

# TX-W32/28D3F 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

B2 - PCB

D - PCB

E - PCB

F - PCB

H - PCB

M1 - PCB

Y - PCB



BACK

B2 - Schematic

D - Schematic

E - Schematic

F - Schematic

H - Schematic

M1 - Schematic

Y - Schematic



BACK

# Service Manual



## Colour Television TX–W32D3F TX–W28D3F EURO–3HW Chassis

### SPECIFICATIONS

(Information in brackets {} refer to TX–W28D3F)

**Power Source :** 220–240V AC, 50Hz  
**Power Consumption :** 151W, {149W}  
**Standby Power Consumption :** 1W  
**Aerial Impedance :** 75Ω unbalanced, Coaxial Type  
**Receiving System :** PAL–I, B, G, D, K, H, PAL 60,  
 SECAM B, G, D, K, L/L'  
 MNTSC, NTSC (AV Only)

**Receiving Channels :**  
 VHF E2 – E12 VHF H1 – H2 (ITALY)  
 VHF A – H (ITALY) VHF R1 – R2  
 VHF R3 – R5 VHF R6 – R12  
 UHF E21 – E69 CATV (S01 – S05)  
 CATV S1 – S10 (M1 – M10) CATV S11 – S20 (U1 – U10)  
 CATV S21 – S41 (HYPERBAND)

**Intermediate Frequency :**  
 Video 38.9 MHz, 34MHz  
 Sound 32.9MHz, 33.4 MHz  
 33.16 MHz, 32.4 MHz  
 40.4MHz, 34.05MHz, 33.05MHz  
 34.47 MHz, 34.5 MHz, 34.65 MHz

Colour

#### Video / Audio Terminals :

<b>AUDIO MONITOR OUT</b>	Audio(RCA x 2)	500mV rms, 1kΩ
<b>AV1 IN</b>	Video (21 pin) Audio (21 pin) RGB (21 pin)	1V p–p 75Ω 500mV rms 10kΩ
<b>AV1 OUT</b>	Video (21 pin) Audio (21 pin)	1V p–p 75Ω 500mV rms 1kΩ
<b>AV2 IN</b>	Video (21 pin) Audio (21 pin) S–Video IN (21 pin)	1V p–p 75Ω 500mV rms 10kΩ Y : 1V p–p 75Ω C : 0.3V p–p 75Ω
<b>AV2 OUT</b>	Video (21 pin) Audio (21 pin)	1V p–p 75Ω 500mV rms 1kΩ
<b>AV3 IN</b>	Audio (RCA x 2) Video (RCA x 1)	500mV rms, 10kΩ 1V p–p 75Ω
<b>AV4 IN</b>	Video (21 pin) Audio (21 pin)	1V p–p 75Ω 500mV rms 10kΩ
<b>AV4 OUT</b>	Video (21 pin) Audio (21 pin)	1V p–p 75Ω 500mV rms 1kΩ

**High Voltage :** 30.5kV ± 1kV (zero beam current)

**Picture Tube :** W76LFC185X05 76cm  
 {W66EHK51X71 66cm}

**Audio Output :**  
 Speaker 2 x 20W (Music Power)  
 8 Ω Impedance

Headphones 8 Ω Impedance

**Accessories supplied :** Remote Control  
 2 x R6 (UM3) Batteries

#### Dimensions :

Height : 555mm {497mm}  
 Width : 862mm {760mm}  
 Depth : 553mm {518mm}  
**Net Weight :** 52kg {39.7kg}

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

### TECHNISCHE DATEN

(Werte in klammern gelten {} nur für TX–W28D3F)

**Netzspannung :** 220–240V AC, 50Hz  
**Leistungsaufnahme :** 151W, {149W}  
**Standby Leistungsaufnahme :** 1W  
**Antennenimpedanz :** 75Ω asymmetrisch, Koaxial–Typ  
**Empfangssystem :** PAL–I, B, G, D, K, H, PAL 60,  
 SECAM B, G, D, K, L/L'  
 MNTSC, NTSC (nur AV Eingang)

**Empfangsbereiche :**  
 VHF E2 – E12 VHF H1 – H2 (ITALY)  
 VHF A – H (ITALY) VHF R1 – R2  
 VHF R3 – R5 VHF R6 – R12  
 UHF E21 – E69 CATV (S01 – S05)  
 CATV S1 – S10 (M1 – M10) CATV S11 – S20 (U1 – U10)  
 CATV S21 – S41 (HYPERBAND)

**Zwischenfrequenz :**  
 Video 38.9 MHz, 34MHz  
 Sound 32.9MHz, 33.4 MHz  
 33.16 MHz, 32.4 MHz  
 40.4MHz, 34.05MHz, 33.05MHz  
 34.47 MHz, 34.5 MHz, 34.65 MHz

Colour

#### Video / Audio Anschlüsse :

<b>AUDIO MONITOR OUT</b>	Audio(RCA x 2)	500mV rms, 1kΩ
<b>AV1 EINGANG</b>	Video (21 pin) Audio (21 pin) RGB (21 pin)	1V p–p 75Ω 500mV rms 10kΩ
<b>AV1 AUSGANG</b>	Video (21 pin) Audio (21 pin)	1V p–p 75Ω 500mV rms 1kΩ
<b>AV2 EINGANG</b>	Video (21 pin) Audio (21 pin) S–Video IN (21 pin)	1V p–p 75Ω 500mV rms 10kΩ Y : 1V p–p 75Ω C : 0.3V p–p 75Ω
<b>AV2 AUSGANG</b>	Video (21 pin) Audio (21 pin)	1V p–p 75Ω 500mV rms 1kΩ
<b>AV3 EINGANG</b>	Audio (RCA x 2) Video (RCA x 1)	500mV rms, 10kΩ 1V p–p 75Ω
<b>AV4 EINGANG</b>	Video (21 pin) Audio (21 pin)	1V p–p 75Ω 500mV rms 10kΩ
<b>AV4 AUSGANG</b>	Video (21 pin) Audio (21 pin)	1V p–p 75Ω 500mV rms 1kΩ

**Hochspannung :** 30.5kV ± 1kV (bei Nullstrahlstrom)

**Bildrohre :** W76LFC185X05 76 cm  
 {W66EHK51X71 66 cm}

**Ton Ausgangsleistung :**  
 Lautsprecher 2 x 20W (Musikleistung)  
 8 Ω Impedanz

Kopfhörer 8 Ω Impedanz

**Mittelg. Zubehör :** Fernbedienung  
 2 x R6 (UM3) Batterien

#### Abmessungen :

Höhe : 555mm {497mm}  
 Breite : 862mm {760mm}  
 Tiefe : 553mm {518mm}  
**Gewicht :** 52kg {39.7kg}

Änderungen der technischen Daten vorbehalten.  
 Gewichte und Abmessungen sind Näherungsangaben.

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## 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 which 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 31.5kV 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 tube 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.

### 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.

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## SICHERHEITSVORKEHRUNGEN

### ALLGEMEINE RICHTLINIEN

1. Es ist empfehlenswert einen Trenntransformator in die Stromversorgung zu schalten, bevor Reparaturen an einem Gerät vorgenommen werden, dessen Chassis unter Spannung steht.
2. Bei der Durchführung von Servicearbeiten dürfen die ursprünglichen Kabelanschlüsse nicht vertauscht werden. Dies gilt insbesondere für die Anschlüsse im Hochspannungsteil. Hat sich ein Kurzschluß ereignet, dann sind alle Teile, an denen Spuren von Überhitzung sichtbar sind, auszuwechseln.
3. Nach Beenden der Servicearbeiten ist sicherzustellen, daß alle Sicherheitsvorrichtungen, wie Isolationsstege, Isolationspapiere, Abschirmungen und Isolations R-C Glieder wieder richtig eingesetzt sind.
4. Wenn der Fernseher während längerer Zeit nicht in Betrieb gesetzt wird, sollte der Netzstecker aus der Netzsteckdose gezogen werden.
5. Im Betrieb sind Spannungen bis zu 31.5kV in diesem Gerät vorhanden. Die Inbetriebnahme des Fernsehers ohne aufgesetzte Rückwand bringt die Gefahr eines elektrischen Schlages von der Fernseher – Stromversorgung mit sich. Servicearbeiten sollten daher auch nie durch Personen versucht werden, die nicht in vollem Umfang mit den Sicherheitsvorkehrungen beim Umgang mit Hochspannungsgeräten vertraut sind. Vor der Handhabung mit der Bildröhre ist die Anode der Bildröhre immer an dem Empfängerchassis zu entladen.
6. Nach Beenden der Servicearbeiten sind die folgenden Kriechstrom-Prüfungen durchzuführen, um den Kunden vor der Gefahr eines elektrischen Schlages zu schützen.

### MESSUNG DES ISOLATIONSWIDERSTANDES IM ABGESCHALTETEN ZUSTAND

1. Den Netzstecker aus der Netzsteckdose ziehen und die beiden Steckerstifte kurzschließen.
2. Den Geräteschalter des Fernsehgerätes einschalten.
3. Mit einem Ohmmeter den Widerstandswert zwischen dem überbrückten Netzkabelstecker und jedem zugänglichen Metallteil am Gehäuse des Fernsehgerätes, wie Schraubenköpfe, Antennen, Achsen der Regler, Griffassungen usw. messen. Wenn ein zugängliches Metallteil keine Rückleitung zum Chassis hat, muß die Anzeige unendlich betragen.

## 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.

## MESSUNG DES KRIECHSTROMS IM EINGESCHALTETEN ZUSTAND

1. Den Netzstecker direkt in eine Netsteckdose stecken. Für diese Messung keinen Trenntransformator verwenden.
2. Einen 2k Ω / 10W–Widerstand in Serie mit einem von außen zugänglichen Metallteil am Fernsehgerät und einer guten, Erdung z.B Wasserleitung, anschließen.
3. Ein Wechselstrom–Voltmeter mit einem Meßbereich von 1000 Ohm.Volt oder größer verwenden, um die Spannung über den Widerstand zu messen.
4. Jedes zugängliche Metallteil prüfen, und an jedem Punkt dies Spannung messen.
5. Den Netzstecker umgekehrt in die Steckdose stecken und jede der obigen Messungen wiederholen.
6. Die Spannung darf an keinem der Punkte 1.4V eff. überschreiten. Wird dieser Wert nicht eingehalten, besteht die Gefahr eines elektrischen Schlages, und das Fernsehgerät sollte daher repariert und nachgeprüft werden, bevor es an den Kunden zurückgegeben wird.

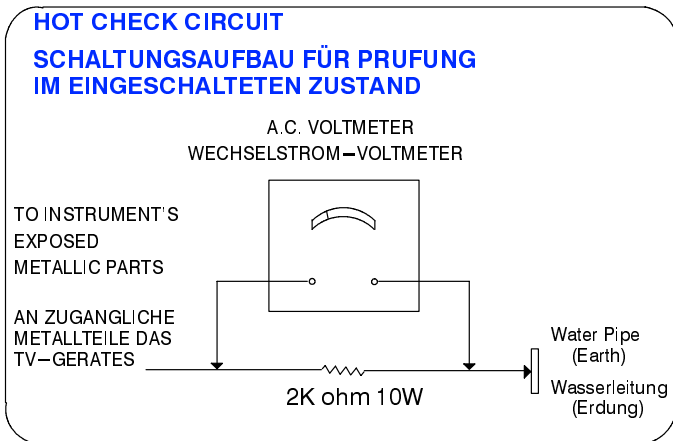


Fig.1.  
Abb.1.

## 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 31.5kV 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 30.5kV ± 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.

## RÖNTGENSTRAHLUNG ACHTUNG :

1. Potentielle Quellen von Röntgenstrahlung in Fernsehgeräten sind das Hochspannungsteil und die Bildröhre.
2. Bei Verwendung eines Bildröhren–Prüfgerätes für den Service ist sicherzustellen, daß es für die Belastung von 31.5kV geeignet ist, ohne daß eine Röntgenstrahlung verursacht wird.

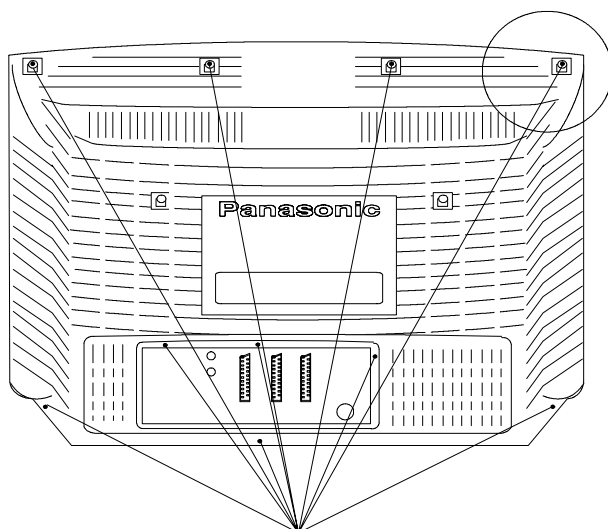
## ANMERKUNG : Es ist wichtig, daß ein präzises, regelmäßig geprüfetes Voltmeter verwendet wird.

1. Helligkeit auf Minimum stellen.
2. Die Hochspannung messen. Die Anzeige des Instrumentes sollte 30.5kV ± 1kV Falls die Anzeige diese Toleranzgrenzen überschreitet, ist die sofortige Behebung nötig, um die Möglichkeit vorzeitigen Komponentenausfalls zu verhüten.
3. Um die Möglichkeit von Röntgenstrahlung zu begrenzen, ist es wichtig, daß nur die vorgeschriebene Bildröhre verwendet wird.

## SERVICE HINTS

### HOW TO REMOVE THE REAR COVER

1. Remove the 10 screws (A) as shown in **Fig.2/Fig.3.**



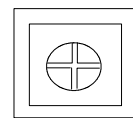
SCREWS A  
SCHRAUBEN A

**Fig. 2.**  
**Abb. 2.**

## SERVICE HINWEISE

### ENTFERNEN DER GERÄTERÜCKWAND

1. Die 10 Schrauben (A) entfernen, siehe **Abb.2/Abb.3.**

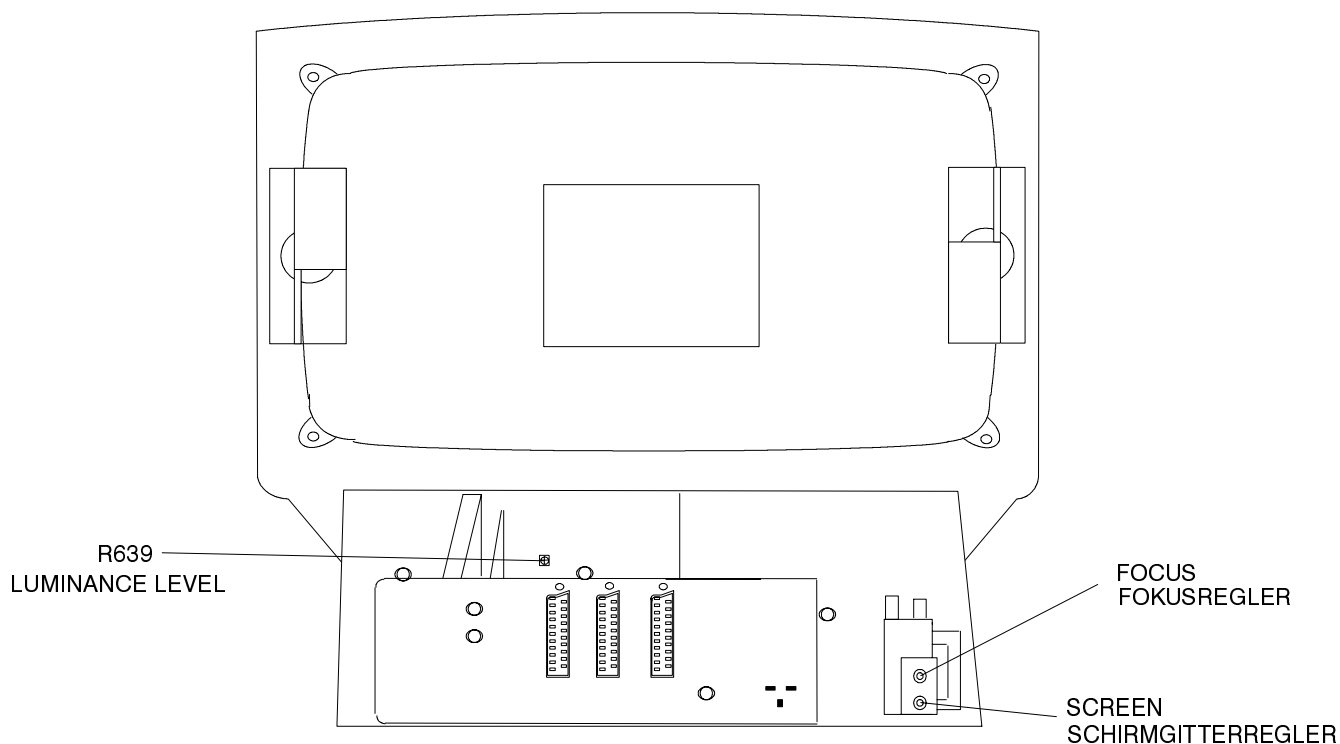


SCREW  
SCHRAUBEN

**Fig. 3.**  
**Abb. 3.**

## LOCATION OF CONTROLS

## LAGE DER EINSTELLREGLER



**Fig. 4.**  
**Abb. 4.**

## SERVICE MODE

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 CCU variants 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 Reveal button on the remote control and at the same time press the Volume down on the customer controls at the front of the TV, this will place the TV into the Service Mode.
2. Press the RED / GREEN buttons to step down / up through the functions.
3. Press the YELLOW / BLUE buttons to alter the function values.
4. Press the STORE button on the preset panel after each adjustment has been made to store the required values.
5. To exit the Service Mode press the Normalisation button.

**NOTE:** This TV also has the option of using a Memory Pack which enables you to copy the preset TV channels and analogue levels into the Memory Pack and then upload them onto another EURO-3HW TV set.

## USING THE MEMORY PACK

### TV to Memory Pack process

1. Plug the memory pack into the lower of the two 21 pin terminals at the back of the TV and switch the TV on. If the TV has only one 21 pin connector then this will be able to accept the memory pack.
2. Go into the 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 STORE button on the TV. The screen will show:—

Storing

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:—

OK!

### Memory Pack to TV Process

1. Plug the memory pack into the lower of the two 21 pin terminals at the back of the TV and switch the TV on. If the TV has only one 21 pin connector then this will be able to accept the memory pack.
2. Go into the Service Mode as explained above. The screen will show:—

Program  
External>>TV

3. Press the STORE button on the TV. The screen will show:—

Loading

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:—

OK!

5. The tuning information from the Memory Pack has now been copied into the TV
6. To exit from the Service Mode switch off the TV.
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:—

Program  
Error!

If this happens then switch off the TV 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.

## ABGLEICHVERFAHREN

Die Fernbedienung dient zum Eingeben und Abspeichern der Einstellwerte, mit Ausnahme der Sperrpunkteinstellung, die grundsätzlich vor den hier beschriebenen Einstellungen vorgenommen werden muss. Die Einstellung erfolgt entsprechend dem Bildschirm–Display. Auf dem Bildschirm–Display erscheinen auch die CCU–Varianten sowie die ungefähren Einstellwerte. Die Einstellfolge für den Service–Modus ist nachstehend beschrieben.

- Um in den Service–Mode zu gelangen, gehen sie bitte wie folgt vor.
  - Stellen sie im Toneinstellungs–Menü die Bässe auf Maximum und die Höhen auf Minimum.
  - Halten sie die REVEAL–Taste auf der Fernbedienung gedrückt und drücken zusätzlich die Taste –/v im Bedienteil des TV–Gerätes. Auf dem Bildschirm erscheint die entsprechende Anzeige für den Service–Mode.
- Die einzelnen Funktionen mit Hilfe der ROTEN und GRÜNEN Taste anwählen.
- Mit der GELBEN und BLAUEN Taste die Werte der einzelnen Funktionen ändern.
- Nach jeder Einstellung die Taste STR auf der Fernbedienung oder am Bedienfeld drücken, um die geänderten Werte abzuspeichern.
- Zum Verlassen des Service–Modus die "N"–Taste auf der Fernbedienung drücken

**HINWEIS:** Dieses FS–Gerät bietet auch die Möglichkeit eines Memory Pack, mit dem Sie die gewählten Fernsehkanäle abspeichern und auf jedes beliebige EURO3HW FS–Gerät umkopieren können.

### Kopieren der Einstelldaten vom FS–Gerät in das Memory Pack

- Das Memory Pack in die AV2–Buchse an der Rückseite des FS–Gerätes stecken und das Gerät einschalten.
- Wie schon oben beschrieben auf Service–Modus umschalten. Auf dem Bildschirm erscheint:

Program  
External>>TV

- Nun die blaue Taste an der Fernbedienung betätigen. Auf dem Bildschirm erscheint:

Program  
TV>>External

- Die Taste STORE am Fernseher drücken. Der Bildschirm meldet nun:

Storing

- Die im FS–Gerät abgespeicherten Kanal–Einstelldaten werden nun in das Memory Pack überspielt. bei abgeschlossener Datenübertragung meldet der Bildschirm:

OK!

### Kopieren der Einstelldaten vom Memory Pack in das FS–Gerät

- Das Memory Pack in die AV2–Buchse an der Rückseite des FS–Gerätes stecken und das Gerät einschalten.
- Wie schon oben beschrieben auf Service–Modus umschalten. Auf dem Bildschirm erscheint:

Program  
External>>TV

- Die Taste STORE am Fernseher drücken. Der Bildschirm meldet nun:

Loading

- Die im Memory Pack abgespeicherten Einstelldaten werden nun in das FS–Gerät überspielt. bei abgeschlossener Datenübertragung meldet der Bildschirm:

OK!

