

SECTION 4 ADJUSTMENT

4.1 ADJUSTMENT PREPARATION

- (1) You can make the necessary adjustments for this unit with either the Remote Control Unit or with the adjustment tools and parts as given below.
- (2) Adjustment with the Remote Control Unit is made on the basis of the initial setting values, however, the new setting values which set the screen to its optimum condition may differ from the initial settings.
- (3) Make sure that AC power is turned on correctly.
- (4) Turn on the power for set and test equipment before use, and start the adjustment procedures after waiting at least 30 minutes.
- (5) Unless otherwise specified, prepare the most suitable reception or input signal for adjustment.
- (6) Never touch any adjustment parts which are not specified in the list for this adjustment - variable resistors, transformers, condensers, etc.
- (7) Presetting before adjustment.
Unless otherwise specified in the adjustment instructions, preset the following functions with the remote control unit:

Setting item	Setting value
BRIGHTNESS	Center
CONTRAST	
COLOUR	
SHARPNESS	
COLOUR TEMP	NORMAL
ZOOM	AUTO

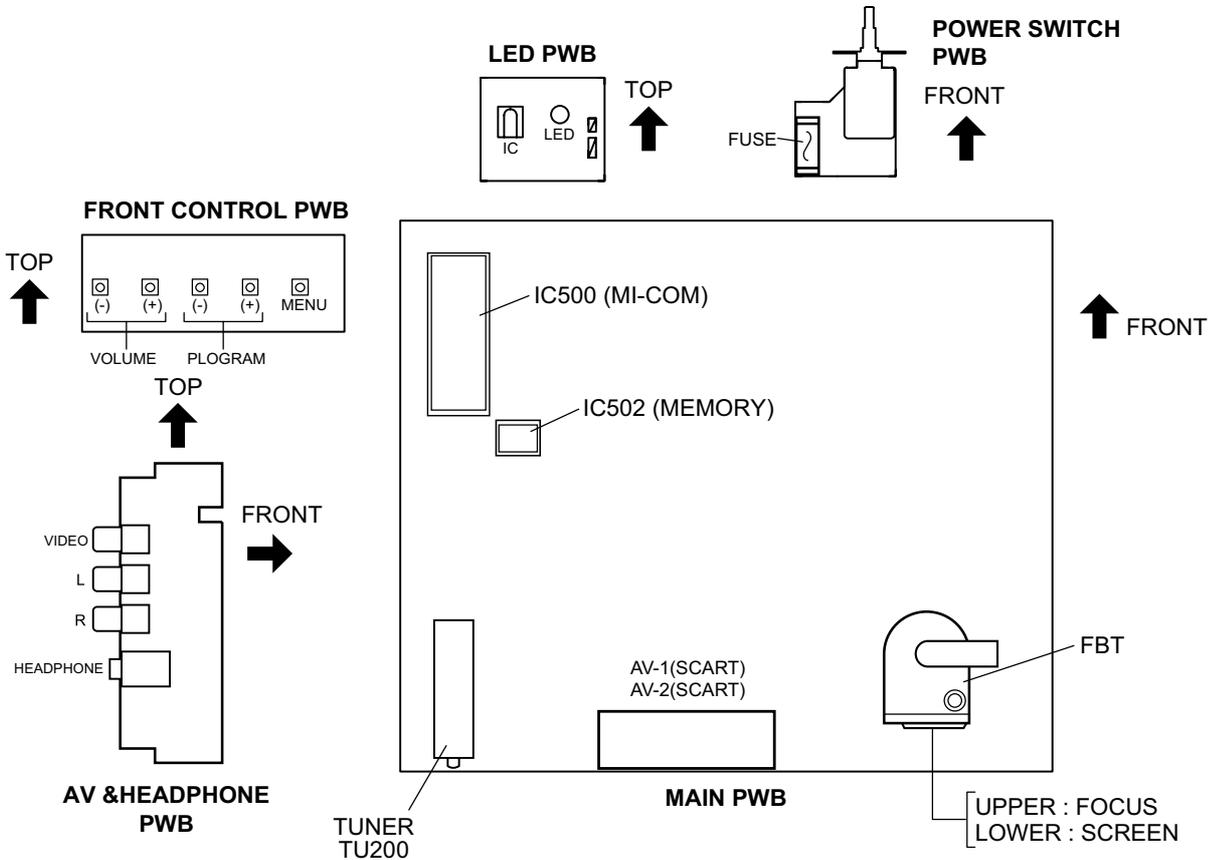
4.2 MEASURING EQUIPMENT

- (1) DC voltmeter (or digital voltmeter)
- (2) Signal generator (Pattern generator)
: [PAL / SECAM / NTSC]
- (3) Remote control unit

