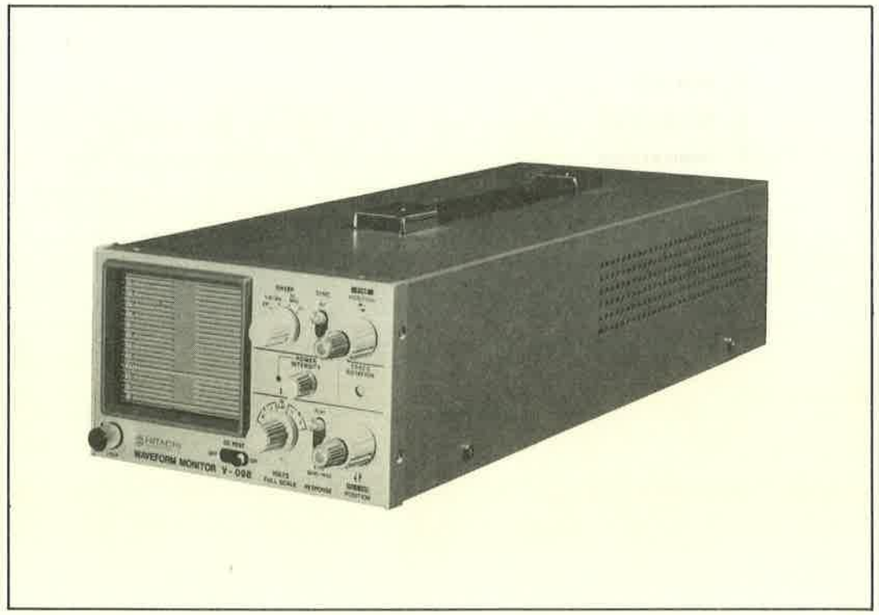
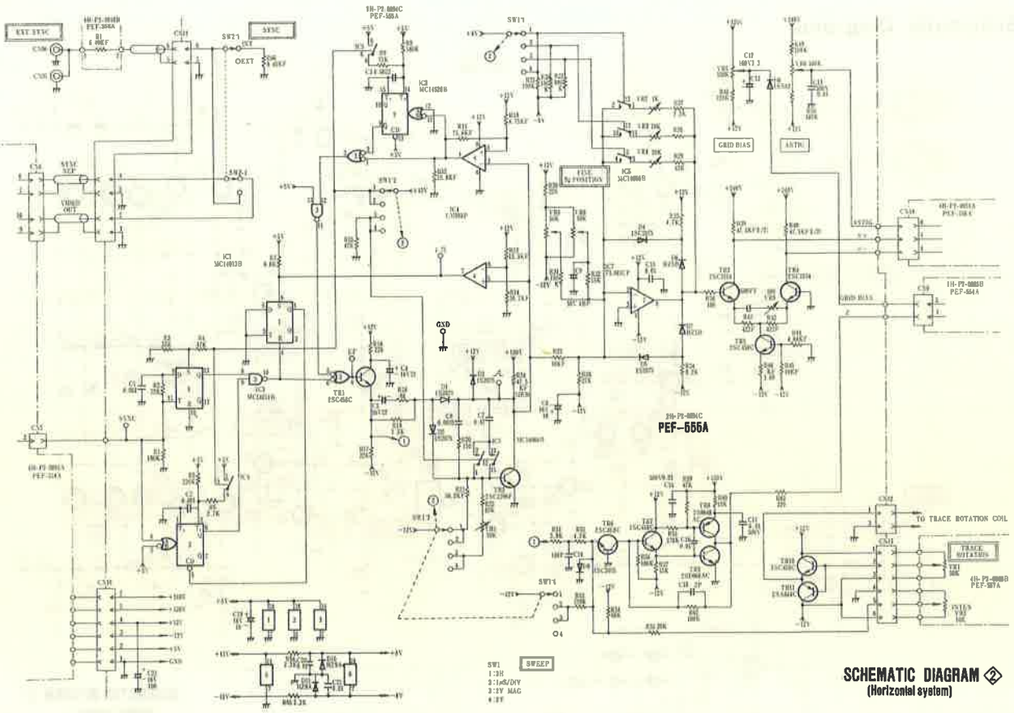
MEMO:





SCHEMATIC DIAGRAM ◈
(Horizontal system)

I. Features

The Hitachi Model V-098 is a compact television waveform monitor of PAL system using a bright 3-1/2 inch rectangular CRT. The V-098 is especially well suited for monitoring signals from the output lines of TV camera, VTR, CCTV and other video systems.

