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J6523
1° Narrow Angle
Luminance Probe

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077
070-1926-00
Product Group 58

INSTRUCTION MANUAL
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INSTRUMENT SERIAL NUMBERS

Each instrument has a serial number on a panel insert, tag,
or stamped on the chassis. The first number or letter
designates the country of manufacture. The last five digits
of the serial number are assigned sequentially and are
unique to each instrument. Those manufactured in the
United States have six unique digits. The country of
manufacture is identified as follows:

B000000	Tektronix, Inc., Beaverton, Oregon, USA
100000	Tektronix Guernsey, Ltd., Channel Islands
200000	Tektronix United Kingdom, Ltd., London
300000	Sony/Tektronix, Japan
700000	Tektronix Holland, NV, Heerenveen, The Netherlands

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SPECIFICATIONS

Introduction

The J6523 1° Narrow Angle Luminance Probe is an optical sensor device intended for use with the J16 Digital Photometer. The J6523 measures luminance in foot-lambert units of measure, while the metric version (J6523-2) measures luminance in candellas per square meter (nits). Both probes have a very narrow light-acceptance angle (1° full angle). The lens system in the probe can focus over the range from 18 inches (45.72 cm) to infinity. The addition of a closeup lens (commercially available) to the J6523 allows focusing closer than 18 inches.

The following instrument specifications apply over a calibration interval of 1000 hours and an ambient temperature range from -15°C to +40°C except as otherwise indicated. Warm-up time for specified accuracies is 1 minute.

OPERATING CHARACTERISTICS

Characteristic	Limit
Measurement Range (Full Scale)	
J6523	19.9 fL to 19,900 fL with 2 1/2-digit J16
	19.99 fL to 19,990 fL with 3 1/2-digit J16

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OPERATING CHARACTERISTICS (cont)

Characteristic	Limit
J6523-2	199 nits to 199,000 nits with 2 1/2-digit J16
	199.9 nits to 199,900 nits with 3 1/2-digit J16
Sensitivity	
J6523	0.1 fL ¹
J6523-2	1 nit ¹
Calibration Accuracy	±5%, ±1 digit to NBS standard light source
Measurement Repeatability	±2%, ±1 digit
Light Acceptance Angle	1° full angle at infinity
Viewing Acceptance Angle	9° full angle
Focus Range	18 inches to infinity

¹The 3 1/2-digit J16 offers sensitivity increased by a factor of 10 over a limited temperature range if the instrument is carefully zeroed.

OPERATING CHARACTERISTICS (cont)

Characteristic	Limit
Spot Size	0.23 inches at a distance of 18 inches
	4.14 inches at a distance of 20 feet
Spectral Response	Within 2% (integrated) of CIE photopic curve

ENVIRONMENTAL CHARACTERISTICS

Characteristic	Limit
Temperature	
Operating	-15°C to +40°C
Non-operating	-55°C to +75°C
Humidity	Approximately 95% for 8 hours
Vibration	15 minutes along each of the 3 major axes at a total displacement of 0.025 inch peak-to-peak (4 g's) from 10 to 55 to 10 Hz in one-minute cycles. Hold for 3 minutes at 55 Hz. All major resonances must be above 55 Hz.

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ENVIRONMENTAL CHARACTERISTICS (cont)

Characteristic	Limit
Shock	30 g's along each of the 3 major axes.
Transportation	Tested to National Safe Transit Committee procedure 1A with a 48-inch drop.
Altitude	
Operating	To 15,000 feet
Non-operating	To 50,000 feet

PHYSICAL CHARACTERISTICS

Characteristic	Limit
Dimensions	
Height	4.7 inches (11.94 cm)
Width	2.6 inches (6.6 cm)
Length	9.2 inches (23.4 cm)
Weight	Approximately 2.5 pounds (1.13 kg)

Standard Accessories

The following standard accessories are included with the instrument:

1	Instruction Manual	070-1926-00
1	Lens cover	200-1835-00
1	Eyepiece cover	200-1836-00

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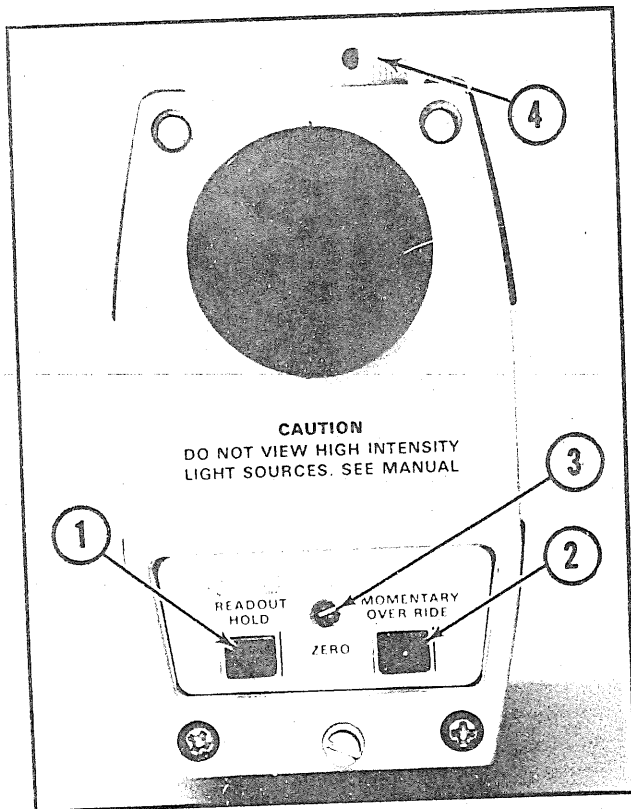


