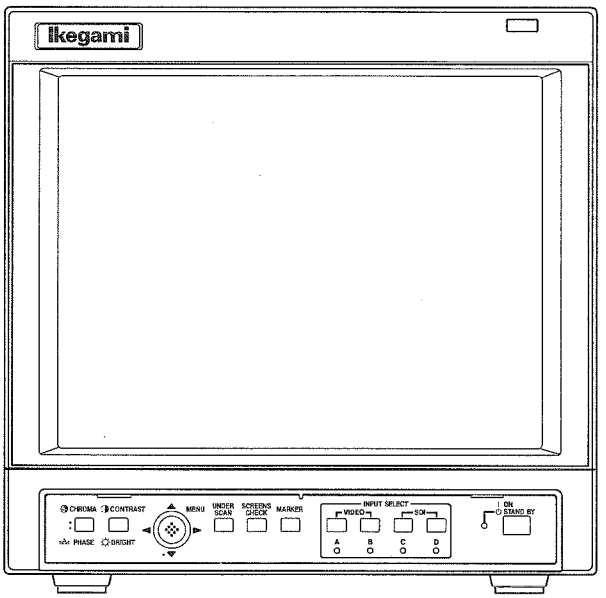
SERVICE MANUAL

COLOR VIDEO MONITOR

TM9-3D

BASIC CHASSIS
V2



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No.YA419
2006/3

SPECIFICATION

Items		Contents
Type		Color Video Monitor
Dimensions (W × H × D)		22.2cm × 22.0cm × 36.03cm (8-3/4" × 8-3/4" × 14-1/4")
Mass		7.9kg (17.41lbs)
Compliant Video Signal	INPUT A / INPUT B INPUT C / INPUT D	NTSC3.58, PAL4.43, White/Black (50Hz/60Hz) 480/60i, 576/50i (compatible with EMBEDDED AUDIO signal)
Input Signal Frequency	Horizontal Vertical	15kHz 50Hz / 60Hz
Video Band		6MHz(-3dB)
Power Input		AC120V, 60Hz
Power Consurmption		0.9A
Environmental Conditions	Operating Temperature Operating Humidity	0°C - 40°C (32°F - 104°F) 20% - 80% (non-condensing)
Picture Tube		⚠ A22AKQ13X17 10-inch measured diagonally
Screen Size		Diagonal : 22.5cm (8-13/16") / H:17.7cm (6-15/16") × V:13.8cm (5-3/8")
CRT High Voltage (Anode)		22.0kV ± 1.3kV [At zero beam current]
Screen Voltage		260V - 570V
Focus Voltage		5.5kV - 6.8kV
Horizontal Resolution	Video Input	280TV lines
Composite Video Input/Output [VIDEO A / VIDEO B]		1V(p-p), 75Ω, negative sync, BNC connector × 4 Bridge connection output possible with automatic termination, 2lines
Ext. Sync Input/Output [EXT. SYNC]		0.3V(p-p) - 4V(p-p), 75Ω, sync, BNC connector × 2 Bridge connection output possible with automatic termination, 1line
Remote Input/Output	MAKE/TRIGGER	Point-of-contact connection output possible, RJ-45 8pin x 1

Design & specifications are subject to change without notice.

SECTION 1
PRECAUTION

1.1 SAFETY PRECAUTIONS [EXCEPT FOR UK]

(1) The design of this product contains special hardware, many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.

(2) Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.

(3) Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by (⚠) on the parts list in Service manual**. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual may cause shock, fire, or other hazards.

(4) **Don't short between the LIVE side ground and ISOLATED (NEUTRAL) side ground or EARTH side ground when repairing.**
Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : (⊥) side GND, the ISOLATED (NEUTRAL) : (⏚) side GND and EARTH : (⏚) side GND.
Don't short between the LIVE side GND and ISOLATED (NEUTRAL) side GND or EARTH side GND and never measure the LIVE side GND and ISOLATED (NEUTRAL) side GND or EARTH side GND at the same time with a measuring apparatus (oscilloscope etc.). If above note will not be kept, a fuse or any parts will be broken.

(5) If any repair has been made to the chassis, it is recommended that the B1 setting should be checked or adjusted (See ADJUSTMENT OF B1 POWER SUPPLY).

(6) The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.

(7) Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10kΩ 2W resistor to the anode button.

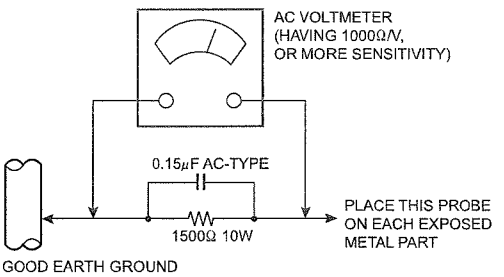
(8) When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.

(9) **Isolation Check (Safety for Electrical Shock Hazard)**
After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screw heads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

a) **Dielectric Strength Test**
The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 3000V AC (r.m.s.) for a period of one second. (. . . Withstand a voltage of 1100V AC (r.m.s.) to an appliance rated up to 120V, and 3000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.)
This method of test requires a test equipment not generally found in the service trade.

b) **Leakage Current Check**
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).
However, in tropical area, this must not exceed 0.2mA AC (r.m.s.).

Alternate Check Method
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1000Ω per volt or more sensitivity in the following manner. Connect a 1500Ω 10W resistor paralleled by a 0.15μF AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.). Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).
However, in tropical area, this must not exceed 0.3V AC (r.m.s.). This corresponds to 0.2mA AC (r.m.s.).



1.2 SAFETY PRECAUTIONS [FOR UK]

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(2) Alterations of the design or circuitry of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.

(3) Many electrical and mechanical parts in the product have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessary be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the Parts List of Service Manual. Electrical components having such features are identified by shading on the schematics and by (⚠) on the Parts List in the Service Manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the Parts List of Service Manual may cause shock, fire, or other hazards.

(4) The leads in the products are routed and dressed with ties, clamps, tubing's, barriers and the like to be separated from live parts, high temperature parts, moving parts and / or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.

WARNING

(1) The equipment has been designed and manufactured to meet international safety standards.
(2) It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
(3) Repairs must be made in accordance with the relevant safety standards.
(4) It is essential that safety critical components are replaced by approved parts.
(5) If mains voltage selector is provided, check setting for local voltage.

1.3 SAFETY PRECAUTIONS [FOR US]

(1) The design of this product contains special hardware, many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.

(2) Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.

(3) Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by (⚠) on the parts list in Service manual.** The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual may cause shock, fire, or other hazards.

(4) **Use isolation transformer when hot chassis.**
The chassis and any sub-chassis contained in some products are connected to one side of the AC power line. An isolation transformer of adequate capacity should be inserted between the product and the AC power supply point while performing any service on some products when the HOT chassis is exposed.

(5) **Don't short between the LIVE side ground and ISOLATED (NEUTRAL) side ground or EARTH side ground when repairing.**
Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : (⊥) side GND, the ISOLATED (NEUTRAL) : (⏚) side GND and EARTH : (⏚) side GND.
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(6) If any repair has been made to the chassis, it is recommended that the B1 setting should be checked or adjusted (See ADJUSTMENT OF B1 POWER SUPPLY).

(7) The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.

(8) Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10kΩ 2W resistor to the anode button.

(9) When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.

