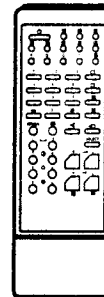
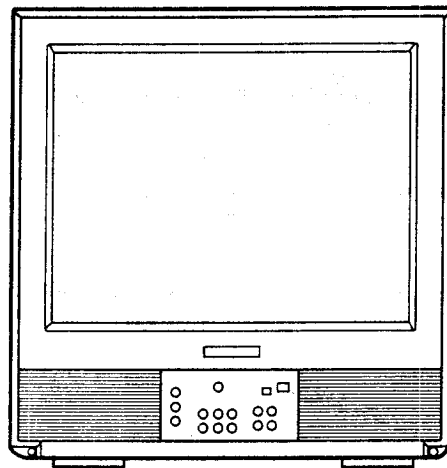


# DAEWOO

## COLOUR TELEVISION SERVICE MANUAL

**CHASSIS: CP-360**  
**PAL-I SYSTEM**  
**MODEL : DTT-2193TU**

DMQ 2193



For Service Manuals Contact  
MAURITRON TECHNICAL SERVICES  
8 Cherry Tree Rd, Chinnor  
Oxon OX9 4QY  
Tel:- 01844-351694 Fax:- 01844-352554  
Email:- enquiries@mauritron.co.uk

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# SPECIFICATIONS

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TV Standard	: PAL/I
Mains Voltage	: 230V AC, 50Hz
Power Consumption	: 98W approx.
Sound Output Power...	: 5.0W × 2 approx (60% MOD, 10% THD)
Speaker	: 10W 8ohms (Norminal)
Teletext System	: 4 pages memory FASTEXT (FLOF or LIST)
Antenna Impedance	: 75 ohm unbalanced 300 ohm balanced with supplied balun
Channel Coverage	: UHF : channels 21 to 69
Tuning System	: Voltage Synthesizer Tuning System
Screen Size	: 55cm (Diagonal)- FST
Channel Indication	: ON-Screen Display
Program Selection	: 90 Programmes
Aux Terminal	: 21 pin EURO-SCART, S-VHS, AV-1
Remote Control Unit	: TYPE R-10A18 (Requires two 1.5V penlight batteries type AA size)
Dimension	: 568(W)x580(H)x564(D)
Weight	: 28.0kg approx.

# SAFETY INSTRUCTIONS

**WARNING :** BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" BELOW.

## ■ X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not be exceed the specified limit. The nominal value of the high voltage of this receiver is 25.0kv (21" : 26.5kv) at zero beam current (minimum brightness) under 230V AC power source. The high voltage must not, under any circumstances, exceed 27.5kv (21" : 29.0kv). Each time a receiver requires servicing, the high voltage should be checked following the HIGH VOLTAGE CHECK procedure on page 22 of this manual. It is recommended the reading of the high voltage be recorded as a part of the service records. It is important to use an accurate and reliable high voltage metre.
2. The only source of X-RAY RADIATION in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.

## ■ SAFETY PRECAUTION

1. Potentials as high as 25000 (21" :26500)volts are present when this receiver is operating. Operation of the receiver outside the cabinet or with the back board removed involves a shock hazard from the receiver.
  - 1) Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high-voltage equipment.
  - 2) Always discharge the picture tube anode to the receiver chassis to avoid the shock hazard before removing the anode cap.
  - 3) Discharge the high potential of the picture tube before handling the tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled.
2. If any Fuse in this TV receiver is blown, replace it with the FUSE specified in the Replacement parts list.
3. When replacing a high wattage resistor (oxide metal film resistor) in circuit board, keep the resistor 10mm away from circuit board.
4. Keep wires away from high voltage of high temperature components.
5. This receiver must operate under AC230 volts. 50Hz NEVER connect to DC supply or any other power of frequency.

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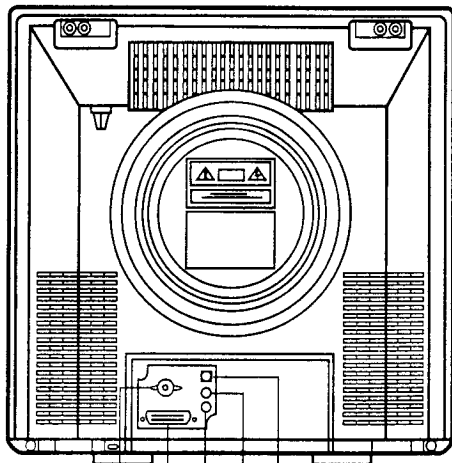
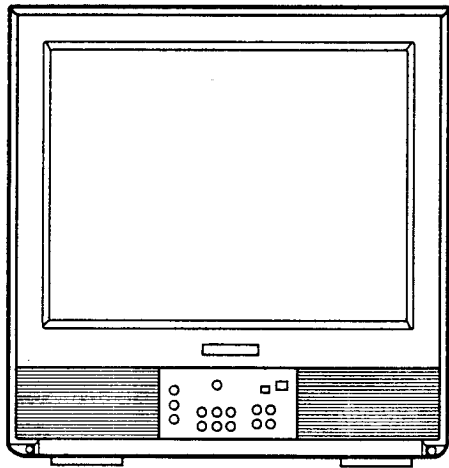
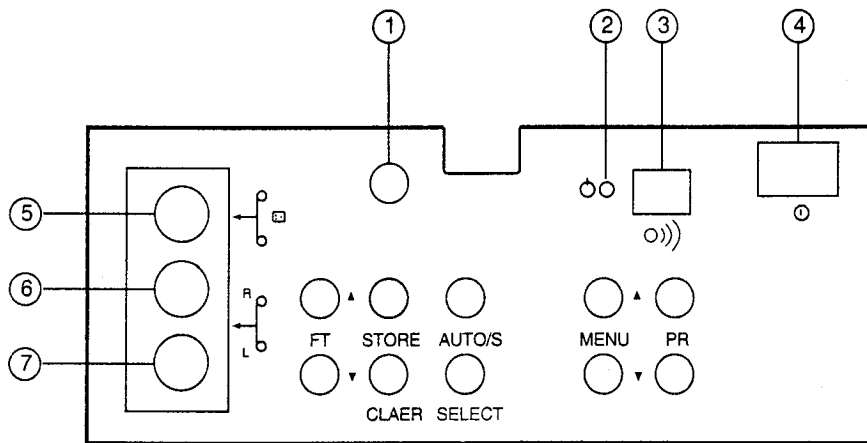
## ■ PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-RAY RADIATION protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements, electrical components

having such features are identified by shading on the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create X-RAY RADIATION.

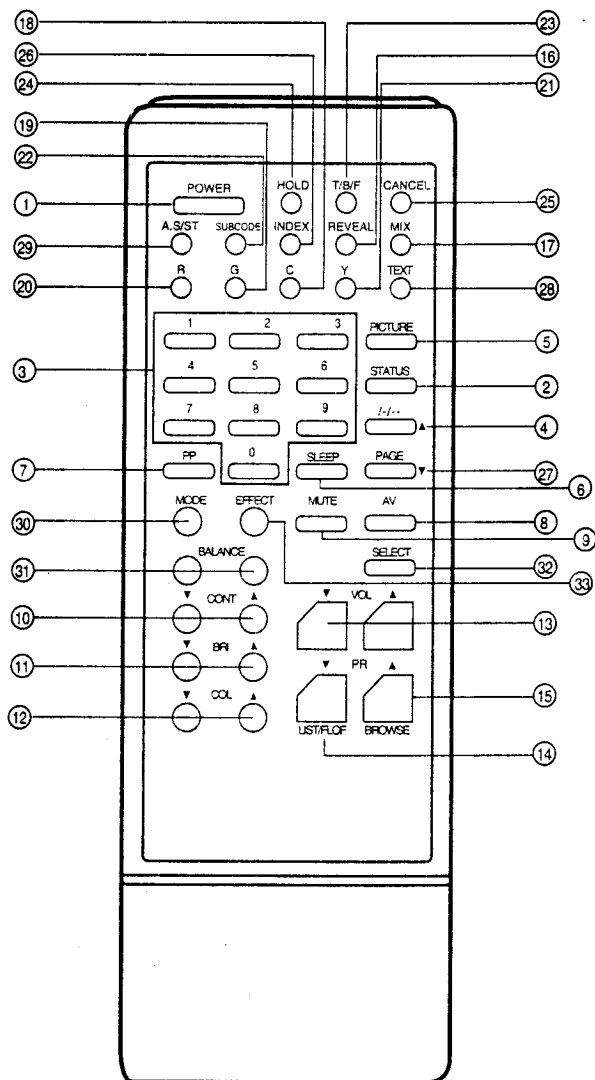
# LOCATION OF CONTROLS

## ■ FRONT VIEW/CONTROL BUTTONS/REAR VIEW



1. EARPHONE JACK
2. STAND-BY INDICATOR
3. REMOTE SENSOR
4. MAIN POWER SWITCH
5. VIDEO INPUT OF RCA JACK  
(AT AV-1 MODE)
6. RIGHT AUDIO INPUT OF RCA  
JACK (AT AV-1 MODE)
7. LEFT AUDIO INPUT OF RCA  
JACK (AT AV-1 MODE)
8. AERIAL SOCKET
9. 21-PIN EURO-SCART JACK  
(AT AV MODE)
10. LEFT AUDIO INPUT OF S-  
VHS (AT S-INPUT MODE)
11. RIGHT AUDIO INPUT OF  
S-VHS (AT S-INPUT MODE)
12. VIDEO INPUT OF S-VHS  
(AT S-INPUT MODE)

# REMOTE CONTROL UNIT



## ■ TV USE

- ① POWER OFF BUTTON
- ② STATUS BUTTON
- ③ PROGRAMME SELECT BUTTONS
- ④ ONE, TWO DIGIT BUTTON
- ⑤ TV BUTTON
- ⑥ SLEEP BUTTON
- ⑦ PP BUTTON
- ⑧ AV BUTTON
- ⑨ MUTE BUTTON
- ⑩ CONTRAST UP/DOWN BUTTON
- ⑪ BRIGHTNESS UP/DOWN BUTTON
- ⑫ COLOUR UP/DOWN BUTTON
- ⑬ VOLUME UP/DOWN BUTTON
- ⑭ PROGRAMME DOWN BUTTON
- ⑮ PROGRAMME UP BUTTON
- ⑲ AUTO-SEARCH BUTTON
- ⑳ SET/RESET/MONO, DUAL- I /DUAL- II SELECTOR BUTTON
- ⑳ BALANCE BUTTON
- ⑳ SELECTOR ("MENU") BUTTON
- ⑳ PSEUDO SELECTOR BUTTON