- o Three monitors are mountable side-by-side in a standard 19-inch rack mount.
- o The V-098 may be operated on AC or DC (optional battery pack, or external DC source).
- o Focusing shift is automatically corrected.
- o Either of two video inputs with loop-through may be selected from the front panel.
- o The displayed video signal is also provided at a video output connector for viewing on a picture monitor.
- o Calibrated 1-volt and 4-volts full scale (140 IRE units) sensivities are provided for displaying video and sync signal levels.
- o A variable sensivity control permits uncalibrated displays from at least 0.2-volt to 4.0-volts full scale.
- o Built-in 1-volt calibration signal, selected from the front panel, may be displayed to check vertical sensivity calibration.
- o Three frequency response modes of FLAT, IRE, 4.43 BANDPASS permit observation of various signal characteristics.
- o Four SWEEP modes of 2H (2 line), 1μs/DIV (expanded 2 line), 2V (2 field) and 2V MAG (expanded 2 field) may be displayed to observe various portions of signals.
- o Either of INT sync or EXT sync may be selected from the front panel. EXT sync inputs connector are loop-through.
- o A DC Restorer maintains the back porch at a constant level despite changes in signal amplitude like Average Picture Level and color burst. This circuit may be turned off when not needed.

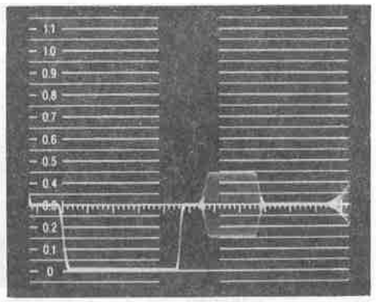


Fig. 6-7 SWEEP control set to 1 μs/DIV.

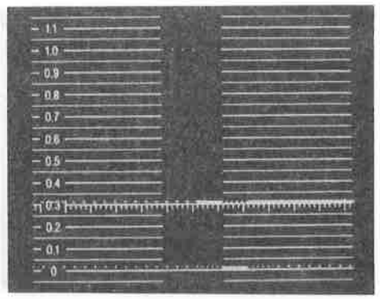


Fig. 6-9 SWEEP control set to 2 V MAG.

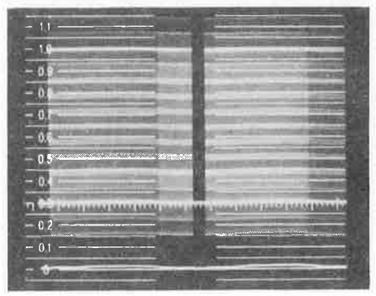


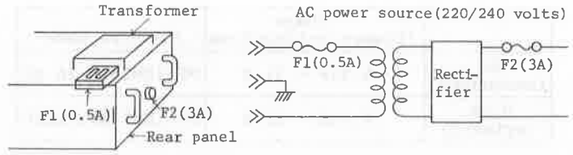
Fig. 6-8 SWEEP control set to 2 V.

cables connected to VIDEO INPUT, EXT SYNC INPUT, VIDEO OUTPUT and EXT DC IN on the rear panel. Otherwise, the cable may be damaged.

When operation is faulty

* Recheck the operating procedure and if problem persists, contact a nearly service station or agent.
* Only our authorized serviceman can provide the repair and recalibration except exchanging the fuses.

Fuse location and procedures for exchanging the fuses.



F1(0.5A): Remove the cover of the fuseholder and put on after exchanging the fuse.

F2(3A): Remove the cap of the fuseholder by turning counterclockwise (against the arrow).
≪Disconnect any power source before exchanging the fuses.≫

Care and repair

* Removal of stain from the case.
  - o When the outside of the case is stained, remove the stain by first wiping it lightly with a cloth moistened with neutral washing agent and then wipe the surface with a dry cloth.
  - o When the panel surface is stained, remove the stain in similar way with a clean, soft cloth. When heavy stains are present, first remove the stains by wiping the surface lightly with a cloth moistened with diluted neutral washing agent and then wipe thoroughly with a dry cloth.
  - o When dust has accumulated on the inside, remove it by using a dry brush, or by using the exhaust of a compressor or a vacuum cleaner.

