

# HITACHI

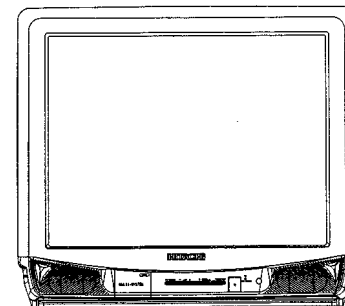
## SERVICE MANUAL

### V2 CHASSIS

YS

No. 0077E

C2198FS	- 051, 751, 081,
C2128FS	981, 191, 192,
C2125MS	195, 433
C2123MN	
C2120PN	



注意: 开始检修电视机机芯以前, 检修人员必须阅读这本检修手册中“Safety Precaution”及“Product Safety Notices”两节。

CAUTION: Before servicing this chassis, it is important that the service technician reads the "Safety Precaution" and "Product Safety Notices" in this Service Manual.

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SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT.

## COLOR TELEVISION

October 1998

Hitachi Consumer Products (S)

## V2 CHASSIS

### SAFETY PRECAUTIONS

**WARNING:** The following precautions should be observed.

1. Do not install, remove, or handle the picture tube in any manner unless shatter proof goggles are worn. People not so equipped should be kept away while picture tubes are handled. Keep the picture tube away from the body while handling.
2. When service is required, an isolation transformer should be inserted between power line and the receiver before any service is performed on the chassis.
3. When replacing the chassis in the cabinet, ensure all the protective devices are put back in place, such as barriers, non-metallic knobs, adjustment or compartment covers or shields, isolation resistors/capacitors, etc.
4. When service is required, observe the original lead dressing. Extra precaution should be taken to assure correct lead dressing in the high voltage circuitry area. Particularly note the R.G.B. lead dressing. Ensure they are dressed well away from the horizontal scan and F.B.T. circuitry.
5. Always use the manufacturer's replacement component. Always replace original spacers and maintain lead lengths. Especially critical components are indicated thus  $\Delta$  on the parts list and should not be replaced by other makes. Furthermore, where a short circuit has occurred, replace those components that indicate evidence of overheating.
6. Before returning a serviced receiver to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the instrument by the manufacturer has become defective, or inadvertently damaged during servicing. Therefore, the following checks are recommended for the continued protection of the customers and service technicians.

### INSULATION

Insulation resistance should not be less than  $7M\Omega$  at 500V DC between the mains poles and any accessible metal parts. Also, no flashover or breakdown should occur during the dielectric strength test, applying 3kV AC or 4.25kV DC for two seconds between the main poles and accessible metal parts.

### HIGH VOLTAGE

High voltage should always be kept at the rated value of the chassis and no higher. Operating at higher voltages may cause a failure of the picture tube or high voltage supply, and also, under certain circumstances could produce X-radiation moderately in excess of design levels. The high voltage must not, under any circumstances, exceed 33.4kV on the chassis.

### X-RADIATION

**TUBES:** The primary source of X-radiation in this receiver is the picture tube. The tube utilised for the above mentioned function in this chassis is specially constructed to limit X-radiation.

For continued X-radiation protection, replace tube with the same type as the original HITACHI approved type.

### PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in HITACHI television receivers have special safety related characteristics. These characteristics are often not evident from visual inspection, nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified by marking with a  $\Delta$  on the schematics and replacement parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create electrical shock, fire, X-radiation, or other hazards.

Product Safety is continuously under review, and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies of HITACHI Service Manuals, may be obtained at a nominal charge from your HITACHI SALES OFFICES.

### TUBE DISCHARGE

The line output stage can develop voltages in excess of 25kV; if the E.H.T. cap is required to be removed, discharge the anode cap to chassis via a high value resistor, prior to its removal from the tube.

## V2 CHASSIS

### SPECIFICATIONS

Power supply	-98*, -192, -195, 05*, -191  -43*  -04*, -08* -75*	AC110V - 240V, 50Hz/60Hz (usable range: 100~264V) AC127V, 50Hz/60Hz (usable range: 100~264V) AC200V - 240V, 50Hz/60Hz (usable range: 150~264V) AC200V - 240V, 50Hz/60Hz AC240V, 50Hz/60Hz
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Aerial input	75 $\Omega$ unbalanced type	
Color picture tube	A51KPD12XX / A51JSY63X / A51QAE320X	
Weight	21.5 kg	
Dimensions (W x H x D)	515mm x 456mm x 481mm	
Speaker	C2123MN : 5x9(cm)x1,	others : 5x9(cm)x2
Sound output	C2123MN : 3Wx1,	others: 3Wx2
Power consumption	C2120PN : 85W C2123MN : 85W C2125MS : 89W	C2128FS : 89W C2198FS : 92W

### Channel coverage

TV (Frequency range: 44MHz ~ 863MHz)

	C2120PN	C2123MN	C2125MS	C2128FS	C2198FS
CCIR: E2~12, E21~69, S01~3, S1~41		0	0	0	0
Japan: J1~12, J13~62				0	0
Hong Kong, UK: UK21~69		0	0	0	0
Australia: AU0~12, AU28~69	0	0	0	0	0
OIRT: R1~12, R21~69		0	0	0	0
USA: US2~13, J-W, US14~69				0	0
China: C1~12, C13~57, Z1~38		0	0	0	0

FM Radio (For C2125MS only)

-43\* ..... 64MHz ~ 75MHz, 87.5MHz ~ 108MHz  
Others ..... 76MHz ~ 108MHz

### Reception system

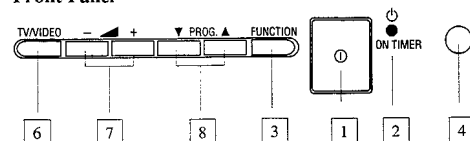
		C2120PN	C2123MN	C2125MS	C2128FS	C2198FS
625-lines	B.G AAL	0	0	0	0	0
	B.G/I/D.K/H PAL		0	0	0	0
	B.G/D.K/K1 SECAM		0	0	0	0
	NTSC50				0	0
525-lines	NTSC50 (VIDEO)	0	0	0	0	0
	NTSC3.58				0	0
	NTSC3.58 (VIDEO)	0	0	0	0	0
	NTSC4.43	0	0	0	0	0
	PAL60	0	0	0	0	0
	SECAM60		0	0	0	0

Specifications may be subject to change without notice for improvement.

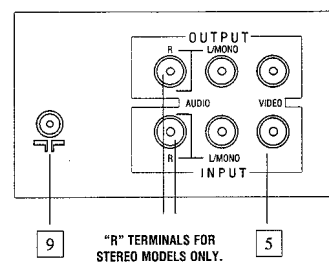
# V2 CHASSIS

## CONTROLS

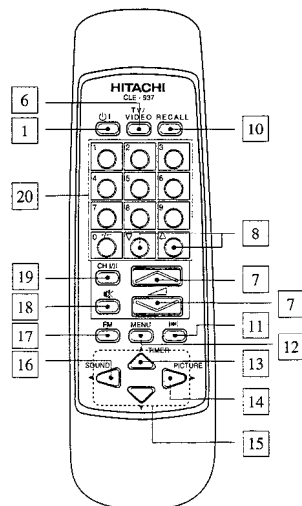
### Front Panel



### Rear Panel



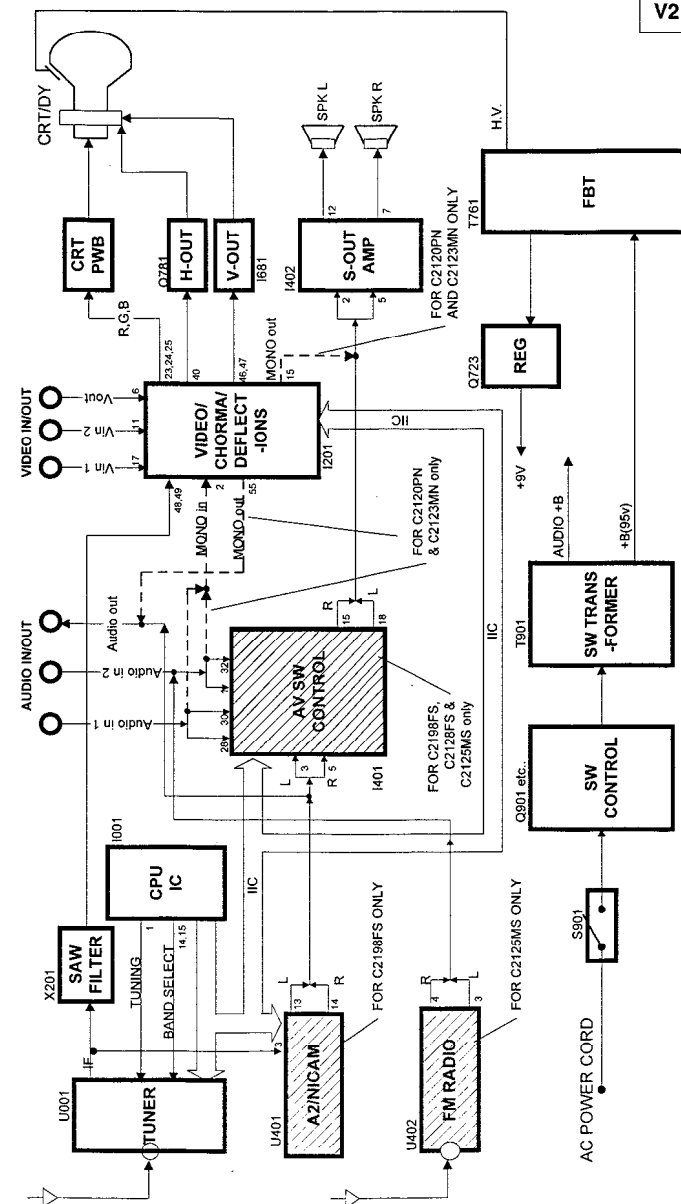
### Remote Control Unit



1	POWER ON/OFF SWITCH
2	POWER STANDBY/TIMER INDICATOR
3	FUNCTION
4	REMOTE CONTROL RECEIVER
5	AV IN/OUT TERMINAL
6	INPUT SELECTOR
7	VOLUME UP/DOWN
8	PROGRAMME UP/DOWN
9	AERIAL TERMINAL
10	RECALL
11	SURROUND SOUND
12	MENU
13	TIMER
14	PICTURE
15	CURSOR
16	SOUND
17	FM (C2125MS ONLY)
18	MUTE
19	CH/II (FOR NIGAM/A2 MODELS)
20	PROGRAMME SELECTOR (DIALECT KEY)

TITLE: BLOCK DIAGRAM OF V2 CHASSIS(C2120PN, C2123MN, C2125MS, C2128FS, C2198FS)

# V2 CHASSIS



## CIRCUIT DESCRIPTION

### Selection and CPU circuitry

IC type, Z90234, performs functions like IIC controls, channel selection, on-screen displays, search tuning, systems selection amongst others. The pin functions of Z90234 is presented in table form as shown below :

PIN NO.	NAME	I/O	FUNCTION
1	VT	Output	Voltage tuning PWM waveform
2	SW2	Output	Message IC sound/audio input 1 selector output.
3	SPAT.1	Output	Spatializer control output 1 (NC)
4	MUTE	Input	Mute control during power on/off
5	WRITE-ENABLE	Output	Write-enable control output for FM radio board
6	CLOCK	Output	Clock signal for FM radio board
7	ALARM	Output	Alarm sound control output. Frequency 1 KHz.
8	SPAT.2	Output	Spatializer control output 2 (NC)
9	PLAY	Output	Play control output for message IC
10	REC	Output	Record control output for message IC
11	POWER	Output	Power ON/OFF control. H: ON, L: OFF
12	M	Output	Output signal for saw filter control.
13	GND		Ground
14	BAND1	Output	Output signal for band selection
15	BAND2	Output	Output signal for band selection
16	SCAN1	Output	Output signal for front panel matrix
17	SCAN2	Output	Output signal for front panel matrix
18	SCAN3	Output	Output signal for front panel matrix
19	RETURN1	Input	Return signal of front panel matrix
20	LED	Output	Output signal for LED control
21	RETURN2	Input	Return signal of front panel matrix
22	B	Output	Blue output for OSD
23	G	Output	Green output for OSD
24	R	Output	Red output for OSD
25	FB	Output	OSD blanking output signal
26	HSYNC	Input	Horizontal synchronous signal i/p pin for OSD
27	VSNC	Input	Vertical synchronous signal i/p pin for OSD
28	OSD OSC.	I/O	Oscillator for OSD
29	OSD OSC.	I/O	Oscillator for OSD
30	X GND		Crystal ground
31	X.IN	Input	Clock in
32	X OUT	Output	Clock out
33	RESET	Output	Reset terminal. H: normal L: Reset
34	Vcc		Voltage supply reference
35	DATA	Output	Data output for FM radio
36	R/C	Input	Remote control signal input
37	SCL1	I/O	IIC data i/o for EEPROM
38	SDA1	I/O	IIC clock select for EEPROM
39	SCL	I/O	Main clock line
40	SDA	I/O	Main data line
41	BG/DK	Output	Port control for sound system select (M: H, BG: L, I: H, DK: L)
42	M/I	Output	Port control for sound system select (M: H, BG: H, I: L, DK: L)

### TUNER AND IF CIRCUIT

The Tuner(U001) used on V2 chassis is powered by the 9V supply, it is IIC Bus controlled and covers VHF, UHF and CATV Band(Mid, Supper and Hyper). The IF output from Tuner(pin 11 of U001) is applied to the amplifier Q201, SAW filter X201 and I201. For Multi-systems model with M-NTSC, switchable SAW filter is used. Q210 at pin 10 of X201 serves to select the IF signal between M/N mode to other modes (e.g. B/G, D/K) before demodulation is made at I201 (TDA8842) and I451(MM1053XS).

i.e. When M/N mode :

Base of Q210 → High

After the demodulation of IF signals from I201 pin 48 & 49, the composite video signals are resulted at pin 6 of I201 for further Video signals processing and Audio sound selection.

For Mono sound models, the composite signal output from pin 6 of I201 is input to a series of bandpass filters(X401~X404) and select with the mode shown in table 1 at I451. The selected signal(e.g. M, B/G, I, or D/K) is then input to pin 1 of I201 via C401.

Table 1.

I451 pin 2	I451 pin 3	Audio Out At pin 1 of I451
H	H	M(4.5MHz)
L	H	B/G(5.5MHz)
H	L	I(6MHz)
L	L	D/K(6.5MHz)

After the FM demodulation performed by I201, the sound output is given at pin 55 and pin 15 (where sound signal at pin 15 already added with Volume control, mute control & other control elements from IIC in I201). With sound output from pin 15, it is then input to pin 2 & 5 of I402(AN5275) for further amplification, and output to the Speakers from pin 7 & 12 of I402.

For the output AV terminal, sound output from pin 55 of I201 is connected to the rear via Q401/Q402, at this point, the audio signal can be output to external equipment if desired.

For Stereo sound models, the IF signal is sent to pin 3 of Nicam/A2 module(U401) where sound system selection, and demodulation are made. The Nicam/A2 Stereo sound output is given at pin 13(L), pin 14(R), pin 16(L) & pin 17(R) of U401. For Nicam/A2 models, the sound outputs from pin 13 & 14 are connected to audio out AV terminals, and pin 16 & 17 are connected to I401(TDA9859) where AV output selection are perform. Volume control for both mono and stereo system are made via IIC Bus in I201 or I401 respectively.

The composite video signal output from pin 6 of I201 is also applied to the SIF rejection filter X202~ X204, the resulting signal is connected to the Video out terminal and return to pin 13 of I201 for color decoding and deflection synchronization etc....

### VIDEO/CHROMA

I201(TDA8842) which incorporates VIDEO/CHROMA/ DEFLECTIONS is used to perform auto color identification of PAL/SECAM/NTSC, sync separation, AFC, H/V oscillator and output stage RGB signals etc...

Video signals from RF, Video 1 and Video 2 entered I201 via pin 13, 17 and 11 respectively. At I201, which input signals(RF, Video 1 or Video 2) to be proceeded are selected by IIC Bus and video signal is demodulated by means of an alignment-free PLL carrier regenerator with an internal VCO. After the color identification and decoding in I201, the color difference signals are matrixed with the luminance signal to obtain the RGB signals which can be controlled on Contrast and Brightness.

