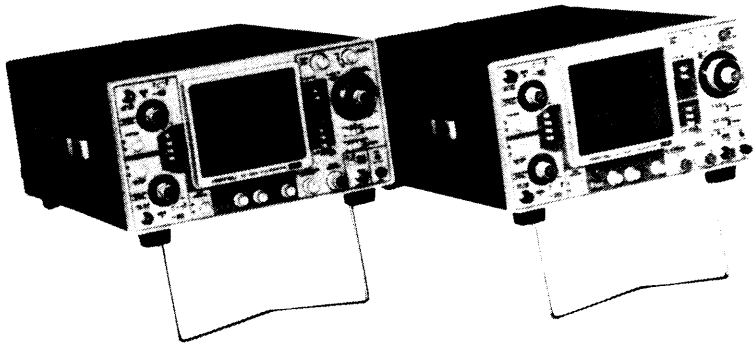
IWATSU

OPERATION MANUAL

OSCILLOSCOPE

SS-5706A
SS-5705A



OPERATION MANUAL

OSCILLOSCOPE

SS-5706A
SS-5705A

D781-416151(L)

Introduction

Thank you for purchasing this IWATSU product.
Your satisfaction by using
the IWATSU product is our goal.

◇ In the future, you may not find the manual and the product itself may tell you how to operate.

◇ However, today, the product needs the manual for you to learn the operation.

◇ This manual is written for the first-time users as well as the experienced users. If you are a first-time user, you will learn easily the full capability of the product step by step. If you are an experienced user, you will be able to find instantly what you want to know.

◇ In order to improve our products, we have been keep listening and we will .....

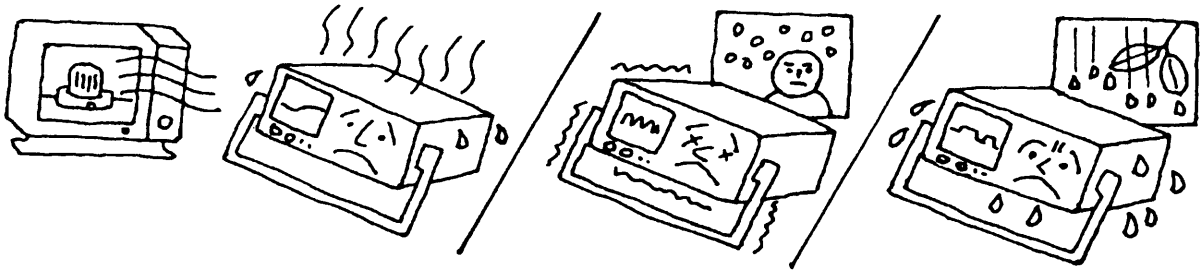
Precautions in Handling

◇ **Do not use the oscilloscope in the harsh environment.**

The environmental characteristics are:

- Operating temperature : 0°C to +40°C
- Operating relative humidity : Less than 90%RH at 40°C

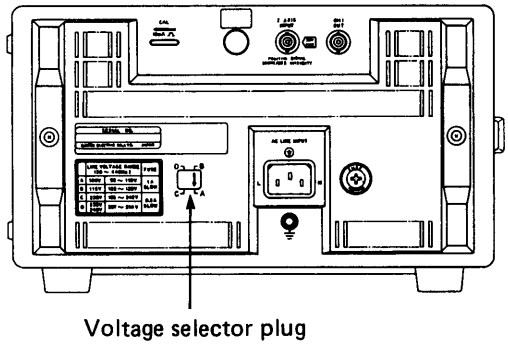
◇ **Avoid using the oscilloscope in the poor ventilation circumstances.**



◇ **Use within the specified supply voltage range. The following supply voltages are selectable.**

- Before connecting the power cord, check the supply voltage. (Refer to Changing over the Supply Voltage on Page 7)

Center voltage (V)	Voltage range (V)
100	90 to 110
115	103 to 128
220	195 to 242
230 240	207 to 250



Voltage selector plug

- When changing the voltage range, disconnect the power cord.

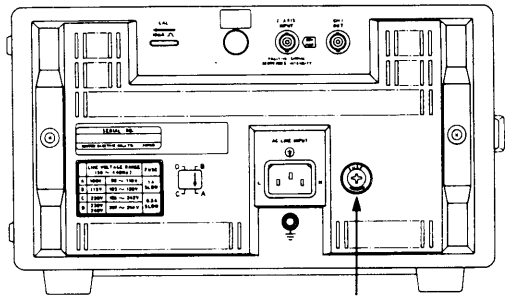
◇ **Use the right power cord which is supplied with the instrument and suitable for your power line.**

- Do not use the instrument without ground connection of the power line.

◇ **Use the specified fuse only.**

When the fuse is gone, or when the supply voltage is changed over (100V/200V AC system), replace with a specified fuse. (Refer to Replacing the Fuse on Page 7)

Setting position	Voltage range (V)	Fuse
100	90 to 110	125V/1A slow blow
115	103 to 128	
220	195 to 242	250V/0.5A slow blow
230, 240	207 to 250	



- Disconnect the power plug from the power outlet before replacing the fuse.
- Replace with the proper fuse only after checking the cause of fuse blow. Replacing with the unspecified fuse may cause damages or fire hazard in worst case.

◇ **Never apply an excessive voltage into the inputs.**

Input connector	Conditions	Maximum input voltage
CH1, CH2, CH3	Direct input connector	±400V MAX
	SS-0060 (X10) probe used	±600V MAX
Z AXIS INPUT	Direct input connector	± 50V MAX

◇ **Do not increase the CRT intensity too high.**

Highly increased intensity may result in eye irritation. When the instrument is left under high intensity condition for a long time, this may burn the phosphor on the CRT face plate.

◇ **Note the following when using the stand.**

- When using the instrument with the stand set, pull it out completely.
- When storing the instrument, be sure to put back the stand.

◇ **Precautions when using the instrument in the vertical position**

This instrument can be used in the vertical position with its CRT facing upward. In this case, be careful not to bring down the instrument by pulling the probe or coaxial cable connected to INPUT.

◇ **Start measuring after 30 minutes of warm-up time.**

The specifications are assured after 30 minutes of warm-up time.

◇ **Use the appropriate cleaner.**

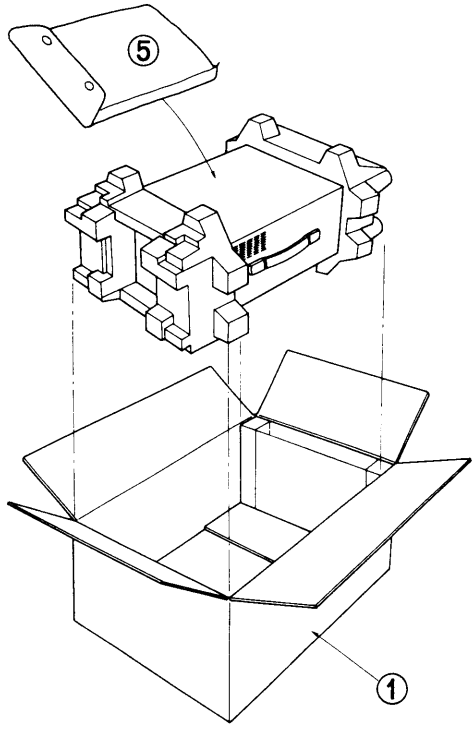
Clean the covers and panels gently with soft cloths dipped in the water or the mild detergent. Using the prohibited cleaner in the list may change the coloring or cause the unexpected damage.

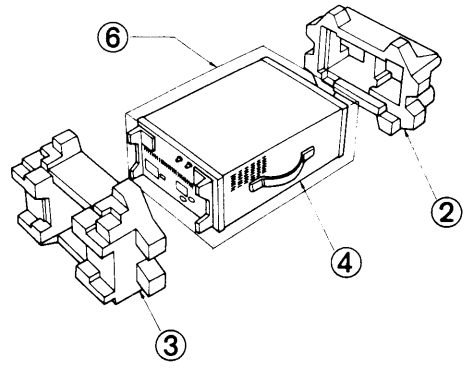
Recommended cleaner	Water, mild detergent
Prohibited cleaner	Acetone, gasoline, ether, alcohol, lacquer, thinner, methyl-ethyl-ketone, detergent containing ketone

Accessories and Packing

◆ Packing List

Open the carton and carefully unpack the oscilloscope and accessories.





① Carton
② Front cushion
③ Rear cushion
④ Oscilloscope
⑤ Accessories
⑥ Plastic bag

◆ Accessories

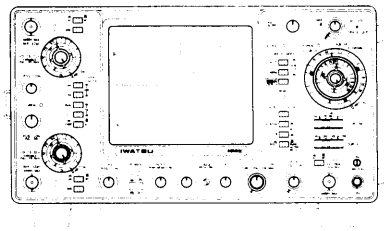
Power cord	1
Probe (SS-0060)	2
Fuse	2
Operation manual	1
Accessories bag	1
Dustproof cover	1

General

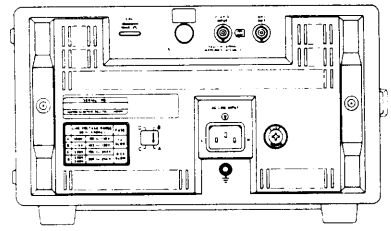
- The oscilloscope SS-5706A/05A is indispensable for the production lines, maintenance/services as well as research and development of electronic devices and instruments.

- This is a measuring instrument which has pursued not only functionality, but also operability, high accuracy, and stability.

- The major features of this instrument are as follows.
  - The vertical deflection system has a frequency band width of DC to 30 MHz (SS-5706A)/DC to 40 MHz (SS-5705A) and can provide 2-phenomenon (in the CHOP or ALTERNATE mode) and 3-phenomenon (in the CHOP or ALTERNATE mode) 6-trace display.
    It is also possible to measure the sum and difference of 2 signals (by ADD).
    Maximum input sensitivity for both CH1 and CH2 is 1 mv/div. by the PULL x 5 MAG function, and a microvoltage can be measured surely.
  - The horizontal deflection system has a maximum sweep rate of 20ns/div, provided by the PULL x 5 MAG (SS-5706A) or of 10ns/div, provided by the PULL x 10 MAG (SS-5705A), and can measure up to high-speed phenomena accurately. Furthermore, it allows to observe TV signal waveforms by X-Y operation and by TV-V, TV-H triggering.
  - The CRT, which is 6-inch (150 mm) rectangular, has a display area of 8 div. x 10 div. (1 div. = 10 mm) with non-parallax internal graticule. It allows high-luminance waveform observation by a stabilized acceleration voltage of about 12 kV.



Contents



MEMO

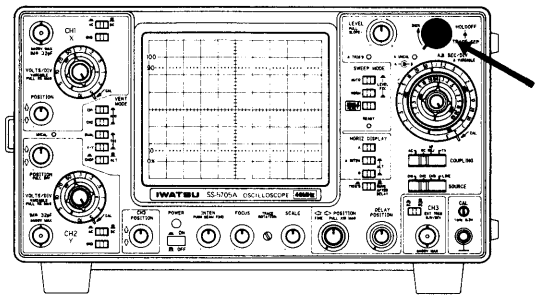
1 2 3 4 5

Getting to Know This Manual

General rules

♦ Notations and Conventions

This manual uses the following notations and conventions.



◇ **Panel illustration**

The panel illustration in the top and right of the each page shows the locations of the keys used for the operation as the painted keys.

◇ Key notations

B [ ] is used to indicate the actual knob or key.

♦ Notations in the operation procedure

AC [ ] DC , AC [ ] DC is used to indicate all the necessary keys for the operation. You can push the keys in any order and may need to push the key several times.

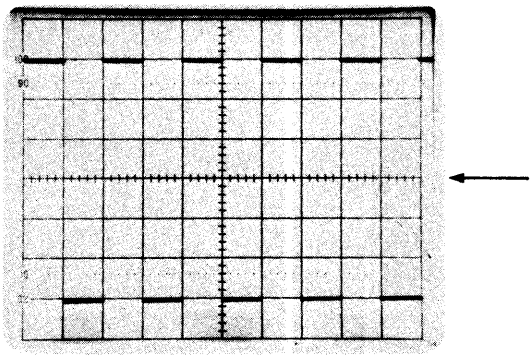
A [ ] ⟶ CH 1 [ ] is used to indicate the key operation sequence.

CH 1 [ ] + CH 2 [ ] is used to press both keys simultaneously.

①、②、③… is used to indicate the operation procedure.

⟵ connects the description and the illustration.

♦ Marks in the screen display illustration



" ⟵ " indicates a signal displayed after an operation or the screen corresponding to the operation.

Getting to Know This Manual

The introduction and operation manuals cover the followings. If you are a first- time user, start from the beginning in the following list.

Before use

"Precautions in Handling" (page IV)	describes what to do and what not to do.
"Accessories and Packing" (page 2)	describes all your items for your initial inspection.

Basic operation

"Panel"	before operating the instrument, understand the functions of the keys and knobs on the panel.
"Basic Operations" (Section 2)	describes the primary information for the operations.

Learning operations

"Functions and Operations" (Section 3)	describes how to use the oscilloscope from the beginning step by step.

Maintenance

"Guide to Diagnosis"	
"Daily Check" (Section 4)	describe how to keep the oscilloscope in good conditions over the long period.

Specifications

"Electrical Specifications"	when checking measurement accuracy, understand the electrical performances of the instrument well and refer to this section.

MEMO

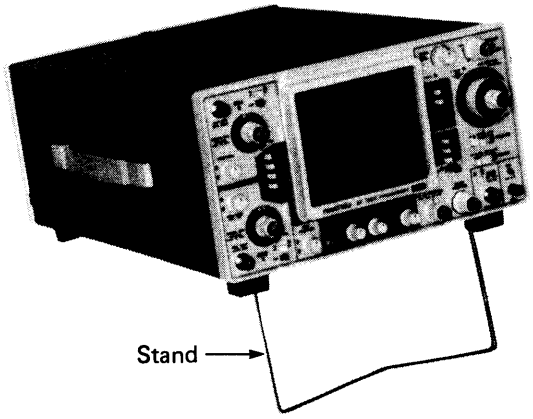
1

1 2 3 4 5

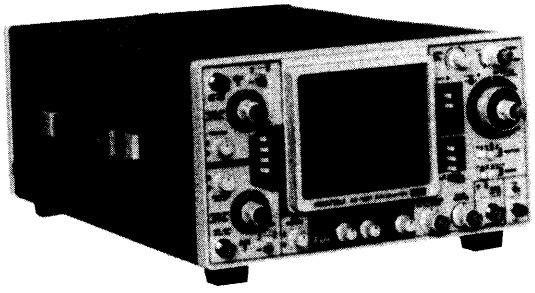
BASIC OPERATIONS

Operation of Stand

◆ Using the Stand



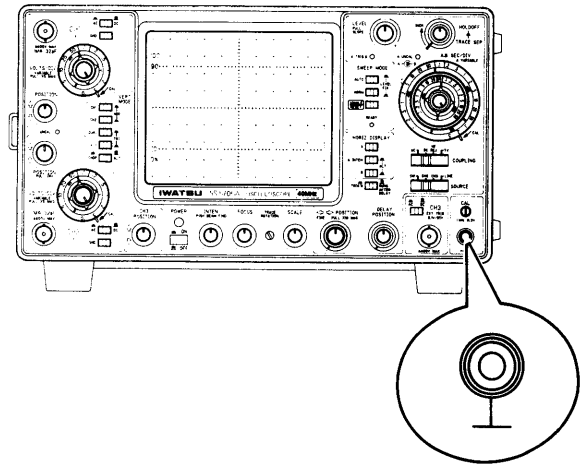
- When observing a waveform, use the stand to facilitate the observation.
  As shown in the left figure, the stand is attached to the bottom cover.
  When using it, pull it out completely. When taking a photo of the waveform shown on the screen, do not use the stand.



