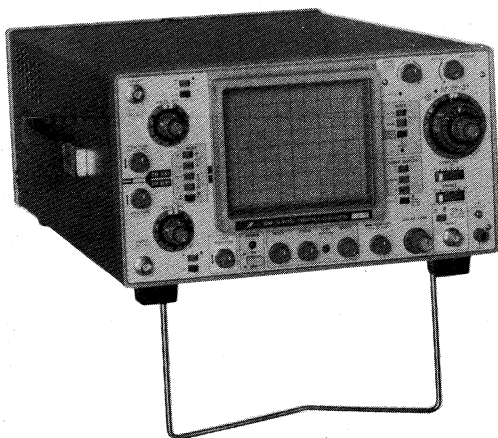


SS-5706

OPERATING MANUAL



OSCILLOSCOPE
SS-5706

信崎通信機株式会社



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Do not increase light intensity excessively

Do not increase the light intensity of traces or spot more than necessary. Excessive light intensity can not only result in eyes fatigue but, if left for a long time, burn the CRT phosphor surface.

Using the SS-5706 with the CRT screen up

The SS-5706 can be used with the CRT screen up. Be careful not to bring the SS-5706 down by pulling hard the probes connected to the signal input connector.

Do not apply excessive voltage

The input voltage limit of each input connector is as follows:

CH 1-2-3 INPUT 400V (DC + peak AC)

Probe input 600V (DC + peak AC)

Z Axis INPUT 50V (DC + peak AC)

Do not apply voltage greater than this.

Connect protective ground terminal to ground

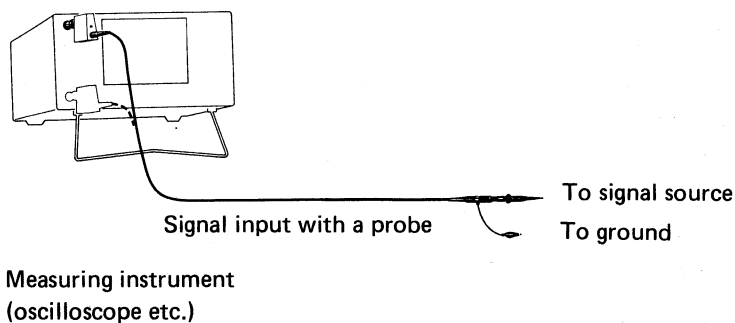
When using the attached two wire cord to supply line voltage from a two-wire power outlet, be sure to ground the ground terminals on the rear panel of SS-5706 for safety.

If an optional triple conductor cord is used to supply line current from a three-wire power outlet, grounding is performed by the power cord ground line.

Probe and input connector ground connections

When measuring a large input signal with a probe or a signal input cable, be sure to ground the probe and signal input connector to the signal source ground.

Do not connect the probe or the signal input cable ground to signal source because overcurrent will flow between the measuring instrument and signal source. This not only damages the probe and the signal input cable, but is also very dangerous.

Connection example

Specifications

1-1 GENERAL

The Iwatsu SS-5706 is 30 MHz triple event observation oscilloscopes.

Their precision and performance are comparable to high grade models and they can be used for a variety of measurement applications such as production line, maintenance, research, and development.

The SS-5706 has the following features:

■ High precision and stability

- Vertical and horizontal axis sensitivity is within $\pm 2\%$. (at 10°C to 35°C)
- High precision calibrator
Frequency accuracy $\pm 1\%$ (at 10°C to 35°C)
Voltage amplitude accuracy $\pm 1\%$ (at 10°C to 35°C)

■ Variety of high grade functions

- Highest acceleration voltage in its class 12 KV
High intensity 6 inch rectangular CRT with illuminated scale
- Displaying of 6 traces with the use of triple event alternate sweep function

- Slep delay function

Usability not attainable with trigger delay method

- Triple even display and ADD operation

Vertical axis sensitivity magnification (CH-1) 1 mV/div

- First in this class to use jitterless synchronization circuit

Enables measurement of high speed signals with little or no jitters

- Hold off variable function

Effective when synchronizing with complicated signals.