- Die Kanal–Einstelldaten sind damit vom Memory Pack in das FS–Gerät überspielt.
- Zum Verlassen des Service–Modus die "N"–Taste auf der Fernbedienung drücken
- Der Kopiervorgang ist somit abgeschlossen, und das Memory Pack kann von der Steckerleiste abgezogen werden.

## Fehler

Falls beim Gebrauch des Memory Packs Fehler auftreten, zeigt das FS–Gerät dies auf dem Bildschirm mit der folgenden Meldung an:

Program  
Error!

In diesem Fall muss der Service–Modus durch Drücken der "N"–Taste auf der Fernbedienung verlassen und anschliessend der Vorgang wiederholt werden. Falls weiterhin Fehlermeldungen erscheinen, müssen die Anschlusskontakte zwischen FS–Gerät und Memory Pack sowie die 9V Batterie im Memory Pack kontrolliert werden.



## Alignment Settings

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

The remote control is used for entering and storing adjustments. The adjustment sequence for the service mode is indicated below.

1. Set the Bass to maximum position, set the Treble to minimum position, press and hold the Reveal button on the remote control and at the same time press the  $\pm$ /V button on the customer controls at the front of the TV, 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 STORE button after each adjustment has been made to store the required values.
5. To exit the Service Mode press the Normalisation button.

Alignment Function		Settings / Special features
Vertical amplitude	V-AMP 038	Optimum setting
Vertical linearity	V-LIN 022	
V-Pos.	V-POS 005	Optimum setting
Horizontal amplitude	H-AMP 043	Optimum setting
Horizontal position	H-POS 035	
EW-amplitude	E/W-AMP 1 020	Optimum setting
EW-amplitude	E/W-AMP 2 015	Optimum setting
Trapezium-comp	TRAPEZ-1 004	Optimum setting
Vert. DC.	VERT. D.C. 008	Not to be adjusted.
Text Position	TEXT POSITION 060	Optimum setting
Cutoff	- - -	Enter Service Mode and step through to Cutoff, connect an oscilloscope to the Blue Cathode and adjust the screen VR of the FBT to get $150 \pm 5V$ at the base of the Cutoff pulse.
Cutoff RGB	CUTOFF RGB 032 032 032	Press the GREEN button to step through these settings. Adjust for optimum.
White RGB	WHITE RGB 032 032 032	Press the GREEN button to step through these settings. Adjust for optimum.
Sub Brightness	SUB BRIGHT 000	Optimum setting

## Abgleichtabelle

(Die angegebenen Werte sind Mittelwerte und Können individuell nach oben oder unten nach dem korrekten Abgleich abweichen)

Die Fernbedienung dient zum Eingeben und Abspeichern der Einstellwerte. Die Einstellfolge für den Service-Modus ist nachstehend beschrieben.

1. Den Tiefenregler auf Höchststellung und den Höhenregler auf Mindeststellung stellen. Nachdem die F-Taste am Bedienfeld des FS-Gerätes gedrückt wurde, die Die Taste "Lautstärke Minus" am FS-Gerät drücken und gleichzeitig die Taste "Reveal" auf der Fernbedienung betätigen. Hierdurch wird das FS-Gerät auf Service-Modus geschaltet.
2. Die einzelnen Funktionen mit Hilfe der ROTEN und GRÜNEN Taste anwählen.
3. Mit der GELBEN und BLAUEN Taste die Werte der einzelnen Funktionen ändern.
4. Nach jeder Einstellung die Taste STR auf der Fernbedienung oder am Bedienfeld drücken, um die geänderten Werte abzuspeichern.
5. Zum Verlassen des Service-Modus die "N"-Taste auf der Fernbedienung drücken

Abgleichfunktion		Einstellung/Besondere Merkmale
Vertikale Amplitude	V-AMP 038	Optimale Einstellung
Vertical linearität	V-LIN 022	
V-Pos.	V-POS 005	Optimale Einstellung
Horizontale Amplitude	H-AMP 043	Optimale Einstellung
Horizontale position	H-POS 035	
OW-amplitude	E/W-AMP 1 020	Optimale Einstellung
OW-amplitude	E/W-AMP 2 015	Optimale Einstellung
Trapez-Kompensation	TRAPEZ-1 004	Optimale Einstellung
Vert. DC.	VERT. D.C. 008	Nicht einstellen
Text Position	TEXT POSITION 060	Optimale Einstellung
Cutoff	---	Den Service Mode aktivieren und auf Cutoff gehen. Oscilloscope an Blaukathode anschliessen und mit dem "Screen" -Regler am Zeilentrafo die untere Spitze des Cutoff-Pulses auf 150V +/- 5V einstellen.
Cutoff RGB	CUTOFF RGB 032 032 032	Die Einstellungen mit Hilfe der GRÜNEN Taste anwählen. Optimale Einstellung.
White RGB	WHITE RGB 032 032 032	Die Einstellungen mit Hilfe der GRÜNEN Taste anwählen. Optimale Einstellung.
Grundhelligket	SUB BRIGHT 000	Optimale Einstellung

## ADJUSTMENT PROCEDURE

Item/Preparation	Adjustments																																																												
<b>Supply Voltage Check</b> 1. Receive a standard test pattern 2. Set the controls: Brightness      Minimum Contrast         Minimum Volume            Minimum	1. Confirm the following voltages. <table border="0"> <tr> <td colspan="3"><b>E PCB</b></td> <td colspan="3"><b>D PCB</b></td> </tr> <tr> <td><b>U5B</b></td> <td>5</td> <td>± 0.5V</td> <td><b>U5A</b></td> <td>5.1</td> <td>+ 0.12/-0.1V</td> </tr> <tr> <td><b>U8A</b></td> <td>8</td> <td>± 0.5V</td> <td><b>U5SB</b></td> <td>5</td> <td>± 0.25V</td> </tr> <tr> <td><b>U9</b></td> <td>9</td> <td>± 0.5V</td> <td><b>TP1</b></td> <td>15</td> <td>± 0.7V</td> </tr> <tr> <td><b>U12</b></td> <td>11.8</td> <td>± 0.5V</td> <td><b>U16</b></td> <td>18.2</td> <td>± 0.8V</td> </tr> <tr> <td></td> <td></td> <td></td> <td><b>U22</b></td> <td>22.5</td> <td>± 1V</td> </tr> <tr> <td></td> <td></td> <td></td> <td><b>U38</b></td> <td>39</td> <td>± 1V</td> </tr> <tr> <td></td> <td></td> <td></td> <td><b>TP2</b></td> <td>54</td> <td>± 2.5V</td> </tr> <tr> <td></td> <td></td> <td></td> <td><b>U150</b></td> <td>150</td> <td>± 1V</td> </tr> <tr> <td></td> <td></td> <td></td> <td><b>U200</b></td> <td>200</td> <td>± 10V</td> </tr> </table>	<b>E PCB</b>			<b>D PCB</b>			<b>U5B</b>	5	± 0.5V	<b>U5A</b>	5.1	+ 0.12/-0.1V	<b>U8A</b>	8	± 0.5V	<b>U5SB</b>	5	± 0.25V	<b>U9</b>	9	± 0.5V	<b>TP1</b>	15	± 0.7V	<b>U12</b>	11.8	± 0.5V	<b>U16</b>	18.2	± 0.8V				<b>U22</b>	22.5	± 1V				<b>U38</b>	39	± 1V				<b>TP2</b>	54	± 2.5V				<b>U150</b>	150	± 1V				<b>U200</b>	200	± 10V
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## ABGLEICH

Vorbereitung	Abgleich																																																												
<b>Prüfen der Versorgungsspannung</b> 1. Testbild empfangen. 2. Helligkeit auf Minimum Kontrast auf Minimum Lautstärke auf Minimum	1. Folgende Spannungen sind zu überprüfen : <table border="0"> <tr> <td colspan="3"><b>E PCB</b></td> <td colspan="3"><b>D PCB</b></td> </tr> <tr> <td><b>U5B</b></td> <td>5</td> <td>± 0.5V</td> <td><b>U5A</b></td> <td>5.1</td> <td>+ 0.12/-0.1V</td> </tr> <tr> <td><b>U8A</b></td> <td>8</td> <td>± 0.5V</td> <td><b>U5SB</b></td> <td>5</td> <td>± 0.25V</td> </tr> <tr> <td><b>U9</b></td> <td>9</td> <td>± 0.5V</td> <td><b>TP1</b></td> <td>15</td> <td>± 0.7V</td> </tr> <tr> <td><b>U12</b></td> <td>11.8</td> <td>± 0.5V</td> <td><b>U16</b></td> <td>18.2</td> <td>± 0.8V</td> </tr> <tr> <td></td> <td></td> <td></td> <td><b>U22</b></td> <td>22.5</td> <td>± 1V</td> </tr> <tr> <td></td> <td></td> <td></td> <td><b>U38</b></td> <td>39</td> <td>± 1V</td> </tr> <tr> <td></td> <td></td> <td></td> <td><b>TP2</b></td> <td>54</td> <td>± 2.5V</td> </tr> <tr> <td></td> <td></td> <td></td> <td><b>U150</b></td> <td>150</td> <td>± 1V</td> </tr> <tr> <td></td> <td></td> <td></td> <td><b>U200</b></td> <td>200</td> <td>± 10V</td> </tr> </table>	<b>E PCB</b>			<b>D PCB</b>			<b>U5B</b>	5	± 0.5V	<b>U5A</b>	5.1	+ 0.12/-0.1V	<b>U8A</b>	8	± 0.5V	<b>U5SB</b>	5	± 0.25V	<b>U9</b>	9	± 0.5V	<b>TP1</b>	15	± 0.7V	<b>U12</b>	11.8	± 0.5V	<b>U16</b>	18.2	± 0.8V				<b>U22</b>	22.5	± 1V				<b>U38</b>	39	± 1V				<b>TP2</b>	54	± 2.5V				<b>U150</b>	150	± 1V				<b>U200</b>	200	± 10V
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## SELF CHECK

Self check is used to automatically check the Bus lines and Hexadecimal code of the TV set.  
 To enter the Self Check mode press Function down button, on the Preset Panel, at the same time pressing the Status button, on the Remote Control, and the screen will show: –  
 When exiting Self Check the customer settings will return to factory setup.

## SELBSTDIAGNOSE

1) Die Selbstdiagnose dient zum automatischen Prüfen der Bus-Leitungen sowie des Hexadezimalcodes des FS-Geräts. Zum Umschalten auf Selbstdiagnose nach dem Drücken der "F"-Taste die "Lautstärke Minus" Taste am Bedienfeld des FS-Geräts und gleichzeitig die Taste "Status" an der Fernbedienung drücken; auf dem Bildschirm erscheint hierauf: –  
 2) Nach der Selbstdiagnose wird das Gerät automatisch auf sämtliche werksseitigen Standardeinstellungen zurückgesetzt: –

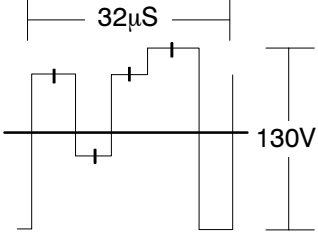
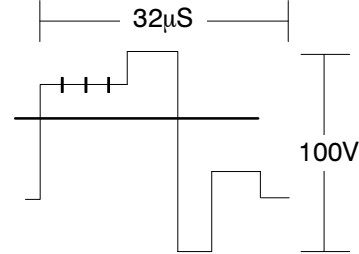
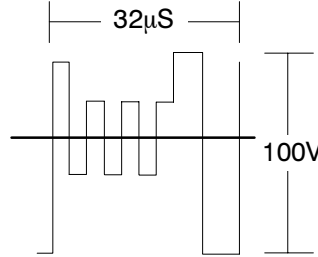
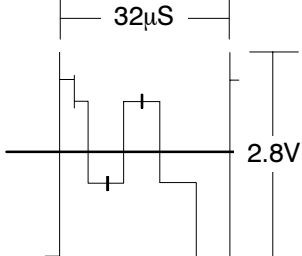
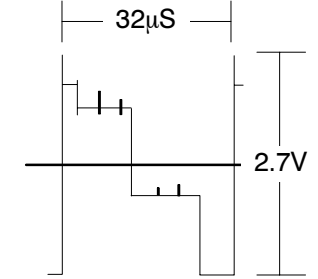
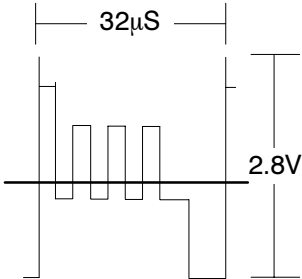
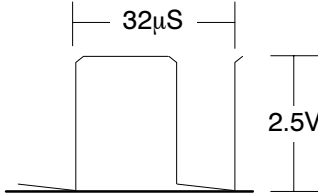
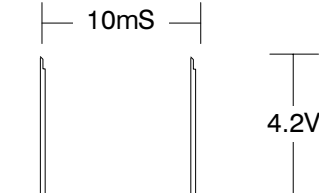
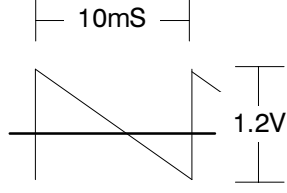
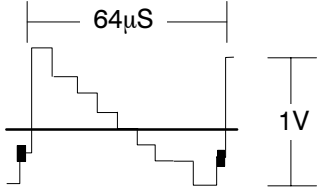
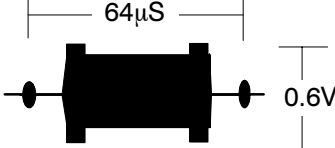
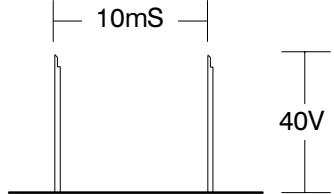
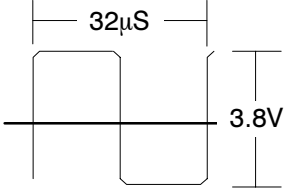
0 — ok		8 — ok		16 — --		Hex codes	
Test Byte	Col Decoder (M)	Col Decoder (P)	TX-W32D3F	TX-W28D3F			
Lst Power	Clock generator	Q – PIP	49	09			
U5 Det	V – Processor	Not Used	73	73			
Protector	DFU	Not Used	E5	E5			
Not Used	Display Processor	EAROM	BF	BF			
Not Used	RGB Processor	Audio Matrix	BB	BB			
Not Used	Deflection IC	Video Matrix	FB	FB			
Not Used	MSP	Tuner	03	03			

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

Wenn der Hauptprozessor (CCU) an den Anschlüssen einen Fehler erkennt, oder der entsprechende Anschluss nicht belegt ist, zeigt die entsprechende Position -- anstelle von OK an.

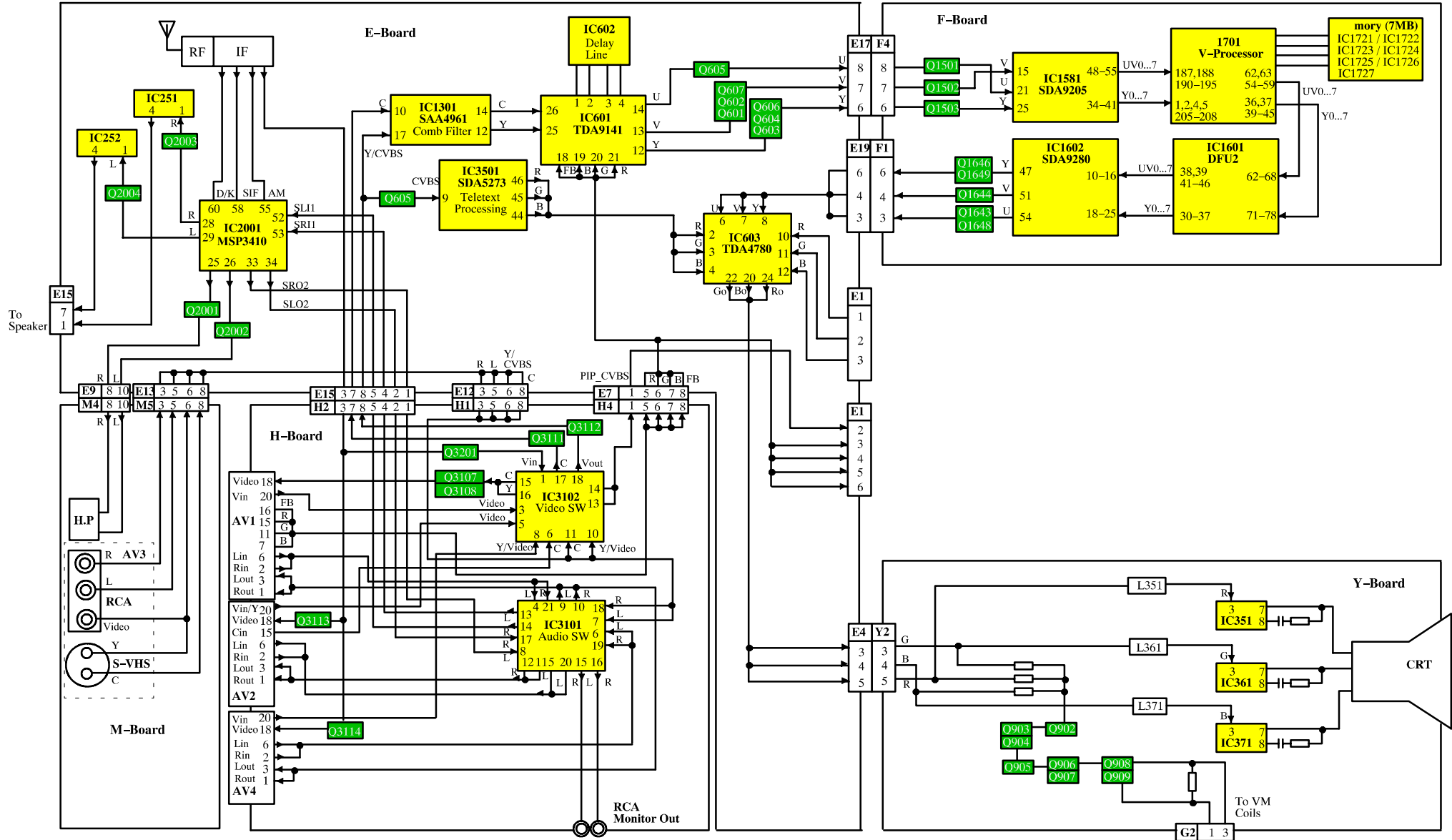
## WAVEFORM PATTERN TABLE SIGNAL TABELLE

**NOTES:** All waveforms have been taken using a standard colour bar pattern.  
**HINWEIS:** Alle oszillogramme wurden unter Verwendung des Standard Farbbalken Testbildes aufgenommen.

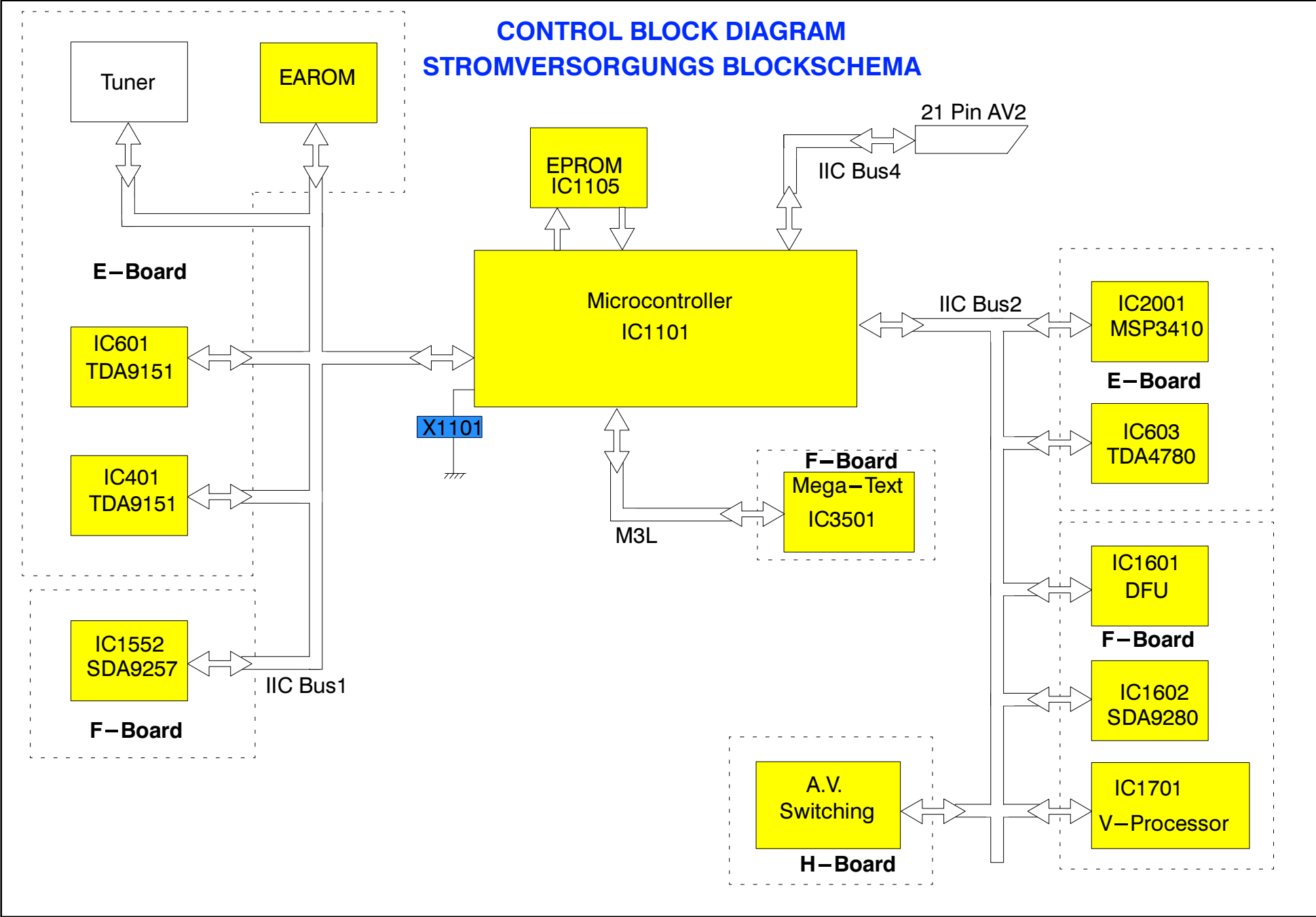
<p><b>RED DRIVE</b> TPY1</p> 	<p><b>GREEN DRIVE</b> TPY2</p> 	<p><b>BLUE DRIVE</b> TPY3</p> 
<p><b>RED OUTPUT</b> IC 603 PIN 24</p> 	<p><b>GREEN OUTPUT</b> IC 603 PIN 22</p> 	<p><b>BLUE OUTPUT</b> IC 603 PIN 20</p> 
<p><b>HORIZONTAL SYNC</b> IC 3501 PIN 4</p> 	<p><b>VERTICAL SYNC</b> IC 3501 PIN 3</p> 	<p><b>VERT OUTPUT IC (INPUT)</b> IC 451 PIN 1</p> 
<p><b>LUMINANCE IN</b> IC601 PIN 26</p> 	<p><b>CHROMINANCE IN</b> IC601 PIN 25</p> 	<p><b>VERTICAL OUTPUT (DRIVE)</b> IC 451 PIN 9</p> 
<p><b>HORIZONTAL OUTPUT</b> IC401 PIN 20</p> 		

