MODEL 023A

MET-ONE WIND DIRECTION SENSOR

REVISION: IM 023A-6 3/86

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023A MET ONE

WIND DIRECTION MEASUREMENT

1.0 GENERAL INFORMATION.

The Met One 023A Wind Direction Sensor uses a light weight, air-foil vane and a potentiometer to produce an output that varies proportional to wind direction.

A1806 Sensor Cable has a quick-connect connector with vinyl-jacketed, shielded cable.

TABLE 1-1 MODEL 023A WIND DIRECTION SENSOR SPECIFICATIONS

PERFORMANCE	
Azimuth	Electrical 0-356° Mechanical 0-360°
Threshold	1.5 mph
Accuracy	+/- 10°
DAMPING RATIO	
Standard	0.25
Optional Fast Response	0.4
POTENTIOMETER SPECS.	
Sand, Dust, Fungus	MIL-E-5272
Salt Spray	MIL-E-12934
TEMPERATURE RANGE	-50°C to +70°C
DELAY DISTANCE	Less than 5 feet
POTENTIOMETER CHARACTERISTICS	
Output Signal	Varying resistance 0-10,000 Ohms
PHYSICAL CHARACTERISTICS	
Weight	1.5 lbs
Finish	Black anodized
Mounting Fixtures	Use with 019 Crossarm

2.0 CALIBRATION PROCEDURE.

A. Connect the sensor leads to the CR10 , CR7 or 21X according to the diagram at the end of this manual. See Figure 1.

B. CR21 - Program the CR21 for DC Excitation and Volts (*4 Mode -- Input Program #3 -- multiplier of 1, offset of 0).

   CR7 or 21X - Program one of the two Programming Tables using Excite, Delay and Measure Input/Output Instruction 4 (500 mV Range: Range Code = 16 for CR7 or Range Code = 14 for 21X, Delay = 5, Excitation = 1000 mV, multiplier = 1, offset =0).

C. Enter the *6 Mode and monitor the channel (CR21) or storage location (CR7 or 21X) where the sensor reading resides. Remove the shoulder screw (Part #11 on the assembly drawing) and carefully rotate the vane until the highest voltage is seen on the display. Take note of the reading. If the reading on the 21X or CR7 goes to -99999 or exceeds 500, change the excitation to 900 mV and repeat this step.

MULTIPLIER AND OFFSET. The multiplier to convert the input voltage to degrees of direction is determined by dividing 360° by the full scale input voltage noted in Step C. The offset should be 0.

A. CR21 Multiplier Example -
   Full scale reading = 1.021
   Multiplier = 360/1.021 = 352.6

B. CR7 or 21X Multiplier Example -
   Full scale reading = 495
   Multiplier = 360/495 = 0.7273

C. CR21 - Enter the *4 Mode and change the multiplier from 1 to the newly computed multiplier value. The CR21 should now read 0° - 360° full scale.

D. CR7 or 21X - Enter the Program Table and change the multiplier in Instruction 4 from 1 to the newly computed multiplier value.

E. Replace the shoulder screw and enter the *6 Mode. You should read 180° (±1°). If not, an adjustment may be made according to paragraph F, Section 4.0.

F. CR7 or 21X - With the shoulder screw in place, note the reading. At this point, re-enter the Excite, Delay and Measure Instruction and change the delay from 5 to 0. Return to the *6 Mode to see if the reading has changed. If it changed, increment the delay by 1 until the reading stablizes.

3.0 SENSOR INSTALLATION.

A. Install the sensor in the mounting bushing (Figure 2). The allen headscrew in the lower part of the sensor housing must be removed first. The screw in the bushing will pass through the bushing and will tighten into sensor housing.

B. Insert the sensor with bushing in the larger diameter connector on the end of the 019 Crossarm. Orient the sensor so that the counter weight is pointing south and tighten the two set screws holding the bushing. Remove and retain shoulder screw (11, Figure 3).

C. Connect the cable assembly to the keyed sensor receptacle and tape it to the mounting arm. To remove the sensor from the tower, simply remove the screw holding the sensor in the mounting bushing. The sensor can then be replaced without going through the alignment procedure.

4.0 ASSEMBLY AND CALIBRATION NOTES.

The numbers in this section refer to Figure 3.

A. Mount the vane (3) on the hub (2). The tail of the vane should be parallel to the sensor housing (1) before tightening the set screw at the top of the hub under the label. Now tighten set screw--**DO NOT OVER-TIGHTEN.**

CAUTION: DO NOT LOOSEN SET SCREWS (9) ON THE SIDE AS THIS WILL DISRUPT FACTORY CALIBRATION. THESE SCREWS LOCK THE HUB ONTO THE POTENTIOMETER SHAFT.

