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Colour TV
Service Manual

CHASSIS: TB1238

MODEL:
21RBS3Ve

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TB 1238 SERIES I²C BUS CONTROL INSTRUSTION

3. The way go into the factory mode
   Step 1. Press the numeric keys, switch to the position 12
   Step 2. Press the numeric keys again, switch to the position 38
   Step 3. Press the MENU key to call up the **POS.LOCK** menu
   Step4. Press the **MUTE** key
   Step5. Press the numeric key to input the password ***1, 2, 3, 8***. Then the TV will enter into the factory mode while the "M" displayed on the top of the screen.

4. Under adjusting mode, you can select the item you want by pressing the " ↓↑ " keys and you can adjust the value of the items when you press the " → ← " keys.
5. If the adjusting is default, please restore the data as previous or adjust according the table as follows.

No	Item	Value	Meaning	No	Item	Value	Meaning
1	RCUT	20*	Red cut-off	35	VP 60	01	60Hz vertical center
2	GCUT	38*	Green cut-off	36	HITS	FD	50Hz/60Hz vertical size
3	BCUT	44*	Blue cut-off	37	VLIN	0A	Vertical linearity
4	GDRV	40*	Green drive	38	VSC	06	Vertical S correction
5	BDRV	40*	Blue drive	39	VLIS	FF	50Hz/60Hz vertical linearity
6	CNTX	3F	Contrast maximum	40	DPC	00	50Hz pillow distortion correction
7	BRTC	30	Brighter center	41	DPCS	00	50/60Hz pillow distortion correction
8	COLC	50	Color center	42	KEY	00	50Hz keystone distortion
9	TNTC	40	Tint center	43	KEYS	00	50/60Hz keystone distortion
10	COLP	10	Color center of PAL	44	WID	00	50Hz horizontal size
11	COLS	40	Color center of SECAM	45	WIDS	00	50/60Hz horizontal size
12	SCNT	0F	Sub-contrast	46	VCP	00	Vertical compensation
13	CNTC	20	Sub-contrast center	47	CNR	00	Coner correction
14	CNTN	08	Sub-contrast minimum	48	HCP	00	Horizontal compensation
15	BRTX	20	Sub-bright maximum	49	SBY	08	SECAM B-Y
16	BRTN	20	Sub-bright minimum	50	SRY	08	SECAM R-Y
17	COLX	7F	Sub-color maximum	51	RAGC	16	R.F. AGC
18	COLN	00	Sub-color minimum	52	AFT	40*	Auto frequency tune
19	TNTX	35	Sub-tint maximum	53	HAFC	00	AFC Gain
20	TNTN	28	Sub-tint minimum	54	V25	55	25 percent Volume
21	ST 3	3F	TV-3.58 sharpness	55	V50	6F	50 percent Volume
22	SV 3	3F	AV-3.58 sharpness	56	BRTS	00	Sub-bright
23	ST 4	20	TV-4.43 sharpness	57	VM 2	30	(CTS-763A)
24	SV 4	3F	AV-4.43 sharpness	58	MOD0	21	Mode 0
25	SHPX	30	Sharpness maximum	59	MOD1	06	For 14 and 21 inches Mode 1
						17	For 25 and 29 inches Mode 2
26	SHPN	1A	Sharpness minimum	60	MOD2	0C	Mode 2
27	TXCX	36	OSD contrast maximum	61	SELF VCO	7G*	Self-diagnosis VCO

No	Item	Value	Meaning	No	Item	Value	Meaning
28	RGCN	16	OSD contrast minimum	62	SELF AGC	69*	Self-diagnosis AGC
29	VMO	7C	VCD data 0	63	SELF BRTC	75*	Self-diagnosis bright center
30	VM 1	00	VCD data 1	64	SELF CNTC	00*	Self-diagnosis contrast center
31	HPOS	0B	Horizontal position	65	SELF TNTC	32*	Self-diagnosis tint center
32	VP 50	04	50 Hz vertical center	66	SELF COL	23*	Self-diagnosis color center
33	HIT	19	50 Hz vertical size	67	OSD	00	OSD width adjustment
34	HPS	02	50/60Hz horizontal center	68	OPT	27	Option
69	MOD3	07	Language	70	ZOOM IN HIT	3F	Zoom in height
71	ZOOM OUT HIT	0b	Zoom out height				

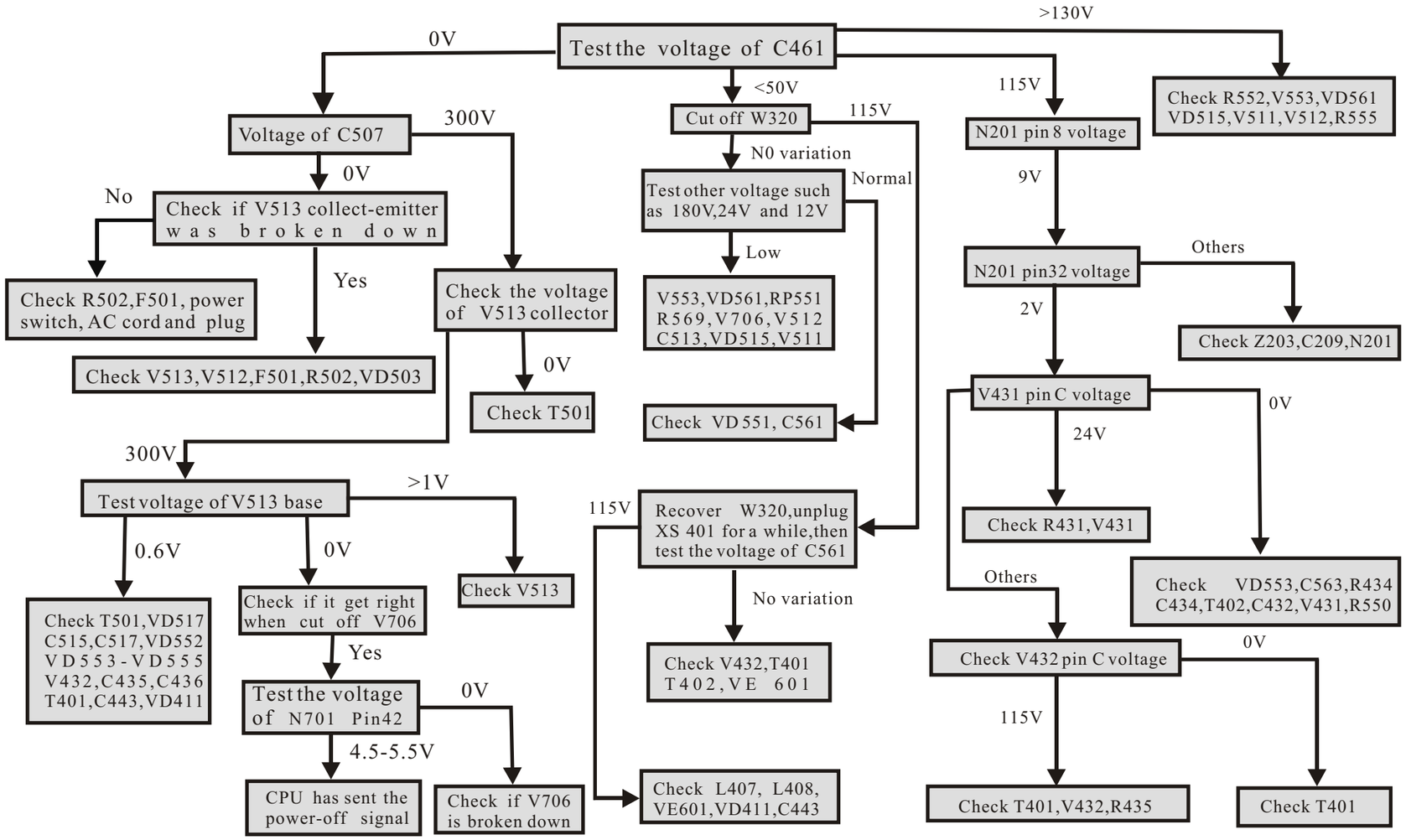
Note:

1. The items with * in value are very special, do not adjust them at random. The items(1-5) are used to debug white-black-balance of set.
2. The general secret code is 2175.
3. If you find the threadlike disturbance on the top of picture, please adjust the VM 2 in the items and make its value come to 34.
4. When E PROM does not work, please exchange the same model chip with data that the manufacture has already input. 2

TYPICAL FAILURE ANALYSE

1. Three-None (no raster, no picture, no sound)

This failure is mainly caused by big-power circuit such as power supply, horizontal scanning, vertical scanning.
The detail checking and repairing steps are as follow.


Test the voltage of C461
0V
>130V
<50V
115V
Voltage of C507
300V
Cut off W320
115V
Check R552,V553,VD561
VD515,V511,V512,R555
N201 pin 8 voltage
N0 variation
0V
Test other voltage such
as 180V,24V and 12V
Normal
9V
No
Check if V513 collect-emitter
was broken down
Low
Others
N201 pin32 voltage
Check R502,F501, power
switch, AC cord and plug
Yes
Check the voltage
of V513 collector
V553,VD561,RP551
R569,V706,V512
C513,VD515,V511
2V
Check Z203,C209,N201
Check V513,V512,F501,R502,VD503
0V
Check T501
Check VD551, C561
V431 pin C voltage
0V
24V
300V
Test voltage of V513 base
>1V
115V
Recover W320,unplug
XS 401 for a while,then
test the voltage of C561
Check R431,V431
0.6V
0V
Check T501,VD517
C515,C517,VD552
VD553-VD555
V432,C435,C436
T401,C443,VD411
Check if it get right
when cut off V706
Check V513
Check VD553,C563,R434
C434,T402,C432,V431,R550
Others
No variation
Check V432,T401
T402,VE601
Check V432 pin C voltage
0V
Yes
Test the voltage
of N701 Pin42
0V
115V
4.5-5.5V
CPU has sent the
power-off signal
Check if V706
is broken down
Check L407, L408,
VE601,VD411,C443
Check T401,V432,R435
Check T401

2. Two-None (no picture, no sound)

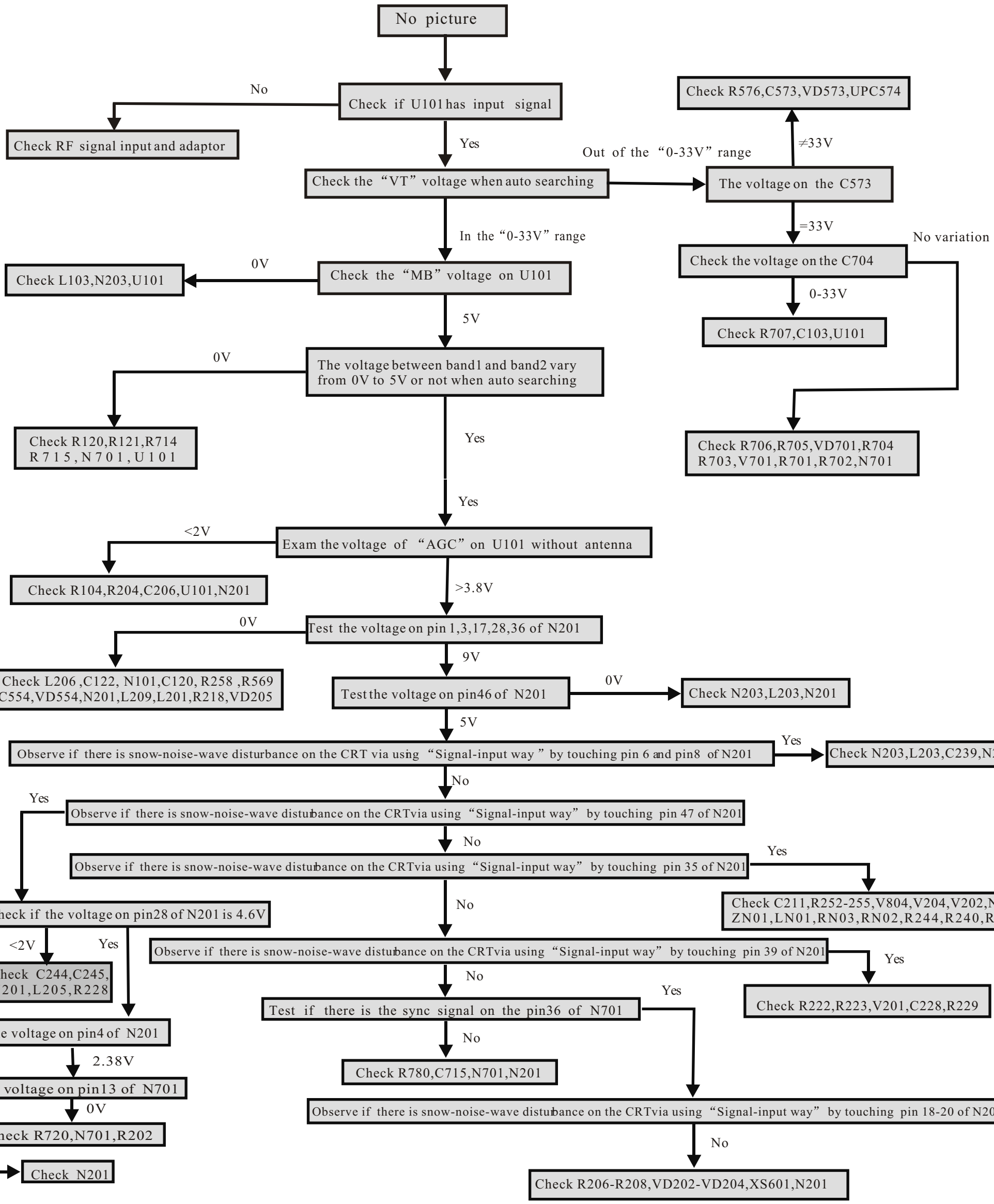
The failure shows that the set does not display the picture but it has noise wave or blue background or OSD on the screen. This means that the circuits of power supply, horizontal scanning, vertical scanning and video amplification are normal and they are not considered in the repairing. The failures are mainly in the small signal processing circuits.