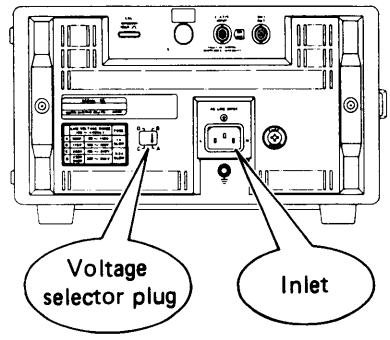
- When storing this instrument, put back the stand.

Ground Teminal for Measurement

Connect to the GROUND of the signal source.



Changing over the Supply Voltage and Replacing the Fuse

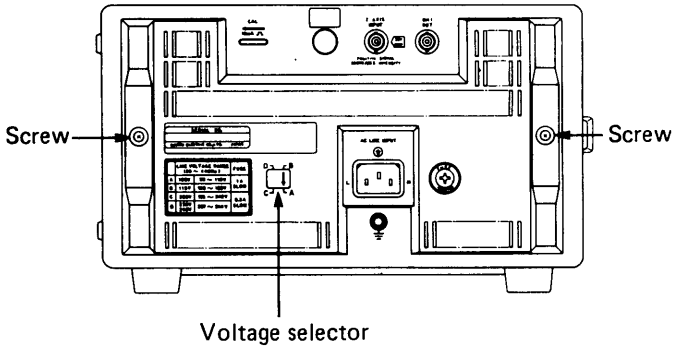


CAUTION

- **When changing over the supply voltage, or replacing the fuse, be sure to disconnect the power cord from the main body.**
- **When inserting a voltage selector plug, be sure to check for the supply voltage used and fit the arrow mark to the voltage.**
  When this is done, check for the fuse specification.

◆ Changing over the supply voltage

Rear panel



① Disconnect the power cord from the main body.

② Remove the right and left 2 screws used to fixing the rear panel, and then, detach the rear panel.

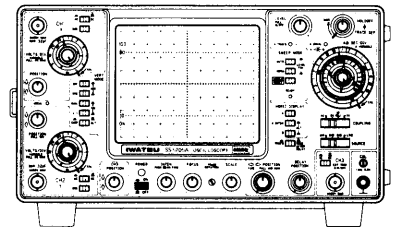
③ Remove the voltage switching plug, adjust an arrow to the supply voltage value used, and insert.

- Voltage Switching Range

	Range		Fuse
A	100V	90 to 110V	125V/1A SLOW
B	115V	103 to 128V	
C	220V	195 to 242V	250V/0.5A SLOW
D	230V 240V	207 to 250V	

④ Remount the rear panel with the 2 screws.

Turning Power On and Off

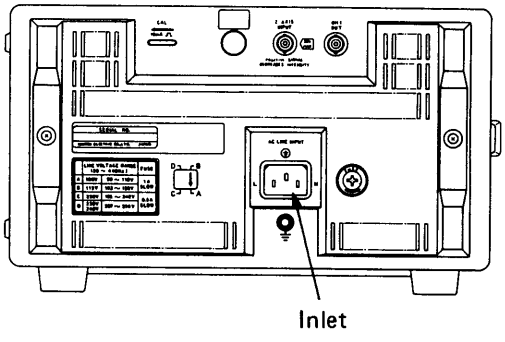


WARNING

◇ **Follow the next rules for the safety operation when connecting the power cord.**
Check the line voltage and use the proper power cord suiting to the line voltage.
Never use the wrong power cord.

◆ Turning the power on

(Rear panel)



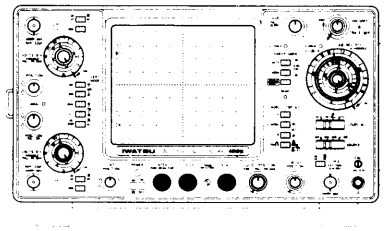
① Push out the power switch and turn the power off position ▟ .
② Insert the power cord plug into the oscilloscope inlet.
③ Insert the power cord plug into the outlet in the wall.
④ Push the power switch and turn the power on position ▙ .
- Upon shipment, the knob INTEN has been turned counterclockwise. Turn it clockwise until the trace has appeared on the screen.
- For SS-5705A, press the INTEN knob (PUSH BEAM FIND). (If the trace is outside the screen at this time, turn the POSITION knob.)

◆ Turning the power off

No special procedure is required for turning the power off.
Press the POWER switch to turn off the power. ▟

INTEN
FOCUS
SCALE
TRACE ROTATION

PUSH BEAM FIND is only for SS-5705A.



To obtain the best measurement circumstances, adjust the display before starting the measurement.

CAUTION

Do not increase the CRT intensity too highly. Highly increased intensity may result in eye irritation. When the instrument is left under high intensity condition for a long time, this may burn the phosphor on the CRT face plate.

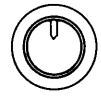
◆ Intensity of the trace

- INTEN (PUSH BEAM FIND)

Rotating the INTEN control clockwise increases the trace intensity.

Pressing the knob draws the trace at the center of the screen (only for SS-5705A).

INTEN
PUSH BEAM FIND



◆ Clearness of the trace line

- FOCUS

Adjusts the clearness of the trace line.

FOCUS

◆ Scale illumination

- SCALE

Adjusts the scale illumination.

SCALE

◆ Tilting of the trace line

- TRACE ROTATION

Adjusts the trace line to the scale when it is tilted due to effects of terrestrial magnetism, etc. Use an adjusting screwdriver.

TRACE
ROTATION

Selecting the input coupling
AC : AC coupling (P.18)
DC : DC coupling (P.18)
GND : Ground potential (P.19)

Selecting the horizontal display
A : A sweep (P.43)
A INTEN : Delay sweep (P.44)
B : B sweep (P.45)

Selecting the sweep mode
AUTO (P.29)
NORM (P.30)
SINGLE (P.31)

HOLDOFF : Adjust the holdoff time (P.42)

Signal input connector
INPUT (P.17)

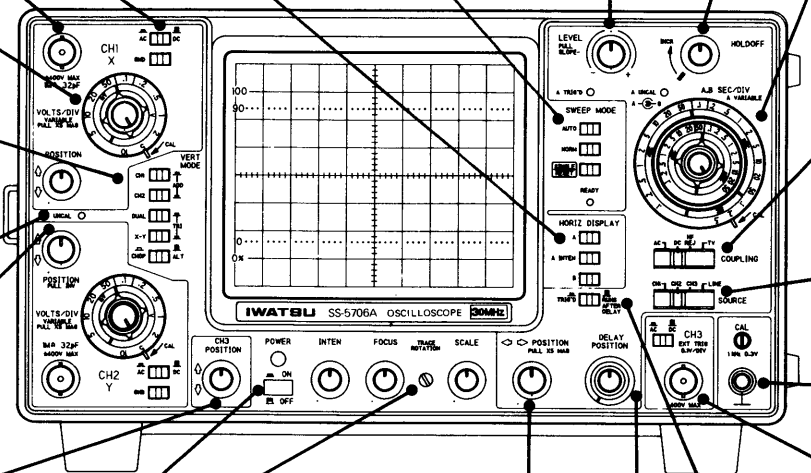
Adjusting the trigger level
LEVEL (P.39)
PULL SLOPE – (P.39)

Selecting A/B sweep rate
A, B SEC/DIV (P.49)
A VARIABLE (P.49)

VOLTS/DIV : Selects the signal amplitude (P.21)
x 5 MAG : Magnifies the signal amplitude by 5 times (P.21)

Selecting the trigger signal coupling
AC : AC coupling (P.33)
DC : DC coupling (P.33)
HF REJ : Low-pass filter coupling (P.34)
TV : TV signal coupling (P.35)

Selecting the signal
CH1 : 1-trace display (P.22)
CH2 : 1-trace display (P.22)
ADD : Adds CH1 and CH2 (P.24)
DUAL : 2-trace display (P.23)
TRI : 3-trace display (P.25)
X-Y : X-Y operation (P.26)
CHOP/ALT : 2-trace display (P.23)



Selecting the trigger signal source
CH1 (P.36)
CH2 (P.36)
CH3 (P.37)
LINE (P.38)

Indicator lamp to light when VARIABLE is UNCAL (uncalibrated).

Calibration signal output (P.13)
Ground terminal for measurement (P.6)

Positioning the signal vertically
POSITION (P.20)
Inverts the CH2 signal INV (P.28)

Inputting the CH3 signal and external trigger signal
CONNECTOR : (P.17, 37)
Selecting a signal coupling mode
AC/DC (P.18)

Positioning the CH3 signal vertically
POSITION (P.20)

Turning POWER ON and OFF (P.8)

POSITION : Positions the signal horizontally (P.40)
x 5 MAG : Magnifies the sweep rate by 5 times (P.41)

Adjusting the display
INTEN BEAM FIND : Adjusts the intensity (P.9)
FOCUS : Adjusts the focus
TRACE ROTATION: Corrects the tilting of the trace line (P.9)
SCALE : Adjusts the scale illumination (P.9)

Adjusting the delay time
DELAY POSITION (P.47)

Selecting the delay sweep
TRIG'D : Triggered delay mode (P.48)
RUNS AFTER DELAY : Continuous delay mode (P.47)

Selecting the input coupling
AC : AC coupling (P.18)
DC : DC coupling (P.18)
GND : Ground potential (P.19)

Signal input connector
INPUT (P.17)

VOLTS/DIV : Selects the signal amplitude (P.21)
x 5 MAG : Magnifies the signal amplitude by 5 times (P.21)

Indicator lamp to light when VARIABLE is UNCAL (uncalibrated).

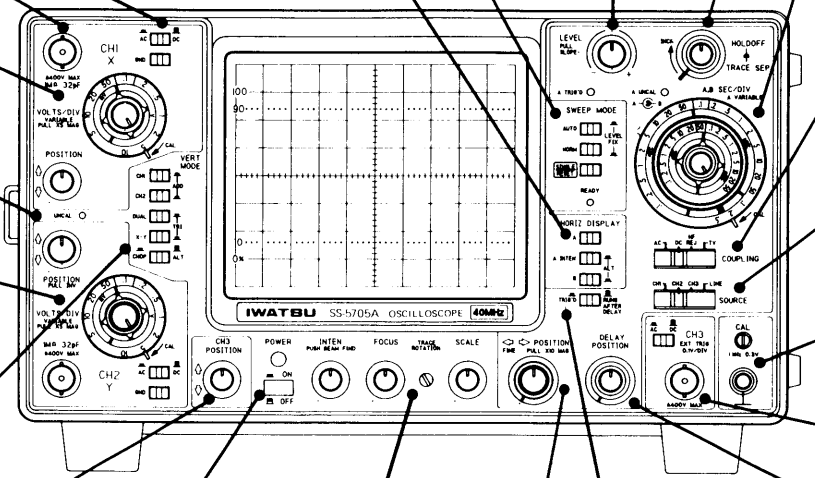
Positioning the signal vertically
POSITION (P.20)
Inverts the CH2 signal INV (P.28)

Selecting the screen display mode
CH1 : 1-trace display (P.22)
CH2 : 1-trace display (P.22)
ADD : CH1, CH2 addition (P.24)
DUAL : 2-trace display (P.23)
TRI : 3-trace display (P.25)
X-Y : X-Y operation (P.26)
CHOP/ALT : 2-trace display (P.23)

Positioning the CH3 signal vertically
POSITION (P.20)

Selecting the sweep mode
AUTO (P.29)
NORM (P.30)
LEVEL FIX (P.32)
SINGLE (P.31)

Selecting the horizontal display
A : A sweep (P.43)
A INTEN : Delay sweep (P.44)
B : B sweep (P.45)
ALT : A/B sweep (P.46)



Turning POWER ON and OFF (P.8)

Adjusting the display
INTEN BEAM FIND : Adjusts the intensity (P.9)
FOCUS : Adjusts the focus
TRACE ROTATION : Corrects the tilting of the trace line (P.9)
SCALE : Adjusts the scale illumination (P.9)

HOLDOFF : Adjusts the holdoff time (P.42)
TRACE SEP : Separates A and B sweep display (P.42)

Adjusting the trigger level
LEVEL (P.39)
PULL SLOPE – (P.39)

Selecting A/B sweep rate
A, B SEC/DIV (P.49)
A VARIABLE (P.49)

Selecting the trigger signal coupling
AC : AC coupling (P.33)
DC : DC coupling (P.33)
HF REF : Low-pass filter coupling (P.34)
TV : TV signal coupling (P.35)

Selecting the trigger signal source
CH1 (P.36)
CH2 (P.36)
CH3 (P.37)
LINE (P.38)

Calibration signal output (P.13)
Ground terminal for measurement (P.6)

Inputting the CH3 signal and external trigger signal
CONNECTOR (P.17, 37)
Selecting a signal coupling mode
AC/DC (P.18)

