ORDER No. SM-98017

Service Manual

Colour Television

TX-28MD4
TX-25MD4
TX-21MD4

EURO4 Chassis

SPECIFICATIONS

(Information in brackets { } refers to model TX-25MD4)
(Information in brackets [ ] refers to model TX-21MD4)

Power Source:	220-240V AC, 50Hz		
Power Consumption:	85W [71W]		
Aerial Impedance:	75Ω unbalanced, Coaxial Type		
Stand-by Power Consumption:	1,8W		
Receiving System:	PAL I, PAL 525/60 M.NTSC NTSC (AV only)		
Receiving Channels:	UHF E21 - E69		
Intermediate Frequency:			
Video	39,5MHz		
Audio	33,5MHz, 32,95MHz		
Colour	35,07MHz (PAL)		
Video/Audio Terminals:			
AUDIO MONITOR OUT	Audio (RCAx2)	500mV rms 1kΩ	
AV1 IN	Video (21 pin)	1V p-p 75Ω	
	Audio (21 pin)	500mV rms 10kΩ	
	RGB (21 pin)		
AV1 OUT	Video (21 pin)	1V p-p 75Ω	
	Audio (21 pin)	500mV rms 1kΩ	
AV2 IN	Video (21 pin)	1V p-p 75Ω	
	Audio (21 pin)	500mV rms 10kΩ	
	S-Video IN (21-pin)	Y: 1V p-p 75Ω C:0.3V p-p 75Ω	
AV2 OUT	Video (21 pin)	1Vp-p 75Ω	
	Audio (21 pin)	500mV rms 1kΩ	
	Selectable output (21 pin)		
AV3 IN	Audio (RCAx2)	500mV rms 10kΩ	
	Video (RCAx1)	1V p-p 75Ω	
High Voltage:	28,5kV ±1kV [28kV ±1kV]	{28,2kV ±1kV}	
Picture Tube:	A66ECF50X41 {A59ECF50X41 [A51ECQ51X01	66cm 59cm} 51cm]	
Audio Output:	2 x 15W (Music Power) 8Ω Impedance		
Headphones:	8Ω Impedance 3,5 mm		
Accessories supplied :	Remote Control 2 x R6 (UM3) Batteries TV Stand		

Dimensions:			
Height:	580 mm	{531 mm}	[478 mm]
Width:	666 mm	{601 mm}	[525 mm]
Depth:	472 mm	{439 mm}	[480 mm]
Net weight:	31kg	{25kg}	[22kg]

Specifications are subject to change without notice.
Weights and dimensions shown are approximate.

NOTE: This Service Manual should be used in conjunction with the EURO4 Technical guide.

Panasonic CS (U.K.) Ltd.
WILLOUGHBY ROAD,
BRACKNELL,
BERKS.,
RG12 8FT.

Panasonic

CONTENTS

SAFETY PRECAUTIONS

GENERAL GUIDE LINES

1. It is advisable to insert an isolation transformer in the AC supply before servicing a hot chassis.
2. When servicing, observe the original lead dress in the high voltage circuits. If a short circuit is found, replace all parts that have been overheated or damaged by the short circuit.
3. After servicing, see that all the protective devices such as insulation barriers, insulation papers, shields and isolation R-C combinations are correctly installed.
4. When the receiver is not being used for a long period of time, unplug the power cord from the AC outlet.
5. Potentials as high as 29,5kV {29,2kV} [29kV] are present when this receiver is in operation. Operation of the receiver without the rear cover involves the danger of a shock hazard from the receiver power supply. Servicing should not be attempted by anyone who is not familiar with the precautions necessary when working on high voltage equipment. Always discharge the anode of the tube.
6. After servicing make the following leakage current checks to prevent the customer from being exposed to shock hazard.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs of the plug.
2. Turn on the receiver's power switch.
3. Measure the resistance value with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the receiver, such as screw heads, aerials, connectors, control shafts etc. When the exposed metallic part has a return path to the chassis, the reading should be between 4M ohm and 20M ohm. When the exposed metal does not have a return path to the chassis, the reading must be infinite.

LEAKAGE CURRENT HOT CHECK

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 2kΩ 10W resistor in series with an exposed metallic part on the receiver and an earth, such as a water pipe.
3. Use an AC voltmeter with high impedance to measure the potential across the resistor.
4. Check each exposed metallic part and check the voltage at each point.
5. Reverse the AC plug at the outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 1.4 Vrms. In case a measurement is outside the limits specified, there is a possibility of a shock hazard, and the receiver should be repaired and rechecked before it is returned to the customer.

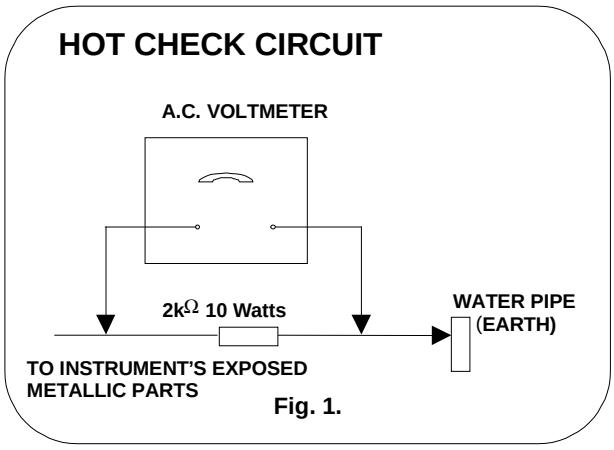


Fig. 1.

X-RADIATION WARNING

1. The potential sources of X-Radiation in TV sets are the high voltage section and the picture tube.
2. When using a picture tube test jig for service, ensure that the jig is capable of handling 29,5kV without causing X-Radiation.

NOTE: It is important to use an accurate periodically calibrated high voltage meter.

1. Set the brightness to minimum.
2. Measure the high voltage. The meter should indicate.
   TX-28MD4 28,5kV ± 1kV.
   TX-25MD4 28,2kV ± 1kV.
   TX-21MD4 28kV ± 1kV.
   If the meter indication is out of tolerance, immediate service and correction is required to prevent the possibility of premature component failure.
3. To prevent any X-Radiation possibility, it is essential to use the specified tube.

SERVICE HINTS

How to remove the rear cover

1. Remove the 9 screws as shown in **Fig.2.**

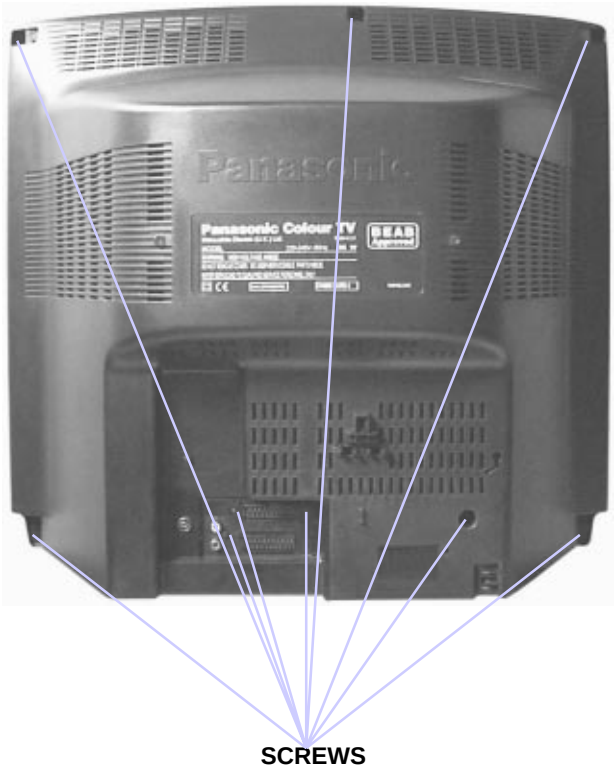


Fig.2.

LOCATION OF CONTROLS

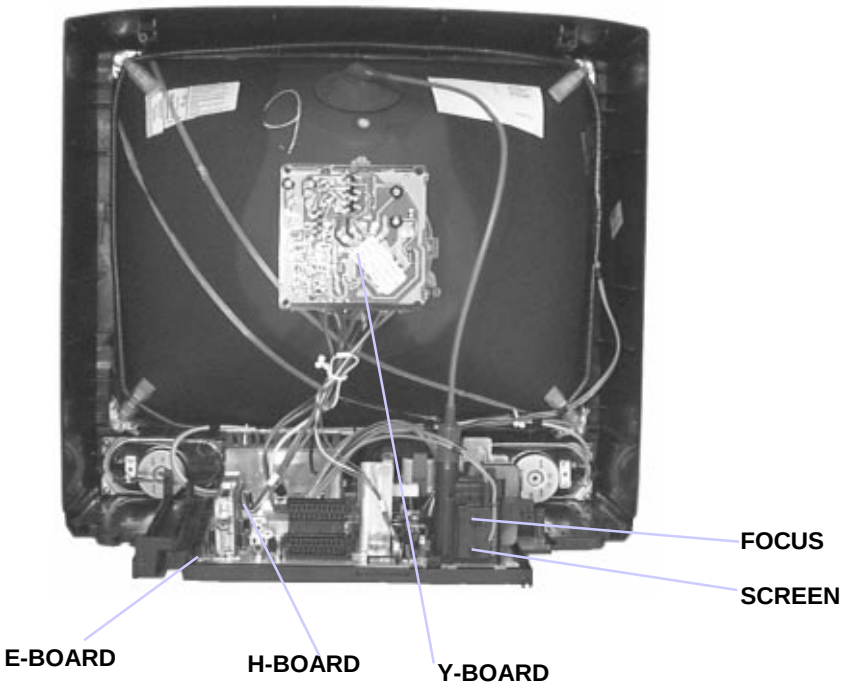


Fig.3.

HOW TO MOVE THE CHASSIS INTO SERVICE POSITION

1. Remove the bead clamper from the mains lead and attach to the degauss coil, shown in **Fig.5**.
2. Hold and lift the rear of the E-PCB chassis and gently pull the chassis toward you, as shown in **Fig.4**.
3. Release the respective wiring clips and rotate the chassis horizontally through 90°, anti-clockwise.
4. Move the EHT lead around to the left side of the CRT neck.
5. Elevate the front of the chassis.
6. Clip the chassis frame onto the bead clamper, on the degauss coil, as shown in **Fig.5**.
7. Locate the base of the chassis frame into the hole (marked A), shown in **Fig.6**.
8. After servicing replace the bead clamper and ensure all wiring is returned to its original position before returning the receiver to the customer.

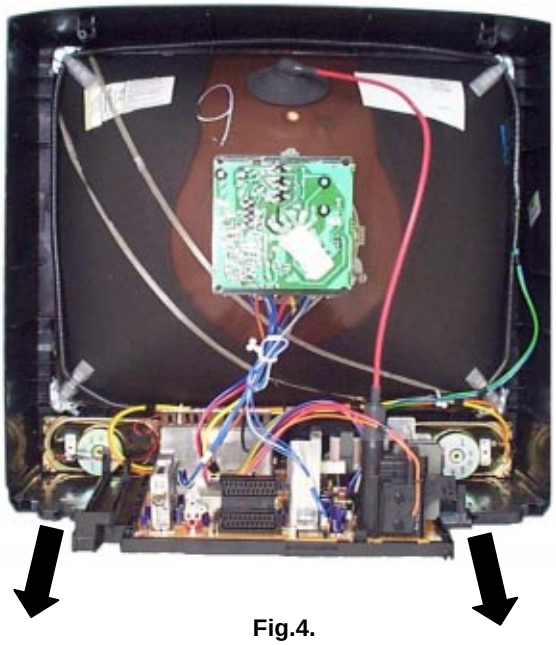


Fig.4.

Fig.5.

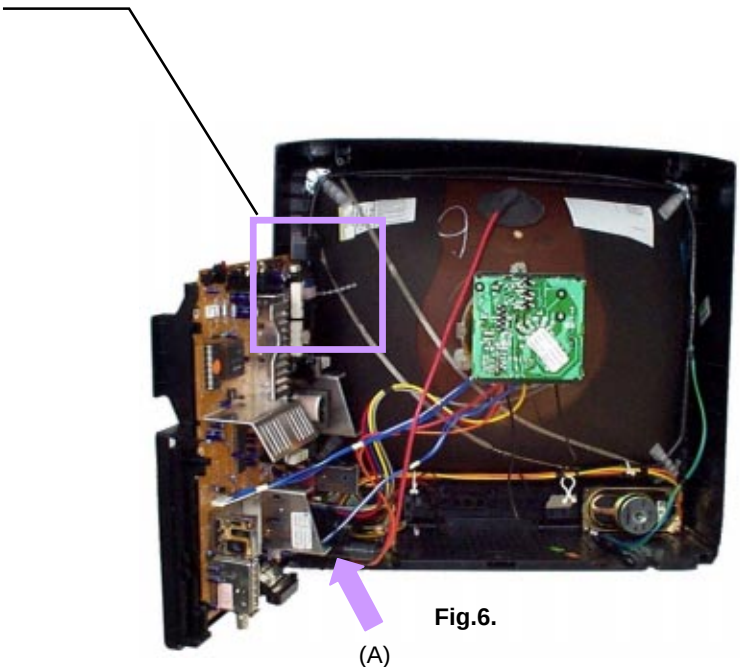


Fig.6.

ADJUSTMENT PROCEDURE

The remote control is used for entering and storing adjustments, with the exception of Cut-off adjustments, which must always be done prior to service adjustment. Perform adjustments in accordance with screen display. The display on the screen also specifies the software version as well as the approx. setting values. The adjustment sequence for the service mode is indicated below.

1. Set the Bass to maximum position, set the Treble to minimum position, press the F button followed by the volume down button on the customer controls at the front of the TV and at the same time press the "**INDEX**" button on the remote control, this will place the TV into the Service Mode.
2. Press the **RED** / **GREEN** buttons to step up / down through the functions.
3. Press the **YELLOW** / **BLUE** buttons to alter the function values.
4. Press the **STR** button after each adjustment has been made to store the required values.
5. To exit the Service Mode, press the "**N"** button.

NOTE: This TV also has the option of using a Memory Pack which enables you to copy the preset TV channels into the Memory Pack and then download them onto this or any other EURO-4 TV set.

TV to Memory Pack process

1. Plug the memory pack into the AV1 21 pin terminal at the back of the TV and switch the TV on.
2. Go into Service Mode as explained above.
   The screen will show :-

Program External>>TV

3. Press the **BLUE** button on the remote control.
   The screen will show :-

Program TV>>External

4. Press the **STR** button on the TV.
   The screen will show :-

Please Wait

5. All the tuning information stored inside the TV will now be transferred to the Memory Pack. This process will take 2-3 minutes to complete and when finished the screen will show :-

Complete

Memory Pack to TV process

1. Plug the memory pack into the AV1 21 pin terminal at the back of the TV and switch the TV on.
2. Go into Service Mode as explained above.
   The screen will show :-

Program External>>TV

3. Press the **STR** button on the TV.
   The screen will show :-

Please Wait

4. All the tuning information stored inside the Memory Pack will now be transferred to the TV. This process will take 2-3 minutes to complete and when finished the screen will show :-

Complete

5. The tuning information from the Memory Pack has now been copied into the TV.
6. To exit from the Service Mode press the **"N"** button.
7. The process has now been completed and the Memory Pack can now be removed.

ERRORS

If an error occurs while using the Memory Pack the TV will detect this and the screen will show :-

Error !!

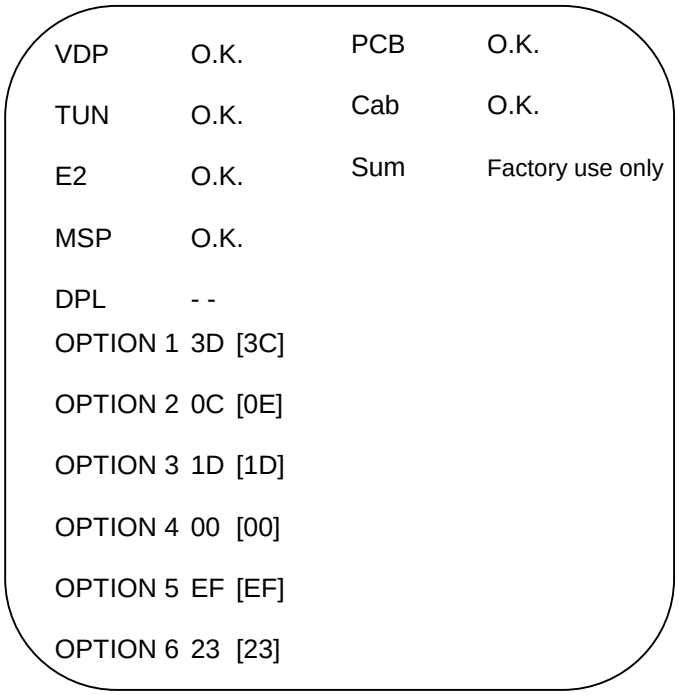
If this happens then press the **"N"** button and repeat the process that was being used. If the errors continue to occur then check the connectors between the TV and the memory pack and check the 9V battery inside the memory pack.

