

HITACHI

No. 0102



SERVICE MANUAL MANUEL D'ENTRETIEN WARTUNGSHANDBUCH

CAUTION:

Before servicing this chassis, it is important that the service technician read the "Safety Precautions" and "Product Safety Notices" in this service manual.

ATTENTION:

Avant d'effectuer l'entretien du châassis, le technicien doit lire les «Précautions de sécurité» et les «Notices de sécurité du produit» présentés dans le présent manuel.

VORSICHT:

Vor Öffnen des Gehäuses hat der Service-Ingenieur die „Sicherheitshinweise“ und „Hinweise zur Produktsicherheit“ in diesem Wartungshandbuch zu lesen.

<u>Model</u>	<u>Chassis</u>
C1422R	F1R
C1422T	F1Y
C2122T	F4Y
CP1422R	F1GR
CP2122R	F4GR
CP1422T	F1GY
CP2022T	F2GY
CP2122T	F4GY
CP1422T-481	F1HY
CP2122T-481	F4HY
CP1422T-491	F1HY
CP2022T-491	F2HY
CP2122T-491	F4HY
CS1422R	F1KR
CS2022R	F2KR
CS2122R	F4KR
CL1422R	F1FR
CL2122R	F4FR

Data contained within this Service manual is subject to alteration for improvement.

Les données fournies dans le présent manuel d'entretien peuvent faire l'objet de modifications en vue de perfectionner le produit.

Die in diesem Wartungshandbuch enthaltenen Spezifikationen können sich zwecks Verbesserungen ändern.

TECHNICAL SPECIFICATIONS

TV Standard	625 lines, STANDARD I (UK) B/G/H/DK, L/L', (Export)
Channel coverage.....	UHF Channels (UK) UHF/VHF Hyper band (Export)
Aerial input impedance	75ohm Unbalanced
Power Consumption	Picture Tube 14" Models < 40W 35.5cm types 20" Models < 48W 48cm types 21" Models < 52W 51cm types
Consumption in standby mode.....	<4W
Mains Voltage	220V/210V, 50Hz
Fuse.....	2 Amp time-lag

SPÉCIFICATIONS TECHNIQUES

Standard TV	625 lignes, STANDARD: R-U B/G/H/DK, L/L': (Export)
Couverture de canaux.....	Canaux UHF (R-U) UHF/VHF Band hyper (Export)
Impédance d'entrée d'antenne.....	75 ohms Non équilibrée
Consommation électrique.....	Tubes-images 14" Models < 40W 35.5cm types 20" Models < 48W 48cm types 21" Models < 52W 51cm types
Consommation en mode veille	<4W
Tention secteur	220V/240V, 50Hz
Fusible	2 Amp time-lag

SPECIFICATIONS TECHNIQUES

Fernsehnorm.....	625 Zeilen, Fernsehnorm I (nur GB) Fernsehnorm B/G/H/DK, L/L' (Export)
Kanäle.....	UHF-Bereich (GB) UHF/VHF/Hyperband Bereich
Antenneneingangsimpedanz	75 ohms Unsymmetrisch
Leistungsaufnahme	Bildröhre 14" Models < 40W 35.5cm types 20" Models < 48W 48cm types 21" Models < 52W 51cm types
Leistungsaufnahme im standby mode.....	<4W
Netzspannung	220/240V, 50Hz
Sicherung.....	2 Amp time-lag

December 1998

ENGLISH

SAFETY PRECAUTIONS

WARNING: The following precautions must be observed.

ALL PRODUCTS

Before any service is performed on the chassis an isolation transformer should be inserted between the power line and the product.

1. When replacing the chassis in the cabinet, ensure all the protective devices are put back in place.
2. When service is required, observe the original lead dressing. Extra precaution should be taken to ensure correct lead dressing in any high voltage circuitry area.
3. Many electrical and mechanical parts in HITACHI products have special safety related characteristics. These characteristics are often not evident from visual inspection, nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified by marking with a  on the schematics and the replacement parts list.

The use of a substitute replacement component that does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list, may create electrical shock, fire, X-radiation, or other hazards.

4. Always replace original spacers and maintain lead lengths. Furthermore, where a short circuit has occurred, replace those components that indicate evidence of overheating.
5. Insulation resistance should not be less than 2M ohms at 500V DC between the main poles and any accessible metal parts.
6. No flashover or breakdown should occur during the dielectric strength test, applying 3kV AC or 4.25kV DC for two seconds between the main poles and accessible metal parts.
7. Before returning a serviced product to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock. The service technician must make sure that no protective device built into the instrument by the manufacturer has become defective, or inadvertently damaged during servicing.

CE MARK

1. HITACHI products may contain the CE mark on the rating plate indicating that the product contains parts that have been specifically approved to provide electromagnetic compatibility to designated levels.
2. When replacing any part in this product, please use only the correct part itemised in the parts list to ensure this standard is maintained, and take care to replace lead dressing to its original state, as this can have a bearing on the electromagnetic radiation/immunity.

PICTURE TUBE

1. The line output stage can develop voltages in excess of 25kV; if the E.H.T. cap is required to be removed, discharge the anode to chassis via a high value resistor, prior to its removal from the picture tube.
2. High voltage should always be kept at the rated value of the chassis and no higher. Operating at higher voltages may cause a failure of the picture tube or high voltage supply, and also, under certain circumstances could produce X-radiation levels moderately in excess of design levels. The high voltage must not, under any circumstances, exceed 29kV on the chassis (except for projection Televisions).
3. The primary source of X-radiation in the product is the picture tube. The picture tube utilised for the above mentioned function in this chassis is specially constructed to limit X-radiation. For continued X-radiation protection, replace tube with the same type as the original HITACHI approved type
4. Keep the picture tube away from the body while handling. Do not install, remove, or handle the picture tube in any manner unless shatterproof goggles are worn. People not so equipped should be kept away while picture tubes are handled

LASERS

If the product contains a laser avoid direct exposure to the beam when the cover is open or when interlocks are defeated or have failed.

SAFETY AND ISOLATION

1. Under no circumstances should any form of repair or maintenance be attempted by any person other than a competent technician or engineer. The following precautions should be observed:
2. For purposes of servicing, the chassis should be supplied from an isolation transformer of at least 150W rating.
3. If disturbed, the original lead dressing should be restored. This is particularly important due to the 'hot coil' nature of the chassis. Lead dressing will also have a bearing on the EMC performance of the chassis.
4. Components marked  on the circuit diagram are safety approved types and have special safety related characteristics. Only the manufacturers replacement components should be used. Replacement with alternative or 'up-rated' parts e.g. higher power resistors definitely does not guarantee the same level of protection and may create a fire, electric shock or X-radiation hazard.
5. Components not bearing the  mark should still be replaced with the originally fitted type and should be mounted in the same way.

The Isolation Barrier

The chassis is a 'hot-coil' chassis whereby the line deflection coils are NOT isolated from the mains since the PSU does not provide B+ rail isolation. Consequently, the mains isolation barrier is more convoluted than in a conventional chassis and a much larger portion of the chassis is non-isolated. Figure 1 shows the isolation barrier position in the chassis.

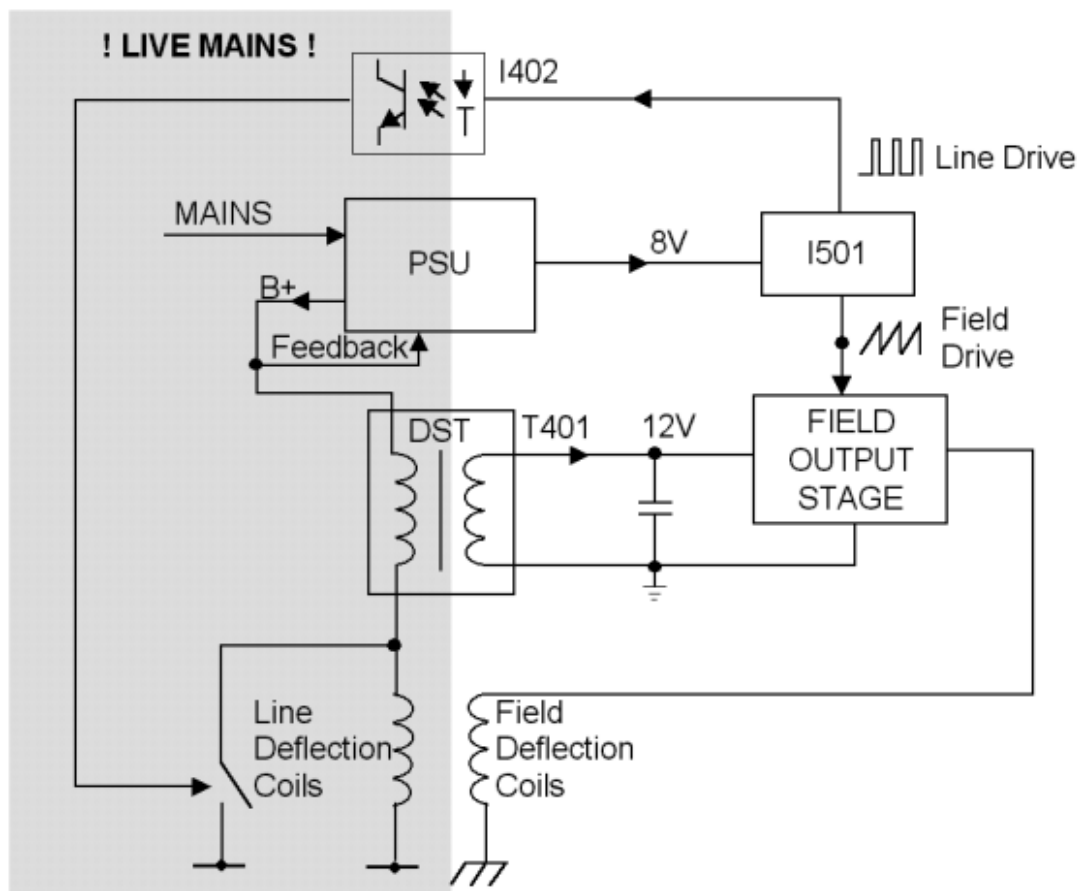


Fig 1 Mains Isolation Barrier Positions

It can be seen that both the DST (T401) and the scan coils now straddle the isolation barrier and are, as such, safety critical components. Also, the opto-coupler (I402) is required to pass line drive from I501 on the 'cold' side to the line drive stage on the 'hot' side. The isolation barrier therefore consists of T802, T401, I402, C804, R804, R805, the scan coils and 6mm air gaps. To maintain barrier integrity care should be taken not to reduce any air gaps, e.g. by protruding wires, following component replacement. Deflection yoke lead dressing is important to maintain double insulation across the isolation barrier. The position of the deflection lead sleeving is maintained by a tie wrap. Should this be removed for any reason, the sleeving should be slid towards the deflection yoke and tie wrapped into position.

Semiconductor Device Handling Precautions

The chassis contains devices which may be damaged by static electrical charge during handling, particularly I501, I602, I701 and Q801. To avoid damage, soldering irons should be earthed and service engineers should ideally wear wrist straps earthed through a 1M resistor or at least discharge themselves to an earthed point.

SERVICING

Microprocessor Control System

Microcontroller

Micro-controller, I701, is either a SAA5288 (on non-teletext sets) or a SAA5290 (on teletext sets). Both devices have integrated on-screen display (OSD) generator; the SAA5290 also has an integrated teletext decoder. The micro-controller has a single 12MHz crystal X701.

The television is controlled by serial (I²C) bus communication, digital switching inputs and outputs, analogue-to-digital inputs and pulse-width-modulation (PWM) outputs.

Reset

At power on, C709 is not charged so the voltage on pin 43 of the micro-controller rises with the 5V supply and resets the micro-controller. An internal resistor to ground at this pin causes C709 to charge up and the voltage on the reset pin to drop to 0V.

In normal operation, transistor Q702 is switched on and the reset pin is low, but if the 10V supply voltage drops below about 8V the transistor will switch off and R721 will pull the reset pin high and reset the device.

User Control

User input is via infra-red remote control (Philips' RC5 protocol), internally decoded from the receiver I703, or from three (non-matrixed) local control keys on active low inputs, I701 pins 18, 19 and 20. The LED flashes each time a key is detected or remote command received.

Tuning

The tuning control voltage to the tuner is controlled via the PWM at pin 1 of I701 and integrating circuit around Q001. Minimum voltage is at maximum mark-space ratio (bottom of each band). Band-switching is controlled by active low outputs on pins 14, 15 and 16 (high, mid, low) and transistors Q002 to Q004. The controller makes AFC corrections by reading on-tune information from I501 via the I²C bus.

As the tuner is controlled by voltage synthesis, there is no direct correlation between the controller output and the tuned frequency.

Non-volatile memory

The non-volatile memory, I702, holds configuration information, user settings, parameters as applicable for I²C controlled ICs and the programme tuning records. It is itself accessed by I²C.

When a new memory IC is fitted, the microcontroller will automatically load default information, which takes a few seconds during power-up. Regular re-loading of the data, or corruption of settings may indicate I702 is faulty.

AV switching

Inputs from pins 8 and 16 of SCART 1 are sampled by analogue to digital conversion on pins 9 and 10 of I701 respectively. The input levels are adjusted such that the controller will automatically switch to AV1 when pin 8 is above 6V and RGB when pin 16 is above 1V. The time constant on pin 16 ensures the controller will not detect real-time RGB insertion using pin 16.

OSD / Teletext

Line and field timings are obtained from V.sync on pin 37 and H.sync input on pin 36. Teletext (on teletext sets only) is obtained from the CVBS input on pin 23. The RGB outputs on pins 34, 33 and 32 respectively are inserted into the TV output when gated by the OSD EN OUT signal on pin 35. OSD / teletext contrast is controlled by the peak reference level on pin 31, generated from the microcontroller PWM output on pin 2 via Q305.

Error codes

Under the following fault conditions the television will switch to standby and flash the LED.

Fault Condition No. of Flashes

Multiple TDA884X I ² C errors	1
Over voltage / X-ray protection (OVP)	2
Line start-up sequence failed	3
Black current (BC) loop unstable	4
Vertical scan failure	5
Continuous TDA884X power-on reset	6

Multiple error codes may appear, eg. two quick flashes, pause, four quick flashes etc. for OVP + BC loop errors.

Adjustments

In order to make service adjustments including setting the height, width, various configuration options, etc., the TV should have a suitable signal tuned in; ideally, a geometry test card. A teletext signal is recommended for setting OSD contrast on a teletext chassis.

To enter service mode, place a shorting link across terminals 2 and 3 of P701.

In service mode, two 2-digit hexadecimal numbers are displayed to the left of the screen; the lefthand one is the service parameter number, the righthand one is the value for that parameter. Some parameters are identified by a two-letter code instead of a number, see below.

For example:- 0A 1F shows parameter ten (0A hex) at thirty-one (1F hex).

In this mode of operation some of the remote control keys have different functions;

The up and down and local select keys are used to select a parameter.

The remote and local left and right keys are used to change the value of the current parameter.

The TV button is used to store any changes.

The teletext select and digit '0' keys are used for programme up or down.

The Normalize key selects factory picture settings immediately over-writing user settings.

The digit keys '1', '2',----'8' toggle the state of the individual bits '7', '6',----'0' of the value of the current parameter, for example, pressing digit key '4' would change value 1F hex to 0F hex.

TO STORE THE CHANGES, PRESS THE TV KEY ON THE HAND UNIT BEFORE REMOVING THE SERVICE MODE LINK. THE MESSAGE 'STORED' WILL BE DISPLAYED TO CONFIRM THE OPERATION.

Under certain circumstances, for example abnormal operation due to suspected corruption of the service parameters, it may be necessary to perform a complete reset of the non-volatile memory (I702). To effect this, press and hold the X (teletext update) key for about 3 seconds or until the set switches to standby. Following this it will be necessary to perform a 'set-up' of the television.

Service Parameters

The following values assume you are watching a tuned in picture, on RF. (On other sources, or with no signal, some values may differ.)

Service parameters 00 to 1A apply to the control registers of I501 as shown in the following table.

No.	Value			Function	Action
	14"	20"	21"		
00	02	02	02	System Control	Do not adjust
01	D0	D0	D0	System Control	Do not adjust
02	1F	1F	1F	Hue (SCART NTSC 4.43 playback only)	Use picture menu control instead
03	20	1D	27	Horizontal shift	Adjust to centre picture horizontally
04-07	00	0 0	00	E-W control	Not used on this chassis
08	20	1F	1E	Vertical slope (linearity)	Adjust for vertical linearity
09	10	0B	1A	Height	Adjust for correct picture height
0A	44	4A	4A	S-correction	Adjust for best vertical S-correction

No.	Value			Function	Action
	14"	20"	21"		
0B	2B	1B	1B	Vertical shift	Adjust to centre picture vertically
0C	29	38	3D	White point - Red	
0D	29	38	3D	White point - Green	See "Adjustments" in Servicing
0E	29	38	3D	White point - Blue	
0F	1C	1C	1C	Peaking (sharpness)	Use picture menu control instead
10	5C	5C	5C	Brightness	Use picture menu control instead
11	9C	9C	9C	Saturation	Use picture menu control instead
12	1C	1C	1C	Contrast	Use picture menu control instead
13	13	13	13	AGC take-over point	See "Adjustments" in Servicing
14	0A	0A	0A	Volume	
15	50	50	50	IF PLL adjustment	Set to 50 hex
16	19	19	19	Vertical zoom	Not used on this chassis
17	20	20	20	Vertical scroll	Not used on this chassis
18	81	81	81	Control 2	Do not adjust
19	08	08	08	Control 3	Do not adjust
1A	00	00	00	Control 4	Do not adjust

Service Parameter Functions

Parameters above 1A are designated by two-letter codes (except text contrast on a teletext set). These control configuration.

Text Mode Text (OSD) contrast Set as preferred, see notes below

Ex Export (VHF/UHF) setting 00 for UHF-only, 01 if multi-band tuner

AV AV socket configuration 00 single SCART, 01 single SCART plus phono inputs

It is advisable to make a note of the existing values prior to commencing servicing. (see "*Adjustments*" in **Servicing**)

Adjustments

H. T. Setting

The HT should be adjusted using R818 to obtain correct width with normal brightness and contrast settings. A Philips complex test pattern is ideal for the operation.

A1 Control

This should be set using the 'screen' control on T401 to achieve 140V black level at the tube base cathodes with the brightness and contrast settings normalized. In practice the black level of the individual guns will differ and are set by I501 to achieve equal cut-off points.

White Points

These should be adjusted via service parameters 0C, 0D and CE whilst viewing a picture with little light area to prevent beam current limiting. The parameters should be adjusted for a black to white swing of 50V $\pm$ 1V (14"), 55V $\pm$ 1V (20") or 60V $\pm$ 1V (21") on each of the three cathodes with the picture normalized.

Text Contrast

White balancing of the red and blue outputs, relative to the green, should be carried out to ensure pure white text, using RV317 (R) and RV319 (B). As the picture outputs are automatically balanced, text white may be set using picture white as a reference once the black and white points (See adjustments section) have been set. The text contrast itself should be adjusted such, that the Text/OSD white parts are approximately 75% of the intensity of a test pattern peak white area: this corresponds to the 75% grey blocks in part of a 'Philips 5544' type test pattern. When the text contrast service parameter is selected the TV switches to teletext mix mode, page 101. If no text is present P100 will still appear in the top left corner of the screen together with some text on the bottom row of the display. There is no on-screen parameter: adjust with volume control as normal and change parameter with programme up/down keys.

AGC

The AGC take-over point should be adjusted via service parameter 13 such, that the tuner output to the SAW filter is 600mV pk-pk (300mV per side for symmetrical tuner output) using a test pattern with no sound carrier.

Focus

Adjust the upper control on the rear of the flyback transformer for best focus.

Positioning

Horizontal position should be adjusted via service parameter 03 so as to centre the picture. Vertical position should be adjusted via service parameter 0B so as to centre the picture. This may be simplified by pressing '1' with service parameter 0B selected to activate service blanking which blanks the lower half of the picture. The edge of the blanked area may then be aligned with the tube centre marks. Service blanking is disabled by once again pressing the '1' key.

Linearity

Horizontal linearity is fixed; no adjustment is possible. Vertical linearity is adjusted using service parameters 08 and 0A (linearity and S-correction) whilst displaying a cross hatch pattern. Adjust the linearity for evenly spaced intervals at the top and bottom of the picture, then adjust the S-correction to achieve equal spacing across the whole screen.

Vertical Protection Disable

Vertical protection is used to shut down the chassis in the event of field-scan failure. For diagnostic purposes this can be disabled by selecting service parameter 0A (S-correction) and pressing the number 2 key on the

hand unit. After repair, vertical protection should always be re-enabled by pressing the number 2 key again and storing it with the TV key. (The value of parameter OA toggles between two values when the number 2 key is pressed, **the higher** of which indicates that the vertical protection is **enabled**.).

Auto Black Level Disable

I501 independently sets the black level of each CRT gun to equalize the cut-off points and therefore provide a true black. For diagnostic purposes this control loop may be disabled by selecting service parameter 02 (hue) and pressing the number 2 key on the hand unit. After repair, the auto black level sampling should always be re-enabled by pressing the number 2 key again and storing it with the TV key. (The value of parameter 02 toggles between two values when the number 2 key is pressed, **the lower** of which indicates black level sampling is **enabled**).

Adjustment Locations (Physical)

See adjustment locations PCB

CIRCUIT DESCRIPTION

Switched Mode Power Supply

Summary

The power supply is a self-oscillating discontinuous buck converter (step-down chopper) under peak current control and designed for up to 65W output power at nominally 98V. The main B+ output of this converter topology is inherently non-isolated and as such, output voltage feedback does not require an opto-coupler. Some energy is derived in flyback mode via an isolated winding on the buck inductor to provide a low power 10V secondary supply from which are derived switched 8V (video processor) and permanent 5V (μ P) supplies.

In stand-by mode, both the B+ and 10V supplies remain close to their nominal operating levels but with virtually zero load, the PSU enters a burst-mode whereby typically 180 in 200 cycles are skipped. In this way, the stand-by power consumption (including degaussing circuit) is less than 4W.

Description of Operation of the Buck Converter

Figure 4 shows the main components of the buck converter. The output voltage may be controlled between zero and the input voltage by varying the on-time of Q801. During this period, $V_{in} - V_{out}$ is applied across the buck inductor (T802 winding pins 7 & 8) and the current in it ramps up linearly. When Q801 is turned off, $-V_{out}$ is applied across the buck inductor and energy is delivered to the load and C809 combination.

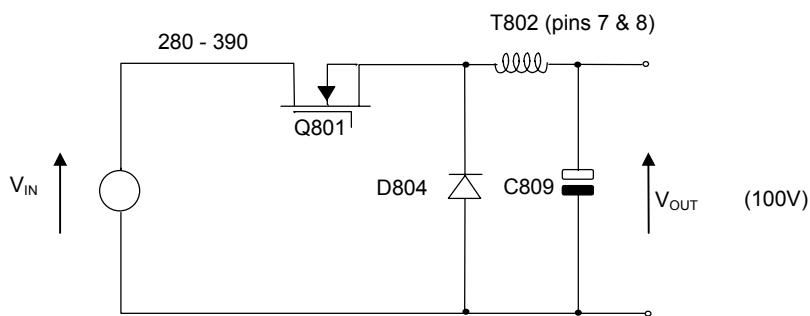


Fig 4 The Buck Converter Topology

Start-Up

At start-up, the overwind output voltage (T802 winding pins 7 & 8) is not present so a start-up bias circuit is required. This consists of R806, D802 and R809. Approximately 16V is produced at the junction of R806 and D802 which is fed via R809 to turn on Q801 for the first time.

Control Method

During the on-time of Q801, the buck inductor voltage flows through the current sense resistor R814 forming an analogue of the buck inductor current. This is fed to the base of Q802 along with a DC bias current from the error amplifier (via R813) such that once a certain buck inductor current level is reached, Q802 turns on. When this happens Q801 is turned off and the inductor current free-wheels through D804. This is peak current-mode control.