# VIDEO AND AUDIO SIGNAL PROCESSING BLOCK DIAGRAM

## BILD SIGNAL / TONSIGNAL BLOCKSCHEMA



**CONTROL BLOCK DIAGRAM  
STROMVERSORGUNGS BLOCKSCHEMA**



## PARTS LOCATION

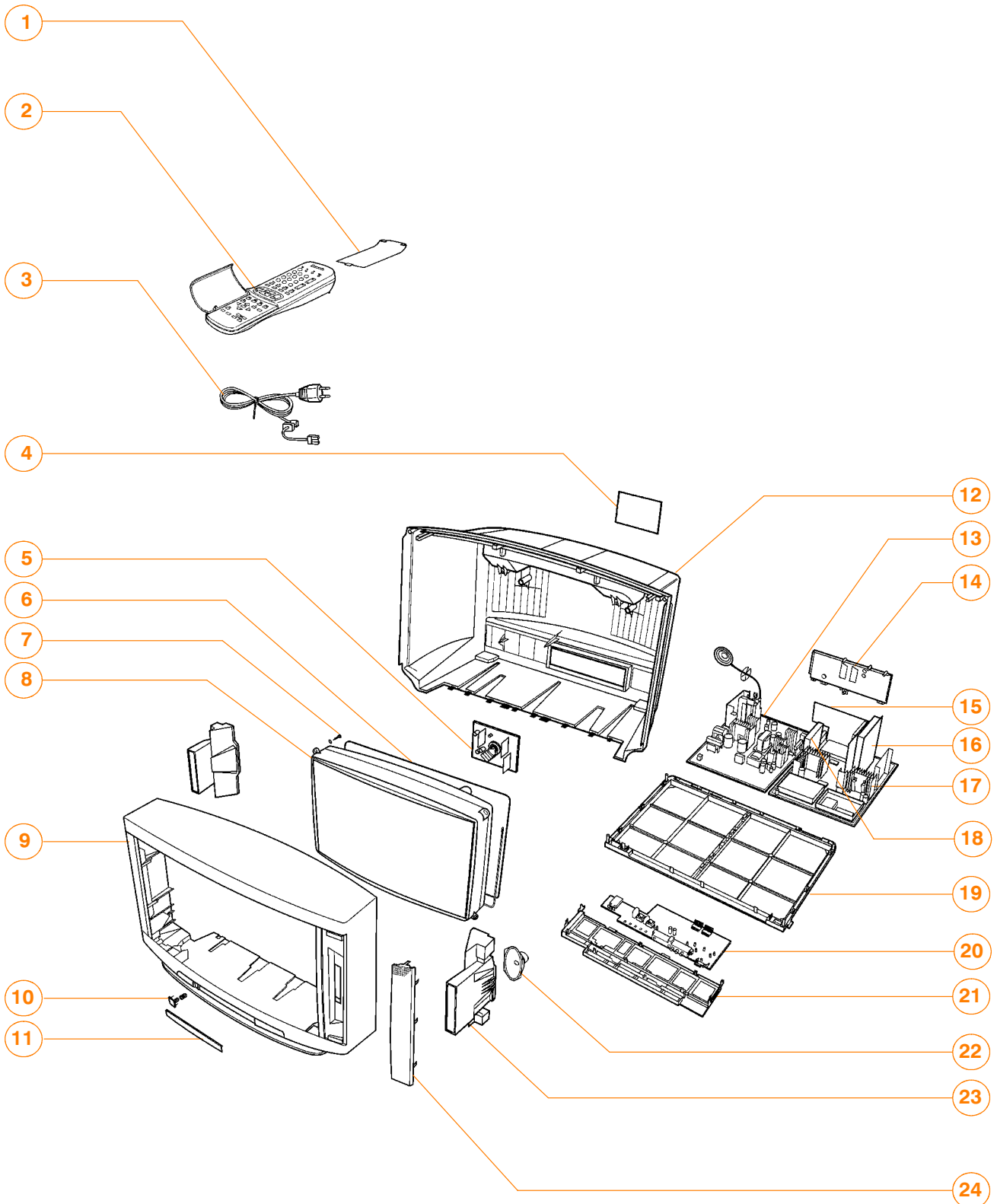
### NOTE :

The numbers on the exploded view below refer to the miscellaneous section of the Replacement Parts List.

## EXPLOSIONSZEICHNUNG

### Anmerking :

Die Nummer auf den mechanischen Teilen zeigt die Bezugsnummer der Ersatzteilliste an.



## 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.

### COMMON PARTS FOR MODELS TX-W32D3F AND TX-W28D3F

Ref No.	Part No.	Description
<b>MISCELLANEOUS COMPONENTS</b>		
1)	UR51EC780	BATTERY COVER (REMOTE)
2)	EUR51923	REMOTE CONTROL
3)	TSX8E0020	POWER CORD ▲
4)	*****	REFER TO DIFFERENCE LIST
5)	*****	REFER TO DIFFERENCE LIST
6)	*****	REFER TO DIFFERENCE LIST
7)	THT1062	CRT FIXING SCREW
8)	*****	REFER TO DIFFERENCE LIST
9)	*****	REFER TO DIFFERENCE LIST
10)	TBX8E033	POWER BUTTON
11)	TBM8E1728	PANASONIC BADGE
12)	*****	REFER TO DIFFERENCE LIST
13)	*****	REFER TO DIFFERENCE LIST
14)	TKP8E1153	AV COVER
15)	TNPA0293AJ	H P.C.B. ▲
16)	TNPA0294AD	F P.C.B. ▲
17)	*****	REFER TO DIFFERENCE LIST
18)	TNPA0317AA	B P.C.B. ▲
19)	TMX8E014	CHASSIS FRAME
20)	*****	REFER TO DIFFERENCE LIST
21)	TMW8E023	CONTROL BRACKET
22)	EAGG1218F2	SPEAKER
23)	TKK8E026	SPEAKER REFLECTOR
24)	*****	REFER TO DIFFERENCE LIST
	TKP8E1149	LID
	TKP8E1150	FRONT PANEL RIGHT
	TKP8E1160	FRONT PANEL RIGHT
	ENV57D03G3	TUNER ▲
	TEK6940	LID CATCHER
	TBM8E1778	REAR AV LABEL
	TLT100K991R	COIL
	TMW8E017	L.E.D.HOLDER
	TMX8E015	PCB SUPPORT BRACKET
	TQB8E2381A	GERMAN INST BOOK ▲
	TQB8E2381B	DUTCH INST BOOK ▲
	TQB8E2381C	ITALIAN INST BOOK ▲
	TQB8E2381D	FRENCH INST BOOK ▲
	TQB8E2381E	SPANISH INST BOOK ▲
	TQB8E2381F	SWEDISH INST BOOK ▲
	TQB8E2381G	NORWEGIAN INST BOOK ▲
	TQB8E2381H	SUOMI INST BOOK ▲
	TQB8E2381K	DANISH INST BOOK ▲
	TQA8E2043	SCHEMATIC DIAGRAM (ITALY) ▲
	TBM8E1532-2	PRESET PANEL
	UM-3DJ-2P	BATTERY-SET
	832AG11D-ESL	I.C.SOCKET
	31221212478	FIX CLIP
	TES4537	SPRING
	TES4537	SPRING
	TES4537	SPRING
	TES4537	SPRING
	F9-4-220	RELAY
	PCS-068A-1	68 PIN I.C.SOCKET
	ERC12GK825	SOLID 0.5W 10% 8M2Ω
	ERDS1TJ6R8	CARBON 0.5W 5% 6R8Ω
<b>INTEGRATED CIRCUITS</b>		
IC101	TDA9814TV3	VIF
IC251	TDA2030AV	AUDIO AMPLIFIER
IC252	TDA2030AV	AUDIO AMPLIFIER
IC351	TDA6111	RGB OUTPUT
IC361	TDA6111	RGB OUTPUT
IC371	TDA6111	RGB OUTPUT
IC401	TDA9151-B	DEFLECTION CONTROL

## ERSATZTEILLISTE

### Wichtiger Sicherheitshinweis

Teile, die mit einem Hinweis ▲ gekennzeichnet sind, sind wichtig für die Sicherheit. Solange ein Auswechsein erforderlich sein, sind unbedingt Originalteile einzusetzen.

Ref No.	Part No.	Description
IC451	TDA8350Q/N5	VERTICAL OUTPUT
IC601	TDA9143-N1	COLOUR DECODER
IC602	TDA4665-V4	DELAY LINE
IC603	TDA4780	RGB VIDEO PROCESSOR
IC845	SE140N	ERROR AMPLIFIER
IC851	TL431ACLPM	COIL
IC852	TL431ACLPM	COIL
IC1051	RPM-637CBRS1	LED RECEIVER
IC1101	SDA30C164-2	MICRO PROCESSOR
IC1102	S-80745AL-Z	RESET
IC1103	MN1280R	RESET
IC1301	SAA4961	COMB FILTER
IC1551	SN74F04DR	CLOCK
IC1552	SDA9257	CLOCK GENERATOR
IC1581	SDA9205-2GEG	A/D CONVERTER
IC1601	UPD93213GF	DFU
IC1602	SDA9280B21GE	VISUAL PROCESSOR
IC1701	MB87D202A	VIDEO PROCESSOR
IC1721	SDA9251-2XGE	RAM
IC1722	SDA9251-2XGE	RAM
IC1723	SDA9251-2XGE	RAM
IC1724	SDA9251-2XGE	RAM
IC1725	SDA9251-2XGE	RAM
IC1726	SDA9251-2XGE	RAM
IC1727	SDA9251-2XGE	RAM
IC2001	MSP3410DPPB4	AUDIO PROCESSOR
IC3101	TEA6420	AUDIO SWITCH
IC3102	TEA6415C	VIDEO SWITCH
IC3501	SDA5273S/134	MEGA TEXT
IC3502	M514256B70RS	DRAM
IC3801	AN7808LB	8V REGULATOR
IC3803	AN7805LB	5V REGULATOR
IC3804	AN7809FLB	9V REGULATOR
IC3805	AN78L08TA	8V REGULATOR
<b>CAPACITORS</b>		
C002	ECUV1H102JCX	S.M.CAP 50V 1nF
C003	ECA1HM101GB	ELECT 50V 100pF
C004	ECUV1H102JCX	S.M.CAP 50V 1nF
C005	ECUV1H102JCX	S.M.CAP 50V 1nF
C006	ECUV1H102JCX	S.M.CAP 50V 1nF
C007	ECUV1H102JCX	S.M.CAP 50V 1nF
C009	ECA1HMR22GB	ELECT 50V 0.22μF
C010	ECUV1H102KBX	S.M.CAP 50V 1nF
C014	ECUV1H103ZFX	S.M.CAP 50V 10nF
C015	ECUV1H390JCX	S.M.CAP 50V 39pF
C016	ECUV1H390JCX	S.M.CAP 50V 39pF
C017	ECA1CM470GB	ELECT 16V 47μF
C019	ECUV1H561JCX	S.M.CAP 50V 560pF
C020	ECUV1H103ZFX	S.M.CAP 50V 10nF
C022	ECUV1H103ZFX	S.M.CAP 50V 10nF
C023	ECUV1H681JCX	S.M.CAP 50V 680pF
C024	ECUV1H103ZFX	S.M.CAP 50V 10nF
C025	ECUV1H101JCX	S.M.CAP 50V 100pF
C026	ECUV1H681JCX	S.M.CAP 50V 680pF
C101	ECUV1H104ZFX	S.M.CAP 50V 100nF
C106	ECUV1H104ZFX	S.M.CAP 50V 100nF
C108	ECUV1H104ZFX	S.M.CAP 50V 100nF
C109	ECUV1H104ZFX	S.M.CAP 50V 100nF
C111	ECUV1H103ZFX	S.M.CAP 50V 10nF
C113	ECUV1H393KBX	S.M.CAP 50V 39nF
C115	ECUV1H104ZFX	S.M.CAP 50V 100nF
C116	ECUV1H030CPX	S.M.CAP 50V 30pF
C117	ECUV1H070DTX	S.M.CAP 50V 70pF
C118	ECEA1CKA100	ELECT 16V 10μF
C120	ECEA1HKA2R2	ELECT 50V 2.2μF
C121	ECEA1HKA2R2	ELECT 50V 2.2μF
C122	ECUV1C105ZFX	S.M.CAP 16V 1000nF
C123	ECEA1HKA2R2	ELECT 50V 2.2μF







Ref No.	Part No.	Description
C1586	ECUV1H104ZFX S.M.CAP	50V 100nF
C1588	ECA1CM470GB ELECT	16V 47μF
C1590	ECUV1H104ZFX S.M.CAP	50V 100nF
C1591	ECUV1H104ZFX S.M.CAP	50V 100nF
C1592	ECUV1H104ZFX S.M.CAP	50V 100nF
C1593	ECA1CM470GB ELECT	16V 47μF
C1594	ECUV1H104ZFX S.M.CAP	50V 100nF
C1595	ECUV1H104ZFX S.M.CAP	50V 100nF
C1596	ECUV1H104ZFX S.M.CAP	50V 100nF
C1599	ECA1CM470GB ELECT	16V 47μF
C1601	ECUV1H104ZFX S.M.CAP	50V 100nF
C1602	ECUV1H104ZFX S.M.CAP	50V 100nF
C1603	ECUV1H103KBX S.M.CAP	50V 10nF
C1604	ECUV1H104ZFX S.M.CAP	50V 100nF
C1605	ECUV1H104ZFX S.M.CAP	50V 100nF
C1606	ECUV1H104ZFX S.M.CAP	50V 100nF
C1607	ECUV1H104ZFX S.M.CAP	50V 100nF
C1608	ECA1CM470GB ELECT	16V 47μF
C1610	ECUV1H104ZFX S.M.CAP	50V 100nF
C1611	ECUV1H103KBX S.M.CAP	50V 10nF
C1612	ECUV1H104ZFX S.M.CAP	50V 100nF
C1613	ECUV1H104ZFX S.M.CAP	50V 100nF
C1614	ECUV1H104ZFX S.M.CAP	50V 100nF
C1616	ECUV1H152JCX S.M.CAP	50V 1.5pF
C1617	ECUV1H104ZFX S.M.CAP	50V 100nF
C1618	ECUV1H104ZFX S.M.CAP	50V 100nF
C1619	ECUV1H104ZFX S.M.CAP	50V 100nF
C1620	ECUV1H104ZFX S.M.CAP	50V 100nF
C1621	ECA1CM470GB ELECT	16V 47μF
C1622	ECUV1H104ZFX S.M.CAP	50V 100nF
C1625	ECA1CM470GB ELECT	16V 47μF
C1641	ECA1CM470GB ELECT	16V 47μF
C1642	ECUV1H104ZFX S.M.CAP	50V 100nF
C1701	ECA1CM470GB ELECT	16V 47μF
C1702	ECUV1H104ZFX S.M.CAP	50V 100nF
C1703	ECUV1H104ZFX S.M.CAP	50V 100nF
C1704	ECUV1H104ZFX S.M.CAP	50V 100nF
C1705	ECUV1H104ZFX S.M.CAP	50V 100nF
C1706	ECUV1H104ZFX S.M.CAP	50V 100nF
C1707	ECUV1H104ZFX S.M.CAP	50V 100nF
C1708	ECUV1H104ZFX S.M.CAP	50V 100nF
C1709	ECUV1H104ZFX S.M.CAP	50V 100nF
C1710	ECUV1H104ZFX S.M.CAP	50V 100nF
C1711	ECUV1H103KBX S.M.CAP	50V 10nF
C1712	ECUV1H104ZFX S.M.CAP	50V 100nF
C1713	ECUV1H104ZFX S.M.CAP	50V 100nF
C1714	ECUV1H104ZFX S.M.CAP	50V 100nF
C1721	ECA1CM470GB ELECT	16V 47μF
C1722	ECA1CM470GB ELECT	16V 47μF
C1723	ECUV1H104ZFX S.M.CAP	50V 100nF
C1724	ECUV1H104ZFX S.M.CAP	50V 100nF
C1725	ECUV1H104ZFX S.M.CAP	50V 100nF
C1726	ECUV1H104ZFX S.M.CAP	50V 100nF
C1727	ECUV1H104ZFX S.M.CAP	50V 100nF
C1728	ECUV1H104ZFX S.M.CAP	50V 100nF
C1729	ECUV1H104ZFX S.M.CAP	50V 100nF
C1730	ECUV1H104ZFX S.M.CAP	50V 100nF
C1731	ECUV1H104ZFX S.M.CAP	50V 100nF
C1732	ECUV1H104ZFX S.M.CAP	50V 100nF
C1733	ECUV1H104ZFX S.M.CAP	50V 100nF
C1734	ECUV1H104ZFX S.M.CAP	50V 100nF
C1735	ECUV1H104ZFX S.M.CAP	50V 100nF
C1736	ECUV1H104ZFX S.M.CAP	50V 100nF
C1740	ECUV1H102KBX S.M.CAP	50V 1nF
C2001	ECA1CM100GB ELECT	16V 10pF
C2002	ECUV1H104ZFX S.M.CAP	50V 100nF
C2003	ECUV1H104ZFX S.M.CAP	50V 100nF
C2004	ECUV1H102JCX S.M.CAP	50V 1nF
C2005	ECUV1H391JCX S.M.CAP	50V 390pF
C2006	ECUV1H391JCX S.M.CAP	50V 390pF
C2007	ECUV1H102JCX S.M.CAP	50V 1nF
C2008	ECUV1H102JCX S.M.CAP	50V 1nF
C2009	ECUV1H102JCX S.M.CAP	50V 1nF
C2010	ECUV1H102JCX S.M.CAP	50V 1nF
C2011	ECUV1H102JCX S.M.CAP	50V 1nF
C2012	ECUV1H102JCX S.M.CAP	50V 1nF
C2014	ECQM1H334J FILM	50V 330nF
C2017	ECA1CM100GB ELECT	16V 10pF
C2018	ECA1CM100GB ELECT	16V 10pF
C2019	ECA1CM221GB ELECT	16V 220pF
C2020	ECUV1H104ZFX S.M.CAP	50V 100nF
C2021	ECUV1H104ZFX S.M.CAP	50V 100nF