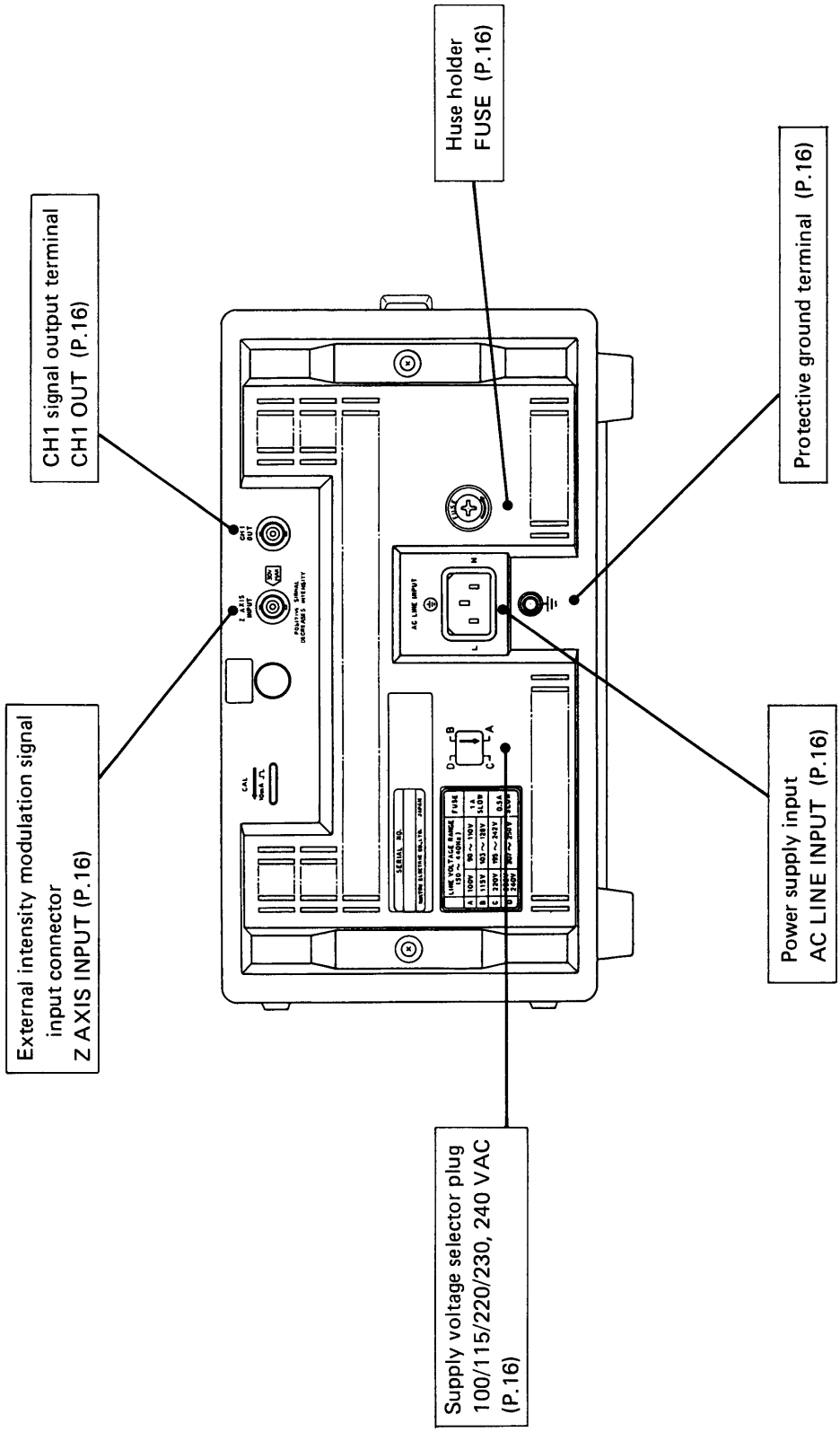
Adjusting the delay time
DELAY POSITION (P.47)

Selecting the delay sweep
TRIG'D : Triggered delay mode (P.48)
RUNS AFTER DELAY : Continuous delay mode (P.47)

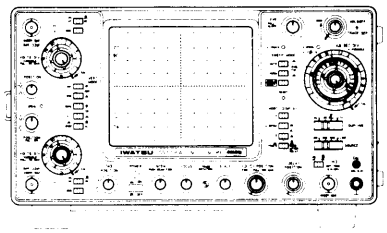
POSITION : Positions the signal horizontally (P.40)
x10 MAG : Magnifies the sweep rate by 10 times (P.41)

Rear Panel

(SS-5706A/SS-5705A)

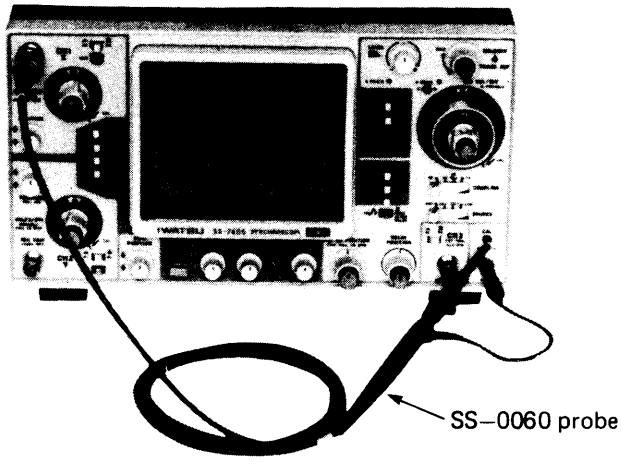


Displaying the CAL waveform



Displaying the signal on the screen is the first step for the oscilloscope users. If you are a first - time user or when confirming how this oscilloscope is operating, the following steps describe how to display the signal on the screen.

♦ Preliminary steup

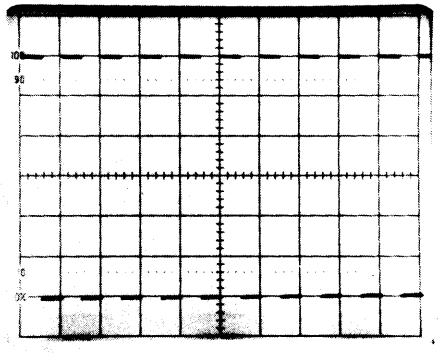


Using the accessory probe (SS - 0060) with its magnification set to 1 : 10, apply the CAL signal into the CH1 input.

♦ Setting

VERT MODE :	CH 1	PULL x (5) 10 MAG:	OFF
VOLTS/DIV :	5 mV/div	SEC/DIV :	1 ms/div
VARIABLE :	CAL	LEVEL :	CENTER
PULL X 5 MAG :	OFF	SWEEP MODE :	AUTO
AC/DC :	DC	COUPLING ;	AC
GND :	OFF	SOURCE :	CH 1
HORIZ DISPLAY:	A		
HORIZONTAL POSITION :	CENTER		

♦ Operating procedure



① Turn the LEVEL knob slightly to the right /left to obtain the triggering securely.

- The waveform of the CAL signal is drawn on the screen at an amplitude of 6 div.
- The slope of the displayed waveform can be changed over by pushing/pulling the LEVEL knob.

MEMO

2

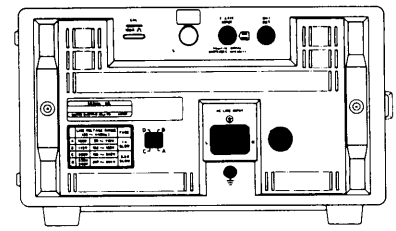
1 2 3 4 5

Functions and Operations

- **Summary**
  The functions and operations are described in detail in this section.

- **Test signal used in this section**
  Unless described, CAL (calibration) signals or sine waves are used for the test signal. To apply the CAL signal, see the "Displaying the CAL waveform" in the "2. BASIC OPERATIONS" section.

INPUT and OUTPUT on the rear panel



◆ ZAXIS INPUT

A connector for the external intensity modulation. Positive going signal decreases the intensity and the negative going signal increases the intensity.

Minimum modulation voltage : 3Vp-p
Frequency range : DC to 3MHz
Maximum input voltage : ±50V (MAX)
Input impedance : 9 kΩ

◆ CH1 OUT

An output connector for the signal applied into CH1 INPUT connector on the front panel.

Output voltage : 50mV/div ± 10% at 50Ω load
Bandwidth (–3dB) : DC to 10MHz (SS-5706A)
DC to 20MHz (SS-5705A)
Output R : Approx. 50 Ω

◆ AC LINE INPUT

An inlet connector for the power cord.

◆ A, B, C, D

Supply voltage selector plug which can select A: 100V, B: 115V, C: 220V or D: 230 or 240V.

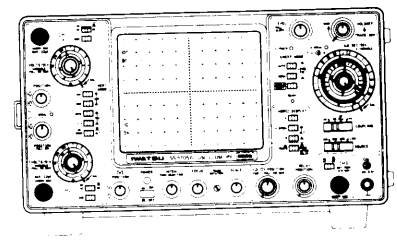
◆ Fuse

Fuse holder. When the supply voltage is of the 100V system, use 1A, and when it is of the 200V system, use 0.5A.

PROTECTIVE GROUND TERMINAL

When a 2-core-type power cord is used, be sure to ground this terminal.

CH1/CH2/CH3 INPUT CONNECTOR



Receives the signal. Use the standard probe or the coaxial cable for applying the signal.

CAUTION

[Never apply an excessive voltage into the inputs.]

CH1, CH2, Ch3 Connector	Maximum input voltage	Without probe : ±400 MAX With SS-0060 (x 10) probe : ±600V MAX

◆ CONNECTING THE PROBE

- The signal amplitude of each channel is attenuated to 1/10 by the standard probe SS-0060 (X 10).
- To enter a trigger signal from the outside, send it to CH3.

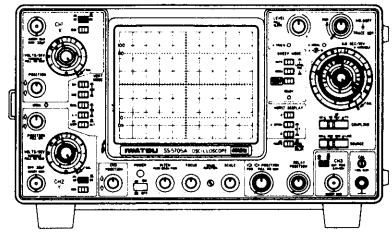
One point advice ◇ Grounding

- Connect the oscilloscope ground (⏚) and the device ground under test.
- Connect the signal ground as short as possible with the probe ground.

◇ Loading effect

- For the accurate measurement, it is important to minimize the loading effect.
  Using the standard probe SS-0060 is generally the best solution for this.
  Input RC without probe: 1MΩ //32pF
  Input RC with probe: 10MΩ //23pF

DC, AC, GND



Couples the input signal. In many cases, the DC coupling is the best choice, since the DC coupling eliminates no signal component. When you measure a small signal amplitude having a large DC offset, use the AC coupling to eliminate the DC level. You will obtain the ground reference level by using the GND coupling.

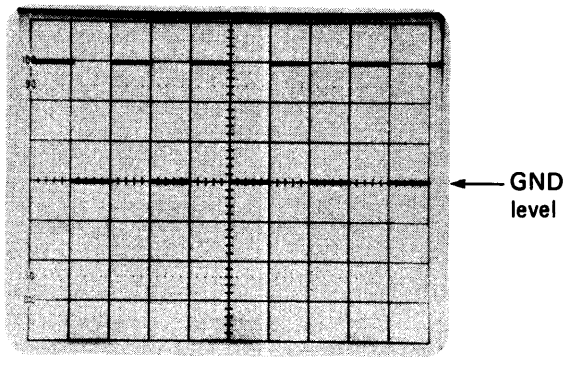
◇ DC coupling

♦ Key operation

AC [▮▮] DC / AC [▮▮] DC

Selecting DC

♦ Operating procedure



① Press the AC [▮▮] DC key and select the DC coupling.

- The CAL signal on the screen is displayed above the ground level.

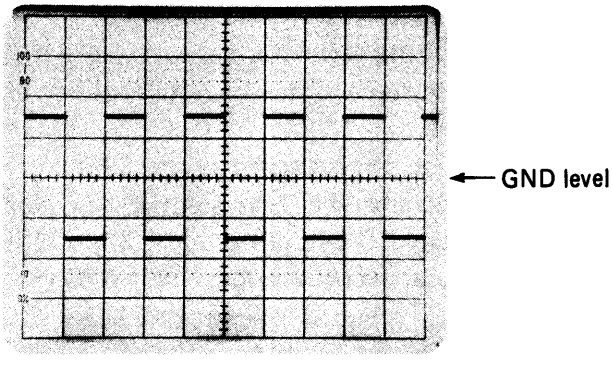
◇ AC coupling

♦ Key operation

AC [▮▮] DC / AC [▮▮] DC

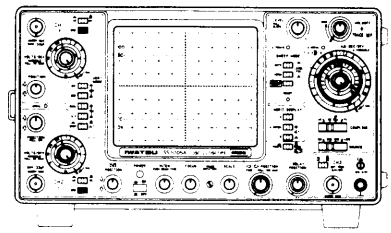
Selecting AC

♦ Operating procedure



① Press the AC [▮▮] DC key and select the AC coupling.

- The CAL signal on the screen is displayed symmetrically over the ground level.



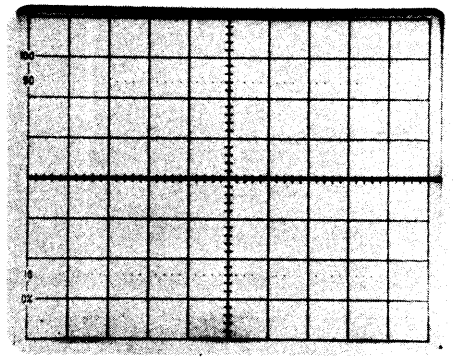
◇ GND coupling

♦ Key operation

GND ▯▯▯ / GND ▯▯▯

Selecting GND

♦ Operating procedure

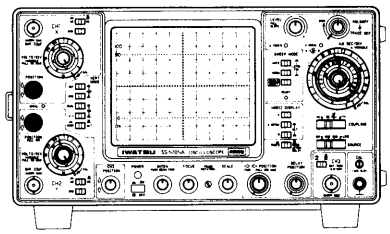


① Press the GND ▯▯▯ key and select the GND coupling.

- The GND coupling shows the ground reference level on the screen.

3

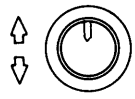
POSITION



Allows to move the signal up and down on the screen to obtain the desired wave form position.

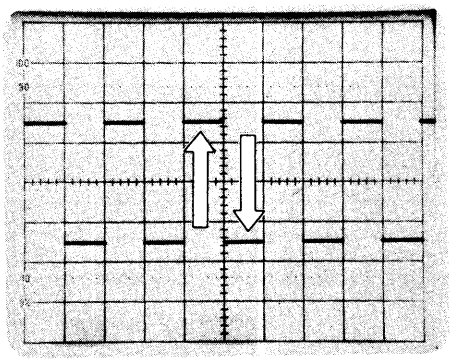
♦ Key operation

POSITION



Positioning Signal

♦ Operating procedure

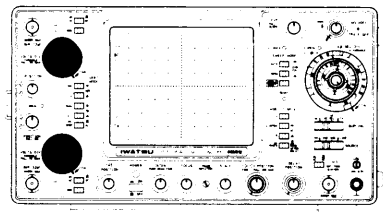


← **GND** level

◇ ⇕ POSITION

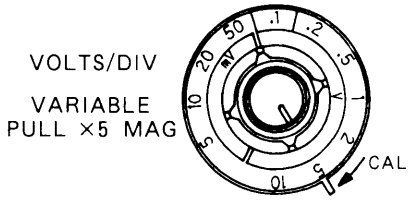
① Using the POSITION knob, position the signal.

