

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 châssis, 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.

RTV servis Horvat

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Croatia

C2156TN	CL2586TAN
C2556TN	CL2886TAN
C2856TN	CP2886TAN
CL2156TAN	C24W1TN
CL2556TAN	C28W1TN
CL2856TAN	C28WD2TN
CP2156TA	C32WD2TN
CP2556TA	GP2886TAN
CP2856TA	CL28W1TAN
CP2156TAN	CL28WD2TAN
CP2556TAN	CL32WD2TAN
CP2856TAN	CP28WD2TAN
C2186TN	CP32WD2TAN
C2586TN	CL24W1TAN
C2886TN	



HITA -02922

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, L/L', (Export)
Channel coverage	UHF Channels (UK) UHF/VHF Hyper band (Export)
Aerial input impedance	75 ohm unbalanced
Programme Selectors	Channel UP/DOWN buttons with 60 programme remote control CH direct input Frequency direct input
Power Consumption	Picture tubes
2156 . . . 90W	51 cm Type
2556 . . . 97W	59 cm Type
2856 . . . 98W	66 cm Type
2186 . . . 91W	51 cm Type
2586 . . . 98W	59 cm Type
2886 . . . 99W	66 cm Type
24W . . . 100W	56 cm Type
28W . . . 120W	66 cm Type
24WD . . . 100W	56 cm Type
28WD . . . 120W	66 cm Type
32WD . . . 130W	76 cm Type
Standby Power Consumption	<7W
Mains Voltage	220V/240V 50 Hz
Fuse	T4.0A Type
Focusing	Electro static

SPÉCIFICATIONS TECHNIQUES

Standard TV	625 lignes, STANDARD R-U B/G/H, L/L': (Export)
Couverture de canaux	Canaux UHF (R-U) UHF/VHF Band hyper (Export)
Impédance d'entrée d'antenne	75 ohms non équilibrée
Sélecteurs de programmes	Touches de sélection de canaux HAUT/BAS avec 60 programmes Télécommande Entrée directe canal (CH) Entrée directe fréquence
Consommation électrique	Tubes-images
2156 . . . 90W	Type 51 cm
2556 . . . 97W	Type 59 cm
2856 . . . 98W	Type 66 cm
2186 . . . 91W	Type 51 cm
2586 . . . 98W	Type 59 cm
2886 . . . 99W	Type 66 cm
24W . . . 100W	Type 56 cm
28W . . . 120W	Type 66 cm
24WD . . . 100W	Type 56 cm
28WD . . . 120W	Type 66 cm
32WD . . . 130W	Type 76 cm
Consommation en mode veille	<7W
Tension secteur	220V/240V 50 Hz
Fusible	Type T4 0A
Mise au point	Electrostatique

SPECIFICATIONS TECHNIQUES

Fernsehnorm	625 Zeilen, Fernsehnorm I (nur GB) Fernsehnorm B/G/H, L/L
Kanäle	UHF-Bereich (GB) UHF-/VHF-/Hyperband-Bereich (Export)
Antenneneingangsimpedanz	75 Ohm unsymmetrisch
Senderwahl	AUF/AB-Taste auf Fernbedienung für 60 Sender Senderdirekteingabe Frequenzdirekteingabe
Leistungsaufnahme	Bildröhre
2156 . . . 90W	51 cm Type
2556 . . . 97W	59 cm Type
2856 . . . 98W	66 cm Type
2186 . . . 91W	51 cm Type
2586 . . . 98W	59 cm Type
2886 . . . 99W	66 cm Type
24W . . . 100W	56 cm Type
28W . . . 120W	66 cm Type
24WD . . . 100W	56 cm Type
28WD . . . 120W	66 cm Type
32WD . . . 130W	76 cm Type
Leistungsaufnahme im Standby-Modus	<7W
Netzspannung	220 V - 240 V, 50 Hz
Sicherung	T4 0A
Fokussierung	Elektrostatisch

SAFETY PRECAUTIONS

WARNING: The following precautions should be observed.

1. Do not install, remove, or handle the picture tube in any manner unless shatter proof goggles are worn. People not so equipped should be kept away while picture tubes are handled. Keep the picture tube away from the body while handling.
2. When service is required, an isolation transformer should be inserted between the power line and the receiver before any service is performed on the chassis.
3. When replacing the chassis in the cabinet, ensure all the protective devices are put back in place.
4. When service is required, observe the original lead dressing. Extra precaution should be taken to ensure correct lead dressing in the high voltage circuitry area.
5. Always use the manufacturer's replacement component. Always replace original spacers and maintain lead lengths. Especially critical components are indicated thus Δ on the parts list and should not be replaced by other makes. Furthermore, where a short circuit has occurred, replace those components that indicate evidence of overheating.
6. Before returning a serviced receiver 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, and be sure that no protective device built into the instrument by the manufacturer has become defective, or inadvertently damaged during servicing.

Therefore, the following checks are recommended for the continued protection of the customers and service technicians.

INSULATION

Insulation resistance should not be less than 10M ohms at 500V DC between the main poles and any accessible metal parts.

Also, 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.

HIGH VOLTAGE

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.

X-RADIATION

TUBES: The primary source of X-radiation in this receiver is the picture tube. The 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.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in HITACHI television receivers 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 Δ on the schematics and the replacement parts list contained in this service manual.

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

Product Safety is continuously under review, and new instructions are issued from time to time. For the latest information, always consult the current HITACHI service manual. A subscription to, or additional copies of HITACHI service manuals may be obtained at a nominal charge from your HITACHI SALES CORPORATION.

CE MARK

Some of these models may contain the CE mark on the rating plate.

This illustrates that the T.V. contains parts that have been specifically approved to provide electromagnetic compatibility to designated levels.

Therefore, when replacing any part in this T.V., please use only the correct part itemized in the parts list of this service manual to ensure this standard is maintained.

Also, take care to replace lead dressing to its original state, as this can also have a bearing on the electromagnetic radiation/immunity.

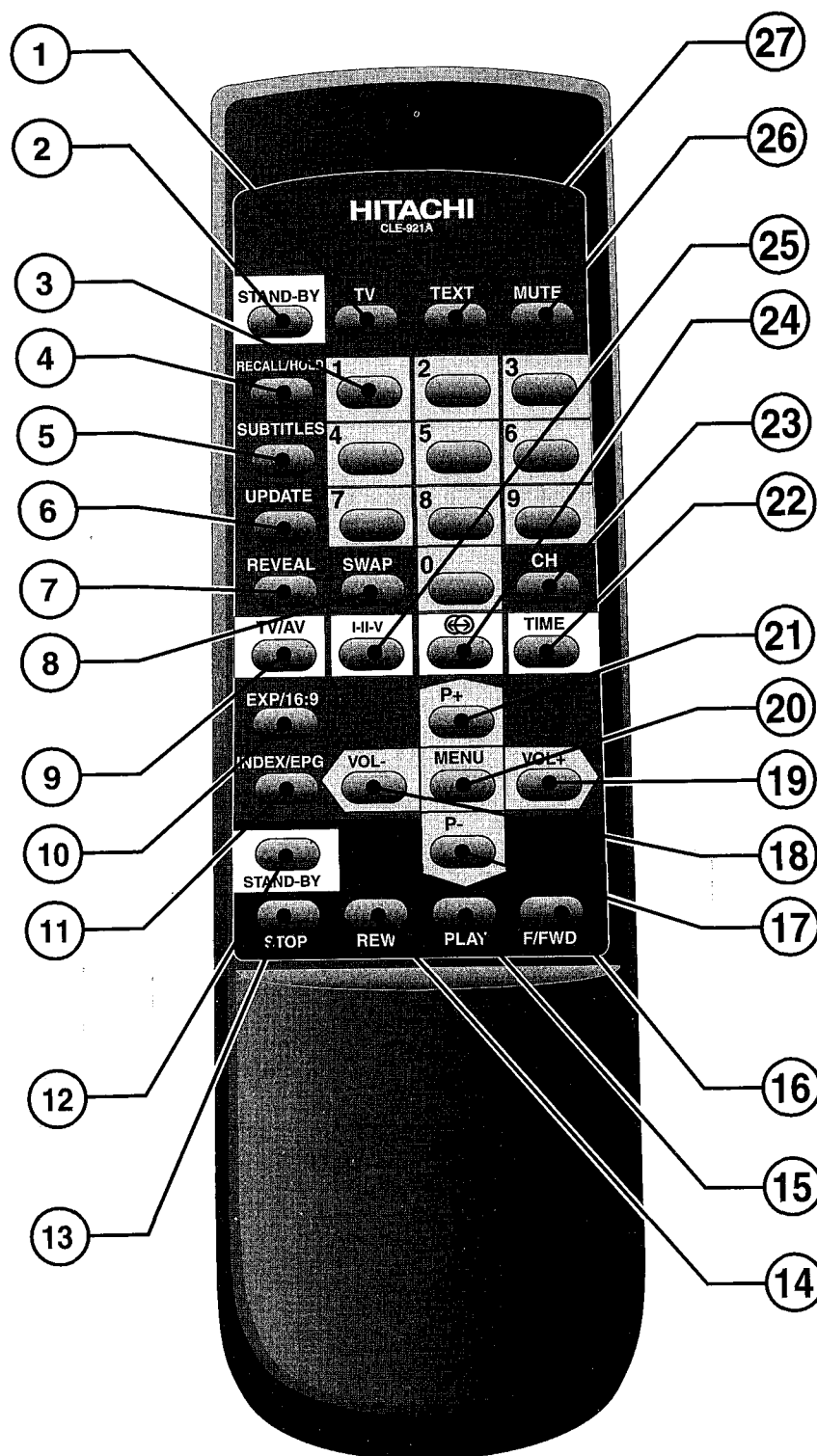
TUBE DISCHARGE

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 tube.

TV OPERATION SUPPLEMENT

**The following pages
are extracted from the
Customer Operating Guide
to assist Service Engineers
in TV set up**

(NOTE: PAGE NUMBERS REFERRED TO WITHIN THIS SECTION ARE UNIQUE TO THE OPERATING GUIDE. THEY DO NOT REFER TO THE PAGE NUMBERS OF THE SERVICE GUIDE OF WHICH THIS SECTION FORMS AN INTEGRAL PART.)



NOTE: SOME MODELS ARE SUPPLIED WITH A DIFFERENT STYLE HANDSET, HOWEVER FUNCTIONALITY REMAINS THE SAME.

NOTE: Make sure the Handset foldout section (Page 3) is extended out for easy referencing.

To automatically tune this TV to your local broadcasting stations follow the step by step guide below. Once the TV has found all your local stations, then they are automatically assigned into the following order: **1.BBC1; 2: BBC2; 3: ITV; 4:CH4/S4C; 5: CH5 (subject to availability); 6: Satellite.**

Alternatively, if you are familiar with local broadcasting frequency or CH numbers, then these can be entered manually. Please refer to the Manual Tuning Procedure section of this booklet.

IMPORTANT NOTE: If you have a VCR or a Satellite receiver connected to this TV please ensure that they are switched on before Autotune commences. In the case of a VCR, insert a pre-recorded tape and begin playback of your equipment. With a Satellite receiver, select SKY NEWS. These measures ensure that all your equipment is tuned in during the AUTOTUNE procedure. (Satellite equipment installation is explained on Page 22 and 23).

Press and **HOLD** the MENU key (20) on your handset until the menu right (top) appears.

To ensure the INSTALL option is displayed the MENU key (20) must be held for approximately 5 seconds.

Highlight **INSTALL** using cursor keys 17 or 21 (if **INSTALL** is not shown follow step above once more).

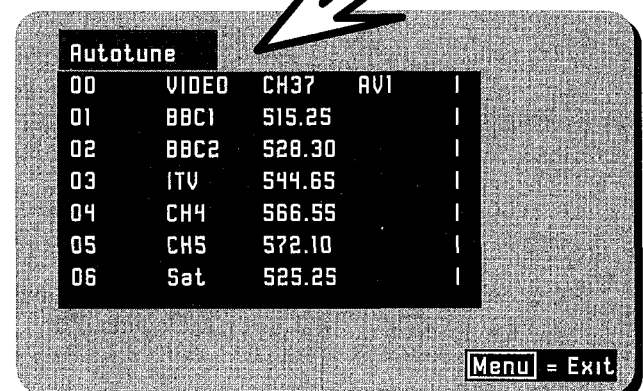
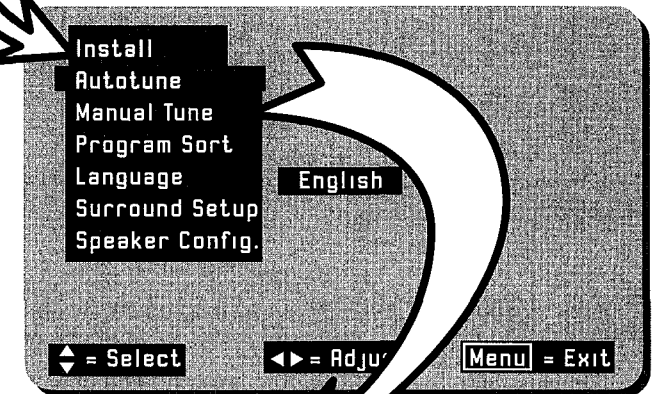
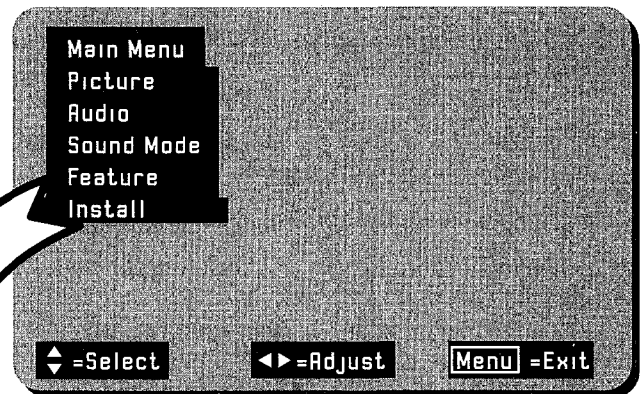
S600061-01-01

Press cursor key 18 or 19 to select **INSTALL**. The **INSTALL** menu (centre right) is shown.

If language setting is incorrect, use cursor keys 17 or 21 to highlight **LANGUAGE**, and select using cursor keys 18 and 19.

Use cursor key 17 or 21 to highlight **AUTOTUNE**.

Use either cursor key 18 or 19 to begin **AUTOTUNE**.



Completed Autotune example.

Program Sort

The PROGRAM SORT menu allows the user to swap programme numbers from one location to another. If necessary follow the steps below.

S600062-01-01

Press and **HOLD** the **MENU** key (20) until Main Menu with **INSTALL** is shown (top right).

Use cursor key 17 or 21 to select **INSTALL** and press cursor key 18 or 19 to enter

Use cursor key 17 or 21 to select **PROGRAM SORT** and press cursor key 18 or 19 to enter

The **PROGRAM SORT** menu is displayed.

Use cursor key 17 or 21 to highlight Program to change (example shows Program 3 **ITV**)

Press **CH** key (23) to select
[select bar turns **RED** in colour]

Use cursor key 17 or 21 to highlight Program to be replaced (example shows Program 1 **BBC1**)

Once highlighted press **CH** key once more to confirm selection [select bar returns to **BLUE**]

Repeat above to swap other programs, or repeatedly press **MENU** key 20 to return to TV operation.

Main Menu
Picture
Audio
Sound Mode
Feature
Install

◄ = Select

◄ = Adjust

Menu = Exit

Install
Autotune
Manual Tune
Program Sort
Language
Surround Setup
Speaker Config.

◄ = Select

◄ = Adjust

Menu = Exit

Program Sort

00	VIDEO	CH37	AV1	
01	BBC1	515.25		
02	BBC2	528.30		
03	ITV	544.65		
04	CH4	566.55		
05	CH5	572.10		
06	Sat	525.25		

◄ = Select

CH = Adjust

Menu = Exit

Program Sort

00	VIDEO	CH37	AV1	
01	BBC1	515.25		
02	BBC2	528.30		
03	ITV	544.65		
04	CH4	566.55		
05	CH5	572.10		
06	Sat	525.25		

◄ = Select

CH = Swap

Menu = Exit

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In this example BBC1 on Program 1 has been selected so that it may be swapped with Program 3 (ITV).

If desired, you may manually tune this TV. There are several methods of Manual Tuning, these include Search Tuning / Fine Tuning and Frequency or CH manual input (this requires you to know your local broadcasting frequency or CH number). This section will also deal with items such as assigning AV sockets to program numbers and Program Naming.

Search Tuning / Fine Tuning

This section deals with locating broadcasting stations using the Search Tuning and combined Fine Tuning facility. Fine Tuning may be required after Search or Automatic Tuning is complete.

S600063-01-01

Press and **HOLD** the **MENU** key (20) on your handset. The Main Menu (top right) is displayed.

Select **INSTALL** and press cursor keys 18 and 19 to enter. The **INSTALL** menu is displayed.

Select **Manual Tune** and press cursor keys 18 or 19 to enter Manual Tune menu.

The **Manual Tune** menu is displayed (bottom right).

Use cursor keys 17/18/19 and 21 to highlight frequency bar of programme N° to Search Tune.

Press **CH** key (23) to select [bar turns RED] and press cursor keys 18/19 to begin **SEARCH TUNE**.

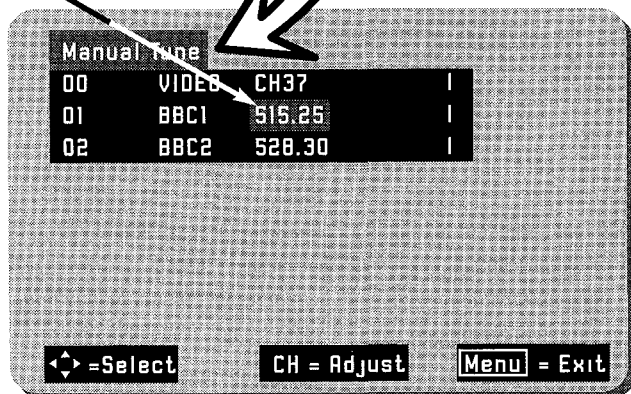
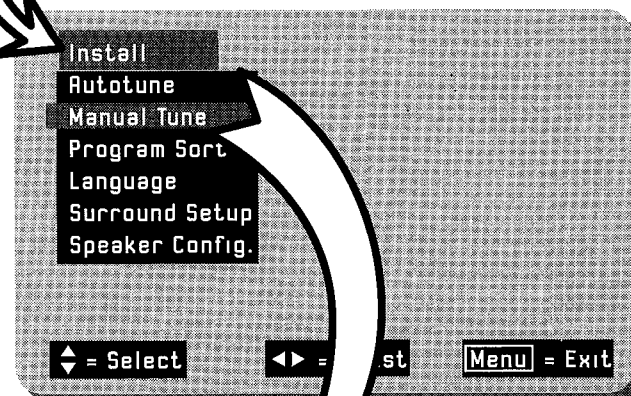
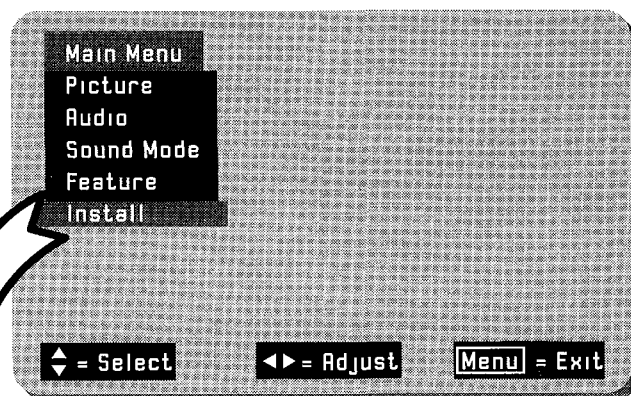
When a broadcast is found either repeatedly press the **MENU** key (20) to store and exit to TV

OR

To continue Search Tune simply press cursor keys 18/19, the TV will start searching once more.

To **FINE TUNE** press cursor keys 17 or 21 until the picture becomes clear.

When complete repeatedly press the **MENU** key (20) to exit, or repeat above to Search/Fine Tune other program numbers if necessary.



Manual Tuning cont.

Entering Known Frequencies

Broadcasting stations transmit the signal to your TV on a particular defined frequency i.e. 525.25MHz. These frequencies can be entered manually if known, and you can obtain this information by calling your local operator. In addition to frequency transmission a corresponding CHANNEL N° is also used e.g. CH34, and this too can be directly input to your TV if known. (The S-- number has no function on this TV).

S600064-01-01

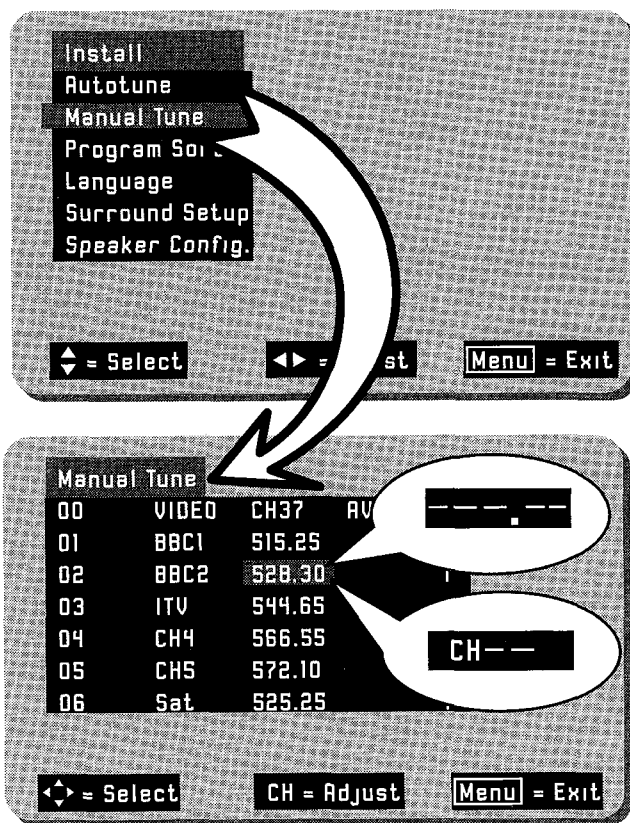
Press and **HOLD MENU** key (20) and select **INSTALL**.
Select **MANUAL TUNE** from **INSTALL** menu.

Use cursor keys 17,18, 19 or 21 to highlight the frequency of the program number you wish to enter.

Press the **CH** key (23) on your handset once, the column changes **RED** to indicate selection.

Repeatedly press **CH** key to select **CH-** or **---.**, and enter the known number using 0-9 keys.

Once the number has been entered, press the **MENU** key once more and the display turns **BLUE**. This is now stored. Press **MENU** to exit.



Assigning AV Prog. N°s

When AV sockets are commonly used, for example, if you view camcorder recorded events frequently, then we suggest assigning a dedicated program number on your TV. This can be any program number that has not already been assigned. Follow the step by step guide below.

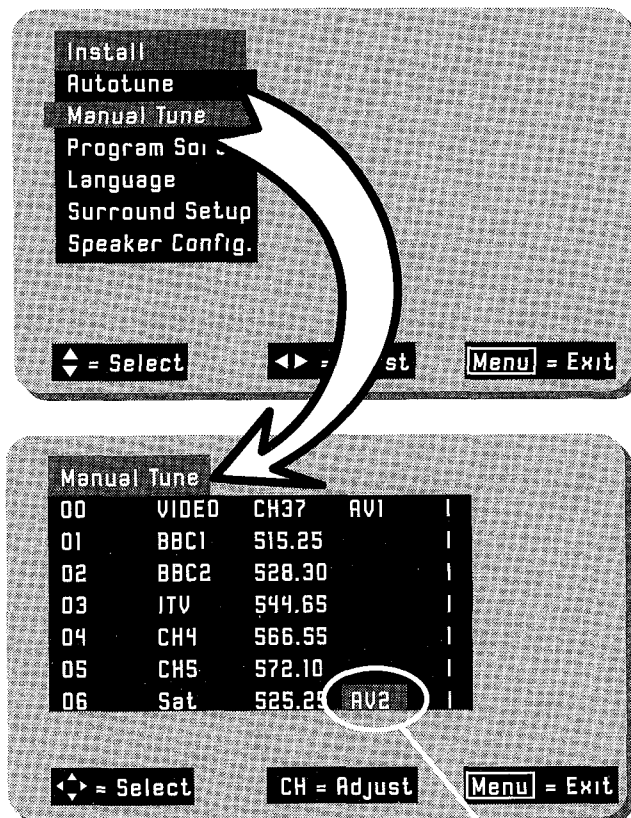
S600065-01-01

Press and **HOLD MENU** key (20) and select **INSTALL**.
Select **MANUAL TUNE** from **INSTALL** menu.

Use cursor keys 17,18, 19 or 21 to highlight the **AV** column of the program number you wish to assign.

Once highlighted press the **CH** key (23) and select between each AV mode using cursor keys 18 or 19.

Repeat above to enter other AV sockets or repeatedly press **MENU** key (20) to store and exit to TV mode.



Program Naming

After Tuning in, most broadcasting station names appear on screen i.e. BBC1, BBC2, ITV etc.. However, you may change or add program names whenever you desire. To add or change program names follow the simple step by step guide below.

S600066-01-01

Press and **HOLD** MENU key (20) and select **INSTALL**.
Select **MANUAL TUNE** from **INSTALL** menu.

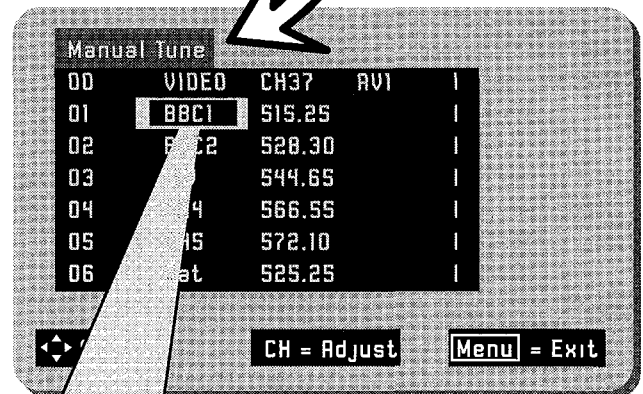
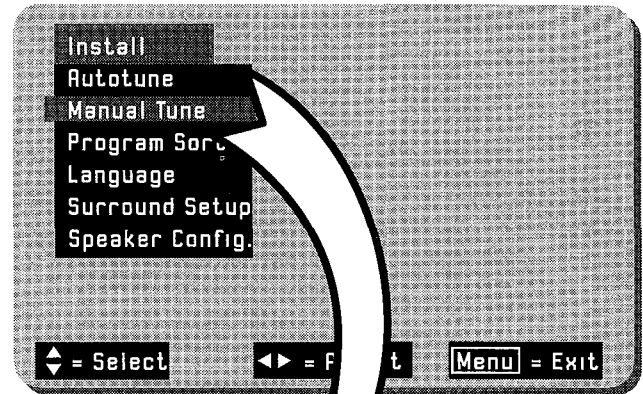
Use cursor keys 17,18, 19 or 21 to highlight the
Program Name you wish to assign or change.

Press the CH key (23) [the first digit will blink], now use
cursor keys 17/21 to scroll through all the characters.

Once the first character has been entered select
next digit using cursor key 19 and repeat above step.

You may use up to 5 characters for any one
Programme Name. Press MENU key (20) to store.

Repeat above steps to assign other Program Names
or repeatedly press MENU key (20) to exit to TV mode.



When selected the character will blink on and off.

Picture and Audio Controls

Picture settings are controlled via the TV's on board Menu system. These levels have already been preset at the factory and should require no adjustment. However, your personal viewing preferences may vary from these settings and alteration should be performed as follows:-

**Press the MENU key 20 on your handset.
The Main Menu is displayed.**

**Use RED colour coded key (9) to select PICTURE
(or use cursor keys 17/21 to select and key 18 or 19 to enter)**

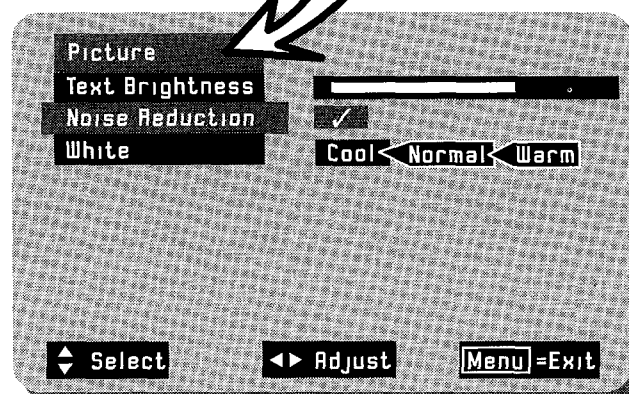
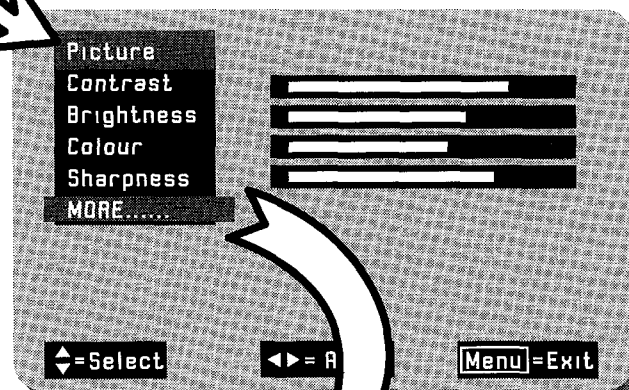
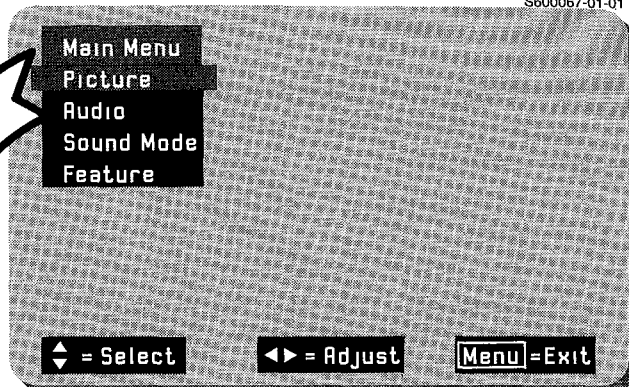
The PICTURE menu (middle right) is displayed.

**Highlight the control to be adjusted using cursor
keys 17 or 21 and adjust with keys 18/19.**

**Adjust other controls if necessary, or repeatedly
press MENU button (key 20) to exit**

**To obtain the MORE sub menu highlight MORE
and press cursor keys 18 or 19 to enter.**

**Select and adjust controls as necessary, once
complete press MENU button (key 20) to exit**



Function Controls

CONTRAST:

BRIGHTNESS:

COLOUR:

SHARPNESS:



*HUE:

*(Hue control appears on-screen only if an NTSC signal is received via the AV sockets).

More Functions

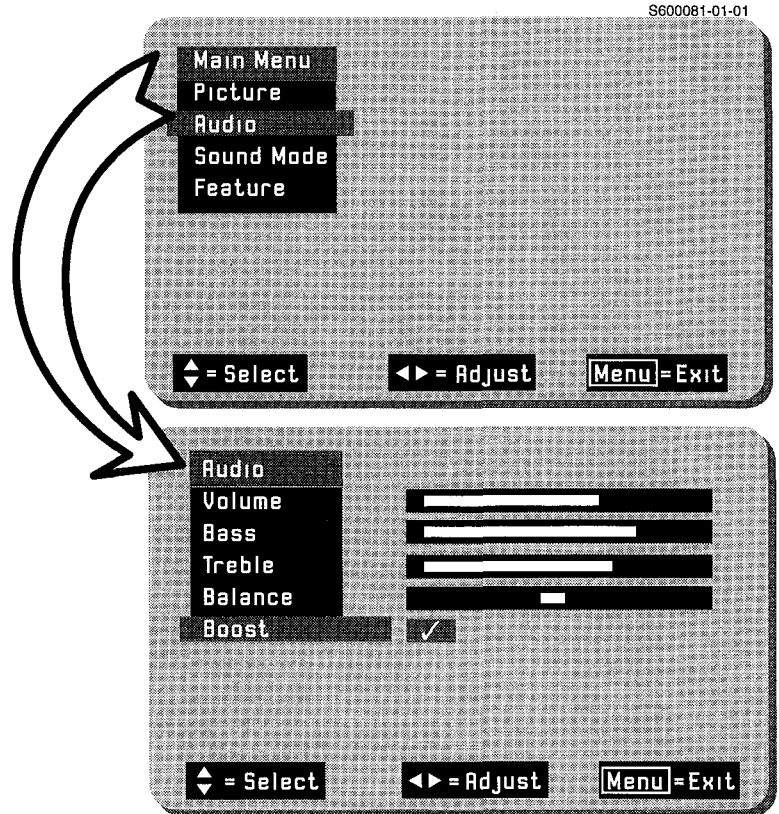
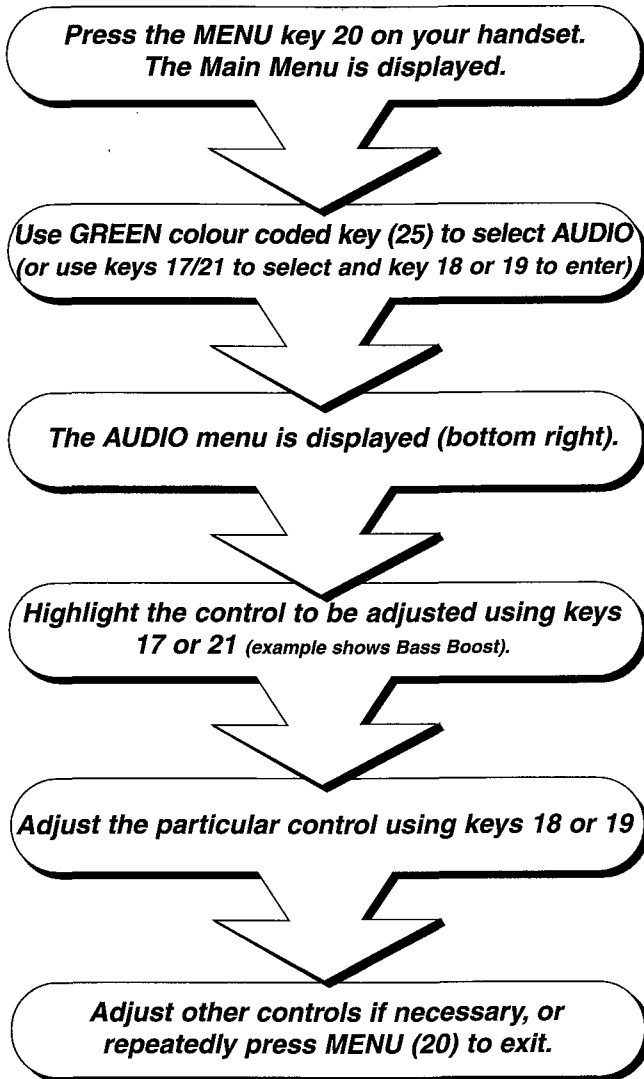
TEXT BRIGHTNESS : This function allows the user to adjust the text brightness of On Screen Display windows and Teletext pages.

NOISE REDUCTION : Noise Reduction improves picture quality when a signal becomes weak or when viewing poorly recorded VCR tapes. When selected a ✓ is displayed.

WHITE: This feature controls the colour temperature displayed on the picture tube.

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The Sound Menu is accessed via the TV's on-board MENU system, and allows the user to control such features as Volume, Bass, Treble, Balance and Bass Boost. These settings have already been preset at the factory, however, your personal listening tastes may differ from those set. Please follow the guide below for adjustment and setting.



