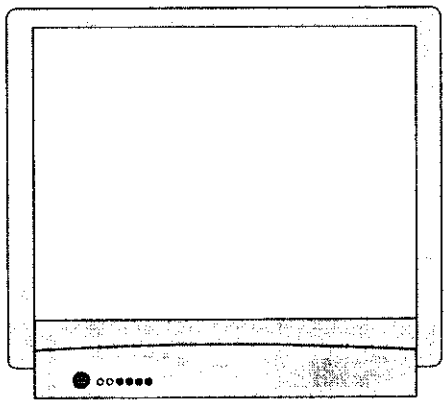
08-1997

MITSUBISHI Service Manual

Colour TV



C21T7G
C21T7S
C25T7S

SPECIFICATIONS

Reception System	CCIR-BG PAL		
Reception Frequency	UHF 470MHz~862MHz VHF 47~170MHz (VB1) VHF 170~448MHz (VB2)		
Mains Input	AC 230V, 50Hz		
Power Consumption	82W	(IEC)	(C21T7G & C21T7S)
	94W	(IEC)	(C25T7S)
	59Wh	(for Italy)	(C21T7S)
	79Wh	(for Italy)	(C25T7S)
Aerial Input	75Ω		
Intermediate Frequency	Video	38.9MHz	
	Sound	33.4MHz	
Audio Output	5W	(Music Power)	
Speaker	11.5 x 5 cm		
Chassis	EE5		
Picture Tube	A51EFS43X09	21"/51cmV, 90°	(C21T7G & C21T7S)
	A59ECY13X01	25"/59cmV, 110°	(C25T7S)
Cabinet dimensions (W x D x H)	49.7cm x 48.5cm x 46cm		(C21T7G & C21T7S)
	58.2cm x 44.5cm x 52cm		(C25T7S)
Weight	19Kg	(C21T7G & C21T7S)	
	24Kg	(C25T7S)	

MITSUBISHI ELECTRIC EUROPE BV

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CONTENTS

1 GENERAL NOTES

1.1 SAFETY PRECAUTIONS

1.1.1 General Warnings

1. Observe any cautions and safety related notes located inside the receiver cabinet and on the receiver chassis.
2. An isolation transformer should be used between the television receiver and the AC power supply point before any test or servicing is performed on a LIVE chassis television receiver.
3. Operation of these receivers outside the cabinet or with the back cover removed involves a shock hazard from the receiver power supplies. Work on the receiver should not be attempted by anyone who is not familiar with the precautions necessary when working on high voltage equipment.
4. Do not install, remove or handle the picture tube unless shatterproof goggles are worn. People not so equipped should be kept away while the picture tube is being handled. Keep the picture tube away from the body while handling.
5. When service is required, observe the original lead dressing. Extra precaution should be given to assure correct lead dressing in the high voltage area. Where a short-circuit has occurred, replace those components that indicate evidence of overheating.

1.1.2 X-RAY Warning

Under fault conditions the CRT can generate X-rays. The use of a lead apron is recommended if available.

When replacing the CRT only use the designated replacement part as it is a critical component with regard to X-rays. No high-voltage adjustments are provided.

1.1.3 Leakage Current Check

Before returning the receiver to the customer it is recommended that the leakage current be measured according to the following method:

With the AC plug removed from the AC source, place a jumper across the live and neutral pins. Turn the receiver AC switch on. Using an OHMMETER, connect one lead to the shorted AC plug and touch the other lead to each exposed metal part (antennas, screw heads, etc.) in turn, particularly any exposed metal part having a return path to the chassis. Any resistance below a value of 1 MEG OHM indicates an abnormality which requires corrective action.

1.2 CONTROLS AND CONNECTORS

1.2.1 Front Panel

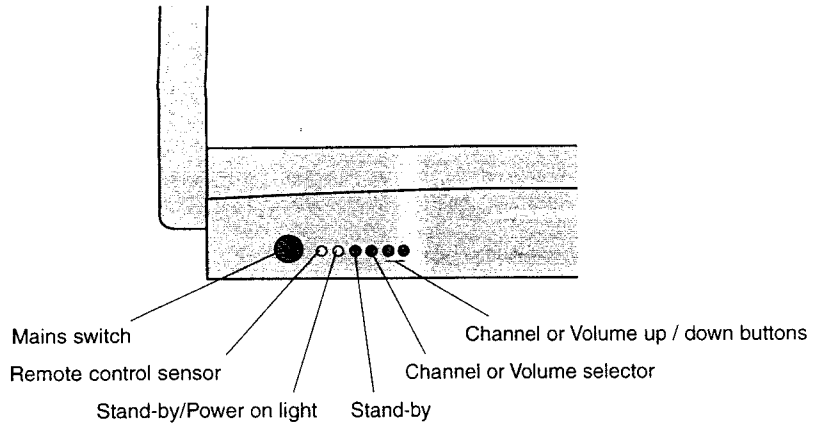


fig. 1.2A Front panel controls

1.2.2 Rear Panel

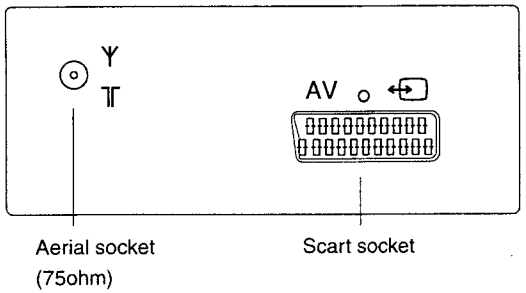


fig. 1.2B Rear panel connectors

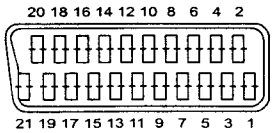


fig. 1.2C Scart socket pin details

SCART SOCKET SPECIFICATION		
Pin	**Signal**	**Spec.**
1	Audio out R	0.5V into 10kΩ
2	Audio in R	0.5V into 10kΩ
3	Audio out L	0.5V into 10kΩ
4	Audio Earth	
5	Blue Earth	
6	Audio in L	0.5V into 10kΩ
7	Blue in	0.7Vpp into 75Ω
8	Function switch	
9	Green Earth	
10	Not connected	
11	Green in	0.7Vpp into 75Ω
12	Not connected	
13	Red Earth	
14	Blanking Earth	
15	Red in	0.7Vpp into 75Ω
16	Blanking	
17	Video out Earth	
18	Video in Earth	
19	Video out	1Vpp into 75Ω
20	Video in	1Vpp into 75Ω
21	Socket Earth	

1.3 REQUIRED EQUIPMENT

1.3.1 Measuring equipment

- Oscilloscope
- Signal generator
- DC milliammeter
- DC voltmeter

1.3.2 Test signals

- PAL Crosshatch
- PAL G-card
- PAL Monoscope (or a VCR playing a monoscope alignment tape)
- PAL Colour-bar with the specification as in figure 1.3A below:

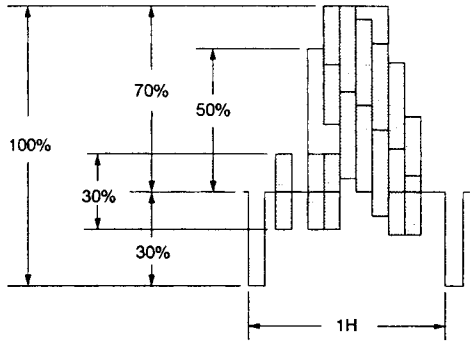


fig. 1.3A Split-field colour bars (with 100% window)

1.4 CONNECTING LEADS

1.4.1 Identification

Connecting leads are generally identified by the colours of their wires according to figure 1.4A below:

Colour	Code
BLACK	A
BROWN	B
RED	C
ORANGE	D
YELLOW	E
GREEN	not used
BLUE	G
VIOLET	H
GREY	J
WHITE	K
PINK	L

Example:

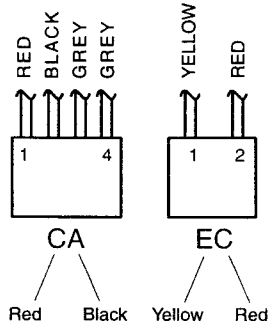


fig. 1.4A Connecting lead identification chart

1.4.2 Lead dressing

Leads must be dressed as shown in table 1.4B and the diagram (fig. 1.4C) below. The leads are routed or clamped so that they do not come close to any heat generating or high-tension parts. The anode lead wire is routed such that no tension is applied to the anode cap. If the mounting angle of the anode cap and the route of the anode lead wires are changed, return them to the initial angle and route.

CLAMP*	LEAD	SPECIAL INSTRUCTIONS
(1)	SC-2	
②	DA	
③	DY	
④	LB	Make a double loop to tale up slack
⑤	SC-1, SA, GA	Make a loop in SC-1 to take up slack
⑥	SB, Focus	Make a loop to take up any slack
⑦	LB, SB, Focus	
(8)	SA, SC-2	
(9)	KK	

* Numbers in (brackets) = permanent clamps, numbers in circles = removable clamps

table 1.4B Lead-dressing details

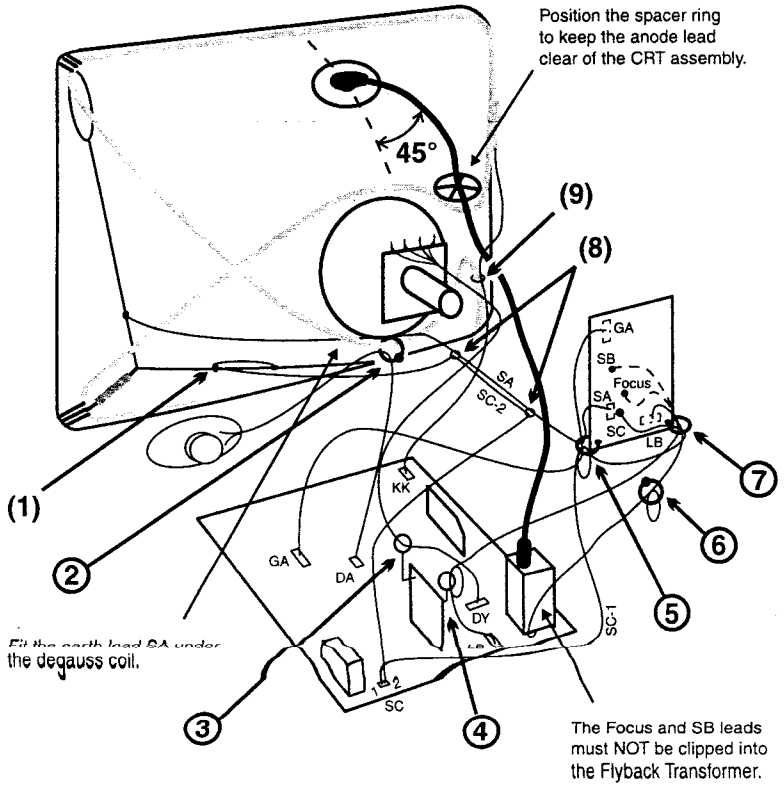


fig. 1.4C Lead-dressing diagram.

2 SERVICE ADJUSTMENT PROCEDURES

2.1 INTRODUCTION

Most service adjustments to these models are made using the remote control (figure 2.1A) with the TV in service mode. The adjustment data is stored in an EEPROM (IC702).

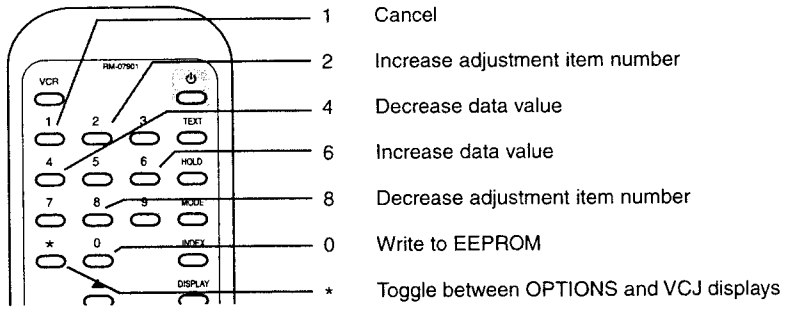


fig. 2.1A Remote Control Unit

2.1.1 Basic adjustment procedure

1. Turn the power on and enter service mode – press MENU to display the MAIN menu then immediately key-in 2-3-5-7.
2. Press the * button to toggle between the OPTION and VCJ adjustment displays (figs. 2.1B and 2.1C):

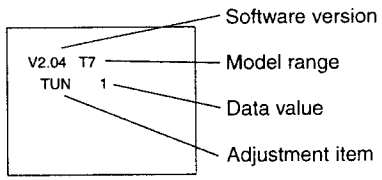


fig. 2.1B Options adjustment display

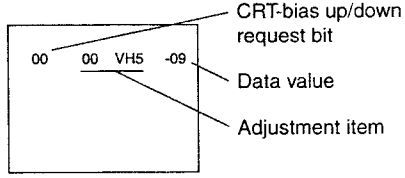


fig. 2.1C VCJ adjustment display

3. Press buttons 2 or 8 to increase or decrease the adjustment item number.
4. Press buttons 6 or 4 to increase or decrease the data value.
5. After completing your adjustments, press button "0" to write the data to the EEPROM.
   To cancel a change, press button "1" before writing the data to the EEPROM. *All* adjustments since the last EEPROM write will be lost.

2.1.2 Software diagnostics system

The microcontroller software contains basic diagnostic tools to help with fault-finding. Two microcontroller pins are used to indicate problems with the EEPROM (IC702) and the VCJ (IC201).

EEPROM – IC702

Should the eeprom fail to respond in some way to the system or if the data transfer to IC701 is continually incorrect then pin 14 of the microcontroller (IC701) will be pulsed continuously to indicate such a problem exists.

The system will continue to try and establish proper I²C communications with the eeprom for up to 30 seconds. The system will then carry out a hardware 'reset' and continue trying for a further 30

seconds. This cycle will repeat indefinitely. This allows the system to operate in a limited way giving the service engineer time to trace the problem.

VCJ – IC201

Should I²C communication with the VCJ fail for some reason then pin 15 of IC701 will be pulsed continuously. The pulses will be HIGH for 2mS every 110mS.

The system will try to establish I²C communication with the VCJ for up to 30 seconds. The system will carry-out a hardware 'reset' and continue again for a further 30 seconds. This cycle will repeat indefinitely. This allows the system to operate in a limited way giving the service engineer time to trace the problem.

H-Timebase

Should the H-Timebase not start then a series of pulses will be output from pin 15 of IC701. The pulses will be HIGH for 125mS every 180mS.

This provides an indicator that the VCJ is functioning but some problem exists in the H-Drive output section of the chassis. The system will keep trying to start the H-Timebase for up to 30 seconds. The system will then carry-out a hardware 'reset' and continue again for a further 30 seconds. This cycle will be repeated a maximum of 10 times. After 10 attempts the system will stop and pin 15 will remain HIGH.

2.2 INITIALISING THE EEPROM

If you have replaced the EEPROM (IC702) or if for any reason the adjustment data has become corrupted it will be necessary to initialise the EEPROM.

2.2.1 Initialising the EEPROM

1. If necessary, switch off by the Mains switch.
2. Connect pins 15 and 21 of IC701 to ground via separate 100Ω resistors.
3. Switch on by the Mains switch and wait 5 seconds.
4. Switch off by the Mains switch and remove the two resistors
5. Switch on again. Press the MENU button to display the MAIN menu then immediately key-in 2-3-5-7 to enter service mode.
6. If necessary, press the * button to select the OPTIONS adjustment display.
7. Press buttons 2 or 8 to select the Option item.
8. If necessary, adjust the data value for each item, using buttons 2 or 4, according to table 2.2A below.

ITEM:	TUN	ATS	STD	SYS	TCS	HTL	LIM	LLC	LLB	CEN	ODD
C21T7G	1	1	0	0	0	0	16	-16	-24	1	0
C21T7S	1	0	0	0	0	0	16	-16	-24	0	0
C25T7S	1	0	0	0	0	0	16	-16	-24	0	1

table 2.2A Data values for the OPTIONS adjustments.

9. Press the 0 button to write the changes to the EEPROM.
10. Press the * button to select the VCJ adjustment display.
11. Press buttons 2 or 8 to select the VCJ item.
12. Adjust the data value for each item, using buttons 2 or 4, according to table 2.2B below.
    Items not listed in the table below are either adjusted as described in the following sections or do not apply to this model.