(10) **Isolation Check (Safety for Electrical Shock Hazard)**
After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screw heads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

a) **Dielectric Strength Test**
The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 3000V AC (r.m.s.) for a period of one second. (. . . . Withstand a voltage of 1100V AC (r.m.s.) to an appliance rated up to 120V, and 3000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.)
This method of test requires a test equipment not generally found in the service trade.

b) **Leakage Current Check**
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).
However, in tropical area, this must not exceed 0.2mA AC (r.m.s.).

Alternate Check Method
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1000Ω per volt or more sensitivity in the following manner. Connect a 1500Ω 10W resistor paralleled by a 0.15μF AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.). Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).
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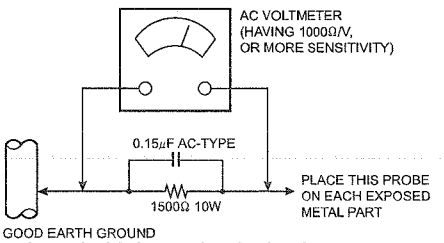
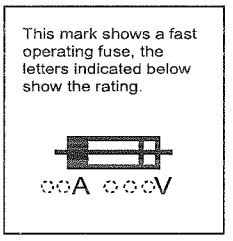
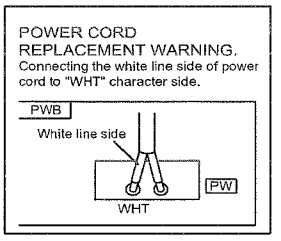


(11) **High voltage hold down circuit check.**
After repair of the high voltage hold down circuit, this circuit shall be checked to operate correctly.See item **"How to check the high voltage hold down circuit"**.





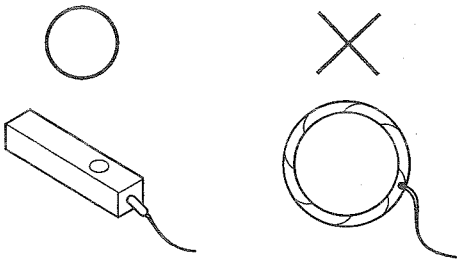
SECTION 2
SPECIFIC SERVICE INSTRUCTIONS

2.1 DEMAGNETIZATION PROCEDURE

2.1.1 CAUTION

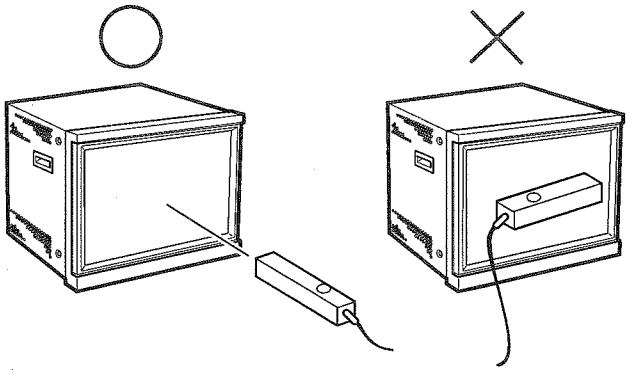
(1) Use a rod-type demagnetization coil.

NOTE:
Never use a ring-shaped demagnetization coil.

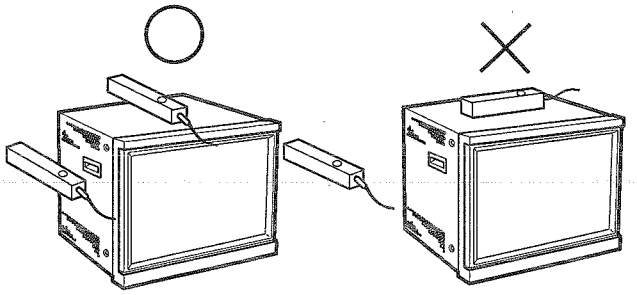


(2) Keep the demagnetization coil at a distance of more than 1.5 cm from the CRT screen and the main unit during use.

(3) When demagnetizing the CRT screen, hold the demagnetization coil perpendicularly to the CRT screen.



(4) When demagnetizing the outer cabinet of the unit, use the demagnetization coil in the orientation as shown below.



2.1.2 DEMAGNETIZING THE CRT SCREEN

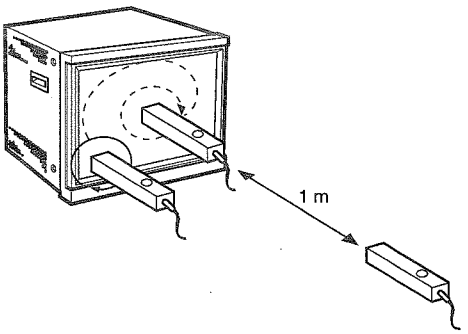
(1) While holding the power button of the demagnetization coil, move it to approach the CRT screen area that has color irregularities. (Keep the demagnetization coil at a distance of more than 1.5 cm from the screen.)

(2) From the area with the colour irregularities, move the demagnetization coil as if drawing a spiral toward the center of the CRT screen.

(3) Move the demagnetization coil slowly away from the center of the CRT screen.

(4) When the demagnetization coil comes to about 1 m from the CRT screen, release the demagnetization coil power button.

(5) If the color irregularities are still observed, repeat the above steps once more.



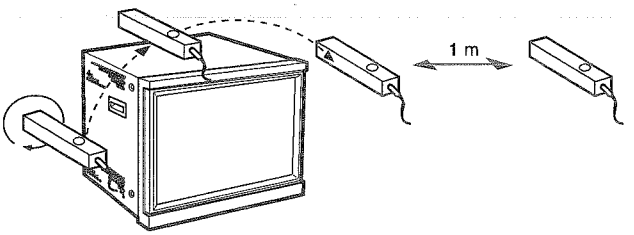
2.1.3 DEMAGNETIZING THE OUTER CABINET OF THE UNIT

(1) While holding the power button of the demagnetization coil, move it to approach the outer cabinet of the unit. (Keep the demagnetization coil at a distance of more than 1.5 cm from the cabinet.)

(2) Keep the demagnetization coil in the same orientation, and move it around the cabinet as if drawing a circle around the side and top panels of the unit.

(3) Move the demagnetization coil slowly away from the outer cabinet of the unit.

(4) When the demagnetization coil comes to about 1 m from the unit, release the power button of the demagnetization coil.



