

TX-21S3T / TC-21S3R Service Manual

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Service Support

Service and repair of this product is supported by Panasonic's LUCI interface.

This interface provides a link between the TV and a standard PC to allow a number of diagnostic and control functions to be performed.

For more details contact your local Panasonic company.


BACK

EXIT

Video / Audio

Control



BACK

E - PCB

Y - PCB



BACK

E - Schematic

Y - Schematic



BACK

Service Manual



Colour Television TX-21S3T TC-21S3R Z-7 Chassis

Specifications

Power Source :	220-240V AC, 50Hz	RCA IN	Video 1V p-p 75Ω
		RCA IN	Audio 500mV rms, 10KΩ
Power Consumption :	50W	High Voltage :	27kV + 0.7kV / - 1kV (zero beam current)
Standby Power Consumption :	1W	Picture Tube :	A51 ESF43X191 51 cm V 90° measured diagonally
Aerial Impedance :	75Ω unbalanced, Coaxial Type	Audio Output :	6 W (Music Power) 8 Ω Impedance
Receiving System :	PAL-I (UHF), PAL-525/60, NTSC (AV Only)	Headphones	8 Ω Impedance
Receiving Channels :	UHF E21 - E69	Accessories supplied :	Remote Control 2 x R6 (UM3) Batteries TV Stand AV Cover
Intermediate Frequency :		Dimensions :	
Video	39.5 MHz	Height :	480 mm
Sound	33.5 MHz	Width :	520 mm
Colour	35.07 MHz	Depth :	485 mm
Video / Audio Terminals :		Net Weight :	20kg
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		

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

IMPORTANT

This receiver uses a **HOT** chassis, after service please ensure that the chassis is returned to its correct position.
Particular care being taken to the position of the customer controls.
Failure to do so could endanger customer safety.

Panasonic CS (U.K.) Ltd.

WILLOUGHBY ROAD,
BRACKNELL
BERKS,
RG12 8FT.

Panasonic

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SAFETY PRECAUTIONS

GENERAL GUIDE LINES

1. It is advisable to insert an isolation transformer in the AC4. supply before servicing a hot chassis.
2. When servicing, observe the original lead dress in the high5. voltage circuits. If a short circuit is found, replace all parts which have been overheated or damaged by the short 6. 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 28kV 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 picture to the chassis before handling the tube.
6. After servicing make the following leakage current checks to prevent the customer from being exposed to shock hazards.

Check each exposed Metallic part and check the voltage at each point.

Reverse the AC plug at the outlet and repeat each of the above measurements.

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.

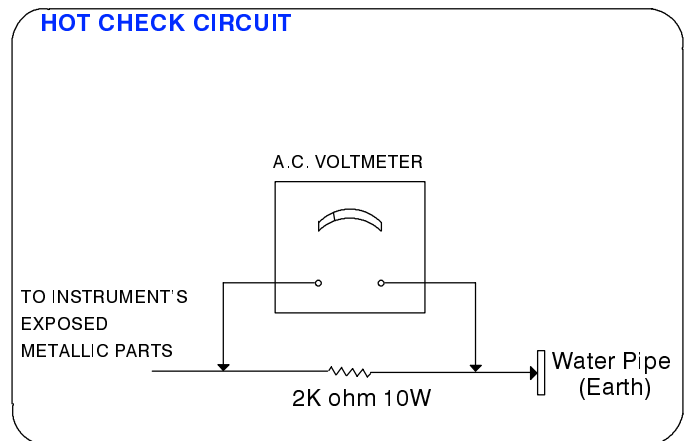


Fig.1

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 1. the jumpered AC plug and each exposed metallic cabinet part on the receiver, such as screw heads, 2. aerials, 2. 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 3. must be infinite.

X—RADIATION WARNING

The potential sources of X—Radiation in TV sets are the high voltage section and the picture tube.

When using a picture tube test jig for service ensure that the jig is capable of handling 28kV without causing X—Radiation.

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

LEAKAGE CURRENT HOT CHECK

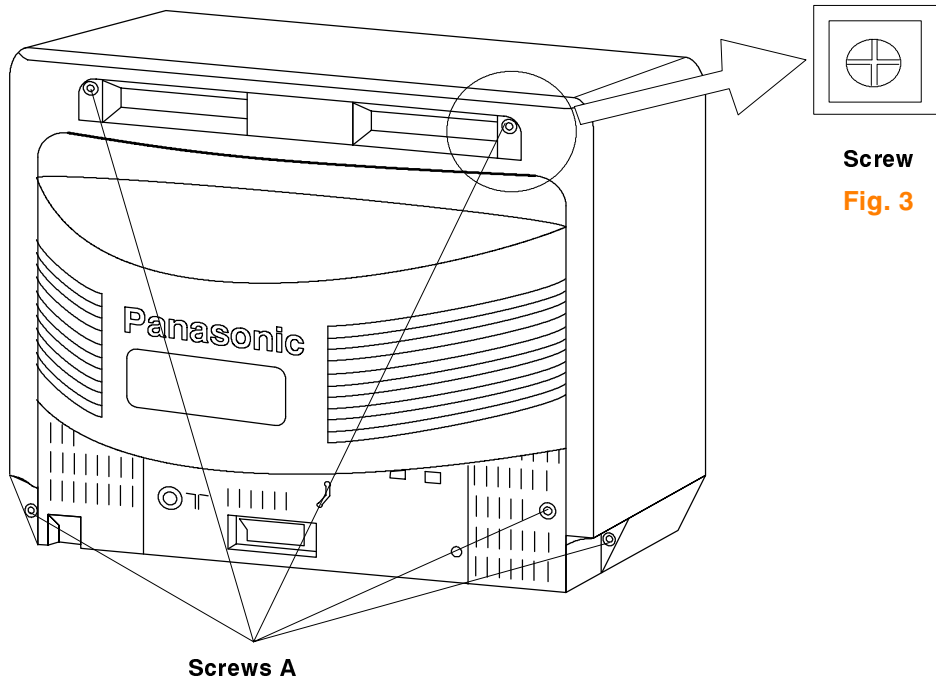
1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 2kΩ 10W resistor in series with an exposed metallic part on the receiver and an earth such as a water 3. pipe.
3. Use an AC voltmeter with high impedance to measure the potential across the resistor.

1. Set the brightness to minimum.
 2. Measure the high voltage. The meter should indicate 27kV + 0.7 / - 1kV if the meter indication is out of tolerance, immediate service and correction is required to prevent the possibility of premature component failure.
- 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 5 screws (A) as shown in Fig.2/Fig.3.



Screws A

Fig. 2

Screw

Fig. 3

HOW TO MOVE THE CHASSIS INTO THE SERVICE POSITION

1. Hold and lift the rear of the E- PCB chassis and gently pull the chassis toward you.
2. Release the respective wiring clips and rotate the chassis clockwise, moving the EHT lead around the left side of the CRT neck.
3. Slide the lower edge of the chassis into the power cable holder case whilst sliding the upper edge of the board into the chassis holding block.
4. After servicing ensure all wiring is returned to its original position before returning the receiver to the customer.

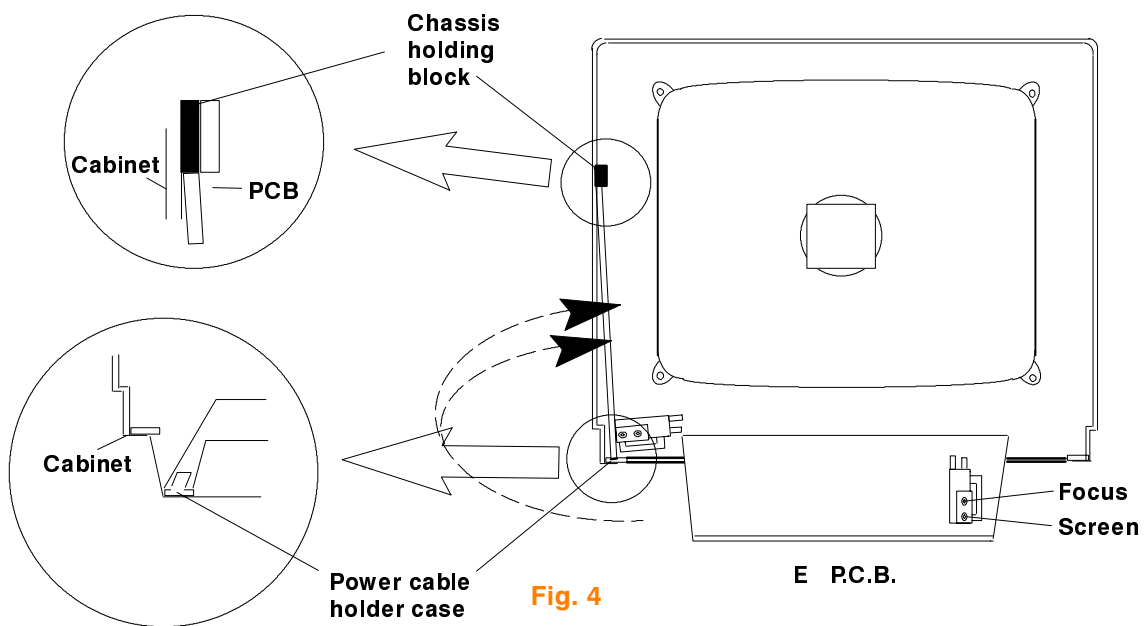


Fig. 4

E P.C.B.

ALIGNMENT SETTINGS

1. Select program position 60 and set the sharpness to minimum.
2. Press the Off Timer button on the remote control and at the same time press the V (down) button on the customer controls at the front of the TV, this will place the TV into Service Mode.
3. Press the \wedge / \vee buttons to step up / down through the functions.
4. Press the + / - buttons to alter the function values.
5. Press the STORE button after each adjustment has been made to store the required values.
6. To exit Service Mode press the Normalisation button.

NOTE : The figures used below are nominal and used for representative purposes only

Alignment Function		Settings / Special Features
1. Vertical amplitude	V-Amp 27	Optimum setting
2. Vertical position	V-Pos 03	Optimum setting
3. Horizontal centre	H-Ctr 07	Optimum setting
4. Red cutoff	R-Cut 186	Optimum setting
5. Green cutoff	G-Cut 220	Optimum setting
6. Blue cutoff	B-Cut 213	Optimum setting
7. Red drive	R-Drv 46	Optimum setting
8. Blue drive	B-Drv 36	Optimum setting
9. AGC	AGC 33	Optimum setting
10. Sub contrast	S-Con 33	Optimum setting
11. Sub colour	S-Col 39	Optimum setting
12. Sub bright	S-Bri 40	Optimum setting

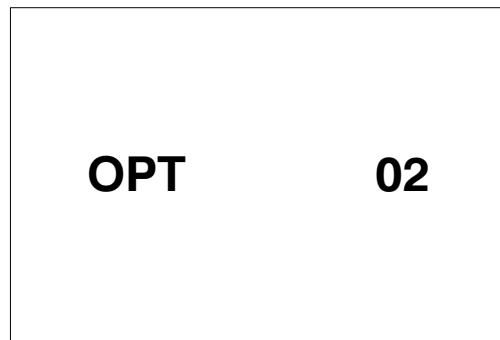
ADJUSTMENTS

ITEM/PREPARATION	ADJUSTMENT PROCEDURE
<p>B VOLTAGE</p> <ol style="list-style-type: none">Operate the TV set.Set controls : Bright minimum Sub Bright minimum Volume minimum Beam Current Zero	<ol style="list-style-type: none">Confirm the indicated test points for the specified voltage. TPE 1: 9V ± 1V TPE 2: 5V ± 0.3V TPE 3: 12V ± 1V TPE 4: 30V ± 2.5V TPE 5: 5V ± 0.3V TPE 6: 9V ± 0.3V TPE 9: 22V ± 1V TPE 10: 185V ± 10V TPE 11: 12V ± 1V TPE 12: 12V ± 1.5V TPE 13: 125V ± 1.5V TPE 14: 8V ± 1V TPE 18: 8V ± 1V TPE 19: 31V ± 1.5V

SELF CHECK

Self check is used to automatically check the Bus Lines Hexadecimal code of the TV set.