Output Voltage Regulation

The non-isolated B+ rail means that no opto-isolator is required for direct V_o control. It can be seen from Figure 5 that V_o minus a small zener voltage drives the emitter of this transistor ($V_o - V_z$) whilst a resistive potential divider feeds the base (kV_o , $k < 1$). If, for instance, the output voltage tends to rise, V_e rises by ΔV_o whereas V_b only rises by ΔkV_o . The net result is an increase in negative bias and an increase in collector (control) current. R818 in the potential divider provides an element of control over the B+ voltage.

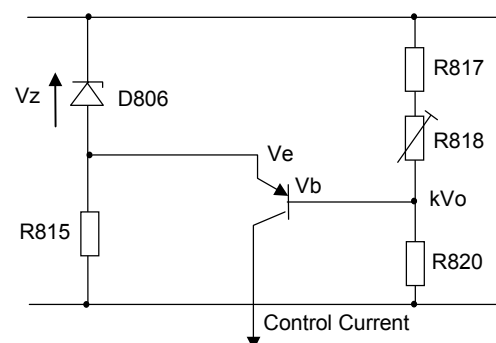


Fig 5 The Error Amplifier

Overvoltage Protection

An unfortunate characteristic of the buck converter is that if the power switch Q801 should become short-circuit, the full rectified mains voltage appears at the output, over stressing components in both the PSU itself and the load. In order to limit the output voltage rise under these conditions, a 130V 5W zener diode D805 is fitted across the B+ output. An over-voltage causes conduction of D805, shorting the B+ output and blowing the fuse F801.

Isolated Supplies

In order to provide low voltage isolated supplies, a secondary winding is included on the buck inductor, phased such that energy is delivered in flyback mode, that is when Q801 is off. During this interval, the buck inductor voltage is clamped to the output voltage and the turns ratio is chosen to provide a secondary of 10V with rectification and smoothing performed by D807 and C812 and overload protection by R821. A permanent 5V μ P supply is derived from this 10V supply by I801 as well as an 8V switched supply under μ P control by Q804, R822, D808 and Q805.

Chassis Start-Up Procedure

The PSU topology used in the chassis has a characteristic which complicates start-up. Until a B+ load is established (i.e. the line output stage starts), the isolated secondaries are very high impedance - simply turning on the video processor 8V supply and waiting for line-drive to start-up would fail since the supply cannot deliver I501's supply current. In order to overcome this problem, a system of 'pseudo line-drive' was devised which allows the line output stage to be driven by the μ P in order to establish a B+ load prior to turn-on of the video processor 8V supply. Figure 6 is a block representation of this system.

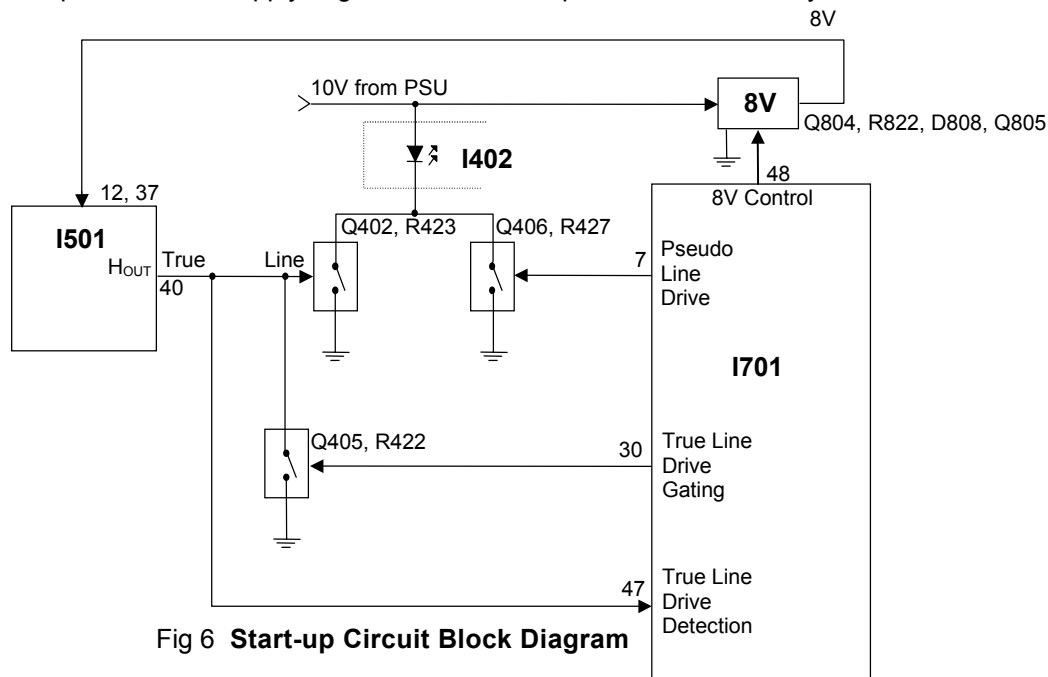


Fig 6 Start-up Circuit Block Diagram

The two line drive sources are OR-ed together at the input of I402, the two driver transistors being Q402 and Q406. The μ P is responsible for ensuring that both line drive sources cannot drive the output stage simultaneously and to achieve this, the true line drive from I501 is monitored (μ P pin 47). In this way, the transition from pseudo to true line-drive is timed to the latter starting up. However, the line-drive stage does not reliably operate at 31kHz so the soft-start cycle of I501 must be gated out. The μ P achieves this by keeping Q405 on for a fixed time after true line-drive has been detected thus keeping Q402 off. When this time has elapsed, pseudo line-drive is stopped and Q405 turned off simultaneously, completing the start-up sequence.

On reverting to stand-by pin 7 reverts to the high state which maintains I402 in conduction via Q406. This maintains Q403 on and the line output transistor (Q404) off.

Tuner and IF Stages

Tuner

The main chassis is fitted with a voltage synthesis UHF tuner for system I. Control of the tuned frequency is achieved by a voltage on pin 2 of the tuner. This voltage is derived from integrating a 33 volt PWM switched waveform. This PWM waveform is derived from pin 1 of the microcontroller I701.

The AFC is sampled by the microcontroller via the I²C bus from I501 and frequency correction is achieved by microcontroller adjustment of the duty cycle of the PWM which then modifies the tuner frequency.

AGC Adjustment

For most aerial input signal levels the tuner operates at maximum gain. At high signal levels the gain of the tuner is reduced by an AGC voltage generated in the IF stage. The AGC output from the IF (pin 54 of I501) is applied to pin 1 of the tuner (H001).

The AGC maintains a maximum IF voltage of 600mV peak to peak. The voltage level can be adjusted using the following procedure:

Short circuit pins 2 and 3 of P701 to enter service mode. When in service mode use the programme up and down keys to select service parameter 13. Using a 40MHz or greater oscilloscope, monitor pin 11 of TU001. Adjust service parameter 13 using the volume up and down keys for 600mV on pin 11 for a single ended tuner, and 300mV for a differential output tuner. Press the RV key to store the AGC value.

AFC Adjustment

The AFC voltage is not available at any point on the chassis; it is read by the microcontroller via the I²C bus. Therefore, one of the following methods can be used to correctly align the AFC.

- a) For demodulator tank coil fitted (I501 = TDA884X Mask 1)

Tune a known channel. Using a spectrum analyzer monitor pin 11 of H001. Fine tune the tuner for a carrier frequency of 38.9MHz. Store the fine tuned frequency (i.e. AFC off). Enter service mode by applying a short circuit to pins 2 and 3 of P701. When in service mode use the programme up and down keys to select service parameter 15. Adjust service parameter 15 using the volume up and down keys until the two bits at the top right of the screen meet the following criteria:

Left hand bit permanently set.

Right hand bit toggles (either 1 to 0 or 0 to 1).

When the AFC value has been set press the TV key to store it.

- b) For demodulator tank coil not fitted (I501 = TDA886X Mask 2)

Adjust service parameter 15 using the volume up and down keys until its value is 50.

When the AFC value has been set press the TV key to store it.

Vision Decoding

The majority of the vision and sound, deflection and colour decoding is performed by I501. The IF signal passes from the tuner through the SAW filter (X001) to filter unwanted frequencies to I501. It is demodulated internally and the output at pin 6 is buffered by Q501. The sound and vision components are now separated. Z501 removes the sound from the vision components and Z601/602 filters the FM sound to pin 1 for demodulation. Video is then fed to the SCART socket output, pin 19 of P501 via Q502.

Source Selection

Source selection is controlled by the microcontroller via I²C bus commands. The video processor I501 can select between internal demodulated CVBS video on its pin 13, external CVBS video (AV1) from pin 20 of P501 on its pin 17 or, if available, from external CVBS video (AV2) from the yellow phono socket of PA501, which is applied to pin 11. The internally demodulated CVBS video is always available on pin 19 of P501.

External RGB is selected within I501. Fast blanking pulses from pin 16 of P501 are passed via an OR-ing circuit of Q301-304 and associated components to pin 26 of I501. This pin controls the state of the RGB outputs to the tube base pins 19, 20 and 21. It has three possible states:

- | | | |
|----|-----------------------|--|
| 1) | Less than 0.4V | Internal RGB from colour decoder. |
| 2) | Between 0.4V and 4.0V | External RGB from pins 7, 11 and 15. |
| 3) | Greater than 4V | Output blanked for OSD/Text insertion. |

When teletext or OSD is displayed, pin 35 of I703 goes from ground to 5.0 Volts. This signal is passed via Q301 and causes pin 26 of I501 to enter the third state above, independent of the state of the other inputs to the OR circuit. During mixed TV/Text mode or whilst the OSD is showing on part of the screen this line will be switching at a high rate. RGB mode can be selected manually by the user and in this case the open-drain output on pin 8 of the micro-controller will be switched off and will be pulled up to 1.7 volts by R307 and R306. Q302 then applies a voltage of about 1.0 volts to pin 26 of I501. In the absence of a higher voltage via Q301 and Q303 from the fast blanking input, pin 16 of P501, this is still sufficient to enter the external RGB mode.

Audio source switching is controlled via the microprocessor I701. The audio is switched from internal to external source via I²C in I501. Internal source is fed to I501 at pin 1 and the external source at pin 2. On models equipped with front AV, the external source is provided either from pins 2 and 6 of P501 or the white phono socket PA501. The external source selection is controlled by pin 3 of I701 and Q703, then switched by I602. On models without front AV, I602 is omitted and bypassed via R601. On models equipped with a headphone socket, the speaker feed from the audio amplifier (I601) is diverted to the headphone when a headphone jack is plugged into PA601.

Colour Decoder

The luma signal processing and colour decoding are implemented by I501. The luminance and chrominance signals are separated internally. A delay line is also incorporated to compensate for the difference between the luma and chroma processing times. There are no adjustments required on the colour decoder.

On-Screen Display

The micro-controller on-screen display (OSD) supplies blanking and RGB signals for overlaying the television picture. Pin 35 of I701 provides blanking pulses which are applied to pin 26 of I501 via Q301, to turn off the decoder RGB output so that the OSD is clearly visible. The RGB signals from pins 34, 33 and 32 of I701 are applied directly to the tube-base via Q306 to Q308 and the text drive colour balance presents R317 and R319.

Horizontal and Vertical Deflection

In addition to decoding and switching, I501 provides deflection processing for the horizontal and vertical time-base circuits. Using video from the IF or external source as appropriate, the timebase circuit of I501 produces horizontal drive pulses at pin 40 to switch horizontal drive transistor Q402, and a differential vertical ramp at pins 46 and 47 to drive the vertical deflection output amplifier (I401).

All geometry adjustments are performed via the I²C bus with the service parameters (See adjustments section) with the exceptions of picture width (which is fine tuned by adjusting the B+ voltage by means of R818) and horizontal linearity (which is fixed by L402.)

Line Circuit

The primary side of the line circuit and the deflection coil are connected to the hot earth. The driver circuit contains an opto-coupler to create isolation between the low signal parts and the mains. The opto-coupler is driven by pin 40 of I501 via transistor Q402.

When Q402 is not conducting, the LED of the opto-coupler is also out of conduction, and Q403 is also not conducting. In this way, Q404 will conduct and the B+ voltage (100V) is placed across winding 2-1 of the line output transformer (T401). A voltage across winding 2-1 of the line output transformer (T401) will cause a voltage across the windings 6- 9, 7- 9, 8- 9 and 10- 9. Energy is now transformed from the primary to the secondary side and charges capacitors C407 (+200V video supply), C408 (+13V field supply) and C409 (-13V field supply).

When transistor Q402 conducts, the LED of the opto-coupler is activated. This causes the transistor of the opto-coupler to conduct, which drives Q403 into conduction. This brings Q404 out of conduction. Due to this configuration, this circuit is protected against missing line-drive pulses. When a line-drive pulse is missed, the line output transistor (Q404) stays out of conduction, because the LED of the opto-coupler is forced into conduction by Q402 and R405 and R406. By this means, damage is avoided when there is no line drive.

The line output transistor Q404 is helped in its switching action by the extra winding 2-3 while C412 helps in the switching action and prevents Q404 overheating.

C418 prevents Q404 from switching at twice line frequency. Line jitter is reduced by capacitor C417 in the collector of Q402.

On the secondary side of the line output transformer (T401) there is a blanking circuit which consists of C749 and R734, D501, D502 and D503. As Q404 switches off this circuit sends a pulse to pin 41 of I501 via R532 to blank the picture.

Horizontal Deflection

The voltage across capacitor C809 is the same as the voltage between B+ and the hot earth. (100V) When Q404 is conducting, this voltage is placed across the horizontal deflection coil via C411 and L402. This causes a linearly increasing current through this coil, thus creating horizontal deflection. When Q404 switches off, horizontal flyback takes place and then horizontal deflection is repeated and so on. C411 and L402 are used for linearity correction.

Vertical Deflection

Vertical deflection is based on a balanced input amplifier I401 connected to the +13V supply and -13V supply. This is driven from pins 46 and 47 of I501 via R407 and R408. A negative going ramp at field rate from I501 pin 46 is used to control I401. When the ramp is at its highest point, vertical flyback is generated at I401 output (pin 5) by means of C403 and D411 and a flyback generator internal to I401. After vertical flyback, the I401 output generates a negative going ramp across the field deflection coil which provides deflection until the next flyback pulse and so on. R413 is used to damp oscillation of the field deflection coil. Vertical deflection amplifier stability against self oscillation is maintained by R412, C404 and C402.

Vertical Protection

When operating normally, the vertical output stage generates a +5.5V pulse during vertical flyback blanking. This pulse is fed via Q407 to I501 beam current input. Should this pulse fail, the picture tube outputs are "blanked off" until after about 12 seconds, the micro controller records a failure. For diagnostic purposes, vertical protection during the 12 second interval may be disabled by pressing the '2' key on the remote control handunit when in service parameter 'OA'. This should always be re-enabled after repair (See adjustments section).

TUBE BASE PANEL

The picture tube amplifiers produce high voltage CRT electrode drives from the low voltage RGB outputs of the TDA884x (I501). They also produce black current information to maintain the grey-scale characteristics which is returned to the colour decoder (I501). Also included is circuitry for picture blanking during switch on.

The picture tube aquadag, (P901), is used to provide beam current information for the colour decoder for the purposes of beam current limiting. The tubebase socket (P902) is fitted with internal spark gaps. D910 provides tube base protection when the spark gaps flash-over.

The panel includes supplies to the tube electrodes and the video amplifiers. Focus and A1 supplies are connected directly from the flying leads of T401.

Video Drives

All video drive adjustments are done via the I²C bus (See adjustments section) with the exception of the black level set point (140V) which is set by the A1 control on the line output transformer (T401). An additional feature for diagnostic purposes is the ability to disable the auto black level circuit by pressing '2' on the remote control hand set when in service parameter 02 (See adjustments section)

Tubebase Video Amplifier Circuit

Each video amplifier channel includes a bipolar cascode amplifier. A R, G or B signal from the colour decoder (I501) is fed to each video amplifier input.

The low frequency gain of each video amplifier is approximately 51, this being determined by the ratio of the feedback resistors to the input resistors. The gain of each video amplifier channel above 2.2 MHz is increased by including a small capacitor across one of the two input resistors of each channel.

Video Amplifier Switch-On Blanking

The emitters of Q906, Q907 and Q908 are biased from the +200V video HT via R917, R905 and Q910. The +13V supply to bias the base connections of Q902, Q905 and Q908 is switched on under control from microcontroller I701 pin 35 (via R435, Q408 and R434 on the main panel) during power up or from standby after emitter bias of Q906, Q907 and Q908 is established.

Thus picture blanking during power up or from standby is ensured.

Auto Grey Scale

During the field blanking period the colour decoder (I501) measures the total cathode circuit leakage currents at the video amplifier outputs via Q901, Q902 and Q903: - During field blanking, the colour decoder applies monitoring pulses to the video amplifier inputs and thence current outputs from Q901, Q902, Q903 are applied to the colour decoder pin 18 via R904 and R516. (During normal unblanked picture operation, the colour decoder ignores the information on its pin 18.) . The current outputs from Q901, Q902 and Q903 are used by I501 to adjust the black current and video gain of each video channel automatically. Thus black level picture beam current and black to white video drives are maintained. Diodes D903, D905 and D906 prevent horizontal smearing/ shadowing of the OSD from spreading across the screen.

TDA884X Video Processor

<i>Pin</i>	<i>Designation</i>	<i>I/O</i>	<i>Description</i>
1	SNDIF	I	Sound IF
2	AUDIOEXT	I	External Audio
3	NC		Not Connected
4	NC		Not Connected
5	PLLLF		IF-PLL loop filter
6	IFVO	O	IF Video
7	SCL	I	Serial Clock
8	SDA	I/O	Serial data
9	DEC _{BG}		Bandgap de-coupling
10	CHROMA	I	Chrominance
11	CVBS/Y	I	External CVBS/Y
12	V _{P1}		Main supply voltage 1 (+8V)
13	CVBS _{INT}	I	Internal CVBS
14	GND 1		Ground 1
15	AUDIOOUT	O	Audio
16	SECPLL		SECAM PLL de-coupling
17	CVBS _{EXT}	I	External CVBS
18	BLKIN	I	Black-current
19	BO	O	Blue
20	GO	O	Green
21	RO	O	Red
22	BCLIN	I	Beam current limiter input/V-guard input
23	RI	I	Red input for insertion
24	GI	I	Green input for insertion
25	BI	I	Blue input for insertion
27	RGBIN	I	RGB insertion
27	LUMIN	I	Luminance
28	LUMOUT	O	Luminance
29	BYO	O	(B-Y) signal
30	RYO	O	(R-Y) signal
31	BYI	I	(B-Y) signal
32	RYI	I	(R-Y) signal
33	REFO	O	Sub-carrier reference
34	XTAL1		3.58MHz crystal connection
35	XTAL2		4.43/3.58MHz crystal connection
36	DET		Loop filter phase detector
37	V _{P2}		2nd supply voltage 1 (+8V)
38	CVBS1O	O	CVBS-1
39	DECDIG		De-coupling digital supply
40	HOUT	O	Horizontal
41	FBISO	I/O	Flyback input/sandcastle output
42	PH2LF		Phase-2 filter
43	PH1LF		Phase-1 filter
44	GND2		Ground 2
45	EWD	O	East-west drive
46	VDRB	O	Vertical drive B
47	VDRA	O	Vertical drive A
48	IFIN1	I	IF input 1
49	FIN2	I	IF input 2
50	EHTO	I	EHT overvoltage protection
51	VSC		Vertical sawtooth capacitor
52	I _{REF}	I	Reference current
53	DEC _{AGC}		AGC de-coupling capacitor
54	AGCOUT	O	Tuner AGC
55	AUDEEM		Audio de-emphasis
56	DECSDEM		De-coupling sound demodulator

Table 2 – TDA884X Pin Designations

9.2 TDA884X Video Processor

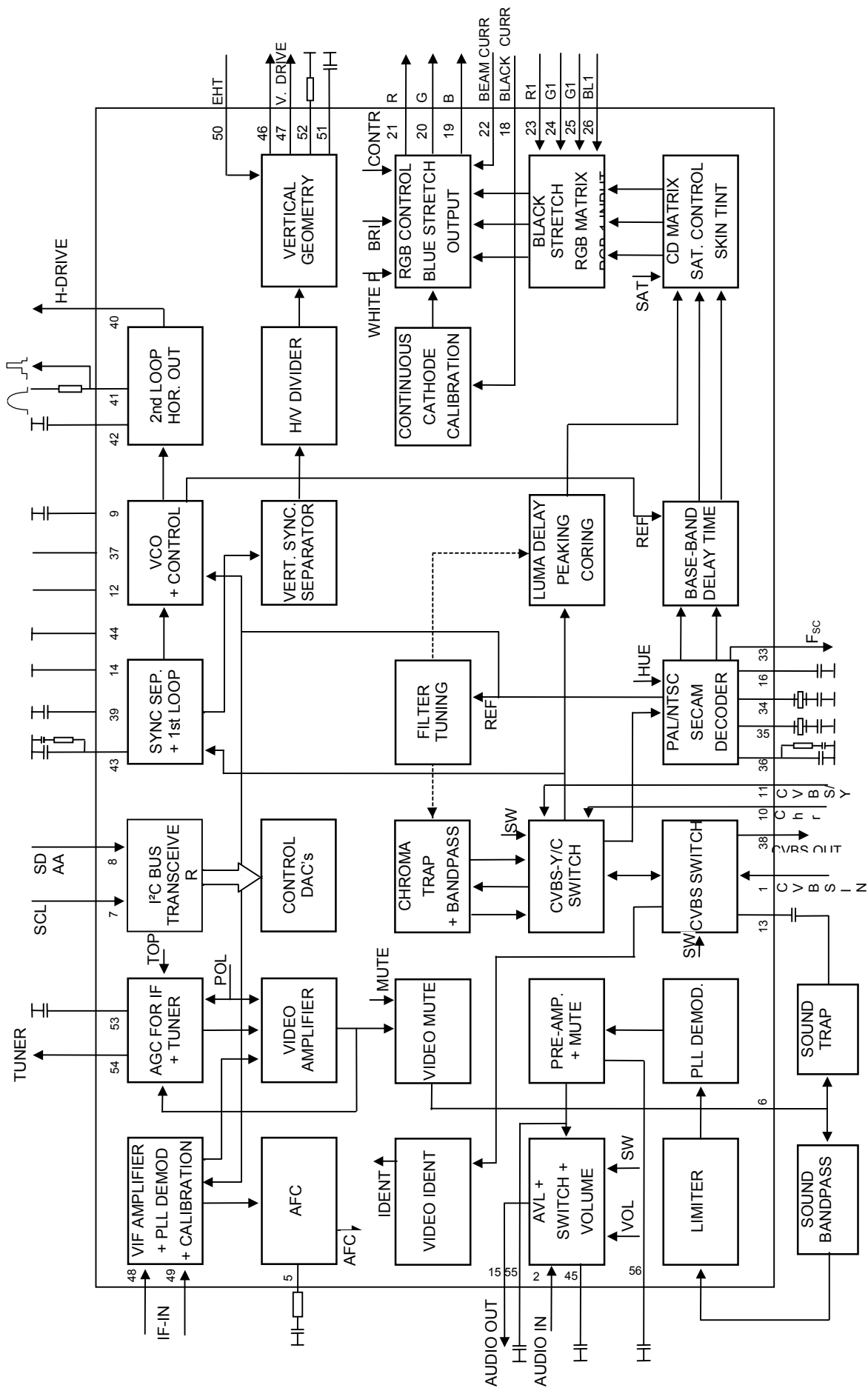


Fig 7 Block Diagram

Remote Control

The remote control system used is the Philip's Enhanced RC5 protocol, with sub-address 00000.

Infra-red Transmitter

The hand unit is controlled by IC781, type PCA84C122AT/093, surface mounted on the keypad side of the PCB. When replacing the part, the /093 is significant as it determines the key codes transmitted. Two AA type batteries in series provide a 3V power supply.

The IC remains in standby mode (oscillator not running) until a key on the matrix is pressed. The oscillator, governed by a 4MHz ceramic resonator XL781 is started. The IC decodes the key with suitable debounce and then transmits the relevant code, repeating as per the RC5 specification until the key is released.