NOTE: Before removing the covers, disconnect any power source beforehand without fail.
Dangerous voltage, capable of causing death, are present in the V-098.
Use extreme caution when handling without the cover.
When cleaning the inside, insure beforehand that no electricity remains in the condensers of the power supply circuit.

than 300 times at normal condition. This means it can be used for about one year when charging is done once a day.

f) When the battery pack is used as a spare battery for emergency, periodic charging (about 15 hours) is needed once a month.

Fig. 6-1 VOLTS FULL SCALE control set to 1 V CAL.

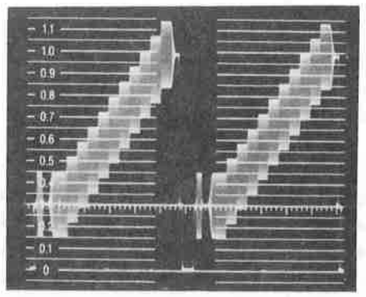


Fig. 6-2 RESPONSE control set to FLAT.

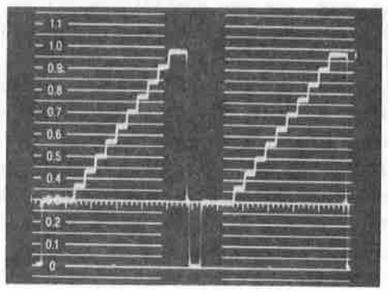
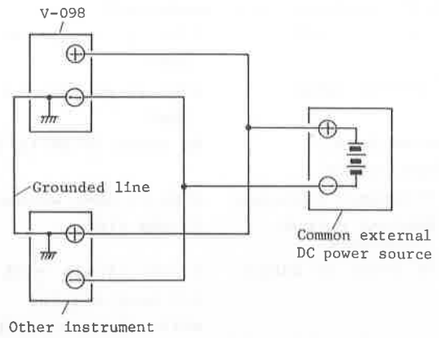


Fig. 6-3 RESPONSE control set to IRE.

it is very dangerous because a large current flows through the grounded line.



≪DANGEROUS CONNECT≫

* Do not apply reverse polarities to EXT DC IN.
* Do not increase the brightness too much. Your eyes may be strained and the fluorescent surface of CRT may be burnt.
* Do not apply an excessive voltage.
  The maximum voltage of each input is as follows.

Never apply a voltage higher than specified.

VIDEO INPUT	±5 volts DC
EXT SYNC INPUT	±5 volts DC

Calibration interval

To maintain instrument accuracy, perform the calibration of the V-099 at least every 1,000 hours of operation, or every six months if used infrequently.

3. Composition

Composition of the Model V-098 is as follows.

(1) V-098 waveform monitor 1
(2) AC power cable 1
(3) Fuse 250V 3A 1
250V 0.5A 1
(4) Operation manual 1

7. Rotate the vertical POSITION control to position the trace to the 0.3 graticule.
8. Rotate the horizontal POSITION control to position the left end of the trace to the left end major division on the 0.3 graticule.
9. Check that the trace aligns with the 0.3 graticule. If not, rotate the TRACE ROTATION control to align the trace with the 0.3 graticule.
10. Set the VOLTS FULL SCALE control to the 1 V CAL.
11. Rotate the vertical POSITION control to position the display in the 0 to 1.0 unit of the graticule. The calibrator waveform of 1.0 unit within ±0.01 unit in amplitude will be displayed (see Fig. 6-1).
12. Apply a 1-volt modulated staircase signal to the VIDEO INPUT A.

NOTE

In a video signal distribution system, its output end must be terminated in 75Ω. When the V-098 is connected to its output end, terminate the other unused VIDEO INPUT A connector in 75Ω.

