MITSUBISHI

AUTO-TRACKING WITH DIGITAL CONTROL COLOR DISPLAY MONITOR

MODEL

HL7925K SERIES

USER'S GUIDE

For future reference, record the serial number of your display monitor in the space below:
SERIAL No. [ ]
The serial number is located on the rear cover of the set.

注　意

本品は外国為替及び外国貿易管理法に定める戦略物資（又は役務）に該当するため、輸出する場合、同法に基づく輸出（又は役務取引）許可が必要です。

CAUTION

These products or technologies are subject to Japanese and/ or COCOM strategic restrictions, and diversion contrary thereto is prohibited.

CAUTION

- The line cord and plug designed for safety is provided with this set.
  It is to be used with a properly grounded power receptacle to avoid possible electrical shock.

- Do not remove the back cover of the set as this can expose you to very high voltages and other hazards.

For Model HL7925K and HL7925KW Series:

WARNING

RADIO INTERFERENCE REGULATIONS STATEMENT FOR U.S.A.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

THIS PRODUCT HAS BEEN FCC-CERTIFIED WITH A SHIELDED SIGNAL COAXIAL CABLE.
USE IT TO REDUCE THE POSSIBILITY OF CAUSING INTERFERENCE TO RADIO, TELEVISION, AND OTHER ELECTRONIC DEVICES.

RADIO INTERFERENCE REGULATIONS STATEMENT FOR CANADA

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

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1. SPECIFICATIONS

1.1 Rating and Specification

1) AC POWER VOLTAGE

MODEL	RATING
HL7925*K	AC 100 ~ 120 V
HL7925*KV	AC 220 ~ 240 V
HL7925*KW	AC 100 ~ 120 V AC 220 ~ 240 V

2) AC POWER FREQUENCY — 50/60 Hz

3) POWER CONSUMPTION — 150 W (typ)

4) INPUT SIGNAL
VIDEO
SYNC.

Analog R,G,B : 0.7 Vp-p (Positive)
Composite sync. on Green : 0.7 Vp-p (Negative)
Composite ext. sync. : 1.5 ~ 5 Vp-p (Negative)
Separate sync. (HD/VD) : 1.5 ~ 5 Vp-p (Positive / Negative)

5) INTERFACE
a) INPUT CONNECTOR
b) INPUT IMPEDANCE

BNC (Receptacle)
75Ω for video and sync. signal
High impedance can be selected by Impedance Select SW.
Loop-through operation is available with T-type BNC connector.

6) SCANNING FREQUENCY

HORIZONTAL 30 kHz ~ 78 kHz
VERTICAL 50 Hz ~ 120 Hz

7) PRE-SET TIMING — See the recommended timing chart specification. (page 6)

8) WARM UP TIME — More than 30 minutes.

9) EFECTIVE DISPLAY AREA — 360 (W) × 270 (H) mm

10) BRIGHTNESS — 100 nit with STD CRT, standard white window video signal.

11) VIDEO AMPLIFIER — 50 Hz ~ 120 MHz±3 dB Tr/Tf<6 nsec

12) BLANKING TIME

Horizontal 55—78 kHz <3.2μsec
40—55 kHz <5.0μsec
30—40 kHz <6.0μsec
Vertical <600μsec

13) LINEARITY

Better than 7%
Note; H-LIN will be specified for
F_H =30-37/47-52/60-64 kHz/75 ~ 78

14) RASTER DISTORTION — Less than 2.0%

15) RASTER SIZE REGULATION — Less than 0.5%

16) MISS CONVERGENCE

Center (Within 270 mm diameter circle) —0.35 mm (Typ)
Other area —0.5 mm (Typ)

17) HIGH VOLTAGE — 27 kV (STD)

18) TEMPERATURE — 0 ~ 40°C (with standard cabinet)

19) OUTLINE SIZE — 498 (W) × 449 (H) × 534 (D) (with standard cabinet)

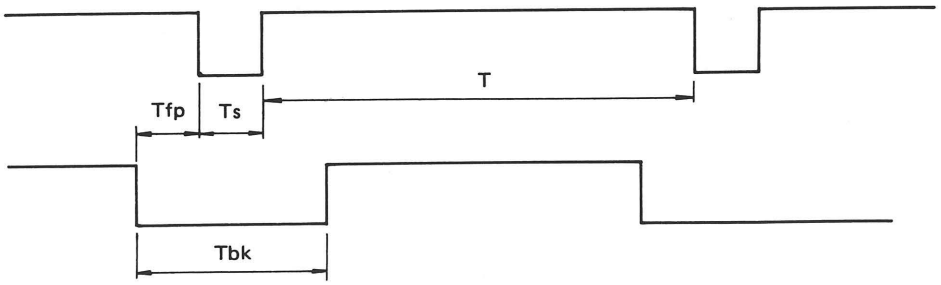
20) WEIGHT — Approx. 33 kg

SPECIFICATION

1.2 Input Signals

SYNC. SIGNAL	INPUT SIGNALS		POLARITY
A COMPOSITE SYNC. SIGNAL ON GREEN VIDEO SIGNAL	RED	0.7 Vp-p TYP (0.35 ~ 1.4 Vp-p AVAILABLE)	POSITIVE
	BLUE		
	GREEN	1.0 Vp-p TYP (0:7 Vp-p VIDEO) (0:3 Vp-p SYNC.)	VIDEO: POSITIVE SYNC. : NEGATIVE
COMPOSITE EXT SYNC. SIGNAL	RED	0.7 Vp-p TYP (0.35 ~ 1.4 Vp-p AVAILABLE)	POSITIVE
	BLUE		
	GREEN		
	COMPOSITE SYNC.	4.0 Vp-p TYP (1.5 ~ 5.0 Vp-p AVAILABLE)	NEGATIVE
SEPARATE HORIZONTAL & VERTICAL SYNC. SIGNAL	RED	0.7 Vp-p TYP (0.35 ~ 1.4 Vp-p AVAILABLE)	POSITIVE
	BLUE		
	GREEN		
	HORIZONTAL VERTICAL SYNC.	4.0 Vp-p TYP (1.5 ~ 5.0 Vp-p AVAILABLE)	NEGATIVE / POSITIVE

1.3 Recommended Timing Chart



TIMING-1 (Pre-set in CH. 0)

Th	13.158	μsec (76 kHz)
Ths	1.1	μsec
Thfp	0.158	μsec
Thbk	3.058	μsec
Tv	14.29	msec (1024H)
Tvs	39.0	μsec
Tvfp	39.0	μsec
Tvbk	815.0	μsec

TIMING-2 (Pre-set in CH. 0)

Th	15.788	μsec (63.3 kHz)
Ths	1.701	μsec
Thfp	0.407	μsec
Thbk	3.957	μsec
Tv	16.672	msec (1056H)
TVs	47.0	μsec (3H)
Tvfp	47.0	μsec (3H)
Tvbk	504.0	μsec (32H)