ADJUSTMENT PROCEDURE

Item / Preparation	Adjustments
+B SET-UP 1. Receive a Greyscale signal. 2. Set the controls :- Brightness Minimum Contrast Minimum Volume Minimum	1. Set the +B voltage up as follows:- Adjust **R811** so that **B2** shows 148V±1V [130V±1V TX-21MD4] 2. Confirm the following voltages. **B9** 5 ± 0,25V **B10** 5 ± 0,25V **B5** 12 ± 0,5V **B11** 33 ± 1,5V **B4** 16 ± 1V **B7** 8 ± 0,5V **B12** 26 ± 1V **B8** 5,5 ± 0,5V **B3** 35 ± 1V **B13** 15 ± 1V **B1** 200 ± 10V **B14** -15 ± 1V
CUT OFF / Ug2 Test 1. Receive a Greyscale signal. 2. Degauss the tube externally. 3. Set the TV into Service Mode 1. 4. Select Cut off mode.	To adjust Cutoff connect an oscilloscope to the Blue cathode, adjust "cutoff" value using the "**Yellow**" and "**Blue**" buttons until the black level is 160V±5V press "**STR**" to store the value. Remove the oscilloscope. Select Ug2 adjustment and adjust the screen VR until the display shows "O.K."

SELF CHECK

Self-check is used to automatically check the bus lines and hexadecimal code of the TV set. To get into the Self-Check mode press the down **(-/v)** button on the customer controls at the front of the set, at the same time pressing the **STATUS** button on the remote control, and the screen will show :-



If the CCU ports have been checked and found to be incorrect or not located then " - - " will appear in place of "O.K.".

Service Aids

To aid in the service of our current chassis there are a number of Service Aids which have been made available.

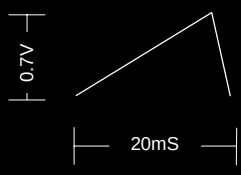
- **LUCI** interface kit (**L**inked **U**tility **C**omputer **I**nterface)
  Part number: TZS6EZ002
  This contains interface and cables for connecting TV service connector and a PC as well as diagnostic software. As new models are introduced upgrade software will become available.

- **VICI** (**V**isual **I**nteractive **C**omputer **I**nformation)
  These C.D.'s contain multimedia documentation providing quick access to service information.
  Part No. TZS7EZ006 & TZS7EZ005
  1. Service Manuals
  2. Instruction Books
  3. Technical Information

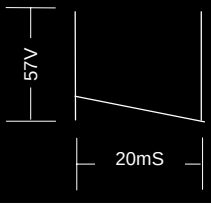
- **TASMIN** (**T**echnically **A**dvanced **S**ystem for **M**ultimedia **I**nteractive **N**otes)
  As well as providing a first step towards more interactive training this product also achieves quick access to Technical Information.

WAVEFORM PATTERN TABLE

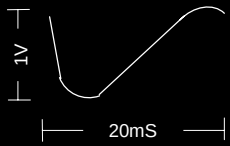
Vert Out
IC601 Pin 31



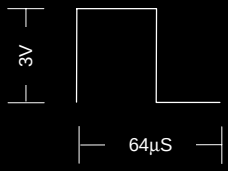
Vert Drive
IC451 Pin 2



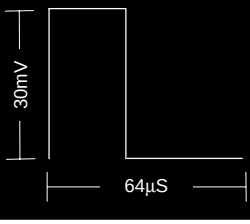
VFLB
IC451 Pin 3



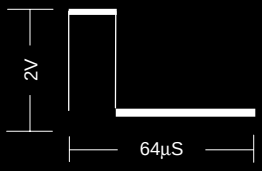
H - Out
IC601 Pin 50



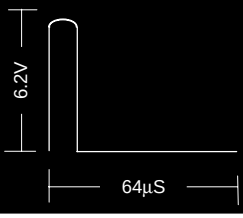
H - Out
IC701 Pin 5



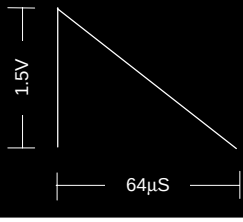
H - Pulse
Base Q503



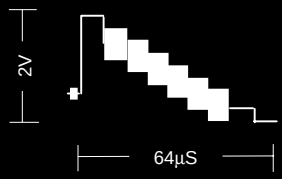
HFLB
IC601 Pin 13



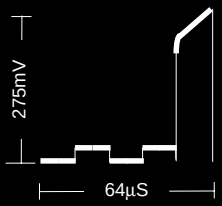
HFLB
IC701 Pin 8



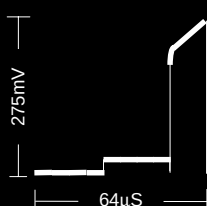
Video Out
IC601 Pin 59



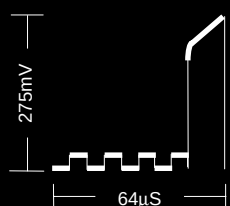
R - Out
IC601 Pin 37



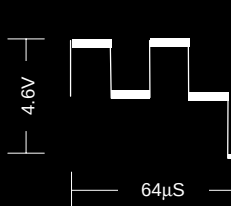
G - Out
IC601 Pin 38



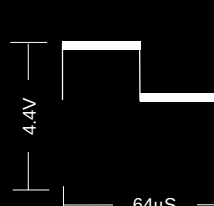
B - Out
IC601 Pin 39



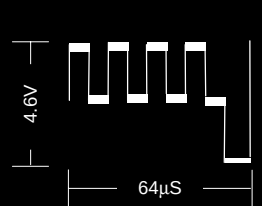
R - Out
E8 Pin 5



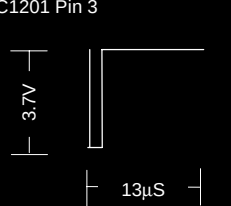
G - Out
E8 Pin 3



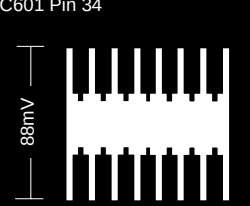
B - Out
E8 Pin 4



SCL
IC1201 Pin 3

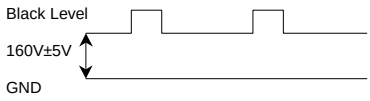


SVM Out
IC601 Pin 34

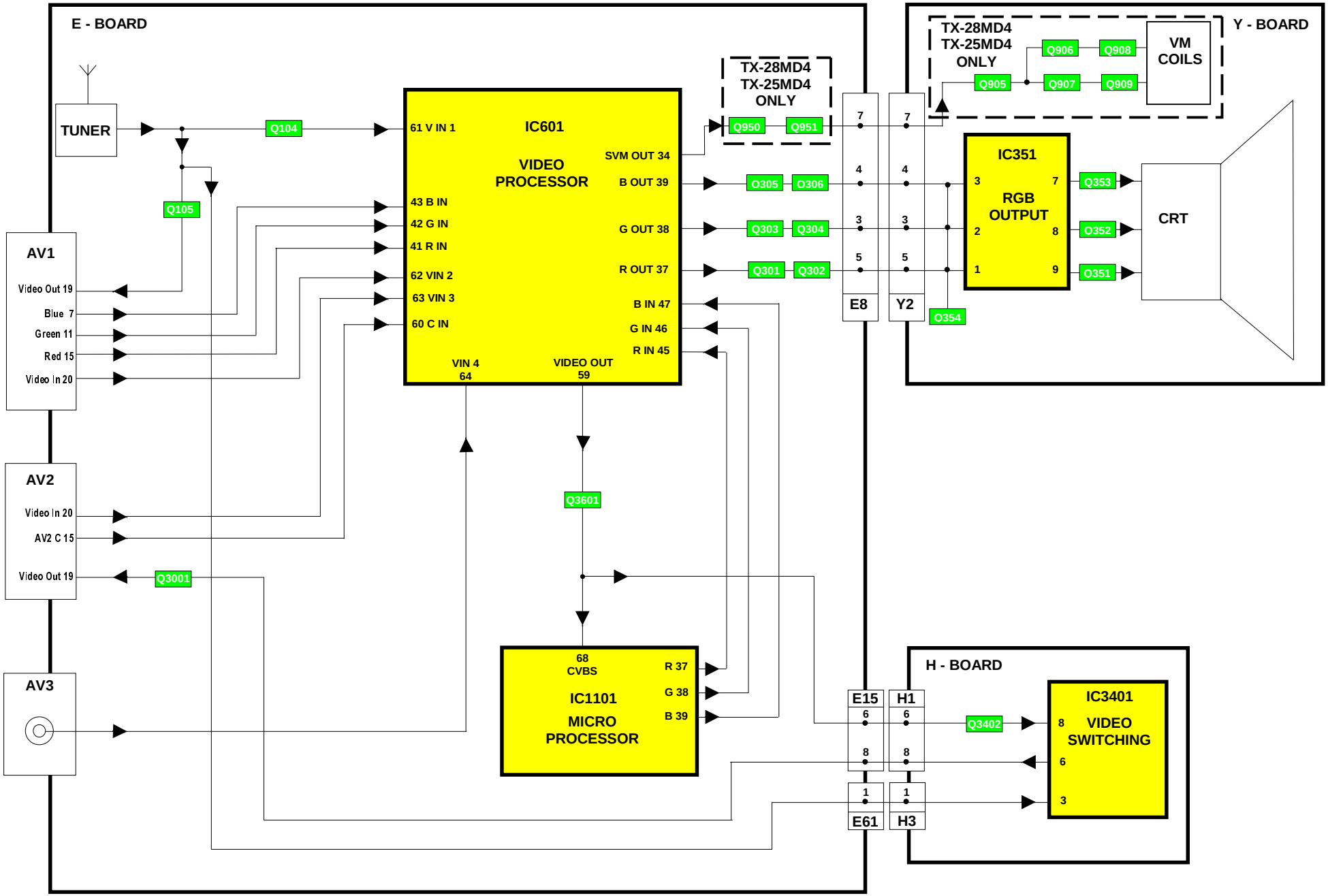


ALIGNMENT SETTINGS

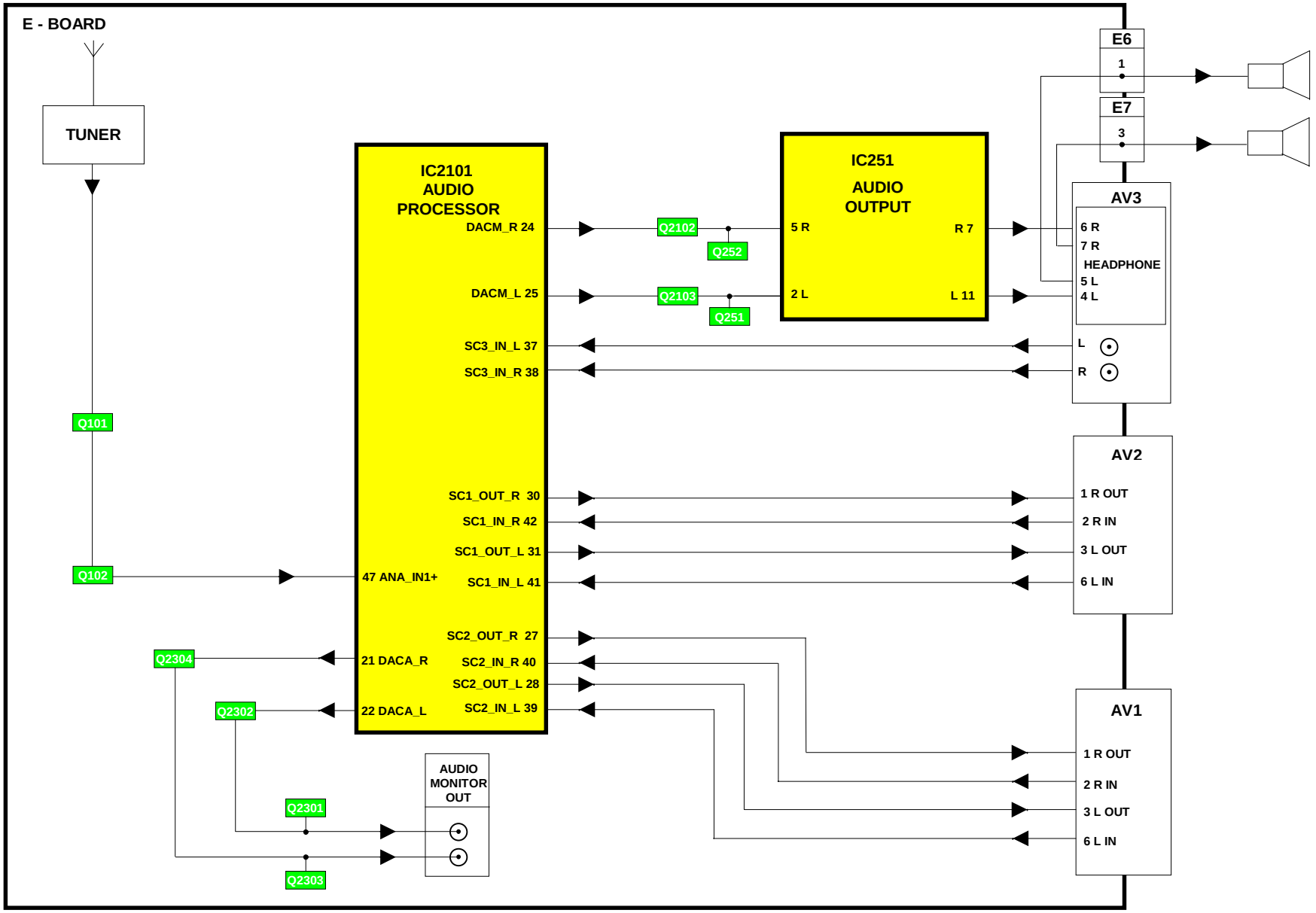
(The figures below are nominal and used for representative purposes only.)

Alignment Function		Settings / Special features
Horizontal Position	H-Pos 061	Optimum setting.
Vertical Position	V-Pos 005	Optimum setting.
Horizontal Amplitude	H-Amp 055	Optimum setting.
Vert. Amplitude	V-Amp 054	Optimum setting.
EW-amplitude	E/W-Amp1 -128	Optimum setting.
EW-amplitude	E/W-Amp2 006	Optimum setting.
Trapezium-comp	Trapez-1 047	Optimum setting.
Trapezium-comp	Trapez-2 -128	Optimum setting.
Vertical Linearity	V-Lin 006	Optimum setting.
Vertical Symmetry	V-Sym 002	Optimum setting.
DVCO	DVCO -005	Receive a PAL Colour Bar Pattern. For DVCO alignment press **"Blue"** button, wait until the colours are changing slowly and press **"STR".**
Cut-off DC	Cut-off 0171	To adjust Cutoff connect an oscilloscope to the blue cathode, adjust "cutoff" value using the "**Yellow**" and "**Blue**" buttons until the black level is 160V±5V press "**STR**" to store the value. Remove the oscilloscope. Select Ug2 adjustment and adjust the screen VR until the display shows "O.K."
Ug2 Test	Ug2 055 O.K.	
Highlight Lowlight	High 0902 0777 0864 Low 0117 0132 0112	Optimum setting.
Sub-Brightness	Sub-Brightness 255	Optimum setting.