The outputs RGB are finally emerged from pin 23~25 of I201 after combined with OSD RGB are then output to CRT PWB.

Internal sync separator and H/V oscillator of I201 produce H drive and V drive signals which are applied to Deflection circuits for processing of Horizontal and Vertical scanning.

### HORIZONTAL DEFLECTION

This circuit uses the horizontal deflection yoke(H. DY) to deflect the electron beam of the CRT horizontally. It also generates high-voltage and medium/low voltage power supplies through FBT. At pin 13, 11 & 17 of I201, the selected composite video signal is applied to the internal separator and phase detector/ correction of I201, the resulted horizontal drive pulse is output from pin 40 of I201.

The horizontal drive pulse is supplied to the horizontal drive circuit consisted of Q721, Q781 and T761. At the horizontal output transistor Q781, it generates a FBT pulse of approximately 1000V at the collector and also causes a sawtooth current to flow to the H.DY, thus deflecting the electron beam in the CRT horizontally. This FBT pulse also causes a high voltage(H.V) and medium/low voltages(i.e. 200V, 16V & 11V) to be generated at the secondary circuit of FBT T761.

The high-voltage beam current is supplied from the +B(95V) to the ACL(Automatic Contrast Limiter) terminal of the FBT. This produces a voltage proportional to the variations in the brightness at the ACL terminal.

## VERTICAL DEFLECTION

At I201, the selected composite video signal from pin 13, 11 or 17 is applied to the internal integrated circuit, V separation circuit and V C/D circuit which counts down the horizontal frequency to obtain the vertical frequency. C605 at pin 51 of I201 is used for ramp generation, and produces the required sawtooth waveform output from pin 46 and 47.

The vertical drive outputs from pin 46 and 47 are applied to pin 2 and 1 of I681 via R601 and R602 respectively. The vertical output to drive the DY is made available at pin 7. The flyback voltage at pin 6 of I681 is applied to pin 7 during flyback period through the voltage switching circuit in I681. This will make the flyback line faster.

The V size, V center and V slope can be adjusted by IIC control.

## POWER SUPPLY CIRCUIT

The power supply circuit of V2 chassis is as below.

## (1) Starting Operation

Power switch S901 turned ON → Rectified at D901 → D904 → Voltage at Q903 base rises → First switching pulse generated at winding P1-P2 of T901 → Drive voltage → Provide to Q905 of winding B1-B3 of T901 → Q905 supply stable drive voltage and L903 provide drive current to Q903 base → Come into normal operations.

## (2) Switching Constant Voltage Operation

AC input voltage rises or +B load decreased (picture get dark) → +B(95V) rises → Ic increased at Q951 → Id increased at I901 → Ic increased at I901 → Voltage decreased at pin 5 of I901 → ON period of Q901 increased → ON period of Q903 decreased → Positive voltage of D951 anode decreased → +B voltage falls → +B voltage stabilized.

## (3) Standby Operation

Remote control power OFF → I001 pin 11 → Q954 off → Q953 off → I201 Vcc pin 37 → Horizontal deflection stopped.

Also → Q952 off → R953 connect into R952 → Voltage of Q951 base rises → ON period of Q903 is slightly decreased by I901 → +B voltage falls (about 65V) → Power consumption decreased.

+5W power provided from T901(S2) winding through D952 and C954 → 5V at pin 34 of I001 stabilized by Q003 and D004.

## AUDIO SWITCHING

For Mono models C2120PN & C2123MN, the audio switching is performed by I201 from the following locations.

- From RF(input at pin 1 of I201)
- From AV-in 1 and AV-in 2 terminal(input at pin 2 of I201)

By the control of IIC, the desired audio signal is selected and output at pin 15(I201) and transferred to audio amplifier I402.

For Stereo model(without Nicam/A2) C2128FS, the audio switching is performed by I401(TDA9859) from the following sources.

- RF audio from pin 15 of I201(parallel input to pin 3 & 5 of I401).
- Audio from L & R of AV-in 1 terminal(input to pin 28 & 30 of I401).
- Audio from L & R of AV-in 2 terminal(input to pin 1 & 32 of I401).

By the control of IIC, the desired audio signal is selected and output at pin 15(R) & pin 18(L) of I401 and transfer to I402.

For Stereo model(with Nicam/A2) C2198FS, the audio switching is performed by I401(TDA9859) from the following sources.

- RF stereo sound from pin 13 & pin 14 of U401 (input to pin 3 & 5 of I401).
- Audio from L & R of AV-in 1 terminal(input to pin 28 & 30 of I401).
- Audio from L & R of AV-in 2 terminal(input to pin 1 & 32 of I401).

By the control of IIC, the desired audio signal is selected and output at pin 15(R) & pin 18(L) of I401 and transfer to I402.

For Stereo model(with FM Radio)C2125MS, the audio switching is performed by I401(TDA9859) from the following sources.

- RF audio from pin 15 of I201(parallel input to pin 3 & 5 of I401).
- Audio from L & R of AV-in 1 terminal(input to pin 28 & 30 of I401).
- Audio from L & R of AV-in 2 terminal or Sound from L & R of FM radio(input to pin 1 & 32 of I401).

By the control of IIC, the desired audio signal is selected and output at pin 15(R) & pin 18(L) of I401 and transfer to I402.

## ADJUSTMENT INSTRUCTIONS

## IIC ADJUSTMENTS

Most of the adjustment items in the V2 chassis are controlled by IIC. Adjustment items include video chroma IC control, sound multiplex Ics, horizontal & vertical deflection and others.

To start the IIC adjustment, first turn off the AC power switch. Press and hold down the TV/Video key and then press the power switch. Release both buttons after the following display appears on screen.

NO.	DATA	
001	: 28	
002	: 28	← Select the Adjust items by ▼ or ▲ cursor
003	: 28	
004	: 80	
005	: 80	
006	: 06	← Adjusts the selected item by ◀ or ▶ cursor
007	: 75	
008	: 40	
		◀ : ADJUST
		RECALL : MEMORIZE

To select the adjustment items(e.g. RGB level, sub-brightness level etc...), press the ▼ or ▲ cursor button on Remote control handset. To adjust the data of selected item, press the ◀ or ▶ cursor button on Remote control handset.

After completing the adjustments, press the **RECALL** button on Remote control handset to memorize the data. Press **MENU** button or turn off the TV set to end the IIC adjustment.

The following are the IIC Bus control and adjustment datas for your reference.

## IIC BUS CONTROL AND ADJUSTMENT

ADJ No.	NAME OF ADJUSTMENT DATA	DATA RANGE	INITIAL DATA(h)	ITEMS AFFECTED DURING CHANGE		
				EEPROM	CPT	TDA8842
1	WHITE POINT R	00-3F	1F	○	○	○
2	WHITE POINT G	00-3F	1F	○	○	○
3	WHITE POINT B	00-3F	1F	○	○	○
6	HORIZONTAL POSITION	00-3F	21	○	○	○
7	SUB-COLOUR	00-3F	1F	○	X	○
8	SUB-TINT	00-3F	1F	○	X	○
9	SUB-BRIGHT	00-3F	1F	○	X	○
10	SUB-CONTRAST	00-3F	17	○	X	○
11	SUB-SHARPNESS	00-3F	1F	○	X	○
12	SWITCH-ON BEHAVIOUR	00-01	0	○	X	○
13	PHASE 1 TIME CONSTANT	00-03	0	○	X	○
14	CRYSTAL	00-03	3	○	X	○
15	FIELD FREQ.	00-03	2	○	X	○
16	INTERLACE	00-01	0	○	X	○
18	SYNCHRONIZATION	00-01	0	○	X	○
19	COLOR DECODER MODE	00-07	0	○	X	○
21	BLACK CURRENT STABILISATION	00-01	0	○	X	○
24	VERTICAL DIVIDER MODE	00-01	0	○	X	○
25	SEARCH TUNING MODE	00-01	0	○	X	○

## IIC BUS CONTROL AND ADJUSTMENT

ADJ No.	NAME OF ADJUSTMENT DATA	DATA RANGE	INITIAL DATA(h)	ITEMS AFFECTED DURING CHANGE		
				EEPROM	CPT	TDA8842
26	VIDEO IDENT MODE	00-01	1	○	X	○
27	LONG BLANKING MODE	00-01	1	○	X	○
29	ENABLE VERTICAL GUARD	00-01	1	○	X	○
30	SERVICE BLANKING	00-01	0	○	X	○
32	PAL-SECAM/NTSC	00-01	0	○	X	○
36	AFC WINDOW	00-01	0	○	X	○
37	IF SENSITIVITY	00-01	0	○	X	○
39	VIDEO MUTE	00-01	0	○	X	○
40	AGC TAKE OVER	00-3F	10	○	X	○
41	SOUND MUTE	00-01	0	○	X	○
51	CHROMA BANDPASS C-FREQ.	00-01	1	○	X	○
54	VERTICAL SHIFT(V POSITION)	00-3F	2A	○	○	○
55	VERTICAL AMPLITUDE(V SIZE)	00-3F	15	○	○	○
56	BLUE STRETCH	00-01	1	○	X	○
57	S-CORRECTION	00-3F	07	○	○	○
58	BLACK STRETCH	00-01	1	○	X	○
59	VERTICAL SLOPE	00-3F	11	○	○	○
63	AUTO COLOR LIMITING	00-01	1	○	X	○
65	START-UP-MODE OF BCL	00-01	0	○	X	○
66	CATHODE DRIVE LEVEL	00-07	05	○	X	○
68	DYNAMIC SKIN CTRL	00-01	1	○	X	○
69	DYNAMIC SKIN CTRL ANGLE	00-01	1	○	X	○
70	FAST FILTER IF-PLL	00-01	0	○	X	○
71	EXTENDED BLUE STRETCH	00-01	0	○	X	○
72	FORCED COLOR-ON	00-01	1	○	X	○
73	BASS SUB-DATA	06-19	0F	○	X	X
80	V-SCAN DISABLED	00-01	0	○	X	X
93	OPERATE AT PICK UP NOISE	00-01	0	○	X	X
94	INPUT LEVEL ADJUST	0-3F	20	○	X	X
95	FH MONITOR ON/OFF	00-01	0	○	X	X
96	STEREO VCO ADJUST	0-3F	20	○	X	X
97	PILOT CANCELER ON/OFF	00-01	0	○	X	X
98	FILTER ADJUST	00-3F	3F	○	X	X
99	LOW BAND FREQUENCY ADJUST	00-3F	20	○	X	X
100	HIGH FREQ SEPARATION ADJUST	00-3F	20	○	X	X
101	50H MONITOR	00-01	0	○	X	X
102	SAP VCO SETTING	00-3F	20	○	X	X
103	MUTE ON/OFF	0-1	0	○	X	X
104	SEPARATION ADJUST	00-3F	15	○	X	X
137	NICAM SET DATA > X	00-FF	0A	○	X	X
138	ERROR RATE < X	00-FF	0B	○	X	X
139	A2 STEREO JUDGE > X	00-7F	0F	○	X	X
140	A2 BILINGUAL JUDGE > X	80-FF	F2	○	X	X

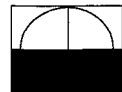
## +B ADJUSTMENT

PREPARATION	PROCEDURES
1. AC input voltage 220+/-5V(50Hz). 2. Turns on the set and set the brightness and contrast to Max. (Signal : Philips Pattern) 3. After 30 sec heat-run, check & adjust the +B voltage.	1. Adjust R950 to obtain +B voltage as below  <b>+B voltage = 95 +/- 0.5V</b>
<b>Measuring Point</b> +B voltage : C953 + side GND : C953 - side	

## HORIZONTAL PHASE ADJUSTMENT

PREPARATION	PROCEDURES
1. Receive the circular pattern signal.	1. Select the IIC control address No 06. 2. Adjust the picture center to meet the CRT geometrical center.

## VERTICAL SLOPE ADJUSTMENT(Must be done before V. Center and V. Size Adjustments)

PREPARATION	PROCEDURES
1. Turns on the TV set and heat run about 5 min. 2. Receive circular pattern signal(PAL). 3. Set all picture settings as below. i.e. Contrast : Max Brightness : Center 4. AC 220 +/-1V.	1. Select the IIC Control address No 30. 2. Press ◀ or ▶ key on remote con. handset so that the bottom half of the picture is blanked. i.e.  Bottom half of picture blanked. 3. Select the IIC Control address No 59. 4. Adjust the vertical slope until the horizontal center line is just at the position where the blanking starts. 5. Select the IIC Control address No 30. 6. Press ◀ or ▶ key on remote con. handset so that picture appears again.

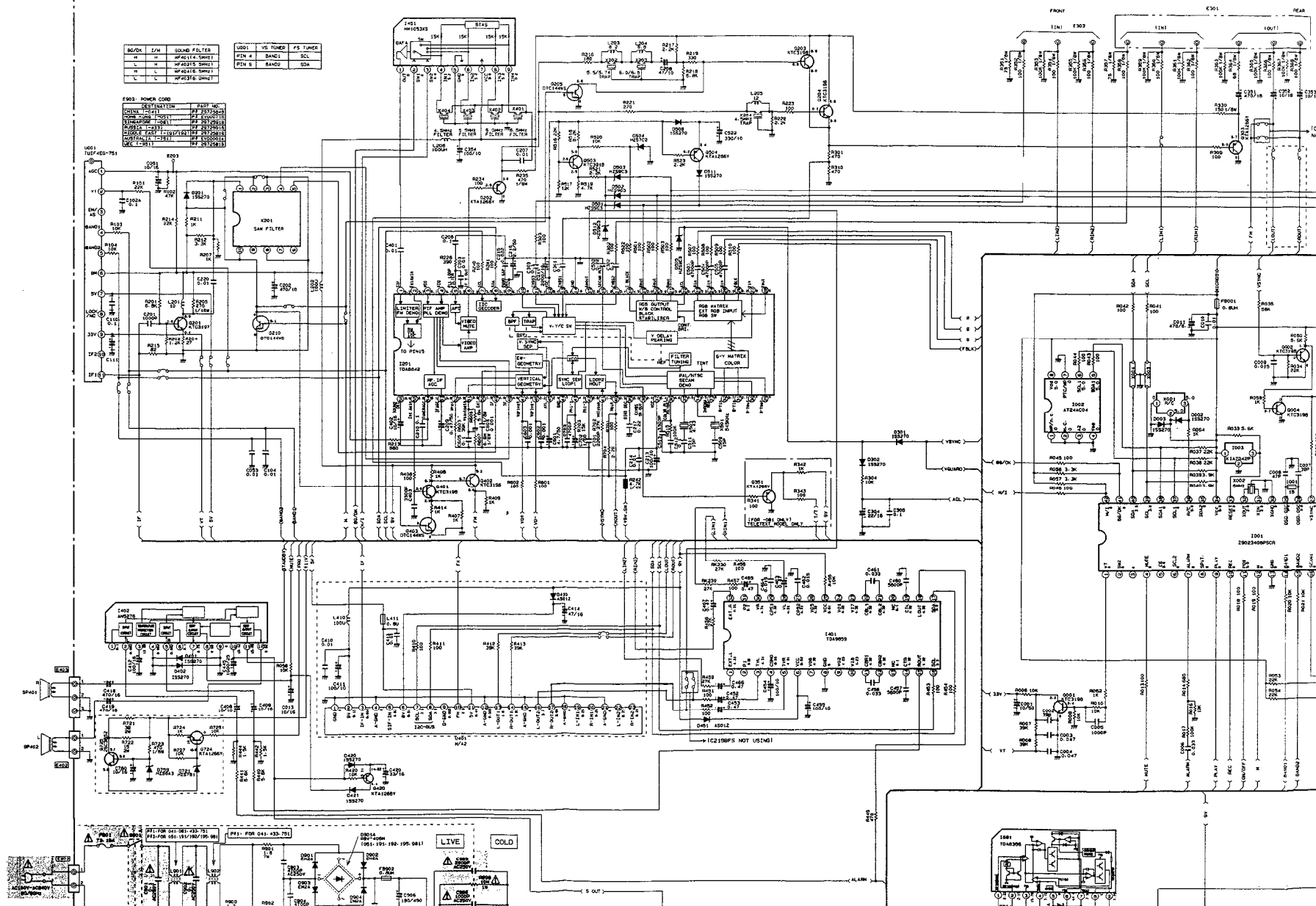
## V2 CHASSIS

### VERTICAL CENTER ADJUSTMENT

PREPARATION	PROCEDURES
<ol style="list-style-type: none"> <li>1. Turns on the TV set &amp; heat run about 5 min.</li> <li>2. Receive the circular pattern signal.</li> <li>3. AC 220 <math>\pm</math> 1V.</li> </ol>	<ol style="list-style-type: none"> <li>1. Select the IIC control address No 54.</li> <li>2. Set the horizontal center line to vertical center marker of CRT by adjustment of IIC. i.e.                     <div data-bbox="613 496 875 632" data-label="Image"> <p>Vertical center marker of CRT</p> </div> </li> </ol>