ITEM:	MTX	TNT	SHA	PCD	HPX
C21T7G / C21T7S	-07	00	001	101	-10
C25T7S	-07	00	001	101	-08

table 2.2B Data values for the VCJ adjustments.

13. Press the 0 button to write the changes to the EEPROM.

2.2.2 EEPROM – OPTION and VCJ item descriptions

OPTION ITEMS		VCJ ITEMS		
TUN	Tuner Type	00	VH5	Vertical-Amplitude - 50Hz
ATS	Auto-Tuning System	01	VBC	Vertical Breathing Correction
STD	Reception Standard	02	PA5	Parabola Amplitude - 50Hz
SYS	Colour System	03	PT5	Parabola Tilt
TCS	Text Character Set	04	LIN	Vertical Linearity
HTL	Hotel Mode Enable	05	CC5	Corner Correction
LIM	Volume Limiter (hotel mode)	06	HW5	Horizontal Width - 50Hz
LLC	Lower Limit Contrast	07	MTX	16x9 - SW.RGB-MATRIX
LLB	Lower Limit Brightness	08	VS5	Vertical Shift - 50Hz
CEN	Centralise DAC Bars	09	HP5	Horizontal Phase - 50Hz
ODD	Odd / even text de-interlace	0A	BDR	Blue Drive
		0B	GDR	Green Drive
		0C	RDR	Red Drive
		0D	CON	Contrast
		0E	BRI	Brightness
		0F	COL	Colour Saturation
		10	TNT	NTSC Tint
		11	SHA	Sharpness
		12	PCD	PAL Chroma Delay
		13	SCD	SECAM Chroma delay
		14	VH6	Vertical Amplitude - 60Hz
		15	PA6	Parabola Amplitude - 60Hz
		16	HW6	Horizontal Width - 60Hz
		17	VS6	Vertical Shift - 60Hz
		18	HP6	Horizontal Phase - 60Hz
		19	HPS	Horizontal Phase - Secam
		1A	HPX	Horizontal Phase - external RGB

2.3 POWER CIRCUIT

2.3.1 B+ Voltage

VR901 (between the Mains Switch and the SMT)

1. Connect a G-card signal.
2. Push the OPTIMUM button.
3. Connect a DC voltmeter's "+" lead to TP91 on the MAIN PCB and the "–" lead to GROUND.
4. Adjust **VR901** so that the voltage is 145±2V for C25T7S or 120±2V for C21T7G / C21T7S.

2.4 VIF CIRCUITS

2.4.1 RF-AGC

VR101 (between the Tuner and Scart socket)

1. Connect a G-card signal.
2. Check the AFT is on for the current channel.
3. Adjust **VR101** so that the picture and sound exhibit no noise, beat or intermodulation distortion.

2.5 DEFLECTION CIRCUITS

2.5.1 Important notes

Before making any adjustments, if you have changed the CRT, FLYBACK TRANSFORMER or made any changes in the deflection circuits; adjust the CRT bias as described in 2.7.1, steps 1 ~3 (Screen control).

Check the VERTICAL BREATHING CORRECTION as follows:

1. Select the VCJ adjustment display.
2. Select adjustment item **01 VBC** with buttons 2 or 8.
3. If necessary, adjust the data value to **-31** using buttons 4 or 6.

2.5.2 Horizontal centre

09 HP5

1. Connect a G-card signal.
2. Select the VCJ adjustment display.
3. Select adjustment item **09 HP5** with buttons 2 or 8.
4. Adjust the horizontal position with buttons 4 or 6.

2.5.3 Horizontal width (C25T7S only)

06 HW5

1. Connect a G-card signal.
2. Select the VCJ adjustment display.
3. Select adjustment item **06 HW5** with buttons 2 or 8.
4. Adjust horizontal width with the buttons 4 or 6.

2.5.4 East-West PCC (C25T7S only)

05 CC5
03 - PT5
02 - PA5

1. Connect an RF PAL Crosshatch signal.
2. Select the VCJ adjustment display.
3. Select adjustment item **05 CC5** with buttons 2 or 8.
4. Adjust the data value to **-25** with buttons 4 or 6.
5. Select adjustment item **03 PT5** with buttons 2 or 8.
6. Watching the second vertical line in from both sides of the screen (figure 2.5A), make any upper and lower distortion symmetrical using buttons 4 or 6.
7. Select adjustment item **02 PA5** with buttons 2 or 8.
8. Adjust the straightness of both vertical lines (figure 2.5B) using buttons 4 or 6.
9. Repeat steps 1 to 8 above if necessary.
10. Check the horizontal width and horizontal centre adjustments and readjust if necessary.

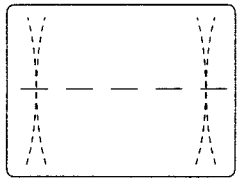


fig. 2.5A

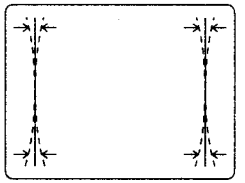


fig. 2.5B

2.5.5 Height and linearity

00 VH5
04 LIN

1. Connect a G-card signal.
2. Select the VCJ adjustment display.
3. Select adjustment item **00 VH5** with buttons 2 or 8.
4. Adjust the circle to a true circle with buttons 4 or 6.
5. Select adjustment item **04 LIN** with buttons 2 or 8.
6. Adjust the linearity to be the same for the top and bottom halves of the circle using buttons 4 or 6.
7. Select adjustment item **00 VH5** with buttons 2 or 8.
8. Readjust the height with buttons 4 or 6.
9. Repeat the steps above for the best overall result.

2.5.6 Vertical centre

08 VS5

1. Connect a G-card signal.
2. Select the VCJ adjustment display.
3. Select adjustment item **08 VS5** with buttons 2 or 8.
4. Adjust the centre line of picture to be within +/– 3mm from the vertical centre on the screen using buttons 4 or 6.

2.5.7 60Hz Defection circuit offsets

14 VH6
15 PA6
16 HW6
17 VS6
18 HP6

1. Connect an RF 60Hz Crosshatch signal.
2. Select the VCJ adjustment display.
3. Select each adjustment code in turn with buttons 2 or 8 and adjust each item to the figures shown in table 2.5C below using buttons 4 or 6.

	VH6	PA6	HW6	VS6	HP6
C21T7G / C21T7S	+06	00	00	+04	-05
C25T7S	+06	+02	-06	+02	-03

table 2.5C 60Hz adjustment offsets

These figures are typical, adjust for best results if necessary.

2.6 CRT CIRCUITS

2.6.1 White balance

0A BDR
0B GDR
0C RDR

1. Connect a VCR and play a PAL-Monoscope alignment tape.
2. Adjust COLOUR to minimum.
3. Select the VCJ adjustment display.
4. Select each adjustment code in turn with buttons 2 or 8 and preadjust each item to the figures shown in table 2.6A below using buttons 4 or 6.

	0A BDR	0B GDR	0C RDR
Data:	+09	+08	+14

table 2.6A White balance starting points

5. Adjust the blue drive and red drive, codes **0A BDR** and **0C RDR**, to give the best white balance.

2.6.2 Focus

FOCUS control on the Flyback Transformer

1. Connect an RF signal such as an off-air broadcast.
2. Adjust the **FOCUS** control for the best overall focus.

2.7 VIDEO CIRCUITS

Perform the following adjustments after adjusting the Deflection circuits. Allow the TV to warm up for 20 minutes before proceeding

2.7.1 Brightness and Contrast

SCREEN control on the Flyback Transformer
0F COL
0E BRI
0D CON
BEAM CURRENT (using connector TP adjacent to the Flyback Transformer)

1. Connect a black raster signal to the RF or AV input.
2. Connect an oscilloscope to the junction of R673 and wire link W603.
3. Adjust the SCREEN control on the Flyback Transformer to give a voltage of 170V as shown in figure 2.7A.

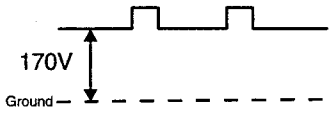


fig. 2.7A

4. Connect an RF Colour-bar signal.
5. Select adjustment item **0F COL** with buttons 2 or 8.
6. Adjust the data value to –31 with buttons 4 or 6.
7. Select adjustment item **0E BRI** with buttons 2 or 8.
8. Adjust using buttons 4 or 6 so that only a slight difference in brightness can be seen between blue and black areas.
9. Select adjustment item **0D CON** with the buttons 2 or 8.
10. Connect a DC ammeter's "+" lead to connector TP pin 1 on the MAIN-PCB and the "–" lead to connector TP pin 2.
11. Adjust the beam current using buttons 4 or 6 to 1100±20µA for C25T7S or 900±20µA for C21T7G / C21T7S.
12. Check, and if necessary, readjust the BRIGHTNESS, code **0E BRI**.
13. Check that the Screen Up/Down Request Bit is 00. If not, repeat steps 1 to 13 above.
14. Now proceed to the Colour Output adjustment.

2.7.2 Colour output

Make this adjustment only after adjusting the White Balance, Brightness and Contrast.

0F COL

1. Connect an RF Colour-bar signal.
2. Select the VCJ adjustment display.
3. Select adjustment item **0F COL** with buttons 2 or 8.
4. Connect an oscilloscope to IC660 - Pin 9 (BLUE-OUT) on the CRT PCB).
5. Make adjustments using buttons 4 or 6 until the waveform is as shown in figure 2.7B.
6. Increase the resulting data value by five steps.

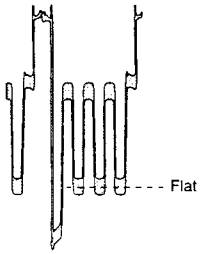


fig. 2.7B

3 OPERATION GUIDE

LANGUAGE SELECTION

The On-Screen display system for this TV can be set to use different languages:

1. Press *and hold* the **MENU** button for 6 or 7 seconds until the Tuning Menu appears.
2. Press the YELLOW button to choose a language.

MENU SYSTEM

The Menu system operates as follows:

1. **Press the MENU button.**

   The Main Menu appears.
   Use ▲ or ▼ to select the control and ◿+ or ◿− to adjust the control.
   With the Picture Menu on the screen, press the **OPTIMUM** button to return the *selected* picture control to the factory pre-set level.

   During normal TV viewing, pressing the **OPTIMUM** button will return *all* the picture settings to the factory pre-set levels.

   Press the **DISPLAY** button to exit.

2. **Press the MENU button twice.**

   The Special Menu appears.
   Use ▲ or ▼ to select the control and ◿+ or ◿− to adjust the control.

2a. **COLOUR SYSTEM:** toggle between AUTO, PAL and 60PAL. This temporarily overides the colour system set in the Tuning menu. Any change is lost when you change channel or select AV.

2b. **AUTO SUBTITLE:** Use ◿+ or ◿− to select ON, OFF or MUTE.

   OFF = No automatic subtitles.
   ON = Subtitles appear when available.
   MUTE = Automatic subtitles appear when the volume is muted.

   By default the subtitle page number is set to 888, this can be changed for each programme position:- press the **MODE** button, the subtitle page number turns ***yellow***, key in the new subtitle page number. Press the **STORE** button to memorise the change. The new subtitle page number turns *red* to confirm the action.

2c. **ON-TIMER:** This sets up the TV so that it will switch itself on from standby at a pre-set time on a pre-set programme number.

   A. Use ▲ or ▼ to select **ON TIMER**.
   B. Press the **MODE** button. The power on time and programme number turn ***yellow***.
   C. *Key in the power-on time in 24hr clock format.*
   D. Key in the programme number with a leading zero if required.
   E. Press the **DISPLAY** button to exit.

   *The On Timer will not work if the **CURRENT TIME** indicator shows **"NOT SET"**. This may happen if your TV has not been able to find the correct time from the Teletext signal on one of the first four programme positions.*

3. **Press and hold the MENU button** for 6 or 7 seconds. The Tuning Menu appears...

TUNING SYSTEM

AUTO-TUNING

The Auto-tuning system will tune in and store all available stations within your reception area. The C21T7G model will also automatically name and position broadcasts from Germany, Austria and Switzerland.

If you have a VCR connected to the TV (by the aerial socket) you should insert a *commercially recorded* videotape and set your VCR to PLAY.

1. Press *and hold* the **MENU** button for 6 or 7 seconds until the Tuning Menu appears.
2. Press ▲ or ▼ to select **ATS** and switch **ON** by pressing ◿+.
3. Press ▼ to select the tuning bar.
4. Start Auto-tuning by pressing ◿+.
   It will take a few minutes for the TV to find, store (and name) all the available stations.

When Automatic Tuning is completed the tuning menu will disappear and the TV will switch to programme position 1.

If your VCR was "found" during Automatic Tuning it will have been stored in a position above 7.

MOVING AND DELETING STATIONS

1. Press and hold the **MENU** button for 6 or 7 seconds until the Tuning Menu appears.
2. Press the **MENU** button again. The Shuffle Menu appears.
3. Use the number buttons to select the station you want to move or delete.
4. To **move** a station:

   Press the **YELLOW** colour button to highlight this programme position in *red*.

   Use the number buttons to select the new programme position. The colour bar at the base of the menu flashes white to confirm the move.

5. To **delete** a station:
   Press the **GREEN** button **twice.**
6. Repeat steps 3 to 7 for other stations.
7. Press the **DISPLAY** button to exit.

PROGRAMME SKIP

This TV has a "skip" feature which allows you to preset a programme number so that it is not selected when changing channels using ▲ or ▼.

1. Press and hold the **MENU** button for 6 or 7 seconds until the Tuning Menu appears.
2. Press the **MENU** button again. The Shuffle Menu appears.
3. Use the number buttons to select the programme position you wish to "skip".
4. Press the **RED** colour button. The programme name turns **RED**.
5. Repeat steps 3 and 4 as required.
6. Press the **DISPLAY** button to exit.

RENAMING PROGRAMMES

1. Press and hold the **MENU** button for 6 or 7 seconds until the Tuning Menu appears.
2. Press **MENU** again. The Shuffle Menu appears.
3. Use the number buttons to select the programme position you want to re-name.
4. Press the **BLUE** colour button. A pointer appears under the first character in the name.
5. Use ◿+ or ◿− to change the character above the pointer. *A blank space = "-".*
6. Press the **BLUE** colour button. The pointer moves to the next character.
7. Repeat steps 5 and 6 to complete the name.
8. Repeat steps 3 to 7 for other programmes.
9. Press the **DISPLAY** button to exit.

MANUAL AND FINE TUNING

1. Press and hold the **MENU** button for 6 or 7 seconds until the Tuning Menu appears.
2. Use the number buttons to select a station.
3. Highlight **ATS** using ▲ or ▼ and switch it **OFF**.
4. Use ▼ to select the band indicator and select the required band using ◿+ or ◿− .
5. Use ▼ to select the tuning bar.
6. Start manual tuning by pressing ◿+ or ◿− . The tuning bar turns **RED** while searching then **YELLOW** after a station is found. Press ◿+ or ◿− again if this is not the right station.
   *If the tuning bar does not turn red, press ▲ or ▼ to highlight **AFT** and switch it **ON** by pressing ◿+. Then go back to step 5.*
7. **To Fine Tune:** press ▲ or ▼ to select **AFT** and switch it **OFF** by pressing ◿+ or ◿− .
8. Press ▼ to select the tuning bar and adjust the fine tuning by **holding** ◿+ or ◿− .
9. When you have finished, press the **STORE** button to memorise the new settings.
10. Press the **DISPLAY** button to exit.

AV SYSTEM AND THE SCART CONNECTOR

This TV has a single Scart socket conforming to EN50049.

1. **Selecting AV mode from TV mode:**

   TV-AV button: selects AV mode, either composite or RGB input depending on what was previously selected.

   RED button: selects AV mode, composite input.

2. **Toggling Composite / RGB mode:**

   Press the **RED** button to toggle between composite and RGB input:

   The on-screen display will show **"AV"** for composite or **"RGB-AV"** for RGB input.

3. **Returning to TV mode:**

   Pressing the **TV-AV** button **or** any number button **or** the ▲ or ▼ buttons will return the set to TV mode *even when Scart pin 8 is high.*

OFF TIMER

SETTING THE TIMER

1. Press the **OFF-TIMER** button, the screen shows K 00.
2. Press the button again to start the clock at 90 then make it count down in ten minute steps until you see the time you want.
3. When the display diappears, the timer is set.

TO CANCEL THE TIMER

Press the **OFF-TIMER** button until the display shows zero, or press Standby.