Video signal separation circuit

- CH-1 signal output function

Useful when use together with counter

- Maximum sweep time of 10 ns/div

- Single sweep function, beam finder function, trace rotation function

- Fix synchronization circuit

■ Small and light weight

■ Practical design for ease of operation

1-2 ELECTRICAL SPECIFICATIONS

1-2-1 Cathode-Ray Tube (CRT)

| | |
|----------------------|---|
| Shape | Rectangular, 6 inches |
| Display Area | 8 div x 10 div (1 div = 10 mm), with internal graticule of parallax-free type |
| Phosphor | B31 |
| Accelerating Voltage | Approximately 12 kV |

1-2-2 Vertical Deflection System

| | |
|-------|---|
| Modes | CH 1, CH 2, ADD, DUAL/ TRI (ALT, CHOP), X-Y CHOP switching rate: approximately 130 kHz |
|-------|---|

Channels 1 and 2

| | |
|--------------------|---|
| Deflection Factor | 5 mV/div to 10 V/div, in 11 calibrated steps in a 1-2-5 sequence Accuracy: $\pm 2\%$ (at 10°C to 35°C) 5 mV/div to 25 V/div, con- tinuously variable with the VARIABLE control x5 MAG (CH1 only) 1 mV/ div Accuracy: $\pm 4\%$ (at 10°C to 35°C) |
| Frequency Response | DC to 30 MHz, -3 dB (5 mV/div to 0.2 V/div) DC to 20 MHz, -3 dB 1 mV/div, 2 mV/div (in the x5 MAG mode) Notes • 10°C to 35°C • AC coupling: The lowest useable frequency is 4 Hz. |

| | |
|-----------------------------|---|
| Pulse Response | Overshoot: 7% Sag (at 1 kHz): 2% Other distortions: 5% (5 mV/div, 10°C to 35°C) |
| Signal Delay | — |
| Input Coupling | AC, DC, GND |
| Input RC | Direct: 1 M Ω $\pm 2\%$ // 32 pF ± 3 pF With probe: 10 M Ω $\pm 3\%$ // 21 pF ± 3 pF |
| Maximum Input Voltage | Direct: 400V (DC + peak AC) With probe: 600V (DC + peak AC) |
| Drift | 0.5 div/hour (5 mV/div) or 2.5 div/hour (1 mV/div) 30 minutes after power is turned on (Standard) |
| Common Mode Rejection Ratio | 5 mV/div 40 : 1 (1 kHz sine wave) 15 : 1 (5 MHz sine wave) |
| Polarity Inversion | CH 2 only |
| Channel 3 | |
| Deflection Factor | 0.1 V/div Accuracy: $\pm 3\%$ (at 10°C to 35°C) |
| Frequency Response | DC to 30 MHz, -3 dB Notes • 10°C to 35°C • AC coupling: The lowest usable frequency is 4 Hz. |
| Pulse Response | Overshoot: 10% Sag (at 1 kHz): 3% Other Distortions: 9% (10°C to 35°C) |
| Input Coupling | AC, DC |
| Input RC | Direct: 1 M Ω $\pm 2\%$ // 32 pF ± 8 pF With probe: 10 M Ω $\pm 2\%$ // 21 pF ± 3 pF |

Maximum Input Voltage

Direct:

400 V (DC +peak AC)

With probe:

600V (DC +peak AC)

1-2-3 Triggering

| | |
|-----------------------------|---|
| Signal Source | CH 1, CH 2, CH 3, LINE, (External trigger can be used by selecting CH 3 with SOURCE switch.) |
| Coupling | AC, DC, HF REJ, TV (A-sweep: TV-V, B-sweep TV-H) |
| Slope | Positive-going (+), Negative-going (—) |
| Minimum Trigger Sensitivity | As shown in Table 1-2-3 |

Table 1-2-3 (at 10°C to 35°C)

| Frequency Range | Sensitivity | |
|-----------------|------------------------|-------|
| | CH 1, CH 2 | CH 3 |
| DC to 5 MHz | 0.5 div | 1 div |
| 5MHz to 30 MHz | 1.5 div. (B: 2 div) | 3 div |

Note

- In TV-mode, synchronization is achieved when amplitude is more than 1 div when composite signal consisting of video signal 7 and synchronization signal 3 is input.
- Trigger signals are attenuated in the following frequency ranges depending on coupling
AC: 10 Hz or less
HF REJ: 10 kHz or higher
- AUTO sweep mode: The lowest useable frequency is 50 Hz.

