

PLEASE CHECK FOR CHANGE INFORMATION
AT THE REAR OF THIS MANUAL.

2213
OSCILLOSCOPE
OPERATORS

INSTRUCTION MANUAL

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OPERATORS SAFETY SUMMARY

The general safety information in this part of the summary is for both operating and servicing personnel. Specific warnings and cautions will be found throughout the manual where they apply and do not appear in this summary.

Terms in This Manual

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

WARNING statements identify conditions or practices that could result in personal injury or loss of life.

Terms as Marked on Equipment

CAUTION indicates a personal injury hazard not immediately accessible as one reads the markings, or a hazard to property, including the equipment itself.

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

Symbols in This Manual



This symbol indicates where applicable cautionary or other information is to be found. For maximum input voltages, see Table 2.

Symbols as Marked on Equipment



DANGER – High voltage.



Protective ground (earth) terminal.



ATTENTION – Refer to manual.

Power Source

This product is intended to operate from a power source that does not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Grounding the Product

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Danger Arising From Loss of Ground

Upon loss of the protective-ground connection, all accessible conductive parts (including knobs and controls that may appear to be insulating) can render an electric shock.

Use the Proper Power Cord

Use only the power cord and connector specified for your product.

Use only a power cord that is in good condition.

For detailed information on power cords and connectors see Figure 1.

Use the Proper Fuse

To avoid fire hazard, use only a fuse of the correct type, voltage rating and current rating as specified in the parts list for your product.

Do Not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an explosive atmosphere unless it has been specifically certified for such operation.

Do Not Remove Covers or Panels

To avoid personal injury, do not remove the product covers or panels. Do not operate the product without the covers and panels properly installed.

SERVICING SAFETY SUMMARY

FOR QUALIFIED SERVICE PERSONNEL ONLY

Refer also to the preceding Operators Safety Summary.

Do Not Service Alone

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid and resuscitation is present.

Use Care When Servicing With Power Applied

Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed connections or components while power is applied.

Disconnect power before removing protective cover, soldering, or replacing components.

CONTROLS, CONNECTORS, AND INDICATORS

The following descriptions are intended to familiarize the operator with the location, operation, and function of the instrument's controls, connectors, and indicators.

POWER, DISPLAY, AND PROBE ADJUST

Refer to Figure 3 for location of items 1 through 7.

- ① **Internal Graticule**-Eliminates parallax viewing error between the trace and graticule lines. Rise-time amplitude and measurement points are indicated at the left edge of the graticule.
- ② **POWER Switch**-Turns instrument power on and off. Press in for ON; press again for OFF.
- ③ **AUTO FOCUS Control**-Adjusts display for optimum definition. Once set, the focus of the crt display will

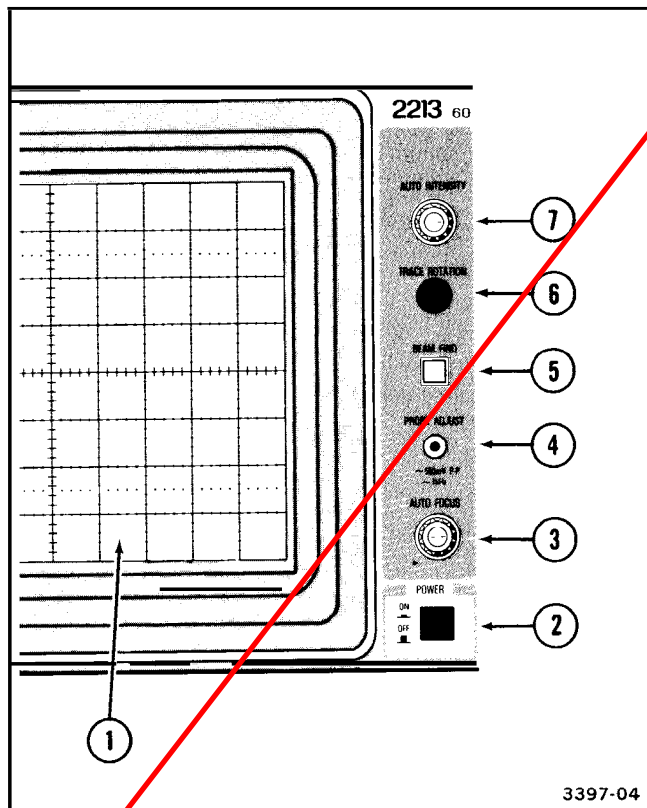


Figure 3. Power, display, and probe adjust controls, connector, and indicator.

be maintained as changes occur in the intensity level of the trace.

- ④ **PROBE ADJ Connector**-Provides an approximately 0.5 V, negative going, square-wave voltage (at approximately 1 kHz) that permits the operator to compensate voltage probes and to check operation of the oscilloscope vertical system. It is not intended to verify the accuracy of the vertical gain or time-base calibration.
- ⑤ **BEAM FIND Switch**-When held in, compresses the display to within the graticule area and provides a visible viewing intensity to aid in locating off-screen displays.
- ⑥ **TRACE ROTATION Control**-Screwdriver control used to align the crt trace with the horizontal graticule lines.
- ⑦ **AUTO INTENSITY Control**-Adjusts brightness of the crt display. This control has no effect when the BEAM FIND switch is pressed in. Once the control is set, intensity is automatically maintained at approximately the same level between SEC/DIV switch settings from 0.5 ms per division to 0.05 μ s per division.

VERTICAL

Refer to Figure 4 for location of items 8 through 16.

- ⑧ **SERIAL and Mod Slots**-The SERIAL slot is imprinted with the instrument's serial number. The Mod slot contains the option number that has been installed in the instrument.
- ⑨ **CH 1 OR X and CH 2 OR Y Connectors**-Provide for application of external signals to the inputs of the vertical deflection system or for an X-Y display. In the X-Y mode, the signal connected to the CH 1 OR X connector provides horizontal deflection, and the signal connected to the CH 2 OR Y connector provides vertical deflection.
- ⑩ **GND Connector**-Provides direct connection to instrument chassis ground.