### VERTICAL SIZE ADJUSTMENT

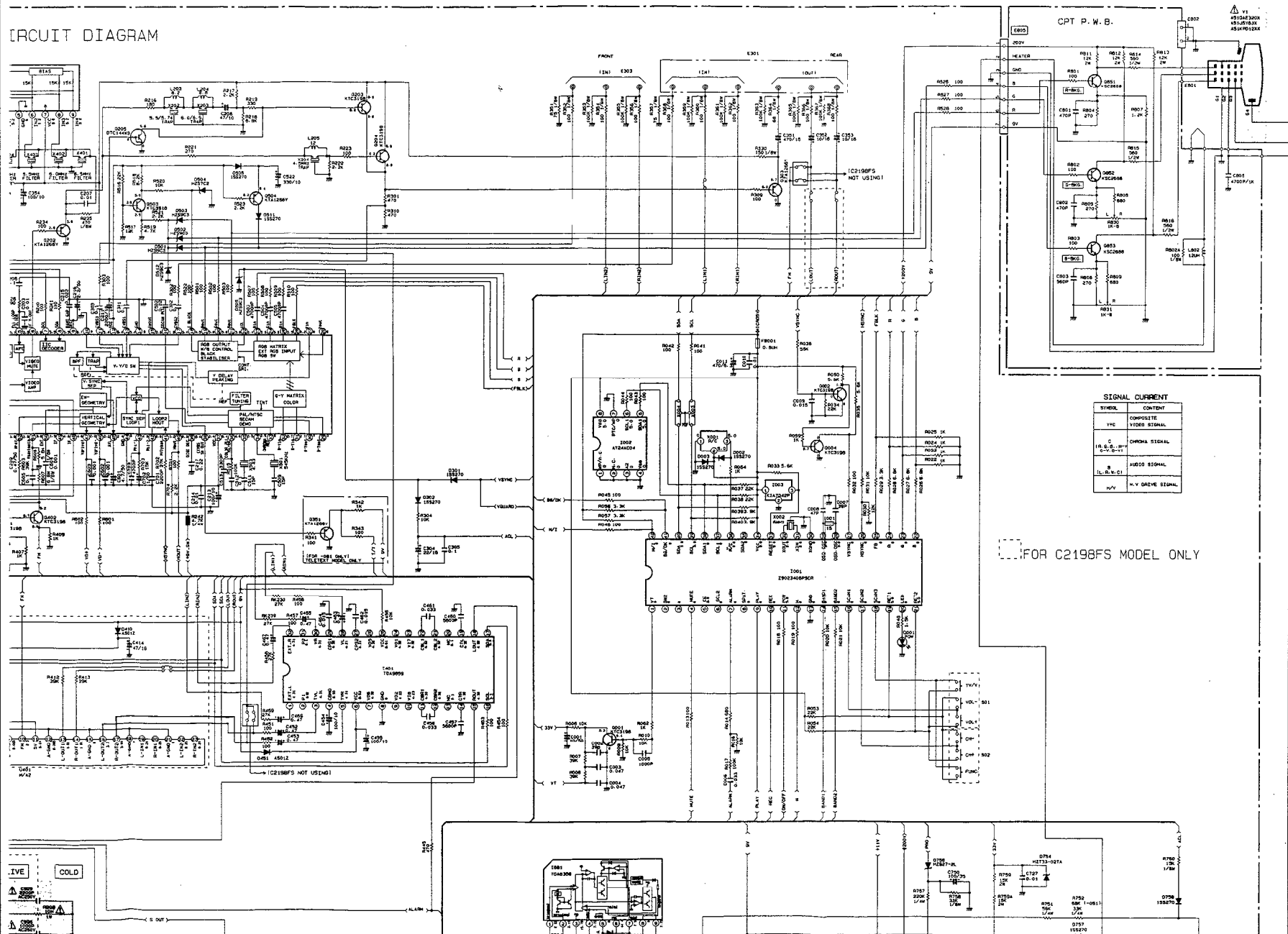
PREPARATION	PROCEDURES
<ol style="list-style-type: none"> <li>1. Turns on the TV set &amp; heat run about 5 min.</li> <li>2. Receive the circular pattern signal.</li> <li>3. Set all picture settings as below. i.e. Contrast : Max Brightness : Center</li> <li>3. AC 220 <math>\pm</math> 1V.</li> </ol>	<ol style="list-style-type: none"> <li>1. Select the IIC control address No 55.</li> <li>2. Adjust IIC data to obtain the following conditions. i.e.                     <div data-bbox="624 842 815 932" data-label="Image"> <p>PAL</p> </div> <p>Picture Top : Inner circle reach the edge of TV raster. Picture Bottom : Inner circle reach the edge of TV raster.</p> </li> <li>3. Receive the NTSC circular signal, and check the picture size after the above V-size adjustment.</li> <li>4. If <math>a &gt; 0\text{mm}</math>, go back to IIC control No 54 (V-center adjustment) and increase the IIC data by 1 position.</li> </ol> <div data-bbox="624 1155 815 1267" data-label="Image"> <p>NTSC</p> </div>





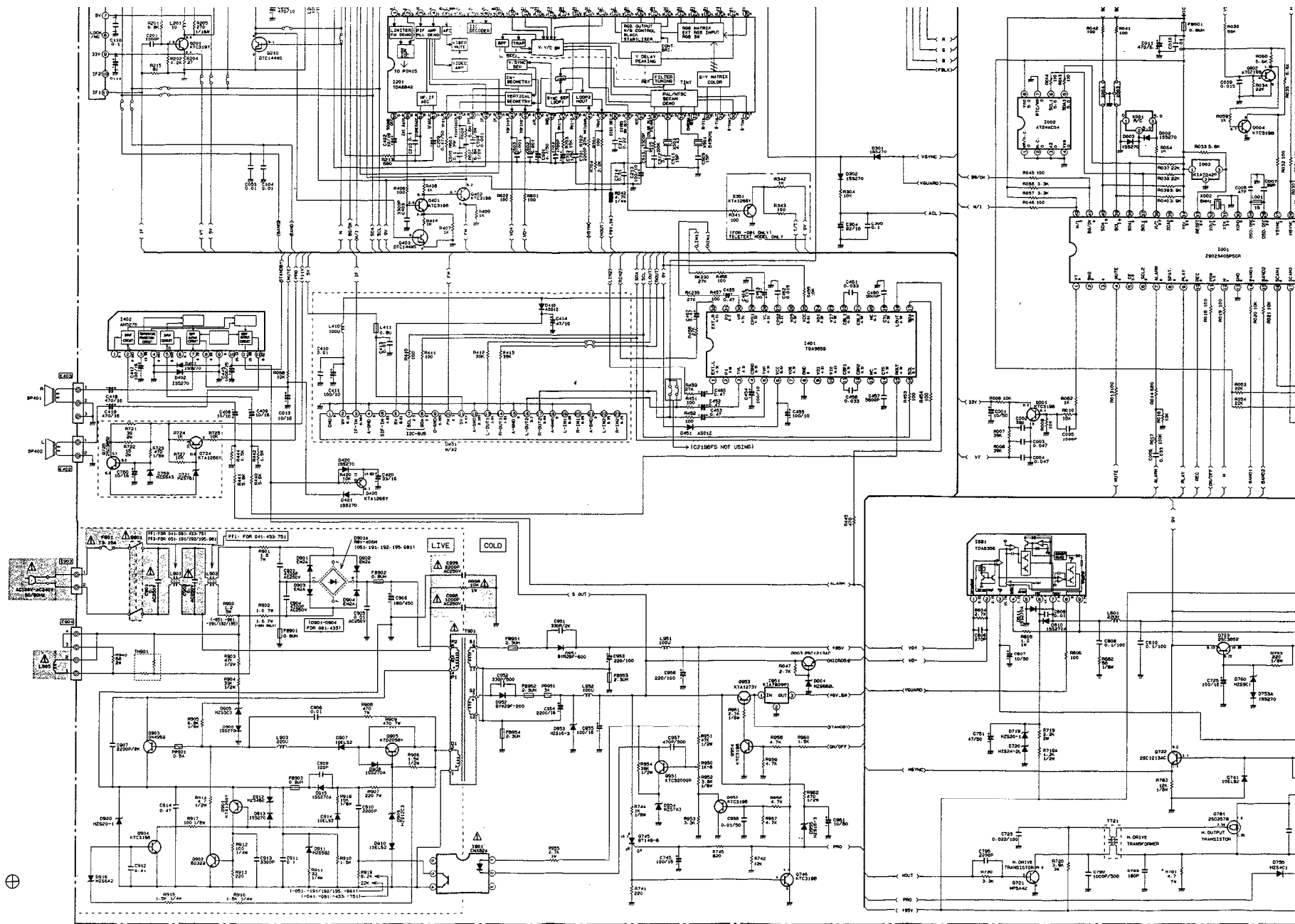
**PRODUCT SAFETY NOTE :** Components marked with a  $\Delta$  and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

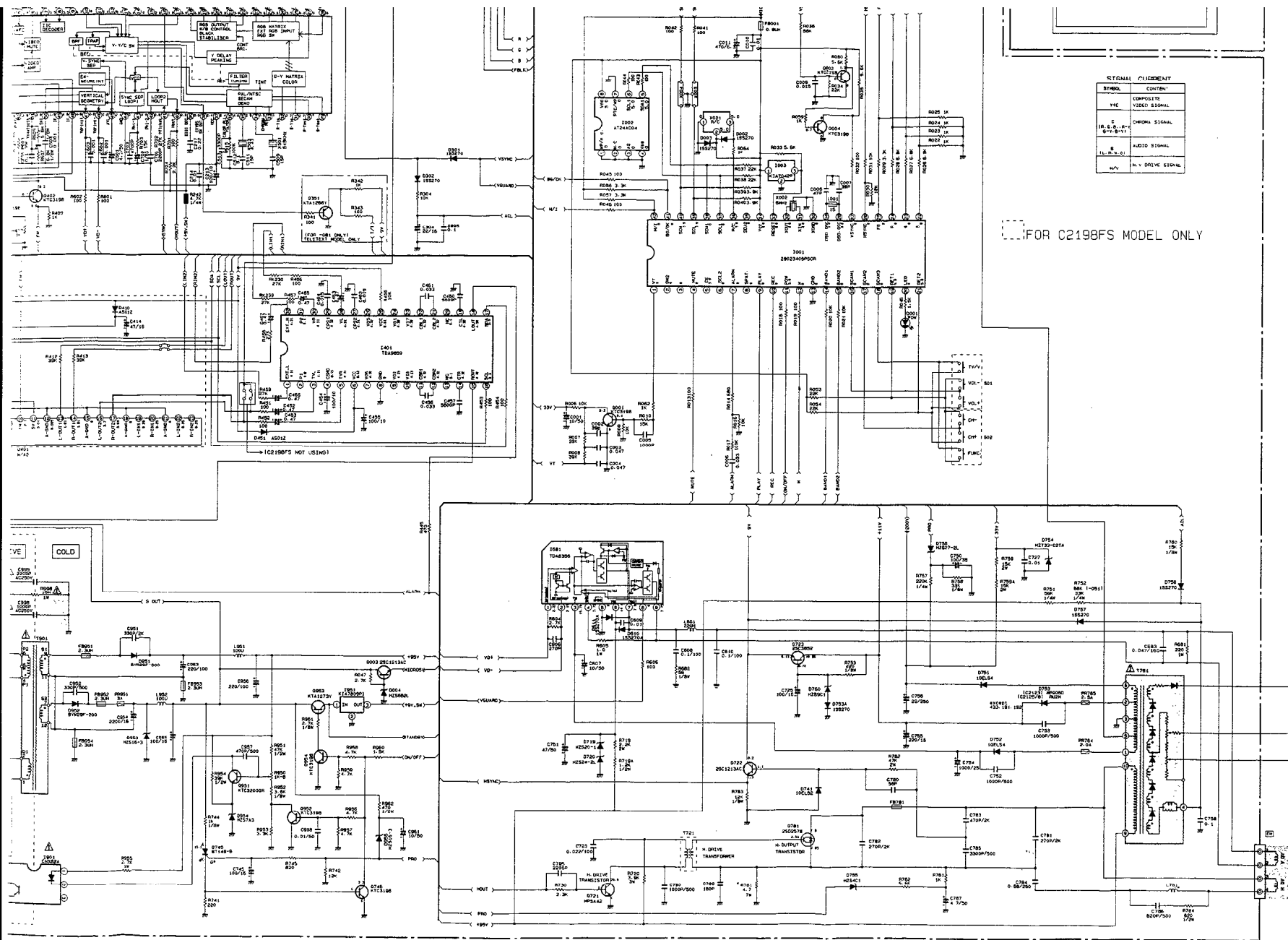
CIRCUIT DIAGRAM



SIGNAL CURRENT	
SYMBOL	CONTENT
Y/C	COMPOSITE VIDEO SIGNAL
10.5 S.S. 10.5 S.S.	CHROMA SIGNAL
10.5 S.S. 10.5 S.S.	AUDIO SIGNAL
H/V	H-V DRIVE SIGNAL

FOR C2198FS MODEL ONLY



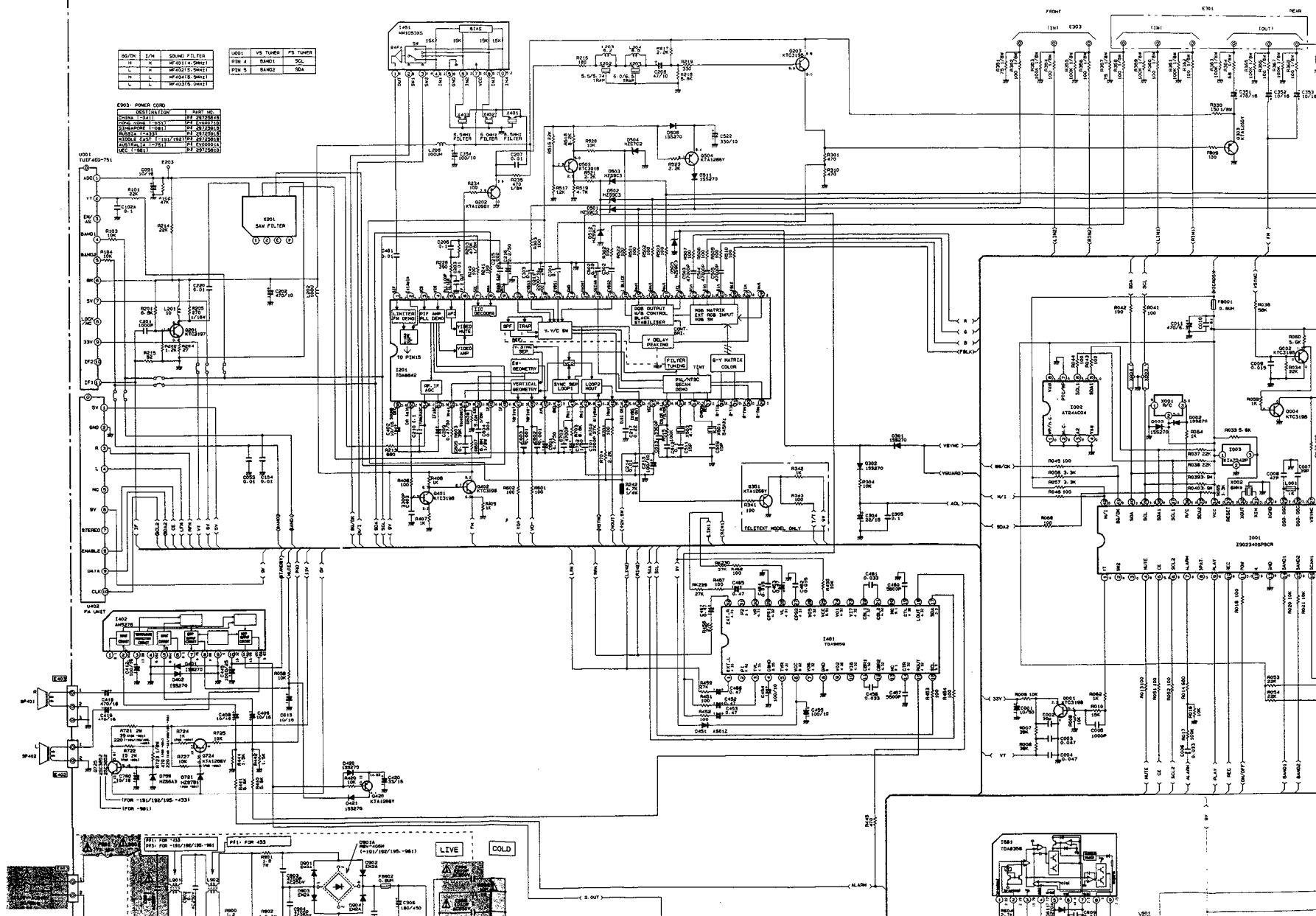


SYMBOL	CONTENT
Y/C	COMPOSITE VIDEO SIGNAL
C	CHROMA SIGNAL
IS & S-P-1	VIDEO SIGNAL
IS & S-P-2	VIDEO SIGNAL
IS & S-P-3	VIDEO SIGNAL
IS & S-P-4	VIDEO SIGNAL
IS & S-P-5	VIDEO SIGNAL
IS & S-P-6	VIDEO SIGNAL
IS & S-P-7	VIDEO SIGNAL
IS & S-P-8	VIDEO SIGNAL
IS & S-P-9	VIDEO SIGNAL
IS & S-P-10	VIDEO SIGNAL
IS & S-P-11	VIDEO SIGNAL
IS & S-P-12	VIDEO SIGNAL
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IS & S-P-99	VIDEO SIGNAL
IS & S-P-100	VIDEO SIGNAL