Before checking these circuits, a kind of practical test method is introduced .It is called Signal-input way .The detail is described as follow:

W e can use the resistance function of an analog multimeter, connect the red pole (negative in ohm scope) on the circuit board ground, then touch softly the test point with another pole (black pole) in ohm scope meanwhile observe the reactivity on the output device.

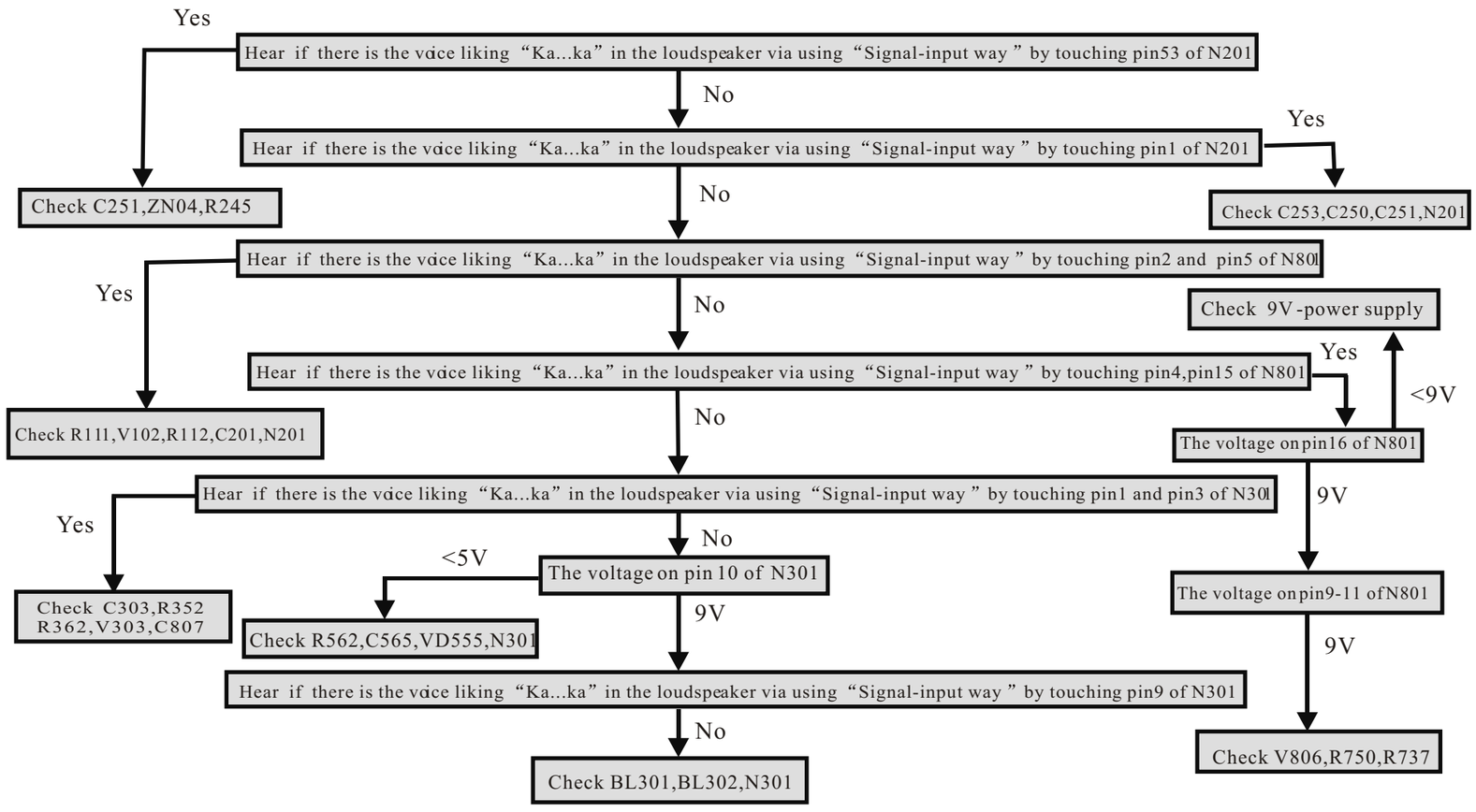
Note: In the TV test, we mainly observe the noise wave on the CRT and listen to the noise voice liking as Ka....Ka from the loudspeakers.

