AKIRA

makes life better

Colour TV
Service Manual

Model Group: CT-29NX9

CHASSIS: 5N11

MODEL:
CT-29NX9AE
CT-29NX9AN

CONTENTS

SPECIFICATIONS

RECEIVING SYSTEM

Sound System	: **A = BG/DK/I/M, R, N = BG/DK/I, CP = BG**
Colour System	: **A = PAL/SECAM/NTSC/NTSC P/B** **R.N = PAL/SECAM/NTSC P/B** **CP = PAL/NTSC P/B**
Picture Tube	: 74 cm (29") diagonal
Ext. Antenna	: 75 Ohm Coaxial Cable
Ext. In/Out	: Audio/Video-in/out
Speakers	: 8W x 2
Volts	: A = AC100 ~ 260V 50/60Hz R,N,CP = AC 150 ~260V 50/60Hz
Power Consumption	: 29" = 120W
Dimension	: 29" = 812(W) x 580(D) x 495(H) mm
Net Weigh	: 29" (46kg)

REMOTE CONTROL

Transmitting System	: Infra-red
Power Supply	: DC 3V (1.5Vx2)

Design and specifications are subject to change without prior notice

CAUTION
Before serving the chassis, read the "X-Ray Radiation Precaution", "Safety Precaution" and "Product Safety Notice" on this page.

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 above the specified limit. The normal value of the high voltage of this receiver is 24KV at zero beam current (minimum brightness) under 220V AC power source. The high voltage must not, under any circumstances, exceed 30KV.

2. Each time a receiver requires servicing, the high voltage should be checked following the High Voltage Check procedure in this manual. It is recommended the reading of the high voltage should be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.

3. The primary 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 part list.

4. Some parts in this receiver have special safety – related characteristics for X-Ray Radiation protection. For continued safety, parts replacement should be undertaken only after referring to the Product Safety Notice.

SAFETY PRECAUTION

Warning: Service should not be attempted by anyone unfamiliar with necessary precaution on this receiver. The following are the necessary precautions observed before servicing this chassis.

1. Since the power supply circuit of this receiver is directly connected to the AC power line, an isolation transformer should be used during any dynamic service to avoid possible shock hazard.

2. Always discharge the picture tube anode to the CRT conductive coating before handling the picture tube. The picture tube is highly evacuated and if broken, glass fragment will be violently expelled. Use shatter proof goggles and keep picture tube away from the unprotected body while handling.

3. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as: non-metallic control knobs, insulating covers, shields, isolation resistor-capacitor network etc.

4. When replacing parts or circuit boards, disconnect the power cord.

5. When replacing a high voltage resistor (Metal oxide film resistor) on circuit board, keep the resistor 10mm (1/2in.)away from circuit board.
6. Connection wires must be kept away from components with high voltage or high temperature.
7. If any fuse in this TV receiver is blow, replace it with the FUSE specified in the chassis part list.
8. The receiver is designed to operate with 220V(50/60Hz) AC mains.

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 high wattage, etc. Replaced parts which have these special safety characteristics are identified in this manual and its supplements, electrical components having such features are shaded on the schematic diagram and the part list.

Before replacing any of these components, read the part list in this manual carefully. The use of substitute replacement parts, which do not have the same safety characteristics, as specified in the part list may create shock, fire, and X-Ray Radiation or other hazards.

ALIGNMENT INSTRUCTION (CHASSIS : 5N11)

(I) CHASSIS ADJUSTMENT

1. EEPROM partial initializing

1.1. Go to the function set menu (there are two methods: a / b)
Press 'VOL+' key and 'VOL-' key on the control board at the same time and switch on power switch, then go to the function set menu.
After TV is on, press "factory" key (See Note 1) twin then go to the function set menu.

1.2. Press 'PM' key and 'SM' key on the control board at the same time until the “INITIAL PART OK” appears, this means the memory having been partially initialized. Operate repeatedly if the picture has no change.

***** All of the TV set EEPROM must be partially initialized before ex-factory or after change of the Chroma IC NN5198 / NN5199 or fully EEPROM initialized after change of the EEPROM 24C04 (OR 24C08,24C16, See Note 4).***

2. Do a search and store.

(II) COMPLETE MACHINE GENERAL ADJUSTMENT

2.1. Screen Voltage Adjustment.

1-1.1 Press 'screen' key (See Note 1);
1-1.2 Adjust the screen knob of FBT to get a horizontal faintness beam line;
1-1.3 Press 'screen' key again or 'stand by' key to go to the normal work status.