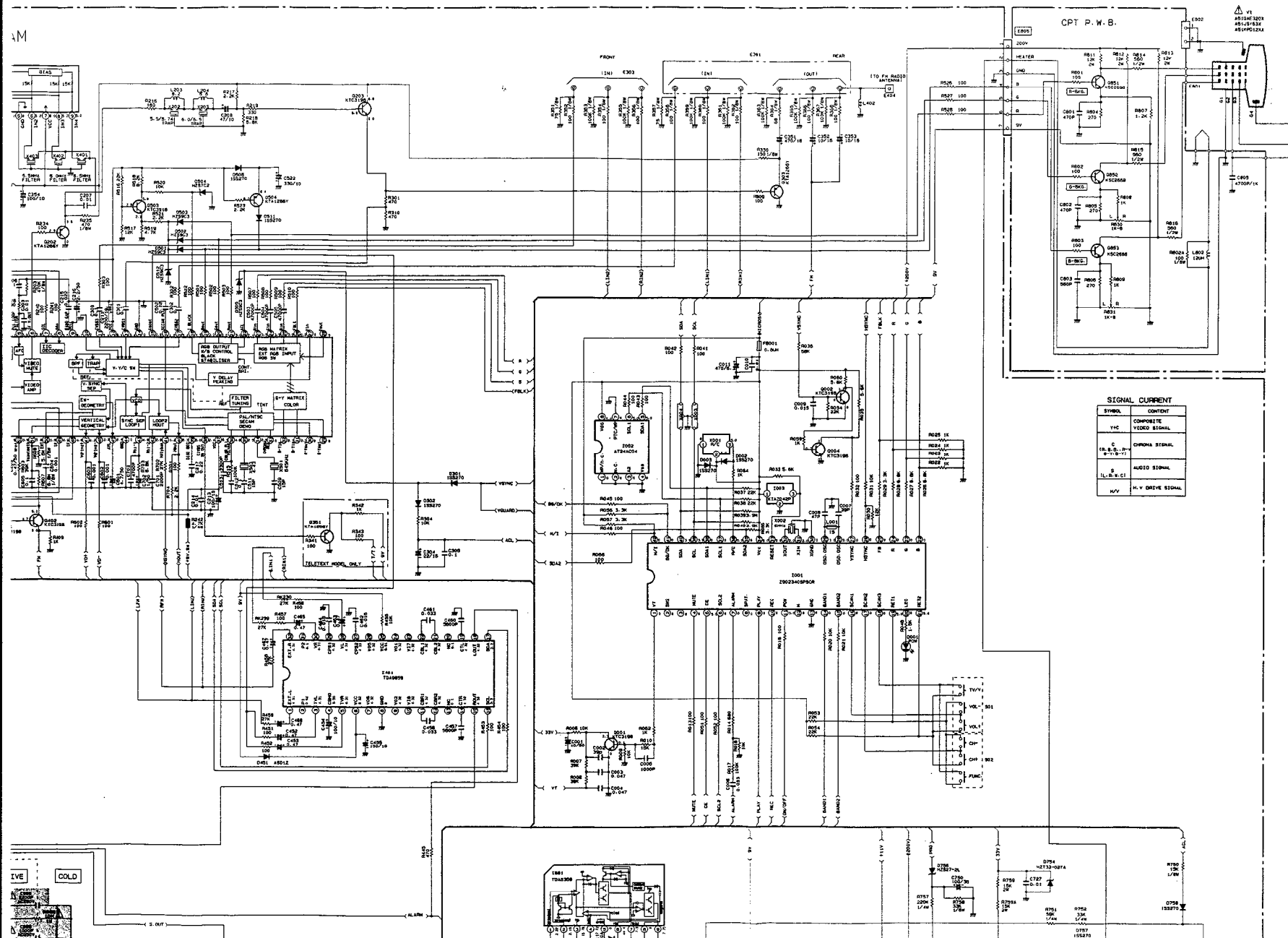
- Since this is basic circuit diagram, the value of the parts is subject to be altered for improvement
- All DC voltage to be measured with a tester (100k $\Omega$ /V).

Voltage taken on a complex color bar signal including a standard color bar signal.

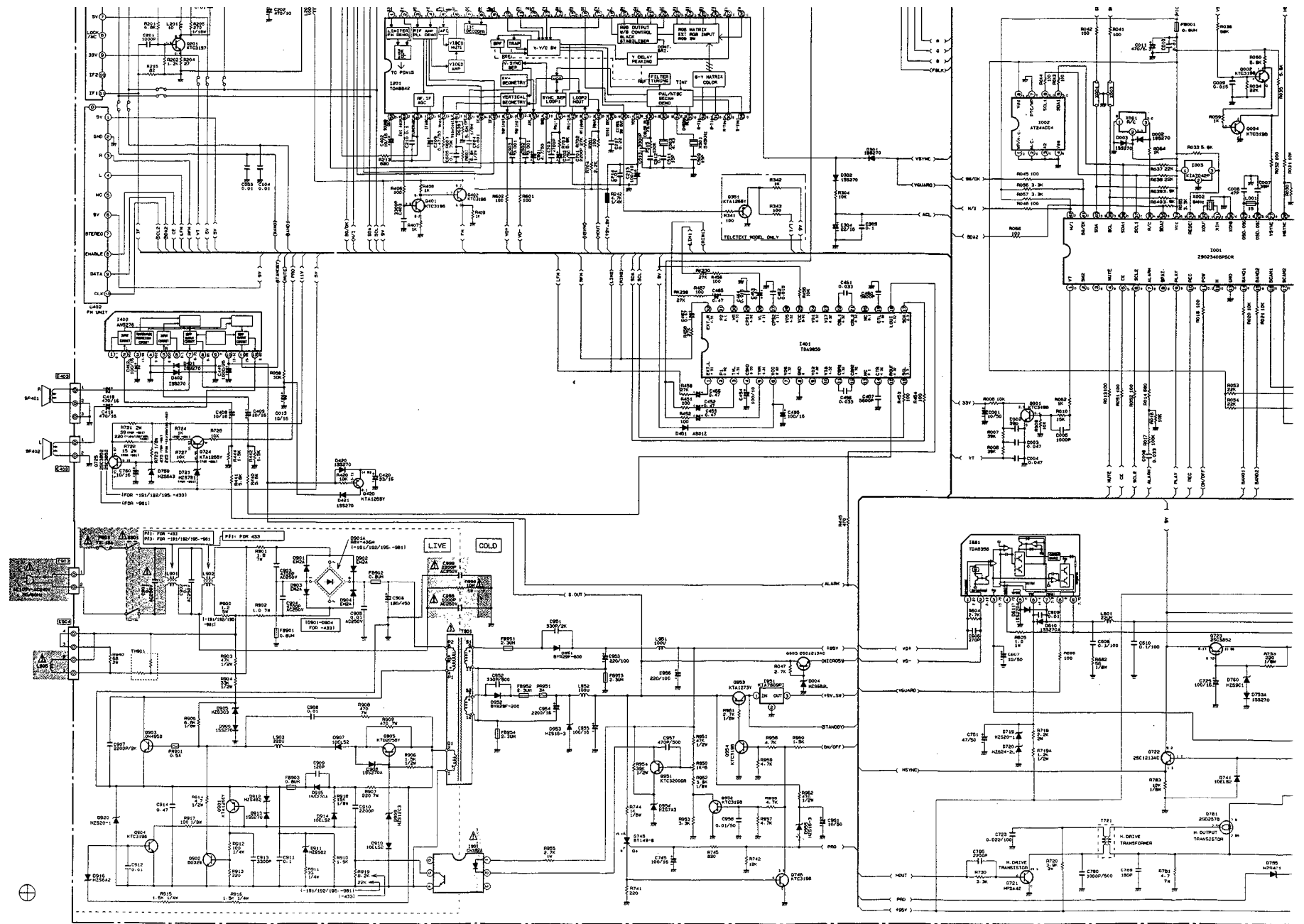
C2125MS CIRCUIT DIAGRAM



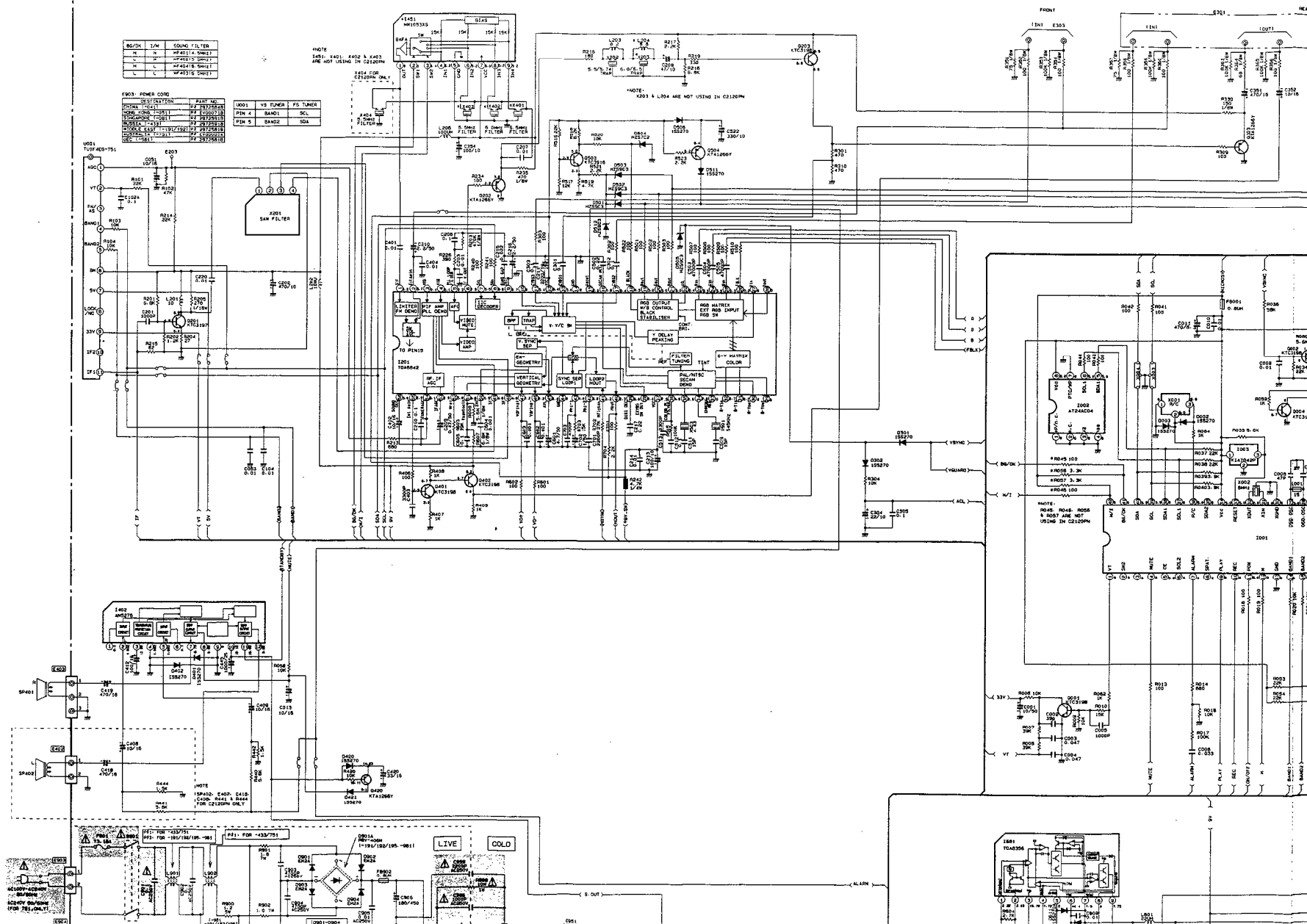
**PRODUCT SAFETY NOTE** - Components marked with a ⚡ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** of this Service Manual. Don't degrade the safety of the receiver through improper servicing.