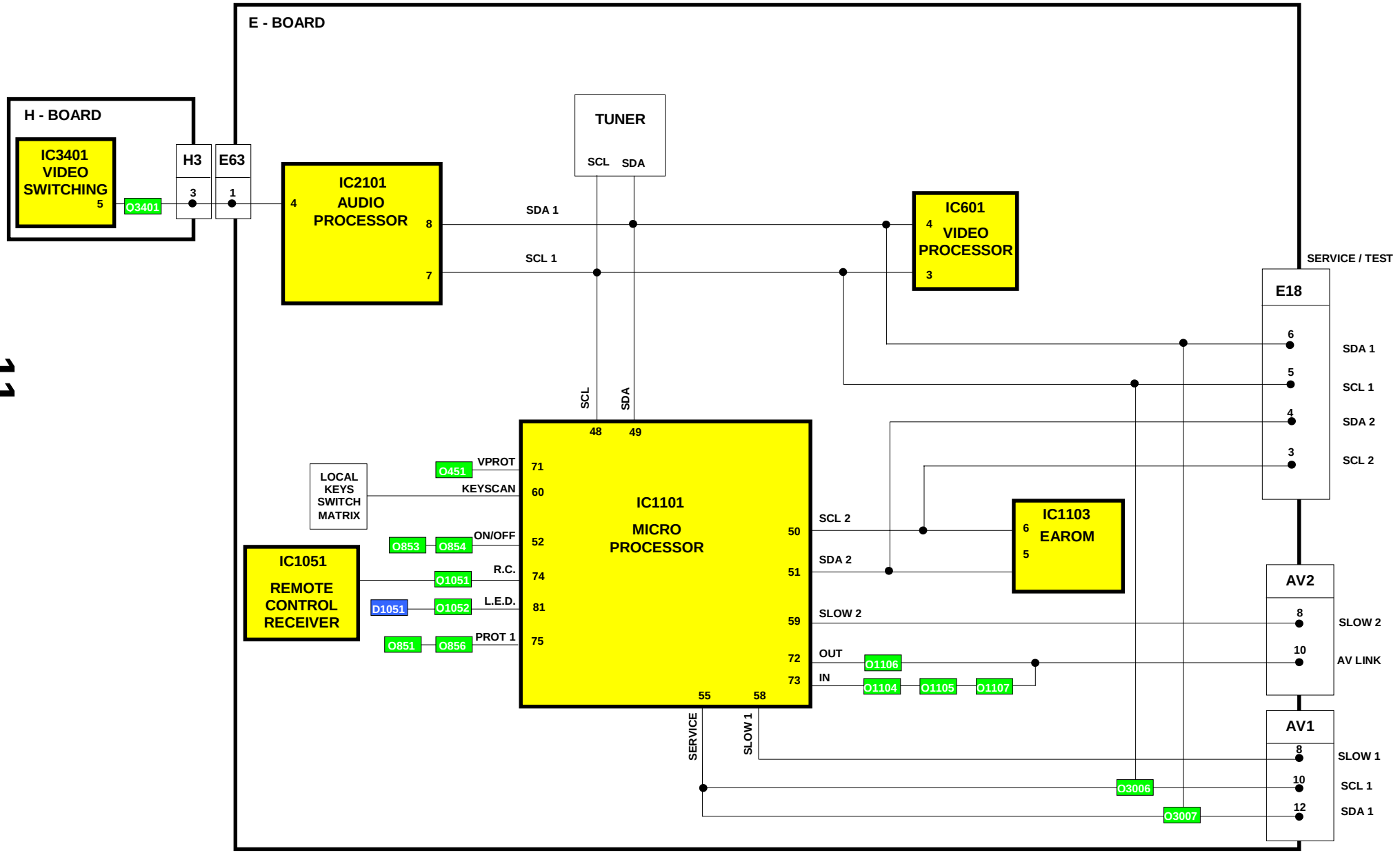
VIDEO BLOCK DIAGRAM



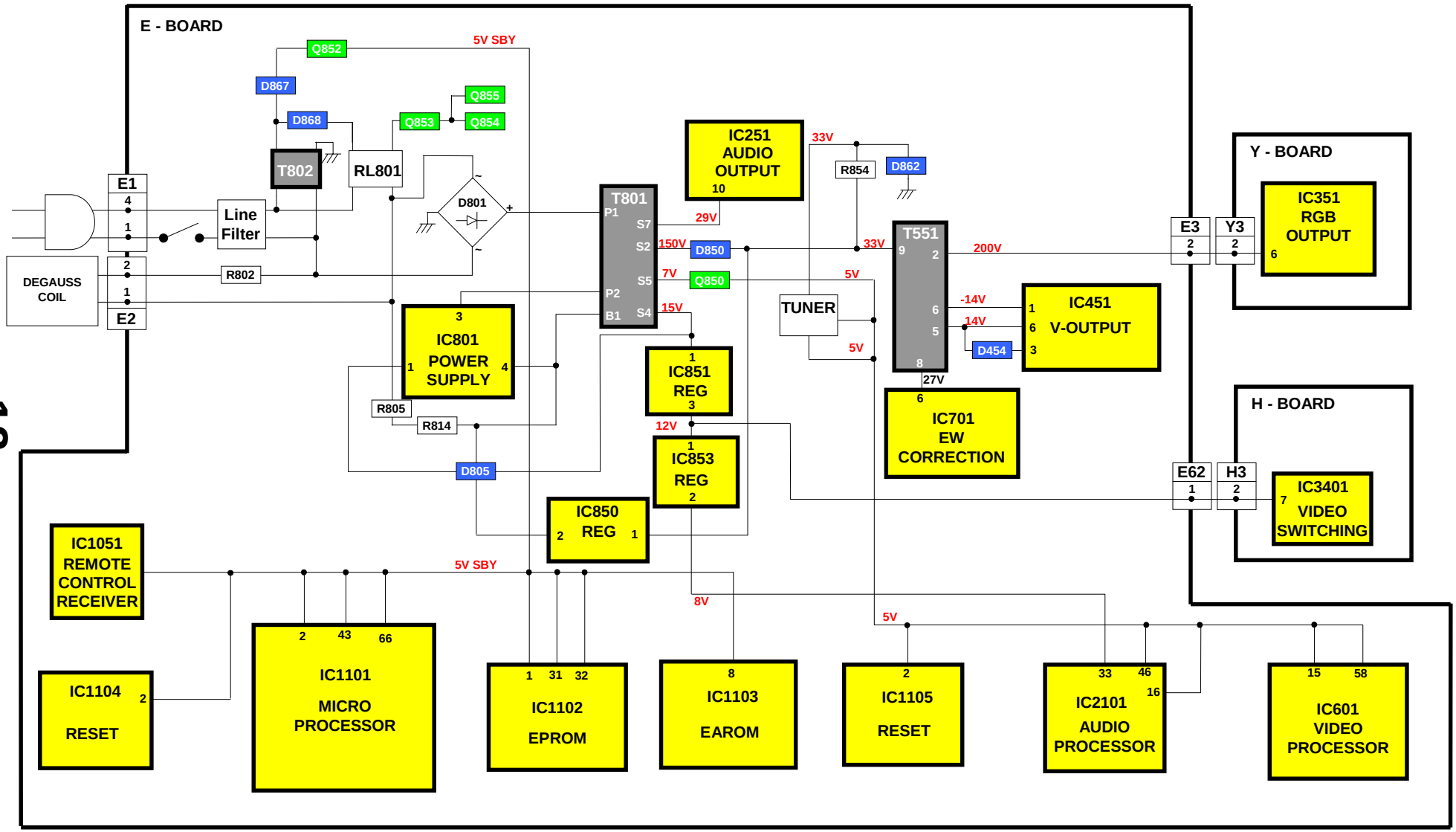
AUDIO BLOCK DIAGRAM



CONTROL BLOCK DIAGRAM

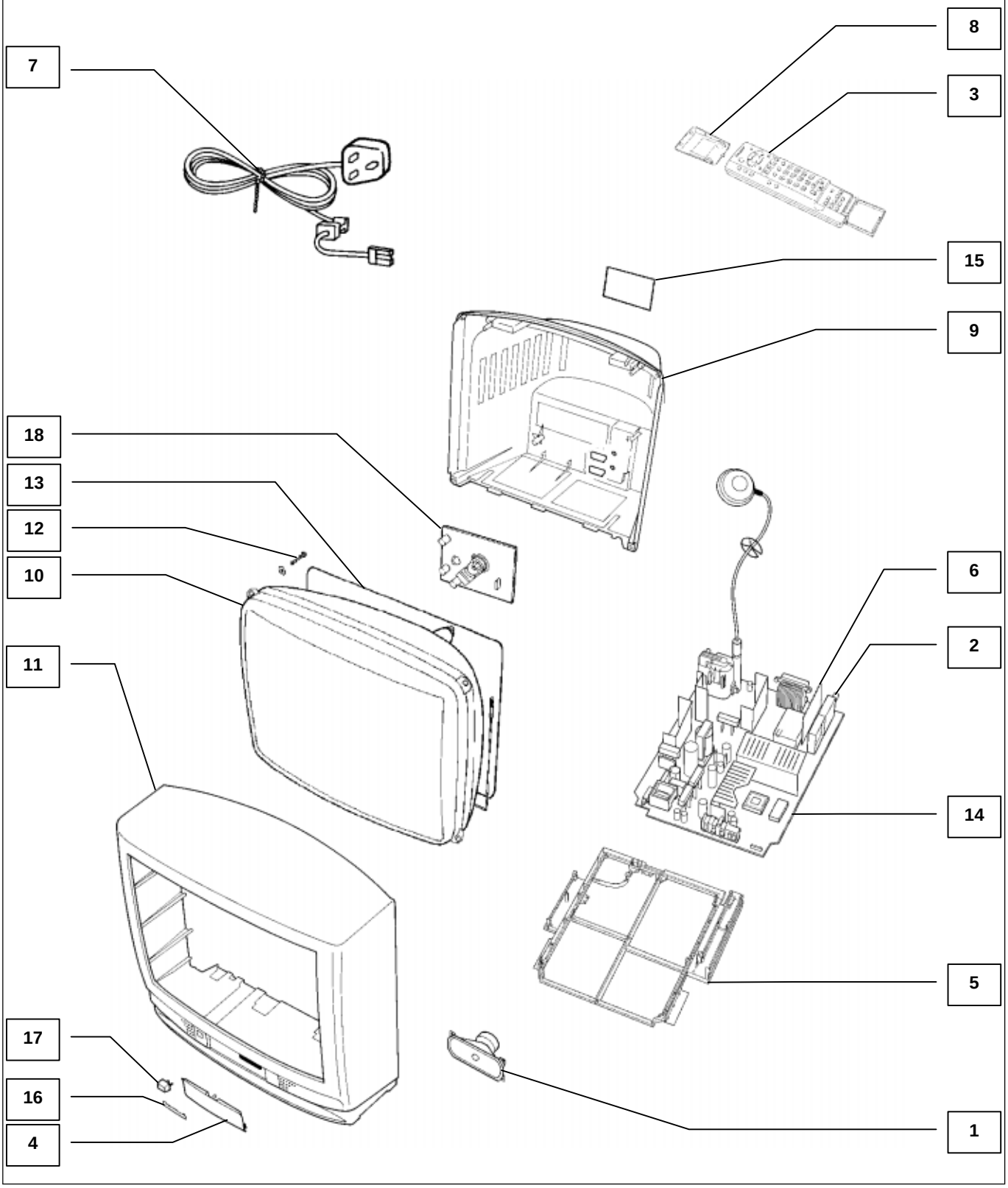


POWER SUPPLY BLOCK DIAGRAM



PARTS LOCATION

NOTE:
The numbers on the exploded view below refer to the mechanical section of the Replacement Parts List.



REPLACEMENT PARTS LIST

Important Safety Notice

Components Identified by ⚠ mark have special characteristics important for safety.
* When replacing any of these components, use only manufacturers specified parts.
In case of ordering these spare parts, please always add the complete Model-Type number to your order.

Cct Ref	Parts Number	Description	
COMMON PARTS			
MECHANICAL PARTS			
1	EASG12D531P2	SPEAKER	
2	ENG27506G	TUNER	⚠
3	EUR511200	REMOTE CONTROL	
4	TKP8E1177	DOOR LID	
5	TMX8E023	CHASSIS FRAME	
6	TNP8EH002AA	H P.C.B.	⚠
7	TSX8E0025	POWER CORD	⚠
8	UR51EC904A	BATTERY COVER (REMOTE)	
MISCELLANEOUS COMPONENTS			
	31221212478	FIX CLIP	
	832AG11D-ESL	I.C. SOCKET	
	F9-4-220	RELAY	
	PCS-084A-1	84 PIN SOCKET	
	TBM8E1879	PRESET LABEL	
	TEK6935	LID SWITCH	
	TKP8E1178	LED PANEL	
	TKP8E1179	LED TUBE	
	TMW8E020-1	LED HOLDER	
	TS2800	TV STAND	
	UM-3DJ-2P	BATTERY PACK	
RL801	TSE1885-1	RELAY	
R802	232266296706	THERMISTOR	⚠
S351	0330550049	CRT SOCKET	
INSTRUCTION BOOKS			
	TQB8E2488-1	ENGLISH	⚠
I.C.s			
IC251	LA4282	AUDIO OUTPUT	
IC351	TDA6103Q-N3	R.G.B. AMPLIFIER	
IC451	LA7845N	VERTICAL OUTPUT	
IC601	VDP3108BPPB1	VIDEO PROCESSOR	
IC701	TEA2031A	HORIZONTAL OUTPUT	
IC801	STRF6654LF51	POWER SUPPLY	
IC851	L78M12MRB	12V REGULATOR	
IC853	AN78L08TA	8V REGULATOR	
IC1051	RPM-637CBRL	LED RECEIVER	
IC1101	SDA5450C48	MICRO PROCESSOR	
IC1102	27C2001-F09	EPROM *	
IC1104	MN1381-R(TA)	DIODE	
IC1105	MN1381-T(TA)	DIODE	
IC2101	MSP3410DPOB4	AUDIO PROCESSOR	
IC3401	TEA2114	AV SWITCHING	
FUSES			
F802	19181-3.15	FUSE	⚠

Cct Ref	Parts Number	Description
F8021	EYF52BC	FUSE HOLDER
F8022	EYF52BC	FUSE HOLDER
DIODES		
D251	MA2180TP	DIODE
D253	MA700TA5	DIODE
D254	MA700TA5	DIODE
D354	1SR124-4AT82	DIODE
D355	1SR124-4AT82	DIODE
D356	1SR124-4AT82	DIODE
D357	MA165TA5	DIODE
D358	MA165TA5	DIODE
D359	MA165TA5	DIODE
D360	MTZJT-7715A	DIODE
D361	MA165TA5	DIODE
D362	MA165TA5	DIODE
D363	MA165TA5	DIODE
D364	MA165TA5	DIODE
D453	MA165TA5	DIODE
D454	ERA15-02V3	DIODE
D456	MTZJT-775.6C	DIODE
D457	MA165TA5	DIODE
D501	MA165TA5	DIODE
D502	1SR124-4AT82	DIODE
D511	MA4047	DIODE
D551	ERD07-15L7	DIODE
D552	RU3LFA1	DIODE
D553	1SR124-4AT82	DIODE
D554	1SR124-4AT82	DIODE
D556	MA165TA5	DIODE
D557	1SR124-4AT82	DIODE
D558	1SR124-4AT82	DIODE
D601	DAN217T146	DIODE
D603	DAN217T146	DIODE
D605	DAN212KT146	DIODE
D606	MA165TA5	DIODE
D607	MA4051	DIODE
D609	1SR124-4AT82	DIODE
D615	STZ6.2NT146	DIODE
D616	STZ6.2NT146	DIODE
D701	MA165TA5	DIODE
D702	MTZJT-775.1C	DIODE
D704	MA29TA5	DIODE
D705	MTZJT-775.6C	DIODE
D801	RBV4-08	DIODE
D803	1SR124-4AT82	DIODE
D804	1SR124-4AT82	DIODE
D805	TLP621GR-LF2	PHOTO COUPLER
D806	1SR124-4AT82	DIODE
D850	RU4BLF-L1	DIODE
D851	MTZJT776.2B	DIODE
D852	MA165TA5	DIODE
D853	MA2180BLFS	DIODE

Cct Ref	Parts Number	Description
D854	TVSRU2AMLFA5	DIODE
D855	FML22SLF610	DIODE
D856	RU4AMLF-M1	DIODE
D857	MTZJT-775.1C	DIODE
D858	MA165TA5	DIODE
D859	MA165TA5	DIODE
D861	MA165TA5	DIODE
D862	MTZJT-7736A	DIODE
D863	MA165TA5	DIODE
D865	MA165TA5	DIODE
D866	MA165TA5	DIODE
D867	EK06-V0	DIODE
D868	1N4150T-77	DIODE
D869	1N4150T-77	DIODE
D870	MA165TA5	DIODE
D871	1N4150T-77	DIODE
D873	MTZJT-775.6C	DIODE
D874	1SR124-4AT82	DIODE
D875	BZX79A75A26A	DIODE
D1051	SLR56UR3FLF	LED
D1101	MA165TA5	DIODE
D1102	MA165TA5	DIODE
D2101	MA723TA5	DIODE
D2102	MA723TA5	DIODE
D2103	MA723TA5	DIODE
D2104	MA723TA5	DIODE
D2105	MTZJT-778.2C	DIODE
D2303	MA723TA5	DIODE
D2304	MA723TA5	DIODE
D3101	MTZJT-778.2C	DIODE
D3102	MTZJT-778.2C	DIODE
TRANSISTORS		
Q101	BC847B	TRANSISTOR
Q102	BC847B	TRANSISTOR
Q104	BC847B	TRANSISTOR
Q105	BC847B	TRANSISTOR
Q251	2SD1328STX	TRANSISTOR
Q252	2SD1328STX	TRANSISTOR
Q301	BC847B	TRANSISTOR
Q302	FMY4T148	TRANSISTOR
Q303	BC847B	TRANSISTOR
Q304	FMY4T148	TRANSISTOR
Q305	BC847B	TRANSISTOR
Q306	FMY4T148	TRANSISTOR
Q351	2SA1767	TRANSISTOR
Q352	2SA1767	TRANSISTOR
Q353	2SA1767	TRANSISTOR
Q354	BC857B	TRANSISTOR
Q451	BC857B	TRANSISTOR
Q503	2SD2398-M2	TRANSISTOR
Q551	BU2508AXLB	TRANSISTOR
Q552	2SC1473-RN	TRANSISTOR
Q701	BC857B	TRANSISTOR
Q850	2SD1273PLB	TRANSISTOR
Q851	BC857B	TRANSISTOR
Q852	2SC1383-S	TRANSISTOR
Q853	BC847B	TRANSISTOR
Q854	BC847B	TRANSISTOR
Q855	BC847B	TRANSISTOR
Q856	BC847B	TRANSISTOR
Q857	2SA1018QTA	TRANSISTOR
Q950	BC847B	TRANSISTOR
Q951	FMY4T148	TRANSISTOR
Q1051	BC847B	TRANSISTOR
Q1052	BC847B	TRANSISTOR
Q1101	BC847B	TRANSISTOR