a. No picture


No picture
Check if U101 has input signal
No
Check RF signal input and adaptor
Yes
Check the "VT" voltage when auto searching
Out of the "0-33V" range
Check R576,C573,VD573,UPC574
≠33V
The voltage on the C573
=33V
No variation
In the "0-33V" range
0V
Check L103,N203,U101
Check the "MB" voltage on U101
Check the voltage on the C704
0-33V
Check R707,C103,U101
5V
0V
The voltage between band1 and band2 vary from 0V to 5V or not when auto searching
Check R120,R121,R714 R715,N701,U101
Yes
Check R706,R705,VD701,R704 R703,V701,R701,R702,N701
Yes
<2V
Exam the voltage of "AGC" on U101 without antenna
Check R104,R204,C206,U101,N201
>3.8V
0V
Test the voltage on pin 1,3,17,28,36 of N201
Check L206 ,C122, N101,C120, R258 ,R569 C554,VD554,N201,L209,L201,R218,VD205
9V
Test the voltage on pin46 of N201
0V
Check N203,L203,N201
5V
Observe if there is snow-noise-wave disturbance on the CRT via using "Signal-input way" by touching pin 6 and pin8 of N201
Yes
Check N203,L203,C239,N201
No
Yes
Observe if there is snow-noise-wave disturbance on the CRTvia using "Signal-input way" by touching pin 47 of N201
No
Observe if there is snow-noise-wave disturbance on the CRTvia using "Signal-input way" by touching pin 35 of N201
Yes
Check C211,R252-255,V804,V204,V202,N201 ZN01,LN01,RN03,RN02,R244,R240,R227
Check if the voltage on pin28 of N201 is 4.6V
No
<2V
Yes
Observe if there is snow-noise-wave disturbance on the CRTvia using "Signal-input way" by touching pin 39 of N201
Yes
Check C244,C245, N201,L205,R228
No
Check R222,R223,V201,C228,R229
Yes
Test if there is the sync signal on the pin36 of N701
The voltage on pin4 of N201
No
2.38V
Check R780,C715,N701,N201
The voltage on pin13 of N701
Observe if there is snow-noise-wave disturbance on the CRTvia using "Signal-input way" by touching pin 18-20 of N201
0V
Check R720,N701,R202
No
0V
Check N201
Check R206-R208,VD202-VD204,XS601,N201

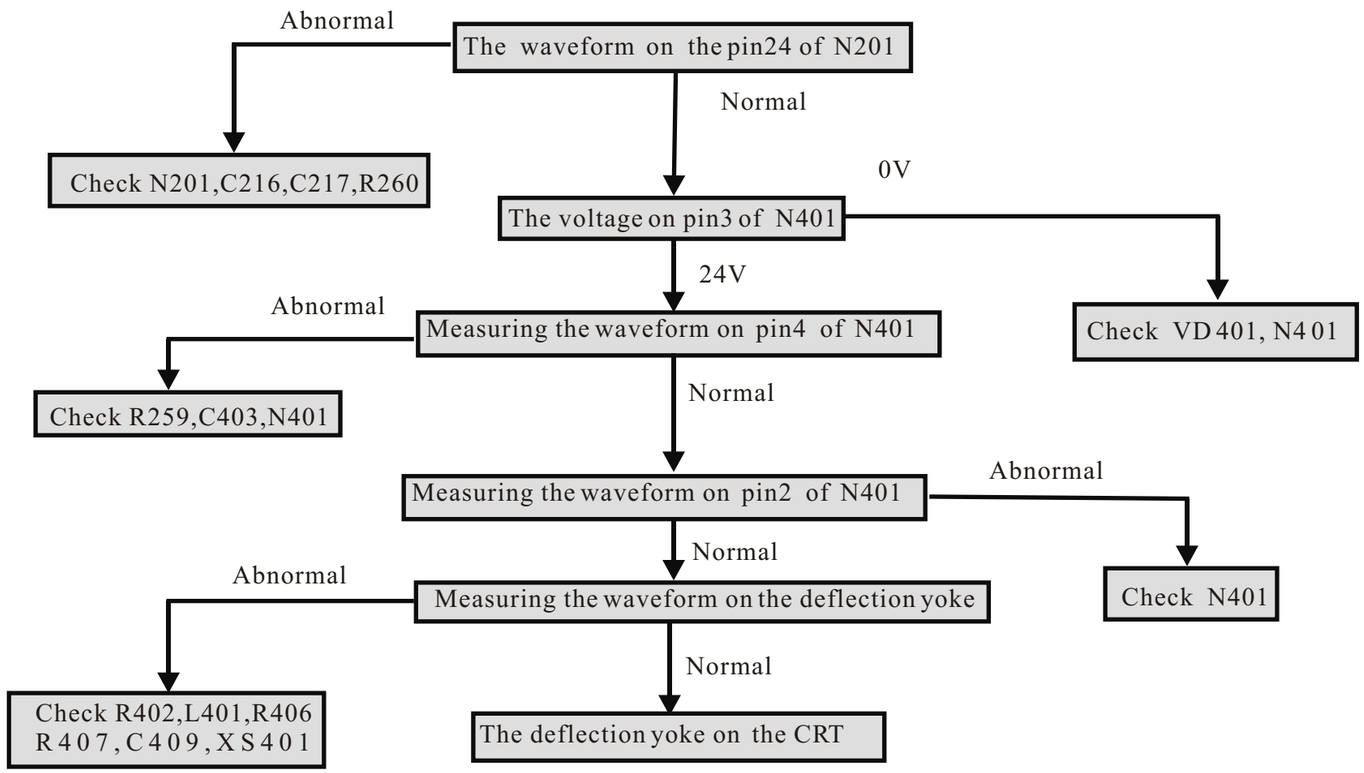
b. No sound

In this kind of failure, first of all we should observe if there is the picture on the CRT . It proves the small signal circuit to work correctly with the picture on the CRT and we only check the sound signal processing and sound amplification circuit. The repairing method (B1) may be referred without picture. The detail checking and repairing steps are as follow.
Note:
Before repairing, assure that the volume is on and the state of set is in TV.


