General Information

Chassis : C4E-R

Safety Instructions

X-RAY RADIATION PRECAUTION

1. The E.H.T. must be checked every time the receiver is serviced to ensure that the C.R.T. does not emit X-ray radiation as result of excessive E.H.T. voltage. The nominal E.H.T. for this receiver is 29.8 kV at zero beam current (minimum brightness) operating at 240V a.c. The maximum E.H.T. voltage permissible in any operating circumstances must not exceed 31.5 kV. When checking the E.H.T., use the 'High Voltage Check' procedure in this manual using an accurate E.H.T. voltmeter.
2. The only source of X-RAY radiation in this receiver is the C.R.T. To prevent X-ray radiation, the replacement C.R.T. must be identical to the original fitted as specified in the Parts List.
3. Some components used in this receiver have safety related characteristics preventing the C.R.T. from emitting X-ray radiation.
   For continued safety, replacement component should only be made after referring the Product Safety Notice.

SAFETY PRECAUTION

1. This receiver has a nominal working E.H.T. voltage of 26.0 kV. Extreme caution should be exercised when working on the receiver with the back removed.
   Do not attempt to service this receiver if you are not conversant with the precautions and procedures for working on high voltage equipment.
   When handling or working on the C.R.T., always discharge the anode to the receiver chassis before removing the anode cap.
   The C.R.T., if broken, will violently expel glass fragments. Use shatter proof goggles and take extreme care while handling. Do not hold the C.R.T. by the neck as this is a very dangerous practice.
2. It is essential that to maintain the safety of the customer all cable forms be replaced exactly as supplied from factory.
3. A small part of the chassis used in this receiver is, when operating, at approximately half mains potential at all times. It is therefore essential in the interest of safety that when serving or connecting any test equipment the receiver should be supplied via a suitable isolating transformer of adequate rating.
4. Replace blown fuses within the receiver with the fuse specified in the parts list.
5. When replacing wires or components to terminals or tags, wind the leads around the terminal before soldering. When replacing safety components identified by the international hazard symbols on the circuit diagram and parts list, it must be a Toshiba approved type and must be mounted as the original.
6. Keep wires away from high temperature components.

PRODUCT SAFETY NOTICE

Many electrical and mechanical components in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-ray radiation protection afforded by them cannot necessarily be obtained by using replacements rated at higher voltages or wattage, etc. Components which have these special safety characteristics in this manual and its supplements are identified by the international hazard symbols on the schematic diagram and parts list. Before replacing any of these components read the parts list carefully.

Substitute replacement components which do not have the same safety characteristics as specified in the parts list may create X-ray radiation

Recommended Safety Parts

Item	Part No.	Description
C440	24082343	PF, 5600pF, ±3%, 1500V
C444	24082336	PF, 3600pF, ±3%, 1500V
C463	24212222	CD, 2200pF, ±10%
C801	24082363	PE, 0.22µF, ±20%, AC250V
C802	24094656	CD, 2200pF, ±20%, AC400V
C803	24094656	CD, 2200pF, ±20%, AC400V
R327	24339569	ME, 5.6 ohm, 2W
R444	24338398	ME, 0.39 ohm, 1W
R448	24338338	ME, 0.33 ohm, 1W
R801	24009954	Metal-Glazed Resistor, 2.2M ohm, 1/2W
R844	24005007	Metal-Glazed Resistor, 8.2M ohm, 1W
R890	24019340	PTC Thermistor, 18 ohm, 290V
R920	24000568	FR, 4.7 ohm, 1W
L462	----------	DY, Supplied with V901
L901	23200205	Coil, Degaussing, TSB-2333AR
T401	23224983	Transformer, Horiz. Drive, TLN1039
T461	23236464	Transformer, Flyback, TFB41 23AR
T801	23211858	Line Filter, TRF3139
T803	23217240	Transformer, Converter, TPW3301AR
Q404	23314375	Transistor, ON4409(508D)
Q826	A8643108	Photo Coupler, TLP621(GR-LF
Q835	23318299	IC, L78MR05
F801	23144898	Fuse, 3.15A
F803	23144875	Fuse, 0.63A
P801	23372012	Power Cord
S801	23145434	Switch, Power, 2C2P
V901	23312670	Picture Tube, A51EAL155X01
V901A	23902891	Socket, CRT, 10P