Function Controls

VOLUME:

BASS:

TREBLE:



BALANCE:



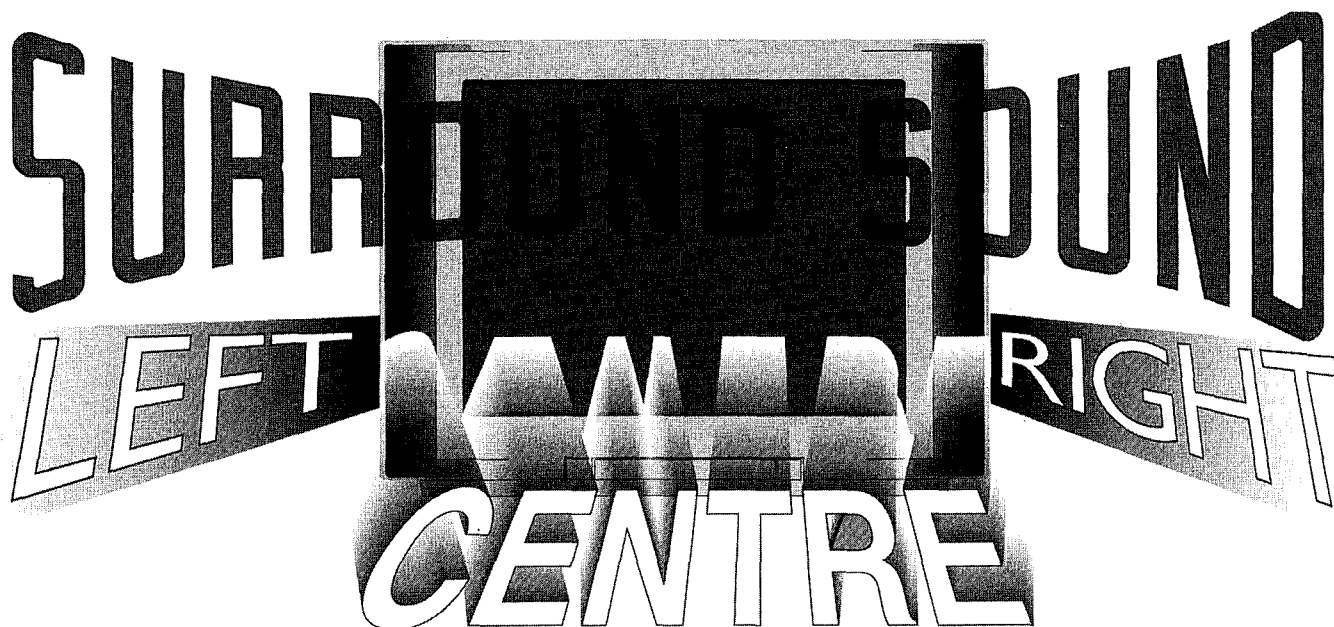
NOTE: The balance control is disabled whilst in Dolby® Pro Logic and Dolby® Pro Logic Theatre modes

BASS BOOST: When selected a ✓ is displayed.

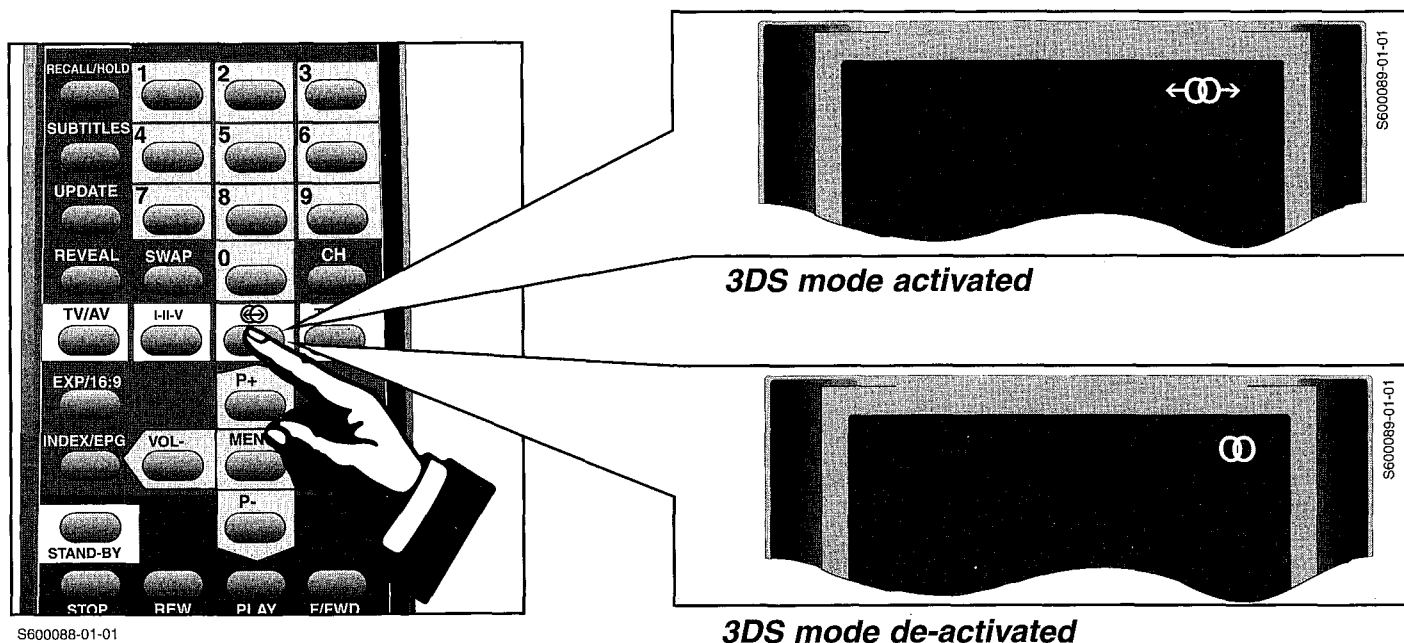
INTERNAL SPEAKER OPTION

Through innovative design and complex internal circuitry, HITACHI have produced this television which recreates superb Dolby Pro Logic cinematic sound. However, to enhance your viewing pleasure when using only the TV's own internal speakers, we have created the 3DS system (3 Dimensional Spatial sound). The 3DS system gives a much wider spread of sound from the TV giving the impression of sound coming from the sides of the room rather than the in built speakers, whilst the important centre dialogue channel is unaltered, still appearing to come from the centre of the screen.

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Activating the 3DS sound spatializer is simple, press the button marked  on the handset to activate, one press more will de-activate. When activated a  symbol appears in the top right hand corner of the screen indicating that 3DS is on. When de-activated the  symbol is displayed on-screen (see below).

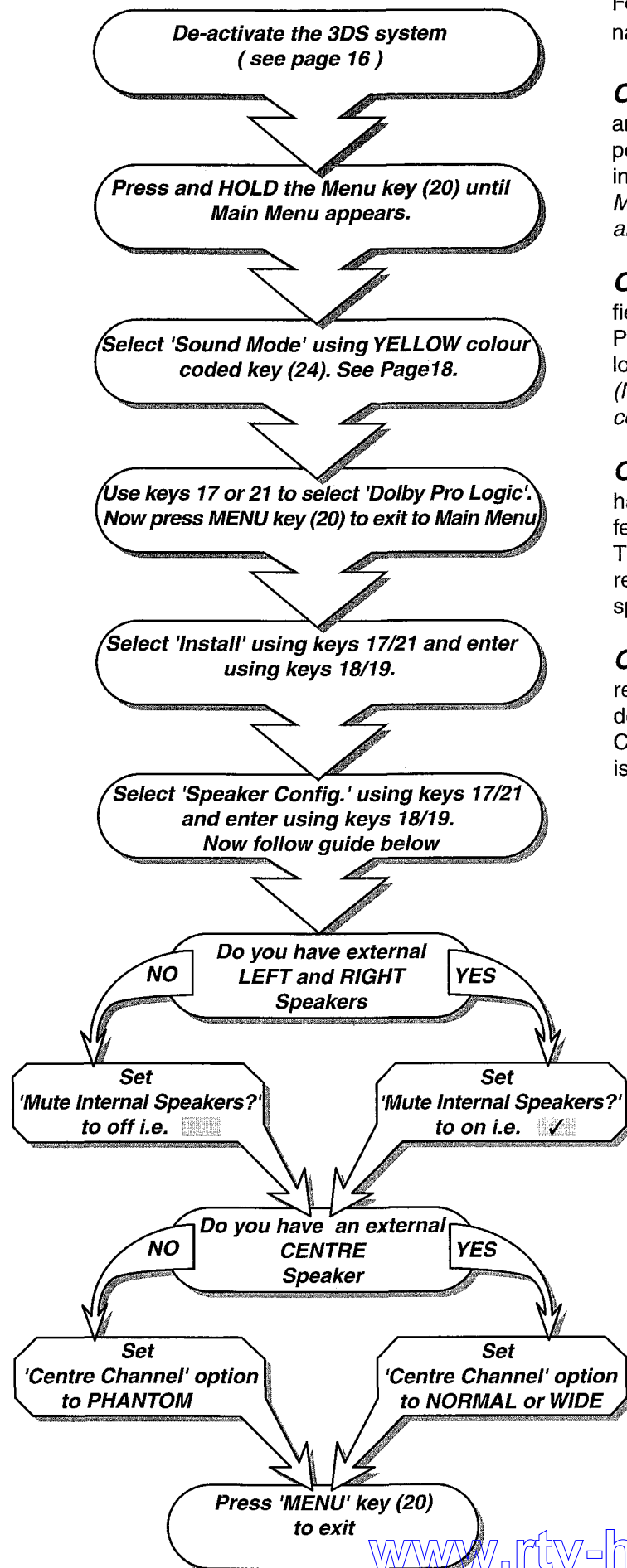


NOTE: In order to appreciate the effect of 3DS it is essential that you are listening to at least a stereophonic program with active left or right information. For example, certain programs containing only speech will appear to have no effect when 3DS mode is selected.

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Speaker Configuration Menu

The Speaker Configuration menu allows the user to access various centre speaker modes. This is particularly useful if an external amplifier is connected to the Centre PHONO Socket. In addition to these options, you may want to replace the TV's internal speaker sound to a full external amplified speaker setup. In this case the user can mute the TV's speakers from within the Speaker Configuration Menu, allowing sound only to be heard through the external amplified sound sources. Follow the step by step guide below:



Follow the guide below describing options with and without external amplifiers connected:

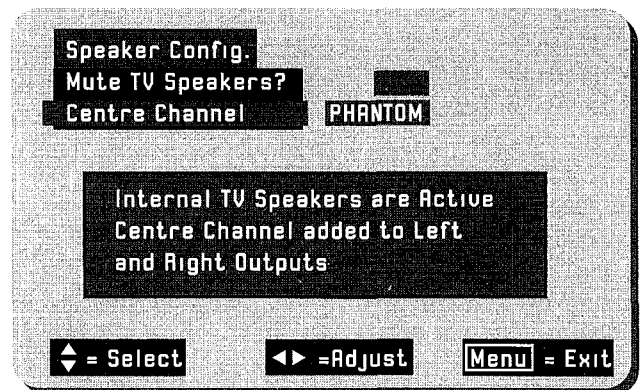
Option 1: (PHANTOM) If you do not have any external amplifiers connected to the TV then select the PHANTOM mode permanently. Phantom allows the TV to create centre dialogue information using the TV's left and right internal speakers. (NORMAL and WIDE have no effect when there are no external centre amplifiers connected [See Notes below]).

Option 2: (PHANTOM) If there are external surround amplifiers connected but no centre amplifier connected, then select PHANTOM mode. This again allows the TV to create centre dialogue information using the left and right internal speakers. (NORMAL and WIDE have no effect when there are no external centre amplifiers connected [See Notes below]).

Option 3: (NORMAL) In option 3, it is presumed the user has a limited bass response centre amplifier connected. If you feel that this best describes your setup then select NORMAL. This mode will anchor dialogue to your centre amplifier whilst relaying bass response through the TV's internal left and right speakers [See Note below].

Option 4: (WIDE) This option assumes there is a good bass response centre amplifier connected to your TV. If this option describes your setup then select WIDE from the Speaker Configuration Menu. In this mode all bass response and dialogue is fed to the centre amplifier [See Notes below].

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Speaker Configuration Menu - note the displayed information window, this briefly describes the mode you have selected.

PLEASE NOTE:

In 2 speaker mode i.e. using only internal TV speakers with 3DS activated, the CENTRE channel option will display PHANTOM and cannot be changed to any other mode.

Whilst in HALL or STEREO modes the 'Centre Channel' option displays 'OFF', and also cannot be changed to any other mode.

Sound Mode Menu

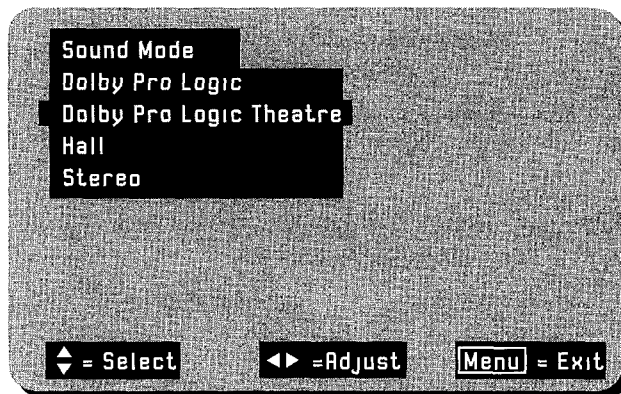
The Sound Mode selection menu allows the user to select between various sound effects. These effects enhance your viewing pleasure, particularly when viewing movies, sports events and concerts etc.. The guide below provides a description of the Sound Modes and what mode is suggested for viewing particular programs.

Press the **MENU** key (20) on your handset and then press the **YELLOW** colour coded key (24)

The 'Sound Mode' menu is shown. Select the desired mode using cursor key's 17 or 21.

After selecting the desired Sound Mode, exit to TV mode by repeatedly pressing **MENU** key (20).

S600068-01-01



DOLBY PRO LOGIC (Internal Speaker Mode)

In this mode virtual surround sound can be created using just the TV's internal speakers. Activate 3DS to enable virtual surround sound. This mode is also particularly suitable for films and programmes that display the DOLBY SURROUND caption. (This mode is recommended for the majority of TV viewing).

DOLBY PRO LOGIC (External Surround Amplifier Mode)

In this mode full cinematic sound is achieved using the TV's internal circuitry, combined with your choice of external surround sound amplifier and speakers. (Please Note: The 3DS system should be de-activated for this mode [see page 16]).

This mode is particularly suited to action movies and dramas that display the DOLBY SURROUND caption.

DOLBY PRO LOGIC (Theatre)

This mode creates a larger sound field for those programmes that have little surround sound content. It is particularly effective when used in conjunction with external surround amplifiers, however, if you are using the TV internal speakers only, activating the 3DS system will also provide a pleasing aural sound.

HALL (External Surround Amplifier Mode)

HALL mode creates an ambient sound effect, especially when viewing mono broadcasts. Again this mode is very effective when used in conjunction with external surround amplifiers. Activate the 3DS mode whilst using the TV's internal speakers to obtain equally pleasing sound from your TV.

Select this mode when viewing classic films or drama events, which were recorded in mono.

STEREO

When STEREO mode is selected, the TV produces high quality stereo sound. *Select this mode when viewing general TV programs and films. (3DS sound can be activated in this mode to provide a much wider stereo image).*

NOTE:

1. *Dolby Pro Logic can only be achieved by the addition of an external surround sound amplifier and speaker system. These are available from your HITACHI dealer.*
2. *Activating 3DS whilst using external surround amplifiers will cause the external surround channels to mute.*
3. *Activating and de-activating 3DS can only be achieved whilst no menus are on-screen (see page 16).*

Surround Setup Menu

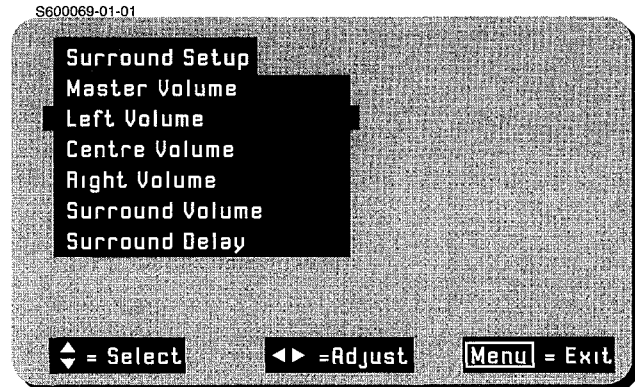
At Hitachi we appreciate the fact that not all living area's are the same, therefore the Surround Setup menu allows the user to balance the sound by adjusting the volume level to each channel, thus accommodating various room layouts. In addition to this the menu also has a Surround Delay mode, this enables the viewer to select the optimum surround sound delay depending on your seating position relative to the TV (not available when 3DS is active). Please note that the Surround Set-up menu is only available in **Dolby® Pro Logic** and **Dolby® Pro Logic Theatre** modes, and thus will automatically default to **Dolby® Pro Logic** when selected.

NOTE: When the SET-UP menu begins, the TV's sound is replaced with a noise signal. This is easier to balance than normal TV sound, and will cycle between the centre, left, right and surround channels (the centre channel cannot be adjusted unless an external amplifier for the centre channel is connected and is adjusted from PHANTOM to WIDE or NORMAL modes in the 'Speaker Config.' menu). If 3DS is active the surround PHONO output becomes muted.

Press and **HOLD** the menu key (20). Use cursor keys 17 or 21 to select **INSTALL**.

Enter the **INSTALL** menu using keys 18 or 19 and select **Surround Setup** with keys 17 or 21

Exit to TV mode by repeatedly pressing the **MENU** key (20) on your handset.



When the TV automatically cycles through the various sound channels, we suggest that you listen to the TV sound for a few moments before adjusting any of the channels. By doing this you may be able to determine which channel needs adjusting. Once you have adjusted the selected level, leave the TV cycle through the Set-up menu a few times more, this will then determine whether you have applied the correct amount of volume level to the selected sound channel.

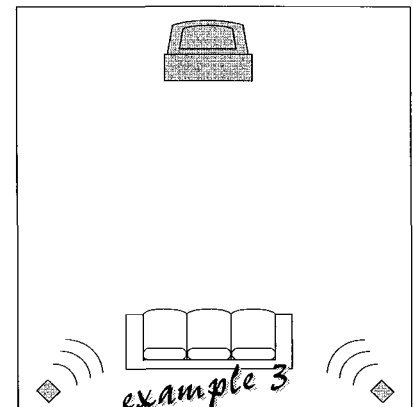
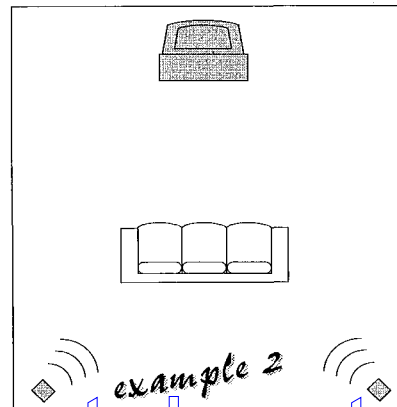
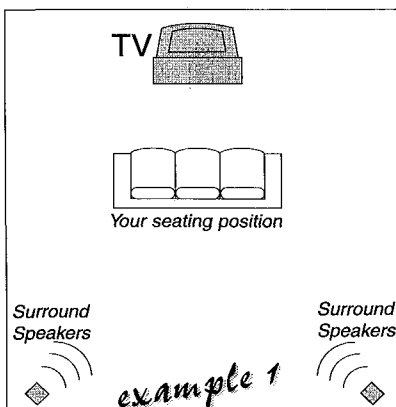
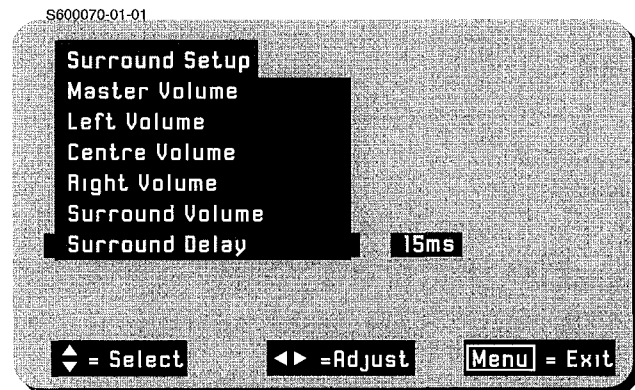
Surround Delay

The Surround Delay mode enables the viewer to set the optimum surround sound delay from the TV. There are three levels to select and these are dependant on how close your viewing position is to the TV. Each setting is displayed as a millisecond value (ms) and are configured as 15ms, 20ms and 25ms. If you feel that your seating position is relatively close to the TV (example 1 below), then set the Surround Delay to 15ms. The 20ms setting should be used if you believe your seating position is midway between the TV and the rear sound source (example 2 below). Set the Surround Setup to 25ms if the seating position is relatively close to the rear sound source (example 3 below). Setting these modes is explained below. **Please note that 3DS should be de-activated before the Surround Delay mode is set.**

Enter the **Surround Setup** Menu as described above and select **Surround Delay** (keys 17/21)

Use cursor keys 18 or 19 to select between 15, 20 and 25ms.

Repeatedly press the **MENU** key (20) to exit.



Connecting External Audio Equipment

If desired you may want to customise your TV by adding external surround speakers. This TV will accommodate external surround speaker systems via external sockets on the rear of the TV. The addition of external surround speakers will enhance your viewing and listening pleasure even further, and we strongly recommend you purchase HITACHI systems to compliment your HITACHI TV (contact your dealer for advice). The illustrations (below) will guide you on the correct installation and settings for external surround speaker set-ups. If you decide to purchase additional amplifiers and speakers then please follow these simple guidelines listed below:

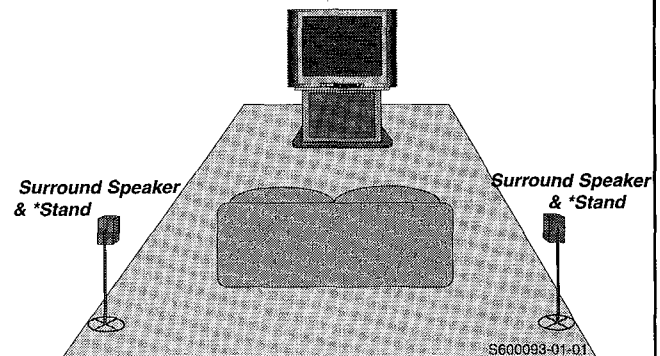
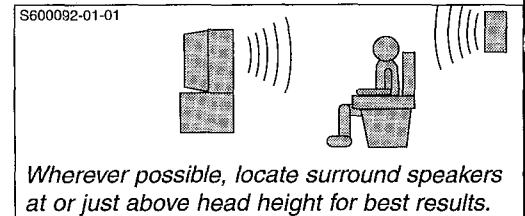
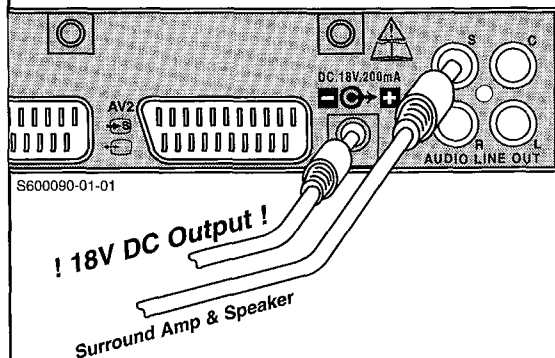
1. If you have purchased just 2 amplifiers and speakers then these are best installed as rear surround speakers, as the TV will use its own internal speakers to create the front left, right and centre channels.
2. Please ensure that you purchase and install the correct rated range of amplifier and speaker for the TV - (front-centre speakers 10Watt or greater) and (rear surround 5Watt or greater). Your HITACHI dealer can advise you on the correct amplifier and speaker choice for your TV.

! IMPORTANT ! The 18V power output socket on the rear of this TV is specifically designed for Hitachi Accessories. Under no circumstances connect any other accessory to this socket, as this could cause serious irreparable damage to your equipment. Before attempting to connect any external equipment, ensure that the TV is switched OFF.

OPTION 1 Option 1 describes and illustrates the connection of Rear Surround Amplifiers & Speakers.

1. Switch off TV.
2. Connect Surround speakers as shown and position as indicated in the illustrations below.
3. Switch TV on.
4. Follow instructions on Page 17 to obtain **Speaker Configuration Option**, and ensure Internal Speakers ARE NOT muted i.e (), also set Centre Channel to PHANTOM.
5. Use the Surround Set-up Menu (Page 19) to adjust the volume level on the Surround Speakers if required.

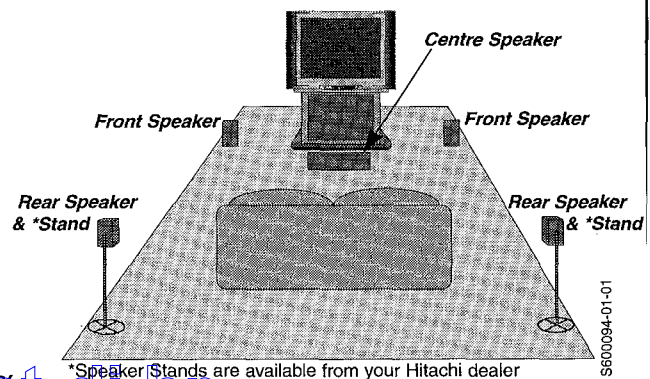
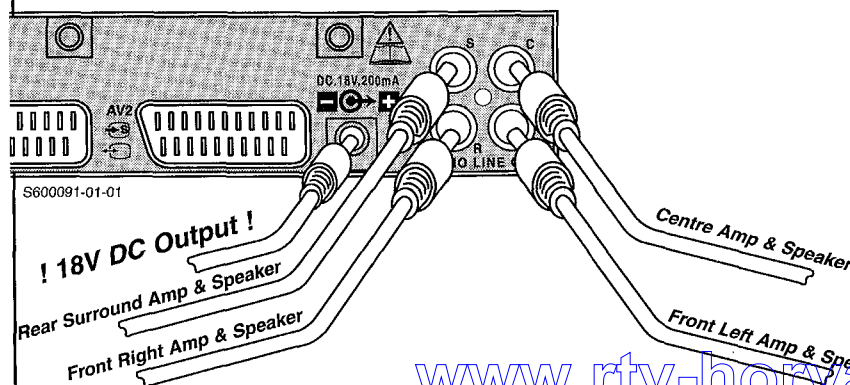
The TV uses internal speakers to provide left and right channels, and also creates its own centre channel. The rear surround speakers enhance your listening pleasure.



OPTION 2 Option 2 describes and illustrates the connection of Rear, Front and Centre Surround Amplifiers & Speakers.

1. Switch off TV.
2. Connect Surround , Left, Right and Centre speakers as shown and position closely to illustration below.
3. Switch TV on.
4. De-activate 3DS and follow instructions on Page 17 to obtain **Speaker Configuration Option**, and ensure Internal Speakers ARE muted i.e. (), also set Centre Channel to WIDE or NORMAL.
5. Use the Surround Set-up Menu (Page 19) to adjust the volume level on the Surround Speakers and Centre speaker if required.

In this configuration full Dolby Pro Logic Sound is achieved using 5 external speakers.



*Speaker Stands are available from your Hitachi dealer

www.rtv-horvat-dj.hr

Solid Background

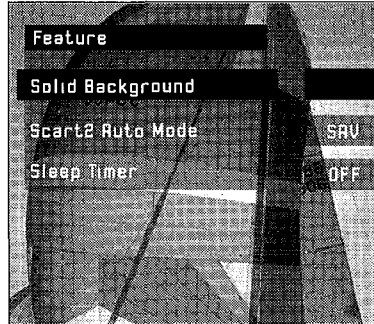
The Solid Background feature controls the appearance of the OSD (On Screen Display) window environment, with either a solid or transparent appearance to the OSD. There are two modes to select from and these are simply ON and OFF. Follow the guide below.

Press the MENU key (20) on your handset.
The Main Menu is displayed.

Use BLUE colour coded key (22) to select FEATURE
(or use cursor keys 17/21 to select and cursor key 18 or 19 to enter)

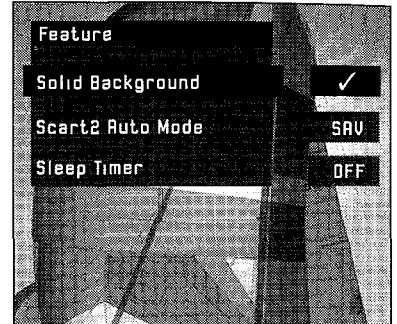
Select Solid Background and adjust the controls
ON or OFF with cursor keys 18 and 19.

S600082-01-01



With Solid Background deselected the OSD window becomes transparent, allowing you to view the TV picture behind the OSD.

S600083-01-01



With Solid Background selected the OSD window becomes solid.

Scart2 Auto Mode

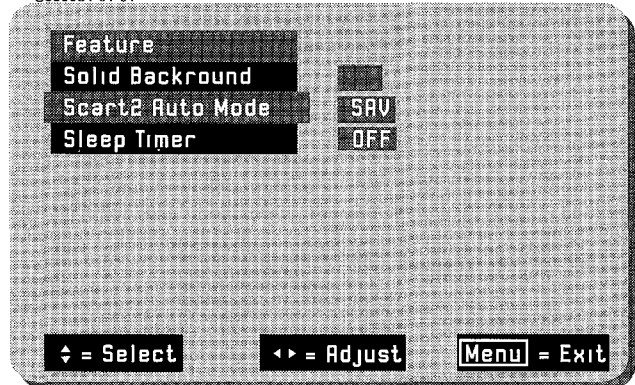
This feature is used to set the condition of Scart 2 Audio/Video input socket. If, for example, you regularly connect external equipment such as S-VHS (Super VHS) Video recorders or camcorders to AV2, then the TV can be set to SAV mode to accommodate such equipment. Standard AV mode can also be set if desired.

Press the MENU key (20) on your handset.
The Main Menu is displayed.

Use BLUE colour coded key (22) to select FEATURE
(or use cursor keys 17/21 to select and cursor key 18 or 19 to enter)

Select Scart2 Auto Mode and adjust the controls
between AV and SAV with cursor keys 18 and 19.

S600084-01-01



Sleep Timer Function

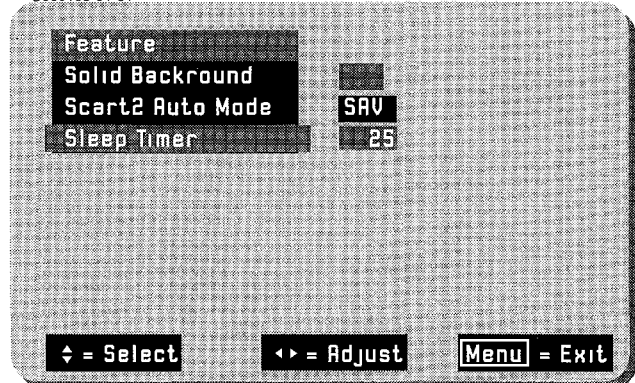
The Feature Menu also incorporates a Sleep Timer Facility. This allows the user to input a set amount of time before the TV automatically shuts down in to Stand by mode. The amount of time is input in 5 minute intervals, to a maximum of 120 minutes (2 hours). When there is only 60 seconds remaining a countdown appears in the top right hand corner of the screen.

Press the MENU key (20) on your handset.
The Main Menu is displayed.

Use BLUE colour coded key (22) to select FEATURE
(or use cursor keys 17/21 to select and cursor key 18 or 19 to enter)

Select Sleep Timer and enter the time value
with cursor keys 18 and 19.

S600108-01-01

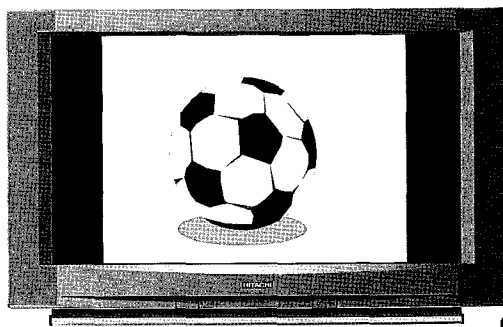


An example of the Sleep Timer function with 25 minutes entered is shown.

NOTE: In addition to the Sleep Timer function, if the TV does not receive a signal for a period of 10 minutes the TV will automatically power down into Stand by mode.

Wide Screen Modes

The various screen modes below and on page 19 are available on this model. Each of these modes are accessed using the 16:9 button (3) on your handset

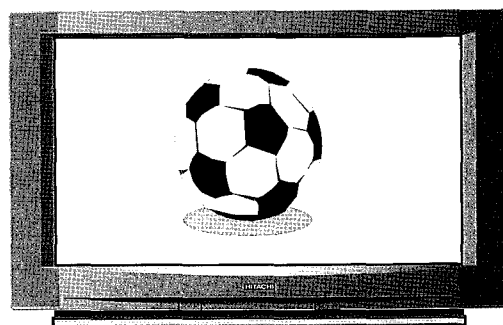


example 1

AUTO

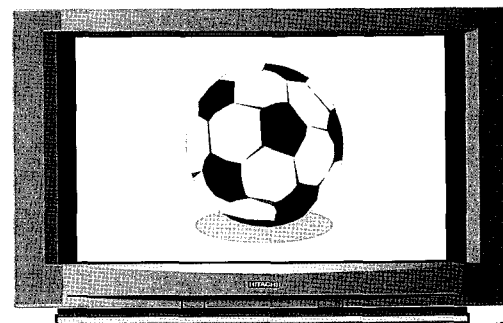
Auto mode automatically detects various screen formats that are transmitted in either conventional (4:3) or wide screen (16:9/14:9). After detecting which signal is being transmitted the TV will automatically switch to the correct screen ratio.

In example 1 (left) a 4:3 conventional picture format is shown, note the black bars to the sides of the screen, this is consistent with screen compression. 4:3 mode can also be manually selected if desired.



example 2

Example 2 (left) illustrates a 16:9 Wide Screen picture format. This type of picture fills the entire TV screen. The 16:9 mode can also be manually selected if desired.



example 3

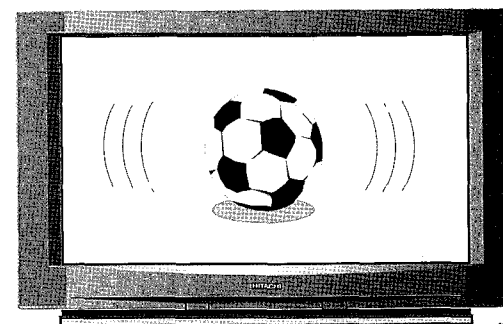
AUTO mode can also detect 14:9 ratio signals, when this mode has been selected thin black bars appear to the sides of the screen (example 3).

NOTE: Other screen formats may be transmitted by certain broadcasters, these are 14 x 9 True Wide Screen and 16 x 9L/14 x 9L with subtitles. Your TV is able to detect these formats and adjust the set automatically *(subject to WSS transmitting).

Hitachi recommend that AUTO is selected for the majority of TV viewing.

NOTES: The function of the AUTO mode is dependent on whether the *Wide Screen Signalling (WSS) is transmitting, check with your local operator for availability.

When WSS is not active the picture mode will default to the Feature settings (see page 19)



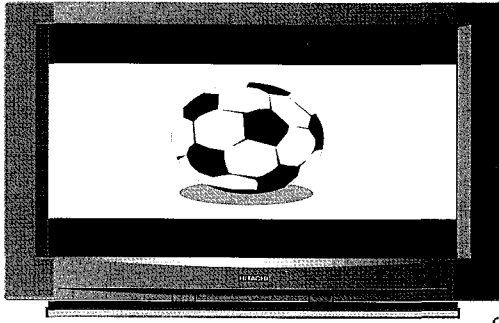
example 4

PANORAMIC

Panoramic mode emulates that of a Wide Screen broadcast for 4 x 3 transmissions. This is achieved by maintaining the proportions of the centre of the screen while extending the images on the sides of the screen (example 4).