2.2. Focus Voltage Adjustment.

2-1.1 Receive monoscope pattern. Set picture mode to standard status;
2-1.2 Adjust the focus knob of FBT to get the clearest sharp picture.

2.3. Horizontal centering adjustment

2.3.1. Receive monoscope pattern;
2.3.2. Press 'factory' key (See Note 1) one time and go to system parameter adjustment menu;
2.3.3. Press 'MENU' key, go to horizontal and vertical parameter adjustment menu;

2.3.4. Select 'H' POSITION by pressing 'PROG+' key and 'PROG-' key. Press 'VOL+' key and 'VOL-' key to adjust the horizontal center of the pattern at the center of CRT screen.
2.3.5. Exit system parameter adjustment menu by pressing 'factory' key twin.

2.4. PAL system vertical pincushion adjustment

2.4.1. Receive PAL system cross hatch pattern signal;
2.4.2. Press 'factory' key one time, go to system parameter adjustment menu;
2.4.3. Press 'MENU' key, go to horizontal and vertical parameter adjustment menu;
2.4.4. Select 'V LINE' and 'V SCURVE' by pressing 'PROG+' key and 'PROG-' key; press 'VOL+' key and 'VOL-' key and adjust corresponding parameter to obtain picture's vertical pin cushion a good status PAL system

2.5. Vertical Size and Vertical Center Adjustment

2.5.1. Continue operation 3. Select 'V HEIGHT" and 'V POSITION', press 'VOL+' key and 'VOL-' key adjust corresponding parameter to obtain picture's vertical size and vertical center adjustment a good status.
2.5.2. Exit system parameter adjustment menu by pressing 'factory' key twin.

2.6. White Balance adjustment

For Factory Auto Computer adjustment

a. Receive white balance test signal;
b. Set picture "MILD" mode.
c. Insert the special plug into CN002, press adjustment key which belongs to white balance adjustment equipment and go to auto white balance adjustment;
d. After adjustment well, remove the plug.

For Factory Auto Computer adjustment

a. Press 'factory' key one time and go to system parameter adjustment menu;
b. Press "MENU" key once, then go to the White Balance adjustment menu;
c. Press ‘Prog +' key and 'Prog -' key to select the R, G, B cutoff and R, B Driver.
d. Press 'VOL+' key and 'VOL-' key to change. Or using the below direct key
e. Key: 0 for SUB-BRIGHT, 1 for CUTOFF-R, 2 for CUTOFF-G, 3 for CUTOFF-B, 4 for DRIVER-R, 5 for DRIVER-B
f. Recall for toggle the Sub-Bright adjustment (Min. contrast, some CPU version do not work)

2.7 Sub-bright adjustment

a. Receive PHILIPS signal;
b. Set picture "RICH" mode.
c. Press 'factory' key one time and go to system parameter adjustment menu;
d. Press digital key '0', select 'SUB-BRIGHT';
e. Press 'VOL+' key and 'VOL-' key until Grey scale signal can be seen;
f. Exit system parameter adjustment menu by pressing 'factory' key twin.

2.8 RF AGC adjustment

a. Receive 60dBuV monoscope pattern;
b. Press 'factory' key one time and go to system parameter adjustment menu;
c. Press 'PROG+' key and 'PROG-' key, select 'RF AGC';
d. Press 'VOL+' key and 'VOL-' key to change the value of 'RF AGC' until picture's noise disturbing just disappears ;
e. Exit system parameter adjustment menu by pressing 'factory' key twin.

2.9 NTSC system horizontal and vertical adjustment

a. Receive NTSC system cross hatch pattern. Adjust same as PAL system.

2.10 Warm up mode

a. Switch on power switch and Press 'factory' key one time; switch off power switch and switch on power switch again, at this time there is no signal white raster and TV won't switch off automatically. TV receiver can be sent to warm up line.
b. Before exit warm up line, press 'factory' key three times continue, at this time exit warm up mode, there is no signal and the LOGO 'AKIRA' pattern will appear.