TO CHECK THE REMAINING TIME

Press the **OFF-TIMER** button *once.*

For the last 10 minutes the display will appear in ***red*** every minute then continuously for the last minute.

4 PARTS LIST

4.1 NOTES

4.1.1 Model-specific parts

As this service manual covers more than one model, the Service Parts List indicates where certain parts are model-specific. If there is no such indication then the parts are common to all models covered by this manual.

21G = C21T7G, 21S = C21T7S, 25S = C25T7S

4.1.2 Ordering

In order to expedite delivery of replacement parts, please specify:

1. Model number and Serial number
2. Part Number and Description
3. Quantity

Unless full information is provided a delay in execution of the order may result.

4.1.3 Safety

Safety Critical components are shown thus: ⚠ and must be replaced with original Mitsubishi parts.

4.1.4 Component tolerances

Component value tolerances are coded as shown in table 4.1A below.

B	C	D	F	G	J	K	M	N	V	X	Z	P	Q
±0.1	±0.25	±0.5	±1	±2	±5	±10	±20	±30	+10 -10	+40 -20	+80 -20	+100 -0	+30 -10

table 4.1A Component tolerances

4.2 SERVICE PARTS LIST

SYMBOL	PART No	PART NAME	DESCRIPTION	MODELS
CRT				
⚠	255P917030	CRT	A51EFS43X09	21G, 21S
⚠	255P930010	CRT	A59ECY13X01	25S
IC				
IC101	270P255030	IC	STV8223A2	
IC201	270P254020	IC	MC44031 E36E-2	
IC351	270P258010	IC	TDA7253	
IC401	270P261010	IC	TDA8171	
IC660	270P207010	IC-CRT-OUTPUT	TEA5101B	
IC701	275P117010	IC-CMOS	SAA5291ZP/003	21S, 25S
IC701	275P117030	IC-CMOS	SAA5291ZP/***	21G
IC702	274P684010	IC	ST24C04	
IC901	272P514010	IC	TEA2261	
IC951	270P260010	IC	TDA8137	
IC956	266P010020	IC	µPC574J-K	
TRANSISTORS				
Q105	260P748020	TRANSISTOR	JC501-Q,R	
Q106	260P749050	TRANSISTOR	JA101-Q,R	
Q107	260P749050	TRANSISTOR	JA101-Q,R	
Q108	260P749050	TRANSISTOR	JA101-Q,R	
Q253	260P748020	TRANSISTOR	JC501-Q,R	

SYMBOL	PART No	PART NAME	DESCRIPTION	MODELS
Q303	260P748020	TRANSISTOR	JC501-Q,R	
Q312	260P748020	TRANSISTOR	JC501-Q,R	
Q450	260P387010	TRANSISTOR	2SC2236-O,Y	
Q451	260P748020	TRANSISTOR	JC501-Q,R	
Q501	260P748030	TRANSISTOR	JC501-R	
Q551	260P422010	TRANSISTOR	2SC2482	
Q552	260P794020	TRANSISTOR	BU2506DX	21G, 21S
Q552	261P007020	TRANSISTOR	S2055N	25S
Q570	260P748020	TRANSISTOR	JC501-Q,R	25S
Q571	260P574020	TRANSISTOR	2SD1264A-P	25S
Q650	260P748020	TRANSISTOR	JC501-Q,R	
Q651	260C255040	TRANSISTOR	2SA950-Y (FORMED)	
Q702	260P748020	TRANSISTOR	JC501-Q,R	
Q703	260P748020	TRANSISTOR	JC501-Q,R	
Q707	260P748020	TRANSISTOR	JC501-Q,R	
Q711	260P749050	TRANSISTOR	JA101-Q,R	
Q731	260P748020	TRANSISTOR	JC501-Q,R	
Q736	260P748020	TRANSISTOR	JC501-Q,R	
Q737	260P748020	TRANSISTOR	JC501-Q,R	
Q743	260P748020	TRANSISTOR	JC501-Q,R	
Q746	260P748020	TRANSISTOR	JC501-Q,R	
Q7A01	260C559050	TRANSISTOR	2SC1740S-E (FORMED)	
Q7A32	260P748020	TRANSISTOR	JC501-Q,R	
Q7A46	260P748020	TRANSISTOR	JC501-Q,R	
Q7A91	260P749050	TRANSISTOR	JA101-Q,R	
Q901	260P932010	TRANSISTOR	SGSF313PI	
Q952	260P387010	TRANSISTOR	2SC2236-O,Y	
Q953	260P748020	TRANSISTOR	JC501-Q,R	
DIODES				
D104	264P370010	DIODE	1N4148	
D201	264P370010	DIODE	1N4148	
D256	264P460020	DIODE	EQA02-05CD/RD5.1EB1	25S
D257	264P460020	DIODE	EQA02-05CD/RD5.1EB1	25S
D258	264P460020	DIODE	EQA02-05CD/RD5.1EB1	25S
D303	264P370010	DIODE	1N4148	
D304	264P370010	DIODE	1N4148	
D401	264P374020	DIODE	1N4003ID	
D501	264P463020	DIODE	EQA02-08C/RD8.2 EB2	
D502	264P370010	DIODE	1N4148	
D503	264P370010	DIODE	1N4148	
D504	264P371010	DIODE	BYD33G/A52R	
D505	264P375020	DIODE	BY228 (FORMED)	25S
D506	264P378020	DIODE	BYW96E (FORMED)	25S
D507	264P371010	DIODE	BYD33G/A52R	
D508	264P371010	DIODE	BYD33G/A52R	
D509	264P371010	DIODE	BYD33G/A52R	
D510	264P371010	DIODE	BYD33G/A52R	
D570	264P370010	DIODE	1N4148	25S
D572	264P370010	DIODE	1N4148	25S
D601	264P370010	DIODE	1N4148	
D650	264P371010	DIODE	BYD33G/A52R	
D655	264P370010	DIODE	1N4148	
D656	264P370010	DIODE	1N4148	
D657	264P370010	DIODE	1N4148	

SYMBOL	PART No	PART NAME	DESCRIPTION	MODELS
D6A7	264P372010	DIODE	BYV96E	
D701	264P370010	DIODE	1N4148	
D702	264P370010	DIODE	1N4148	
D710	264P370010	DIODE	1N4148	
D730	264P370010	DIODE	1N4148	
D731	264P370010	DIODE	1N4148	
D732	264P370010	DIODE	1N4148	
D753	264P465040	DIODE	EQA02-12AB/RD13EB1,B2	
D792	264P584020	DIODE LE	SML1216W-C,D	
D7A30	264P370010	DIODE	1N4148	
D901	264P376010	DIODE	BYW56	
D902	264P376010	DIODE	BYW56	
D903	264P376010	DIODE	BYW56	
D904	264P376010	DIODE	BYW56	
D905	264P371010	DIODE	BYD33G/A52R	
D906	264P372010	DIODE	BYV96E	
D907	264P481060	DIODE	RD3.0FB2	
D908	264P370010	DIODE	1N4148	
D909	264P481060	DIODE	RD3.0FB2	
D930	264P370010	DIODE	1N4148	
D951	264P378020	DIODE	BYW96E (FORMED)	
D952	264P377020	DIODE	BYW95B (FORMED)	
D953	264P377020	DIODE	BYW95B (FORMED)	
D957	264P464030	DIODE	EQA02-10A/RD10EB2	
COILS AND TRANSFORMERS				
L101	325C165000	COIL-PEAKING	0.82µH-J	
L102	325C161030	COIL-PEAKING	10µH-K	
L103	325C121030	COIL-PEAKING	10µH-K	
L104	323P175060	COIL-VIF	AFT (38.9~39.5 MHz)	
L106	325C121030	COIL-PEAKING	10µH-K	
L108	321C031040	COIL-RF	10µH-K	
L109	411P001070	LEAD-FERRITE		
L201	321C031040	COIL-RF	10µH-K	
L203	321C031040	COIL-RF	10µH-K	
L207	411P001070	LEAD-FERRITE		
L208	411P001070	LEAD-FERRITE		
L209	411P001070	LEAD-FERRITE		
L253	325C120010	COIL-PEAKING	1µH-M	
L303	411P001070	LEAD-FERRITE		
L312	325C120070	COIL-PEAKING	3.3µH-K	
L314	325C120070	COIL-PEAKING	3.3µH-K	
L401	411P001070	LEAD-FERRITE		
L503	411D009020	CORE-FERRITE		
L504	409P749010	COIL-PCC-CHOKE	15µH	25S
L505	409P748010	COIL-PCC	1µH	25S
L551	333P012010	COIL-HORIZ-LIN		
L600	411P001070	LEAD-FERRITE		
L650	325C121030	COIL-PEAKING	10µH-K	
L738	411P001070	LEAD-FERRITE		
L739	411P001070	LEAD-FERRITE		
L744	411P001070	LEAD-FERRITE		
L754	325C120010	COIL-PEAKING	1µH-M	
L755	325C120010	COIL-PEAKING	1µH-M	
L7A44	411P001070	LEAD-FERRITE		
L901	321C030050	COIL-RF	2.2µH-K	

SYMBOL	PART No	PART NAME	DESCRIPTION	MODELS
L903	411P001070	LEAD-FERRITE		
L905	411P001070	LEAD-FERRITE		
L951	321C153020	COIL-RF	390µH-K	
L953	321C031040	COIL-RF	10µH-K	
L955	411P001070	LEAD-FERRITE		
L956	321C031040	COIL-RF	10µH-K	
L991	351P038070	LINE FILTER	SS10V-20010	
L992	351P044010	LINE FILTER	AT 4043/90	
⚠ T551	334P255010	TRANS-FLYBACK		21G, 21S
⚠ T551	334P256010	TRANS-FLYBACK		25S
T552	336P034010	TRANS-HORIZ-DRIVE		21G, 21S
T552	336P034010	TRANS-HORIZ-DRIVE		25S
⚠ T901	350P664020	TRANS-POWER		25S
⚠ T901	350P718010	TRANS-POWER		21G, 21S
⚠	409P564040	COIL-DEGAUSSING		25S
⚠	409P564060	COIL-DEGAUSSING		21G, 21S
RESISTORS – FIXED AND VARIABLE				
R212	103P906060	R-METAL	0.4W 51K-F	
⚠ R352	103P378060	R-FUSE	1/4W 3.3-J	
R414	103P463030	R-METAL	1/4W 2.2K-F	25S
R508	109D074030	R-CEMENT METAL	5W 3.9K-K/J	
R511	102P081040	R-CEMENT-WIRE	7W 4.7-K	21G, 21S
⚠ R512	103P442020	R-FUSE-METAL	1W 560-K/J	
⚠ R513	103P397090	R-FUSE	1/2W 0.82-J	
⚠ R514	103P397090	R-FUSE	1/2W 0.82-J	
R523	102P228080	R-CEMENT-WIRE-SUS	10W 4.7-K/J	25S
⚠ R671	103P447080	R-FUSE-METAL	1W 0.68-K/J	
⚠ R687	103P391030	R-FUSE	1/2 W 100J	
R701	103P903030	R-METAL	0.4W 2.2K-F	
R7A01	103P907010	R-METAL	0.4W 82K-F	
R921	109D074010	R-CEMENT-METAL	5W 1.8K-K/J	
⚠ R981	109P913050	R-COMPOSITION	1/2W 6.8M-J	
⚠ R982	109P913050	R-COMPOSITION	1/2W 6.8M-J	
R991	102P081040	R-CEMENT-WIRE	7W 4.7-K	
⚠ R992	109P911090	R-COMPOSITION	1/2W 470K-J	
VR101	127C380080	VR-SEMIFIXED	1/5W B10K-M	
VR901	127C380040	VR-SEMIFIXED	1/5W B1K-M	
CAPACITORS				
C510	MELP420010	C-M-PLASTIC-PP	1600V 0.018µF-J	25S
C5A3	172P952040	C-M-PLASTIC-PP	2000V (1700VP-P) 9100pF	25S
C5B3	172P951050	C-M-PLASTIC-PP	2000V (1700VP-P) 3900pF	25S
C5B3	172P952030	C-M-PLASTIC-PP	2000V (1700VP-P) 8200pF	21G, 21S
C904	185D059040	C-ELECTROLYTIC	385V/400V 150µF	
⚠ C981	189P091010	C-CERAMIC-AC	AC400V E4700pF-M	
⚠ C991	189P180030	C-M-POLYPROPYLENE-AC	275VAC (X2) 0.22µF-M	21G, 21S
⚠ C992	189P180030	C-M-POLYPROPYLENE-AC	275VAC (X2) 0.22µF-M	25S
CONNECTORS AND SWITCHES				
J251	452C080020	21 PIN-SCART	035-098-4505	
⚠ J601	449C126010	CRT SOCKET	033 055044	
S701	432P089020	SW-KEY-BOARD		
S702	432P089020	SW-KEY-BOARD		
S703	432P089020	SW-KEY-BOARD		
S704	432P089020	SW-KEY-BOARD		
⚠ S991	432C081010	SW-PUSH	ESB92D21B	

SYMBOL	PART No	PART NAME	DESCRIPTION	MODELS
MISCELLANEOUS				
	CF101	296P084020	CERAMIC-TRAP	TPS5.5MWA	
	CF301	296P014020	CERAMIC-FILTER	5.5MHz	
⚠	F991	283D047040	FUSE	T2A	
⚠	RP991	265P071050	POSISTOR	PTH451C41BG180N	
	SF101	296P138010	SAW-FILTER	G1968M 38.9MHz	
	SP391	480P660020	SPEAKER	5"X3"	
	TU101	295P430020	TUNER-TV	UV1315/IEC	
	X601	285P142020	QUARTZ-CRYSTAL	17.734475MHz	
	X701	285P139040	QUARTZ-CRYSTAL	12MHz	
⚠	Z516	299P193070	PROTECTOR	5000	
	Z701	939P698020	IR-PHOTO-MODULE	TSOP1733KS1	
⚠	Z951	299P193090	PROTECTOR	1600	
⚠	Z952	299P193010	PROTECTOR	2000	
PCB ASSEMBLIES				
⚠		920A435004	ASSY-PWB-MAIN		25S
⚠		920A436005	ASSY-PWB-MAIN		21G
⚠		920A436006	ASSY-PWB-MAIN		21S
⚠		921C205001	ASSY-PWB-CRT		21G, 21S
⚠		921C205002	ASSY-PWB-CRT		25S
MECHANICAL AND COSMETIC				
	IC351	596D850010	HOLDER-IC		
	IC401	596D850010	HOLDER-IC		
	IC660	596D884010	HOLDER-IC		
	IC951	596D884010	HOLDER-IC		
	Q552	596D884010	HOLDER-IC		
	Q571	669D220020	SCREW-TB	3X8	25S
	Q901	596D884010	HOLDER-IC		
⚠		246C022070	AC-POWER-CORD/PLUG		
		290P079010	REMOTE CONTROL		
		669D212040	SCREW-TB-BIND	3X10 BLACK	
		669D218070	SCREW (CRT)	5X35	
		669D220030	SCREW-TB	3X10	
		669D221060	SCREW-TB	4X16	
⚠		700C612060	ASSY BACK-COVER		21G
⚠		700C614010	ASSY BACK-COVER		21S
⚠		700C614090	ASSY BACK-COVER		25S
		701D610060	ASSY CABINET-FRONT		25S
		701D611010	ASSY CABINET-FRONT		21G, 21S
		754C062010	KNOB-POWER		
		754C063010	KNOB-PUSH		
		801C284040	PACKING-CASE		21G, 21S
		801C285040	PACKING-CASE		25S
		803A466010	CUSHION SET		25S
		803A467010	CUSHION SET		21G, 21S
		831D296020	PACKING-BAG		21G, 21S
		831D296030	PACKING-BAG		25S
		871C603010	SERVICE MANUAL		
		872C126090	IB-COLOUR		21G
		872C127000	IB-COLOUR		21S, 25S

5 SCHEMATIC DIAGRAMS

5.1 NOTES

5.1.1 General

- DC voltages are measured from the points indicated to circuit ground.
- Waveforms are for a PAL colour bar signal.
- Test Points are shown as: "TP6A", etc.
- This is a basic circuit diagram – receivers are subject to modification due to continuous engineering improvement.