This mode is generally recommended if AUTO is not selected.

MANUAL SETTINGS Some modes can also be manually selected if some pictures appear distorted or stretched, or subtitle information becomes lost. Follow the guide below to apply the correct setting.

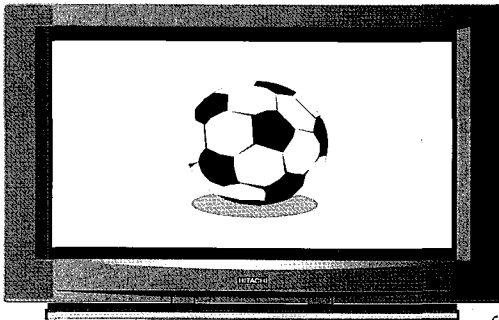


example 5

16 x 9L

The 16:9 Letterbox mode is used to expand a 16:9 letterbox style picture so that it uses the full screen to display the picture. Letterbox type pictures are identifiable by the black bars that appear on the top and bottom of the screen and some objects appear stretched (see example 5). Once selected, the 16:9L mode displays the picture as example 2 on page 18.

14 x 9L



example 6

When viewing pictures in the 14:9 Letterbox mode (example 6) thin black bars appear at the top and bottom of the screen, and images become slightly elongated. By selecting 14:9L mode the user can expand the TV picture to display more of the screen (see example 3).



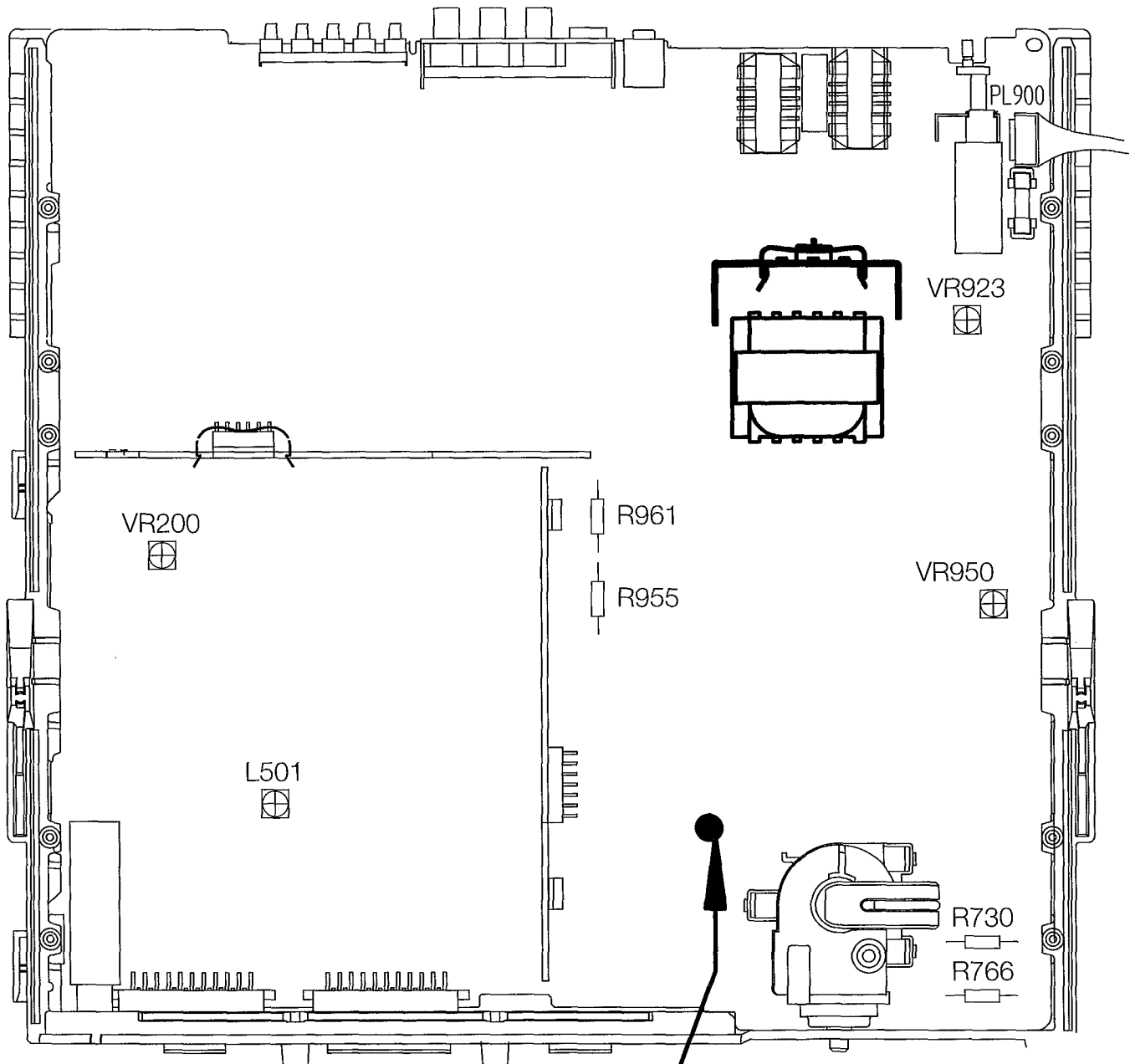
example 7

If viewing movies or programmes containing screen subtitles whilst in 16 x 9L or 14 x 9L modes, the subtitle may become lost to the bottom of the screen. To overcome this problem, simply press the SUBTITLE button (5) once. The SUBTITLE feature compresses the bottom of the screen allowing the subtitles to be viewed, as in example 7. If, however, you wish to view Teletext subtitles a further press of the SUBTITLE button is required, this will then restore the screen to its original setting.

NOTE: Whatever Wide Screen mode was set before the TV is switched off will be the same condition when it is switched back on.

The references to the Wide Screen modes are purely for guidance purposes only, your preferences may vary to those listed.

ADJUSTMENT POINTS



**TO REMOVE PRINTED CIRCUIT BOARD
FROM CHASSIS FRAME REMOVE
THIS RIVET**

CIRCUIT DESCRIPTION

A7 PSU

From switch on the A.C. voltage is rectified by diodes D901 - D904, which produces approximately 300V across C905. This is then applied to the collector of Q903 via the primary winding of T900. Initially the voltage on pin 7 of IC900 will rise to approximately 16V via R901, D905 and Q905. This allows the internal circuitry of IC900 to generate a sawtooth waveform at pin 4, from which a squarewave output is obtained at pin 6. This output is applied to the gate of Q901 which turns on and off, this alters the voltage on the emitter of Q903 causing this device to turn on and off, generating the outputs in the secondary windings of T900.

After initial power up IC900 pin 7 is supplied from the bias winding (pin 4) of T900 via D911 for continued operation. The bias winding voltage is also rectified by D910 which is then supplied to the base of Q906 via R930. Q906 turns on and pulls the base of Q905 low via R930 turning Q905 off, this is done to reduce the power dissipated by R901 once the power supply is running.

A current sense circuit consisting of R910, R900, R922 and VR923 feeds back a voltage to pin 3 of IC900, this voltage is compared with an internal reference voltage, of approximately 0.8V should the applied voltage exceed the reference the pulse width is limited from output pin 6. In this way Q903 is offered protection from changes in primary current.

R909 and C914 act as a soft start circuit, this limits the pulse width output from pin 6 during the initial start up period, allowing a gradual rise to full power.

Q907, Q908 and associated circuitry are for reducing the frequency of the power supply when the set is in standby.

A sense voltage rectified by D910 consisting of R908 and R906, supplies pin 2 of IC900, this is then compared to an internal reference voltage. If it exceeds the internal reference the output from pin 6 will be limited by the internal error amp. ZD970 will go short if the +B exceeds 180V.

The secondary voltage induced in T900 winding 14/16 is rectified by D950, producing the H.T. voltage which is smoothed by C977. In standby the H.T. rises slightly.

Winding 12/17 produces approximately 11V via D951, which is smoothed by C957. This is then applied to IC952 and Q957. IC952 is a +5V regulator which supplies the micro processor in both standby and normal running modes.

Q957 is used to switch, and regulate the +8V supply to the chassis, the output voltage being set by ZD957, D965, D966 and D967/J967A. The +8V is also used as the header supply for the +5V supply regulator IC951.

Winding 11/18 produces approximately 26V via D952, which is smoothed by C955 and then applied Q951 through R974, which is used as a current sense. The output from Q951 supplies +26V for the audio amplifier IC4000.

H.T. regulation is controlled by Q954 stage. The base of Q954 is set at a pre-determined level by the resistor network R950, VR950 and R953. The emitter of Q954 is held at approximately 6V2 by ZD950. Should the H.T. rise, the base voltage becomes more positive than the emitter, and this difference is amplified by the transistor and applied to opto-coupler IC901. The output from IC901 is then applied to pin 1 of IC900 which regulates the H.T. by altering the duty cycle of the waveform output from pin 6 of IC900.

STANDBY SWITCHING

The low voltage supplies are switched off in standby, this is controlled by the micro processor which outputs a high from pin 24 in standby and a low when the set is out of standby. This is then applied to resistors R948 and R982. This "high" is also applied to the base of Q950 via R982 which turns on, pulling the base of Q952 low, allowing Q951 to turn off, which removes the 26V to the audio section. When the set

is out of standby the low applied to R982 is passed to the base of Q950 which turns off, allowing the base of Q952 to be pulled high via R993, Q952 in turn pulls the base of Q951 low through R992. Q951 will now supply the 26V audio (on Dolby models the 26V is also used as the header supply for the 18V regulator, IC953 which is provided to power the IR surround speaker transmitter via the phono socket at the rear of the set). The high applied to R948 is passed to the base of Q959 which turns on, pulling the base of Q957 low which turns off removing the chassis 8V supply. With the set out of standby the low applied to R948 is passed to the base of Q959 which turns off allowing the base of Q957 to rise via R986, Q957 then turns on supplying the regulated 8V.

POWER GOOD AND PROTECTION

IC950 is made up of 4 comparators, the power good line uses comparator 2. Pin 5 is used as the reference which is held at 2.5V by IC954 supplied by pull up resistor R956. Pin 4 uses R961/R962 and R955/R959 as a potential divider which is connected between the +11V (C957) and T900 winding 12/17 through D959 which is in forward converter mode. In operation this means pin 4 is held below the reference level of pin 5 until the mains supply is interrupted or the set is switched off at which time pin 4 rises above pin 5 and the output pin 2 is pulled low. This low is applied to pin 60 of IC001 via R078. In normal operation pin 2 is held high by pull up resistor R957 from the 5V supply.

The protection line is held high under normal running conditions by R971 from the 5V supply, this high is applied to pin 22 of IC001. When the protection line is pulled low IC001 goes into standby mode, the set can be restarted by the usual methods of bringing the set out of standby, but until the cause of the protection circuit operation is removed the set will return to its standby state.

The over current for the 26V audio supply uses comparator 1, a reference voltage is set up on pin 6 by resistors R967 and R964. The voltage being compared is fed to pin 7 using the potential divider R968 and R966 which is supplied from the output side of the current sense resistor R974. Should the voltage on pin 7 fall below that of pin 6 pin 1 will be pulled low and thus pulling the protection line low via D958 putting the set into standby.

Comparator 3 is used to protect against a layer short within the F.B.T. it will also act as protection for a short on the secondary outputs of the F.B.T. IC950 is supplied with approximately 26V via D960 to pin 3 from this supply a reference voltage is fed to pin 9 using potential divider R972/R969. Pin 8 is supplied by another potential divider this time made up of four resistors R973/R970 + R730 + R766. R730 + R766 sample the current flowing through Q751 should this increase the voltage drop across R730 + R766 will increase and raise the voltage of pin 8 when it exceeds pin 9 and pin 14 will be pulled low putting the set into standby.

Comparator 4 is used for EHT/over voltage protection, as all the F.B.T. secondary voltages are proportional the 200V supply to the CRT base is used to generate the voltage to be used in comparison, this is done by using a potential divider made up of R718, R749 and R719 on all but the 21" chassis this uses only R718 and R749, R719 is a link. ZD717 monitors the voltage at the junction of R718 and R749, if this exceeds 36V the Zener diode conducts applying a high on pin 10 of IC950 this is compared with the reference voltage on pin 11 which also uses the 2.5V set up by IC954. When pin 10 is higher than 2.5V pin 13 is pulled low in turn pulling the protection line low via D957 putting the set into standby.

The L.T. lines are given protection using diodes D962, D963, D969 and D972 these are connected in reverse bias from the protection line to the 18V, 8V, 5V and standby 5V

supplies respectively. Should any of the low voltage lines have a short circuit to ground the protection line will be pulled low causing the set to go into standby.

If the +B or audio supply lines become short circuit to ground before the protection on the secondary of the power supply, the primary over current protection (pin 3 IC900) will operate turning off the drive output from pin 6 IC900.

For models fitted with version 1.S software or later pins 45 and 46 of IC001 should be shorted together. This is for added protection using software. The horizontal pulse applied to pin 45 for OSD/TEXT positioning is sampled and measured by pin 46. The expected waveform will be a square wave with a maximum mark measurement of 20µs and a maximum space measurement of 100µs. If these maximums are exceeded the protection routine will activate.

DEFLECTION STAGES

IC501 generates the deflection output and control pulses.

HORIZONTAL

Pin 40 of IC501 is the horizontal drive output, this requires a pull up resistor to the 8V supply which is R551. The output is then applied to Q701 via R733, FB700 and R707/C736. The collector of Q701 is supplied from the +B via R701 and the primary winding of T702. The secondary of T702 drives the output transistor Q751, the collector of which is supplied from the +B via R735, R751, L700 and the primary of the FBT T701. The emitter of Q751 is connected to ground via R730 and R766 which are sense resistors and used for the protection circuit.

The capacitive divider network of C717 and C708 is used in conjunction with R724, R759, D713 and D714 to supply a line pulse with an amplitude of approximately 8V peak to peak. This pulse is applied to the micro processor IC001 pin 45 via Q005 and IC501 pin 41 via Q508 this is used for phase detection and to generate the sandcastle pulse used to synchronise the colour decoder, delay line and secam decoder.

VERTICAL

The vertical output amplifier IC601 requires a differential input to pins 1 and 2 this is supplied by IC501 from pins 46 and 47. IC601 pin 4 is supplied with 18V from IC602 which is used for general operation, pin 8 is supplied for the 200V rail via R621 and regulated by ZD603 it is also connected to the 27V rail via R617 to keep the voltage on pin 8 higher than pin 4 voltage during the flyback period on 21" models and purely from the 27V supply on all other models. The vertical scan output is between pins 9 and 3 of IC601. Pin 5 is the feedback control and is dependent on the value of resistors R602 and R603. Pin 10 supplies a frame frequency pulse to pin 22 of IC501 this is used for the vertical guard function. The vertical pulse required by the micro processor IC001 is derived from the vertical output via C603, R610 and R611 the resultant waveform is clamped by ZD602.

EAST-WEST CORRECTION (WITHOUT IC603)

The picture geometry is controlled via the I2C bus, which is accessed by the menus in service mode. Pin 45 of IC501 outputs the parabolic waveform which is input to pin 12 of IC601, the amplified output from pin 11 this is connected to the centre of the diode modulator via R618 and L751. To stabilize the picture geometry during extremes of picture content brilliance the pin 4 output of T701(the abl) is fed back to pin 12 of IC601 via R764 and C744.

EAST-WEST CORRECTION (WITH IC603)

The picture geometry is controlled via the I2C bus, which is accessed by the menus in service mode. Pin 45 of IC501 outputs the parabolic waveform which is input to the gate of the MOSFET IC603 which is used to amplify the parabola. The drain is connected to R618 and the source is connected to ground. In this configuration J252 and J1 are removed which disconnect pins 11 and 12 of IC60. J246 and J247 are inserted connecting the MOSFET to the rest of the circuit.

Microprocessor and Related Circuits

The SAA5296/SAA5297 microprocessor (IC001) controls all the major functions of the television chassis.

The program code for the microprocessor is either stored within the microprocessor (SAA5297) or is stored in the M27C512 EPROM (IC002) (SAA5296).

The 74HCT573 latch (IC003) is used to interface the EPROM to the microprocessor. This device separates address lines A0-A7 from the microprocessor multiplexed address/data outputs AD0-AD7.

The 4016B analogue switch (IC004) is used to connect/disconnect the microprocessor I²C bus to the peripheral I²C bus and the scart I²C bus.

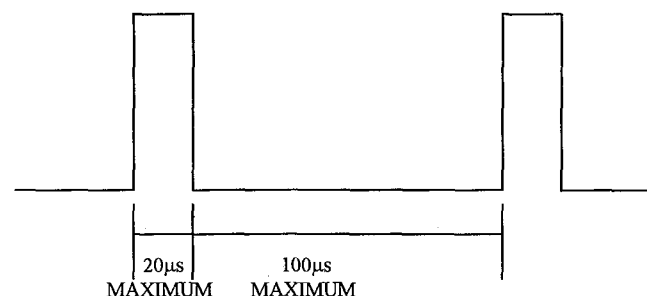
The ST24W16 EEPROM (IC005) is used to store all the TV (service and user) settings required by the microprocessor to control the TV. This device is connected to the microprocessor I²C bus. There is a separate write enable line controlled by the microprocessor to prevent inadvertent writes to the EEPROM. (Pin 67 of IC001).

Power on, standby and IR reception is indicated by the front panel LED. Either a LTL2114 (LED002) or a TLSH2101 (LED001) is fitted. The following table shows the various states of the LED:

LED State	Description
Off	TV switched off
On, dim	TV switched on, normal operation
On, dim, bright flash	TV switched on, normal operation, IR command received
On, bright	TV switched on, standby operation

The PIC-21043SP infra-red receiver (IR001) filters, demodulates and amplifies infra-red signals transmitted by the handset and sends them to the microprocessor for decoding and execution.

The 4-way or 5-way front panel switch (SW001) is connected via a resistor network to an ADC input on the microprocessor for command decoding and execution.



Protection Waveform
to Pin 46 IC001

IC001 SAA5296 Microprocessor Pin Definitions

Pin	Name	I/O	Level	Description
1	MUTE	O	OPEN LOW	Mute left and right audio amplifiers No mute
2	SAV.SW	I	HIGH LOW	SAV3 not connected SAV3 connected
3	KEYS	I	>4.2V 4.0-4.2V 3.3-3.7V 2.7-3.2V 1.3-1.8V 0.9-1.2V 0.7-0.8V <0.7V	No keys pressed MENU key pressed P+ key pressed P- key pressed V+ key pressed V- key pressed V+ and V- keys pressed N/A
4	N/C		0V	
5	AV1.SW	I	>3.1V 1.6-3.1V <1.6V	AV1 connected - 4:3 AV1 connected- 16:9 AV1 not connected
6	AV2.SW	I	>3.1V 1.6-3. IV <1.6V	AV2 connected - 4:3 AV2 connected - 16:9 AV2 not connected
7	AV3.ENA	O	OPEN LOW	AV3 enabled AV2 enabled
8	PANORAMIC	O	HIGH LOW	Panoramic function enabled Panoramic function disabled
9	COMPRESS	O	HIGH LOW	Compress function enabled Compress function disabled
10	N/C		X	
11	N/C		X	
12	V _{SSD}	I	0V	Digital ground
13	EA	I	HIGH LOW	Program memory internal (SAA 5297) Program memory external (SAA 5296)
14	N/C		0V	
15	N/C		0V	
16	N/C		0V	
17	PSEN	O	HIGH LOW	External program memory disable External program memory enable
18	ALE	O	HIGH LOW	External latch enable External latch disable
19	REF-	I	0V	ADC negative voltage reference
20	N/C		0V	
21	N/C		0V	
22	PROTECTION	I	HIGH LOW	PSU OK PSU FAIL
23	N/C		0V	
24	ON/OFF	O	HIGH LOW	PSU OFF PSU ON
25	LED ₁ BRIGHT	O	OPEN LOW	LED DIM LED BRIGHT
26	EXTBLK	O	HIGH LOW	Blanking output for external RGB Normal picture
27	V _{SSA}	I	0V	Analogue ground
28	CVBS0	I	1V p-p	Composite video input for teletext decoding
29	N/C		0V	
30	BLACK	I	-	Video black level storage input
31	IREF	I		Reference current input for analogue circuits
32	A15	O	X	Address line 15 for external EPROM
33	A14	O	X	Address line 14 for external EPROM
34	A13	O	X	Address line 13 for external EPROM
35	A12	O	X	Address line 12 for external EPROM
36	N/C		X	
37	I.C.	I	0V	Digital ground
38	N/C		X	

Pin	Name	I/O	Level	Description
39	RGBREF	I	X	RGB output high level
40	B	O	X	BLUE OSD/text pixel output
41	G	O	X	GREEN OSD/text pixel output
42	R	O	X	RED OSD/text pixel output
43	EXTBLK	O	X	Fast blanking output for OSD/text
44	OSDBRI	O	X	PWM output to control OSD/text brightness
45	HSYNC	I	X	Horizontal sync input for OSD/text synchronisation
46	HSYNC	I	X	Horizontal sync input for OSD/text synchronisation
47	VSNC	I	X	Vertical sync input for OSD/text synchronisation
48	VSNC	I	X	Vertical sync input for OSD/text synchronisation
49	V _{DDA}	I	5V	Analogue supply
50	REF+	I	5V	ADC positive reference
51	V _{DDT}	I	5V	Teletext supply
52	A11	O	X	Address line 11 for external EPROM
53	A10	O	X	Address line 10 for external EPROM
54	A9	O	X	Address line 9 for external EPROM
55	A8	O	X	Address line 8 for external EPROM
56	OSCGND	O	0V	Crystal oscillator ground
57	XTALIN	I	X	12MHz crystal oscillator input
58	XTALOUT	O	X	12MHz crystal oscillator output
59	RESET	I	HIGH LOW	Reset microprocessor Normal operation
60	PWRGD	I	HIGH LOW	PSU OK PSU FAIL
61	INT.I ² C.ENA	O	HIGH LOW	Enable peripheral I ² C bus Disable peripheral I ² C bus
62	V _{DDM}	I	5V	Microprocessor supply
63	RC	I	X	Remote control input
64	N/C		X	
65	MIC.SCL	I/O	X	Microprocessor I ² C bus serial clock
66	MIC.SDA	I/O	X	Microprocessor I ² C bus serial data
67	E ² WE	O	HIGH LOW	EEPROM write disable EEPROM write enable
68	EXT.I ² C.ENA	O	OPEN LOW	Disable scart I ² C bus Enable scart I ² C bus
69	AD0	I/O	X	Multiplexed address/data line 0 for external EEPROM
70	AD1	I/O	X	Multiplexed address/data line 1 for external EEPROM
71	AD2	I/O	X	Multiplexed address/data line 2 for external EEPROM
72	AD3	I/O	X	Multiplexed address/data line 3 for external EEPROM
73	AD4	I/O	X	Multiplexed address/data line 4 for external EEPROM
74	AD5	I/O	X	Multiplexed address/data line 5 for external EEPROM
75	AD6	I/O	X	Multiplexed address/data line 6 for external EEPROM
76	AD7	I/O	X	Multiplexed address/data line 7 for external EEPROM
77	VGA1	I/O	X	TBA
78	VGA2	I/O	X	TBA
79	VGA3	I/O	X	TBA
80	VGA4	I/O	X	TBA

IC002 27C512 EPROM Pin Definitions

Pin	Name	I/O	Level	Description
1	A15	I	X	Address line 15
2	A12	I	X	Address line 12
3	A7	I	X	Address line 7
4	A6	I	X	Address line 6
5	A5	I	X	Address line 5
6	A4	I	X	Address line 4
7	A3	I	X	Address line 3
8	A2	I	X	Address line 2
9	A1	I	X	Address line 1
10	A0	I	X	Address line 0
11	D0	O	X	Data line 0
12	D1	O	X	Data line 1
13	D2	O	X	Data line 2
14	V _{ss}	I	0V	Ground
15	D3	O	X	Data line 3
16	D4	O	X	Data line 4
17	D5	O	X	Data line 5
18	D6	O	X	Data line 6
19	D7	O	X	Data line 7
20	CE	I	HIGH LOW	EPROM in standby mode EPROM in operation mode
21	A10	I	X	Address line 10
22	OE	I	HIGH LOW	D0-D7 outputs high impedance D0-D7 outputs active
23	A11	I	X	Address line 11
24	A9	I	X	Address line 9
25	A8	I	X	Address line 8
26	A13	I	X	Address line 13
27	A14	I	X	Address line 14
28	V _{cc}	I	5V	Supply

IC003 74HCT573 Latch Pin Definitions

Pin	Name	I/O	Level	Description
1	OE	I	0V	Enable outputs A0-A7
2	AD0	I	X	Multiplexed address/data line 0 input
3	AD1	I	X	Multiplexed address/data line 1 input
4	AD2	I	X	Multiplexed address/data line 2 input
5	AD3	I	X	Multiplexed address/data line 3 input
6	AD4	I	X	Multiplexed address/data line 4 input
7	AD5	I	X	Multiplexed address/data line 5 input
8	AD6	I	X	Multiplexed address/data line 6 input
9	AD7	I	X	Multiplexed address/data line 7 input
10	GND	I	0V	Ground
11	LE	I	HIGH LOW	Latch AD0-AD7 inputs to A0-A7 outputs Maintain current A0-A7 output levels
12	A7	O	X	Address line 7 output
13	A6	O	X	Address line 6 output
14	A5	O	X	Address line 5 output
15	A4	O	X	Address line 4 output
16	A3	O	X	Address line 3 output
17	A2	O	X	Address line 2 output
18	A1	O	X	Address line 1 output
19	A0	O	X	Address line 0 output
20	V _{cc}	I	5V	Supply

IC004 4016B Analogue Switch Pin Definitions

Pin	Name	I/O	Level	Description
1	INT.SDA	I/O	X	Peripheral I ² C bus SDA
2	MIC.SDA	I/O	X	Microprocessor I ² C bus SDA
3	MIC.SDA	I/O	X	Microprocessor I ² C bus SDA
4	EXT.SDA	I/O	X	Scart I ² C bus SDA
5	EXT.SDA.ENA	I	HIGH LOW	Scart I ² C bus SDA enable Scart I ² C bus SDA disable
6	EXT.SCL.ENA	I	HIGH LOW	Scart I ² C bus SCL enable Scart I ² C bus SCL disable
7	GND	I	0V	Ground
8	EXT.SCL	I/O	X	Scart I ² C bus SCL
9	MIC.SCL	I/O	X	Microprocessor I ² C bus SCL
10	MIC.SCL	I/O	X	Microprocessor I ² C bus SCL
11	INT.SCL	I/O	X	Peripheral I ² C bus SCL
12	INT.SCL.ENA		HIGH LOW	Scart I ² C bus SCL enable Scart I ² C bus SCL disable
13	INT.SDA.ENA	I	HIGH LOW	Scart I ² C bus SDA enable Scart I ² C bus SDA disable
14	V _{cc}	I	5V	Supply

IC005 ST24W16 EEPROM Pin Definitions

Pin	Name	I/O	Level	Description
1	N/C		0V	
2	N/C		0V	
3	N/C		0V	
4	GND	I	0V	Ground
5	MIC.SDA	VO	X	Microprocessor I ² C bus SDA
6	MIC.SCL	I/O	X	Microprocessor I ² C bus SCL
7	E ² WE	I	HIGH LOW	EEPROM write disable EEPROM write enable
8	V _{cc}	I	5V	Supply

IR001 PIC-21043SP Infra-Red Receiver Pin Definitions

Pin	Name	I/O	Level	Description
1	RC	O	X	Remote control data output
2	V _{cc}	I	5V	Supply
3	GND	I	0V	Ground

TUNER AND IF STAGES

The tuner is powered from the chassis 5V and 33V supplies, it is controlled by the microprocessor IC001 via I²C bus commands. Pin 1 of the tuner is the AGC input and is connected to pin 54 of IC501 via R200 and R227, which is controlled by the I²C bus and adjusted in the "tuner" option in service mode. Pins 2 and 3 are not connected. Pin 4 is the SCL input. Pin 5 is the SDA input/output. Pin 6 is not connected. Pin 7 is the 5V for the tuner supplied via L200. Pin 8 is not connected. Pin 9 is the tuning voltage which is supplied from the 200V from T701 via R725 and R726 and stabilised by ZD200 and applied to pin 9 through R207. Pins 10 and 11 are the IF outputs which are fed to pins 1 and 2 of CP501 for the video path and pins 1 and 2 of CP202 for the FM audio path. The output from CP501 pins 4 and 5 are then input to IC501 pins 48 and 49, which demodulates the signal and supplies a composite video waveform from pin 6 which is applied to the base of Q500.

CP202 is a parallel sound saw filter, the output from pins 4 and 5 are applied to pins 1 and 2 of IC202. The signal is passed through an internal A.G.C. controlled 3 stage amplifier, to the detector stage of the IC. The A.G.C. stage characteristics are determined by the value of C221 connected to pin 19.

The signal is limited and phase shifted by the tuned circuit of L203 etc., connected to pins 16 and 17 this produces a reference signal used for intercarrier detection. The detected intercarrier (which supplies both FM mono and NICAM FM stereo) signal emerges from pin 7 and is then amplified by Q204. The signal is then applied to IC400 pin 12 for further processing.

CL MODELS ONLY

When used with a SECAM signal IC501 is switched for positive modulation via the I²C bus and is selected in the manual tuning option of the installation menu by choosing either L or L'. For NICAM sound CP202 and IC202 with associated components are used as described previously. For AM sound the output from pin 10 of the tuner is applied to the base of Q200 via R213 and C206 the DC bias on the base of Q200 is set by R212 and R216. Q200 amplifies the signal which is then fed to the base of Q201 via R210. Q201 is a buffer which makes the signal available to CP201.

Pin 9 of IC501 is a switched port controlled via the I²C bus, which is low when system L is selected and high when system L' is selected.

When system L is selected the low is applied to the base of Q203 in turn allows the collector to stay high because of pull up resistor R218 which also makes the base of Q202 high pulling the collector and pin 1 of CP201 low, this allows the signal to pass from the emitter of Q201 through C207, D203, L201 and C209 before being applied to pin 2 of CP201.

When system L' is selected the high is applied to the base of Q203 which then pulls the base of Q202 low as well as the signal path to pin 2 of CP201. The collector of Q202 rises due to pull up resistor R217 and the signal from the emitter of Q201 passes through C207 and D202 to pin 1 of CP201.

The output from CP201 pins 4 and 5 are input to pins 1 and 16 of IC201 which is an AM demodulator. The AM audio pin is obtained for pin 6 which is fed via C411 to pin 29 of IC400 for further processing.

EXTERNAL VIDEO INPUT/OUTPUT

The majority of the video switching functions are carried out by IC501 which is controlled by the I²C bus.

The composite video at the emitter of Q500 is fed via R310 to pin 19 of E302 (scart 1) which is available for use by appropriately connected equipment. The signals being received by the tuner are output and independent of the picture displayed.

The composite video output from pin 38 is applied to the base of Q505 via R534, the emitter is connected to ground via R530. The collector is connected to the base of Q506 and also R533 which is a pull up to +8V. The emitter of Q506 is connected to the +8V supply. The collector is connected to R532 and R531 which is connected to the emitter of Q505 at the other end. This network doubles the signal level from 1V to 2V which is fed to pin 19 of E301 (scart 2). The signal from pin 38 IC501 is also applied to Q503 via R526, which is then applied to the micro processor IC001 pin 28 via C001, this is required for the teletext function.

The external video input applied to scart 1 pin 20 is fed to IC501 pin 17 via R115 and C521. Because of the limitations of the number of input ports to IC501 the composite video/luminance input to scart 2 and the composite video/luminance input to AV3 (phono/SVHS sockets front of chassis) use a common input pin 11. AV2 signals are applied to Q304 via C320 and R335. R351 and R350 set the DC bias point. AV3 signals are applied to Q302 via C332 and R339. R340 and R338 set the DC bias point, this is deliberately set so Q302 is turned on, the voltage across R337 and R352 keeps Q304 turned off as the emitter is not 0.6V lower than the base. The control of which signal is input is carried out by the micro processor IC001 pin 7, which pulls the base of Q302 low via D302 and R349, allowing the signal fed into AV2 to be processed by IC501.

NOTE

For chassis's fitted with the TDA8844 or TDA8843 type IC501, Q506 is deleted. The values of R531 and C539 altered and the sub panel containing the delay line and SECAM processing IC's is deleted.

EXTERNAL AUDIO INPUT/OUTPUT (56 series +non Dolby 16:9)

All the audio switching is performed within the IC400. The output from pin 47 is fed to E302 (scart 1) pin 1 via C312, R321 and L303. The output from pin 48 is fed to E302 pin 3 via C309 R320 and L302. These are the right and left RF (nicam/A2/mono) outputs respectively which are available to be connected to appropriate external equipment.

The output from pin 57 is fed to E301 (scart 2) pin 1 via C305, R307 and L301. The output from pin 58 is fed to E301 pin 3 via C303, R306 and L300. These are the monitor right and left outputs respectively which are available to be connected to appropriate external equipment.

The AV2 right input to E301 pin 2 is fed via C417 and R414 to pin 36 of IC400. The AV2 left input to E301 pin 6 is fed via C416 and R415 to pin 37 of IC400. The AV1 right input to E302 pin 2 is fed via C414 and R412 to pin 33 of IC400. The AV1 left input to E302 pin 6 is fed via C415 and R413 to pin 34 of IC400.

AV3 inputs applied to the phono sockets front of set fed through buffer stages C315, R326, Q300, C413 and R419 for the left and C316, R329, Q301, C412 and R418 for the right, to pins 32 and 31 of IC400 respectively.

(86 series + Dolby 16:9)

The output from IC 400 pin 47 is fed to E302 (scart 1) pin 1 via C312, R321 and L303. The output from pin 48 is fed to E302 pin 3 via C309, R320 and L302. These are the RF (nicam/A2/mono) right and left outputs respectively which are available to be connected to appropriate external equipment.

The output from pin 63 is fed to E301 (scart 2) pin 1 via E006, C305, R307 and L301. The output from pin 62 is fed to E301 pin 3 via E006, C303, R306 and L300, these are the monitor right and left outputs respectively which are available to be connected to appropriate external equipment.

The output from pin 57 is the surround channel which is supplied to an external amplifier via R4502, L4501, C4504 and E4500.

The output from pin 58 is the centre channel which is supplied to an external amplifier via R4501, L4500, C4502 and E4500.

The right and left outputs from pins 60 and 61 of IC400 not only go to the on board amplifier but are also fed via R4503, L4502, C4506 and R4504, L4503, C4508 to E4500 for connection to an external amplifier.

The AV2 right input to E301 pin 2 is fed via C417 and R414 to pin 36 of IC400. The AV2 left input to E301 pin 6 is fed via C416 and R415 to pin 37 of IC400. The AV1 right input to E302 pin 2 is fed via C414 and R412 to pin 33 of IC400. The AV1 left input to E302 pin 6 is fed via C415 and R413 to pin 34 of IC400.

AV3 inputs applied to the phono sockets front of set fed through buffer stages C315, R326, Q300, C413 and R419 for the left and C316, R329, Q301, C412 and R418 for the right, to pins 32 and 31 of IC400 respectively.

AUDIO AMPLIFIER

The audio amplifier used on this chassis is the TDA7263M which is a double amplifier with one power supply pin 9. In this application it is used for left and right in all models (on the 86 series Dolby version the left and right can be fed via the phono outputs to an external amplifier).

