Transmitter contains a continuous-rotation potentiometer, having 2° electrical "dead zone" at 358°-360°, and with a power supply and a 2-second time-delay circuit, mounted separately. Normally used with Recorders showing wind direction from 0°-360° across the chart. The "dead zone" and time-delay circuit prevent the Recorder pen from excessive reversals at North.

Power requirements 12 volts (from power supply). Electrical output to specification.

Construction of No. 6040 Wind Velocity and No. 6533 Wind Direction Transmitters. Stainless steel shaft from rotor or vane turns in sealed ball bearings, lubricated for all normal temperatures, connected by driving pin to motor. Entire Transmitter conveniently removable by disconnecting the aircraft-type connector mounted in the Pipe Adapter. Terminal strip facilitates attaching the connecting wires from the Indicator.

RECORDERS FOR WIND VELOCITY AND DIRECTION



No. 6270 Wind Recorder; in flush-mounting case for installation in relay rack or cabinet. Makes 15 day record of wind velocity and direction between change of charts.

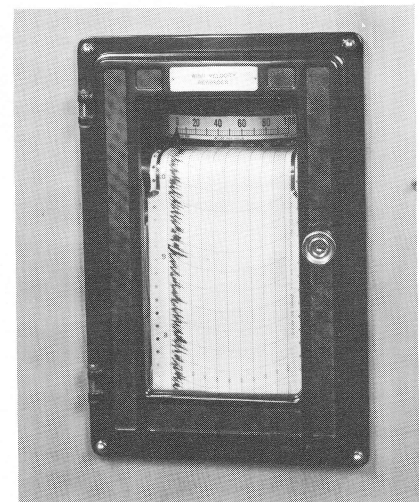
Continuous graphic records of wind velocity and wind directions are made by these recording instruments.

A standard Graphic Recorder connected to a Gurley DC Anemometer shows the variations that continually occur in wind velocities. The Recorder has a normal chart speed of 3 inches per hour, and one chart will contain 15-2/3 days' record at that speed. For conditions of extreme gustiness, where velocities may change several hundred percent within a few seconds, a change-over chart speed of 3 inches per minute is provided.

The wind direction record is made by a self-synchronous motor mounted in the Recorder, with a cam attached to its shaft. The recording motor is wired to the self-synchronous motor in the No. 6533 Transmitter. Motion of the cam actuates a pen to travel across the chart, which is graduated 0°-180°/360°-180°. The pen moves from left to right in recording direction from North to East to South; and from right to left, in the South-West-North half of the compass. An auxiliary pen drawing a line on the chart margin indicates by a change of position in which segment the direction is being recorded.

DIMENSIONS AND WEIGHTS

| Model | Inches Width | Inches Height | Inches Depth | Net | Approximate Pounds | |
|----------|--------------------------------|--------------------------------|-------------------------------|-----|--------------------|---------|
| | | | | | Domestic | Foreign |
| No. 6200 | 10 ³ / ₄ | 16 | 8 ¹ / ₂ | 38 | 75 | 95 |
| No. 6210 | 8 ³ / ₈ | 14 ¹ / ₂ | 8 ³ / ₄ | 34 | 70 | 90 |
| No. 6250 | 10 ³ / ₄ | 16 | 8 ¹ / ₂ | 41 | 80 | 90 |
| No. 6270 | 19 | 16 | 8 ¹ / ₂ | 65 | 115 | 135 |



*No. 6200
Wind Velocity Recorder*

RECORDERS FOR WIND VELOCITY AND DIRECTION

The chart is driven by a powerful synchronous electric clock through gears which move the chart roll. All Recorders are regularly equipped with a quick change-over lever to permit use of either of the two speed ranges provided, 3" per hour, or 3" per minute.

The Recorder cases mount flush in a panel, except No. 6210 Portable Wind Velocity Recorder, which is in a self-contained case with carrying handle. All Recorders have clear glass doors with lock and key, can be serviced entirely from the front and the charts and scale are illuminated.

Charts are 108 ft. long, ruled 4½" wide, and are individually packed in cardboard boxes with a space at the end for recording data. The ink supplied is a superior product which does not evaporate quickly in the inkwell, but is absorbed quickly by the chart. It can be used in high or low temperatures. It is supplied in 2 oz. and in 1 pint bottles in red or green. The Recorder inkwell holds 1 oz. of ink — enough for several weeks' use. The inkwell lifts out for cleaning and refilling. The pen point is glass.