2.2 MAIN CPU [SIGNAL PWB : IC6805] PIN FUNCTION

Pin No.	Pin name	I/O	Function
1	P20/A16	O	Not used
2	P21/A17	O	Not used
3	P22/A18	O	Not used
4	P23/A19 IND_A	O	LED A (for Diagnosis) [ON = L]
5	P24/A20 IND_B	O	LED B (for Diagnosis) [ON = L]
6	P25/A21 IND_C	O	LED C (for Diagnosis) [ON = L]
7	P26/A22 IND_D	O	LED D (for Diagnosis) [ON = L]
8	P27/A23	O	Not used
9	P30/ALE	O	Not used
10	P31/RDX	O	Not used
11	Vss (GND)	-	GND
12	P32/WRLX (RTS)	O	Not used
13	P33/WRHX (CTS)	O	Not used
14	P34/HRQ (ID_SET)	O	Auto setting for ID number control [Control = L]
15	P35/HAKX (DCD)	O	Not used
16	P36/RDY (TXD_ENA)	O	Not used
17	P37/CLK (RI)	O	Not used
18	P40/SCK	O	Clock for flash memory writing
19	P41/SOT (RXD)	O	Data receive for flash memory writing
20	P42/SIN (TXD)	I	Data trnsmission for flash memory writing
21	P43/SCK1 (SCLK)	O	Not used
22	P44/SOT1 (SOUT)	O	Not used
23	Vcc (5V)	I	5V power supply
24	P45/SIN1	O	Not used
25	P46/ADTG	O	Not used
26	P47/SCK0	O	Not used
27	C	-	Capacitor for power supply stabilization (0.1µF)
28	P50/SDA0/SOT0	I/O	Data for Inter IC (serial) bus : Deflection IC etc.
29	P51/SCL0/SIN0	O	Clock for Inter IC (serial) bus : Deflection IC etc.
30	P52/SDA1	I/O	Data for Inter IC (serial) bus : Signal IC etc.
31	P53/SCL1	O	Clock for Inter IC (serial) bus : Signal IC etc.
32	P54/SDA2	I/O	Data for Inter IC (serial) bus : main memory
33	P55/SCL2	O	Clock for Inter IC (serial) bus : main memory
34	AVcc	I	5V power supply
35	AVRH	-	GND
36	AVRL	-	GND
37	AVss	-	GND
38	P60/AN0	O	Not used
39	P61/AN1	O	Not used
40	P62/AN2	O	Not used
41	P63/AN3	O	Not used
42	Vss	-	GND
43	P64/AN4	O	Not used
44	P65/AN5	O	Not used
45	P66/AN6	O	Not used
46	P67/AN7	O	Not used
47	V.SYNC P70/IRQ0	I	V.sync
48	REQ_DET P71/IRQ1	O	Not used
49	MD0	I	Mode setting for flash memory writing [Setting = H]
50	MD1	I	Mode setting for flash memory writing [Setting = H]
51	MD2	I	Mode setting for flash memory writing [Setting = L]
52	HSTX	I	Hardware stand-by [Stand-by = L]
53	TARRY_R P72/IRQ2	O	TALLY LED (red) control [ON = H]
54	P73/IRQ3	O	Not used
55	OCP P74/IRQ4	I	Over-current deetection [Detect = H]
56	X_RAY P75/IRQ5	I	X-ray deetection [Detect = L]
57	INP_A/B_SEL P76/ IRQ6	O	INPUT A / B select [INPUT A = H, INPUT B = L]
58	P77/IRQ7	O	Not used
59	H SYNC P80/TIN0	I	H.sync
60	P81/TIN1	O	Not used
61	VIDEO_SLOT_SEL P82/TOT0	O	Video/Unit select [Video = H, Unit = L]
62	DEG_SN P83/TOT1	O	demagnetization coil / S/N coil select control [demagnetization coil = H, S/N coil = L]
63	REMOTE P84/IN0	I	Remote control input
64	P85/IN1	O	Not used
65	P86/IN2	O	Not used
66	P87/IN3	O	Not used
67	P90/OUT0	O	Not used
68	V_OFF P91/OUT1	O	Single horizontal line switch [Display = H]
69	P92/PPG0	O	Not used
70	V_OFF_DET P93/ PPG1	I	Neck-bleak prevention detection [Detect = H]
71	P94/PPG2	O	Not used
72	P95/PPG3	O	Not used
73	TALLY_G P96/PPG4	O	TALLY LED (green) control [ON = H]
74	SYNC_SEL P97/ PPG5	O	EXT/INT ext. sync select [EXT = L, INT = H]
75	COMB_SW PA0/ OUT2	O	Comb filter select [Colour =H, White/black = L]
76	PA1/OUT3	O	Not used
77	RESET RSTX	I	Reset
78	POWER PA2	O	Power control [ON = H]
79	PA3	O	Not used
80	PA4/CKOT	O	Not used
81	Vss	-	GND
82	X0	I	System clock osillation (crystal) : 16MHz
83	X1	I	System clock osillation (crystal) : 4MHz
84	Vcc	I	5V power supply
85	FLASH P00/AD00	I	Program wake-up for flash memory writing
86	FLASH2 P01/AD01	I	External pull-up for flash memory writing
87	P02/AD02	O	Not used
88	SCREENS_CHK P03/AD03	O	Screen check select [RGB single colour = L]
89	UNIT_DET P04/AD04	I	Unit detection [Unit detect = L]
90	P05/AD05	O	Not used
91	SIN0 P06/AD06	I	Key input data 0
92	SIN1 P07/AD07	I	Key input data 1
93	SIN2 P10/AD08	I	Key input data 2
94	SIN3 P11/AD09	O	Not used
95	I2C STOP P12/AD10	I	Inter IC (serial) bus stop [Stop = H]
96	SCAN0 P13/AD11	O	Key input scan 0
97	SCAN1 P14/AD12	O	Key input scan 1
98	SCAN2 P15/AD13	O	Key input scan 2
99	SCAN3 P16/AD14	O	Key input scan 3
100	SCAN4 P17/AD15	O	Key input scan 4

SECTION 3
DISASSEMBLY

3.1 DISASSEMBLY PROCEDURE

CAUTIONS:

- Some parts are active even after the main power switch is set to OFF.
- Be sure to unplug the power cord from the power outlet before proceeding with disassembly or assembly of the unit.

3.1.1 REMOVING THE TOP COVER

(1) Remove the 4 screws **[A]** and 4 screws **[B]**.
(2) Remove the TOP COVER.

3.1.2 REMOVING THE SDI PWB

- Remove the TOP COVER.

(1) Remove the 6 screws **[C]**.
(2) Remove the REAR COVER.
(3) Remove the 2 screws **[D]**, 2 screws **[E]** and 4 screws **[F]**.
(4) Remove the PWB COVER.
(5) Remove the 4 screws **[G]**.
(6) Remove the SDI PWB from the PWB BASE.

3.1.3 REMOVING THE REAR PANEL AND THE TERMINAL BRACKET

- Remove the TOP COVER.
- Remove the SDI PWB.

(1) Remove the 4 screws **[H]**.
(2) Remove the REAR PANEL.
(3) Remove the 3 screws **[J]**, 1 screw **[K]**, 1 screw **[L]**, 1 screw **[M]** and 1 screw **[N]**.
(4) Remove the AC INLET and the POWER SWITCH.
(5) Remove the TERMINAL BRACKET.

3.1.4 REMOVING THE BOTTOM COVER

- Remove the TOP COVER.
- Remove the SDI PWB.
- Remove the REAR PANEL and the TERMINAL BRACKET.

(1) Remove the 2 screws **[P]**.
(2) Remove the BOTTOM COVER.

3.1.5 REMOVING THE MAIN PWB, SIGNAL PWB, LINE FILTER PWB AND FRONT CONTROL PWB

- Remove the TOP COVER.
- Remove the SDI PWB.
- Remove the REAR PANEL and the TERMINAL BRACKET.
- Remove the BOTTOM COVER.

(1) Remove the 2 screws **[Q]** and 4 claws **[R]**.
(2) Remove the MAIN PWB (with SIGNAL PWB and LINE FILTER PWB affixed on the MAIN PWB).
(3) Remove the SIGNAL PWB from the MAIN PWB (Only the connector connection).
(4) Remove the LINE FILTER PWB from the MAIN PWB (Only the connector connection).
(5) Remove the FRONT CONTROL PWB from the CHASSIS BASE.

3.1.6 REMOVING THE TALLY PWB

- Remove the TOP COVER.

(1) Remove the 2 claws **[S]**.
(2) Remove the TALLY PWB.

3.1.7 CHEKING THE MAIN PWB

- Remove the TOP COVER.
- Remove the REAR PANEL and the TERMINAL BRACKET.
- Remove the BOTTOM COVER.