TIMING-3 (Pre-set in CH. 0)

Th	20.960	μsec (47.7kHz)
Ths	2.000	μsec
Thfp	1.000	μsec
Thbk	5.000	μsec
Tv	16.667	msec (795H)
TVs	84.0	μsec (4H)
Tvfp	63.0	μsec (3H)
Tvbk	566.0	μsec (27H)

TIMING-4 (Pre-set in CH. 0)

Th	26.4	μsec (37.9kHz)
Ths	3.2	μsec
Thfp	1.0	μsec
Thbk	6.4	μsec
Tv	16.58	msec (600H)
TVs	106.0	μsec
Tvfp	26.0	μsec
Tvbk	739.0	μsec

TIMING-5 (Pre-set in CH. 8)

Compatible Timing for VGA 3 modes

Th	31.778	μsec (31.5kHz)
Ths	3.813	μsec
Thfp	0.636	μsec
Thbk	6.356	μsec
	480 LINE (60 Hz)	
Tv	16.683	msec
TVs	64.0	μsec
Tvfp	318.0	μsec
Tvbk	1430.0	μsec
	400 LINE (70 Hz)	
Tv	14.268	msec
TVs	64.0	μsec
Tvfp	381.0	μsec
Tvbk	1557.0	μsec
	350 LINE (70 Hz)	
Tv	14.268	msec
TVs	64.0	μsec
Tvfp	1176.0	μsec
Tvbk	3146.0	μsec

2. INSTALLATION

2.1 General

This section explains how to install the monitor and how to verify its basic operation. The monitor is throughly adjusted and checked out at the factory, but it may require certain minor adjustments to adapt it to a particular display generator or other controller and to compensate for minor adjustment disturbances caused during transportation. Complete adjustment procedures and other basic checks are described in section 4, and section 5, but only selected simple procedures should be necessary for initial installation.

2.2 Unpacking

The monitor is normally packaged in a separated shipping container by MITSUBISHI ELECTRIC CORPORATION.
Open the top of container, then remove the inside packing materials and lift out the monitor carefully.
Accessories are placed at the bottom of container, and/or the top of packing materials.

2.3 Installation Place

- The monitor should be placed away from the device which generates the magnetic fields, eg. transformer and motor, because the magnetic fields cause the miss-convergence.
- The sufficient ventilation is necessary for long time stable operation. So, do not block the vents of cabinet.
- In order to get the excellent display image and prevent eye fatigue, it is recommended to avoid the direct light shining to the screen of monitor.

2.4 Caution before Power ON

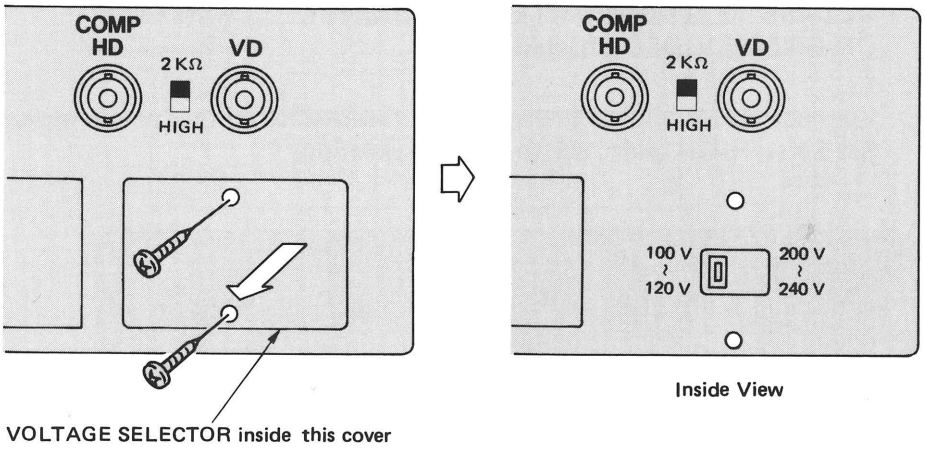
Please make sure that wires, components and structures are in perfect mechanical order and not damaged during transportation.
Before turning on the power switch, check the AC power line voltage and frequency and make sure that the power line voltage selector inside the cover in the rear panel is set to the proper position as follows, and the rating of fuse is identical with the fuse rating label on the rear panel.

Except the Model No. HL7925*KW is setted in the factory before shipment. Please don't touch the Voltage Selector and Fuse, if you use except HL7925*KW.

POWER LINE VOLTAGE	AC 100 ~ 120 V	AC 220 ~ 240 V
VOLTAGE SELECTOR	Set to 100 ~ 120 V position	Set to 220 ~ 240 V position

MODEL	HL7925*K	HL7925*KV	HL7925*KW
FUSE	UL/CSA Type	IEC Type	UL/CSA/IEC Type
RATING	250 V, 3.5 A	250 V, 3.15 A	250 V, 4 A
TYPE	Time Delay	Time Lag	Time Lag

How to access the VOLTAGE SELECTOR



VOLTAGE SELECTOR inside this cover

Inside View

INSTALLATION

2.5 Degaussing

(Degaussing is required whenever the monitor is installed or moved to other place. Degaussing procedure is explained in 3.1 ⑦.)

When it is necessary to degauss the monitor absolutely, it is advised to use a degaussor.
The procedure of degaussing used by a degaussor is as follows.

(1) The degaussor should be turned on more than six feet away from the monitor.

(2) Approach it to the monitor with moving in a circular motion, then move it around slowly along the screen, top and sides of the monitor a few times.

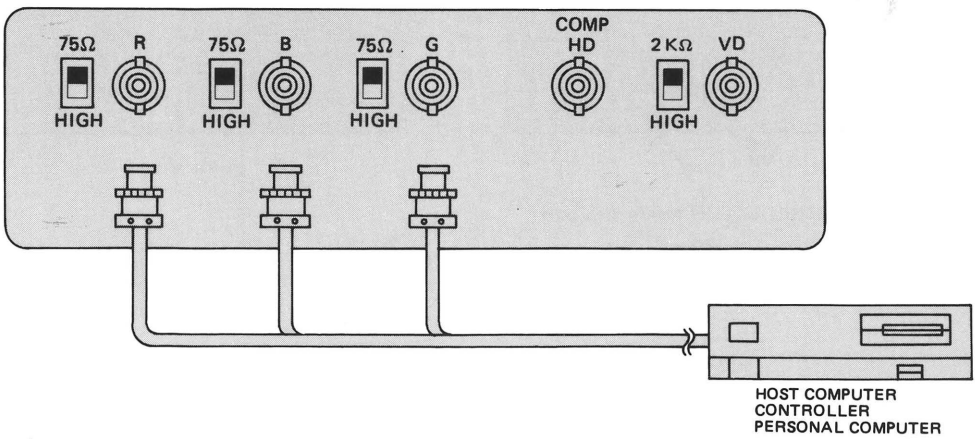
(3) Take back the degaussor from the monitor gradually with moving in a circular motion, then turn it off more than six feet away from the monitor.