Yes
Hear if there is the voice liking “Ka...ka” in the loudspeaker via using “Signal-input way ” by touching pin53 of N201
No
Yes
Hear if there is the voice liking “Ka...ka” in the loudspeaker via using “Signal-input way ” by touching pin1 of N201
Check C251,ZN04,R245
No
Check C253,C250,C251,N201
Hear if there is the voice liking “Ka...ka” in the loudspeaker via using “Signal-input way ” by touching pin2 and pin5 of N801
Yes
No
Check 9V-power supply
Yes
Hear if there is the voice liking “Ka...ka” in the loudspeaker via using “Signal-input way ” by touching pin4,pin15 of N801
<9V
Check R111,V102,R112,C201,N201
No
The voltage on pin16 of N801
Hear if there is the voice liking “Ka...ka” in the loudspeaker via using “Signal-input way ” by touching pin1 and pin3 of N301
9V
Yes
No
<5V
The voltage on pin 10 of N301
The voltage on pin9-11 of N801
Check C303,R352
R362,V303,C807
Check R562,C565,VD555,N301
9V
9V
Hear if there is the voice liking “Ka...ka” in the loudspeaker via using “Signal-input way ” by touching pin9 of N301
No
Check V806,R750,R737
Check BL301,BL302,N301

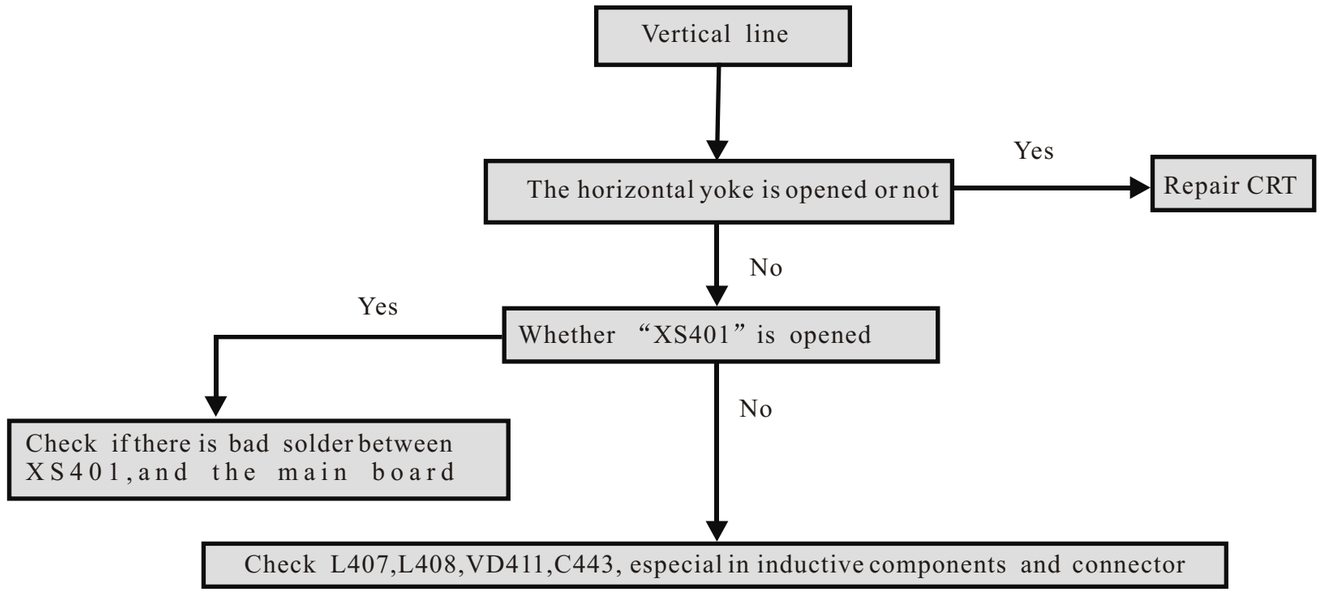
3. Only horizontal line in the middle of the screen

If vertical deflection circuit does not work, this kind of failure will happen. In deflection yoke, there only has horizontal sweeping. The electron beam in the CRT only moves in the horizontal orientation so form this failure.
(While checking horizontal and vertical deflection circuit s failure, we have better to use an oscilloscope.)


Abnormal
The waveform on the pin24 of N201
Normal
Check N201,C216,C217,R260
0V
The voltage on pin3 of N401
24V
Abnormal
Measuring the waveform on pin4 of N401
Check VD401, N401
Check R259,C403,N401
Normal
Abnormal
Measuring the waveform on pin2 of N401
Abnormal
Normal
Check N401
Abnormal
Measuring the waveform on the deflection yoke
Normal
Check R402,L401,R406
R407,C409,XS401
The deflection yoke on the CRT

4. Only vertical line in the middle of the screen

This is a dangerous failure. It probable causes flashover and smoking inside the set. Don t let your TV work for a long time as this failure appears.
Because the electron beam can not move in the horizontal orientation, the failure should be in the horizontal deflection circuit. We mainly check the open-circuit fault in horizontal deflection circuit.
The detail checking and repairing steps are as follow:

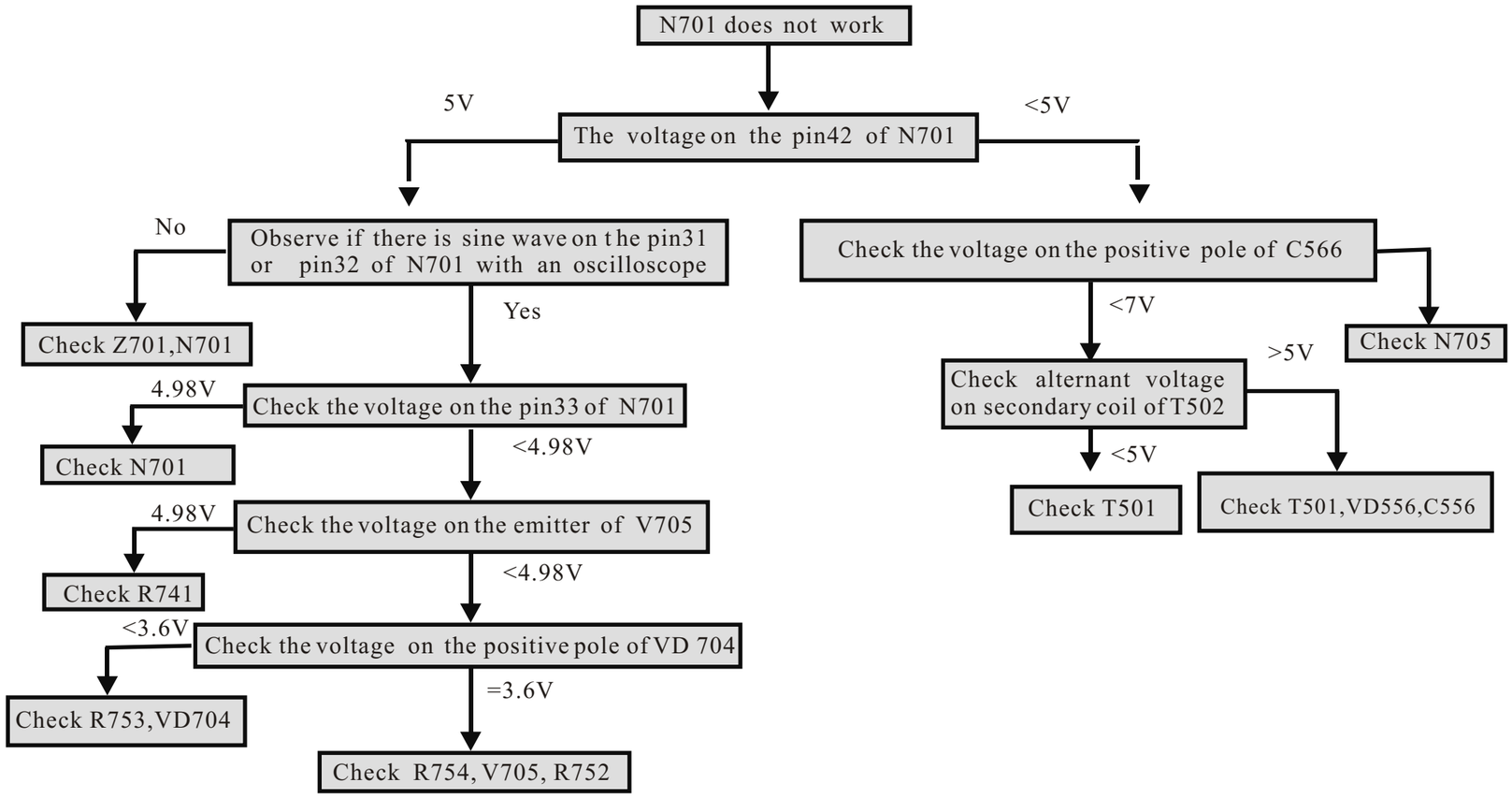

Vertical line
The horizontal yoke is opened or not
Yes
Repair CRT
No
Whether “XS401” is opened
Yes
Check if there is bad solder between XS401,and the main board
No
Check L407,L408,VD411,C443, especial in inductive components and connector

5. CPU does not work

In television, remote-control system is similar with the computer system. In theory, it can work if it holds two conditions as follow:

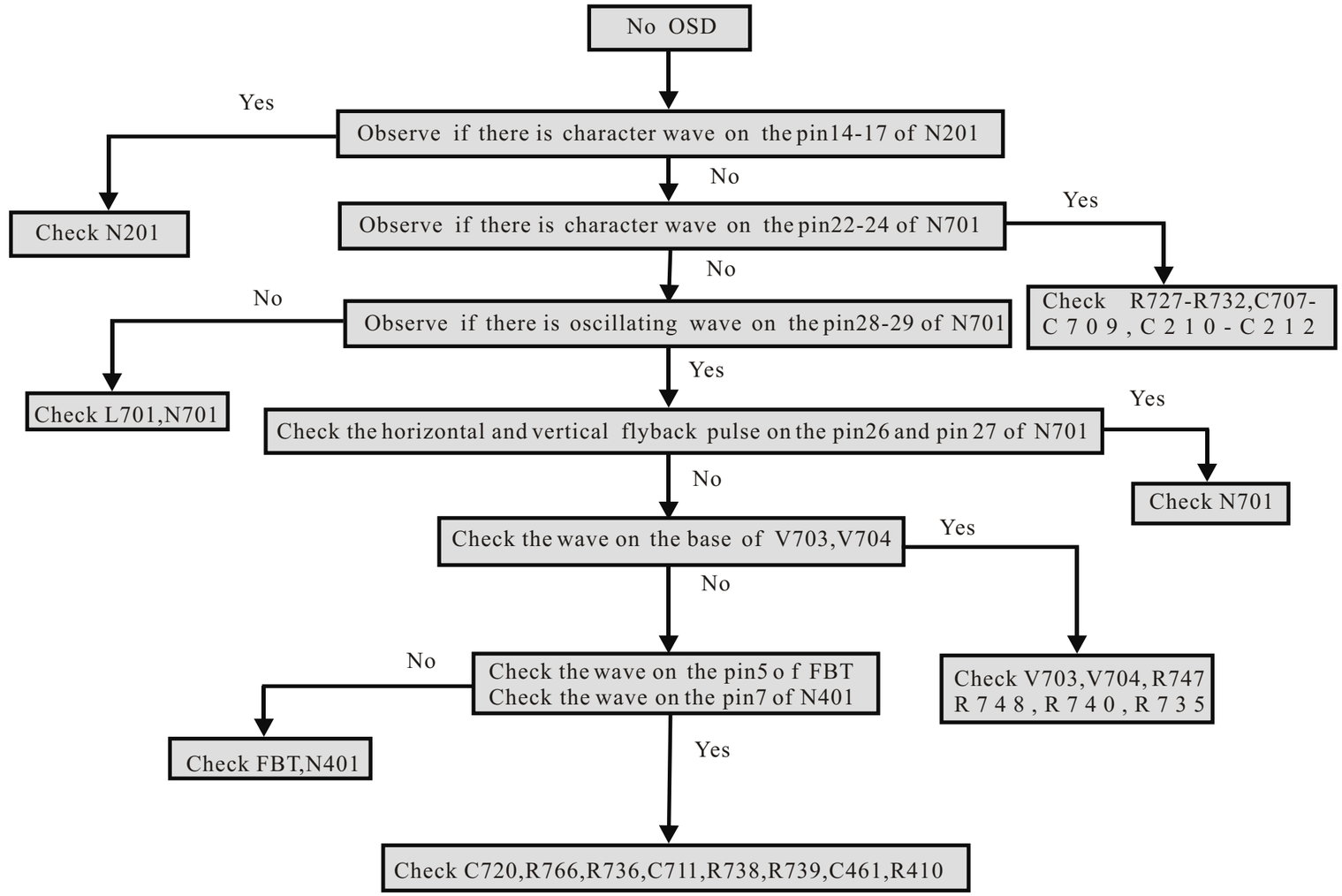
1) The power supply: In general, it is 5V, the error is not above 10% and the disturbance pulse is as small as possible.
2) The clock pulse: In TB 1238 circuit, the clock pulse is generated by pin31/ pin32 of N701 and a 8M crystal oscillator.