Wind velocity and wind direction are recorded simultaneously by No. 6270 twin Recorder, having one clock and chart drive.

AC power, 115 volt, 50 or 60 cycles, is required to operate the electric clock, or a spring driven clock can be supplied at the same price for use in the portable instrument.

Models

No. 6200 Wind Velocity Recorder, flush type case, with interchangeable time scales of 3 in. per hour and 3 in. per minute, synchronous electric clock, recording wind velocities from 0 to 100 miles per hour\$

No. 6210 Wind Velocity Recorder, in portable case with carrying handle and with spring-driven clock, otherwise like 6200\$

No. 6250 Wind Direction Recorder, flush type case, range 0°-360°, scale 0°-180°/360°-180°; with interchangeable time scales of 3 in. per hour and 3 in. per minute, synchronous electric clock\$

No. 6270 Wind Velocity-Wind Direction Recorder. The left-hand instrument is the velocity recorder and has the chart drive. The right-hand instrument is the Direction Recorder and is coupled to the Velocity Recorder chart drive; in flush switchboard case with synchronous electric clock drive.

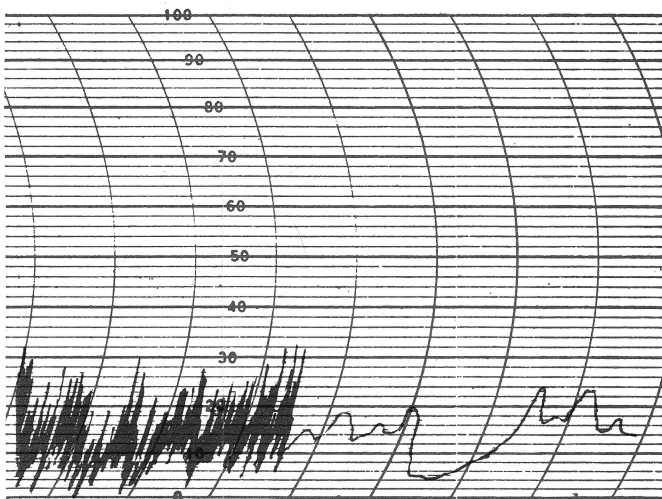
6240-C Wind Velocity charts, 108 ft. long, in cardboard box, each\$

6241-C Wind Direction charts, 108 ft. long, in cardboard box, each\$

No. 6242 Ink, red or green, 2 oz. bottle\$

No. 6243 Ink, red or green, pint bottle\$

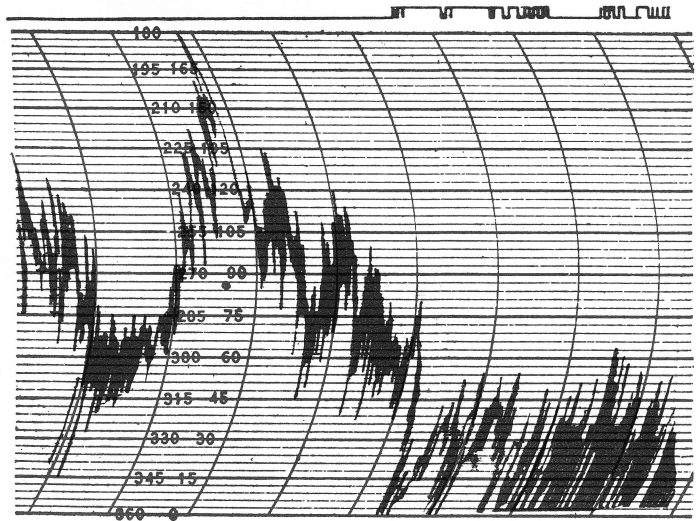
Wind Velocity and Direction Charts



Wind Velocity chart. Each section contains 15 minutes' record at the normal speed of 3 inches per hour; or 15 seconds' record when operated at 3 inches per minute. The faster record helps analyze gusty or unusual wind conditions.

Charts are available for 0 — 100 mph, — 150 Km. p.h., or 0 — 120 Knots. The chart drive is a powerful synchronous electric motor, although a spring-driven clock is available where the electric supply is not available or not reliable.

The record illustrated shows both the fast and regular chart speeds.