VOLTS/DIV VARIABLE PULL x5 MAG



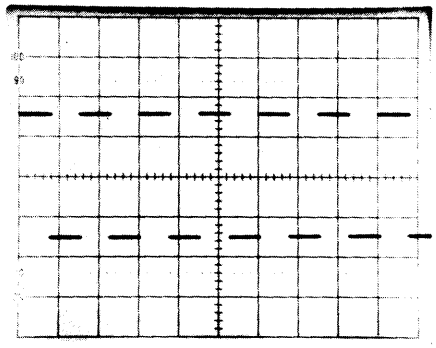
Changes the signal amplitude to obtain the appropriate size. You can change the amplitude continuously by using the VARIABLE function. To pull the knob makes the signal amplitude five times higher.

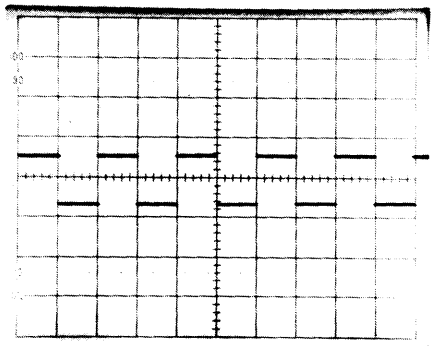
♦ Key operation

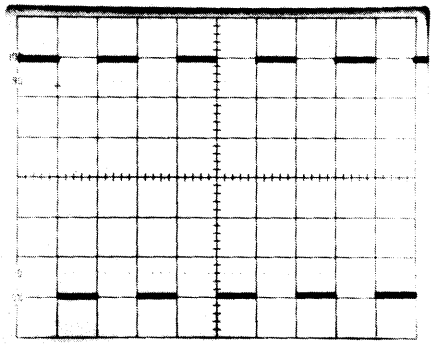


CH1, CH2 Signal amplitude Selecting

♦ Operating procedure







◇ **VOLTS/DIV** (Outer knob)

① Using the VOLTS/DIV knob, select the defection factor.

◇ **VARIABLE** (Inner knob)

① Using the VARIABLE knob, changes the amplitude continuoulsy.

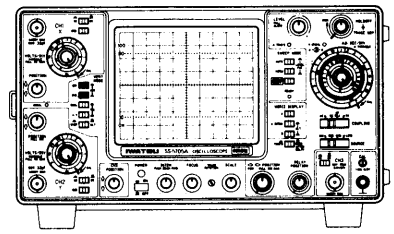
- Counterclockwise turn decreases the sensitivity.
- The variable range is 1/2.5 times or less of the deflection factor at the CAL (Calibration) position, or fully clockwise position (Indicator goes off.).
- Turning counterclockwise makes the signal amplitude uncalibrated and illuminates the UNCAL indicator.
- The UNCAL is common to CH1 and CH2.

◇ **PULL x 5 MAG (inner knob)**

① Pulling the VARIBLE knob makes the amplitude five times larger than the deflection factor.

3.6 Selecting the signal VERT MODE

CH1, CH2



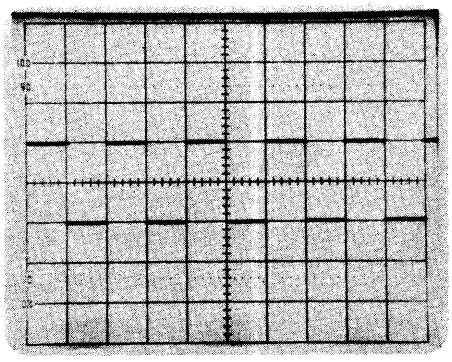
Selects the signal channel to be displayed.

♦ **Key operation**

CH 1 [ ] / CH 2 [ ]

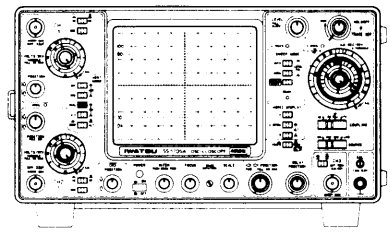
Selecting CH1 or CH2

♦ **Operating procedure**



① Change over the VERT MODE switch to select either CH1 or CH2.

DUAL



This is used in case of 2-trace display. The 2-trace display mode consists of the ALTRNATE and CHOP modes.
This mode allows 2-trace observation of high-speed signals to low-speed signals.

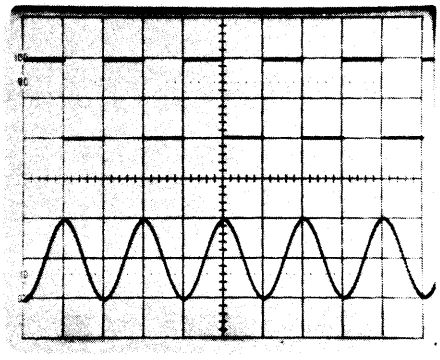
◇ ALT display mode and CHOP display mode

♦ Key operation

DUAL → CHOP ALT

Setting DUAL　　Selecting CHOP or ALT

♦ Operating procedure

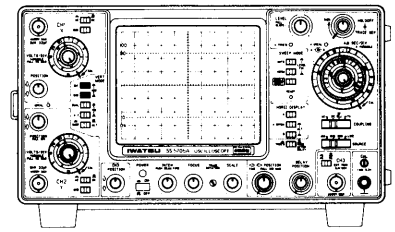


① Set the VERT MODE switch to select the DUAL mode.
② Select CHOP or ALT mode.
- In the CHOP display mode, the signals on Channel 2 are displayed sequentially at the chop switching rate of about 128 kHz and swept.

One point advice

- The CHOP multi - display mode is relatively advantageous for displaying the low-speed signal.
- The ALT multi - display mode is advantageous for displaying the high-speed signal.

ADD



Display the algebraic added.

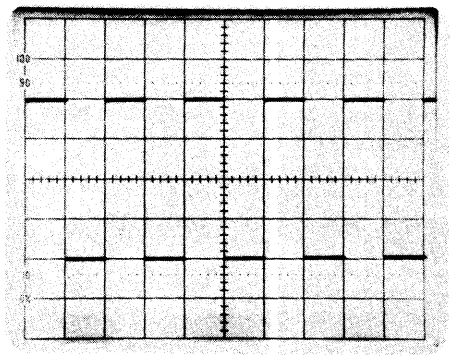
♦ Key operation

CH 1 [▦] + CH 2 [▦]

Setting CH1 and CH2 at the same time

♦ Operating procedure

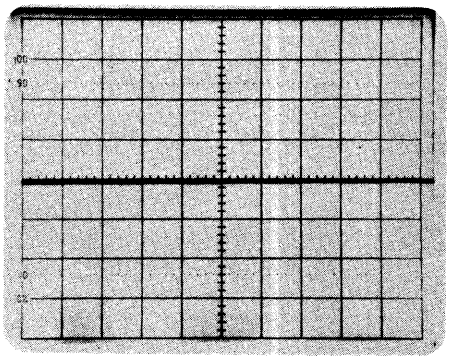
ADD : Added display



① Enter the same signal into CH1 and CH2.
② Press the CH1 [▦] key and CH2 [▦] key at the same time to set ADD mode.

- Two waveforms can be observed (CH1 + CH2).

ADD and CH2 INV : Differential display with the CH2 INV on

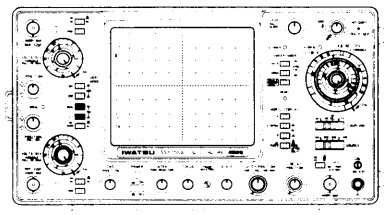


③ Pull the POSITION knob on CH2 to set INV mode.

- The difference between CH1 signal and CH2 signal displayed [(CH1) + (−CH2)].

One point advice • For differential input (INV), set CH1/CH2 signal input coupling in the same way. Though the position of a trace can be adjusted in each of both channel POSITIONs, set the POSITIONs at almost the center to measure correctly.

TRI



This is used in case of 3-trace display. The 3-trace display mode consists of the ALTERNATE and CHOP modes. This function allows to observe 3 signals, entered into CH1, CH2 and CH3, simultaneously.

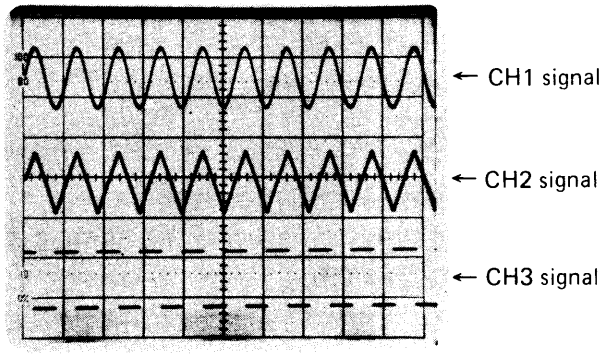
♦ Key operation

DUAL [□□□] + X−Y [□□□] ⟶ CHOP [□□□] ALT

Setting DUAL and X-Y at the same time

Selecting CHOP or ALT

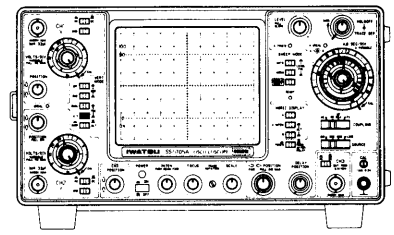
♦ Operating procedure



① Press DUAL [□□□] key and X-Y [□□□] key at the same time to set the TRI mode.

- Selecting the CHOP key sweeps 3 signals in the CHOP mode.
- Selecting the ALT key sweeps 3 signals in the ALTERNATE mode.

X-Y



This is available for X-Y display which assumes the signals entered into CH1 as a X axis, and those to CH2 as a Y axis. The X-Y display mode is advantageous for displaying the Lissajous pattern or voltage-current curve of the semiconductor characteristics.

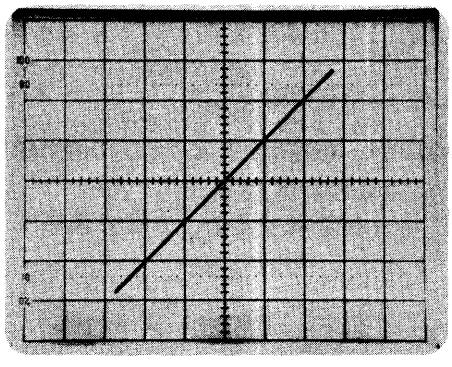
◆ Key operation

X−Y

Setting X-Y

◆ Operating procedure

Input: Sine wave common to CH1 and CH2



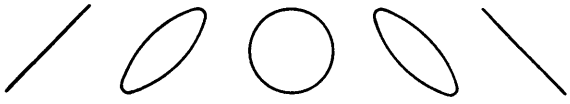
① Turn the X−Y knob to select X-Y.

- Turn the VOLTS/DIV knob on CH1 to select the signal amplitude on the X axis.
  The position can be adjusted by turning the ⇦ ⇨ POSITION knob.
- Turn the VOLTS/DIV knob on CH2 to select the signal amplitude on the Y axis.
  The position can be adjusted by turning the ⇧ ⇩ POSITION.

	Y axis	X axis
Input	CH2	CH1
Deflection factor	CH2 VOLTS/DIV, VARIABLE and x 5 MAG	CH1 VOLTS/DIV, VARIABLE and x 5 MAG
Position	CH2 ⇧ ⇩ POSITION	⇦ ⇨ POSITION

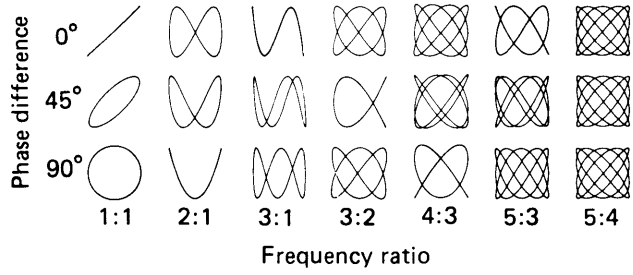
One point advice

- The Lissajous pattern of the sine wave

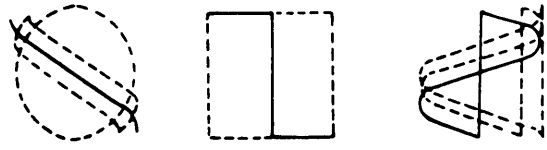


(a) 0° 360° (b) 45° 315° (c) 90° 270° (d) 135° 225° (e) 180°

- Lissajous patterns of various frequency ratios



- The Lissajous pattern of the different waveform

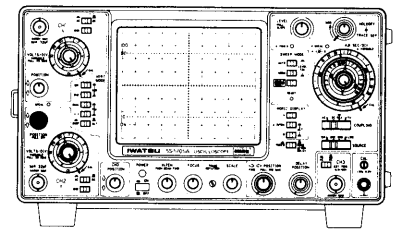


(a) Sine vs. triangle (b) Sine vs. square (c) Sine vs. ramp

3

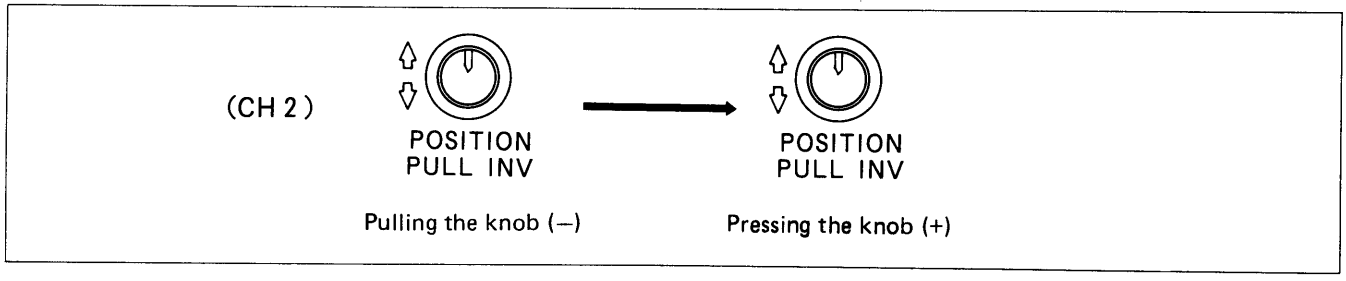
3.7 Inverting the signal

CH2 INV

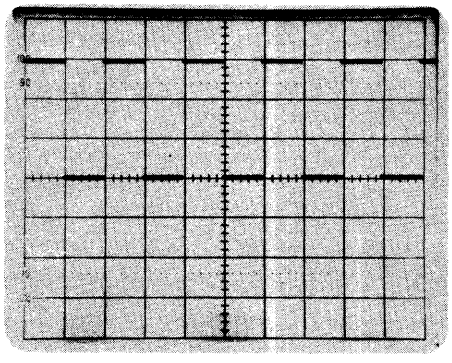


Inverts the CH2 signal polarity to the negative polarity.