The RC5 pulse train output is modulated within the IC onto a 33.33kHz (f.osc/120) carrier with low (1:3) mark:space ratio, reducing power consumption and allowing higher LED current. The output on pin 21 of IC781 drives TR781 which provides high current pulses through infra-red transmitter diode D781. Reservoir capacitor CE781 reduces momentary battery voltage drop which may otherwise affect the IC.

Infra-red Receiver

The chassis uses an integrated receiver, IC702, which provides a fully demodulated output to the microcontroller through R703, pulled up by R702.

Keypad N°	Symbol	Functions	Keypad N°	Symbol	Functions
1		Standby	16		Programme Up
2	1	N° 1	17		Increase Volume
3	2	N° 2	18		Decrease Volume
4	3	N° 3	19		*Fastext (RED)
5	4	N° 4	20		Menu/*Fastext (GREEN)
6	5	N° 5	21		Menu/*Fastext YELLOW)
7	6	N° 6	22		Menu/*Fastext (CYAN)
8	7	N° 7	23		Normalize/*Hold
9	8	N° 8	24		*Expand
10	9	N° 9	25		*Reveal
11	0	N° 0	26		Status/*Fastext Index
12		TV	27		AV Select
13		*Text/*Mix	28		*Time/*Subcode
14		Programme Down	29		**Audio Select
15		Mute	30		*Update

* These functions are only present on chassis fitted with teletext

** These functions are only present on chassis fitted with stereo

Table 3 Keypad Idents and Functions

Microprocessor Control System

Microcontroller

Micro-controller, I701, is either a SAA5288 (on non-teletext sets) or a SAA5290 (on teletext sets). Both devices have integrated on-screen display (OSD) generator; the SAA5290 also has an integrated teletext decoder. The micro-controller has a single 12MHz crystal X701.

The television is controlled by serial (I²C) bus communication, digital switching inputs and outputs, analogue-to-digital inputs and pulse-width-modulation (PWM) outputs.

Reset

At power on, C709 is not charged so the voltage on pin 43 of the micro-controller rises with the 5V supply and resets the micro-controller. An internal resistor to ground at this pin causes C709 to charge up and the voltage on the reset pin to drop to 0V.

In normal operation, transistor Q702 is switched on and the reset pin is low, but if the 10V supply voltage drops below about 8V the transistor will switch off and R721 will pull the reset pin high and reset the device.

User Control

User input is via infra-red remote control (Philips' RC5 protocol), internally decoded from the receiver I703, or from three (non-matrixed) local control keys on active low inputs, I701 pins 18, 19 and 20. The LED flashes each time a key is detected or remote command received.

Tuning

The tuning control voltage to the tuner is controlled via the PWM at pin 1 of I701 and integrating circuit around Q001. Minimum voltage is at maximum mark-space ratio (bottom of each band). Band-switching is controlled by active low outputs on pins 14, 15 and 16 (high, mid, low) and transistors Q002 to Q004. The controller makes AFC corrections by reading on-tune information from I501 via the I²C bus.

As the tuner is controlled by voltage synthesis, there is no direct correlation between the controller output and the tuned frequency.

Non-volatile memory

The non-volatile memory, I702, holds configuration information, user settings, parameters as applicable for I²C controlled ICs and the programme tuning records. It is itself accessed by I²C.

When a new memory IC is fitted, the microcontroller will automatically load default information, which takes a few seconds during power-up. Regular re-loading of the data, or corruption of settings may indicate I702 is faulty.

AV switching

Inputs from pins 8 and 16 of SCART 1 are sampled by analogue to digital conversion on pins 9 and 10 of I701 respectively. The input levels are adjusted such that the controller will automatically switch to AV1 when pin 8 is above 6V and RGB when pin 16 is above 1V. The time constant on pin 16 ensures the controller will not detect real-time RGB insertion using pin 16.

OSD / Teletext

Line and field timings are obtained from V.sync on pin 37 and H.sync input on pin 36. Teletext (on teletext sets only) is obtained from the CVBS input on pin 23. The RGB outputs on pins 34, 33 and 32 respectively are inserted into the TV output when gated by the OSD EN OUT signal on pin 35. OSD / teletext contrast is controlled by the peak reference level on pin 31, generated from the microcontroller PWM output on pin 2 via Q305.

Error codes

Under the following fault conditions the television will switch to standby and flash the LED.

Fault Condition	No. of Flashes
Multiple TDA884X I ² C errors	1
Over voltage / X-ray protection (OVP)	2
Line start-up sequence failed	3
Black current (BC) loop unstable	4
Vertical scan failure	5
Continuous TDA884X power-on reset	6

Multiple error codes may appear, eg. two quick flashes, pause, four quick flashes etc. for OVP + BC loop errors.

Adjustments

In order to make service adjustments including setting the height, width, various configuration options, etc., the TV should have a suitable signal tuned in; ideally, a geometry test card. A teletext signal is recommended for setting OSD contrast on a teletext chassis.

To enter service mode, place a shorting link across terminals 2 and 3 of P701.

In service mode, two 2-digit hexadecimal numbers are displayed to the left of the screen; the lefthand one is the service parameter number, the righthand one is the value for that parameter. Some parameters are identified by a two-letter code instead of a number, see below.

For example: - 0A 1F shows parameter ten (0A hex) at thirty-one (1F hex).

In this mode of operation some of the remote control keys have different functions;

The up and down and local select keys are used to select a parameter.

The remote and local left and right keys are used to change the value of the current parameter.

The TV button is used to store any changes.

The teletext select and digit '0' keys are used for programme up or down.

The Normalize key selects factory picture settings immediately over-writing user settings.

The digit keys '1', '2',----'8' toggle the state of the individual bits '7', '6',----'0' of the value of the current parameter, for example, pressing digit key '4' would change value 1F hex to 0F hex.

TO STORE THE CHANGES, PRESS THE TV KEY ON THE HAND UNIT BEFORE REMOVING THE SERVICE MODE LINK. THE MESSAGE 'STORED' WILL BE DISPLAYED TO CONFIRM THE OPERATION.

Under certain circumstances, for example abnormal operation due to suspected corruption of the service parameters, it may be necessary to perform a complete reset of the non-volatile memory (I702). To effect this, press and hold the X (teletext update) key for about 3 seconds or until the set switches to standby . Following this it will be necessary to perform a 'set-up' of the television.

Service Parameters

The following values assume you are watching a tuned in picture, on RF. (On other sources, or with no signal, some values may differ.)

Service parameters 00 to 1A apply to the control registers of I501 as shown in the following table.

No.	Value			Function	Action
	14"	20"	21"		
00	02	02	02	System control	Do not adjust
01	D0	D0	D0	System control	Do not adjust
02	1F	1F	1F	Hue (SCART NTSC 4.43 playback only)	Use picture menu control instead
03	20	1D	27	Horizontal shift	Adjust to centre picture horizontally
04-07	00	00	00	E-W control	Not used on this chassis
08	20	1F	1E	Vertical slope (linearity)	Adjust for vertical linearity
09	10	0B	1A	Height	Adjust for correct picture height
0A	44	4A	4A	S-correction	Adjust for best vertical S-correction
0B	2B	1B	1B	Vertical shift	Adjust to centre picture vertically
0C	29	38	3D	White point - Red	
0D	29	38	3D	White point - Green	See adjustments section
0E	29	38	3D	White point - Blue	
0F	1C	1C	1C	Peaking (sharpness)	Use picture menu control instead
10	5C	5C	5C	Brightness	Use picture menu control instead
11	9C	9C	9C	Saturation	Use picture menu control instead
12	1C	1C	1C	Contrast	Use picture menu control instead
13	13	13	13	AGC take-over point	See adjustments section
14	0A	0A	0A	Volume	
15	50	50	50	IF PLL adjustment	Set to 50 hex.
16	19	19	19	Vertical zoom	Not used on this chassis
17	20	20	20	Vertical scroll	Not used on this chassis
18	81	81	81	Control 2	Do not adjust
19	08	08	08	Control 3	Do not adjust
1A	00	00	00	Control 4	Do not adjust

Table 4 **Service Parameter Functions**

Parameters above 1A are designated by two-letter codes (except text contrast on a teletext set). These control configuration.

Text Mode	Text (OSD) contrast	Set as preferred, see notes below
Ex	Export (VHF/UHF) setting	00 for UHF-only, 01 if multi-band tuner
AV	AV socket configuration	00 single SCART, 01 single SCART plus phono inputs

It is advisable to make a note of the existing values prior to commencing servicing. (See adjustments section).

Microprocessor Pin-outs

<i>Pin</i>	<i>Designation</i>	<i>I/O</i>	<i>Purpose</i>
1	P2.0/TPWM	O	Tuning PWM
2	P2.1/PWM0	O	Text contrast PWM
3	P2.2/PWM1	O	AV audio control: high = AV2, low = RGB/AV1
4	P2.3/PWM2	O	*FM/AM source select (low = AM)
5	P2.4/PWM3	O	*SCART/internal sound select (low = internal sound)
6	P2.5/PWM4	O	*L' control select (active high)
7	P2.6/PWM5	O	Pseudo line drive
8	P2.7	O	Force RGB high = RGB mode
9	P3.0/ADC0		AV1 SCART pin 8 level detection (ADC)
10	P3.1/ADC1		AV1 SCART pin 16 level detection (ADC)
11	P3.2/ADC2		AGC level sampling (ADC)
12	P3.3		–
13	Vssd		Digital ground
14	P0.0	I	High band tuner select (active low)
15	P0.1	I	Mid band tuner select (active low)
16	P0.2	I	Low band tuner select (active low)
17	P0.3	O	Audio mute control (active low)
18	P0.4	I	Select key
19	P0.5	I	Down key
20	P0.6	I	Up key
21	P0.7		–
22	Vssa		Analogue ground
23	CVBS0	I	Composite video
24	CVBS1		–
25	Black	I	Video black level storage
26	Iref	I	Reference current
27	Frame		–
28	Test		Ground
29	COR		–
30	P3.4		TDA884X Line drive gating: high in standby & start-up, low in operation
31	RGBref	I	RGB reference
32	OSD B	O	Blue OSD
33	OSD G	O	Green OSD
34	OSD R	O	Red OSD
35	OSD EN	O	OSD enable
36	H sync	I	Horizontal sync
37	V sync	I	Vertical sync
38	Vdda		+5V display power supply
39	Vddt		+5V display power supply
40	Osc gnd		Crystal oscillator ground
41	Osc in	I	12MHz crystal oscillator
42	Osc out	O	12MHz crystal oscillator
43	Reset	I	Reset (active high)
44	Vddm		+5V microcontroller power supply
45	P1.0/Int1	I	Remote control
46	P1.1/T0	O	Standby/IR LED: low = LED bright, high = LED dim
47	P1.2/Int0	I	Line drive from TDA884x
48	P1.3/T1	O	Standby control (active low)
49	P1.6/SCL		I ² C clock
50	P1.7/SDA		I ² C data
51	P1.4	I	Service mode (active low)
52	P1.5	I	Halt microcontroller control (active low)
NOTE	*		Only used on French chassis

Table 5 Pin Descriptions

SAA5290 (Teletext) & SAA5288 (Non-teletext) Microcontrollers

Note: The SAA5288 microcontroller used on non-teletext models does not perform the functions in the shaded area.

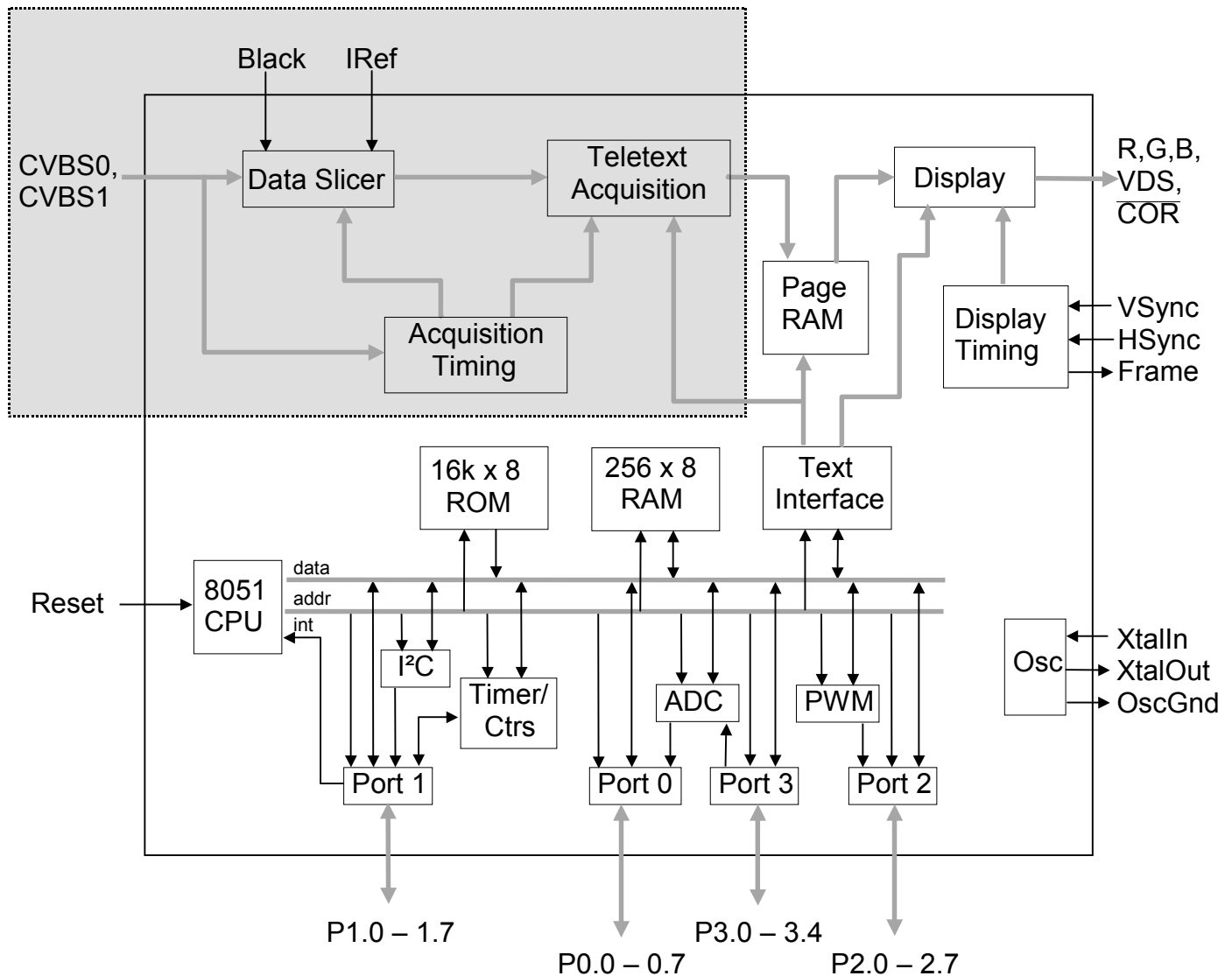


Fig 8 Block Diagram

USER GUIDE

Operating Instructions

Using the Menus

Green Key	Selects the PICTURE controls menu.
Yellow Key	Selects the MANUAL/TUNING menu.
Blue Key	Selects the FEATURES menu.
Red Key	Used only within the other menus above.

The green, yellow and blue keys select the Menus as listed above. See pages 3 and 4 for full details of their functions.

In Teletext mode they enable quick access to topical subjects related to the magazine you have selected. Just press the key with the same colour as the topic at the foot of the page.

Up/Down Keys	(P+/P-) Move the cursor (coloured bar) when using Menus.
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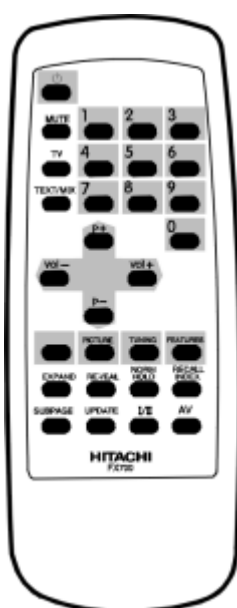
When viewing television these keys will select next/previous TV station.

When using Teletext these keys will select next/previous pages.

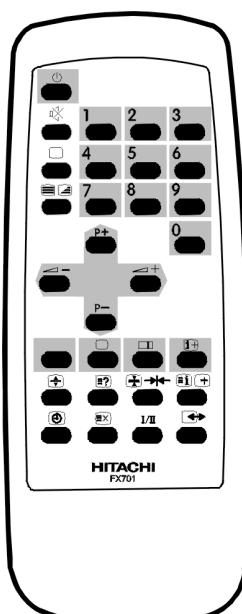
Left/Right Keys	(vol - or ) / (vol + or ) Move the cursor (coloured bar), or makes adjustments when using Menus.
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In TV and Teletext mode they will adjust the volume down and up.

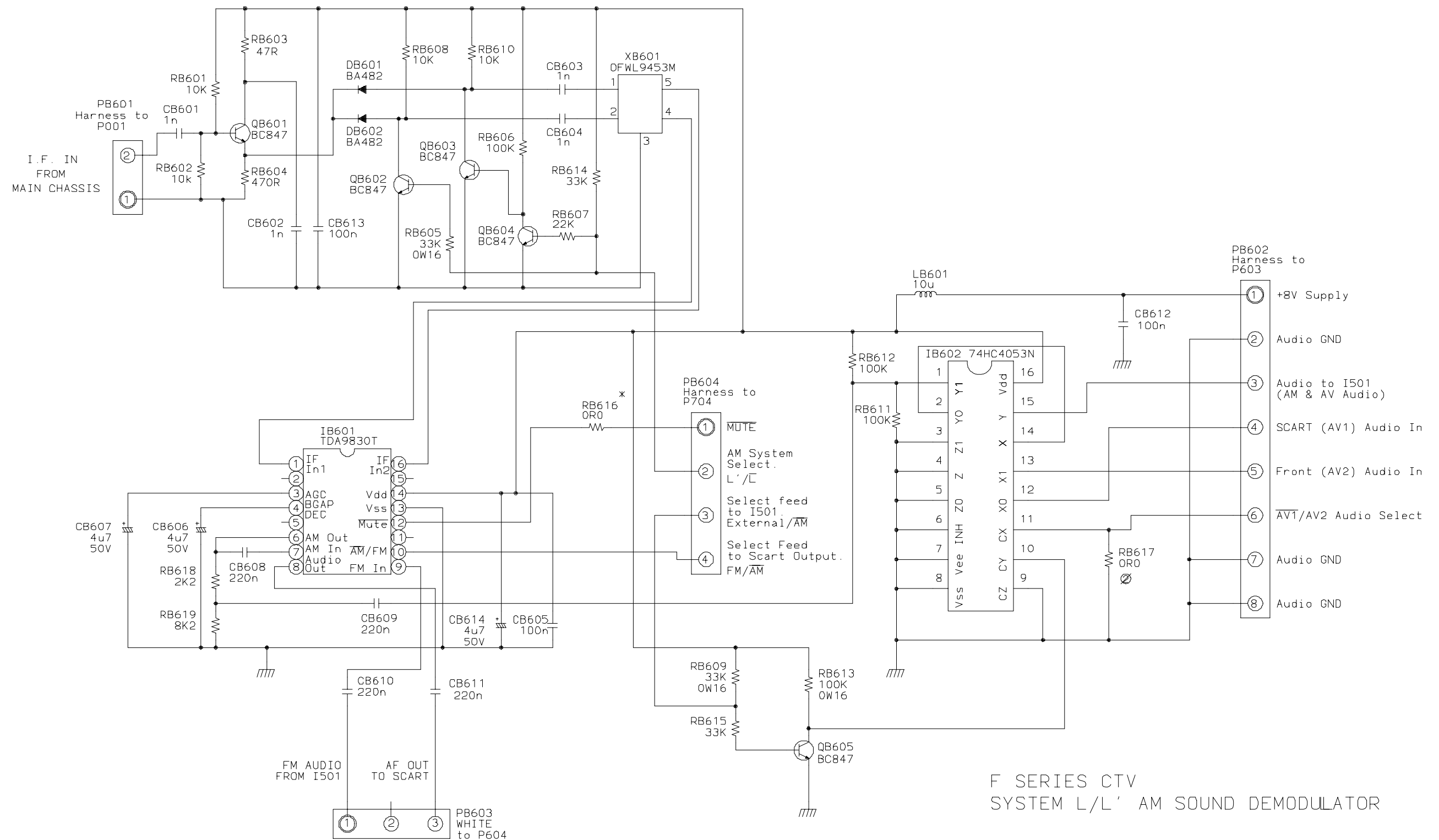
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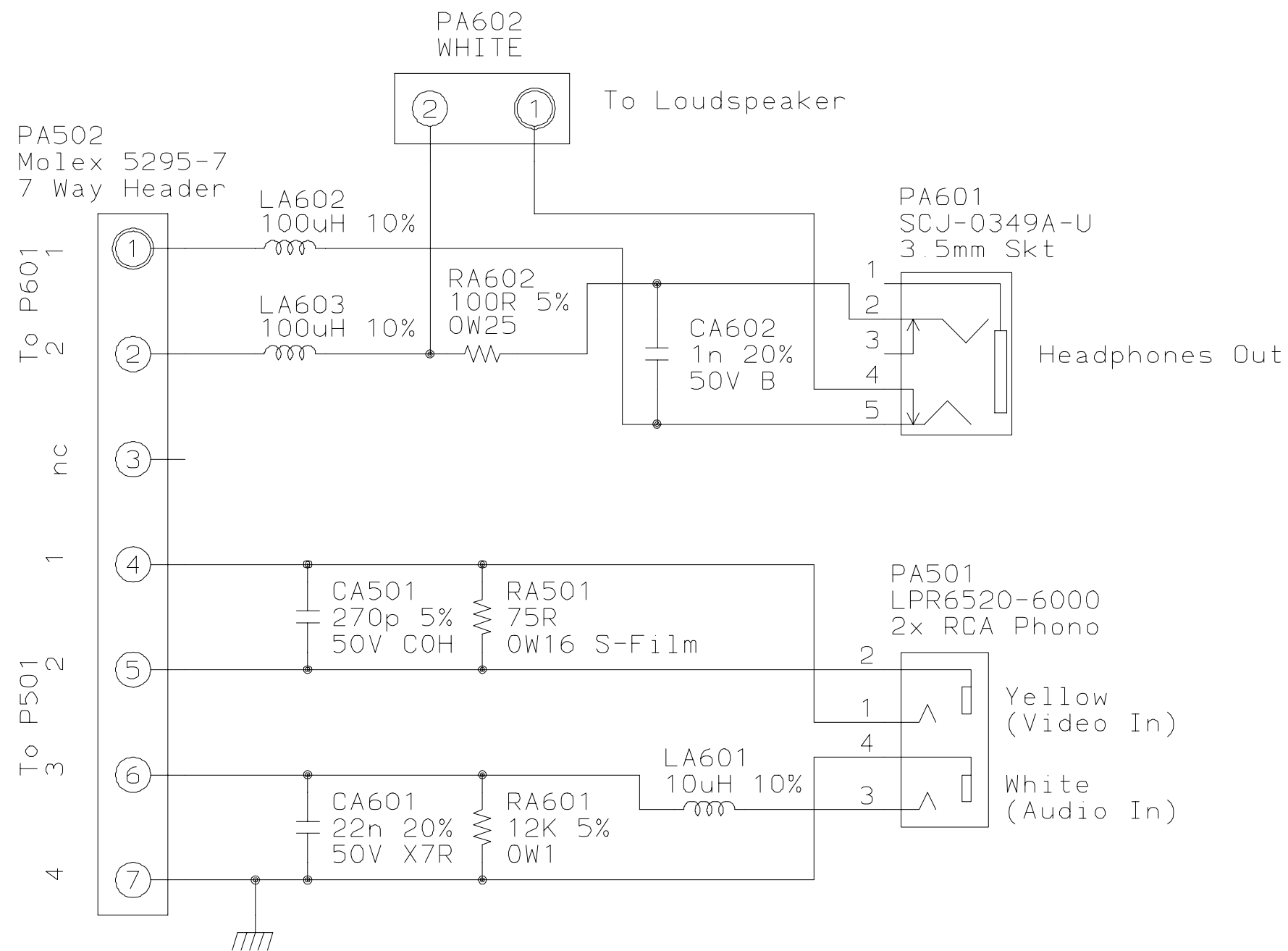