B. Remove shoulder screw (11) from hub (2). Retain this screw.

C. Slide the counter weight (4) on the short shaft (5), lay the sensor housing (1) horizontal and by sliding the counter weight (4) in and out, achieve a balance point where both vane and counter weight are roughly level. Tighten two set screws in counter weight.

DO NOT OVER-TIGHTEN.

Perfect balance is only required if sensor is to be mounted in a nonvertical manner.

D. Place the label (13) on the top of hub (2).

E. Check to see that vane assembly rotates freely (Threshold).

F. Replace the shoulder screw (11) through the hole in the hub and into the threaded hole in sensor housing (1). In this position the sensor is producing a 180° output signal. If it does not read 180°, loosen the 2 set screws (9) on the side of the hub and turn the potentiometer shaft (visible in center of top of hub under lable) with a small screwdriver until 180° is reached.

5.0 GENERAL MAINTENANCE SCHEDULE

24-36-Month Intervals:

A. Replacement of potentiometer.

B. Recommended complete factory overhaul of sensor.

Schedule is based on average to adverse environments.

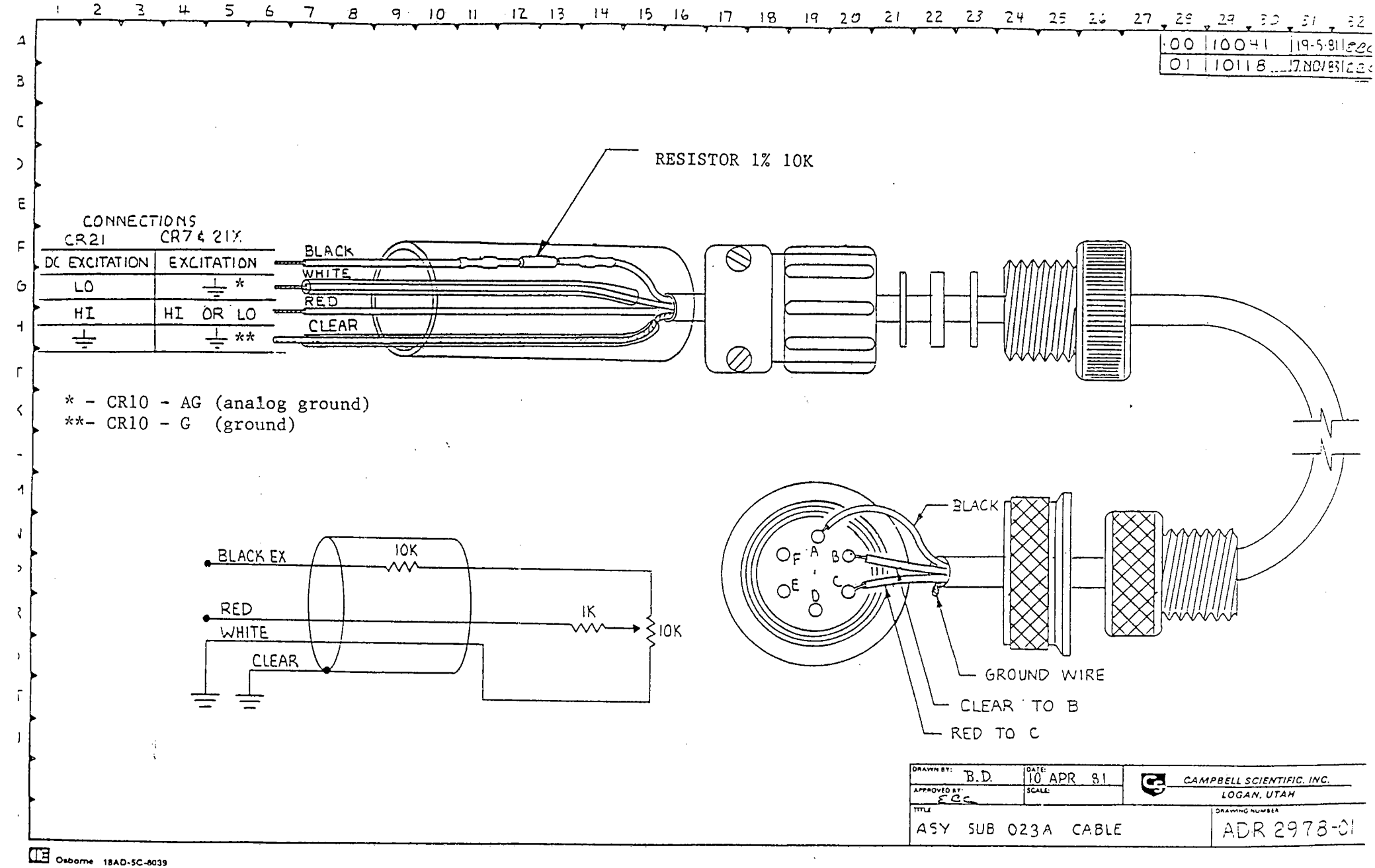

FIGURE 1. 02 A Wind Direction Sensor and Hookup.