Fig. 1. J6523 controls.

INSTRUMENT CONTROLS

(1) READOUT HOLD

This two-position, push-push switch enables storing a measurement. In the stored (button-in) position of the switch, the measurement level present just prior to pushing the button will be retained and displayed until the switch is returned to the non-store (button-out) position, or the MOMENTARY OVER-RIDE switch is pushed.

(2) MOMENTARY OVER-RIDE

This is a momentary-contact, pushbutton switch that over-rides the READOUT HOLD switch. Pushing the MOMENTARY OVER-RIDE switch while a reading is stored allows a new reading to be taken. When the switch is released, the new reading will be stored.

(3) ZERO

This is a screwdriver adjustment that, in conjunction with the ZERO adjustment on the J16, adjusts for a zero reading under no-light conditions.

(4) Focus Control

This is a rotary control used to focus the lens system of the J6523. The instrument will focus over the range of 18 inches to infinity.

INSTRUMENT OPERATION

General

The J6523 can be operated hand-held, tripod-mounted, or mounted directly onto a J16. An optional accessory extension cable (Tektronix Part Number 012-0414-02) is available to facilitate hand-held or tripod-mounted operation. Older extension cables (Tektronix Part Numbers 012-0414-00 or 012-0414-01) should not be used with the J6523.

CAUTION

If the J6523 is to be operated with a 2 1/2-digit J16 (below serial number B052000), the J16 will require some minor modifications. A no-cost Field Modification Kit (Tektronix Part Number 040-0746-00) is available to facilitate these modifications. Contact your local Tektronix Field Office or representative to order this kit.

Probe Installation

To install the J6523, engage the hook on the front of the probe in the recess in the battery pack of the J16. See Fig. 2a. Loosen the latch thumbscrew. Pull out the latch on the J6523 (see Fig. 2b) and engage the connector on the bottom of the J6523 with the connector on top of the J16.

Release the latch on the J6523 and tighten the latch thumbscrew. The J6523 also has a standard 1/4"-20 threaded hole in the bottom of the instrument to facilitate tripod mounting if so desired.

CAUTION

When operating the J6523 mounted directly onto the J16, do not use the J6523 as a carrying handle. Use the carrying handle on the J16.

ZERO Adjustment

After connecting the J6523 to the J16, turn the instrument power on. Leave the lens and eyepiece covers in place on the J6523 and allow one minute for instrument warm-up. After one minute, press the X.1 button on the J16 and adjust the J16 ZERO adjustment until the readout indicates between 00.0 and 00.5, and the minus sign is not on. Then, press the X1000 button on the J16 and adjust the J6523 ZERO adjustment until the readout again indicates 00.0 without the minus sign on. Repeat the two adjustments until zero readings are obtained in both switch positions. Periodic adjustment of zeroing may be necessary to compensate for instrument drift.