♦ **Key operation**

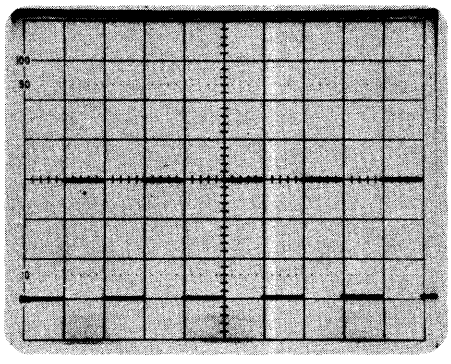


♦ **Operating procedure**



① Enter a signal into CH2.

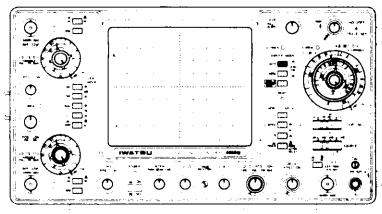
② Press the POSITION knob on CH2.



③ Pull the POSITION knob on CH2 to select the INV mode.

One point advice The polarity of the trigger signal is not altered by changing over CH2 INV.

AUTO



Generates the sawtooth signal in either case the oscilloscope is triggered or not. Triggering the oscilloscope provides the stable display, and not triggering the oscilloscope may provide the erroneous display. Use the NORM sweep mode, when your signal frequency is below 50 Hz or you do not want to display the trace at the lack of triggering.

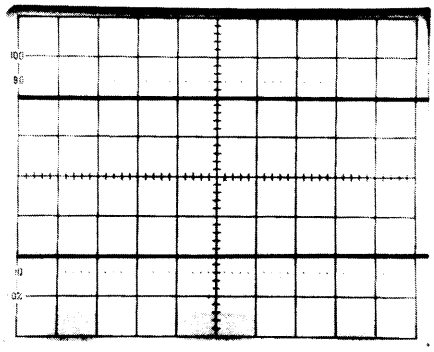
♦ **Key operation**

SWEEP MODE

AUTO

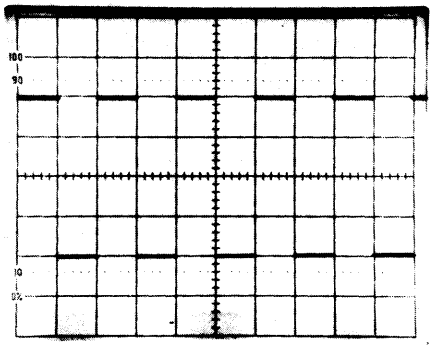
Selecting AUTO

♦ **Operating procedure**



① Set the SWEEP MODE switch to select the AUTO mode.

• CAL display without triggering



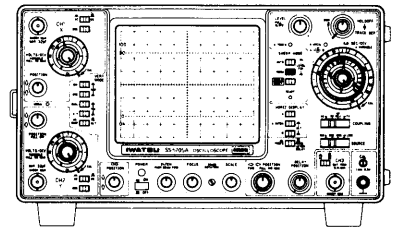
• CAL display with triggering

One point advice

- It is necessary to adjust the trigger level to trigger the oscilloscope.
- Use the NORM sweep mode when your signal frequency is below 50 Hz.
- When the trigger (TRIG) signal frequency is 50 Hz or less, sweep operation starts automatically, seeming to be non-triggered. In this case, select NORM which is described in the following section.

3.8 Selecting the Sweep Mode
SWEEP MODE

NORM



Allows to display the signal only when the oscilloscope is triggered. The AUTO mode is easier way to obtain the triggering. Use the NORM sweep mode, when your signal frequency is below 50 Hz or you do not want to display the trace at the lack of triggering.

♦ **Key operation**

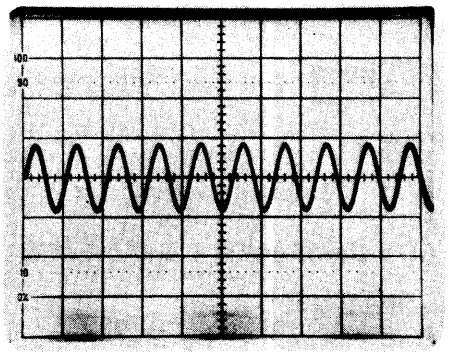
SWEEP MODE

NORM

Selecting NORM

3

♦ **Operating procedure**



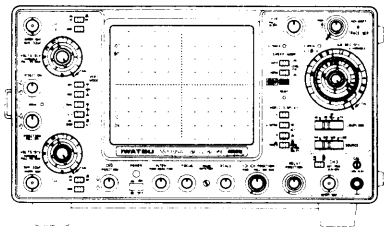
① Set the SWEEP MODE switch to select the NORM mode.

- No trace is available on the screen at the lack of triggering.

One point advice

- Use the NORM sweep mode when your signal frequency is below 50 Hz.
- Use the AUTO mode when you want to check the ground level.

SINGLE



Allows to generate the sweep and display the signal once when the oscilloscope is triggered at the ready condition.
Until you set the oscilloscope ready again, the oscilloscope will not be triggered. Therefore, the SINGLE sweep mode is useful for capturing the single shot event and taking the picture of the signal.

♦ **Preliminary setup**

Let's suppose the CAL signal as the single shot event. Do not apply the CAL signal until the instruction says so.

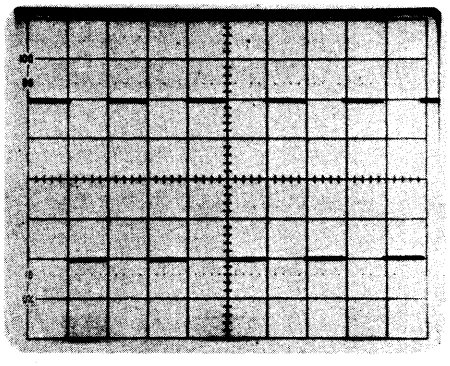
♦ **Key operation**

SWEEP MODE

SINGLE RESET = READY ○

Setting SINGLE — LED indicator lights. (waiting for signals)

♦ **Operating procedure**



① Press the SINGLE RESET key to select the SINGLE sweep mode.
- Confirm that the READY indicator goes on.

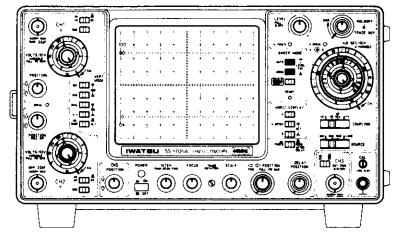
② Apply the CAL signal.
- The sweep runs once with the TRIG'D indicator on, then the READY indicator goes off after the sweep ends.

One point advice

- When you want to perform single sweep, press the SINGLE RESET key, and make sure that the READY indicator is illuminated. (wait condition)
- Two-trace simultaneous single sweep is allowed in the CHOP mode only.

LEVEL FIX

LEVEL FIX is only for SS-5705A.



Since the trigger level is set at around 0 V, if the trigger signal large enough in amplitude is input, the triggering is obtained automatically, even if LEVEL is not operated. Since the trigger level has been fixed, LEVEL FIX cannot be set at an arbitrary position, though signals can be triggered very easily and without fail.

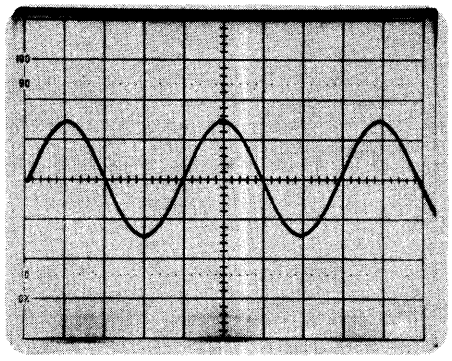
◆ **Key operation**

SWEEP MODE

AUTO ▭ + NORM ▭

Pressing these keys at the same time
to select LEVEL FIX

◆ **Operating Procedure**

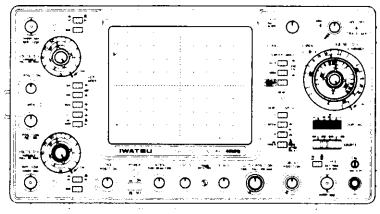


① Press the AUTO ▭ key and the NORM ▭ key at the same time to select LEVEL FIX.

One point advice · The minimum amplitude to obtain the triggering is determined by frequencies.
1 div. at 100 Hz to 5 MHz (1.5 div. for B sweep)
2 div. at 5 MHz to 20 MHz (3 div. for B sweep)

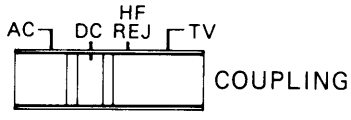
3.9 Selecting the Trigger Coupling
COUPLING

AC, DC



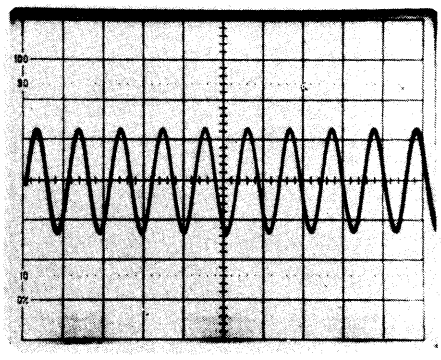
Select the TRIG signal coupling mode for stable triggering fitted to the type of a trigger signal (AC or DC) or to the purpose of observation.

♦ Key operation



Selecting AC or DC

♦ Operating procedure

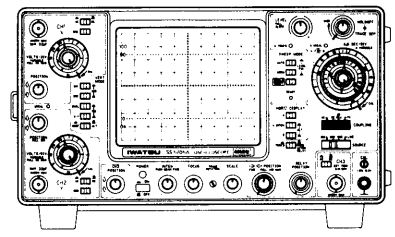


① Select either AC or DC by changing over the COUPLING switch.

One point advice · AC : rejects the dc offset level from the trigger signal. Below the 10Hz frequency the triggering may be difficult because of the trigger signal amplitude attenuation.

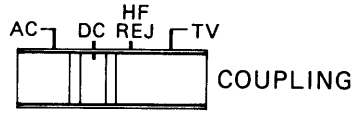
· DC : passes all the signal components.

HF REJ



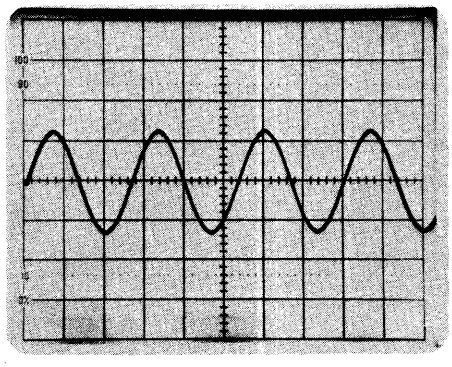
Occasionally the trigger signal noise may cause the triggering difficult to obtain the stable display. Use the frequency rejection coupling to reject noise.

◆ **Key operation**



Selecting HF REJ

◆ **Operating procedure**



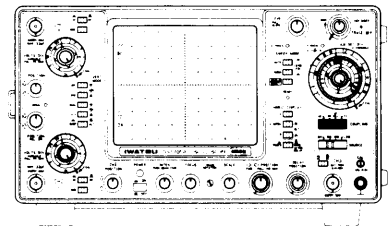
① Set the COUPLING switch to select the HF REJ mode.

One point advice

The high-frequency trigger signal (approx. 10 kHz or more) or high-frequency noise superimposed on the trigger signal are attenuated, and only the low-frequency component is allowed to pass.

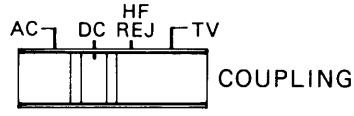
3.9 Selecting the Trigger Coupling
COUPLING

TV



Allows to trigger the composite video signal easily.

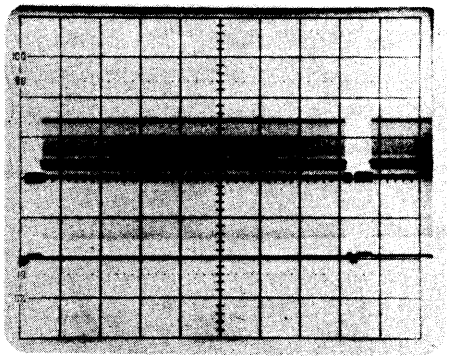
♦ **Key operation**



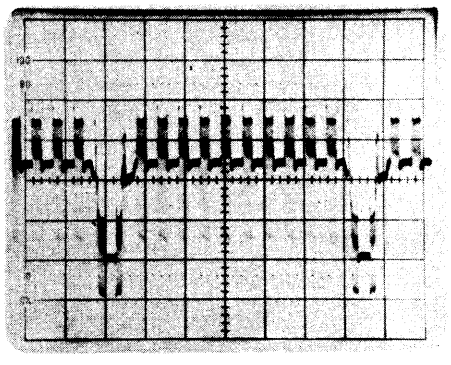
Selecting TV

♦ **Operating procedure**

TV-V : A sweep



TV-H : A sweep



◇ Monitorning TV-V signals

① Set the COUPLING switch to select the TV mode.

② Press the A switch in the HORIZ DISPLAY mode to select A.

- Set SLOPE to "+" and to "—", when a synchronous signal is positive and when it is negative respectively.
- By setting the sweep rate at 2 ms/div, a composite video signal for 1V can be monitored.

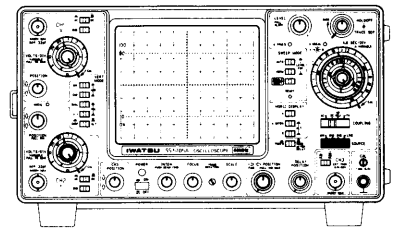
◇ Monitoring TV-H signals

③ Press the B switch in the HORIZ DISPLAY mode to select B.

- By setting the sweep rate at 10 μs/div, a composite video signal for 1H can be monitored.

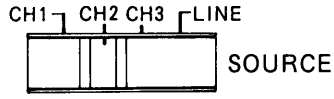
One point Advice · When observing the TV-V signal after selecting TV, switch over HORIZ DISPLAY to A SWEEP, and when observing the TV-H signal, switch over to B SWEEP.

CH1, CH2



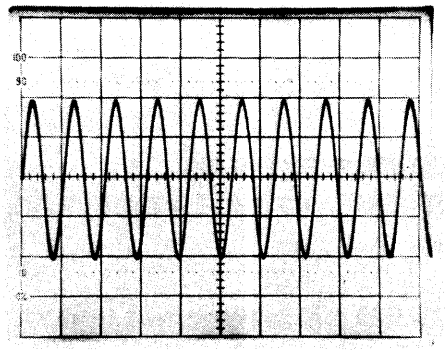
It is necessary to trigger the oscilloscope to obtain the stable display on the screen. The trigger source is selected from the two signals of the CH1 and CH2 vertical inputs.