1-2-4 Horizontal Deflection System

| | |
|---------------------|--|
| Modes | A, A INTEN, B (DLY'D) |
| A-Sweep | |
| Sweep Modes | AUTO, NORM, SINGLE |
| Sweep Rates | 0.1 μ sec/div to 0.5 sec/div, in 21 calibrated steps in a 1-2-5 sequence 0.1 μ sec/div to 1.25 sec/div, con- tinuously variable with the VARIABLE control Accuracy I (Over center 8 divi- sions): $\pm 2\%$ (at 10°C to 35°C) Accuracy II (Over any 2 of the center 8 divisions): $\pm 5\%$ (10°C to $\pm 35^\circ\text{C}$) |
| Hold-Off Time | Variable with the HOLDOFF control |
| B-Sweep | |
| Delay | Continuous delay (RUNS AF- TER DELAY), triggered delay (TRIG'D) |
| Sweep Rates | 0.1 μ sec/div to 50 msec/div, in 18 calibrated steps in a 1-2-5 sequence Accuracy I (Over center 8 divi- sions): $\pm 3\%$ (at 10°C to 35°C) Accuracy II (Over 2 of the cen- ter 8 divisions): $\pm 5\%$ (at 10°C to + 35°C) |
| Delay Jitter | 1/20,000 or less |
| Sweep Magnification | 5 times (Maximum sweep rate: 20 nsec/ div) Accuracy I of magnified sweep rate (Over center 8 divisions) $\pm 5\%$ at 20 nsec/div to 0.1 sec/div (at 10°C to 35°C) Exclude the first 2 divisions for 20 ns/div. |

Accuracy II of magnified sweep rate (Over any 2 of the center 8 divisions):

$\pm 6\%$ at 0.2 $\mu\text{sec}/\text{div}$ to 0.1 sec/div (at 10°C to 35°C)

1-2-5 X-Y Operation

| | |
|-----------------------|--|
| Signal Input | X axis: CH1, Y axis: CH 2 |
| X Axis | X axis: CH1, Y axis: CH 2 |
| Deflection Factor | Same as that of CH 1 Accuracy: $\pm 5\%$ (at 10°C to 35°C) |
| Frequency Response | DC to 2 MHz, -3 dB |
| Input RC | Same as that of CH 1 |
| Maximum input voltage | Same as that of CH 1 |
| Y Axis | same as CH 2 |
| X-Y Phase Difference | 3° or less (at DC to 50 kHz) |

1-2-6 External Brightness Modulation

| | |
|-----------------------|---|
| Input Voltage | 3 Vp-p |
| Polarity | Positive decreases intensity negative increases intensity |
| Frequency Range | DC to 1 MHz |
| Input Resistance | 10 k Ω $\pm 20\%$ |
| Maximum Input Voltage | 50 V (DC +peak AC) |

1-2-7 Calibrator

| | |
|----------------------|---|
| Waveform | Square wave |
| Repetition Frequency | 1 kHz Accuracy: $\pm 1\%$ (at 10°C to 35°C) |
| Duty Ratio | 40% to 60% |
| Output Voltage | 0.3 V Accuracy: $\pm 1\%$ (at 10°C to 35°C) |
| CH 1 Signal Output | |
| Output Voltage | 50 mV $\pm 20\%$ per displayed amplitude division |
| Bandwidth | DC to 10 MHz, -3 dB |

1-2-8 Power Supply

| | |
|-------------------|--|
| Voltage Range | 100V (90 to 110 V)/ 115V (103 to 128 V)/ 220V (195 to 242 V)/ 230, 240V (207 to 264 V)/AC One of these voltage ranges can be selected with voltage selector plug (A, B, C, D) |
| Frequency Range | 50 to 440 Hz |
| Power Consumption | Approximately 48 W (at 100 VAC) |