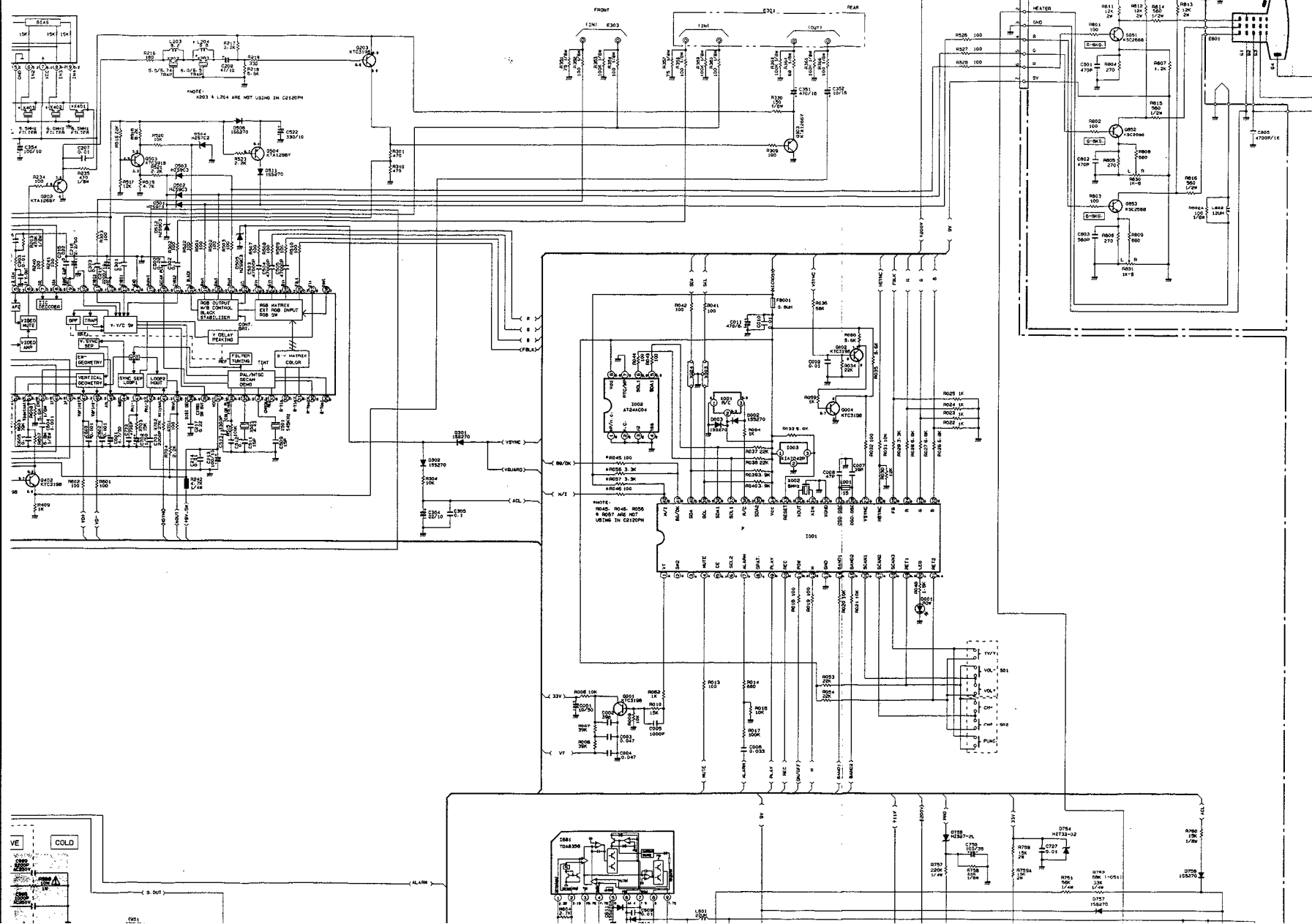
SYMBOL	CONTENT
Y/C	COMPOSITE VIDEO SIGNAL
C	CHROMA SIGNAL
A	AUDIO SIGNAL
H/V	H.V. DRIVE SIGNAL