The outputs from IC400 are applied to pins 1 and 5 of IC4000 via series resistors R4001 and R4002. The outputs are then taken from pins 8 and 10 passed through the DC blocking capacitors C4007 and C4011, the signals pass through E4000 the headphone socket which contains a switch, when no headphones are inserted the signal is applied to the speakers via PL4000. When headphones are inserted the internal speakers are disconnected and the signal passed through resistors R4014 and R4015 prior to being applied to the headphones which require a restricted power output.

Networks R4008/C4008 and R4011/C4010 are for stability whilst networks R4004/R4005/C4005 and R4007/R4009/C4006 are for the feedback control of the IC on pins 2 + 4.

A hardware mute is also employed on this model, this is carried out by pulling pin 3 low with Q4000 via R4006. Under normal working conditions pin 3 is at approximately half the supply voltage.

Q4000 is controlled by the micro processor IC001 via R001.

Dolby Pro-Logic Section

The Yamaha YSS241 is controlled by the Micro-processor via the I²C line (pin 52 & 53). The μ also controls the Reset from (pin 20 IC400 to pin 9 IC450)

The Dolby section uses four outputs from the TDA9875 - IC400

- Word select (WS)- Begins at pin 23 -IC400 to pin 2 of IC453 where it is inverted and emerges at pin 3 it then goes to pin 13 -IC450 -. This signal allows the separation between Left & Right.
- Master clock (SYSCLK) - Begins at pin 21 IC400 and then goes to pin 6 IC450 - This clock is for the Yamaha YSS241 (8.192 MHz).

- Bit Clock (SCK) - begins at pin 22 IC400 and then goes to pin 14 IC450 - for synchronising the I2S data.
- I2S R/L data (SD01) - begins at pin 25 IC400 and then goes to pin 12 IC450- Right/Left data input.

After Dolby processing there are 2 outputs returned to the TDA9875 via the shift registers.

- decoded Right and Left Signals (pin 41 IC450 Digital Format)
- Decoded Centre and surround (pin 40 IC450 Digital Format)
- A bit clock output is also supplied to the shift registers for synchronisation (pin 36 IC450)

PICTURE AND CONTROL ADJUSTMENTS

+B VOLTAGE ADJUSTMENT

- (1) AC input voltage = $230V \pm 5V/50Hz$.
- (2) Turn +B voltage VR (VR950) to mid-point (if pre-adjustment not done).
- (3) Receive Philips circuit pattern. Switch on chassis and set the brightness and contrast to maximum.
- (4) After applying heat run for 1 MIN. or more, turn VR950 gradually and adjust +B (re-check after 30 secs).

Measuring point: +B voltage C958 + side
gnd C958 – side

- (5) Set the value of +B voltage to the value shown in the table below.

MODEL	+B VOLTAGE (V)
2156/86	110 V +/- 0.2V
2556/86	152 V +/- 0.2V
2856/86 (24/28WIWD)	152 V +/- 0.2V
32W/WD	149 V +/- 0.2V

AFC ALIGNMENT

- (1) apply relevant RF signal. (a) CH40 UK (b) CH05 EXPORT
- (2) on dual o/ multistandard receivers select BG standard.
- (3) Enter frequency on CTV controls to ensure AFC loop is off.
- (4) Select A.F.C. using service tuner option menu by pressing volume up or down buttons.

● Export

- (1) Apply L' standard RF signal.
- (2) Enter frequency on CTV controls.
- (3) Select "L' I.F A.F.C." using service tuner option menu by pressing volume up or down buttons.

Sound AFC ALIGNMENT

To set L203 first the IF must be set as current A7 spec then:-

- (1) Tune to appropriate channel for each model number (channel should have NICAM or A2 sound)
- (2) Turn L203 clockwise until noise signal present on scope
- (3) Turn L203 slowly anticlockwise until no noise appears on signal
- (4) Then add a 180° turn in anticlockwise direction (a clean fixed signal must be seen)
- (5) This point is now the set point
- (6) To check correct set point has been achieved turn L203 through 180° first in anticlockwise direction checking for the fixed noise free signal then return to the set point. Next turn in a clockwise direction 180° checking for the fixed noise free signal then return to set point
- (7) The signal should now be locked to constant tone
- (8) Change channel to appropriate program +1 then back to appropriate program the NICAM symbol should appear (or tone signals for non nicam sets)

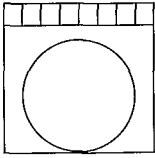
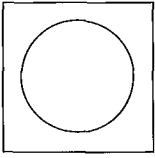
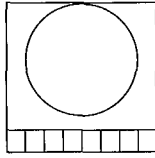
AGC ALIGNMENT

- (1) With the signal received, apply heat run for more than two minutes to avoid the influence of circuit temperature drift.
- (2) Connect a voltmeter of at least 100K internal resistance to the A.G.C. terminal of the tuner.
- (3) Receive the channel below.
- (4) Adjust A.G.C. using the service A.G.C. option in the menu until the following voltage is obtained.

Receive signal		Voltage setting (V)	Setting
Freq	Level		
C40	+60dBuV	3.3+/- 0. IV	UK
C40	+60dBuV	2.8+/- 0.1V	EXPORT 56
C40	+60dBuV	3+/- 0. IV	EXPORT 86/ 16:9

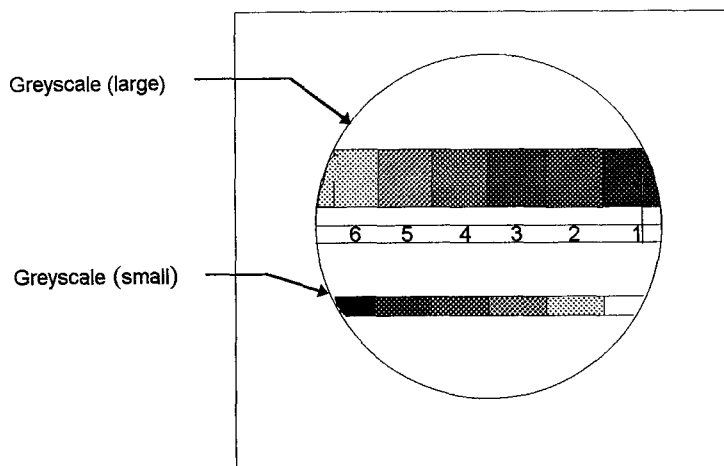
HORIZONTAL PHASE/VERTICAL CENTRE/VERTICAL AMPLITUDE

- (1) Wait 5 minutes minimum after switching on the mains before adjustment.
- (2) Receive the Philips circle pattern.
- (3) Set brightness and contrast to maximum.
- (4) The set should face North or South.
- (5) AC input should be $230V \pm 5V$ 50Hz.
- (6) Adjust software control (using PC/HAND SET)
- (7) Adjust control so that the centre of the picture is as in the diagram below.

	Upper: Extends Lower: Shrinks	Standard	Upper: Shrinks Lower: Extends
Picture Condition			
Size	Adjust until upper part of castellations disappear.	Adjust until both sides of castellations disappear.	Adjust until lower part of castellations disappear.

FOCUS ADJUSTMENT

- (1) Receive the Philips circle pattern.
- (2) Adjust after horizontal/vertical has been adjusted.
- (3) Switch the received signal to the cross hatch signal.



- (4) Turn the focus VR gradually clockwise from the full counter clockwise position so that the focus of the vertical line in the centre part, furthest to the right is adjusted for best result (contrast - maximum, brightness - normal).

CUT-OFF ADJUSTMENT (use 100/1 scope probe)

- (1) Rough adjustment.
 - (1.1) Set to video mode with no signal.
 - (1.2) Turn screen pot of FBT until FBT lines disappear.
- (2) Fine adjustment (56, 86 using TDA8375*)
 - (2.1) Change to AV mode no signal is required.
 - (2.2) Connect probe to CRT green cathode.
 - (2.3) Adjust screen pot until the following is achieved.



(3) Fine adjustment (16/9 set's and set's using TDA884*)

(3.1) Set cathode voltage to

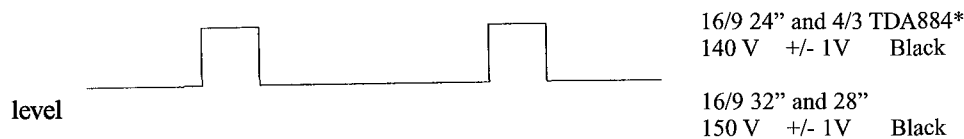
84V (16/9 24" and 4/3 TDA884*) using service menu.

91V (16/9 32" and 16/9 28") using service menu.

(3.2) Change to AV mode no signal is required.

(3.3) Connect probe to CRT green cathode.

(3.4) Adjust screen pot until the following is achieved.



WHITE BALANCE ADJUSTMENT

(1) Receive 30% white signal. (Or use generator through AV1, for improved signal)

(2) For 4/3 models High brightness: (set brightness level to > 2.5 cd/m²)

For 16/9 models High brightness: (set brightness level to > 10 cd/m²)

Adjust RGB gain of TDA8375 (or TDA8844) via I²C, to give correct colour temp for country code.

PROTECTION CHECKS

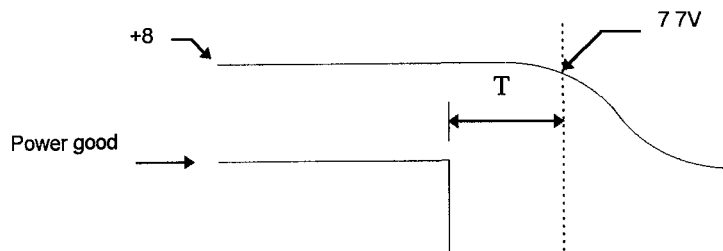
POWER GOOD LINE

(1) Set picture to same conditions as above.

(2) Measure pin 1 IC950. Should be HI, if LOW then cut R961.

If HI but no power down timing (see below) then cut R955 (if fitted).

(3) Check power down logic timing (>100mS).



PRIMARY CURRENT LIMIT

(1) In standby apply full load +40%, to the +B & audio rails (dynamic load)

(2) Adjust VR923 until set trips out.

(3) In standby apply full load, +B = 0.6A = 26V = 1.2A +18V (21 inch only) = 0.66A. PSU should not trip.

Loads (for trip)

28/25" +B = 150R +26V = 20R (Resistive)

32" +B = 140R +26V = 20R (Resistive)

21" +B = 170R +18 = 18R (Resistive)

ANODE/FOCUS SHORT-CIRCUIT CHECK

(1) Receive the circle pattern signal.

(2) Set the contrast/brightness to maximum.

(3) Check trip point by measuring voltage drop across R735 (0.7A - 1.2A)

(4) Or alternatively add dc voltage to R730/R766 until set trips. (The dc level should be equivalent to >1.5* (+B current peak value) 1.6 → 2.6 VDC SET **SHOULD** TRIP.

VOLTAGE MEASUREMENTS

IC001							
PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE
1	0V	21	0V	41**	0V	61	5V
2	5.1V	22	5.1V	42**	0V	62	5V
3	5V	23	0V	43*	0.11V	63	4.8V
4	0V	24	0.1V	44***	2.7V	64	5V
5	0V	25	3.3V	45*	1V	65*	5V
6	0V	26	0.25V	46	2.1	66*	5V
7	5V	27	0V	47	0.18V	67*	5V
8	0V	28	2.4V	48	0.18V	68	0V
9	0V	29	0V	49	5.1V	69*	2.2V
10	5V	30	2.1V	50	5V	70*	2.6V
11	5V	31	2.5V	51	5.1V	71*	2.1V
12	0V	32*		52*	1.9V	72*	2V
13	0V	33*		53*	1.5V	73*	2.2V
14	0V	34*	1.4V	54*	3.1V	74*	2.7V
15	0V	35*	2.1V	55*	3.2V	75*	2.1V
16	0V	36	0V	56	0V	76*	2V
17*	2.5V	37	0V	57	2.4V	77	1.3V
18*	1.6V	38	1.4V	58	2.6V	78	1.6V
19	0V	39	2.1V	59	0V	79	1.2V
20	0V	40**	0V	60	5.1V	80	1.2V

* DIGITAL WAVEFORM 5V P.P

** DIGITAL WAVEFORM 2V P.P

*** DIGITAL WAVEFORM 4V P.P

IC002							
PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE
1	4.9V	9	2.5V	17	1.8V	25	0V
2	4.9V	10	2.6V	18	1.9V	26	2.2V
3	0V	11	2.1V	19	1.9V	27	2.6V
4	0V	12	2.3V	20	1.8V	28	0V
5	1.7V	13	1.6V	21	1.2V	29	0V
6	0.4V	14	1.5V	22	0V	30	4.9V
7	1.3V	15	1.5V	23	2.3V	31	4.9V
8	3.6V	16	0V	24	2.4V	32	4.9V

IC003							
PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE
1	0V	6*	2V	11****	1.65V	16*	2.6V
2*	1.9V	7*	2.2V	12*	2.8V	17*	2.7V
3*	2V	8*	2.2V	13*	2.5V	18*	3.1V
4*	2.7V	9*	2.4V	14*	2.2V	19*	2.3V
5*	1.6V	10	0V	15*	3.5V	20	5V

* DIGITAL WAVEFORM 5V P.P

**** DIGITAL WAVEFORM 5V P.P

IC004			
PIN	VOLTAGE	PIN	VOLTAGE
1	0V	8	0V
2	0V	9	0V
3	0V	10	0V
4	0V	11	0V
5	4.9V	12	4.9V
6	4.9V	13	4.9V
7	0V	14	4.9V

IC005			
PIN	VOLTAGE	PIN	VOLTAGE
1	0V	5	0V
2	0V	6	0V
3	0V	7	4.9V
4	0V	8	4.9V

IC201							
PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE
1	1.8V	5	1.9V	9	0V	13	0V
2	0V	6	1.9V	10	0V	14	7.8V
3	2.4V	7	0V	11	N/C	15	0V
4	4.3V	8	N/C	12	N/C	16	1.8V

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IC202			
PIN	VOLTAGE	PIN	VOLTAGE
1	3.3V	11	2.6V
2	3.3V	12	2V
3	0.3V	13	1.9V
4	0.2V	14	1.9V
5	3.1V	15	6V
6	1.8V	16	2.8V
7	2.2V	17	2.8V
8	0.1	18	1V
9	1.9V	19	3V
10	1.5V	20	7.6V

IC400							
PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE
1	0V	17	2.4V	33	2.4V	49	0V
2	0V	18	3.5V	34	2.4V	50	0V
3	0V	19	3.5V	35	0V	51	2.4V
4	4.8V	20	4.8V	36	2.4V	52	2.4V
5	4.8V	21	1.5V	37	2.4V	53	2.4V
6	0V	22	4.8V	38	4.9V	54	2.4V
7	4.8V	23	4.8V	39	4.9V	55	2.4V
8	2.3V	24		40	0V	56	0V
9	4.9V	25	0V	41	2.4V	57	2.4V
10	2.3V	26	4.8V	42	1.7V	58	2.4V
11	2.4V	27	4.8V	43	0V	59	4.9V
12	2.4V	28	0V	44	2.5V	60	2.4V
13	0V	29	2.4V	45	2.5V	61	2.4V
14	0V	30	0V	46	2.5V	62	2.4V
15	4.8V	31	2.4V	47	2.4V	63	2.4V
16	4.8V	32	2.4V	48	2.4V	64	4.9V

IC501							
PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE
1	1.8V	15	3.1V	29	2.3V	43	3.9V
2	3.8V	16	0V	30	2.3V	44	0V
3	3.7V	17	3.4V	31	1.4V	45	2.7V
4	3.7V	18	7.7V	32	1.4V	46	2.2V
5	2.8V	19	2.8V	33	0.2V	47	2.2V
6	3.3V	20	2.7V	34	2.4V	48	4.5V
7	4.8V	21	2.7V	35	2.5V	49	4.5V
8	4.8V	22	2.6V	36	4.9V	50	1.9V
9	6.7V	23	0V	37	7.3V	51	3.7V
10	0.4V	24	3.7V	38	2.7V	52	3.9V
11	3.4V	25	3.7V	39	5V	53	3.9V
12	7.5V	26	0.1V	40	2.1V	54	4.4V
13	3.9V	27	0V	41	0.8V	55	2.9V
14	0V	28	2.8V	42	3.2V	56	3.6V

IC502 (ALL MODELS FITTED WITH TDA8375)							
PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE
1	4.5V	5	0.9V	9	4.5V	13	0V
2	0V	6	0V	10	0V	14	1.3V
3	0V	7	0.8V	11	2.9V	15	0V
4	0V	8	0V	12	2.9V	16	1.3V

IC503 (SECAM MODELS FITTED WITH TDA8375)							
PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE
1	1.6V	5	N/C	9	1.8V	13	N/C
2	1.1V	6	0V	10	1.8V	14	N/C
3	7.8V	7	3.3V	11	0V	15	0.93V
4	N/C	8	4.2V	12	N/C	16	3.5V

IC601			
PIN	VOLTAGE	PIN	VOLTAGE
1	2.4V	8	*
2	2.3V	9	8.8V
3	8.5V	10	2.2V
4	18.5V	11	0V
5	8.5V	12	2.6V
6	0V	13	0V
7	0V		

* 25"+28" models with a link fitted in R617/D604 position and R621 missing 27V.
21" and 16:9 models with D604 and R621 fitted 49V.

IC602		IC603 (16:9 models)	
PIN	VOLTAGE	PIN	VOLTAGE
INPUT	23V		
REF.	0V		
OUTPUT	18.1V		

IC900			
PIN	VOLTAGE	PIN	VOLTAGE
1	3.3V	5	0V
2	1.8V	6	1.9V
3	0.09V	7	12V
4	1.8V	8	5V

IC901			
PIN	VOLTAGE	PIN	VOLTAGE
1	120.4V	4	0V
2	120.4V	5	3.3V
3	0.5V	6	0.4V

IC950			
PIN	VOLTAGE	PIN	VOLTAGE
1	5.1V	8	3.2V
2	4.9V	9	4V
3	26.7V	10	0V
4	0.3V	11	2.4V
5	2.5V	12	0V
6	8.2V	13	5.2V
7	9V	14	4.9V

IC951		IC952		IC953		IC954	
PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE
INPUT	7.9V	INPUT	10.5V	INPUT	28V	OUTPUT	2.5V
REF.	0.23V	REF.	0V	REF.	0V	REF.	0V
OUTPUT	5.2V	OUTPUT	5V	OUTPUT	18V		

IC4000			
PIN	VOLTAGE	PIN	VOLTAGE
1	1.6V	7	0V
2	1.7V	8	13.8V
3	15V	9	0V
4	1.7V	10	2.4V
5	1.7V	11	0V
6	0V		

86 SERIES AND 16:9 DOLBY MODELS

IC450							
PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE
1	0V	17	5.1V	33	2.5V	49	5V
2*	2.5V	18	5V	34	2.5V	50	5V
3*	2.5V	19	5V	35*	2.5V	51	5V
4*	2.5V	20	5V	36*		52*	4.9V
5	0V	21	5V	37*	5V	53*	4.9V
6*****	2.5V	22	5V	38	1.2V	54	5.1V
7*	2.5V	23	5V	39	1.2V	55	5.1V
8	0V	24	5V	40*	1.3V	56	0V
9	5V	25	5V	41*	5.1V	57	0V
10	5.1V	26	5V	42*	5.1V	58	0V
11*	2.5V	27	5V	43	5.1V	59	0V
12*	1.4V	28	5V	44	5V	60	0V
13*	2.5V	29	5V	45	5.1V	61	0V
14*	2.5V	30	5V	46	5V	62*	5.1V
15	5V	31	5V	47	5V	63*	5.1V
16	5V	32	5V	48	5V	64	5.1V

* DIGITAL WAVEFORM 5V P.P.
***** DIGITAL WAVEFORM 6V P.P.

IC453			
PIN	VOLTAGE	PIN	VOLTAGE
1	5.1V	8	0V
2*	2.5V	9	5.1V
3*	2.5V	10	5.1V
4	0V	11*	2.5V
5	0V	12*	2.4V
6	5.1V	13	5.1V
7	0V	14	5.1V

* DIGITAL WAVEFORM 5V P.P.

IC454			
PIN	VOLTAGE	PIN	VOLTAGE
1*	2.1V	8*	1.3V
2	0V	9*	1.3V
3*	2.5V	10*	1.3V
4*	1.3V	11*	1.3V
5*	1.3V	12*	1.3V
6*	1.3V	13	1.3V
7	0V	14	5.1V

* DIGITAL WAVEFORM 5V P.P.

IC455			
PIN	VOLTAGE	PIN	VOLTAGE
1*	1.2V	8*	1.2V
2	0V	9*	1.2V
3*	2.5V	10*	1.2V
4*	1.2V	11*	1.2V
5*	1.2V	12*	1.2V
6*	1.2V	13*	1.2V
7	0V	14	5.1V

* DIGITAL WAVEFORM 5V P.P.

IC456 + IC457			
PIN	VOLTAGE	PIN	VOLTAGE
1	0V	8*	1.2V
2	0V	9	N/C
3*	2.5V	10*	1.2V
4*	1.2V	11*	1.2V
5*	1.2V	12*	1.2V
6*	1.2V	13	0V
7	0V	14	5.1V

* DIGITAL WAVEFORM 5V P.P.

CRN	B	C	E	CRN	G	D	S
Q1	2.7V	5.1V	2V	Q901	2.4V	10.4V	0.26V
Q003	-0.25V	5.1V	0.2V	CRN	B	C	E
Q004	0.1V	5.1V	0.07V	Q902	2.5V	0V	0.02V
Q005	1.4V	5.1V	0.98V	(5)Q903	10.1V		10.3V
Q202*	0V	3.2V	0V	Q905	4.5V	64V	12V
Q202**	3.2V	0V	0V	Q906	0.67V	0.08V	0V
Q203*	4.4V	0V	0V	Q907	0.02V	0.94V	0V
Q203**	0V	3.2V	0V	Q908	0.75V	0.02V	0V
Q204	1.75V	0V	2.4V	Q950	0.32V	0.8V	0V
Q304	2.5V	7.8V	4.2V	Q951	27.4V	28.2V	28V
(1)Q4000	0.1V	15.2V	0V	Q952	0.8V	0.07V	0V
Q500	3.2V	7.6V	2.6V	Q954	6.9V	119V	6.3V
Q503	3.5V	7.8V	2.9V	Q957	8.6V	11.3V	7.9V
Q505	3.5V	7.1V	2.9V	Q959	0.3V	8.5V	0V
Q506	7.1V	5.7V	7.9V				
Q508	1.7V	7.8V	1.6V				
Q701	-0.98V	28.5V	-0.22V				
(2)Q703	2.3V	18.1V	1.7V				
(3)Q751	0.28V		0.3V				
(4)Q801	7.8V	142V	7.3V				
(4)Q802	7.8V	138V	7.3V				
(4)Q803	7.8V	140V	7.3V				
(4)Q804	137V	9V	135V				
(4)Q805	139V	8.9V	137V				
(4)Q806	142V	9V	140V				
(4)Q811	3.3V	7.3V	2.5V				
(4)Q812	3.3V	7.3V	2.7V				
(4)Q813	3.3V	7.3V	2.6V				
(4)Q814	138V	187V	137V				
(4)Q815	136V	187V	135V				
(4)Q816	141V	187V	139V				

* Measured in system L ** Measured in system L'

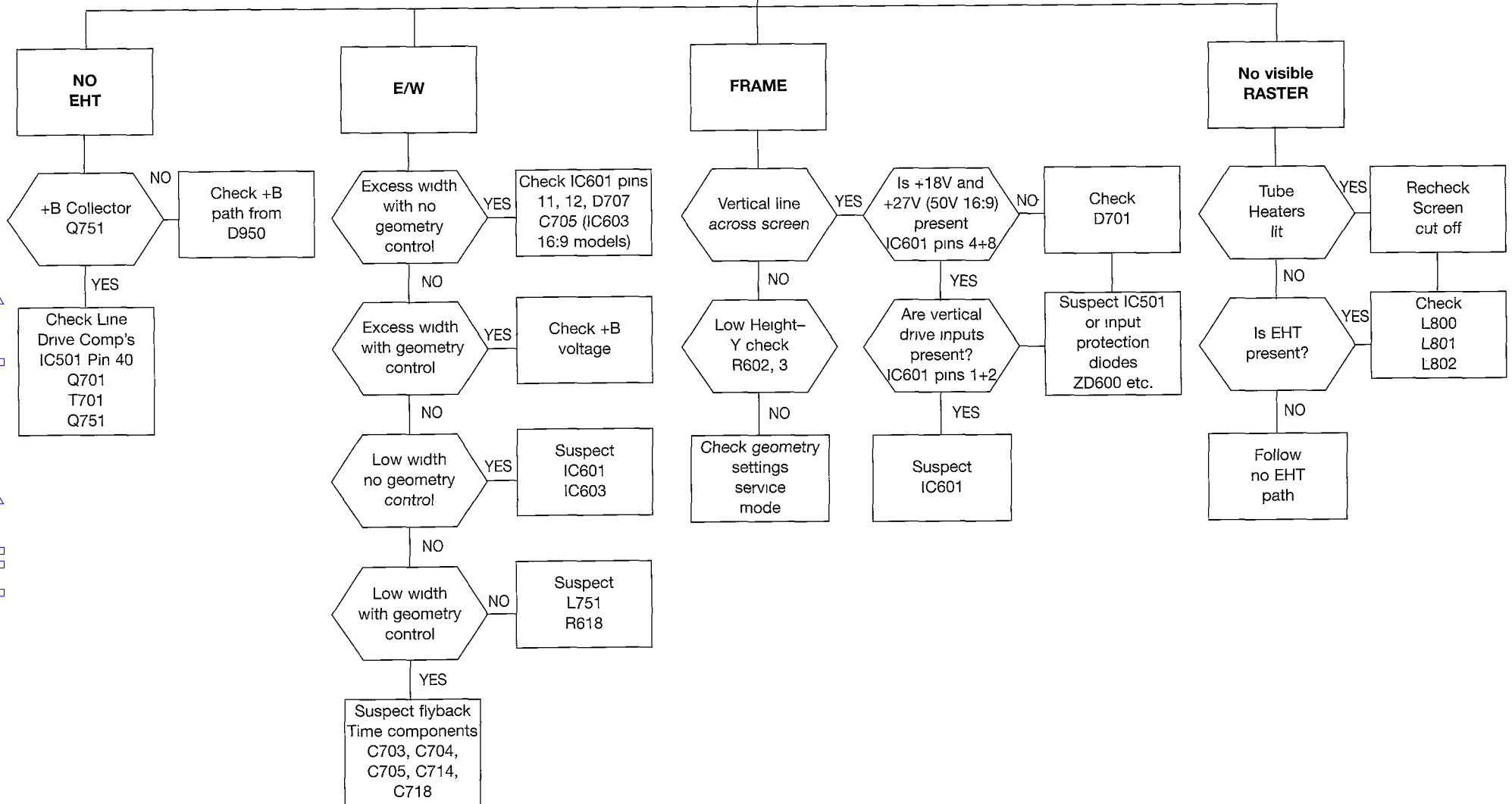
MEASUREMENTS MADE USING A FLUKE 77 MULTIMETER.

- (1) When hardware mute activated by micro B=0.7V C=0V E=0V
- (2) Dependent on picture content and customer control settings. Measurements made with contrast at maximum, brilliance and colour at mid position. Using a circle pattern signal.
- (3) Q751 collector waveform approximately 1200v pk.to pk.
- (4) C.R.T. base transistor voltages dependent on picture content and customer control settings.
Measurements made with contrast at maximum, brilliance and colour set to mid position. Using a circle pattern signal.
- (5) Q903 collector waveform approximately 550V pk. to pk.

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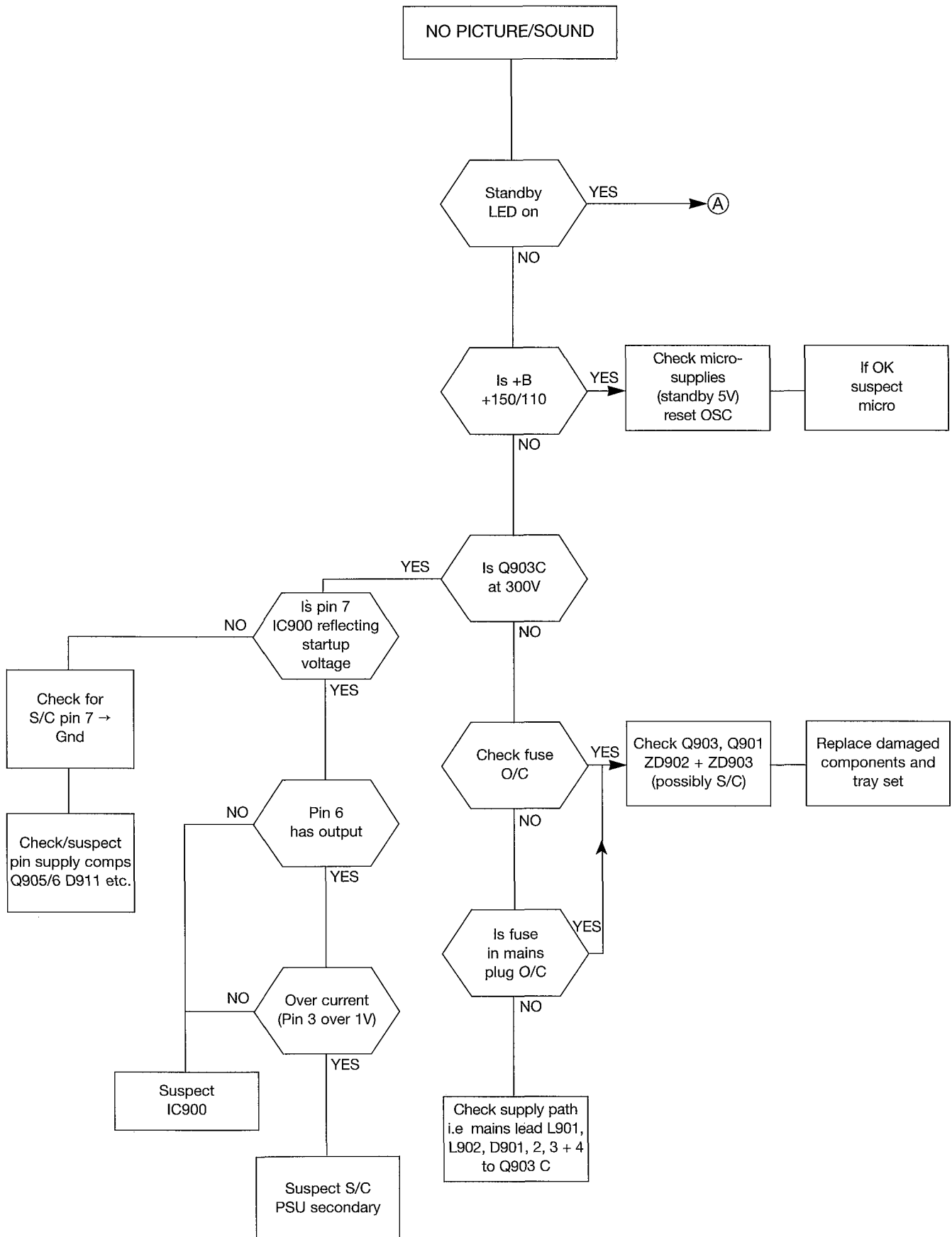
DIAGNOSTIC FLOW CHART

DEFLECTION FAULTS



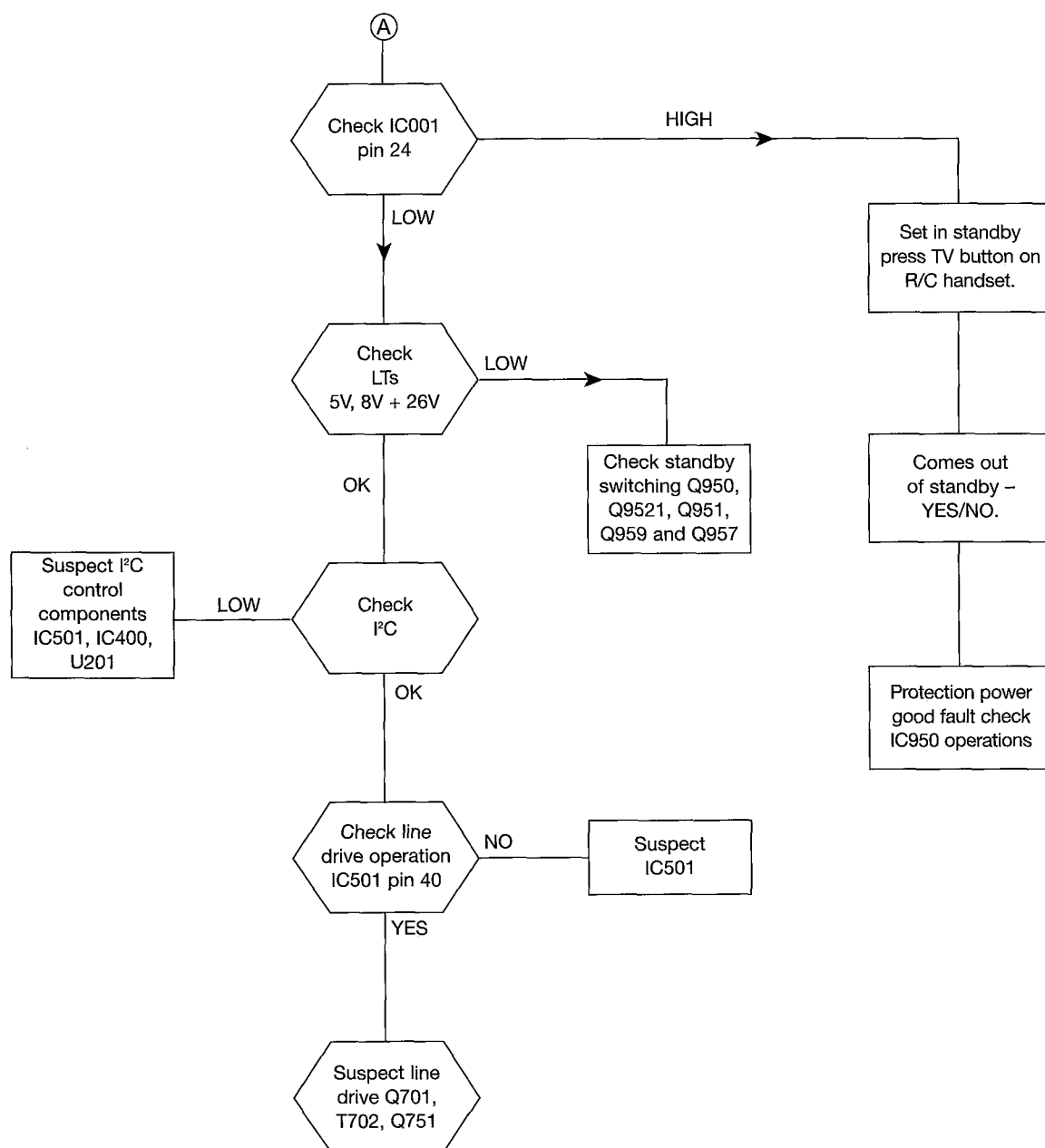
DIAGNOSTIC FLOW CHART

POWER SUPPLY



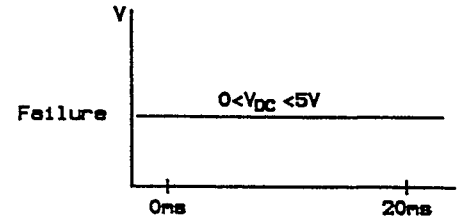
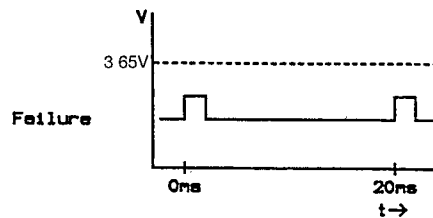
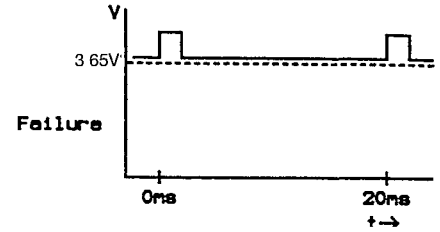
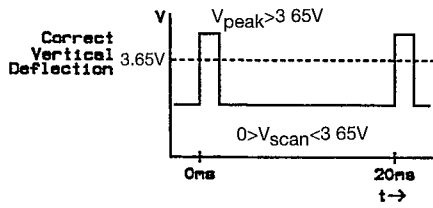
DIAGNOSTIC FLOW CHART