NOTES:

1. Connect the remote IC PIN7 and PIN16 through a jiggle switch on the USER remote handset , this switch is defined as "screen" key; Connect the remote IC PIN8 and PIN16 through a jiggle switch on the USER remote handset , this switch is defined as "factory" key,

2. On the product line's alignment service we must use special memorizer that has been well written with respective correct version data.

3. If having no special memorizer that has been well written with data when servicing out of factory, we can use blank new EEPROM. Then the new EEPROM will be automatically totally initialized with default data after main power switch is on. Most parameters are free-alignment after initialized; only need adjust the several parameters of function set parameter and system parameter adjustment menu.

4. If no blank new EEPROM or no special memorizer that has been well written with data, we can use memorizer that has been written with old data instead, but must be totally re initialized; the operation is as following:
   a) After TV is on, press "factory" key twin□ then go to the function set menu;
   b) Press 'AV/TV' key and 'P.M' key on the control board, the TV turns off automatically; this means the
   memory having been totally initialized. Operate repeatedly if the picture has no change;
   c) Switch off and exit;
   d) After initialized, adjust the several parameters of function set parameter and system parameter adjustment menu.

5. The parameters of function set parameter and system parameter adjustment menu mustn't be adjusted;

* Ensure no adjustment on the following parameter except those parameter mentioned in this manual:-

a) System parameter adjustment menu (This is coming from the NN5198/ NN5199)
   AFT
   VIF VCO
   H VCO
   VIFDET NEG
   VIFDET INT
   VIFDET EXT
b) The ninth digital and the tenth digital of function set parameter
   These parameters must be IC interior values. If the above parameters have been changed, we must partially initialize the EEPROM.

6. Two different initializing

a) Fully initialize: initialize the EEPROM's most work data and preset default value. Including:
work parameter of NN5199, horizontal and vertical parameter, OPTION parameter (via. function set parameter), picture mode parameter, volume mode parameter and white balance parameter.

b) Partially initialize: only initialize work parameter of NN5199 and the ninth digital and the tenth digital of function set parameter(via. ISUD0, ISUD1,ISUD3,ISUD4,ISUD5),preset as interior values.

7. If use 25" or above Pure Flat tube, adjustment of horizontal size and pincushion distortion must be done as follows :

a) Receive 60dBuV PAL system monoscope pattern;
b) Press 'factory' key one time and go to system parameter adjustment menu;
c) Press 'MENU' key and select ' Position Menu ' as below

V POSITION	for adjust vertical position	00 to 07
H POSITION	for adjust Horizontal position	00 to 1F
V EHT	for adjust vertical shape	00 to 0F
H EHT	for adjust Horizontal shape	00 to 0F

d) Press 'MENU' key and select ' geometry Menu ' as below;

V-AMP	for adjust vertical size	00 to 7F
V_LINE	for adjust vertical linearity	00 to 3F
V_SC3	for adjust vertical S-correction X^3	00 to 3F
H-AMP	for adjust Horizontal size	00 to 3F
EW-PARA	for adjust Pincushion	00 to 3F
EW-COR	for adjust Pincushion corner	00 to 0F
TRAPEZ	for adjust trapezium	00 to 3F
V_SC5	for adjust vertical S-correction X^5	00 to 0F

e) Receive 60dBuV NTSC system monoscope pattern;
Repeat the above step 7.2 to 7.4.
f) Exit system parameter adjustment menu by pressing 'factory' key twin.

8. Option Code

1. Press 'factory' key twin and go to Option Code Menu

```
1 2 3 4 5 6 7 8
9 A
1 3 7 1 4 0 4 6
* *
```

The first digit 8 Digit is set by Factory. The last two digit "9" and "A" is the random data from NN5198/NN5199.

OPTION 1 (Sopdata1)(number 1 and 2)

```
 x x x x |x x x x ---> Sharp Peak frequency 3/4Mhz (0/1) (For NN5198)
| | | | | | +------> Super Woofer sound setting ON/OFF
| | | | | +--------> RGB limit ON/OFF
| | | | +----------> Reserved for internal using, must be zero
| | | +------------> NTSC decoder ON/OFF (include 3.58 & 4.43)
| | +--------------> SECAM decoder ON/OFF
| +----------------> YUV ON/OFF
+------------------> NTSC QSS
```