Cct Ref	Parts Number	Description
Q1104	BC847B	TRANSISTOR
Q1105	BC847B	TRANSISTOR
Q1106	BC847B	TRANSISTOR
Q1107	BC847B	TRANSISTOR
Q1108	BC847B	TRANSISTOR
Q2101	BC857B	TRANSISTOR
Q2102	BC857B	TRANSISTOR
Q2103	BC857B	TRANSISTOR
Q2301	BC847B	TRANSISTOR
Q2302	BC857B	TRANSISTOR
Q2303	BC847B	TRANSISTOR
Q2304	BC857B	TRANSISTOR
Q3001	BC847B	TRANSISTOR
Q3006	BC847B	TRANSISTOR
Q3007	BC847B	TRANSISTOR
Q3401	BC847B	TRANSISTOR
Q3402	BC847B	TRANSISTOR
Q3601	BC847B	TRANSISTOR
TRANSFORMERS		
T501	ETH19Y173AY	TRANSFORMER
T551	ZTFL94002A	F.B.T. ⚠
T802	ETP35KAN619U	TRANSFORMER ⚠
COILS		
L104	EXCELSA35T	COIL
L106	TLTACT100K	COIL
L107	TLTACT6R8K	COIL
L301	TLTACT4R7K	COIL
L302	TLTACT4R7K	COIL
L451	EXCELSA35T	COIL
L501	EXCELSA35V	COIL
L553	ELC08D682E	COIL
L601	TLTACT4R7K	COIL
L602	TLTACT4R7K	COIL
L603	TLTACT4R7K	COIL
L604	TLTACT4R7K	COIL
L606	TLTACT4R7K	COIL
L607	ELJFC2R2KF	COIL
L701	ELC10D822E	COIL
L850	EXCELSA35T	COIL
L851	EXCELSA35T	COIL
L852	ELEIN470KA	COIL
L853	EXCELSA35T	COIL
L854	EXCELSA35T	COIL
L855	EXCELSA35T	COIL
L856	EXCELSA39V	COIL
L1103	TLTACT100K	COIL
L1104	EXCELSA35T	COIL
L1105	ELJFC2R2KF	COIL
L2101	TLTACT100K	COIL
L2103	EXCELSA35T	COIL
L2104	TLTACT4R7K	COIL
L3001	ELEMV1R5MA	COIL
L3002	ELEMV1R5MA	COIL
L3003	ELEMV1R5MA	COIL
L3004	ELEMV1R5MA	COIL
L3005	ELEBR2R2KA	COIL
L3006	ELEBR2R2KA	COIL
L3007	TLTACT2R2K	COIL
L3101	ELEBT6R8KA	COIL
L3102	ELEBT6R8KA	COIL
L3401	ELESN2R2KA	COIL
L3402	ELESN2R2KA	COIL
FILTERS		
L804	ELF18N010A	LINE FILTER

Cct Ref	Parts Number	Description			
CRYSTALS					
X601	4730007267	CRYSTAL			
X1101	TSSA121	CRYSTAL			
X2101	4730007158	CRYSTAL			
RESISTORS					
C101	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA39	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA27	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA54	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA52	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA48	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA47	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA45	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA44	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA40	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA38	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA37	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA55	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA28	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA49	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA26	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA25	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA22	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA16	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA15	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA14	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA13	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA12	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA11	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA10	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA36	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA9	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA57	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JSE3	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JSE26	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JSE22	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JSE18	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JSE12	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JSE10	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JSE33	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JSE35	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JSE4	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JSE5	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA60	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JSH001	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA58	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA35	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA32	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA23	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA30	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA21	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA31	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA29	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA51	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA33	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA59	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA5	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA50	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA8	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA43	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA46	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA34	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA56	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
R101	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R102	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R103	ERJ6GEYJ222	S.M.CARB	0.1W	5%	2K2

Cct Ref	Parts Number	Description			
R104	ERJ6GEYJ332	S.M.CARB	0.1W	5%	3K3
R105	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R106	ERJ6GEYJ681	S.M.CARB	0.1W	5%	680
R107	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R111	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R112	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R113	ERJ6GEYJ223	S.M.CARB	0.1W	5%	22K
R114	ERJ6GEYJ331	S.M.CARB	0.1W	5%	330
R115	ERJ6GEYJ331	S.M.CARB	0.1W	5%	330
R116	ERJ6GEYJ562	S.M.CARB	0.1W	5%	5K6
R117	ERJ6GEYJ222	S.M.CARB	0.1W	5%	2K2
R118	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R121	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470
R251	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R252	ERJ6GEYJ242	S.M.CARB	0.1W	5%	2K4
R253	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R254	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R255	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R256	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470
R257	ERJ6GEYJ270	S.M.CARB	0.1W	5%	27
R258	ERJ6GEYJ242	S.M.CARB	0.1W	5%	2K4
R259	ERJ6GEYJ270	S.M.CARB	0.1W	5%	27
R260	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R261	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470
R262	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R265	ERD25TJ2R2	CARBON	0.25W	5%	2R2
R266	ERD25TJ2R2	CARBON	0.25W	5%	2R2
R267	ERF7ZK4R7	WOUND	7W	10%	4R7 ⚠
R271	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R272	ERF7ZK4R7	WOUND	7W	10%	4R7 ⚠
R301	ERJ6GEYJ391	S.M.CARB	0.1W	5%	390
R302	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R303	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R304	ERJ6GEYJ331	S.M.CARB	0.1W	5%	330
R305	ERJ6GEYJ391	S.M.CARB	0.1W	5%	390
R306	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R307	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R308	ERJ6GEYJ331	S.M.CARB	0.1W	5%	330
R309	ERJ6GEYJ391	S.M.CARB	0.1W	5%	390
R310	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R311	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R312	ERJ6GEYJ331	S.M.CARB	0.1W	5%	330
R351	ERJ6GEYJ302	S.M.CARB	0.1W	5%	3K
R352	ERJ6GEYJ302	S.M.CARB	0.1W	5%	3K
R353	ERJ6GEYJ302	S.M.CARB	0.1W	5%	3K
R354	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R355	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R356	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R357	ERDS1TJ104	CARBON	0.5W	5%	100K
R358	ERDS1TJ104	CARBON	0.5W	5%	100K
R359	ERDS1TJ104	CARBON	0.5W	5%	100K
R366	ERDS1TJ152	CARBON	0.5W	5%	1K5
R367	ERDS1TJ152	CARBON	0.5W	5%	1K5
R368	ERDS1TJ152	CARBON	0.5W	5%	1K5
R369	ERD25TJ472	CARBON	0.25W	5%	4K7
R372	ERQ12AJ121	FUSIBLE	0.5W	5%	120 ⚠
R373	ERJ6GEYJ220	S.M.CARB	0.1W	5%	22
R374	ERD25TJ274	CARBON	0.25W	5%	270K
R375	ERJ6GEYJ684	S.M.CARB	0.1W	5%	680K
R376	ERJ6GEYJ183	S.M.CARB	0.1W	5%	18K
R378	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R379	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R380	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R381	ERJ6GEYJ473	S.M.CARB	0.1W	5%	47K
R451	ERJ6GEYJ223	S.M.CARB	0.1W	5%	22K
R452	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0

Cct Ref	Parts Number	Description			
R453	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R454	ERJ6GEYJ752	S.M.CARB	0.1W	5%	7K5
R455	ERJ6GEYJ222	S.M.CARB	0.1W	5%	2K2
R456	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100K
R457	ERJ6GEYJ223	S.M.CARB	0.1W	5%	22K
R458	ERD25TJ1R5	CARBON	0.25W	5%	1R5
R459	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R460	ERDS1TJ331	CARBON	0.5W	5%	330
R463	ERD25TJ222	CARBON	0.25W	5%	2K2
R464	ERJ6GEYJ182	S.M.CARB	0.1W	5%	1K8
R465	ERJ6GEYJ681	S.M.CARB	0.1W	5%	680
R502	ERJ6GEYJ511	S.M.CARB	0.1W	5%	510
R506	ERD25TJ560	CARBON	0.25W	5%	56
R507	ERG1FJ271P	METAL	1W	5%	270
R509	ERDS1TJ152	CARBON	0.5W	5%	1K5
R510	ERDS1FJ152	CARBON	0.5W	5%	1K5
R553	ERG1SJ152	METAL	1W	5%	1K5
R554	ERG1SJ101	METAL	1W	5%	100
R555	ERQ12HKR33	METAL	0.5W	5%	R33
R558	ERDS1TJ124	CARBON	0.5W	5%	120K
R559	ERQ12HKR33	METAL	0.5W	5%	R33
R560	ERJ6GEYJ274	S.M.CARB	0.1W	5%	270K
R561	ERJ6GEYJ273	S.M.CARB	0.1W	5%	27K
R563	ERJ6GEYJ474	S.M.CARB	0.1W	5%	470K
R564	ERJ6GEYJ623	S.M.CARB	0.1W	5%	62K
R566	ERJ6GEYJ563	S.M.CARB	0.1W	5%	56K
R567	ERF7ZK1R0	WOUND	7W	10%	1
R601	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R602	ERJ6GEYJ821	S.M.CARB	0.1W	5%	820
R603	ERJ8GEYJ103	S.M.CARB	.125W	5%	10K
R604	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R605	ERD25TJ331	CARBON	0.25W	5%	330
R606	ERD25TJ331	CARBON	0.25W	5%	330
R607	ERJ6GEYJ821	S.M.CARB	0.1W	5%	820
R608	ERJ6GEYJ271	S.M.CARB	0.1W	5%	270
R609	ERJ6GEYJ122	S.M.CARB	0.1W	5%	1K2
R610	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R611	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R612	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R613	ERJ6GEYJ152	S.M.CARB	0.1W	5%	1K5
R622	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R636	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R645	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R647	ERJ6GEYJ472	S.M.CARB	0.1W	5%	4K7
R648	ERJ6GEYJ152	S.M.CARB	0.1W	5%	1K5
R650	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R651	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R652	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R654	ERJ6GEYJ622	S.M.CARB	0.1W	5%	6K2
R655	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R658	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15K
R659	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R660	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R701	ERQ12AJ101	FUSIBLE	0.5W	5%	100
R703	ERG2FJ821	METAL	2W	5%	820
R704	ERJ6GEYJ563	S.M.CARB	0.1W	5%	56K
R705	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100K
R706	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R707	ERJ6GEYJ391	S.M.CARB	0.1W	5%	390
R708	ERJ6GEYJ393	S.M.CARB	0.1W	5%	39K
R709	ERJ6GEYJ393	S.M.CARB	0.1W	5%	39K
R710	ERJ6GEYJ273	S.M.CARB	0.1W	5%	27K
R711	ERG1SJ101	METAL	1W	5%	100
R712	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R803	ERC12ZGK335D	SOLID	0.5W	10%	3M3
R805	ERD25TJ473	CARBON	0.25W	5%	47K

Cct Ref	Parts Number	Description			
R806	ERD25TJ100	CARBON	0.25W	5%	10
R807	ERD25TJ332	CARBON	0.25W	5%	3K3
R809	ERD25TJ681	CARBON	0.25W	5%	680
R810	ERW2PKR33	WOUND	2W	20%	R33
R811	ERW2PKR33	WOUND	2W	20%	R33
R812	ERD75TAJ825	CARBON	0.75W	5%	8M2
R813	ERF7ZK2R7	WOUND	7W	20%	2R7
R814	ERD25TJ473	CARBON	0.25W	5%	47K
R815	ERD25TJ222	CARBON	0.25W	5%	2K2
R850	ERD25TJ122	CARBON	0.25W	5%	1K2
R852	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R853	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R854	ERG2FJ223	METAL	2W	5%	22K
R855	ERJ6GEYJ752	S.M.CARB	0.1W	5%	7K5
R857	ERJ6GEYJ752	S.M.CARB	0.1W	5%	7K5
R858	ERJ6GEYJ752	S.M.CARB	0.1W	5%	7K5
R859	ERJ6GEYJ753	S.M.CARB	0.1W	5%	75K
R860	ERQ1CJP2R2	FUSIBLE	1W	10%	2R2
R861	ERD25TJ221	CARBON	0.25W	5%	220
R862	ERD25TJ272	CARBON	0.25W	5%	2K7
R863	ERDS1TJ560	CARBON	0.5W	5%	56
R864	ERDS1TJ680	CARBON	0.5W	5%	68
R865	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R867	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R868	ERJ6GEYJ223	S.M.CARB	0.1W	5%	22K
R869	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R870	ERJ6GEYJ272	S.M.CARB	0.1W	5%	2K7
R871	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15K
R872	ERG1SJ183	METAL	1W	5%	18K
R873	ERG1SJ223	METAL	1W	5%	22K
R874	ERD25TJ104	CARBON	0.25W	5%	100K
R876	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R877	ERW2PKR56	WOUND	2W	10%	R56
R878	ERJ6GEYJ473	S.M.CARB	0.1W	5%	47K
R951	ERJ6GEYJ391	S.M.CARB	0.1W	5%	390
R952	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R953	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R954	ERJ6GEYJ391	S.M.CARB	0.1W	5%	390
R1051	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R1052	ERJ6GEYJ271	S.M.CARB	0.1W	5%	270
R1053	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R1054	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R1101	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1102	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R1103	ERJ6GEYJ331	S.M.CARB	0.1W	5%	330
R1104	ERJ6GEYJ331	S.M.CARB	0.1W	5%	330
R1105	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1106	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100K
R1107	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100K
R1108	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R1109	ERJ6GEYJ472	S.M.CARB	0.1W	5%	4K7
R1110	ERJ6GEYJ472	S.M.CARB	0.1W	5%	4K7
R1111	ERJ6GEYJ473	S.M.CARB	0.1W	5%	47K
R1112	ERJ6GEYJ473	S.M.CARB	0.1W	5%	47K
R1113	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1115	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470
R1116	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1117	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1118	ERJ6GEYJ472	S.M.CARB	0.1W	5%	4K7
R1119	ERJ6GEYJ472	S.M.CARB	0.1W	5%	4K7
R1120	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1121	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1122	ERD25TJ471	CARBON	0.25W	5%	470
R1123	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1125	ERJ6GEYJ472	S.M.CARB	0.1W	5%	4K7
R1126	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100

Cct Ref	Parts Number	Description			
R1127	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1128	ERJ6GEYJ682	S.M.CARB	0.1W	5%	6K8
R1129	ERJ6GEYJ682	S.M.CARB	0.1W	5%	6K8
R1130	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R1131	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R1132	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1133	ERJ6GEYJ273	S.M.CARB	0.1W	5%	27K
R1136	ERJ6GEYJ823	S.M.CARB	0.1W	5%	82K
R1137	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R1138	ERJ6GEYJ474	S.M.CARB	0.1W	5%	470K
R1139	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R1140	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470
R1141	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470
R1145	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1146	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1147	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1148	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1149	ERJ6GEYJ223	S.M.CARB	0.1W	5%	22K
R1151	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1152	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1154	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1155	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1156	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R1157	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R1158	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R1159	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R1160	ERJ6GEYJ223	S.M.CARB	0.1W	5%	22K
R1161	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R1162	ERJ6GEYJ222	S.M.CARB	0.1W	5%	2K2
R1163	ERJ6GEYJ222	S.M.CARB	0.1W	5%	2K2
R1164	ERJ6GEYJ332	S.M.CARB	0.1W	5%	3K3
R1165	ERJ6GEYJ512	S.M.CARB	0.1W	5%	5K1
R1166	ERJ6GEYJ912	S.M.CARB	0.1W	5%	9K1
R1167	ERJ6GEYJ100	S.M.CARB	0.1W	5%	10
R1168	ERJ6GEYJ473	S.M.CARB	0.1W	5%	47K
R1169	ERJ6GEYJ472	S.M.CARB	0.1W	5%	4K7
R1170	ERJ6GEYJ273	S.M.CARB	0.1W	5%	27K
R1171	ERJ6GEYJ224	S.M.CARB	0.1W	5%	220K
R1172	ERJ6GEYJ223	S.M.CARB	0.1W	5%	22K
R1173	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100K
R1174	ERJ6GEYJ221	S.M.CARB	0.1W	5%	220
R1175	ERJ6GEYJ225	S.M.CARB	0.1W	5%	2M2
R1176	ERJ6GEYJ100	S.M.CARB	0.1W	5%	10
R2101	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R2102	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R2103	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R2104	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R2105	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R2106	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R2107	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R2108	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R2109	ERJ6GEYJ183	S.M.CARB	0.1W	5%	18K
R2110	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R2111	ERJ6GEYJ221	S.M.CARB	0.1W	5%	220
R2112	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R2113	ERJ6GEYJ562	S.M.CARB	0.1W	5%	5K6
R2114	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R2115	ERJ6GEYJ222	S.M.CARB	0.1W	5%	2K2
R2116	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R2117	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R2118	ERJ6GEYJ222	S.M.CARB	0.1W	5%	2K2
R2119	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R2120	ERJ6GEYJ222	S.M.CARB	0.1W	5%	2K2
R2302	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100K
R2303	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R2304	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470

Cct Ref	Parts Number	Description			
R2305	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R2306	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R2308	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100K
R2309	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R2310	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470
R2311	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R2312	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R3001	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3002	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470
R3003	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3004	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15K
R3005	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3006	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470
R3007	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3008	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15K
R3009	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R3010	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R3011	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R3012	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R3013	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3014	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470
R3015	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3016	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15K
R3017	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3018	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470
R3019	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3020	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15K
R3021	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R3022	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R3023	ERJ6GEYJ123	S.M.CARB	0.1W	5%	12K
R3024	ERJ6GEYJ472	S.M.CARB	0.1W	5%	4K7
R3025	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R3026	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R3044	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R3046	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3047	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3048	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R3049	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3050	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10K
R3057	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R3101	ERDS1TJ151	CARBON	0.5W	5%	150
R3102	ERDS1TJ151	CARBON	0.5W	5%	150
R3103	ERG2FJ221	METAL	2W	5%	220
R3104	ERG2FJ221	METAL	2W	5%	220
R3105	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3106	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3107	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15K
R3108	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15K
R3402	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R3403	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3404	ERJ6GEYJ242	S.M.CARB	0.1W	5%	2K4
R3405	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100K
R3406	ERJ6GEYJ301	S.M.CARB	0.1W	5%	300
R3407	ERJ6GEYJ123	S.M.CARB	0.1W	5%	12K
R3408	ERJ6GEYJ472	S.M.CARB	0.1W	5%	4K7
R3409	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75
R3601	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3602	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3603	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3604	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3605	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3606	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100
R3607	ERJ6GEYJ472	S.M.CARB	0.1W	5%	4K7
R3608	ERJ6GEYJ752	S.M.CARB	0.1W	5%	7K5
R3609	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R3610	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K