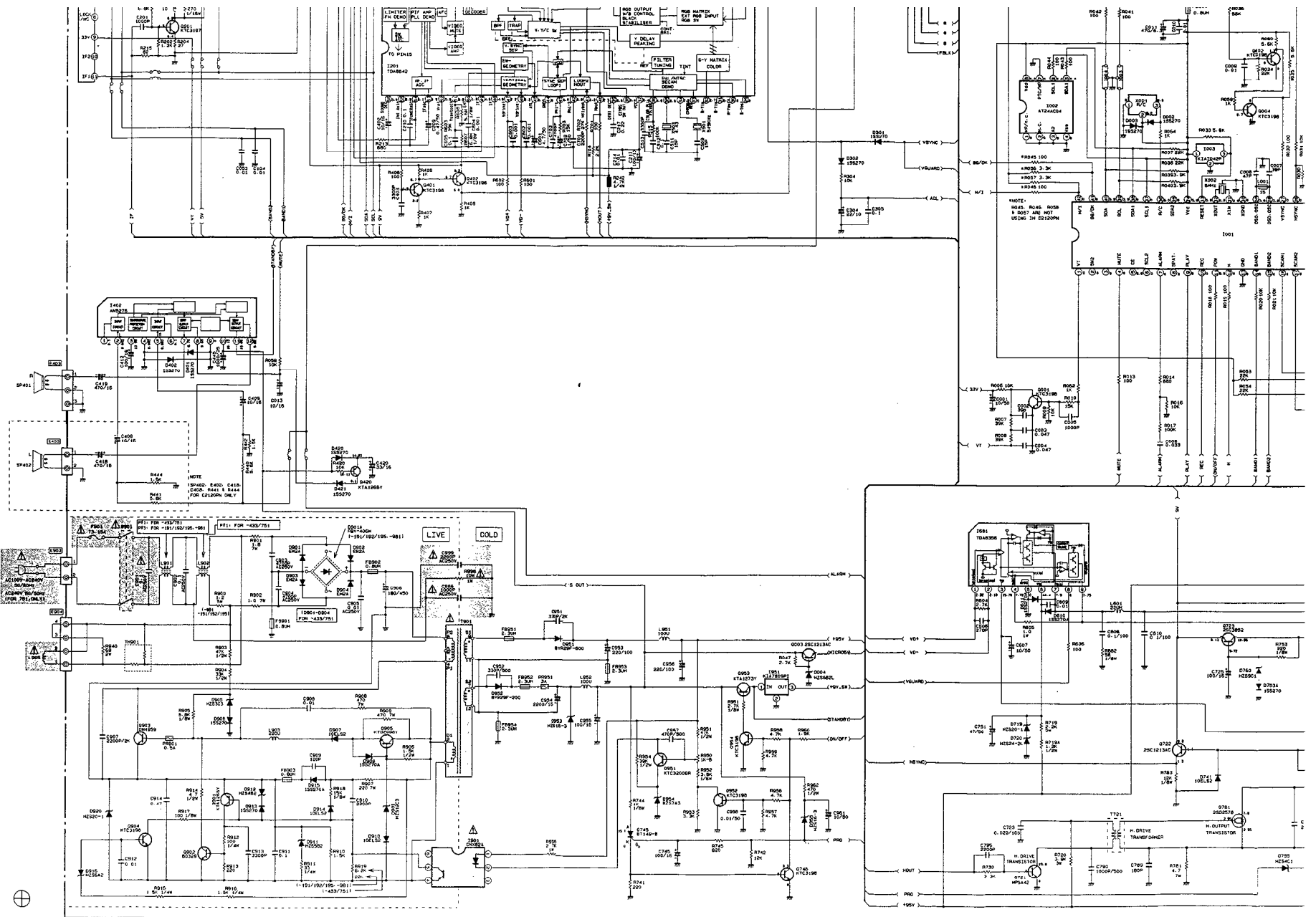




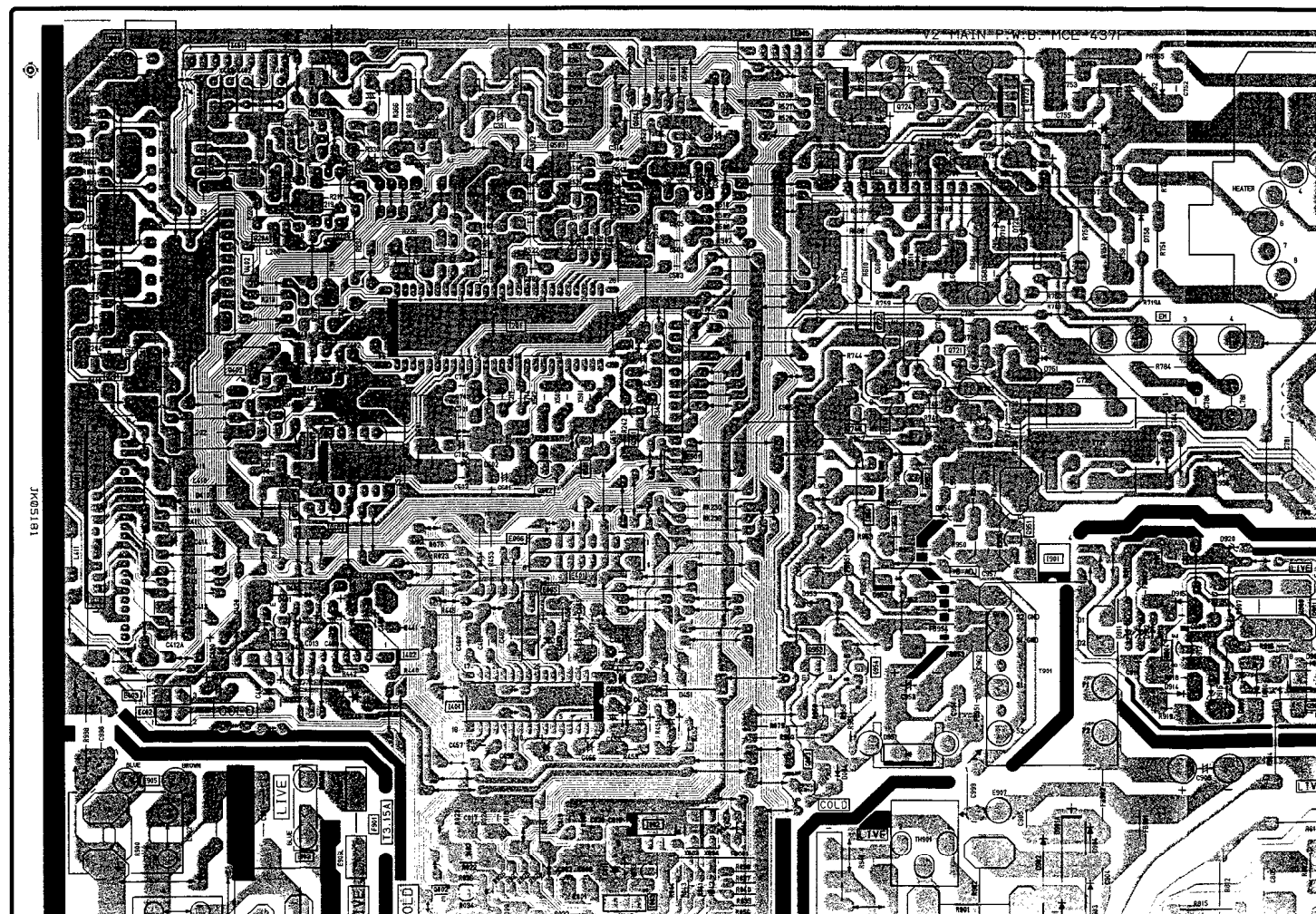




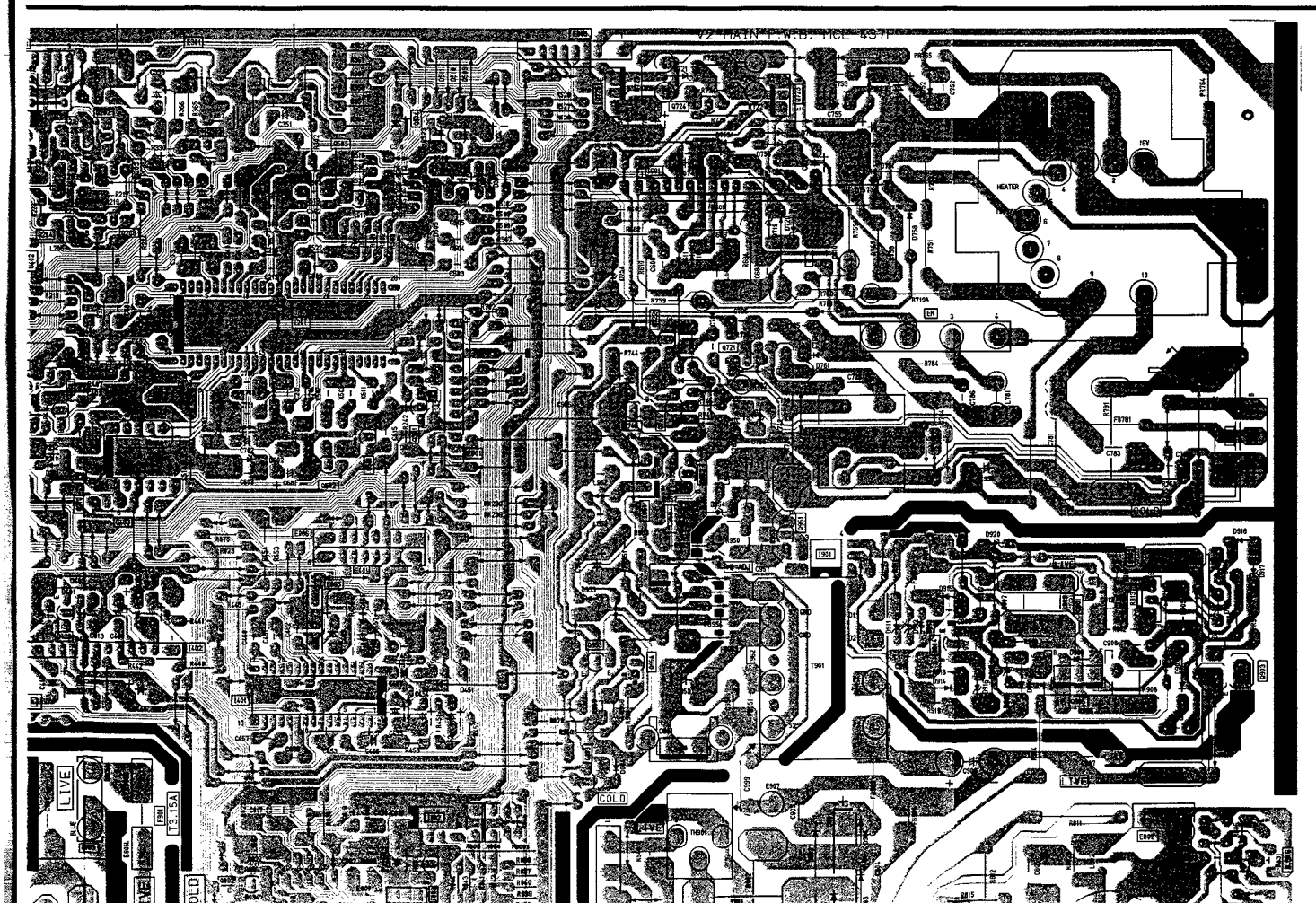
6951  
8700 CH





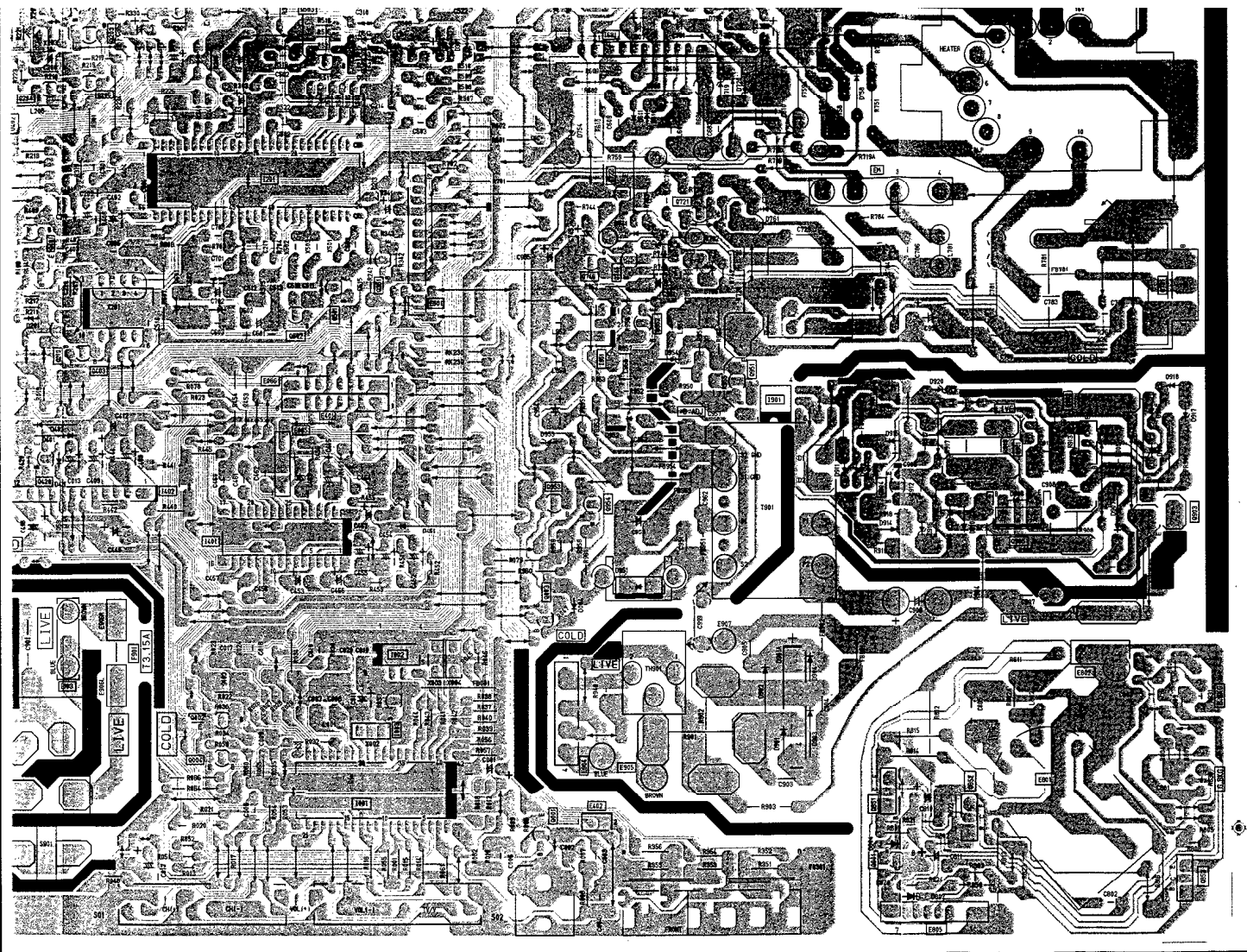


# PRINTED WIRING BOARD MAIN PWB





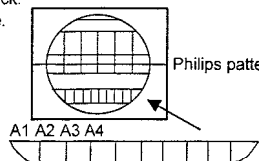




## WHITE BALANCE ADJUSTMENT

PREPARATION	PROCEDURES						
<ol style="list-style-type: none"> <li>1. Switch on the TV set for at lease 20mins.</li> <li>2. Adjust this adjustment after the Purity adjustment.</li> <li>3. Ensure the vertical incident illumination on CRT surface to be 20 lux or less.</li> <li>4. Receive the white balance raster.</li> <li>5. Turns the low bright adjustment VRs R830 &amp; R831 fully counterclockwise.</li> <li>6. Select the IIC Control address No 01 (White point red), No 02(White point green) and No 03(White point blue) and set all datas to 1FH.</li> <li>7. Turns the screen VR of FBT fully counterclockwise.</li> <li>8. Select the IIC Control address No 10(Sub-contrast) and set the data to 17.</li> <li>9. Select the IIC Control address No 9(Sub-brightness) and set the data to 1F.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remain the screen at IIC Control mode, and press the [TV/VIDEO] button 1 time to obtain the lateral line mode.</li> <li>2. Turns the Screen VR of FBT clockwise and set it to the position where the bright red line starts to appear.</li> <li>3. Takes the red as the reference, adjust R830 &amp; R831 till both appear to the same level as the red.</li> <li>4. Adjusts the Screen VR of FBT until the white raster line is just slightly seen.</li> <li>5. Release the lateral line mode by pressing the [TV/VIDEO] button once.</li> <li>6. Set the White Balance meter probe at the center of the screen.</li> <li>7. Adjusts the following keys of IIC and R830/R831 to the desired W/B color temperature. <div style="text-align: center;"> <table> <tr> <td>IIC Address No</td><td></td></tr> <tr> <td>R Drive</td><td>01</td></tr> <tr> <td>B Drive</td><td>03</td></tr> </table> </div> </li> </ol> <p><b>Notes :</b></p> <ol style="list-style-type: none"> <li>a. Fix the G Drive at 1FH(IIC Address No. 02), do not adjust.</li> <li>b. To obtain the low brightness and high brightness conditions, adjust the brightness control of remote control handset.</li> </ol>	IIC Address No		R Drive	01	B Drive	03
IIC Address No							
R Drive	01						
B Drive	03						

## SUB-BRIGHTNESS ADJUSTMENT(Must adjust after H. size adjustment)

PREPARATION	PROCEDURES
<ol style="list-style-type: none"> <li>1. Switch on the TV set for at lease 20 min.</li> <li>2. Ensure the vertical incident illumination on CRT surface to be 20 lux or less.</li> <li>3. Receive the Color Circular Philips pattern.</li> <li>4. Set the following settings by remote control handset. <div style="margin-left: 20px;"> Contrast : max  Color : Center  Brightness : Center </div> </li> </ol>	<ol style="list-style-type: none"> <li>1. Select the IIC control address No 09.</li> <li>2. Adjust the data until A1 portion becomes black and A2 portion becomes lighter black. <div style="margin-left: 20px;"> i.e.  </div> </li> </ol>



## REPLACEMENT PARTS LIST

**PRODUCT SAFETY NOTE :** Components marked with a  $\Delta$  have special characteristics important to safety, before replacing any of these components, read carefully the PRODUCTS SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

**ABBREVIATIONS** Capacitors .....CD: Ceramic Disk, PF: Polyester Film, EL: Electrolytic,  
PP: Polypropylene, PR: Paper, TA: Tantalum, TM: Trimer.  
Resistors .....CF: Carbon Film, WW: Wire Wound, FR: Fuse Resistor,  
MG: Metal Glazed, VR: Variable Resistor, MF: Metal Oxide Film.  
Semiconductors.....TR: Transistor, DI: Diode, ZD: Zener Diode, VA: Varistor, TH: Thermistor.

SYMBOL NO.	PART NO.	DESCRIPTIONS	SYMBOL NO.	PART NO.	DESCRIPTIONS
	QD06441	FRAME ASSY(C2128FS)	C220	AN00624R	PF 0.01MF +-10% 50V
	QD06361	FRAME ASSY(C2125MS)	C301	AN00637R	PF 0.1MF +-10% 50V
	QD06451	FRAME ASSY(C2123MN)	C302	AN00637R	PF 0.1MF +-10% 50V
	QD06361	BACKCOVER ASSY	C303	AN00637R	PF 0.1MF +-10% 50V
		(For C2128FS/C2128FS/C2125MS)	C304	0800298R	EL 22MF 10V(SMG)
	QD06352	BACKCOVER ASSY	C305	AN00637R	PF 0.1MF +-10% 50V
		(For C2123MN, C2120PN only)	C310	0800282R	EL 2.2MF 50V(SMG)
	B001	JK05181B	C351	0800352R	EL 470MF 10V(SMG)
	C001	0800294R	C352	0800291R	EL 10MF 16V(SMG)
	C002	0890122R	C353	0800291R	EL 10MF 16V(SMG)
	C003	AN00633R			(Not for C2123MN, C2120PN)
	C004	AN00633R	C354	0800325R	EL 100MF 10V(SMG)
	C005	0890087R	C401	AN00624R	PF 0.01MF +-10% 50V
	C006	AN00631R	C402	0800291R	EL 10MF 16V(SMG)
	C007	0890122R	C403	AN00617R	PF 0.0033MF +-10% 50V
	C008	0890067R	C404	0890101R	CD 0.01MF +-10% 50V(B)
	C009	AN00626R			(C2123MN only)
	C010	AN00624R	C408	0800291R	EL 10MF 16V(SMG)
	C011	0800351R			(Not for C2123MN)
	C013	0800291R	C409	0800291R	EL 10MF 16V(SMG)
	C051	0800291R	C410	AN00624R	PF 0.01MF +-10% 50V
	C053	AN00624R			(For C21298 & C2128FS-051,081,981 only)
	C102A	AN00637R	C411	0800325R	EL 100MF 10V(SMG)-C2128 only
	C104	AN00624R			(For C21298 & C2128FS-051,081,981 only)
	C201	0890087R	C412	0800326R	EL 100MF 16V(SMG)
	C202	0800352R	C412A	0800324R	EL 100MF 6.3V(SMG)-C2198 only
	C203	0890087R	C413	AN00624R	PF 0.01MF +-10% 50V
	C206	AN00637R			(For C21298 & C2128FS-051,081,981 only)
	C207	AN00624R	C414	0800317R	EL 47MF 16V(SMG)
	C208	0800316R			(For C21298 & C2128FS-051,081,981 only)
	C209	0800277R	C418	0800353R	EL 470MF 16V(SMG)
	C210	AN00637R			(No using in C2123MN model)
	C211	0800366F	C419	0800353R	EL 470MF 16V(SMG)
	C213	0800325R	C420	0800309R	EL 33MF 16V(SMG)
	C214	AN00624R	C445	0800362F	EL 1000MF 25V(SMG)
	C215	AN00628R	C452	0800277R	EL 0.47MF 50V(SMG)
	C216	0800282R			(Not for C2123MN, C2120PN)
	C217	0880198R	C453	0800277R	EL 0.47MF 50V(SMG)
					(Not for C2123MN, C2120PN)

## REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	DESCRIPTIONS	SYMBOL NO.	PART NO.	DESCRIPTIONS
C454	0800325R	EL 100MF 10V(SMG)	C703	AN00619R	PF 0.0047MF +-10% 50V
		(Not for C2123MN, C2120PN)	C723	0279851F	PF 0.022MF +-10% 100V
C455	0800325R	EL 100MF 10V(SMG)	C725	0800326R	EL 100MF 16V(SMG)
		(Not for C2123MN, C2120PN)	C727	AN00624R	PF 0.01MF +-10% 50V
C456	AN00631R	PF 0.033MF +-10% 50V	C745	0800326R	EL 100MF 16V(SMG)
		(Not for C2123MN, C2120PN)	C750	0800328R	EL 100MF 35V(SMG)
C457	AN00621R	PF 0.0056MF +-10% 50V	C751	0800321R	EL 47MF 50V(SMG)
		(Not for C2123MN, C2120PN)	C752	0244501R	CD 1000PF +-10% 500V(B)
C460	AN00621R	PF 0.0056MF +-10% 50V	C753	0244501R	CD 1000PF +-10% 500V(B)
		(Not for C2123MN, C2120PN)	C754	0800362F	EL 1000MF 25V(SMG)
C461	AN00631R	PF 0.033MF +-10% 50V	C755	0800335R	EL 220MF 16V(SMG)
		(Not for C2123MN, C2120PN)	C756	0253973F	EL 22MF 250V(SME)
C462	AN00626R	PF 0.015MF +-10% 50V	C758	AN00637R	PF 0.1MF +-10% 50V
		(Not for C2123MN, C2120PN)	C759	0244501R	CD 1000PF +-10% 500V(B)
C463	0800277R	EL 0.47MF 50V(SMG)	C760	0800291R	EL 10MF 16V(SMG)
		(Not for C2123MN, C2120PN)			(For C2125MS & C2198FS only)
C464	AN00626R	PF 0.015MF +-10% 50V	C781	AN01136F	PF 9100PF 2KV
		(Not for C2123MN, C2120PN)	C783	0244721F	CD 470PF +-10% 2KV(B)
C465	0800277R	EL 0.47MF 50V(SMG)	C784	AN01183F	PF 0.68MF +-10% 250V
		(Not for C2123MN, C2120PN)	C785	0244507R	CD 3300PF +-10% 500V(B)
C466	0800277R	EL 0.47MF 50V(SMG)	C786	0243512R	CD 820PF +-10% 500V(B)
		(Not for C2123MN, C2120PN)	C787	0800288R	EL 4.7MF 50V(SMG)
C467	0800277R	EL 0.47MF 50V(SMG)	C789	0890077R	CD 180PF +-10% 50V(B)
		(Not for C2123MN, C2120PN)	C790	0244501R	CD 1000PF +-10% 500V(B)
C502	0880198R	PF 0.22MF +-5% 50V	C795	AN00615R	PF 0.0022MF +-10% 50V
C503	AN00633R	PF 0.047MF +-10% 50V	C801	0890083R	CD 470PF +-10% 50V(B)
C504	AN00633R	PF 0.047MF +-10% 50V	C802	0890083R	CD 470PF +-10% 50V(B)
C505	AN00633R	PF 0.047MF +-10% 50V	C803	0890084R	CD 560PF +-10% 50V(B)
C509	0890116R	CD 15PF +-5% 50V(CH)	C805	AJ00542F	CD 4700PF +-10% 1KV(B)
C511	0890116R	CD 15PF +-5% 50V(CH)	C901	AN00144S	PF 0.1MF +-20% 250V
C512	AN00637R	PF 0.1MF +-10% 50V	C902	AN00144S	PF 0.1MF +-20% 250V
C513	AN00617R	PF 0.0033MF +-10% 50V	C903	0248593F	CD 4700PF 250V(F)
C522	0800343R	EL 330MF 10V(SMG)	C904	0248593F	CD 4700PF 250V(F)
C601	0800288R	EL 4.7MF 50V(SMG)	C905	0248594F	CD 1000PF 250V(F)
C602	0890087R	CD 1000PF +-10% 50V(B)	C906	AL00097	EL 180MF 450V(KMH)
C603	0890087R	CD 1000PF +-10% 50V(B)	C907	0244215	CD 2200PF +-10% 2KV
C604	0890087R	CD 1000PF +-10% 50V(B)	C908	AN00624R	PF 0.01MF +-10% 50V
C605	AN00637R	PF 0.1MF +-10% 50V	C909	0890075R	CD 120PF +-5% 50V(SL)
C606	0890079R	CD 270PF +-10% 50V(B)	C910	AN00615R	PF 0.0022MF +-10% 50V
C607	0800294R	EL 10MF 50V(SMG)	C911	0270734R	PF 0.1MF +-5% 50V
C608	0279693R	PF 0.1MF +-10% 100V	C912	AN00624R	PF 0.01MF +-10% 50V
C609	AN00624R	PF 0.01MF +-10% 50V	C913	AN00617R	PF 0.0033MF +-10% 50V
C610	0279693R	PF 0.1MF +-10% 100V	C914	0270743R	PF 0.47MF +-10% 50V
C683	0279691R	PF 0.047MF +-10% 160V	C951	0244718	CD 330PF +-10% 2KV(B)
C701	AN00615R	PF 0.0022MF +-10% 50V	C952	0243507	CD 330PF +-10% 500V(B)
C702	0800279R	EL 1MF 50V(SMG)	C953	AL01211	EL 220MF 100V(KMF)

## REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	DESCRIPTIONS	SYMBOL NO.	PART NO.	DESCRIPTIONS
C954	0800087F	EL 2200MF 16V(SME)	D753	2343961M	DI MPG06D
C955	0800326R	EL 100MF 16V(SMG)			(For C2198FS/C2128FS/C2123MN only)
C956	0258129F	EL 220MF 100V(KME)	D753	2333001M	DI RU2M-C2125MS/C2198FS only
C957	0243509R	CD 470PF +-10% 500V(B)	D753A	2338321M	DI 1SS270
C958	AN00624R	PF 0.01MF +-10% 50V	D754	2335991M	ZD HZT33-02
$\Delta$ C961	0800294R	EL 10MF 50V(SMG)	D755	2339827M	ZD HZS4C1
$\Delta$ C998	AJ00601	PF 1000PF 250V	D756	2339222M	ZD HZS27-2L
$\Delta$ C999	AJ00603	PF 2200PF 250V	D757	2338321M	DI 1SS270
D001	CH00231P	LED(RED)	D758	2338321M	DI 1SS270
D002	2338321M	DI 1SS270	D759	2339843M	ZD HZS6A3
D003	2338321M	DI 1SS270			(For C2125MS & C2198FS only)
D004	2339022M	ZD HZS6B2L	D760	2339867M	ZD HZS9C1
D201	2338321M	DI 1SS270	D901	2342711M	DI EM2A - for 433, 081 only
		(For C2198FS, C2128FS only)	D901A	2338314	DI RBV-406M (LF-A)
D301	2338321M	DI 1SS270			(All models except 433 & 081)
D302	2338321M	DI 1SS270	D902	2342711M	DI EM2A - for 433, 081 only
D401	2338321M	DI 1SS270	D903	2342711M	DI EM2A - for 433, 081 only
D402	2338321M	DI 1SS270	D905	2342711M	DI EM2A - for 433, 081 only
D410	2339481M	DI AS01Z 200V	D905	2339819M	ZD HZS3C3
		(For C21298 & C2128FS-051,081,981 only)	D906	2338321M	DI 1SS270
D420	2338321M	DI 1SS270	D907	CH00711M	DI 10ELS2
D421	2338321M	DI 1SS270	D908	2337341M	DI 1SS270A
D451	2339481M	DI AS01Z 200V	D909	2339889M	ZD HZS12C3
		(Not for C2123MN, C2120PN)	D910	CH00711M	DI 10ELS2
D501	2339869M	ZD HZS9C3	D911	2339835M	ZD HZS5B2
D502	2339869M	ZD HZS9C3	D912	2339825M	ZD HZS4B2
D503	2339869M	ZD HZS9C3	D913	2338321M	DI 1SS270
D504	2339858M	ZD HZS7C2	D914	CH00711M	DI 10ELS2
D505	2339869M	ZD HZS9C3	D915	2337341M	DI 1SS270A
D506	2338321M	DI 1SS270	D916	2339842M	ZD HZS6A2
D511	2338321M	DI 1SS270	D920	2339821M	ZD HZS20-1
D512	2339869M	ZD HZS9C3	D951	2349983	DI BYR 29F-600
D610	2337341M	DI 1SS270A	D952	2349991	DI BYW 29F-200
D611	2337341M	DI 1SS270A	D953	2339903M	ZD HZS16-3
D719	2339921M	ZD HZS20-1	D954	2339853M	ZD HZS7A3
D720	2339212M	ZD HZS24-2L	D955	2339903M	ZD HZS16-3
D721	2339854M	ZD HZS7B1	$\Delta$ DY	BY00682	DY-C90-21SF3
		(For C2125MS-981, 195 & C2198FS only)	E0701	2788084	EARTH WIRE
D741	CH00711M	DI 10ELS2	E203	2774731R	FERRITE BEAD CORE
D751	CH00712M	DI 10ELS4 400V	E301	2695261	6P JACK PIN
D752	CH00712M	DI 10ELS4 400V			(Not for C2123MN, C2120PN)

## REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	DESCRIPTIONS	SYMBOL NO.	PART NO.	DESCRIPTIONS
E301	2695251	4P JACK PIN	I003	CP02871R	IC KIA7042P
		(For C2123MN, C2120PN only)	I201	CP05811U	IC TDA8842
E303	EQ00212	3P PIN JACK	I401	CP05801U	IC TDA9859
		(Not for C2123MN, C2120PN)			(Not for C2123MN, C2120PN)
E303	EQ00211	2P PIN JACK	I402	CP05751	IC AN5276
		(For C2123MN, C2120PN only)	I681	CP05651	IC TDA8356
E402	2902261	2P MINI PLUG PIN W/BASE	I451	2020601	IC MM1053XS
		(Not using in C2123MN)			(Not using in C2120PN)
E403	2902262	3P MINI PLUG PIN W/BASE	$\Delta$ I901	2917783	IC CNX82A 300
E404	EF08681	2P CONNECTOR - C2125MS only	I951	CP04771	IC KIA7809P1
E701	2776242A	CF MAGNET	L001	2123105M	AXIAL COIL +-10% 15MH
$\Delta$ E801	2698352B	CRT SOCKET 21"	L201	2123103M	AXIAL COIL +-10% 10MH
E802	2903542	2P PLUG PIN WITH BASE	L202	2122253M	AXIAL COIL +-10% 100MH
E805	2995604	8P SUB MINI CON. W/WIRE	L203	2123102M	AXIAL COIL +-10% 8.2MH
E903	2972581A	POWER CORD - 191/2/5 & 981	L204	2123101M	AXIAL COIL +-10% 6.8MH
$\Delta$ E903	2972591A	POWER CORD - 081 & 433 only			(Not using in C2120PN)
$\Delta$ E903	EV00071C	POWER CORD - 051 only	L205	2123104M	AXIAL COIL +-10% 12MH
$\Delta$ E903	EV00001	POWER CORD - 751 only			(For C2198FS/C2128FS only)
E904	2903544	4P PLUG PIN W/BASE	L206	2122956M	AXIAL COIL +-10% 100MH
E905	2995909	2J PROCESSED WIRE W/AMPIN	L402	BZ02631	FM ANT. COIL - C2125MS only
E906L	2729252BR	FUSE HOLDER	L410	2122253M	AXIAL COIL +-10% 100MH
E906R	2729252BR	FUSE HOLDER			(For C2198FS, C2128FS-051,081, 981 only)
EM	2665272A	4P PLUG PIN W/BASE	L411	2123468M	FERRITE CORE 0.8MH
$\Delta$ F901	2721615	FUSE 3.15A			(For C2198FS, C2128FS-051,081, 981 only)
FB001	2123468M	FERRITE CORE 0.8MH	L601	BH00205R	HIGH FREQ. INDUCTOR 22MH
FB781	2122653M	FERRITE CORE	L781	2164541B	H LINEARITY COIL
FB901	2123468M	FERRITE CORE 0.8MH	L802	2125798N	RADIAL COIL 12MH
FB902	2123468M	FERRITE CORE 0.8MH	$\Delta$ L901	BZ02393	LINE FILTER - All except 433,081
FB903	2123468M	FERRITE CORE 0.8MH	$\Delta$ L901	BZ02391	LINE FILTER - For 433 & 081 only
FB951	2123462M	FERRITE CORE 2.3MH	$\Delta$ L901	BZ02391	LINE FILTER - For 433 only
FB952	2123462M	FERRITE CORE 2.3MH	L903	2220595AR	CHOKE COIL 220MH
FB953	2123462M	FERRITE CORE 2.3MH	L905	2276006	DEGAUSSING COIL
FB954	2123462M	FERRITE CORE 2.3MH	L951	BH00734R	PEAKING COIL +-10% 100MH
I001	CP05772	IC Z90234-3945	L952	BH00734R	PEAKING COIL +-10% 100MH
I002	CP03461	IC AT24AC04	PR764	AZ00104M	2A PROTECTOR
		1002(Memory IC) needs to program by factory before placement. As different programmes are for different models, serviceman please indicate the model name and destination code when purchase this part to ensure correct programme provided. Ex. CP03461 IC AT24AC04(C2125MS-192)	PR765	AZ00105M	2.5A PROTECTOR
			PR901	AZ00101M	0.5A PROTECTOR
			PR951	AZ00106M	3A PROTECTOR
			Q001	CF01421R	TRS KTC3198 GR
			Q002	CF01421R	TRS KTC3198 GR
			Q003	2320663M	TRS 2SC1213AC

## REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	DESCRIPTIONS	SYMBOL NO.	PART NO.	DESCRIPTIONS
Q004	CF01421R	TRS KTC3198 GR	Q954	CF01421R	TRS KTC3198 GR
Q201	CF01011R	TRS KTC3197	R006	0700054M	CF 10K OHM +5% 1/16W
Q202	CF01431R	TRS KTA 1266Y	R007	0700062M	CF 39K OHM +5% 1/16W
Q203	CF01421R	TRS KTC3198 GR	R008	0700062M	CF 39K OHM +5% 1/16W
Q204	CF01421R	TRS KTC3198 GR (For C2128FS, C2198FS only)	R009	0700054M	CF 10K OHM +5% 1/16W
Q205	2326875R	TRS DTC144WS (For C2128FS, C2198FS only)	R010	0700056M	CF 15K OHM +5% 1/16W
Q210	2326875R	TRS DTC144WS (For C2128FS, C2198FS only)	R013	0700027M	CF 100 OHM +5% 1/16W
Q303	CF01431R	TRS KTA 1266Y	R014	0700038M	CF 680 OHM +5% 1/16W
Q351	CF01431R	TRS KTA 1266Y (For all C2125MS & C2128FS-081only)	R016	0700054M	CF 10K OHM +5% 1/16W
Q401	CF01421R	TRS KTC3198 GR	R017	0700067M	CF 100K OHM +5% 1/16W
Q402	CF01421R	TRS KTC3198 GR	R018	0700027M	CF 100 OHM +5% 1/16W
Q403	2326875R	TRS DTC144WS (For C2128FS, C2198FS only)	R019	0700027M	CF 100 OHM +5% 1/16W (For C2128FS, C2198FS only)
Q420	CF01431R	TRS KTA 1266Y	R020	0700054M	CF 10K OHM +5% 1/16W
Q503	CF01421R	TRS KTC3198 GR	R021	0700054M	CF 10K OHM +5% 1/16W
Q504	CF01431R	TRS KTA 1266Y	R022	0700041M	CF 1K OHM +5% 1/16W
Q721	CF01061R	TRS MPSA42	R023	0700041M	CF 1K OHM +5% 1/16W
Q722	2320663M	TRS 2SC1213AC	R024	0700041M	CF 1K OHM +5% 1/16W
Q723	2312171	TRS 2SC3852	R025	0700041M	CF 1K OHM +5% 1/16W
Q724	CF01431R	TRS KTA 1266Y (For C2125MS-981, 195 & C2198FS only)	R026	0700052M	CF 6.8K OHM +5% 1/16W
Q725	2312171	TRS 2SC3852 (For C2125MS-981, 195 & C2198FS only)	R027	0700052M	CF 6.8K OHM +5% 1/16W
Q745	CJ00161R	TRS BT149-B	R028	0700052M	CF 6.8K OHM +5% 1/16W
Q746	CF01421R	TRS KTC3198 GR	R029	0700047M	CF 3.3K OHM +5% 1/16W
Q781	CF02221	TRS 2SD2578	R030	0700055M	CF 1K OHM +5% 1/16W
Q851	CF02181	TRS KSC2688	R031	0700054M	CF 10K OHM +5% 1/16W
Q852	CF02181	TRS KSC2688	R032	0700027M	CF 100 OHM +5% 1/16W
Q853	CF02181	TRS KSC2688	R033	0700051M	CF 5.6K OHM +5% 1/16W
Q901	CF01431R	TRS KTA 1266Y	R034	0700058M	CF 22K OHM +5% 1/16W
Q902	CF01221	TRS BD329	R035	0700051M	CF 5.6K OHM +5% 1/16W
Q903	2314792	TRS BUT12AF/ON4959	R036	0700064M	CF 56K OHM +5% 1/16W
Q904	CF01421R	TRS KTC3198 GR	R037	0700058M	CF 22K OHM +5% 1/16W
Q905	CF01831	TRS KTD2058Y	R038	0700058M	CF 22K OHM +5% 1/16W
Q951	CF01051R	TRS KTC 3200 GR	R039	0700048M	CF 3.9K OHM +5% 1/16W
Q952	CF01421R	TRS KTC3198 GR	R040	0700048M	CF 3.9K OHM +5% 1/16W
Q953	CF01991R	TRS KTA1273Y	R041	0700027M	CF 100 OHM +5% 1/16W
			R042	0700027M	CF 100 OHM +5% 1/16W (For C2128FS & C2128FS only)
			R043	0700027M	CF 100 OHM +5% 1/16W
			R044	0700027M	CF 100 OHM +5% 1/16W
			R045	0700027M	CF 100 OHM +5% 1/16W (Not using in C2120PN)


## REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	DESCRIPTIONS	SYMBOL NO.	PART NO.	DESCRIPTIONS
R046	0700027M	CF 100 OHM +5% 1/16W (Not using in C2120PN)	R217	0700045M	CF 2.2K OHM +5% 1/16W
R047	0700046M	CF 2.7K OHM +5% 1/16W	R218	0700052M	CF 6.8K OHM +5% 1/16W
R048	0700043M	CF 1.5K OHM +5% 1/16W	R219	0700034M	CF 330 OHM +5% 1/16W
R051	0700027M	CF 100 OHM +5% 1/16W (For C2125MS only)	R221	0700033M	CF 270 OHM +5% 1/16W (For C2198FS & C2128FS only)
R052	0700027M	CF 100 OHM +5% 1/16W (For C2125MS only)	R222	0700045M	CF 2.2K OHM +5% 1/16W (For C2198FS & C2128FS only)
R053	0700058M	CF 22K OHM +5% 1/16W	R223	0700027M	CF 100 OHM +5% 1/16W (For C2198FS & C2128FS only)
R054	0700058M	CF 22K OHM +5% 1/16W	R226	0700035M	CF 390 OHM +5% 1/16W
R056	0700047M	CF 3.3K OHM +5% 1/16W (Not using in C2120PN)	R234	0700027M	CF 100 OHM +5% 1/16W
R057	0700047M	CF 3.3K OHM +5% 1/16W (Not using in C2120PN)	R240	0700027M	CF 100 OHM +5% 1/16W
R058	0700054M	CF 10K OHM +5% 1/16W	R241	0700027M	CF 100 OHM +5% 1/16W
R059	0700041M	CF 1K OHM +5% 1/16W	R242	0119687G	MF 4.7 OHM +5% 1/4W
R060	0700051M	CF 5.6K OHM +5% 1/16W	R301	0700036M	CF 470 OHM +5% 1/16W
R062	0700041M	CF 1K OHM +5% 1/16W	R302	0700027M	CF 100 OHM +5% 1/16W
R064	0700041M	CF 1K OHM +5% 1/16W	R303	0700027M	CF 100 OHM +5% 1/16W
R065	0700047M	CF 3.3K OHM +5% 1/16W (For C2125MS only)	R304	0700054M	CF 10K OHM +5% 1/16W
R066	0700027M	CF 100 OHM +5% 1/16W (For C2125MS only)	R309	0700027M	CF 100 OHM +5% 1/16W
R101	0700058M	CF 22K OHM +5% 1/16W	R310	0700036M	CF 470 OHM +5% 1/16W
R102	0700063M	CF 47K OHM +5% 1/16W	R330	0100045M	CF 150 OHM +5% 1/8W
R103	0700054M	CF 10K OHM +5% 1/16W	R341	0700027M	CF 100 OHM +5% 1/16W (For C2125MS only)
R104	0700054M	CF 10K OHM +5% 1/16W	R342	0700041M	CF 1K OHM +5% 1/16W (For C2125MS only)
R201	0700052M	CF 6.8K OHM +5% 1/16W	R343	0700027M	CF 100 OHM +5% 1/16W (For C2125MS only)
R202	0700042M	CF 1.2K OHM +5% 1/16W	R351	0100038M	CF 75 OHM +5% 1/8W
R204	0700019M	CF 27 OHM +5% 1/16W	R352	0100041M	CF 100 OHM +5% 1/8W
R205	0700033M	CF 270 OHM +5% 1/16W	R353	0100113M	CF 100K OHM +5% 1/8W
R207	0700041M	CF 1K OHM +5% 1/16W (For C2198FS & C2128FS only)	R354	0100041M	CF 100 OHM +5% 1/8W
R211	0700041M	CF 1K OHM +5% 1/16W (For C2198FS & C2128FS only)	R355	0100113M	CF 100K OHM +5% 1/8W (Not for C2123MN, C2120PN)
R212	0700047M	CF 3.3K OHM +5% 1/16W (For C2198FS & C2128FS only)	R356	0100041M	CF 100 OHM +5% 1/8W
R213	0700038M	CF 680 OHM +5% 1/16W	R357	0100038M	CF 75 OHM +5% 1/8W
R214	0700058M	CF 22K OHM +5% 1/16W	R358	0100041M	CF 100 OHM +5% 1/8W
R215	0700026M	CF 82 OHM +5% 1/16W	R359	0100113M	CF 100K OHM +5% 1/16W
R216	0700031M	CF 180 OHM +5% 1/16W	R360	0100041M	CF 100 OHM +5% 1/16W
			R361	0100113M	CF 100K OHM +5% 1/8W (Not for C2123MN, C2120PN)