OPTION 2 (Sopdata2)(number 3 and 4)

```
x x x x| x x x x ---> Two AV source only
| | | | | | +------> Three AV source
| | | | | +--------> S-video source support
| | | | +----------> Reserved for internal using, must be zero
| | | +------------> M decoder ON/OFF
| | +--------------> I decoder ON/OFF
| +----------------> BG decoder ON/OFF
+------------------> Reserved for internal using, must be zero
```

OPTION 3 (Sopdata3)

```
x x x x x x x x ---> Tuner LNA
| | | | | | +------> Hold on when no signal
| | | | | +--------> VIF VCO 38MHz or 38.9MHz selection
| | | | +----------> Reserved for internal using, must be zero
| | | +------------> Game available
| | +--------------> Gamma Correction ON/OFF (0/1)  (For NN5198)
| +----------------> RGB Gain 0.56/0.83 (0/1)    (For NN5198)
+------------------> Reserved for internal using, must be zero
```

OPTION 4 (Sopdata4)(number 7 and 8)

```
x x x x |x x x x ---> Multi-language OSD ON/OFF
| | | | | | +------> LOGO enable ON/OFF
| | | | | +--------> LOGO define ON/OFF
| | | | +----------> Reserved for internal using, must be zero
| | | +------------> BBE sound ON/OFF
| | +--------------> QSS switch    ON/OFF
| +----------------> SIF Internal/External (1/0)     (For NN5198)
+------------------> Reserved for internal using, must be zero
```

OPTION 5 (Dwork3)(number 9 and A)

```
x x x x |x x x x ---> ISUD0
| | | | | | +------> ISUD1
| | | | | +--------> PAL_M/N ON/OFF
| | | | +----------> Reserved for internal using, must be zero
| | | +------------> ISUD3
| | +--------------> ISUD4
| +----------------> ISUD5
+------------------> Reserved for internal using, must be zero
```

(III) COLOUR PURITY AND CONVERGENCE ADJUSTMENT

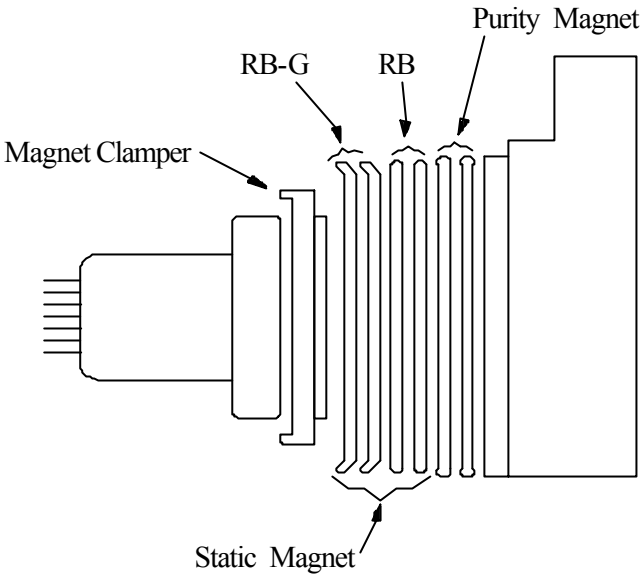
3. COLOUR PURITY ADJUSTMENT (See Fig.1)

BEFORE ANY ADJUSTMENTS DESCRIBED BELOW ARE ATTEMPTED,V-HIGH, B+ VOLTAGE AND FOCUSING ADJUSTMENT MUST BE COMPLETED.

1. Place the TV receiver facing NORTH or SOUTH.
2. Plug in TV receiver and turn it on .
3. 3.Operate and warm-up the TV receiver at least over 30 minutes.
4. Fully degauss the TV receiver by using an external degaussing coil
5. Receive a crosshatch pattern and adjust the static convergence control roughly.
6. Loosen the clamp screw of the deflection yoke and pull the deflection yoke towards you.
7. Enter into ADJUST MENU .set the values of C-R,C-G,C-B to “00”.
8. Adjust the purity magnets so that green field is obtained at the center of the screen.
9. Slowly push the deflection yoke toward bell of CRT and set it where a uniform green field is obtained.
10. Tighten the clamp screw of the deflection yoke.