(1) Put the main chassis assembly in service position by placing the FRONT PANEL side facing downward.
(2) The electrical check for the MAIN PWB is now ready.

CAUTIONS:

- Before turning on power, make sure that the CRT earth wire and other connectors are properly connected.
- The unit is unstable when it is placed on its side so please be careful that it does not topple over during work.
- Use insulating materials, if necessary, to avoid possible electrical contacts between PWBs and expose terminals, etc.

3.1.8 NOTE CONCERNING WIRE CLAMPING

- Be sure to reconnect the wire clamps that have been disconnected during the above work.

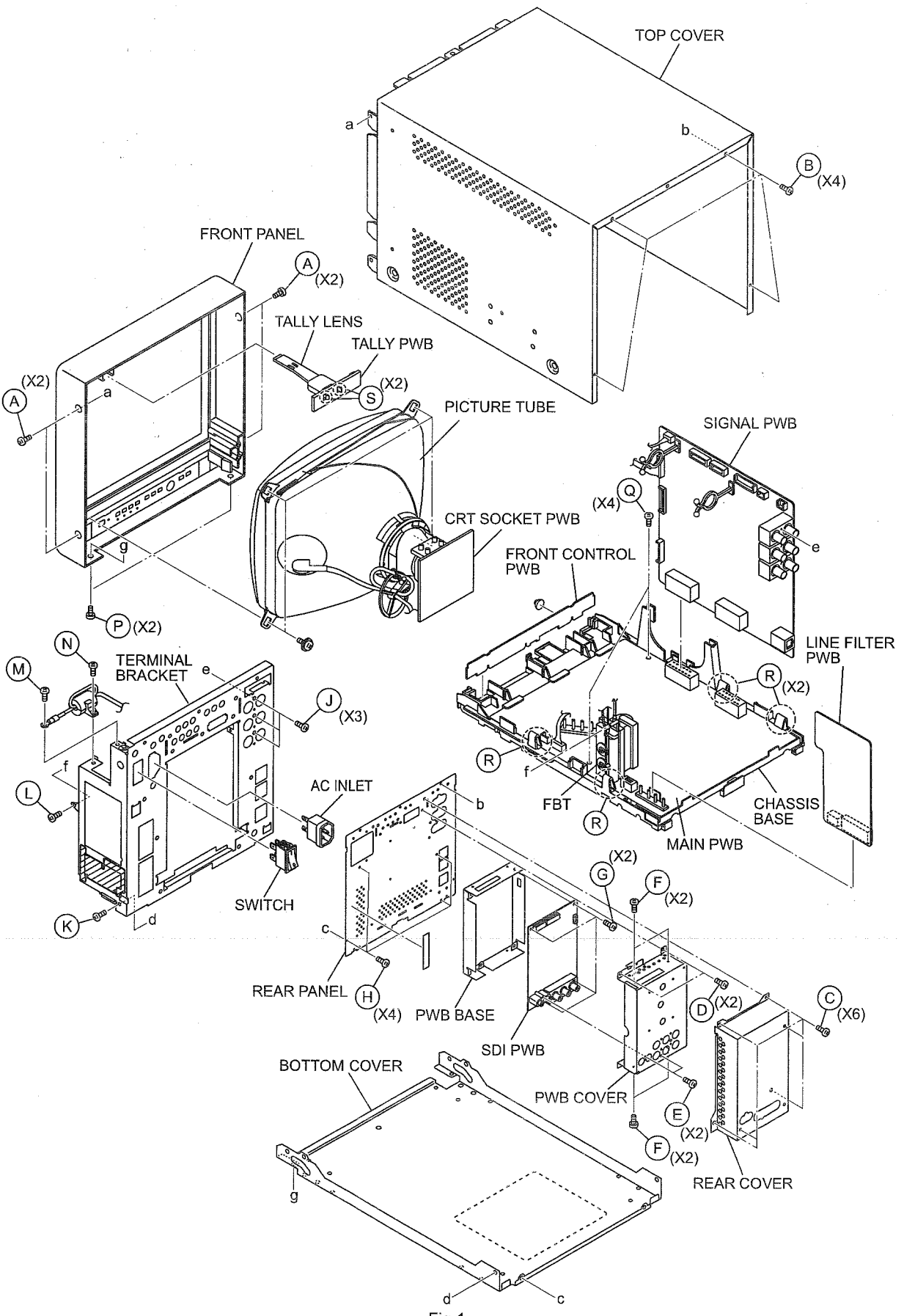

TOP COVER
a
b
B
(X4)
FRONT PANEL
A
(X2)
TALLY LENS
TALLY PWB
(X2)
S
(X2)
A
a
PICTURE TUBE
SIGNAL PWB
(X4)
Q
CRT SOCKET PWB
e
FRONT CONTROL PWB
g
P
(X2)
N
M
TERMINAL BRACKET
e
J
(X3)
LINE FILTER PWB
R
(X2)
R
f
f
L
AC INLET
b
FBT
R
CHASSIS BASE
MAIN PWB
(X2)
G
F
(X2)
SWITCH
K
d
c
REAR PANEL
H
(X4)
PWB BASE
D
(X2)
C
(X6)
SDI PWB
BOTTOM COVER
PWB COVER
E
(X2)
F
(X2)
REAR COVER
g
d
c

Fig.1

3.2 MEMORY IC REPLACEMENT

- This model uses the memory IC.
- This memory IC stores data for proper operation of the video and deflection circuits.
- When replacing, be sure to use an IC containing this (initial value) data.

3.2.1 MEMORY IC REPLACEMENT PROCEDURE

1. Power off
Switch off the power and disconnect the power plug from the AC outlet.

2. Replace the memory IC
Be sure to use the memory IC written with the initial setting values.

3. Power on
Connect the power plug to the AC outlet and switch on the power.

4. Adjust the items that can be adjusted on the front panel key. (Some items cannot be adjusted unless the required signal is input.)

5. Check the SET-UP MENU and set its items as required.
a). Press the [▼] key and the [CHROMA/PHASE] key simultaneously, and the SET-UP MENU screen of Fig.2 will be displayed.
b). Check the items in the SET-UP MENU by comparing them with the data in the table on page 1-11. If any items are set differently, set it as required.
c). Press the [MENU] key to exit the SET-UP MENU screen.

6. Check the MAIN MENU and set its items as required.
a). Press the [MENU] key to display the MAIN MENU screen (Fig.3).
b). Check the items in the MAIN MENU by comparing them with the data in the table on page 1-11. If any items are set differently, set it as required.
c). Press the [MENU] key to exit the MAIN MENU screen.

7. Check the initial setting values of the items in the SERVICE MENU (Fig.4). If any items are set differently, set it as required. For the setting method and the initial setting value, see the corresponding pages for "SERVICE ADJUSTMENT" in this manual.