POWER SUPPLY

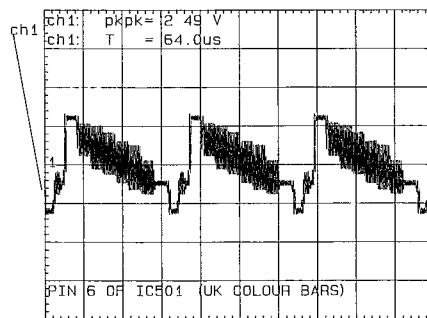


WAVEFORMS

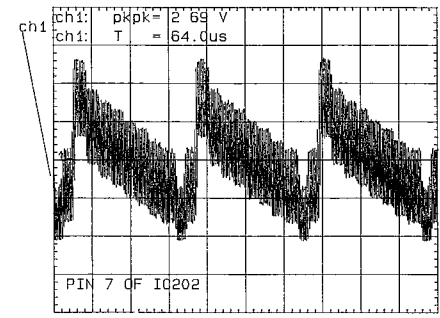
Pin 22 of IC501
If IC501 sees any of the failure waveforms the screen will be blanked by IC501, although the O.S.D. will still be displayed



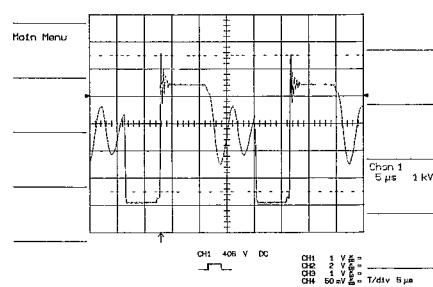
Pin 6 of IC501



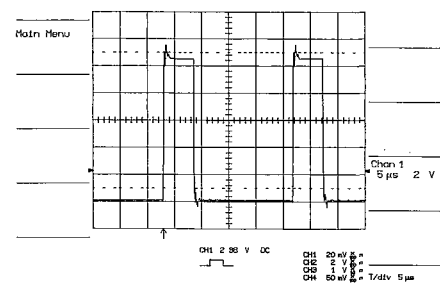
Pin 7 of IC202



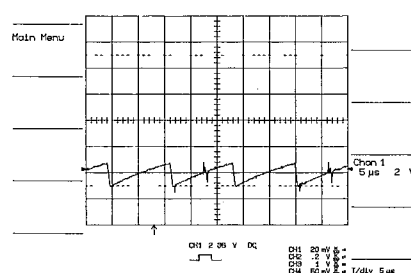
Q903 collector



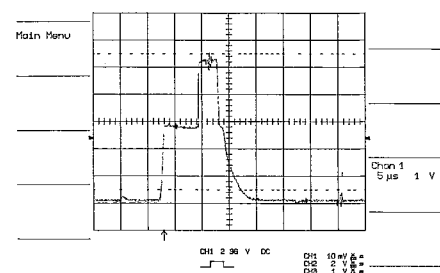
Q901 gate



IC900 Pin 4

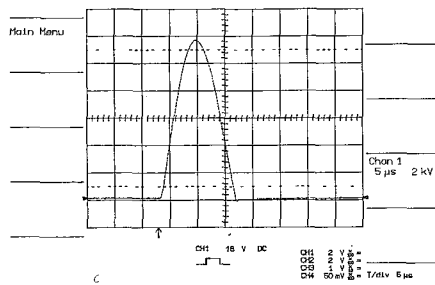


IC501 Pin 41

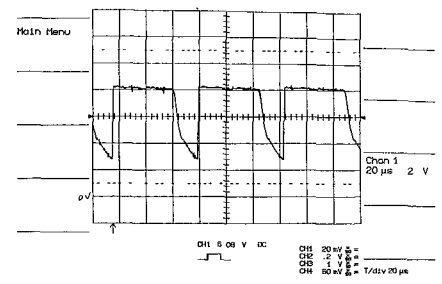


Q757 collector

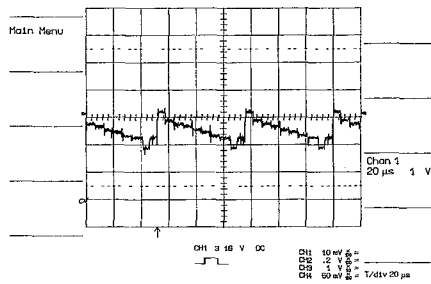
NO OR SLOW
TRIGGER



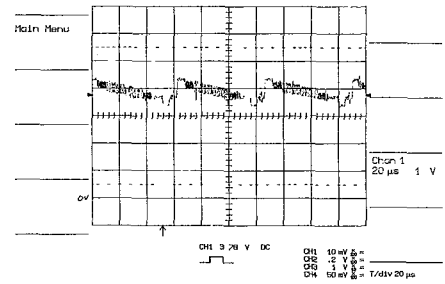
IC501 Pin 18



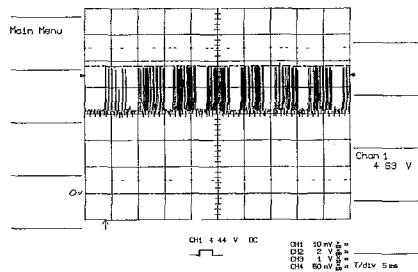
IC501 Pin 28



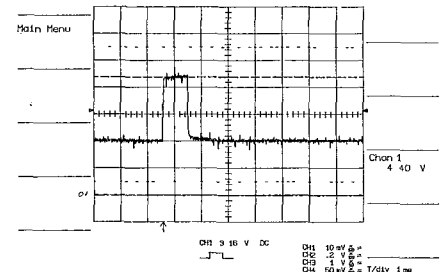
IC501 Pin 13



Represents
text/O.S.D. levels
at anodes of
D001, D003 and
D004



IC501 Pin 22



PRESENTATION PARTS

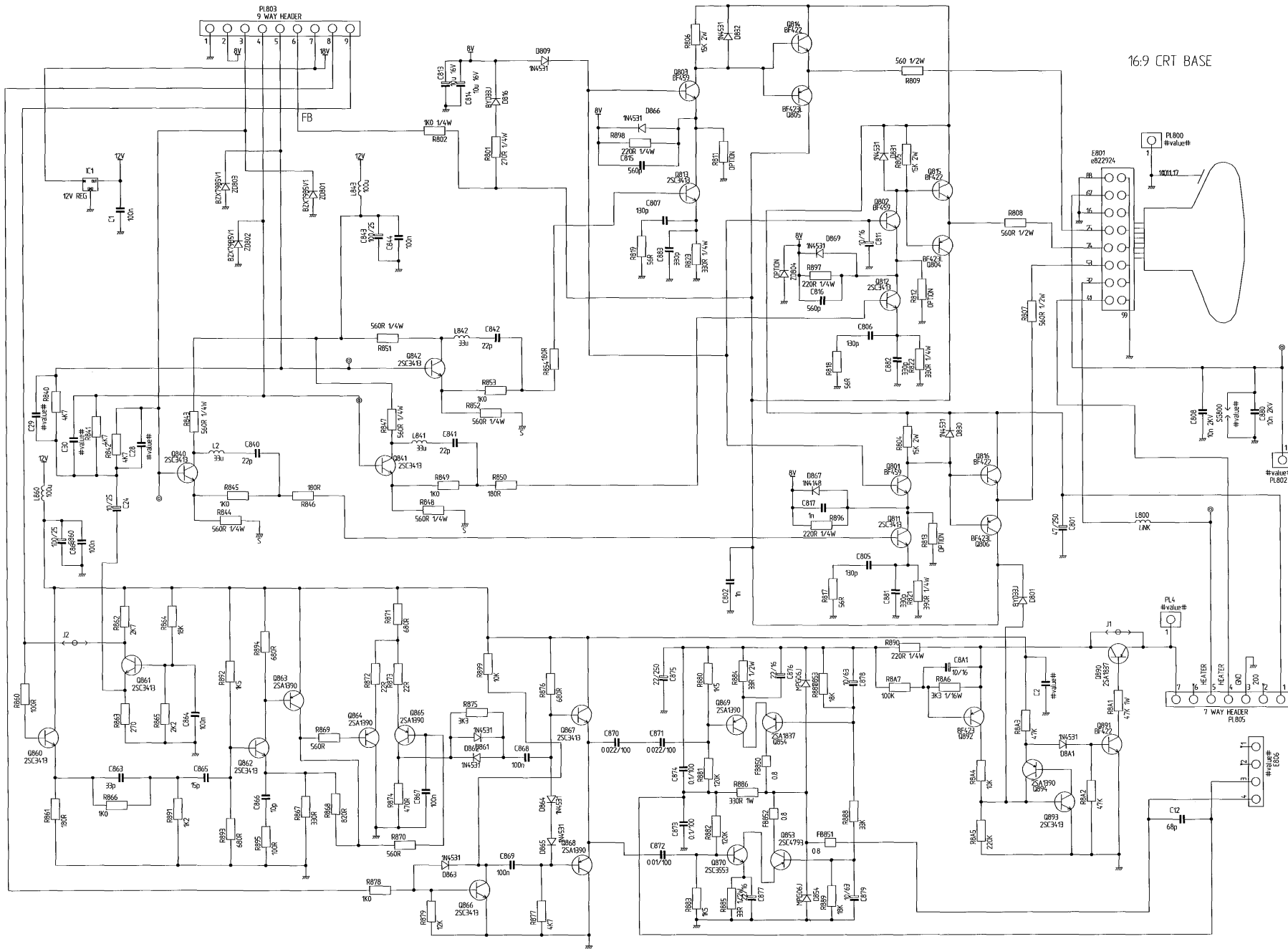
	TYPE	PART No
△ CRT TYPE 51 cm MODELS.....	A51EAL55X10/155X10.....	T154010
△ CRT TYPE 56 cm 16:9 MODELS.....	W56ECK001X03.....	T156019
△ CRT TYPE 59 cm MODELS.....	A59EAK071X.....	T159016
△ CRT TYPE 66 cm 56 & UK 86 MODELS.....	A66EAK071X.....	T166021
△ CRT TYPE 66 cm EXP 86 MODELS.....	A66EAK252/552X01.....	T180004
△ CRT TYPE 66 cm 16:9 MODELS.....	W66ESF001X13.....	T166025
△ CRT TYPE 76 cm 16:9 MODELS.....	W76ESF031X13.....	T176001
△ CABINET BACK 51 cm MODELS.....		X263188
△ CABINET BACK 56 cm 16:9 MODELS.....		X240781
△ CABINET BACK 59 cm 56 MODELS.....		X240682
△ CABINET BACK 59 cm 86 MODELS.....		X240535
△ CABINET BACK 66 cm 56 MODELS.....		X263512
△ CABINET BACK 66 cm 86 MODELS.....		X240557
△ CABINET BACK 66 cm 16:9 MODELS.....		X240632
△ CABINET BACK 76 cm 16:9 MODELS.....		X240761
FRONT FRAME 51 cm 56 TN/TAN MODELS.....		SA00017
FRONT FRAME 51 cm 56 TA MODELS.....		SA00020
FRONT FRAME 51 cm 86 MODELS.....		SA00030
FRONT FRAME 56 cm W1 MODELS.....		SA00035
FRONT FRAME 59 cm 56 TN/TAN MODELS.....		SA00019
FRONT FRAME 59 cm 56 TA MODELS.....		SA00021
FRONT FRAME 59 cm 86 MODELS.....		SA00031
FRONT FRAME 66 cm 56 TN/TAN MODELS.....		SA00018
FRONT FRAME 66 cm 56 TA MODELS.....		SA00022
FRONT FRAME 66 cm 86 MODELS.....		SA00032
FRONT FRAME 66 cm W1 MODELS.....		SA00033
FRONT FRAME 66 cm WD2 MODELS.....		SA00034
FRONT FRAME 76 cm WD2 MODELS.....		SA00036
HITACHI BADGE 51 cm MODELS.....		X640251
HITACHI BADGE 56 & 16:9 MODELS.....		X640261
HITACHI BADGE 59 & 66 cm 86 MODELS.....		X640281
RF LEAD.....		E847158
I.R/L.E.D LENS 56 & 2186 MODELS.....		X425142
I.R/L.E.D LENS 56 & 76 cm MODELS.....		X425142
I.R/L.E.D LENS 66 cm 16:9 MODELS.....		X425076
I.R/L.E.D LENS 59 & 66 cm 86 MODELS.....		X425073
△ MAINS LEAD.....	UK.....	E846815
△ MAINS LEAD.....	EXPORT.....	E846662
MAINS KNOB 56 & 2186 MODELS.....		X321171
MAINS KNOB 56 & 76 cm MODELS.....		X321201
MAINS KNOB 66 cm 16:9 MODELS.....		X321152
MAINS KNOB 59 & 66 cm 86 MODELS.....		X321133
R/C HANDSET 56, 86 & W1 EXPORT MODELS.....	CLE-921B.....	X100071
R/C HANDSET 56, 86 & W1 UK MODELS.....	CLE-921A.....	X100072
R/C HANDSET WD2 MODELS.....	CLE-929A.....	X100081

MISCELLANEOUS PARTS

SPEAKER 51 cm 56 MODELS.....	5W 8R.....	JGK00262
SPEAKER 56 cm MODELS.....	15W 8R.....	E511136
SPEAKER 51, 59 & 66 cm 86 MODELS.....		E511134
SPEAKER 59 & 66 cm 56 & 16:9 MODELS.....	10W 8R.....	E511132
SPEAKER 76cm 16:9 MODELS.....	12W 8R.....	E511138

LITERATURE

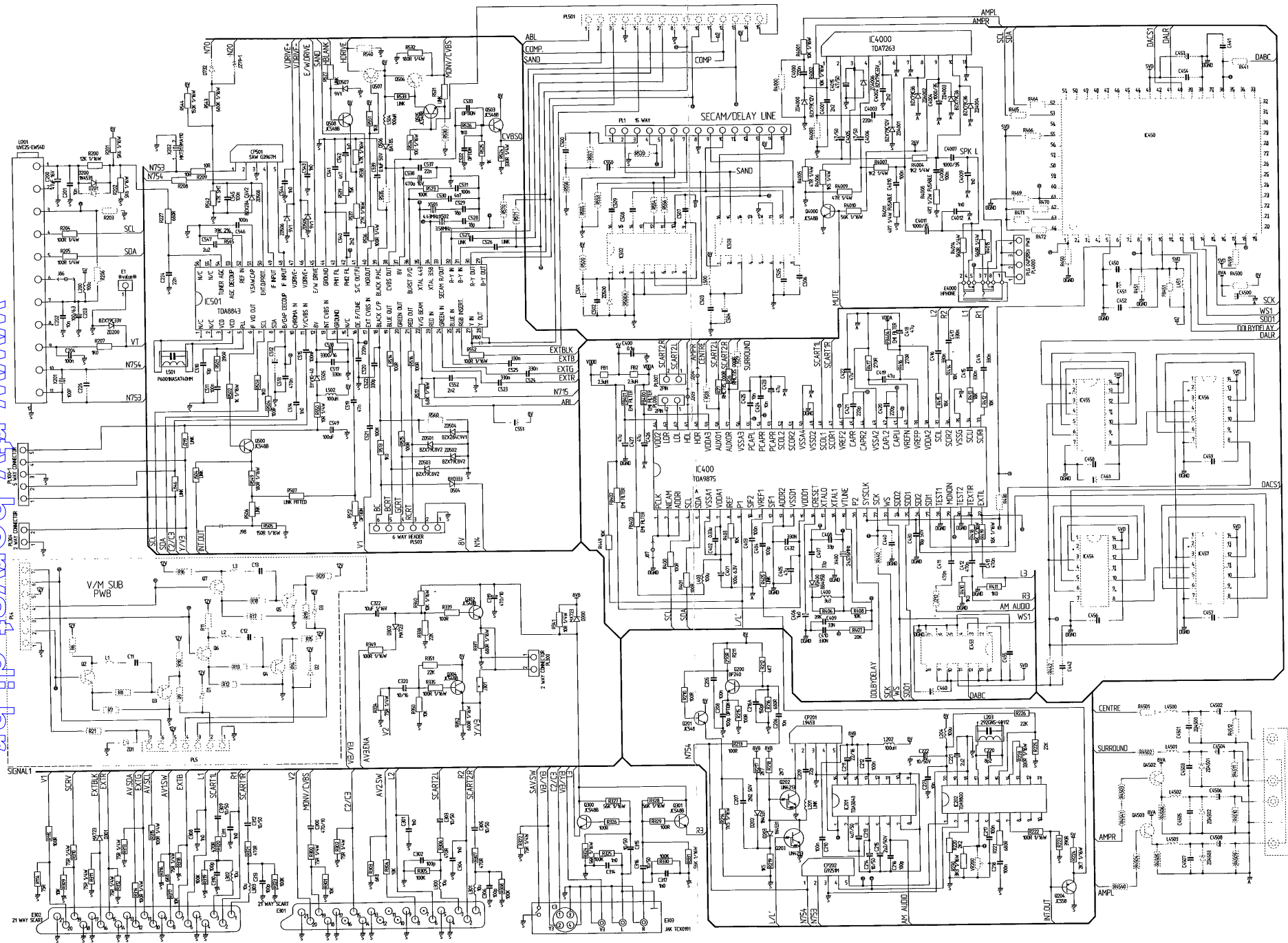
MODEL No.	LANGUAGE	GUIDE No.
C2156TN-311..... C2556TN-311 C2856TN-311	ENGLISH.....	X831450
C2186TN-311..... C2586TN-311 C2886TN-311	ENGLISH	X831488
C24WITN-311.....	ENGLISH.....	X831505
C28WITN-311.....	ENGLISH.....	X831506
C28WD2TN-311.....	ENGLISH.....	X831507
C32WD2TN-311.....	ENGLISH.....	X831508
CL24WITAN-300.....	NOT FINALISED.....	X831562
CL28WITAN-300.....	NOT FINALISED.....	X831563
CL28WD2TAN-300.....	NOT FINALISED.....	X831564
CL32WD2TAN-300.....	NOT FINALISED.....	X831565
CL2156TAN-351..... CL2556TAN-351 CL2856TAN-351	FRENCH	X831524
CL2586TAN-351..... CL2886TAN-351	FRENCH	X831489
CP2156TAN-301	SWEDISH & NORWEGIAN	X831523
CP2556TAN-301 CP2856TAN-301		
CP2156TA-341	GERMAN.....	X831561
CP2556TA-341 CP2856TA-341		
CP2886TAN-341	GERMAN.....	X831490
CP2856TA-371	ITALIAN	X831517
CP2156TAN-381	SPANISH.....	X831466
CP2556TAN-381 CP2856TAN-381		
CP2886TAN-381	SPANISH.....	X831491
CP2156TAN-481	GREEK	X831515
CP2556TAN-481 CP2856TAN-481		
CP2886TAN-481	GREEK	X831516
CP28WD2TAN-481	GREEK	X831566
CP32WD2TAN-481	GREEK.....	X831567



16:9 CRT BASE
BASE DE TUBE CATHODIQUE 16:9
16:9 BILDRÖHRENBASIS



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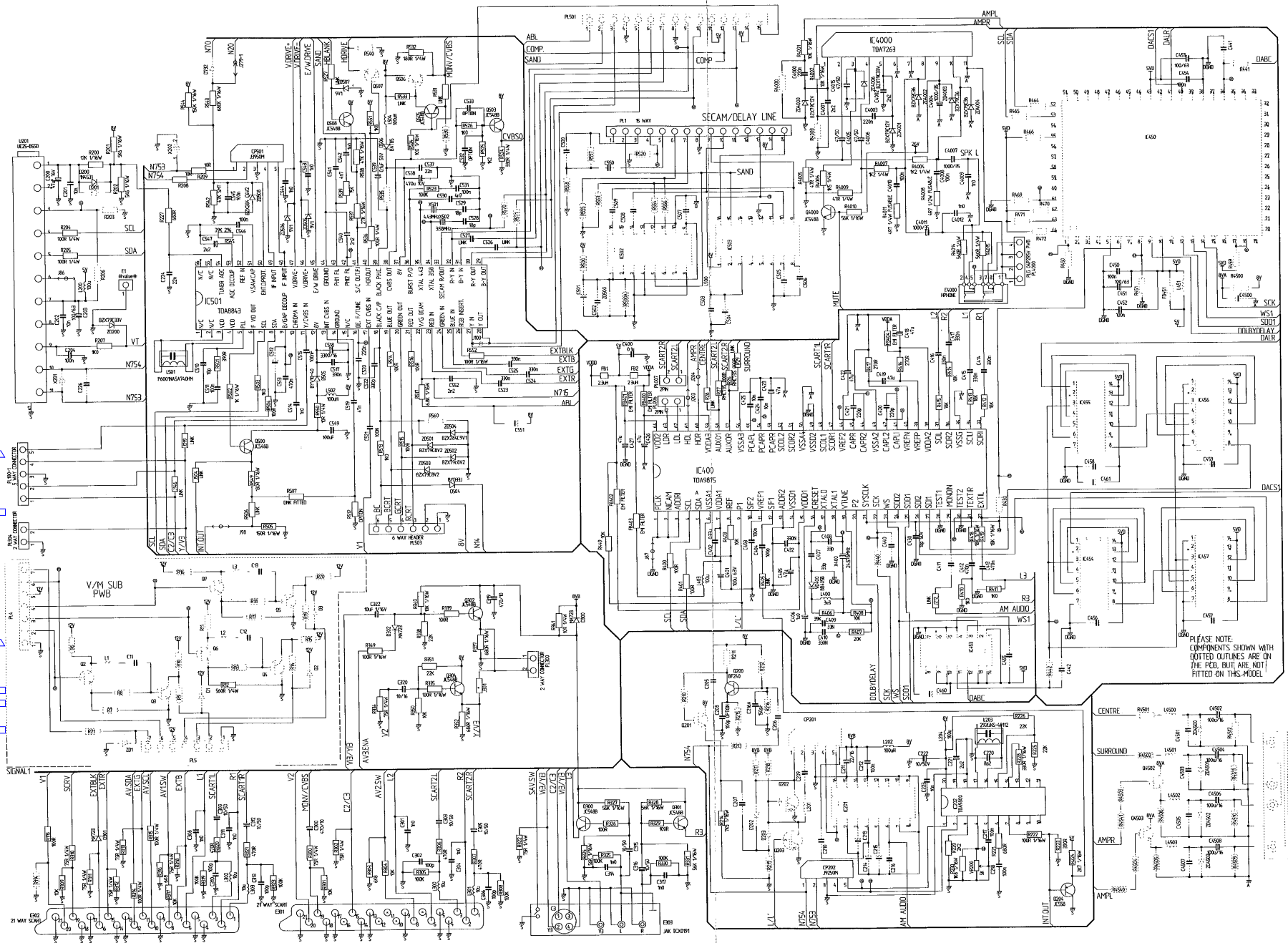


SIGNAL CIRCUIT DIAGRAM CL24W1TAN
 SCHÉMA DE MONTAGE DE CIRCUIT DE TRAITEMENT DU SIGNAL CL24W1TAN
 SIGNALSCHALTBILD CL24W1TAN

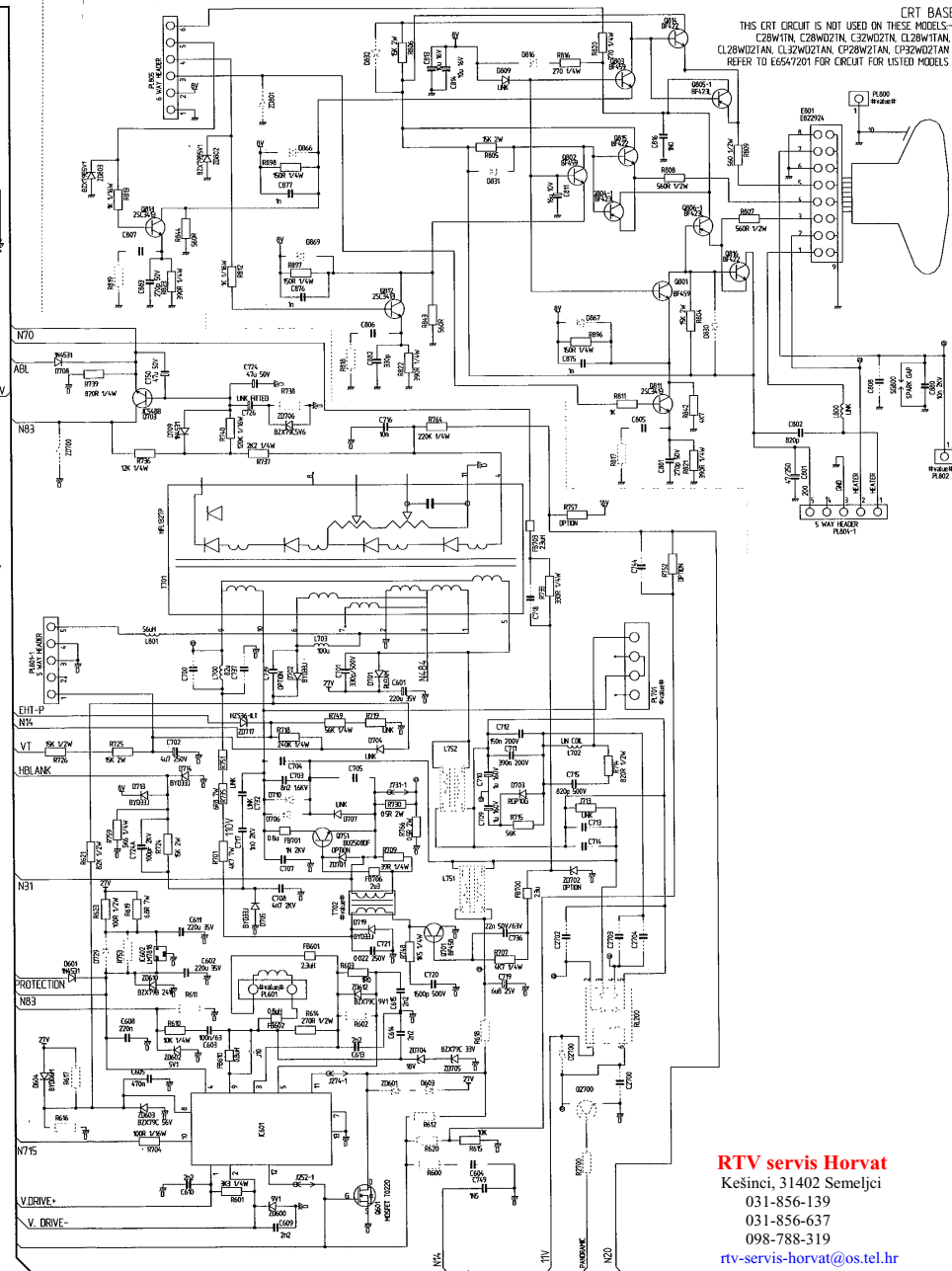
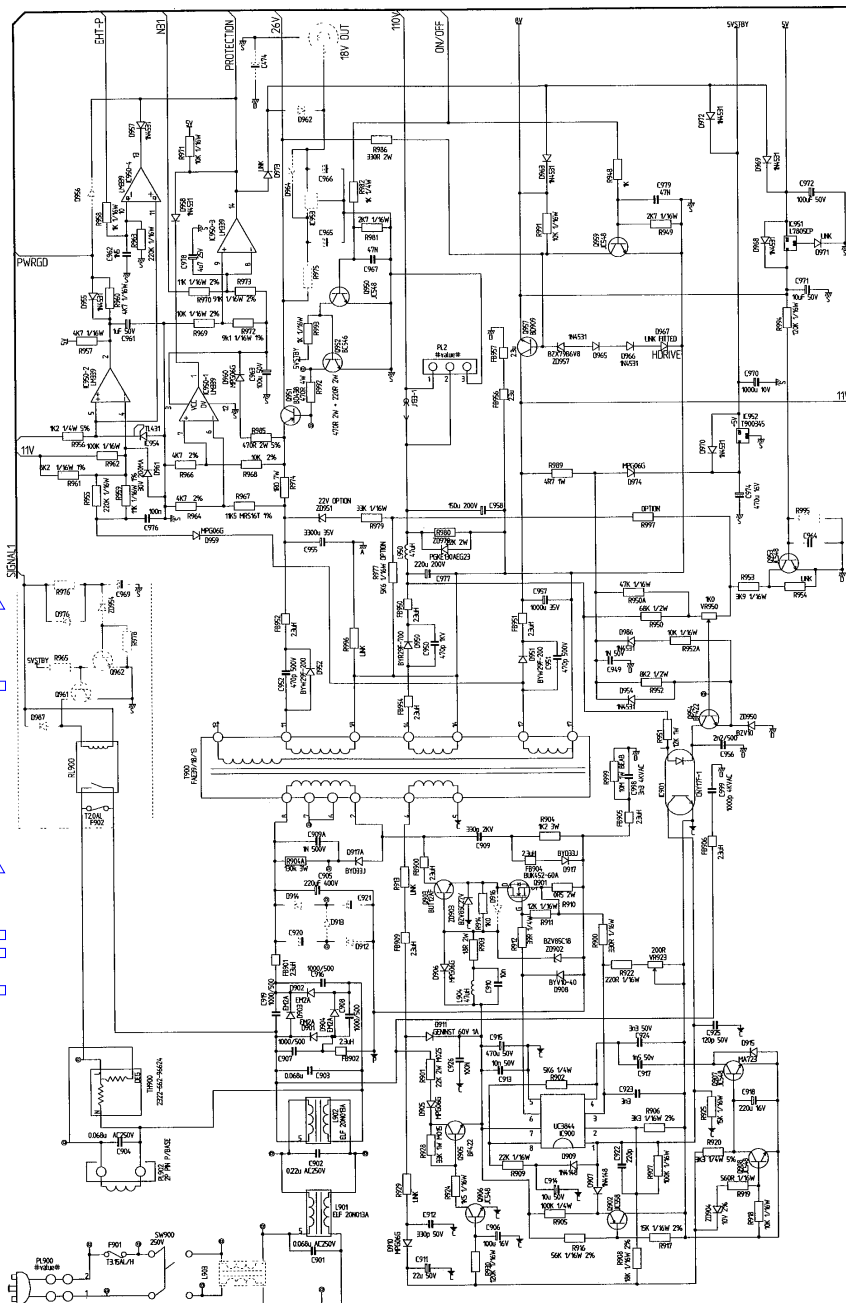


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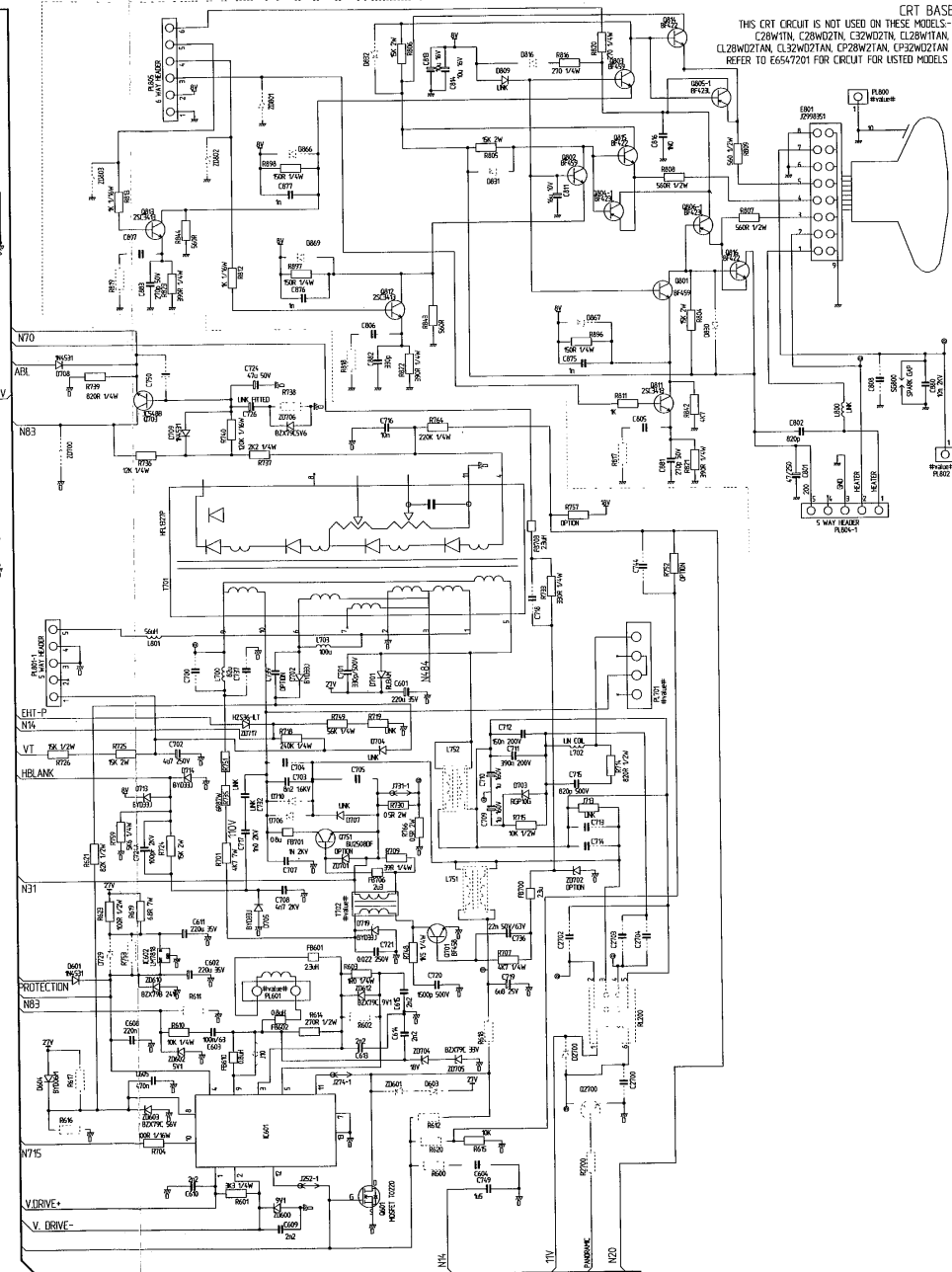
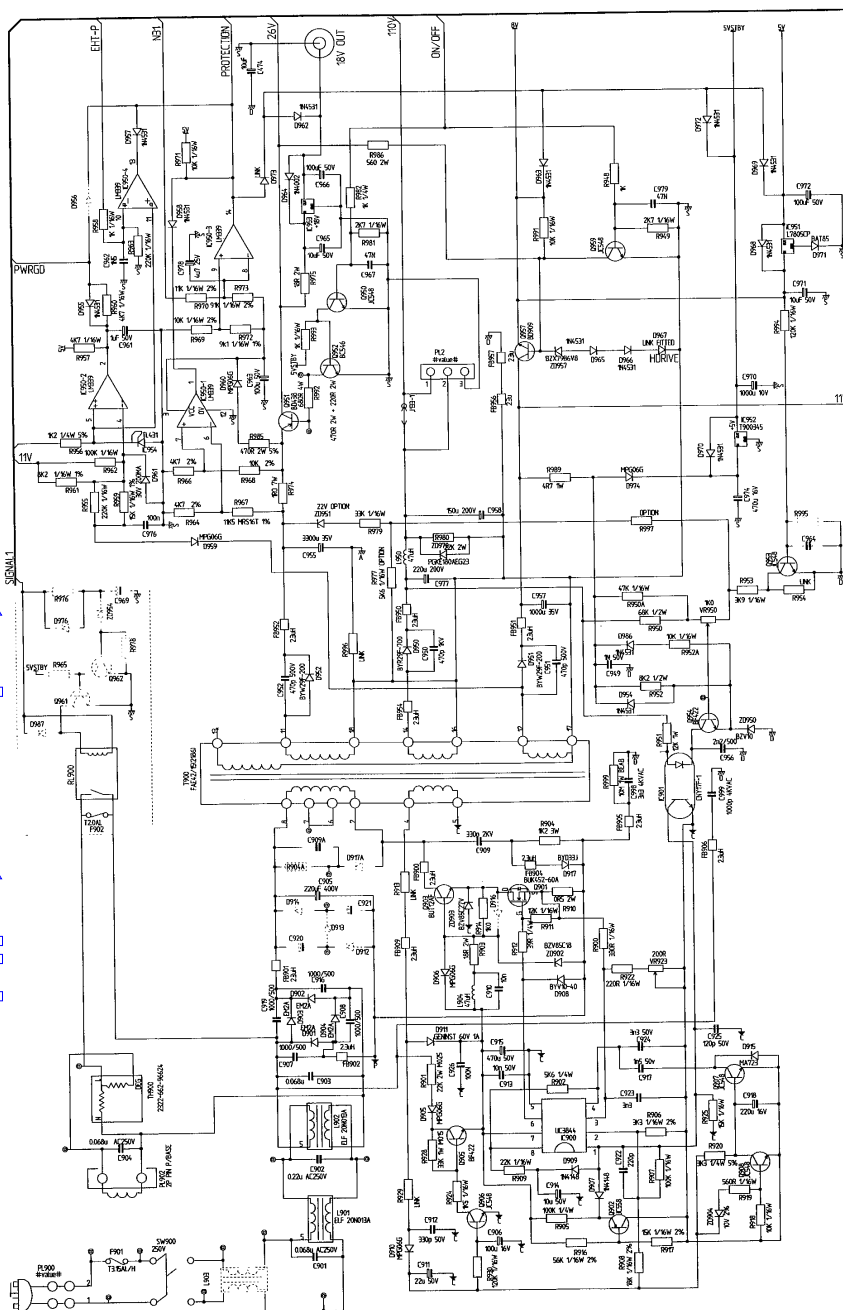