5.1.2 Servicing Precautions

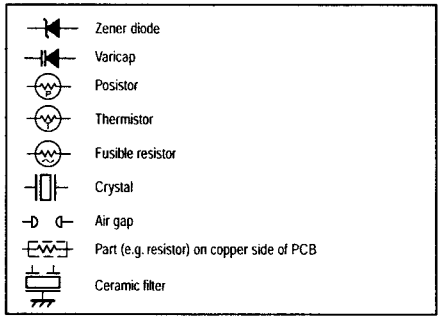
The ⚠ symbol indicates components with characteristics critical to safety and performance.

These parts **must** only be replaced with parts having identical values and characteristics – refer to the Service Parts List for the correct Mitsubishi part numbers.

Do not compromise the safety of the receiver by improper servicing.

5.1.3 Component Information

SPECIFIC SYMBOLS



RESISTORS

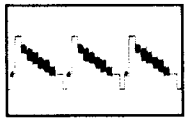
Value	without spec.	Ω, K = KΩ, M = MΩ
Wattage	without spec.	1/4W or 1/6W (chips: 1/10W)
Tolerance	without spec.	±5%
		D = ±0.5%, F = ±1%, G = ±2%, J = ±5%, K = ±10%
Type	without spec.	Carbon film
	(S)	Composition
	(MB)	Metal oxide film
	(CE)	Cemented
	(W)	Wire wound
	(M)	Metal film
	(MPC)	Metal plate cement
	(ML)	Metal linear

CAPACITORS

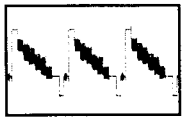
Value	without spec.	pF for values >1, µF for values <1
Voltage	without spec.	50V
Tolerance	without spec.	electrolytic: ±20%, others ±10%
		C = ±0.25pF, D = ±0.5pF, F = ±1pF, G = ±2pF or 2%, J = ±5%, K = ±10%, M = ±20%, P = +100 -0%, Z = +80 -20%, Q = +30 -10%, T = +200 -0%
Type	without spec.	Ceramic
	(MF)	Polyester
	(PP)	Polypropylene film
	(ALM)	Aluminous electrolytic
	(TF)	Twin film
	(SC)	Semiconductor ceramic
	(MP)	Metalised paper
	(MPP)	Metalised plastic film
	(MMF)	Metalised polyester
	(MF.PP)	Polyester/polypropylene film
	(PS)	Polystyrene (styrol)
	(TAN) or (TANT)	Tantalum
		Electrolytic
	(BP) or (NP)	Non-polarised electrolytic
Characteristic	(only ceramic capacitors)	
	without spec.	B or F (high dielectric)
	CH, SL, etc.	Temperature compensating types

5.2 WAVEFORMS

Waveforms are for a PAL colour bar signal on the RF input and are measured with all picture controls at optimum.

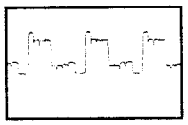


1 2.1V p-p (H)



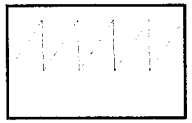
2 1.1V p-p (H)

3 2.0V p-p (H)

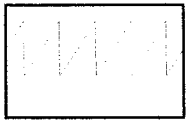


4 2.0V p-p (H)

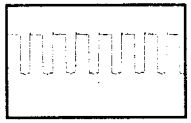
5 2.0V p-p (H)



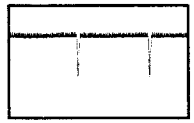
6 1.6V p-p (V)



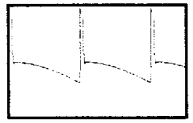
7 1.6V p-p (V)



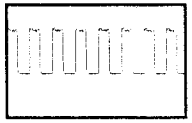
8 0.62V p-p (H)



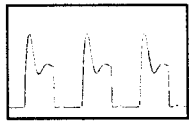
9 0.5V p-p (V)



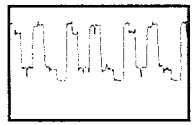
10 52V p-p (V)



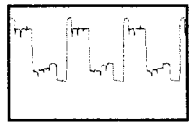
11 0.8V p-p (H)



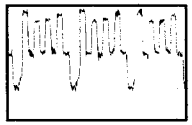
12 220V p-p (H)



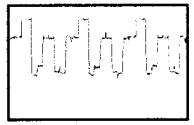
13 1.2V p-p (H)



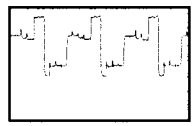
14 1.3V p-p (H)



15 1.4V p-p (H)



16 86V p-p (H)



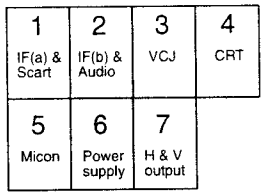
17 87V p-p (H)

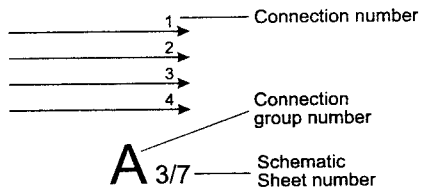
18 97V p-p (H)

5.3 DIAGRAMS

5.3.1 Sheet Information

The schematic diagram is shown on the following 7 pages. The layout of the sheets and links between the sheets are illustrated:





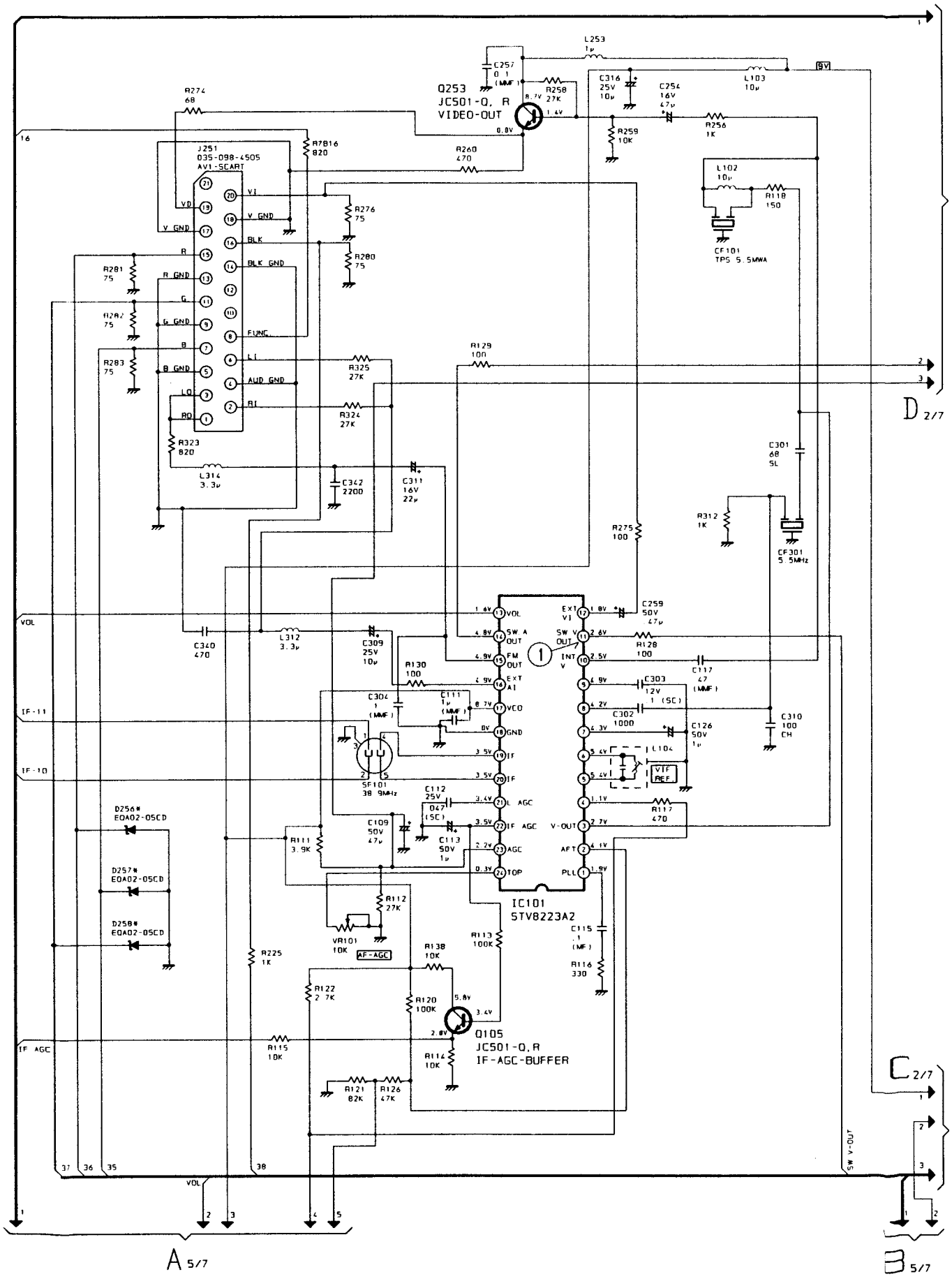
5.3.2 Model variations

Component differences between models are indicated in the diagram with an asterisk: ✱.

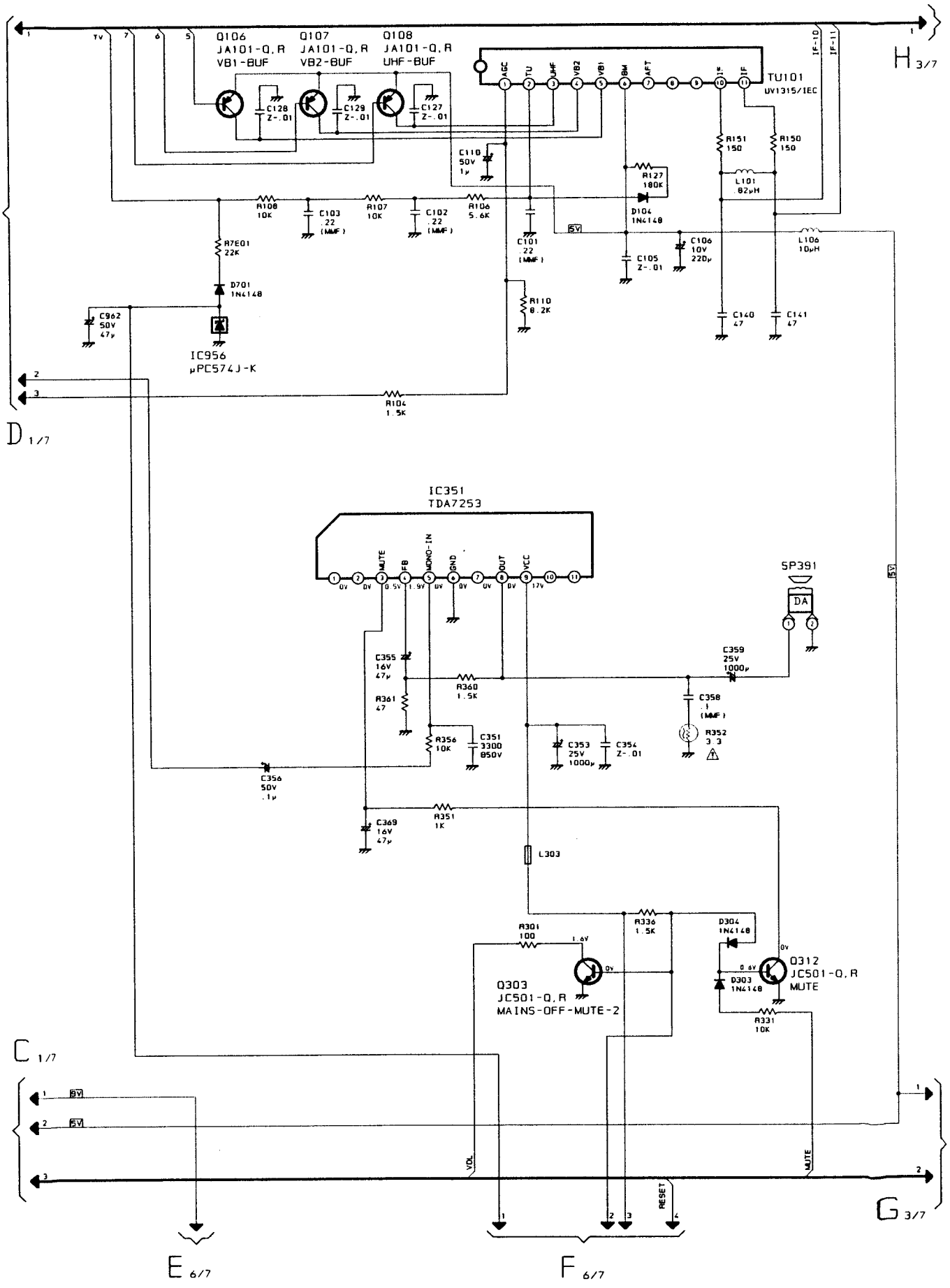
The table below details the differences (**N** = not fitted, **Y** = fitted).

REF	21T7G	21T7S	25T7S
CRT	A51EFS43X09	A51EFS43X09	A59ECY13X01
C140	Y	N	N
C141	Y	N	N
C411	Y	Y	N
C510	N	N	Y
C567	N	N	Y
C569	N	N	Y
C571	N	N	Y
C577	N	N	Y
C5A3	N	N	Y
C5B3	2kV 8200pF	2kV 8200pF	2kV 3900pF
C5C3	N	N	Y
C5D3	400V 0.47µF	400V 0.47µF	400V 0.39µF
C991	Y	Y	N
C992	N	N	Y
D256	N	N	Y
D257	N	N	Y
D258	N	N	Y
D505	N	N	Y
D506	N	N	Y
D570	N	N	Y
D572	N	N	Y
IC701	275P117030	275P117010	275P117010
L504	N	N	Y
L505	N	N	Y
L551	333P012030	333P012030	333P012010
Q552	BU2506DX	BU2506DX	S2055N
Q570	N	N	Y
Q571	N	N	Y
R401	18K	18K	12K
R403	12K	12K	18K
R405	8.2K	8.2K	5.6K
R406	1 ½W	1 ½W	1.5 ½W
R407	1 ½W	1 ½W	1.5 ½W
R408	470 ½W	470 ½W	820 ½W
R412	8.2K	8.2K	100
R413	N	N	Y
R414	N	N	Y
R460	Y	Y	N
R463	N	N	Y
R4Y1	N	N	Y
R503	100K	100K	120K
R504	6.8K	6.8K	2.7K
R506	2.2K	2.2K	1.2K
R511	Y	Y	N
R515	680 ½W	680 ½W	560 ½W
R519	2.7M ½W	2.7M ½W	2.2M ½W
R520	47K	47K	39K
R521	150K	150K	120K
R522	1K ½W	1K ½W	1K ¼W
R523	N	N	Y
R551	N	N	Y
R570	N	N	Y
R571	N	N	Y
R573	N	N	Y
R574	N	N	Y
R575	N	N	Y
R576	N	N	Y
R577	N	N	Y
R579	N	N	Y
R580	N	N	Y
R686	Y	Y	N
R731	18K	18K	27K
R7A31	4.7K	4.7K	8.2K
R7C37	39K	39K	12K
R908	0.47 2W	0.47 2W	0.33 2W
R928	1.2K	1.2K	680
R958	15K 3W (MB)	15K 3W (MB)	22K 3W (MB)
T551	334P255010	334P255010	334P256010
T901	350P718010	350P718010	350P664020