To get into the Self Check mode press the Status button on the Remote Control, followed by the V button on the customer controls at the front of the TV, and the screen will show:—



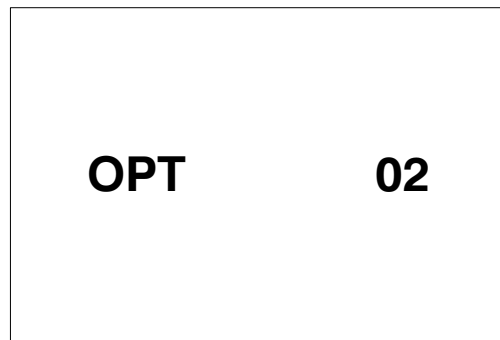
ADJUSTMENTS

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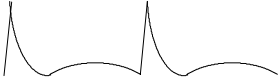
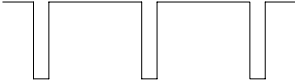

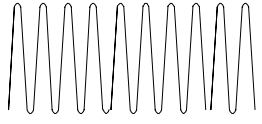


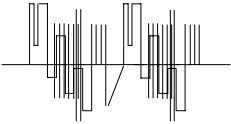
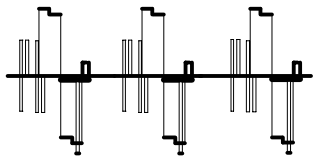
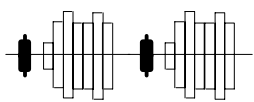
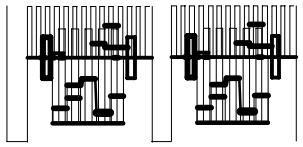
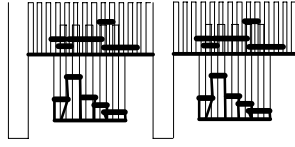
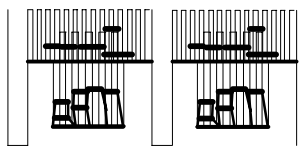

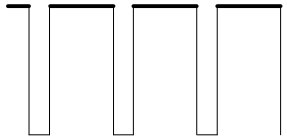
SELF CHECK

Self check is used to automatically check the Bus Lines Hexadecimal code of the TV set.

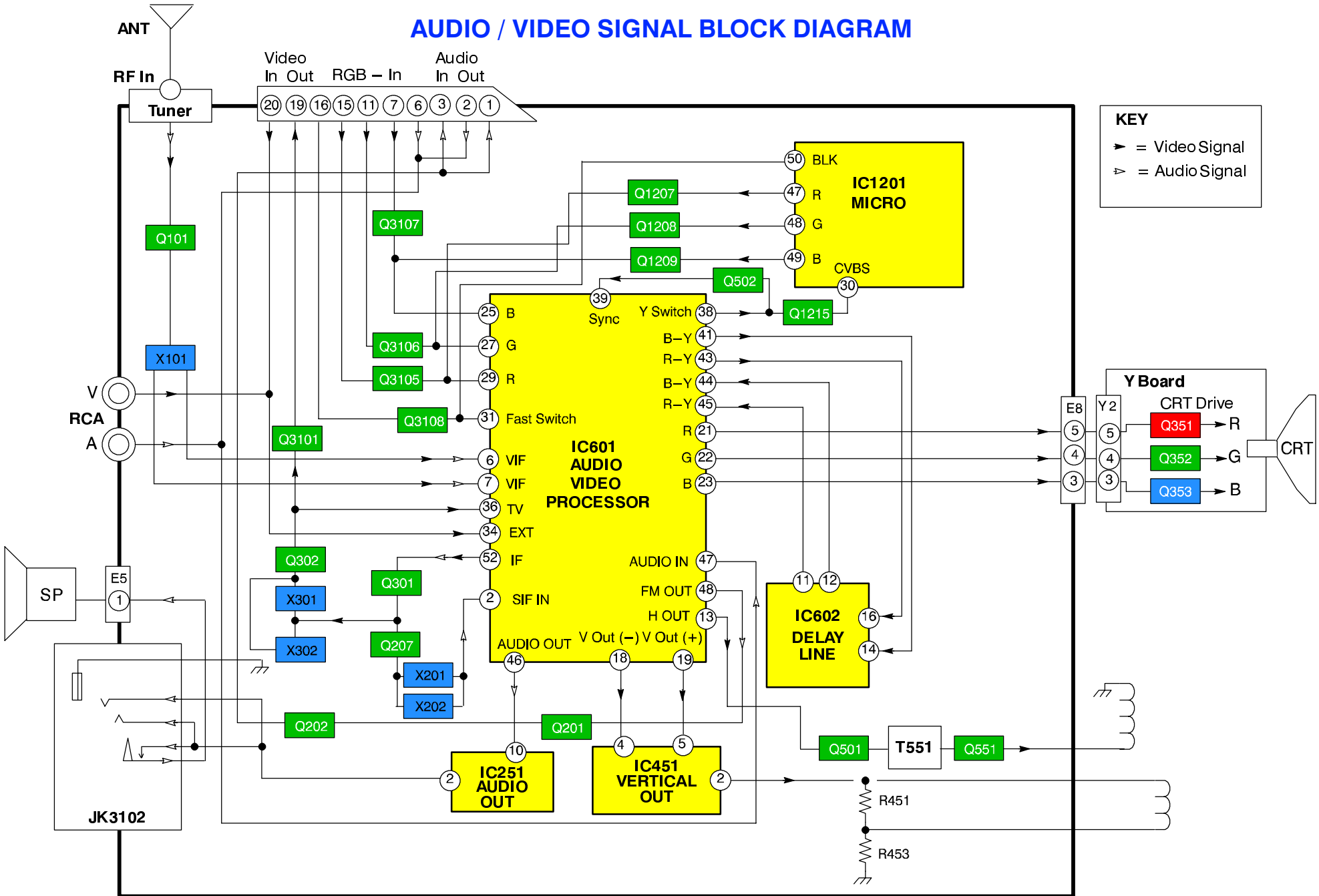
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WAVEFORM PATTERN TABLE

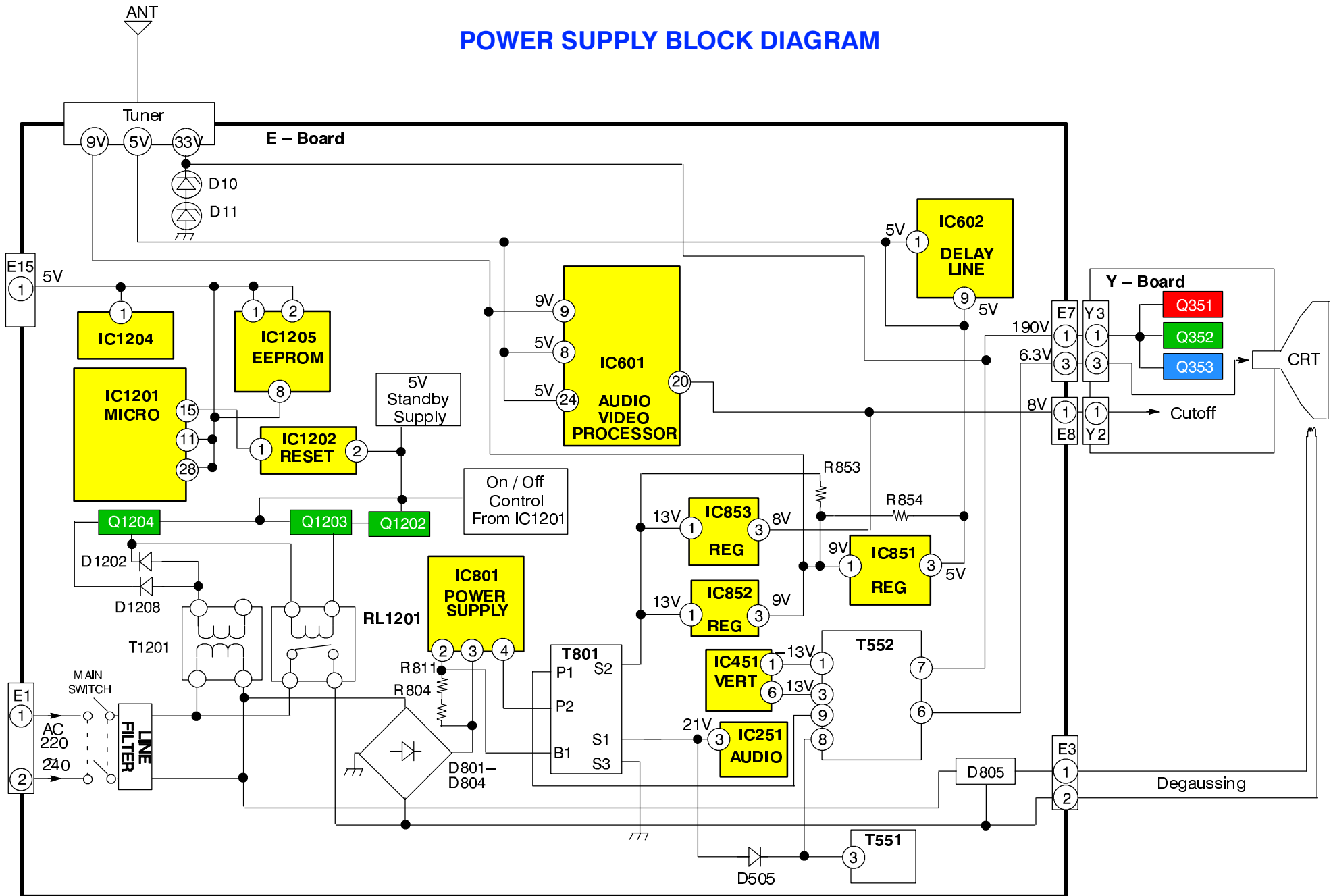
<p style="text-align: center;">Vert Out IC IN</p>  <p style="text-align: center;">IC451 pin 4</p>	<p style="text-align: center;">H.Sync</p>  <p style="text-align: center;">IC601 pin 11</p>	<p style="text-align: center;">SCL</p>  <p style="text-align: center;">IC1201 pin 3</p>	<p style="text-align: center;">H – OSC</p>  <p style="text-align: center;">IC 601 pin 15</p>
<p style="text-align: center;">SDA</p>  <p style="text-align: center;">IC601 pin 14</p>	<p style="text-align: center;">Slow Switch</p>  <p style="text-align: center;">IC1201 pin 46</p>	<p style="text-align: center;">'BY' Out</p>  <p style="text-align: center;">IC601 pin 41</p>	<p style="text-align: center;">'RY' Out</p>  <p style="text-align: center;">IC601 pin 43</p>
<p style="text-align: center;">IF VO</p>  <p style="text-align: center;">IC601 pin 52</p>	<p style="text-align: center;">B Out</p>  <p style="text-align: center;">TPE15</p>	<p style="text-align: center;">G Out</p>  <p style="text-align: center;">TPE16</p>	<p style="text-align: center;">R Out</p>  <p style="text-align: center;">TPE17</p>
<p style="text-align: center;">Vert Drive</p>  <p style="text-align: center;">IC451 pin 2</p>	<p style="text-align: center;">H. Out</p>  <p style="text-align: center;">IC601 pin 13</p>		