Cct Ref	Parts Number	Description			
CAPACITORS					
C102	ECUV1H103ZFX	S.M. CAP	50V	10nF	
C103	ECJ2VF1H104Z	ELECT	350V	100nF	
C106	ECUV1H560JCX	S.M. CAP	50V	56pF	
C107	ECJ2VF1H104Z	ELECT	350V	100nF	
C108	ECA1CM470GB	ELECT	16V	47µF	
C109	ECUV1H102JCX	S.M. CAP	50V	1nF	
C110	ECUV1H103ZFX	S.M. CAP	50V	10nF	
C111	ECA1HMR33GB	ELECT	50V	10nF	
C117	ECUV1H103ZFX	S.M. CAP	50V	10nF	
C118	ECJ2VF1H104Z	ELECT	350V	100nF	
C119	ECA1CM221GB	ELECT	16V	220µF	
C120	ECA1CM221GB	ELECT	16V	220µF	
C121	ECUV1H561KBX	S.M. CAP	50V	560pF	
C124	ECUV1H220JCX	S.M. CAP	50V	22pF	
C125	ECUV1H100DCX	S.M. CAP	50V	10pF	
C251	ECA1EM100GB	ELECT	25V	10pF	
C252	ECUV1H223KBX	S.M. CAP	50V	22nF	
C253	ECA1HM4R7GB	ELECT	50V	4.7µF	
C254	ECQM1H274J	FILM	50V	270nF	
C255	ECA1EM101GB	ELECT	25V	100µF	
C256	ECUV1H223KBX	S.M. CAP	50V	22nF	
C257	ECA1HM4R7GB	ELECT	50V	4.7µF	
C258	ECA1EM100GB	ELECT	25V	4.7µF	
C259	ECQM1H274J	FILM	50V	270nF	
C260	ECA1VM102GB	ELECT	35V	1nF	
C261	ECA1VM102GB	ELECT	35V	1nF	
C262	ECQM1H474J	FILM	50V	470nF	
C263	ECA1HM010GB	ELECT	50V	1µF	
C264	ECA1HHG222E	ELECT	50V	1µF	
C265	ECQM1H474J	FILM	50V	470nF	
C266	ECA1HM010GB	ELECT	50V	1µF	
C267	ECJ2VB1H104K	ELECT	350V	100nF	
C268	ECJ2VB1H104K	ELECT	350V	100nF	
C270	ECJ2VB1H104K	ELECT	350V	100nF	
C301	ECJ2VB1C104K	ELECT	350V	100nF	
C302	ECJ2VB1C104K	ELECT	350V	100nF	
C303	ECJ2VB1C104K	ELECT	350V	100nF	
C304	ECA1CM100GB	ELECT	16V	10µF	
C351	ECUV1H090DCN	S.M. CAP	50V	10µF	
C352	ECUV1H090DCN	S.M. CAP	50V	10µF	
C353	ECUV1H090DCN	S.M. CAP	50V	10µF	
C354	ECQM2104KZ	FILM	250V	100nF	
C355	ECUV1H471JCX	S.M. CAP	50V	470pF	
C356	ECUV1H471JCX	S.M. CAP	50V	470pF	
C357	ECUV1H471JCX	S.M. CAP	50V	470pF	
C358	ECQM1H224J	FILM	50V	220nF	
C360	ECKC3D152J	CERAMIC	2KV	1.5nF	⚠
C361	ECA1HMR47GB	ELECT	50V	1.5nF	
C363	ECA1VM471GB	ELECT	35V	470µF	
C364	ECUV1H103ZFX	S.M. CAP	50V	10nF	
C451	ECUV1H102JX	S.M. CAP	50V	10nF	
C453	ECUV1H152KBX	S.M. CAP	50V	10nF	
C454	ECUV1H223KBM	S.M. CAP	50V	10nF	
C455	ECEA1HKA010	ELECT	50V	1µF	
C456	ECA1HHG221B	ELECT	50V	220µF	
C458	ECQB1222JF3	FILM	100V	2.2nF	
C459	222236516154	FILM	160V	2.2nF	
C461	ECCR2H270J	CERAMIC	500V	27pF	
C508	ECQV1H105JZ	FILM	50V	1µF	
C509	ECEA1HU101	ELECT	50V	100µF	
C510	ECUV1H104KBX	S.M. CAP	50V	100µF	
C511	ECQM2683JZ	FILM	250V	68nF	
C552	ECWH15H102J	FILM	1500V	1nF	
C557	ECKC2H471J	CERAMIC	500V	470pF	⚠
C558	ECA1HHG471E	ELECT	50V	470µF	

Cct Ref	Parts Number	Description			
C560	ECA2GHG2R2B	ELECT	400V	470µF	
C561	ECA1EHG102B	ELECT	25V	470µF	
C562	ECKC2H101J	CERAMIC	500V	100pF	⚠
C563	ECA2EHG220B	ELECT	250V	20µF	
C564	ECEA2AU2R2	ELECT	100V	20µF	
C565	ECQP1H273J	FILM	100V	20µF	
C566	ECKC2H471J	CERAMIC	500V	470pF	⚠
C567	ECA1EHG102B	ELECT	25V	470pF	
C568	ECKC2H471J	CERAMIC	500V	470pF	⚠
C569	ECKC2H102J	CERAMIC	500V	1nF	⚠
C601	ECUV1H104KBX	S.M. CAP	50V	1nF	
C602	ECA1HM101GB	ELECT	50V	100µF	
C603	ECUV1H102JCX	S.M. CAP	50V	1nF	
C604	ECUV1H223ZFX	S.M. CAP	50V	22nF	
C605	ECA1HM101GB	ELECT	50V	100µF	
C606	ECA1HM3R3GB	ELECT	50V	3.3µF	
C607	ECJ2VF1H104Z	ELECT	350V	100nF	
C608	ECUV1H153KBX	S.M. CAP	50V	15nF	
C609	ECUV1H153KBX	S.M. CAP	50V	15nF	
C610	ECUV1H153KBX	S.M. CAP	50V	15nF	
C611	ECUV1H153KBX	S.M. CAP	50V	15nF	
C612	ECUV1H153KBX	S.M. CAP	50V	15nF	
C613	ECUV1H153KBX	S.M. CAP	50V	15nF	
C614	ECUV1H050CCX	S.M. CAP	50V	50pF	
C615	ECUV1H050CCX	S.M. CAP	50V	50pF	
C616	ECA1CM100GB	ELECT	16V	10µF	
C617	ECUV1H223KBX	S.M. CAP	50V	22nF	
C618	ECA1CM221GB	ELECT	16V	220µF	
C619	ECJ2VB1H473K	ELECT	350V	47nF	
C620	ECA1HM101GB	ELECT	50V	100µF	
C621	ECJ2VB1C104K	ELECT	350V	100nF	
C622	ECUV1H683KBX	S.M. CAP	50V	68nF	
C623	ECUV1H102JCX	S.M. CAP	50V	1nF	
C624	ECJ3VB1C474K	ELECT	3.5KV	470nF	
C625	ECJ3VB1C474K	ELECT	3.5KV	470nF	
C626	ECJ3VB1C474K	ELECT	3.5KV	470nF	
C627	ECJ3VB1C474K	ELECT	3.5KV	470nF	
C628	ECA1CM100GB	ELECT	16V	10µF	
C629	ECUV1H104KBX	S.M. CAP	50V	10µF	
C630	ECCR1H100J	CERAMIC	50V	10µF	
C631	ECUV1H683ZFX	S.M. CAP	50V	68nF	
C632	ECUV1H270JCX	S.M. CAP	50V	27pF	
C633	ECUV1H271JCX	S.M. CAP	50V	270pF	
C634	ECUV1H271JCX	S.M. CAP	50V	270pF	
C635	ECUV1H180JCX	S.M. CAP	50V	18pF	
C636	ECUV1H271JCX	S.M. CAP	50V	270pF	
C637	ECUV1H101JCX	S.M. CAP	50V	100pF	
C638	ECUV1H471JCX	S.M. CAP	50V	470pF	
C639	ECUV1H332KBM	S.M. CAP	50V	470pF	
C701	ECA1HHG101B	ELECT	50V	100µF	
C702	ECUV1H103KBX	S.M. CAP	50V	10nF	
C703	ECEA1HGE100	ELECT	50V	10µF	
C704	ECQB1H223K	FILM	50V	22nF	
C705	ECQB1H222J	FILM	50V	2.2nF	
C804	ECQE2A474MWB	FILM	100V	470nF	
C806	ECKWNA101MBC	CERAMIC	400V	100µF	
C807	ECKC2H472J	CERAMIC	500V	4.7nF	⚠
C808	ECKC2H472J	CERAMIC	500V	4.7nF	⚠
C809	ECKC2H472J	CERAMIC	500V	4.7nF	⚠
C810	ECKC2H472J	CERAMIC	500V	4.7nF	⚠
C814	ECKC3D102J	CERAMIC	2KV	1nF	⚠
C815	ECKC1H471J	CERAMIC	50V	470pF	
C816	ECA1EM101GB	ELECT	25V	100µF	
C817	ECQE6104K	FILM	600V	100nF	⚠
C818	ECKWNA332MEC	CERAMIC	250V	3.3nF	
C819	ECQB1H152K	FILM	50V	1.5nF	

Cct Ref	Parts Number	Description			
C850	ECKC3D471JB	CERAMIC	2KV	470pF	⚠
C851	ECA2CM221E	ELECT	160V	220µF	
C852	ECA2CHG101E	ELECT	160V	100µF	
C853	ECKC2H471J	CERAMIC	500V	470pF	⚠
C854	ECA1EM102GB	ELECT	25V	100µF	
C855	ECKC2H471J	CERAMIC	500V	470pF	⚠
C856	ECA1AHG222B	ELECT	10V	470pF	
C857	ECKC2H471J	CERAMIC	500V	470pF	⚠
C858	ECEA1HGE102	ELECT	50V	470pF	
C859	ECJ2VF1H104Z	ELECT	350V	100nF	
C860	ECA1HM101GB	ELECT	50V	100µF	
C862	ECJ2VF1H104Z	ELECT	350V	100nF	
C863	ECA1HM101GB	ELECT	50V	100µF	
C866	ECJ2VF1H104Z	ELECT	350V	100nF	
C867	ECA1CM100GB	ELECT	16V	10µF	
C868	ECA1CM100GB	ELECT	16V	10µF	
C869	ECA1EM101GB	ELECT	25V	100µF	
C870	ECA1EM471GB	ELECT	25V	470µF	
C871	ECA1CM102B	ELECT	16V	470µF	
C872	ECA1CM471GB	ELECT	16V	470µF	
C873	ECA1CM100GB	ELECT	16V	10µF	
C875	ECA2CM4R7B	ELECT	160V	10µF	
C876	ECA1AHG471E	ELECT	10V	470pF	
C950	ECJ2VB1C104K	ELECT	350V	100nF	
C1051	ECUV1H103KBX	S.M. CAP	50V	10nF	
C1052	ECA1HM101GB	ELECT	50V	100µF	
C1053	ECUV1H331JCX	S.M. CAP	50V	330pF	
C1101	ECJ2VF1H104Z	ELECT	350V	100nF	
C1102	ECA0JM101G	ELECT	6.3V	100µF	
C1103	ECUV1H220JCX	S.M. CAP	50V	22pF	
C1104	ECUV1H220JCX	S.M. CAP	50V	22pF	
C1105	ECUV1H101JCX	S.M. CAP	50V	100pF	
C1108	ECUV1H333KBX	S.M. CAP	50V	33nF	
C1111	ECA1CM100GB	ELECT	16V	10µF	
C1112	ECUV1H103KBX	S.M. CAP	50V	10nF	
C1115	ECJ3VB1C474K	ELECT	3.5KV	470nF	
C1116	ECUV1H472KBX	S.M. CAP	50V	4.7nF	
C1117	ECJ2VF1H104Z	ELECT	350V	100nF	
C1118	ECUV1H103KBX	S.M. CAP	50V	10nF	
C1119	ECUV1H221JCX	S.M. CAP	50V	220pF	
C1120	ECJ2VF1H104Z	ELECT	350V	100nF	
C1121	ECUV1H221JCX	S.M. CAP	50V	220pF	
C1123	ECUV1H101JCX	S.M. CAP	50V	100pF	
C1124	ECUV1H391JCX	S.M. CAP	50V	390pF	
C1125	ECUV1H391JCX	S.M. CAP	50V	390pF	
C1126	ECUV1H391JCX	S.M. CAP	50V	390pF	
C1127	ECUV1H221JCX	S.M. CAP	50V	220pF	
C1128	ECUV1H223KBX	S.M. CAP	50V	22nF	
C1129	ECUV1H270JCX	S.M. CAP	50V	27pF	
C2101	ECUV1H102JCX	S.M. CAP	50V	1nF	
C2102	ECUV1H102JCX	S.M. CAP	50V	1nF	
C2103	ECUV1H102JCX	S.M. CAP	50V	1nF	
C2104	ECUV1H102JCX	S.M. CAP	50V	1nF	
C2105	ECUV1H102JCX	S.M. CAP	50V	1nF	
C2106	ECUV1H102JCX	S.M. CAP	50V	1nF	
C2107	ECUV1H102JCX	S.M. CAP	50V	1nF	
C2108	ECUV1H102JCX	S.M. CAP	50V	1nF	
C2109	ECUV1H102JCX	S.M. CAP	50V	1nF	
C2110	ECUV1H102JCX	S.M. CAP	50V	1nF	
C2111	ECA1CM100GB	ELECT	16V	10µF	
C2112	ECA1CM100GB	ELECT	16V	10µF	
C2113	ECA1HM3R3GB	ELECT	50V	3.3µF	
C2114	ECJ2VF1H104Z	ELECT	350V	100nF	
C2115	ECUV1H221JCX	S.M. CAP	50V	220pF	
C2116	ECUV1H221JCX	S.M. CAP	50V	220pF	
C2117	ECUV1H221JCX	S.M. CAP	50V	220pF	

Cct Ref	Parts Number	Description		
C2118	ECUV1H221JCX	S.M. CAP	50V	220pF
C2119	ECUV1H221JCX	S.M. CAP	50V	220pF
C2120	ECUV1H221JCX	S.M. CAP	50V	220pF
C2121	ECA1CM100GB	ELECT	16V	10µF
C2122	ECJ2VF1H104Z	ELECT	350V	100nF
C2123	ECUV1H221JCX	S.M. CAP	50V	220pF
C2124	ECUV1H070DTX	S.M. CAP	50V	70pF
C2125	ECUV1H470JCX	S.M. CAP	50V	47pF
C2126	ECUV1H070DTX	S.M. CAP	50V	70pF
C2127	ECUV1H010CCX	S.M. CAP	50V	1pF
C2128	ECUV1H010CCX	S.M. CAP	50V	1pF
C2129	ECA1CM102B	ELECT	16V	1pF
C2130	ECA1CM331B	ELECT	16V	330µF
C2131	ECUV1H103ZFX	S.M. CAP	50V	10nF
C2132	ECUV1H103ZFX	S.M. CAP	50V	10nF
C2134	ECUV1H103ZFX	S.M. CAP	50V	10nF
C2135	ECA1HM101GB	ELECT	50V	100µF
C2136	ECJ2VF1H104Z	ELECT	350V	100nF
C2137	ECA1CM100GB	ELECT	16V	10µF
C2138	ECUV1H471KBX	S.M. CAP	50V	470pF
C2139	ECUV1H221JCX	S.M. CAP	50V	220pF
C2140	ECA1HM101GB	ELECT	50V	100µF
C2141	ECUV1H152JCX	S.M. CAP	50V	1.5pF
C2301	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C2302	ECA1CM470GB	ELECT	16V	47µF
C2303	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C2304	ECA1CM470GB	ELECT	16V	47µF
C3001	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C3002	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C3003	ECA1CM470GB	ELECT	16V	47µF
C3005	ECUV1H561JCX	S.M. CAP	50V	560pF
C3006	ECJ3VB1C474K	ELECT	3.5KV	470nF
C3007	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C3008	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C3009	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C3010	ECA1CM470GB	ELECT	16V	47µF
C3012	ECUV1H561JCX	S.M. CAP	50V	560pF
C3013	ECJ3VB1C474K	ELECT	3.5KV	470nF
C3014	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C3015	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C3016	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C3017	ECA1CM470GB	ELECT	16V	47µF
C3019	ECUV1H561JCX	S.M. CAP	50V	560pF
C3020	ECJ3VB1C474K	ELECT	3.5KV	470nF
C3021	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C3022	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C3023	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C3024	ECA1CM470GB	ELECT	16V	47µF
C3026	ECUV1H561JCX	S.M. CAP	50V	560pF
C3027	ECJ3VB1C474K	ELECT	3.5KV	470nF
C3028	ECUV1H222JCX	S.M. CAP	50V	2.2nF
C3029	ECA1HM101GB	ELECT	50V	100µF
C3032	ECUV1H271JCX	S.M. CAP	50V	270pF
C3033	ECUV1H271JCX	S.M. CAP	50V	270pF
C3034	ECUV1H271JCX	S.M. CAP	50V	270pF
C3035	ECUV1H271JCX	S.M. CAP	50V	270pF
C3101	ECUV1H104KBX	S.M. CAP	50V	270pF
C3102	ECUV1H104KBX	S.M. CAP	50V	270pF
C3103	ECUV1H561JCX	S.M. CAP	50V	560pF
C3104	ECUV1H561JCX	S.M. CAP	50V	560pF
C3105	ECUV1H561JCX	S.M. CAP	50V	560pF
C3106	ECUV1H561JCX	S.M. CAP	50V	560pF
C3107	ECA1HM470GB	ELECT	50V	47µF
C3108	ECA1HM470GB	ELECT	50V	47µF
C3111	ECUV1H391JCX	S.M. CAP	50V	390pF
C3112	ECUV1H271JCX	S.M. CAP	50V	270pF