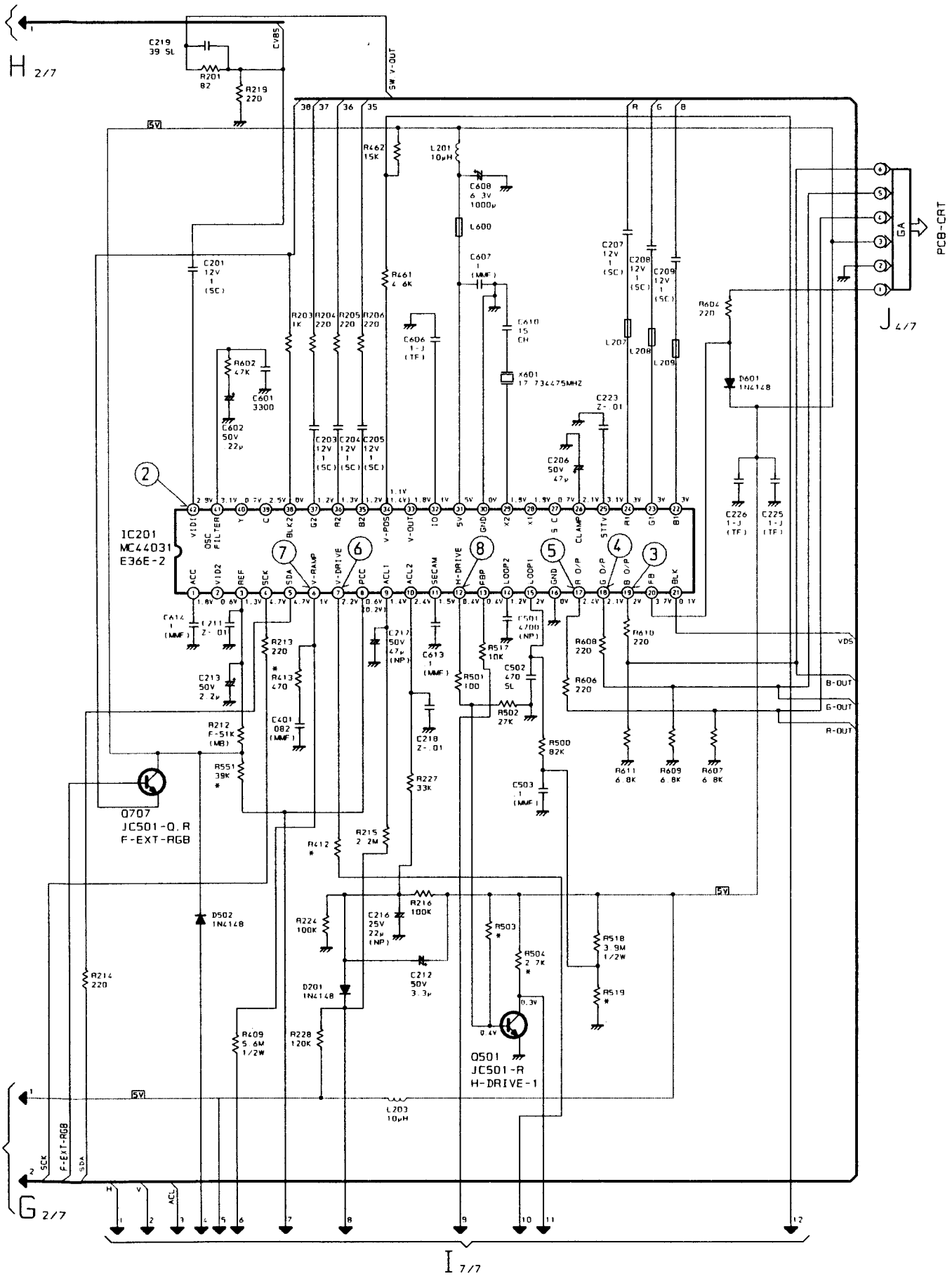
5.3.3 Schematic diagrams



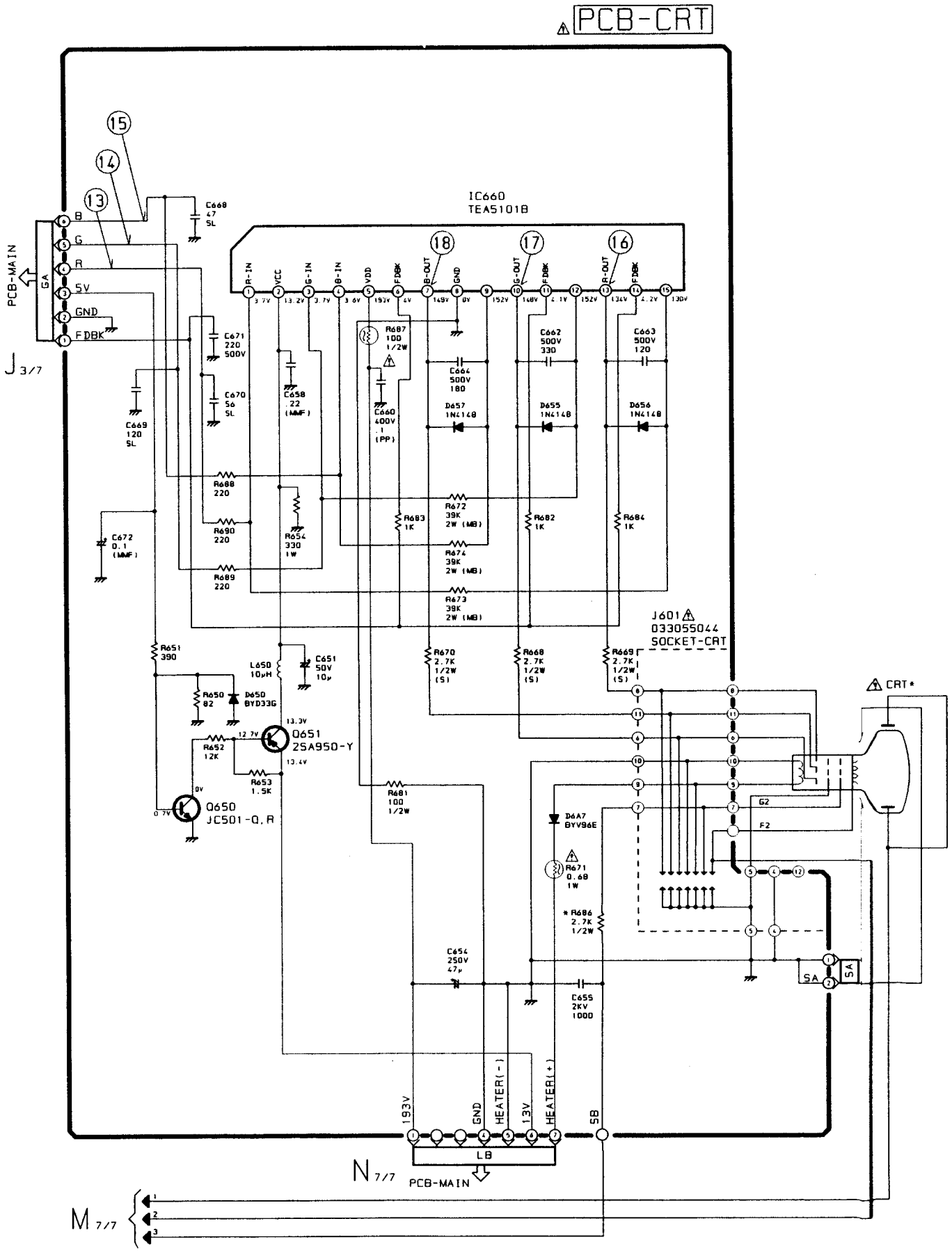
SCHEMATIC DIAGRAMS C21T7G, C21T7S, C25T7S SHEET 1/7



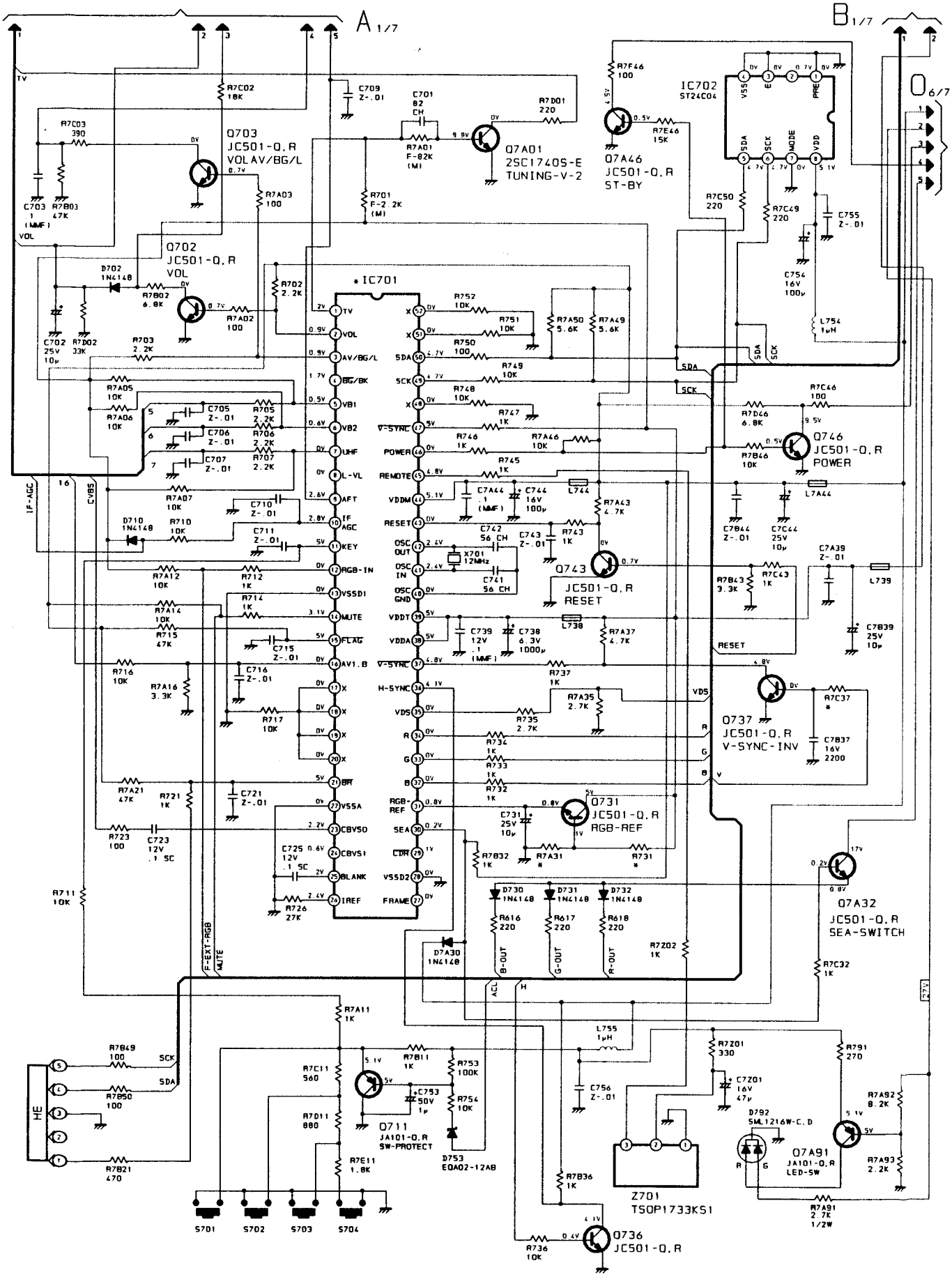
SCHEMATIC DIAGRAMS C21T7G, C21T7S, C25T7S SHEET 2/7