13. Set the VOLTS FULL SCALE control to A 1.
14. Rotate the vertical POSITION control to align the blanking level of the waveform with the 0.3 graticule. A modulated staircase signal will be displayed as shown in Fig. 6-2. In this setting, the tolerance of a frequency response is within ±5% from 25Hz to 5MHz.
15. Set the RESPONSE control to IRE. A modulated staircase signal will be displayed as shown in Fig. 6-3. In this setting, a frequency response reduces as shown in Fig. 4-1.
16. Set the RESPONSE control to 4.43 BANDPASS. A modulated staircase signal will be displayed as shown in Fig. 6-4. In this setting, only the components of the signal within the 3.9 to 4.9 MHz frequency range are displayed. (In this setting, the signal from sweep oscillator with composite sync is displayed as shown in Fig. 6-5.)
17. For setting of 4.43 BANDPASS, pull and rotate the PULL VAR control. Then, the display is continuously magnified up to five times as shown in Fig. 6-6.
18. Press the PULL VAR control, and set the RESPONSE control to FLAT and the SWEEP to 1μS/DIV. A magnified H sync interval or picture blanking interval is displayed as shown in Fig. 6-7.

2H sweep	
Repetition rate	Equal to half line rate of applied video or external sync.
1μs/DIV sweep accuracy	Within ±3%
DC RESTORATION	
Clamp time	Back porch
Blanking level shift with 10% to 90% APL change	APL changes from 50% to either 10% or 90% will cause blanking level shift of 0.02 unit or less.
CALIBRATOR	
Frequency	At least 2 cycles will be displayed in 2H sweep. Must synchronize 2H sweep
Amplitude	1 volt within ±1%
EXTERNAL SYNC	
Input signal requirement	1.5 volts to 4.5 volts composite sync will synchronize sweeps
Input impedance	~15kΩ in parallel with ~10pF
POWER	
Line voltage	AC 220/240 volts within ±10%
Line frequency	50 to 400 Hz
Power consumption	~30 watts on AC line source of 220 volts
External DC source	DC 11.5 to 14 volts at EXT DC IN terminals
Optional battery	2 hours or more
AMBIENT TEMPERATURE	
Rated range of use	+10 to +30°C
Operating	0 to +40°C
Storage	-15 to +60°C (without battery pack)
DIMENSIONS	145(W) × 88(H) × 395(D)mm
WEIGHT	Approx. 4.0kg (without battery pack) Approx. 2.5kg (battery pack)

OPTION

19" × 3.5" rack (mountable up to three sets)

AD-099 battery pack

(Ni-Cd battery)

Nominal capacity	3500 mAh
Nominal voltage	12 V
Discharge ending voltage	10 V
Recharging current	350 mA
Recharging time	About 15 hours

⑧ RESPONSE
Selects FLAT, IRE or 4.43 BANDPASS frequency response characteristics.

⑨ VOLTS FULL SCALE
Selects the full scale vertical deflection factors for video input A, video input B, or the internal 1 V CAL (1 volt calibrator) signal.

⑩ DC REST
Selects the DC restorer ON or OFF.

⑪ LOCK
Uses for rack-mounting.
(Rear-Panel)

⑫ FOCUS
Adjusts for optimum display definition.

⑬ POWER SOURCE
Selects AC(TRICKLE CHG), EXT DC, BATT or BATT FULL CHG.

AC(TRICKLE): The instrument is operated on AC line source of 198-242 (at 220VAC)/216-264 (at 240VAC) volts. The AD-099 Battery Pack (option) is Trickle-Charged when connected to AC line source.

EXT DC: The instrument is operated on an external DC power source of 11.5-14 volts (~1.3A) at EXT DC terminals.

BATT: The instrument is operated with the AD-099 Battery Pack (option).

BATT FULL CHG: The AD-099 Battery Pack is charged when connected to AC line source. It requires at least 15 hours to full charge level after Power Lamp begines blinking.

CAUTION!

The – (negative) terminal of EXT DC IN is inside connected to chassis.

⑭ EXT DC IN ±
Terminals for applying External DC power source.

CAUTION!

Do not apply reverse polarities to EXT DC IN.

⑮ BATT IN
Connector for the AD-099 Battery Pack.

⑯ AC
Connector for applying AC line source.

⑰ VIDEO INPUT A
BNC connectors for applying an external video signal to VIDEO INPUT A. The inputs are loop-through and compensated for 75Ω.

⑱ VIDEO INPUT B
BNC connectors for applying an external video

5. Panel Controls