Service Adjustments

GENERAL INFORMATION

All adjustments are thoroughly checked and corrected when the receiver leaves the factory. Therefore the receiver should operate normally and produce proper colour and B/W pictures upon installation. However, several minor adjustments may be required depending on the particular location in which the receiver is operated.
This receiver is shipped completely in cardboard carton. Carefully draw out the receiver from the carton and remove all packing materials. Plug the power cord into a convenient 240 volts 50 Hz AC two pin power outlet. Turn the receiver ON. Check and adjust all the customer controls such as BRIGHTNESS, CONTRAST and COLOUR Controls to obtain natural colour or B/W picture.

AUTOMATIC DEGAUSSING

A degaussing coil is mounted around the picture tube so that external degaussing after moving the receiver is normally unnecessary, providing the receiver is properly degaussed upon installation. The degaussing coil operates for about 1 second after the power to the receiver is switched ON. If the set is moved or faced in a different direction, the power switch must be switched off at least 30 minutes in order that the automatic degaussing circuit operates properly. Should the chassis or parts of the cabinet become magnetized to cause poor colour purity, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube, the sides and front of the receiver and slowly withdraw the coil to a distance of about 2 m before disconnecting it from AC source. If colour shading still persists, perform the COLOUR PURITY ADJUSTMENT and CONVERGENCE ADJUSTMENTS procedures.

HIGH VOLTAGE CHECK

CAUTION: There is no HIGH VOLTAGE ADJUSTMENT on this chassis.

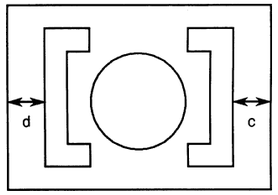
1. Connect an accurate high voltage meter to the second anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST Controls to minimum (zero beam current).
3. High voltage will be measured below 31.5kV.
4. Change the BRIGHTNESS Control to both extremes to be sure the high voltage does not exceed the limit of 29.0 kV under any conditions.

HEIGHT ADJUSTMENT

1. Receive the WG PHILIPS pattern, and set the contrast and colour to minimum, and the brightness to centre.
2. Adjust HEIGHT Control (R351) so that white blocks at top and bottom of the picture are are just masked.

HORIZONTAL CENTRE ADJUSTMENT

1. Receive the UK PHILIPS pattern.
2. Set the contrast and colour to centre, and the brightness to centre.
3. Adjust H. CENTER USER Control (R451) so the pattern can be located for d-c to be + 4.0 mm.



FOCUS ADJUSTMENT

Adjust FOCUS Control on FLYBACK TRANS. (T461) for well defined scanning lines in the centre area on the screen.

DELAYED R-F AGC ADJUSTMENT

1. Tune the set to the strongest station in your area.
2. Turn AGC DELAY Control (R151) on PIF Board to fully counterclockwise position.
3. Adjust AGC DELAY Control clockwise until noise (snow) disappears on the screen.

CRT GREY SCALE ADJUSTMENT

1. Press VIDEO INPUT button on Remote Control unit to turn TV to video input mode. Next press PICTURE SELECT button to select function and set CONTRAST to minimum, BRIGHTNESS to maximum, COLOUR to minimum.
2. Turn the SCREEN Control (on T461) fully counterclockwise.
3. Set the RED, GREEN and BLUE CUT OFF Controls (R557, R558, R559) counterclockwise to the centre position.
4. Set the CUT OFF SW. (S202) in the H. line position.
5. Set the SUB BRIGHTNESS Control to minimum.
6. Rotate the SCREEN Control gradually clockwise until the first horizontal line of a colour (RED, GREEN or BLUE) appears slightly on the screen.
   Set the SCREEN Control to this position.
7. Adjust the CUT OFF Controls to obtain the slightly lighted horizontal lines in the same levels of three colours (RED, GREEN and BLUE).
   The lines may look like white if the CUT OFF Controls are adjusted properly.
8. Return the CUT OFF SW. (S202) in the receiving position.
9. Set the BRIGHTNESS Control to the maximum and COLOUR Control to the centre.
10. Set the BRIGHTNESS and CONTRAST Controls to obtain dark grey raster. Then check the white balance in low brightness. If the white balance is not proper, retouch the CUT OFF Controls to obtain a good white balance in both low and high light areas.