2. CONVERGENCE ADJUSTMENT (See Fig.1)

1. Receive a dotted pattern.
2. Unfix the convergence magnet clamped and align red with blue dots at the center of the screen by rotating (R,B) static convergence magnets.
3. Align Red/Blue with green dots at the center of the screen by rotating (RB-G) static convergence magnet.
4. Fix the convergence magnets by turning the clamped.
5. Remove the DY wedges and slightly tilt the deflection yoke horizontally and vertically to obtain the good overall convergence.
6. Fix the deflection yoke by wedges.
7. If purity error is found, follow “PURITY ADJUSTMENT” instructions.



(FIG.1)

(IV) FINAL INSPECTION AND ELECTRICAL FUNCTIONAL CHECK

1. CHECKING THE ELECTRICAL FUNCTION:-

1. Connect the power cord and connect the signal to RF input.
2. Check the power supply whether OK or not. Switch on the TV set and the LED is on. Switch off the TV screen and should not have CRT spot within 3 sec.
3. Receive the channel 1 for monoscope pattern to check the picture focus and the round circle should not be distorted. The centre position, and VOS line/size are within spec. Check the brightness, contrast and colour condition. Check the convergence, picture must be clear, focus OK and white balance are OK. Also check the complete screen picture quality. High voltage condition OK and the Screen picture must be OK.
4. Check all the functional keys must be working well.
5. Receive colour pattern signal and the system colour. (PAL/SECAM/NTSC). Check the power main on/off switch, brightness, volume, colour, contrast and tint. The picture quality must not have colour noise, unbalance size and distorted condition.
6. Check the sound quality standards, Volume up/down are OK to spec, and sound output. Ensure the sound output is not distorted and noisy. No interference for DK/BG/I/M.
7. Use remote Control Unit for all types of function check and ensure OK.
8. Check the words display condition.
9. Shock test and make sure the picture and sound are not distorted and shifted.
10. Use strong and weak signal to check the colour picture condition. After adjust the signal level to 35-40 dB and the colour should not gone. The picture and sound must be OK. At 60 dB the picture should not have snow noise.
11. Ensure the factory mode setting are set. Set-off the factory mode function and last switch off the TV set.
12. All the “NG” sets must send for repairing and recording for reference.
13. Check the AV input and output the picture and sound must be OK.

2. RELIABILITY AGING TEST:-

1. 1st lot of production sets. Sampling 20 sets for aging 7 days continues test with colour signal in. Normal production sets must be age for 1 day.