SIGNAL CIRCUIT DIAGRAM C24W1TN
SCHÉMA DE MONTAGE DE CIRCUIT DE TRAITEMENT DU SIGNAL C24W1TN
SIGNALSCHALTBILD C24W1TN

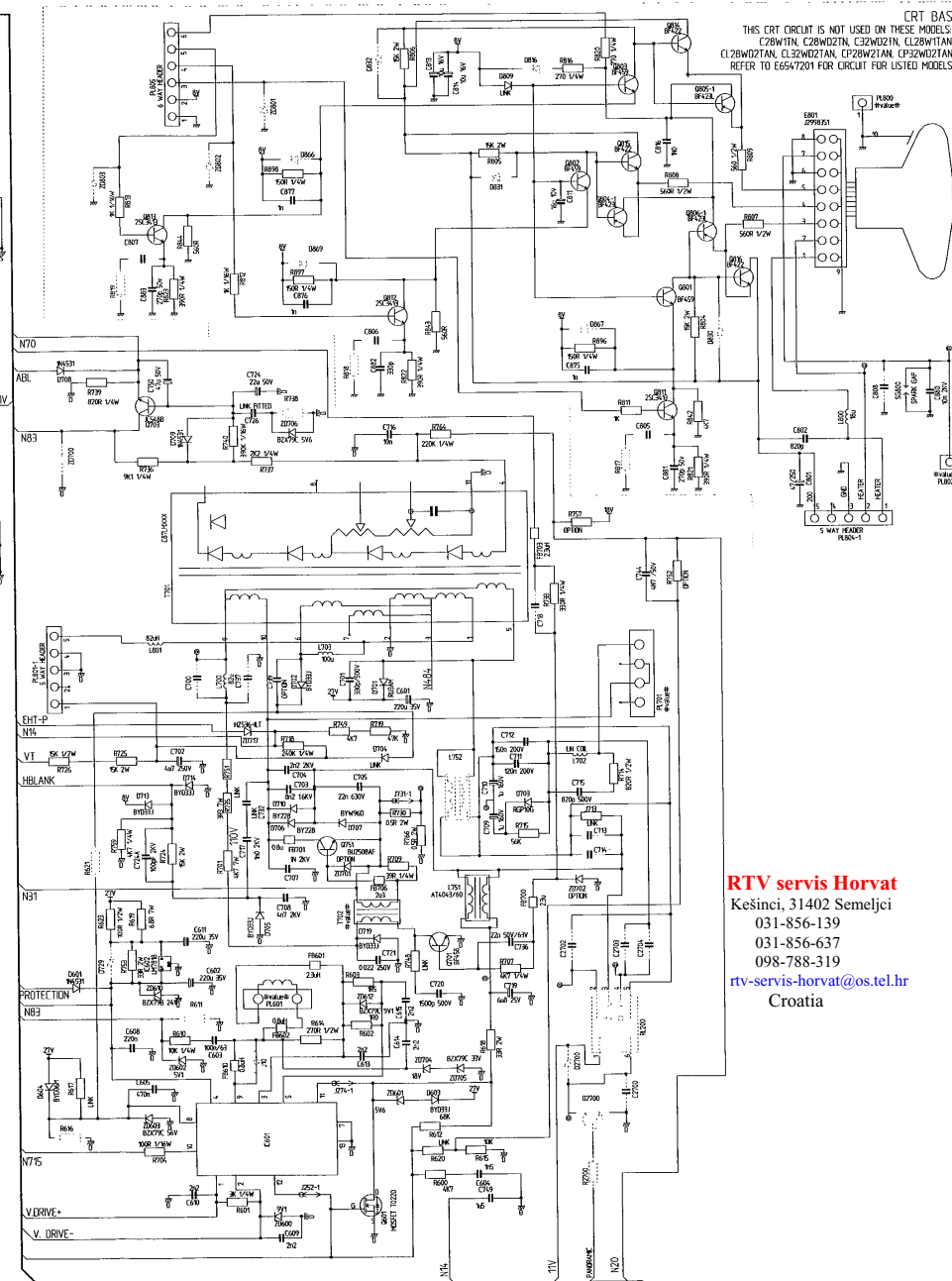
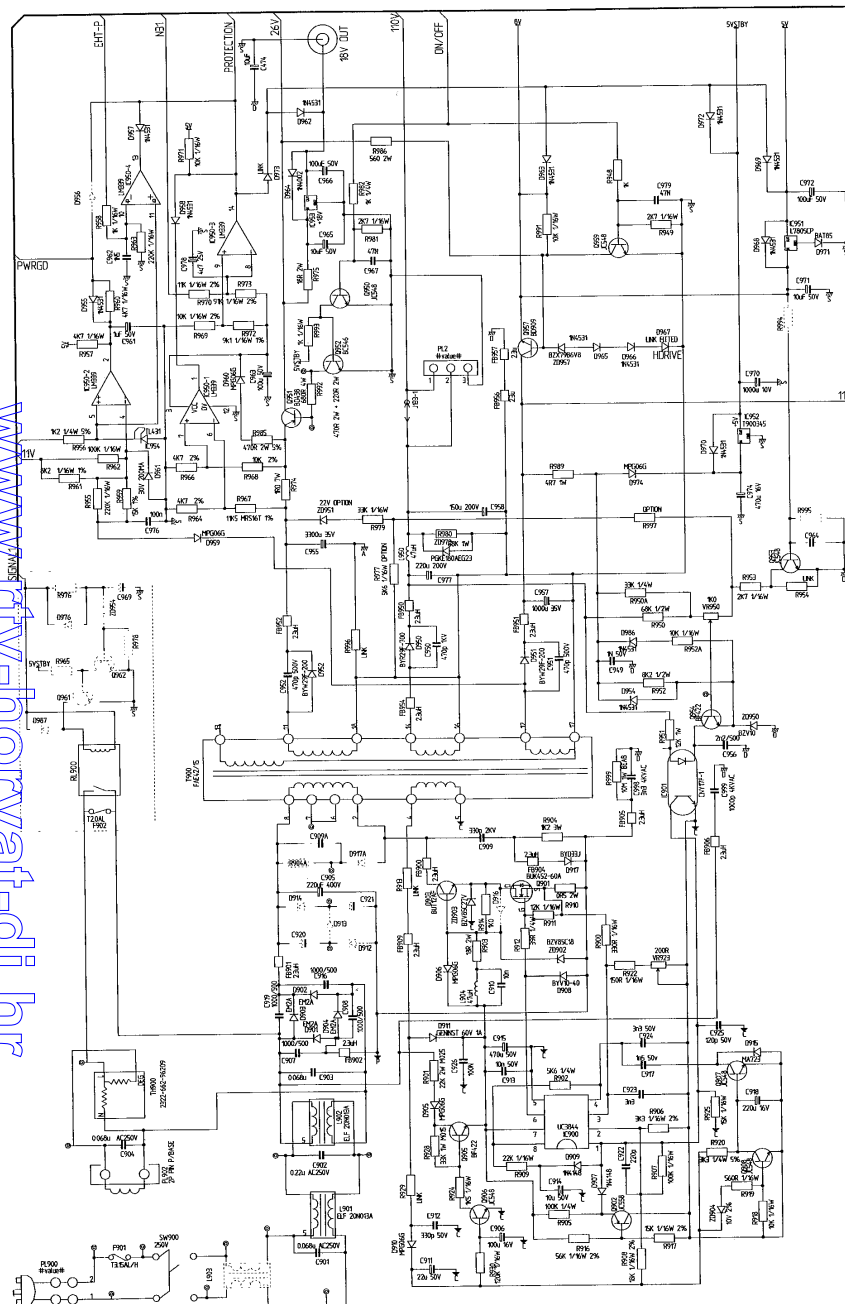


POWER AND DEFLECTION CIRCUIT DIAGRAM CL2156TAN
 SCHÉMA DE MONTAGE DE CIRCUIT DE PUISSANCE ET DE DÉVIATION CL2156TAN
 SCHALTBILD NETZSPANNUNG UND ABLENKUNG CL2156TAN

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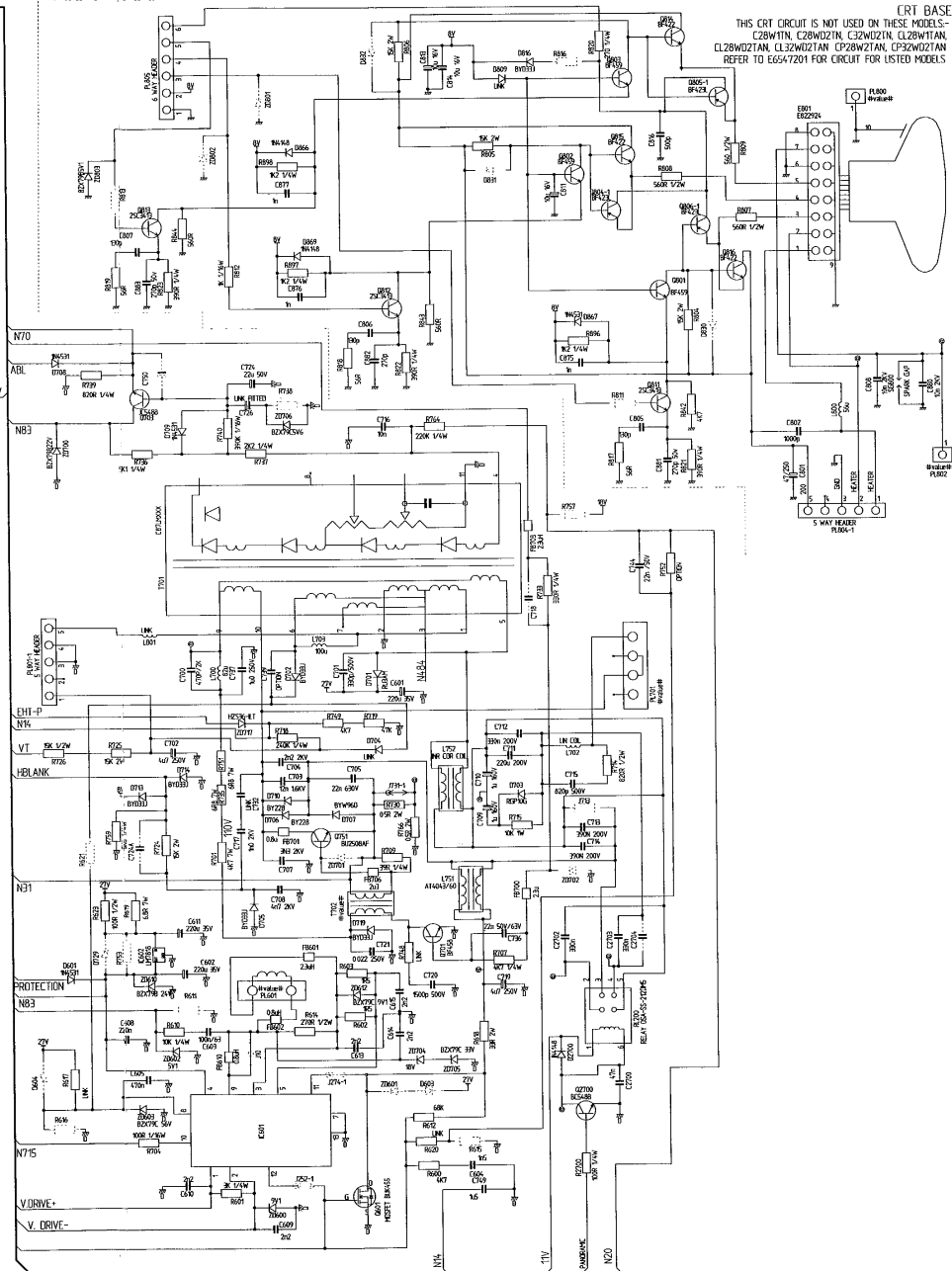
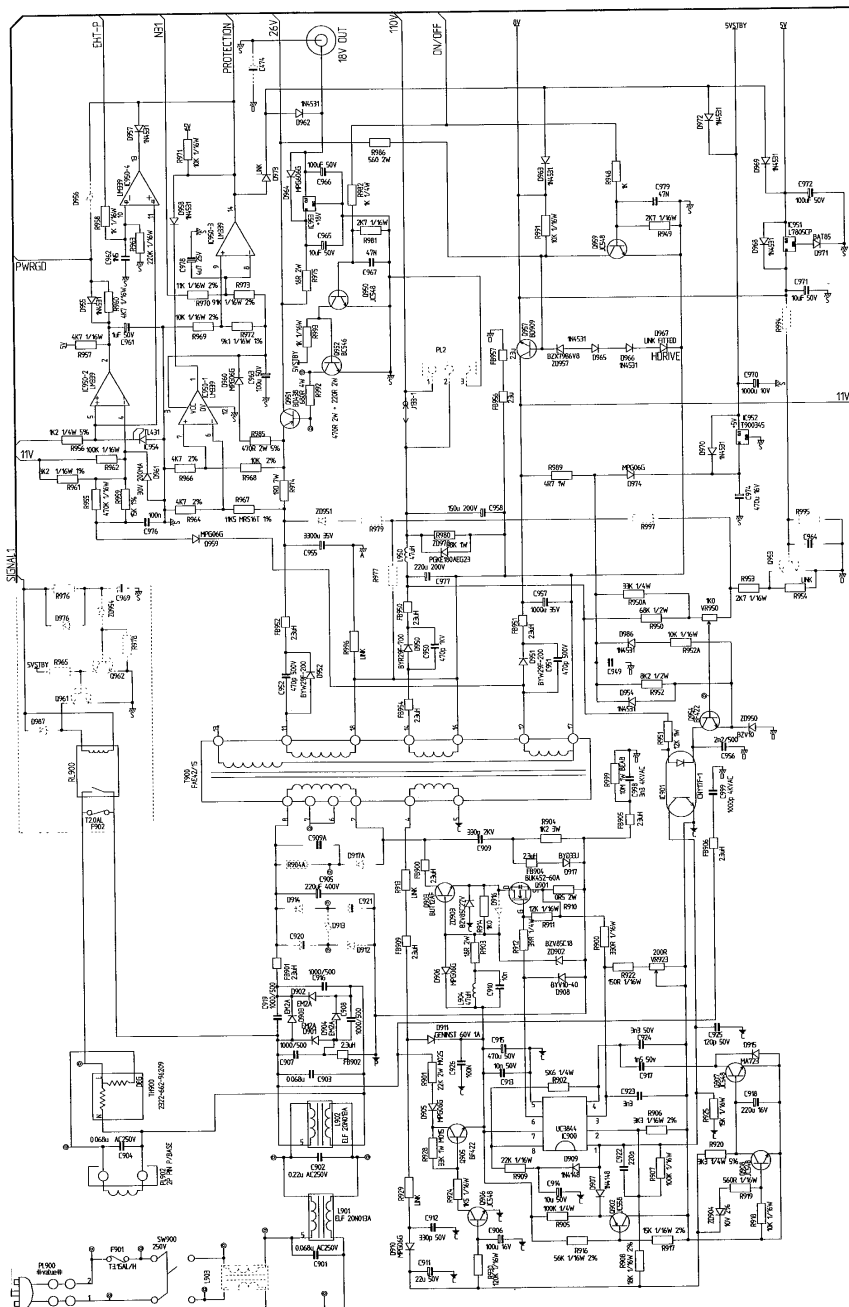


POWER AND DEFLECTION CIRCUIT DIAGRAM C2186TN
 SCHÉMA DE MONTAGE DE CIRCUIT DE PUISSANCE ET DE DÉVIATION C2186TN
 SCHALTBILD NETZSPANNUNG UND ABLENKUNG C2186TN

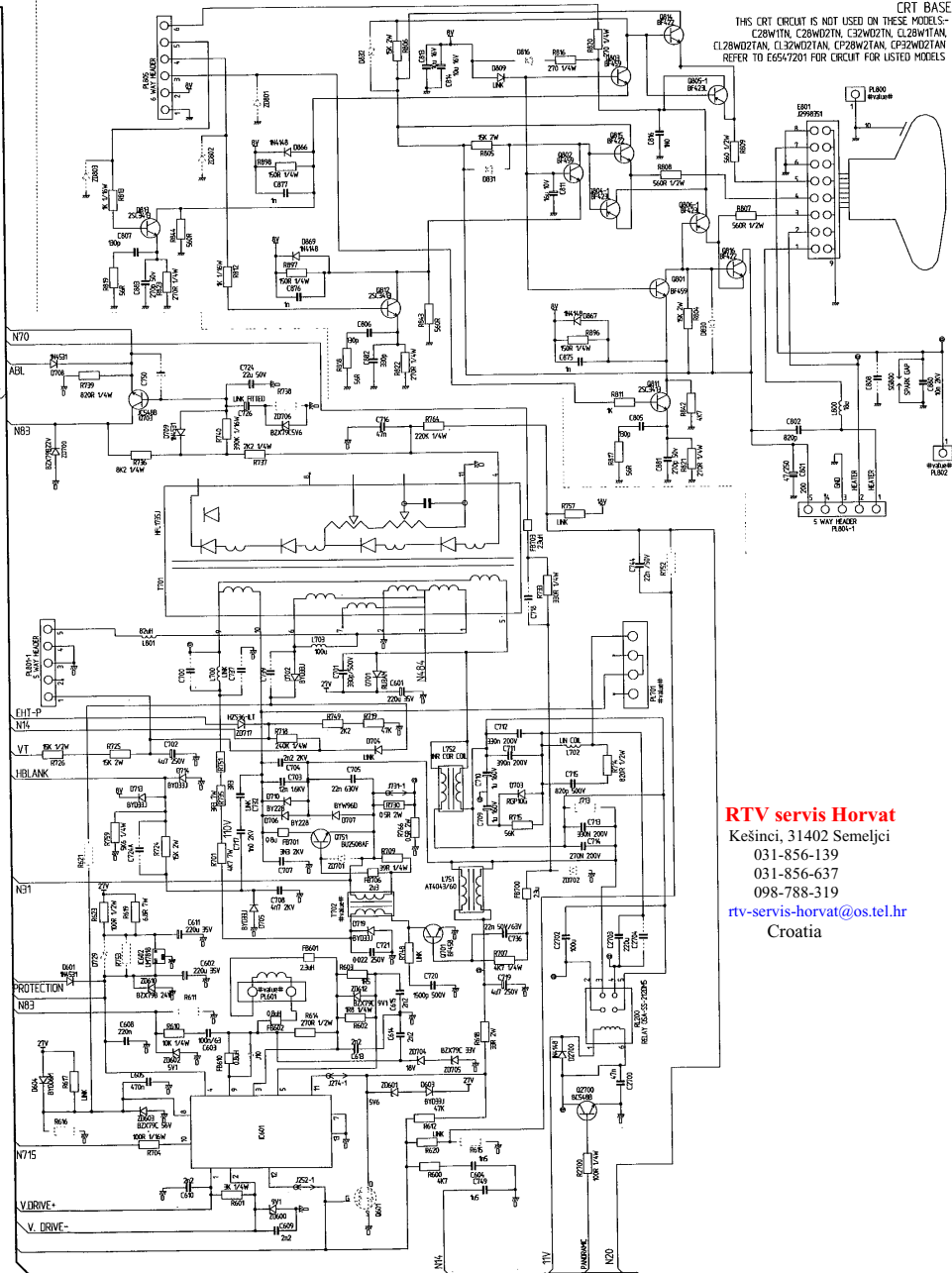
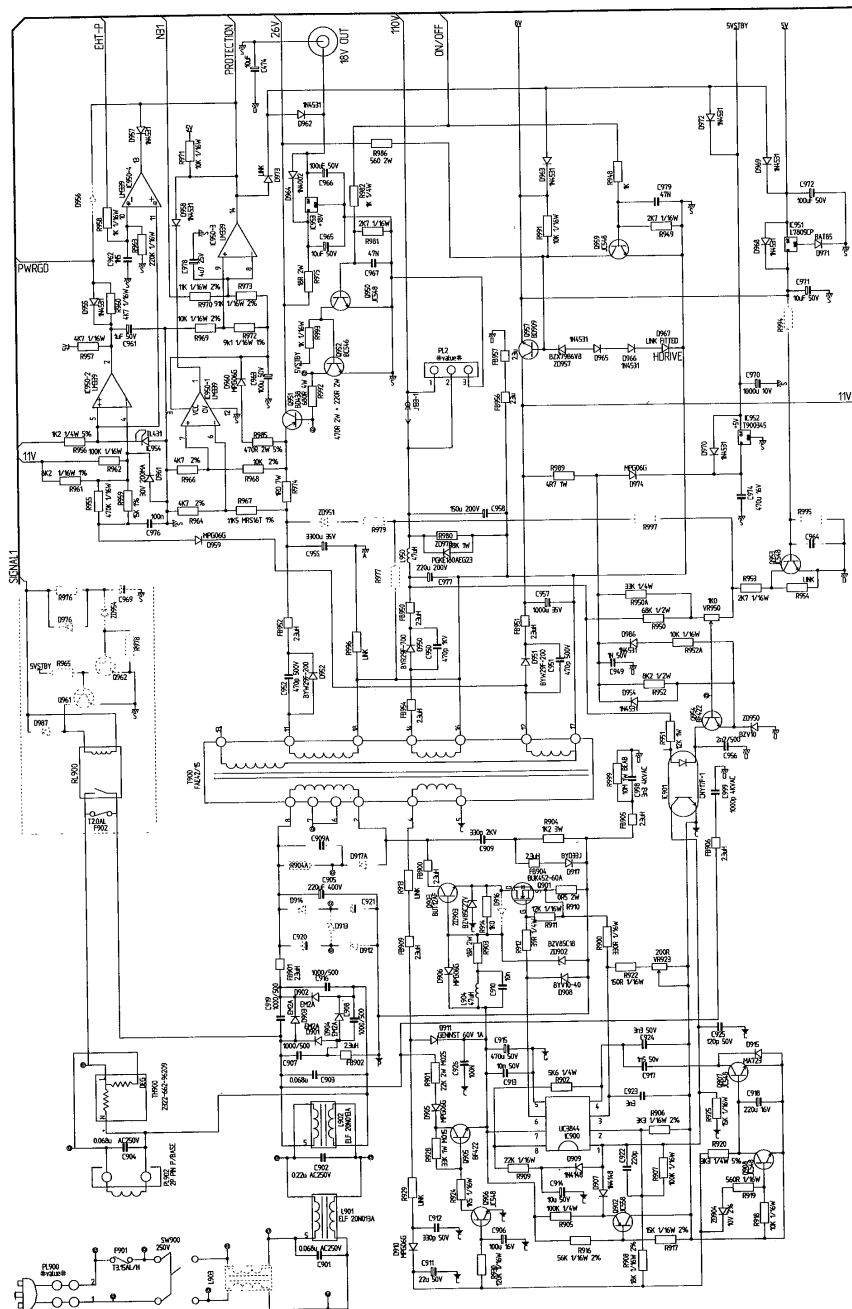


POWER AND DEFLECTION CIRCUIT DIAGRAM CL2886TAN
SCHEMA DE MONTAGE DE CIRCUIT DE PUISSANCE ET DE DÉVIATION CL2886TAN
SCHALTBILD NETZSPANNUNG UND ABLENKUNG CL2886TAN

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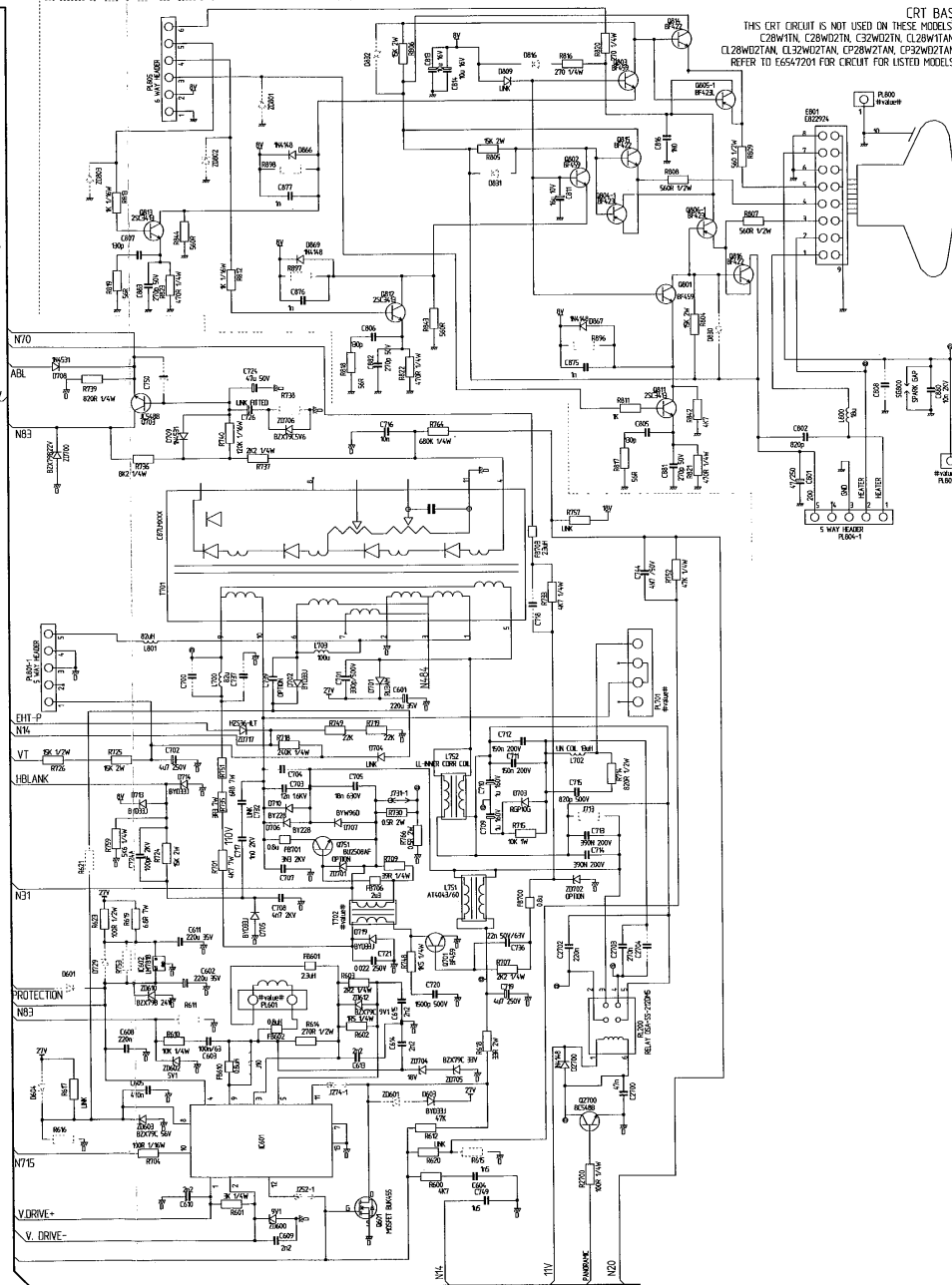
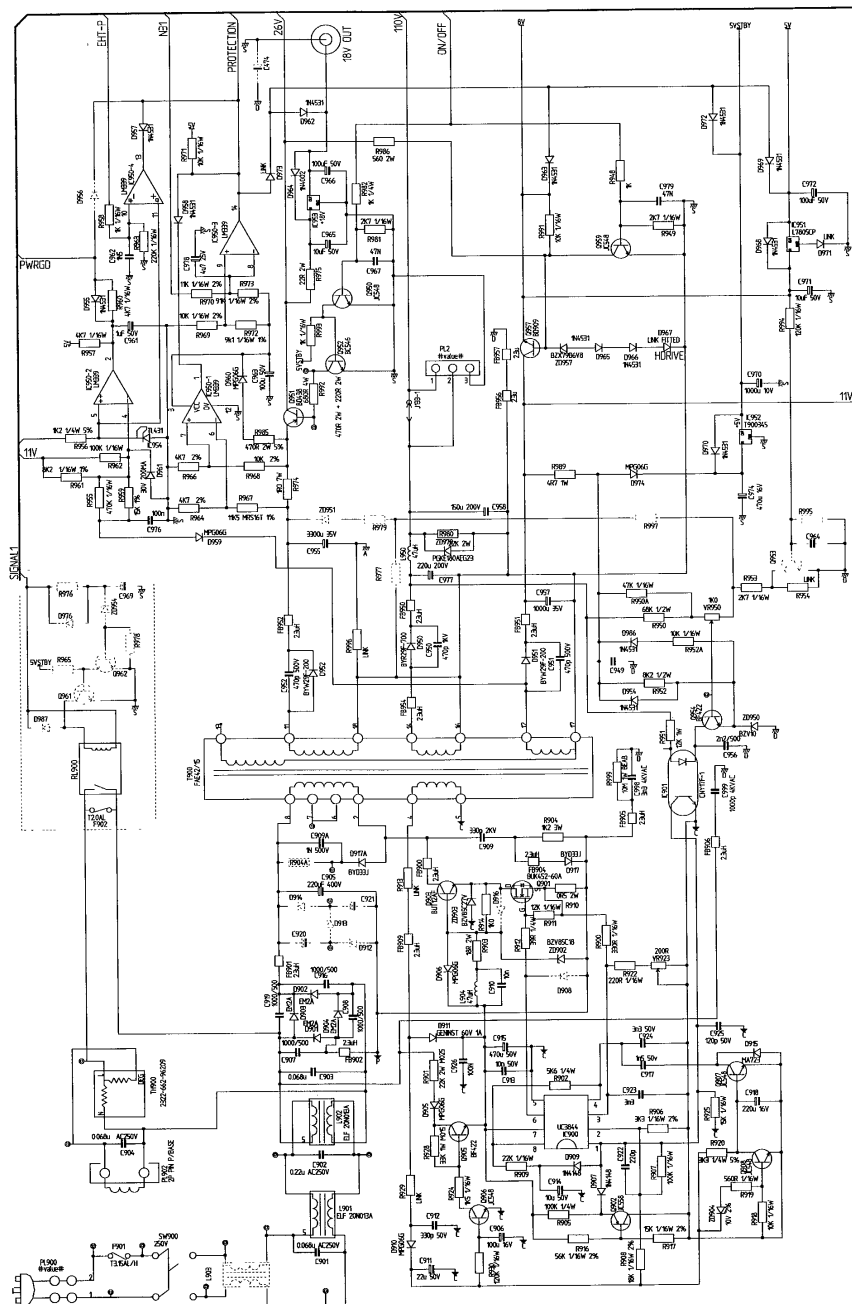


POWER AND DEFLECTION CIRCUIT DIAGRAM CL28WD2TAN
SCHÉMA DE MONTAGE DE CIRCUIT DE PUISSANCE ET DE DÉVIATION CL28WD2TAN
SCHALTBILD NETZSPANNUNG UND ABLENKUNG CL28WD2TAN

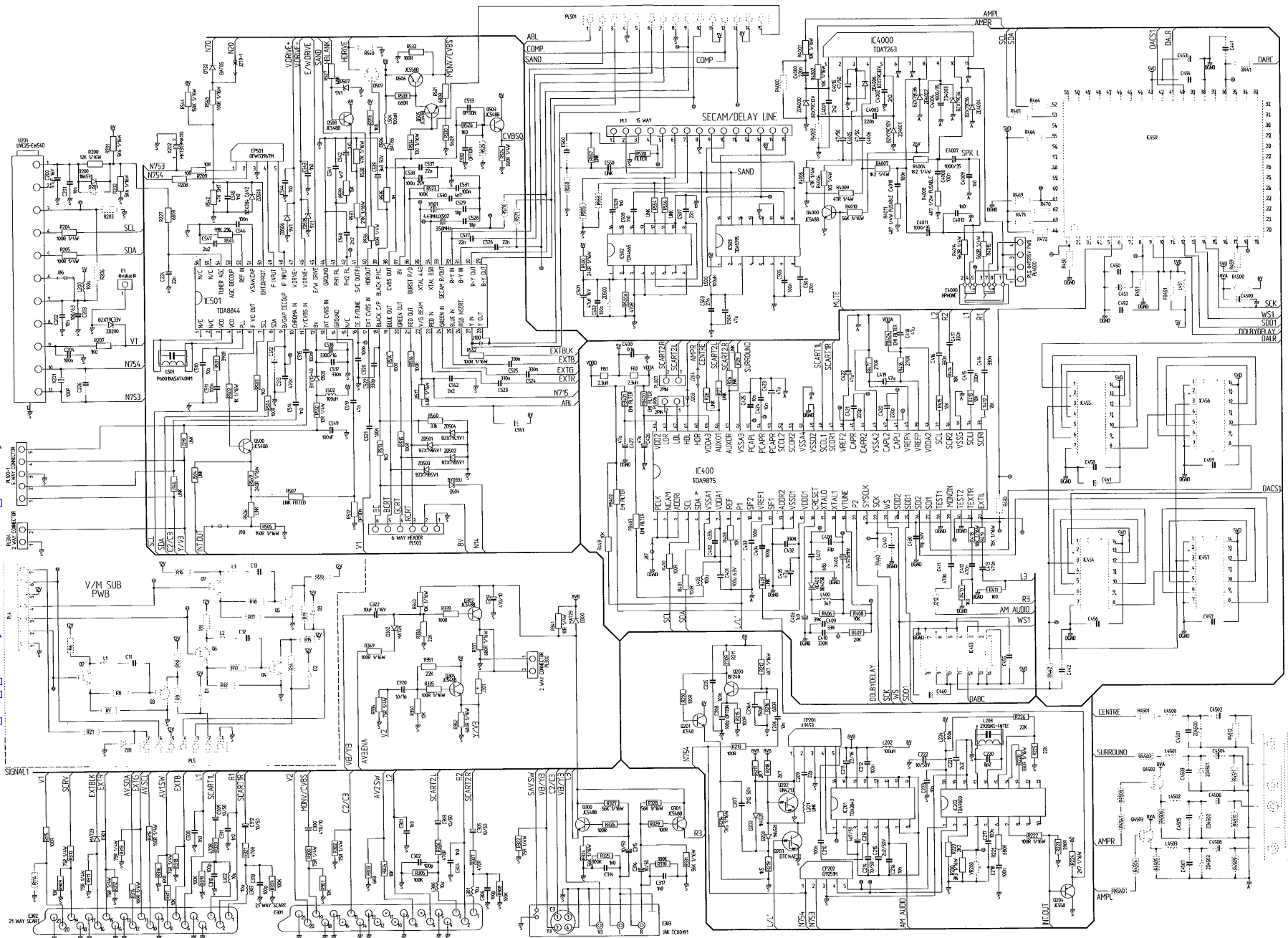


POWER AND DEFLECTION CIRCUIT DIAGRAM CL32WD2TAN
 SCHÉMA DE MONTAGE DE CIRCUIT DE PUISSANCE ET DE DÉVIATION CL32WD2TAN
 SCHALTBILD NETZSPANNUNG UND ABLENKUNG CL32WD2TAN