AUDIO / VIDEO SIGNAL BLOCK DIAGRAM

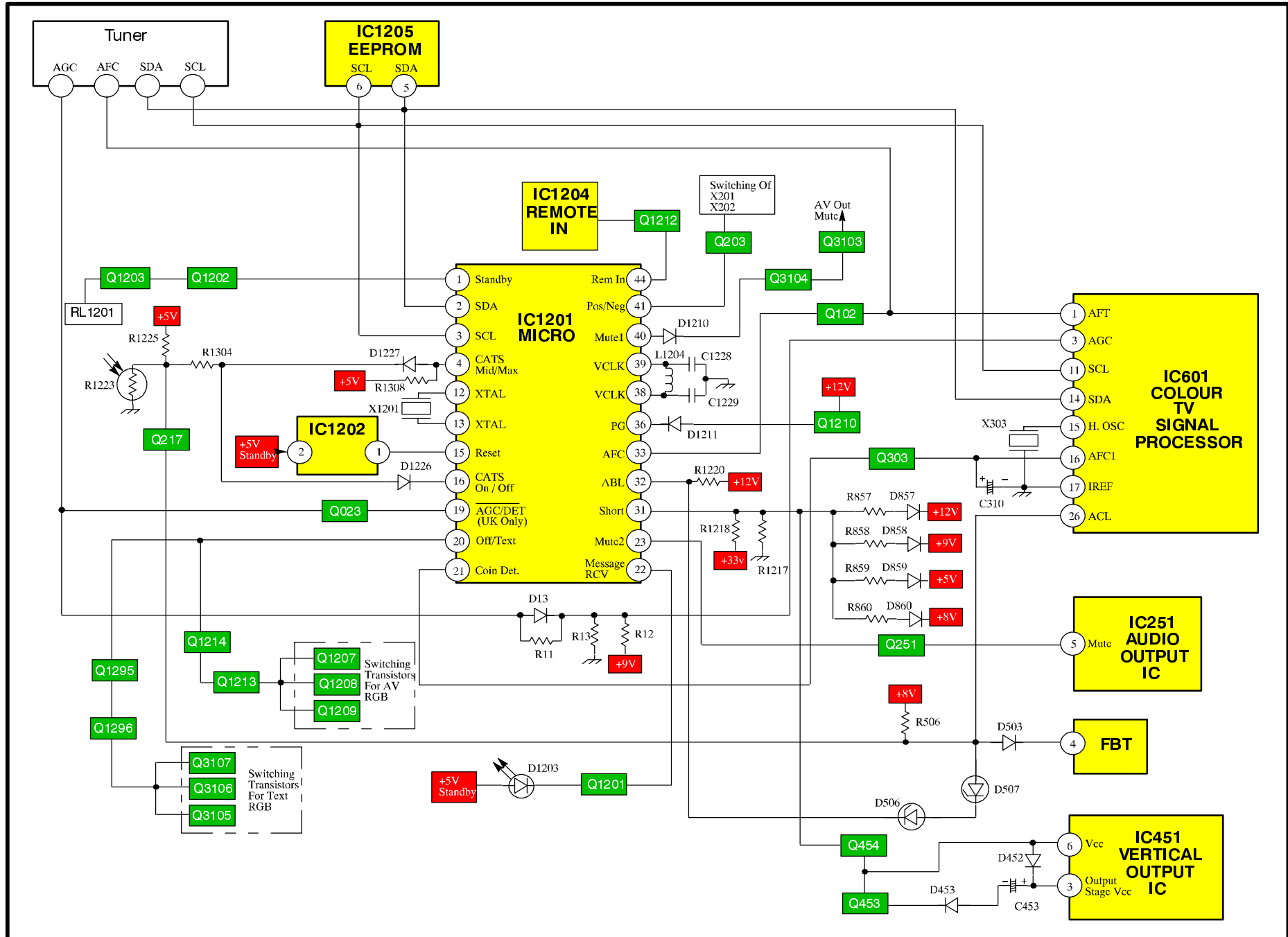


KEY
 ▶ = Video Signal
 ▷ = Audio Signal

POWER SUPPLY BLOCK DIAGRAM



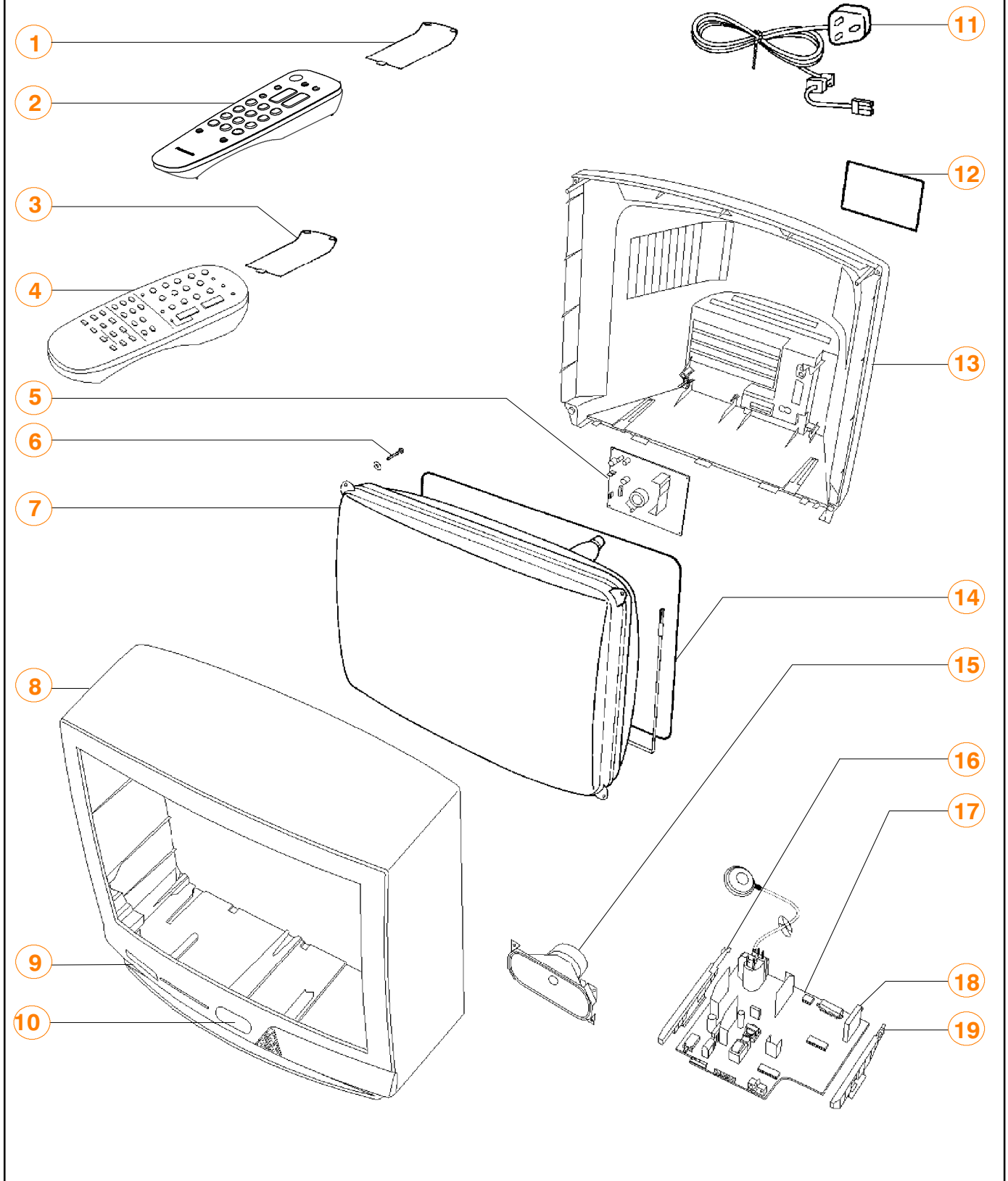
CONTROL LINE BLOCK DIAGRAM



PARTS LOCATION

NOTE :

The numbers on the exploded view below refer to the miscellaneous 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 manufacturer's specified parts.