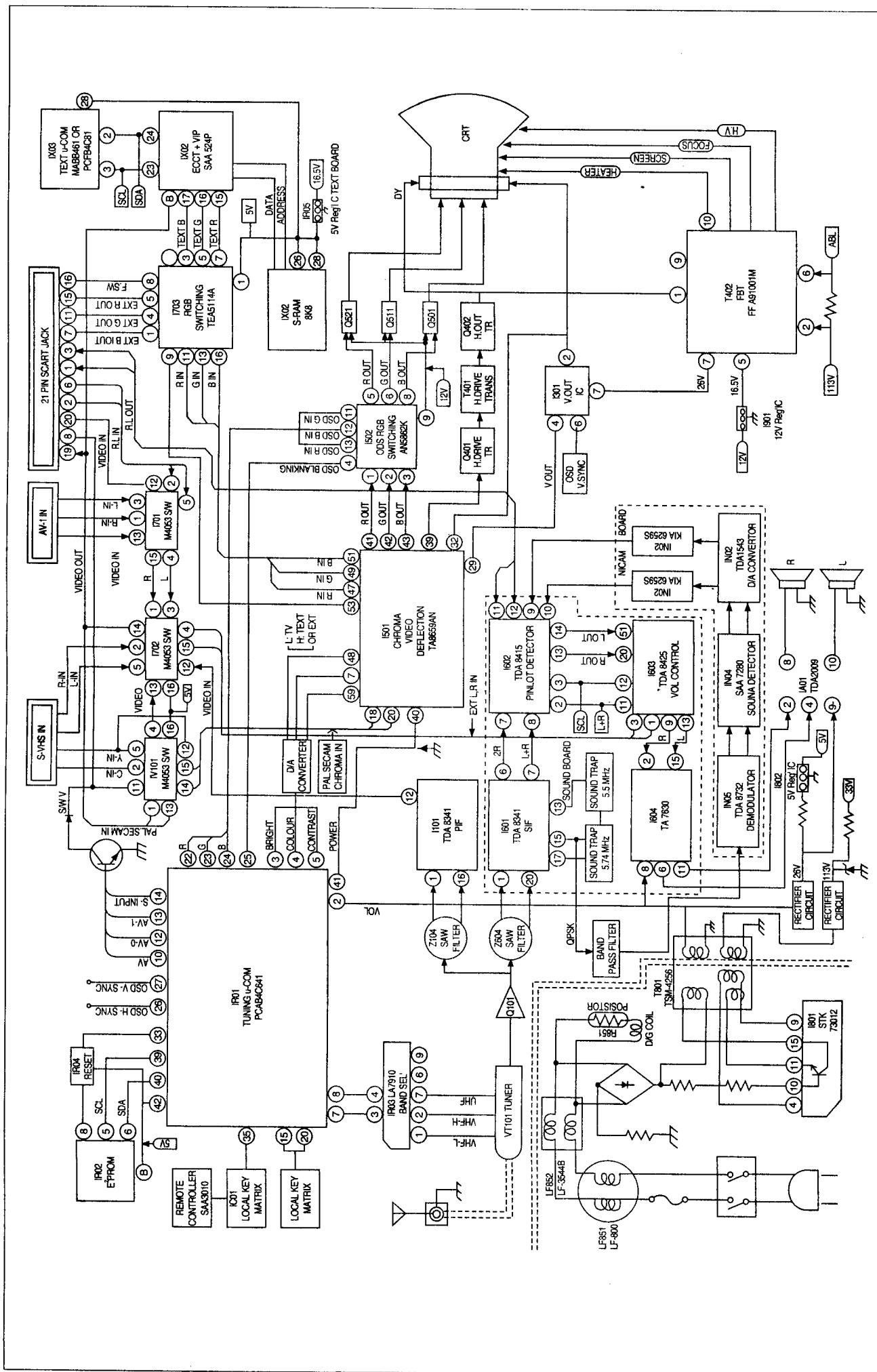
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## ■ TEXT USE

- ② STATUS BUTTON
- ③ PAGE SELECT BUTTONS
- ④ PAGE UP BUTTON
- ⑭ LIST/FLOF BUTTON
- ⑮ BROWSE BUTTON
- ⑯ REVEAL BUTTON
- ⑰ MIX BUTTON
- ⑱ CYAN BUTTON
- ⑲ GREEN BUTTON
- ⑳ RED BUTTON
- ②① YELLOW BUTTON
- ②② SUB-CODE BUTTON
- ②③ DOUBLE HEIGHT BUTTON
- ②④ HOLD BUTTON
- ②⑤ CANCEL BUTTON
- ②⑥ INDEX BUTTON
- ②⑦ PAGE DOWN BUTTON
- ②⑧ TEXT BUTTON
- ②⑨ PAGE STORE BUTTON

# BLOCK DIAGRAM








# OPERATING INSTRUCTIONS

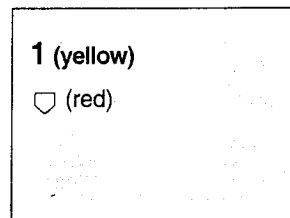
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## MAINS SUPPLY

This receiver is designed to operate with 170V AC to 260V AC 50Hz range. Do not operate the receiver on DC power supplies or any other voltage.

## HOW TO SWITCH ON

- Switch the receiver on by pressing the MAIN POWER SWITCH (  ).  
In this case the STAND-BY indicator (  ) will illuminate, then the TV will be in the stand-by mode.
- Next press the PROGRAMME UP/DOWN button (PR  /  ) in front of the receiver or digit 0-9 on the remote control unit. After about 5 seconds a picture will appear.  
First, the programme number appears on the upper left of the screen with yellow colour. Then, after about 2 seconds, the sound status (stereo or mono) also appears under the programme number with red colour.
- When the TV is power on, the STAND-BY indicator (  ) had go out.

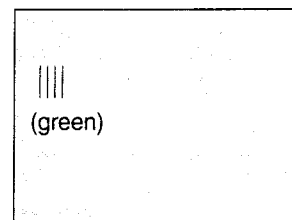


## TUNING THE RECEIVER

This TV receiver is capable of memorizing 90 programmed broadcasting channels. To preset the channel memory positions and receive different broadcast channels, follow the procedures described below.

### 1. AUTO SEARCH UP BUTTON ("AUTO/S")

- In the TV mode, to tune the receiver to your desired programme, you must press the "AUTO/S" button.
- When the "AUTO SEARCH" button is pressed, the analog indication of the tuning voltage (tuning position bar) will be displayed on the centre of screen with "GREEN" and a programme is swept from the present tuning level in the up direction.
- When the best picture and sound are caught, the sweeping operation is stopped, and automatically the analog indication of tuning voltage is disappeared.



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- If that programme is what you'd not like to memory, press "AUTO SEARCH" button again and then the receiver automatically searches the next on air programme.
- If that programme is what you'd like to memory, press "STORE" button. Then the program number previously selected appears on the upper left of the screen and the "STORE-" or "STORE--" is also appears on the centre of the screen with red colour.
- At this condition, the desired programme number is selected with the (PR▲/▼) button of the receiver or digit "0 to 9" on the remote control unit.
- After the desired programme number is selected, press the "STORE" button again.
- When the store operation is executed, a colour of OSD "STORE" changes from red to green and in few seconds, the selected programme number will be displayed on the upper left of the screen for about 5 seconds.
- If you continues to memory other programmes, please reiterate the above operations.
- By doin these operationg, you are able to store up to 90 programmes on the receiver.
- If you press this "AUTO SEARCH" button and keep it pressed during 3 seconds, the system will be changed to the next band.

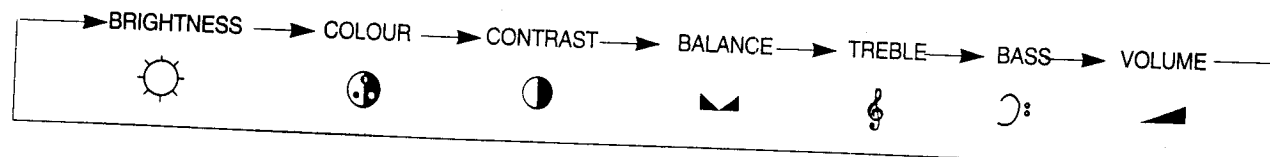
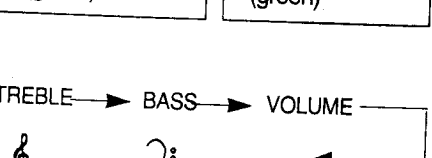
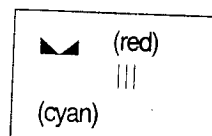
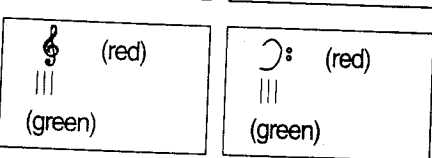
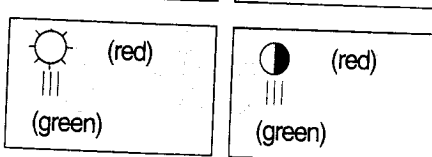
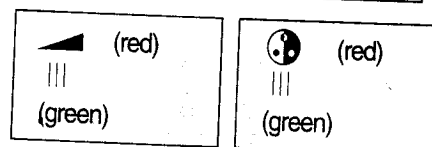
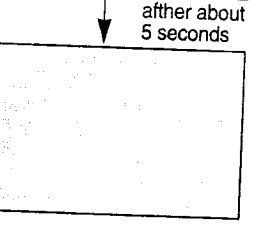
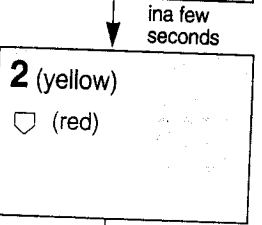
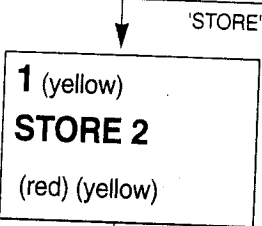
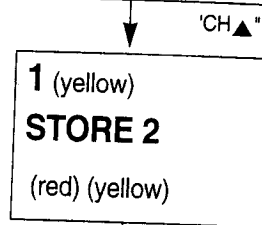
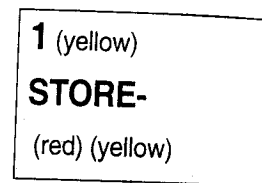
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## 2. FINE TUNING UP/DOWN BUTTON (FT▲/▼).

- In most cases you can obtain a good picture and sound by using the "AUTO/S" button.
- If however, the picutre quality is poor, due to the broadcasting signal condition, adjust the "FT▲/▼" buttons to create a clear picture.
- In the TV mode, these buttons are used to finely adjust the tuning voltage.
- During the "FT▲/▼" operation, the OSD will show as follows.
  - "TUNE" together with an analog indication is displayed on upper right of the screen with red and green colour.
  - a tuning position bar that indicates the tuning voltage.

## ANALOG MENU SELECT BUTTON ("SELECT")

- This button is used to select the volume, brightness, colour, balance, Treble, Bass and contrast control output.
- When this button is pressed, the analog value and the analog symbol appears on the center of the screen for 5 seconds.
- Whenever this button is pressed, while the analog value appears on the screen, it is switched as follows.
- As the OSD fades away, the control will be start from the "VOLUME ( ▲ )" )"



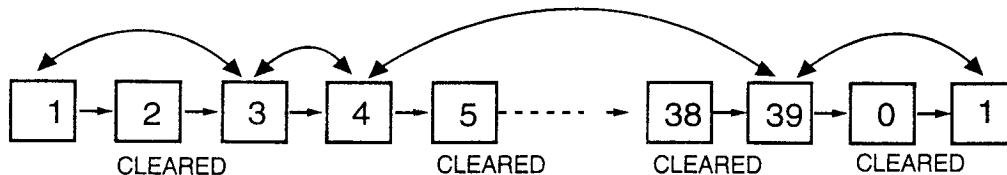


### ANALOG MENU UP/DOWN BUTTON (MENU▲/▼)

- These buttons are used to move up/down the analog value (VOLUME, BRIGHTNESS, COLOUR, CONTRAST, BALANCE, TREBLE, BASS) being selected by the "SELECT" button.
- While the "MENU▲/▼" button is pressed, the analog value appears on the screen.