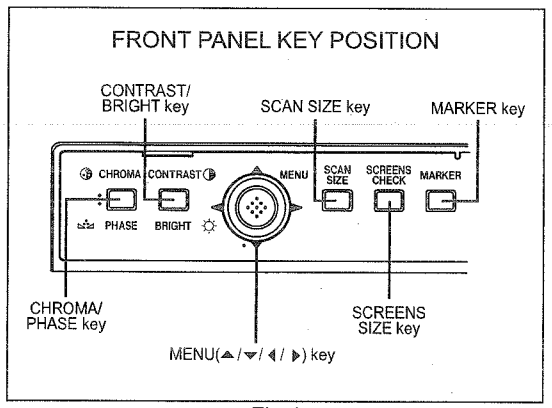


Fig.1

SET-UP MENU SCREEN

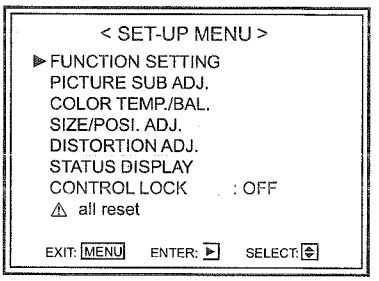


Fig.2

MAIN MENU SCREEN

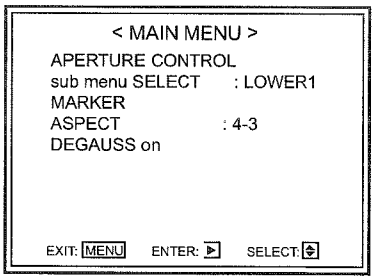


Fig.3

SERVICE MENU SCREEN

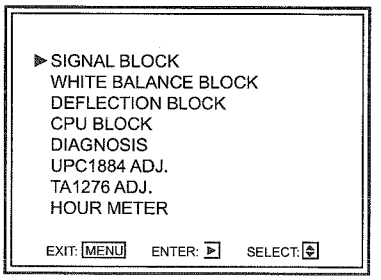


Fig.4

Setting items	Settings	Item No.
SIGNAL BLOCK	Adjust	SA ~ SU
WHITE BALANCE BLOCK	Adjust	WA ~ WX
DEFLECTION BLOCK	Adjust	DA ~ DZ, D1 ~ D3
CPU BLOCK	Adjust	CA ~ CE
UPC1884 ADJ.	Fixed	---
TA1276 ADJ.	Fixed	---
HOUR METER	Fixed	---
SET FPGA : 100%_AREA	Fixed	IA ~ IN
SET FPGA : A.MARKER	Fixed	AA ~ AN
SET FPGA : S.MARKER	Fixed	FA ~ FN
SET FPGA : H.BLANKING	Fixed	BA ~ BN

3.2.2 FACTORY SETTING POSITION

3.2.2.1 SETTING OF FRONT PANEL KEY

Setting item	Setting value
MAIN POWER (REAR)	OFF
SUB POWER (STAND-BY)	OFF
INPUT SELECT	INPUT A
CONTRAST	0
BRIGHT	0
CHROMA	0
PHASE	0
MARKER	OFF
SCAN SIZE	OFF
SCREENS CHECK	OFF

3.2.2.2 SETTING OF SET-UP MENU SCREEN

(1) FUNCTION SETTING

Setting item	Setting value	Description
COLOR SYSTEM	AUTO	Input NTSC / PAL signal
SYNC SELECT	INT.	
RUSH DELAY TIME	STD	
TALLY SELECT	GREEN	
REMOTE SYSTEM		
CONTROL FORM	MAKE	
PORT F1	INP.A	
PORT F2	INP.C	
PORT F3	MARKER	
PORT F4	ASPECT	
PORT F5	TALLY	
PORT F6	L.METER	
E.AUDIO GROUP	1G	
HOUR METER × 100h	000	

(2) PICTURE SUB ADJ.

Setting item	Setting value	Description
CONTRAST	00	
BRIGHT	00	
CHROMA	00	
PHASE	00	Input NTSC signal

(3) COLOR TEMP./BAL.

Setting item	Setting value	Description
COLOR TEMP.	LOW	
BLUE DRIVE	00	
RED DRIVE	00	
GREEN CUTOFF	00	
BLUE CUTOFF	00	
RED CUTOFF	00	

(4) SIZE/POSI. ADJ.

Setting item	Setting value	Description
H SIZE	00	
H POSITION	00	
V SIZE	00	
V POSITION	00	

(5) DISTORTION ADJ.

Setting item	Setting value	Description
PARALLELOGRAM	00	
TRAPEZOID	00	
ROTATION	00	
PURITY	00	

(6) STATUS DISPLAY

Setting item	Setting value	Description
STATUS DISPLAY	ON	
LEVEL METER	OFF	Input SDI signal
BAR TYPE	3COLORS	Input SDI signal
BAR BRIGHTNESS	LOW	Input SDI signal
REFERENCE LEVEL	-20dB	Input SDI signal
OVER LEVEL	-8dB	Input SDI signal

(7) CONTROL LOCK

Setting item	Setting value	Description
CONTROL LOCK	OFF	

3.2.2.3 SETTING OF MAIN MENU SCREEN

Setting item	Setting value
APERTURE CONTROL	
LEVEL	04
CONTROL FREQ.	LOW
SUB MENU POSI.	LOWER1
MARKER	
MARKER SELECT	OFF
ASPECT SELECT	4:3
SAFETY MARKER	OFF
R-MARKER SELECT	OFF
R-ASPECT SELECT	4:3
R-SAFETY MARKER	OFF
ASPECT	4-3

3.3 REPLACEMENT OF CHIP COMPONENT

3.3.1 CAUTIONS

(1) Avoid heating for more than 3 seconds.
(2) Do not rub the electrodes and the resist parts of the pattern.
(3) When removing a chip part, melt the solder adequately.
(4) Do not reuse a chip part after removing it.

3.3.2 SOLDERING IRON

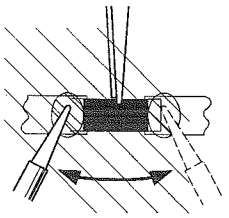
(1) Use a high insulation soldering iron with a thin pointed end of it.
(2) A 30w soldering iron is recommended for easily removing parts.

3.3.3 REPLACEMENT STEPS

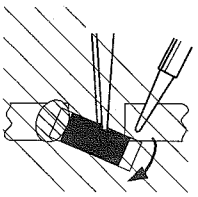
1. How to remove Chip parts

[Resistors, capacitors, etc.]

(1) As shown in the figure, push the part with tweezers and alternately melt the solder at each end.

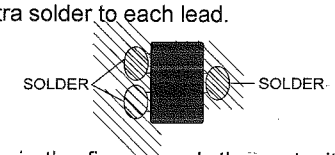


(2) Shift with the tweezers and remove the chip part.

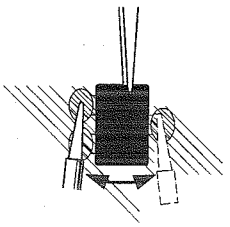


[Transistors, diodes, variable resistors, etc.]

(1) Apply extra solder to each lead.



(2) As shown in the figure, push the part with tweezers and alternately melt the solder at each lead. Shift and remove the chip part.

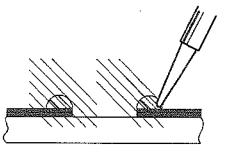


NOTE :
After removing the part, remove remaining solder from the pattern.

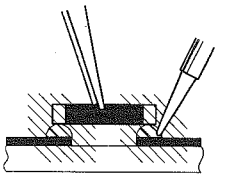
2. How to install Chip parts

[Resistors, capacitors, etc.]

(1) Apply solder to the pattern as indicated in the figure.

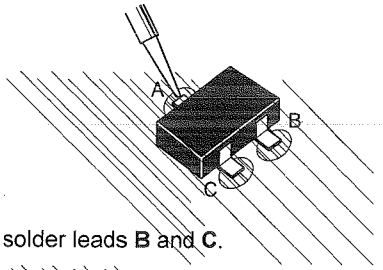


(2) Grasp the chip part with tweezers and place it on the solder. Then heat and melt the solder at both ends of the chip part.