Ref No.	Part No.	Description
C2022	ECA1HM3R3GB ELECT	50V 3.3μF
C2023	ECUV1H471JCX S.M.CAP	50V 470pF
C2024	ECUV1H471JCX S.M.CAP	50V 470pF
C2025	ECUV1H221JCX S.M.CAP	50V 220pF
C2026	ECUV1H221JCX S.M.CAP	50V 220pF
C2027	ECUV1H221JCX S.M.CAP	50V 220pF
C2028	ECUV1H221JCX S.M.CAP	50V 220pF
C2029	ECUV1H221JCX S.M.CAP	50V 220pF
C2030	ECUV1H221JCX S.M.CAP	50V 220pF
C2031	ECUV1H104ZFX S.M.CAP	50V 100nF
C2032	ECA1CM100GB ELECT	16V 10pF
C2034	ECUV1H070DCX S.M.CAP	50V 7pF
C2035	ECUV1H560JCX S.M.CAP	50V 56pF
C2036	ECUV1H100DCX S.M.CAP	50V 10pF
C2037	ECUV1H220JCX S.M.CAP	50V 22pF
C2039	ECUV1H070DCX S.M.CAP	50V 7pF
C2040	ECUV1H560JCX S.M.CAP	50V 56pF
C2041	ECUV1H560JCX S.M.CAP	50V 56pF
C2042	ECUV1H104ZFX S.M.CAP	50V 100nF
C2043	ECA1CM100GB ELECT	16V 10pF
C2044	ECUV1H010CCX S.M.CAP	50V 1pF
C2045	ECUV1H010CCX S.M.CAP	50V 1pF
C2050	ECUV1H223ZFX S.M.CAP	50V 22nF
C2051	ECUV1H223ZFX S.M.CAP	50V 22nF
C2052	ECUV1H103ZFX S.M.CAP	50V 10nF
C2053	ECUV1H103ZFX S.M.CAP	50V 10nF
C2054	ECA1CM331B ELECT	16V 330pF
C2055	ECA1CM331B ELECT	16V 330pF
C2058	ECUV1H683ZFX S.M.CAP	50V 68nF
C2059	ECUV1H102KBX S.M.CAP	50V 1nF
C2060	ECUV1H102KBX S.M.CAP	50V 1nF
C2351	ECA1CM471GB ELECT	16V 470pF
C2352	ECA1CM471GB ELECT	16V 470pF
C2353	ECA1HM4R7GB ELECT	50V 4.7μF
C2354	ECKC1H103JB CERAMIC	50V 10nF
C2355	ECA1HMR33GB ELECT	50V 0.33μF
C2356	ECKC1H103JB CERAMIC	50V 10nF
C2360	ECKC1H103JB CERAMIC	50V 10nF
C2361	ECA1CM471GB ELECT	16V 470pF
C2362	ECA1CM471GB ELECT	16V 470pF
C2363	ECA1HM4R7GB ELECT	50V 4.7μF
C2364	ECKC1H103JB CERAMIC	50V 10nF
C2365	ECA1HMR33GB ELECT	50V 0.33μF
C2366	ECKC1H103JB CERAMIC	50V 10nF
C3001	ECKC1H561J CERAMIC	50V 560pF
C3002	ECKC1H561J CERAMIC	50V 560pF
C3005	ECCR1H151J CERAMIC	50V 150pF
C3101	ECEA1HN4R7UB ELECT	50V 4.7μF
C3102	ECA1HM470GB ELECT	50V 47μF
C3103	ECA1CM470GB ELECT	16V 47μF
C3106	ECUV1H561JCX S.M.CAP	50V 560pF
C3107	ECA1HM470GB ELECT	50V 47μF
C3108	ECA1CM470GB ELECT	16V 47μF
C3110	ECUV1H561JCX S.M.CAP	50V 560pF
C3111	ECUV1H102JCX S.M.CAP	50V 1nF
C3112	ECA1HM470GB ELECT	50V 47μF
C3113	ECA1HM470GB ELECT	50V 47μF
C3114	ECA1CM470GB ELECT	16V 47μF
C3115	ECEA1HNR47UB ELECT	50V 0.47μF
C3116	ECA1HM470GB ELECT	50V 47μF
C3117	ECEA1HN4R7UB ELECT	50V 4.7μF
C3118	ECEA1HN4R7UB ELECT	50V 4.7μF
C3119	ECA1HM470GB ELECT	50V 47μF
C3120	ECA1CM470GB ELECT	16V 47μF
C3122	ECUV1H561JCX S.M.CAP	50V 560pF
C3123	ECEA1HN4R7UB ELECT	50V 4.7μF
C3125	ECUV1H561JCX S.M.CAP	50V 560pF
C3126	ECEA1HN4R7UB ELECT	50V 4.7μF
C3127	ECEA1HN4R7UB ELECT	50V 4.7μF
C3128	ECEA1HN4R7UB ELECT	50V 4.7μF
C3129	ECUV1H102JCX S.M.CAP	50V 1nF
C3130	ECEA1HN4R7UB ELECT	50V 4.7μF
C3131	ECUV1H473KBX S.M.CAP	50V 47nF
C3132	ECA1CM470GB ELECT	16V 47μF
C3133	ECA1CM470GB ELECT	16V 47μF
C3134	ECA1CM470GB ELECT	16V 47μF
C3135	ECA1HMR47GB ELECT	50V 0.47μF
C3136	ECA1CM470GB ELECT	16V 47μF
C3137	ECA1HM470GB ELECT	50V 47μF
C3138	ECA1HM470GB ELECT	50V 47μF
C3139	ECUV1H222JCX S.M.CAP	50V 2.2nF
C3140	ECUV1H222JCX S.M.CAP	50V 2.2nF



Ref No.	Part No.	Description
D3351	1SS254T-77	DIODE
D3501	MA4030	DIODE
D3801	MA4043	DIODE
D3802	MTZJT-778.2A	DIODE
D3803	ERA81004V3	DIODE
D3805	MA4091	DIODE
D3806	MA165TA5	DIODE 1SS133T-77
D3807	MA165TA5	DIODE 1SS133T-77

### FUSES

F531	TR5-T1000	FUSE	△
F801	XBA2C50TH15	FUSE	
F845	TR5-T2000	FUSE	△
F846	TR5-T1250	FUSE	△
F8011	EYF52BC	FUSE HOLDER	
F8012	EYF52BC	FUSE HOLDER	

### TERMINALS AND LINKS

JA2	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JA3	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JA5	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JA6	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JA7	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JA8	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JA9	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JK3001	TJB16656	A.VTERMINAL			
JSB3	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE010	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE011	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE012	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE015	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE02	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE022	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE023	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE024	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE025	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE028	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE042	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE050	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE056	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE057	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE058	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE062	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE064	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE066	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSE091	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF001	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF002	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF004	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF005	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF015	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF026	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF038	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF040	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF041	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF045	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF046	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF049	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF050	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF054	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF056	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF059	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF061	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSF062	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSH004	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSH005	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSH01	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSH010	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω
JSH02	ERJ6GEY0R00	S.M.CARB	0.1W	5%	0Ω

### COILS

LC1503	ELKTR391CA	DELAY LINE
LC1507	EXCEMT103DTM	COIL
LC1508	EXCEMT103DTM	COIL
LC1509	EXCEMT103DTM	COIL
LC1510	EXCEMT103DTM	COIL

Ref No.	Part No.	Description
LC1601	ELKTR391CA	DELAY LINE
LC1602	ELKTR391CA	DELAY LINE
LC1603	ELKTR391CA	DELAY LINE
LC1609	ELKTR560BA	DELAY LINE
L002	TLT047K991R	COIL
L004	TLT047K991R	COIL
L005	TLT047K991R	COIL
L102	TLT056K991R	COIL
L103	EQV7EN203B	COIL
L105	ELESNR22MA	COIL
L107	ELESNR22MA	COIL
L108	ELESNR22MA	COIL
L109	EIL7EN015Q	COIL
L110	EQL7EN022Q	COIL
L113	EIL7EN015Q	COIL
L252	EXCELSA35T	COIL
L253	EXCELSA35T	COIL
L254	EXCELSA35T	COIL
L255	EXCELSA35T	COIL
L351	SDL5000	DELAY LINE
L352	EXCELD25V	COIL
L353	TLT150K991R	COIL
L361	SDL5000	DELAY LINE
L362	EXCELD25V	COIL
L363	TLT150K991R	COIL
L371	SDL5000	DELAY LINE
L372	EXCELD25V	COIL
L373	TLT150K991R	COIL
L381	TLT220K991R	COIL
L401	EXCELD35V	COIL
L402	EXCELD35V	COIL
L451	EXCELD35V	COIL
L552	EXCELSA35T	COIL
L553	EXCELSA35T	COIL
L554	EXCELD35V	COIL
L555	EXCELD35C	COIL
L571	ELC18B801L	COIL
L572	ELHKL025B	COIL
L575	ELC18B331E	COIL
L576	ELC08D101E	COIL
L601	TLT047K991R	COIL
L602	TLT047K991R	COIL
L603	TLT047K991R	COIL
L605	ERD25TC0T	CARBON 0.25W 5% 0Ω
L801	ELF18D486D	COIL
L802	ELF18D486D	COIL
L807	ELF18D856A	COIL
L808	EXCELSA35T	COIL
L809	EXCELD35C	COIL
L810	EXCELSA39V	COIL
L811	EXCELSA39V	COIL
L812	EXCELD35V	COIL
L813	EXCELD35V	COIL
L817	EXCELD35V	COIL
L845	EXCELSA35T	COIL
L847	EXCELSA35B	COIL
L848	EXCELSA35T	COIL
L850	EXCELSA35T	COIL
L851	EXCELSA35B	COIL
L854	ELEIE150KA	COIL
L856	EXCELSA35T	COIL
L859	EXCELSA35T	COIL
L860	EXCELSA35T	COIL
L861	EXCELSA35T	COIL
L862	EXCELSA35T	COIL
L864	EXCELD35V	COIL
L1102	EXCELD35V	COIL
L1103	EXCELD35V	COIL
L1104	EXCELSA35T	COIL
L1105	ELEXT4R7KA	COIL
L1301	TLT330K991R	COIL
L1302	TLT100K991R	COIL
L1303	TLT101K991R	COIL
L1304	TLT100K991R	COIL
L1306	TLT101K991R	COIL
L1307	ERD25TC0T	CARBON 0.25W 5% 0Ω
L1501	EXCELD35V	COIL
L1502	TLT033K991R	COIL
L1503	TLT033K991R	COIL
L1504	TLT033K991R	COIL
L1552	EXCELD35V	COIL

Ref No.	Part No.	Description
L1553	EXCELD35V	COIL
L1575	EXCELD35V	COIL
L1576	EXCELD35V	COIL
L1601	EXCELD35V	COIL
L1602	EXCELD35V	COIL
L1603	TLT100K991R	COIL
L1604	TLT100K991R	COIL
L1605	TLT100K991R	COIL
L1606	TLT100K991R	COIL
L1607	EXCELD35V	COIL
L1641	EXCELD35V	COIL
L1701	EXCELD35V	COIL
L1721	EXCELD35V	COIL
L1722	EXCELD35V	COIL
L2001	TLT047K991R	COIL
L2003	EXCELD35V	COIL
L2004	TLT068K991R	COIL
L2005	TLT068K991R	COIL
L2351	ELEBR6R8KA	COIL
L2361	ELEBR6R8KA	COIL
L3001	ELEBR6R8KA	COIL
L3002	ELEBR6R8KA	COIL
L3003	ELEBR470KA	COIL
L3101	ELEMV1R5MA	COIL
L3102	ELEMV1R5MA	COIL
L3103	ELEMV1R5MA	COIL
L3104	ELEMV1R5MA	COIL
L3107	ELEMV1R5MA	COIL
L3108	ELEMV1R5MA	COIL
L3109	ELEMV1R5MA	COIL
L3110	ELEMV1R5MA	COIL
L3111	ELEMV1R5MA	COIL
L3112	ELEMV1R5MA	COIL
L3113	ELEMV1R5MA	COIL
L3114	ELEMV1R5MA	COIL
L3503	EXCELD35V	COIL
L3507	EXCELD35V	COIL
L3509	EXCELD35V	COIL
L3511	TLT100K991R	COIL

## TRANSISTORS

Q008	BC847B	TRANSISTOR OR 2SD601ATX
Q101	BC847B	TRANSISTOR OR 2SD601ATX
Q102	BC847B	TRANSISTOR OR 2SD601ATX
Q103	BC847B	TRANSISTOR OR 2SD601ATX
Q104	BC847B	TRANSISTOR OR 2SD601ATX
Q105	BC847B	TRANSISTOR OR 2SD601ATX
Q106	BF799E6327	CHIP TRANSISTOR
Q107	BC847B	TRANSISTOR OR 2SD601ATX
Q108	BC847B	TRANSISTOR OR 2SD601ATX
Q109	BC860B	TRANSISTOR
Q251	BC847B	TRANSISTOR OR 2SD601ATX
Q252	BC847B	TRANSISTOR OR 2SD601ATX
Q401	BC847B	TRANSISTOR OR 2SD601ATX
Q502	2SC2925STA	TRANSISTOR
Q531	BC547B	TRANSISTOR
Q532	BC547B	TRANSISTOR
Q533	BC547B	TRANSISTOR
Q535	BC547B	TRANSISTOR
Q551	BC547B	TRANSISTOR
Q552	2SC5144LBMA1	TRANSISTOR
Q553	2SC1473—RN	TRANSISTOR
Q554	2SC1473—RN	TRANSISTOR
Q572	BC547B	TRANSISTOR
Q573	BC557B	TRANSISTOR
Q574	2SD1265AOPLB	TRANSISTOR
Q601	BC847B	TRANSISTOR OR 2SD601ATX
Q602	BC857B	TRANSISTOR OR 2SB709ATX
Q603	BC847B	TRANSISTOR OR 2SD601ATX
Q604	BC857B	TRANSISTOR OR 2SB709ATX
Q605	BC857B	TRANSISTOR OR 2SB709ATX
Q607	BC847B	TRANSISTOR OR 2SD601ATX
Q608	BC847B	TRANSISTOR OR 2SD601ATX
Q609	BC847B	TRANSISTOR OR 2SD601ATX
Q610	BC847B	TRANSISTOR OR 2SD601ATX
Q611	BC847B	TRANSISTOR OR 2SD601ATX
Q612	BC847B	TRANSISTOR OR 2SD601ATX
Q801	2SK1489MAT	TRANSISTOR
Q803	2SD965—R	TRANSISTOR
Q804	2SA719—TA	TRANSISTOR

Ref No.	Part No.	Description
Q845	2SA684R	TRANSISTOR
Q846	BC547B	TRANSISTOR
Q847	BC557B	TRANSISTOR
Q848	BC547B	TRANSISTOR
Q849	2SA1018QTA	TRANSISTOR
Q850	2SD1474PLB	TRANSISTOR
Q851	BC547B	TRANSISTOR
Q852	BC547B	TRANSISTOR
Q901	BC847B	TRANSISTOR OR 2SD601ATX
Q902	BC847B	TRANSISTOR OR 2SD601ATX
Q903	BC847B	TRANSISTOR OR 2SD601ATX
Q904	BC857B	TRANSISTOR OR 2SB709ATX
Q905	BC847B	TRANSISTOR OR 2SD601ATX
Q906	BC847B	TRANSISTOR OR 2SD601ATX
Q907	BC857B	TRANSISTOR OR 2SB709ATX
Q908	2SA1535ARLB	TRANSISTOR
Q909	2SC3944ARLB	TRANSISTOR
Q1052	BC557B	TRANSISTOR
Q1101	BC847B	TRANSISTOR OR 2SD601ATX
Q1102	BC847B	TRANSISTOR OR 2SD601ATX
Q1103	BC847B	TRANSISTOR OR 2SD601ATX
Q1106	BC847B	TRANSISTOR OR 2SD601ATX
Q1107	BC847B	TRANSISTOR OR 2SD601ATX
Q1108	BC847B	TRANSISTOR OR 2SD601ATX
Q1112	2SC3757QRTX	TRANSISTOR
Q1191	BC847B	TRANSISTOR OR 2SD601ATX
Q1301	BC847B	TRANSISTOR OR 2SD601ATX
Q1303	BC847B	TRANSISTOR OR 2SD601ATX
Q1304	BC847B	TRANSISTOR OR 2SD601ATX
Q1501	BC847B	TRANSISTOR OR 2SD601ATX
Q1502	BC847B	TRANSISTOR OR 2SD601ATX
Q1503	BC847B	TRANSISTOR OR 2SD601ATX
Q1575	BC847B	TRANSISTOR OR 2SD601ATX
Q1642	BC847B	TRANSISTOR OR 2SD601ATX
Q1643	BC847B	TRANSISTOR OR 2SD601ATX
Q1644	BC857B	TRANSISTOR OR 2SB709ATX
Q1647	BC847B	TRANSISTOR OR 2SD601ATX
Q1648	BC857B	TRANSISTOR OR 2SB709ATX
Q1649	BC857B	TRANSISTOR OR 2SB709ATX
Q2001	BC860B	TRANSISTOR
Q2002	BC860B	TRANSISTOR
Q2003	BC860B	TRANSISTOR
Q2004	BC860B	TRANSISTOR
Q2006	BC857B	TRANSISTOR OR 2SB709ATX
Q2007	BC847B	TRANSISTOR OR 2SD601ATX
Q2351	BC547B	TRANSISTOR
Q2352	BC547B	TRANSISTOR
Q2353	BC557B	TRANSISTOR
Q2361	BC547B	TRANSISTOR
Q2362	BC547B	TRANSISTOR
Q2363	BC557B	TRANSISTOR
Q3101	BC847B	TRANSISTOR OR 2SD601ATX
Q3102	BC847B	TRANSISTOR OR 2SD601ATX
Q3103	BC847B	TRANSISTOR OR 2SD601ATX
Q3104	BC847B	TRANSISTOR OR 2SD601ATX
Q3105	BC847B	TRANSISTOR OR 2SD601ATX
Q3106	BC847B	TRANSISTOR OR 2SD601ATX
Q3107	BC857B	TRANSISTOR OR 2SB709ATX
Q3108	BC847B	TRANSISTOR OR 2SD601ATX
Q3113	BC847B	TRANSISTOR OR 2SD601ATX
Q3114	BC847B	TRANSISTOR OR 2SD601ATX
Q3115	BC857B	TRANSISTOR OR 2SB709ATX
Q3201	BC847B	TRANSISTOR OR 2SD601ATX
Q3351	BC847B	TRANSISTOR OR 2SD601ATX
Q3352	BC857B	TRANSISTOR OR 2SB709ATX
Q3501	BC847B	TRANSISTOR OR 2SD601ATX
Q3502	BC847B	TRANSISTOR OR 2SD601ATX
Q3503	2SC3130TX	TRANSISTOR
Q3801	2SD1474PLB	TRANSISTOR

## RESISTOR

RL571	TSEH8012	RELAY
RL806	TSE1885—1	RELAY
R003	ERJ6GEYJ223	S.M.CARB 0.1W 5% 22KΩ
R006	ERJ6GEYJ393	S.M.CARB 0.1W 5% 39KΩ
R011	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R012	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R101	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R102	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R103	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ







Ref No.	Part No.	Description
R1108	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1111	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1112	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1113	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1116	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1117	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1118	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1119	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1120	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1121	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1122	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1123	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1124	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1125	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1126	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1127	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1128	ERJ6GEYJ100	S.M.CARB 0.1W 5% 10Ω
R1129	ERJ6GEYJ100	S.M.CARB 0.1W 5% 10Ω
R1133	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1134	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1135	ERJ6GEYOR00	S.M.CARB 0.1W 5% Ω
R1136	ERJ6GEYJ221	S.M.CARB 0.1W 5% 220Ω
R1137	ERJ6GEYJ561	S.M.CARB 0.1W 5% 560Ω
R1138	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1142	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1143	ERJ6GEYJ392	S.M.CARB 0.1W 5% 3K9Ω
R1144	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1145	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1149	ERJ6GEYJ473	S.M.CARB 0.1W 5% 47KΩ
R1150	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1151	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1152	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1153	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1154	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1156	ERJ6GEYJ182	S.M.CARB 0.1W 5% 1K8Ω
R1163	ERJ6GEYJ152	S.M.CARB 0.1W 5% 1K5Ω
R1164	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1169	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1170	ERJ6GEYJ332	S.M.CARB 0.1W 5% 3K3Ω
R1171	ERJ6GEYJ682	S.M.CARB 0.1W 5% 6K8Ω
R1172	ERJ6GEYJ561	S.M.CARB 0.1W 5% 560Ω
R1174	ERDS1TJ561	CARBON 0.5W 5% 560Ω
R1182	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1183	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1184	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1185	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1186	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1188	ERJ6GEYJ222	S.M.CARB 0.1W 5% 2K2Ω
R1190	ERJ6GEYOR00	S.M.CARB 0.1W 5% Ω
R1191	ERJ6GEYJ104	S.M.CARB 0.1W 5% 100KΩ
R1192	ERJ6GEYJ104	S.M.CARB 0.1W 5% 100KΩ
R1193	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1194	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1301	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1302	ERJ6GEYJ392	S.M.CARB 0.1W 5% 3K9Ω
R1305	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1306	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1307	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1308	ERJ6GEYJ105	S.M.CARB 0.1W 5% 1MΩ
R1313	ERJ6GEYOR00	S.M.CARB 0.1W 5% Ω
R1315	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1317	ERJ6GEYJ181	S.M.CARB 0.1W 5% 180Ω
R1318	ERJ6GEYJ181	S.M.CARB 0.1W 5% 180Ω
R1319	ERJ6GEYOR00	S.M.CARB 0.1W 5% Ω
R1320	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1321	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1322	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1323	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1324	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1325	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1326	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1327	ERJ6GEYJ470	S.M.CARB 0.1W 5% 47Ω
R1328	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1329	ERJ6GEYOR00	S.M.CARB 0.1W 5% Ω
R1337	ERJ6GEYJ562	S.M.CARB 0.1W 5% 5K6Ω
R1340	ERJ6GEYJ272	S.M.CARB 0.1W 5% 2K7Ω
R1501	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1502	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1504	ERJ6GEYJ121	S.M.CARB 0.1W 5% 120Ω
R1507	ERJ6GEYJ272	S.M.CARB 0.1W 5% 2K7Ω
R1508	ERJ6GEYJ121	S.M.CARB 0.1W 5% 120Ω
R1510	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω

Ref No.	Part No.	Description
R1511	ERJ6GEYJ272	S.M.CARB 0.1W 5% 2K7Ω
R1513	ERJ6GEYJ272	S.M.CARB 0.1W 5% 2K7Ω
R1515	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1516	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1517	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1518	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1519	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1520	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1523	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1550	ERJ6GEYJ221	S.M.CARB 0.1W 5% 220Ω
R1551	ERJ6GEYJ180	S.M.CARB 0.1W 5% 18Ω
R1552	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1554	ERJ6GEYJ180	S.M.CARB 0.1W 5% 18Ω
R1555	ERJ6GEYJ331	S.M.CARB 0.1W 5% 330Ω
R1560	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1561	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1562	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1563	ERJ6GEYJ180	S.M.CARB 0.1W 5% 18Ω
R1568	ERJ6GEYJ221	S.M.CARB 0.1W 5% 220Ω
R1570	ERJ6GEYJ331	S.M.CARB 0.1W 5% 330Ω
R1572	ERJ6GEYJ561	S.M.CARB 0.1W 5% 560Ω
R1575	ERJ6GEYJ391	S.M.CARB 0.1W 5% 390Ω
R1576	ERJ6GEYJ821	S.M.CARB 0.1W 5% 820Ω
R1577	ERJ6GEYJ750	S.M.CARB 0.1W 5% 75Ω
R1578	ERJ6GEYJ100	S.M.CARB 0.1W 5% 10Ω
R1581	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1605	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1606	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1608	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1620	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1621	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1622	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1624	ERJ6GEYOR00	S.M.CARB 0.1W 5% Ω
R1625	ERJ6GEYJ271	S.M.CARB 0.1W 5% 270Ω
R1626	ERJ6GEYJ391	S.M.CARB 0.1W 5% 390Ω
R1627	ERJ6GEYJ622	S.M.CARB 0.125W 5% 6K2Ω
R1628	ERJ6GEYJ151	S.M.CARB 0.1W 5% 150Ω
R1629	ERJ6GEYJ201	S.M.CARB 0.1W 5% 200Ω
R1630	ERJ6GEYJ181	S.M.CARB 0.1W 5% 180Ω
R1631	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R1632	ERJ6GEYJ133	S.M.CARB 0.125W 5% 13KΩ
R1633	ERJ6GEYJ151	S.M.CARB 0.1W 5% 150Ω
R1634	ERJ6GEYOR00	S.M.CARB 0.1W 5% Ω
R1641	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1643	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1644	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1646	ERJ6GEYJ331	S.M.CARB 0.1W 5% 330Ω
R1647	ERJ6GEYJ151	S.M.CARB 0.1W 5% 150Ω
R1648	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1649	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1650	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1652	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1653	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1654	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1656	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R1659	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1662	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1666	ERJ6GEYOR00	S.M.CARB 0.1W 5% Ω
R1667	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1668	ERJ6GEYJ560	S.M.CARB 0.1W 5% 56Ω
R1679	ERJ6GEYJ473	S.M.CARB 0.1W 5% 47KΩ
R1680	ERJ6GEYJ153	S.M.CARB 0.1W 5% 15KΩ
R1681	ERJ6GEYOR00	S.M.CARB 0.1W 5% Ω
R1682	ERJ6GEYJ151	S.M.CARB 0.1W 5% 150Ω
R1683	ERJ6GEYJ151	S.M.CARB 0.1W 5% 150Ω
R1688	ERJ6GEYJ561	S.M.CARB 0.1W 5% 560Ω
R1701	ERJ6GEYJ180	S.M.CARB 0.1W 5% 18Ω
R1703	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1704	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1705	ERJ6GEYJ473	S.M.CARB 0.1W 5% 47KΩ
R1706	ERJ6GEYJ473	S.M.CARB 0.1W 5% 47KΩ
R1707	ERJ6GEYJ180	S.M.CARB 0.1W 5% 18Ω
R1710	ERJ6GEYJ180	S.M.CARB 0.1W 5% 18Ω
R1713	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R1716	ERJ6GEYOR00	S.M.CARB 0.1W 5% Ω
R1724	ERJ6GEYJ561	S.M.CARB 0.1W 5% 560Ω
R1730	ERJ6GEYJ821	S.M.CARB 0.1W 5% 820Ω
R1777	ERJ6GEYJ561	S.M.CARB 0.1W 5% 560Ω
R1778	ERJ6GEYJ821	S.M.CARB 0.1W 5% 820Ω
R2001	ERJ6GEYJ473	S.M.CARB 0.1W 5% 47KΩ
R2004	ERJ6GEYJ103	S.M.CARB 0.1W 5% 10KΩ
R2005	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω

Ref No.	Part No.	Description				
R2006	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R2007	ERJ6GEYJ183	S.M.CARB	0.1W	5%	18KΩ	
R2008	ERJ6GEYOR00	S.M.CARB	0.1W	5%	0Ω	
R2009	ERJ6GEYOR00	S.M.CARB	0.1W	5%	0Ω	
R2010	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R2011	ERJ6GEYJ222	S.M.CARB	0.1W	5%	2K2Ω	
R2012	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R2013	ERJ6GEYJ222	S.M.CARB	0.1W	5%	2K2Ω	
R2014	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470Ω	
R2015	ERJ6GEYJ222	S.M.CARB	0.1W	5%	2K2Ω	
R2016	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470Ω	
R2017	ERJ6GEYJ222	S.M.CARB	0.1W	5%	2K2Ω	
R2018	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470Ω	
R2019	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470Ω	
R2020	ERJ6GEYJ562	S.M.CARB	0.1W	5%	5K6Ω	
R2021	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1KΩ	
R2022	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470Ω	
R2023	ERJ6GEYOR00	S.M.CARB	0.1W	5%	0Ω	
R2025	ERJ6GEYJ123	S.M.CARB	0.1W	5%	12KΩ	
R2026	ERJ6GEYJ562	S.M.CARB	0.1W	5%	5K6Ω	
R2027	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1KΩ	
R2038	ERJ6GEYOR00	S.M.CARB	0.1W	5%	0Ω	
R2039	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470Ω	
R2044	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470Ω	
R2045	ERJ6GEYJ471	S.M.CARB	0.1W	5%	470Ω	
R2351	ERQ14AJW100	METAL	0.25W	5%	10Ω	Δ
R2352	ERD25TJ101	CARBON	0.25W	5%	100Ω	
R2353	ERD25TJ101	CARBON	0.25W	5%	100Ω	
R2354	ERD25TJ473	CARBON	0.25W	5%	47KΩ	
R2355	ERD25TJ102	CARBON	0.25W	5%	1KΩ	
R2356	ERD25TJ102	CARBON	0.25W	5%	1KΩ	
R2357	ERD25TJ102	CARBON	0.25W	5%	1KΩ	
R2358	ERD25TJ102	CARBON	0.25W	5%	1KΩ	
R2359	ERD25TJ271	CARBON	0.25W	5%	270Ω	
R2360	ERD25TJ183	CARBON	0.25W	5%	18KΩ	
R2361	ERD25TJ100	CARBON	0.25W	5%	10Ω	
R2371	ERQ14AJW100	METAL	0.25W	5%	10Ω	Δ
R2372	ERD25TJ101	CARBON	0.25W	5%	100Ω	
R2373	ERD25TJ101	CARBON	0.25W	5%	100Ω	
R2374	ERD25TJ473	CARBON	0.25W	5%	47KΩ	
R2375	ERD25TJ102	CARBON	0.25W	5%	1KΩ	
R2376	ERD25TJ102	CARBON	0.25W	5%	1KΩ	
R2377	ERD25TJ102	CARBON	0.25W	5%	1KΩ	
R2378	ERD25TJ102	CARBON	0.25W	5%	1KΩ	
R2379	ERD25TJ271	CARBON	0.25W	5%	270Ω	
R2380	ERD25TJ183	CARBON	0.25W	5%	18KΩ	
R2381	ERD25TJ100	CARBON	0.25W	5%	10Ω	
R3006	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75Ω	
R3101	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1KΩ	
R3102	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1KΩ	
R3107	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100KΩ	
R3108	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100KΩ	
R3109	ERJ6GEYJ681	S.M.CARB	0.1W	5%	680Ω	
R3110	ERJ6GEYJ681	S.M.CARB	0.1W	5%	680Ω	
R3111	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1KΩ	
R3112	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1KΩ	
R3114	ERJ6GEYJ681	S.M.CARB	0.1W	5%	680Ω	
R3115	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100KΩ	
R3117	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100KΩ	
R3118	ERJ6GEYJ681	S.M.CARB	0.1W	5%	680Ω	
R3119	ERJ6GEYJ333	S.M.CARB	0.1W	5%	33KΩ	
R3120	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3121	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3122	ERJ6GEYJ333	S.M.CARB	0.1W	5%	33KΩ	
R3123	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15KΩ	
R3124	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75Ω	
R3125	ERJ6GEYJ470	S.M.CARB	0.1W	5%	47Ω	
R3126	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1KΩ	
R3127	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1KΩ	
R3128	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100KΩ	
R3129	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100KΩ	
R3130	ERJ6GEYJ681	S.M.CARB	0.1W	5%	680Ω	
R3131	ERJ6GEYJ681	S.M.CARB	0.1W	5%	680Ω	
R3132	ERD2FCVVG100T	CARBON	2W	2%	10Ω	
R3133	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3134	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3135	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3136	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3137	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75Ω	
R3138	ERJ6GEYJ470	S.M.CARB	0.1W	5%	47Ω	
R3139	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	

Ref No.	Part No.	Description				
R3140	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3141	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3142	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3143	ERJ6GEYJ333	S.M.CARB	0.1W	5%	33KΩ	
R3144	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3145	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3146	ERJ6GEYJ333	S.M.CARB	0.1W	5%	33KΩ	
R3147	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15KΩ	
R3148	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75Ω	
R3149	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75Ω	
R3150	ERJ6GEYJ470	S.M.CARB	0.1W	5%	47Ω	
R3151	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75Ω	
R3152	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3153	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3154	ERD2FCVVG100T	CARBON	2W	2%	10Ω	
R3158	ERJ6GEYJ470	S.M.CARB	0.1W	5%	47Ω	
R3159	ERJ6GEYJ681	S.M.CARB	0.1W	5%	680Ω	
R3160	ERJ6GEYJ563	S.M.CARB	0.1W	5%	56KΩ	
R3161	ERJ6GEYJ121	S.M.CARB	0.1W	5%	120Ω	
R3162	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3163	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15KΩ	
R3165	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10KΩ	
R3167	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10KΩ	
R3178	ERJ6GEYOR00	S.M.CARB	0.1W	5%	0Ω	
R3180	ERJ6GEYOR00	S.M.CARB	0.1W	5%	0Ω	
R3182	ERJ6GEYOR00	S.M.CARB	0.1W	5%	0Ω	
R3184	ERJ6GEYOR00	S.M.CARB	0.1W	5%	0Ω	
R3185	ERJ6GEYJ333	S.M.CARB	0.1W	5%	33KΩ	
R3186	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3187	ERJ6GEYJ333	S.M.CARB	0.1W	5%	33KΩ	
R3188	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3192	ERJ6GEYOR00	S.M.CARB	0.1W	5%	0Ω	
R3193	ERJ6GEYOR00	S.M.CARB	0.1W	5%	0Ω	
R3194	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75Ω	
R3195	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75Ω	
R3196	ERJ6GEYJ470	S.M.CARB	0.1W	5%	47Ω	
R3197	ERD2FCVVG100T	CARBON	2W	2%	10Ω	
R3198	ERJ6GEYJ470	S.M.CARB	0.1W	5%	47Ω	
R3199	ERJ6GEYJ470	S.M.CARB	0.1W	5%	47Ω	
R3200	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100KΩ	
R3201	ERJ6GEYJ332	S.M.CARB	0.1W	5%	3K3Ω	
R3202	ERJ6GEYJ332	S.M.CARB	0.1W	5%	3K3Ω	
R3205	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100KΩ	
R3206	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100KΩ	
R3207	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100KΩ	
R3208	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3209	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3210	ERJ6GEYJ152	S.M.CARB	0.1W	5%	1K5Ω	
R3211	ERJ6GEYJ152	S.M.CARB	0.1W	5%	1K5Ω	
R3212	ERJ6GEYJ123	S.M.CARB	0.1W	5%	12KΩ	
R3213	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3214	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15KΩ	
R3215	ERD2FCVVG100T	CARBON	2W	2%	10Ω	
R3216	ERJ6GEYJ680	S.M.CARB	0.1W	5%	68Ω	
R3217	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1KΩ	
R3218	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75Ω	
R3219	ERJ6GEYJ123	S.M.CARB	0.1W	5%	12KΩ	
R3220	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3221	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15KΩ	
R3222	ERJ6GEYJ680	S.M.CARB	0.1W	5%	68Ω	
R3223	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1KΩ	
R3224	ERJ6GEYJ750	S.M.CARB	0.1W	5%	75Ω	
R3225	ERD2FCVVG100T	CARBON	2W	2%	10Ω	
R3226	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15KΩ	
R3227	ERJ6GEYOR00	S.M.CARB	0.1W	5%	0Ω	
R3228	ERJ6GEYJ680	S.M.CARB	0.1W	5%	68Ω	
R3229	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3230	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1KΩ	
R3231	ERD2FCVVG100T	CARBON	2W	2%	10Ω	
R3232	ERJ6GEYJ272	S.M.CARB	0.1W	5%	2K7Ω	
R3233	ERJ6GEYJ331	S.M.CARB	0.1W	5%	330Ω	
R3236	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10KΩ	
R3237	ERJ6GEYJ103	S.M.CARB	0.1W	5%	10KΩ	
R3238	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15KΩ	
R3239	ERJ6GEYJ153	S.M.CARB	0.1W	5%	15KΩ	
R3240	ERJ6GEYJ104	S.M.CARB	0.1W	5%	100KΩ	
R3351	ERJ6GEYJ101	S.M.CARB	0.1W	5%	100Ω	
R3352	ERJ6GEYJ472	S.M.CARB	0.1W	5%	4K7Ω	
R3353	ERJ6GEYJ474	S.M.CARB	0.1W	5%	47KΩ	
R3354	ERJ6GEYJ102	S.M.CARB	0.1W	5%	1KΩ	
R3355	ERJ6GEYJ391	S.M.CARB	0.1W	5%	390Ω	

Ref No.	Part No.	Description
R3501	ERJ6GEYJ100	S.M.CARB 0.1W 5% 10Ω
R3502	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R3503	ERJ6GEYJ471	S.M.CARB 0.1W 5% 470Ω
R3505	ERJ6GEYJ100	S.M.CARB 0.1W 5% 10Ω
R3506	ERJ6GEYJ100	S.M.CARB 0.1W 5% 10Ω
R3507	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R3508	ERJ6GEYJ151	S.M.CARB 0.1W 5% 150Ω
R3509	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R3513	ERJ6GEYJ471	S.M.CARB 0.1W 5% 470Ω
R3514	ERJ6GEYJ471	S.M.CARB 0.1W 5% 470Ω
R3515	ERJ6GEYJ471	S.M.CARB 0.1W 5% 470Ω
R3516	ERJ6GEYJ472	S.M.CARB 0.1W 5% 4K7Ω
R3517	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R3518	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R3520	ERJ6GEYJ221	S.M.CARB 0.1W 5% 220Ω
R3521	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R3522	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R3523	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R3526	ERD25TC0T	CARBON 0.25W 5% 0Ω
R3531	ERJ6GEYJ221	S.M.CARB 0.1W 5% 220Ω
R3532	ERJ6GEYJ391	S.M.CARB 0.1W 5% 390Ω
R3534	ERD25TJ181	CARBON 0.25W 5% 180Ω
R3536	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R3539	ERJ6GEY0R00	S.M.CARB 0.1W 5% 0Ω
R3540	ERJ6GEYJ392	S.M.CARB 0.1W 5% 3K9Ω
R3541	ERJ6GEYJ392	S.M.CARB 0.1W 5% 3K9Ω
R3542	ERJ6GEYJ392	S.M.CARB 0.1W 5% 3K9Ω
R3802	ERG3FJ100	METAL 3W 5% 10Ω ▲
R3803	ERJ6GEYJ221	S.M.CARB 0.1W 5% 220Ω
R3804	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω

Ref No.	Part No.	Description
<b>SWITCHES</b>		
S801	ESB91232A	SWITCH ▲
S1051	EVQ23405R	SWITCH
S1052	EVQ23405R	SWITCH
S1053	EVQ23405R	SWITCH
S1054	EVQ23405R	SWITCH
S1055	EVQ23405R	SWITCH
<b>TRANSFORMERS</b>		
T501	TLHA003	TRANSFORMER
T551	ZTFH65011A	F.B.T. ▲
T801	ETP35KAN615U	TRANSFORMER ▲
T802	ETS49AH137ND	TRANSFORMER
T803	ETQ19K55AY	TRANSFORMER
<b>FILTERS</b>		
X101	EFCT6504BF	FILTER
X102	EFCT5M7MW3	FILTER
X103	EFCT6R0MW5	FILTER
X104	K3953—M100	SAW FILTER
X105	L9454M	SAW FILTER
X106	EFCV3195T6	CERAMIC FILTER
X107	EFCT7004BF	CERAMIC FILTER
X109	EFCV4045T4	CERAMIC FILTER
X601	TSSA024	CRYSTAL
X602	TSSA025	CRYSTAL
X1101	TAF10020	CRYSTAL
X1551	TSSA009	CRYSTAL
X2001	4730007158	CRYSTAL
X3501	TSSA009	CRYSTAL

**DIFFERENCES FOR MODEL TX–W32D3F**


**DIFFERENCES FOR MODEL TX–W28D3F**

Ref No.	Part No.	Description
<b>MISCELLANEOUS COMPONENTS</b>		
4)	TBM8E1742	MODEL LABEL
5)	TNPA0292AA	Y P.C.B. <span style="float:right">▲</span>
6)	TLK8E05123	DEGAUSS COIL <span style="float:right">▲</span>
8)	W76LFC185X05	CRT
9)	TKY8E110	CABINET <span style="float:right">▲</span>
12)	TKU8E00290	BACK COVER <span style="float:right">▲</span>
13)	TNPA0295AW	D P.C.B. <span style="float:right">▲</span>
17)	TNPH0063AZ	E P.C.B. <span style="float:right">▲</span>
20)	TNPA0291AB	M P.C.B. <span style="float:right">▲</span>
24)	TKP8E1148	SPEAKER NET
	TLK8E05124	GEOMAGNETIC CORRECTION COIL▲
	TPC8E4651	OUTER CARTON
	TPD8E621	TOP CUSHION
	TPD8E622	BOTTOM CUSHION
<b>CAPACITORS</b>		
C574	TAC1114Z564A	CERAMIC 400V 0.56μF
C581	ECQF4153JZH	FILM 400V 15nF
C819	ECOS2GA181DB	ELECT 400V 180pF
C820	ECOS2GA181DB	ELECT 400V 180pF
C1901	ECQM1H474J	FILM 50V 470nF
C1902	ECQM1H474J	FILM 50V 470nF
C1903	ECA1EM470GB	ELECT 25V 47pF
C1904	ECKC1H103JB	CERAMIC 50V 10nF
<b>DIODES</b>		
D401	MA167TA5	DIODE
D848	EU02	DIODE
D852	MTZJT–779.1C	DIODE
D1052	AU01V0	DIODE
D1053	AU01V0	DIODE
D1054	AU01V0	DIODE
D1055	AU01V0	DIODE
<b>INTEGRATED CIRCUITS</b>		
IC1104	X24C0302EK	EAROM
IC1105	27C2001C14AC	EPR0M
IC1901	LA6515	EARTH CORRECTION
<b>COILS</b>		
L573	ELHKLBO28B	COIL
L1901	EXCELDR25V	COIL
<b>RESISTOR</b>		
R370	ERQ1CJP1R0	FUSIBLE 1W 5% 1R0Ω <span style="float:right">▲</span>
R555	ERD25CKF2802	METAL 25W 1% 28KΩ <span style="float:right">▲</span>
R557	ERD25CKF6492	METAL 25W 1% 65KΩ <span style="float:right">▲</span>
R558	ERO50PKF4532	METAL 50W 1% 45KΩ <span style="float:right">▲</span>
R574	ERG3FJ151	METAL 3W 5% 150Ω <span style="float:right">▲</span>
R591	ERF2AKR15	WIRE 2W 10% R15Ω
R847	ERQ1CKPR68	FUSIBLE 1W 5% R68Ω <span style="float:right">▲</span>
R909	ERJ6GEYJ222	S.M.CARB 0.1W 5% 2K2Ω
R910	ERJ6GEYJ101	S.M.CARB 0.1W 5% 100Ω
R1901	ERD25TJ110	CARBON 0.25W 5% 11Ω
R1902	ERD25TJ110	CARBON 0.25W 5% 11Ω
R1903	ERD25TJ154	CARBON 0.25W 5% 150KΩ
R1904	ERD25TJ154	CARBON 0.25W 5% 150KΩ
R1905	ERD25TJ154	CARBON 0.25W 5% 150KΩ
R1906	ERD25TJ753	CARBON 0.25W 5% 75KΩ
R1908	ERD25TJ682	CARBON 0.25W 5% 6K8Ω
R1909	ERD25TJ362	CARBON 0.25W 5% 3K6Ω







Ref No.	Part No.	Description
<b>MISCELLANEOUS COMPONENTS</b>		
4)	TBM8E1738	MODEL LABEL
5)	TNPA0292AD	Y P.C.B. <span style="float:right">▲</span>
6)	TXFLK01DAG	DEGAUSS COIL <span style="float:right">▲</span>
8)	W66EHK51X71	CRT
9)	TKY8E120	CABINET <span style="float:right">▲</span>
12)	TKU8E00300	BACK COVER <span style="float:right">▲</span>
13)	TNPA0295AN	D P.C.B. <span style="float:right">▲</span>
17)	TNPH0063BA	E P.C.B. <span style="float:right">▲</span>
20)	TNPA0348AE	M P.C.B. <span style="float:right">▲</span>
24)	TKP8E1152	SPEAKER NET
	TPC8E4652	OUTER CARTON
	TPD8E623	CUSHION TOP
	TPD8E624	CUSHION BOTTOM
<b>CAPACITORS</b>		
C028	ECUV1H103KBX	S.M.CAP 50V 10nF
C574	TAC1114Z824A	CERAMIC 400V 0.82μF
C581	ECQF4123JZH	FILM 400V 12nF
C664	ECUV1H103ZFX	S.M.CAP 50V 10nF
C665	ECUV1H103KBX	S.M.CAP 50V 10nF
C705	ECUV1H101JCX	S.M.CAP 50V 100pF
C819	ECOS2GG181NGELECT	400V 180μF <span style="float:right">▲</span>
C820	ECOS2GG181NGELECT	400V 180μF <span style="float:right">▲</span>
C848	ECKC2H471J	CERAMIC 500V 470pF <span style="float:right">▲</span>
C3813	ECUV1H471JCX	S.M.CAP 50V 470pF
<b>DIODES</b>		
D373	MTZJT–7715A	DIODE
D401	MA165TA5	DIODE 1SS133T–77
D848	ERB32–02E	DIODE RU30LFS1
D852	MTZJT776.2B	DIODE
<b>INTEGRATED CIRCUITS</b>		
IC1104	X24C0302EI	EAROM
IC1105	27C2001C14AE	EPR0M
<b>COILS</b>		
L573	ELHKLBO26B	COIL
<b>RESISTOR</b>		
R370	ERQ1CKPR82	METAL 1W 5% R82Ω <span style="float:right">▲</span>
R555	ERD25TJ223	CARBON 0.25W 5% 22KΩ
R557	ERO25CKF7152	METAL 25W 1% 72KΩ <span style="float:right">▲</span>
R558	ERO50PKF5762	METAL 50W 1% 58KΩ <span style="float:right">▲</span>
R574	ERG3FJ121	METAL 3W 5% 120Ω <span style="float:right">▲</span>
R591	ERF5AKR22	WIRE 5W 10% R22Ω
R847	ERQ1CKPR33	METAL 0.5W 10% R33Ω <span style="float:right">▲</span>
R909	ERJ6GEYJ102	S.M.CARB 0.1W 5% 1KΩ
R910	ERJ6GEYJ151	S.M.CARB 0.1W 5% 150Ω

# SCHEMATIC DIAGRAM FOR MODELS TX-W32D3F TX-W28D3F (Euro-3HW 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.

## Notes

- RESISTOR**  
All resistors are carbon 1/4W resistor, unless marked as follows:  
Unit of resistance is OHM ( $\Omega$ ) (K=1,000, M=1,000,000).
- CAPACITORS**  
All capacitors are ceramic 50V, unless marked as follows:  
Unit of capacitance is  $\mu$ F, unless otherwise stated.
- COIL**  
Unit of inductance is  $\mu$ H, unless otherwise stated.
- Components marked 'L' on the schematic diagram shows leadless parts.
- TEST POINT**  
 : Test Point position
- EARTH SYMBOL**  
 : Chassis Earth (Cold)     : Line Earth (Hot)
- 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
-  : Indicates the Video signal path  
 : Indicates the Audio signal path  
 : Indicates the Vertical/Horizontal signal path
- This schematic diagram is the latest at the time of printing and is subject to change without notice.