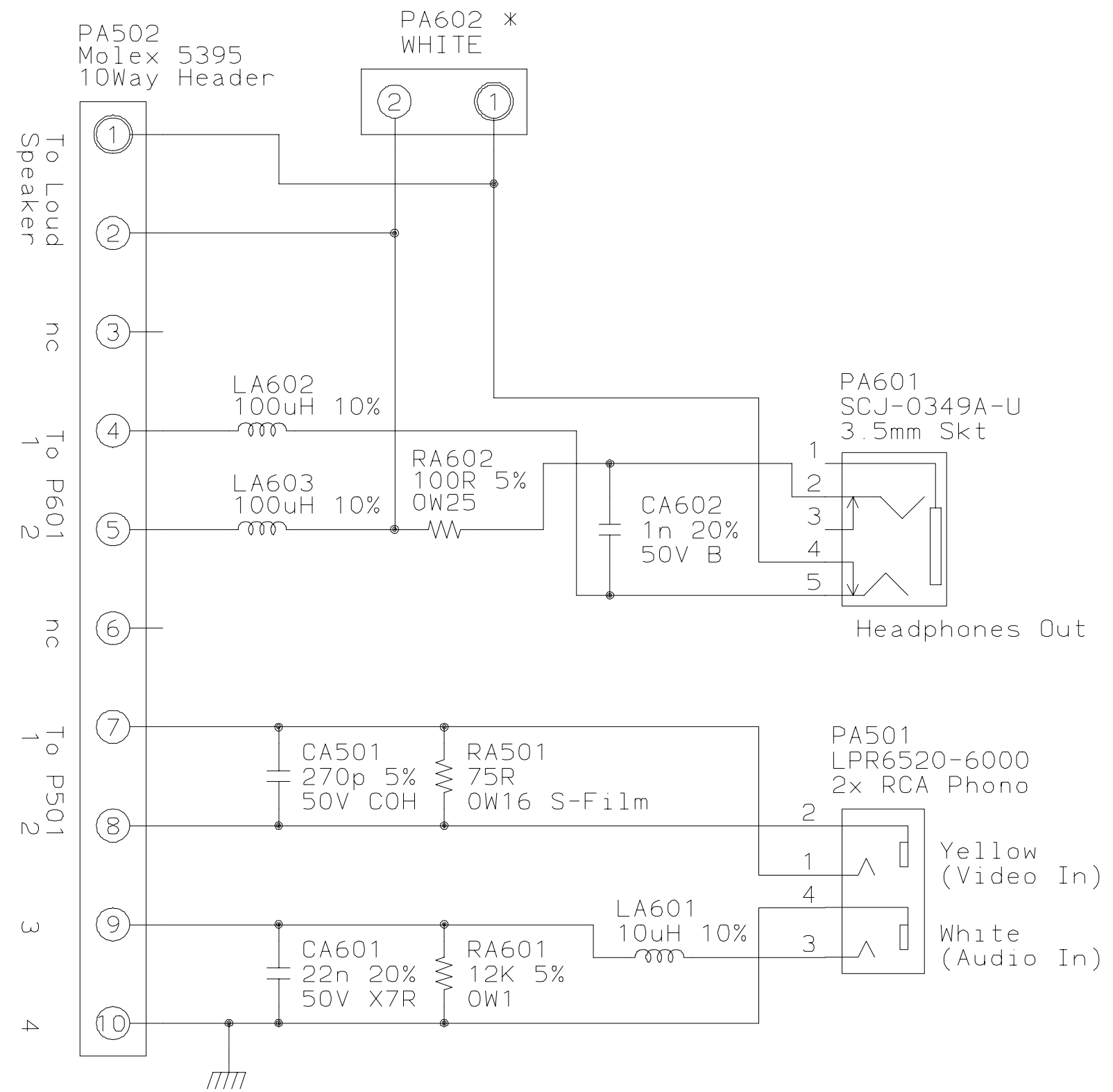
FX700 RCHU



FX701 RCHU





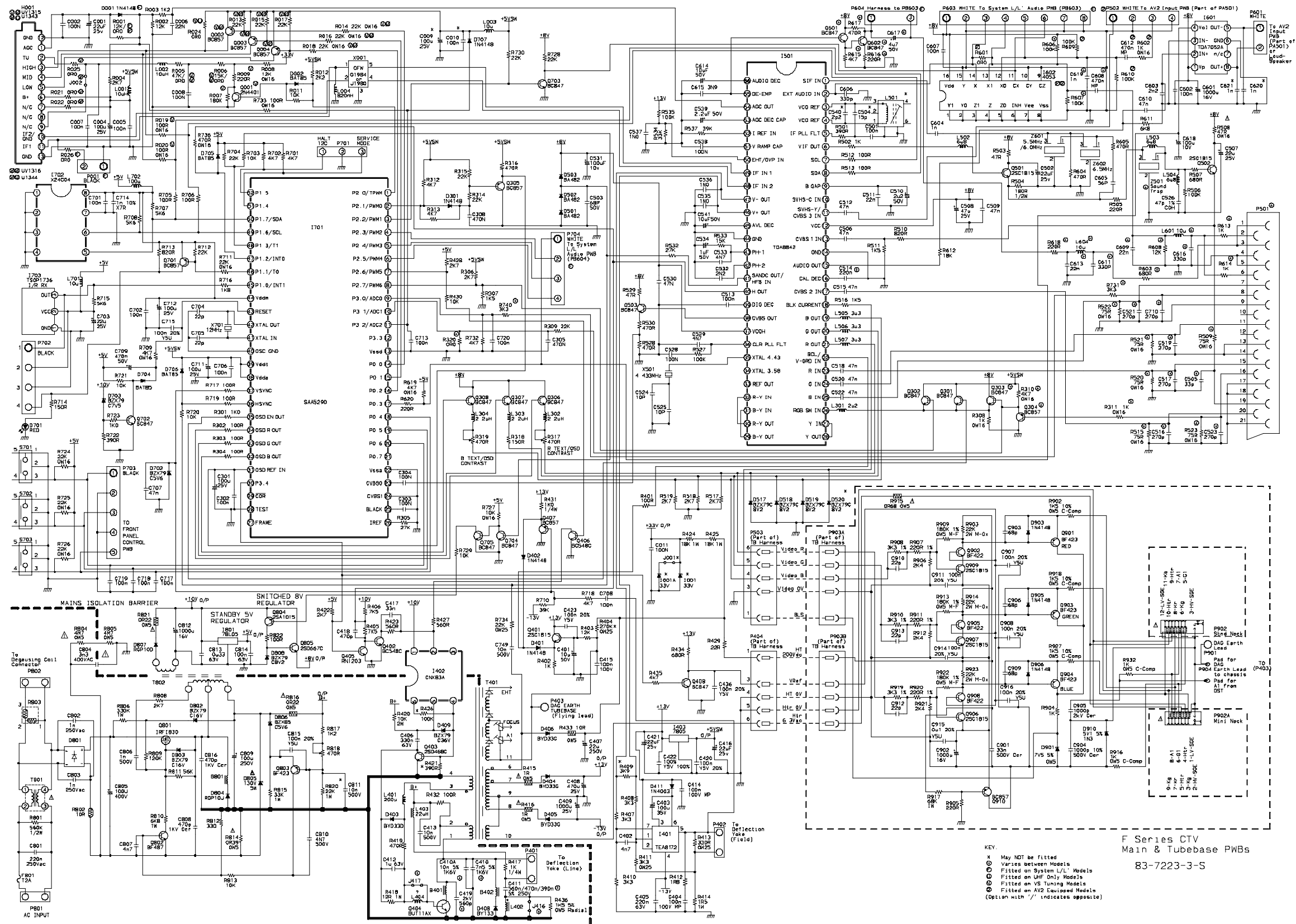


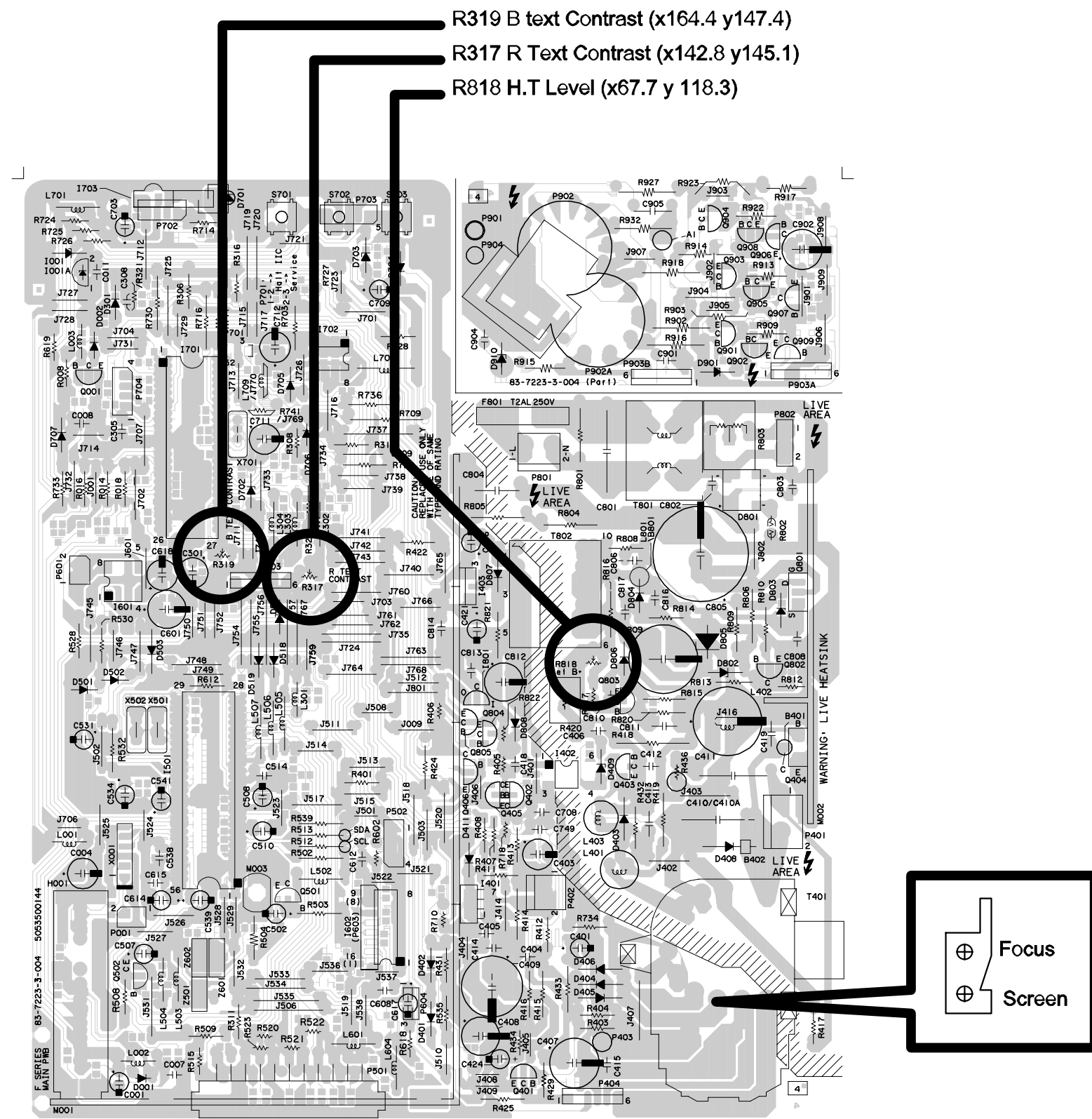
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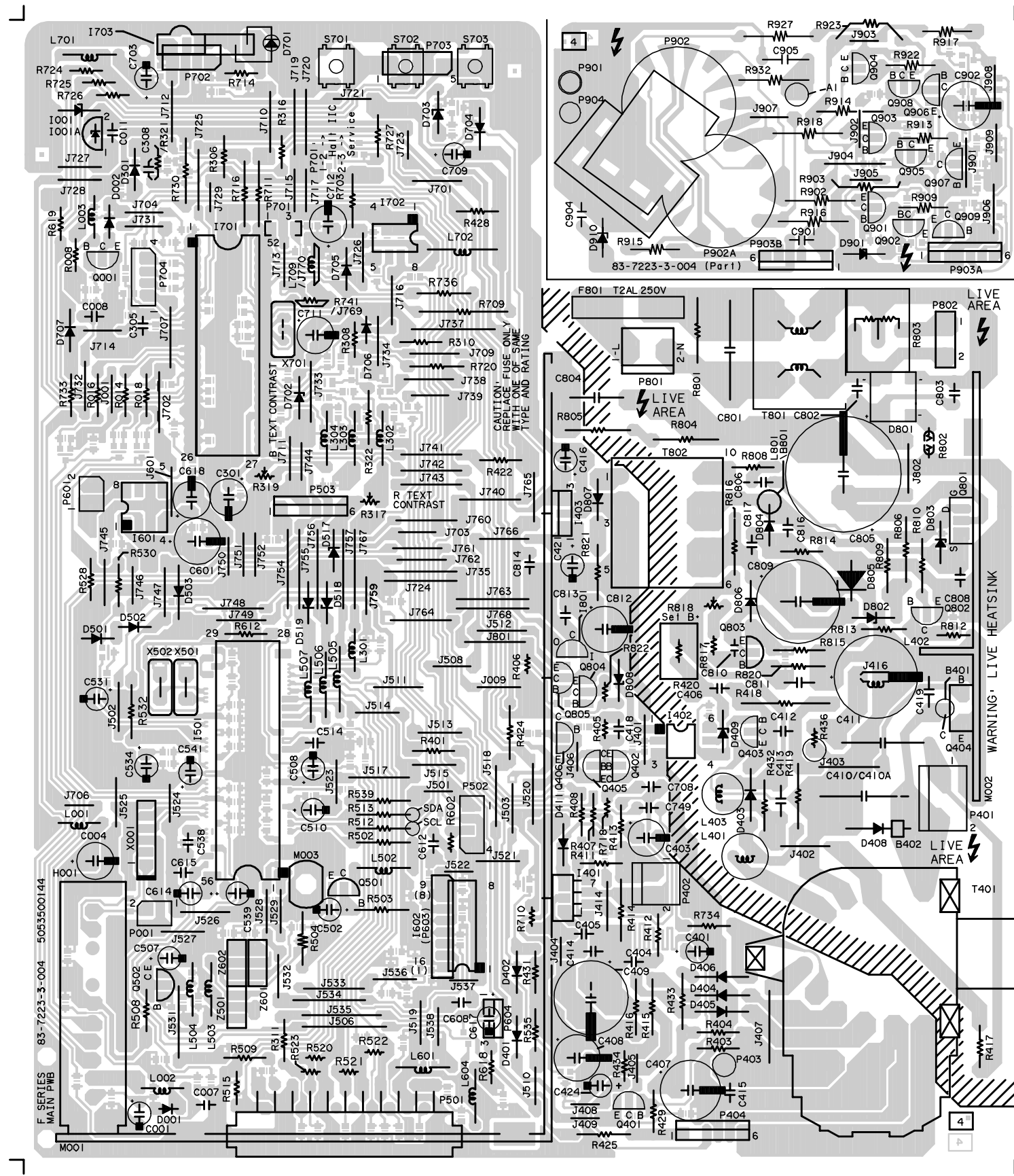
2 of 3

AV2 20" AND 21" MODELS

HITACHI





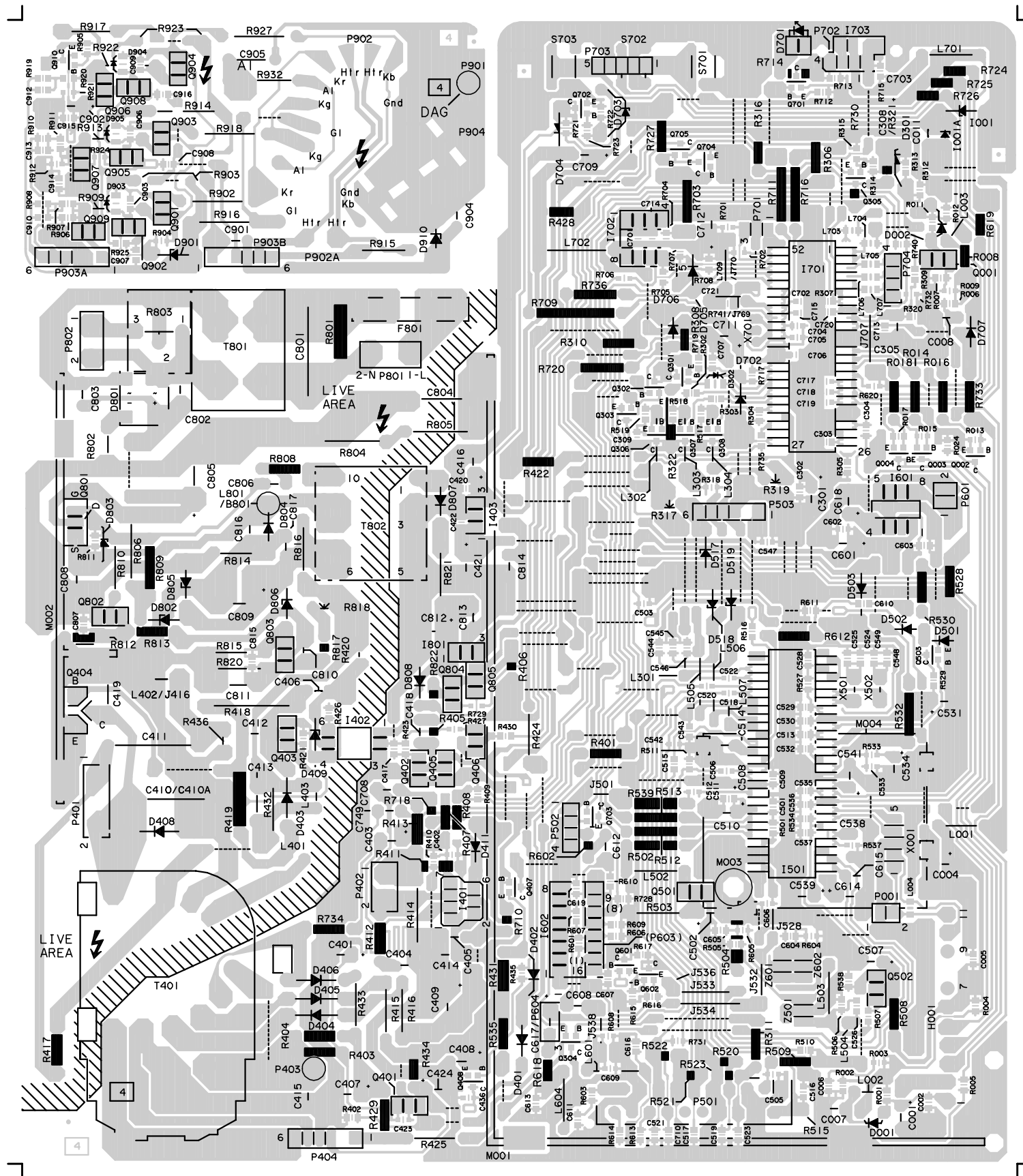


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2 of 5

MAIN CHASSIS AND VIDEO PCB (COMP)

HITACHI

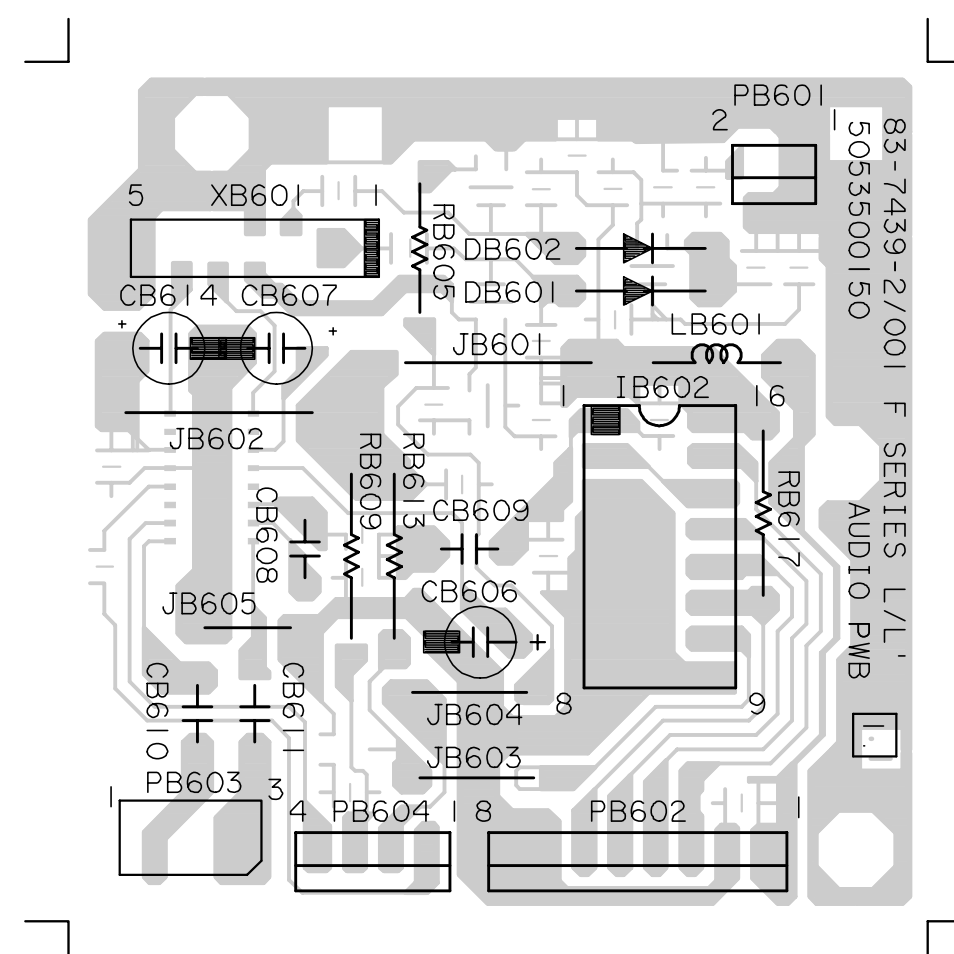
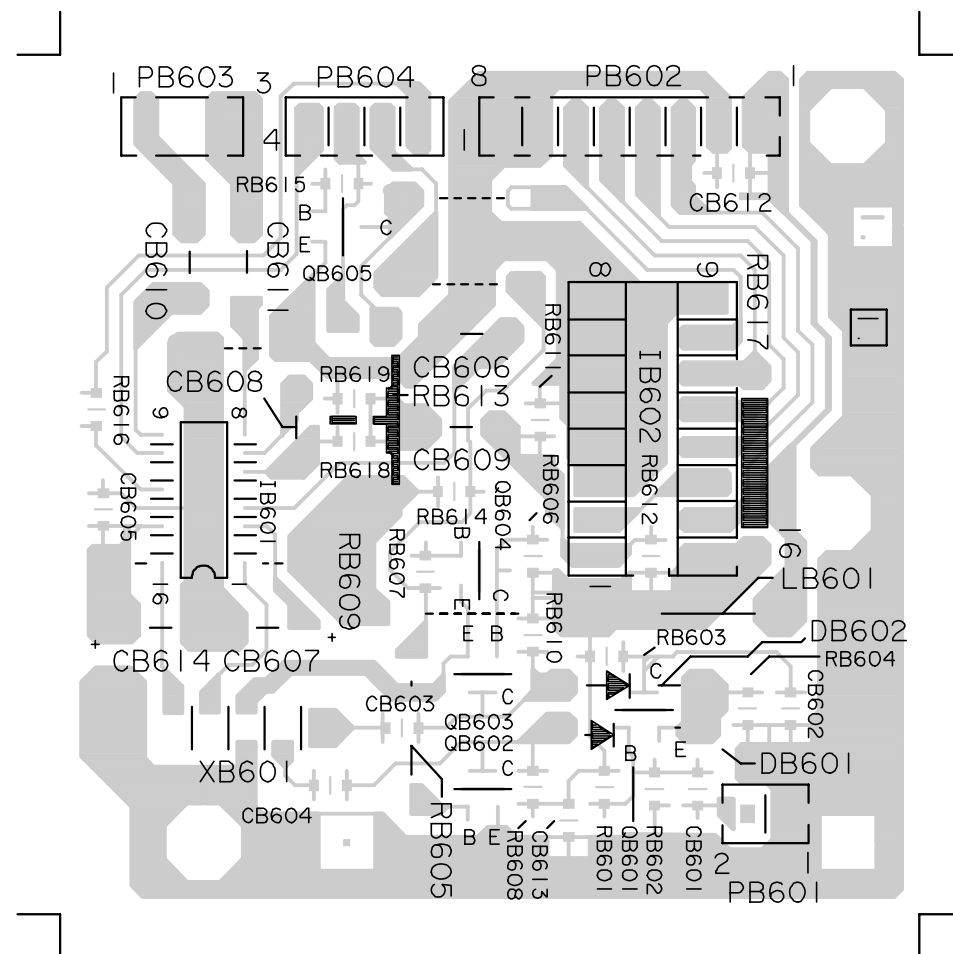