### PROGRAMME UP/DOWN BUTTON (PR▲/▼)

- In the normal TV mode, these are sequential programme selection buttons. But "CLEARED" programme number cannot be selected.

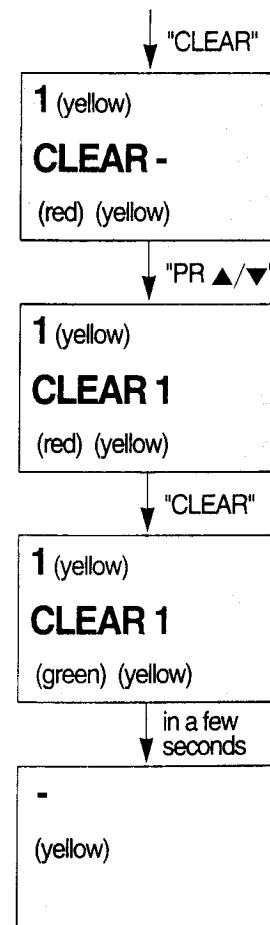


- In the stand-by mode, it will switch on the receiver.
- While one of the "PR▲/▼" buttons is continuously pressed, the programme up/down selection operation takes place every approx. 1 SEC/PROGRAMME Until it is released.

**NOTE :** If less than two programmes are available, the programme number does not change

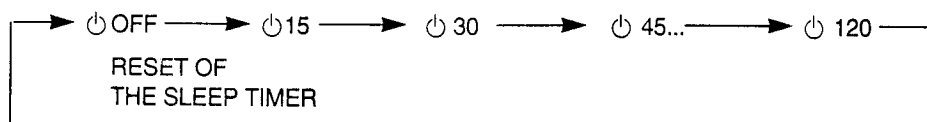
### STORE AND CLEAR BUTTON ("STORE" AND "CLEAR")

- These are used to store and clear the programme number.
- For "STORE", refer to "AUTO SEARCH UP" operation.
- If the programme is what you'd like to erase, press "CLEAR" button. Then the programme number previously selected appears on the upper left of the screen and "CLEAR-" or "CLEAR--" is also appears on the centre of the screen with red colour.
- At this condition, the program number which you want to erase can be selected with the "PR▲/▼" button of the receiver or digit "0" to "9" on the remote control unit.
- Press the "CLEAR" button again and then a colour of OSD "CLEAR" changes from red to green, it means that all tuning information of that programme number was cancelled.



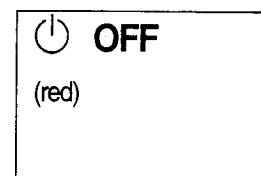
### SLEEP BUTTON ("SLEEP")

- With this button, up to 2 hours every 15 minutes can be set to the sleep timer.
- If you press the "SLEEP" button for the first time, the sleep-timer non-set display "⏻ OFF" appears on the upper left side of the screen.
- When this button is pressed again, 15 minutes are set to the sleep timer.
- This display appears for 5 seconds unless no key is pressed. Whenever pressed again, the setting time is incremented by 15 minutes.

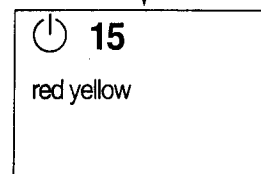


- While sleep-timer is set, if this button is pressed, the remaining time of the sleep timer appears on the screen.
- In addition, when this button is pressed again, the setting time is changed with the upper multiple of 15 minutes.
- When the remaining time is "0", the TV receiver turns "OFF".

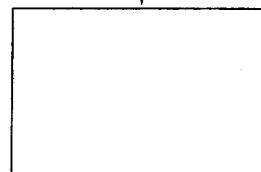
**NOTE :** In the TV mode, if the broadcasting signal is not continuously present for approx. 5 minutes, the TV receiver becomes automatically power off. However in the VIDEO mode, this function does not work.



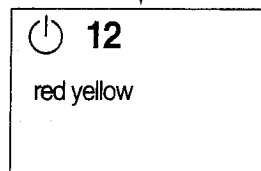
"SLEEP"



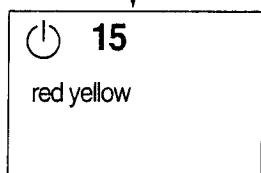
after about 5 seconds



"SLEEP"



"SLEEP"



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
## ■ REMOTE CONTROL UNIT OPERATIONS.

### REMOTE CONTROL UNIT FUNCTIONS

The remote control unit operates with size-AA(penlight) batteries which are factory supplied. It has 42 push buttons with functions as following.

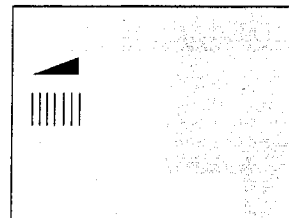
Before operating the TV receiver with the remote control unit, first switch on the receiver by the MAIN POWER SWITCH and complete the tuning as previously described.

#### POWER OFF ( )



Push the "  " button to turn the TV receiver OFF only when the MAIN POWER SWITCH is on.

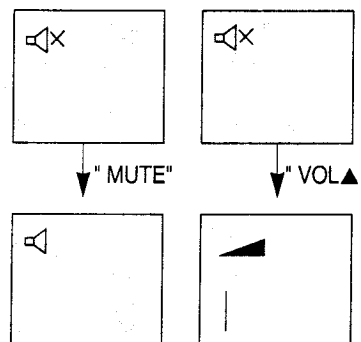
#### VOLUME UP/DOWN (VOL / )

Pushing the "VOL $\blacktriangle$ " button increases until you release your finger. Pushing the "VOL $\blacktriangledown$ " buttons reduces volume continuously until you release your finger. When you push these buttons, the volume indication bar appears on the centre of the screen as a green colour.



#### MUTE

- Pushing this button cuts off the sound reproduced from the speaker, and then "  " will be displayed on the screen with red colour.  
To switch the sound back on, press it again and then "  " will be displayed on the screen.
- On mute state, when you press the "VOL $\blacktriangle$ " button, the sound level starts from minimum level.
- All display appears for 5 seconds unless no key is pressed.

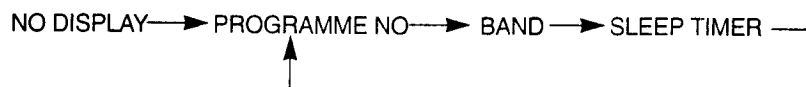


#### STATUS

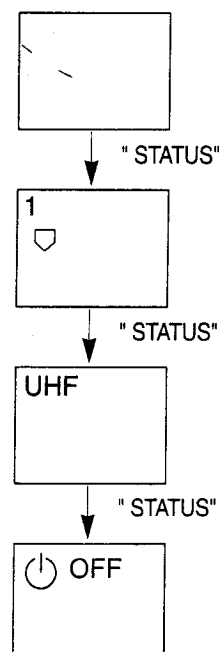
In TV mode, this is used to display the programme number, band and sleeptimer of the present.

This display appears for 5 seconds unless no key is pressed.

Whenever this button is pressed again, it is changed as follows.



**NOTE :** In the teletext mode, the status of teletext will be recalled the page.  
There fore the boxes on row 0 and 24 are shown on a block background.  
during 5 seconds.  
In case of double-height was selected, the display is set to the top of the page



However, in the AV, AV-1 and s-input mode, this function does not work.

## PROGRAMME SELECT BUTTONS ("0"- "9") AND ONE, DUAL DIGIT BUTTON ("-/")

Selecting programme number can be done with digit buttons "0" to "9" and "-/-" button.

If the receiver is in the stand-by condition, digit buttons can be used to switch on the receiver.

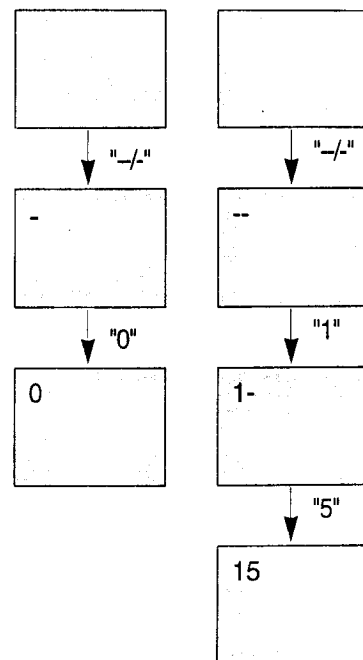
After switching on, this receiver will start from "single digit(-)" mode.

You can change the programme number as follows.

- NOTE :**
- If the programme number is 0 to 9, after single (-) digit is displayed, press the number directly.
  - If that programme number is 10 to 39, after dual (--) digit is displayed, the programme number is selected by pressing two numbers.

### (EXAMPLE)

In case of programme number "15", first press the "1" button and then press the "5" button within 10 seconds.



## CONTRAST UP/DOWN BUTTON (CONT ▲/▼)

Pressing these buttons increase/decrease contrast gradually until you release your finger.

## BRIGHTNESS UP/DOWN BUTTON (BRI ▲/▼)

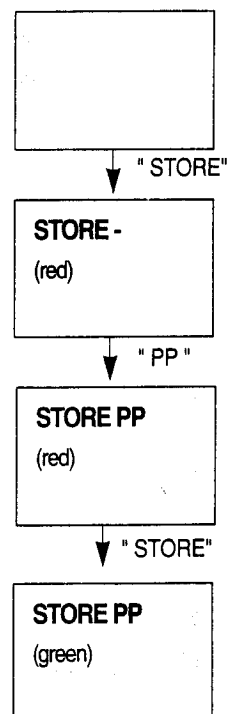
Pressing these buttons increase/decrease Brightness gradually until you release your finger

## COLOUR UP/DOWN BUTTON (COL ▲/▼)

Pressing these buttons increase/decrease colour gradually until you release your finger.

## PERSONAL PREFERENCE ("PP")

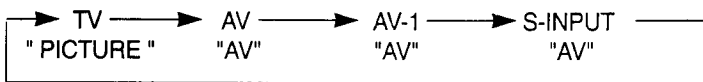
- This button is used to reset all analog controls which is previously stored.
- The PP storing method is as follows.
  - Set the each analog (volume, brightness, colour, contrast) controls to the desired level.
  - Press the "STORE" button in the receiver and Then "STORE-" or "STORE--" will be displayed on the centre of the screen.
  - Press the "PP" button in the remote control unit, then it will be changed from "STORE-" to "STORE PP"
  - Press the "STORE" button in the receiver again.
  - When store is executed, the colour of "STORE" character changes from red to green.
- When the TV receiver is switch on by the "MAIN POWER SWITCH, all analog levels are set to "PP" position which is previously stored.