Television s remote-control system also needs reset circuit that can preset the values in internal register. The circuit around pin33 of N701 is called auto-reset circuit. If CPU detects errors in resetting, it will come to the state of programme protected.
The detail checking and repairing steps are as follow:


N701 does not work
The voltage on the pin42 of N701
5V
<5V
Observe if there is sine wave on the pin31 or pin32 of N701 with an oscilloscope
No
Yes
Check Z701,N701
Check the voltage on the pin33 of N701
4.98V
<4.98V
Check N701
Check the voltage on the emitter of V705
4.98V
<4.98V
Check R741
Check the voltage on the positive pole of VD 704
<3.6V
=3.6V
Check R753,VD704
Check R754, V705, R752
Check the voltage on the positive pole of C566
<7V
>5V
Check N705
Check alternant voltage on secondary coil of T502
<5V
Check T501
Check T501,VD556,C556

6. No OSD (On Screen Display)

This failure is usually cause by the circuit of character generated and located. Most of reasons are that the horizontal and vertical flyback pulse signals do not come to CPU.
We can judge this failure by measuring the wave of the character in an oscilloscope.
The detail checking and repairing steps are as follow:


No OSD
Observe if there is character wave on the pin14-17 of N201
Yes
Check N201
No
Observe if there is character wave on the pin22-24 of N701
Yes
Check R727-R732,C707-C709,C210-C212
No
Observe if there is oscillating wave on the pin28-29 of N701
No
Check L701,N701
Yes
Check the horizontal and vertical flyback pulse on the pin26 and pin 27 of N701
Yes
Check N701
No
Check the wave on the base of V703,V704
Yes
Check V703,V704,R747 R748,R740,R735
No
Check the wave on the pin5 of FBT
Check the wave on the pin7 of N401
No
Check FBT,N401
Yes
Check C720,R766,R736,C711,R738,R739,C461,R410

VARIOUS PARAMETERS OF INTEGRATED CIRCUIT

A. Pin voltage of N201

PIN	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
VOL.	4.9V	3.5V	4.1V	2.4V	0V	2V	2V	1.2V	4.2V
FUNC.	DE EMP	A-OUT	IF VCC	AFT GND	IF GND	IF IN 1	IF IN 2	RF-AGC	IF AGC
PIN	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
VOL.	2.4V	3.8V	0V	0V	3V	3V	3V	9.1V	2.5V
FUNC.	APC	XCO	Y/C GND	FB	R IN	G IN	B IN	RGB VCC	R OUT
PIN	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**
VOL.	2.4V	2.5V	6.1V	4.6V	5.3V	1V	1.8V	3.9V	4.1V
FUNC.	G OUT	B OUT	ABL	V RAMP	V FB	V OUT	V AGC	SCL	SDA
PIN	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
VOL.	9.3V	3.8V	0.4V	4V	2V	0V	1.3V	5.3V	3V
FUNC.	H VCC	ID CW	FBP IN	SYNC OUT	H OUT	DEF GND	SCP	CVBS OUT	DIG VCC
PIN	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**
VOL.	2.5V	2.5V	3.1V	7.3V	1.6V	0V	3.2V	2.3V	2.8V
FUNC.	B-Y IN	R-Y IN	Y IN	H AFC	EXT Y IN	DIG GND	TV Y IN	BLACK DET	C IN
PIN	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**
VOL.	5.4V	3.8V	4.6V	0V	8.2V	8.2V	9.1V	4.7V	5.6V
FUNC.	Y/C VCC	IF DET	LOOP FIL	VCD GND	VC 01	Vc02	VCO VCC	SIF IN	REG
PIN	**55**	**56**							
VOL.	4.3V	3.5V							
FUNC.	EXT A IN	FM DET							