4.3 ADJUSTMENT ITEM

- FOCUS ADJUSTMENT
- SCREEN ADJUSTMENT
- DEFLECTION CIRCUIT ADJUSTMENT
- VIDEO CIRCUIT ADJUSTMENT

4.4 ADJUSTMENT LOCATIONS



4.5 BASIC OPERATION OF SERVICE MODE

4.5.1 HOW TO ENTER THE SERVICE MODE

- (1) Press the [INFORMATION] key and [MUTING] key simultaneously in the main menu, and the SERVICE MENU screen (Fig.1) will be displayed.

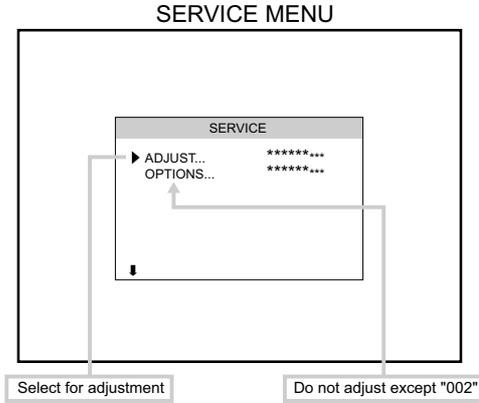


Fig.1

- (2) While the SERVICE MENU screen is displayed, press the []/[[*]] and [']/[([] key and select the "ADJUST...", then ADJUST MENU screen (Fig.2) will be displayed.