## Remarks


- The Power 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. Take the following precautions:

## Precautions







- Do not touch the hot part, or the hot and cold parts at the same time, as you are liable to a shock hazard.
- Do not short-circuit the hot and cold circuits as electrical components may be damaged.
- 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.
- Make sure to disconnect the power plug before removing the chassis.

# ZEICHENERKLÄRUNG FÜR MODELL TX-W32D3F TX-W28D3F (Euro-3HW Chassis)

## WICHTIGER SICHERHEITSHINWEIS

Teile, die mit einem Hinweis  gekennzeichnet sind, sind wichtig für die Sicherheit. Sollte ein Auswechseln erforderlich sein, sind unbedingt Originalteile einzusetzen.

## Anmerkung

- WIDERSTÄNDE**  
Alle 1/4Watt Widerstände sind Kohlewiderstände, Abweichungen sind folgt gekennzeichnet.  
Die Maßeinheit ist OHM ( $\Omega$ ) (K=1,000 M=1,000,000)
- KONDENSATOREN**  
Alle Kondensatoren sind Keramikausführungen  
Spannungsfestigkeit 50V. Abweichungen sind wie folgt gekennzeichnet.  
Die Maßeinheit ist  $\mu$ F, wenne keine andersen Bezeichnungen genannt sind
- SPULEN**  
Die Maßeinheit ist  $\mu$ H, Abweichungen sind gekennzeichnet.  
Mit 'L' gekennzeichnete Teile sind ohne Anschlußdrähte.
- TESTPUNKE**  
 : Kennzeichnung der Testpunktpositio
- MASSE SYMBOL**  
 : Erdung am Chassis     : Erdung an Masse-Leitung
- SPANNUNGSMESSUNG**  
Spannungsmessungen sind mit einem DC-Voltmeter durchzuführen. Die Meßbedingungen sind folgende:  
Netzspannung                      AC 220V-240V 50Hz  
Wiedregabe Signal                Farbbalken-Testbild  
Alle übrigen Einstellungen für Benutzer Sollangaben
-  : Videosignalweg  
 : Audiosignalweg  
 : Signalweg für Hor/Vert. Synchronsignale
- Änderungen im Laufe der Fertigung sind möglich.

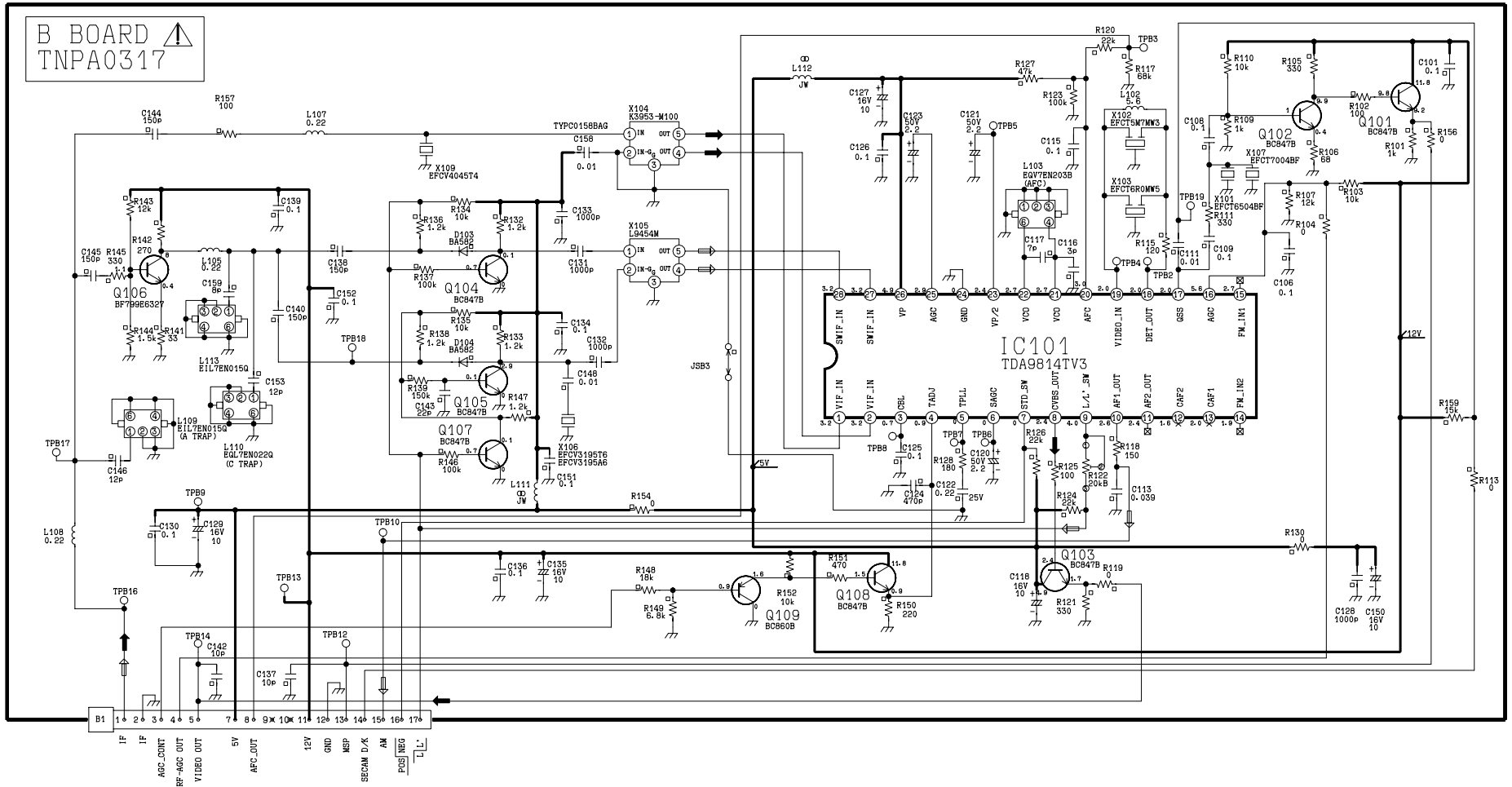
## Bemerkungen

- Das Schaltnetzteil enthält Bereiche, die direkt mit dem Netz verbunden sind. Diese Bereiche sind im Schalplan mit HOT gekennzeichnet. Alle anderen Schaltungen sind mit COLD gekennzeichnet und haben keine direkte Verbindung mit dem Netz.

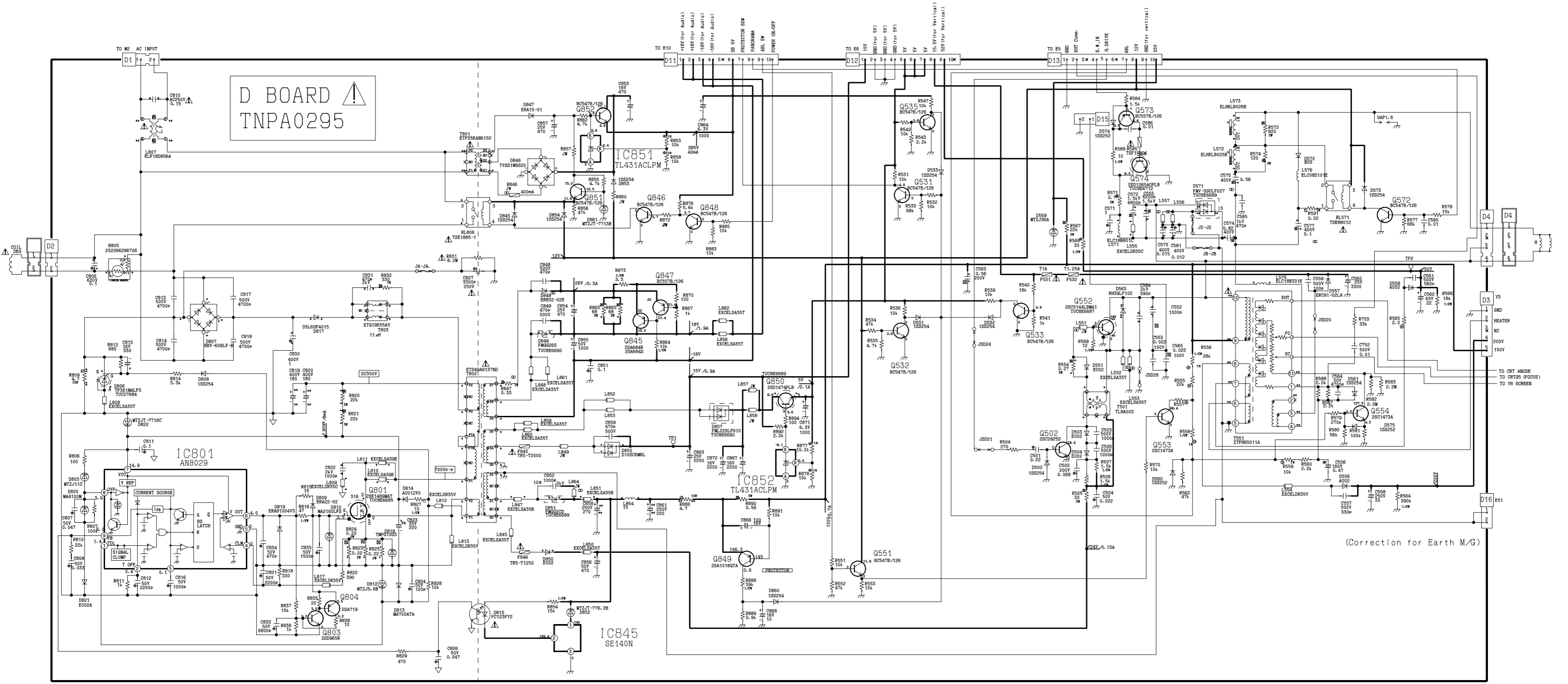
## Für den netzverbundenen Bereich (HOT) sind folgende Vorsichtsmaßnahmen zu beachten:

- Weder die Leitungen im heißen noch Leitungen im heißen und im kalten Bereich gleichzeitig berühren. Es besteht die Gefahr eines elektrischen Schlages.
- Keinesfalls die Leitungen im heißen Bereich mit denen im kalten Bereich verbinden oder kurzschließen. Dies kann zur Zerstörung von Bauteilen oder Sicherungen führen. Außerdem ist die elektrische Betriebssicherheit des Gerätes nicht mehr gegeben.
- Keine Messinstrumente gleichzeitig an Leitungen im heißen und kalten Bereich anschließen. Sicherungen könnten zerstört werden. Die Erde des Messinstrumentes immer mit der des zu prüfenden Schaltkreises verbinden.
- Vor Ausbau des Chassis, Stecker aus der Netzsteckdose ziehen.

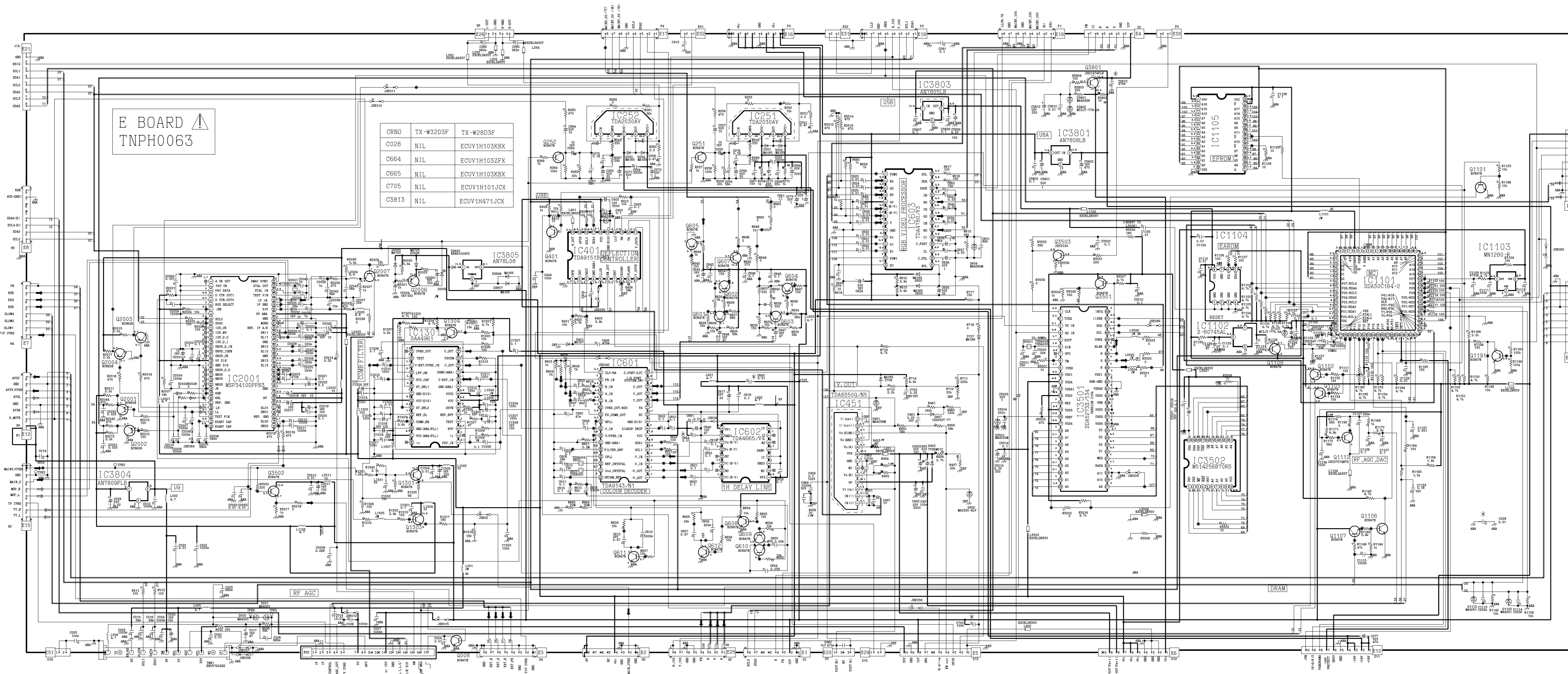
B BOARD  
TNPA0317



D BOARD  
TNPA0295



(Correction for Earth M/G)



E BOARD  
TNP0063

CRN0	TX-W32D3F	TX-W28D3F
C028	NIL	ECUV1H103KBX
C664	NIL	ECUV1H103ZFX
C665	NIL	ECUV1H103KBX
C705	NIL	ECUV1H471JCX
C3813	NIL	ECUV1H471JCX

RF AGC

DRAM

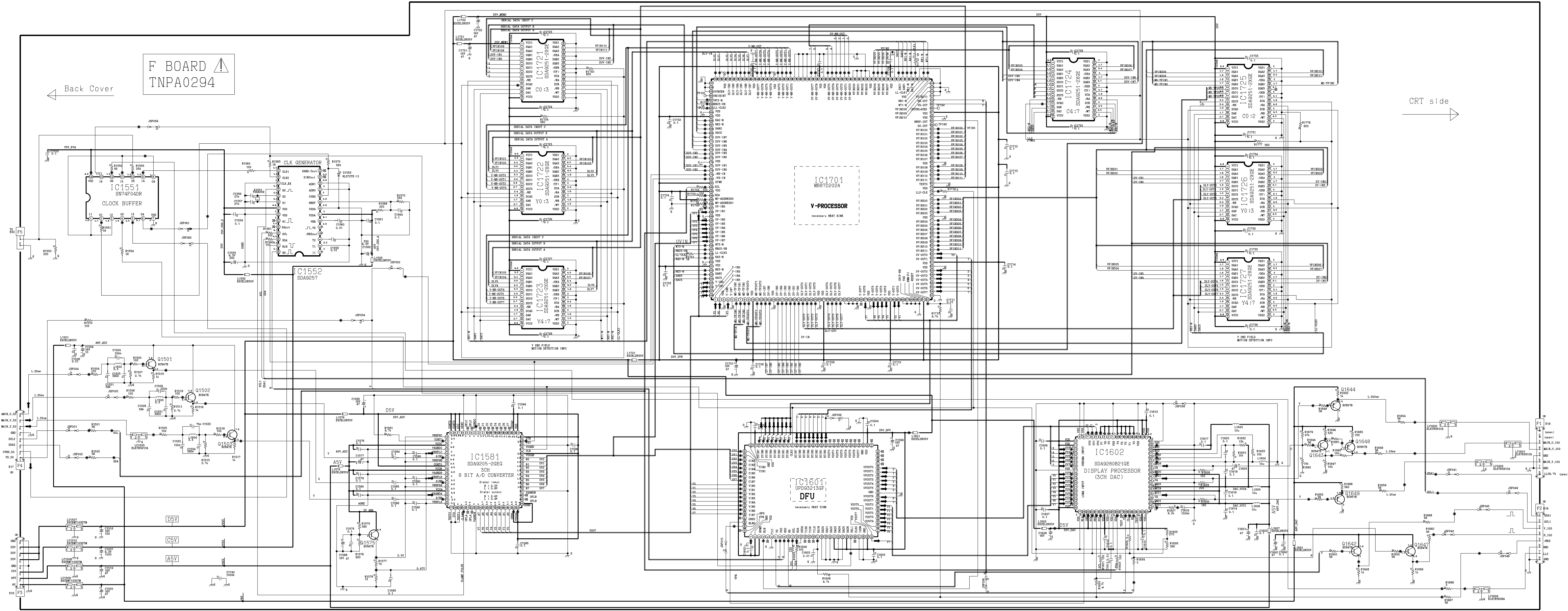
12V  
G.MUTE  
AVTR  
AVTR\_CTR  
ATDC  
ATSC