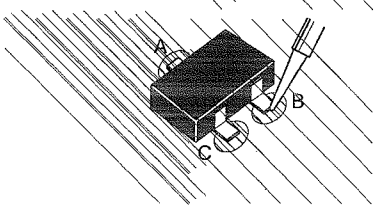


[Transistors, diodes, variable resistors, etc.]

(1) Apply solder to the pattern as indicated in the figure.
(2) Grasp the chip part with tweezers and place it on the solder.
(3) First solder lead **A** as indicated in the figure.



(4) Then solder leads **B** and **C**.



SECTION 4
ADJUSTMENT

4.1 ADJUSTMENT PREPARATION

(1) **There are 2 ways of adjusting this unit : One is the MENU as on screen display and the other is the conventional method using adjustment parts and components.**

(2) **The adjustment using the MENU as on screen display is made on the basis of the initial setting values. The setting values which adjust the screen to the optimum condition can be different from the initial setting values.**

(3) Make sure that connection is correctly made AC to AC power source.

(4) Turn on the power of the unit and measuring instruments for warning up for at least 30 minutes before starting adjustments.

(5) If the receive or input signal is not specified, use the most appropriate signal for adjustment.

(6) Never touch the parts (such as variable resistors, transformers and condensers) not shown in the adjustment items of this service adjustment.

4.2 PRESET SETTING BEFORE ADJUSTMENTS

For the functions other than those that should be set before each adjustment, reset them to the initial setting values according to the table on page 1-11 before proceeding to the adjustment. Correct adjustments will not be possible unless the values of the functions are reset to the initial setting values.

4.3 MEASURING INSTRUMENT AND FIXTURES

- DC voltmeter (Digital voltmeter)
- High voltage voltmeter
- Oscilloscope
- Colour analyzer (Colour temperature meter)
- Signal generator (Pattern generator) [NTSC, PAL, SD SDI]

4.4 STANDARD SIGNAL FOR ADJUSTMENT

Refer to the following figure for Standard signal for adjustment.

COMPOSITE VIDEO SIGNAL
(PAL / NTSC COLOUR BAR)

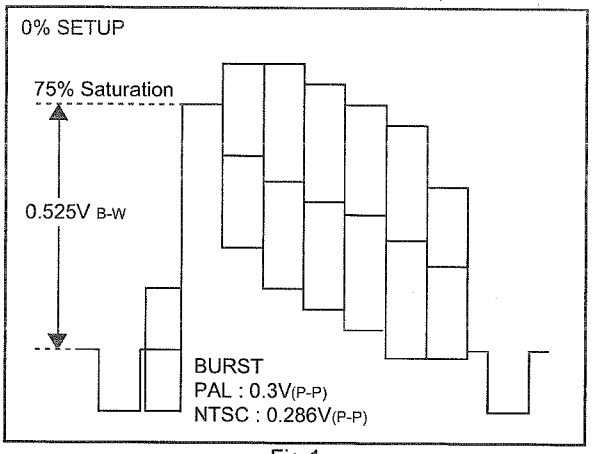


Fig.1

4.5 ADJUTMENT ITEMS

- **B1 VOLTAGE ADJUSTMENT**
- **CRT HIGH VOLTAGE CHECK**
- **X-RAY PROTECTOR OPERATION CHECK**
- **FOCUS / CONVERGENCE ADJUSTMENT**
- **PURITY CORRECTION ADJUSTMENT**
- **VIDEO CIRCUIT ADJUSTMENTS**
  - WHITE BALANCE LOW LIGHT adjustment
  - WHITE BALANCE HIGH LIGHT adjustment (HIGH : D9300 / LOW : D6500)
  - SUB BRIGHT HIGH adjustment
  - SUB BRIGHT LOW adjustment
  - SUB CONTRAST adjustment
  - SUB COLOUR adjustment
  - SUB PHASE adjustment
- **DEFLECTION CIRCUIT ADJUSTMENTS**
- **NORMAL SCAN MODE**
  - H.POSITION / H.SIZE (VIDEO / SDI) adjustment
  - V.POSITION / ROTATION (VIDEO / SDI) adjustment
  - V.LINEARITY adjustment
  - V.SIZE (4:3) adjustment
- **UNDER SCAN MODE**
  - V.POSITION / H.SIZE (VIDEO / SDI) adjustment
  - V.SIZE (4:3) adjustment
- **SDI INPUT ADJUSTMENT**
  - SDI INPUT LEVEL adjustment

4.6 BASIC OPERATION OF SERVICE MODE

4.6.1 SERVICE MENU ITEMS

The SERVICE MENU is roughly classified according to set-up and adjustments, and is divided into the following items.
Do not alter the values of unnecessary items.

Setting item	Setting contents
SIGNAL BLOCK	Video system setting
WHITE BALANCE BLOCK	White balance setting
DEFLECTION BLOCK	Deflection system setting
CPU BLOCK	Main CPU system setting [Other than C[C39] do not adjust]
DIAGNOSIS	Self - check be displayed
UPC1884 ADJ.	DEF processor system setting [Do not adjust]
TA1276 ADJ.	RGB processor system setting [Do not adjust]
HOUR METER	HOUR METER be displayed
UPDATE CPU PROGRAM	CPU Ver. be displayed
EEPROM VERSION	EEPROM Ver. be displayed
FPGA VERSION	FPGA UNIT Ver. be displayed
SET FPGA : 100%_AREA	AREA MARKER setting [Do not adjust]
SET FPGA : A.MARKER	AREA MARKER correction setting [Do not adjust]
SET FPGA : S.MARKER	SAFETY MARKER setting [Do not adjust]
SET FPGA : H.BLANKING	H.BLANKING setting [Do not adjust]

4.6.2 HOW TO ENTER THE SERVICE MENU

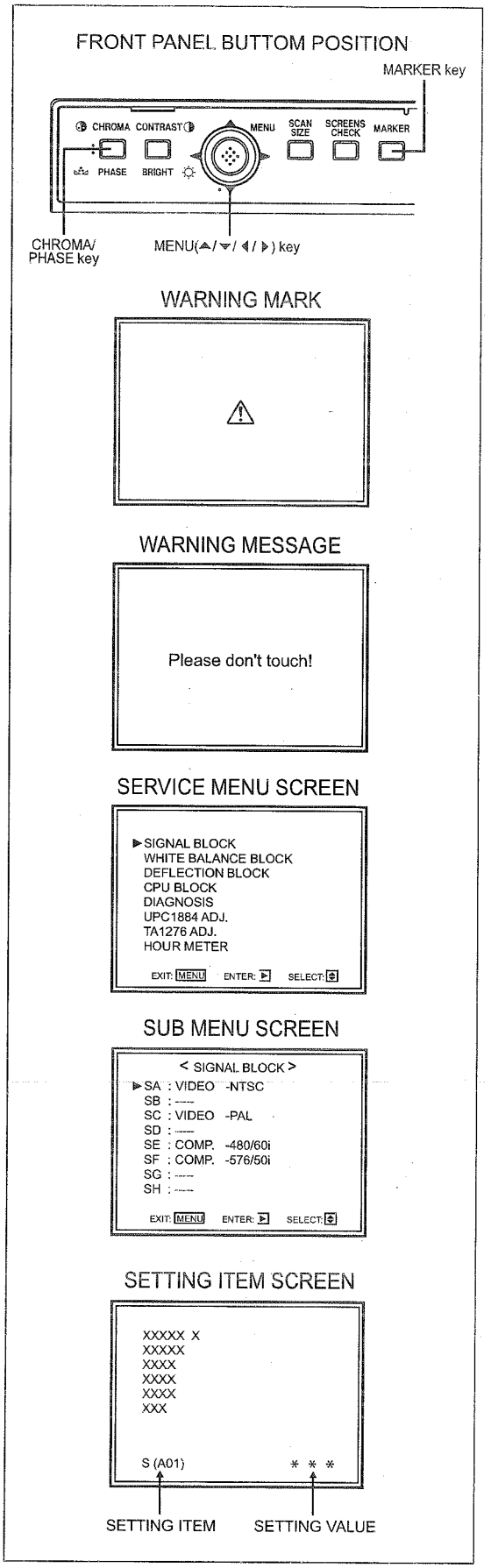
(1) Press the [▼] key and [MARKER] key simultaneously.
The ⚠ mark appears on the screen.
(2) Before the ⚠ mark disappears (within 5 seconds after it appears), press the [▼] key and [CHROMA/PHASE] key simultaneously.
The warning message "**Please don't touch!**" appears on the screen.
(3) Before the warning message disappears (within 5 seconds after it appears), press the [▶] key.
The SERVICE MENU appears on the display.