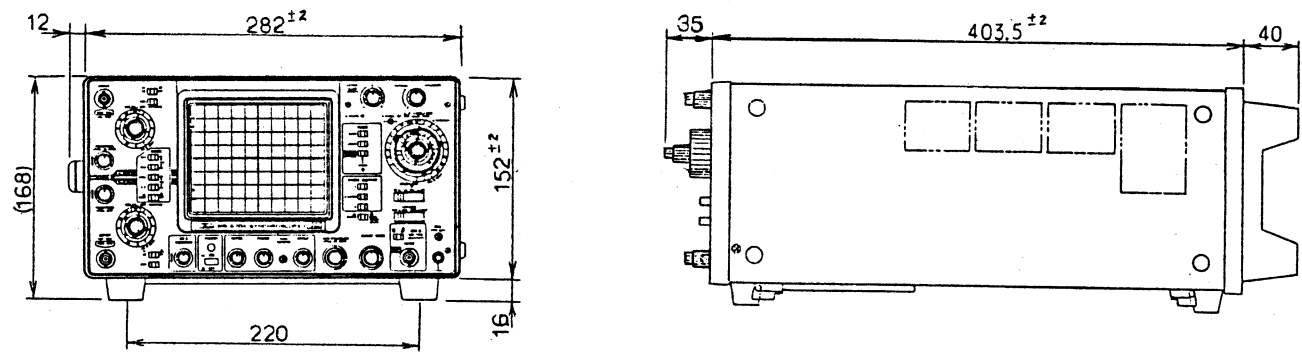
1-3 PHYSICAL CHARACTERISTICS

| | | | |
|------------|---|-----------|---|
| | | Altitude | Operating: 5,000 m maximum (atmospheric pressure 428 mm Hg) Non-operating: 15,000 m maximum (atmospheric pressure 87 mmHg) |
| Weight | Approximately 7.2 kg | Vibration | From 10 Hz to 55 Hz and back in 1 minute; double amplitude 0.63 mm; for 15 minutes each in vertical, horizontal, and longitudinal directions for a total of 45 minutes |
| Dimensions | 282 ±2 (W) x 152 ±2 (H) x 403 ±2 (L) (mm) | | |
| | See Figure 1-3-1. | | |

1-4 ENVIRONMENTAL CHARACTERISTICS

| | | | |
|-----------------------|-----------------------------|--------|---|
| Operating Temperature | 0°C to 40°C | Impact | One side is raised to an elevation angle of 30° (10 cm maximum), and let fall on a piece of hard wood. Each side is put to this test 3 times. |
| Operating Humidity | 40°C, 90% Relative Humidity | | |
| Storage Temperature | -20°C to 70°C | Drop | A package ready for transportation is dropped from a height of 90 cm. |
| Storage Humidity | 70°C, 80% Relative Humidity | | |