3. MECHANICAL INSPECTION:-

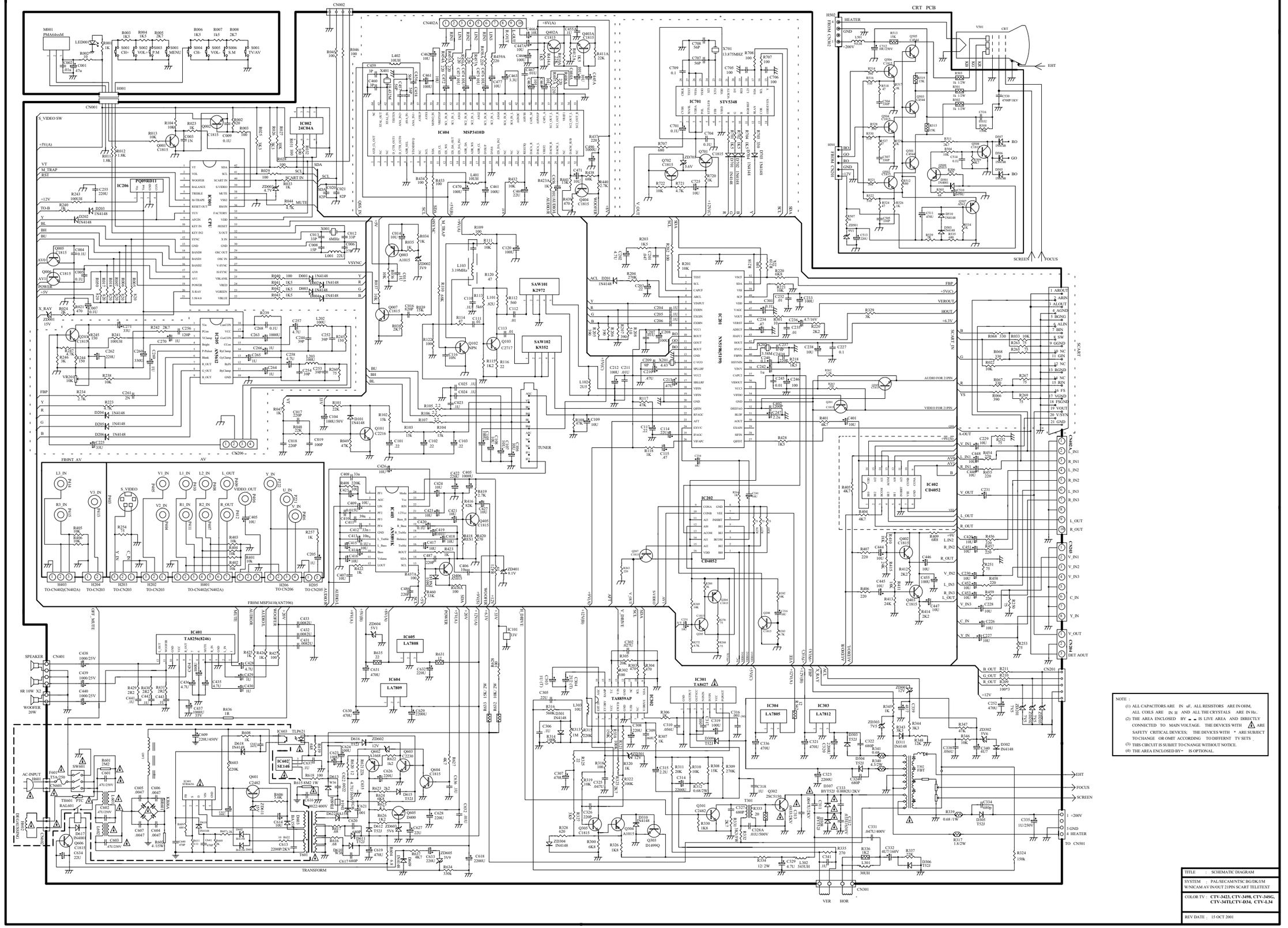
1. Inspect all glue are firmly placed.
2. Check all screws are tightened, no missing and loose.
3. Check all the connectors are fully located onto the chassis base.
4. Check all the safety components are firmly located onto the chassis and no damage.
5. The TV internal side should not see any excess metal materials.
6. Check all the cable and wire are OK in-used.
7. Check the FBT and switching transformers not high mounting. The big capacitor are not slanting and high mounting.

4. HIGH POTENTIAL TESTING:-

1. Set the mega-meter is set in position.(Insulation tester)
2. Set the meter to DC500V.
3. Use the meter probe onto the tuner body and the power cord on connector socket.
4. Switch on the button and test the insulation performance and the reading at 2/3 position.
5. Insulation spec must over 9.0 Mohm. if not reject.
   Note: Everyday work check the high pot. Condition as 3100V, 10 mA, 5 sec are OK.

5. SAFETY CHECK:-

1. High voltage checking. Use high pot tester and set the tester to 3100V, 10mA and ensure the AC/DC switch is in AC position. Set the tester to 10mA and timer to 5 sec. Test all naked metal of the TV and ensure no arcing and sparking.
2. Checking methods.
   - connect the power cord into power socket.
   - the high pot tester gun pointed at metal part of TV set body.
   - switch on the switch to test the high electric power.
   - connect with high voltage within 5 second and remove the tester gun point.



NOTE :

(1) ALL CAPACITORS ARE IN uF, ALL RESISTORS ARE IN OHM, ALL COILS ARE IN H AND ALL THE CRYSTALS ARE IN Hz..

(2) THE AREA ENCLOSED BY ▬ ▬ IS LIVE AREA AND DIRECTLY CONNECTED TO MAIN VOLTAGE. THE DEVICES WITH ⚠ ARE SAFETY CRITICAL DEVICES; THE DEVICES WITH * ARE SUBJECT TO CHANGE OR OMIT ACCORDING TO DIFFERNT TV SETS .

(3) THIS CIRCUIT IS SUBJET TO CNANGE WITHOUT NOTICE.

(4) THE AREA ENCLOSED BY - IS OPTIONAL.

TITLE : SCHEMATIC DIAGRAM

SYSTEM : PAL/SECAM/NTSC BG/DK/I/M
W/NICAM AV IN/OUT 21PIN SCART TELETEXT

COLOR TV : **CTV-3423, CTV-3498, CTV-34SG,**
CTV-34TI,CTV-D34, CTV-L34

REV DATE : 15 OCT 2001