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## AV SELECTOR

- This button is selected to mode among the AV, AV-1 and S-VHS input in this receiver.
- When ever this button is pressed, the screen display will change as follows



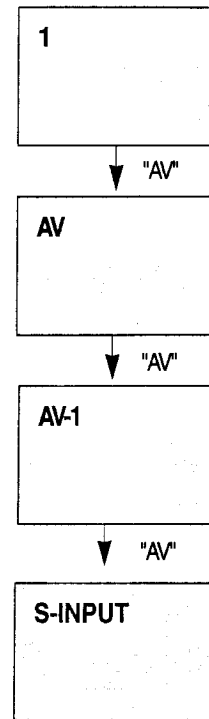
- When you want to back to the "TV" mode, press the "PICTURE" button.

## BALANCE LEFT/RIGHT BUTTON

- These are used to adjust the balance between left sound output and right sound output. Balance control should be adjusted to get the best stereo effect.
- If the present balance state is not what you'd like to want, Press "BALANCE" button and adjust balance.
- Balance indication appears on the centre of the screen with cyan colour.

## EFFECT BUTTON

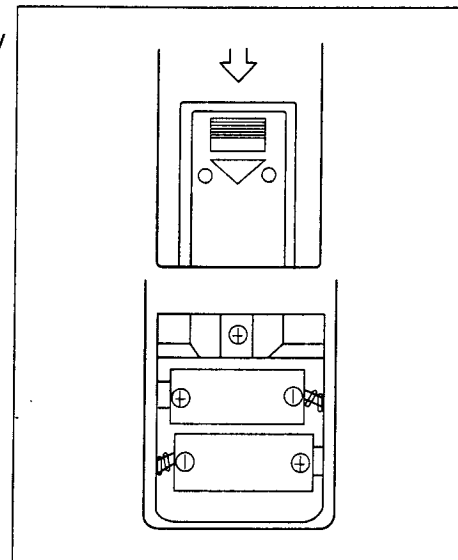
- This button is used to obtain a pseudo stereo effect with mono transmissions.
- If you'd like to listen "PSEUDO STEREO" Press this button. Then "EFFECT" indication appears on the upper left of the screen.



## BATTERY INSTALLATION AND REPLACEMENT

The remote control unit is operated two 1.5V AA (penlight) batteries. For battery installation or replacement.

- (1) Turn the remote control unit upside down. Press down on the battery compartment grip and slide the cover in the direction of the arrow.
- (2) Install the two new batteries, making sure that battery polarity matches with the (+) (-) marks inside the battery compartment.
- (3) Close the battery compartment cover.



**NOTE:** Use only size AA (UM-3, AA)x2 or the equivalent. If you do not intend to use your TV for prolonged periods because of holiday, etc., turn off the MAIN POWER SWITCH on the receiver.

## EFFECTIVE OPERATING RANGE

The remote control unit is designed to operate within a distance of about 7m.

If malfunction occur even through you are within the effective operating range, batteries may be weak and require replacement.

**PRECAUTION:** The remote control unit will not function properly if strong light strikes the sensor window or if there are obstacles between the remote control unit and the receiver.

## ■ FOR TELETEXT USE

The teletext service are carried on the TV transmission and therefore will only be available when a TV programme can be received on the screen. It presents in page from its own digest of news, views and wide variety of other information, which is constantly being updated. The teletext decoder incorporated in CCT (computer controlled teletext) controlled by micro computer and all teletext functions are controlled with remote control.

### SWITCHING TO THE TELETEXT PAGE

- Press the "TEXT" button then the receiver is switched to teletext mode.
- When "TEXT" button is pressed again in TELETEXT mode, this is interpreted as a reset function;
  - Abandon mix, cancel or hold mode.
  - Switch off the reveal function (cleared)
  - If double height, full page will be displayed.

For operating as a normal television receiver, PICTURE button should be pressed. The last requested page will remain in the page memory unless the program number is changed or unless the television is switched into stand by.

### PAGE SELECTION

When teletext mode is first selected, index page S100 is automatically obtained in FLOF mode. But in list mode, the page which is stored in RED RANK is obtained. Any other page is obtained by simply pressing three number button in sequence. The requested page number is displayed at the upper left side of the screen. When the third digit has been entered, the page header is changed from white to green colour.

It indicates that the displayed page is not yet the requested page.

After the requested page is obtained, the page header turns on white colour.

### PAGE RECEPTION

After a new page has been entered, the previous page is displayed until the new page is received. On reception of the new page, the header reveals to white and the rolling page number stops, showing the requested page number.

**NOTE:** 1. If the new page is a newsflash or subtitle page, a normal television picture is automatically turned on, and the newsflash or subtitle is displayed in a box within the picture.  
2. Conversely, if the old page was a newsflash or subtitle page, and the new page is not, then the picture is turned off.

### PAGE UP/DOWN (PAGE▲/▼)

Page number up increments the page number in the digit by 1, page number down decrements it.

### INDEX

When this button is pressed in FLOF mode, the teletext decoder is set up to display the index page.

But when this button is pressed in LIST mode, the teletext decoder is set up to display the RED RANK.

### MIX

In normal teletext mode, television and character data is not displayed simultaneously.

The mix mode results in a combined display of television and character data.

During the first 5 seconds, the boxed on row 0 and 24 contains also the page number and, if in subcode mode, the subcode.

In case double height was been selected, the display is forced to full page.

### REVEAL

Some pages have part of the display conceal, a quiz page with concealed answers, for example. The command "REVEAL" displays the concealed text as long as "REVEAL" button pressed again.

### HOLD

Some pages contain more information that can be displayed on the screen simultaneously and are therefore subdivided into a series of two or more subpages.

The first sub-page of a series four sub-pages, for example, has the indication 1/4 displayed at the top right of the screen.

These sub-pages are "rotated", that is, each subpage is displayed for certain time (determined by the broadcasting authorities) before being replaced by next page.

If it is desired to halt this rotation and retains a particular sub-page, the "HOLD" button should be pressed. The message "HOLD" will be displayed on the centre of status message row instead of the current page number and the page acquisition is stopped. This command stops the reception of teletext data and can be used to prevent the updating of pages whenever required. Normal operation is restored by pressing HOLD button again or entering a new page number.

In mix or cancel mode the boxes 0 and 24 will be displayed on a block background during 5 seconds. In case of double height, the display will be forced to the top of the page.

Reveal function is cancelled.

## DOUBLE HEIGHT (T/B/F)

Normally small character are used in teletext mode but in some circumstances the "double height", facility may be useful, when the viewer is some distance from the receiver, for example. Either the top or bottom half of the display can be expanded by pressing the double-height button. When this button is pressed for the first time, the top half of the display is expanded. If it is pressed again the bottom half of the display is expanded.

To return the display to normal-sized characters, this button should be pressed.

If the television mode is selected while the characters are being displayed, normal characters will displayed when the system is next returned to teletext mode.

## SUBCODE

In television mode, it displays the current time, which is derived from teletext, in upper corner of the screen. The time is displayed during 5 seconds, in double height.

In teletext mode, this button is used to the subcode mode.

**NOTE :** In the PICTURE mode, whenever the TEXT buttons pressed, it will be displayed a bar (-) with yellow on the screen.

## SUBCODE PAGE ACCESS

For teletext information which is longer than one page it may take some time for the automatic changing of sub pages to reach the sub page you require. It is possible, however, to enter the sub-page you require and then continue watching the normal television picture until the correct sub-page is reached.

A. Select the required page using the page selection button.

B. Press the "SUB CODE" button. The character "Z" and sub code digits "\*\*\*\*\*" will be displayed in the top left of the screen.

C. Enter the desired sub-page number before figure "Z\*\*\*\*\*" disappears. For example, if you select sub-page 10 you must press 0,0,1 and 0 button.

Then the character "▲" is displayed following the page number.

D. Press the "CANCEL" to return to normal television programme. When the correct sub-page is reached the page number will appear on the normal television picture.

E. Press the "TEXT" button to display the stored page.

F. To clear the sub-coded page you must enter a new page number.

**NOTE:** It is not possible to select another television station during a sub-page access operation.

## DIGIT ENTRY

In teletext mode, digit 0 to 9 are used to enter a page number or a subcode.

As digits are entered will be displayed as follows.

	page number	subcode
first digit	S 1 - -	Z 1 * * *
second digit	S 1 2 -	Z 1 2 * *
third digit	S 1 2 3	Z 1 2 3 *
fourth digit	S 4 - -	• Z 1 2 3 4

During digit entry the acquisition is stopped. If a 3-digit page number or a 4-digit sub-coder is not completed within 5 second, the previous page will be restored and requested again.

## CANCEL

The text cancel button suppresses the text display and restores the normal television pictures while the receiver remains in teletext mode. This facility allows the viewer to request teletext pages and alter teletext controls without interrupting a television programme. If a new page is requested, while teletext is cancelled, the page header is displayed in a box on the screen for 5 seconds.

When the new page has been received, the new page number is displayed in a box on the screen.

## LIST/FLOF BUTTON

The list feature is very useful and powerful one. It means for the user to maintain a list of four favorite page number which can be quickly and easily requested without the need to button in multiple digit sequence. The page number and status of each of 4 decoder is shown in 4 coloured number in the status row.

## HOW TO LIST 4 PAGE NUMBERS

When you select the text mode you can find that 4 stage in the status low flash. If you want to select your favorite page number on the red background. Press R button and three number buttons on the transmitter remote control unit in sequence. For example, if you want to select 100 page on the red background, press R button and three digit (1.0.0) in sequence, you can find page 100 is shown in black on a red background.

If you want to select a page number on the green background, press G button and three number button in sequence.

If you want to select a page number on the yellow background, press Y button and three number button in sequence.

If you want to select a page number on the cyan background, press C button and three number button in sequence.

When the receiver is in list mode, if you press the LIST/FLOF button, several teletext functions are reset, the page memory is disappeared, and the teletext decoder is set up to display the index page (S100).

To return to the LIST mode, press the LIST/FLOF button again.

## HOW TO STORE LIST

A list is stored by using the "STORE" button in the front of the receiver. When the list is being stored, the numbers in each of the acqun circuits are displayed as black characters on a white background. The normal display is restored once the numbers have been stored.

## R, G, Y, C BUTTON

When the receiver is in list mode the page numbers available for 4 colours (R.G.Y.C) are displayed in the text status row.

The selection is made by pressing the coloured button R/G/Y/C that corresponds to the desired coloured option.