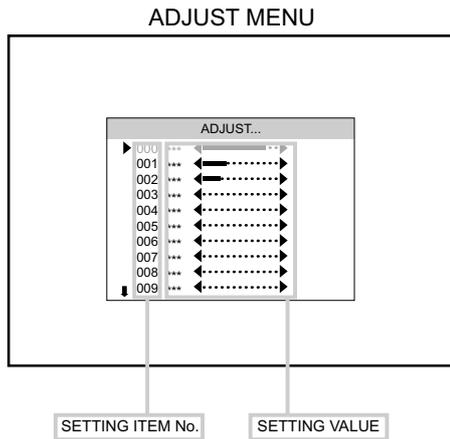


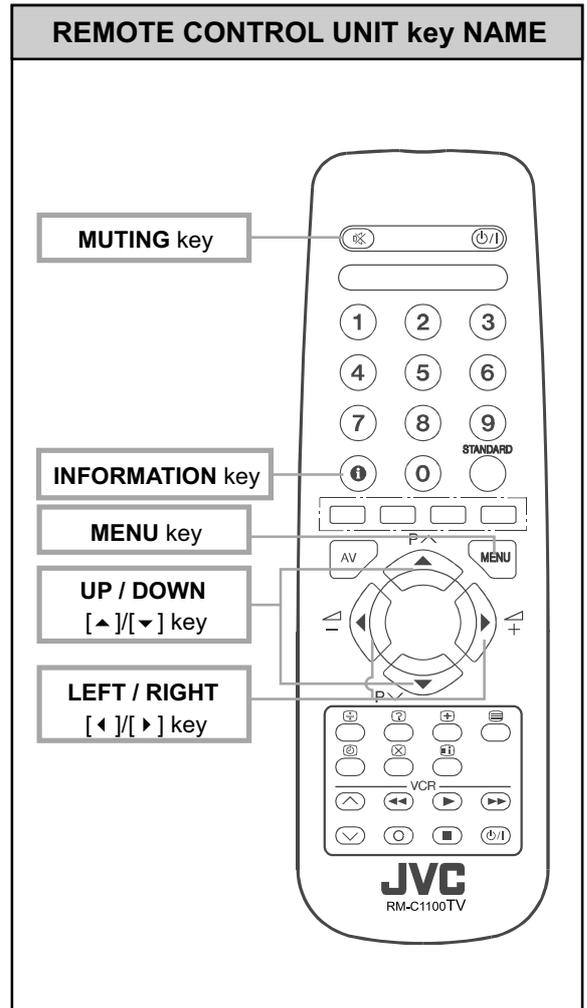
Fig.2

4.5.2 SELECTION OF ADJUSTMENT ITEMS

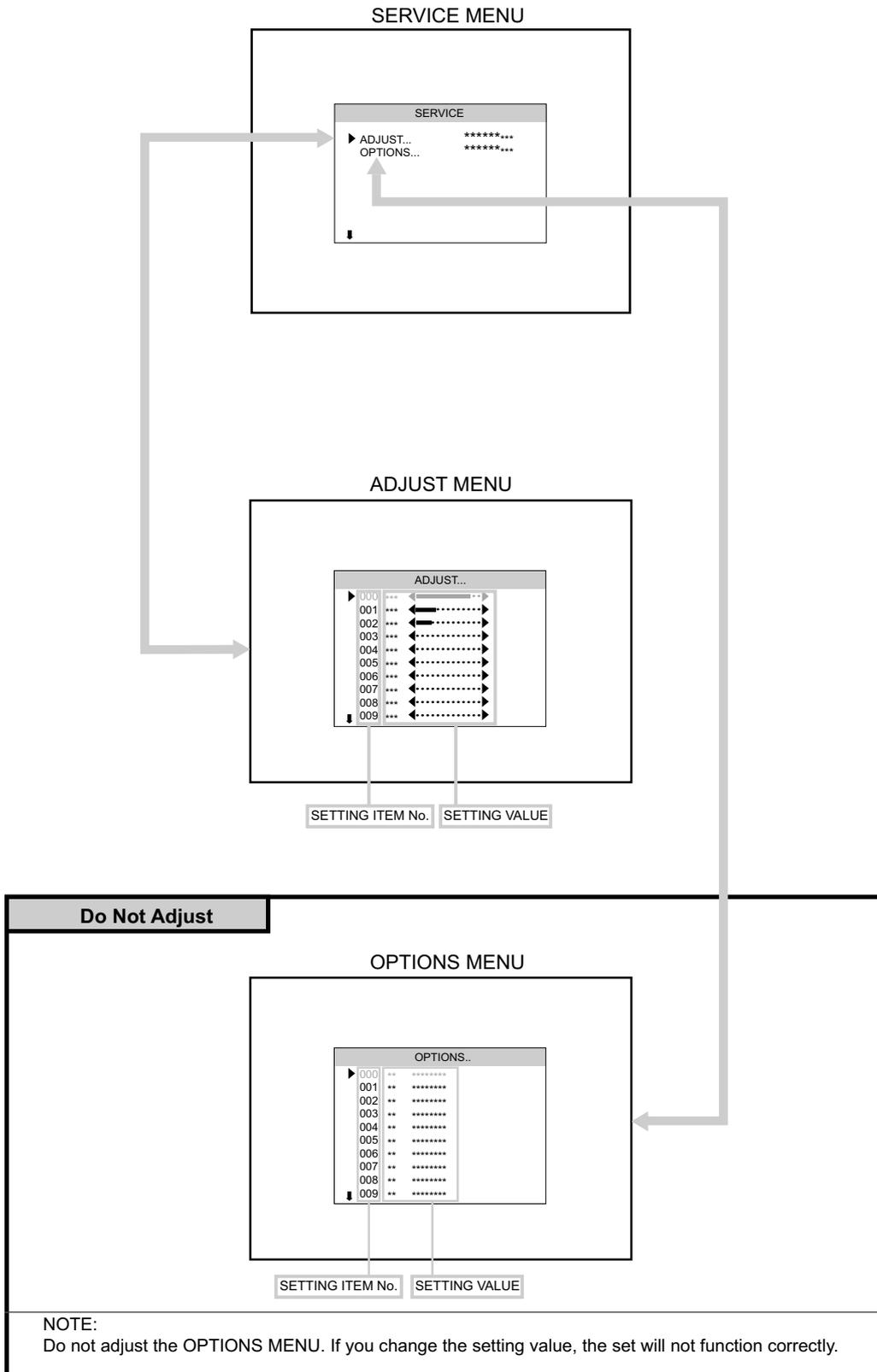
- (1) Enter the SERVICE MODE.
- (2) Press the FUNCTION []/[[*]] key to select the adjustment item.
- (3) Press the FUNCTION [']/[([] key to set the setting value.
- (4) The setting value will be stored automatically when release the REMOTE CONTROL UNIT keys.

4.5.3 HOW TO EXIT SERVICE MODE

- (1) Press the [MENU] key.