Cct Ref	Parts Number	Description			
C3401	ECQM1H224J	FILM	50V		220nF
C3402	ECUV1H101JCX	S.M. CAP	50V		100pF
C3403	ECA1HM101GB	ELECT	50V		100µF
C3404	ECQM1H224J	FILM	50V		220nF
C3405	ECUV1H180JCX	S.M. CAP	50V		18pF
C3406	ECUV1H271JCX	S.M. CAP	50V		270pF
C3407	ECUV1H271JCX	S.M. CAP	50V		270pF
C3408	ECA1HM101GB	ELECT	50V		100µF
C3601	ECA1HM101GB	ELECT	50V		100µF
JSE28	ECUV1H104KBX	S.M. CAP	50V		100µF
TERMINALS AND LINKS					
JK2301	JPJ841101320	RCA / HEADPHONE JACK			
JK3101	TJB16673	A.V. TERMINAL			
SWITCHES					
S801	ESB92S11B	SWITCH			
S1201	EVQ23405R	SWITCH			
S1202	EVQ23405R	SWITCH			
S1203	EVQ23405R	SWITCH			
S1204	EVQ23405R	SWITCH			
S1205	EVQ23405R	SWITCH			

DIFFERENCES FOR MODEL TX-21MD4

MECHANICAL PARTS					
9	TKU8E00370	BACK COVER			
10	A51ECQ51X01	C.R.T.			
11	TKY8E170	CABINET			
12	VP15005-35	CRT FIXING SCREW			
13	TLK8E05143	DEGAUSS COIL			
14	TNP8EE009AD	E P.C.B.			
15	TQF8E2594	MODEL LABEL			
16	TBM153022	PANASONIC BADGE			
17	TBX8E041-1	POWER BUTTON			
18	TNP8EY013AB	Y P.C.B.			
MISCELLANEOUS COMPONENTS					
	TPC8E4669	OUTER CARTON			
	TPD8E606-1	TOP CUSHION			
	TPD8E607-1	BOTTOM CUSHION			
	ZTUZAE450A	ANODE LEAD			
I.C.s					
IC850	SE130N	ERROR AMPLIFIER			
IC1103	XGL2-01DA	EAROM *			
TRANSFORMERS					
T801	ETS39AG1K7AD	TRANSFORMER			
COILS					
L552	ELH5L4104	COIL			
RESISTORS					
JA2	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
JA1	ERJ8GEY0R00	S.M.CARB	.125W	5%	0
R363	ERDS1TJ103	CARBON	0.5W	5%	10K
R364	ERDS1TJ103	CARBON	0.5W	5%	10K
R365	ERDS1TJ103	CARBON	0.5W	5%	10K
R370	ERD25TJ102	CARBON	0.25W	5%	1K
R377	ERQ1ABJP5R6S	METAL	0.5W	5%	5R6
R461	ERW2PK2R2	WOUND	2W	10%	2R2
R702	ERQ12HJ220	METAL	0.5W	5%	22
CAPACITORS					
C365	ECA1CM100GB	ELECT	16V		10µF
C551	ECKC3D561J	CERAMIC	2KV		10µF
C555	ECWH15H822J	FILM	1500V		8.2nF
C556	ECQF4123JZH	FILM	400V		12nF
C559	ECWF2474JBB	FILM	500V		470nF
C811	ECOS2GA151CB	ELECT	400V		150pF

Cct Ref	Parts Number	Description			

DIFFERENCES FOR MODEL TX-25MD4

MECHANICAL PARTS					
9	TKU8E00360	BACK COVER			
10	A59ECF50X41	C.R.T.			
11	TKY8E180	CABINET			
12	VP17005-32	CRT FIXING SCREW			
13	TLK8E05138	DEGAUSS COIL			
14	TNP8EE009AL	E P.C.B.			
15	TQF8E2595	MODEL LABEL			
16	TBM8E1728	PANASONIC BADGE			
17	TBX8E042-1	POWER BUTTON			
18	TNP8EY012AD	Y P.C.B.			
MISCELLANEOUS COMPONENTS					
	TPC8E4670	OUTER CARTON			
	TPD8E608-1	TOP CUSHION			
	TPD8E609	BOTTOM CUSHION			
	ZTUZAE550A	ANODE LEAD			
I.C.s					
IC850	SE140N	ERROR AMPLIFER			
IC1103	XGL2-02EA	EAROM *			
DIODES					
D901	MA165TA5	DIODE			
D902	MA165TA5	DIODE			
D904	MA165TA5	DIODE			
D905	MA165TA5	DIODE			
D906	RLS72TE-11	DIODE			
TRANSISTORS					
Q905	BC847B	TRANSISTOR			
Q906	BC847B	TRANSISTOR			
Q907	BC857B	TRANSISTOR			
Q908	2SA1535ARLB	TRANSISTOR			
Q909	2SC3944ARLB	TRANSISTOR			
TRANSFORMERS					
T801	ETS39AG1J7AD	TRANSFORMER			
COILS					
L552	ELH5L4105	COIL			
L554	ELC18B102L	COIL			
L901	EXCELSA24T	COIL			
L902	EXCELSA24T	COIL			
RESISTORS					
JA3	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA2	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
JA1	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0
R363	ERD25TJ103	CARBON	0.25W	5%	10K
R364	ERD25TJ103	CARBON	0.25W	5%	10K
R365	ERD25TJ103	CARBON	0.25W	5%	10K
R370	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K
R377	ERQ1ABJP5R1	METAL	0.5W	5%	5R1
R461	ERW2PK1R2	WOUND	2W	10%	1R2
R702	ERQ12HJ8R2	FUSIBLE	0.5W	5%	8R2
R913	ERJ6GEYJ473	S.M.CARB	0.1W	5%	47K
R914	ERJ6GEYJ822	S.M.CARB	0.1W	5%	8K2
R915	ERJ6GEYJ152	S.M.CARB	0.1W	5%	1K5
R916	ERJ6GEYJ391	S.M.CARB	0.1W	5%	390
R919	ERQ14AJW390	FUSIBLE	0.25W	5%	39
R920	ERQ14AJW390	FUSIBLE	0.25W	5%	39
R921	ERD25TJ471	CARBON	0.25W	5%	470
R922	ERD25TJ393	CARBON	0.25W	5%	39K
R923	ERD25TJ393	CARBON	0.25W	5%	39K
R924	ERDS1FJ390	CARBON	0.5W	5%	39
R925	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0

Cct Ref	Parts Number	Description			
R926	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0 Ω
R927	ERD25TJ471	CARBON	0.25W	5%	470 Ω
R928	ERD25TJ5R6	CARBON	0.25W	5%	5R6 Ω
R929	ERDS1FJ471	CARBON	0.5W	5%	470 Ω ⚠
R930	ERD25TJ5R6	CARBON	0.25W	5%	5R6 Ω
R931	ERDS1FJ390	CARBON	0.5W	5%	39 Ω ⚠
R935	ERQ14AJW3R9	FUSIBLE	0.25W	5%	3R9 Ω ⚠
R936	ERQ1CJP331	FUSIBLE	1W	5%	330 Ω ⚠
CAPACITORS					
C366	ECA1CM100GB	ELECT	16V		10µF
C551	ECKC3D152J	CERAMIC	2KV		1.5nF ⚠
C554	ECWF2H514J	FILM	500V		1.5nF ⚠
C555	ECWH15H103J	FILM	1500V		10nF
C556	ECQM4333JC	FILM	400V		33nF
C559	ECWF2H684J	FILM	500V		33nF ⚠
C811	ECOS2GG181NG	ELECT	400V		180µF ⚠
C902	ECA1VM101GB	ELECT	35V		100µF
C903	ECUV1H472KBX	S.M. CAP	50V		4.7nF
C904	ECUV1H472KBX	S.M. CAP	50V		4.7nF
C906	ECUV1H471KBX	S.M. CAP	50V		470pF
C908	ECUV1H151JCX	S.M. CAP	50V		150pF
C909	ECKC2H472J	CERAMIC	500V		4.7nF ⚠
C910	ECKC2H472J	CERAMIC	500V		4.7nF ⚠
C911	ECUV1H151JCX	S.M. CAP	50V		150pF
C912	ECEA2CU100	ELECT	160V		10µF
C913	ECA1HM101GB	ELECT	50V		100µF
C914	ECA1HM101GB	ELECT	50V		100µF
C916	ECEA2CGE100	ELECT	160V		10µF

DIFFERENCES FOR MODEL TX-28MD4

MECHANICAL PARTS

9	TKU8E00350	BACK COVER	⚠
10	A66ECF50X41	C.R.T.	⚠
11	TKY8E190	CABINET	⚠
12	VP17005-32	CRT FIXING SCREW	
13	TLK8E05140	DEGAUSS COIL	⚠
14	TNP8EE009AC	E P.C.B.	⚠
15	TQF8E2596	MODEL LABEL	⚠
16	TBM173052	PANASONIC BADGE	
17	TBX8E041-1	POWER BUTTON	
18	TNP8EY012AC	Y P.C.B.	⚠

MISCELLANEOUS COMPONENTS

	TPC8E4671	OUTER CARTON	
	TPD8E639	TOP CUSHION	
	TPD8E640	BOTTOM CUSHION	
	ZTUZAE550A	ANODE LEAD	⚠

I.C.s

IC850	SE140N	ERROR AMPLIFER
IC1103	XGL2-02FA	EAROM *

DIODES

D901	MA165TA5	DIODE
D902	MA165TA5	DIODE
D904	MA165TA5	DIODE
D905	MA165TA5	DIODE
D906	RLS72TE-11	DIODE

TRANSISTORS

Q905	BC847B	TRANSISTOR
Q906	BC847B	TRANSISTOR
Q907	BC857B	TRANSISTOR
Q908	2SA1535ARLB	TRANSISTOR
Q909	2SC3944ARLB	TRANSISTOR

Cct Ref	Parts Number	Description			
TRANSFORMERS					
T801	ETS39AG1J7AD	TRANSFORMER			
COILS					
L552	ELH5L4105	COIL			
L554	ELC18B102L	COIL			
L901	EXCELSA24T	COIL			
L902	EXCELSA24T	COIL			
RESISTORS					
JA3	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0 Ω
JA2	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0 Ω
JA1	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0 Ω
R363	ERD25TJ103	CARBON	0.25W	5%	10K Ω
R364	ERD25TJ103	CARBON	0.25W	5%	10K Ω
R365	ERD25TJ103	CARBON	0.25W	5%	10K Ω
R370	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1K Ω
R377	ERQ1ABJP5R1	METAL	0.5W	5%	5R1 Ω ⚠
R461	ERW2PK1R2	WOUND	2W	10%	1R2 Ω ⚠
R702	ERQ12HJ8R2	FUSIBLE	0.5W	5%	8R2 Ω ⚠
R913	ERJ6GEYJ473	S.M.CARB	0.1W	5%	47K Ω
R914	ERJ6GEYJ822	S.M.CARB	0.1W	5%	8K2 Ω
R915	ERJ6GEYJ152	S.M.CARB	0.1W	5%	1K5 Ω
R916	ERJ6GEYJ391	S.M.CARB	0.1W	5%	390 Ω
R919	ERQ14AJW390	FUSIBLE	0.25W	5%	39 Ω ⚠
R920	ERQ14AJW390	FUSIBLE	0.25W	5%	39 Ω ⚠
R921	ERD25TJ471	CARBON	0.25W	5%	470 Ω
R922	ERD25TJ393	CARBON	0.25W	5%	39K Ω
R923	ERD25TJ393	CARBON	0.25W	5%	39K Ω
R924	ERDS1FJ390	CARBON	0.5W	5%	39 Ω ⚠
R925	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0 Ω
R926	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0 Ω
R927	ERD25TJ471	CARBON	0.25W	5%	470 Ω
R928	ERD25TJ5R6	CARBON	0.25W	5%	5R6 Ω
R929	ERDS1FJ471	CARBON	0.5W	5%	470 Ω ⚠
R930	ERD25TJ5R6	CARBON	0.25W	5%	5R6 Ω
R931	ERDS1FJ390	CARBON	0.5W	5%	39 Ω ⚠
R935	ERQ14AJW3R9	FUSIBLE	0.25W	5%	3R9 Ω ⚠
R936	ERQ1CJP331	FUSIBLE	1W	5%	330 Ω ⚠
CAPACITORS					
C366	ECA1CM100GB	ELECT	16V		10µF
C551	ECKC3D122J	CERAMIC	2KV		1.2nF ⚠
C554	ECWF2H514J	FILM	500V		1.2nF ⚠
C555	ECWH15H103J	FILM	1500V		10nF
C556	ECQM4333JC	FILM	400V		33nF
C559	ECWF2H684J	FILM	500V		33nF ⚠
C811	ECOS2GG181NG	ELECT	400V		180µF ⚠
C902	ECA1VM101GB	ELECT	35V		100µF
C903	ECUV1H472KBX	S.M. CAP	50V		4.7nF
C904	ECUV1H472KBX	S.M. CAP	50V		4.7nF
C906	ECUV1H471KBX	S.M. CAP	50V		470pF
C908	ECUV1H151JCX	S.M. CAP	50V		150pF
C909	ECKC2H472J	CERAMIC	500V		4.7nF ⚠
C910	ECKC2H472J	CERAMIC	500V		4.7nF ⚠
C911	ECUV1H151JCX	S.M. CAP	50V		150pF
C912	ECEA2CU100	ELECT	160V		10µF
C913	ECA1HM101GB	ELECT	50V		100µF
C914	ECA1HM101GB	ELECT	50V		100µF
C916	ECEA2CGE100	ELECT	160V		10µF

SCHEMATIC DIAGRAMS FOR MODELS

TX-28MD4 / TX-25MD4 / TX-21MD4

(EURO-4 CHASSIS)

IMPORTANT SAFETY NOTICE
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturers' specified parts.

NOTE

1. RESISTOR
   All resistors are carbon ¼W resistor, unless marked otherwise.
   Unit of resistance is OHM (Ω) (k=1,000, M=1,000,000)
2. CAPACITORS
   All capacitors are ceramic 50V unless marked otherwise.
   Unit of capacitance is µF unless otherwise stated.
3. COIL
   Unit of inductance is µH, unless otherwise stated.

4. TEST POINT
    Test Point Position

5. EARTH SYMBOL

    Chassis Earth (Cold)

    Line Earth (Hot)

6. VOLTAGE MEASUREMENT
   Voltage is measured by a DC voltmeter.
   Measurement conditions are as follows:

Power source	AC 220V-240V, 50Hz
Receiving Signal	Colour Bar signal (RF)
All customer controls	Maximum position

7.

 Indicates the Video signal path

 Indicates the Audio signal path

These schematic diagrams are the latest at time of printing and are subject to change without notice.

REMARKS

a. Do not touch the hot part, or the hot and cold parts at the same time, as you are liable to a shock hazard.

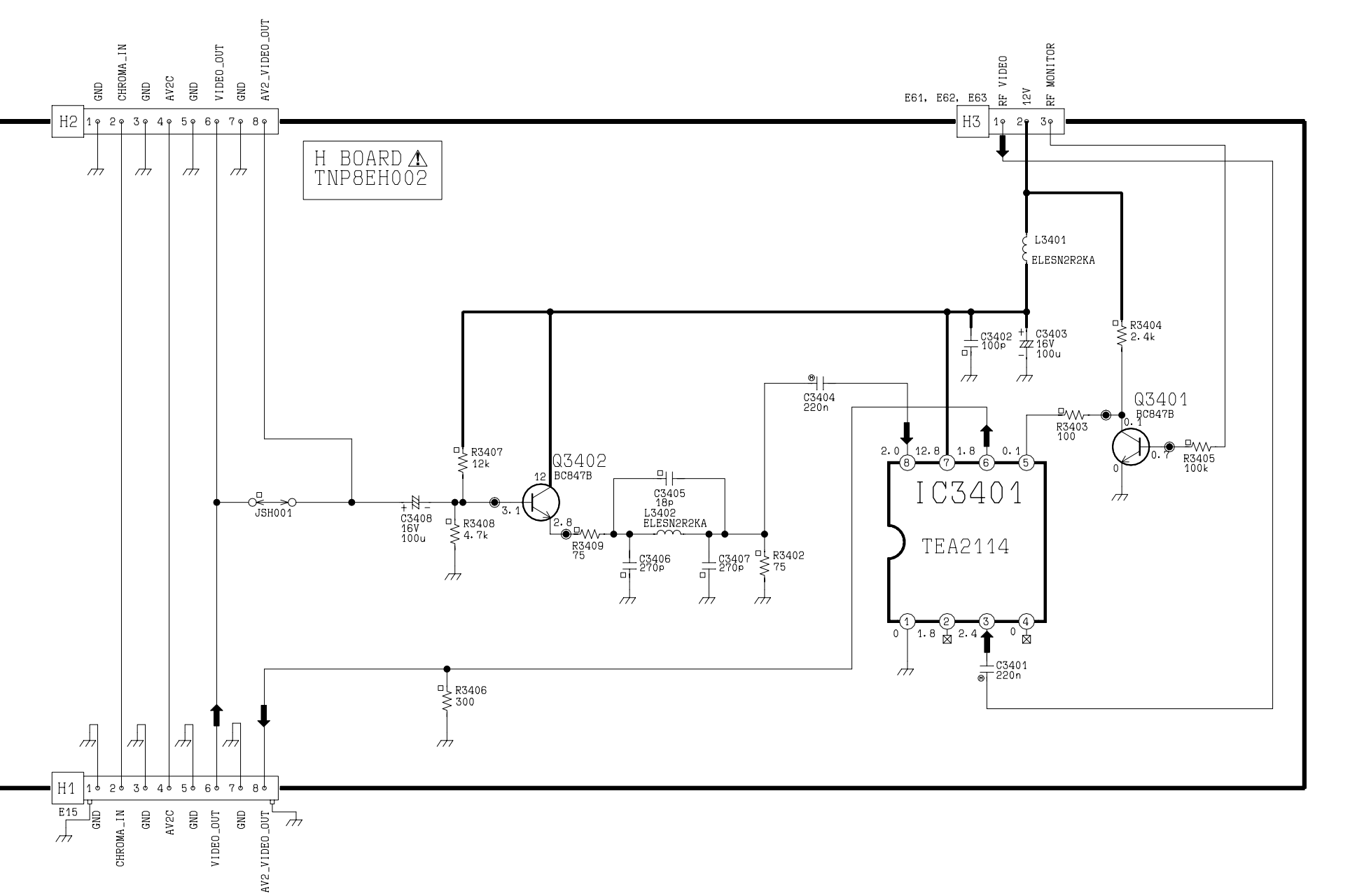
b. Do not short circuit the hot and cold circuits as electrical components may be damaged.

c. Do not connect an instrument, such as an oscilloscope, to the hot and cold circuits simultaneously as this may cause fuse failure. Connect the earth of the instruments to the earth connection of the circuit being measured.