PARTS COMMON TO TX – 21S3T AND TC – 21S3R

Ref No.	Part No.	Description			Ref No.	Part No.	Description			
MISCELLANEOUS COMPONENTS										
1)	*****	REFER TO DIFFERENCE LIST			C201	ECUV1H272K BX	S.M.CAP	50V	2.7nF	
2)	*****	REFER TO DIFFERENCE LIST			C203	ECUV1H220J CX	S.M.CAP	50V	22pF	
3)	*****	REFER TO DIFFERENCE LIST			C204	ECUV1H220J CX	S.M.CAP	50V	22pF	
4)	*****	REFER TO DIFFERENCE LIST			C207	ECEA1CN100	ELECT	16V	10µF	
5)	TNP8EY011AC	Y.P.C.B.		▲	C208	ECA1CM100GB	ELECT	16V	10pF	
6)	THE492-4	CRT FIXING SCREW			C251	ECA1EM471GB	ELECT	25V	470pF	
7)	A51EFS43X191	C.R.T.		▲	C252	ECA1HM010GB	ELECT	50V	1pF	
8)	TKY8E140	CABINET		▲	C253	ECA1EM470GB	ELECT	25V	47pF	
9)	TBX8E038	POWER BUTTON			C254	ECUV1H272J CX	S.M.CAP	50V	2.7nF	
10)	TKK8E027	AV TERMINAL COVER			C255	ECQB1H104J	FILM	50V	100nF	
11)	TSX8E0017	POWER CORD		▲	C256	ECQM1H224J	FILM	50V	220nF	
12)	*****	REFER TO DIFFERENCE LIST			C257	ECQM1H474J	FILM	50V	470nF	
13)	TKU8E00230	REAR COVER		▲	C258	ECA1EM101GB	ELECT	25V	1µF	
14)	TLK8E05133	DEGAUSS COIL		▲	C260	ECA1EM102GB	ELECT	25V	1nF	
15)	EASG12D531A2	SPEAKER			C261	ECUV1H471J CX	S.M.CAP	50V	470pF	
16)	TMZ8E001	CHASSIS RAIL (RIGHT)			C262	ECA1HM101GB	ELECT	50V	100pF	
17)	*****	REFER TO DIFFERENCE LIST			C301	ECA1HM101GB	ELECT	50V	100pF	
18)	ENV87D05G3	TUNER		▲	C302	ECUV1H104ZFX	S.M.CAP	50V	100nF	
19)	TMZ8E002	CHASSIS RAIL (LEFT)			C303	ECA1CM471GB	ELECT	16V	470pF	
	TBM8E1626	PANASONIC BADGE			C304	ECUV1H104ZFX	S.M.CAP	50V	100nF	
	TKP8E1164	SMOKED PANEL			C305	ECA1HM101GB	ELECT	50V	100pF	
	TBX8E039	KEY PAD			C307	ECA1HM101GB	ELECT	50V	100pF	
	TMW8E015-2	LED HOLDER			C308	ECUV1H104ZFW	S.M.CAP	50V	100nF	
	TPC8E4583	OUTER CARTON			C309	ECUV1H103K BX	S.M.CAP	50V	10nF	
	TPD8E562	CUSHION			C310	ECA1HM010GB	ELECT	50V	1pF	
	TQB8E2257	INST BOOK		▲	C311	ECUV1H104ZFX	S.M.CAP	50V	100nF	
	TS2800S	TV STAND			C312	ECUV1H104ZFX	S.M.CAP	50V	100nF	
	UM-3DEP-2P	BATTERY			C313	ECUV1H104ZFX	S.M.CAP	50V	100nF	
INTEGRATED CIRCUITS										
IC251	LA4265	AUDIO OUTPUT			C314	ECEA1HNR47UB	ELECT	50V	0.47µF	
IC451	LA7840	VERTICAL OUTPUT			C315	ECEA1HN2R2UB	ELECT	50V	2.2µF	
IC601	M52778SP	AUDIO VIDEO PROCESSOR			C316	ECA1HM101GB	ELECT	50V	100pF	
IC602	U3665M-MDP	DELAY LINE			C317	ECA1HM101GB	ELECT	50V	100pF	
IC801	STR58041A-M	POWER SUPPLY			C318	ECEA1HNR47UB	ELECT	50V	0.47µF	
IC851	L78M05MRB	5V REGULATOR			C319	ECUV1H104ZFX	S.M.CAP	50V	100nF	
IC852	L78M09MRB	9V REGULATOR			C323	ECUV1H102J CX	S.M.CAP	50V	1nF	
IC853	AN78M08LB	8V REGULATOR			C342	ECUV1H120J CX	S.M.CAP	50V	12pF	
IC1202	MN1280R	RESET			C351	ECUV1H221J CX	S.M.CAP	50V	220pF	
IC1204	RPM-637CBRS	RECEIVER			C352	ECUV1H271J CX	S.M.CAP	50V	270pF	
CAPACITORS										
C010	ECUV1H103K BX	S.M.CAP	50V	10nF	C353	ECUV1H221J CX	S.M.CAP	50V	220pF	
C011	ECA1CM100GB	ELECT	16V	10pF	C355	ECKC3D152J	CERAMIC	2KV	1.5nF	
C012	ECUV1H103K BX	S.M.CAP	50V	10nF	C357	ECKC2H152J	CERAMIC	500V	1.5nF	
C014	ECUV1H080DCX	S.M.CAP	50V	80pF	C362	ECUV1H102ZFX	S.M.CAP	50V	1nF	
C015	ECA1HM330B	ELECT	50V	33pF	C368	ECEA2EU010	ELECT	250V	1µF	
C017	ECUV1H100DCX	S.M.CAP	50V	10pF	C369	ECA1HMR47GB	ELECT	50V	0.47µF	
C019	ECUV1H103K BX	S.M.CAP	50V	10nF	C370	ECA1CM220GB	ELECT	16V	22µF	
C020	ECA1HM010GB	ELECT	50V	1pF	C371	ECA1CM221GB	ELECT	16V	220pF	
C102	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω	C401	ECUV1H223K BX	S.M.CAP	50V	22nF
C105	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω	C402	ECUV1H472K BX	S.M.CAP	50V	4.7nF
C106	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω	C403	ECA1HM010GB	ELECT	50V	1pF
C107	ECA1HMR22GB	ELECT	50V	0.22µF	C404	ECUV1H103ZFX	S.M.CAP	50V	10nF	
C108	ECUV1H103K BX	S.M.CAP	50V	10nF	C452	ECQM1H274J	FILM	50V	270nF	
C109	ECA1HMR47GB	ELECT	50V	0.47µF	C453	ECEA1HU101	ELECT	50V	100µF	
C110	ECA1HM0R1B	ELECT	50V	0.1µF	C454	ECQM1H394J	FILM	50V	390nF	
C111	ECUV1H103K BW	S.M.CAP	50V	10nF	C457	ECQM1H394J	FILM	50V	390nF	
C112	ECA1HMR47GB	ELECT	50V	0.47µF	C461	ECUV1H100CCX	S.M.CAP	50V	10pF	
C113	ECUV1H103K BX	S.M.CAP	50V	10nF	C501	ECA1HM010GB	ELECT	50V	1pF	
C114	ECA1HM010GB	ELECT	50V	1pF	C502	ECUV1H223K BX	S.M.CAP	50V	22nF	
					C503	ECUV1H391J CX	S.M.CAP	50V	390pF	
					C504	ECEA1HN010UB	ELECT	50V	1µF	
					C505	ECUV1H331J CX	S.M.CAP	50V	330pF	
					C506	ECQM1273K ZW	FILM	100V	27nF	
					C507	ECA1HM100GB	ELECT	50V	10pF	
					C541	ECEA1EN4R7UB	ELECT	25V	4.7µF	
					C550	ECA1VM471GB	ELECT	35V	470pF	
					C551	ECWH12H103J	FILM	1250V	10nF	
					C552	ECQM4333J C	FILM	400V	33nF	
					C554	ECKC3D681J	CERAMIC	2KV	680pF	
					C557	ECWF2H394J Z	CERAMIC	500V	390nF	
					C558	ECEA2CU4R7	ELECT	160V	4.7µF	
					C559	ECKC2H471J	CERAMIC	500V	470pF	

Ref No.	Part No.	Description			
C560	ECKC2H471J	CERAMIC	500V	470pF	△
C561	ECEA2EU100	ELECT	250V	10 μ F	
C562	ECKC2H471J	CERAMIC	500V	470pF	△
C563	ECA1VM471GB	ELECT	35V	470pF	
C564	ECA1CM471GB	ELECT	16V	470pF	
C565	ECA1VM471GB	ELECT	35V	470pF	
C566	ECKC2H471J	CERAMIC	500V	470pF	△
C567	ECA1VM471GB	ELECT	35V	470pF	
C601	ECUV1H473KBX	S.M.CAP	50V	47nF	
C602	ECUV1H153KBX	S.M.CAP	50V	15nF	
C603	ECA1HM010GB	ELECT	50V	1pF	
C605	ECUV1H150JCX	S.M.CAP	50V	15pF	
C606	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C607	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C608	ECUV1H470JCX	S.M.CAP	50V	47pF	
C609	ECUV1H470JCX	S.M.CAP	50V	47pF	
C610	ECA1HM101GB	ELECT	50V	100pF	
C611	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C612	ECUV1H103KBX	S.M.CAP	50V	10nF	
C613	ECUV1H103KBX	S.M.CAP	50V	10nF	
C614	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C623	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C630	ERJ8GEY0R00	S.M.CAR	125W	5%	0 Ω
C802	ECQU2A823MNB	FILM	200V	82nF	
C803	ECKC2H472J	CERAMIC	500V	4.7nF	△
C804	ECKC2H472J	CERAMIC	500V	4.7nF	△
C805	ECKC2H472J	CERAMIC	500V	4.7nF	△
C806	ECKC2H472J	CERAMIC	500V	4.7nF	△
C807	ECOS2GA101BB	ELECT	400V	100 μ F	
C808	ECQB1H333J	FILM	50V	33nF	
C810	ECA1VM101GB	ELECT	35V	100pF	
C811	ECA1JM100GB	ELECT	63V	10pF	
C812	ECA2CHG221E	ELECT	160V	220pF	
C817	ECA1VM101GB	ELECT	35V	100pF	
C820	ECKWNA332ME	CERAMIC	250V	3.3nF	
C853	ECA1EM102GB	ELECT	25V	1nF	
C854	ECA1VM471GB	ELECT	35V	470pF	
C855	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C856	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C857	ECA1HM101GB	ELECT	50V	100pF	
C858	ECA1AM222B	ELECT	10V	2.2nF	
C859	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C860	ECA1HM101GB	ELECT	50V	100pF	
C861	ECA1CM102B	ELECT	16V	1.0nF	
C1201	ECA1EM102GB	ELECT	25V	1nF	
C1202	ECA1EM101GB	ELECT	25V	1 μ F	
C1203	ECA1EM471GB	ELECT	25V	470pF	
C1204	ECUV1H471KBX	S.M.CAP	50V	470pF	
C1205	ECUV1H471KBX	S.M.CAP	50V	470pF	
C1206	ECUV1H471KBX	S.M.CAP	50V	470pF	
C1207	ECUV1H471KBX	S.M.CAP	50V	470pF	
C1208	ECUV1H471KBX	S.M.CAP	50V	470pF	
C1210	ECUV1H473KBX	S.M.CAP	50V	47nF	
C1218	ECA1HM010GB	ELECT	50V	1pF	
C1219	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C1220	ECA0JM101G	ELECT	6.3V	100pF	
C1221	ECUV1H331JCX	S.M.CAP	50V	330pF	
C1226	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C1227	ECA1HM101GB	ELECT	50V	100pF	
C1228	ECUV1H390JCX	S.M.CAP	50V	39pF	
C1229	ECUV1H390JCX	S.M.CAP	50V	39pF	
C1232	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C1234	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C1241	ECA1HM101GB	ELECT	50V	100pF	
C1244	ECA1CM100GB	ELECT	16V	10pF	
C1249	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C1255	ECA1HM101GB	ELECT	50V	100pF	
C1256	ECUV1H104KBX	S.M.CAP	50V	100nF	
C1257	ECUV1H561JCX	S.M.CAP	50V	560pF	
C1258	ECA1CM100GB	ELECT	16V	10pF	
C1259	ECUV1H150JCX	S.M.CAP	50V	15pF	
C1260	ECUV1H560JCX	S.M.CAP	50V	56pF	
C1261	ECA1HM101GB	ELECT	50V	100pF	
C1262	ECUV1H390JCX	S.M.CAP	50V	39pF	
C1263	ECUV1H390JCX	S.M.CAP	50V	39pF	
C1264	ECUV1H390JCX	S.M.CAP	50V	39pF	
C1265	ECUV1H560JCX	S.M.CAP	50V	56pF	
C1266	ECA1CM100GB	ELECT	16V	10pF	
C3101	ECUV1H101JCX	S.M.CAP	50V	100pF	
C3102	ECUV1H561KBX	S.M.CAP	50V	560pF	
C3104	ECUV1H102KBX	S.M.CAP	50V	1nF	

Ref No.	Part No.	Description			
C3105	ECUV1H101JCX	S.M.CAP	50V	100pF	
C3109	ECUV1H561JCX	S.M.CAP	50V	560pF	
C3110	ECA1HM3R3GB	ELECT	50V	3.3 μ F	
C3113	ECUV1H103KBX	S.M.CAP	50V	10nF	
C3117	ECUV1H104ZFX	S.M.CAP	50V	100nF	
C3115	ECEA1CN100	ELECT	16V	10 μ F	
C3118	ECEA1CN100	ELECT	16V	10 μ F	
C3119	ECEA1CN100	ELECT	16V	10 μ F	
C3120	ECA1AM471GB	ELECT	10V	470pF	