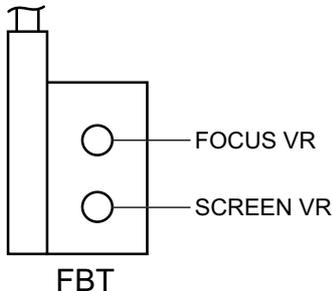


4.5.4 SERVICE MENU SCREEN

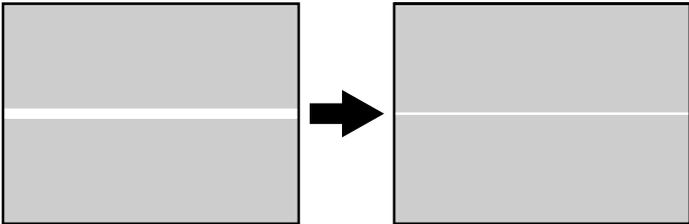


4.6 ADJUSTMENTS PROCEDURE

4.6.1 FOCUS ADJUSTMENT

Item	Measuring instrument	Test point	Adjustment part	Description
FOCUS adjustment	Signal generator Remote control unit		FOCUS VR [On the FBT]	(1) Receive a PAL crosshatch signal. (2) Adjust FOCUS VR on the FBT as thin as possible. 

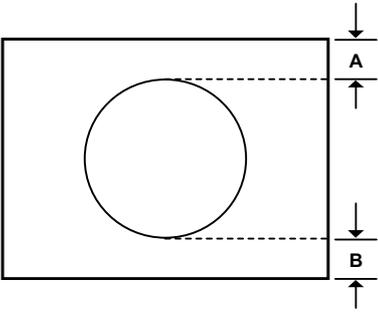
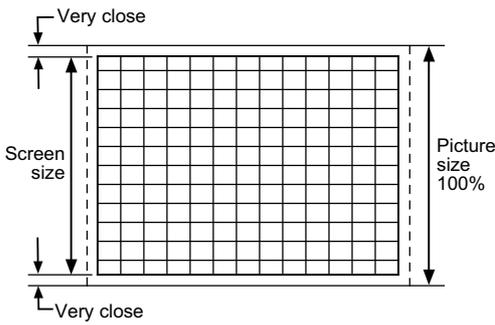
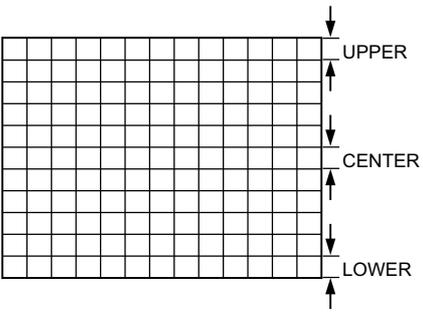
4.6.2 SCREEN ADJUSTMENT

Item	Measuring instrument	Test point	Adjustment part	Description
SCREEN adjustment	Remote control unit		002 [OPTIONS MENU] SCREEN VR [On the FBT]	(1) Enter the OPTIONS MENU. (2) Select option No. 002 and change bit 6 from 0 to 1 disabling vertical scan. Then horizontal line appears. (3) Adjust horizontal line as thin as possible via screen adjust pot. (4) Press number 0 key to leave service menu.
				

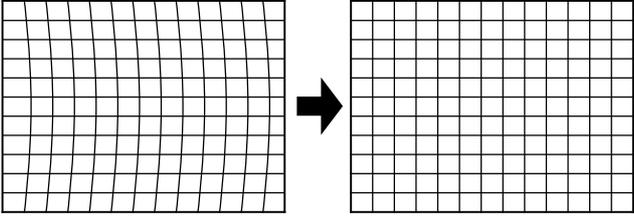
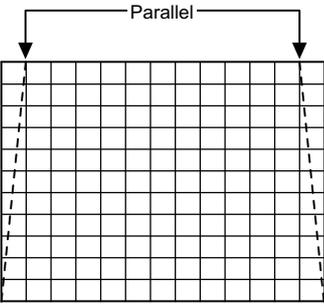
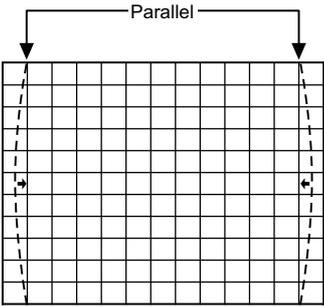
4.6.3 AGC ADJUSTMENT