4.6.3 SETTING THE SERVICE MENU ITEMS

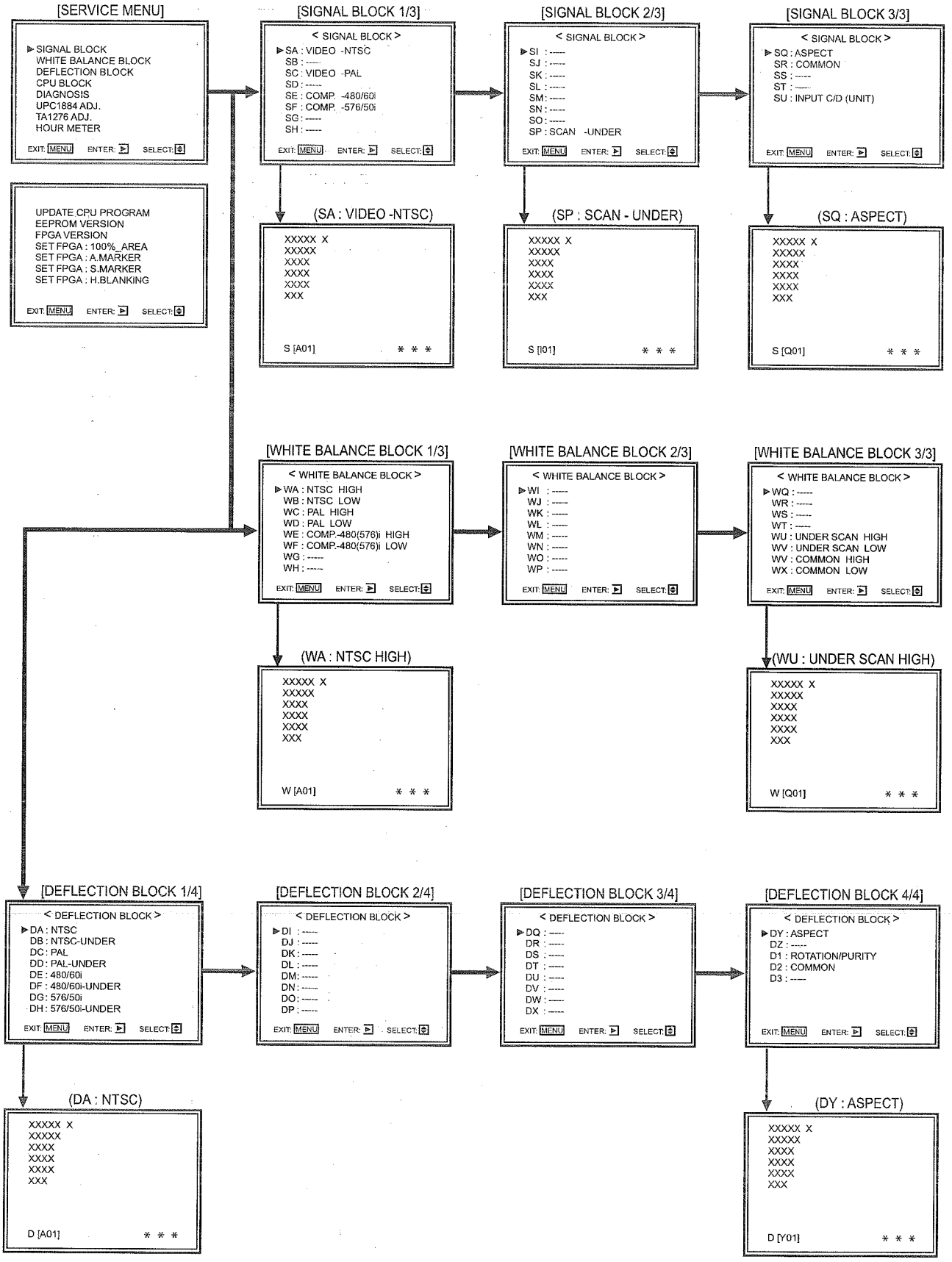
(1) With the SERVICE MENU displayed, press [▼] key to select the item to be adjusted, then press [▶] key to enter the SUB MENU.
(2) With the SUB MENU displayed, press [▼] key to select the item to be adjusted, then press [▶] key to enter the setting item screen.
(3) Set the adjustment item by varying it with the [⇕] key and [⇔] key.
Changed setting value is memorized when it was adjusted.