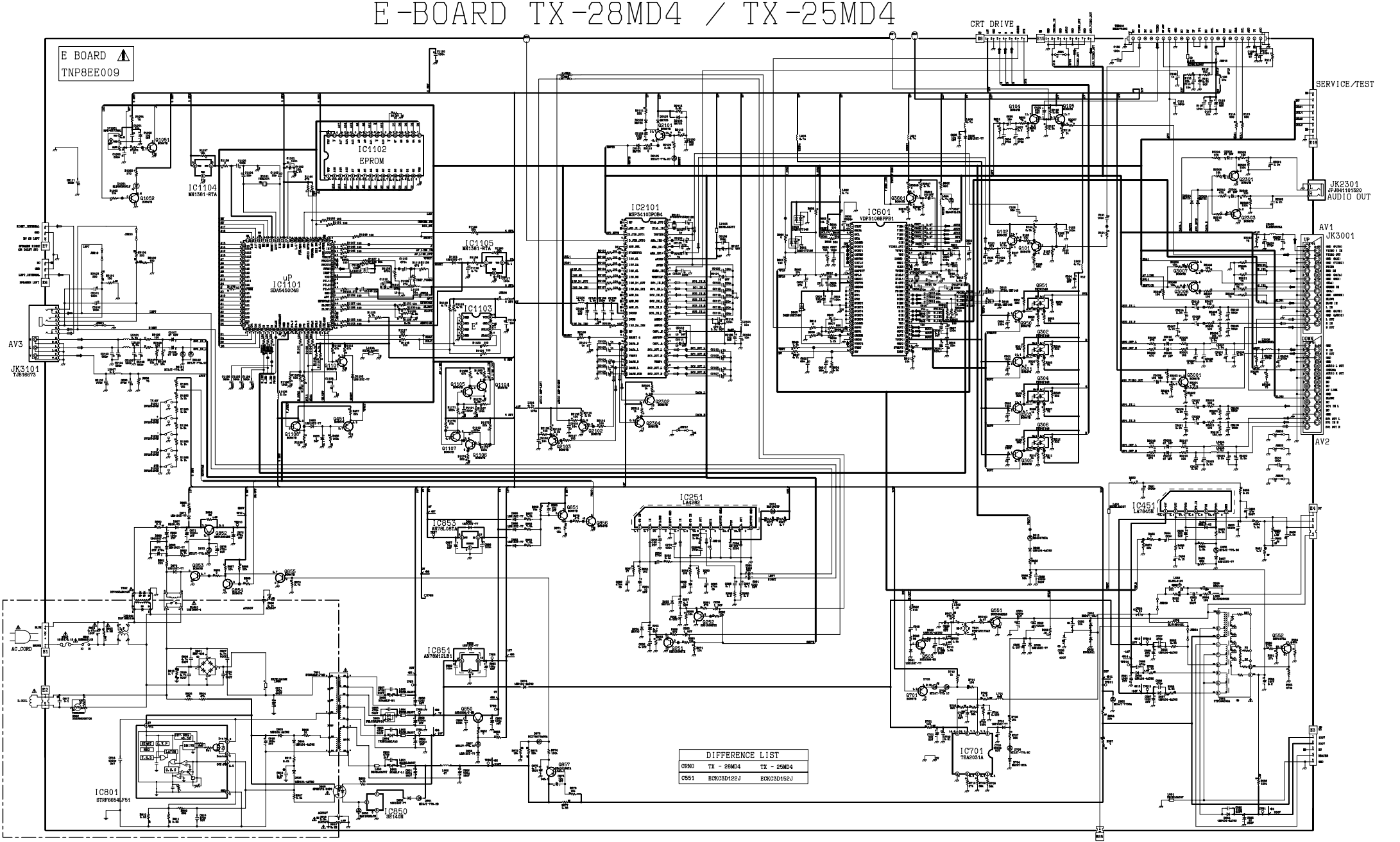
d. Make sure to disconnect the power plug before removing the chassis.

NOTE

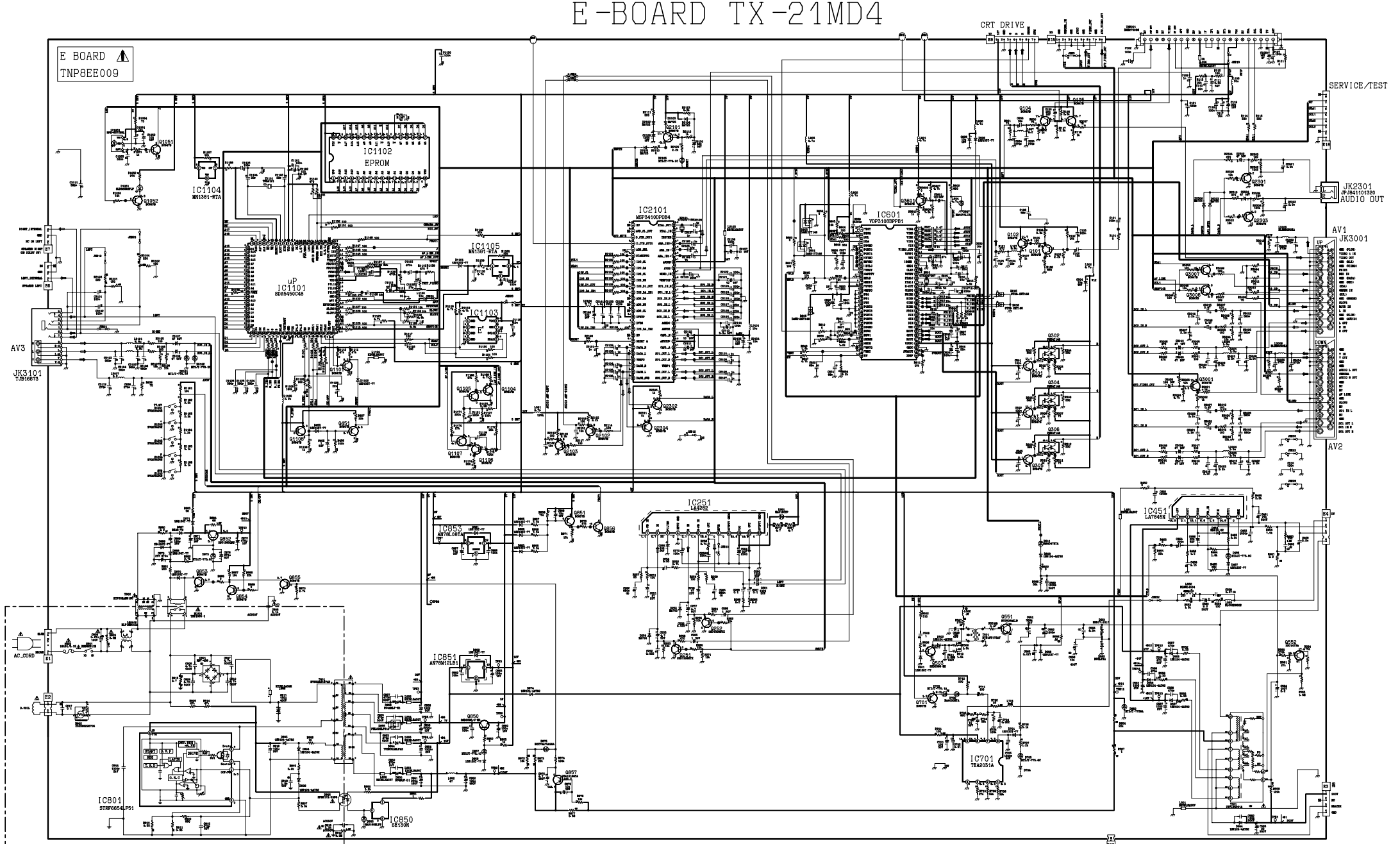
1. The Power Supply Circuit contains a circuit area, which uses a separate power supply to isolate the earth connection. The circuit is defined by HOT and COLD indications in the schematic diagram. All circuits, except the Power Circuit, are COLD.


H BOARD ⚠
TNP8EH002
H2
GND
CHROMA_IN
GND
AV2C
GND
VIDEO_OUT
GND
AV2_VIDEO_OUT
H3
E61, E62, E63
RF VIDEO
12V
RF MONITOR
H1
E15
L3401
ELESN2R2KA
C3402
100p
C3403
16V
100u
R3404
2.4k
C3404
220n
Q3401
BC847B
R3403
100
R3405
100k
R3407
12k
Q3402
BC847B
JSH001
C3408
16V
100u
R3408
4.7k
C3405
18p
L3402
ELESN2R2KA
R3409
75
C3406
270p
C3407
270p
R3402
75
IC3401
TEA2114
C3401
220n
R3406
300