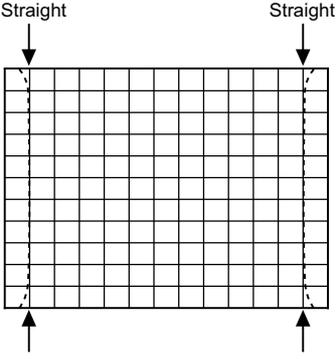
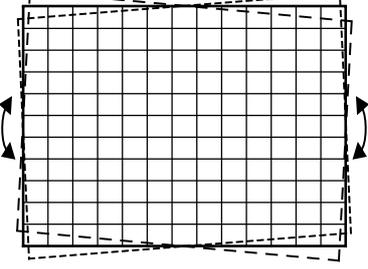
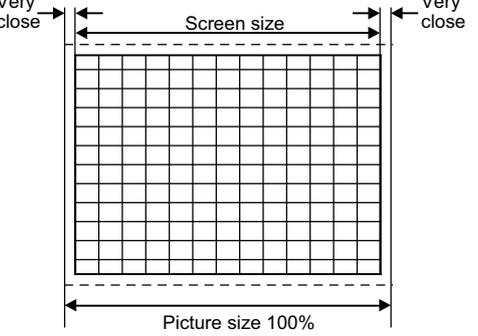
Item	Measuring instrument	Test point	Adjustment part	Description
AGC adjustment	Signal generator Remote control unit Volt meter		003	(1) Receive a PAL signal at 60dBµV RF signal level. (2) Enter the SERVICE MENU. (3) Select ADJUST MENU. (4) Select 003 . (5) Adjust 003 by pressing until voltage at pin 1 of TUNER is equal to 3.0V.

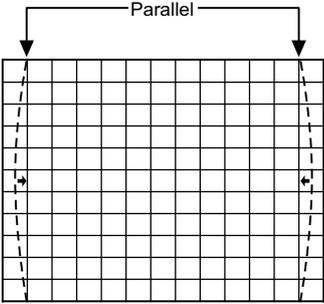
4.6.4 DEFLECTION CIRCUIT ADJUSTMENT

Item	Measuring instrument	Test point	Adjustment part	Description
VERTICAL POSITION adjustment	Signal generator		030	<ol style="list-style-type: none"> (1) Receive a PAL circle pattern signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 030. (5) Adjust 030 to make A=B. (6) Check and readjust 030 item if the adjustment becomes improper after some other geometric adjustments are done. (7) Select 110 (FULL mode). (8) Adjust 110 in the same procedure.
	Remote control unit		110 (FULL mode)	
				
VERTICAL SIZE adjustment	Signal generator		031	<ol style="list-style-type: none"> (1) Receive a PAL crosshatch signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 031. (5) Adjust 031 until horizontal black lines on both the upper and lower part of the cross-hatch pattern become very closed the upper and lower horizontal sides of picture size and nearly about to disappear. (6) Check and readjust 031 item if the adjustment becomes improper after some other geometric adjustments are done. (7) Select 111 (FULL mode). (8) Adjust 111 in the same procedure.
	Remote control unit		111 (FULL mode)	
				
VERTICAL S-CORRECTION & LINEARITY adjustment	Signal generator		032	<ol style="list-style-type: none"> (1) Receive a PAL crosshatch signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 032. (5) Adjust 032 until the size of squares on both the upper and lower part of crosshatch pattern become equal to the squares laying on the vertical center of the crosshatch pattern. (6) Check and readjust 032 item if the adjustment becomes improper after some other geometric adjustments are done. (7) Select 033. (8) Adjust 033 until all the size of squares of the crosshatch pattern become in equal size from the top of the screen to its bottom of the whole screen. (9) Check and readjust 033 item if the adjustment becomes improper after some other geometric adjustments (especially after than S-COR adjustment) are done. (10) Select 112 (FULL mode). (11) Adjust 112 in the same procedure as 5. (12) Select 113 (FULL mode). (13) Adjust 113 in the same procedure as 8.
	Remote control unit		033 112 (FULL mode) 113 (FULL mode)	
				