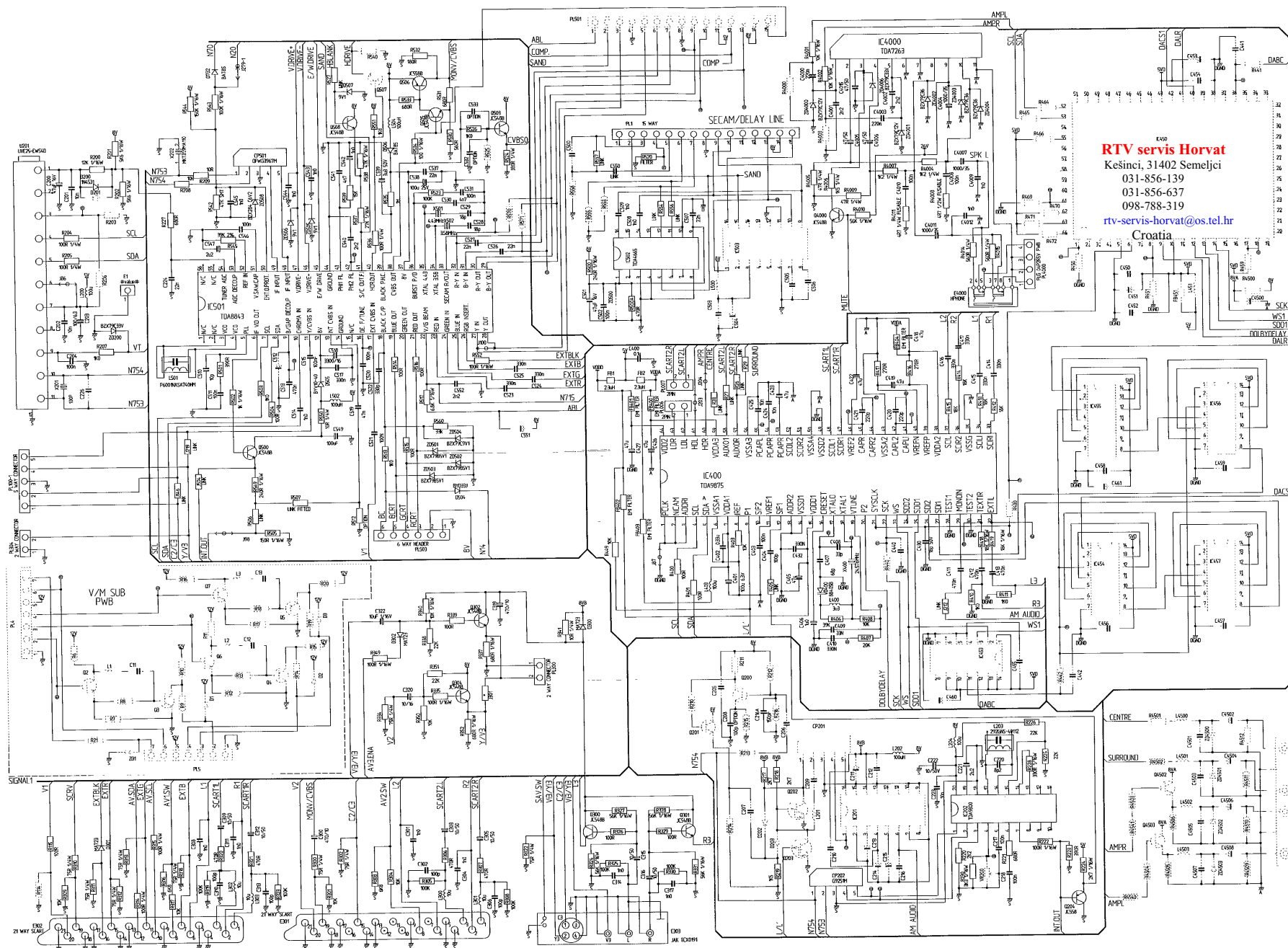
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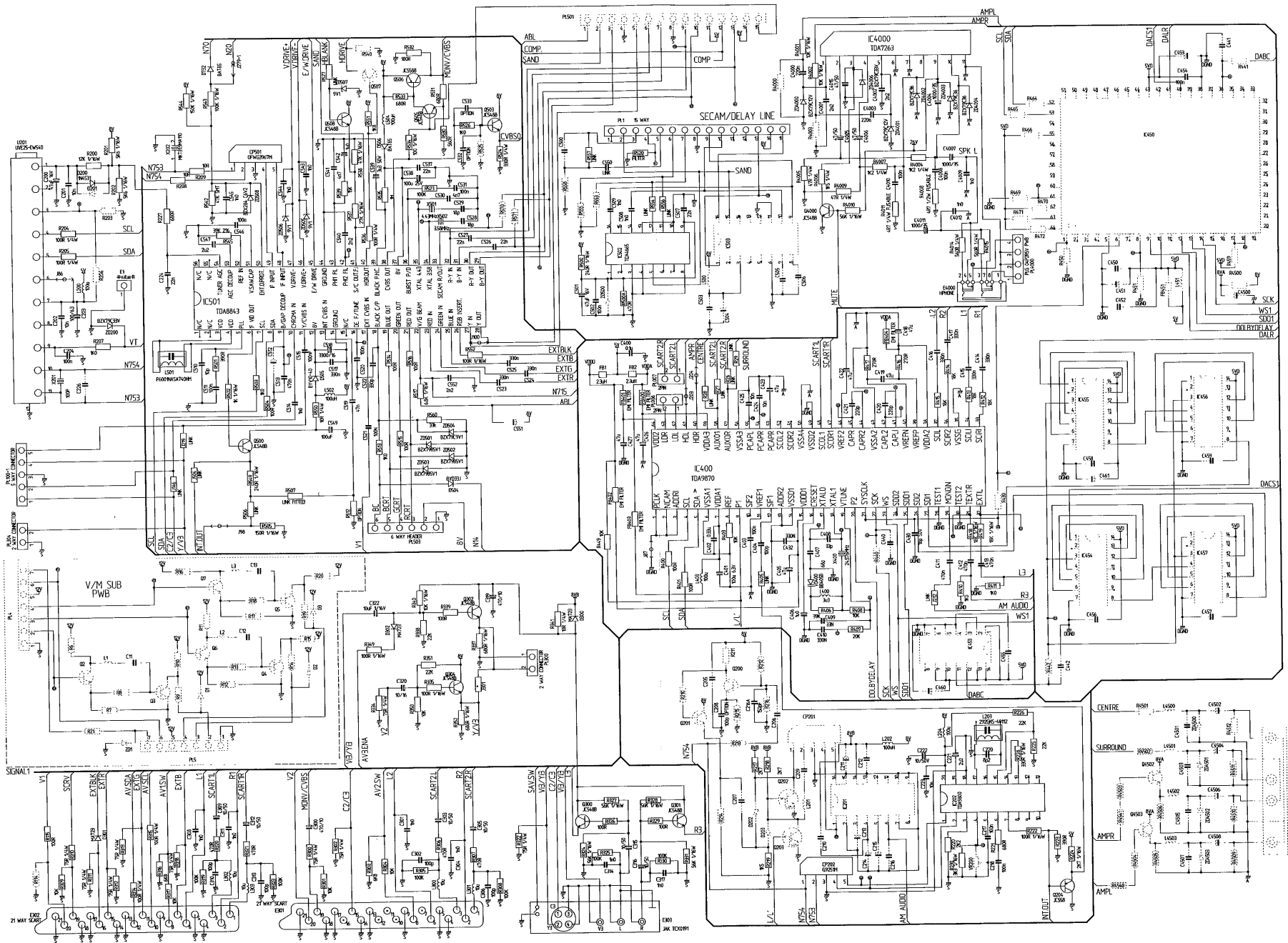
POWER AND DEFLECTION CIRCUIT DIAGRAM CL24W1TAN
 SCHÉMA DE MONTAGE DE CIRCUIT DE PUISSANCE ET DE DÉVIATION CL24W1TAN
 SCHALTBILD NETZSPANNUNG UND ABLENKUNG CL24W1TAN



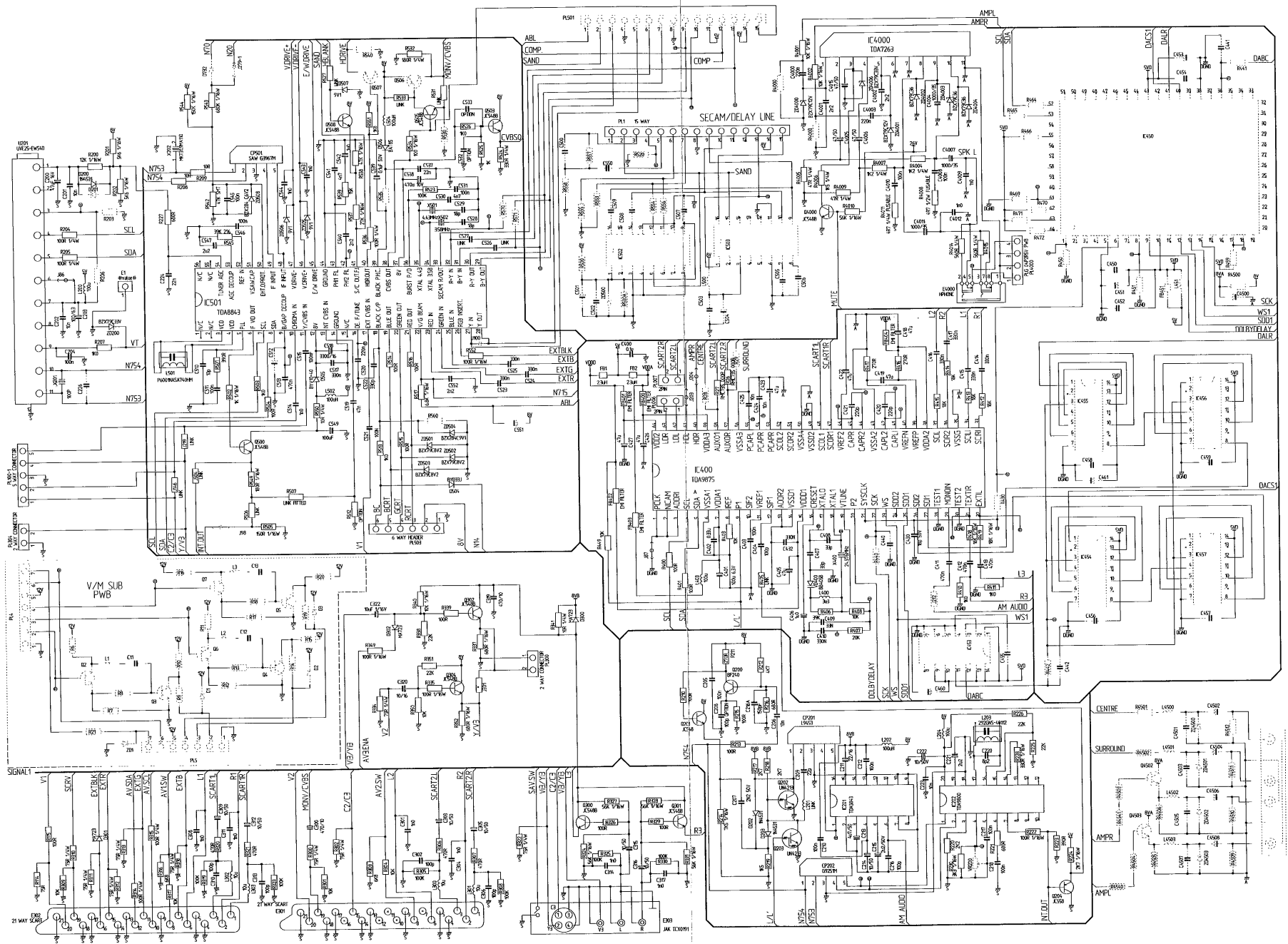
SIGNAL CIRCUIT DIAGRAM CL2856TAN
 SCHÉMA DE MONTAGE DE CIRCUIT DE TRAITEMENT DU SIGNAL CL2856TAN
 SIGNALSCHALTBIID CL2856TAN



SIGNAL CIRCUIT DIAGRAM CP2856TAN
SCHÉMA DE MONTAGE DE CIRCUIT DE TRAITEMENT DU SIGNAL CP2856TAN
SIGNALSCHALTBILD CP2856TAN



SIGNAL CIRCUIT DIAGRAM CP2856TA
 SCHÉMA DE MONTAGE DE CIRCUIT DE DE TRAITEMENT DU SIGNAL CP2856TA
 SIGNALSCHALTBIID CP2856TA



SIGNAL CIRCUIT DIAGRAM CL24W1TAN
SCHEMA DE MONTAGE DE CIRCUIT DE DE TRAITEMENT DU SIGNAL CL24W1TAN
SIGNALSCHALTBIKD CL24W1TAN



PRODUCT SAFETY NOTE: Components marked with a Δ have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** of this service manual. Don't degrade the safety of this receiver through improper servicing.

NOTE DE SECURITE PRODUIT : Les composants marqués d'un Δ ont une caractéristique de sécurité importante. Avant de procéder à tout remplacement de ces composants, lire avec soin la **NOTICE DE SECURITE PRODUIT** de ce manuel d'entretien. Ne mettez pas en cause la sécurité de ce récepteur en le réparant de manière incorrecte.

HINWEIS ZUR PRODUKTSICHERHEIT: Mit Δ gekennzeichnete Teile sind für die Betriebssicherheit von besonderer Bedeutung. Lesen Sie die **HINWEISE ZUR PRODUKTSICHERHEIT** aufmerksam durch, bevor Sie ein solches Teil auswechseln. Beeinträchtigen Sie die Sicherheit dieses Geräts nicht durch unsachgemäße Wartungsarbeiten.

CRN	Part No.	Models	CRN	Part No.	Models	CRN	Part No.	Models
C001	J0880194R		C310	J0890074R		C458	J0893027R	
C002	J0890083R		C311	J0880031R		C459	J0893027R	
C003	J0893027R		C312	J0800294R		C460	J0800326R	
C004	J0800326R		C313	J0890074R		C461	J0800326R	
C006	J0890084R		C314	J0880031R		C474	J0800291R	
C009	J0880194R		C315	J0800294R		C480	J0890076R	
C010	J0880194R		C316	J0800294R		C481	J0890076R	
C011	J0893027R		C317	J0880031R		C501	J0800317R	
C012	J0228042R		C319	J0800352R		C502	J0880194R	
C013	J0228042R		C320	J0800291R		C503	J0880194R	
C014	J0800333R		C322	J0800291R		C504	J0800317R	
C016	J0880194R		C400	J0880194R		C505	J0880194R	
C017	J0880194R		C4000	J0880062R		C506	J0880062R	
C018	J0880194R		C4001	J0880035R		C507	J0880048R	
C020	J0890064R		C4002	J0880035R		C508	J0880031R	
C021	J0800326R		C4003	J0880062R		C509	J0880031R	
C022	J0800326R		C4004	J0800363F		C510	J0890114R	
C023	J0800326R		C4005	J0800321R		C511	J0880194R	
C025	J0800282R		C4006	J0800321R		C513	C457883	
C1300	J0880194R		C4007	J0800363F		C514	J0880031R	
C1301	J0880194R		C4008	J0880194R		C515	J0880194R	
C1302	J0880194R		C4009	J0880031R		C517	C353883	
C1303	J0893027R		C401	J0800324R		C518	J0800371F	
C1304	J0880194R		C4010	J0880194R		C519	J0880053R	
C1305	J0880035R		C4011	J0800363F		C520	J0893013R	16:9
C1306	J0880035R		C4012	J0880031R		C520	J0893027R	56's/86's
C1307	J0880044R		C4015	J0800321R		C521	J0880194R	
C1308	J0800317R		C402	C353883		C522	J0228066R	
C1310	H163007		C403	J0880194R		C523	J0880064R	
C1313	J0800291R		C404	J0890074R		C524	J0880064R	
C1314	J0800317R		C405	J0800321R		C525	J0880064R	
C2	J0880194R		C406	J0800279R		C526	H163007	16:9
C200	J0800317R		C407	J0228042R		C526	J0880048R	56's/86's
C201	C140759		C408	J0228042R		C527	H163007	16:9
C202	J0880044R		C409	C343882		C527	J0880048R	56's/86's
C203	J0800324R		C410	C353883		C528	J0890117R	2186/56's/16:9
C204	J0880194R		C411	C457759		C528	J0890121R	25" & 28" 86's
C205	J0880194R		C412	C457759		C529	J0890117R	
C206	J0880044R		C413	C457759		C530	J0880039R	
C207	J0880035R		C414	C353883		C531	J0880194R	
C209	J0890118R		C415	C353883		C537	J0880048R	
C210	J0880194R		C416	C353883		C538	J0800327R	56's/86's
C211	J0800299R		C417	C353883		C538	J0800352R	16:9
C212	J0880194R		C418	J0800317R		C539	J0800284R	56's/86's
C213	J0800288R		C419	J0800317R		C539	J0880194R	16:9
C214	J0800294R		C420	J0228062R		C540	J0893035R	
C215	J0800282R		C421	J0228062R		C541	J0880039R	
C216	J0880044R		C422	J0800317R		C542	J0800279R	
C216A	J0228758R	CL 86, CL 16:9	C423	J0800317R		C543	J0893031R	
C216A	J0890076R	CL 56	C424	C140882		C544	J0893031R	
C217	J0880194R		C425	C140882		C545	J0290238R	56's/86's
C218	J0880194R		C426	J0800317R		C545	J0893027R	16:9
C220	C802182		C427	J0800317R		C546	C150711	
C221	J0800282R		C430	J0228736R		C547	J0800282R	
C222	J0800294R		C432	C353883		C549	J0800326R	
C223	J0880044R		C450	J0880194R		C550	H163007	
C224	J0880048R		C4501	J0880048R	86's	C552	J0880035R	
C24	J0800292R		C4501	J0893048R	16:9 Dolby	C6001	J0893031R	
C2700	J0880053R		C4502	J0800326R		C6002	J0893031R	
C2702	J0299926F	32" 16:9	C4503	J0880048R	86's	C6003	J0893031R	
C2702	J0299930F	24" 16:9	C4503	J0893048R	16:9 Dolby	C6004	J0893031R	
C2702	J0299932F	28" 16:9	C4504	J0800326R		C6005	J0893027R	
C2703	J0299930F	32" 16:9	C4505	J0880035R		C6006	J0893027R	
C2703	J0299931F	24/28" 16:9	C4506	J0800326R		C6007	J0893027R	
C300	J0800352R		C4507	J0880035R		C6008	J0893027R	
C301	J0880031R		C4508	J0800326R		C6009	J0893027R	
C302	J0890074R		C451	J0800324R		C601	J0800337R	
C303	J0800294R		C452	J0880194R		C6010	J0893027R	
C304	J0880031R		C453	J0800324R		C6011	J0893027R	
C305	J0800294R		C454	J0880194R	16:9 Dolby	C6013	J0800291R	
C306	J0890074R		C454	J0893027R	86's	C6014	J0893027R	
C308	J0880031R		C457	J0893027R		C6015	J0893027R	
C309	J0800294R							

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CRN	Part No.	Models	CRN	Part No.	Models	CRN	Part No.	Models
C6016	J0893027R		C716	C140707		C883	J0890081R	25/28" 56's
C6017	J0893027R		C717	J0244211R		Δ C901	C648751	
C6018	J0800291R		C718A	J0299933R		Δ C902	J0262774N	
C6019	J0800291R		C719	J0253971F	16:9	Δ C903	C648751	
C602	J0800337R		C719	J0259472N	56/86's	Δ C904	C648751	
C6020	J2784693		C720	J0244503R		C905	C001544	
C6021	J0228040R		C721	J0250511R		C906	J0800326R	
C6022	J0893027R		C724	J0800282R	21" 56's	C907	J0244501R	
C6023	J0228040R		C724	J0800303R	86's 16:9	C908	J0244501R	
C6027	J0880194R		C724	J0800321R	25"/28" 56's	C909	JAJ00127F	
C6028	J0880194R		C724A	JAJ00121		C909A	J0244501R	
C6029	J0880194R		C724B	JAJ00121		C910	J0880044R	
C603	J0880194R		C726	H163007		C911	J0800303R	
C6030	J0800279R		C732	H163007		C912	J0890081R	
C6037	J0800326R		C736	J0880048R		C913	J0880044R	
C6038	J0800326R		C737	C160708		C914	J0800294R	
C604	J0880033R		C744	J0880039R	24" 16:9/56 86's	C915	J0800356F	
C6041	C457883		C744	J0880048R	28", 32" 16:9	C916	J0244501R	
C6042	C457883		C749	J0880033R		C917	C135713	
C6043	J0800317R		C750	J0800316R		C918	J0800335R	
C6044	J0800291R		C801	J0253975F		C919	J0244501R	
C6045	C457883		C802	J0243512R	56's/86's 24"	C922	J0890078R	
C6046	C457883				16:9	C923	J0880037R	
C6047	J0800317R		C802	J0890087R	28", 32" 16:9	C924	J0880037R	
C6048	J0893027R		C805	J0246467R		C925	J0890075R	
C605	C457759		C806	J0246467R		C926	J0880194R	
C6050	J0880194R		C807	J0246467R		C950	JAJ00129R	
C6051	J0893027R		C808	E884110		C951	J0243509R	
C6053	J0880194R		C811	J0800291R	28", 32" 16:9	C952	J0243509R	
C6054	J0880194R		C811	J0800326R	56/86's 24" 16:9	C955	J0253935F	
C608	J0880062R		C813	J0800291R		C956	J0244505R	
C609	J0880035R		C814	J0800291R		C957	J0800363F	
C610	J0890092R		C815	J0890084R		C958	J0253492	
C611	J0800337R		C816	J0890084R	28", 32" 16:9	C961	J0800279R	
C613	J0244505R		C816	J0890087R	24" 16:9	C962	J0880033R	
C614	J0244505R		C817	J0890084R		C963	J0800329R	
C615	J0244505R		C840	J0890071R		C965	J0800294R	
C700	J0244202F		C841	J0890071R		C966	J0800329R	
C701	J0243507R		C842	J0890071R		C967	J0880053R	
C702	J0257540F		C843	J0800327R		C970	J0800359F	
C703	C142760	16:9	C844	J0880194R		C971	J0800294R	
C703	C832760	56/86's	C860	J0800327R		C972	J0800329R	
C704	J0244215R		C861	J0880194R		C974	J0800353R	
C705	J0299993F	24" 16:9	C864	J0880194R		C976	J0880194R	
C705	J0299994F	56's/86's/ 28" 16:9	C865	J0890116R		C977	J0259431F	
			C866	J0890075R		C978	J0800286R	
			C867	J0880194R		C979	J0880053R	
C705	J0299995F	32" 16:9	C868	J0880194R		Δ C998	C333753	
C707	C333760	32" 16:9	C869	J0880194R		Δ C999	C130753	
C707	JAJ00134	56's/86's	C870	C242711		CLIP	N235033	
C707	JAJ00141F	24/28" 16:9	C871	C242711		CP201	J2305541	
C708	J0245612F		C872	C140711		CP202	E518050	Export
C709	J0253952R	56's/86's, 24/28"	C873	C150711		CP202	E518052	UK
		16:9	C874	C150711		CP501	E518051	UK
C709	J0253953R	32" 16:9	C875	C130877	56/86's 24" 16:9	CP501	E518068	Export
C710	J0253952R	56's/86's, 24/28"	C875	J0253973R	28", 32" 16:9	D001	J2348921M	
		16:9	C876	C130877	56/86's 24" 16:9	D002	J2348921M	
C710	J0253953R	32" 16:9	C876	J0800279R	28", 32" 16:9	D003	J2348921M	
C711	J0262783F	25"/28" 56/86's	C877	C130877	56/86's 24" 16:9	D004	J2348921M	
C711	J0299932F	24" 16:9	C877	J0800279R	28", 32" 16:9	D020	T531055	
C711	J0299930F	28" 16:9	C878	J0258124R		D200	J2348921M	
C711	J0299933F	21", 32" 16:9	C879	J0258124R		D202	J2348921M	
C712	J0262785F	25/28" 56/86's	C880	E884110		D203	J2348921M	
C712	J0299928F	21"	C881	J0890077R	24" 16:9	D2700	T531053	
C712	J0299929F	24" 16:9	C881	J0890079R	21", 86's 28", 32"	D300	T531068	
C712	J0299932F	28", 32" 16:9			16:9	D301	T531068	
C713	J0299932F	32" 16:9	C881	J0890081R	25/28" 56's	D302	T531068	
C713	J0299933F	28" 16:9	C882	J0890077R	24" 16:9	D504	T431113	
C713	J0299934F	24" 16:9	C882	J0890079R	28", 32" 16:9	D505	T531056	
C714	J0299931F	32" 16:9	C882	J0890081R	21" & 86's	D506	T531055	56's/86's
C714	J0299933F	28" 16:9	C882	J0890082R	25/28" 56's	D506	T531056	16:9
C714	J0299934F	24" 16:9	C883	J0890077R	24" 16:9	D543	J2348921M	
C715	J0243512R		C883	J0890079R	21" & 86's	D6001	T531067	

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CRN	Part No.	Models	CRN	Part No.	Models	CRN	Part No.	Models
D6002	T531067	21" 25/28", 16:9	D970	J2348921M	56's, W1's 86's, WD2's 25"/28" 56's/ 86's, 24" 16:9 21" 28", 32" 16:9 24" 16:9 21"/25" 56's, 86's, 28", 32" 16:9 28" 56's, 86's, 28" 16:9 56's, 86's, 24", 32" 16:9	FB700	J2123462M	56's, 86's, 28", 32" 16:9
D6003	T531067		D971	H163007		FB701	J2123461M	All except Greek Greek Models 56's, 86's 16:9
D6004	T531067		D972	J2348921M		FB703	J2123462M	
D6005	T531067		D973	H163007		FB706	J2123462M	
D6006	T531067		D974	J2343962M		FB850	J2123461M	
D601	J2348921M		D977	J2348921M		FB851	J2123461M	
D604	T431123		D986	E846903		FB852	J2123461M	
D701	J2336612		E1	E841051		FB900	J2123462M	
D702	T431113		E1	E841052		FB901	J2123462M	
D703	J2343941M		E2	E841056		FB902	J2123462M	
D704	H163007		E2	H114001		FB904	J2123462M	
D705	T431113		E3	H114002		FB905	J2123462M	
D706	T431117F		E3	H114005		FB906	J2123462M	
D707	H163007		E3	E846876		FB909	J2123462M	
D707	T431116F		E3	J2975131		FB950	J2123462M	
D708	J2348921M		E300	E846825	56's, 86's 28", 32" 16:9 24" 16:9 56's, 86's, 24", 28" 16:9 32" 16:9 56's, 86's, 24" 16:9 28", 32" 16:9 28", 32" 16:9 56's, 86's, 24" 16:9	FB951	J2123462M	
D709	J2348921M		E301	E826923		FB952	J2123462M	
D710	T431117F		E302	E826923		FB954	J2123462M	
D713	T431113		E303	J2673821		FB956	J2123462M	
D714	T431113		E4	H114002		FB957	J2123462M	
D719	T431113		E4000	J2672041		IC001	T900742	Tn's & Tan's Ta's 25", 28" 56's, 86's 21" 56's 21" 86's 24", 28" 16:9 32" 16:9
D732	T531055		E4500	E826157		IC002	T900748	
D801	T431113		E4701	E846661		IC002	E730164	
D809	H163007		E4701	E846863		IC002	E730163	
D816	T431113		E4701	E846911		IC003	T900726	
D820	J2348921M		E6001	E826928		IC004	T900438	
D821	J2348921M		E800	E843241		IC005	T900693	
D822	J2348921M		Δ E801	E822924		IC1300	T900672	
D853	J2343962M		Δ E801	E822926		IC201	J2004461	
D854	J2343962M		E803	E846902		IC202	T900602	
D861	J2348921M		E805	E846894		IC400	T900728	25", 28" 56's, 86's 21" 56's 21" 86's 24", 28" 16:9 32" 16:9 25", 28" 56's, 86's Exp 16:9 UK 16:9 21"
D862	J2348921M		E805	E846901		IC400	T900745	
D864	J2348921M		E806	E846837		IC4000	J2020012	
D865	J2348921M		E806	E846893		IC4000A	H235401	
D866	J2348921M		E806	E846905		IC4000A	H235403	
D867	J2348921M		E901	J2721792		IC4000A	H235404	
D869	J2348921M		E902	J2721792		IC4000A	H235409	
D901	J2342711M		E903	E826148		IC4000A	H235412	
D902	J2342711M		F&S LEAD	A525316		IC4000B	G884020	
D903	J2342711M		Δ F901	J2722445		IC4000C	B976404	
D904	J2342711M	56's/86's 16:9	Δ F902	E882359	24" 16:9 25", 28" 56's, 86's Exp 16:9 UK 16:9 21" 25", 28" 56's, 86's 21" 16:9	IC450	T900724	25", 28" 56's, 86's 21" 16:9
D905	J2343962M		FB001	J2123462M		IC453	T900730	
D906	J2343962M		FB002	J2123462M		IC454	T900753	
D907	T531053		FB003	J2123462M		IC455	T900753	
D908	T531056		FB004	J2123462M		IC456	T900753	
D909	T531053		FB005	J2123462M		IC457	T900753	
D910	J2343962M		FB1	J2123462M		IC501	T900731	
D911	T531070		FB1300	J2123462M		IC501	T900734	
D915	T531068		FB1301	J2123462M		IC501	T900743	
D917	T431113		FB1302	J2123462M		IC501	T900755	
D917A	T431113		FB2	J2123462M		IC502	T900609	
D950	T431127		FB400	E770091	25", 28" 56's, 86's 21" 16:9	IC503	J2004431	25", 28" 56's, 86's 21" 16:9
D950A	H224081		FB401	E770091		IC6001	T900757	
D951	T431126		FB402	E770091		IC6002	T900761	
D951A	J4520883		FB403	E770091		IC6003	T900760	
D951B	J8821114		FB404	E770091		IC6004	T900761	
D952	J2349991		FB451	J2123462M		IC601	T900642	
D954	J2348921M		FB6001	J2123462M		IC601A	H235402	
D955	J2348921M		FB6002	J2123462M		IC601A	H235404	
D957	J2348921M		FB6003	H163007		IC601A	H235411	
D958	J2348921M		FB6004	J2123462M		IC601B	G884020	
D959	J2343962M		FB6005	J2123462M	Δ IC901 IC950 IC951 IC951A	IC601C	B976404	56's, W1's 86's, WD2's
D960	J2343962M		FB6006	J2123462M		IC602	T900667	
D961	T531069		FB601	J2123462M		IC602A	G884023	
D962	J2348921M		FB602	J2123461M		IC602C	B976404	
D963	J2348921M		FB610	J2123461M		IC801	T900756	
D964	J2343962M		FB700	J2123461M		IC900	T900452	
D965	J2348921M							
D966	J2348921M							
D967	H163007							
D967	T531055							
D968	J2348921M							
D969	J2348921M							

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CRN	Part No.	Models	CRN	Part No.	Models	CRN	Part No.	Models
IC951C	B976404		LED002	T547047	56's, 21" 86's, 24" & 32" 16:9	Q815	T633133	
IC952	T900345					Q816	T633133	
IC952A	H224075		PL002	J2902264		Q840	J2327773R	
IC953	T900695		PL006	J2902261		Q841	J2327773R	
IC954	T900473		PL007	J2902261		Q842	J2327773R	
IR001	JCZ00502U		PL1	E821921		Q853	J2315391	
J256	E842020		PL100	J2902264		Q853A	H224079	
J6003	J0195250R		PL1300	E821919		Q854	J2315381	
J6004	J0195250R		PL300	J2902261		Q854A	H224081	
J6005	J0195250R		PL304	J2902261		Q860	J2327773R	
J6006	J0195250R		PL4000	J2902263		Q861	J2327773R	
J6007	J0195250R		PL503	J2902265		Q862	J2327773R	
J6010	J0195250R		PL6001	E846912		Q863	J2327753R	
L010	J2123103M	CL	PL6002	E846913		Q864	J2327753R	
L010	H163007	C, CP	PL601	J2661752		Q865	J2327753R	
L011	H163007	CP, C	PL701	J2661753		Q866	J2327773R	
L011	J2123103M	CL	PL800	E843241		Q867	J2327773R	
L012	H163007	C, CP	PL801	J2902263	56's, 86's 16:9	Q868	J2327753R	
L012	J2123103M	CL	PL801	J2902264		Q869	J2327753R	
L2	J2123098M		PL802	A525316		Q870	J2327783R	
L200	J2123781R		PL803	J2902268		Q901	T636073	
L201	H163007		PL804	J2902263	56's, 86's 24"	Q902	J2315921R	
L202	J2122253M		PL804	J2902264	56's, 86's, 24" 16:9	Q903	T636072	
L203	L410169		PL805	J2902265		Q903A	H235352	56's, 86's 28" & 32" 16:9
L204	J2122956M		PL805	J2902266		Q903A	H235417	24" 16:9
L300	J2122943M		PL900	E825259		Q903A	H235418	
L301	J2122943M		PL902	J2661751		Q903B	G884020	
L302	J2123103M		Q001	J2326872R		Q903C	B976404	
L303	J2123103M		Q003	J2315891R		Q903D	B912319	
L400	J2123096M		Q004	J2315891R		Q905	T633133	
L403	J2123781R		Q005	J2315891R		Q906	J2315891R	
L4500	J2122943M		Q1	J2315891R		Q907	J2315891R	
L4501	J2122943M		Q1300	J2315891R		Q908	J2315891R	
L4502	J2122943M		Q1302	J2315891R		Q950	J2315891R	
L4503	J2122943M		Q200	T633134		Q951	T632084	
L500	J2122253M		Q201	J2315891R		Q952	T631265	
L501	L410173		Q202	T631300		Q954	T633133	
L502	J2122253M		Q203	T631300		Q957	T636069	
L504	J2122253M		Q204	J2315921R		Q957A	H234344	
L6008	J2122935M		Q2700	T631275		Q957B	G311331	16:9
L700	H163007	56's, 86's, 24" 16:9	Q300	J2315891R		Q957B	G884020	56's, 86's
L700	JBH00039	28", 32" 16:9	Q301	J2315891R		Q957C	B976404	
L702	J2161371	56's, 86's, 28", 32" 16:9	Q302	J2315891R		Q957D	F133310	
L702	L380115	24" 16:9	Q304	J2315891R		Q957E	G560331	
L751	J2220641	28", 32" 16:9	Q4000	J2315891R		Q959	J2315891R	
L751	J2220642	25", 28" 56's, 86's	Q4502	H163007		R001	J0700027M	
L751	J2124531	24" 16:9	Q4503	W024001		R002	J0700027M	
L752	L380121		Q500	J2315891R		R003	J0700027M	
L752	H163007	21", 24" 16:9	Q503	J2315891R		R004	J0700027M	
L800	H163007	25" & 28", 32" 16:9	Q505	J2315891R		R005	J0700027M	
L800	JBH00031R	28" 16:9	Q506	J2315921R		R006	J0195875R	16:9
L800	L300011	28" 16:9	Q508	J2315891R		R006	J0700027M	56's, 86's
L801	H163007	28" 16:9	Q601	T636073	24" 16:9	R008	J0700047M	
L801	JBH00037R	21"	Q601	T636074	28" 16:9	R010	E770091	
L801	JBH00039R	25", 28" 56's & 86's, 24" & 32" 16:9	Q701	T633137	24" 16:9	R011	E770091	
L801			Q701	T633142	56's, 86's, 28" & 32" 16:9	R012	J0700027M	
L802	H163007		Q703	J2315891R		R013	J0700027M	
L841	J2123098M		Q751	J2315161R	21"	R015	J0700059M	25"/28" 86's, 28" 16:9
L842	J2123098M		Q751A	H235305	25", 28", 16:9	R016	J0700034M	21, 24"/32" 16:9, 25"/28" 56
L843	J2122253M		Q751B	G884020		R017	J0187060M	21, 24"/32" 16:9, 25"/28" 56
L860	J2122253M		Q801	T633137		R017	J0700042M	25"/28" 86's, 28" 16:9
Δ L901	L210064		Q802	T633137		R019	J0700054M	
Δ L902	L210064		Q803	T633137		R020	J0700042M	
Δ L904	J2125579		Q804	T633143		R021	J0700045M	
Δ L910	J2274361	24", 25"	Q805	T633143		R023	J0700027M	
Δ L910	J2274362	28"	Q806	T633143		R024	J0700027M	
Δ L910	L130039	21"	Q811	J2327773R		R025	J0700027M	
Δ L910	L130043	32"	Q812	J2327773R		R026	J0700027M	
L950	JBH00036R		Q813	J2327773R				
LED001	T547041	25" & 28" 86's/28" 16:9	Q814	T633133				