Wind Direction is recorded by the pen traces in the chart and on the margin. If the wind is East of North, the record will be from 0° (North) to 180° (South) (East being 90° since direction is read clockwise, from 0° to 360°). East being to the right of North, the marginal trace is in its right-hand position. Winds from the West or left of North will be read as an angle of 180° to 360°, and indicated by the marginal trace in the left-hand position.

GURLEY UNIVERSAL ANEMOMETER



Reads Wind Velocity in Miles per Hour, Kilometers per Hour, and Knots

There is a growing requirement at airports for wind measurement to be expressed in more than one unit. It is for this purpose that the Gurley Universal Anemometer is offered. This instrument enables the observer to report wind velocities immediately in either: (1) Miles per Hour; (2) Kilometers per Hour; (3) Knots.

Description of Instrument

The *Transmitter* is the standard No. 6040 Wind Velocity Transmitter (described on pages 2 - 3).

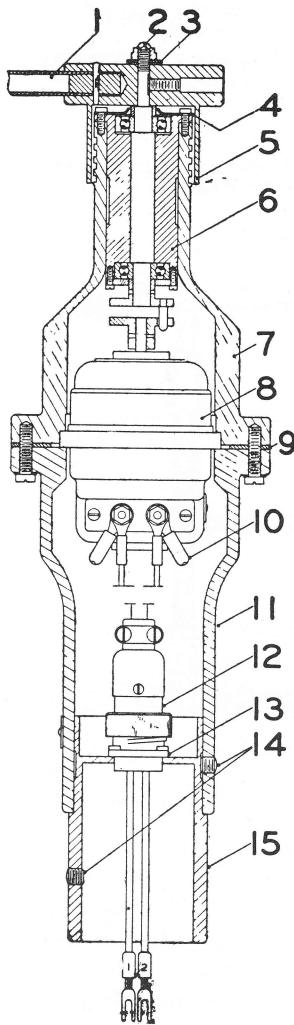
The *Calibrator* contains three separate calibrating circuits, which are adjusted to interpret the speed of the rotor in Miles per Hour (mph); Kilometers per Hour (Kmph); and Knots. (Kn). The Calibrator is connected by two wires to the Transmitter. A switch on the Calibrator provides for making the wind reading in one of the three units.

The *Indicator* is similar to the regular No. 6053 Indicator (pages 2 and 3) except that its dial is graduated 0-160. Principal divisions and numerals are luminous, as is the pointer. When the Calibrator switch is at the unit desired, the indicator reads velocities in that unit. (100 mph is equal to 160.9 Kmph, or 86.8 Knots).

No. 6011-U Gurley Universal Anemometer, composed of No. 6040 Transmitter, No. 6061-U Calibrator, and No. 6053-U Indicator

Shipping weight, domestic 50 lbs., foreign 100 lbs. \$

GURLEY CIRCUIT-ACTUATING WIND VELOCITY TRANSMITTER



No. 6041 Wind Velocity Transmitter, with built-in Calibration resistors.

No. 6041 Wind Velocity Transmitter is used for military and industrial purposes, and is designed to actuate electrical circuits or operate alarms at pre-determined wind velocities. Completely self-powered, compact, light weight Transmitter is fitted with a calibrated network to afford precise regulation of current to the external circuit. In a typical application, the Transmitter is connected to a 475-ohm load, and at 100 MPH the delivered current is 3.85 milliamperes ($\pm 2\%$). Since the current is proportional to wind speed, the external circuit can be designed to operate at a critical wind velocity.

No. 6041 Wind Velocity Transmitter

All parts treated to resist salt water, humidity and fungus attack, calibrated to specific external circuit resistance; 12" high, cup assembly 18" diam., weight 4½ lbs.