No 0102

3 of 5

MAIN CHASSIS AND VIDEO PCB (TRACK)

HITACHI

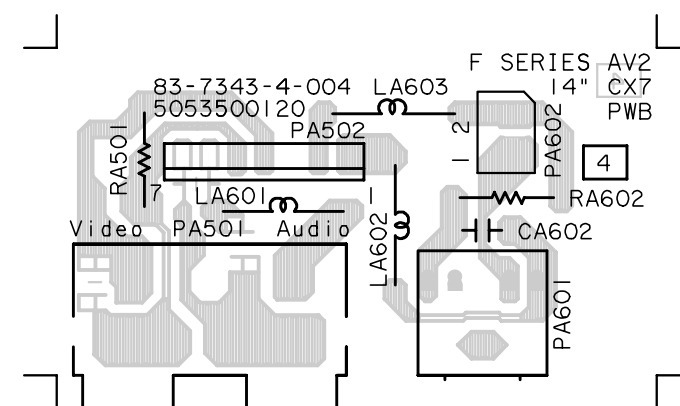


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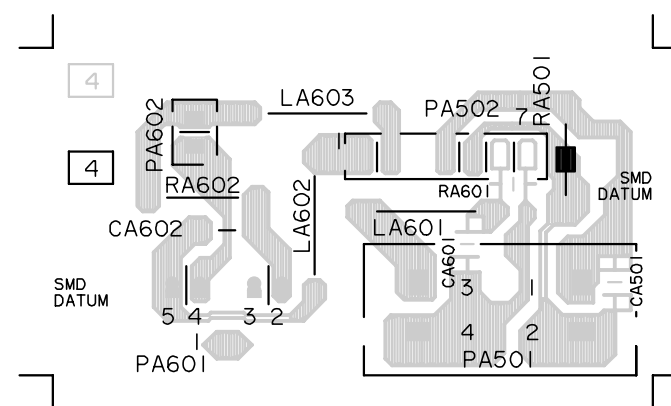
4 of 5

SYSTEM L/L' SOUND DEMODULATOR

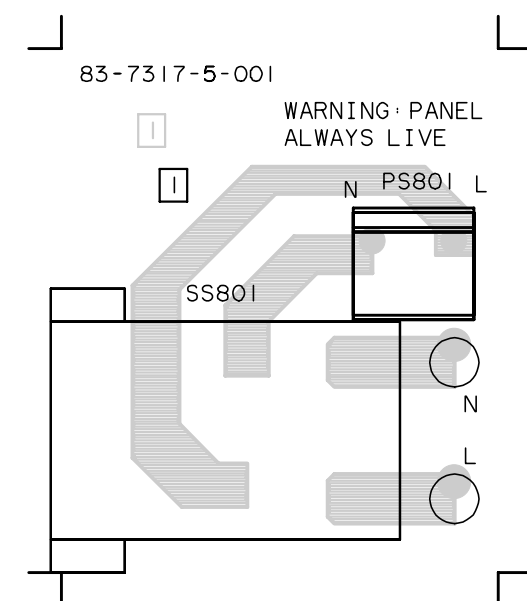
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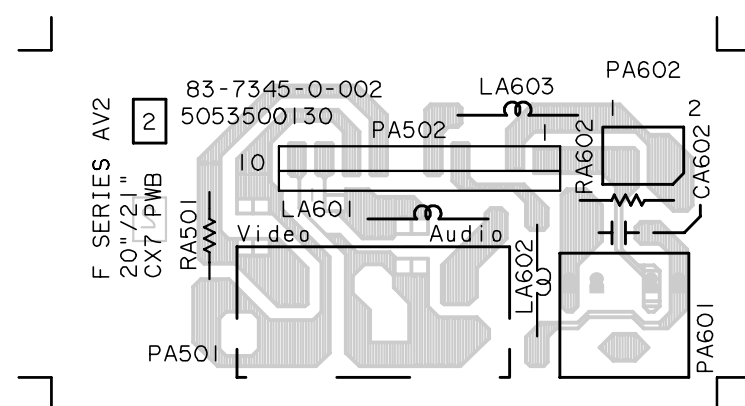
COMPONENT SIDE (14 INCH MODELS)



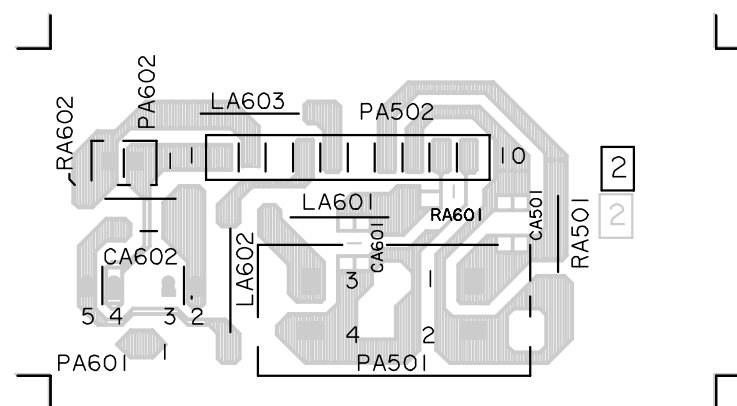
TRACK SIDE (14 INCH MODELS)



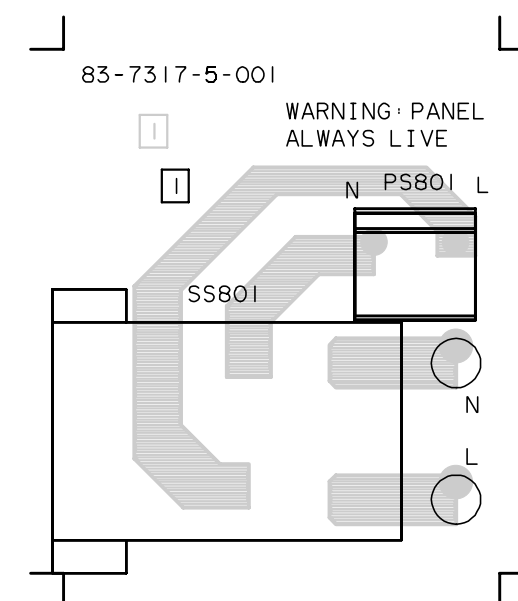
ON/OFF SWITCH COMPONENT LAYOUT



COMPONENT SIDE (20/21 INCH MODELS)

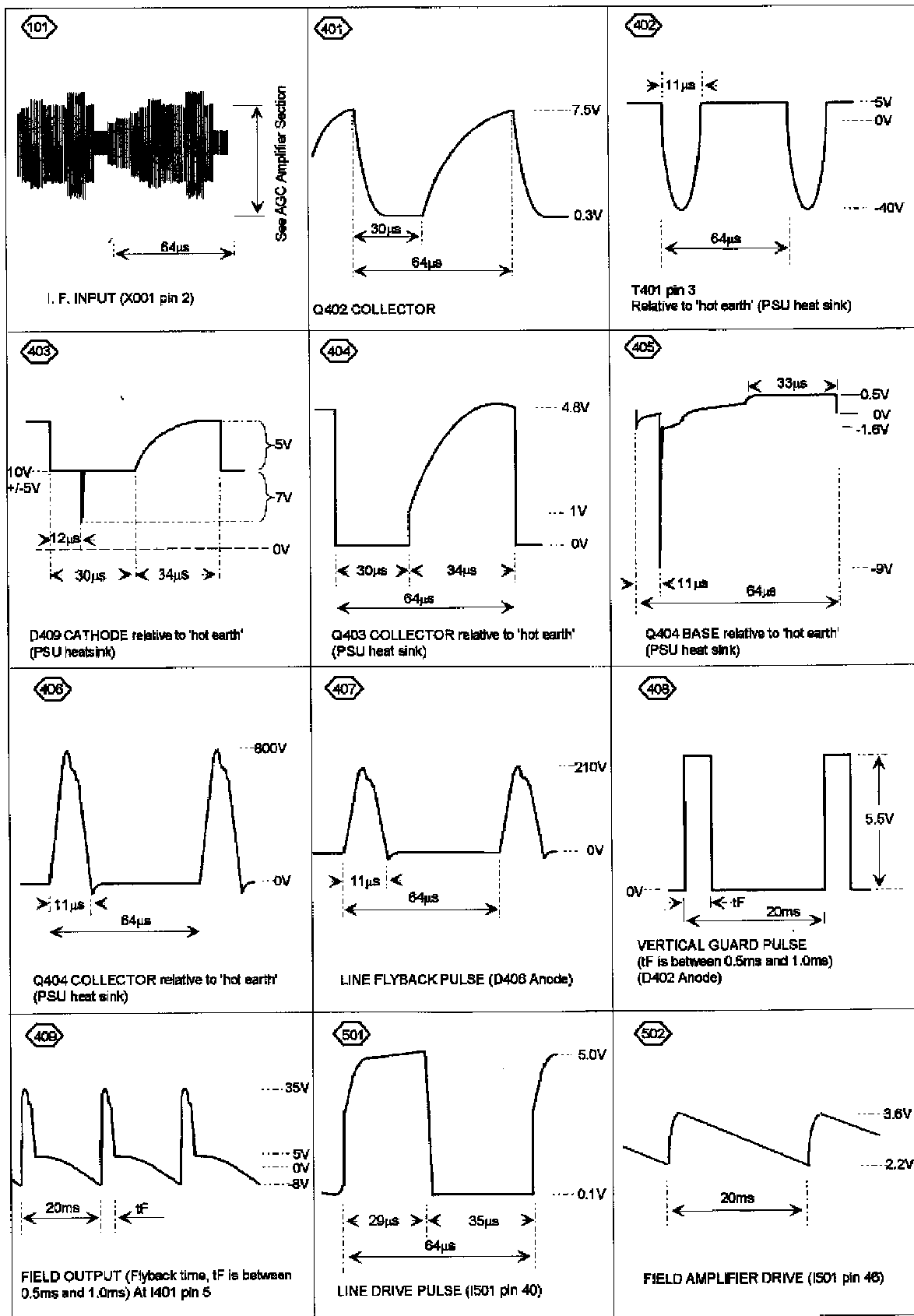


TRACK SIDE (20/21 INCH MODELS)

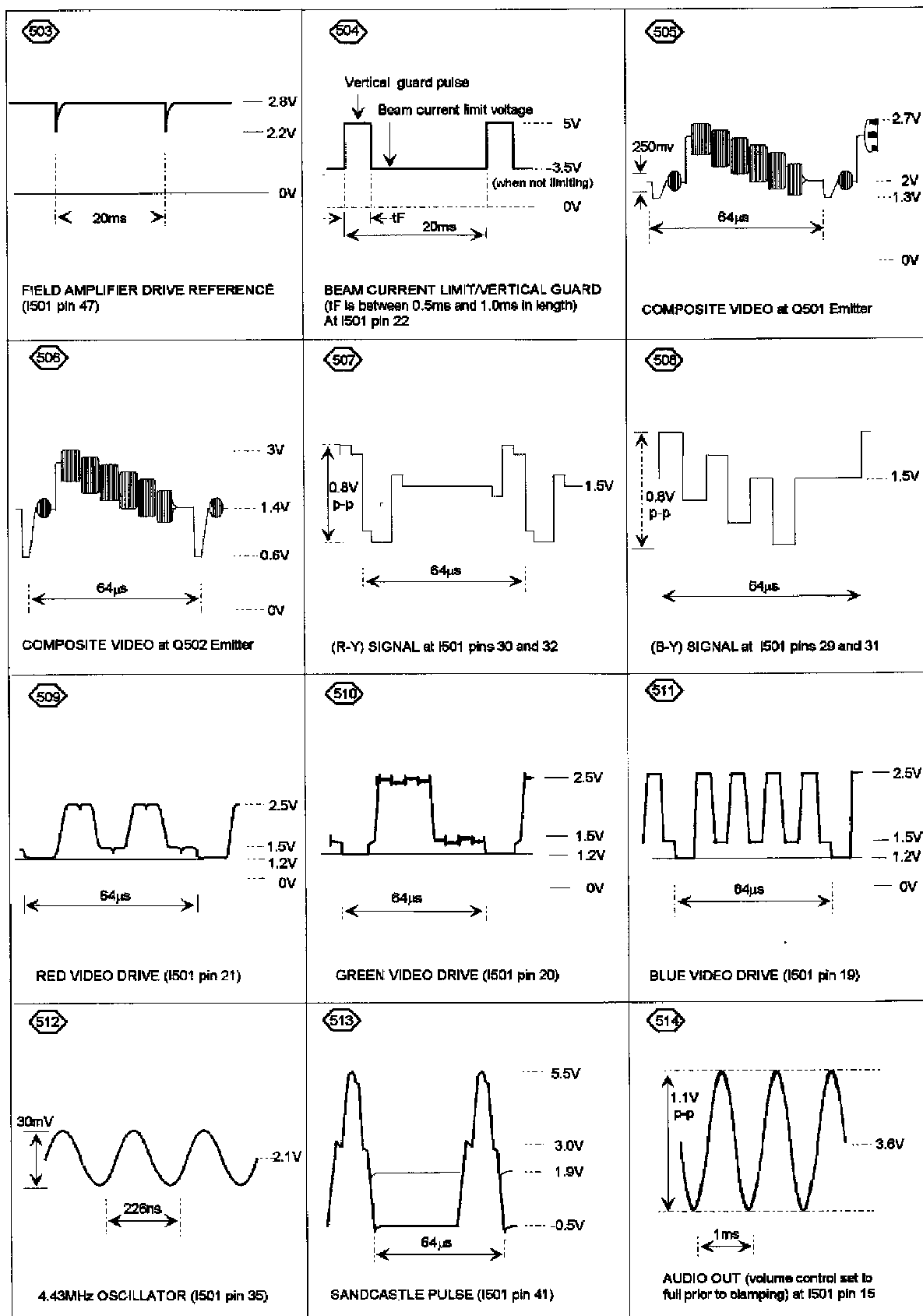


ON/OFF SWITCH COMPONENT LAYOUT

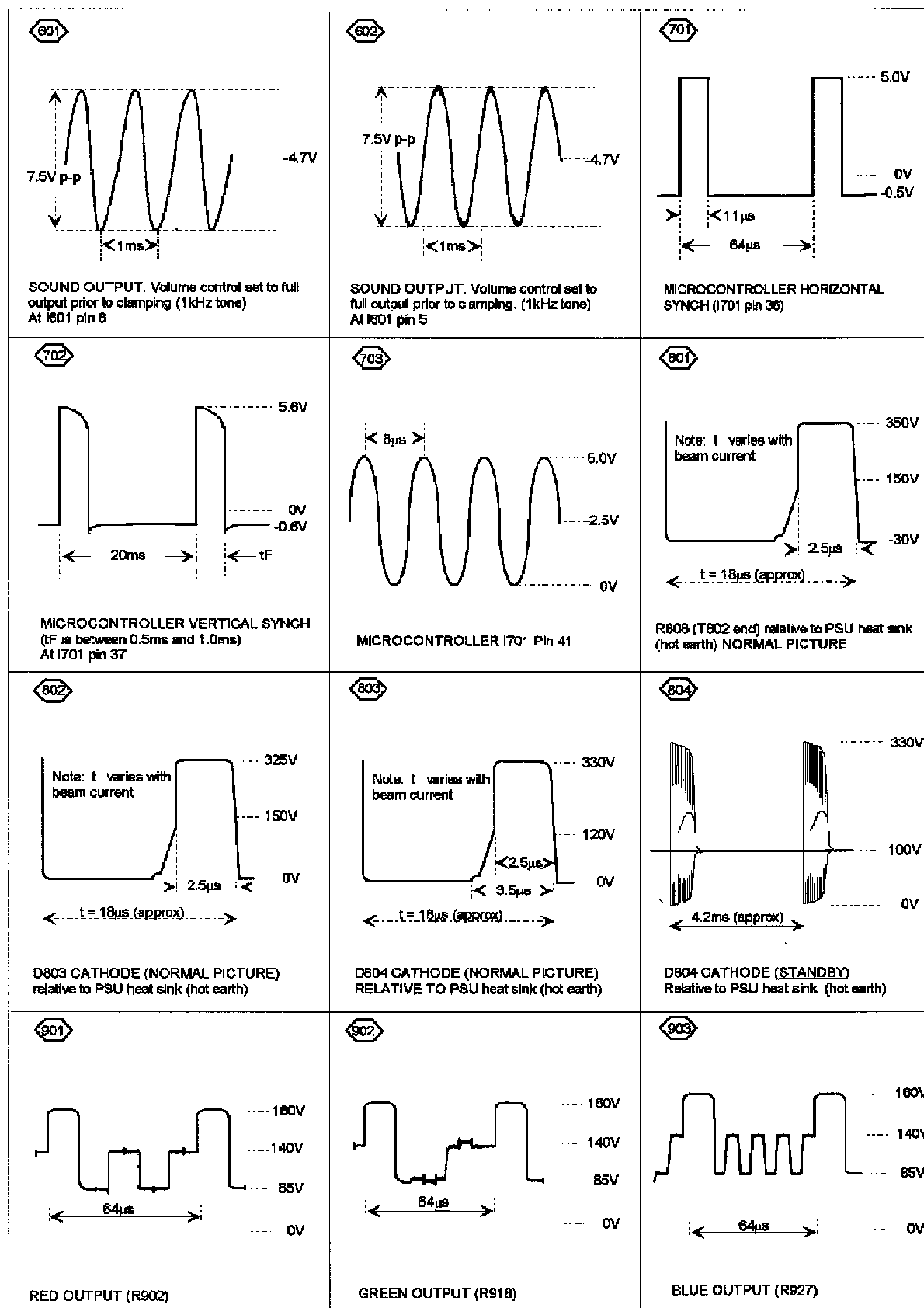
Section 14 WAVEFORMS



Waveforms



Waveforms



Section 15 COMPONENTS LIST

14" Models	C1422R	C1422T	CP1422R	CP1422T	CP1422T-481	CP1422T-491	CL1422R	CS1422R
Chassis type	F1R	F1Y	F1GR	F1GY	F1HY	F1HY	F1FR	F1KR
20" Models				CP2022T		CP2022T-491		CS2022R
Chassis type				F2GY		F2HY		F2KR
21" Models		C2122T	CP2122R	CP2122T	CP2122T-481	CP2122T-491	CL2122R	CS2122R
Chassis type		F4Y	F4GR	F4GY	F4HY	F4HY	F4FR	F4KR

Critical Safety Components

A number of electrical components in this television contribute to operating safety, and the protection afforded by them cannot necessarily be maintained by using replacement components rated for higher voltage, wattage etc. They are identified by  in the parts list and on the circuit diagram to indicate that only manufacturer's approved replacements are to be used.

15.1 CAPACITORS

The following components are common to all chassis

Cct Ref.	Val	Tol.%	Volts	Xpos(track)	Xpos(comp)	Ypos	Type	Part No.
C001	22μ	20	25	189.00	25.00	12.50	Elect 85°C	T5213422091
C002	100n	20	50	195.00	19.00	12.00	Y5V S.M.0805	T5280810491
C004	100μ	20	25	201.00	13.00	64.50	Elect 85°C	T5213410191
C005	100n	20	50	204.50	9.50	42.85	Y5V S.M.0805	T5280810491
C006	22n	20	50	173.50	40.50	15.60	Y5V S.M.0805	T5230822391
C007	100n	5	63	177.10	36.90	11.90	Metal polyester	T5275110491
C008	100n	5	63	193.75	20.25	190.50	Metal polyester	T5275110491
C011	100n	5	63	197.60	16.40	217.00	Metal polyester	T5275110491
C301	100μ	20	25	169.75	44.25	145.50	Elect 85°C	T5213410191
C302	100n	20	50	167.25	46.75	143.50	Y5V S.M.0805	T5280810491
C305	470n	5	63	189.50	24.50	192.50	Metal polyester	T5275147491
C308	470n	5	63	192.70	21.30	214.00	Metal polyester	T5275147491
C401	10μ	20	50	71.00	143.00	45.00	Elect 85°C	T5213610091
C402	4n7	20	50	93.50	120.50	66.50	X7R S.M.0805	T5230847291
C403	100μ	20	35	82.00	132.00	69.50	Elect	T5213510191
C404	100n	5	100	80.00	134.00	43.00	Metal polyester	T5271110491
C405	1μ	5	63	95.50	118.50	48.75	Metal polyester	T5275110591
C406	330n	5	63	61.20	152.80	101.80	Metal polyester	T5275133491
C407	22μ	20	250	72.50	141.50	15.00	CEO4W Elect	T5214422012
C408	470μ	20	25	92.75	121.25	22.50	Elect 85°C	T5213447101
C409	1000μ	20	25	91.50	122.50	38.75	Elect 85°C	T5213410212
C412	1μ	20	63	53.75	160.25	92.50	CF93M Metal	T5275110591
C413	10000p	10	500	50.50	163.50	72.45	DC CK45	T5232310301
C414	100n	5	100	93.50	120.50	45.00	Metal polyester	T5271110491
C415	100n	5	100	61.50	152.50	12.00	Metal polyester	T5271110491
C416	22μ	20	25	97.10	116.90	148.50	Elect 85°C	T5213422091
C417	33n	20	50	80.00	134.00	88.00	Y5V S.M.0805	T5280833391
C418	470p	5	50	85.50	128.50	90.50	Ceramic	T5247047191
C420	100n	20	50	94.35	119.65	145.25	Y5V S.M.0805	T5280810491
C421	22μ	20	16	95.50	118.50	130.75	CEO4W Elect	T5213322091
C422	100n	20	50	94.50	119.50	139.00	Y5V S.M.0805	T5280810491
C423	100n	20	50	83.15	130.85	9.50	Y5V S.M.0805	T5280810491
C436	100n	20	50	97.10	116.90	14.30	Y5V S.M.0805	T5280810491
C501	100n	20	50	161.50	52.50	75.50	Y5V S.M.0805	T5280810491
C502	22μ	20	25	145.50	68.50	54.00	Elect 85°C	T5213422091
C503	68p	5	50	135.80	78.20	120.30	COH S.M.0805	T5240868091
C504	15p	5	50	161.50	52.50	65.50	COH S.M.0805	T5240815091
C505	33p	5	50	162.55	51.45	19.20	COH S.M.0805	T5240833091
C506	47n	20	50	152.50	61.50	84.50	X7R S.M.0805	T5230847391
C507	22μ	20	25	185.10	28.90	43.50	Elect 85°C	T5213422091
C508	47μ	20	25	151.50	62.50	82.00	Elect 85°C	T5213447091
C509	47n	20	50	161.50	52.50	81.50	X7R S.M.0805	T5230847391
C510	2μ2	20	50	154.50	59.50	76.50	Elect 85°C	T5213622991
C511	22n	20	50	151.00	63.00	78.50	X7R S.M.0805	T5230822391
C512	47n	20	50	145.50	68.50	80.00	X7R S.M.0805	T5230847391
C513	100n	20	50	169.50	44.50	90.00	Y5V S.M.0805	T5280810491
C515	47n	20	50	140.25	73.75	87.15	X7R S.M.0805	T5230847391