2.6 Connection of Signal Cables

The signal cable should be made with 75 ohm coaxial cable.
(Type RG59/U or equivalent)

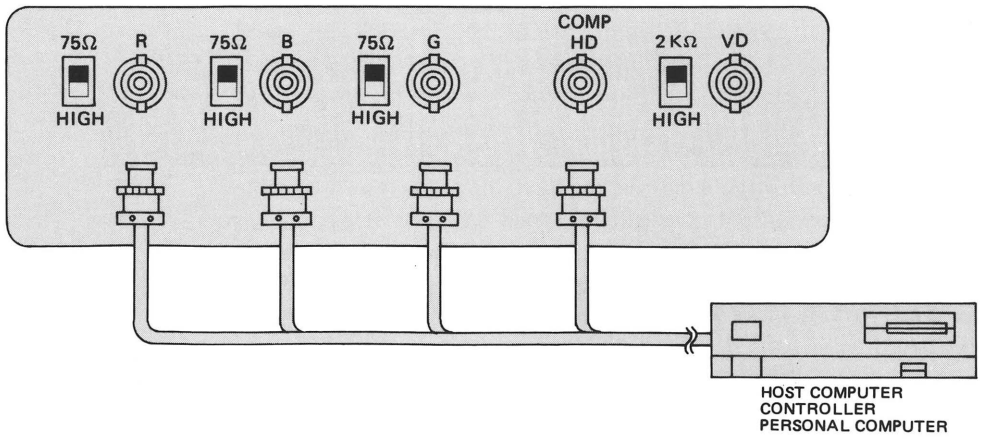
(1) IN CASE OF A COMPOSITE SYNC. SIGNAL
ON GREEN VIDEO SIGNAL

Connect R,G,B video signals to BNC receptacles on rear panel respectively.
Set 2 KΩ/HIGH select SW to "2 KΩ" position.



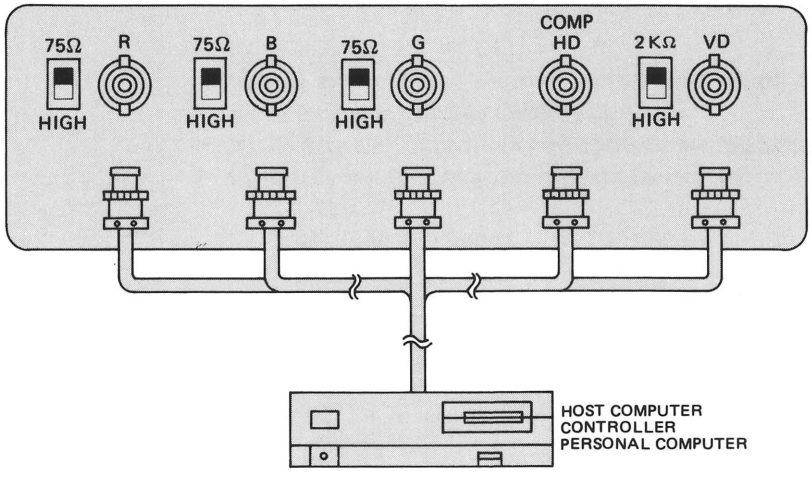
(2) IN CASE OF COMPOSITE EXT. SYNC. SIGNAL

Connect R,G,B video signals and Composite sync. signal to BNC receptacles on rear panel respectively.
Set 2 KΩ/HIGH select SW to "2 KΩ" position.



(3) IN CASE OF SEPARATE HORIZONTAL AND VERTICAL SYNC. SIGNALS

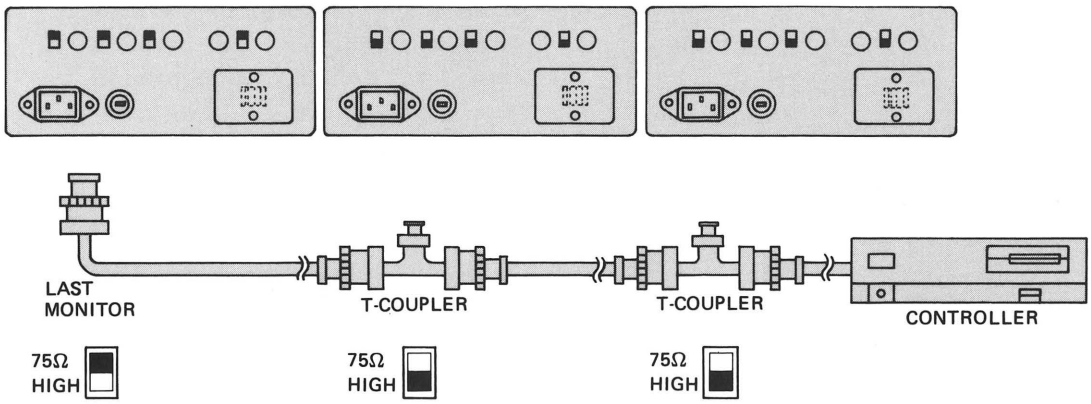
Connect R,G,B video signals and horizontal, vertical sync. signals to BNC receptacles on rear panel respectively.
Set 2 KΩ/HIGH select SW to "2 KΩ" position.



INSTALLATION

(4) IN CASE OF OPERATING MONITORS IN A LOOP THROUGH STRINGS.

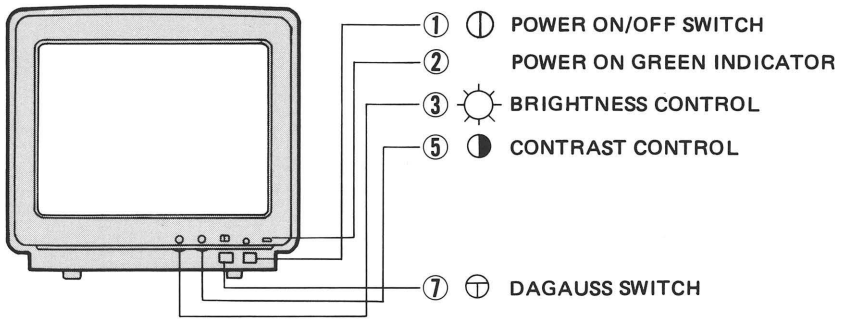
Set the all of "75Ω/HIGH" or "2 KΩ/HIGH" switches of all monitors, except the last unit, with loop through strings to "HIGH" and terminate the last monitor to 75Ω, or 2 KΩ.