# V2 CHASSIS

## REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	DESCRIPTIONS	SYMBOL NO.	PART NO.	DESCRIPTIONS
R362	0100041M	CF 100 OHM +-5% 1/8W (Not for C2123MN, C2120PN)	R452	0700027M	CF 100 OHM +-5% 1/16W (Not for C2123MN, C2120PN)
R363	0100113M	CF 100K OHM +-5% 1/8W	R452	0700062M	CF 39K OHM +-5% 1/16W (For C2198FS only)
R364	0100037M	CF 68 OHM +-5% 1/8W	R453	0700027M	CF 100 OHM +-5% 1/16W (Not for C2123MN, C2120PN)
R365	0100113M	CF 100K OHM +-5% 1/8W	R454	0700027M	CF 100 OHM +-5% 1/16W (Not for C2123MN, C2120PN)
R366	0100041M	CF 100 OHM +-5% 1/8W	R455	0700054M	CF 10K OHM +-5% 1/16W (Not for C2123MN, C2120PN)
R367	0100113M	CF 100K OHM +-5% 1/8W (Not for C2123MN, C2120PN)	R456	0700027M	CF 100 OHM +-5% 1/16W (Not for C2123MN, C2120PN)
R368	0100041M	CF 100 OHM +-5% 1/8W (Not for C2123MN, C2120PN)	R457	0700027M	CF 100 OHM +-5% 1/16W (Not for C2123MN, C2120PN)
R406	0700027M	CF 100 OHM +-5% 1/16W	R458	0700059M	CF 27K OHM +-5% 1/16W (Not for C2123MN, C2120PN)
R407	0700041M	CF 1K OHM +-5% 1/16W	R459	0700059M	CF 27K OHM +-5% 1/16W (Not for C2123MN, C2120PN)
R408	0700041M	CF 1K OHM +-5% 1/16W	R501	0700027M	CF 100 OHM +-5% 1/16W
R409	0700041M	CF 1K OHM +-5% 1/16W	R502	0700027M	CF 100 OHM +-5% 1/16W
R410	0700027M	CF 100 OHM +-5% 1/16W (For C2198FS only)	R503	0700027M	CF 100 OHM +-5% 1/16W
R411	0700027M	CF 100 OHM +-5% 1/16W (For C2198FS only)	R507	0700027M	CF 100 OHM +-5% 1/16W
R412	0700027M	CF 100 OHM +-5% 1/16W (For C2198FS only)	R508	0700027M	CF 100 OHM +-5% 1/16W
R413	0700027M	CF 100 OHM +-5% 1/16W (For C2198FS only)	R509	0700027M	CF 100 OHM +-5% 1/16W
R414	0700041M	CF 1K OHM +-5% 1/16W (For C2198FS, C2128FS only)	R510	0700027M	CF 100 OHM +-5% 1/16W
R415	0700027M	CF 100 OHM +-5% 1/16W (For C2198FS only)	R515	0700067M	CF 100K OHM +-5% 1/16W
R416	0700027M	CF 100 OHM +-5% 1/16W (For C2198FS only)	R516	0700059M	CF 22K OHM +-5% 1/16W
R420	0700054M	CF 10K OHM +-5% 1/16W	R517	0700055M	CF 12K OHM +-5% 1/16W
R440	0700051M	CF 5.6K OHM +-5% 1/16W	R518	0700053M	CF 8.2K OHM +-5% 1/16W
R441	0700051M	CF 5.6K OHM +-5% 1/16W (Not for C2123MN)	R519	0700049M	CF 4.7K OHM +-5% 1/16W
R442	0700043M	CF 1.5K OHM +-5% 1/16W	R520	0700054M	CF 10K OHM +-5% 1/16W
R444	0700043M	CF 1.5K OHM +-5% 1/16W (Not for C2123MN)	R521	0700045M	CF 2.2K OHM +-5% 1/16W
R445	0700036M	CF 470 OHM +-5% 1/16W (Not for C2123MN, C2120PN)	R522	0700027M	CF 100 OHM +-5% 1/16W
R451	0700027M	CF 100 OHM +-5% 1/16W (Not for C2123MN, C2120PN)	R523	0700045M	CF 2.2K OHM +-5% 1/16W
R451	0700062M	CF 39K OHM +-5% 1/16W (For C2198FS only)	R526	0700027M	CF 100 OHM +-5% 1/16W
			R527	0700027M	CF 100 OHM +-5% 1/16W
			R528	0700027M	CF 100 OHM +-5% 1/16W
			R601	0700027M	CF 100 OHM +-5% 1/16W
			R602	0700027M	CF 100 OHM +-5% 1/16W
			R603	0700062M	CF 39K OHM +-5% 1/16W
			R604	0700046M	CF 2.7K OHM +-5% 1/16W

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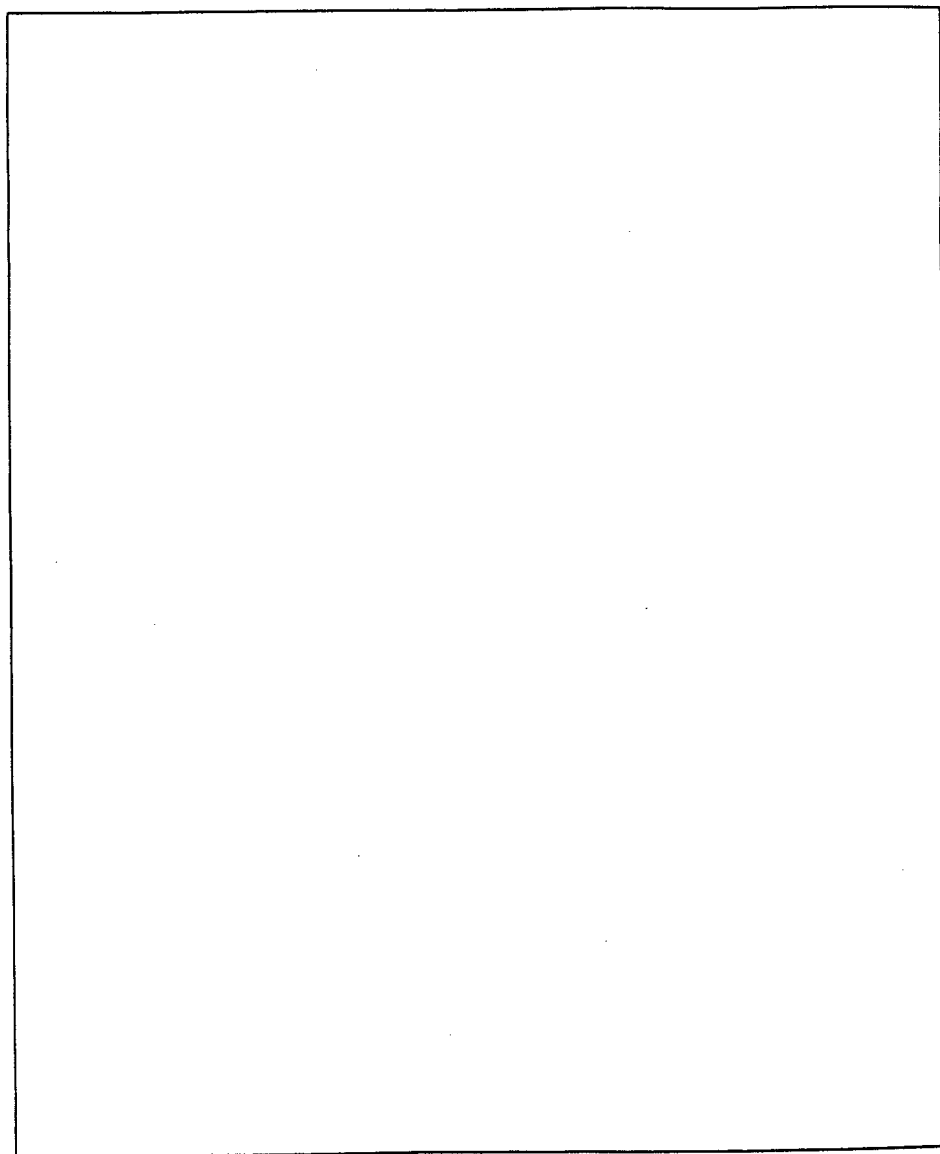
SYMBOL NO.	PART NO.	DESCRIPTIONS	SYMBOL NO.	PART NO.	DESCRIPTIONS
R605	0119722M	MF 1 OHM +-5% 1W	R782	0110285S	MF 47K OHM +-5% 2W
R606	0700027M	CF 100 OHM +-5% 1/16W	R783	0100091M	CF 12K OHM +-5% 1/8W
R607	0179598M	MF 6.8M OHM +-5% 1/8W	R784	0113748M	CF 820 OHM +-5% 1/2W
R608	0179597M	MF 5.6M OHM +-5% 1/8W	R801	0700027M	CF 100 OHM +-5% 1/16W
R681	0110129S	MF 220 OHM +-5% 1W	R802	0700027M	CF 100 OHM +-5% 1/16W
R682	0100035M	CF 56 OHM +-5% 1/8W	R802A	0100041M	CF 100 OHM +-5% 1/8W
R701	0700027M	CF 100 OHM +-5% 1/16W	R803	0700027M	CF 100 OHM +-5% 1/16W
R702	0700059M	CF 27K OHM +-5% 1/16W	R804	0700033M	CF 270 OHM +-5% 1/16W
R703	0700056M	CF 15K OHM +-5% 1/16W	R805	0700033M	CF 270 OHM +-5% 1/16W
R704	0700045M	CF 2.2K OHM +-5% 1/16W	R806	0700033M	CF 270 OHM +-5% 1/16W
R719	0110253S	MF 2.2K OHM +-5% 2W	R807	0700042M	CF 1.2K OHM +-5% 1/16W
R719A	0113752M	CF 1.2K OHM +-5% 1/2W	R808	0700038M	CF 680 OHM +-5% 1/16W
R720	0110359S	MF 3.9K OHM +-5% 3W	R809	0700038M	CF 680 OHM +-5% 1/16W
R721	0110211S	MF 39 OHM +-5% 2W	R811	0110271S	MF 12K OHM +-5% 2W
		(For C2125MS & C2198FS only)	R812	0110271S	MF 12K OHM +-5% 2W
R722	0110201S	MF 15 OHM +-5% 2W	R813	0110271S	MF 12K OHM +-5% 2W
		(For C2125MS-981, 195 & C2198FS only)	R814	0113744M	CF 560 OHM +-5% 1/2W
R723	0100057M	CF 470 OHM +-5% 1/8W	R815	0113744M	CF 560 OHM +-5% 1/2W
		(For C2125MS-981, 195 & C2198FS only)	R816	0113744M	CF 560 OHM +-5% 1/2W
R724	0700041M	CF 1K OHM +-5% 1/16W	R830	AW00074	VR 1K-B
		(For C2125MS-981, 195 & C2198FS only)	R831	AW00074	VB 1K-B
R725	0700054M	CF 10K OHM +-5% 1/16W	R900	0147518A	WW 1.2 OHM +-5% 5W
		(For C2125MS-981, 195 & C2198FS only)			(Not for 081, 433 models)
R727	0700054M	CF 10K OHM +-5% 1/16W	R901	0147616A	WW 1.8 OHM +-10% 7W
		(For C2125MS-981, 195 & C2198FS only)	R902	0147610AX	WW 1 OHM +-5% 7W
R730	0700047M	CF 3.3K OHM +-5% 1/16W	R903	0113791M	CF 47K OHM +-5% 1/2W
R741	0700032M	CF 220 OHM +-5% 1/16W	R904	0113787M	CF 33K OHM +-5% 1/2W
R742	0700055M	CF 12K OHM +-5% 1/16W	R905	0100085M	CF 6.8K OHM +-5% 1/8W
R744	0100065M	CF 1K OHM +-5% 1/8W	R906	0113754M	CF 1.5K OHM +-5% 1/2W
R745	0700039M	CF 820 OHM +-5% 1/16W	R907	AT00962F	WW 220 OHM +-5% 7W
R751	0114219M	CF 56K OHM +-5% 1/4W	R908	AT00966F	WW 470 OHM +-5% 7W
R752	0114213M	CF 33K OHM +-5% 1/4W	R909	AT00966F	WW 470 OHM +-5% 7W
R753	0100049M	CF 220 OHM +-5% 1/8W	R910	0700043M	CF 1.5K OHM +-5% 1/16W
R757	0118969M	MF 220K OHM +-1% 1/4W	R911	0114053M	CF 33 OHM +-5% 1/4W
R758	0119643M	MF 33K OHM +-1% 1/8W	R912	0114131M	CF 100 OHM +-5% 1/4W
R759	0110273S	MF 15K OHM +-5% 2W	R913	0700032M	CF 220 OHM +-5% 1/16W
R759A	0110273S	MF 15K OHM +-5% 2W	R914	0113692M	CF 4.7 OHM +-5% 1/2W
R760	0100093M	CF 15K OHM +-5% 1/8W	R915	0114165M	CF 1.5K OHM +-5% 1/4W
R761	0700041M	CF 1K OHM +-5% 1/16W	R916	0114165M	CF 1.5K OHM +-5% 1/4W
R762	0700051M	CF 5.6K OHM +-5% 1/16W	R917	0100041M	CF 100 OHM +-5% 1/8W
R781	0147620A	WW 4.7 OHM +-10% 7W	R918	0100093M	CF 15K OHM +-5% 1/8W

## REPLACEMENT PARTS LIST

**PRODUCT SAFETY NOTE :** Components marked with a  $\Delta$  have special characteristics important to safety, before replacing any of these components, read carefully the PRODUCTS SAFETY NOTICE of this Service Manual.  
Don't degrade the safety of the receiver through improper servicing.

SYMBOL NO.	PART NO.	DESCRIPTIONS	SYMBOL NO.	PART NO.	DESCRIPTIONS
R919	0700058M	CF 22K OHM $\pm 5\%$ 1/16W	U401	HP00731	NICAM/A2 UNIT - C2198FS only
R940	0144155A	WW 68 OHM $\pm 10\%$ 2w	U402	CW00312	FM RADIO ASSY-C2125MS only
R950	AW00102	VR 1K-B	$\Delta$ V1	2471272	CRT A51KPD12XX
R951	0113791M	CF 47K OHM $\pm 5\%$ 1/2W	WL	2976143	2P CONNECTOR BASE (Not using in C2123MN model)
R952	0100078M	CF 3.6K OHM $\pm 5\%$ 1/8W	WR	2976755A	3J MINI CONN. W/WIRES
R953	0700047M	CF 3.3K OHM $\pm 5\%$ 1/16W	X001	CZ00641	REMOCON RECEIVER
R954	0113789M	CF 39K OHM $\pm 5\%$ 1/2W	X002	2168371	X'TAL 6MHZ
R955	0110155S	MF 2.7K OHM $\pm 5\%$ 1W	X003	2791754R	LC FILTER
R956	0700049M	CF 4.7K OHM $\pm 5\%$ 1/16W	X004	2791754R	LC FILTER
R957	0700049M	CF 4.7K OHM $\pm 5\%$ 1/16W	X201	BG01481U	SAW FILTER K6276K (Not for C2120PN, C2123MN)
R958	0700049M	CF 4.7K OHM $\pm 5\%$ 1/16W	X201	BG01491U	SAW FILTER TSF5370P (For C2120PN, C2123MN only)
R959	0700049M	CF 4.7K OHM $\pm 5\%$ 1/16W	X202	BN00171	CER. TRAP 5.5/5.74MHZ
R960	0700043M	CF 1.5K OHM $\pm 5\%$ 1/16W	X203	BN00172	CER. TRAP 6.0/6.5MHZ (Not for C2120PN)
R961	0100075M	CF 2.7K OHM $\pm 5\%$ 1/8W	X204	2123451	CERAMIC TRAP 4.5MHZ (For C2198FS, C2128FS only)
$\Delta$ R962	0113742M	CF 470 OHM $\pm 5\%$ 1/2W	X401	2167213B	CERAMIC FILTER 6.5MHZ (Not for C2120PN)
R998	0174704	MF 10M OHM 5% 1W	X401	2167211B	CERAMIC FILTER 5.5MHZ (For C2120PN only)
RK220	0700054M	CF 10K OHM $\pm 5\%$ 1/16W (For C2125MS only)	X402	2167212B	CERAMIC FILTER 6.0MHZ (Not for C2120PN)
RK221	0700054M	CF 10K OHM $\pm 5\%$ 1/16W (For C2125MS only)	X403	2167211B	CERAMIC FILTER 5.5MHZ (Not for C2120PN)
RK230	0700059M	CF 27K OHM $\pm 5\%$ 1/16W (Not for C2123MN, C2120PN)	X404	2167311B	CERAMIC FILTER 4.5MHZ (For C2198FS, C2128FS only)
RK239	0700059M	CF 27K OHM $\pm 5\%$ 1/16W (Not for C2123MN, C2120PN)	X501	2791505	CRYSTAL 3579.545KHZ
RK244	0700051M	CF 5.6K OHM $\pm 5\%$ 1/16W (For C2125MS only)	X503	2170043	CRYSTAL 4.43MHZ
RK246	0700051M	CF 5.6K OHM $\pm 5\%$ 1/16W (For C2125MS only)			
RK332	0100033M	CF 47 OHM $\pm 5\%$ 1/8W			
S01	FE00282	TACT SW 3 KEY			
S02	FE00282	TACT SW 3 KEY			
$\Delta$ S901	2634732	MAINS SWITCH			
SP401	GK00441	SPEAKER 5 X 9			
SP402	GK00441	SPEAKER 5 X 9 (Not using in C2123MN model)			
T721	BS00011	H.DRIVE TRANS			
$\Delta$ T761	BW00991	FBT			
$\Delta$ T901	BT01061	SWITCHING TRANSFORMER			
TH901	CJ00041	THERMISTOR			
U001	HJ00381	TUNER			
U1101	HL01141	REMOTE CONTROL CLE-937			

## MEMO



**HITACHI**

RAS-50CNHA1 / RAC-50CNHA1

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