DIODES

D010	MA4150	DIODE
D011	MA4150	DIODE
D306	MTZJT-774.7A	DIODE
D307	MTZJT-774.7A	DIODE
D351	MA165TA5	DIODE
D352	MA165TA5	DIODE
D353	MA165TA5	DIODE
D354	MA165TA5	DIODE
D452	ERA15-02V3	DIODE
D453	MA165TA5	DIODE
D454	MA165TA5	DIODE
D455	MA165TA5	DIODE
D503	MA165TA5	DIODE
D504	MA165TA5	DIODE
D505	1SR124-4AT82	DIODE
D506	MTZJ33B	DIODE
D541	MA165TA5	DIODE
D542	MA165TA5	DIODE
D551	TVSRH2F-LFB3	DIODE
D552	TVSRU2AMV1	DIODE
D553	1SR124-4AT82	DIODE
D554	1SR124-4AT82	DIODE
D555	ERA22-02V3	DIODE
D556	MA167TA5	DIODE
D557	1SR124-4AT82	DIODE
D801	EMO2BMV0	DIODE
D802	EMO2BMV0	DIODE
D803	EMO2BMV0	DIODE
D804	EMO2BMV0	DIODE
D805	232266296706	THERMISTOR
D808	1SR124-4AT82	DIODE
D809	1SR124-4AT82	DIODE
D810	RU3LFA1	DIODE
D811	1SR124-4AT82	DIODE
D812	R2KNLFA1	DIODE
D814	MA165TA5	DIODE
D815	1SR124-4AT82	DIODE
D816	1SR124-4AT82	DIODE
D851	TVSRU3AM	DIODE
D852	TVSRU2AMV1	DIODE
D857	MA165TA5	DIODE
D858	MA165TA5	DIODE
D859	MA165TA5	DIODE
D860	MA165TA5	DIODE
D861	MA165TA5	DIODE
D1202	MA170	DIODE
D1203	SLR56UR3FLF	LED
D1205	MA170	DIODE
D1207	MTZJT-778.2A	DIODE
D1208	MA170	DIODE
D1209	MTZJT-775.1C	DIODE
D1211	MA165TA5	DIODE
D1212	MA165TA5	DIODE
D1213	MA165TA5	DIODE
D1214	MA170	DIODE
D1217	MA165TA5	DIODE
D1218	MA165TA5	DIODE
D1219	MA165TA5	DIODE
D1220	MA165TA5	DIODE
D1221	MA165TA5	DIODE
D1222	MA165TA5	DIODE
D1224	MA165TA5	DIODE
D1226	MA700TA5	DIODE
D1227	MA700TA5	DIODE
D1301	MTZJT-775.1A	DIODE
D1311	MA165TA5	DIODE
D3101	MA165TA5	DIODE

Ref No.	Part No.	Description
FUSES		
F801	2153.15H	FUSE
F8011	EYF52BC	FUSE HOLDER
F8012	EYF52BC	FUSE HOLDER
TERMINALS AND LINKS		
JC1	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC11	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC12	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC13	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC14	ERJ8GEY0R00	S.M.CARB .125W 5% 0Ω
JC2	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC20	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC21	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC22	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC23	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC24	ERJ8GEY0R00	S.M.CARB .125W 5% 0Ω
JC25	ERJ8GEY0R00	S.M.CARB .125W 5% 0Ω
JC26	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC27	ERJ8GEY0R00	S.M.CARB .125W 5% 0Ω
JC28	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC3	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC7	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC8	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JC9	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JEAKK	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JEANK	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JEGK	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JEJK	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JEMK	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JEPK	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JEXK	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JEZK	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
JK3102	TJB16663	A.V.TERMINAL
J124	EXCELSA35T	COIL
J203	EXCELSA35V	COIL
J321	EXCELSA35T	COIL
COILS		
L010	EXCELSA35T	COIL
L012	EXCELSA35T	COIL
L102	EQL7EN025Q	COIL
L103	EQV7EN210Q	COIL
L107	TLTACT6R8K	COIL
L201	TLTACT150K	COIL
L202	TLTACT4R7K	COIL
L253	TLS159054E	COIL
L301	TLTACT100K	COIL
L303	TLTACT150K	COIL
L551	ELH5L429	COIL
L553	ELH16F702	COIL
L801	ELF18D281A	COIL
L803	EXCELSA35T	COIL
L851	EXCELSA35T	COIL
L852	EXCELSA35T	COIL
L1201	EXCELSA35T	COIL
L1202	TLTACT331K	COIL
L1203	TLTACT100K	COIL
L1204	TLTACT6R8K	COIL
L1207	TLTACT100K	COIL
L1209	EXCELSA35T	COIL
TRANSISTORS		
Q023	BC847B	TRANSISTOR
Q102	BC847B	TRANSISTOR
Q201	BC847B	TRANSISTOR
Q202	BC847B	TRANSISTOR
Q251	BC847B	TRANSISTOR
Q252	BC857B	TRANSISTOR
Q253	BC847B	TRANSISTOR
Q301	BC847B	TRANSISTOR
Q302	BC847B	TRANSISTOR

Ref No.	Part No.	Description
Q303	BC847B	TRANSISTOR
Q351	2SC4714RL2	TRANSISTOR
Q352	2SC4714RL2	TRANSISTOR
Q353	2SC4714RL2	TRANSISTOR
Q354	BC857B	TRANSISTOR
Q453	BC847B	TRANSISTOR
Q454	BC847B	TRANSISTOR
Q501	2SD2398-M2	TRANSISTOR
Q502	BC857B	TRANSISTOR
Q503	BC847B	TRANSISTOR
Q504	BC847B	TRANSISTOR
Q551	BU2506DFRB	TRANSISTOR
Q801	BC847B	TRANSISTOR
Q802	2SD965-R	TRANSISTOR
Q1201	BC847B	TRANSISTOR
Q1202	BC847B	TRANSISTOR
Q1203	BC847B	TRANSISTOR
Q1204	2SC1317-TA	TRANSISTOR
Q1205	BC847B	TRANSISTOR
Q1207	BC847B	TRANSISTOR
Q1208	BC847B	TRANSISTOR
Q1209	BC847B	TRANSISTOR
Q1210	BC857B	TRANSISTOR
Q1211	BC857B	TRANSISTOR
Q1212	BC847B	TRANSISTOR
Q1213	BC847B	TRANSISTOR
Q1217	2SD965-R	TRANSISTOR
Q1240	BC847B	TRANSISTOR
Q1295	BC857B	TRANSISTOR
Q1296	BC847B	TRANSISTOR
Q3101	2SC1318-S	TRANSISTOR
Q3103	2SD1328STX	TRANSISTOR
Q3104	BC857B	TRANSISTOR
Q3105	BC857B	TRANSISTOR
Q3106	BC857B	TRANSISTOR
Q3107	BC857B	TRANSISTOR
Q3108	BC857B	TRANSISTOR
RESISTOR		
RL1201	TSE1885-1	TRANSISTOR
R010	ERJ6GEYJ153	S.M.CARB 0.1W 5% 15KΩ
R011	ERJ6GEYJ271	S.M.CARB 0.1W 5% 270Ω
R013	ERJ6GEYJ223	S.M.CARB 0.1W 5% 22KΩ
R014	ERG2SJS273	METAL 2W 5% 27KΩ
R016	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R017	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R018	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R024	ERJ6GEYJ123	S.M.CARB 0.1W 5% 12KΩ
R025	ERJ6GEYJ104	S.M.CARB 0.1W 5% 100KΩ
R101	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R107	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R108	ERJ6GEYJ124	S.M.CARB 0.1W 5% 120KΩ
R109	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R110	ERJ6GEYJ392	S.M.CARB 0.1W 5% 3K9Ω
R112	ERJ8GEYJ122	S.M.CARB .125W 5% 1K2Ω
R113	ERJ6GEYJ124	S.M.CARB 0.1W 5% 120KΩ
R114	ERJ6GEYJ123	S.M.CARB 0.1W 5% 12KΩ
R115	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R116	ERJ6GEYJ152	S.M.CARB 0.1W 5% 1K5Ω
R117	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R202	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R203	ERJ6GEYJ122	S.M.CARB 0.1W 5% 1K2Ω
R205	ERJ6GEYJ222	S.M.CARB 0.1W 5% 2K2Ω
R206	ERJ6GEYJ182	S.M.CARB 0.1W 5% 1K8Ω
R221	ERJ6GEYJ221	S.M.CARB 0.1W 5% 220Ω
R226	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R227	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R229	ERJ6GEYJ470	S.M.CARB 0.1W 5% 47Ω
R251	ERJ6GEYJ3R3	S.M.CARB 0.1W 5% 3.3Ω
R252	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R254	ERJ6GEYJ121	S.M.CARB 0.1W 5% 120Ω
R255	ERJ6GEYJ181	S.M.CARB 0.1W 5% 180Ω
R256	ERJ6GEYJ104	S.M.CARB 0.1W 5% 100KΩ
R257	ERQ1CJP120	METAL 1W 5% 12Ω
R259	ERJ6GEYJ331	S.M.CARB 0.1W 5% 330Ω
R260	ERJ6GEYJ332	S.M.CARB 0.1W 5% 3K3Ω
R261	ERJ6GEYJ682	S.M.CARB 0.1W 5% 6K8Ω
R262	ERJ6GEYF104V	S.M.CARB0.125W 1% 100KΩ
R263	ERJ6GEYF622V	S.M.CARB0.125W 1% 6.2KΩ