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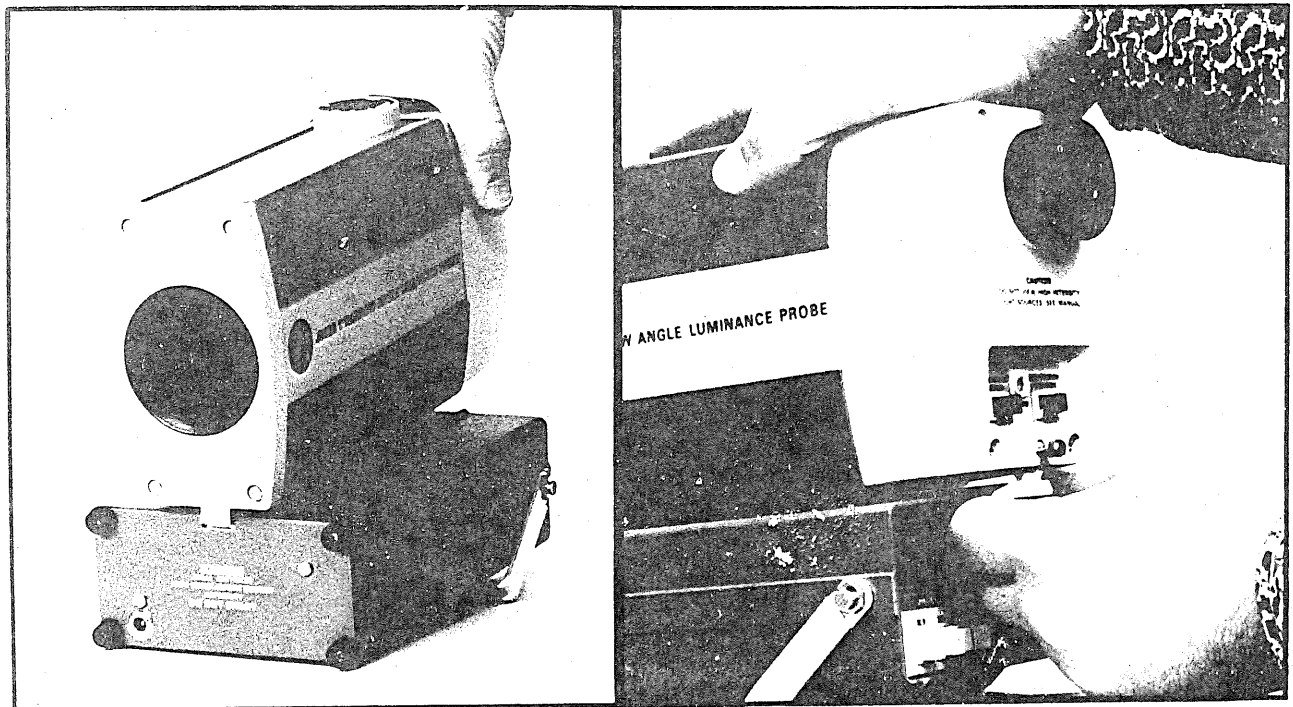


Fig. 2. Installing the J6523 into a J16.

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Focusing

After the J6523 is connected to the J16 and the zeroing is accomplished, remove the lens and eyepiece covers from the J6523. Aim the J6523 at the light source to be measured and look through the eyepiece.

WARNING

Avoid viewing high-intensity light sources (e.g., arc lamps, lasers, the sun, etc.) through the eyepiece of the J6523. Viewing such light sources can result in damage to the eye.

Prior to taking a measurement, the J6523 must be focused. Best visual focus (determined by the eye of the individual user) does not always provide correct focus. The preferred method is to adjust the focus until there is no relative motion between the target and the dark spot visible in the J6523 eyepiece when moving the eye slightly from side to side.

If it is necessary to focus on objects closer than 18 inches (45.72 cm), external close-up lenses (commercially available) can be attached to the J6523. The lenses used

should be the 48 mm screw-in type. Also, the front housing of the J6523 is threaded to accept a 55 mm diameter screw-in lens shade.

Making A Measurement

The dark spot visible in the eyepiece represents the area where the light measurement is to be made. After positioning the instrument so the dark spot coincides with the point to be measured and the instrument is focused, press the READOUT HOLD pushbutton. The dark spot should now turn red to indicate a measurement has been taken and is being stored. Read the measurement level from the J16 readout. This measurement level will be held until the READOUT HOLD pushbutton is set to the non-store (button-out) position, or the MOMENTARY OVER-RIDE pushbutton is pressed.

To make a new measurement, aim the instrument at a new target and refocus. Then, press the MOMENTARY OVER-RIDE button and hold it in for at least 5 seconds. The spot in the eyepiece should change from red to black to indicate the instrument is not in the hold mode. When the button is released, the spot will again become red, and a new measurement will have been taken and held.

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CALIBRATION AND SERVICE

General

Because of the technical difficulties involved, Tektronix, Inc. recommends that calibration and repair of the J6523 be done only at the Tektronix Factory Service Center. Contact your local Tektronix Field Office or representative for further information.

Repackaging

If the J6523 is to be shipped to Tektronix, Inc. for service or repair, attach a tag showing:

- (1) Owner (with address)
- (2) Name of an individual at your firm to be contacted
- (3) Complete instrument serial number
- (4) Description of the service required

Save and re-use the package in which your instrument was shipped. If the original package is unfit for use or not available, repackage the instrument as follows:

- (1) Obtain a carton of corrugated cardboard having inside dimensions of no less than 6 inches more than the instrument dimensions; this will allow for cushioning. Refer to Table 1 for carton test strength requirements.

TABLE 1

SHIPPING CARTON TEST STRENGTH

Gross Weight (lb)	Carton Test Strength (lb)
0—10	200
10—30	275

- (2) Surround the instrument with polyethylene sheeting to protect the finish of the instrument.
- (3) Cushion the instrument on all sides by tightly packing dunnage or urethane foam between the carton and the instrument, allowing 3 inches on all sides.
- (4) Seal the carton with shipping tape or an industrial stapler.

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