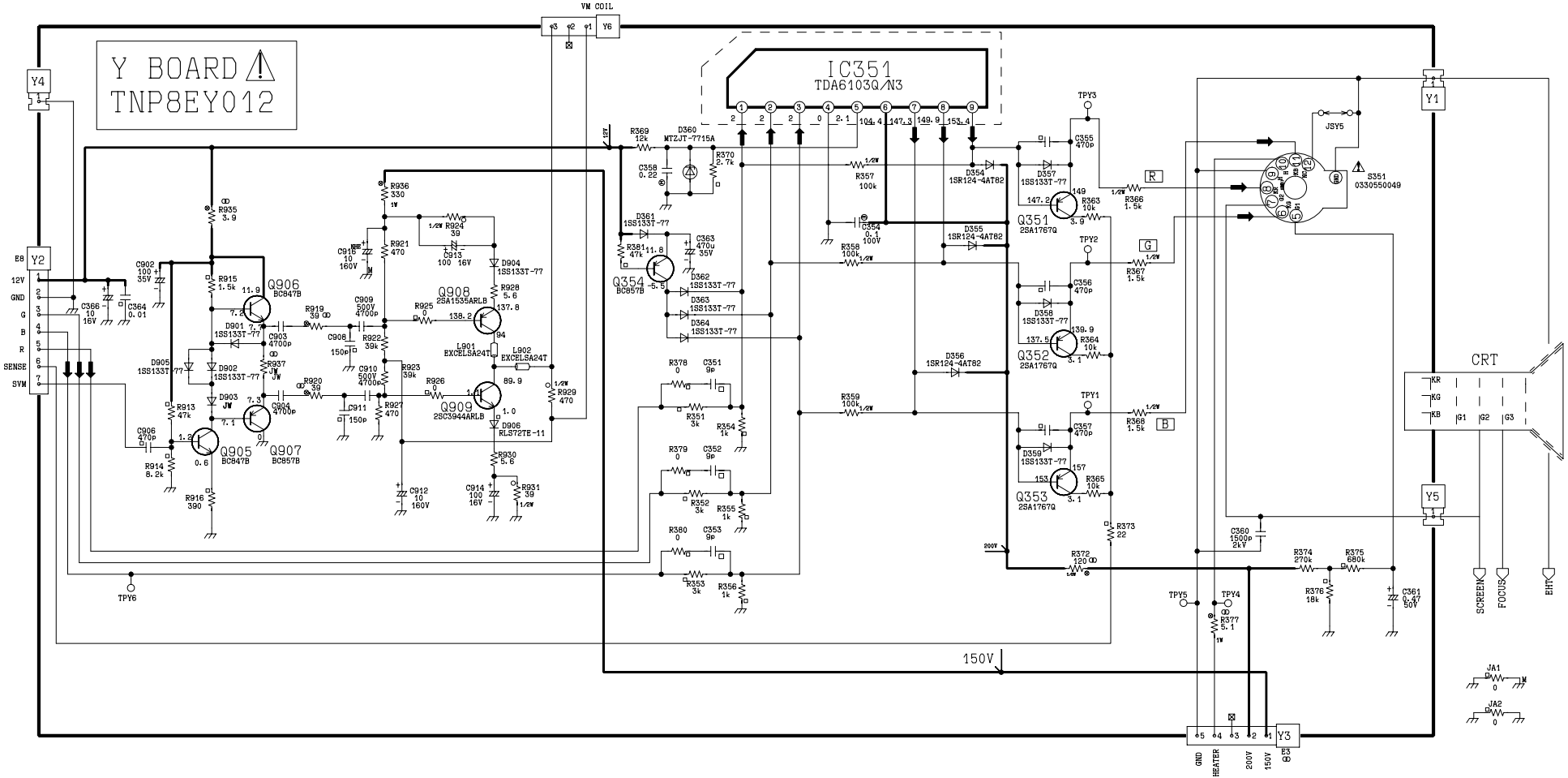
E-BOARD TX-28MD4 / TX-25MD4



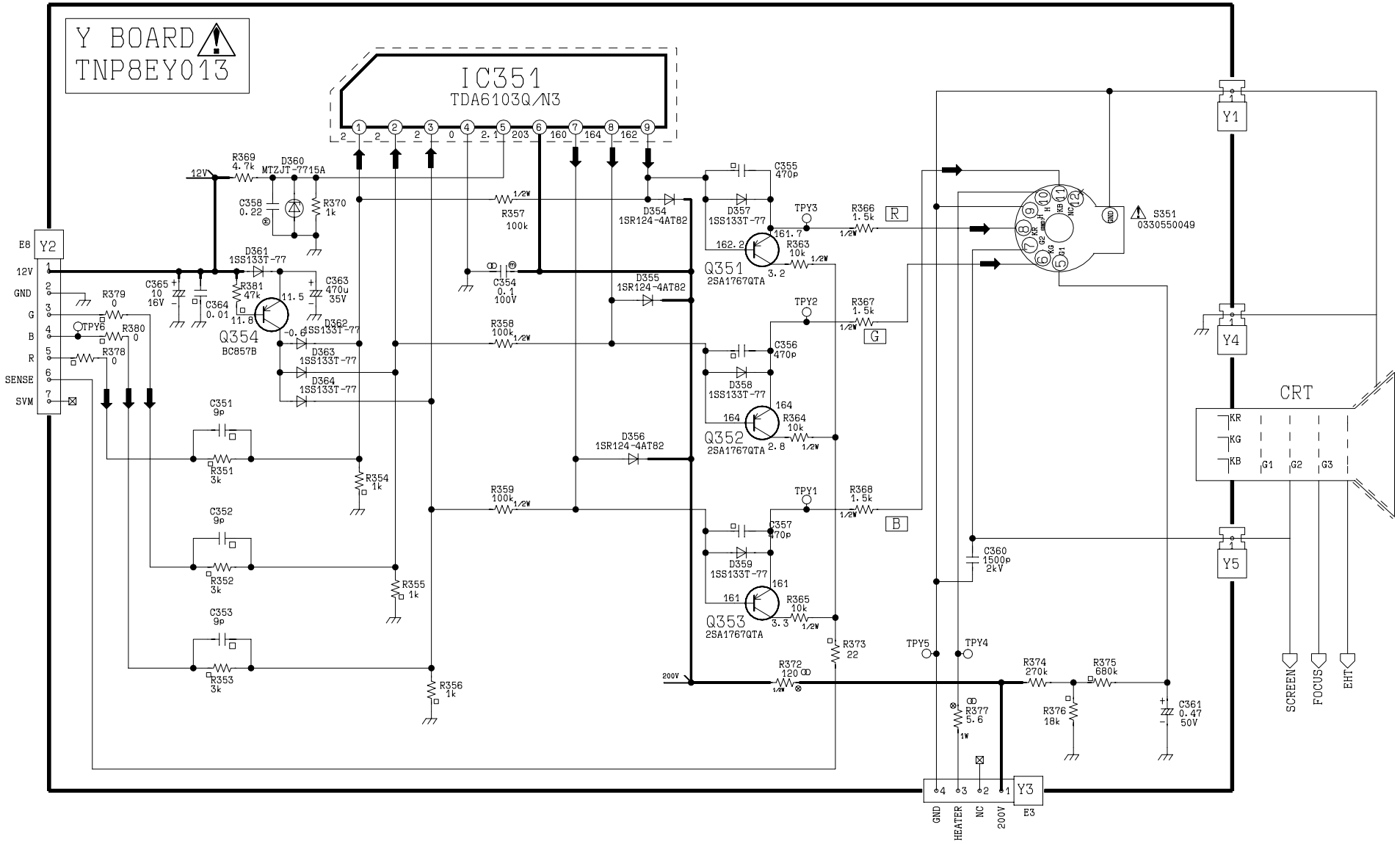
E-BOARD TX-21MD4



Y-BOARD TX-28MD4 / TX-25MD4



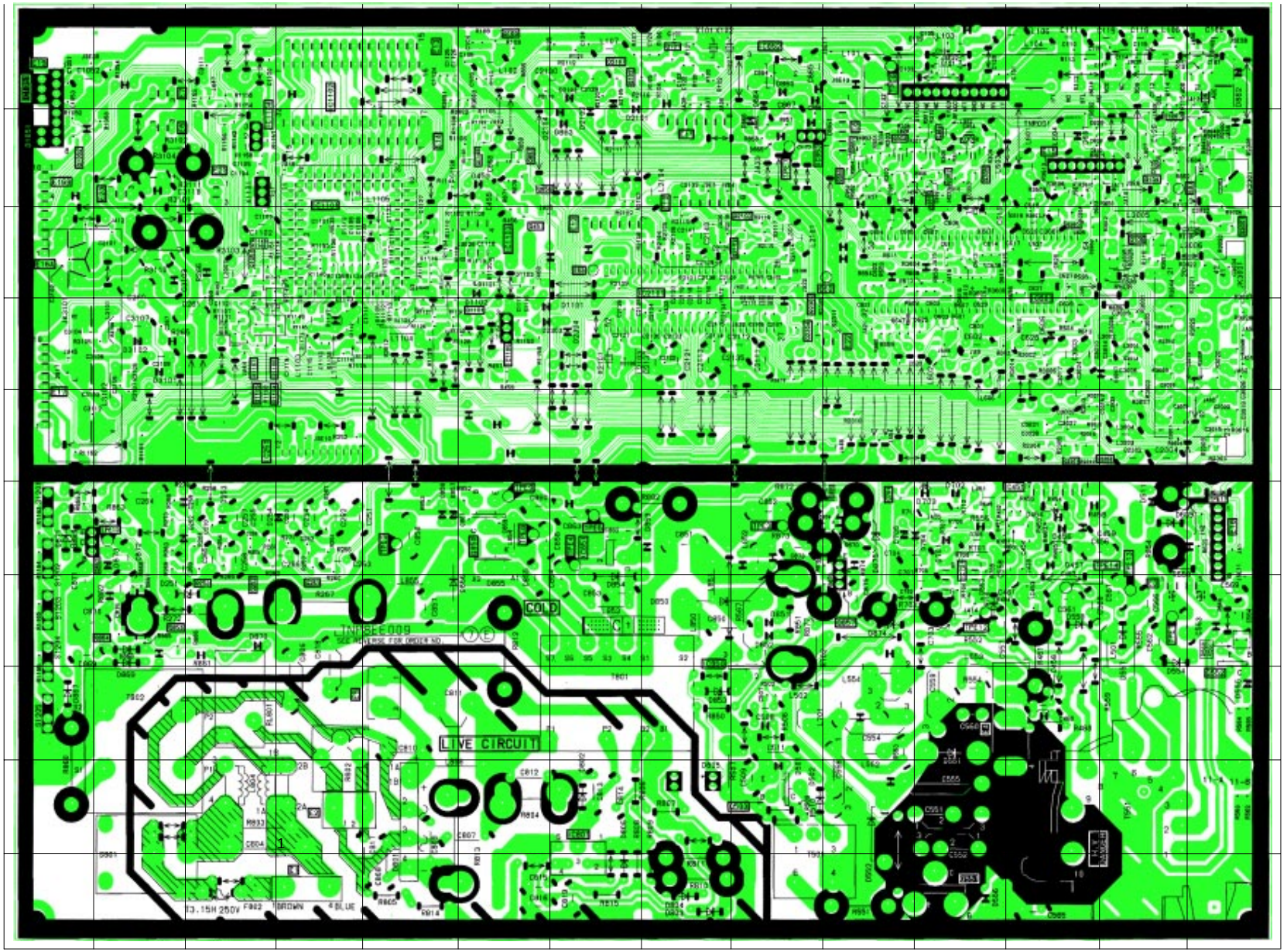
Y-BOARD TX-21MD4



CONDUCTOR VIEWS

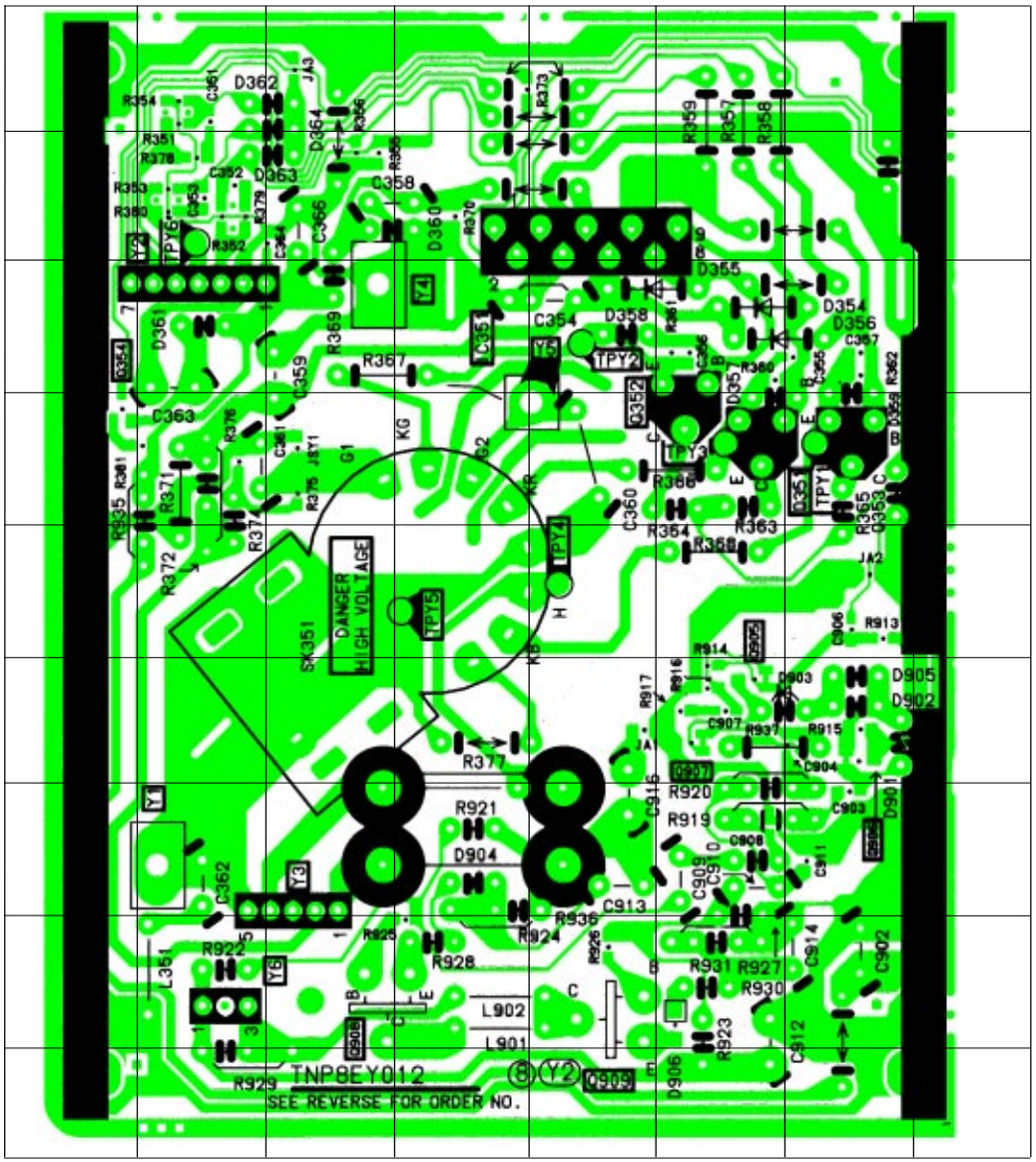
E - BOARD TNP8EE009

TRAN'S		DIODES		D558	L4
Q3601	L8	D3103	B7	D557	M4
Q3007	M9	D3101	B7	D556	K1
Q3001	N8	D3102	B7	D555	N3
Q3006	N10	D2161	G9	D554	M4
Q2304	I7	D2105	G10	D553	K4
Q2303	M6	D2104	F9	D552	J2
Q2301	I7	D2103	G10	D551	K3
Q2103	I8	D2102	G9	D511	M5
Q2102	H8	D1103	F8	D502	I2
Q2101	G10	D1102	F7	D501	I2
Q1108	F9	D1101	G7	D457	L5
Q1107	C7	D1051	A9	D456	L5
Q1106	C7	D875	J5	D454	L5
Q1105	C7	D874	J4	D453	F9
Q1104	C7	D873	B5	D254	C5
Q1101	F7	D871	A5	D253	C5
Q1052	A9	D870	871	D252	B5
Q1051	C8	D869	B4	D251	B4
Q951	J9	D868	B4	**IC'S**	
Q950	J9	D867	A3	IC2101	H8
Q857	J4	D866	I9	IC1105	F7
Q856	F9	D865	I9	IC1104	C9
Q855	J5	D864	I10	IC1103	F8
Q854	B4	D863	G9	IC1102	D10
Q853	B4	D862	N10	IC1101	D8
Q852	B5	D861	J9	IC1051	A10
Q850	F5	D860	I10	IC852	I10
Q701	J5	D859	H5	IC851	G5
Q552	N3	D858	E5	IC850	H4
Q551	K1	D857	E5	IC801	G2
Q503	I2	D855	F4	IC701	K5
Q451	F8	D854	G4	IC601	L7
Q394	K9	D853	H3	IC451	L5
Q305	K9	D852	I4	IC251	D6
Q303	K9	D851	I4	**TP'S**	
Q302	J9	D850	H4	TPE14	M5
Q301	K9	D806	G2	TPE13	M4
Q253	C4	D805	H2	TPE12	K4
Q252	C4	D804	H1	TPE11	N5
Q252	C4	D803	H1	TPE10	B5
Q251	D4	D802	G2	TPE9	E5
Q105	M8	D801	E1	TPE8	F5
Q104	M9	D705	J5	TPE7	I9
Q103	F10	D704	K5	TPE6	J10
Q102	G10	D703	K5	TPE5	G5
Q101	H10	D702	K5	TPE4	G5
		D701	K5	TPE3	E5
		D609	M5	TPE2	I5
		D607	L9	TPE1	M4



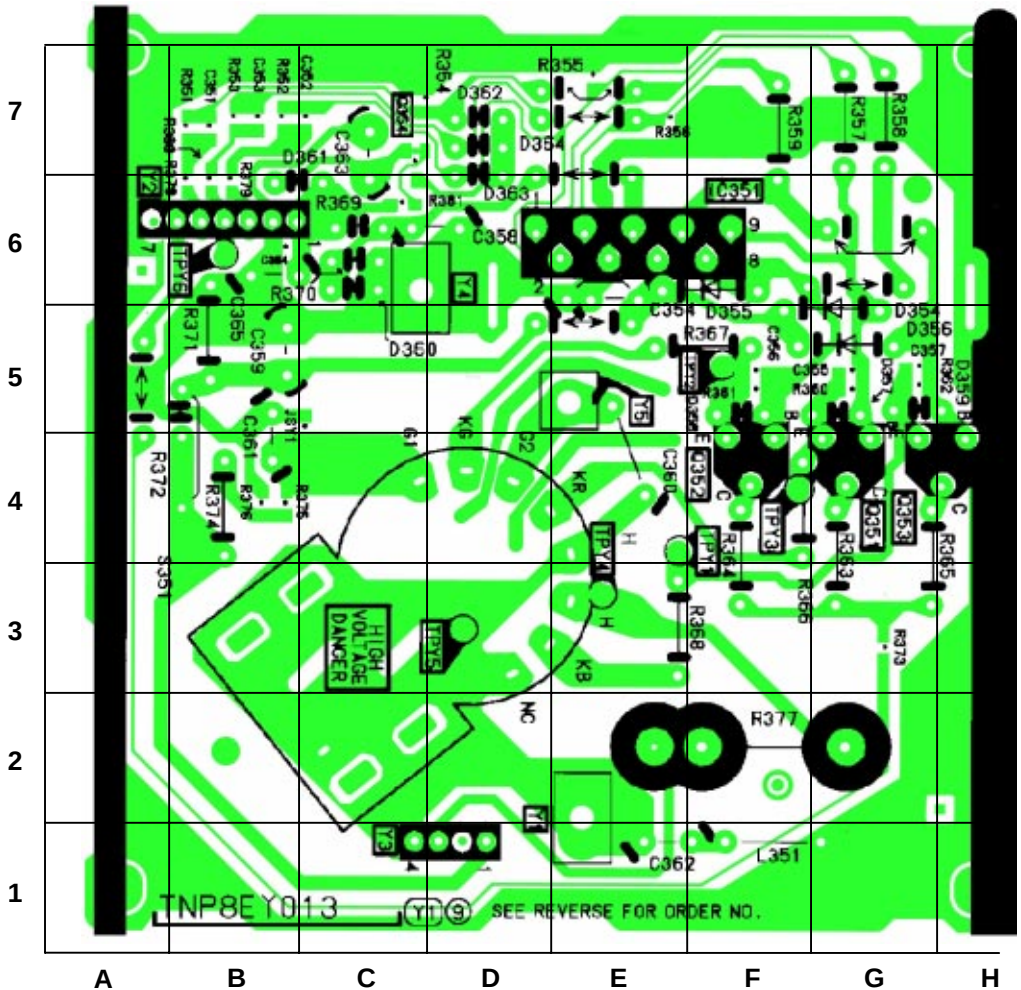
Y - BOARD TNP8EY012

TRANSISTORS	
Q909	E1
Q908	C2
Q907	F4
Q906	G3
Q905	F5
Q354	A7
Q353	G6
Q352	F6
Q351	F6
DIODES	
D906	F1
D905	G4
D904	D3
D902	G4
D901	G3
D364	C9
D363	C8
D362	B9
D361	B7
D360	D8
D359	G6
D358	E7
D357	F7
D356	G7
D355	F7
D354	G7
TEST POINTS	
TPY6	B8
TPY5	D5
TPY4	E5
TPY3	F6
TPY2	E7
TPY1	G6
IC'S	
IC351	E8



Y - BOARD TNP8EY013

DIODES	
D354	G5
D355	F6
D356	G5
D357	G5
D358	F5
D359	G5
D360	C6
D361	B6
D362	D7
D363	D7
D364	D7
TEST POINTS	
TPY1	E4
TPY2	F5
TPY3	F4
TPY4	E3
TPY5	D3
TPY6	B6
TRANSISTORS	
Q351	G4
Q352	F4
Q353	G4
Q354	C7
I.C.'S	
IC351	E6



NOTES

ORDER No. SM-98051

Service Manual

SUPPLEMENT 1

Colour Television

TX-28MD4
TX-25MD4
TX-21MD4

Additional information for Self-Check feature

(Information in brackets {} refers to the TX-21MD4)

FACTORY SETTINGS

To return customer settings to factory settings and clear owner ID of all information input by the customer, enter Self-Check mode. Press the down **(-/v)** button on the customer controls at the front of the TV set, at the same time pressing the **STATUS** button on the remote control. To exit Self Check, switch off the TV set at the power button.

NOTE: Self Check should only be used when refurbishing the TV set and not during normal repair work.

VDP	O.K.	PCB	O.K.
TUN	O.K.	Cab	O.K.
E2	O.K.	Sum	Factory use only
MSP	O.K.		
DPL	- -		
OPTION 1	3D	{3C}	
OPTION 2	0C	{0E}	
OPTION 3	1D	{1D}	
OPTION 4	00	{00}	
OPTION 5	EF	{EF}	
OPTION 6	23	{23}	

Self Check is also used to automatically check the bus lines and hexadecimal code of the TV set. If the CCU ports have been checked and found to be incorrect or not located then " - - " will appear in place of "O.K.". For more in-depth TV diagnostics use the **LUCI** interface as listed below.

Service Aids

To aid in the service of our current chassis there are a number of Service Aids which have been made available.

- **LUCI** interface kit (**L**inked **U**tility **C**omputer **I**nterface)
  Part number: TZS6EZ002
  This contains interface and cables for connecting TV service connector and a PC as well as diagnostic software. As new models are introduced upgrade software will become available.
- **VICI** (**V**isual **I**nteractive **C**omputer **I**nformation)
  These C.D.'s contain multimedia documentation providing quick access to service information.
  Part No. TZS7EZ006 & TZS7EZ005
  1. Service Manuals
  2. Instruction Books
  3. Technical Information
- **TASMIN** (**T**echnically **A**dvanced **S**ystem for **M**ultimedia **I**nteractive **N**otes)
  As well as providing a first step towards more interactive training this product also achieves quick access to Technical Information.

Panasonic