Ref No.	Part No.	Description
R264	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R301	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R302	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R303	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R304	ERJ6GEYJ302	S.M.CARB 0.1W 5% 3KΩ
R305	ERJ6GEYJ471	S.M.CARB 0.1W 5% 470Ω
R306	ERJ6GEYJ471	S.M.CARB 0.1W 5% 470Ω
R307	ERJ6GEYJ471	S.M.CARB 0.1W 5% 470Ω
R309	ERJ6GEYJ182	S.M.CARB 0.1W 5% 1K8Ω
R310	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R311	ERJ6GEYJ181	S.M.CARB 0.1W 5% 180Ω
R312	ERJ6GEYJ181	S.M.CARB 0.1W 5% 180Ω
R313	ERQ14AJ470	METAL 0.25W 5% 47Ω ▲
R314	ERJ6GEYJ471	S.M.CARB 0.1W 5% 470Ω
R315	ERJ6GEYJ471	S.M.CARB 0.1W 5% 470Ω
R316	ERQ14AJ470	METAL 0.25W 5% 47Ω ▲
R317	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R318	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R319	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R320	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R323	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R351	ERG2ANJ103	METAL 2W 5% 10KΩ
R352	ERG2ANJ103	METAL 2W 5% 10KΩ
R353	ERG2ANJ103	METAL 2W 5% 10KΩ
R366	ERJ6GEYJ431	S.M.CARB 0.1W 5% 430Ω
R367	ERJ6GEYJ431	S.M.CARB 0.1W 5% 430Ω
R368	ERJ6GEYJ431	S.M.CARB 0.1W 5% 430Ω
R369	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R370	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R371	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R372	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R373	ERJ6GEYJ391	S.M.CARB 0.1W 5% 390Ω
R374	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R375	ERDS1TJ272	CARBON 0.5W 5% 2K7Ω
R378	ERD25TJ274	CARBON 0.25W 5% 270KΩ
R379	ERJ6GEYJ183	S.M.CARB 0.1W 5% 18KΩ
R380	ERJ6GEYJ684	S.M.CARB 0.1W 5% 680KΩ
R386	ERDS1TJ272	CARBON 0.5W 5% 2K7Ω
R387	ERDS1TJ272	CARBON 0.5W 5% 2K7Ω
R401	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R402	ERJ6GEYJ822	S.M.CARB 0.1W 5% 8K2Ω
R403	ERJ6GEYJ682	S.M.CARB 0.1W 5% 6K8Ω
R451	ERDS1TJ331	CARBON 0.5W 5% 330Ω
R452	ERJ6GEYJ1R0	SM.CARBO.125W 5% 1Ω
R453	ERDS1TJ1R0	CARBON 0.5W 5% 1Ω
R454	ERJ6GEYF153V	SM.CARBO.125W 1% 15KΩ
R456	ERO25CKF5601	METAL 0.25W 1% 5K6Ω ▲
R457	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R458	ERD25TJ683	CARBON 0.25W 5% 68KΩ
R459	ERJ6GEYJ332	S.M.CARB 0.1W 5% 3K3Ω
R460	ERJ6GEYJ473	S.M.CARB 0.1W 5% 47KΩ
R461	ERJ6GEYJ473	S.M.CARB 0.1W 5% 47KΩ
R462	ERJ6GEYJ473	S.M.CARB 0.1W 5% 47KΩ
R501	ERJ6GEYJ391	S.M.CARB 0.1W 5% 390Ω
R502	ERJ6GEYJ681	S.M.CARB 0.1W 5% 680Ω
R503	ERG3SJS101	METAL 3W 5% 10Ω
R504	ERG2ANJ471	METAL 2W 5% 470Ω
R505	ERJ6GEYJ433	SM.CARBO.125W 5% 43KΩ
R506	ERJ6GEYJ153	S.M.CARB 0.1W 5% 15KΩ
R508	ERJ6GEYJ153	S.M.CARB 0.1W 5% 15KΩ
R510	ERJ6GEYJ561	S.M.CARB 0.1W 5% 560Ω
R511	ERJ6GEYJ334	S.M.CARB 0.1W 5% 330KΩ
R513	ERJ6GEYJ471	S.M.CARB 0.1W 5% 470Ω
R515	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R516	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R518	ERJ6ENF1302	SM.CARBO.125W 5% 3KΩ
R519	ERJ6GEYJ204	SM.CARBO.125W 5% 200KΩ
R520	ERJ6GEYJ334	S.M.CARB 0.1W 5% 330KΩ
R521	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R541	ERJ6GEYJ332	S.M.CARB 0.1W 5% 3K3Ω
R542	ERJ6GEYJ332	S.M.CARB 0.1W 5% 3K3Ω
R543	ERJ6GEYJ222	S.M.CARB 0.1W 5% 2K2Ω
R553	ERQ1CJP102	METAL 1W 5% 1KΩ ▲
R555	FF84252R0J	RESISTOR 42W 5% 2Ω
R557	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R560	ERDS1TJ204	CARBON 0.5W 5% 200KΩ
R601	ERJ6GEYJ332	S.M.CARB 0.1W 5% 3K3Ω
R602	ERJ6GEYJ222	S.M.CARB 0.1W 5% 2K2Ω
R603	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R604	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R605	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ

Ref No.	Part No.	Description
R606	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R611	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R612	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R613	ERJ6GEYJ395	SM.CARBO.125W 5% 3M9Ω
R801	ERF5ZK2R7	WOUND 5W 20% 2.7Ω ▲
R804	ERDS1TJ224	CARBON 0.5W 5% 220KΩ
R805	ERW2PKR33	WIRE 2W 10% 0.33Ω
R806	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R807	ERG2ANJ101	METAL 2W 5% 100Ω ▲
R808	ERG12SJ561P	METAL 12W 5% 560Ω ▲
R809	ERG2SJ560P	METAL 2W 5% 56Ω ▲
R810	ERQ12HJ100	METAL 0.5W 5% 10Ω ▲
R811	ERDS1TJ224	CARBON 0.5W 5% 220KΩ
R813	ERJ6GEYJ202	SM.CARBO.125W 5% 2KΩ
R814	ERD75TAJ825	CARBON 0.75W 5% 8M2Ω ▲
R819	ERDS1TJ104	CARBON 0.5W 5% 100KΩ
R853	ERG2ANJ270	METAL 2W 5% 27Ω
R857	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R858	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R859	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R860	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R861	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R1201	ERQ1CJP2R2	FUSIBLE 1W 5% 2R2Ω ▲
R1202	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1203	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1204	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1205	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1206	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1208	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1211	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1212	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1214	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1217	ERJ6ENF7501	S.M.CARB 0.1W 1% 7K5Ω
R1218	ERO50PKF5603	METAL 50W 1% 560KΩ ▲
R1219	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1220	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1221	ERJ6GEYJ271	S.M.CARB 0.1W 5% 270Ω
R1222	ERJ6GEYJ330	S.M.CARB 0.1W 5% 33Ω
R1223	P1201	SENSOR
R1224	ERJ6GEYJ683	S.M.CARB 0.1W 5% 68KΩ
R1225	ERJ6GEYJ433	SM.CARBO.125W 5% 43KΩ
R1226	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1227	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1228	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1229	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1231	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1232	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1233	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1235	ERJ6GEYJ152	S.M.CARB 0.1W 5% 1K5Ω
R1236	ERJ6GEYJ223	S.M.CARB 0.1W 5% 22KΩ
R1237	ERJ6GEYJ222	S.M.CARB 0.1W 5% 2K2Ω
R1238	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1239	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1240	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1243	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1244	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1246	ERD25TJ272	CARBON 0.25W 5% 2K7Ω
R1247	ERD25TJ221	CARBON 0.25W 5% 220Ω
R1248	ERJ6GEYJ223	S.M.CARB 0.1W 5% 22KΩ
R1249	ERDS1TJ121	CARBON 0.5W 5% 120Ω
R1250	ERDS1TJ560	CARBON 0.5W 5% 56Ω
R1252	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1253	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1255	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1257	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1258	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R1259	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1261	ERJ6GEYJ122	S.M.CARB 0.1W 5% 1K2Ω
R1263	ERJ6GEYJ122	S.M.CARB 0.1W 5% 1K2Ω
R1265	ERJ6GEYJ122	S.M.CARB 0.1W 5% 1K2Ω
R1266	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1267	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1268	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1269	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1270	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1271	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1272	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1273	ERJ6GEYJ333	S.M.CARB 0.1W 5% 33KΩ
R1274	ERJ6GEYJ104	S.M.CARB 0.1W 5% 100KΩ
R1276	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1279	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω

Ref No.	Part No.	Description
R1280	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R1282	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1283	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1284	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1285	ERJ6GEYJ222	S.M.CARB 0.1W 5% 2K2Ω
R1286	ERJ6GEYJ222	S.M.CARB 0.1W 5% 2K2Ω
R1287	ERJ6GEYJ222	S.M.CARB 0.1W 5% 2K2Ω
R1288	ERJ6GEYJ222	S.M.CARB 0.1W 5% 2K2Ω
R1289	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1291	ERJ6GEYJ432	S.M.CARB 0.1W 5% 4K3Ω
R1293	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1294	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1295	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1296	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1297	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1298	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1303	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1304	ERJ6GEYJ184	S.M.CARB 0.1W 5% 180KΩ
R1305	ERJ6GEYJ392	S.M.CARB 0.1W 5% 3K9Ω
R1308	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1309	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1311	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R3101	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R3102	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R3103	ERJ6GEYJ564	S.M.CARB 0.1W 5% 560KΩ
R3104	ERJ6GEYJ104	S.M.CARB 0.1W 5% 100KΩ
R3105	ERJ6GEYJ750	S.M.CARB 0.1W 5% 75Ω
R3106	ERJ6GEYJ750	S.M.CARB 0.1W 5% 75Ω
R3107	ERJ6GEYJ750	S.M.CARB 0.1W 5% 75Ω
R3108	ERJ6GEYJ750	S.M.CARB 0.1W 5% 75Ω
R3109	ERJ6GEYJ221	S.M.CARB 0.1W 5% 220Ω
R3110	ERJ6GEYJ222	S.M.CARB 0.1W 5% 2K2Ω
R3111	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R3114	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R3115	ERDS1TJ750	CARBON 0.5W 5% 75Ω
R3120	ERJ6GEYJ750	S.M.CARB 0.1W 5% 75Ω
R3121	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R3122	ERJ6GEYJ221	S.M.CARB 0.1W 5% 220Ω
R3123	ERJ6GEYJ221	S.M.CARB 0.1W 5% 220Ω
R3124	ERJ6GEYJ221	S.M.CARB 0.1W 5% 220Ω
R3125	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R3126	ERJ6GEYJ153	S.M.CARB 0.1W 5% 15KΩ
R3127	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R3128	ERJ6GEYJ273	S.M.CARB 0.1W 5% 27KΩ
R3130	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R3132	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R3133	ERJ6GEYJ223	S.M.CARB 0.1W 5% 22KΩ
R3134	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R3136	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R3137	ERJ6GEYJ223	S.M.CARB 0.1W 5% 22KΩ
R3138	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R3140	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R3141	ERJ6GEYJ223	S.M.CARB 0.1W 5% 22KΩ
R3142	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R3143	ERJ6GEYJ181	S.M.CARB 0.1W 5% 180Ω

Ref No.	Part No.	Description
SWITCHES		
S351	0330550049	CRT SOCKET
S801	ESB91232A	SWITCH ▲
S1201	EVQ23405R	SWITCH
S1202	EVQ23405R	SWITCH
S1203	EVQ23405R	SWITCH
S1204	EVQ23405R	SWITCH
S1205	EVQ23405R	SWITCH
TRANSFORMERS		
T551	ETH19Z169AZ	TRANSFORMER
T552	ZTFK33005A	F.B.T. ▲
T801	ETS29AK227AC	TRANSFORMER ▲
T1201	ETP35KAN617U	TRANSFORMER
FILTERS		
X101	F1045A	FILTER
X104	EFCV4155A3	CERAMIC FILTER
X201	EFC56R0MS5	FILTER
X301	EFCWS6004T	CERAMIC FILTER
X303	TAFCSB503F6	FILTER
X601	TSS116M6	CRYSTAL
X1201	CSA18.00MXZ	CRYSTAL