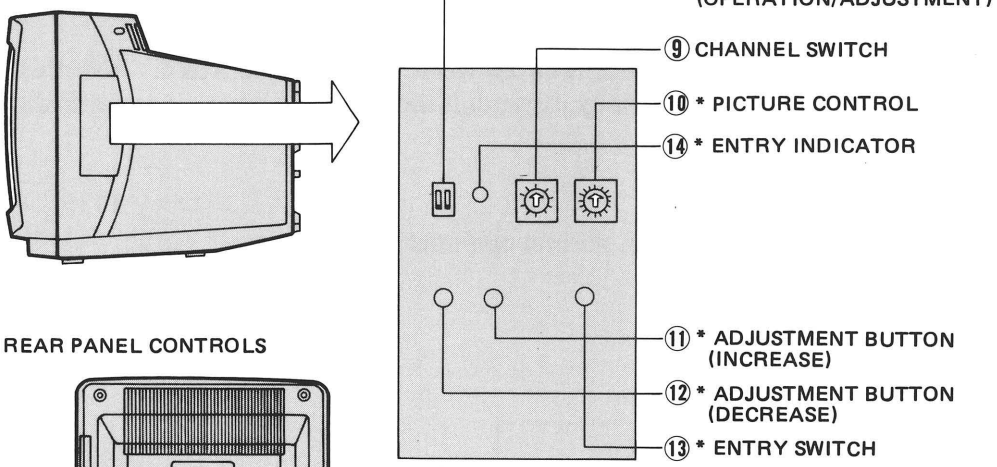
3. CONTROLS LOCATION AND DESCRIPTION

3.1 Under normal operation

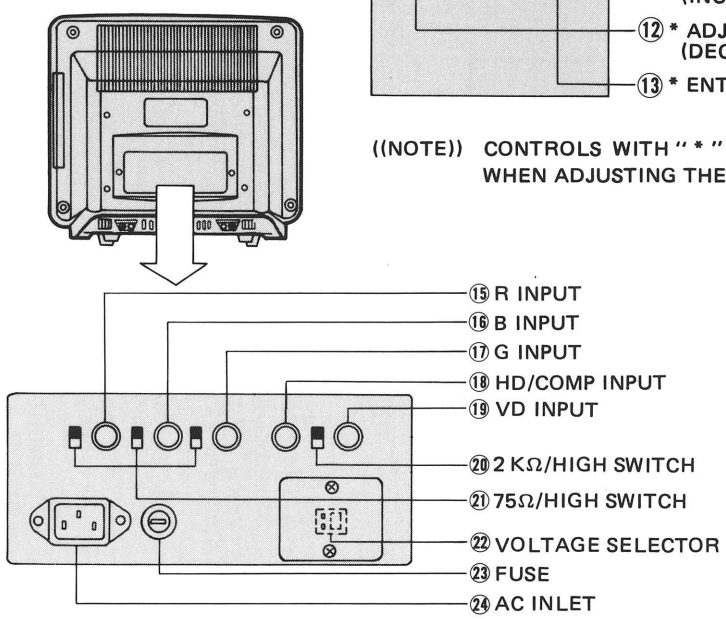
FRONT CONTROLS



SIDE LID CONTROLS



REAR PANEL CONTROLS



((NOTE)) CONTROLS WITH " * " ARE USED WHEN ADJUSTING THE PICTURE DIMENSIONS.

CONTROLS LOCATION AND DESCRIPTION

① POWER ON/OFF SWITCH

Push the button then the green indicator ② will illuminate and the power on. Push the button again then the power off and the green indicator ② will go off.

② GREEN INDICATOR

The green LED is provided for indicating that the main power supply is working.

③ BRIGHTNESS CONTROL

Turn BRIGHTNESS CONTROL ③ clockwise for greater brightness.

⑤ CONTRAST CONTROL

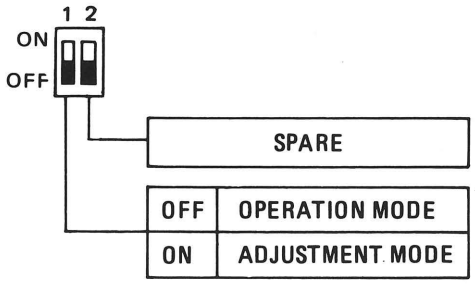
Turn CONTRAST CONTROL ⑤ clockwise for deeper contrast.

⑦ DEGAUSS SWITCH

Push the button for a short time to work the degauss circuit. Also this monitor has an automatic degauss circuit working at every power switched on.

⑧ MODE SWITCH

Set OPERATION MODE in normal operation.

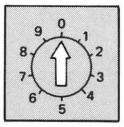


CONTROLS LOCATION AND DESCRIPTION

⑨ CHANNEL SWITCH

Select the CHANNEL needed. (See section 2.3)

CHANNEL		
CH 0	Pre-settable by user (11 timings)	AUTO CHANNEL
CH 1 to CH 7	Pre-settable by user (1 timing for each CH)	ENHANCED CHANNEL
CH 8	VGA 3 modes	
CH 9		



⑮ R INPUT

Connect red video signal.

⑯ B INPUT

Connect blue video signal.

⑰ G INPUT

Connect green video signal with composite sync. or without composite sync. signal.

⑱ HD/COMP INPUT

Connect horizontal sync. signal when using separate external, or composite sync. signal when using composite external.

⑲ VD INPUT

Connect vertical sync. signal when using separate ext. sync. signal.

CONTROLS LOCATION AND DESCRIPTION

⑳㉑ 75Ω/HIGH SWITCH / 2 KΩ/HIGH SWITCH
For "Single-Unit" operation, set to "75Ω" or "2 KΩ" position. For "Loop-thru-Strings" operation, set to "HIGH" position for all units except the last one, and the last one be set at "75Ω" or "2 KΩ" position.

Operation	Switch Position	
	75Ω/2 KΩ	HIGH
Single-Unit	YES	NO
Loop-thru-Strings	YES Last unit only	YES

NOTE: "T-coupler" must be used for "Loop-thru-Strings".

㉒ VOLTAGE SELECTOR (under the cover)

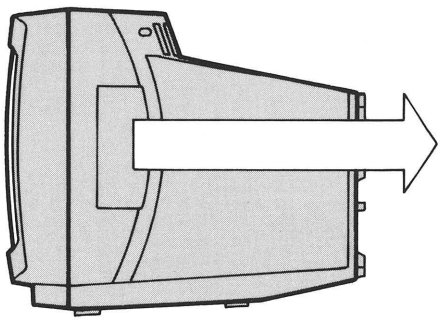
㉓ FUSE

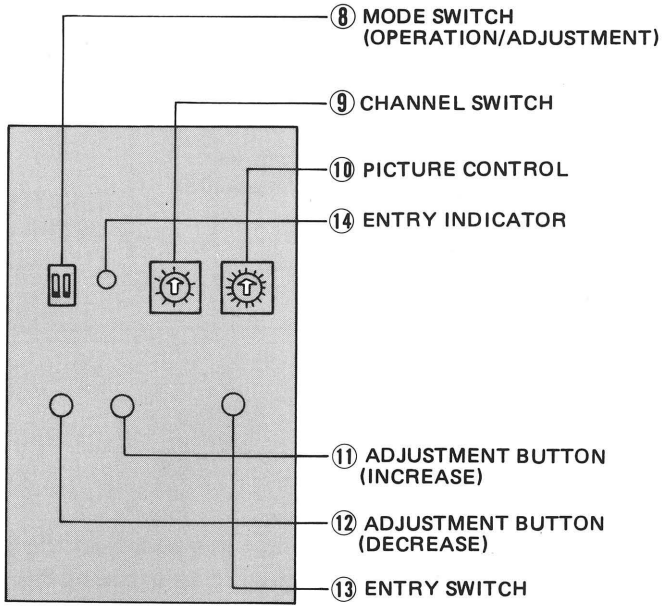
㉔ AC INPUT
Connect AC power cord.