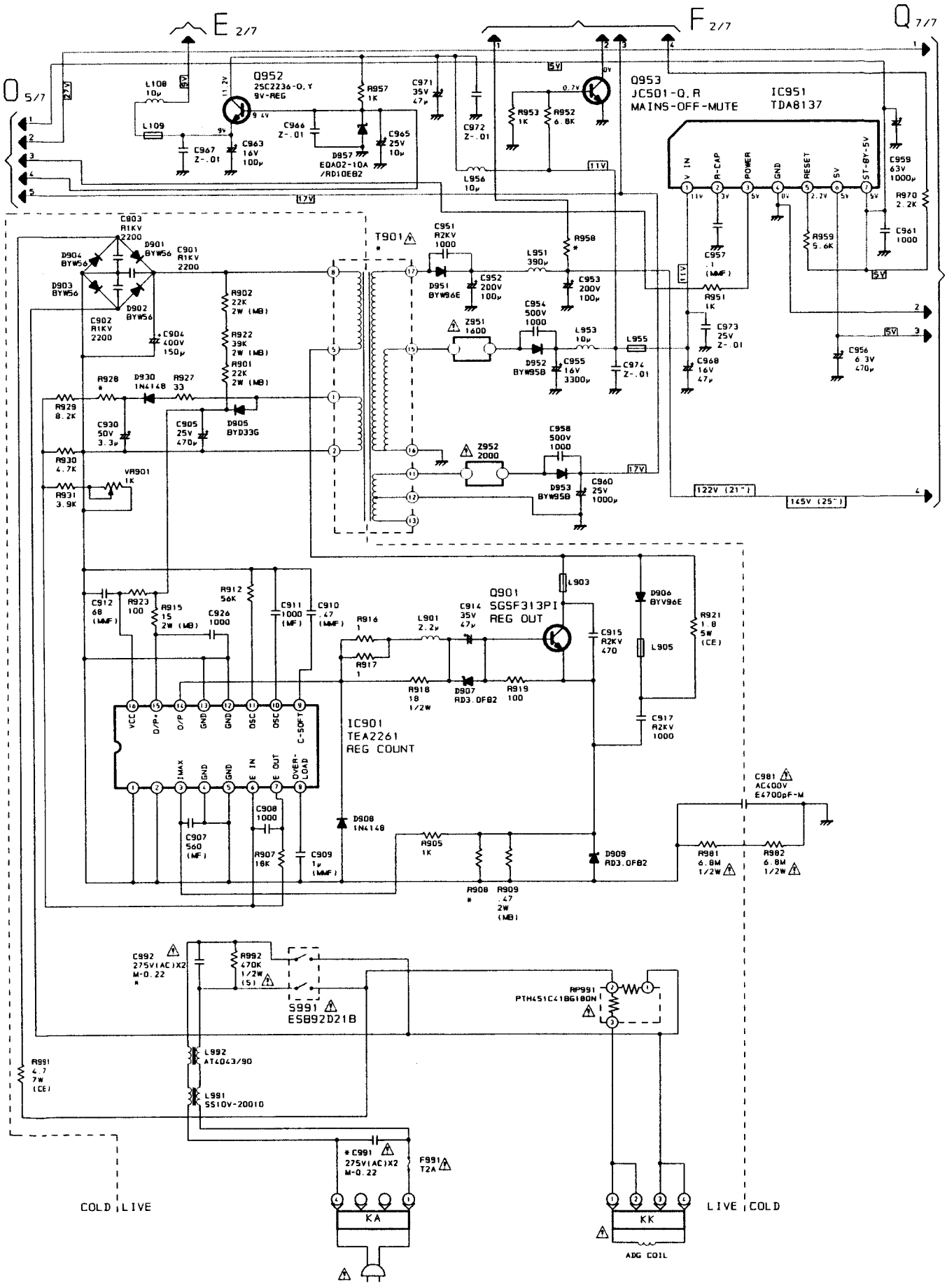


SCHEMATIC DIAGRAMS C21T7G, C21T7S, C25T7S SHEET 3/7

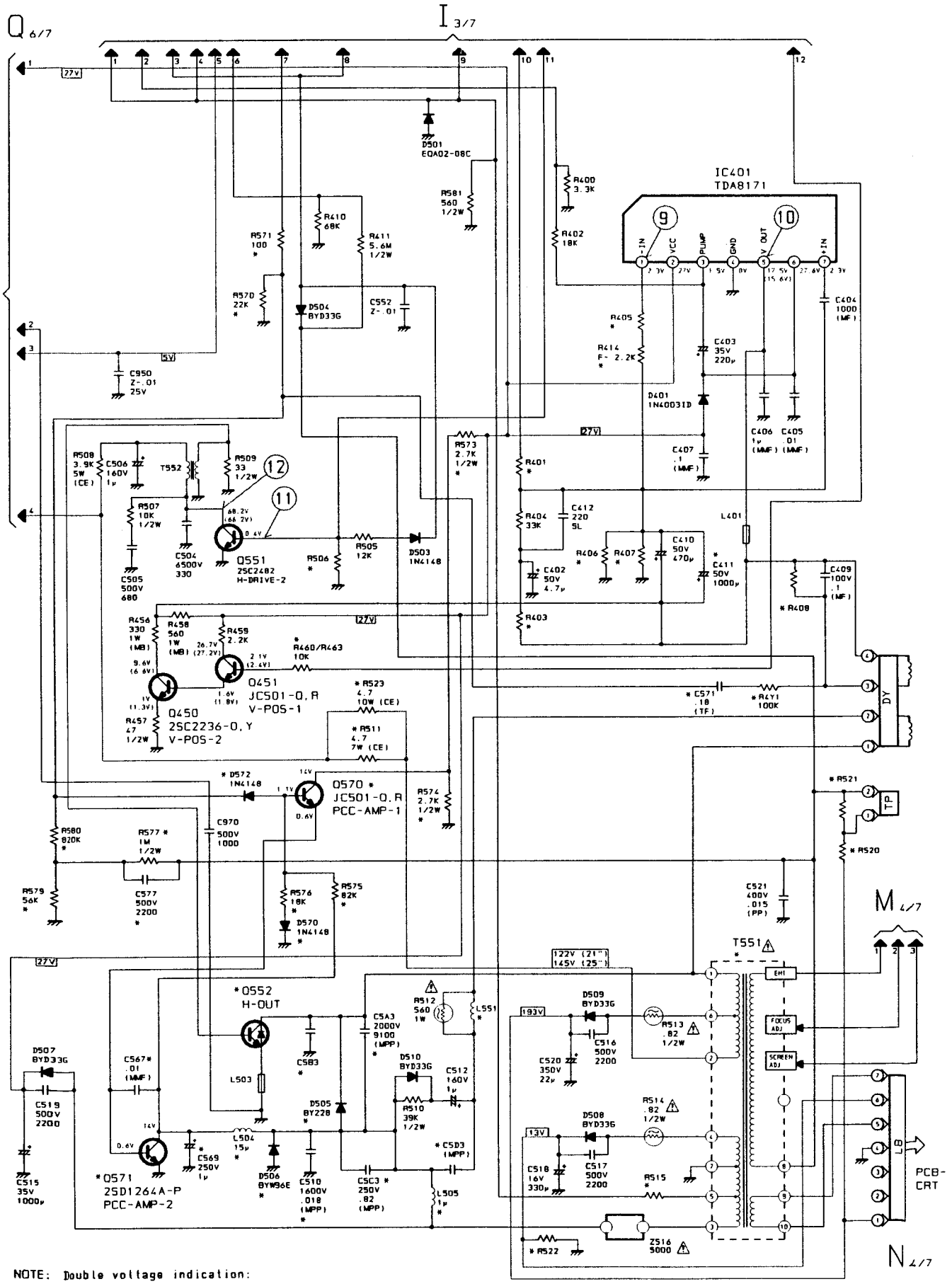


SCHEMATIC DIAGRAMS C21T7G, C21T7S, C25T7S SHEET 4/7


A 1/7
B 1/7
IC702
ST24C04
Q703
JC501-Q,R
VOL AV/BG/L
Q7A01
2SC1740S-E
TUNING-V-2
Q7A46
JC501-Q,R
ST-BY
Q702
JC501-Q,R
VOL
* IC701
Q746
JC501-Q,R
POWER
Q743
JC501-Q,R
RESET
Q737
JC501-Q,R
V-SYNC-INV
Q731
JC501-Q,R
RGB-REF
Q7A32
JC501-Q,R
SEA-SWITCH
Q711
JA101-Q,R
SW-PROTECT
Q7A91
JA101-Q,R
LED-SW
Q736
JC501-Q,R
Z701
TSOP1733KS1
S701
S702
S703
S704
TV
VOL
AV/BG/L
BG/BK
VB1
VB2
UHF
L-VL
AFT
IF AGC
KEY
RGB-IN
VSSD1
MUTE
FLAG
AV1.B
VSSA
CBVSO
CBVSI
BLANK
IREF
X701
12MHz
V-SYNC
H-SYNC
VDS
RGB-REF
SEA
CDR
VSSD2
FRAME
POWER
REMOTE
VDDM
RESET
VDDT
VDDA
SDA
SCK
IF-AGC
CVBS
F-EXT-RGB
MUTE
B-OUT
G-OUT
R-OUT
SCK
SDA
RESET
VDS
R
G
B
V
H
HE



SCHEMATIC DIAGRAMS C21T7G, C21T7S, C25T7S SHEET 6/7



NOTE: Double voltage indication:

6.6V <-- C25T7S

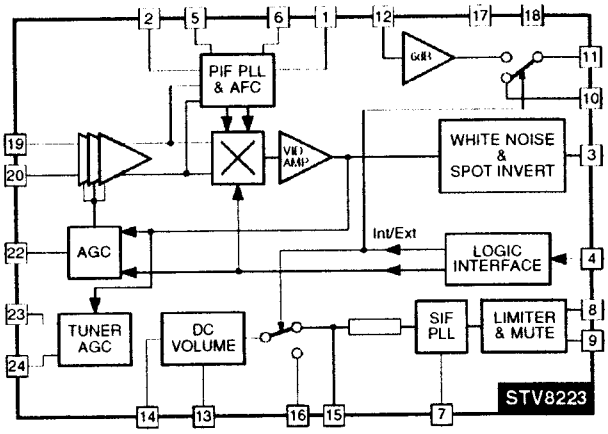
(6.1V) <-- C21T7G & C21S7S

SCHEMATIC DIAGRAMS C21T7G, C21T7S, C25T7S SHEET 7/7

6 IC BLOCK DIAGRAMS

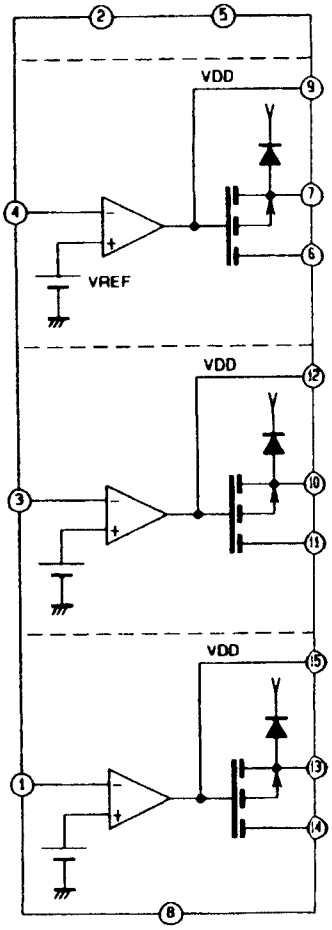
IC101

STV8223A2



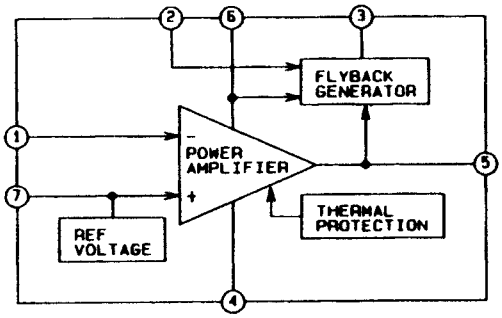
IC660

TEA5101



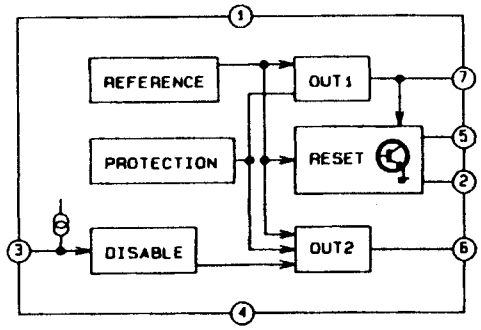
IC401

TDA8171



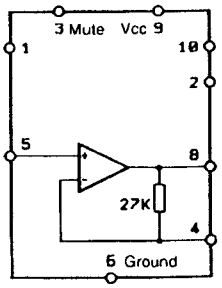
IC951

TDA8137



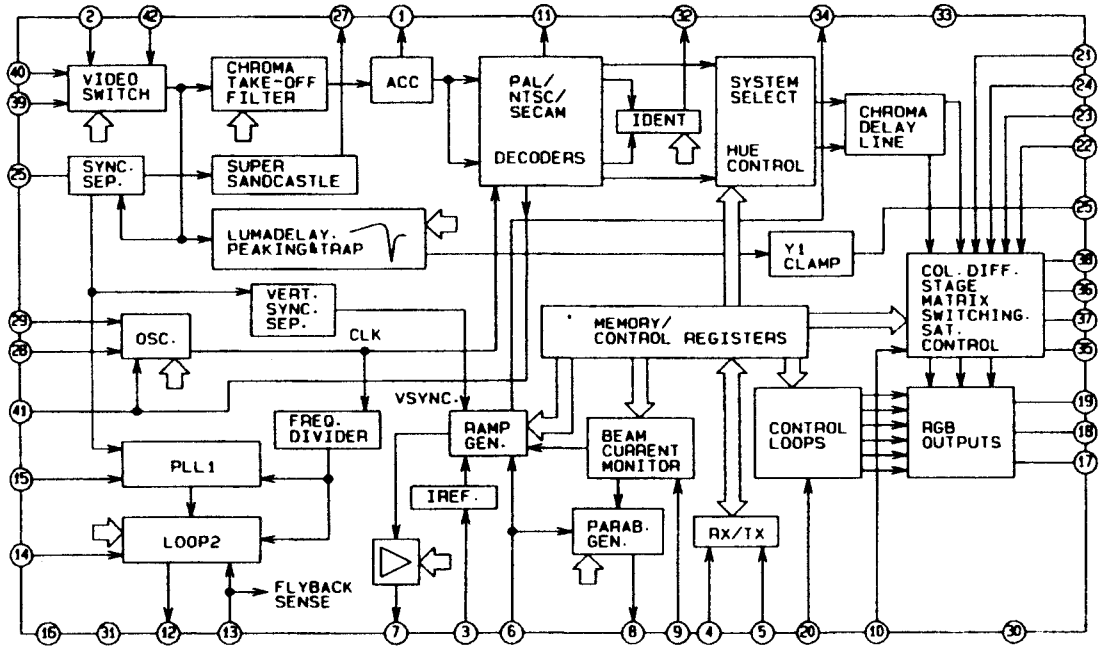
IC351

TDA7253



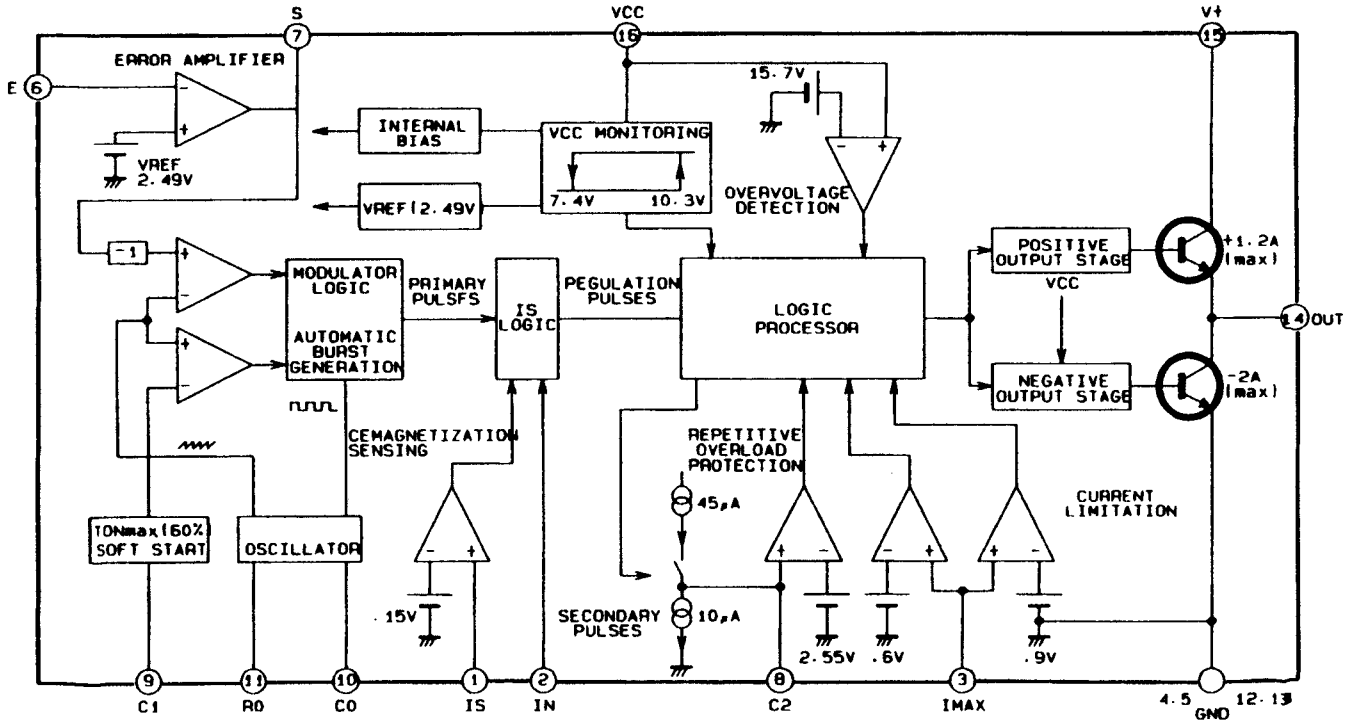
IC201

MC44031



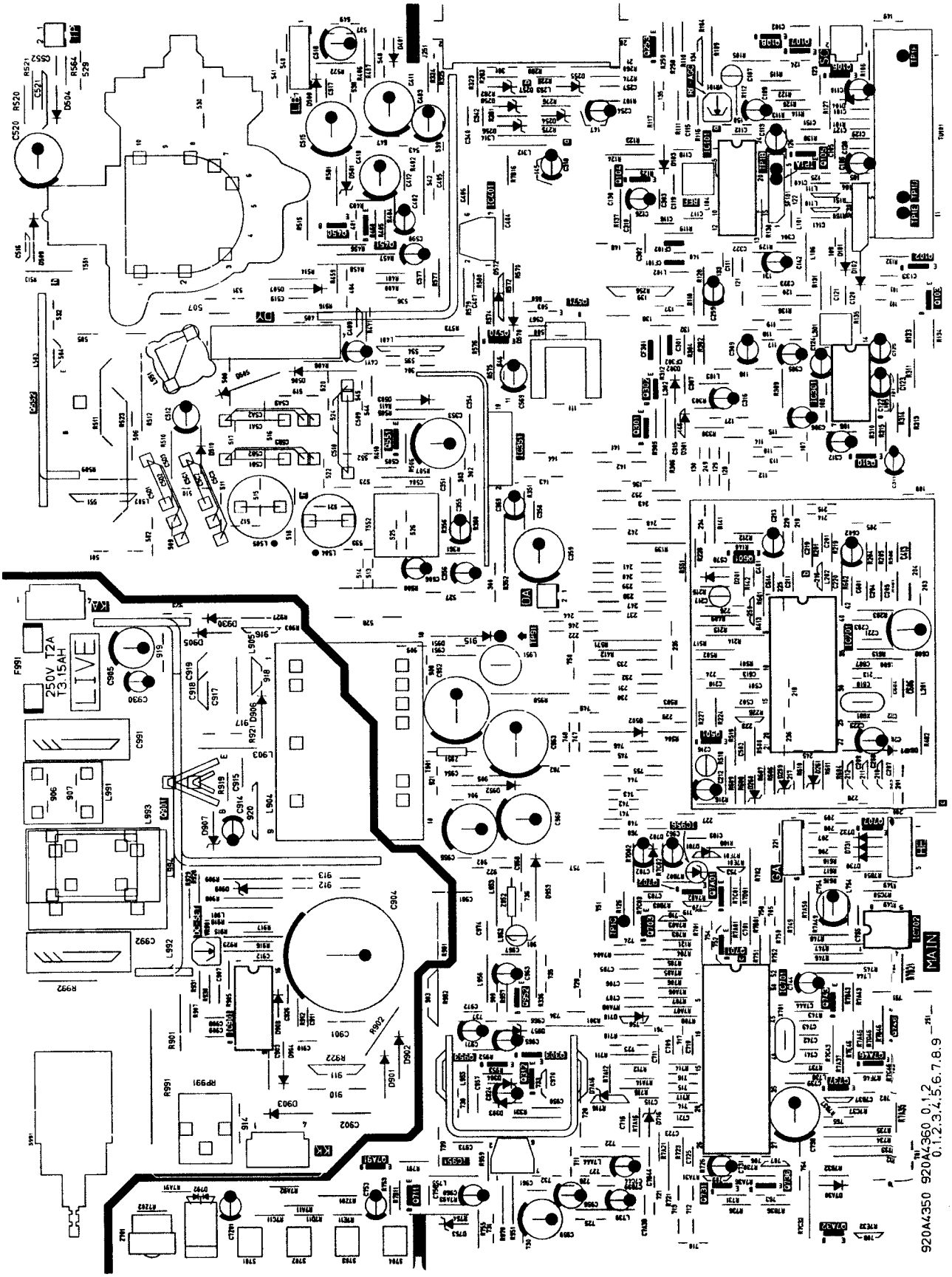
IC901

TEA2261



7 PCB DIAGRAMS

PCB-MAIN (EE5 CHASSIS)