SUB-BRIGHTNESS ADJUSTMENT

1. Tune in a colour programme of Philips pattern.
2. Set the CONTRAST Control to the minimum and the BRIGHTNESS Control to the centre.
3. Set the COLOUR Control to the minimum.
4. Set the SUB-BRIGHT. Control (R551) so that the voltage across terminals Y-Z can be 0.2 ± 0.05V with voltmeter and leave the receiver for five minutes in this state.
5. Watching the picture well, adjust the SUB-BRIGHT. Control in the position where the picture does not show evidence of blooming in high bright area and not appear too dark in low bright portion.
6. Check the proper picture variation by rotating the CONTRAST and BRIGHTNESS Controls to both extremes.
7. If the picture does not appear dark with the CONTRAST and BRIGHTNESS Controls turned to the minimum, or not appear bright with the controls turned to the maximum, adjust the SUB-BRIGHT. Control again for the acceptable picture.

BUS DATA SETTING

1. In the TV set of initial lot of production, SAA5290ZP/024 is used for QA01. But replace with SAA5290ZP/032 for servicing.
2. When QA01 only is replaced, it is not necessary to change the mode data.
3. When memory IC (QA02) is replaced, change the mode data in the manner below.

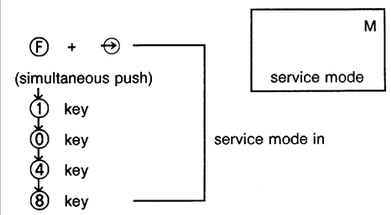
ADJUSTMENT METHOD FOR SERVICING

1.OUTLINE

In the service mode, MODE DATA adjustments can be made easily with user remote control unit. (CT-9689 only)

2.SERVICE MODE OPERATION

2-1. How to Enter the Service Mode

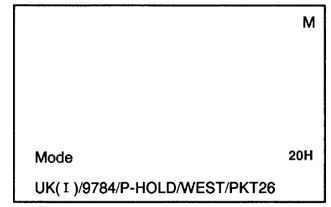


2-2. How to Exit from the Service Mode

Exit the service mode by turning the power on/off with the remote control.

3. ADJUSTMENT IN THE SERVICE MODE

Service Mode Level Adjustments
1) Push Ⓕ + ◪ key (simultaneous push) to appear Mode Data to be adjusted.
2) Adjust with the level UP/DOWN (VOL UP/DOWN) key.



Example of screen display in level adjustment

PICTURE I-F ALIGNMENT

GENERAL
Refer to figure 4 for test equipment connection.

PRELIMINARY STEPS
Supply +5 volts to the 5V-1 line.

SIGNAL GENERATOR
Connect to both leads of R101 with signal level of 75 dBµ, and open the solder-link at IF OUT of tuner on the Main Board. (See figure 4.)

DVM
Connect to pin #44 of 1C501 on the Main Board through the detector.

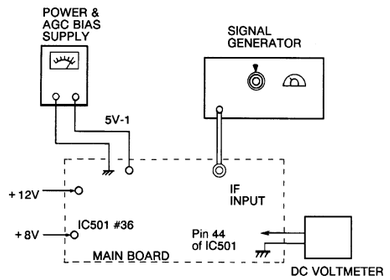


Figure 4. Picture IF Alignment

STEP
Detector Coil

SIGNAL GENERATOR
39.5 MHz CARRIER WAVE (Level 75 dBµ)

ADJUST
T103

REMARKS
1. Supply external DC power (+ 5V) to 5V-1 line.
2. Supply + 8V to pin 36 of IC501.
3. Supply external DC power to + 12V line.
4. Apply test signal to IF input.
5. Adjust T103 so that DC voltage at pin 44 of IC501 becomes 3.2V ± 0.5V.

After completing the above steps, disconnect the equipment and re-solder the links on the Main Board, and adjust the AGC Delay control (R151) following DELAYED RF AGC ADJUSTMENTS.