CONTROLS LOCATION AND DESCRIPTION

3.2 When adjusting the picture dimensions

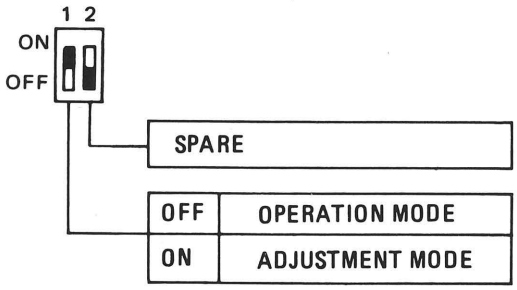
SIDE LID CONTROLS





⑧ MODE SWITCH

Set ADJUSTMENT MODE on when you start adjusting the picture dimensions.

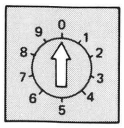


CONTROLS LOCATION AND DESCRIPTION

⑨ CHANNEL SWITCH

Select the CHANNEL needed. (See section 2.3.)

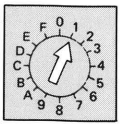
CHANNEL		
CH 0	Pre-settable by user (11 timings)	AUTO CHANNEL
CH 1 to CH 7	Pre-settable by user (1 timing for each CH)	ENHANCED CHANNEL
CH 8	VGA 3 modes	
CH 9		



⑩ PICTURE CONTROL

Select necessary number as you adjust the picture dimensions.
Numbers present following adjustment items.

0	SPARE	
1	H-PHASE	Re-adjust these items according to the input signal timing.
2	H-SIZE	
3	H-POSITION	
4	V-POSITION	
5	V-SIZE	
6	V-SIZE-FINE	
7-9	SPARE	
A	PCC-AMP	Re-adjust these items if necessary.
B	PCC-PHASE	
C-F	SPARE	



CONTROLS LOCATION AND DESCRIPTION

⑪ ADJUSTMENT BUTTON (INCREASE)

⑫ ADJUSTMENT BUTTON (DECREASE)
When ADJUSTMENT BUTTON ⑪ or ⑫ is pushed, motions of adjustment items are as follows.

BUTTON ⑤	BUTTON ⑥
WIDEN	NARROW
SHIFT TO RIGHT	SHIFT TO LEFT
UP	DOWN

⑬ ENTRY SWITCH
Push when you make entry of new timing into the internal memory.

⑭ ENTRY INDICATOR
At the entry, if the picture data is memorized, ENTRY INDICATOR ⑨ is lit for about 0.5 second.
If not, it blinks.

CONTROLS LOCATION AND DESCRIPTION

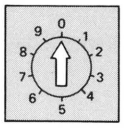
3.3 EXPLANATION ON CHANNEL

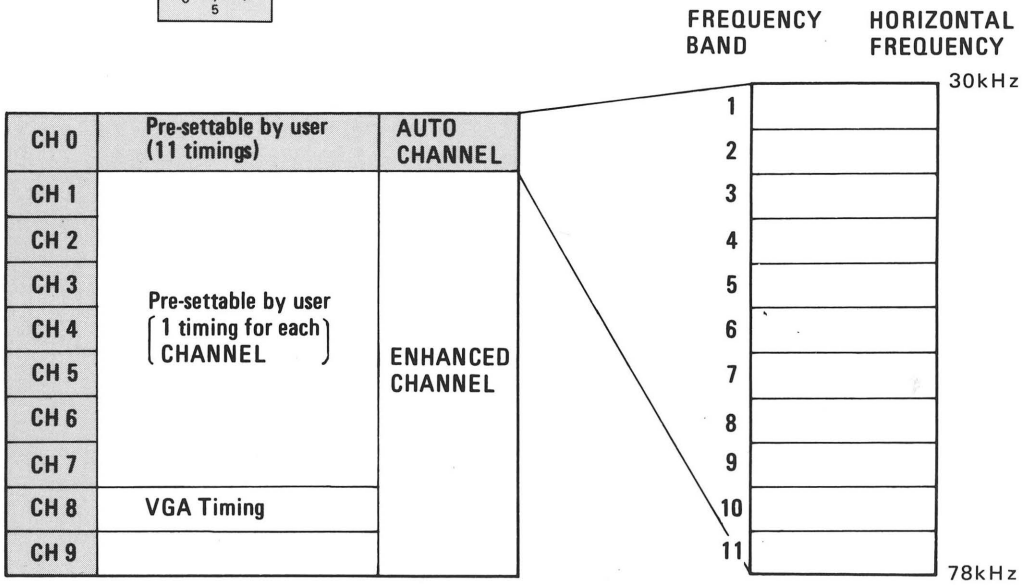
CHANNEL must be selected properly when the monitor is normally used, or when you want to adjust the picture dimensions.
This monitor has 10 CHANNELS and they are classified into two types of CHANNEL.

CHANNEL	TYPE OF CHANNEL
CH 0	AUTO CHANNEL
CH 1 to CH 9	ENHANCED CHANNEL

Structure of CHANNEL is as follows.

[CHANNEL SWITCH]





The characteristic for each CHANNEL is shown in the following table.