## BROWSE BUTTON

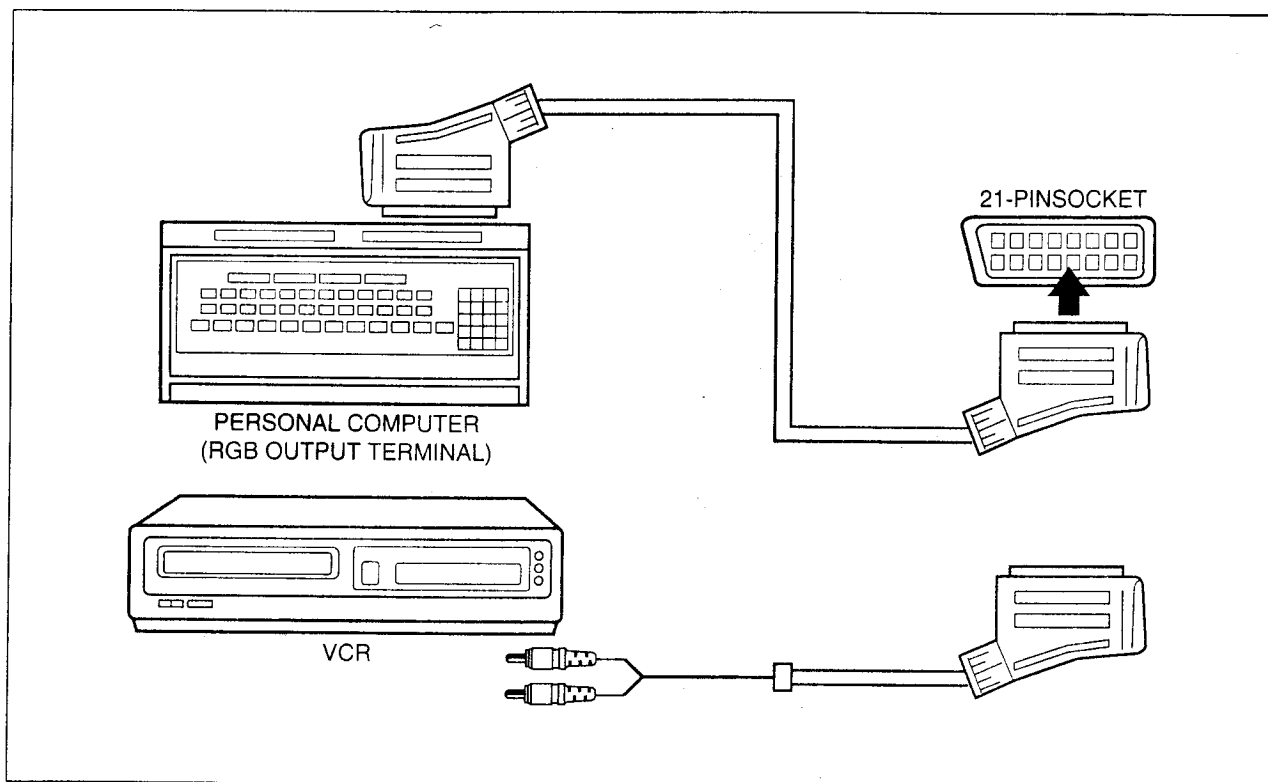
Browse, as the name implies, enables the user to very easily scan through the entrie database. Browse in its simplest sense instructs the dder to capture the next complete page which arrives. It can therefeen as an almost instant way of accessing random pages in the database and thereby removing the need to button in digit to glance and unfamiliar pages.

## ■ CONNECTING THE EXTERNAL EQUIPMENT.

- This TV receiver is equipped with a 21 pin EURO-SCART for your desired equipment to be connected.
- A personal computer, VCR, video disc player or other AV apparatus can be connected to the 21 pin EURO-SCART on the rear panel of the TV rceiver.
  - Use of the video equipment.
- In case of using the equipment which has THE pin 8 input function signal, you can enjoy the programme from VCR tapes or video discs, etc. even though the receiver is any mode (TV, AV). But in case of using the equipment which does not have this function signal you can enjoy the programme from an AV apparatus only in AV mode.
- Select AV mode by press the "AV" button in the remote control unit.
- At this time, the "AV" is displayed on upper left of the screen.
- When you want to back to the "TV", press the "PICTURE" button.
  - Use of a personal computer
- The personal computer must be the type which has the pin 16 fast signal (TV/RGB switching)
  - In hhis case, you can enjoy the programme from the personal computer even though the receiver is in any mode.
- A personal computer which does not have this function signal cannot be use but if the personal computer has a RF output terminal, it can be used by making the connection to the antenna terminal.

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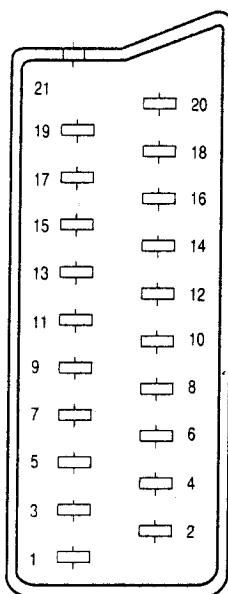




**NOTE:** In the TV mode, if the broadcasting signal is not continuously present for approx. 5 minutes, the receiver become automatically power off. However, in the AV mode, this function does not work.

#### PIN DESCRIPTION OF A 21 PIN EURO-SCART

1. Audio Out (linked with 3)
2. Audio In (linked with 6)
3. Audio Out (linked with 1)
4. Audio Earth
5. Blue Earth
6. Audio In
7. Blue In
8. TV/Video Switch
9. Green Earth
10. NC
11. Green In
12. NC
13. Red Earth
14. NC
15. Red In
16. Rapid Blanking switching
17. Video Earth
18. Rapid Blanking Earth
19. Video Out
20. Video In
21. Shield Earth

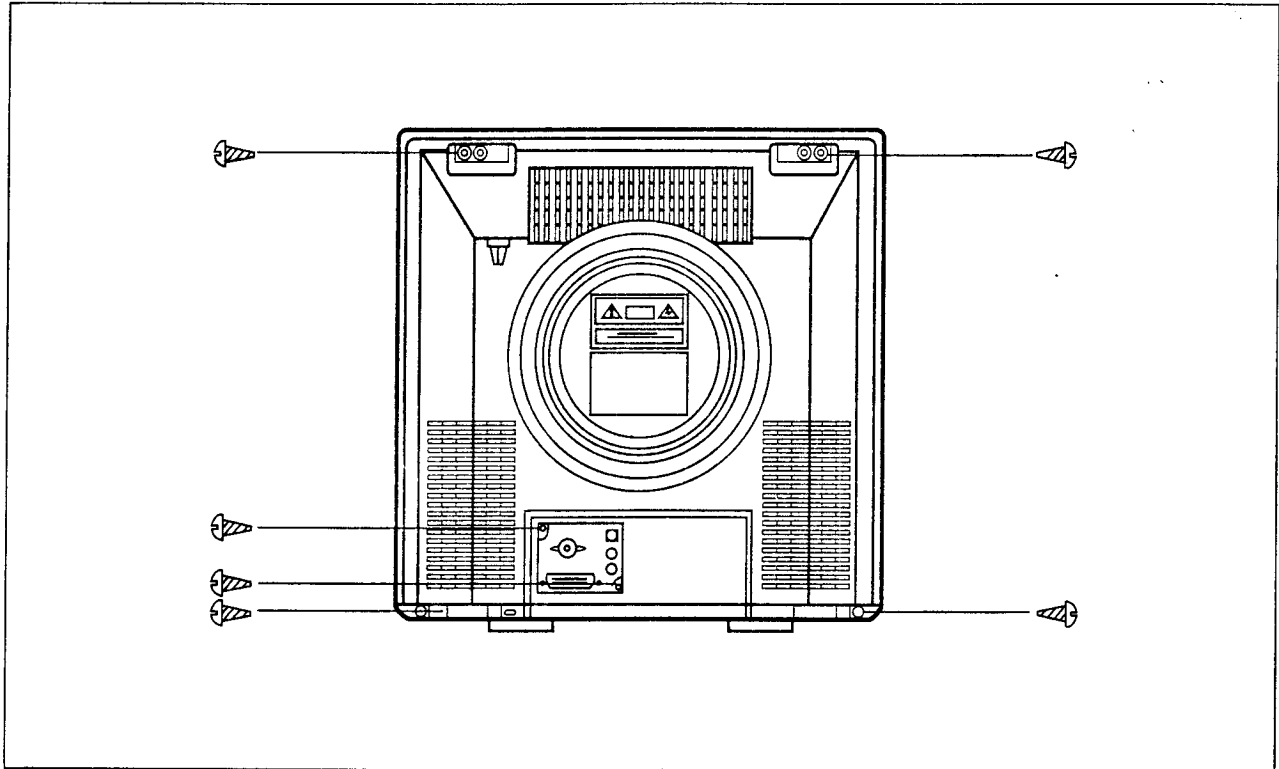


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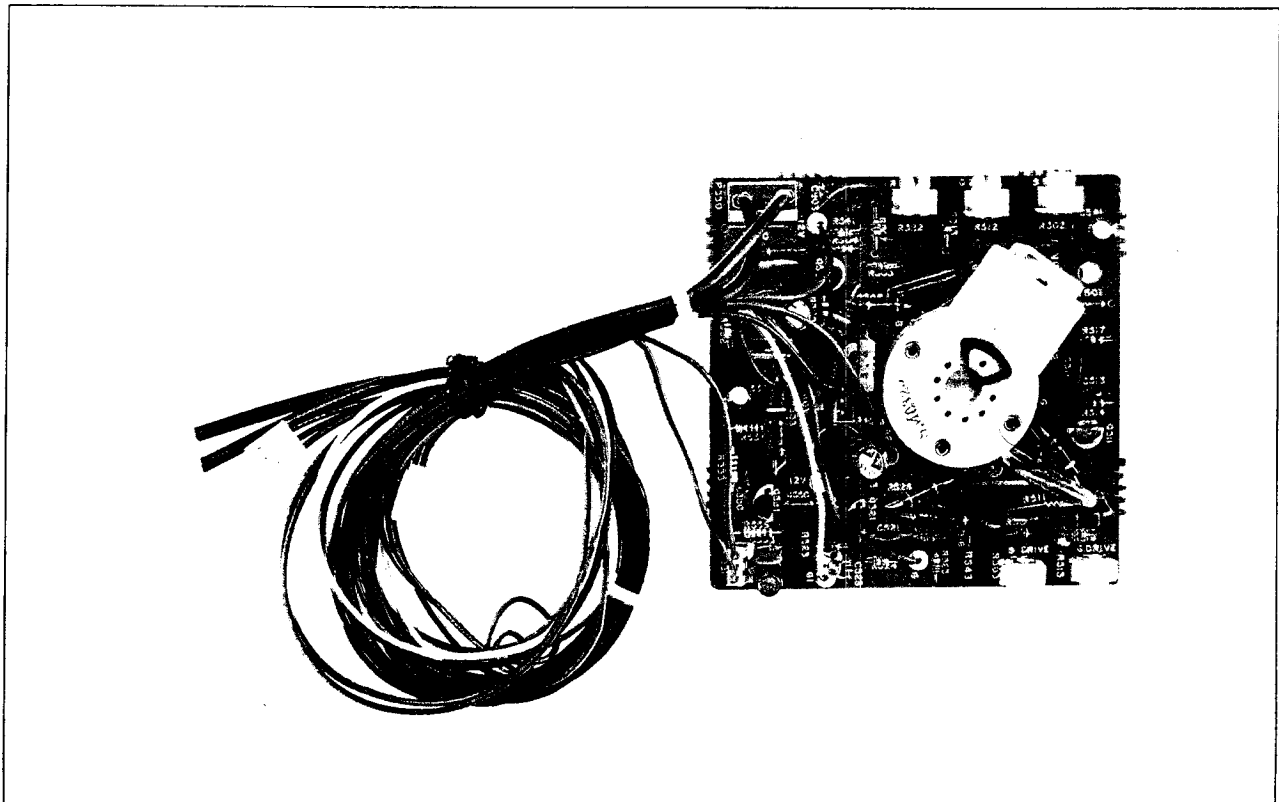
# REMOVAL AND SERVICING OF CHASSIS