Item	Measuring instrument	Test point	Adjustment part	Description
HORIZONTAL POSITION adjustment	Signal generator		038	(1) Receive a PAL circle pattern signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 038 . (5) Adjust 038 to make C=D . (6) Check and readjust 038 item if the adjustment becomes improper after some other geometric adjustments are done. (7) Select 118 (FULL mode). (8) Adjust 118 in the same procedure.
	Remote control unit		118 (FULL mode)	
HORIZONTAL SIZE adjustment	Signal generator		039	(1) Receive a PAL crosshatch signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 039 . (5) Adjust 039 until vertical lines on both the left and right part of the crosshatch will be visible nor screen will be so wide. (6) Check and readjust 039 item if the adjustment becomes improper after some other geometric adjustments are done. (7) Select 119 (FULL mode). (8) Adjust 119 in the same procedure.
	Remote control unit		119 (FULL mode)	
ANGLE adjustment	Signal generator		016	(1) Receive a PAL crosshatch signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 016 . (5) Adjust 016 until the vertical lines of the crosshatch pattern become straight. (6) Check and readjust 016 item if the adjustment becomes improper after some other geometric adjustments are done.
	Remote control unit			

Item	Measuring instrument	Test point	Adjustment part	Description
BOW adjustment	Signal generator		017	(1) Receive a PAL crosshatch signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 017 . (5) Adjust 017 until the vertical lines become straight. (6) Check and readjust 017 item if the adjustment becomes improper after some other geometric adjustments are done. NOTE: In case where there is a bow-shaped distortion of images on the screen. (Figure)
	Remote control unit			
				
TRAPEZIUM adjustment	Signal generator		034	(1) Receive a PAL crosshatch signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 034 . (5) Adjust 034 until vertical lines, especially lines at the sides of the picture frame become parallel to the both sides of picture tubes as close as possible. (6) Check and readjust 034 item if the adjustment becomes improper after some other geometric adjustments are done. (7) Select 114 (FULL mode). (8) Adjust 114 in the same procedure.
	Remote control unit		114 (FULL mode)	
				
SIDE PIN adjustment	Signal generator		035	(1) Receive a PAL crosshatch signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 035 . (5) Adjust 035 until vertical lines close to the both sides of the picture frame become parallel to vertical sides of picture tube without any bending to left or to right side of the screen. (6) Check and readjust 035 item if the adjustment becomes improper after some other geometric adjustments are done. (7) Select 115 (FULL mode). (8) Adjust 115 in the same procedure.
	Remote control unit		115 (FULL mode)	
				

Item	Measuring instrument	Test point	Adjustment part	Description
CORNER adjustment	Signal generator		036	(1) Receive a PAL crosshatch signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 036 . (5) Adjust 036 until vertical lines at the upper corners of the picture frame become vertical and parallel to vertical corner sides of picture tube. (6) Check and readjust 036 item if the adjustment becomes improper after some other geometric adjustments are done. (7) Select 037 . (8) Adjust 037 until vertical lines at the lower corners of the picture frame become vertical and parallel to vertical corner sides of picture tube. (9) Check and readjust 037 item if the adjustment becomes improper after some other geometric adjustments are done. (10) Select 116 (FULL mode). (11) Adjust 116 in the same procedure as 5. (12) Select 113 (FULL mode). (13) Adjust 113 in the same procedure as 8.
	Remote control unit		037 116 (FULL mode) 117 (FULL mode)	
				
ROTATION adjustment	Signal generator		083	(1) Receive a PAL crosshatch signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 083 . (5) Adjust 083 to rotate the complete master clockwise and counter clockwise depending on the CRT. (6) Check and readjust 083 item if the adjustment becomes improper after some other geometric adjustments are done.
	Remote control unit			
				
NTSC HORIZONTAL SIZE adjustment	Signal generator		135	(1) Receive a NTSC crosshatch signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 135 . (5) Adjust 135 until vertical lines on both the left and right part of the cross-hatch will be visible nor screen will be so wide. (6) Check and readjust TRAPEZ item if the adjustment becomes improper after some other geometric adjustments are done. (7) Select 142 (FULL mode). (8) Adjust 142 in the same procedure.
	Remote control unit		142 (FULL mode)	
				

Item	Measuring instrument	Test point	Adjustment part	Description
NTSC SIDE PIN adjustment	Signal generator Remote control unit		136	<p>(1) Receive a NTSC crosshatch signal.</p> <p>(2) Enter the SERVICE MODE.</p> <p>(3) Select ADJUST MENU.</p> <p>(4) Select 136.</p> <p>(5) Adjust 136 until vertical lines close to the both sides of the picture frame become parallel to vertical sides of picture tube without any bending to left or to right side of the screen.</p> <p>(6) Check and readjust 136 item if the adjustment becomes improper after some other geometric adjustments are done.</p>
 <p>The diagram shows a 10x10 grid. Two vertical dashed lines are drawn on the left and right sides of the grid. Two solid vertical lines are drawn slightly inward from the dashed lines. A horizontal line with arrows at both ends is labeled 'Parallel', indicating the goal is to make the solid lines parallel to the vertical sides of the grid.</p>				
TELETEXT SCREEN SIZE adjustment	Signal generator Remote control unit		143	<p>(1) Receive a PAL crosshatch signal.</p> <p>(2) Enter the SERVICE MODE.</p> <p>(3) Select ADJUST MENU.</p> <p>(4) Select 143.</p> <p>(5) Adjust 143 to adjust the proper vertical size of Teletext screen.</p> <p>(6) Check and readjust 143 item if the adjustment becomes improper after some other geometric adjustments are done.</p>