Main Diagram

U902A MAIN BOARD PB5859-1

1	AUDIO OUT (R)
2	AUDIO IN (R)
3	AUDIO OUT (L)
4	AUDIO EARTH
5	EARTH
6	AUDIO IN (L)
7	BLUE IN
8	EXT/TV
9	GREEN EARTH
10	NC
11	GREEN IN
12	NC
13	RED EARTH
14	NC
15	RED IN
16	RAPID BLANKING
17	VIDEO EARTH
18	RAPID BLK EARTH
19	VIDEO OUT
20	VIDEO IN
21	SHIELD EARTH

PH01 SCART SOCKET(21 PIN)

H001 UF813BX1

L101 PL-0.47

L102 TLN8040

IC601 TDA2611A

ICN01 MM1031XS

IC603 MC14053BCP or TC4053BP

ICA01 SAA5290ZP032

ICA02 NM24C02EN

W661 SPK-1351

1.0V(p-p) WITH 100% MOD

SCART OUT

AUDIO IN

EXT.VIDEO

VIDEO OUT

EXT.MUTE

SCART MUTE

EXT. VIDEO

INT. VIDEO

TV VIDEO

SHIELD

STAND BY (RED) SCL003URC3FX

IR-9109A-K

CAUTION LIVE AREA

Continued at 1

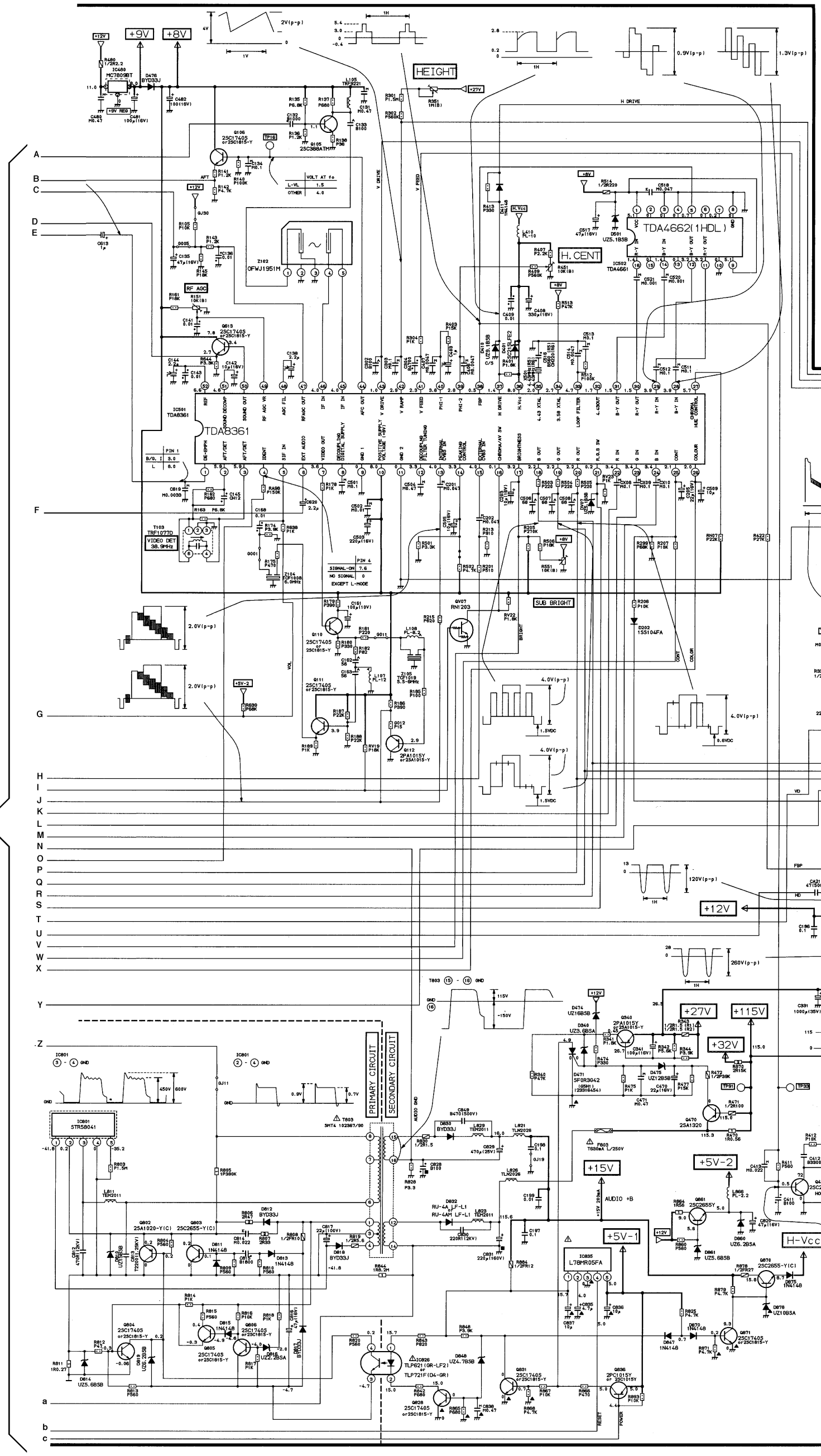