Figure 1-3-1 Dimensional Diagram

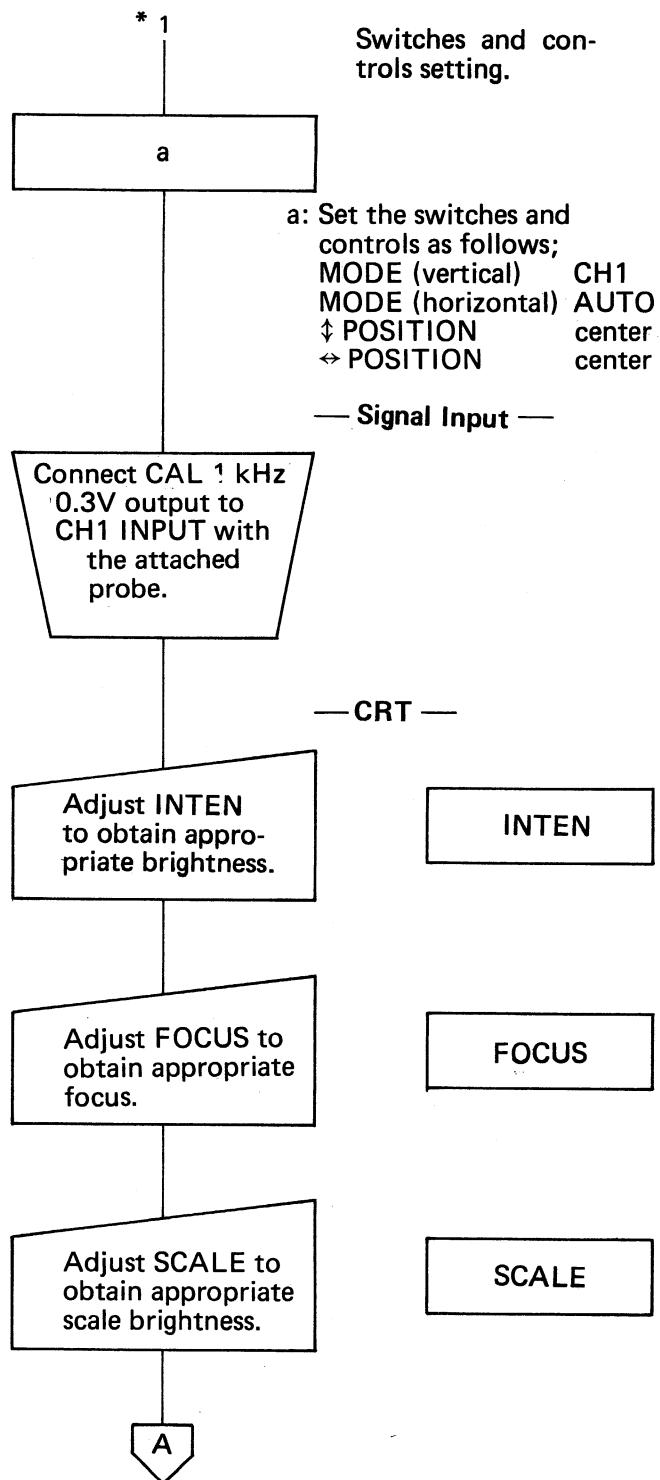
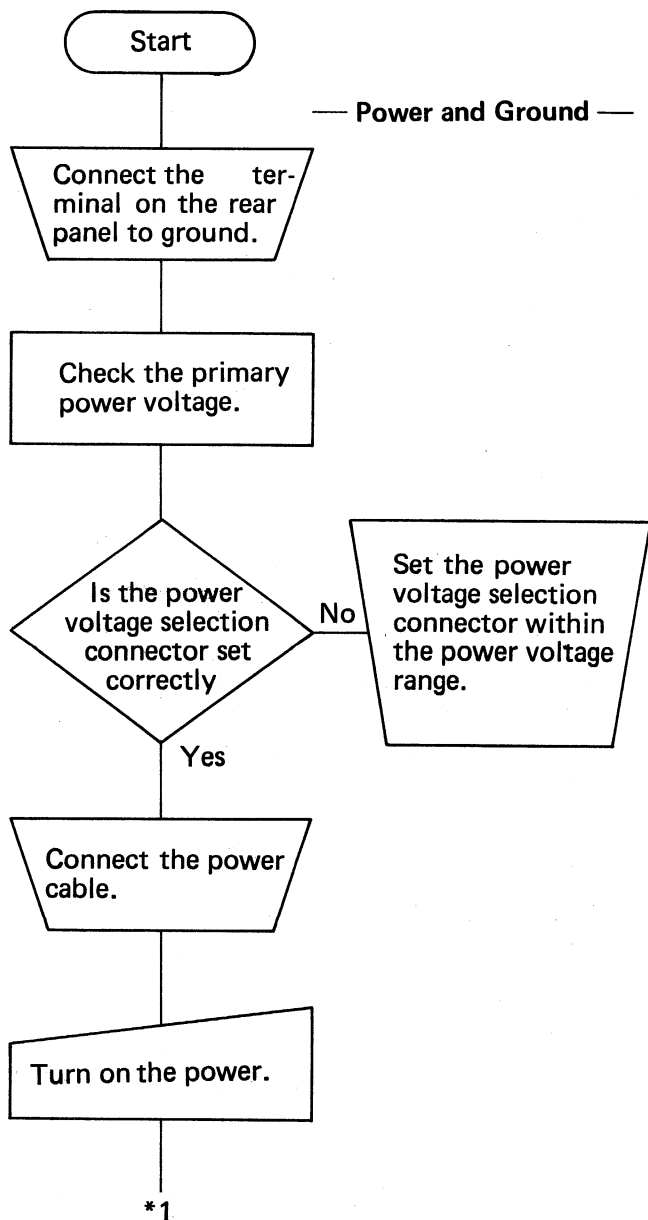


NOTES _____

Operating Information

2-1 PROCEDURE TO DISPLAY CAL WAVE

The following operation flowchart shows the procedure for displaying CAL wave by connecting CAL 1 kHz 0.3 V output to CH1 INPUT using the attached probe.