- | | |
|-------------------------|--|
| 1. Rotor Arm. | 9. Neoprene Gasket. |
| 2. Cap Nut. | 10. Cable Assembly (Including Built-In Calibration Resistors). |
| 3. Sealing Washer. | 11. Lower Housing. |
| 4. Bearing Dust Shield. | 12. Socket Connectors. |
| 5. Hub & Rain Shield. | 13. Plug Connector. |
| 6. Bearing Assembly. | 14. Socket Set Screws. |
| 7. Upper Housing. | 15. Pipe Collar Assembly. |
| 8. Generator. | |

No. 6041 Wind Velocity Transmitter

PROTECTION ANEMOMETER SYSTEM

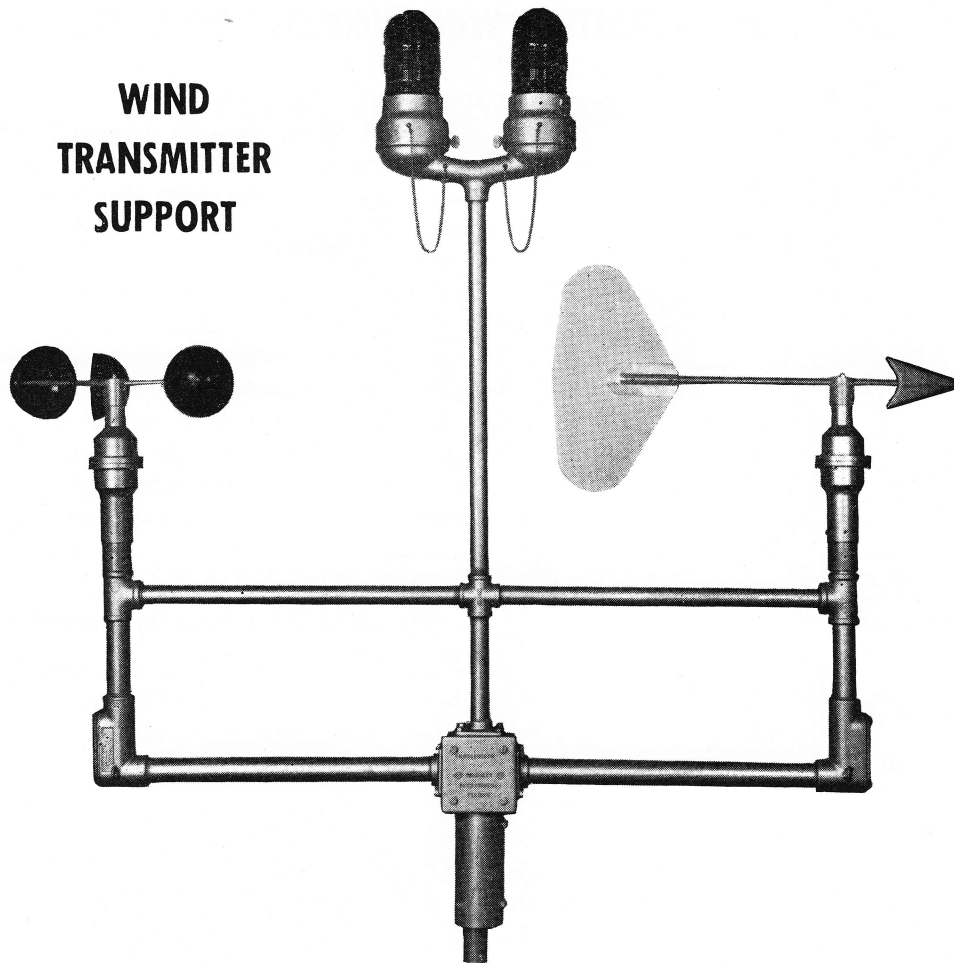
The Gurley Protection Anemometer System provides both normally-open and normally-closed contact points which can sound remote alarms or shut off current from equipment, which might otherwise be damaged by operation during high winds. The System is useful in providing automatic protection for large gantry cranes, ore bridges, and similar structures.

Variations of this System can be supplied, capable of providing control at two or more different wind velocities.

The System consists of one each of the following components: — No. 6040 Wind Velocity Transmitter; No. 6053 Wind Velocity Indicator with special Calibrator; a Sensitive Relay, a Power Relay and Power Supply, together with an alarm horn and green and red signal lights. The instruments (except the Transmitter) are mounted in a standard 19 in. x 7 in. steel panel.