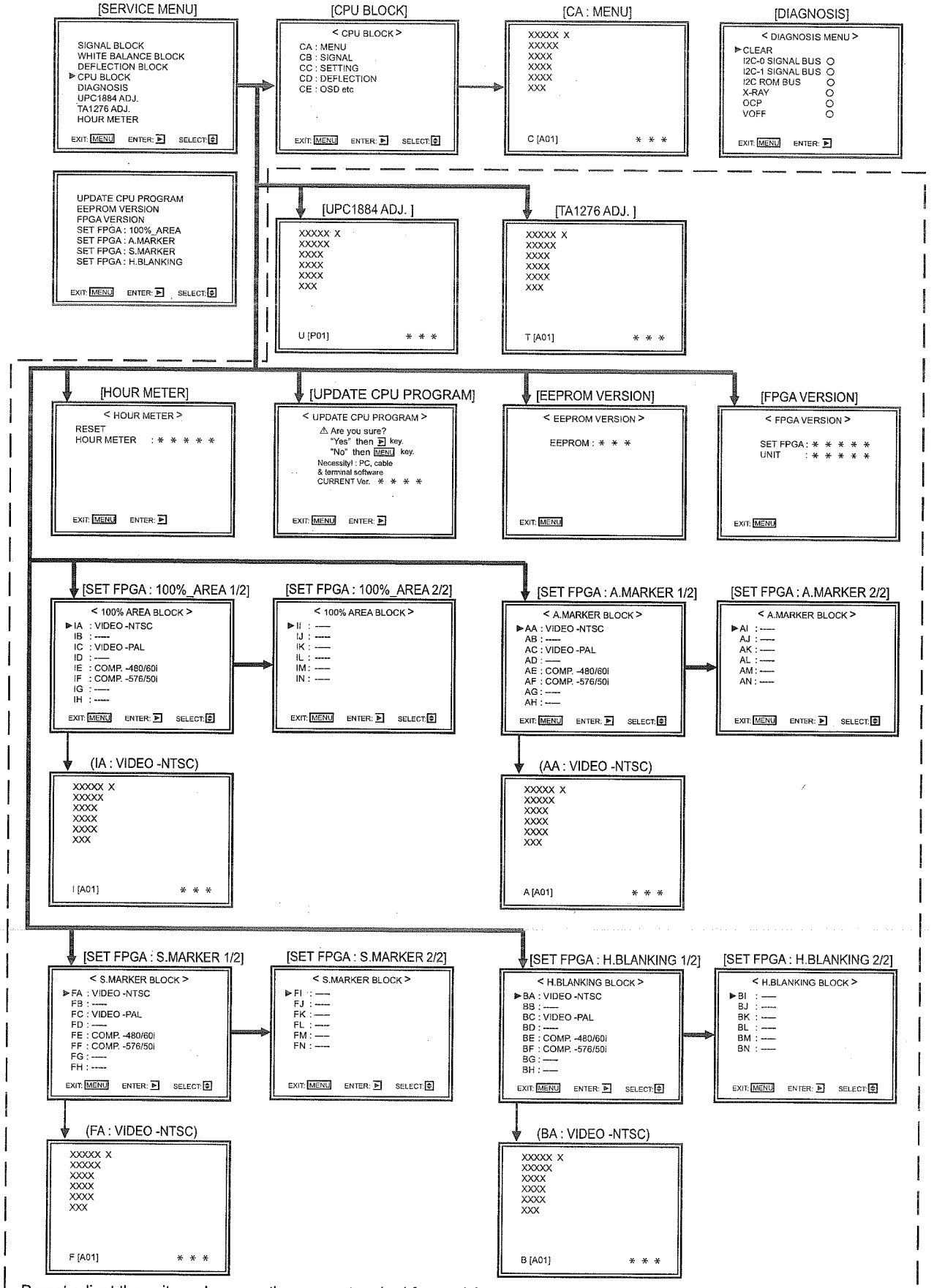
4.6.4 HOW TO EXIT THE SERVICE MENU

(1) After completing the adjustment of an item, press the [MENU] key to return to the SUB MENU.
(2) Press the [MENU] key again to return to the SERVICE MENU.
(3) Press the [MENU] key again to return to the normal screen.



4.6.5 SERVICE MENU FLOW CHART




[SERVICE MENU]
SIGNAL BLOCK
WHITE BALANCE BLOCK
DEFLECTION BLOCK
▶CPU BLOCK
DIAGNOSIS
UPC1884 ADJ.
TA1276 ADJ.
HOUR METER
EXIT: MENU ENTER: SELECT:
[CPU BLOCK]
< CPU BLOCK >
CA : MENU
CB : SIGNAL
CC : SETTING
CD : DEFLECTION
CE : OSD etc
EXIT: MENU ENTER: SELECT:
[CA : MENU]
XXXXX X
XXXXX
XXXX
XXXX
XXXX
XXX
C [A01] * * *
[DIAGNOSIS]
< DIAGNOSIS MENU >
▶CLEAR
I2C-0 SIGNAL BUS
I2C-1 SIGNAL BUS
I2C ROM BUS
X-RAY
OCP
VOFF
EXIT: MENU ENTER:
UPDATE CPU PROGRAM
EEPROM VERSION
FPGA VERSION
SET FPGA : 100%_AREA
SET FPGA : A.MARKER
SET FPGA : S.MARKER
SET FPGA : H.BLANKING
EXIT: MENU ENTER: SELECT:
[UPC1884 ADJ.]
XXXXX X
XXXXX
XXXX
XXXX
XXXX
XXX
U [P01] * * *
[TA1276 ADJ.]
XXXXX X
XXXXX
XXXX
XXXX
XXXX
XXX
T [A01] * * *
[HOUR METER]
< HOUR METER >
RESET
HOUR METER : * * * * *
EXIT: MENU ENTER:
[UPDATE CPU PROGRAM]
< UPDATE CPU PROGRAM >
⚠ Are you sure?
"Yes" then ▶ key.
"No" then MENU key.
Necessity! : PC, cable
& terminal software
CURRENT Ver. * * * *
EXIT: MENU ENTER:
[EEPROM VERSION]
< EEPROM VERSION >
EEPROM : * * *
EXIT: MENU
[FPGA VERSION]
< FPGA VERSION >
SET FPGA : * * * * *
UNIT : * * * * *
EXIT: MENU
[SET FPGA : 100%_AREA 1/2]
< 100% AREA BLOCK >
▶IA : VIDEO -NTSC
IB : -----
IC : VIDEO -PAL
ID : ——
IE : COMP. -480/60i
IF : COMP. -576/50i
IG : -----
IH : -----
EXIT: MENU ENTER: SELECT:
[SET FPGA : 100%_AREA 2/2]
< 100% AREA BLOCK >
▶II : ——
IJ : ——
IK : ——
IL : ——
IM : ——
IN : ——
EXIT: MENU ENTER: SELECT:
[SET FPGA : A.MARKER 1/2]
< A.MARKER BLOCK >
▶AA : VIDEO -NTSC
AB : -----
AC : VIDEO -PAL
AD : ——
AE : COMP. -480/60i
AF : COMP. -576/50i
AG : -----
AH : ——
EXIT: MENU ENTER: SELECT:
[SET FPGA : A.MARKER 2/2]
< A.MARKER BLOCK >
▶AI : ——
AJ : ——
AK : ——
AL : ——
AM : ——
AN : ——
EXIT: MENU ENTER: SELECT:
(IA : VIDEO -NTSC)
XXXXX X
XXXXX
XXXX
XXXX
XXXX
XXX
I [A01] * * *
(AA : VIDEO -NTSC)
XXXXX X
XXXXX
XXXX
XXXX
XXXX
XXX
A [A01] * * *
[SET FPGA : S.MARKER 1/2]
< S.MARKER BLOCK >
▶FA : VIDEO -NTSC
FB : -----
FC : VIDEO -PAL
FD : ——
FE : COMP. -480/60i
FF : COMP. -576/50i
FG : -----
FH : -----
EXIT: MENU ENTER: SELECT:
[SET FPGA : S.MARKER 2/2]
< S.MARKER BLOCK >
▶FI : ——
FJ : ——
FK : ——
FL : ——
FM : ——
FN : ——
EXIT: MENU ENTER: SELECT:
[SET FPGA : H.BLANKING 1/2]
< H.BLANKING BLOCK >
▶BA : VIDEO -NTSC
BB : -----
BC : VIDEO -PAL
BD : ——
BE : COMP. -480/60i
BF : COMP. -576/50i
BG : -----
BH : ——
EXIT: MENU ENTER: SELECT:
[SET FPGA : H.BLANKING 2/2]
< H.BLANKING BLOCK >
▶BI : ——
BJ : ——
BK : ——
BL : ——
BM : ——
BN : ——
EXIT: MENU ENTER: SELECT:
(FA : VIDEO -NTSC)
XXXXX X
XXXXX
XXXX
XXXX
XXXX
XXX
F [A01] * * *
(BA : VIDEO -NTSC)
XXXXX X
XXXXX
XXXX
XXXX
XXXX
XXX
B [A01] * * *
Do not adjust these items because they are not rquired for servicing.