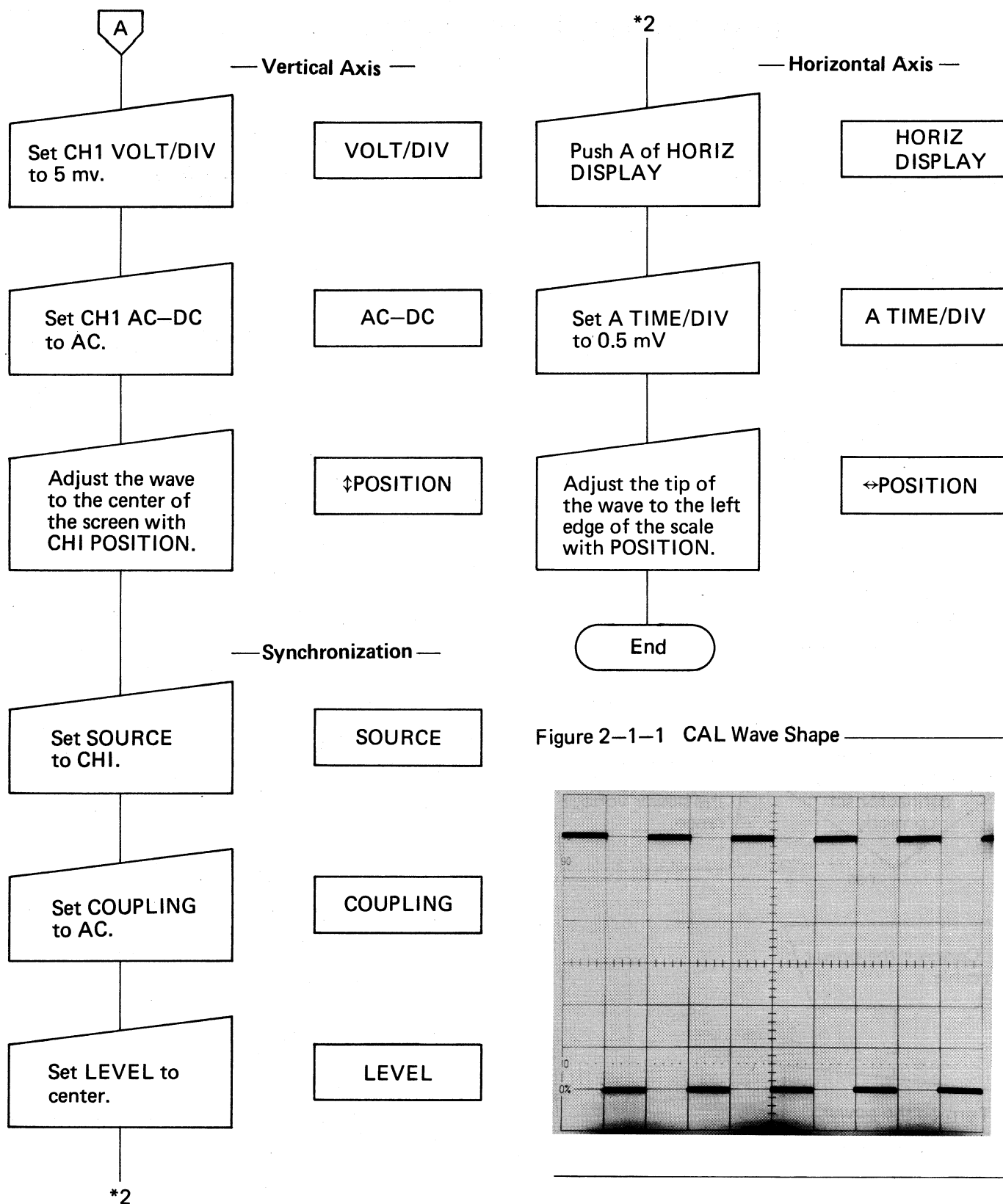


Figure 2-1-1 CAL Wave Shape