Main Diagram Cont'd

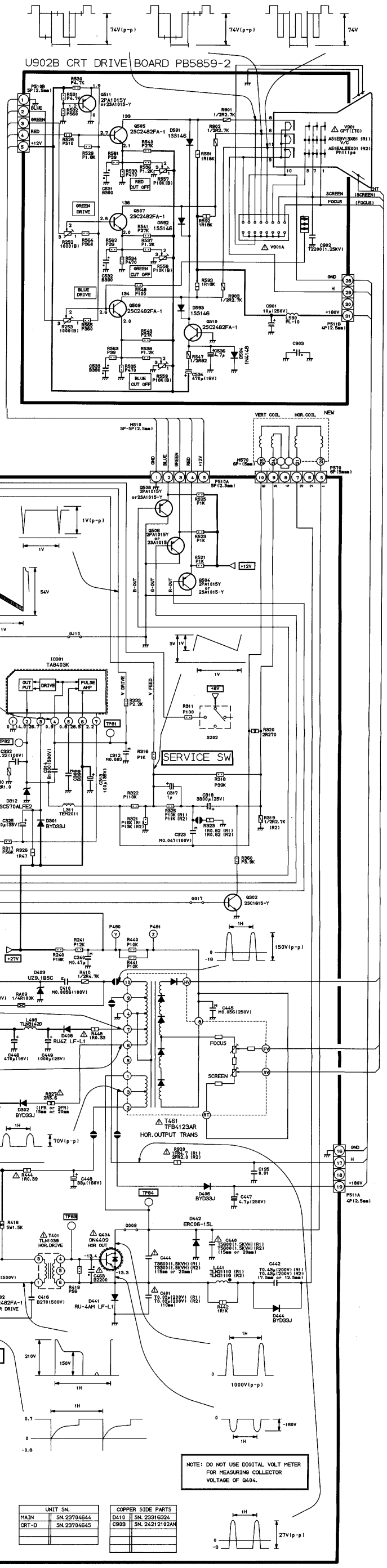
C4ER CIRCUIT SPEC COMPONENT VALUES BY CPT TYPE

No.	Loc.No.	R1	R2
1	V901	A51EAL55X01[PHILIPS]	A51EBV13X81[VIDEO COLOR]
2	C401	T0.03μ(200V)	T0.03μ(200V)
3	C440	T5600(1.5KVH)	T5600(1.5KVH)
4	C442	T0.43μ(200V)	T0.43μ(200V)
5	C444	T3600(1.5KVH)	T3300(1.5KVH)
6	L441	TLN2111G	TLN2055
7	R920	1FR4.7	2FR2.0
8	R321	P16K	P13K
9	R323	1R0.82	1R0.82
10	R325	P10K	P11K
11	R319	NOT REQ'D	1/2R2.7K
12	R343	1/2R1.5	1/2R1.5

C4ER CIRCUIT SPEC COMPONENT VALUES BY CRYSTAL TYPE(SUPPLIER)

No.	Loc.No.	R5	R6
1	X501	4.43MHz (N.D.K.)	4.43MHz (PHILIPS)
2	C516	B560	CH220





UNIT SN.	
MAIN	SN.23704644
CRT-D	SN.23704645

COPPER SIDE PARTS	
D410	SN.23316324
C903	SN.24212102AN

1