Cct Ref.	Val	Tol.%	Volts	Xpos(track)	Xpos(comp)	Ypos	Type	Part No.
C516	270p	5	50	168.00	46.00	16.50	COH S.M.0805	T5240827191
C517	270p	5	50	150.50	63.50	5.25	COH S.M.0805	T5240827191
C518	47n	20	50	153.00	61.00	101.20	X7R S.M.0805	T5230847391
C519	270p	5	50	144.50	69.50	5.25	COH S.M.0805	T5240827191
C520	47n	20	50	148.00	66.00	102.75	X7R S.M.0805	T5230847391
C521	270p	5	50	136.50	77.50	5.25	COH S.M.0805	T5240827191
C522	47n	20	50	153.00	61.00	104.50	X7R S.M.0805	T5230847391
C523	270p	5	50	154.00	60.00	5.25	COH S.M.0805	T5240827191
C524	10p	5	50	180.50	33.50	109.50	COH S.M.0805	T5240810091
C525	10p	5	50	177.50	36.50	109.50	COH S.M.0805	T5240810091
C528	100n	20	50	169.00	45.00	109.50	Y5V S.M.0805	T5280810491
C529	4n7	20	50	167.50	46.50	98.00	X7R S.M.0805	T5230847291
C530	47n	20	50	167.50	46.50	95.50	X7R S.M.0805	T5230847391
C531	100μ	20	10	191.50	22.50	97.00	Elect 85°C	T5213210191
C532	2n2	10	50	169.50	44.50	85.25	X7R S.M.0805	T5230822291
C533	4n7	20	50	184.00	30.00	85.50	X7R S.M.0805	T5230847291
C534	1μ	20	50	187.50	26.50	87.50	CE04W Elect	T5213601091
C535	1n	10	50	167.50	46.50	80.00	X7R S.M.0805	T5230810291
C536	1n	10	50	167.50	46.50	77.50	X7R S.M.0805	T5230810291
C537	1n	10	50	167.55	46.45	71.20	X7R S.M.0805	T5230810291
C538	100n	5	63	178.50	35.50	71.00	Metal polyester	T5275110491
C539	2μ2	20	50	170.25	43.75	57.50	Elect 85°C	T5213622991
C541	10μ	20	50	178.00	36.00	81.00	Elect 85°C	T5213610091
C542	100p	5	50	141.40	72.60	90.25	COH S.M.0805	T5240810191
C543	22n	20	50	143.50	70.50	91.85	X7R S.M.0805	T5230822391
C601	1000μ	20	16	179.10	34.90	133.60	CE04E Elect	T5213310212
C602	100n	20	50	177.65	36.35	136.50	Y5V S.M.0805	T5280810491
C603	2n2	10	50	194.00	20.00	133.00	X7R S.M.0805	T5230822291
C604	1n	10	50	164.00	50.00	49.00	X7R S.M.0805	T5230810291
C605	56p	5	50	148.50	65.50	50.00	COH S.M.0805	T5240856091
C606	330p	5	50	161.50	52.50	56.00	COH S.M.0805	T5240833191
C607	100n	20	50	126.00	88.00	41.50	Y5V S.M.0805	T5280810491
C608	470n	5	63	122.00	92.00	35.00	Metal polyester	T5275147491
C609	22n	20	50	127.50	86.50	20.50	X7R S.M.0805	T5230822391
C610	47n	20	50	177.75	36.25	120.50	X7R S.M.0805	T5230847391
C611	330p	5	50	119.50	94.50	8.50	COH S.M.0805	T5240833191
C612	470n	5	63	125.50	88.50	65.75	Metal polyester	T5275147491
C613	22n	20	50	110.50	103.50	12.00	X7R S.M.0805	T5230822391
C614	10μ	20	50	175.50	38.50	57.50	Elect 85°C	T5213610091
C615	3n9	10	50	182.00	32.00	62.00	Ceramic plate	T5231339291
C616	330p	5	50	132.00	82.00	24.10	COH S.M.0805	T5240833191
C618	100μ	20	10	177.70	36.30	140.00	Elect 85°C	T5213210191
C619	1n	10	50	120.50	93.50	58.50	X7R S.M.0805	T5230810291
C701	100n	20	50	132.50	81.50	200.25	Y5V S.M.0805	T5280810491
C702	100n	20	50	167.60	46.40	184.45	Y5V S.M.0805	T5280810491
C703	22μ	20	25	187.50	26.50	231.00	Elect 85°C	T5213422091
C704	22p	5	50	167.60	46.40	179.95	COH S.M.0805	T5240822091
C705	22p	5	50	167.60	46.40	177.70	COH S.M.0805	T5240822091
C706	100n	20	50	167.60	46.40	174.00	Y5V S.M.0805	T5280810491
C707	47n	20	50	150.00	64.00	173.00	X7R S.M.0805	T5230847391
C708	100n	5	63	76.00	138.00	80.50	Metal polyester	T5275110491
C709	0μ47	20	50	123.50	90.50	217.00	Elect 85°C	T5213647891
C710	270p	5	50	139.00	75.00	5.25	COH S.M.0805	T5240827191
C711	100μ	20	25	153.50	60.50	181.00	Elect 85°C	T5213410191
C712	100μ	20	25	157.40	56.60	204.00	Elect 85°C	T5213410191
C713	100n	20	50	184.50	29.50	180.50	Y5V S.M.0805	T5280810491
C714	10n	20	50	135.50	78.50	200.25	X7R S.M.0805	T5230810391
C715	1n	10	50	167.60	46.40	182.20	X7R S.M.0805	T5230810291
C717	100n	20	50	174.10	39.90	168.20	Y5V S.M.0805	T5280810491
C718	100n	20	50	174.10	39.90	165.95	Y5V S.M.0805	T5280810491
C719	100n	20	50	174.10	39.90	163.70	Y5V S.M.0805	T5280810491
C720	100n	20	50	189.50	24.50	189.50	Y5V S.M.0805	T5280810491
C749	10000p	10	500	81.50	132.50	76.00	DC CK45	T5232310301
⚠ C801	220n	20	250	61.50	152.50	163.50	AC Mains X2	T5270106201
C802	1n	20	250	34.00	180.00	169.00	AC Ceramic	T5230106991
C803	1n	20	250	13.00	201.00	168.00	AC Ceramic	T5230106991
⚠ C804	3n3	20	400	84.00	130.00	164.50	AC R12.5 Cls Y	T5230133201
C805	100μ	20	400	37.00	177.00	143.00	Elect 105°C	T5210313800

Cct Ref.	Val	Tol.%	Volts	Xpos(track)	Xpos(comp)	Ypos	Type	Part No.
C806	1000p	10	500	51.75	162.25	146.25	DC Ceramic	T5232310291
C807	4n7	20	50	8.00	206.00	117.65	X7R S.M.0805	T5230847291
C809	100μ	20	250	50.50	163.50	120.50	Elect 105°C Low ESR	T5216007100
C810	4n7		500	60.50	153.50	108.00	Ceramic	T5232347291
C811	10000p	10	500	51.50	162.50	103.00	DC CK45	T5232310301
C812	1000μ	20	16	91.00	123.00	114.50	CE04W Elect	T5213310212
C813	330n	5	63	97.00	117.00	115.00	Metal polyester	T5275133491
C814	100n	5	63	104.75	109.25	126.00	Metal polyester	T5275110491
C815	100n	20	50	49.50	164.50	109.15	Y5V S.M.0805	T5280810491
C817	470p	10	500				Ceramic disc	T5232347191
C901	33n	10	250	48.50	165.50	198.50	Metal polyester	T5272233391
C902	1000μ	20	16	13.00	201.00	227.50	Elect 85°C	T5213310201
C903	68p	5	50	23.25	190.75	205.35	COH S.M.0805	T5240868091
C904	1000p	10	500	93.50	120.50	201.50	DC Ceramic	T5232310291
C905	1000p	10	2kV	44.50	169.50	237.50		T5234210201
C906	60p	5	50	23.25	109.75	220.35	COH S.M.0805	T5240868091
C907	100n	20	50	24.50	189.50	196.65	Y5V S.M.0805	T5280810491
C908	100n	20	50	30.35	183.65	215.00	Y5V S.M.0805	T5280810491
C909	60p	5	50	25.50	188.50	235.25	COH S.M.0805	T5240868091
C910	22p	5	50	3.35	210.65	203.50	COH S.M.0805	T5240822091
C912	33p	5	50	3.35	210.65	231.00	COH S.M.0805	T5240833091
C913	22p	5	50	3.35	210.65	218.00	COH S.M.0805	T5240822091
C914	100n	20	50	8.00	206.00	209.65	Y5V S.M.0805	T5280810491
C915	100n	20	50	8.85	205.15	225.00	Y5V S.M.0805	T5280810491
C916	100n	20	50	29.10	184.90	230.00	Y5V S.M.0805	T5280810491
CA501	270p	5	50				COH S.M.0805	T5240827191
CA601	22n	20	50				X7R S.M.0805	T5230822391
CA602	1000p	10	50				DC Ceramic	T5231310291

15.1.1 Capacitor Differences Table (14" Models)

Model No	C1422T	C1422R	CP1422T	CP1422R	CP1422T-481 CP1422T-491	CS1422R	CL1422R
Chassis	F1Y	F1R	F1GY	F1GR	F1HY	F1KR	F1FR
Cct Ref							
C009	T5213410191	T5213410191	T5213410191	T5213410191	T5213410191	T5213410191	
C010	T5280810491	T5280810491	T5280810491	T5280810491	T5280810491	T5280810491	
C303	T5280810491		T5280810491		T5280810491		
C304	T5280810491		T5280810491		T5280810491		
C410	T5270208501	T5270208501	T5270208501	T5270208501	T5270208501	T5270208501	T5270208501
C411	T5270339401	T5270339401	T5270339401	T5270339401	T5270339401	T5270339401	T5270339401
C419	T5234256100	T5234256100	T5234256100	T5234256100	T5234256100	T5234256100	T5234256100
C514						T5275122491	T5275122491
C617	T5213647991	T5213647991	T5213647991	T5213647991	T5213647991	T5213647991	
C808	T5233210201	T5233210201	T5233210201	T5233210201	T5233210201	T5233210201	T5233247191
C816							T5233247191
CB601							T5230810291
CB602							T5230810291
CB603							T5230810291
CB604							T5230810291
CB605							T5230810291
CB606							T5213647991
CB607							T5213647991
CB608							T5275122491
CB609							T5275122491
CB610							T5275122491
CB611							T5275122491
CB612							T5230810491
CB613							T5230810491
CB614							T5213647991

15.1.2 Capacitor Differences Table (20" Models)

Model No	CP2022T	CS2022R	CP2022T-491
Chassis	F2GY	F2KR	F2HY
Cct Ref			
C303	T5280810491		T5280810491
C304	T5280810491		T5280810491
C410	T5270208701	T5270208701	T5270208701
C411	T5270356402	T5270356402	T5270356402
C419	T5234256100	T5234256100	T5234256100
C514		T5275122491	
C617	T5213647991	T5213647991	T5213647991
C808	T5233247191	T5233247191	T5233247191
C816	T5233247191	T5233247191	T5233247191

15.1.3 Capacitor Differences Table (21" Models)

Model No	CP2122R	CS2122R	CL2122R	C2122T	CP2122T	CP2122T-481 CP2122T-491
Chassis	F4GR	F4KR	F4FR	F4Y	F4GY	F4HY
Cct Ref						
C303				T5280810491	T5280810491	T5280810491
C304				T5280810491	T5280810491	T5280810491
C410	T5270208601	T5270208601	T5270208601	T5270208601	T5270208601	T5270208601
C411	T5270347401	T5270347401	T5270347401	T5270347401	T5270347401	T5270347401
C419						
C514		T5275122491	T5275122491			
C617	T5213647991	T5213647991		T5213647991	T5213647991	T5213647991
C808	T5233247191	T5233247191	T5233247191	T5233247191	T5233247191	T5233247191
C816	T5233247191	T5233247191	T5233247191	T5233247191	T5233247191	T5233247191
CB601			T5230810291			
CB602			T5230810291			
CB603			T5230810291			
CB604			T5230810291			
CB605			T5230810291			
CB606			T5213647991			
CB607			T5213647991			
CB608			T5275122491			
CB609			T5275122491			
CB610			T5275122491			
CB611			T5275122491			
CB612			T5230810491			
CB613			T5230810491			
CB614			T5213647991			

15.1.4 Difference Table Component Values

Cct Ref.	Val	Tol.%	Volts	Xpos(track)	Xpos(comp)	Ypos	Type	Part No.
C009	100μ	20	25	192.50	21.50	163.00	Elect 85°C	T5213410191
C010	100n	20	50	189.50	24.50	163.00	Y5V S.M.0805	T5280810491
C303	100n	20	50	181.20	32.80	160.50	Y5V S.M.0805	T5280810491
C304	100n	20	50	184.50	29.50	159.25	Y5V S.M.0805	T5280810491
C410	7n5	5	1600	42.50	171.50	78.50	Metal polyprop	T5270208501
C410	11n	5	1600				Metal polyprop	T5270208701
C410	10n	5	1600				Metal polyprop	T5270208601
C411	390n	5	250	38.50	175.50	90.00	Metal polyprop	T5270339401
C411	560n	5	250				Metal polyprop	T5270356402
C411	470n	5	250				Metal polyprop	T5270347401
C419	560p	10	2kV	18.50	195.50	101.00	DC Ceramic	T5234256100
C514	220n	5	63	153.60	60.40	90.00	Metal polyester	T5275122491
C617	4μ7	20	50	113.50	100.50	33.00	Elect 85°C	T5213647991
C808	1000p	10	1kV	11.50	202.50	131.00	Ceramic	T5233210201
C808	470p	10	1kV				Ceramic	T5233247191
C816	470p	10	1kV				Ceramic	T5233247191
CB601	1n0	10	50				X7R S.M.0805	T5230810291
CB602	1n0	10	50				X7R S.M.0805	T5230810291
CB603	1n0	10	50				X7R S.M.0805	T5230810291
CB604	1n0	10	50				X7R S.M.0805	T5230810291
CB605	1n0	10	50				X7R S.M.0805	T5230810291
CB606	4μ7	20	50				Elect 85°C	T5213647991
CB607	4μ7	20	50				Elect 85°C	T5213647991
CB608	220n	5	63				Metal polyester	T5275122491
CB609	220n	5	63				Metal polyester	T5275122491
CB610	220n	5	63				Metal polyester	T5275122491
CB611	220n	5	63				Metal polyester	T5275122491
CB612	100n	20	50				X7R S.M.0905	T5230810491
CB613	100n	20	50				X7R S.M.0905	T5230810491
CB614	4μ7	20	50				Elect 85°C	T5213647991

15.2 RESISTORS

The following components are common to all chassis

Cct Ref.	Val	Tol.%	Watts	Xpos(track)	Xpos(comp)	Ypos	Type	Part No.
R002	12k	5	0.1	176.50	37.50	15.60	S.M.0805	T5132312309
R003	1k2	5	0.1	185.40	28.60	21.70	S.M.0805	T5132312209
R004	2k7	5	1/6	189.00	25.00	18.50	Carbon film	T5142127295
R005	47k	5	0.1	202.60	11.40	18.20	S.M.0805	T5132347309
R006	15k	5	0.1	201.00	13.00	192.90	S.M.0805	T5132315309
R007	180k	5	0.1	194.25	19.75	193.50	S.M.0805	T5132318409
R008	12k	1	1/6	205.00	9.00	201.00	Metal film	T5135812340
R009	220R	5	0.1	202.25	11.75	198.50	S.M.0805	T5132322109
R011	10k	5	0.1	199.50	14.50	200.30	S.M.0805	T5132310309
R012	2k2	5	0.1	196.00	18.00	205.00	S.M.0805	T5132322209
R021	0R	5	0.1	203.00	11.00	33.40	S.M.0805	T5132300009
R025	0R	5	0.1	195.00	19.00	18.00	S.M.0805	T5132300009
R301	1k	5	0.1	149.50	64.50	167.50	S.M.0805	T5132310209
R302	100R	5	0.1	141.10	72.90	159.00	S.M.0805	T5132310109
R303	100R	5	0.1	146.20	67.80	159.00	S.M.0805	T5132310109
R304	100R	5	0.1	156.00	58.00	162.50	S.M.0805	T5132310109
R305	27k	5	0.1	174.50	39.50	153.50	S.M.0805	T5132327309
R307	1k5	5	0.1	181.25	32.75	211.50	S.M.0805	T5132315209
R308	1k	5	1/6	139.25	74.75	172.50	Carbon film	T5142110295
R309	22k	5	0.1	183.20	30.80	209.00	S.M.0805	T5132322309
R310	4k7	5	1/6	125.00	89.00	176.75	Carbon film	T5142147295
R311	1k	5	1/6	157.75	56.25	23.25	Carbon film	T5142110295
R312	4k7	5	0.1	191.75	22.25	209.50	S.M.0805	T5132347209
R313	4k7	5	0.1	188.90	25.10	213.00	S.M.0805	T5132347209
R314	22k	5	0.1	184.95	29.05	214.00	S.M.0805	T5132322309
R315	22k	5	0.1	184.95	29.05	218.70	S.M.0805	T5132322309
R316	470R	5	1/6	177.50	36.50	216.50	Carbon film	T5142147195
R317	470R	30		142.80	71.20	145.10	6mm Linear pot	T5162160780

Cct Ref.	Val	Tol.%	Watts	Xpos(track)	Xpos(comp)	Ypos	Type	Part No.
R319	470R	30		164.50	49.50	147.50	6mm Linear pot	T5162160780
R401	100R	5	0.1	128.00	86.00	88.25	S.M.0805	T5142110195
R402	1k	5	0.1	69.85	144.15	10.00	S.M.0805	T5132310209
R403	12k	5	1.6	66.50	147.50	24.00	Carbon film	T5142112395
R405	7k5	5	1/6	88.50	125.50	90.50	Carbon film	T5142175295
R406	7k5	5	1/6	105.50	108.50	104.00	Carbon film	T5142175295
R407	3k3	5	1/6	91.00	123.00	72.00	Carbon film	T5142133295
R408	3k3	5	1/6	93.50	120.50	72.00	Carbon film	T5142133295
R410	3k3	5	0.1	88.50	125.50	63.85	S.M.0805	T5132333209
R411	3k3	5	0.25	84.30	129.70	64.00	Carbon film	T5142833295
R412	1R8	5	0.25	77.00	137.00	43.50	Carbon film	T5142818995
R413	330R	5	0.25	85.00	129.00	67.00	Carbon film	T5142833195
R414	1R5	5	1.0	85.00	129.00	46.00	Metal oxide	T5130315903
⚠ R415	1R	5	0.5	78.25	135.75	39.25	Fusible	T5140101001
⚠ R416	1R	5	0.5	81.75	132.25	39.25	Fusible	T5140101001
R417	1k	5	0.25	7.50	206.50	29.50	Carbon film	T5142810295
R418	12R	5	3.0	59.50	154.50	98.50	Metal oxide	T5130512003
R419	470R	5	0.25	47.00	167.00	84.95	Carbon film	T5142847195
R420	10k	5	2.0	72.50	141.50	112.20	Wire wound	T5154210325
R421	390R	5	0.1	60.50	153.50	90.35	S.M.0805	T5132339109
R422	2k7	5	1/6	109.75	104.25	154.50	Carbon film	T5142127295
R423	560R	5	0.1	82.50	131.50	88.00	S.M.0805	T5132356109
R424	18k	5	1.0	109.00	105.00	86.00	Metal oxide	T5130318303
R425	18k	5	1.0	82.50	131.50	5.50	Metal oxide	T5130318303
R427	560R	5	0.1	94.00	120.00	93.50	S.M.0805	T5132356109
R428	2k7	5	1/6	113.40	100.60	204.75	Carbon film	T5142127295
R429	22R	5	1/6	78.00	136.00	15.50	Carbon film	T5142122090
R430	10k	5	0.1	102.85	111.15	92.00	S.M.0805	T5132310309
R431	1k	5	0.25	103.50	110.50	45.50	Carbon film	T5142810295
⚠ R432	100R	5	1.0	54.00	160.00	70.00	Metal oxide	T5130310103
R433	10R	5	0.5	71.75	142.25	40.50	Fusible	T5133110003
R434	680R	5	1/6	84.75	129.25	24.50	Carbon film	T5142168195
R435	4k7	5	0.1	107.50	106.50	42.15	S.M.0805	T5132347209
R501	390R	5	0.1	161.50	52.50	71.00	S.M.0805	T5132339109
R502	1k	5	1/6	138.75	75.25	68.50	Carbon film	T5142110295
R503	47R	5	0.25	143.00	71.00	54.00	Carbon film	T5140100101
R504	180R	5	0.5	154.50	59.50	40.50	Carbon film	T5142418190
R505	220R	5	0.1	151.50	62.50	47.50	S.M.0805	T5132322109
R506	100k	5	0.1	176.30	37.70	35.50	S.M.0805	T5132310409
R507	680R	5	0.1	182.00	32.00	32.90	S.M.0805	T5132368109
R508	47R	5	1/6	140.00	74.00	51.00	Carbon film	T5142147095
R509	75R	5	1/6	163.75	50.25	22.00	Carbon film	T5142175095
R512	100R	5	1/6	138.75	75.25	71.50	Carbon film	T5142110195
R513	100R	5	1/6	138.75	75.25	74.50	Carbon film	T5142110195
R515	75R	5	1/6	168.00	46.00	18.00	Carbon film	T5142175095
R516	1k5	5	0.1	157.00	57.00	113.35	S.M.0805	T5132315209
R517	2k7	5	0.1	137.00	77.00	112.25	S.M.0805	T5132327209
R518	2k7	5	0.1	140.00	74.00	112.25	S.M.0805	T5132327209
R519	2k7	5	0.1	143.00	71.00	112.25	S.M.0805	T5132327209
R521	75R	5	1/6	141.25	72.75	19.05	Carbon film	T5142175095
R522	75R	5	1/6	140.65	73.35	23.25	Carbon film	T5142175095
R523	75R	5	1/6	149.50	64.50	19.00	Carbon film	T5142175095
R527	100R	5	0.1	169.50	44.50	104.50	S.M.0805	T5132310409
R532	27k	5	1/6	186.50	27.50	100.00	Carbon film	T5142127395
R533	15k	5	0.1	184.00	30.00	88.00	S.M.0805	T5132315309
R534	33k	5	0.1	167.50	46.50	74.15	S.M.0805	T5132333309
R535	100k	5	1/6	103.50	110.50	25.50	Carbon film	T5142110495
R537	39k	5	0.1	179.50	34.50	68.50	S.M.0805	T5132339309
R602	1k	5	1/6	121.75	92.25	70.75	Carbon film	T5142110295
R603	680R	5	0.1	122.50	91.50	16.00	S.M.0805	T5132368109
R604	470R	5	0.1	171.00	43.00	49.00	S.M.0805	T5132347109
R605	470R	5	0.1	156.00	58.00	50.00	S.M.0805	T5132347109
R606	100k	5	0.1	126.50	87.50	49.00	S.M.0805	T5132310409
R607	100k	5	0.1	118.50	95.50	52.00	S.M.0805	T5132310409
R608	12k	5	0.1	127.50	86.50	27.75	S.M.0805	T5132312309
R609	100k	5	0.1	126.50	87.50	51.50	S.M.0805	T5132310409
R610	100k	5	0.1	126.50	87.50	59.50	S.M.0805	T5132310409