F BOARD  
TNPA0294

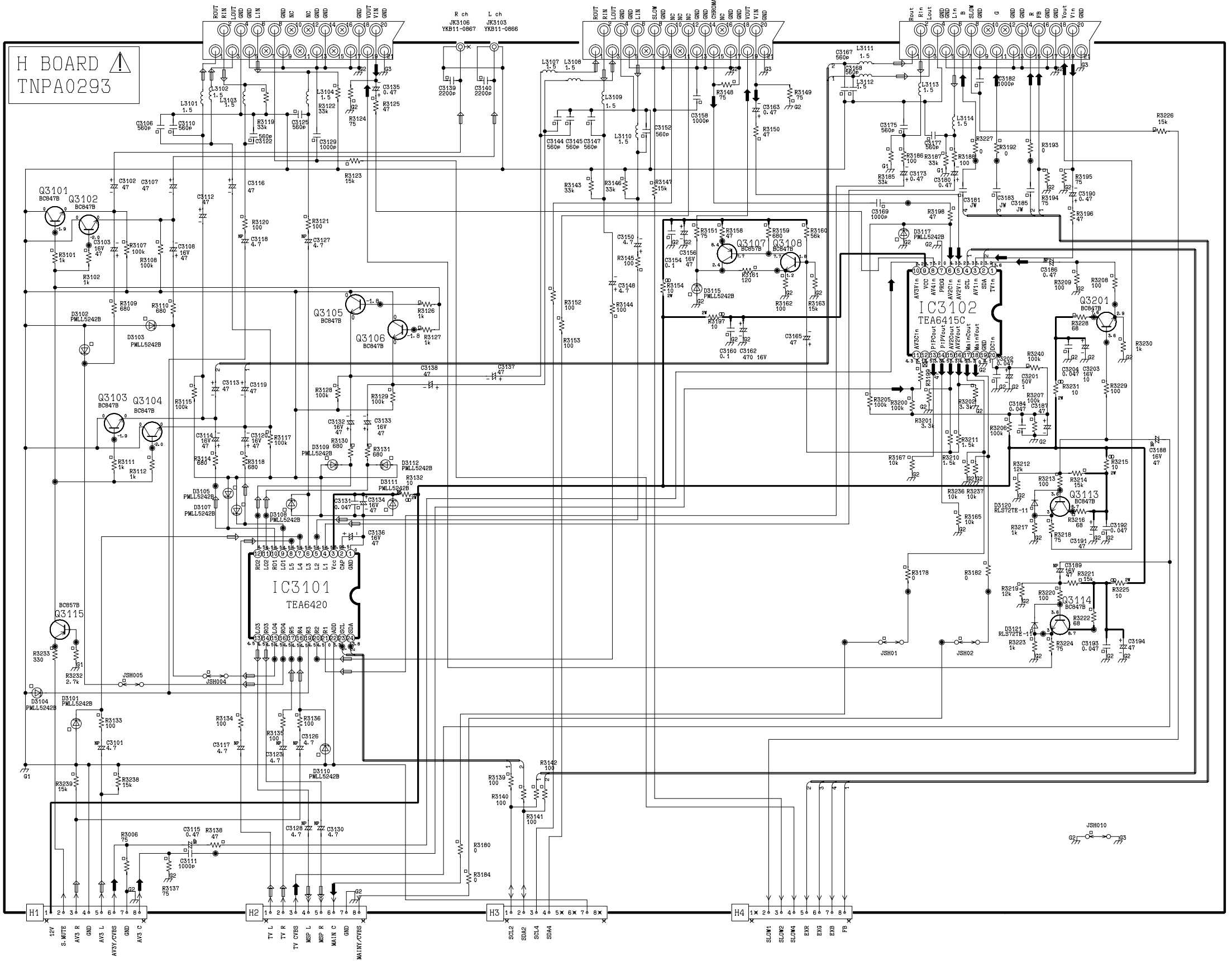
Back Cover

CRT side



H BOARD  
TNPA0293

AV4 JK3104 AV2 JK3102 AV1 JK3101

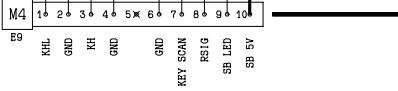
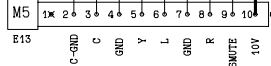
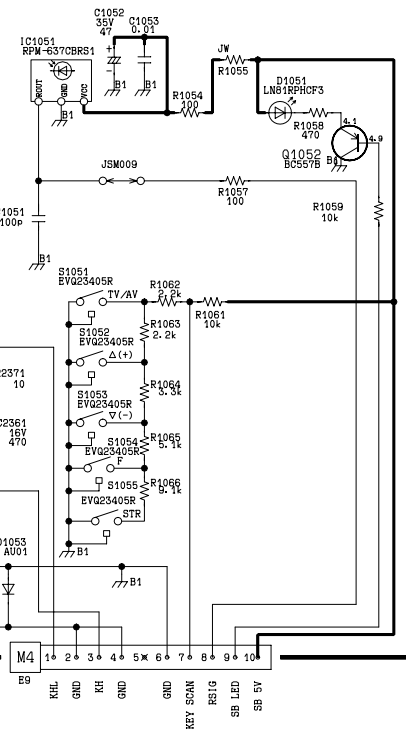
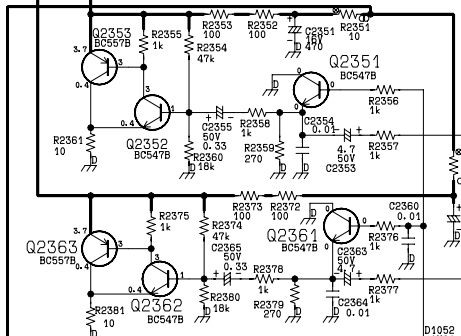
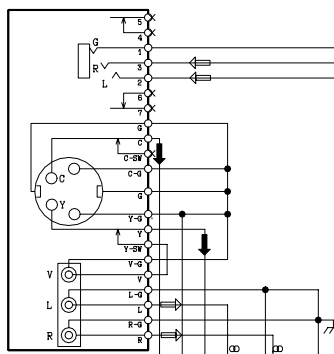
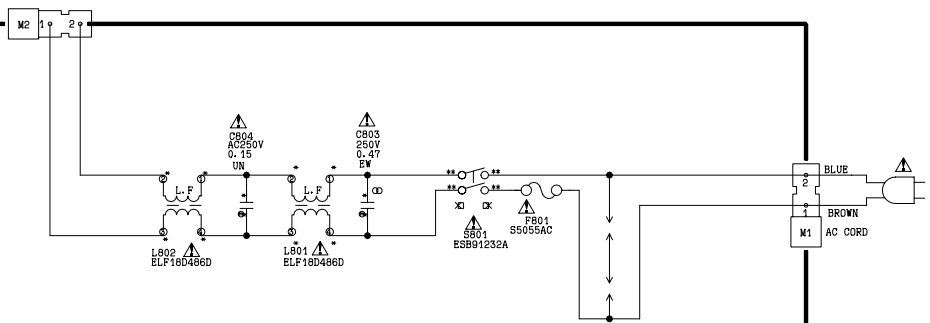


JSH010

M BOARD  
TNPA0291

COLD

HOT



M BOARD  
TNPA0348

COLD

HOT

M2 1 2

C804  
AC250V  
0.15

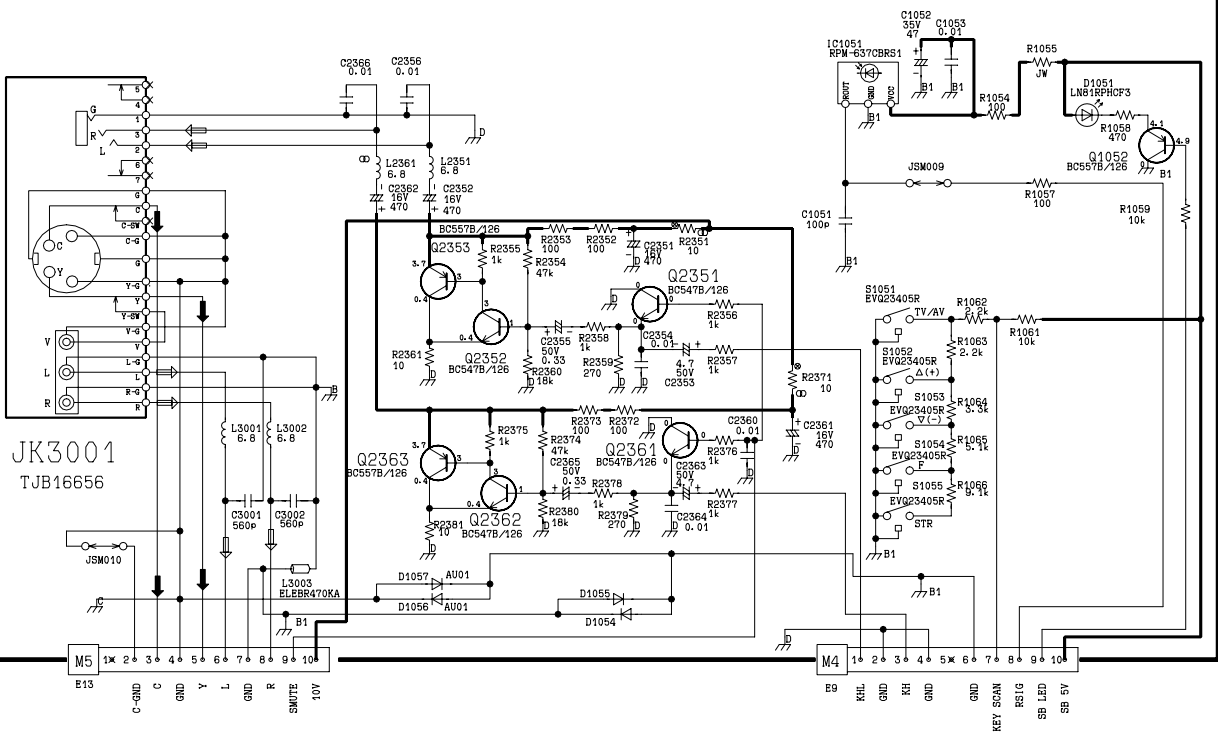
C803  
250V  
0.47

L802  
ELF18D486D

L801  
ELF16D486D

F801  
S501  
ES891232A

BLUE  
BROWN  
M1 AC CORD



JK3001  
TJB16656

M5 1X 2 3 4 5 6 7 8 9 10

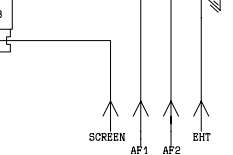
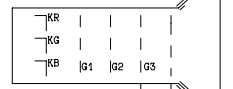
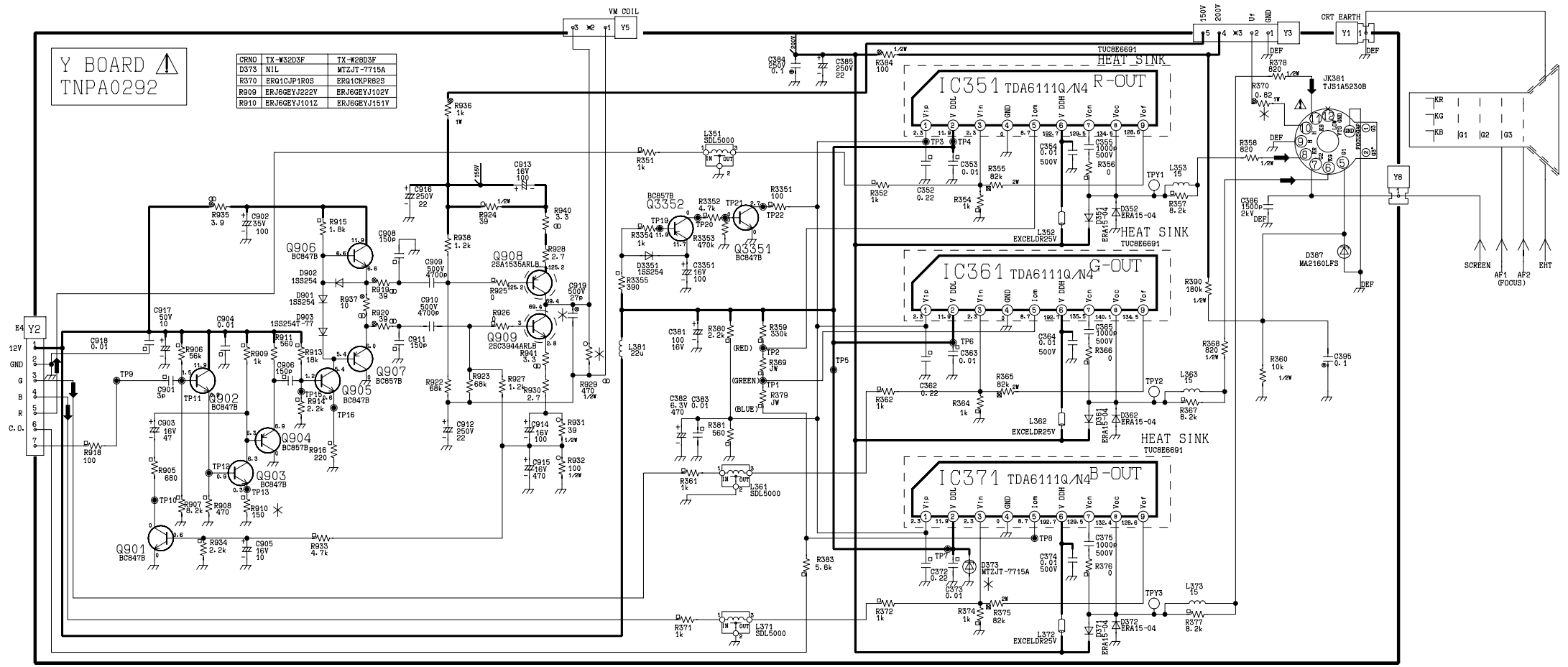
C-OND C OND Y L OND R SMUTE 10V

M4 1 2 3 4 5 6 7 8 9 10

E9 KHL OND XH OND KEY SCAN RSIG LED SB 5V

Y BOARD  
TNPA0292

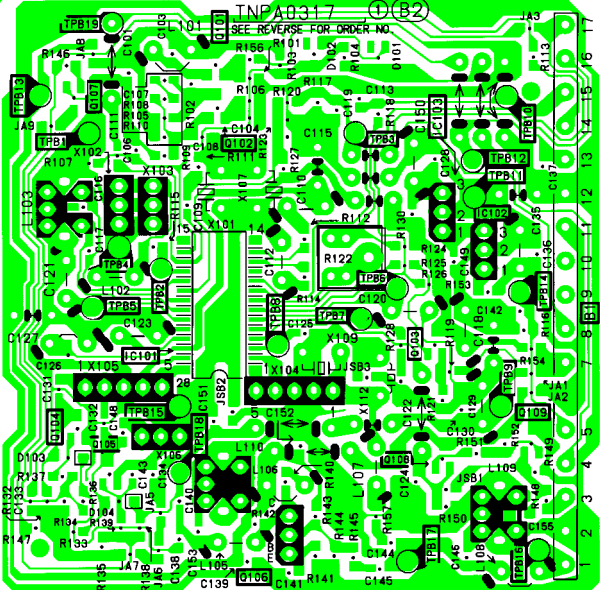
CRND	TX-W32DSF	TX-W28DSF
D373	N1L	MTZJT-7715A
R370	ERQ1CJP1R0S	ERQ1CKPR2BS
R909	ERJ6GEVJ222V	ERJ6GEVJ102V
R910	ERJ6GEVJ101Z	ERJ6GEVJ151V



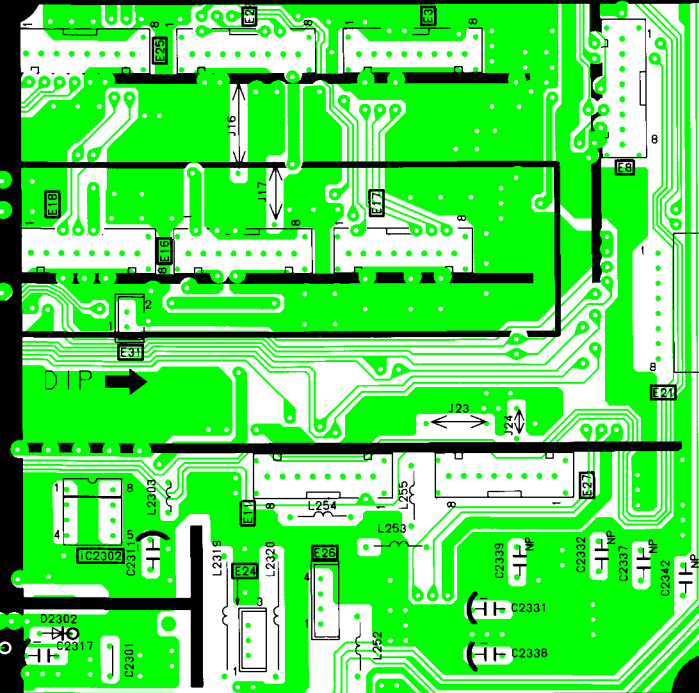
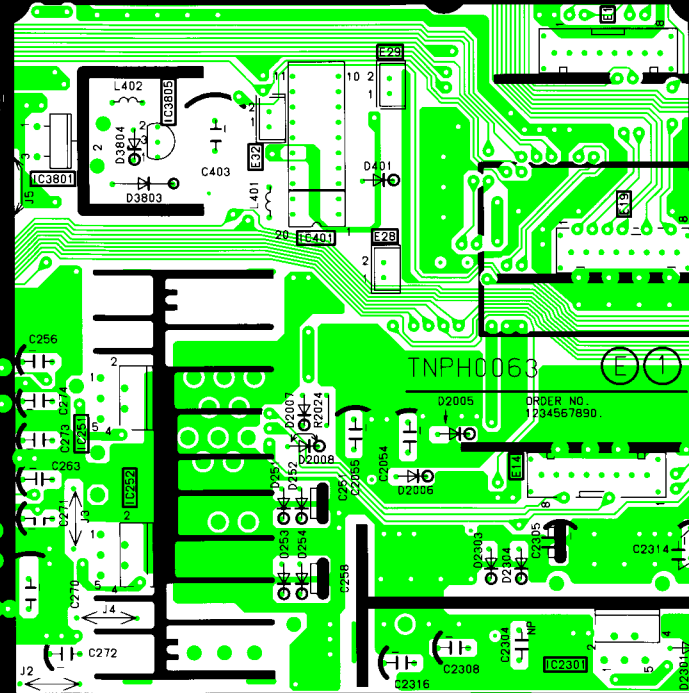
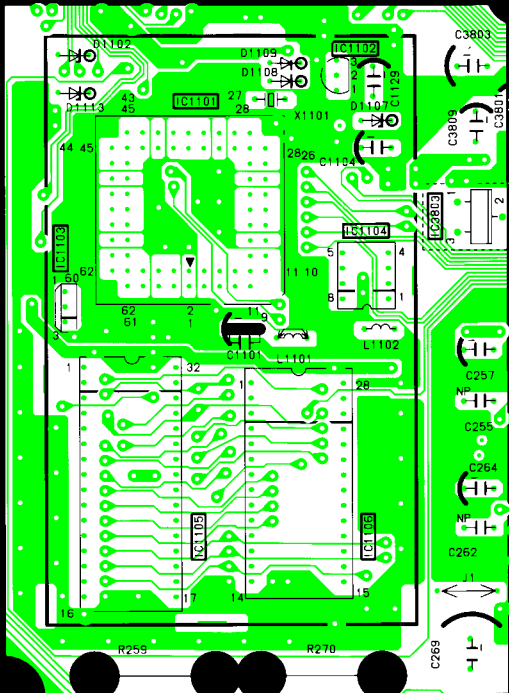
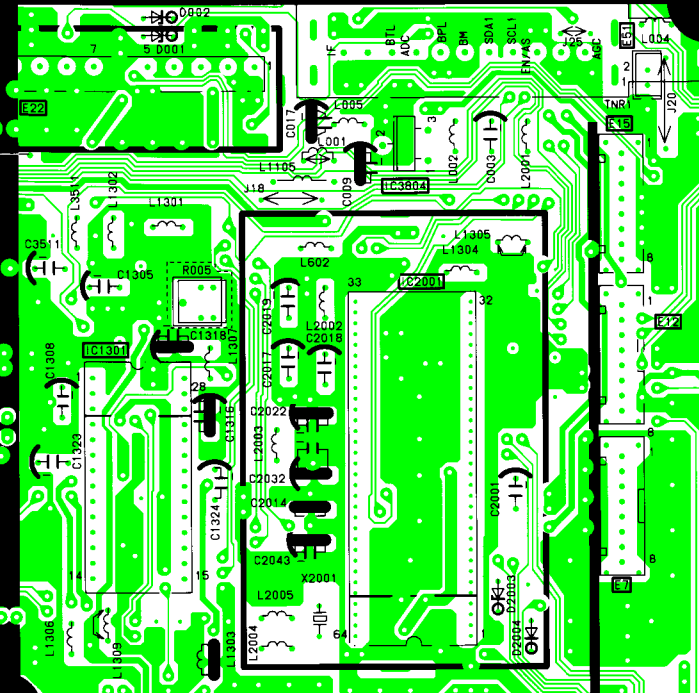
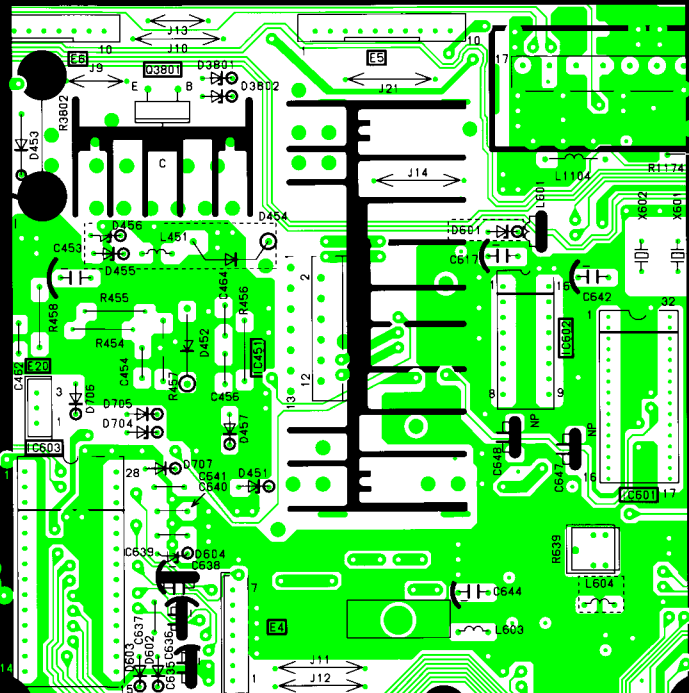
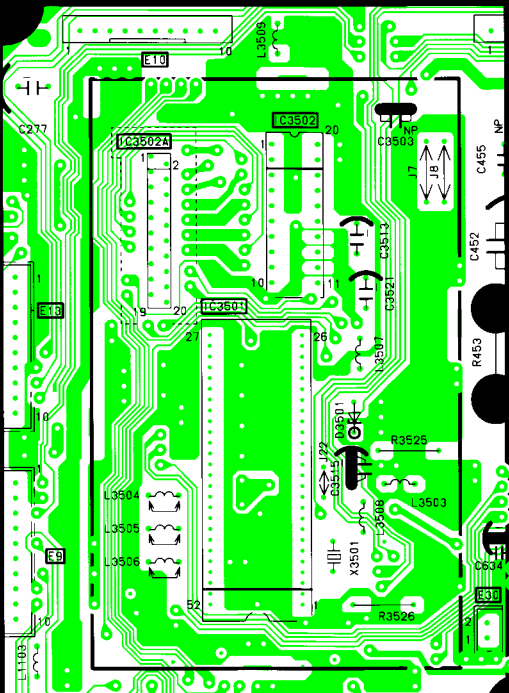
TNP A0317

(B2)