CONTROLS LOCATION AND DESCRIPTION

CAHNNEL	DESCRIPTION
AUTO CHANNEL (CH 0)	This CHANNEL has 15 bands for horizontal frequency of 30 – 78 kHz and picture data can be memorized in each band. (1) IN OPERATION MODE When in OPERATION MODE, monitor displays the picture with the size and position as memorized in the band corresponding with the horizontal frequency of input sync. signal. (2) IN ADJUSTMENT MODE In case of pre-setting the new picture dimensions, the data concerned is memorized in the band corresponding with the horizontal frequency of input sync. signal. Difference between adjacent each horizontal frequency hsould be kept 3 kHz or more, because horizontal frequency which monitor counts has little discrepancy from that of input signal.
ENHANCED CHANNEL (CH 1 – CH 9)	This ENHANCED CHANNEL has 9 CHANNELs and 1 (one) specified timing can be memorized in each CHANNEL. (1) IN OPERATION MODE When horizontal frequency of input signal matches that of selected CHANNEL, monitor displays the picture of the size and position as memorized in the selected CHANNEL. When horizontal frequency of input signal is different from that of selected CHANNEL, monitor displays the picture of the size and position which is memorized in the band of AUTO CHANNEL (CH 0) corresponding to the horizontal frequency of input sync. signal. (2) IN ADJUSTMENT MODE In case of pre-setting the new picture dimensions, the data concerned is memorized in selected CHANNEL. In CH 1 to CH 7, the timing which customer requests can be memorized. In CH 8 the following timings are memorized at factory. CH 8 : IBM VGA mode

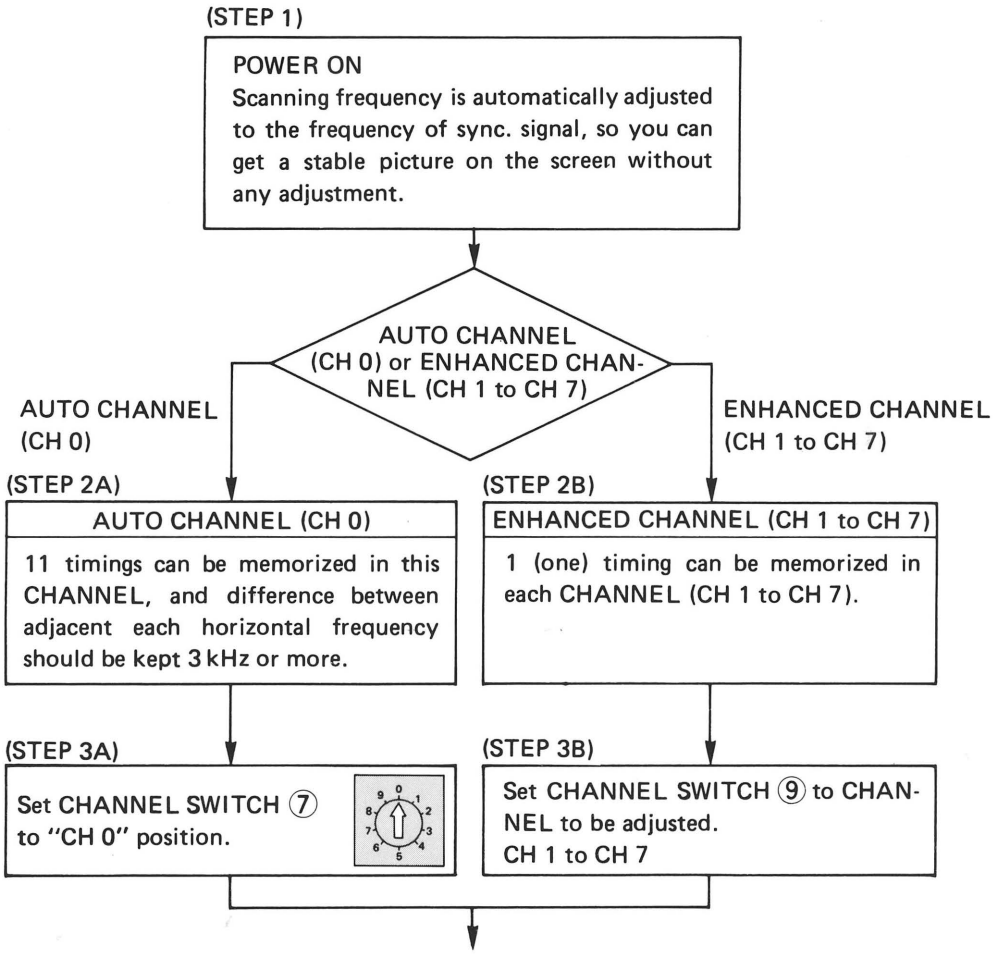
4. ADJUSTMENT

4.1 Preparation

In the following adjustment procedures, some condition is assumed as follows.

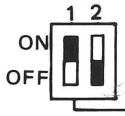
- AC Power source with proper voltage and frequency is supplied, and the power line voltage selector in the rear panel is set to the proper position. (refer to item 2.4)
- Video signals with proper line rate are applied to the red, green and blue inputs. And either the green video signal with composite sync. or a proper external sync. signal is also applied, then the sync. selector switch is set to the proper position.
  (refer to item 2.6)
- Before starting adjustments, it is supposed to degauss every part of the monitor and Warm-up the monitor with displaying a picture more than 20 minutes.

4.2 Procedure



(STEP 4)

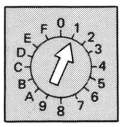
Set No. 1 of MODE SWITCH ⑧ to "ON" position.



OFF	OPERATION MODE
ON	ADJUSTMENT MODE

(STEP 5)

Set PICTURE CONTROL ⑩ to the number (adjustment item) necessary.



NO.	ADJUSTMENT ITEM	REMARKS
0	SPARE	
1	H-PHASE	Re-adjust these items according to the input signal timing.
2	H-SIZE	
3	H-POSITION	
4	V-POSITION	
5	V-SIZE	
6	V-SIZE-FINE	
7-9	SPARE	
A	PCC-AMP	Re-adjust these items if necessary. (timing free items)
B	PCC-PHASE	
C-F	SPARE	

(STEP 6)

Adjust picture size and position by ADJUSTMENT BUTTON ⑪, ⑫.