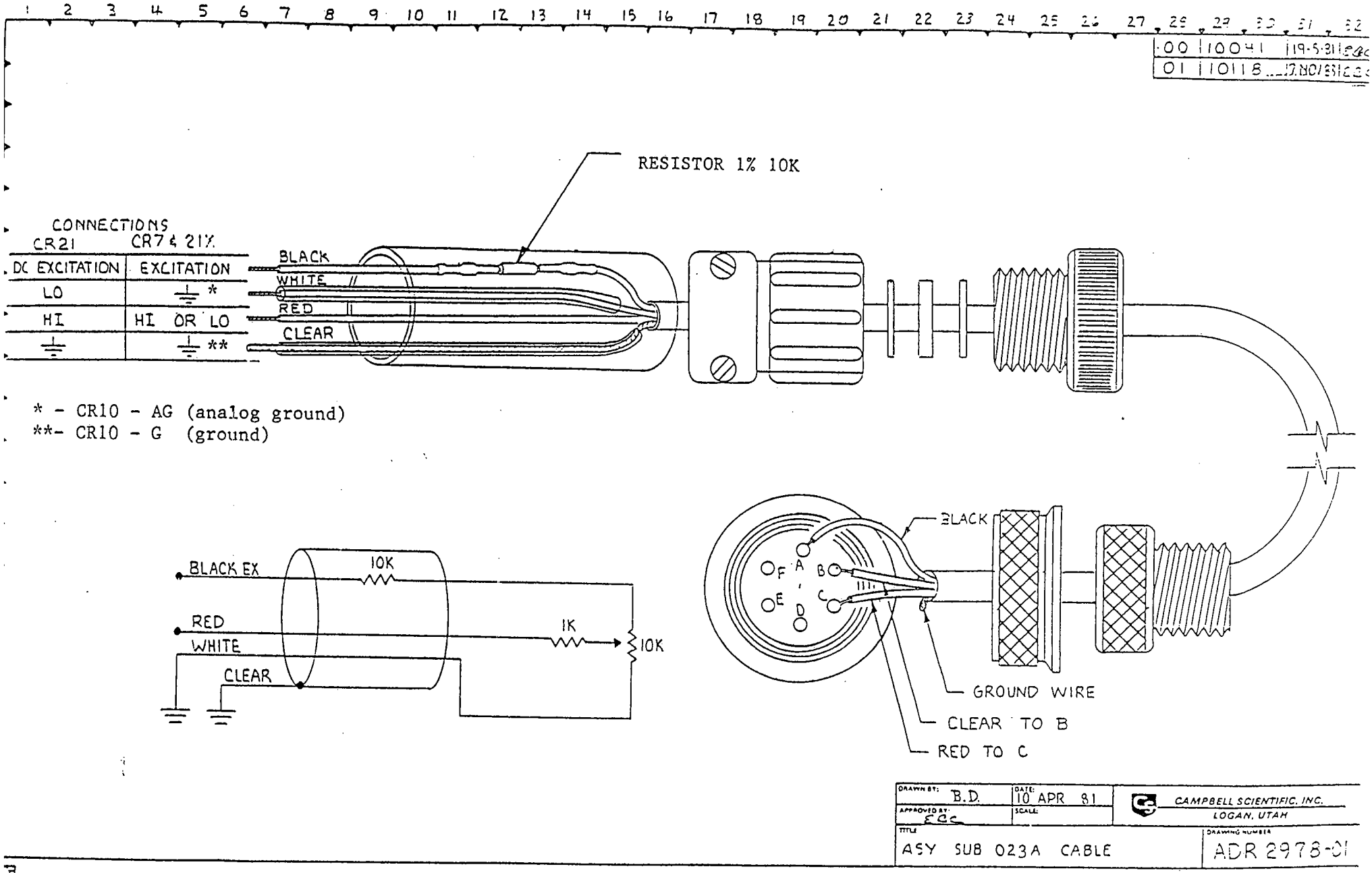

FIGURE 1. 02 A Wind Direction Sensor and Hookup.