Cct Ref.	Val	Tol.%	Watts	Xpos(track)	Xpos(comp)	Ypos	Type	Part No.
R611	6k8	5	0.1	171.00	43.00	119.00	S.M.0805	T5132368209
R612	18k	5	1/6	163.50	50.50	113.50	Carbon film	T5142118395
R613	1k	5	0.1	133.50	80.50	5.50	S.M.0805	T5132310209
R614	1k	5	0.1	128.50	85.50	5.50	S.M.0805	T5132310209
R615	4k7	5	0.1	131.30	82.70	35.00	S.M.0805	T5132347209
R616	220R	5	0.1	133.80	80.20	36.20	S.M.0805	T5132322109
R617	470R	5	0.1	132.50	81.50	46.00	S.M.0805	T5132347109
R618	220R	5	1/6	113.00	101.00	16.40	Carbon film	T5142122195
R619	4k7	5	1/6	204.50	9.50	208.75	Carbon film	T5142147290
R620	220R	5	0.1	182.00	32.00	170.00	S.M.0805	T5132322109
R701	4k7	5	0.1	148.25	65.75	198.25	S.M.0805	T5132347209
R702	4k7	5	0.1	152.00	62.00	198.25	S.M.0805	T5132347209
R703	10k	5	1/6	140.75	73.25	204.50	Carbon film	T5142110395
R704	22k	5	0.1	144.00	70.00	197.25	S.M.0805	T5132322309
R705	100R	5	0.1	140.75	73.25	191.75	S.M.0805	T5132310109
R706	100R	5	0.1	137.75	76.25	191.75	S.M.0805	T5132310109
R707	5k6	5	0.1	155.00	59.00	193.50	S.M.0805	T5132356209
R708	5k6	5	0.1	150.00	64.00	191.75	S.M.0805	T5132356209
R709	4k7	5	1/6	121.50	92.50	183.00	Carbon film	T5142147290
R710	39k	5	1/6	104.25	109.75	50.00	Carbon film	T5142139395
R711	4k7	5	1/6	163.50	50.50	211.25	Carbon film	T5142147290
R712	4k7	5	0.1	171.00	43.00	230.50	S.M.0805	T5132347209
R713	820R	5	0.1	173.50	40.50	233.50	S.M.0805	T5132382109
R714	150R	5	1/6	164.50	49.50	234.50	Carbon film	T5142115195
R715	4k7	5	0.1	184.50	29.50	234.00	S.M.0805	T5132347209
R716	1k8	5	0.1	169.75	44.25	220.55	S.M.0805	T5132318209
R717	100R	5	0.1	157.70	56.30	169.20	S.M.0805	T5132310109
R718	4k7	5	1/6	88.00	126.00	73.50	Carbon film	T5142147295
R719	100R	5	0.1	145.50	68.50	173.00	S.M.0805	T5132310109
R720	10k	5	0.1	138.00	76.00	176.00	S.M.0805	T5132310309
R721	10k	5	0.1	117.00	97.00	224.00	S.M.0805	T5132310309
R722	390R	5	0.1	124.50	89.50	227.50	S.M.0805	T5132339109
R723	1k	5	0.1	121.50	92.50	223.50	S.M.0805	T5132310209
R724	4k7	5	1/6	198.00	16.00	235.00	Carbon film	T5142147295
R725	4k7	5	1/6	195.25	18.75	232.50	Carbon film	T5142147295
R726	4k7	5	1/6	192.25	21.75	229.75	Carbon film	T5142147295
R727	10k	5	1/6	137.50	76.50	223.50	Carbon film	T5142110390
R728	22k	5	0.1	126.50	87.50	56.50	S.M.0805	T5132322309
R729	10k	5	0.1	98.85	115.15	98.50	S.M.0805	T5132310309
R730	22k	5	1/6	174.50	39.50	216.50	Carbon film	T5142122395
R731	3k3	5	0.1	138.15	75.85	23.45	S.M.0805	T5132333209
R732	4k7	5	0.1	189.50	24.50	187.00	S.M.0805	T5132347209
R734	22k	5	0.25	61.00	153.00	50.50	Carbon film	T5142822395
R735	0R	5	0.1				S.M.0805	T5132300009
R736	470R	5	1/6	125.75	88.25	187.25	Carbon film	T5142147190
R740	3k3	5	0.1	185.50	28.50	206.75	S.M.0805	T5132333209
R801	560k	5	0.5	68.50	145.50	171.50	Carbon film	T5142456490
R802	10R,	5		18.50	195.50	151.00	3A Thermistor	T5101108400
R803	PTH451C02BG200N270			24.50	189.50	179.00	Posistor	T5101106900
⚠ R804	4M7	5	0.5	78.50	135.50	155.50	Metal glaze	T5140147590
⚠ R805	4M7	5	0.5	82.50	131.50	157.50	Metal glaze	T5140147590
R806	330k	5	1.0	21.00	193.00	133.25	Metal oxide	T5130333490
R808	2k7	5	1/6	54.00	160.00	149.50	Carbon film	T5142127295
R809	120k	5	1/6	24.50	189.50	128.25	Carbon film	T5142112495
R810	6k8	5	1.0	17.25	196.75	117.75	Metal oxide	T5130368203
R811	56k	5	0.1	47.50	166.50	140.00	S.M.0805	T5132356309
R812	330R	5	1/6	8.00	206.00	111.65	Carbon film	T5142133195
R813	10k	5	1/6	25.50	188.50	114.50	Carbon film	T5142110395
⚠ R814	0R39	5	0.5	41.00	173.00	131.50	Metal oxide	T5130239807
R815	33k	5	1.0	40.00	174.00	110.00	Metal oxide	T5130333303
⚠ R816	0R22	5	0.5	60.50	153.50	138.50	Fusible	T5133122803
R817	1k2	5	1/6	65.00	149.00	113.50	Carbon film	T5142112295
R818	470R	30		67.50	146.50	119.50	6mm Linear pot	T5162160780
R820	22k	5	1.0	40.50	173.50	106.50	Metal oxide	T5130322303
⚠ R821	0R22	5	0.5	90.00	124.00	133.00	Fusible	T5133122803
R822	100R	5	1/6	88.50	125.50	98.50	Carbon film	T5142110195
R902	1k5	10	0.5	34.00	180.00	207.00	Carbon comp	T5112215290

Cct Ref.	Val	Tol.%	Watts	Xpos(track)	Xpos(comp)	Ypos	Type	Part No.
R903	12k	5	3.0	24.50	189.50	211.50	Metal oxide RS08B	T5130512303
R904	1k	5	0.1	28.85	185.15	198.50	S.M.0805	T5132310209
R905	330R	5	0.1	14.10	199.90	241.00	S.M.0805	T5132333109
R906	2k4	5	0.1	8.65	205.35	203.50	S.M.0805	T5132324209
R907	220R	1	0.1	8.65	205.35	206.50	S.M.0805	T5132122009
R908	3k3	1	0.1	3.35	210.65	206.50	S.M.0805	T5132133019
R909	180k	1	0.5	13.50	200.50	205.50	Metal film	T5135718039
R910	3k3	1	0.1	3.35	210.65	220.50	S.M.0805	T5132133019
R911	220R	1	0.1	8.25	205.75	220.50	S.M.0805	T5132122009
R912	2k4	5	0.1	8.65	205.35	215.00	S.M.0805	T5132324209
R913	180k	1	0.5	13.50	200.50	220.50	Metal film	T5135718039
R914	12k	5	3.0	27.70	186.30	226.40	Metal oxide RS08B	T5130512303
R915	0R68	5	0.5	71.40	142.40	196.50	Fusible	T5133168803
R916	1k	5	0.5	36.00	178.00	202.50	Carbon comp	T5111210290
R917	100k	5	1.0	20.80	193.20	243.50	Metal oxide	T5130310403
R918	1k5	10	0.5	36.70	177.30	221.50	Carbon comp	T5112215290
R919	3k3	1	0.1	3.35	210.65	233.50	S.M.0805	T5132133019
R920	220R	1	0.1	8.85	205.15	233.50	S.M.0805	T5132122009
R921	2k4	5	0.1	11.15	202.85	230.50	S.M.0805	T5132324209
R922	180k	1	0.5	16.25	197.75	236.25	Metal film	T5135718039
R923	12k	5	3.0	24.00	190.00	241.50	Metal oxide RS08B	T5130512303
R924	0R	5	0.1	17.85	196.15	216.50	S.M.0805	T5132300009
R925	0R	5	0.1	20.10	193.90	198.00	S.M.0805	T5132300009
R927	1k5	10	0.5	43.00	171.00	242.50	Carbon comp	T5112215290
R932	1k	5	0.5	44.50	169.50	233.00	Carbon comp	T5111210290
RA501	75R	5	1/6				Carbon film	T5142175095
RA601	12k	5	0.1				S.M.0805	T5132312309
RA602	100R	5	0.25				Carbon film	T5142810195

15.2.1 Resistor Differences Table (14" Models)

Model No	C1422T	C1422R	CP1422T	CP1422R	CP1422T-481 CP1422T-491	CS1422R	CL1422R
Chassis	F1Y	F1R	F1GY	F1GR	F1HY	F1KR	F1FR
Cct Ref							
R001	T5132300009	T5132300009	T5132300009	T5132300009	T5132300009	T5132300009	T5132312309
R013			T5132322309	T5132322309	T5132322309	T5132322309	T5132322309
R014			T5132322309	T5142122395	T5142122395	T5142122395	T5142122395
R015			T5132322309	T5132322309	T5132322309	T5132322309	T5132322309
R016			T5142122395	T5142122395	T5142122395	T5142122395	T5142122395
R017			T5132322309	T5132322309	T5132322309	T5132322309	T5132322309
R018			T5142122395	T5142122395	T5142122395	T5142122395	T5142122395
R024	T5132300009	T5132300009					
R026							T5132300009
R318	T5132322109	T5132322109	T5132322109	T5132322109	T5132322109	T5132322109	T5132322109
R404	T5142827495	T5142827495	T5142827495	T5142827495	T5142827495	T5142827495	T5142827495
R409	T5132339209	T5132339209	T5132339209	T5132339209	T5132339209	T5132339209	T5132347209
R426	T5132310409	T5132310409	T5132310409	T5132310409	T5132310409	T5132310409	T5132356309
R436							T5130215206
R510	T5132310209	T5132310209	T5132310209	T5132310209	T5132310209	T5132310209	T5132382109
R511	T5132312209	T5132312209	T5132312209	T5132312209	T5132312209	T5132312209	T5132315209
R520	T5142175095	T5142175095	T5142175095	T5142175095	T5142175095	T5142175095	
R528	T5142147195		T5142147195		T5142147195		
R529	T5132347009		T5132347009		T5132347009		
R530	T5142147195		T5142147195		T5142147195	T5142147195	T5142147195
RB601							T5132310309
RB602							T5132310309
RB603							T5132347009
RB604							T5132347109
RB605							T5142122395
RB606							T5142122495
RB607							T5132322309
RB608							T5132310309
RB609							T5132322309
RB610							T5142110395
RB611							T5132310409
RB612							T5142110495

15.2.2 Resistor Differences Table (20" Models)

Models No	CP2022T	CS2022R	CP2022T-491
Chassis	F2GY	F2KR	F2HY
Cct Ref			
R001	T5132300009	T5132300009	T5132300009
R013	T5132322309	T5132322309	T5132322309
R014	T5142122395	T5142122395	T5142122395
R015	T5132322309	T5132322309	T5132322309
R016	T5142122395	T5142122395	T5142122395
R017	T5132322309	T5132322309	T5132322309
R018	T5142122395	T5142122395	T5142122395
R306	T5142127290	T5142127290	T5142127290
R318	T5132315109	T5132315109	T5132315109
R404	T5142822495	T5142822495	T5142822495
R409	T5132347209	T5132347209	T5132347209
R426	T5132356309	T5132356309	T5132356309
R436	T5130215207	T5130215207	T5130215206
R510	T5132382109	T5132382109	T5132382109
R511	T5132315209	T5132315209	T5132315209
R520	T5142175095		T5142175095
R528	T5142147195		T5142147195
R529	T5132347009		T5132347009
R530	T5142147195	T5142147195	T5142147195
R733			T5142110195

15.2.3 Resistor Differences Table (21" Models)

Models No	CP2122R	CS2122R	CL2122R	C2122T	CP2122T	CP2122T-481 CP2122T-491
Chassis	F4GR	F4KR	F4FR	F4Y	F4GY	F4HY
Cct Ref						
R001	T5132300009	T5132300009	T5132312309	T5132300009	T5132300009	T5132300009
R013	T5132322309	T5132322309	T5132322309		T5132322309	T5132322309
R014	T5142122395	T5142122395	T5142122395		T5142122395	T5142122395
R015	T5132322309	T5132322309	T5132322309		T5132322309	T5132322309
R016	T5142122395	T5142122395	T5142122395		T5142122395	T5142122395
R017	T5132322309	T5132322309	T5132322309		T5132322309	T5132322309
R018	T5142122395	T5142122395	T5142122395		T5142122395	T5142122395
R024				T5132300009		
R026			T5132300009			
R306	T5142127290	T5142127290	T5142127290	T5142127290	T5142127290	T5142127290
R318	T5132315109	T5132315109	T5132315109	T5132315109	T5132315109	T5132315109
R404	T5142822495	T5142822495	T5142822495	T5142822495	T5142822495	T5142822495
R409	T5132347209	T5132347209	T5132347209	T5132347209	T5132347209	T5132347209
R426	T5132356309	T5132356309	T5132356309	T5132356309	T5132356309	T5132356309
R436	T5130215207	T5130215207	T5130215207	T5130215207	T5130215207	T5130215206
R510	T5132382109	T5132382109	T5132382109	T5132382109	T5132382109	T5132382109
R511	T5132315209	T5132315209	T5132315209	T5132315209	T5132315209	T5132315209
R520	T5142175095			T5142175095	T5142175095	T5142175095
R528				T5142147195	T5142147195	T5142147195
R529				T5132347009	T5132347009	T5132347009
R530		T5142147195	T5142147195	T5142147195	T5142147195	T5142147195
R733			T5132300009			T5142110195
RB601			T5132310309			
RB602			T5132310309			
RB603			T5132347009			
RB604			T5132347109			
RB605			T5142122395			
RB606			T5142122495			
RB607			T5132322309			
RB608			T5132310309			
RB609			T5132322309			
RB610			T5142110395			
RB611			T5132310409			
RB612			T5142110495			

15.2.4 Difference Table Component Values

Cct Ref.	Val	Tol.%	Watts	Xpos(track)	Xpos(comp)	Ypos	Type	Part No.
R001	0R	5	0.1	186.00	28.00	13.50	S.M.0805	T5132300009
R001	12k	5	0.1				S.M.0805	T5132312309
R013	22k	5	0.1	206.50	7.50	166.75	S.M.0805	T5132322309
R014	22k	5	1/6	191.25	22.75	172.00	Carbon film	T5142122395
R015	22k	5	0.1	202.00	12.00	165.75	S.M.0805	T5132322309
R016	22k	5	1/6	191.25	22.75	175.50	Carbon film	T5142122395
R017	22k	5	0.1	197.50	16.50	165.75	S.M.0805	T5132322309
R018	22k	5	1/6	190.60	23.40	168.30	Carbon film	T5142122395
R024	0R	5	0.1	206.50	7.50	159.75	S.M.0805	T5132300009
R026	0R	5	0.1				S.M.0805	T5132300009
R306	2k7	5	1/6				Carbon film	T5142127290
R318	220R	5	0.1	149.40	64.60	145.50	S.M.0805	T5132322109
R318	150R	5	0.1				S.M.0805	T5132315109
R404	270k	5	0.25	69.00	145.00	27.50	Carbon film	T5142827495
R404	220k	5	0.25				Carbon film	T5142822495
R409	4k7	5	0.1				S.M.0805	T5132347209
R409	3k9	5	0.1				S.M.0805	T5132339209
R426	100k	5	0.1	66.00	148.00	98.15	S.M.0805	T5132310409
R426	56k	5	0.1				S.M.0805	T5132356309
R436	1k5	5	0.5				2U RSI 08	T5130215206
R436	1k5	5	0.5				Metal oxide	T5130215207
R510	1k	5	0.1	167.35	46.65	24.50	S.M.0805	T5132310209
R510	820R	5	0.1				S.M.0805	T5132382109
R511	1k2	5	0.1	143.50	50.50	87.15	S.M.0805	T5132312209
R511	1k5	5	0.1				S.M.0805	T5132315209
R520	75R	5	1/6	148.50	65.50	22.00	Carbon film	T5142175095
R528	470R	5	1/6	199.50	14.50	122.75	Carbon film	T5142147195
R529	47R	5	0.1	192.00	22.00	104.50	S.M.0805	T5132347009
R530	470R	5	1/6	193.50	20.50	121.50	Carbon film	T5142147195
R733	100R	5	1/6	199.25	14.75	156.50	Carbon film	T5142110195
R733	0R	5	0.1				S.M.0805	T5132300009
RB601	10k	5	0.1				S.M.0805	T5132310309
RB602	10k	5	0.1				S.M.0805	T5132310309
RB603	47R	5	0.1				S.M.0805	T5132347009
RB604	470R	5	0.1				S.M.0805	T5132347109
RB605	22k	5	1/6				Carbon film	T5142122395
RB606	220k	5	1/6				Carbon film	T5142122495
RB607	22k	5	0.1				S.M.0805	T5132322309
RB608	10k	5	0.1				S.M.0805	T5132310309
RB609	22k	5	0.1				S.M.0805	T5132322309
RB610	10k	5	1/6				Carbon film	T5142110395
RB611	100k	5	0.1				S.M.0805	T5132310409
RB612	100k	5	1/6				Carbon film	T5142110495

15.3 INTEGRATED CIRCUITS

The following components are common to all chassis

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
I001	Voltage stabilizer ZTK33B	207.00	7.00	226.75	T6615003642
I401	Field output amplifier TEA8172	100.00	114.00	56.50	T6644076001
I402	Photo-coupler	77.00	137.00	93.00	T6642900200
I403	+5V, 1A Voltage regulator	100.00	114.00	139.50	T6640001907
I601	Audio output amplifier TDA7052A	191.70	22.30	137.00	T6644900901
I702	4kbit EEPROM DIP-8 XL24C04P	130.00	84.00	203.00	T6647051809
I703	Infra-red receiver TSOP1736	180.00	34.00	244.75	T6642900100
I801	Voltage regulator 5V o/p MC78L05ACP	93.00	121.00	110.00	T6640000806

15.3.1 Integrated Circuit Differences Table (14" Models)

Model No	C1422T	C1422R	CP1422T	CP1422R	CP1422T-481 CP1422T-491	CS1422R	CL1422R
Chassis	F1Y	F1R	F1GY	F1GR	F1HY	F1KR	F1FR
Cct Ref							
I501	T6643901001	T6643901001	T6643901001	T6643901001	T6643901001	T6643900901	T6643900901
I602	T6645010502	T6645010502	T6645010502	T6645010502	T6645010502	T6645010502	
I701	T6647900401	T6647900501	T6647900401	T6647900501	T6647900601	T6647900701	T6647900801
IB601							T6643901150
IB602							T6645010502

15.3.2 Integrated Circuit Differences Table (20" Models)

Model No	CP2022T	CS2022R	CP2022T
Chassis	F2GY	F2KR	F2HY
Cct Ref			
I501	T6643901001	T6643900901	T6643901001
I602	T6645010502	T6645010502	T6645010502
I701	T6647900401	T6647900701	T6647900601

15.3.3 Integrated Circuit Differences Table (21" Models)

Model No	CP2122R	CS2122R	CL2122R	C2122T	CP2122T	CP2122T-481 CP2122T-491
Chassis	F4GR	F4KR	F4FR	F4Y	F4GY	F4HY
Cct Ref						
I501	T6643901001	T6643900901	T6643900901	T6643901001	T6643901001	T6643901001
I602	T6645010502	T6645010502		T6645010502	T6645010502	T6645010502
I701	T6647900501	T6647900701	T6647900801	T6647900401	T6647900401	T6647900601
IB601			T6643901150			
IB602			T6645010502			

15.3.4 Difference Table Component Values

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
I501	Video processor TDA8842 (N2)	158.00	56.00	62.00	T6643900901
I501	Video processor TDA8840 (N2)	158.00	56.00	62.00	T6643901001
I602	Audio selector switch MC74HC4053N	115.50	98.50	41.50	T6645010502
I602	Audio selector switch MC74HC4053N	115.50	98.50	41.50	T6645010502
I701	Microcontroller SAA5290PS/089	177.50	36.50	198.00	T6647900401
I701	Microcontroller SAA5288PS/006	177.50	36.50	198.00	T6647900501
I701	Microcontroller SAA5290PS/104	177.50	36.50	198.00	T6647900601
I701	Microcontroller SAA5288PS/032	177.50	36.50	198.00	T6647900701
I701	Microcontroller SAA5288PS/030	177.50	36.50	198.00	T6647900801
IB601	Linear, TDA9830T				T6643901150
IB602	MC74HC4053N				T6645010502

15.4 DIODES

The following components are common to all chassis

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
D002	BAT85 Schottky	199.00	15.00	196.00	T6613900131
D301	1N4148	188.90	25.10	209.50	T6613003037
D401	1N4148	107.50	106.50	31.50	T6613003037
D402	1N4148	107.50	106.50	45.50	T6613003037
D403	RGP15J-G23 rectifier	57.25	156.75	72.25	T6611013043
D404	BYD33G	55.75	158.25	35.50	T6611036047
D405	BYD33G	70.75	143.25	32.00	T6611036047
D406	BYD33G	55.75	158.25	39.50	T6611036047
D408	BY133GP-G23 rectifier	37.00	177.00	71.50	T6611029646
D409	Zener HZ36-2-TD	63.00	151.00	87.45	T6615016730
D411	1N4003-G23	97.50	116.50	73.00	T6611007340
D501	BA482	199.00	15.00	116.50	T6611900030
D502	BA482	193.50	20.50	114.00	T6611900030
D503	BA482	184.00	30.00	116.00	T6611900030
D517	Zener MA1082L-TP	147.00	67.00	126.50	T6615007341
D518	Zener MA1082L-TP	148.50	65.50	124.75	T6615007341
D519	Zener MA1082L-TP	152.50	61.50	124.75	T6615007341
D701	Red LED 90° 10.5mm leg	168.25	45.75	240.50	T6618900202
D702	Zener BZX79C5V6	155.00	59.00	160.00	T6615024840
D704	BAT85 Schottky	115.50	98.50	227.50	T6613900131
D705	BAT85 Schottky	156.00	58.00	187.00	T6613900131
D706	BAT85 Schottky	144.00	70.00	175.50	T6613900131
D707	1N4148	187.25	26.75	181.00	T6613003037
D801	DB107G rectifier	22.50	191.50	168.50	T6611900501
D802	Zener HZ16-1-TD	35.50	178.50	117.00	T6615005236
D803	Zener HZ16-1-TD	61.50	152.50	143.00	T6615005236
D804	RGP10J-G23	53.75	160.25	129.00	T6613002246
D805	Suppressor	35.20	178.80	130.00	T6615900300
D806	Zener BZX85C5V6	57.00	157.00	115.50	T6615001641
D807	RGP10D, 1A, 200V, 150ns	90.00	124.00	147.50	T6613002234
D808	Zener HZ9B2-TD 0.5W	85.50	128.50	108.50	T6615006933
D901	Zener HZ7C2-TD, 7.3 – 7.7V	37.50	176.50	195.50	T6615014430
D903	Switching diode	20.25	193.75	206.55	T6613900250
D904	Switching diode	21.70	192.30	236.50	T6613900250
D905	Switching diode	20.25	193.75	221.50	T6613900250
D910	Zener BZV85C5V1	89.00	125.00	194.00	T6615900030

15.4.1 Diodes Differences Table (14" Models)

Model No	C1422T	C1422R	CP1422T	CP1422R	CP1422T-491 CP1422T-491	CS1422R	CL1422R
Chassis	F1Y	F1R	F1GY	F1GR	F1HY	F1KR	F1FR
Cct Ref							
D001							T6613003032
D520	T6615007341	T6615007341	T6615007341	T6615007341	T6615007341	T6615007341	
D703	T6615007341	T6615007341	T6615007341	T6615007341	T6615007341	T6615007341	T6615024934
DB601							T6611900030
DB602							T6611900030

15.4.2 Diodes Differences Table (20" Models)

Model No	CP2022T	CS2022R	CP2022T-491
Chassis	F2GY	F2KR	F2HY
Cct Ref			
D001			
D703	T6615024934	T6615024934	T6615024934

15.4.3 Diodes Differences Table (21" Models)

Model No	CP2122R	CS2122R	CL2122R	C2122T	CP2122T	CP2122T-481 CP2122T-491
Chassis	F4GR	F4KR	F4FR	F4Y	F4GY	F4HY
Cct Ref						
D001			T6613003032			
D703	T6615024934	T6615024934	T6615024934	T6615024934	T6615024934	T6615024934
DB601			T6611900030			
DB602			T6611900030			

15.4.4 Difference Table Component Values

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
D001	1N4148-TD 75V 150mA				T6613003032
D520	Zener MA1082L-TP	160.25	53.75	126.50	T6615007341
D703	Zener MA1082L-TP	124.50	89.50	221.00	T6615007341
D703	Zener BZX79C7V5				T6615024934
DB601	BA482				T6611900030
DB602	BA482				T6611900030