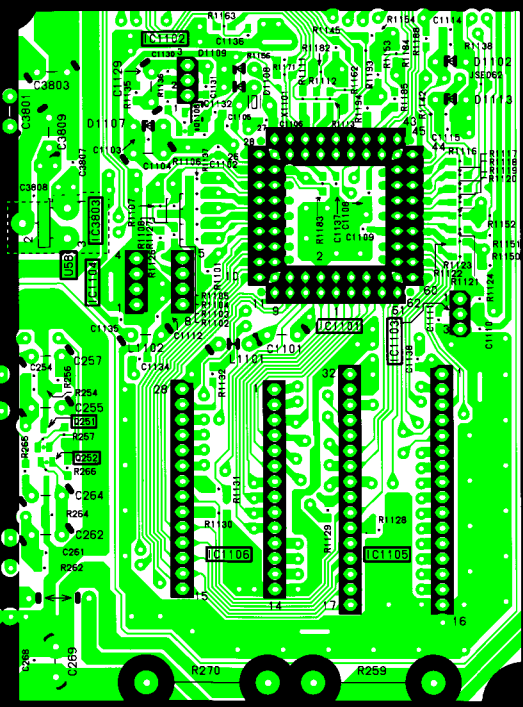
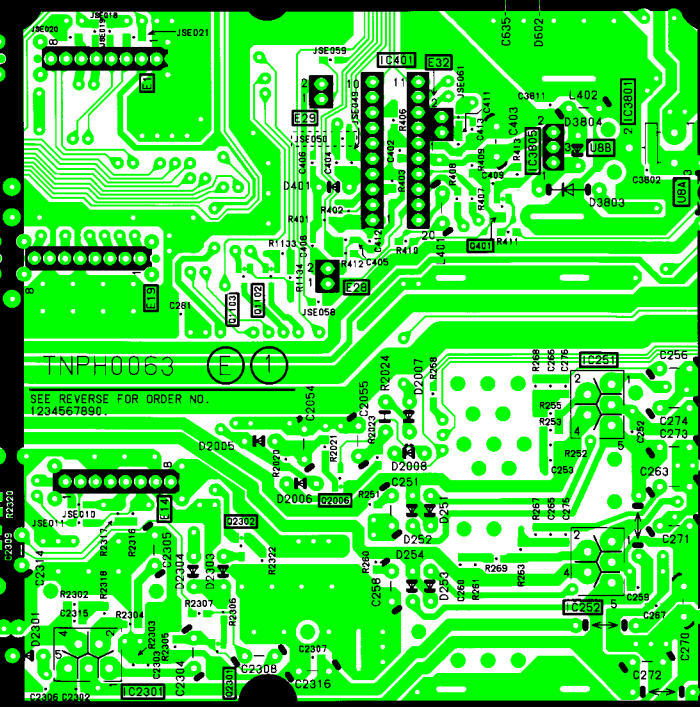
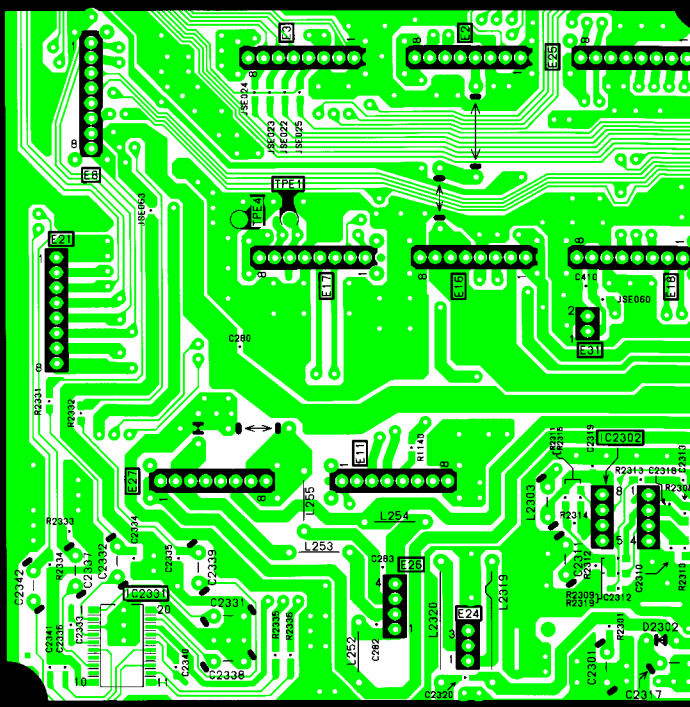
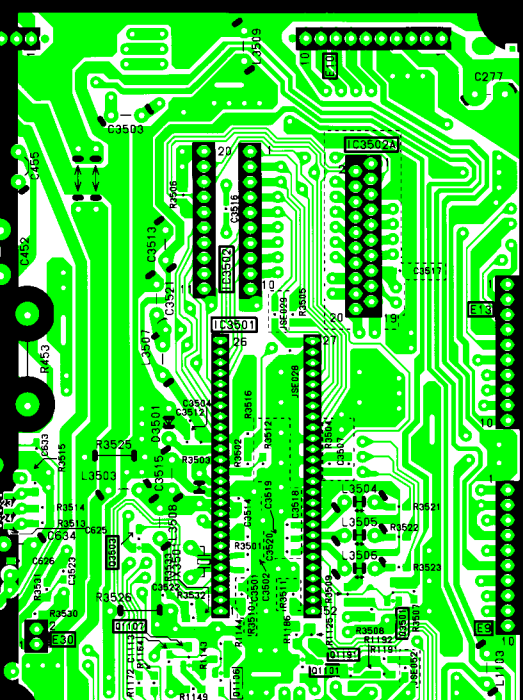
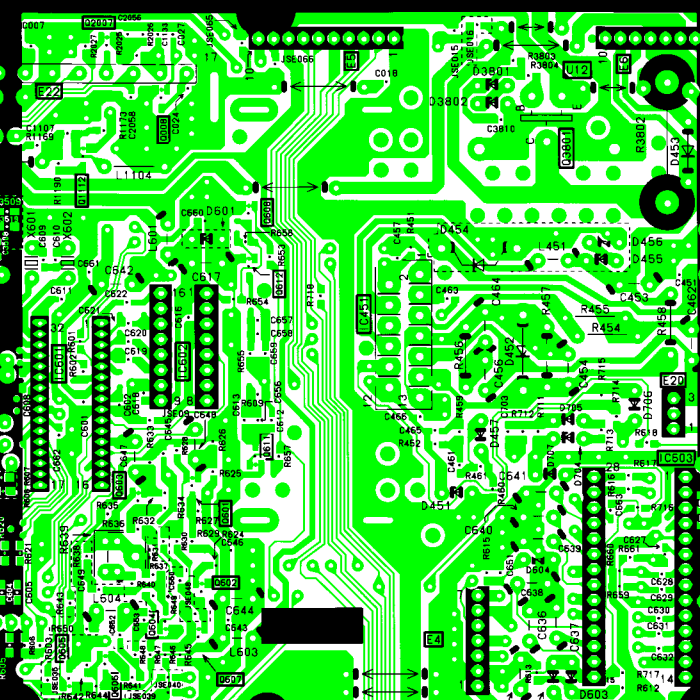
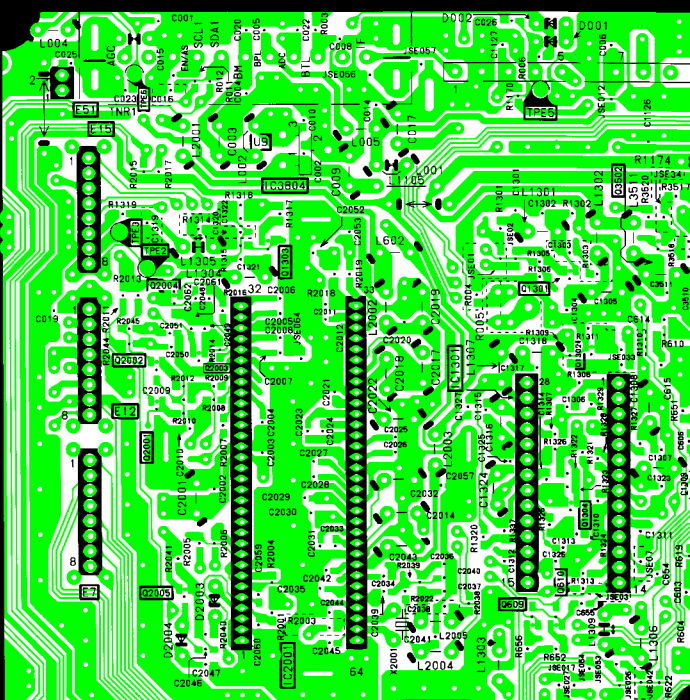
SEE REVERSE FOR ORDER NO.

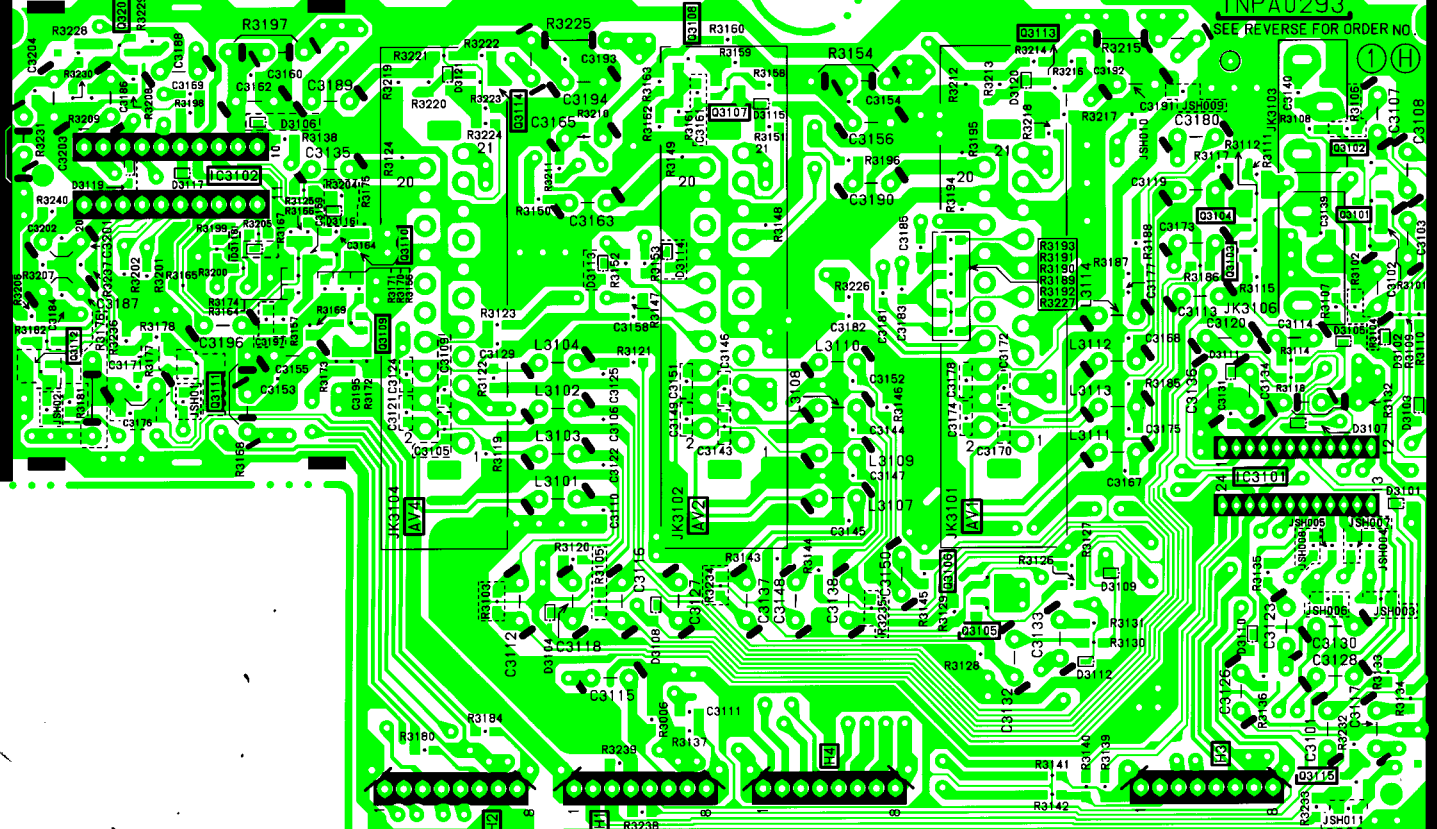


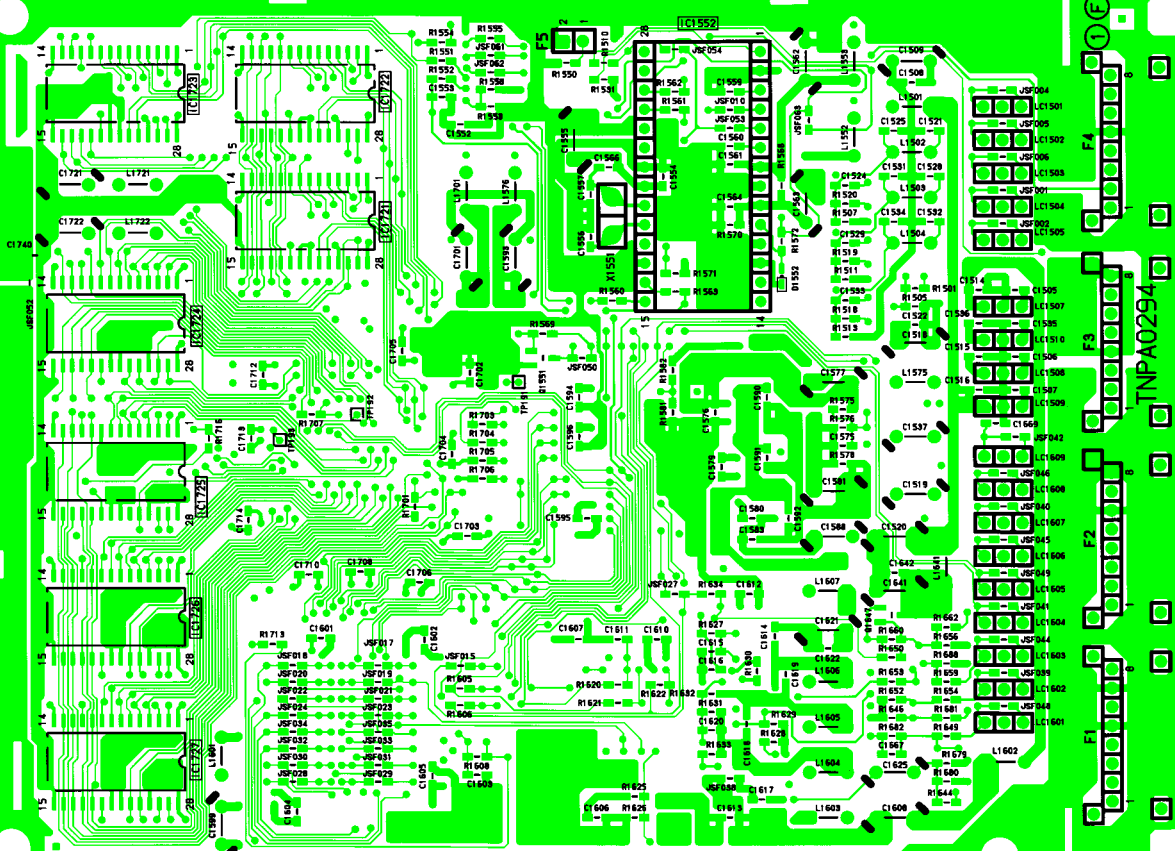






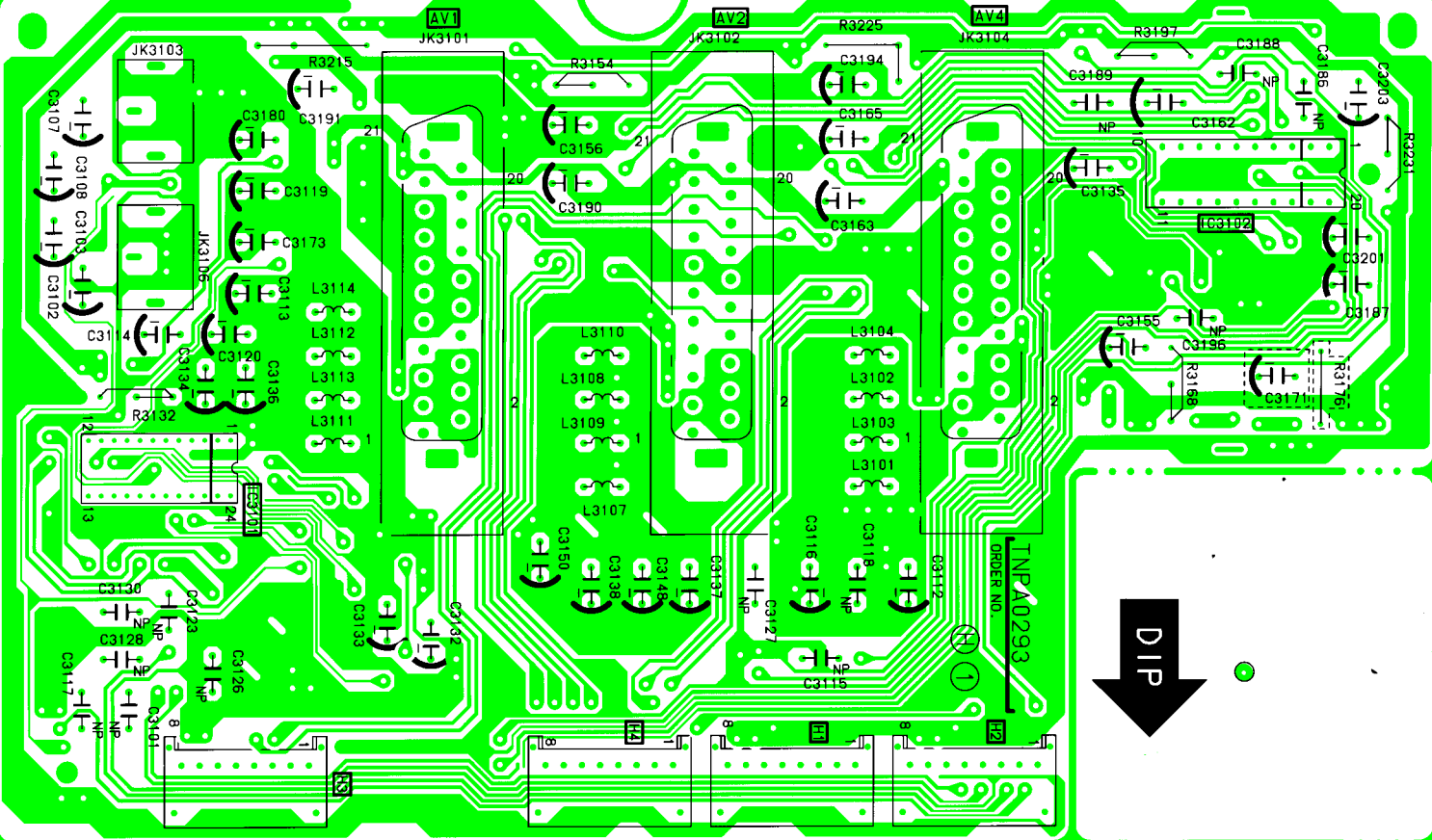


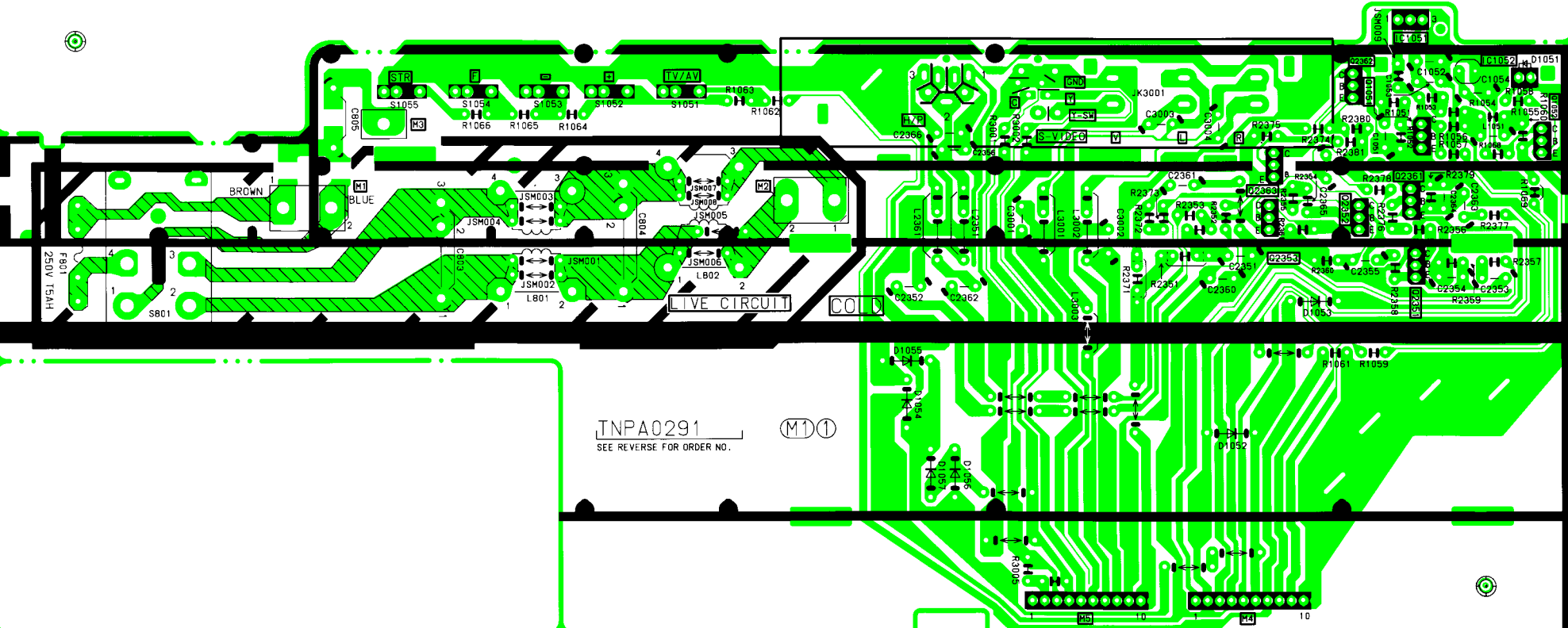




TNPA0294







F801  
250V 15AH

BROWN

BLUE

LIVE CIRCUIT

COLD

TNPA0291  
SEE REVERSE FOR ORDER NO.

(M1) ①

TNPA0292

SEE REVERSE FOR ORDER NO.

(2) (Y)

H.V. DANGER

JK381