No. 6130 Protection Anemometer System

**WIND
TRANSMITTER
SUPPORT**

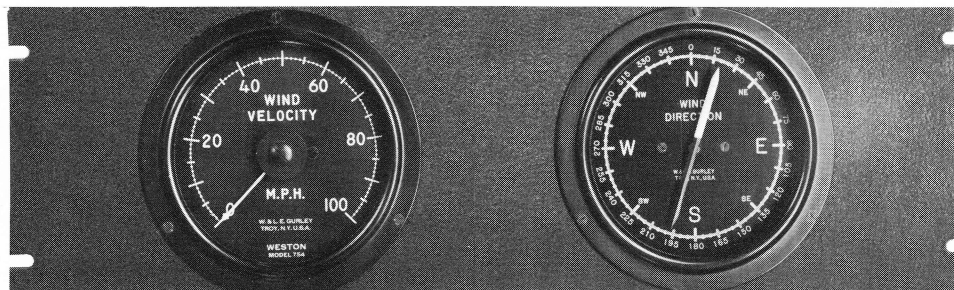


This support is equipped with junction boxes to facilitate wiring. Eyelets for attaching guy wires or rods are provided. Designed for mounting by slip-fitter with set screws on 2½ inch pipe, which is usually fabricated at location. Drawing with dimensions and method of bracing furnished on request.

The red double obstruction light is offered where installation is at or near an airport, but may be omitted.

Dimensions: Height, bottom of slip-fitter to top of obstruction light, 62 inches; length of arms, each 26 inches. Shipping weight, approximately 100 lbs.

- No. 6300 Duplex Support for Wind Transmitters, including red double obstruction light \$
- No. 6301 Duplex Support for Wind Transmitters, omitting red double obstruction light \$
- No. 6302 Double Obstruction Light with red globes (shipping weight 22 lbs.) \$



No. 6053 Wind Velocity Indicator and No. 6553 Wind Direction Indicator

Instrument Panel

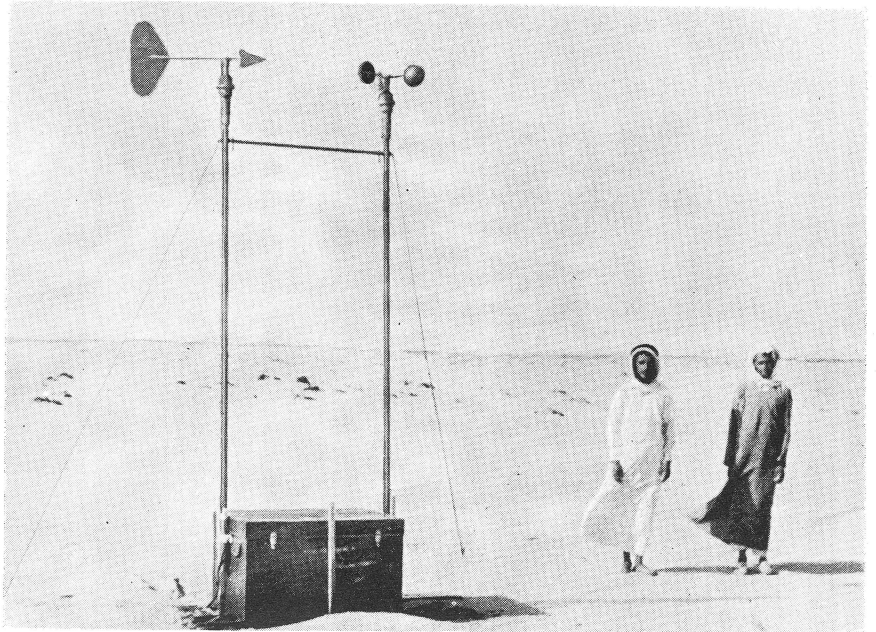
Consists of standard 19-inch steel panel, 7 inches high for 4½" dial Indicators and 5¼ inches high for 2¾" dial Indicators. Slotted for attachment to a radio relay rack support or cabinet. Gray crackle finish regularly supplied; black crackle finish optional.

- No. 6314 Panel Mounting for 4½" Indicators \$
- No. 6312 Panel Mounting for 2¾" Indicators \$

**PORTABLE
AUTOMATIC
WIND
INSTRUMENTS**

Gurley recording station for wind velocity and direction in use in the Arabian desert. These instruments are serviced only twice per month.

Courtesy Arabian-American Oil Co.