## ■ REAR COVER REMOVAL

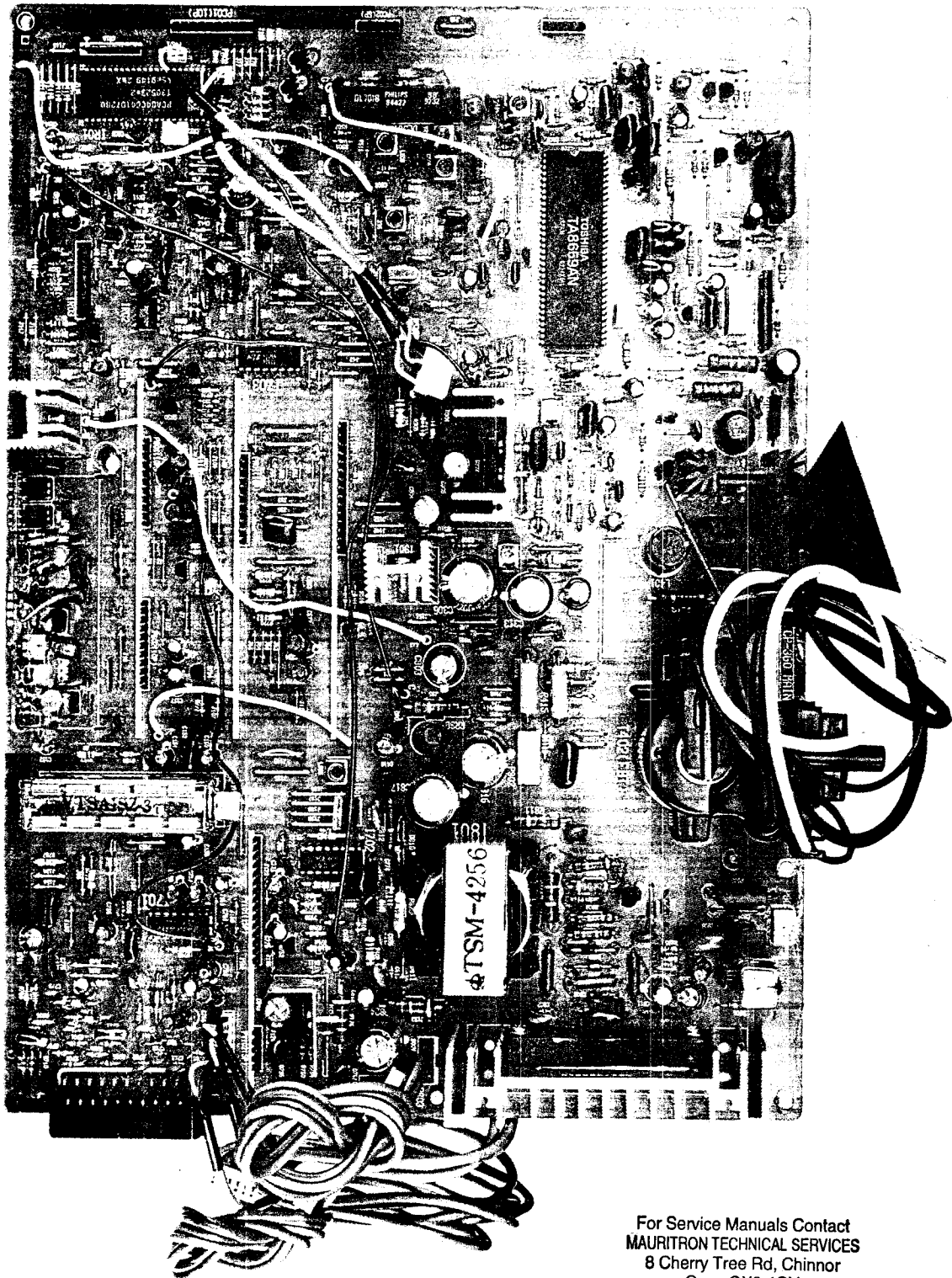
**WARNING:** BEFORE REMOVING COVER, RECEIVER MUST BE DISCONNECTED FROM MAINS SUPPLY



## ■ CRT BOARD VIEW

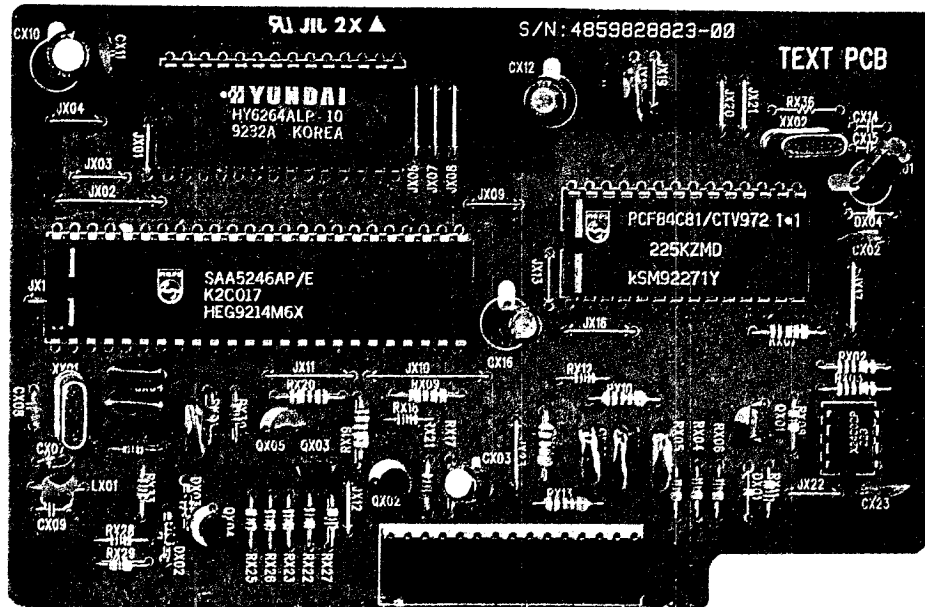


■ MAIN BOARD VIEW

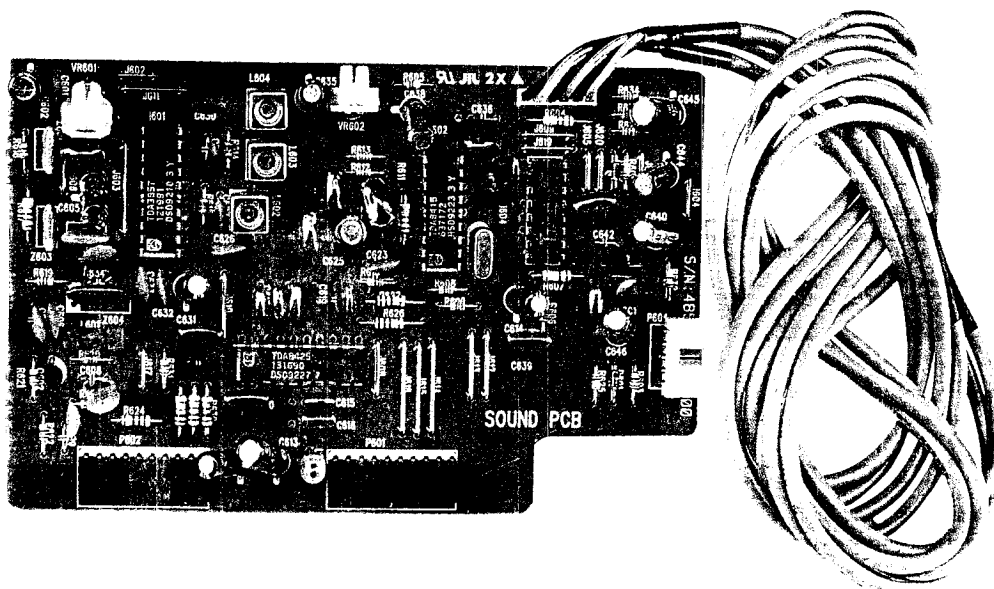


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## ■ TELETEXT BOARD VIEW



## ■ SOUND BOARD VIEW

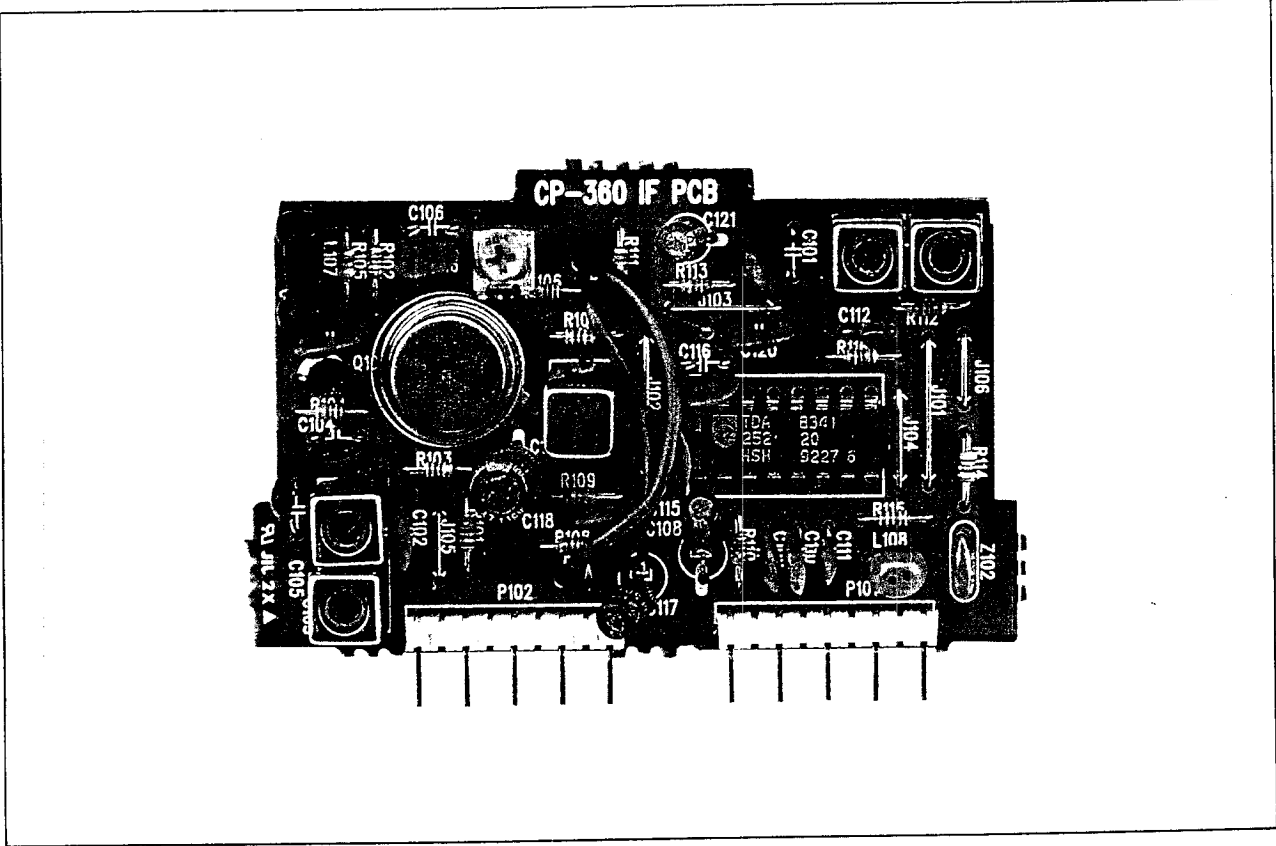


The image shows a rectangular printed circuit board (PCB) for a NICAM system. The board is populated with numerous electronic components, including integrated circuits, resistors, capacitors, and connectors. Key labels and components visible on the board include:

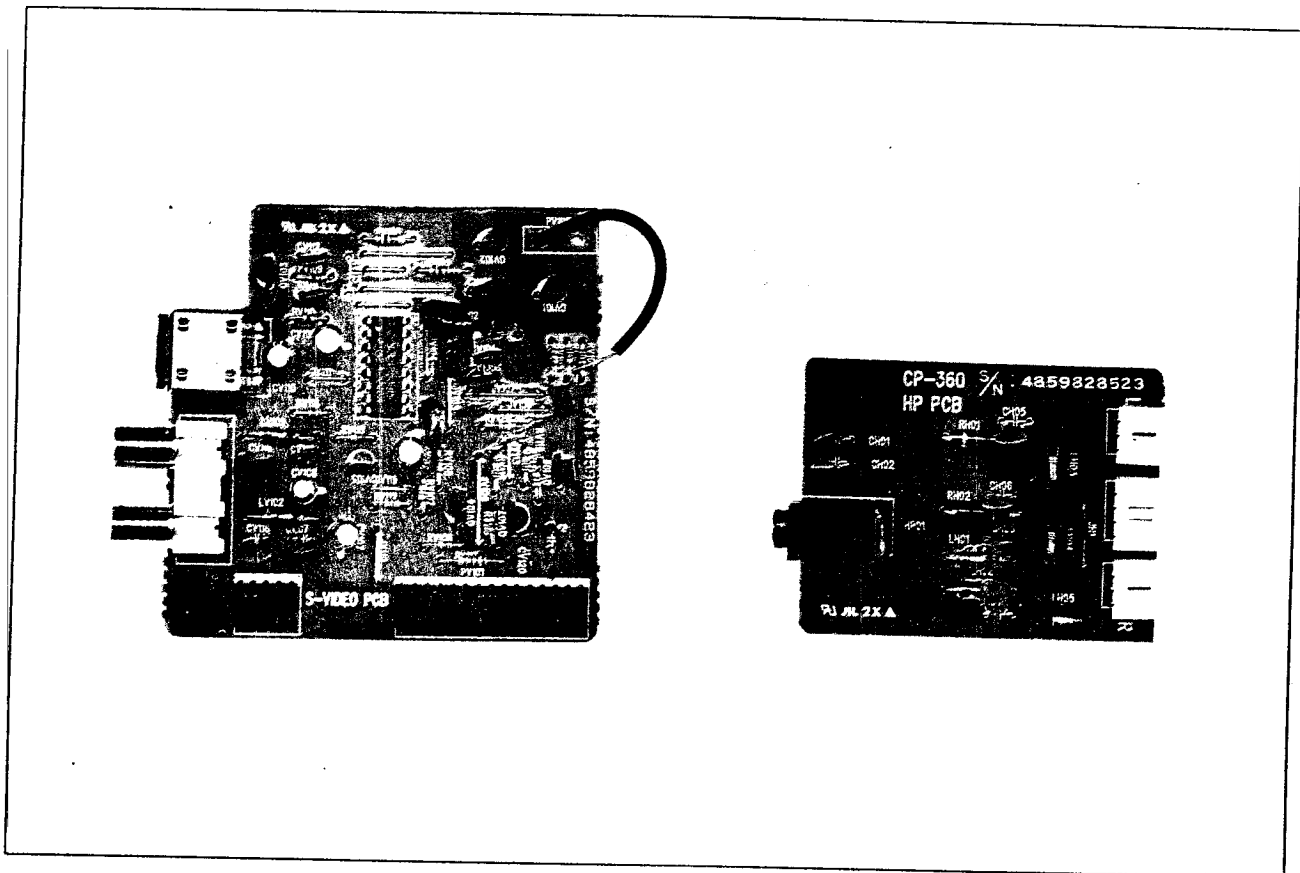
- Top Left:** "NICAM PCB" and "S/N: 4859828123-00".
- Top Center:** A large integrated circuit labeled "XN01" with "CN13" and "CN15" nearby.
- Top Right:** Two circular components labeled "INO1" and "INO2".
- Center:** A large rectangular area with a dashed border, containing several smaller components and labels like "CN13", "CN15", "CN17", "CN18", "CN19", "CN20", "CN21", "CN22", "CN23", "CN24", "CN25", "CN26", "CN27", "CN28", "CN29", "CN30", "CN31", "CN32", "CN33", "CN34", "CN35", "CN36", "CN37", "CN38", "CN39", "CN40", "CN41", "CN42", "CN43", "CN44", "CN45", "CN46", "CN47", "CN48", "CN49", "CN50", "CN51", "CN52", "CN53", "CN54", "CN55", "CN56", "CN57", "CN58", "CN59", "CN60", "CN61", "CN62", "CN63", "CN64", "CN65", "CN66", "CN67", "CN68", "CN69", "CN70", "CN71", "CN72", "CN73", "CN74", "CN75", "CN76", "CN77", "CN78", "CN79", "CN80", "CN81", "CN82", "CN83", "CN84", "CN85", "CN86", "CN87", "CN88", "CN89", "CN90", "CN91", "CN92", "CN93", "CN94", "CN95", "CN96", "CN97", "CN98", "CN99", "CN100".
- Bottom Left:** A series of four circular connectors labeled "LN01", "LN02", "LN03", and "LN04".
- Bottom Center:** A large rectangular area with a dashed border, containing several smaller components and labels like "CN13", "CN15", "CN17", "CN18", "CN19", "CN20", "CN21", "CN22", "CN23", "CN24", "CN25", "CN26", "CN27", "CN28", "CN29", "CN30", "CN31", "CN32", "CN33", "CN34", "CN35", "CN36", "CN37", "CN38", "CN39", "CN40", "CN41", "CN42", "CN43", "CN44", "CN45", "CN46", "CN47", "CN48", "CN49", "CN50", "CN51", "CN52", "CN53", "CN54", "CN55", "CN56", "CN57", "CN58", "CN59", "CN60", "CN61", "CN62", "CN63", "CN64", "CN65", "CN66", "CN67", "CN68", "CN69", "CN70", "CN71", "CN72", "CN73", "CN74", "CN75", "CN76", "CN77", "CN78", "CN79", "CN80", "CN81", "CN82", "CN83", "CN84", "CN85", "CN86", "CN87", "CN88", "CN89", "CN90", "CN91", "CN92", "CN93", "CN94", "CN95", "CN96", "CN97", "CN98", "CN99", "CN100".
- Bottom Right:** A series of four circular connectors labeled "LN01", "LN02", "LN03", and "LN04".

The board is densely packed with components, and the labels are clearly visible, providing a detailed view of the internal circuitry of the NICAM system.

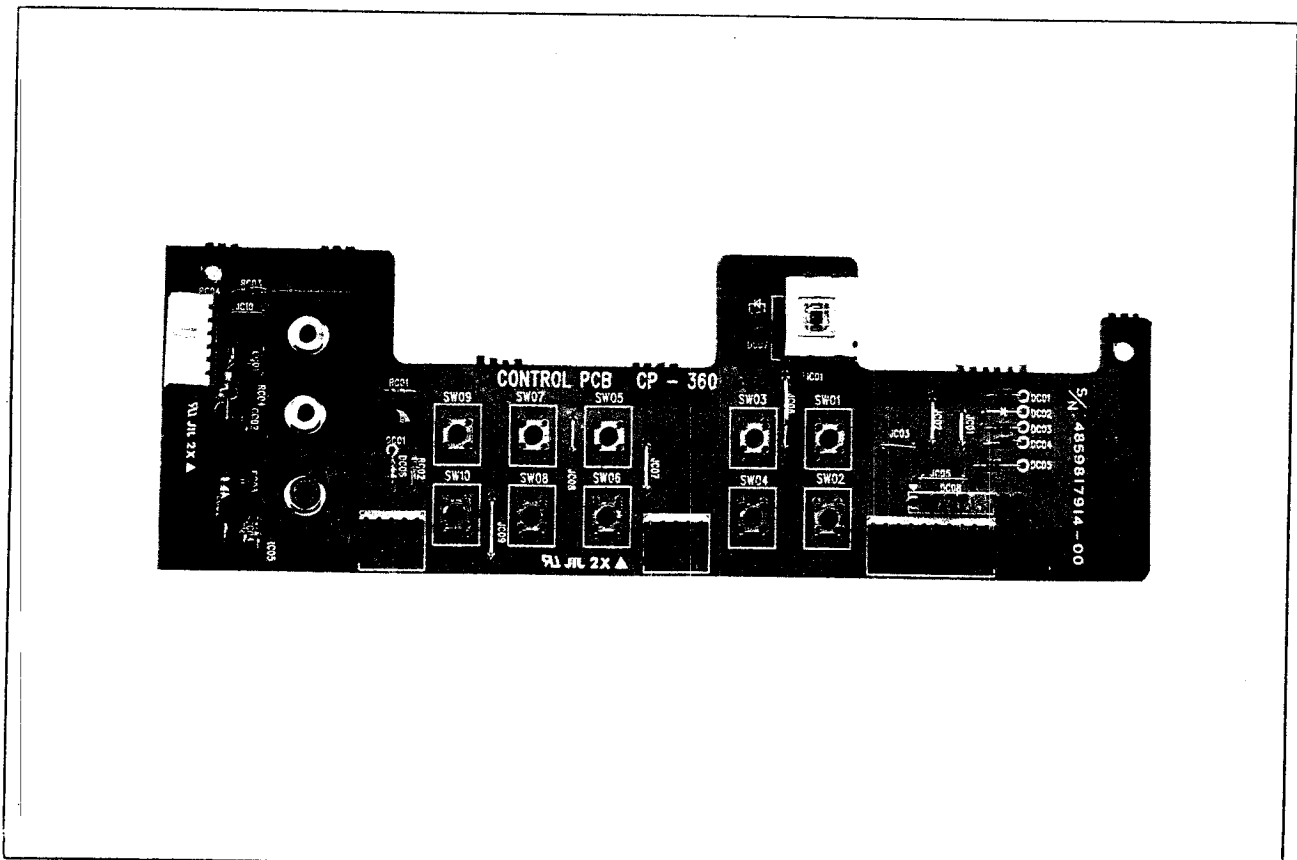
## PIF BOARD VIEW



## ■ S-VHS BOARD VIEW & HP BOARD VIEW



## ■ CONTROL BOARD VIEW



**WARNING:** BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 OF THIS MANUAL.

## IC OPERATION DESCRIPTION

### GENERAL INFORMATION

All adjustment are thoroughly checked and corrected when the receiver leaves the factory. Therefore the receiver should operate normally and produce proper colour and B/W pictures upon installation. However, several minor adjustments may be required depending on the particular location in which the receiver is operated. This receiver is shipped completely in a cardboard carton. Carefully draw out the receiver from the carton and remove all packing materials. Plug the power cord into a convenient 230 volts 50Hz AC power outlet. Turn the receiver ON and adjust the FINE TUNING for best picture, detail with the AFT switch in the OFF position.