DIFFERENCES FOR MODEL TX – 21S3T

Ref No.	Part No.	Description
MISCELLANEOUS COMPONENTS		
3)	UR51EC769	BATTERY COVER (REMOTE)
4)	TNQ8E0461-2	REMOTE CONTROL
12)	TBM8E1610	MODEL LABEL
17)	TNP8EE007AC	E P.C.B. ▲
CAPACITORS		
C1230	ECUV1H333KBX	S.M.CAP 50V 33nF
C1231	222236516154	FILM 160V 150nF
C1242	ECUV1H220JCX	S.M.CAP 50V 22pF
C1245	ECUV1H333KBX	S.M.CAP 50V 33nF
C1250	ECUV1H151JCX	S.M.CAP 50V 150pF
C1251	ECQM1H333J	FILM 50V 33nF
DIODES		
D1225	MA165TA5	DIODE
INTEGRATED CIRCUITS		
IC1201	SDA5254V11	MICROPROCESSOR
IC1205	XL24C02P-BAB	EAROM

Ref No.	Part No.	Description
COILS		
L1206	EXCELSA35T	COIL
L1208	TLTACT100K	COIL
TRANSISTORS		
Q1214	BC857B	TRANSISTOR
Q1215	BC857B	TRANSISTOR
Q1216	BC847B	TRANSISTOR
RESISTOR		
R1213	ERJ6GEYJ222	S.M.CARB 0.1W 5% 2K2Ω
R1215	ERJ6GEYJ682	S.M.CARB 0.1W 5% 6K8Ω
R1216	ERJ6GEYJ682	S.M.CARB 0.1W 5% 6K8Ω
R1230	ERJ6GEYJ823	S.M.CARB 0.1W 5% 82KΩ
R1241	ERJ6GEYJ822	S.M.CARB 0.1W 5% 8K2Ω
R1242	ERJ6GEYJ564	S.M.CARB 0.1W 5% 560KΩ
R1256	ERJ6GEYJ122	S.M.CARB 0.1W 5% 1K2Ω
R1275	ERJ6GEYJ225	S.M.CARB 0.125W 5% 2M2Ω
R1277	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1278	ERJ6GEYJ182	S.M.CARB 0.1W 5% 1K8Ω
R1290	ERJ6GEYJ123	S.M.CARB 0.1W 5% 12KΩ
R1292	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1306	ERJ6GEYJ182	S.M.CARB 0.1W 5% 1K8Ω
R1307	ERJ6GEYJ182	S.M.CARB 0.1W 5% 1K8Ω

DIFFERENCES FOR MODEL TC – 21S3R

Ref No.	Part No.	Description
MISCELLANEOUS COMPONENTS		
1)	UR50RC1112	BATTERY COVER (REMOTE)
2)	TNQ8E0460	REMOTE CONTROL
12)	TBM8E1645	MODEL LABEL
17)	TNP8EE007AJ	E P.C.B. ▲
CAPACITORS		
C1230	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
C1242	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
C1245	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω

Ref No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1201	SDA5222V21	MICROPROCESSOR
IC1205	XL24C02P-BAA	EAROM
TERMINALS AND LINKS		
JC29	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
J121	T3A206022	S.M.CARB 0.1W 5% 0Ω
RESISTOR		
R1215	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R1216	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R1242	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R1275	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω

SCHEMATIC DIAGRAM FOR MODELS TX-21S3T / TC-21S3R (Z-7 CHASSIS)

IMPORTANT SAFETY NOTICE

Components identified by mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

1. RESISTOR

All resistors are carbon 1/4W resistor, unless marked. Unit of resistance is OHM (Ω) (K=1,000, M=1,000,000).

- | | |
|----------------|---------------|
| : Nonflammable | : Metal Oxide |
| : Metal Film | : Fuse |
| : Wire Wound | : Solid |

2. CAPACITOR

All capacitors are ceramic 50V capacitors, unless marked as follows: Unit of capacitance is μ F, unless otherwise stated.

- | | |
|----------------------------|-------------------|
| : Temperature Compensation | : Polyester |
| : Polypropylene | : Dipped Tantalum |
| : Electrolytic | : Bipolar |
| : Metallised Polyester | : Z-Type |

3. COIL

Unit of inductance is μ H, 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 220 / 240V, 50Hz
 Receiving Signal Colour Bar signal (RF)
 All customer controls. Maximum position

7. Indicates the Video signal path
 Indicates the Audio signal path
 Indicates the Vertical/Horizontal signal path

8. This schematic diagram is the latest at the time of printing and is subject to change without notice.

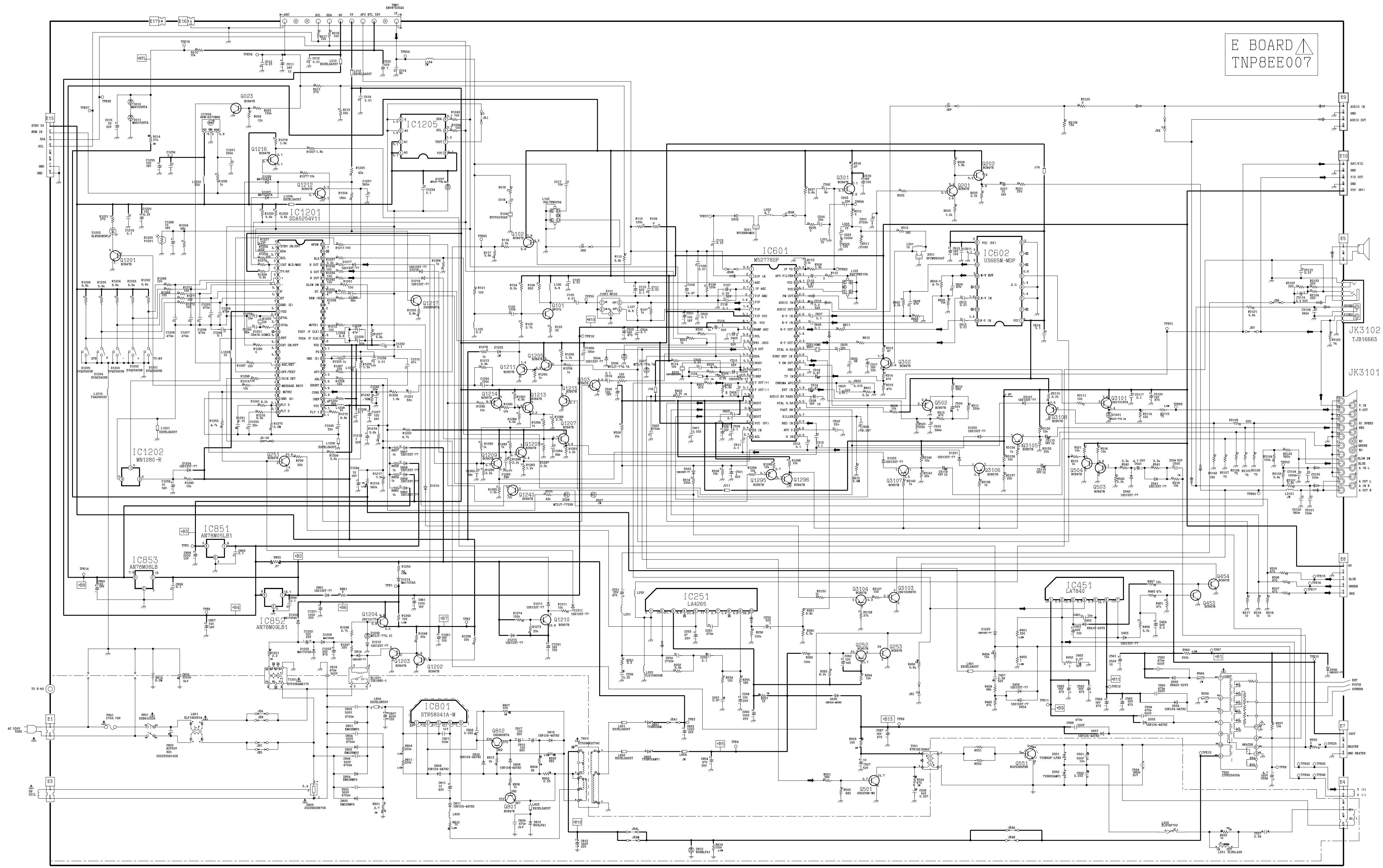
Remarks:

1. Care must be taken when servicing this receiver, as it uses a **HOT** chassis. The circuit is defined by **HOT** and **COLD** indications in the schematic diagram. Take the following precautions. All circuits except the Audio, Video input circuits are **HOT**.

2. Precautions

- a. Do not touch the **HOT** part, or the **HOT** and **COLD** parts of the chassis, 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.

E - BOARD TX - 21S3T



E BOARD
TNP8EE007

JK3102
JK3101

V. IN
V. OUT
R1 SPEED
NC
GREEN
RC
SLW SW
BLW IN L
A. OUT L
A. IN R
A. OUT R

BF
BLUE
GREEN
RED

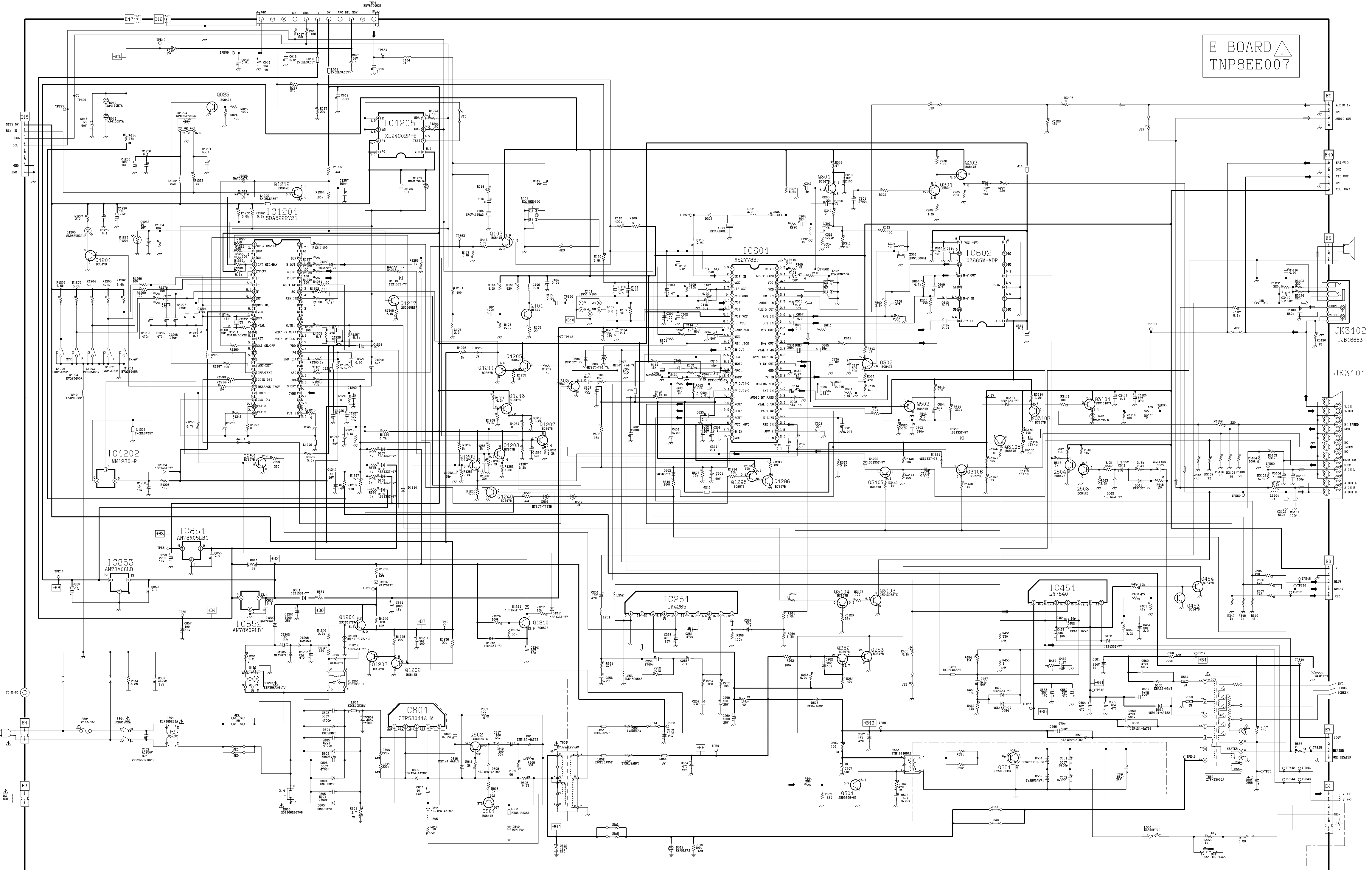
EXT
FOOTB
SWERN

HEATER
100V

IND HEATER

V (+)
V (-)