MAIN PCB COMPONENT ADDRESSES

C509	C7
C510	C7
C5A1	B7
C5A2	B7
C5A3	C7
C5B1	B7
C5B2	B7
C5B3	C7
C904	C3
C981	D4
C991	A5
CF101	E8
CF102	E9
CF301	E8
CF302	E8
D101	G9
D102	G8
D103	E9
D104	G10
D201	F6
D254	E10
D255	E10
D256	D10
D257	D10
D258	D10
D259	F4
D260	F4
D261	F4
D301	E7, F7
D302	E8
D303	D2
D304	D2
D401	C10
D501	C9
D502	E5
D503	C7, D7
D504	A10
D505	B8
D506	C8
D507	C8
D508	C10
D509	A9

D570	D8
D572	D8
D601	G5
D701	F4
D702	E4
D710	E3
D716	E2
D730	G4
D731	G4
D732	G4
D753	D1
D792	B1
D7A16	E2
D7A30	G1
D901	C2
D902	C2
D903	C2
D904	C2
D905	B6
D906	B5
D907	B4
D908	C3
D909	B4
D930	B6
D951	D5
D952	D4
D953	D4
D957	D2
F991	A5
IC101	F9
IC201	G6
IC301	F7, G7
IC351	D7
IC401	D9
IC701	F3
IC702	G3
IC901	B3
IC951	D1
IC956	E4
IC956	F4
J251	D10
L101	F9

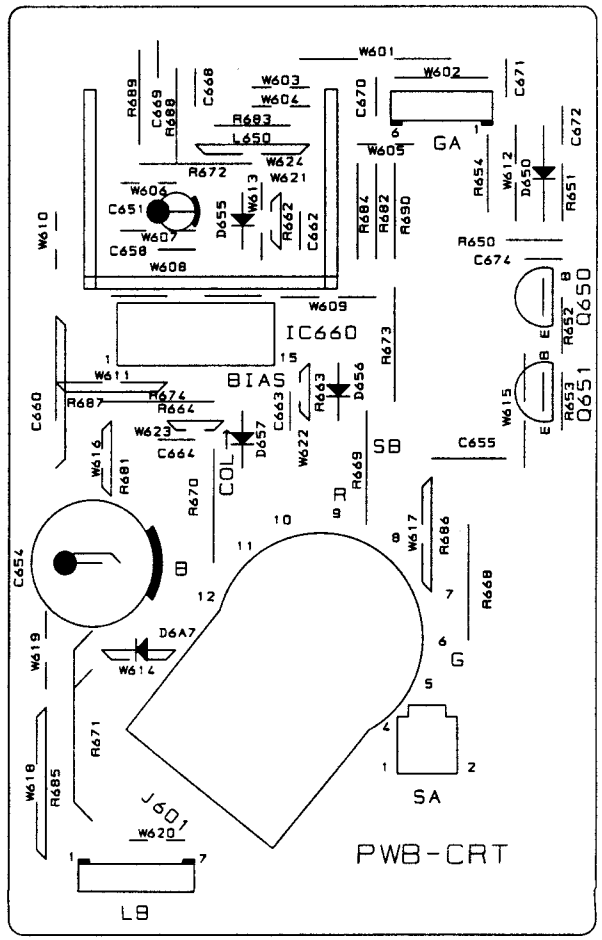
L102	E8
L103	F8
L104	F9
L105	G7
L106	F9
L110	F9
L111	F9
L201	G5
L202	G6
L253	E10
L301	F8, G8
L302	E7
L312	D9
L314	D9
L401	C8
L502	B7
L503	A8
L504	C6
L505	B6
L551	B8
L600	G5
L738	F2
L739	E1
L744	G3
L754	G4
L755	D1
L7A44	E1
L903	B5
L904	B4
L905	B6
L951	D5
L952	D3
L953	D4
L956	D3
L991	A4
L992	B3
L993	B4
L994	B4
Q102	G8
Q103	G8
Q104	E9
Q105	G9

Q106	G10
Q107	F10
Q108	F10
Q253	E10
Q301	E7
Q302	E7
Q303	E2
Q310	G7
Q312	D2
Q450	C9
Q451	C9
Q501	F5
Q551	C7
Q552	A7
Q570	D8
Q571	E8
Q601	F6
Q701	F3
Q702	E4
Q703	E3
Q707	G4
Q711	D1
Q731	F1
Q736	F1
Q737	G2
Q743	G3
Q743	G3
Q746	G2
Q7A01	F4
Q7A32	G1
Q7A46	G2
Q7A91	C1
Q901	B4
Q952	D3
Q953	D2
R212	F6
R352	D6
R405	C9
R508	C6, D6
R511	A7
R512	B7
R513	A8

R514	C8
R516	C8
R701	F3
R7A01	F3
R7F01	F4
R921	B5
R981	D3
R982	D3
R991	B2
RP991	B2
S701	B1
S702	C1
S703	C1
S704	C1
S991	A2
SF101	F9
SF301	G9
T551	A9, B9
T552	C6
T901	D5, E5
TP1A	F9
TP1B	F9
TP1C	E3
TP1D	G9
TP1E	G9
TP1F	G10
TP91	D6
VR101	F10
VR901	B3
X601	G5
X701	F3
Z701	A1, B1
Z951	D5
Z952	D3

CRT PCB

D650	J601
D655	L650
D656	Q650
D6A6	Q651
D6A7	R671
IC660	R687

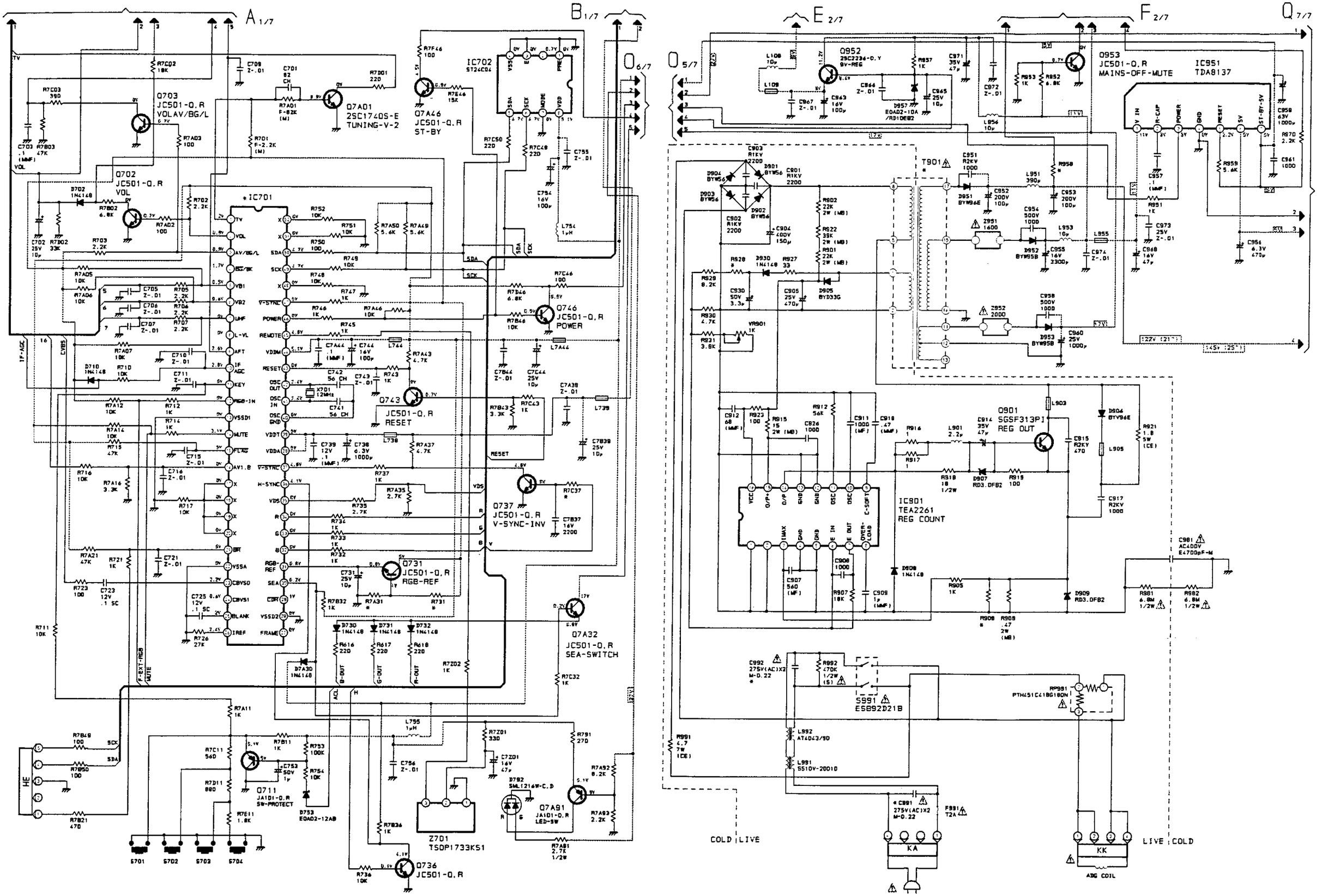


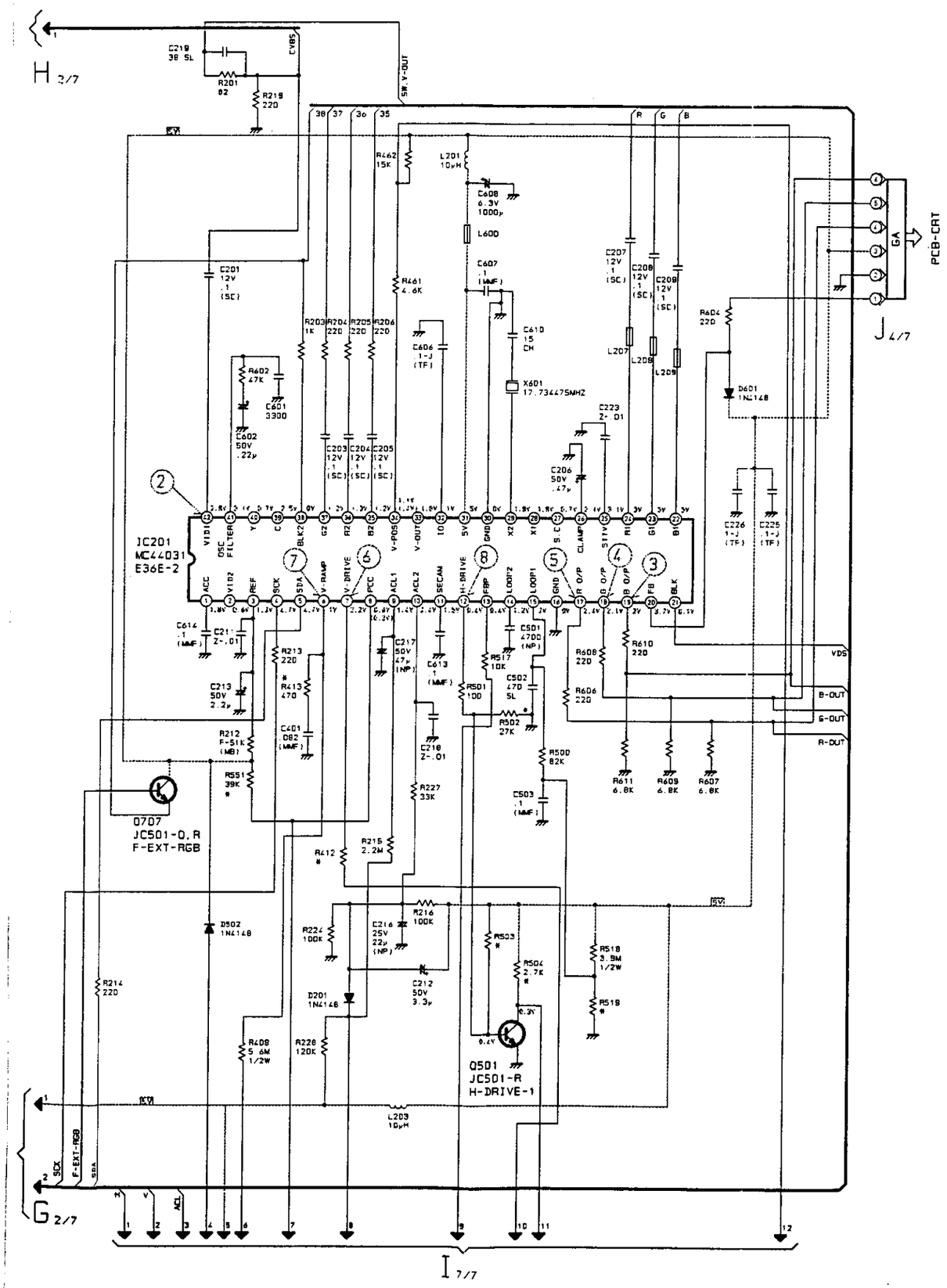
Model variations

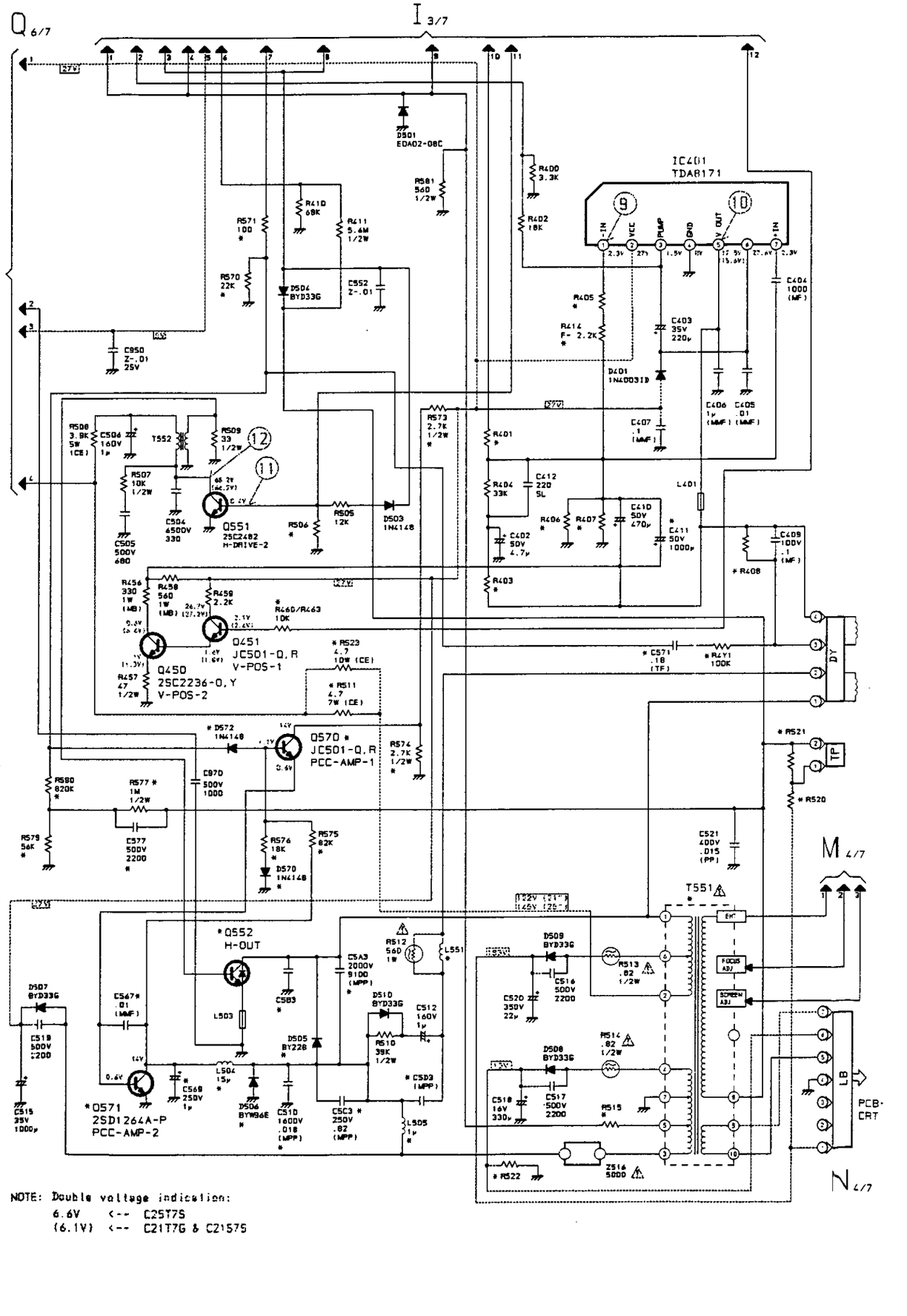
Component differences between models are indicated in the diagram with an asterisk: .