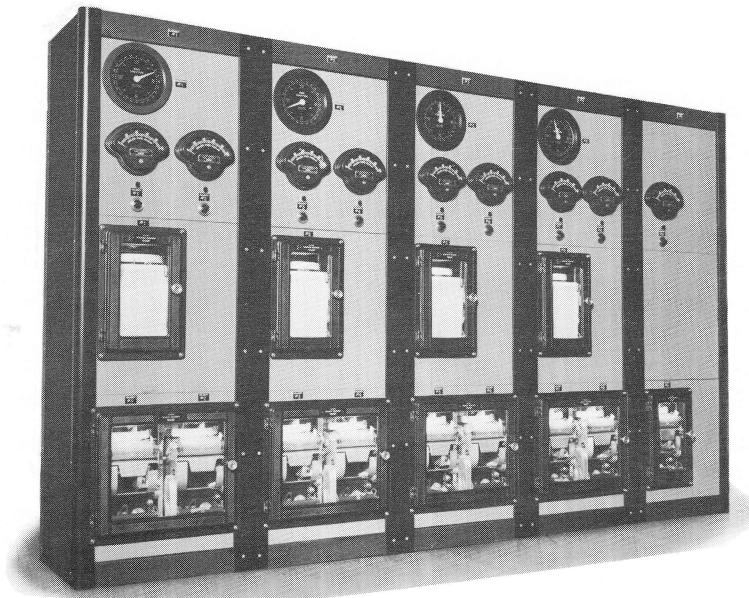
In remote locations where electric power is not available, wind records can be obtained with a Gurley portable automatic instrument. This consists of a regular No. 6040 Wind-powered Wind Velocity Transmitter connected to a No. 6210 spring-powered Velocity Recorder; and a special No. 6541 battery-powered Wind Direction Transmitter connected to a special No. 6260 spring-powered Direction Recorder.

The velocity portion of the above system is self-powered, and the direction portion is powered by a 12 volt storage battery. The unattended running time of the system is 15 days. After this interval charts and batteries need to be changed and the recorder springs wound.

The Recorders, batteries, and supplies are contained in a special chest which also serves as a carrying case for transmitters, guys, stakes, etc. when moving. The chest is fitted to carry a year's supply of charts and ink. Spare marginal and writing pens are also provided.

Furnished complete including masts, guys and stakes, but less battery. Overall size of chest is 36 in. x 22 in. x 21 in. Masts and cross brace carried separately. Weight of outfit, approximately 250 lbs. net. Shipping weight, 400 lbs.

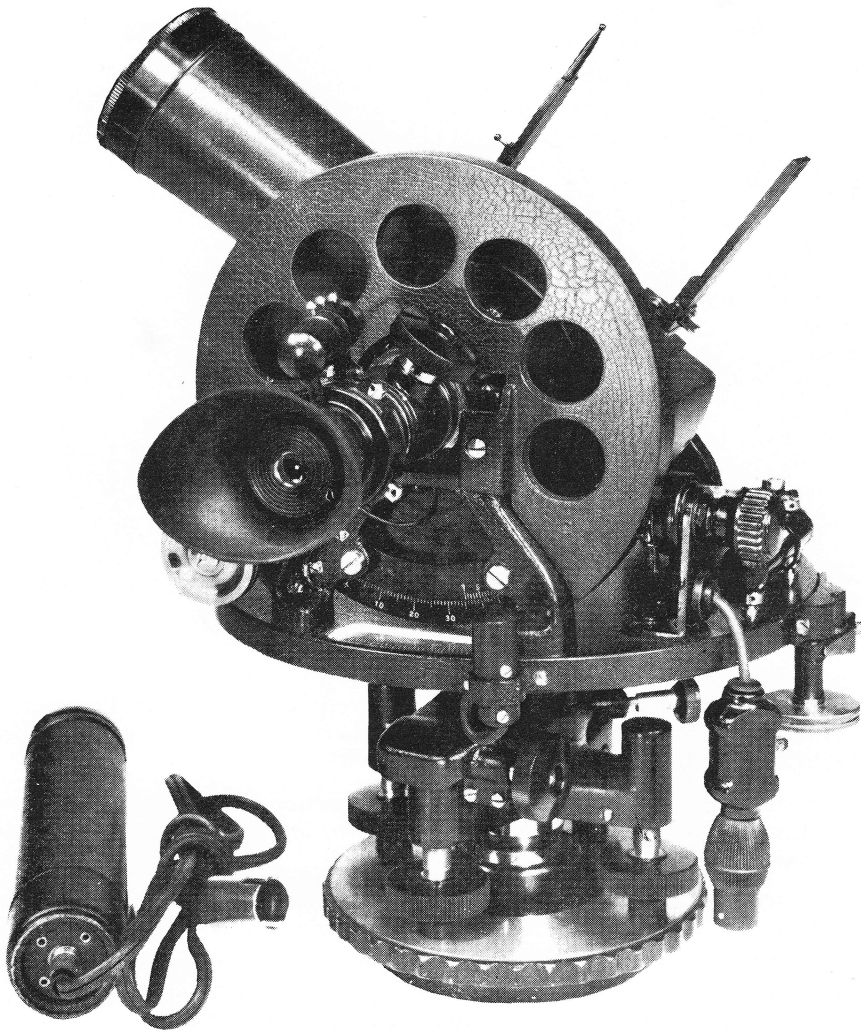
Gurley No. 6110 Portable Wind Recording Station \$