E - BOARD TC - 21S3R



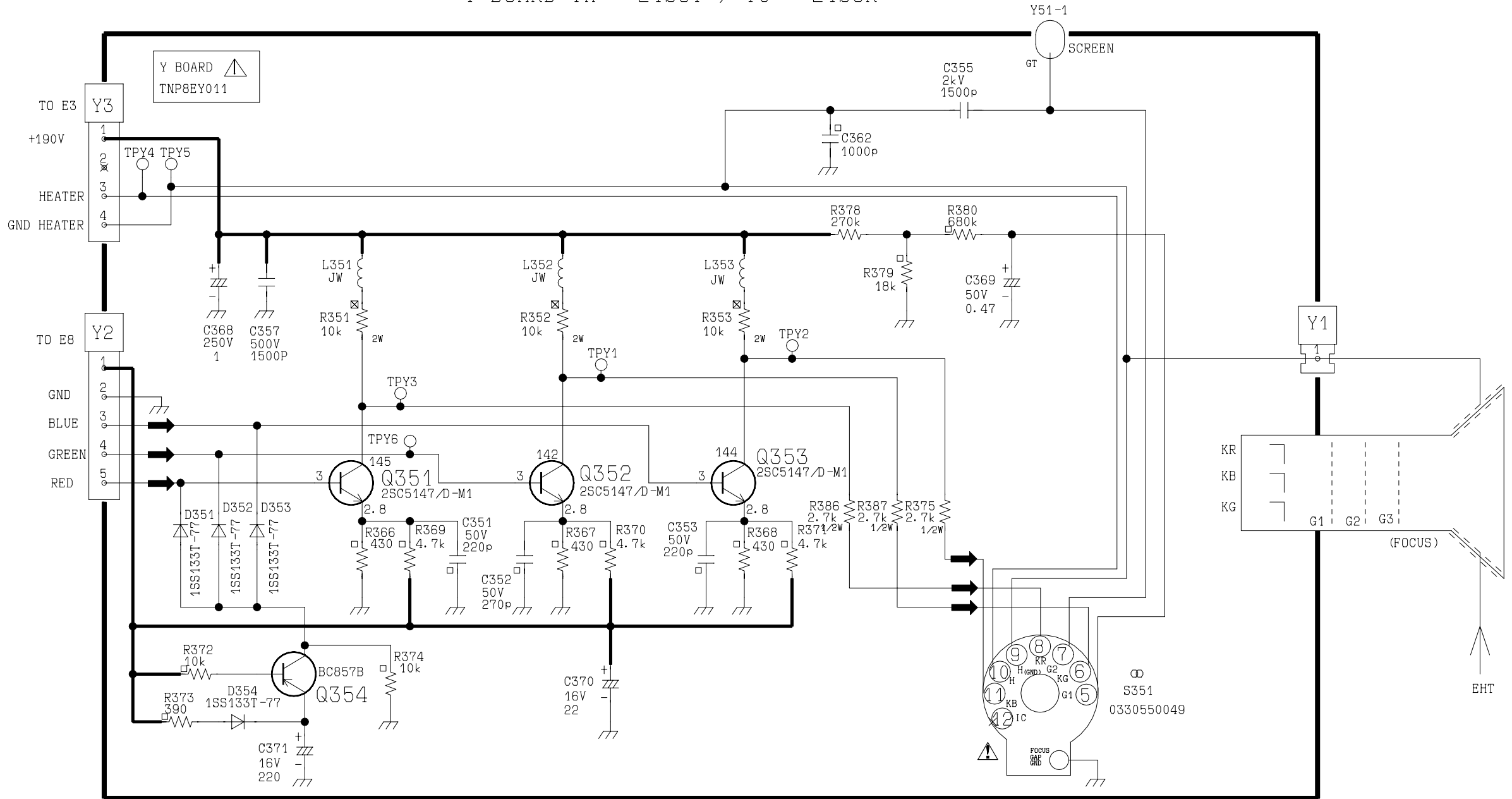
E BOARD
TNP8EE007

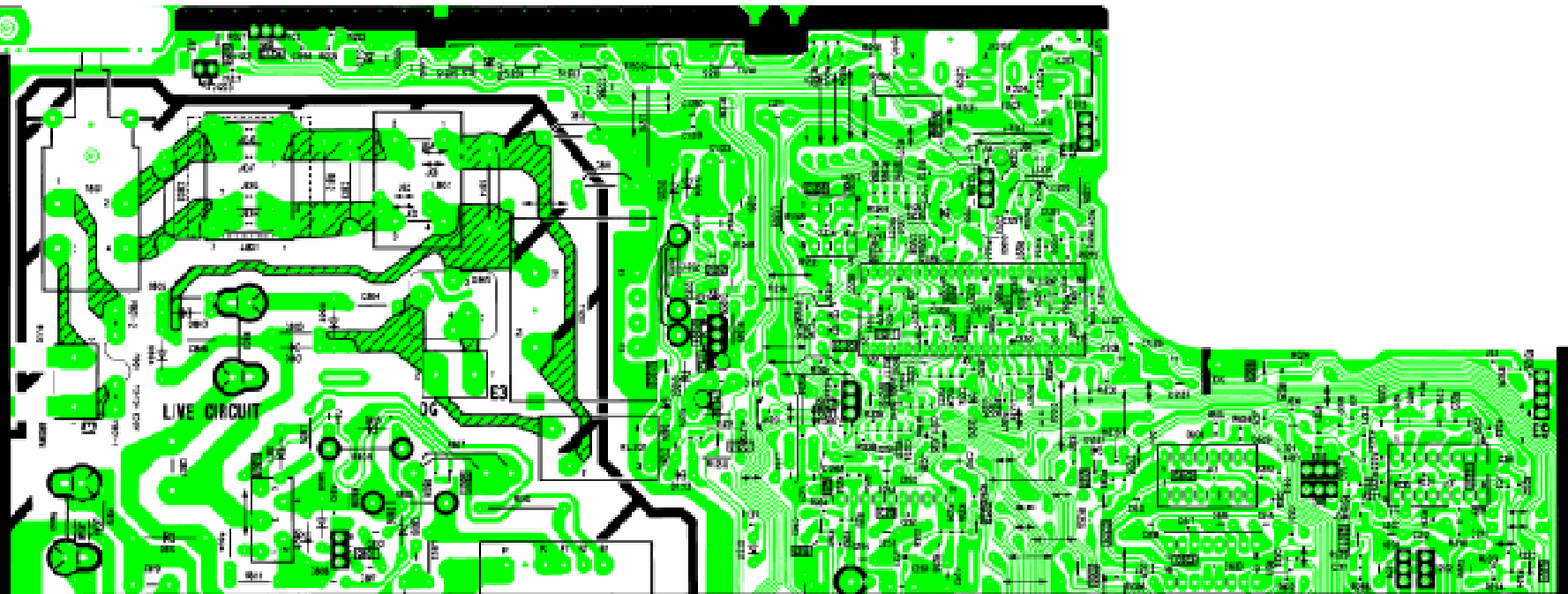
JK3102
TJB1663

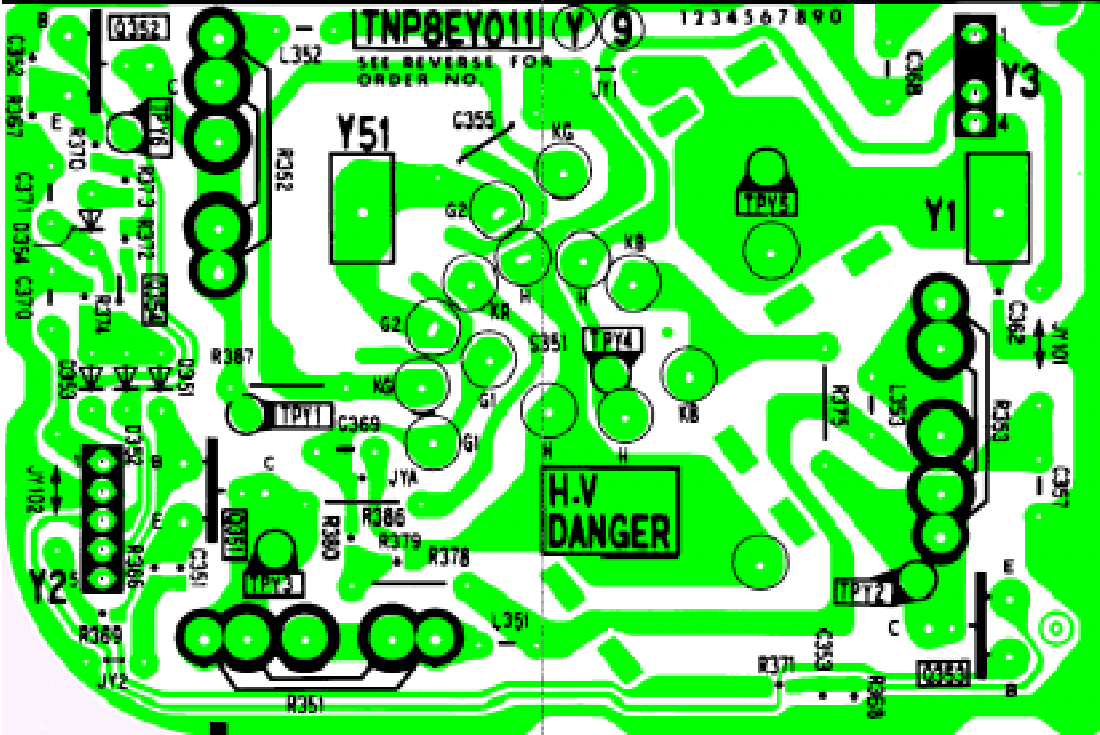
JK3101

E7
E8
E9
E10

Y BOARD TX - 21S3T / TC - 21S3R







TNP8EY011 Y 9

1 2 3 4 5 6 7 8 9 0

SEE REVERSE FOR ORDER NO.

**H.V.
DANGER**

C352 R367 C371 C354 C370

J110 J2 J3 J4 J5 J6

J101 J102 J103 J104 J105 J106