♦ **Key operation**



Selecting CH1, CH2

♦ **Operating procedure**



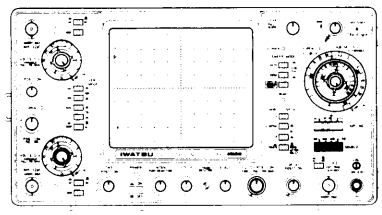
① Set the SOURCE switch to select a channel (CH1 or CH2) where signals can be triggered.

One point advice

- When CH1 or CH2 is selected by changing over the SOURCE switch, the input signal applied to INPUT is input to the trigger circuit. This method is called internal trigger.
- When observing 2 signals (2-trace observation), select the channel where the input signal has a higher voltage and less noises. This allows you to obtain more stable triggering.

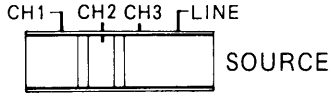
3.10 Selecting the Trigger Sourcel SOURCE

CH3



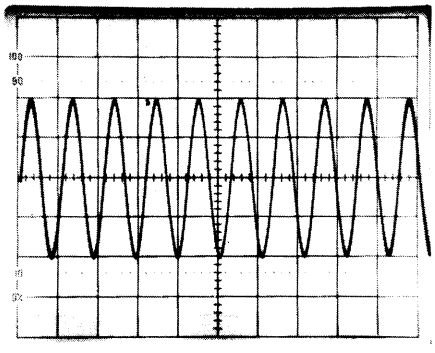
When making the signal standstill on the screen repeatedly to observe it, there are two trigger methods; internal trigger (CH1, CH2, CH3) and external trigger (CH3).
In the external trigger (CH3), it is possible to stably trigger the signal irrespective of the amplitude of an input signal on the vertical axis, once it is triggered and, by displaying it on the screen (3-trace observation), signals can be measured quantitatively.

◆ Key operation



Selecting CH3 trigger signal

◆ Operating procedure

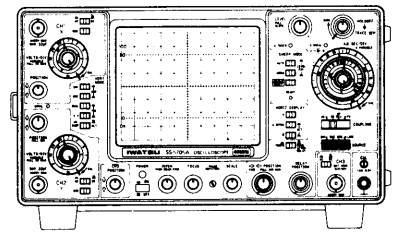


① Set the SOURCE switch to select the CH3 mode.
② Input the external trigger signal to the CH3 EXT TRIG connector.

One point advice

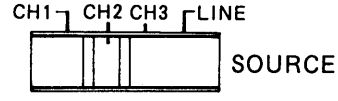
- The CH3 is not only available when VERT MODE is TRI (3-trace observation), but also available as an external trigger signal.
- If the signal (external trigger), which has constant time relations (integer multiplied) with the CH1 or CH2 input signal, is applied to the CH3 as an external trigger signal, the CH1 or CH2 input signal comes to a standstill to allow to observe.

LINE



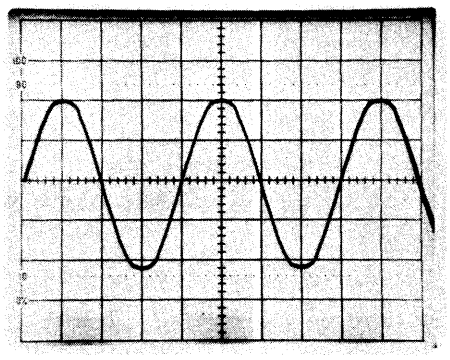
Triggers the oscilloscope with the line frequency. The LINE trigger source is useful for checking the line voltage ripple voltage, and other voltages related to line frequency.

♦ **Key operation**



Selecting LINE

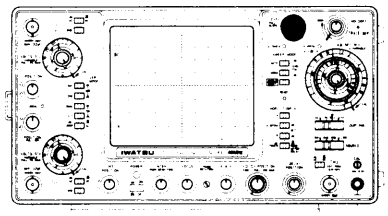
♦ **Key operation**



① Set the SOURCE switch to select the LINE mode.

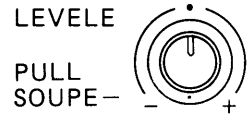
One point advice · The method of dividing the supply voltage and of applying it to the synchronous circuit, when observing the supply frequency, is called line trigger.

LEVEL
PULL SLOPE —



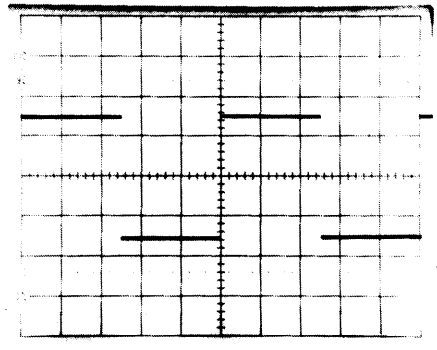
Allows to trigger at the desired level of the trigger signal. It is necessary to trigger the oscilloscope to obtain the stable display.
The slope (+/—) of the waveform on the screen can be changed over by pushing/pulling the knob.

♦ Key operation

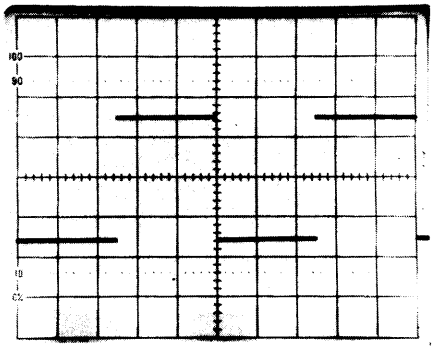


Adjusting
TRIG LEVEL

♦ Operating procedure



① Turn LEVEL knob to the right/left to adjust the trigger level and obtain the triggering.
② Pressing the LEVEL knob triggers the slope from the + side.
③ This is an example when the LEVEL knob is set almost at the center.

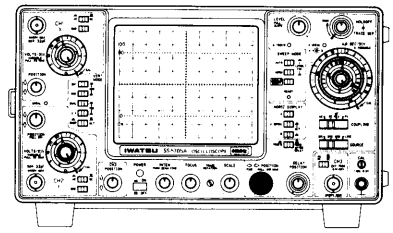


④ Pulling the LEVEL knob triggers the slope from the — side.

3.12 Positioning the Signal Horizontally

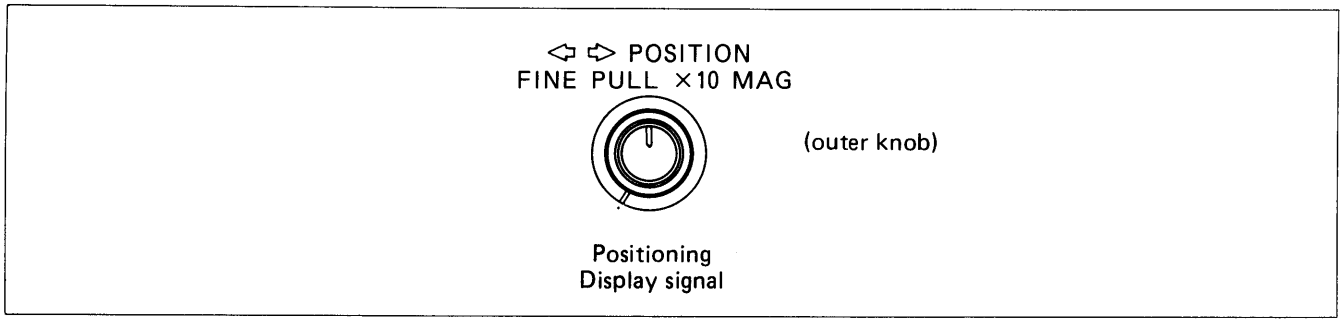
◀ ▶ POSITION
FINE PULL x 10 MAG

FINE is only for SS-5705A.
x5 is for SS-5706A and
x10 is for SS-5705A.



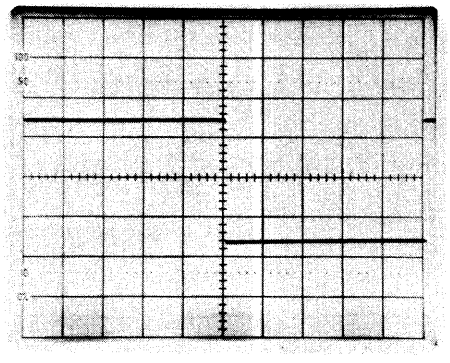
Allows to position display signals horizontally. Fine (inner knob) can finely move ths signals for the best viewing (only for SS-5705A).

♦ Key operation



3

♦ Operating prodecure



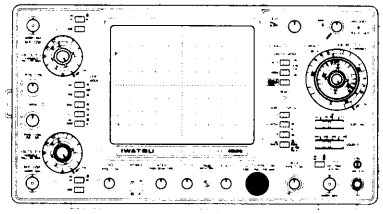
① Using the POSITION knob (outer knob), position the display signal for the best viewing.

- Turning the POSITION knob clockwise moves the signal to the right.
- Turning the POSITION knob counterclockwise moves the signal to the left.
- FINE is a fine regulator for horizontal positioning. (only for SS-5705A)

One point advice · Fine is only for SS-5705A.

◀▶ POSITION
FINE PULL x 5(10) MAG

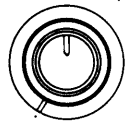
FINE is only for SS-5705A.
x5 is for SS-5706A and x10 is for SS-5705A.



The display signal is magnified by five times (SS-5706A) or by ten times (SS-5705A) horizontally, based on the center of the scale.

◆ Key operation

◁▷ POSITION
FINE PULL ×5(10) MAG

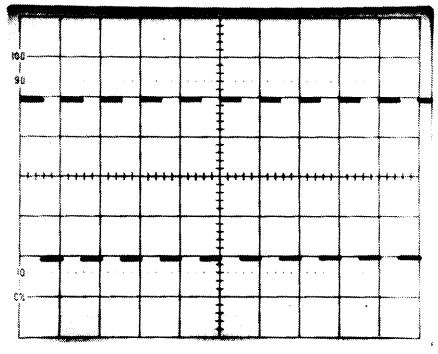


(inner knob)

Finely adjusting movement of signals and Magnifying signals

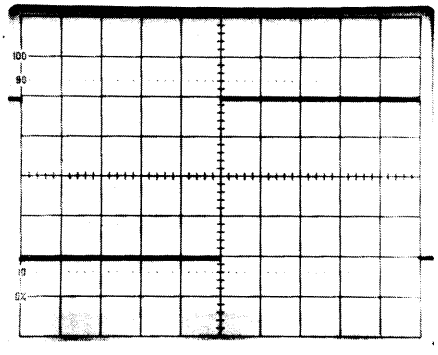
◆ Operating procedure

Normal



① Fit the part of the signal you want to magnify to the center scale of the screen.

PULL x 5 (10) MAG

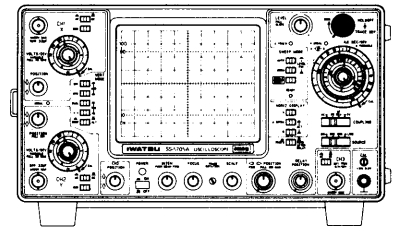


② Pull the inner knob to horizontally magnify the display signal, based on the center of the scale.

One point advice · A magnification factor is 5 times for SS-5706A, and 10 times for SS-5705A.

HOLDOFF
TRACE SEP

TRACE SEP is only for SS-5705A.



Allows to trigger the complex signal by varying the holdoff time (HOLDOFF). In the ALT display mode, the A and B sweep display can be separated in TRACE SEP.

◆ Key operation

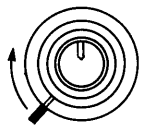
HORIZ DISPLAY

A INTEN [ ] + B [ ]

Pressing these keys at the same to select ALT

,

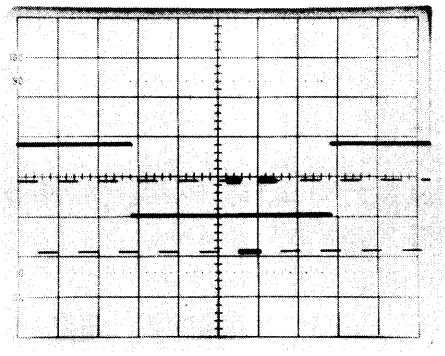
HOLDOFF



TRACE SEP

{ HOLDOFF (outer knob)
{ TRACE SEP (inner knob)

◆ Operating procedure



◇ HOLDOFF (outer knob)

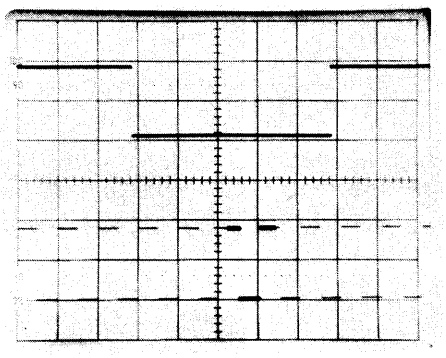
① Turn the HOLDOFF knob to obtain the stable screen display.

◇ TRACE SEP (Inner knob)

① Press the A INTEN [ ] and B [ ] keys to select ALT.

- When the A-sweep and B-sweep displays overlap each other and are not easy to view, operate as follows.

② Turning the TRACE SEP knob moves the B-sweep display.



One point advice

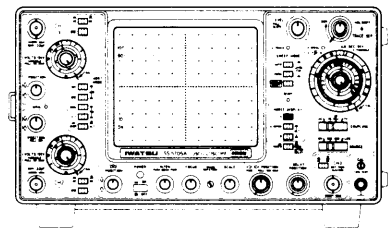
- Fully counterclockwise turn of the HOLDOFF

TRACE SEP knob sets the minimum hold-off time.

- Pressing the HORIZ DISPLAY B [ ] key shows the B-sweep displays only.

3.14 Selecting the Horizontal Display HORIZ DISPLAY

A



Provides the primary time base. The sweep rate is set in A SEC/DIV and A VARIABLE modes.

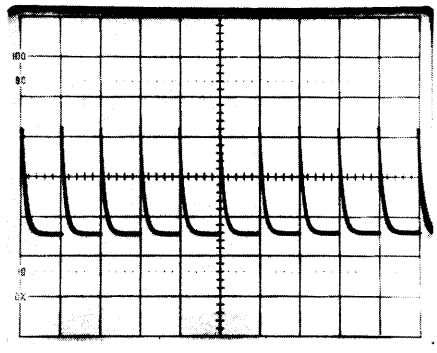
◆ Key operation

HORIZ DISPLAY

A ▭▭▭

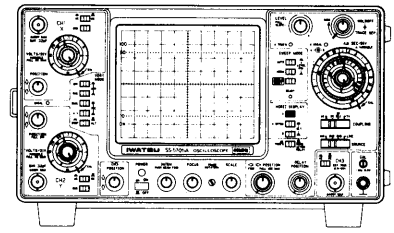
Selecting A time base

◆ Operating procedure



① Press the A ▭▭▭ key and select the A horizontal display.