4.6.5 VIDEO CIRCUIT

Item	Measuring instrument	Test point	Adjustment part	Description
WHITE BALANCE adjustment	Signal generator Remote control unit		023 024 025	(1) Receive a PAL black & white signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 023 , 024 and 025 respectively. (5) Adjust 023 , 024 and 025 respectively, until the white part turns to pure white without any other colour.
COLOUR CUTOFF LEVEL adjustment	Signal generator Remote control unit		026 027 028	(1) Receive a PAL crosshatch signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 026 , 027 and 028 respectively. (5) Adjust 026 , 027 and 028 respectively, until the black part turns to pure black without any other colour.
PAL Y DELAY adjustment	Signal generator Remote control unit		006	(1) Receive a PAL colour bar signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 006 . (5) Adjust 006 until the colour transients on the colour bar pattern becomes as sharper and possible as colours between transients do not mix with each other.
SECAM Y DELAY adjustment	Signal generator Remote control unit		007	(1) Receive a SECAM colour bar signal. (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 007 . (5) Adjust 007 by pressing until the colour transients on the colour bar pattern becomes as sharper and possible as colours between transients do not mix with each other.
NTSC Y DELAY adjustment	Signal generator Remote control unit		008	(1) Receive a NTSC colour bar signal from an external source (e.g. FRONT AV : EXT-3). (2) Enter the SERVICE MODE. (3) Select ADJUST MENU. (4) Select 008 . (5) Adjust 008 by pressing until the colour transients on the colour bar pattern becomes as sharper and possible as colours between transients do not mix with each other.

SECTION 1 PRECAUTION

Please refer to "AV-28RT4BU/A, AV-28RT4BU/B, AV-28RT4BU/C, AV-28RT4SU/A, AV-28RT4SU/B and AV-28RT4SU/C (No.YA079)" about this section.

SECTION 2 SPECIFIC SERVICE INSTRUCTIONS

Please refer to "AV-28RT4BU/A, AV-28RT4BU/B, AV-28RT4BU/C, AV-28RT4SU/A, AV-28RT4SU/B and AV-28RT4SU/C (No.YA079)" about this section.

SECTION 3 DISASSEMBLY

Please refer to "AV-28RT4BU/A, AV-28RT4BU/B, AV-28RT4BU/C, AV-28RT4SU/A, AV-28RT4SU/B and AV-28RT4SU/C (No.YA079)" about this section.

SECTION 4 ADJUSTMENT

4.1 SETTING VALUES OF OPTION ITEMS

When a previous TUNER (VE-30009637) is replaced by a new TUNER (VE-30033888), it should be adjusted to the setting values in the table below. If the TUNER of the model with the new TUNER (VE-30033888) is replaced, there is no need for adjustment.

4.1.1 SETTING VALUE OF OPTINS ITEM

Make sure not to change the values that are not in the table below. If those values are changed, the unit will not operate normally.

Item	Setting value															
	BEFORE								AFTER							
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Option 11	1	0	0	0	1	1	1	0	1	0	0	0	1	1	1	0
Option 12	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
Option 13	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0
Option 14	1	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0
Option 15	1	0	1	0	1	0	1	0	0	1	0	1	0	0	1	0
Option 16	0	0	0	0	1	0	0	1	0	0	0	0	1	0	1	1
Option 17	1	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0
Option 18	0	0	0	1	1	0	1	1	0	0	0	1	1	1	0	1

4.1.2 HOW TO ENTER THE SERVICE MODE

- (1) Press the INFORMATION key and MUTING key simultaneously, and the SERVICE MENU 1 screen will be displayed. (Fig.1)