The table below details the differences (N = not fitted, Y = fitted).

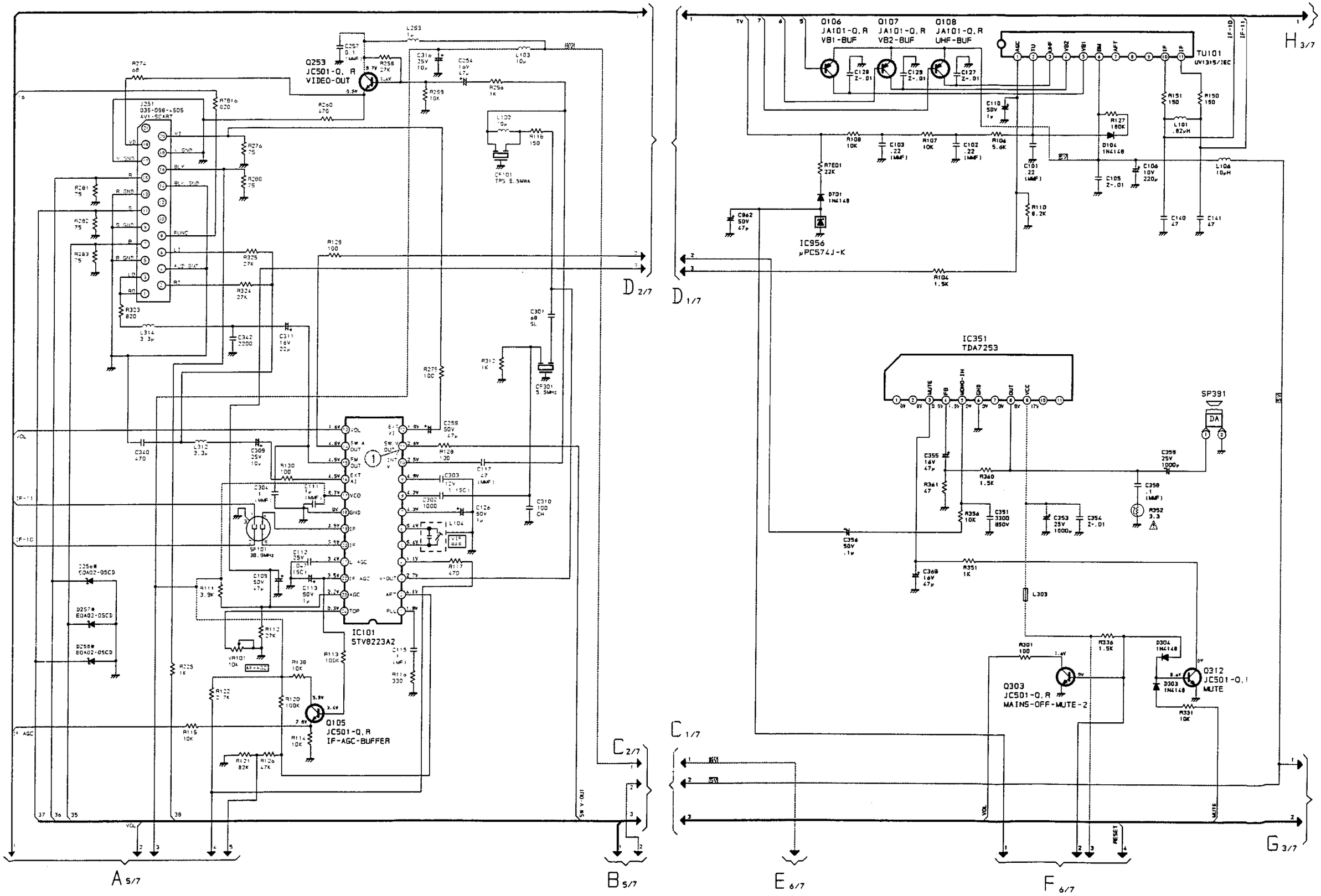
REF	21T7G	21T7S	25T7S
CRT	A51EFS43X09	A51EFS43X09	A59ECY13X01
C140	Y	N	N
C141	Y	N	N
C411	Y	Y	N
C510	N	N	Y
C567	N	N	Y
C569	N	N	Y
C571	N	N	Y
C577	N	N	Y
C5A3	N	N	Y
C5B3	2kV 8200pF	2kV 8200pF	2kV 3900pF
C5C3	N	N	Y
C5D3	400V 0.47µF	400V 0.47µF	400V 0.39µF
C991	Y	Y	N
C992	N	N	Y
D256	N	N	Y
D257	N	N	Y
D258	N	N	Y
D505	N	N	Y
D506	N	N	Y
D570	N	N	Y
D572	N	N	Y
IC701	275P117030	275P117010	275P117010
L504	N	N	Y
L505	N	N	Y
L551	333P012030	333P012030	333P012010
Q552	BU2506DX	BU2506DX	S2055N
Q570	N	N	Y
Q571	N	N	Y
R401	18K	18K	12K
R403	12K	12K	18K
R405	8.2K	8.2K	5.6K
R406	1 ½W	1 ½W	1.5 ½W
R407	1 ½W	1 ½W	1.5 ½W
R408	470 ½W	470 ½W	820 ½W
R412	8.2K	8.2K	100
R413	N	N	Y
R414	N	N	Y
R460	Y	Y	N
R463	N	N	Y
R4Y1	N	N	Y
R503	100K	100K	120K
R504	6.8K	6.8K	2.7K
R506	2.2K	2.2K	1.2K
R511	Y	Y	N
R515	680 ½W	680 ½W	560 ½W
R519	2.7M ½W	2.7M ½W	2.2M ½W
R520	47K	47K	39K
R521	150K	150K	120K
R522	1K ½W	1K ½W	1K ¼W
R523	N	N	Y
R551	N	N	Y
R570	N	N	Y
R571	N	N	Y
R573	N	N	Y
R574	N	N	Y
R575	N	N	Y
R576	N	N	Y
R577	N	N	Y
R579	N	N	Y
R580	N	N	Y
R686	Y	Y	N
R731	18K	18K	27K
R7A31	4.7K	4.7K	8.2K
R7C37	39K	39K	12K
R908	0.47 2W	0.47 2W	0.33 2W
R928	1.2K	1.2K	680
R958	15K 3W (MB)	15K 3W (MB)	22K 3W (MB)
T551	334P255010	334P255010	334P256010
T901	350P718010	350P718010	350P664020

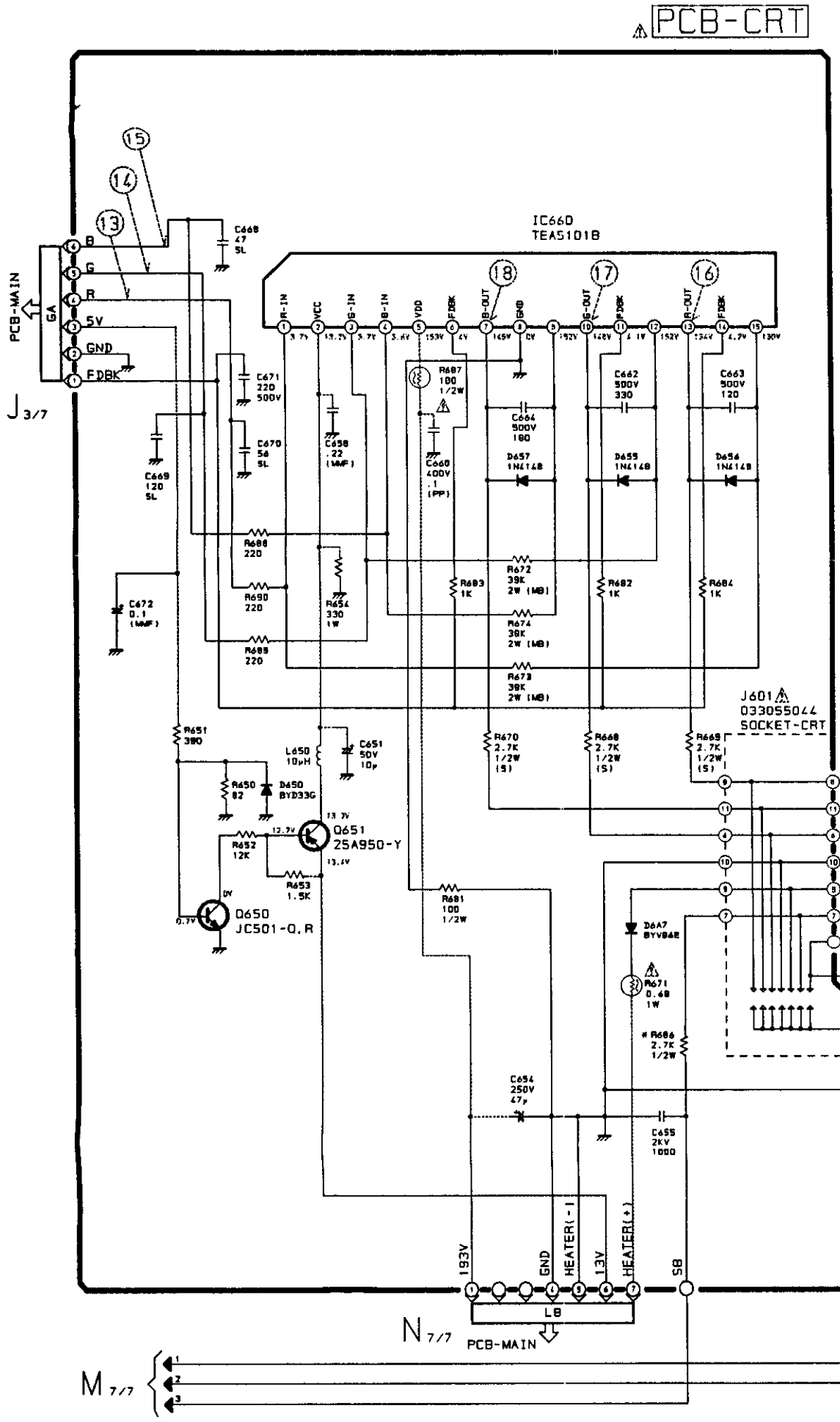

A 1/7
B 1/7
E 2/7
F 2/7
Q 7/7
O 5/7
O 6/7
Q703 JC501-Q,R VOL/AV/BG/L
Q7A01 2SC1740S-E TUNING-V-2
Q7A46 JC501-Q,R ST-BY
IC702 ST24C04
Q702 JC501-Q,R VOL
*IC701
Q746 JC501-Q,R POWER
Q743 JC501-Q,R RESET
Q737 JC501-Q,R V-SYNC-INV
Q731 JC501-Q,R RGB-REF
Q7A32 JC501-Q,R SEA-SWITCH
Q711 JA1D1-Q,R SW-PROTECT
Q7A81 JA1D1-Q,R LED-SW
Q736 JC501-Q,R
Z701 TSOP1733KS1
Q952 2SC2234-Q,Y 9V-REG
Q953 JC501-Q,R MAINS-OFF-MUTE
IC951 TDA8137
T901
Q901 SGSF313PI REG OUT
IC801 TEA2261 REG COUNT
S891 ES892D21B
KA
KK
ADG COIL
COLD LIVE
LIVE COLD
S701 S702 S703 S704
HE
F-EXT-RGB MUTE
IF-AGC
CVBS





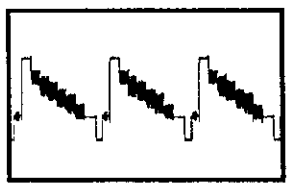
NOTE: Double voltage indication:
6.6V <-- C25T7S
(6.1V) <-- C21T7G & C21S7S


Q253
JC501-Q, R
VIDEO-OUT
J251
035-098-4505
AV1-SCART
IC101
STV8223A2
Q105
JC501-Q, R
IF-AGC-BUFFER
SF101
38.9MHz
CF101
TPS. E. SMWA
CF301
5.5MHz
Q106
JA101-Q, R
VB1-BUF
Q107
JA101-Q, R
VB2-BUF
Q108
JA101-Q, R
UHF-BUF
TU101
UV1315/IEC
IC956
μPC574J-K
IC351
TDA7253
SP391
Q303
JC501-Q, R
MAINS-OFF-MUTE-2
Q312
JC501-Q, R
MUTE
D251*
EQA02-05CD
D257*
EQA02-05CD
D258*
EQA02-05CD
D104
1N4148
D303
1N4148
D304
1N4148
D701
1N4148
H 3/7
D 2/7
D 1/7
A 5/7
B 5/7
C 2/7
C 1/7
E 6/7
F 6/7
G 3/7

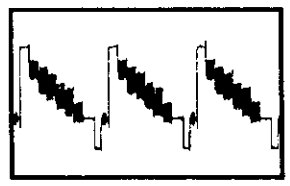


WAVEFORMS

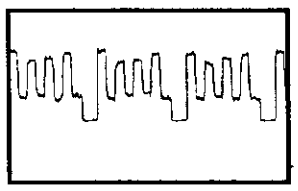
Waveforms are for a PAL colour bar signal on the RF input and are measured with all picture controls at optimum .



1 2.1V p-p (H)

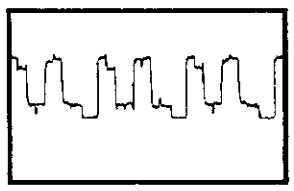


2 1.1V p-p (H)

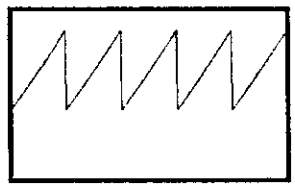


3 2.0V p-p (H)

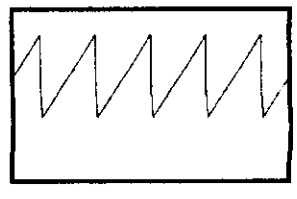
4 2.0V p-p (H)



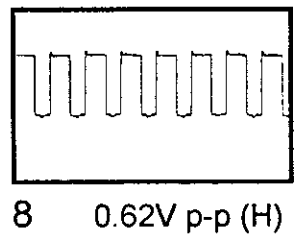
5 2.0V p-p (H)



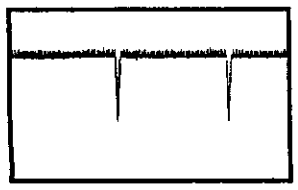
6 1.6V p-p (V)



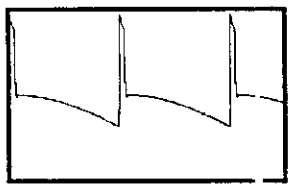
7 1.6V p-p (V)



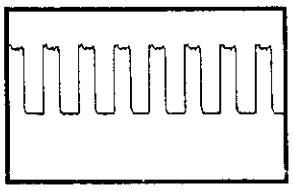
8 0.62V p-p (H)



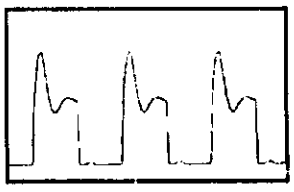
9 0.5V p-p (V)



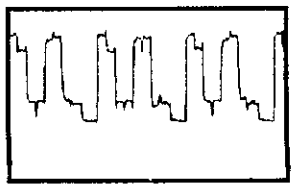
10 52V p-p (V)



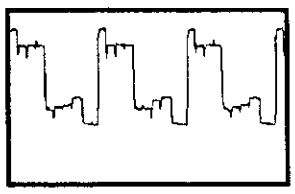
11 0.8V p-p (H)



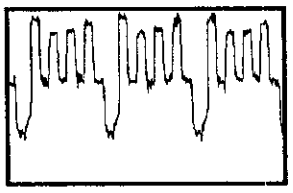
12 220V p-p (H)



13 1.2V p-p (H)

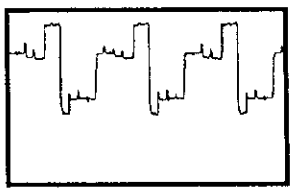


14 1.3V p-p (H)

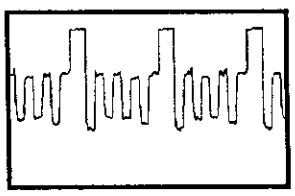


15 1.4V p-p (H)

16 86V p-p (H)



17 87V p-p (H)



18 97V p-p (H)