A INTEN



In order to observe the start position (delay time) and sweep length of the B sweep, this function brightens (luminance modulation) and displays the B-sweep display position on the A-sweep display. The sweep rate is set with A SEC/DIV, and the B-sweep width (sweep rate) with B SEC/DIV.

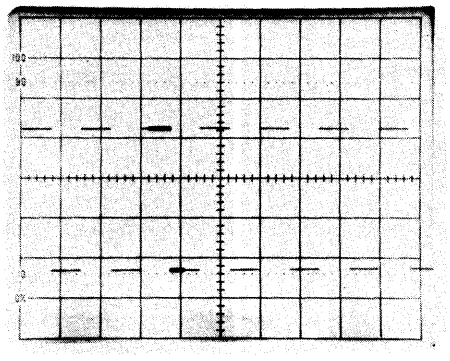
◆ **Key operation**

HORIZ DISPLAY

A [□□]

Selecting A INTEN

◆ **Operating procedure**

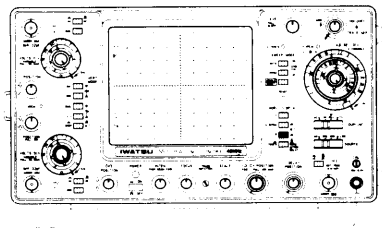


① Press the A INTEN [□□] key and select the A INTEN mode.

One point advice · With A INTEN mode selected and when selecting the B-sweep start position (delay time), turn the DELAY POSITION knob.

3.14 Selecting the Horizontal Display HORIZ DISPLAY

B



Provides the delayed time base. The B time base is intended for magnifying signals in the direction of the time axis and for displaying them. The B sweep rate is set in B SEC/DIV mode.

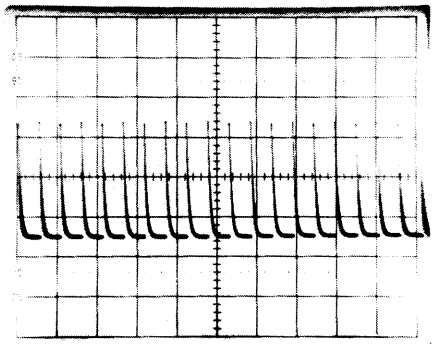
♦ Key operation

HORIZ DISPLAY

B

Selecting B horizontal display

♦ Operating procedure

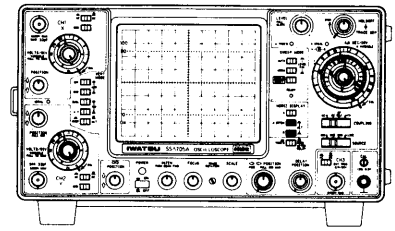


① Press the B key and select the B horizontal display mode.

3.14 Selecting the Horizontal Display HORIZ DISPLAY

ALT

ALT is only for SS-5705A.



The ALT mode provides the A primary sweep intensified by the delayed sweep and the delayed sweep on the same screen.

◆ Key operation

HORIZ DISPLAY

A INTEN [ ] + B [ ]

Pressing these keys at
the same time to select ALT

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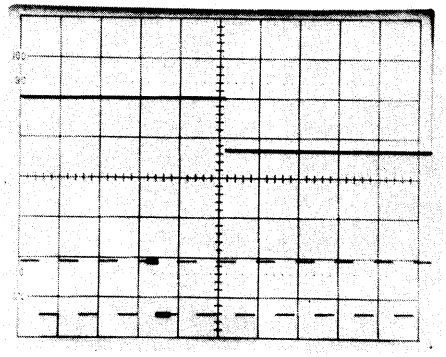
◆ Operating procedure

With the TRACE SEP knob turned clockwise:



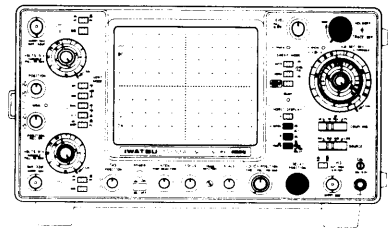
① Press the A INTEN [ ] key and the B [ ] key at the same time to select the ALT mode.

- Turning the TRACE SEP knob allows to observe the A-sweep and B-sweep displays, separated from each other.
- Turning the DELAY POSITION knob allows to select the delay time (B-sweep start point).

3.15 Selecting the Continuous Delay Mode

RUNS AFTER DELAY

ALT is only for SS-5705A.

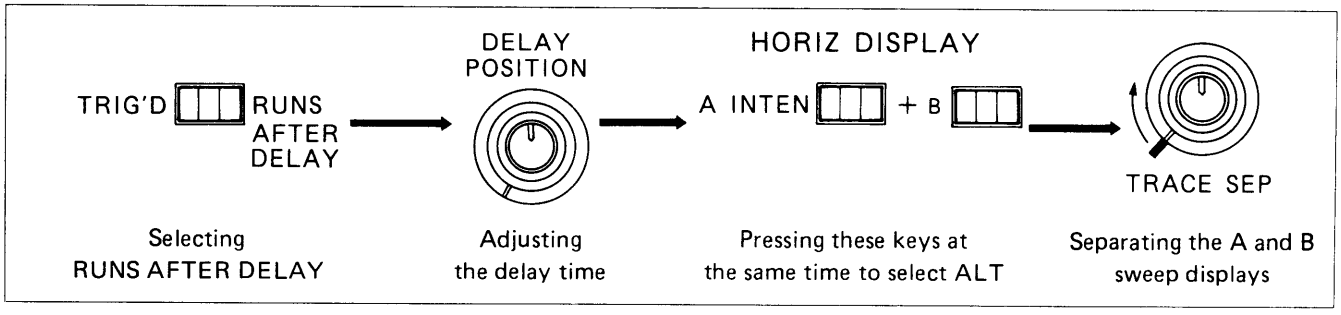


The continuous delay called RUNS AFT DLY allows to delay and display the signal continuously. In the ALT display mode, the A and B sweep displays will be separated.

◆ Preliminary setup

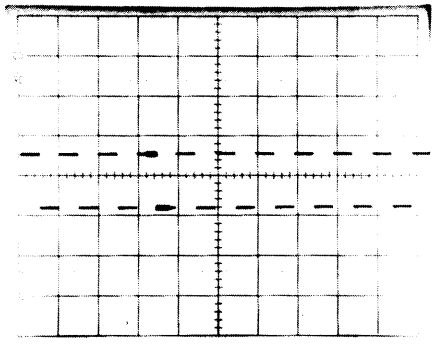
- Select A INTEN or the ALT display mode

◆ Key operation

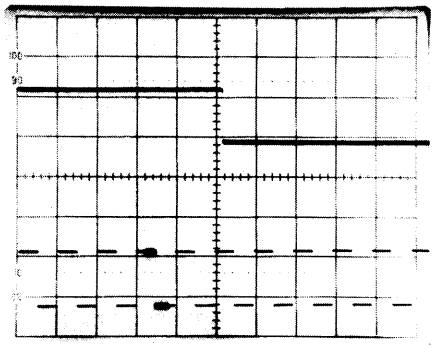


◆ Operating procedure

A INTEN



ALT



① Press the TRIG'D RUNS AFTER DELAY key and select the RUNS AFTER DELAY mode.

② Turn the DELAY POSITION knob to move luminance modulation to the part of the waveform which you want to magnify and observe.

- Setting HORIZ DISPLAY to B sweep magnifies and displays the part which is modulated in luminance.

③ Select ALT in HORIZ DISPLAY.

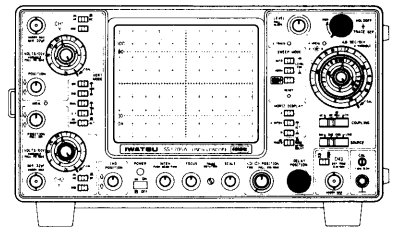
④ Turn the TRACE SEP knob to move the B-sweep display to an easy-to-observe position.

One point advice Only the B-sweep display can be displayed by pressing the B key in HORIZ display.

3.15 Selecting the Continuous Delay Mode

TRIG'D

ALT is only for SS-5705A.

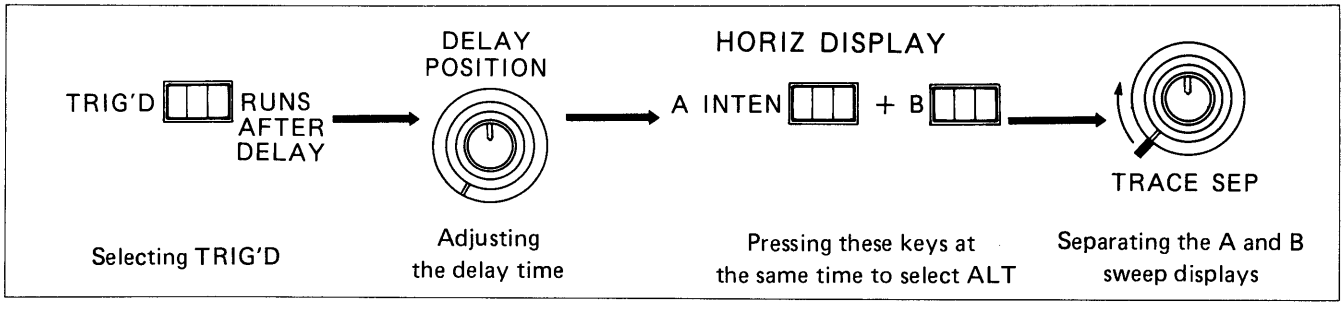


The triggered delay called TRIG AFT DLY allows to run the B sweep when the B sweep is triggered after the certain delay time. In the ALT display mode, the A and B sweep displays will be separated.

◆ **Preliminary setup**

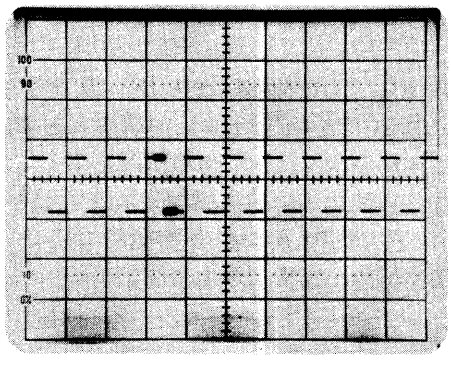
- Select A INTEN or the ALT display mode.

◆ **Key operation**



◆ **Operating procedure**

A INTEN:

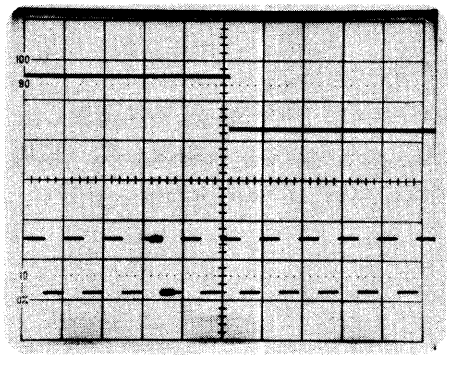


① Press the TRIG'D RUNS AFTER DELAY key to select the TRIG'D mode.

② Turn the DELAY POSITION knob to move luminance modulation to the part of the waveform which you want to magnify and observe.

- Setting HORIZ DISPLAY to B Sweep magnifies and displays the part which is modulated in luminance.

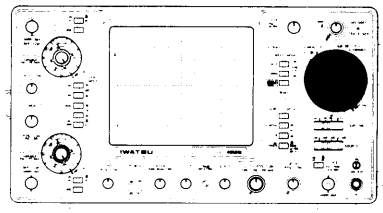
ALT:



③ Select ALT in HORIZ DISPLAY.

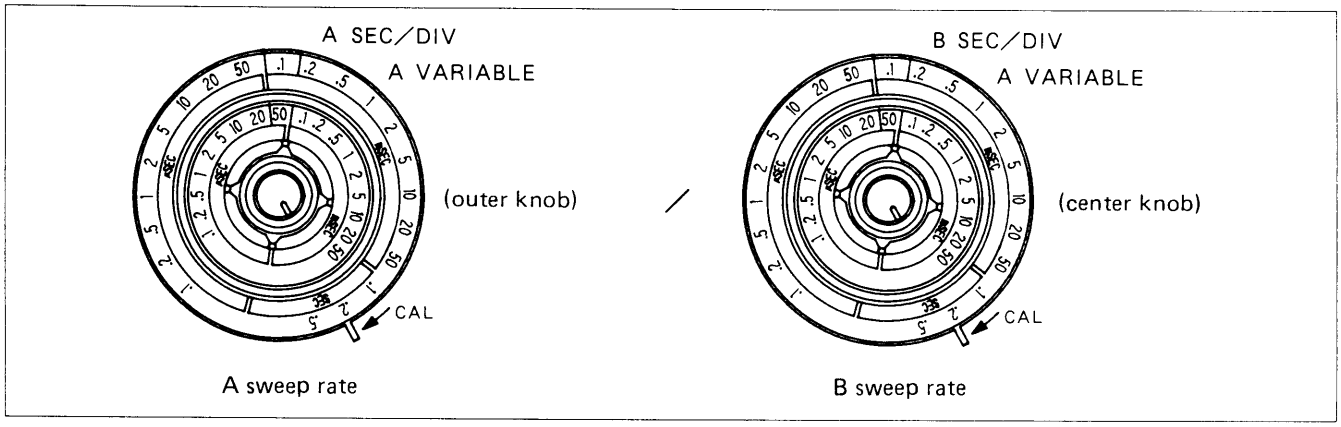
④ Turn the TRACE SEP knob to move the B-sweep display to an easy-to-observe position.

SEC/DIV
A VARIABLE

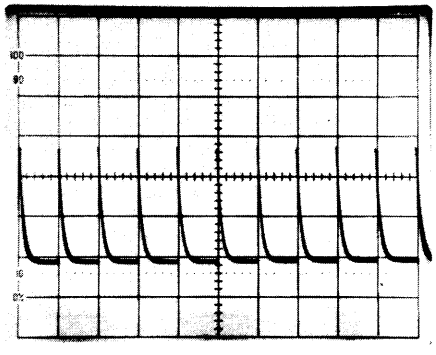


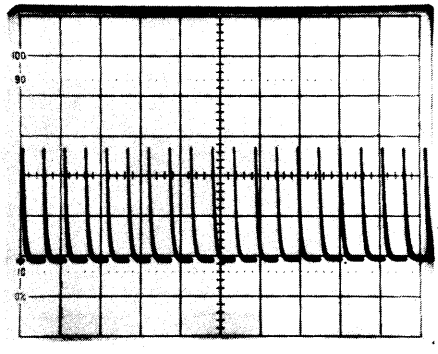
Allows to expand and compress the display waveform horizontally for the best viewing condition. When you expand the signal, you obtain the more detail of the signal, but you see the shorter duration. VARIABLE varies the sweep rate continuously.