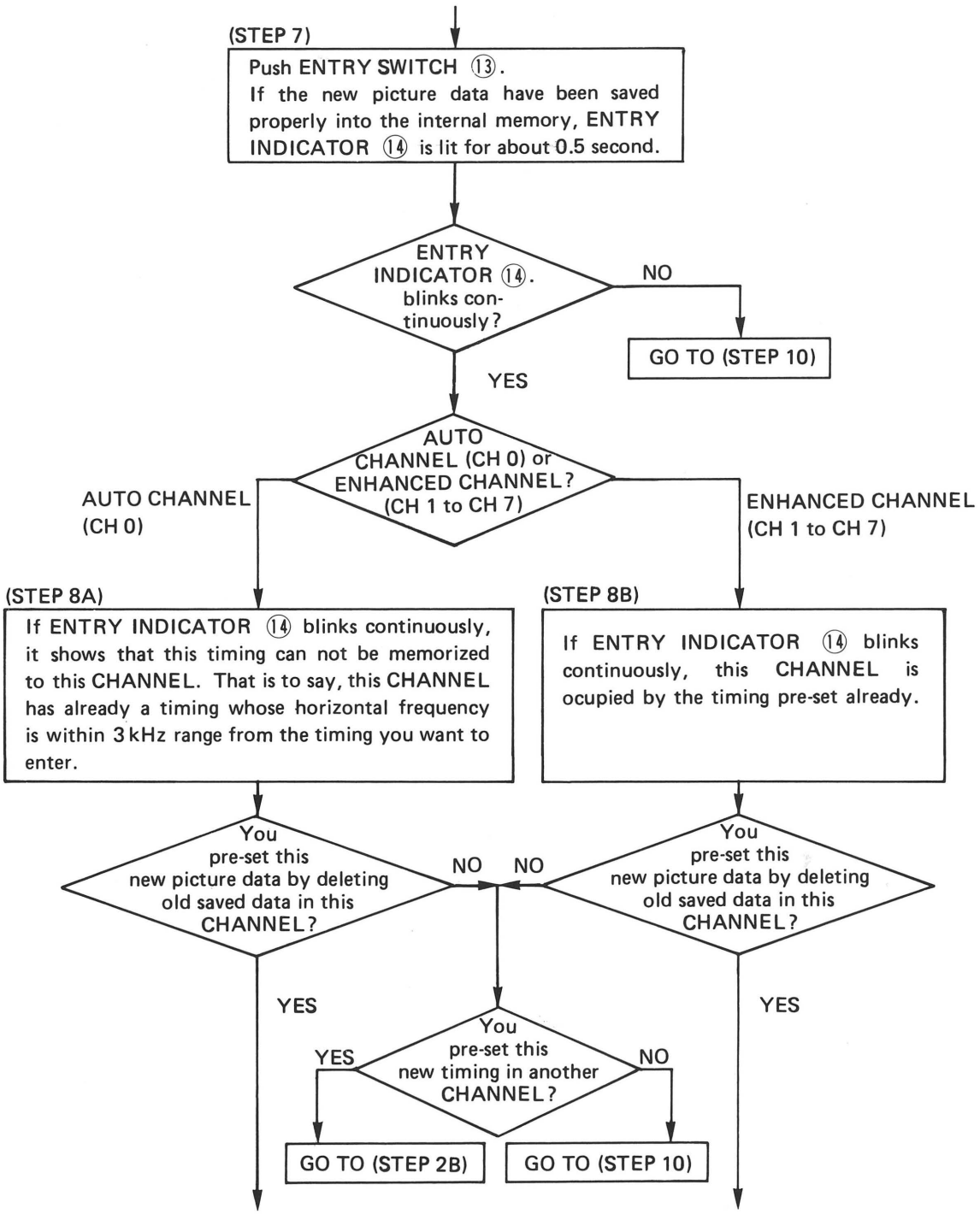
Another item must be adjusted? — YES

NO

You Pre-set this new picture condition? — NO

YES

GO TO (STEP 10)


(STEP 7)
Push ENTRY SWITCH ⑬.
If the new picture data have been saved properly into the internal memory, ENTRY INDICATOR ⑭ is lit for about 0.5 second.
ENTRY INDICATOR ⑭. blinks continuously?
NO
GO TO (STEP 10)
YES
AUTO CHANNEL (CH 0) or ENHANCED CHANNEL? (CH 1 to CH 7)
AUTO CHANNEL (CH 0)
ENHANCED CHANNEL (CH 1 to CH 7)
(STEP 8A)
If ENTRY INDICATOR ⑭ blinks continuously, it shows that this timing can not be memorized to this CHANNEL. That is to say, this CHANNEL has already a timing whose horizontal frequency is within 3 kHz range from the timing you want to enter.
(STEP 8B)
If ENTRY INDICATOR ⑭ blinks continuously, this CHANNEL is ocupied by the timing pre-set already.
You pre-set this new picture data by deleting old saved data in this CHANNEL?
NO
NO
You pre-set this new picture data by deleting old saved data in this CHANNEL?
YES
YES
You pre-set this new timing in another CHANNEL?
YES
NO
GO TO (STEP 2B)
GO TO (STEP 10)

(STEP 9A)

Push ENTRY SWITCH ⑬ once more.
If the new picture data have been saved properly into the internal memory, ENTRY INDICATOR ⑭ is lit for about 0.5 second.
(NOTE) In this case, old saved timings within 3 kHz range in horizontal frequency will be deleted automatically.

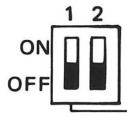
(STEP 9B)

Push ENTRY SWITCH ⑬ once more.
If the new picture data have been saved properly into the internal memory, ENTRY INDICATOR ⑭ is lit for about 0.5 second.
(NOTE) In this case, old saved timing in this CHANNEL will be deleted automatically.
Besides in CH 8 the following timings are memorized at factory.

CH 8 : VGA

(STEP 10)

Set No. 1 of MODE SWITCH ⑧ to "OFF" position.



OFF	OPERATION MODE
ON	ADJUSTMENT MODE

END

ADJUSTMENT

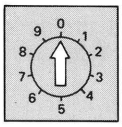
4.3 What picture comes out ?

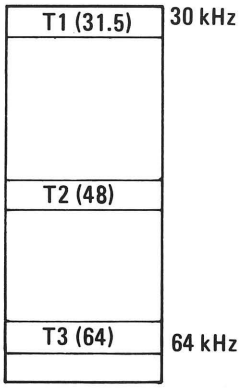
(EXAMPLE 1)

Following 3 timings are memorized in AUTO CHANNEL (CH 0).

T1 (fH = 31.5 kHz)
T2 (fH = 48 kHz)
T3 (fH = 64 kHz)

(CHANNEL SWITCH) (AUTO CHANNEL (CH 0))





WHAT PICTURE COMES OUT?

In this case, relationship between input signal and memorized timing is as follows.

HORIZONTAL FREQ. OF INPUT SIGNAL	MEMORIZED TIMING CORRESPOND TO INPUT SIGNAL
31.5 kHz	T1 (31.5)
48 kHz	T2 (48)
64 kHz	T3 (64)

Since above 3 timings are memorized in AUTO CHANNEL (CH 0), the range of horizontal frequency of new timings which are available for additional pre-setting without deleting them is as follows.

fH = 34.5 – 45 kHz, 51 – 61 kHz, 68 ~ 78 kHz

(EXAMPLE 2)

Following 3 timings are memorized in AUTO CHANNEL (CH 0) and 2 timings are memorized in ENHANCED CHANNEL (CH 1 and CH 2).

AUTO CHANNEL : CH 0 T1 (f_H = 31.5 kHz, f_V = 60 Hz, H sync. pol = −, V sync. pol = −)
CH 0 T2 (f_H = 48 kHz, f_V = 60 Hz, H sync. pol = −, V sync. pol = −)
CH 0 T3 (f_H = 64 kHz, f_V = 60 Hz, H sync. pol = −, V sync. pol = −)
ENHANCED CHANNEL: CH 1 T4 (f_H = 30.5 kHz, f_V = 70 Hz, H sync. pol = −, V sync. pol = −)
CH 1 T5 (f_H = 48 kHz, f_V = 60 Hz, H sync. pol = +, V sync. pol = +)

WHAT PICTURE COMES OUT?