15.5 CHOKES, COILS, DELAY LINES AND CRYSTALS

The following components are common to all chassis

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
L001	Peaking coil TRF-8100J 10μH	197.00	17.00	72.75	T5064410025
L002	Peaking coil TRF-8100J 10μH	189.00	25.00	15.50	T5064410025
L003	Peaking coil TRF-8100J 10μH	196.50	17.50	178.60	T5064410025
L004	Choke, 560nH, 10%, S.M. W/W	194.50	19.50	53.85	T5064615682
L301	Peaking coil TFR-8229J 2.2μH	142.50	71.50	105.00	T5064422925
L302	Peaking coil TFR-8229J 2.2μH	138.50	75.50	149.50	T5064422925
L303	Peaking coil TFR-8229J 2.2μH	143.70	70.30	149.50	T5064422925
L304	Peaking coil TFR-8229J 2.2μH	148.70	65.30	149.50	T5064422925
L401	Choke coil 200μH, 5%, 0.5A RMS	58.25	155.75	63.00	T5062190010
L403	Choke coil 22μH, 10%, 1.5A	62.75	151.25	78.00	T5062190017
L502	Coil TRF-3689J 6.8μH, 5%	130.00	84.00	63.00	T5064068929
L503	Coil TRF-3689J 8.2μH, 5%	173.50	40.50	43.00	T5064082929
L505	Choke 3μ3H, 10%	145.75	68.25	98.65	T5064533939
L506	Choke 3μ3H, 10%	148.75	65.25	97.40	T5064533939
L507	Choke 3μ3H, 10%	151.95	62.05	96.65	T5064533939
L601	Peaking coil TRF-8100J 10μH	134.00	80.00	20.00	T5064410025
L604	Peaking coil TRF-8100J 10μH	116.50	97.50	7.50	T5064410025
L701	Peaking coil TRF-8100J 10μH	193.50	20.50	238.50	T5064410025
L702	Coil TRF-3101J 100μH, 5%	113.00	101.00	196.50	T5064010129
X501	Xtal 4.433619 (29pF) PR	179.00	35.00	104.50	T6699240510
X701	Xtal 12.00MHz (20pF) PR	158.00	56.00	176.75	T6699214510
LA601	Choke 10μH				T5064010039
LA602	Coil TRF-3101J 100μH, 5%				T5064010129
LA603	Coil TRF-3101J 100μH, 5%				T5064010129

15.5.1 Chokes, Coils, Delay Lines And Crystals Differences Table (14" Models)

Model No	C1422T	C1422R	CP1422T	CP1422R	CP1422T-481 CP1422T-491	CS1422R	CL1422R
Chassis	F1Y	F1R	F1GY	F1GR	F1HY	F1KR	F1FR
Cct Ref							
L402	T5062290201	T5062290201	T5062290201	T5062290201	T5062290201	T5062290201	T5062290201
XB601							T5052390001
LB601							T5064410025
X001	T5052390003	T5052390003	T5052390002	T5052390002	T5052390002	T5052390005	T5052390002
Z501	T5050790002	T5050790002	T5050790001	T5050790001	T5050790001	T5050716700	T5050716700
Z601	T5050790003	T5050790003	T5050790004	T5050790004	T5050790004	T5050790004	T5050790004
Z602						T5050701600	

15.5.2 Chokes, Coils, Delay Lines And Crystals Differences Table (20" Models)

Model No	CP2022T	CS2022R	CP2022T-491
Chassis	F2GY	F2KR	F2HY
Cct Ref			
L402	T5062290004	T5062290004	T5062290004
X001	T5052390002	T5052390005	T5052390002
Z501	T5050790001	T5050716700	T5050790001
Z601	T5050790004	T5050790004	T5050790004

15.5.3 Chokes, Coils, Delay Lines And Crystals Differences Table (21" Models)

Model No	CP2122R	CS2122R	CL2122R	C2122T	CP2122T	CP2122T-481 CP2122T-491
Chassis	F4GR	F4KR	F4FR	F4Y	F4GY	F4HY
Cct Ref						
L402	T5062290004	T5062290004	T5062290004	T5062290004	T5062290004	T5062290004
LB601			T5064410025			
X001	T5052390002	T5052390005	T5052390002	T5052390003	T5052390002	T5052390002
XB601			T5052390001			
Z501	T5050790001	T5050716700	T5050716700	T5050790002	T5050790001	T5050790001
Z601	T5050790004	T5050790004	T5050790004	T5050790003	T5050790004	T5050790004
Z602			T5050701600			

15.5.4 Difference Table Component Values

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
L402	Linearity coil 97F-141				T5062290004
L402	Linearity coil XLH139	26.25	187.75	104.25	T5062290201
XB601	Saw filter OFWL9453M				T5052390001
LB601	Peaking coil TRF-8100J 10μH				T5064410025
X001	Saw filter OFWG1984M	187.50	26.50	69.00	T5052390002
X001	Saw filter OFWJ1980M	187.50	26.50	69.00	T5052390003
X001	Saw filter OFWG1984M				T5052390002
X001	Saw filter OFWK2950M	187.50	26.50	69.00	T5052390005
Z501	Ceramic filter trap 5.5/6.5MHz	168.00	46.00	33.00	T5050716700
Z501	Double filter trap TPWA04B	168.00	46.00	33.00	T5050790001
Z501	Bandstop filter 6.0/6.5MHz	168.00	46.00	33.00	T5050790002
Z601	Ceramic filter 6.0MHz	163.50	50.50	42.50	T5050790003
Z601	Ceramic filter 5.5MHz	163.50	50.50	42.50	T5050790004
Z602	Ceramic filter SFE 6.5MB	168.00	46.00	42.50	T5050701600

15.6 TRANSFORMERS

The following components are common to all chassis

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
⚠ T801	Filter EMI transformer type	41.50	172.50	183.50	T5061700200
⚠ T802	S.M.P.S.U.	75.00	139.00	137.50	T5061800101

15.6.1 Transformer Differences Table (14" Models)

Model No	C1422T	C1422R	CP1422T	CP1422R	CP1422T-481 CP1422T-491	CS1422R	CL1422R
Chassis	F1Y	F1R	F1GY	F1GR	F1HY	F1KR	F1FR
Cct Ref							
T401	T5062690328	T5062690328	T5062690328	T5062690328	T5062690328	T5062690328	T5062690328

15.6.2 Transformer Differences Table (20" Models)

Model No	CP2022T	CS2022R	CP2022T-491
Chassis	F2GY	F2KR	
Cct Ref			
T401	T5062690228	T5062690228	T5062690228

15.6.3 Transformer Differences Table (21" Models)

Model No	CP2122R	CS2122R	CL2122R	C2122T	CP2122T	CP2122T-481 CP2122T-491
Chassis	F4GR	F4KR	F4FR	F4Y	F4GY	F4HY
Cct Ref						
T401	T5062690228	T5062690228	T5062690228	T5062690228	T5062690228	T5062690228

15.6.4 Difference Table Component Values

⚠ T401	Flyback	31.00	183.00	43.50	T5062690328
⚠ T401	Flyback				T5062690228

15.7 TRANSISTORS

The following components are common to all chassis

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
Q001	2N4401	195.50	18.50	196.00	T6622900201
Q301	BC847 S.M.	144.00	70.00	165.00	T6621900000
Q302	BC847 S.M.	132.00	82.00	165.50	T6621900000
Q303	BC847 S.M.	134.50	79.50	154.50	T6621900000
Q304	BC857 S.M.	118.00	96.00	25.00	T6623900000
Q305	BC857 S.M.	181.50	32.50	214.00	T6623900000
Q306	BC847 S.M.	139.50	74.50	154.50	T6621900000
Q307	BC847 S.M.	144.50	69.50	154.00	T6621900000
Q308	BC847 S.M.	149.30	64.70	154.00	T6621900000
Q401	NPN HF 2SC1815YTPE2	80.75	133.25	12.50	T6621015332
Q402	NPN HF	85.40	128.60	82.50	T6621017233
Q403	NPN 2SD468C-T2	57.00	157.00	95.00	T6622017031
Q404	NPN LF	11.50	202.50	95.00	T6622900300
Q405	NPN HF RN1203-TPE4	91.00	123.00	87.60	T6621025430
Q406	NPN HF	97.50	116.50	88.50	T6621017233
Q407	BC857 S.M.	107.25	106.75	59.50	T6623900000
Q408	BC847 S.M.	97.10	116.90	16.30	T6621900000
Q501	NPN HF 2SC1815YTPE2	142.30	71.70	58.50	T6621015332
Q502	NPN HF 2SC1815YTPE2	183.75	30.25	35.20	T6621015332
Q601	BC847 S.M.	129.50	84.50	44.00	T6621900000
Q602	BC847 S.M.	134.75	79.25	41.00	T6621900000
Q701	BC857 S.M.	166.50	47.50	234.00	T6623900000
Q702	BC847 S.M.	119.00	95.00	227.00	T6621900000
Q703	BC847 S.M.	124.00	90.00	74.75	T6621900000
Q704	BC847 S.M.	145.50	68.50	215.50	T6621900000
Q705	BC847 S.M.	141.50	72.50	219.50	T6621900000
Q801	MOS FET IRFI830G	11.50	202.50	140.50	T6626900100
Q802	NPN LF BF487	13.50	200.50	113.00	T6622900400
Q803	NPN HF BF423	56.50	157.50	107.00	T6621026500
Q804	PNP HF 2SA1015YTPE2	92.50	121.50	98.50	T6623002050
Q805	NPN LF 2SD667C-TZ	97.50	116.50	101.50	T6622013330
Q901	NPN HF BF423	30.15	183.85	203.00	T6621026500
Q902	BF869	25.50	188.50	201.50	T6622900401

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
Q903	NPN HF BF423	30.00	184.00	218.00	T6621026500
Q904	NPN HF BF423	33.60	180.40	233.00	T6621026500
Q905	BF869	25.00	189.00	216.50	T6622900401
Q906	NPN HF 2SC1815YTPE2	17.75	196.25	233.50	T6621015332
Q907	NPN HF 2SC1815YTPE2	12.75	201.25	217.50	T6621015332
Q908	BF869	26.50	187.50	231.50	T6622900401
Q909	NPN HF 2SC1815YTPE2	11.75	202.25	200.50	T6621015332
Q910	BC857 S.M.	8.80	205.20	237.40	T6623900000

15.7.1 Transistor Differences Table (14" Models)

Model No	C1422T	C1422R	CP1422T	CP1422R	CP1422T-481 CP1422T-491	CS1422R	CL1422R
Chassis	F1Y	F1R	F1GY	F1GR	F1HY	F1KR	F1FR
Cct Ref							
Q002			T6623900000	T6623900000	T6623900000	T6623900000	T6623900000
Q003			T6623900000	T6623900000	T6623900000	T6623900000	T6623900000
Q004			T6623900000	T6623900000	T6623900000	T6623900000	T6623900000
Q503	T6621900000		T6621900000		T6621900000		
QB601							T6621900000
QB602							T6621900000
QB603							T6621900000

15.7.2 Transistor Differences Table (20" Models)

Model No	CP2022T	CS2022R	CP2022T-491
Chassis	F2GY	F2KR	F2HY
Cct Ref			
Q002	T6623900000	T6623900000	T6623900000
Q003	T6623900000	T6623900000	T6623900000
Q004	T6623900000	T6623900000	T6623900000
Q503	T6621900000		T6621900000

15.7.3 Transistor Differences Table (21" Models)

Model No	CP2122R	CS2122R	CL2122R	C2122T	CP2122T	CP2122T-481 CP2122T-491
Chassis	F4GR	F4KR	F4FR	F4Y	F4GY	F4HY
Cct Ref						
Q002	T6623900000	T6623900000	T6623900000		T6623900000	T6623900000
Q003	T6623900000	T6623900000	T6623900000		T6623900000	T6623900000
Q004	T6623900000	T6623900000	T6623900000		T6623900000	T6623900000
Q503				T6621900000	T6621900000	T6621900000
QB601			T6621900000			
QB602			T6621900000			
QB603			T6621900000			

15.7.4 Difference Table Component Values

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
Q002	BC857 S.M.	205.50	8.50	162.00	T6623900000
Q003	BC857 S.M.	201.00	13.00	161.00	T6623900000
Q004	BC857 S.M.	196.50	17.50	161.00	T6623900000
Q503	BC847 S.M.	192.00	22.00	110.00	T6621900000
QB601	BC847 S.M.				T6621900000
QB602	BC847 S.M.				T6621900000
QB603	BC847 S.M.				T6621900000

15.8 PINS AND SOCKETS

The following components are common to all chassis

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
P401	Base & pin, 2P (P=10.16mm)	16.00	198.00	83.00	T5056490206
P402	Base & pin, 2P (P=5.08mm)	99.95	136.05	62.10	T5056490207
P403	Pin, (JST)	62.75	151.25	20.50	T5056203901
P501	21 way SCART connector	144.50	69.50	0.50	T5056390019
P502	Base & pin, 4P	118.05	95.95	76.10	T5056490404
P601	Base & pin, 2P	201.00	13.00	141.50	T5056490205
P701	3 way plug 2556P03TA00	152.00	62.00	200.95	T5056490301
P801	Base & pin, 2P	83.00	131.00	174.00	T5056490204
P802	2 way plug, 1.6 x 7.5	15.00	199.00	180.75	T5056404523
P901	Pin (JST)	96.00	118.00	232.50	T5056203901
P904	G1 Bias				T5649390002
PA501	Jack pin				T5056390030
PA601	Phono jack, SCJ-0349A-U				T5056390035

15.8.1 Pin and Socket Differences Table (14" Models)

Model No	C1422T	C1422R	CP1422T	CP1422R	CP1422T-481 CP1422T-491	CS1422R	CL1422R
Chassis	F1Y	F1R	F1GY	F1GR	F1HY	F1KR	F1FR
Cct Ref							
P001							T5056490205
P603							T5056415832
P604							T5057803007
P704							T5056490404
P902A	T5056390028	T5056390028	T5056390028	T5056390028	T5056390028	T5056390028	
P902							T5056306736
P903	T5057806001	T5057806001	T5057806001	T5057806001	T5057806001	T5057806001	T5057806002
PA502	T5057807004	T5057807004	T5057807004	T5057807004	T5057807004	T5057807004	T5057807004
PA602	T5056490205	T5056490205	T5056490205	T5056490205	T5056490205	T5056490205	T5056490205
PB601							T5057802017
PB602							T5057808002
PB603							T5056490302
PB604							T5057804004

15.8.2 Pin and Socket Differences Table (20" Models)

Model No	CP2022T	CS2022R	CP2022T-491
Chassis	F2GY	F2KR	F2HY
Cct Ref			
P001			
P603			
P604			
P704			
P902	T5056306736	T5056306736	T5056306736
P903	T5057806002	T5057806002	T5057806002
PA502	T5057810002	T5057810002	T5057810002

15.8.3 Pin and Socket Differences Table (21" Models)

Model No	CP2122R	CS2122R	CL2122R	C2122T	CP2122T	CP2122T-481 CP2122T-491
Chassis	F4GR	F4KR	F4FR	F4Y	F4GY	F4HY
Cct Ref						
P001			T5056490205			
P603			T5056415832			
P604			T5057803007			
P704			T5056490404			
P902	T5056306736	T5056306736	T5056306736	T5056306736	T5056306736	T5056306736

Model No	CP2122R	CS2122R	CL2122R	C2122T	CP2122T	CP2122T-481 CP2122T-491
P903	T5057806002	T5057806002	T5057806002	T5057806002	T5057806002	T5057806002
PA502	T5057810002	T5057810002	T5057810002	T5057810002	T5057810002	T5057810002
PB601			T5057802017			
PB602			T5057808002			
PB603			T5056490302			
PB604			T5057804004			

15.8.4 Difference Table Component Description

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
P001	Base and pin 2P				T5056490205
P603	Base and Pin 8P/P=2.54mm.l				T5056415832
P604	Wire ass'y, W/3P connector				T5057803007
P704	Base and pin 4P				T5056490404
⚠ P902A	CRT base socket mini-neck	64.00	150.00	209.00	T5056390028
⚠ P902	CRT socket SFCBA0812A-TT				T5056306736
P903	Wiring assembly connector W/6P				T5057806001
P903	Wiring assembly connector W/6P				T5057806002
PA502	Wire ass'y W/07P connector				T5057807004
PA502	Wire ass'y W/10P connector				T5057810002
PA602	Base & pin 2P				T5056490205
PB601	Wire ass'y, W.2P connector				T5057802017
PB602	Wire ass'y, W/8P connector				T5057808002
PB603	Base and pin 3P				T5056490302
PB604	Wire ass'y, W/4P connector				T5057804004

15.9 FERRITE BEADS

The following components are common to all chassis

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
B401	Core bead BRH 5x4x1.5mm	34.50	179.50	55.50	T5061105400
B402	Core bead BRH 5x4x1.5mm	10.00	204.00	31.50	T5061105400

15.9.1 Ferrite Bead Differences Table

Model No	C1422T	C1422R	CP1422T	CP1422R	CP1422T-481 CP1422T-491	CS1422R	CL1422R
Chassis	F1Y	F1R	F1GY	F1GR	F1HY	F1KR	F1FR
Cct Ref							
B801							T5061105200

15.9.2 Ferrite Bead Differences Table

Model No	CP2022T	CS2022R	CP2022T-491
Chassis	F2GY	F2KR	F2HY
Cct Ref			
B801	T5061105200	T5061105200	T5061105200

15.9.3 Ferrite Bead Differences Table

Model No	CP2122R	CS2122R	CL2122R	C2122T	CP2122T	CP2122T-481 CP2122T-491
Chassis	F4GR	F4KR	F4FR	F4Y	F4GY	F4HY
Cct Ref						
B801	T5061105200	T5061105200	T5061105200	T5061105200	T5061105200	T5061105200

15.9.4 Difference Table Component Description

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
B801	Ferrite bead BF45H 3.4x4.5x0.8				T5061105200

15.10 LINKS

The following circuit locations are tinned, soft copper wire links and numbered T6119210605 unless otherwise stated.

J002	J401	J402	J403	J404	J405	J406	J407	J408	J409	J413	J414	J420	J501	J502
J503	J506	J507	J508	J509	J510	J511	J512	J513	J514	J515	J516	J517	J518	J519
J520	J521	J522	J523	J524	J525	J526	J527	J528	J529	J531	J532	J533	J534	J535
J536	J537	J538	J601	J602	J701	J702	J703	J704	J705	J706	J707	J708	J709	J710
J711	J712	J713	J714	J715	J716	J717	J719	J720	J721	J722	J723	J724	J725	J726
J727	J728	J729	J730	J731	J732	J733	J734	J735	J737	J738	J739	J740	J741	J742
J743	J744	J745	J746	J747	J748	J749	J750	J751	J752	J753	J754	J755	J756	J757
J758	J759	J760	J761	J762	J763	J764	J765	J766	J767	J768	J769	J801	J802	J901
J902	J903	J904	J905	J906	J907	J908	J909	J009	J407	J408	J409	J702	J704	J706
J802	J909													

15.11 MISCELLANEOUS

The following components are common to all chassis

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
I703A	IR support spacer				T5649090086
⚠ F801	2A Time-lag fuse	87.50	126.50	184.00	T5054420033
F801A	Fuse holder clipFHC-015				T5056506400
F801B	Fuse holder cover				T5056390003
S701	Switch	146.50	67.50	236.00	T5054508001
S702	Switch	131.50	82.50	236.00	T5054508001
S703	Switch	116.50	97.50	236.00	T5054508001
⚠	Mains On/Off switch Assembly				T01-1574-6
⚠	Mains On/Off switch PCB				T5053500110
	On/Off Switch 2 pole push-push power				T5054524488
Lead	Mains switch PCB connect				T5057802014
Base and pin 2P					T5056490204

15.11.1 Tuner Difference Table (14" Models)

Model No	C1422T	C1422R	CP1422T	CP1422R	CP1422T-481 CP1422T-491	CS1422R	CL1422R
Chassis	F1Y	F1R	F1GY	F1GR	F1HY	F1KR	F1FR
Cct Ref							
H001	T5052190002	T5052190002	T5052190001	T5052190001	T5052190001	T5052190001	5052190001

15.11.2 Tuner Difference Table (20" Models)

Model No	CP2022T	CS2022R	CP2022T-491
Chassis	F2GY	F2KR	F2HY
Cct Ref			
H001	T5052190001	T5052190001	T5052190001

15.11.3 Tuner Difference Table (21" Models)

Model No	CP2122R	CS2122R	CL2122R	C2122T	CP2122T	CP2122T-481 CP2122T-491
Chassis	F4GR	F4KR	F4FR	F4Y	F4GY	F4HY
Cct Ref						
H001	T5052190001	T5052190001	T5052190001	T5052190002	T5052190001	T5052190001

15.11.4 Difference Table Component Description

Cct Ref	Description	Xpos(track)	Xpos(comp)	Ypos	Part No
H001	Tuner VHF/UHF UV1315AS/IEC	199.00	15.00	7.20	T5052190001
H001	Tuner UHF U1343AS/IEC	199.00	15.00	7.20	T5052190002

15.12 CABINET PARTS

	Description	14"	20"	21"
⚠	CRT A51AEZ90X13			T5051290005
⚠	CRT A48AGY13X71		T5051290004	
⚠	CRT A34AGT13X38P	T5051290006		
	Antenna loop	T5052490001		
	L/Speaker 25Ω, 2W, 3" round	T5055190900		
	L/Speaker 25Ω, 2W, 5"x2.25"		T5055190800	T5055190800
⚠	Mains Lead 13A Plg with filter	T5056790002		T5056790002
⚠	Mains lead export	T5056790007	T5056790007	T5056790007
	Earth braid assembly		T5057801002	T5057801003
	Wire assembly ground	T5057801023		
	Wire assembly W/2P connector	T5057802016	T5057802012	T5057802012
	Wire assembly MW/2P connector	T5057802015	T5057802013	T5057802013
	Label back warning	T5635690142	T5635690149	T5635690148
	Label carton	T5635690146	T5635690151	T5635690152
	Rubber foot (white)		T5649090047	T5649090047
	Foot self adhesive	T5642022700		
	Screw T/F (plastic) 3.5 x 1.0	T5640226600	T5640226600	T5640226600
	Chassis rail L.H.		T5649090101	T5649090101
	Chassis rail R.H.	T5649090093	T5649090102	T5649090102
	Chassis rail Ctr	T5649090094		
	Knob On/Off	T5649090090	T5649090105	T5649090105
	Actuator	T5649090091	T5649090099	T5649090106
	Prism	T5649090092	T5649090100	T5649090107
	Speaker clip	T5649090095		
	Front cover	T5649090113	T5649090117	T5649090118
	Facia	T5649090114	T5649090119	T5649090120
	Back cover	T5649090115	T5649090121	T5649090121
	Support bracket		T5649190042	T5649190042
	Retaining plate (Phono PCB)	T5649190043	T5649190043	T5649190043
	Stud PT-K55x20 (M5x20)			T5649490040
	Tube mounting washer (toothed)		T5649490041	T5649490041
	Tube mounting washer	T5649490001		
	Tube mounting washer (toothed)	T47-1186-6		
	Finger nut M5			T5649490042
	Badge "HITACHI"	T5649490044	T5649490044	T5649490044
	Screw BRB M4, 0x16 S-ZN-CC	T7033252252	T7033252252	T7033252252
	Nut full STL M5 PLT			T7076340012
	Nut full STL M6 PLT		T7079390012	
	Tube mounting bracket		T83-3687-3	
	Lead Speaker - connector (350mm)	T83-6065-0-001	T83-6065-0-001	T83-6065-0-001
	Platform nut M6		T85-4698-3	
⚠	Degaussing coil double insulated			T87-0048-6-003
⚠	Degaussing coil double insulated		T85-9660-3	
⚠	Degaussing coil double insulated	T87-0017-6-004		
	Carton	T9510019037	T9510020037	T9510020037
	EPS bottom		T9520008037	T9520012037
	EPS top		T9520013037	T9520014037
	EPS back	T9520010037		
	EPS front	T9520011037		



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