◆ Key operation



◆ Operating procedure





① Using the A SEC/DIV knob (outer knob), select the A sweep rate.
- By turning the A VARIABLE knob (inner knob), the sweep rate can be varied continuously.
- When the A VARIABLE knob is set to the position other than CAL (non-calibration), the A UNCAL indicator goes on.

② Press the HORIZ DISPLAY key to select B (B sweep).

③ Turn the B SEC/DIV knob (in the center) to select the B sweep rate.

One point advice Turning the A VARIABLE knob fully clockwise results in the CAL (calibration) mode.

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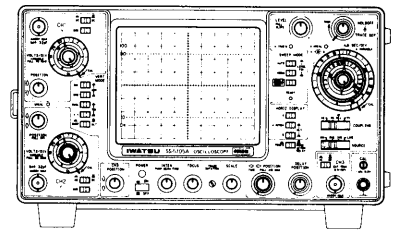
DAILY CHECK

Cleaning



This page describes how to clean the oscilloscope to keep it in good condition over a long period of time.

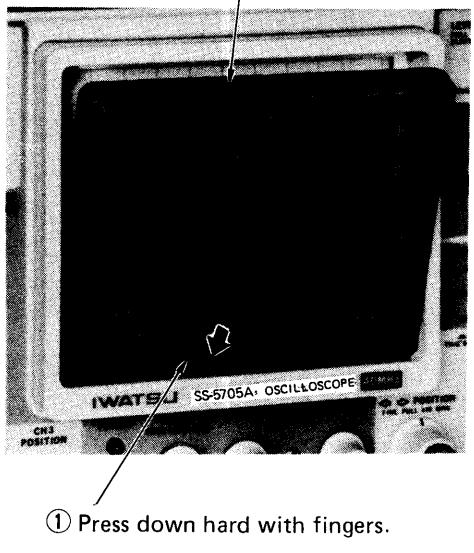
◆ Follow the next instructions

◇ Use the appropriate cleaner

Clean the covers and panels gently with the soft cloths dipped in the water or the mild detergent. Using the prohibited cleaner in the list may change the color or cause the unexpected damage.

Recommended cleaner	Water, mild detergent
Prohibited cleaner	Acetone, gasoline, ether, alcohol, lacquer, thinner, methyl-ethyl-ketone, detergent containing ketone

◇ How to take off the filter



How to remove

1. Pressing down the lower part of the filter hard with fingers, pull the upper part of the filter toward you with them.

Cleaning

1 Clean the filter and the screen face gently with the soft cloth.

2 Use the mild detergent if necessary.

Quick Calibration

◆ **Periodical calibration**

The periodical calibration ensures the accurate measurement and may reduce the risk of the instrument damage as well. The six-month calibration interval is recommended for the normal use and the one-thousand-hour interval is recommended for the frequent use.

◆ **Quick check**

The following lists the quick check procedures.

Check	Adjust
Unaligned trace	• Adjust the TRACE ROTATION control to align the horizontal trace with the horizontal scale graticule.
Out of focus	• Adjust the FOCUS control.
Probe phase compensation	• See the probe manual.

Quick Diagnostics

◆ **Quick diagnostics**

Follow the next procedures when the oscilloscope does not operate properly.

Symptom	Check	Action
No trace display	• Is the oscilloscope plugged in? • Is the power switch turned on? • Is the INTEN control turned correctly clockwise? • Is the sweep mode set to the SINGLE or NORM? • Is the display positioned corrently?	Plug in the oscilloscope. Turn the power switch on. Turn the INTEN control clockwise. Set the sweep mode to the AUTO. Turn the POSITION knobs for the vertical and horizontal axes almost to the center.
Obscure scale	• Is the SCALE control turned counter-clockwise? • Are the illumination lamps burnt out?	Turn the SCALE control clockwise. Replace the lamps. See the service manual for the detail.
Out of focus	• Is the FOCUS control adjusted correctly?	Adjust the FOCUS control correctly.
No signal display	• Is the probe OK? • Is the vertical coupling set to the GND? • Is the VERT MODE set to the correct channel? • Is the VOLTS/DIV switch set too low sensitivily?	Change the probe Set the GND key to OFF. Set the VERT MODE to the channel into which the signal is applied. Set the VOLTS/DIV switch to the higher sensitivity.
No triggering	• Is the trigger source selected correctly? • Is the trigger signal coupling mode selected correctly? • Is the TRIG LEVEL adjusted correctly?	Set the trigger source to the channel into which the signal is applied. When the input signal is other than the TV signal, select AC, DC or HF REJ. Adjust the TRIG LEVEL to the right level. (Indicator goes on.)
Jittering display	• Is the line voltage below the rating?	Use the oscilloscope within the rating.

Storing and Transporting

◆ Storing

Store the oscilloscope under the circumstances in the right table.
Avoid to store at the sunny or dusty place, or corrosive gas area.

Storage temperature	SS-5706A/SS-5705A −20°C to +70°C
Storage humidity	SS-5706A/SS-5705A less than 80% RH at +70°C

◆ Transporting

Transporting the oscilloscope, pack it with the original packings or equivalent ones.

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1 2 3 4 **5**

SPECIFICATIONS

SPECIFICATIONS

All the specifications in this section are :

1) applicable to the both units of the SS-5706A and the SS-5705A unless otherwise specified.
2) valid within +10°C to +35°C, unless otherwise specified.
3) valid after 30-minute warm-up time.

ELECTRICAL SPECIFICATIONS

Vertical deflection system (Y axis)

Mode: CH1, CH2, ADD
DUAL/TRI (ALT, CHOP), X-Y
CHOP switching frequency: 128 kHz ±1%

CH1 and CH2

Deflection factor: 5 mV/div to 10 V/div in a 1-2-5 sequence of 11 steps
5 mV/div to 25 V/div (continuously variable with VARIABLE)
1 mV/div (PULL x5 MAG)
Accuracy:
5 mV/div to 10 V/div ±2%
1 mV/div ±3%

Frequency response: SS-5706A
5mV/div to 2V/div; DC to 30 MHz; −3dB
1mV/div to 2mV/div; DC to 15 MHz; −3dB
< Note >
• The lower cutoff frequency (−3dB) at AC coupling is 4 Hz.

SS-5705A
5mV/div to 2V/div; DC to 40 MHz; −3dB
1mV/div to 2mV/div; DC to 20 MHz; −3dB
< Note >
• The lower cutoff frequency (−3dB) at AC coupling is 4 Hz.

Rise time: 11.6 ns (SS-5706A)
8.75 ns (SS-5705A)
(Rise time is calculated from "Bandwidth x Rise time = 0.35")

Pulse response: At 5 mV/div
Overshoot : 7%
Sag (at 1kHz) : 2%
Other distortion : 5%

Signal delay: By internal delay cable (only for SS-5705A)

Input coupling: AC, DC, GND

Input RC: 1 MΩ ±2% // 32pF ± 2pF (without probe)
10 MΩ ±2% // Approx. 23pF (with SS-0060 (x10) probe)

Maximum input voltage:
±400V MAX (without probe)
±600V MAX (with SS-0060 (x10) probe)

Drift: 0.5 div/hour (at 5mV/div) or 2.5 div/hour (at 1mV/div) after 30 - minute warmup (typical value)

Common mode rejection ratio:

At 5 mV/div

40: 1 (1 kHz sine wave)

15: 1 (5 MHz sine wave)

Polarity: CH2 only

CH3

Deflection factor: 0.1V/div

Accuracy: ±3%

Frequency response: SS-5706A

DC to 30 MHz; −3dB

< Note >

- The lower cutoff frequency (−3dB) at AC coupling is 4 Hz.

SS-5705A

DC to 40 MHz; −3dB

< Note >

- The lower cutoff frequency (−3dB) at AC coupling is 4 Hz.

Pulse response: Overshoot : 9.0%

Sag (at 1 kHz) : 2.5%

Other distortion : 8.0%

Input coupling: AC, DC

Input RC: 1 MΩ ±2% // 32pF ± 8pF (without probe)

10 MΩ ±2% // Approx. 23pF (with SS-0060 (x10) probe)

Maximum input voltage:

±400V MAX (without probe)

±600V MAX (with SS-0060 (x10) probe)

Triggering

Trigger sensitivity: The value parenthesized is for SS-5705A.

Frequency range	Maximum sensitivity	
	CH1, CH2	CH3
DC to 5 MHz	A : 0.5 div B : 0.7 div	A : 1.0 div B : 1.5 div
5 MHz to 30 (40) MHz	A : 1.5 div B : 2.0 div	A : 3.0 div B : 4.0 div

< Note >

- FIX (only for SS-5705A) is;

1.0 div at 100 Hz to 5 MHz (B: 1.5 div)

2.0 div at 5 MHz to 20 MHz (B: 2.5 div)

- For the trigger level of TV-V and TV-H, the trigger pulse of the synthetic video signal is 1 div. or more. However, it is true when the synthetic signals in a ratio of 7:3 between video signals and trigger signals are entered.
- The trigger signals is attenuated at the frequency of.
  AC : 10 Hz or lower
  HF REJ : 10 kHz or higher
- The lower limit frequency at AUTO mode is 50 Hz.

Trigger source: CH1, CH2, CH3, LINE
(For external trigger, turn the SOURCE switch to CH3.)
Coupling: AC, DC, HF REJ, TV (A Sweep: TV-V, B Sweep. TV-H)
Polarity: Positive (+), negative (—)

Horizontal deflection system (X axis)
Horizontal display: A, A INTEN, B (DLY'D), ALT (SS-5705A only)
A time base
Sweep mode: AUTO, NORM, SINGLE
Sweep rate: 0.1 μs/div to 0.5 s/div in a 1-2-5 sequence of 21 steps
0.1 μs/div to 1.25 s/div (continuously variable with VARIABLE)
Accuracy I : (over center 8 divisions)
±2%
Accuracy II : (over any 2 divisions within center 8 divisions)
±5%
Holdoff time: Variable by the regulator
B time base
Delay: Continuous delay (RUNS AFT DLY) or triggered delay (TRIG'D)
Sweep rate: 0.1 μs/div to 50 ms/div in a 1-2-5 sequence of 18 steps
Accuracy : (over center 8 divisions)
±3%
Delay jitter: 1/20,000 or less
Sweep magnification: 5 times (max. sweep rate: 20 ns/div) (SS-5706A)
10 times (max. sweep rate: 10 ns/div) (SS-5705A)
SS-5706A
Accuracy I : (over center 8 divisions)
±4% at 20 ns/div to 0.1 s/div
Accuracy II : (over any 2 divisions within center 8 divisions)
±9% at 20 ns/div to 0.1 μs/div
±5% at 0.2 μs/div to 0.1s/div
< Note >
- The first 40 ns and the last 40 ns of the sweep are not valid for this specification.

SS-5705A
Accuracy I : (over center 8 divisions)
±4% at 10 ns/div to 50 ms/div

Accuracy II : (over any 2 divisions within center 8 divisions)
±9% at 10 ns/div to 50 ns/div
±5% at 100 ns/div to 50 ms/div
< Note >
- The first 20 ns and the last 20 ns of the sweep are not valid for this specification.

X-Y operation

Input:	X axis: CH1, Y axis: CH2
X axis	
Deflection factor:	Same as CH1
	Accuracy: ±5%
Frequency response:	DC to 2 MHz; −3dB
Input RC:	Same as CH1
Max. input voltage:	Same as CH1
Y axis:	Same as CH2
Phase difference:	Within 3° (at DC to 50 kHz)

External intensity modulation (Z axis)

Min. modulation voltage:	3 Vp-p
Polarity:	Positive-going signal decreases intensity, and negative-going signal increases intensity.
Frequency range:	DC to 3 MHz
Input impedance:	9 kΩ ± 10%
Max. input voltage:	±50V MAX

Signal output

Calibrator	
Waveform:	Square wave
Repetition rate:	1 kHz
	Accuracy: ±1%
Duty ratio:	40% to 60%
Output voltage:	0.3V
	Accuracy: ±1%
CH1 signal output	
Output voltage:	±20% at 50 mV/div (at 50 Ω load)
Bandwidth:	DC to 10 MHz; −3dB (SS-5706A)
	DC to 20 MHz; −3dB (SS-5705A)
Output impedance.	Approx. 50 Ω
CRT	
Shape:	Rectangular, 6 inches

Display area:	8 div x 10 div (1 div = 10 mm) Non-parallax internal graticule with scale illumination
Phosphor:	B31
Accelerating voltage:	Approx. 12 kV

Power supply

Voltage range:	90 to 110/103 to 128/195 to 242/207 to 250V AC Any one of above ranges can be selected by the voltage selector plugs (A, B, C and D).
Frequency range:	50 Hz to 440 Hz
Power consumption:	Approx. 48W (at 100V AC)

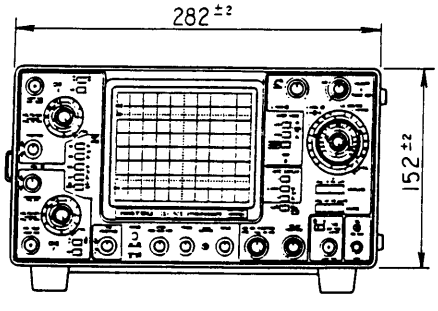
WEIGHT AND DIMENSIONS

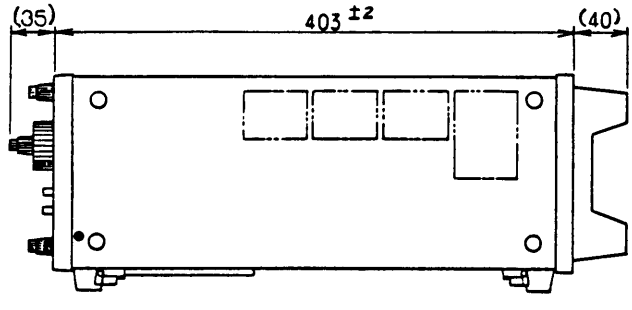
Weight:	Approx. 7 kg
Size:	(282 ±2) W x (152 ±2) H x (403 ±2) L [mm]

ENVIRONMENTAL CHARACTERISTICS

Operating temperature:	0°C to +40°C
Operating humidity:	90% at 40°C (relative humidity)
Storage temperature:	−20°C to +70°C
Storage humidity:	80% at 70°C (relative humidity)
Altitude:	Operating : 5,000 m, barometric pressure of 405 mmHg Non-operating : 15,000 m, barometric pressure of 90 mmHg
Vibration test:	Start from 10 Hz to 55 Hz and back in one minute. Peak-to-peak amplitude 0.67 mm; for 15 minutes each in vertical, horizontal, and longitudinal directions for a total of 45 minutes.
Shock test:	Raise one side by 10 cm and let it fall onto a piece of a hard wood; 4 times for each side.
Drop test:	Pack the instrument in the transportation corton and drop it from the height of 90 cm.
Warm-up time:	The specifications for SS-5705A/5706A are assured after 30 minutes of warm-up time.

Appearance





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