When CH 1 (ENHANCED CH) is selected, relationship between input signal and memorized timing is as follows.

Frequency and Polarity of horizontal and vertical input sync. signal. → Memorized Timing correspond to input signal.

f_H	f_V	H sync. pol	V sync. pol	
48 kHz	60 Hz	−	−	→ VGA (480 LINE MODE)
31.5 kHz	60 Hz	−	−	→ T2
48 kHz	60 Hz	+	−	→ T5
30.5 kHz	70 Hz	−	−	→ T4

CHANNEL No.	Memorized Timing	Memorized Item of Timing				CHANNEL Classification
		f_H (kHz)	f_V (Hz)	H sync. Pol (+/−)	V sync. Pol (+/−)	
CH 0	T1	31.5				AUTO CHANNEL (See Table b)
	T2	48.0				
	T3	64.0				
CH 1	T4	30.5	70	−	−	Enhanced CHANNEL
CH 2	T5	48.0	60	+	−	
CH 3						
CH 4						
CH 5						
CH 6						
CH 7						
CH 8	VGA 480L	31.5	60	−	−	
	VGA 400L	31.5	70	−	+	
	VGA 350L	31.5	70	+	−	
				+	+	
CH 9						

Table (a)

Auto CHANNEL (CH 0)

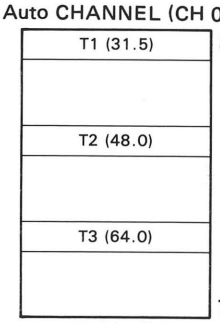


Table (b)

5. QUICK CHECK

Belows are some common problems you may encounter. Refer to this check list before contacting a service technician.

5.1 Monitor screen is blank

(1) Check brightness and contrast controls, and adjust to maximum brightness by turning the control ③.

(2) Check power.

- Verify that the power-on indicator on the front of the monitor is illuminated.
- Check whether the power cord is plugged into the electrical outlet, and/or the AC inlet of the monitor.
- Confirm that the electrical outlet is active and works properly.
- Confirm that the power line voltage selector is set to the proper position. (refer to item 2.4)

(3) Check connection.

- Check that your generator or the computer outputs some image.
- Check that the video signal cables and the sync. signal cables are correctly connected to the monitor. (refer to item 2.6)
- Check that the input impedance selector switches are set to proper position.

5.2 Monitor screen image is too dim or bright

(1) Check brightness and contrast controls. (refer to 5.1 (1))

(2) Check connection. (refer to 5.1 (3))

5.3 Monitor generates beep sound

(1) Check power.

- Confirm that the power line voltage selector is set to the proper position. (refer to item 2.4)
- Confirm that the electrical outlet works properly.

(2) Check that the horizontal picture width is controlled properly.

- When the horizontal picture width is set too wide, the protection circuit in the monitor is activated.
  Beep sound is generated and the both side of the picture fluctuates during the protection circuit active.
  Please adjust the horizontal width control to get narrower picture.

5.4 Booming sound just after power "ON"

(1) It is not accident because of the sound when each time you turn on the display monitor, auto degaussing circuit moving itself, and the booming sound (3 ~ 4 sec.) occur.

5.5 Monitor screen is not stable

Input signals which are in the horizontal scanning frequency range of 30 kHz ~ 78 kHz, and in the vertical scanning frequency range of 50 Hz ~ 120 Hz, can be automatically locked on and displayed on the screen by the auto-tracking function.
If you can not get the stable picture on the screen, please check followings.

(1) Check connection. (refer to 5.1 (3))

(2) Check the level of the sync. signals.
The level of the sync. signal are shown in item 1.2 when using composite external sync.

(3) Confirm the horizontal scanning frequency, and the vertical scanning frequency.

- The monitor can accept only following signals.

Horizontal scanning frequency	30 kHz – 78 kHz
Vertical scanning frequency	50 Hz – 120 Hz

(4) It is normal for this monitor to need approx. 5 seconds after the sync. signals provided for locking on, and displaying a stable picture.

6. CARE and MAINTENANCE

6.1 General

Provided the color display monitor is connected to the proper power source and is handled gently, it should give you a long period of trouble-free productivity. If there is an occasion when you suspect a malfunction with the unit, unplug the set and have it checked by your qualified service technician for conditions such as:

- The set has been dropped or the cabinet has been damaged.
- The set has been exposed to rain or water.

If you are unable to restore normal operation by following the procedures in this guide, do not attempt any further adjustments as improper adjustment of other controls will result in damage. Unplug the set and call your dealer.

If the set fails, or exhibits a distinct change in performance, then this indicates a need for service. Unplug the set and have it checked by a professional service technician.

6.2 Operation

- Operate the set only from the power source indicated on the back of the cabinet.
- To use a power source that is not marked on the back of the monitor will shorten the life of the monitor and cause damage in addition to improper operation.
- To ensure safe operation, the power plug must be inserted only into a standard three-prong power outlet which is correctly grounded through normal electrical wiring. Extension cords used with the equipment must be three-wire and be correctly wired to provide connection to the ground. Wrongly wired extension cords are a major cause of fatalities. The fact that the equipment operates satisfactorily does not imply that the power point is grounded and that the installation is completely safe. For your safety, if in any doubt about the effective grounding of the power point, consult a qualified electrician.
- For continued protection against risk of fire, replace only with same type and ratings of fuse.
- Do not overload wall outlets and extension cords as this can result in fire or shock.
- Adjust only those controls that are described in this guide. Improper adjustment of other controls may result in damage and could require the services of a technician to restore proper operation.
- Do not allow anything to reset on the power cord. Do not locate this monitor where the cord will be abused by persons walking on it.
- When not using the set for extended periods of time, such as a weekend or vacation, unplug the set from the wall outlet.

- If the same characters or graphics are shown for a long time with the Brightness and Contrast controls set to maximum positions, part of the screen may become damaged. Use these controls with care.
- Do not remove the back cover of the set as this can expose you to very high voltages and other hazards.
- Do not drop or push objects into the cabinet openings. Some internal parts carry hazardous voltages and contact can result in electrical shock or fire.
- Never operate the set near water.
- Never spill liquid of any kind on the monitor. If liquid has accidentally spilled into it, unplug the set and have it checked by a service technician.

6.3 Cleaning

- Always unplug the monitor before cleaning.
- Wipe the screen and cabinet front and sides with a soft cloth.
- If the screen requires more than dusting, apply a household window cleaner to a soft cloth to clean the monitor screen.

Caution – Do not use benzene, thinner or any volatile substances to clean the unit as the finish may be permanently marked. Never leave the unit in contact with rubber or vinyl for an extended period.

MITSUBISHI ELECTRIC CORPORATION
HEAD OFFICE: MITSUBISHI DENKI BLDG., MARUNOUCHI, TOKYO 100. TELEX: J24532 CABLE: MELCO TOKYO

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