Check and adjust all the customer controls such as BRIGHTNESS, CONTRAST and COLOUR Controls to obtain a natural B/W picture.

### AUTOMATIC DEGAUSSING

A degaussing coil is mounted around the picture tube so that external degaussing after moving the receiver is normally unnecessary, providing the receiver is properly degaussed upon installation. The degaussing coil operates for about 1 second after the power to the receiver is switched ON. If the set is moved or placed in a different direction, the power switch must be switched off for at least 15 minutes in order for the automatic degaussing circuit to operate properly.

Should the chassis or parts of the cabinet become magnetized to cause poor colour purity, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube, the sides and front of the receiver and slowly withdraw the coil to a distance of about 2m before disconnecting it from the AC source. If colour shading still persists, perform the COLOUR PURITY ADJUSTMENT and CONVERGENCE ADJUSTMENTS procedures, as mentioned later.

### HIGH VOLTAGE CHECK

**CAUTION:** There is no HIGH VOLTAGE ADJUSTMENT on this chassis. The +113 volt power supply must be properly adjusted to insure the correct high voltage.

1. Connect an accurate high voltage metre to the anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST controls to minimum (zero beam current).
3. High voltage should be below 27.5kv
4. Rotate the BRIGHTNESS Control to both extremes to be sure the high voltage does not exceed the limit of 27.5kv under any conditions.

### HORIZONTAL CENTRE ADJUSTMENT

1. Receive RETMA pattern signal.
2. Adjust R404 so that the horizontal centre of the picture may be coincident with the mechanical centre.

### V-HEIGHT ADJUSTMENT

V-HEIGHT Control (R303) on the MAIN Board changes the size of the picture of pattern, having an equal effect on the top and the bottom. Make a final adjustment to overscan the mask 2 cm at the top and the bottom.

### FOCUS ADJUSTMENT

Adjust FOCUS Control on FBT for well defined scanning lines in the central area of the screen.

### DELAYED R-F AGC ADJUSTMENT

1. Receive PAL COLOUR BAR signal in the VHF high band.
2. Set the CONTRAST control to Max. the BRIGHTNESS control to provide adequate black and grey scales.
3. Maintain the fine tuning on the screen, and adjust VR116 (AGC DELAY CONTROL VR.) in order that it may be located on the position which the picture noise disappear on the image.

### COLOUR AMPLITUDE AND PHASE ADJUSTMENT

1. Receive a PAL/DEM signal (Philips Model PM 5518)
2. Connect the probe of an oscilloscope to B-Y output.
3. Adjust L503 and VR513 in order to make the waveform flat on the screen (Figure 1).
4. Receive a colour bar signal instead of the DEM signal.
5. Adjust L503 to make B-Y output stable. (Figure 2)

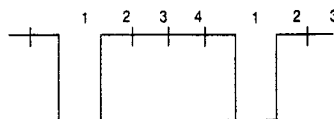


Figure 1

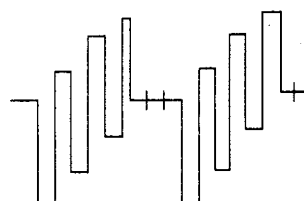


Figure 2

## WHITE BALANCE ADJUSTMENT

The purpose of this procedure is to optimize the picture tube to obtain the best black and white picture at all brightness levels while at the same time achieving maximum usable brightness. Normal RF AGC setting and purity adjustment must precede this procedure. This adjustment is to be made only after a warm-up of at least 15 minutes.

When the antenna is connected to the receiver, tune in a strong picture channel.

Rotate the Colour control to maximum CCW position and misadjust PRE-SET tuning so that the receiver will not produce a colour picture while the following adjustments are being performed.

1. Set the Green Drive (R515) and the Blue Drive (R505) controls to mid-position.
2. Set the Sub-Bright control (R222) to maximum.
3. Set the Bias controls (R502, R512, R522) and Mode controls (Contrst, Bright, Colour) to minimum.
4. TV display change to Video display.
5. Connect a short clip lead between chassis ground and pin 4 of I301.
6. Rotate the screen control to Clockwise or anticlockwise so as to obtain dim horizontal line of the colour in red, green and blue.
7. Rotate the Red, Green and Blue Bias controls of the other colours (Which did not appears on the screen clockwise, until a dim white line is obtained).
8. Rotate the screen control gradually anti-clockwise until the last horizontal line disappears on the screen.
9. Remove the short clip lead between chassis ground and pin 4 of I301.
10. Video display change to TV display.
11. Rotate the Sub-Bright control (VR533) gradually anticlockwise until the last Beam disappears on the screen.
12. Set the Contrast control and the Brightness control to maximum.
13. Set the two Drive controls (R505, R515) to obtain best white uniformity on the screen.
14. Rotate the Contrast and Bright controls until a dim raster is obtained.
15. Touch-up adjustment of the three Bias Controls to obtain best white uniformity on the screen.

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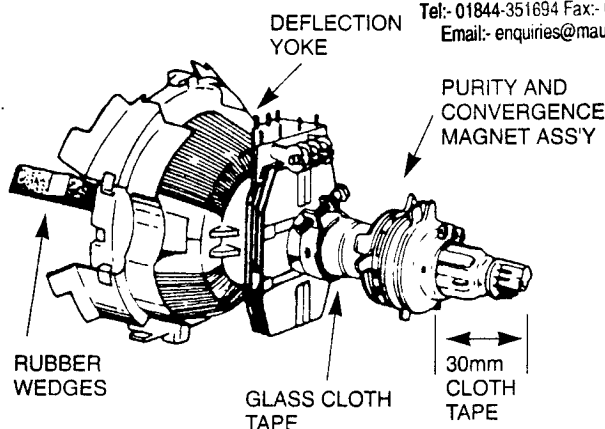


Fig. 4-1

## CONVERGENCE ADJUSTMENTS

Note: Before attempting any convergence adjustments, the receiver should be warmed-up for at least fifteen minutes.

### Centre Convergence Adjustment

1. Receive a crosshatch pattern from a colour bar signal generator.
2. Adjust Controls for a well defined pattern.
3. Adjust two tabs of the 4-Pole Magnets to change the angle between them (See figure 5) and superimpose red and blue vertical in the centre area of the screen. (See figure 6).
4. Turn both tabs at the same time, keeping the contrast angle to superimpose red and blue horizontal lines at the centre of the screen (See figure 6).
5. Adjust two tabs of the 6-Pole Magnets to superimpose red/blue line and green line. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.

### Circumference Convergence Adjustment

1. Loosen the clamping screw of the deflection yoke to allow the yoke to tilt.
2. Put in a wedge temporarily as shown in figure 3. (Do not remove the cover paper on adhesive part of the wedge).
3. Tilt the front of the deflection yoke up or down to obtain the best convergence under the circumstance. (See figure 6) Push the mounted wedge into the space between the picture tube and the yoke to fix the yoke temporarily.
4. Put another wedge into the bottom space and remove the paper cover for adhesion.
5. Tilt front the yoke right or left to obtain the best convergence under the circumstances. (See figure 6)
6. Keep the yoke position firm and put another wedge in one of the upper spaces. Remove cover paper and stick the wedge on the picture tube to fix the yoke.
7. Detach the temporarily mounted wedge and put it in the other upper spaces. Stick it on the picture tube to fix the yoke.
8. After fixing three wedges, recheck overall convergence. Tighten the screw. Firmly to fix the yoke and check the yoke is firm.

Stick 3 adhesive tapes on wedges as shown in figure 4.

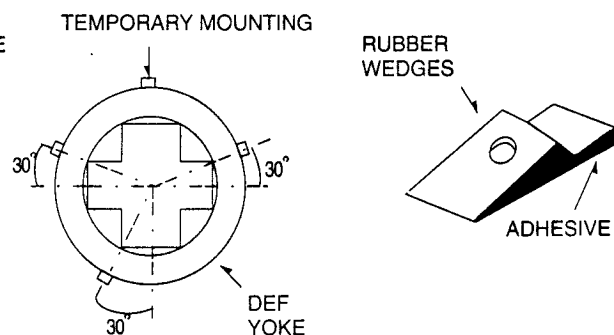
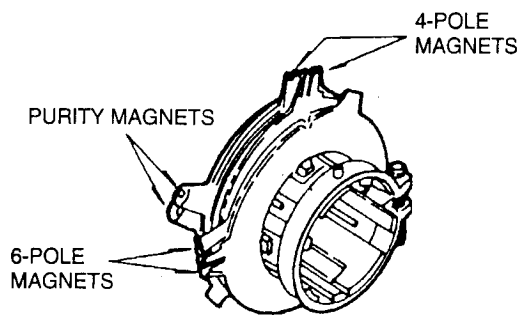


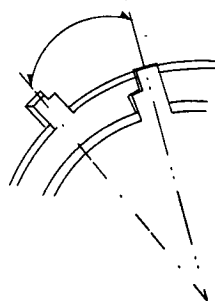
Fig. 4-2



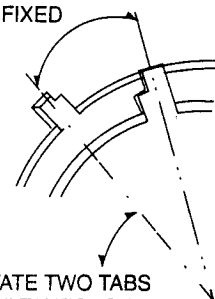


CONVERGENCE MAGNET ASSEMBLY

ADJUST THE ANGLE  
(VERTICAL-LINES)



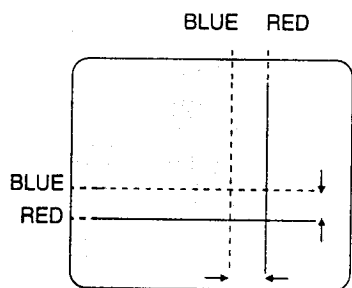
FIXED



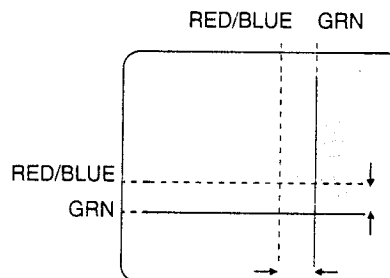
ROTATE TWO TABS  
SIMULTANEOUSLY  
(HORIZONTAL LINES)

ADJUSTMENT OF MAGNETS

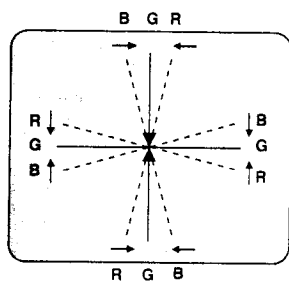
Fig. 5



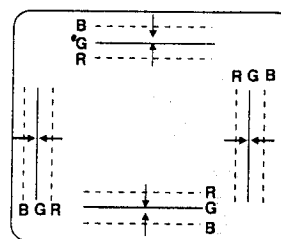
4-POLE MAGNETS MOVEMENT



6-POLE MAGNETS MOVEMENT



INCLINE THE YOKE UP (OR DOWN)



INCLINE THE YOKE RIGHT (OR LEFT)

Circumference Convergence by DEF Yoke

Fig. 6 Dot Movement Patten