**INDUSTRIAL WIND
INSTRUMENT INSTALLATIONS**

Wind direction and velocity at several different locations are indicated and recorded at one central point in this installation, which includes nine wind velocity and four wind direction instruments.

Special assemblies of wind instruments can be made from the standard elements described in this Bulletin. Quotations will be submitted on request.



No. 4520 Gurley Pilot Balloon Theodolite

GURLEY PILOT BALLOON THEODOLITE

The direction and velocity of wind currents are measured by the Pilot Balloon Theodolite. Hydrogen filled balloons are released, and their path observed by the Theodolite. Since the balloon rises at a fairly constant speed, the upper air currents can be computed by noting the horizontal and vertical angles at regular time-intervals, usually every 30 seconds.

The Gurley Pilot Balloon Theodolite has superior optics, making it possible to follow the balloon to great heights. The graduations (white on black background), may be read accurately and rapidly. The tangent motion devices consist of fiber wheels running in grooves turned by large knurled heads placed conveniently to the right and left hands. They are free from backlash and play, and the telescope can be pointed in either direction without disengaging. A battery-operated lighting system permits use at night.

A Tripod and an instrument case are provided.

Specifications

Telescope: Focal length about $12\frac{3}{4}$ " , inverting, magnifying $15\frac{1}{2}$ x (25x is optional — specify by adding suffix-letter "A", as No. 4520-A). Objective lens 2" diameter. Eyepiece with rubber eyeshield placed at left-hand telescope axis. Focusing pinion. Glass reticle with cross-lines. Folding open sights for picking-up balloons.

Angle-Reading Devices: Horizontal circle 7" , vertical circle $5\frac{1}{8}$ " diameter, graduated to degrees, reading by vernier to 0.1 degree, figured single row each 10° from 0° to 360° . Scales in close proximity for easy reading by observer. Slow motion of circles operated by friction-wheels. If telescope is moved by hand it will drive friction wheels, so no disengagement is required. Graduations white on black background. Horizontal circle may be set at zero and clamped to enable angle reading from original position. Spirit levels mounted on top plate.

Leveling Head: Four-screw type, screws fitted to bushings for convenient replacement. Bronze spindle and socket. $3\frac{1}{2}$ " — 8 thread baseplate. Lower clamp and tangent screw. Shifting center.

Lighting Device: Horizontal and vertical circle vernier illuminated by flashlight lamp connected through a rheostat to bayonet connector. Flashlight may be carried in observer's pocket. Cross-line reticle illuminated.

Equipment: No. 402 Standard tripod, fixed-length legs 58" long. Fitted hardwood instrument case with carrying strap, containing sun shade, screw driver, adjusting pins, and oil container.

Weights and Dimensions: Weight of Theodolite 17 lbs., of Tripod 12 lbs., shipping weight, (2 cartons) domestic 65 lbs., foreign 100 lbs. Sizes of export boxes: Case #1, 19" x 18" x 20" , net weight 17 lbs., legal 30 lbs. gross 62 lbs.; Case #2, 63" x 8" x 8" , net 12 lbs., legal 14 lbs., gross 37 lbs.

No. 4520 Gurley Pilot Balloon Theodolite \$

No. 4521 Gurley Pilot Balloon Theodolite with wide-angle spotting telescope \$



W. & L. E. GURLEY

A TELEDYNE COMPANY

Troy, New York, U.S.A. 12181 Telephone (518) 272-6300