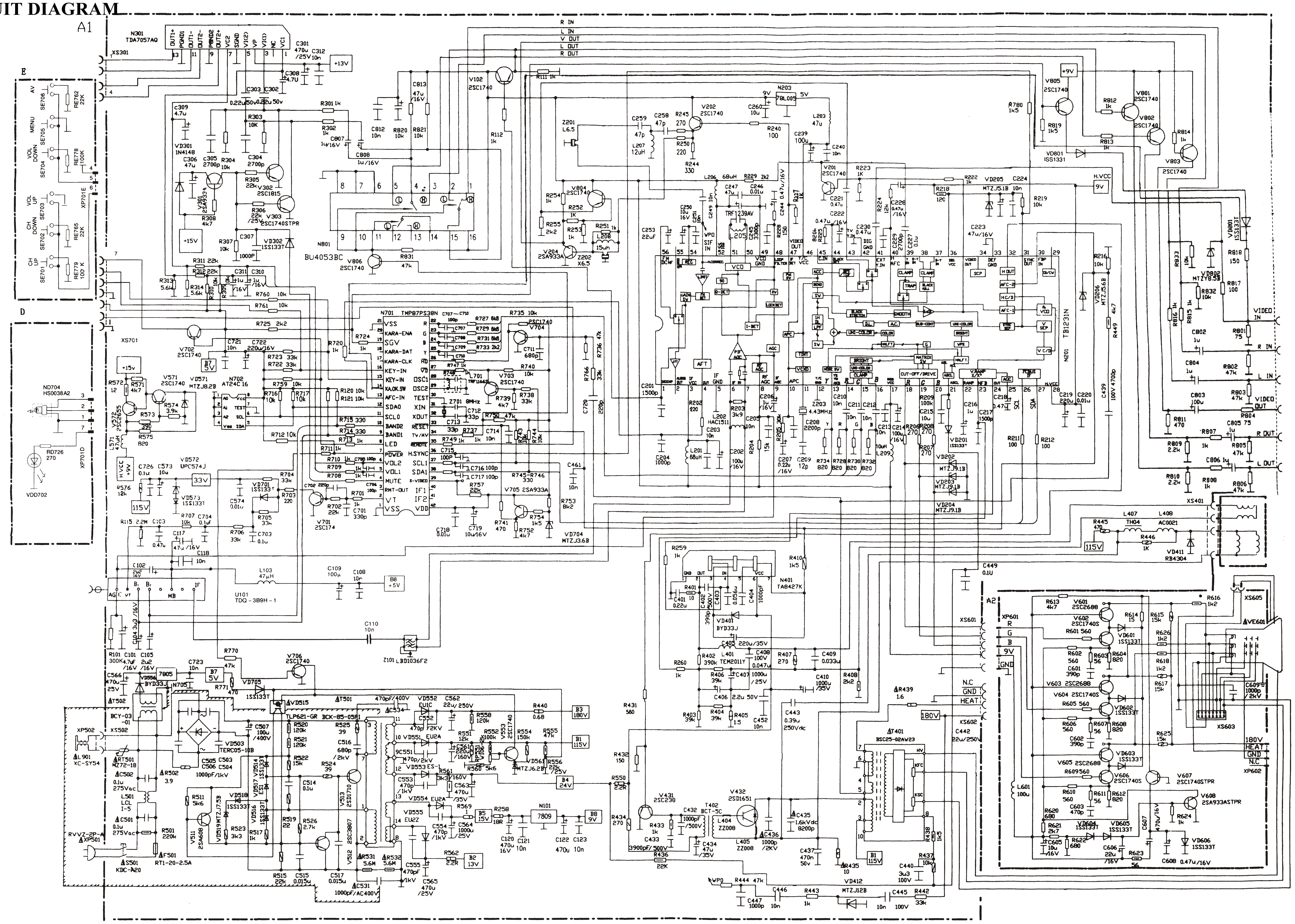
B. Pin voltage of N701

PIN	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
VOL.	0V	4.8V	5V	0V	3.8V	3.8V	0V	5V	5V
FUNC.	GND	VT	RMT OUT	MUTE	VOL1	VOL2	POWER	LED	BAND1
PIN	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
VOL.	0V	5V	5V	2.4V	0V	4.8V	4.9V	0V	0V
FUNC.	BAND2	SCL0	SDA0	AFC IN	KARA SW	KEY IN 1	KEY IN 2	KARA CLK	KARA DATA
PIN	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**
VOL.	0V	0V	0V	0V	0V	0V	0V	4.4V	4.8V
FUNC.	SGV	KARA ENA	GND	OSD R	OSD G	OSD B	OSD Y	HD	VD
PIN	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
VOL.	5V	5V	0V	1.4V	2.2V	5V	0.6V	4.5V	4.8V
FUNC.	OSC1	OSC2	TEST	X IN	X OUT	RESET	TV/AV	REMOTE	H SYNC
PIN	**37**	**38**	**39**	**40**	**41**	**42**			
VOL.	3.8V	4V	0.2V	0.2V	0V	5V			
FUNC.	SCL1	SDA1	S VIDEO	IF 1	IF 1	VCC			

C. Pin voltage of N401 (TA8427)

PIN	**1**	**2**	**3**	**4**	**5**	**6**	**7**
VOL.	0V	14.1V	27.2V	0.93V	0.83V	26.8V	1.33V
FUNC.	GND	V OUT	PUMP POWER	INPUT	PHASE COMPEN.	POWER SUPPLY	PULSE OUT

CIRCUIT DIAGRAM



Pin Voltage of N701(Unit:V)

pin2	pin4	pin7	pin8	pin9	pin10	pin11	pin12	pin13	pin15	pin16
4.90	4.92	0.02	4.98	0.04	0.04	4.99	4.99	2.79	4.97	4.97

pin19	pin26	pin27	pin28	pin29	pin31	pin32	pin33	pin34	pin35	pin36
0.03	4.37	4.78	4.98	4.98	2.05	2.30	4.98	0.63	4.93	3.94

pin37	pin38	pin39	pin42
3.90	4.10	0.36	4.99

Pin Voltage of N201(Unit:V)

pin1	pin3	pin4	pin6	pin7	pin8	pin9	pin10	pin11	pin14	pin15
4.94	9.08	2.38	1.94	1.94	1.23	4.19	2.38	3.81	3.01	2.99

pin16	pin17	pin18	pin19	pin20	pin21	pin22	pin23	pin24	pin25	pin26
3.01	9.13	2.54	2.42	2.50	6.10	4.55	5.29	0.92	1.81	3.93

pin27	pin28	pin30	pin31	pin32	pin35	pin36	pin39	pin40	pin41	pin43
4.13	9.34	0.39	3.93	1.95	2.84	5.25	3.05	7.29	1.57	3.19

pin44	pin46	pin47	pin48	pin50	pin51	pin52	pin53	pin54
2.33	5.43	3.75	4.59	8.23	8.23	9.06	4.71	5.61

Pin Voltage of N401(Unit:V)

pin1	pin2	pin3	pin4	pin5	pin6	pin7
0	14.10	27.2	0.93	0.83	26.8	1.33

Notice:

1. All resistance values are in ohms. k represents kΩ. M represents MΩ. k =10^3. M=10^6
2. The rated power of all resistance is 1/6W unless otherwise noted.
3. All capacitance values without unit are in pF . m represents mF, n represents nF ,m=10^6 ,n=10^3 .
4. The rated voltage of all capacitances is 50V unless otherwise noted.
5. Product safety should be considered when a component replacement is made in any area of a receiver.

The values of the components indicated by a mark ⚠ in this circuit diagram have special Significance to product safety . It is particularly recommended that only the parts specified in service Manual be used for components replacement pointed out by the mark.

6. This circuit diagram covers a basic or representative chassis by only. The re may be some components or partial circuit differences between the actual chassis and the circuit diagram.

EXPLODED VIEW