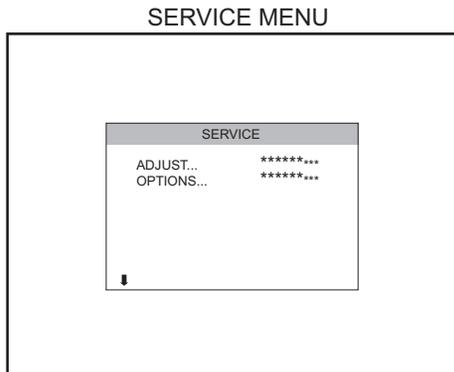


Fig.1

4.1.3 HOW TO SELECT THE OPTIONS MENU

While the SERVICE MENU screen is displayed, press the [▲]/[▼] key and select the "OPTIONS...", then OPTIONS MENU screen will be displayed.(Fig.2)

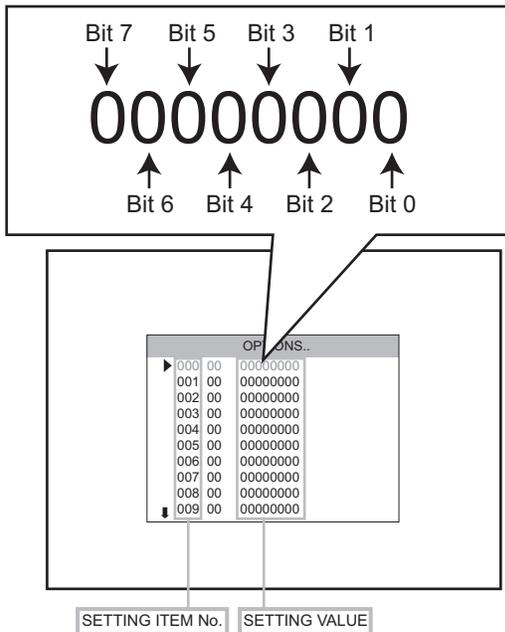


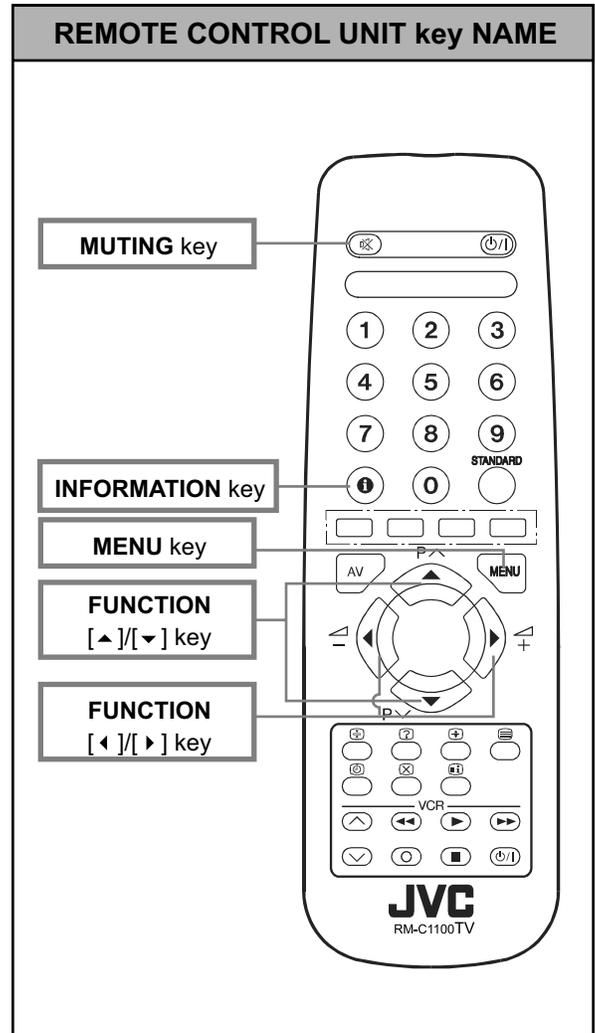
Fig.2

4.1.4 SELECTION OF OPTIONS ITEM

- (2) Press the FUNCTION [▲]/[▼] key to select the options item.
- (3) Press the FUNCTION [◀]/[▶] key to change the setting value.

4.1.5 HOW TO STORE OF SETTING VALUE

- (1) The setting value will be stored auto matically when release the REMOTE CONTROL UNIT keys.



SECTION 5 TROUBLESHOOTING

Please refer to "AV-28RT4BU/A, AV-28RT4BU/B, AV-28RT4BU/C, AV-28RT4SU/A, AV-28RT4SU/B and AV-28RT4SU/C (No.YA079)" about this section.