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CRN	Part No.	Models	CRN	Part No.	Models	CRN	Part No.	Models
R028	J0195875R	86's, 16:9	R1305	J0700041M		R313	R715330	
R028	J0700027M	56's	R1306	H163007		R314	R120330	
R029	J0195875R	86's, 16:9	R1308	H163007		R315	R120330	
R029	J0700027M	56's	R1309	H163007		R316	J0700052M	
R030	J0195875R	16:9	R131	J0195885R		R317	J0700054M	
R030	J0700027M	56's, 86's	R1312	J0700052M		R318	R715330	
R031	J0700027M		R1313	J0700058M		R319	J0700067M	
R032	J0700027M		R1314	J0195883R		R320	J0700036M	
R033	J0700027M		R1315	J0195893R		R321	J0700036M	
R034	J0700027M		R132	J0195885R		R322	R715330	
R037	J0700027M		R133	J0195885R		R323	J0700067M	
R038	J0700027M		R134	J0195885R		R324	J0700064M	
R039	J0700027M		R135	J0195885R		R325	J0700067M	
R044	E770091		R136	J0195885R		R326	J0700027M	
R045	E770091		R137	J0195885R		R327	J0700064M	
R046	E770091		R138	J0195885R		R328	J0700064M	
R047	E770091		R140	J0700033M		R329	J0700027M	
R048	E770091		R141	J0700033M		R330	J0700067M	
R049	J0195885R		R142	J0700033M		R331	J0700064M	
R050	J0195885R		R143	J0700033M		R334	R715330	
R051	J0195885R		R144	J0700033M		R335	J0700027M	
R052	J0195885R		R145	E770091		R337	J0700038M	
R053	J0195885R		R2	E770091		R338	J0700058M	
R054	J0195885R		R200	J0700055M		R339	J0700027M	
R055	J0195885R		R201	J0700051M		R340	J0700054M	
R056	J0195885R		R202	J0700051M		R341	R110330	
R057	J0195885R		R204	R120330		R349	J0700027M	
R058	J0195885R		R205	R120330		R350	J0700054M	
R059	J0195885R		R207	J0700041M		R351	J0700058M	
R065	R222330		R208	R110330		R352	J0700038M	
R067	J0700054M		R209	R110330		R4	J0195925R	
R068	J0700054M		R210	J0700027M		R400	J0700027M	
R069	J0700054M		R211	J0700033M		R4001	J0700054M	
R071	J0700054M		R212	J0700049M		R4002	J0700054M	
R072	J0700054M		R212A	J0700061M		R4004	R132330	
R073	J0700049M		R213	J0700027M		R4005	R417330	
R074	J0700049M		R214	J0187086M		R4006	R135330	
R075	J0700027M		R215	J0700027M		R4007	R132330	
R076	J0700027M		R216	J0700038M		R4008	R407551	
R077	J0700027M		R217	J0700046M		R4009	R417330	
R078	J0700027M		R218	J0700046M		R401	J0700027M	
R079	J0195875R		R219	J0700043M		R4010	J0700064M	
R080	J0700027M		R22	J0195250R		R4011	R407551	
R081	J0700027M		R220	J0700045M		R4014	R526330	
R082	J0700054M		R221	J0700038M		R4015	R526330	
R083	J0700027M		R222	J0700027M		R403	J0700054M	
R084	J0700027M		R223	J0700035M		R405	H163007	
R085	J0700027M		R224	J0700046M		R406	J0195939R	
R086	J0700027M		R225	J0700058M		R407	J0195932R	
R087	J0700054M		R226	J0700058M		R408	J0195925R	
R088	J0700054M		R227	J0700038M		R410	J0700041M	
R089	J0700049M		R228	J0700034M		R411	J0700041M	
R090	J0700059M		R230	J0700044M		R412	J0700057M	
R091	J0700046M		R230	J0700047M		R413	J0700057M	
R093	J0700054M		R26	J0195250R		R414	J0700057M	
R098	J0700054M		R27	J0195250R		R415	J0700057M	
R1	E770091		R2700	R120330		R416	J0195885R	
R100	R247330		R28	H163007		R417	J0195885R	
R102	R323330		R29	H163007		R418	J0195931R	
R103	J0700027M		R3	J0700041M		R419	J0195931R	
R107	J0700054M		R300	R715330		R430	E770091	
R109	J0700059M		R301	J0700054M		R440	J0195250R	
R110	J0700027M		R302	R715330		R441	J0195250R	
R112	J0700042M		R303	J0700052M		R442	H163007	
R114	J0187038M		R304	J0700054M		R449	J0700054M	
R115	J0700027M		R305	J0700067M		R450	J0700027M	
R129	J0700054M		R306	J0700036M		R4501	J0700027M	
R130	J0700054M		R307	J0700036M		R4502	J0700027M	
R1300	H163007		R308	J0700067M		R4503	J0700027M	
R1301	H163007		R309	J0700054M		R4504	J0700027M	
R1302	H163007		R310	R715330		R4509	J0700067M	
R1303	J0700041M		R311	R715330		R451	J0700027M	
R1304	J0700054M		R312	R715330		R4510	J0195950R	28"/32" WD2's

PRODUCT SAFETY NOTE: Components marked with a Δ have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this service manual. Don't degrade the safety of this receiver through improper servicing.

NOTE DE SECURITE PRODUIT : Les composants marqués d'un Δ ont une caractéristique de sécurité importante. Avant de procéder à tout remplacement de ces composants, lire avec soin la NOTICE DE SECURITE PRODUIT de ce manuel d'entretien. Ne mettez pas en cause la sécurité de ce récepteur en le réparant de manière incorrecte.

HINWEIS ZUR PRODUKTSICHERHEIT: Mit Δ gekennzeichnete Teile sind für die Betriebssicherheit von besonderer Bedeutung. Lesen Sie die HINWEISE ZUR PRODUKTSICHERHEIT aufmerksam durch, bevor Sie ein solches Teil auswechseln. Beeinträchtigen Sie die Sicherheit dieses Geräts nicht durch unsachgemäße Wartungsarbeiten.

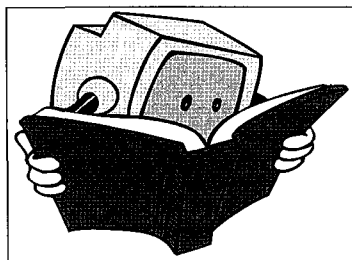
CRN	Part No.	Models	CRN	Part No.	Models	CRN	Part No.	Models
R4510	J0700067M	86's	R6008	J0700032M		R749	R232736	32" 16:9
R4511	J0195950R	28"/32" WD2's	R6009	J0700032M		R749	R242736	24" 16:9
R4511	J0700067M	86's	R601	J0700047M	21"	R749	R437736	25", 28"/28" 16:9
R4512	J0195950R	28"/32" WD2's	R601	R330330	25", 28", 16:9	R749	R546736	21"
R4512	J0700067M	86's	R6010	J0187038M		R751	H163007	21", 25", 28"
R4540	J0195250R		R6011	J0187038M		R751	J0147622	32" 16:9
R4541	J0195250R		R6012	J0187038M		R751	J0147630	24", 28" 16:9
R459	J0195925R	86's	R6013	J0195925R		R752	R447330	
R459	J0700054M	28"/32", WD2's	R6014	J0195137R		R753	R313549	
R464	J0700027M		R6015	J0195137R		R757	H163007	
R465	J0700027M		R6016	J0700027M		R759	R437330	25", 28" 86's
R466	J0700054M		R6017	J0700027M		R759	J0147630	21", 25"/28", 56's, 16:9
R469	J0700027M		R6018	J0195871R				21", 25", 28"/28", 32" 16:9
R470	J0700054M		R602	R100330	25"/28" 56's/86's	R764	R252330	24" 16:9
R471	J0700054M		R602	R105330	24"/28" 16:9			
R472	J0700054M		R602	R108330	32" 16:9	R764	R658330	
R5	H163007		R6021	J0195875R		R766	R000618	
R500	J0187050M		R6022	J0195875R		R801	R227330	
R500A	R427330		R6027	J0195250R		R802	R130330	
R501	J0700035M		R6028	J0195250R		R804	R145571	
R502	J0700041M		R603	R100330	21"	R805	R145571	
R503	J0700027M		R603	R105330	25"/28" 56's/86's	R806	R145571	
R504	J0700027M				28"/32" 16:9	R807	J0113744M	
R505	J0700029M		R603	R202330	24" 16:9	R808	J0113744M	
R506	H163007		R6043	J0195925R		R809	J0113744M	
R507	H163007		R6046	J0195875R		R811	J0700041M	
R513	J0700041M		R6047	J0700051M		R812	J0700041M	
R514	J0700027M		R6048	J0700051M		R813	J0700041M	
R515	J0700027M		R610	R140330		R816	R227330	
R516	J0700027M		R612	R447330	24"/32" 16:9	R817	J0700024M	
R517	J0700052M		R612	R648330	25", 28"/28" 16:9	R818	J0700024M	
R520	E770091		R614	J0113735M		R819	J0700024M	
R523	J0700067M		R617	H163007		R820	R130330	
R524	R323330		R618	R313571	25", 28"/32" 16:9	R821	R227330	25", 28" 56's
R525	J0700041M		R618	H163007	24", 28" 16:9	R821	R323330	32" 16:9
R526	J0700041M		R619	J0147630		R821	R329330	21"/25", 28" 86's
R527	H163007		R620	H163007				/28" 16:9
R530	J0700037M		R621	J0113797M		R821	R427330	24" 16:9
R531	H163007	16:9	R623	J0113725M		R822	R227330	25", 28" 56's
R531	J0700038M	56's, 86's	R701	J0140933S		R822	R323330	32" 16:9
R532	J0700031M	56's, 86's	R704	J0700027M		R822	R329330	21", 25", 28"
R532	R128330	16:9	R707	R437330				86's/28", 16:9
R533	H163007	16:9	R709	R319330		R822	R427330	24" 16:9
R533	J0700038M	56's, 86's	R714	J0113748M		R823	R227330	25", 28" 56's
R534	J0700027M		R715	J0113774M	21"	R823	R323330	32" 16:9
R535	J0700081M		R715	J0113793M	25", 28"	R823	R329330	21"/25", 28"
R536	R120330		R715	R140570	16:9			86's/28", 16:9
R537	J0700059M		R718	R254736				24" 16:9
R538	J0700063M		R719	H163007	21"	R823	R427330	
R539	J0700056M		R719	J0119647M	25", 28"/28", 32"	R830	R132330	
R542	J0195941R				16:9	R835	R132330	
R543	J0700067M	56's, 86's, 28" 16:9	R719	R242736	24" 16:9	R836	R132330	
R543	J0700078M	24"/32" 16:9	R724	J0110273S		R840	J0700049M	
R544	J0700069M	56's, 86's, 24"/28" 16:9	R725	R145549	56's, 86's, 24", 28" 16:9	R841	J0700049M	
		32" 16:9			32" 16:9	R842	J0700049M	
R544	J0700072M		R725	R242549		R843	J0700037M	
R545	R349725		R726	J0113778M		R844	J0700037M	
R549	J0700029M	16:9, 25", 28" (UK Only)	R730	R000618		R845	J0700041M	
		21"/25", 28" 16:9 (Export)	R733	R323330		R846	J0700031M	
R549	J0700031M		R735	J0147622	25", 28" 56's, 86's, 32" 16:9	R847	J0700037M	
					21"/24", 28" 16:9	R848	J0700037M	
R550	R110330		R735	J0147630	25", 28" 56's, 86's	R849	J0700041M	
R551	J0187071M		R736	R140330	21"	R850	J0700031M	
R552	J0700027M		R736	R142330	28" 16:9	R851	J0700037M	
R554	H163007		R736	R531330	24" 16:9	R852	J0700037M	
R556	H163007		R736	R832330	32" 16:9	R853	J0700041M	
R557	H163007		R736	R437330		R854	J0700031M	
R560	J0195937R	25"/28" 86's	R737	R232330		R860	J0700027M	
R560	J0700061M	25"/28" 56's	R739	R822330		R861	R222330	
R600	R437330		R740	J0700075M	25", 28", 16:9	R862	J0700046M	
R6006	J0195890R		R740	R152330	21"	R863	J0700033M	
R6007	J0700032M		R748	R130330	25" 28", 16:9	R864	J0700057M	
			R748	R135330	21"	R865	J0700045M	
						R866	H163007	

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CRN	Part No.	Models	CRN	Part No.	Models	CRN	Part No.	Models
R867	J0700034M		R953	J0700048M	21"	W10	E842020	
R868	J0700039M		R954	H163007		W800	EC5A400A	
R869	J0700037M		R955	J0700072M	56's, 86's	X001	E516030F	
R870	J0700037M		R955	J0700076M	16:9	X201	E518064	
R871	R222330		R956	R132330		X202	E518069	
R872	J0700018M		R957	J0700049M		X400	E516056F	
R873	J0700018M		R958	J0700041M		X501	E516048F	
R874	J0700039M		R959	R141725	21"	X502	J2791502	
R875	J0700047M		R959	R145725	25", 28" & 16:9	X6000	E516059F	
R876	J0700042M		R960	J0700049M		ZD001	T536179	
R877	J0700049M		R961	R832725		ZD021	T536178	25", 28" 56's
R878	J0700041M		R962	J0700067M		ZD021	T536190	21"/86's, 16:9
R879	J0700055M		R963	J0700072M		ZD022	T536178	25", 28" 56's
R880	R135330		R964	R437725		ZD022	T536190	21"/86's, 16:9
R881	R152330		R966	R437725		ZD023	T536178	25", 28" 56's
R882	R152330		R967	R000708		ZD023	T536190	21"/86's, 16:9
R883	R135330		R968	R140725		ZD1300	T536185	
R884	J0113713M		R969	R140725		ZD200	T536215	
R885	J0113713M		R970	R141725		ZD4000	T536177	
R886	R323570		R971	J0700054M		ZD4001	T536177	
R887	R148330		R972	R000709		ZD4002	T536171	
R888	R155330		R973	R941725		ZD4003	T536171	
R889	R148330		R974	J0147610	25", 28" & 16:9	ZD4004	T536171	
R890	H163007		R974	R100549	21"	ZD4006	T536215	
R892	J0700043M		R975	J0147054AF		ZD4500	T536177	
R893	J0700038M		R980	R242571	21"	ZD4501	T536177	
R894	J0700038M		R980	R648570	25", 28" & 16:9's	ZD4502	T536177	
R895	J0700027M		R981	J0700046M		ZD4503	T536177	
R896	R125330	56's/86's	R982	R130330		ZD501	T536186	21"/86's, 16:9
R896	R132330	28" 16:9	R985	R427571		ZD501	T536201	25", 28" 56's
R896	R427330	24" 16:9	R986	R323571	21"	ZD502	T536186	21"/86's, 16:9
R897	R125330	56's/86's	R986	R526571	25", 28" & 16:9's	ZD502	T536201	25", 28" 56's
R897	R132330	28" 16:9	R989	R407542		ZD503	T536186	21"/86's, 16:9
R897	R427330	24" 16:9	R991	J0700054M		ZD503	T536201	25", 28" 56's
R898	R125330	56's/86's	R992	R427571	21"	ZD504	T536184	56's
R898	R132330	28" 16:9	R992	R628858	25", 28" & 16:9's	ZD504	T536284	86's & 16:9
R898	R427330	24" 16:9	R993	J0700041M		ZD505	T536184	
R900	J0700034M		R994	J0700068M		ZD506	T536184	
R901	R242571		R996	H163007		ZD507	T536184	
R902	R536736		Δ R999	R170727		ZD508	T536179	56's
R903	J0147054AF		RIV	JEU00212		ZD508	T536280	86's & 16:9
R904	R132859		RL2700	E171111		ZD600	T536184	
R904A	R153740		SG800	J2340037	28", 32" 16:9	ZD6001	T536279	
R905	R150736		SG800	J2340039	56's 86's, 24" 16:9	ZD6002	T536279	
R906	R333725					ZD6003	T536279	
R907	J0700067M		SG801	J2340037		ZD6004	T536279	
R908	R148725		SKT IC6001	E823936		ZD6005	T536279	
R909	J0700058M		SW001	E139408	86's & 16:9	ZD6006	T536279	
R910	R000618		SW001	E139506	56's	ZD6007	T536279	
R911	J0700055M		Δ SW900	J2633391		ZD6008	T536279	
R912	R319330		Δ T701	J2436626	32" 16:9	ZD6009	T536279	
R913	H163007		Δ T701	J2436771	28" 16:9	ZD601	T536185	
R914	J0700041M		Δ T701	J2436798	25", 28"	ZD6010	T536279	
R916	R546725		Δ T701	J2436798	24" 16:9	ZD602	T536174	
R917	R145725		Δ T701	JBW00605	21"	ZD603	T536259	
R918	J0700054M		T702	J2260291U		ZD610	T536237	
R919	J0700037M		Δ T900	L380122	24" 16:9/25", 28"	ZD612	T536184	
R920	R333330		Δ T900	L380123	21" 56's	ZD700	T536236	
R922	J0700029M	25", 28" & 16:9	Δ T900	L380128	32" 16:9	ZD704	T536246	
R922	J0700032M	21"	Δ T900	L380129	21" 86's	ZD705	T536215	
R924	J0700043M		Δ T900	E441044	25", 28" & 16:9	ZD706	T536185	21"/86's, 16:9
R925	J0700056M		TH900	E441045	21"	ZD706	T536213	25", 28" 56's
R928	R343570		U201	E710054	UK	ZD717	J2339251M	
R929	H163007		U201	E710056	EXPORT	ZD902	T536246	
R930	J0700068M		VD400	T532017		ZD903	T536266	
R948	J0700041M		VGA ASSY	A527270		ZD904	T536176	
R949	J0700046M		VR923	J0160421R		ZD950	T536207	
R950	J0113795M		VR950	J0160211R		ZD955	H163007	
R950A	J0100101M	25", 28" & 16:9	W001	EC520502		ZD957	T536266	
R950A	J0700063M	21"	W002	EC551105		ZD970	J2344121M	21"
R951	R142546		W003	EC551505		ZD970	J2344122M	25", 28" & 16:9
R952	J0113772M		W004	W024001				
R952A	J0700054M		W005	EC520802				
R953	J0700046M	25", 28" & 16:9	W006	W024001				
			W007	E842020				



SERVICE MANUAL SUPPLEMENT SUPPLEMENT AU MANUEL D'ENTRETIEN ERGÄNZUNG ZUM WARTUNGSHANDBUCH

TO BE USED IN CONJUNCTION WITH SERVICE MANUAL
SM00006

A UTILISER EN LIEN AVEC LE MANUEL DE SERVICE SM00006

IN VERBINDUNG MIT DEM WARTUNGSHANDBUCH SM00006
ZU BENÜTZEN

CAUTION:

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

ATTENTION:

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

VORSICHT:

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

C2156TN	CL2586TAN
C2556TN	CL2886TAN
C2856TN	CP2886TAN
CL2156TAN	C24W1TN
CL2556TAN	C28W1TN
CL2856TAN	C28WD2TN
CP2156TA	C32WD2TN
CP2556TA	CP2886TAN
CP2856TA	CL28W1TAN
CP2156TAN	CL28WD2TAN
CP2556TAN	CL32WD2TAN
CP2856TAN	CP28WD2TAN
C2186TN	CP32WD2TAN
C2586TN	CL24W1TAN
C2886TN	

Data contained within this Service manual supplement 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.

SAFETY PRECAUTIONS

WARNING: The following precautions should be observed.

1. Do not install, remove, or handle the picture tube in any manner unless shatter proof goggles are worn. People not so equipped should be kept away while picture tubes are handled. Keep the picture tube away from the body while handling.
2. When service is required, an isolation transformer should be inserted between the power line and the receiver before any service is performed on the chassis.
3. When replacing the chassis in the cabinet, ensure all the protective devices are put back in place.
4. When service is required, observe the original lead dressing. Extra precaution should be taken to ensure correct lead dressing in the high voltage circuitry area.
5. Always use the manufacturer's replacement component. Always replace original spacers and maintain lead lengths. Especially critical components are indicated thus Δ on the parts list and should not be replaced by other makes. Furthermore, where a short circuit has occurred, replace those components that indicate evidence of overheating.
6. Before returning a serviced receiver 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, and be sure that no protective device built into the instrument by the manufacturer has become defective, or inadvertently damaged during servicing.

Therefore, the following checks are recommended for the continued protection of the customers and service technicians.

INSULATION

Insulation resistance should not be less than 10M ohms at 500V DC between the main poles and any accessible metal parts.

Also, 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.

HIGH VOLTAGE

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.

X-RADIATION

TUBES: The primary source of X-radiation in this receiver is the picture tube. The 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.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in HITACHI television receivers 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 Δ on the schematics and the replacement parts list contained in this service manual.

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

Product Safety is continuously under review, and new instructions are issued from time to time. For the latest information, always consult the current HITACHI service manual. A subscription to, or additional copies of HITACHI service manuals may be obtained at a nominal charge from your HITACHI SALES CORPORATION.

CE MARK

Some of these models may contain the CE mark on the rating plate.

This illustrates that the T.V. contains parts that have been specifically approved to provide electromagnetic compatibility to designated levels.

Therefore, when replacing any part in this T.V., please use only the correct part itemized in the parts list of this service manual to ensure this standard is maintained.

Also, take care to replace lead dressing to its original state, as this can also have a bearing on the electromagnetic radiation/immunity.

TUBE DISCHARGE

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 tube.

PRECAUTIONS DE SECURITE

MISE EN GARDE: Les précautions suivantes doivent être observées.

1. Ne pas installer, déposer ou manipuler le tube-image sans s'être muni de lunettes de protection incassables au préalable. Les personnes non équipées doivent rester à distance des tubes manipulés. Ne pas approcher le tube du corps pendant la manipulation.
2. Quand un entretien est nécessaire, introduire un transformateur d'isolement entre la ligne d'alimentation et le récepteur avant d'effectuer tout entretien sur le châssis.
3. Lors de la repose du châssis dans l'armoire, s'assurer que tous les dispositifs de protection sont remis en place.
4. Quand un entretien est nécessaire, observer l'acheminement original des fils. S'entourer de précautions supplémentaires pour garantir l'acheminement correct dans les zones de circuits à haute tension.
5. Toujours utiliser les pièces de rechange d'origine. Toujours remplacer les entretoises d'origine et respecter la longueur des câbles. Les composants fondamentaux sont signalés par le symbole Δ dans la liste de pièces et ne doivent pas être remplacés par d'autres marques. En outre, après un court-circuit, remplacer les composants qui présentent des signes de surchauffe.
6. Avant de renvoyer un récepteur réparé au client, le dépanneur doit procéder à un contrôle minutieux de l'appareil pour s'assurer que son fonctionnement ne présente aucun risque d'électrocution et qu'aucun dispositif de protection intégré n'a été endommagé ou rendu défectueux pendant l'entretien.

Par conséquent, les contrôles suivants sont préconisés pour assurer la protection continue des clients et des dépanneurs.

ISOLEMENT

La résistance d'isolement ne doit pas être inférieure à 10 M ohms à 500 V CC entre les pôles principaux et toutes pièces métalliques accessibles.

De plus, aucune formation de décharge en surface ou de claquage ne doit se produire pendant l'essai de rigidité diélectrique, en appliquant 3 kV CA ou 4,25 kV CC pendant deux secondes entre les pôles principaux et les pièces métalliques accessibles.

HAUTE TENSION

La haute tension doit toujours être maintenue à la valeur nominale du châssis sans jamais la dépasser. Tout fonctionnement à des tensions supérieures peut entraîner une défaillance du tube-image ou de l'alimentation haute tension et, dans certains cas, produire des niveaux de rayons X dépassant légèrement les niveaux nominaux. La haute tension

ne doit, dans aucun cas, dépasser 29 kV sur le châssis.

RAYONS X

TUBES: La source primaire de rayons X dans ce récepteur est le tube-image. Le tube utilisé dans le châssis pour la fonction mentionnée précédemment est spécialement construit pour limiter les rayons X. Pour assurer une protection continue contre les rayons X, le tube de rechange doit être du même type que le tube HITACHI agréé d'origine.

NOTICE DE SECURITE DU PRODUIT

Un grand nombre de pièces électriques et mécaniques des téléviseurs HITACHI présentent des caractéristiques de sécurité spécifiques qui, souvent, ne sont pas apparentes à l'œil nu. En outre, elles n'offrent pas nécessairement la protection prévue si l'on utilise des composants de rechange prévus pour des tensions, des puissances, etc. supérieures. Les pièces de rechange qui bénéficient de ces caractéristiques de sécurité spéciales sont identifiées par le symbole Δ sur les schémas et la liste de pièces de rechange proposés dans le présent manuel.

L'utilisation de composants de rechange ne possédant pas les mêmes caractéristiques de sécurité que les composants HITACHI préconisés dont la liste est fournie dans ce manuel d'entretien, peut donner lieu à une électrocution, un incendie, l'exposition aux rayons X ou autres dangers.

La sécurité du produit est continuellement revue et de nouvelles instructions sont publiées de temps à autre. Pour obtenir les informations les plus récentes, consulter le manuel d'entretien HITACHI actuel. Un abonnement ou des exemplaires supplémentaires des manuels d'entretien HITACHI sont disponibles pour un montant nominal auprès de la CORPORATION DE VENTES HITACHI.

LABEL CE

Certains modèles comportent le label CE sur la plaque signalétique.

Cela signifie que le téléviseur comprend des pièces spécifiquement agréées qui assurent la compatibilité électromagnétique aux niveaux désignés.

Par conséquent, pour maintenir cette norme de qualité, il convient d'utiliser la pièce correcte indiquée dans la liste de pièces de ce manuel d'entretien lors du remplacement de toute pièce de ce téléviseur.

Il convient également d'acheminer les fils comme précédemment, car cela peut avoir un effet sur l'immunité aux rayons électromagnétiques.

DECHARGE DU TUBE

L'étage de sortie de ligne peut développer des tensions supérieures à 25 kV. Si l'obturateur THT doit être retiré, décharger l'anode au châssis par l'intermédiaire d'une résistance de forte valeur avant son retrait du tube.

SICHERHEITSHINWEISE

ACHTUNG: Bitte beachten Sie nachstehende Sicherheitshinweise.

1. Beim Einbauen, Ausbauen oder Bewegen der Bildröhre sind unbedingt Sicherheitshandschuhe gegen Glassplitter zu tragen. Personen, die keine entsprechenden Handschuhe tragen, sollten sich fernhalten. Bildröhre immer vom Körper weg halten.
2. Vor Wartungsarbeiten und Öffnen des Geräts ist stets ein Trenntransformator zwischen der Stromversorgung und dem Gerät anzubringen.
3. Beim Wiederausammenbau des Geräts sicherstellen, daß alle Sicherheitseinrichtungen wieder angebracht wurden.
4. Bei Wartungsarbeiten ursprüngliche Verdrahtung beachten. Vor allem bei den Hochspannungsstromkreisen ist auf korrekte Verdrahtung zu achten.
5. Verwenden Sie stets Originalersatzteile des Herstellers. Immer nur Originalabstandsstücke verwenden und Kabellängen beibehalten. Besonders wichtige Teile sind auf der Teileliste mit Δ gekennzeichnet und sollten niemals mit Teilen anderer Hersteller ersetzt werden. Bei einem Kurzschluß sind alle Teile, bei denen Überhitzungserscheinungen zu erkennen sind, auszutauschen.
6. Bevor ein Gerät an den Kunden zurückgesandt wird, muß der Service-Ingenieur das Gerät gründlich überprüfen, um sicherzustellen, daß ein Betrieb ohne Gefahr durch Stromschläge möglich ist und daß keine der Sicherheitseinrichtungen des Geräts defekt ist oder bei den Wartungsarbeiten versehentlich beschädigt wurde.

Für fortgesetzte Sicherheit von Kunden und Service-Ingenieuren wird deshalb empfohlen, nachstehende Überprüfungen durchzuführen.

ISOLIERUNG

Der Isolationswiderstand zwischen den Hauptpolen und jeglichen zugänglichen Metallteilen sollte mindestens 10 M Ω bei 500 V GS betragen.

Darüberhinaus sollte beim Prüfen der Durchschlagsfestigkeit durch Anlegen von 3 kV WS oder 4,25 kV GS für zwei Sekunden zwischen den Hauptpolen und zugänglichen Metallteilen kein Über- oder Durchschlag erfolgen.

HOCHSPANNUNG

Hochspannung sollte den für das Gerät angegebenen Nennwert niemals überschreiten. Der Betrieb bei höheren Spannungen kann zum Ausfall der Bildröhre oder der Hochspannungsversorgung führen. Unter gewissen Umständen könnte Röntgenstrahlung entstehen, die die vorgesehenen Werte etwas überschreitet. Hochspannung darf auf keinen Fall 29 kV überschreiten.

RÖNTGENSTRAHLUNG

BILDRÖHRE: Die Hauptquelle für Röntgenstrahlung bei diesem Gerät ist die Bildröhre. Die für die o.g. genannte Funktion verwendete Bildröhre in diesem Gerät ist speziell so konstruiert, daß sie wenig Röntgenstrahlung erzeugt.

Für fortgesetzten Schutz vor Röntgenstrahlung ist deshalb die Bildröhre nur gegen eine Bildröhre desselben Typs wie die Originalbildröhre von HITACHI zu ersetzen.

HINWEIS ZUR PRODUKTSICHERHEIT

Viele elektrische und mechanische Teile in HITACHI-Fernsehempfängern verfügen über spezielle Sicherheitseinrichtungen, die bei Sichtprüfungen oft nicht gleich ins Auge fallen. Auch kann es sein, daß sich der Schutz, den sie gewöhnlich bieten, durch Ersatzteile, die für höhere Spannungen, Leistung usw. ausgelegt sind, nicht erzielen läßt. Teile mit diesen speziellen Sicherheitseinrichtungen sind auf den Schaltplänen und Ersatzteillisten in diesem Wartungshandbuch mit Δ gekennzeichnet.

Bei der Verwendung von anderen Ersatzteilen, die nicht dieselben Sicherheitseigenschaften wie die von HITACHI empfohlenen und in den Teilelisten in diesem Wartungshandbuch aufgeführten Teile besitzen, kann es zu Stromschlägen, Feuer, erhöhter Röntgenstrahlung oder anderen Gefahren kommen.

Die Produktsicherheit wird ständig überprüft, und von Zeit zu Zeit werden diesbezüglich neue Anweisungen herausgegeben. Die jüngsten Informationen finden Sie jeweils in aktuellsten HITACHI Wartungshandbuch. Für eine geringe Gebühr erhalten Sie zusätzliche Exemplare oder ein Abonnement der HITACHI Wartungshandbücher von Ihrer HITACHI SALES CORPORATION.

CE-GEPRÜFT

Einige dieser Modelle besitzen am Typenschild das CE-Zeichen.

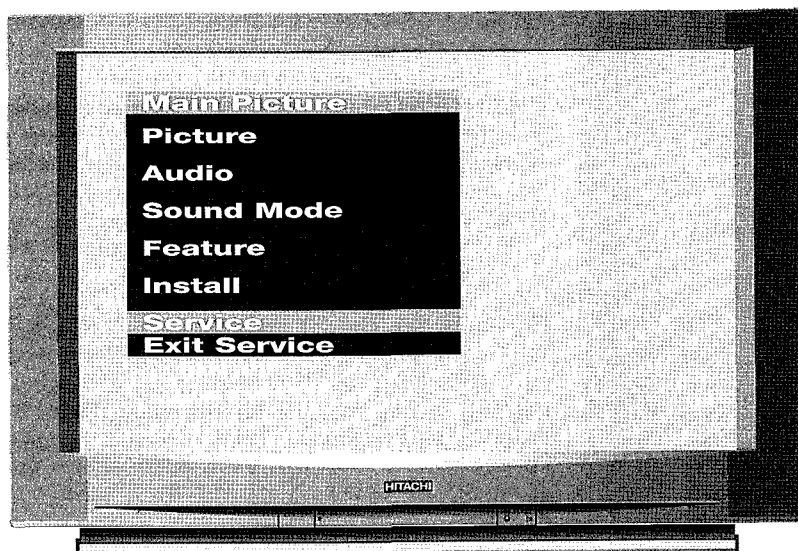
Dies bedeutet, daß das Fernsehgerät Teile enthält, die speziell überprüft wurden und Störfreiheit gemäß den entsprechenden Vorschriften garantieren.

Verwenden sie deshalb beim Austauschen von Teilen dieses Fernsehgeräts nur entsprechende, in der Teileliste dieses Wartungshandbuchs aufgeführte Teile, um sicherzustellen, daß diese Störfreiheit weiterhin garantiert ist.

Achten Sie auch darauf, die ursprüngliche Verdrahtung wieder herzustellen, da dies auch Auswirkungen auf die Störfreiheit haben kann.

ENTLADUNG DER BILDRÖHRE

In der Zeilenablenkstufe können Spannungen von über 25 kV entstehen. Wenn der Hochspannungskondensator ausgebaut werden muß, Anode vor dem Ausbauen aus der Röhre über hochohmigen Widerstand an Gehäuse entladen.



SERVICE MODE

To enter service menu from main menu press 'volume +' and 'volume -' on the TV set together and hold until the menu changes to include the service options.

Press 'program +' and 'program -' to highlight "Service" option.

Press 'volume +' or '-' to enter.

MODE DE SERVICE

Pour accéder au menu de service à partir du menu principal, appuyez simultanément sur les touches « volume + » et « volume - » du téléviseur et maintenez-les enfoncées jusqu'à ce que le menu affiché présente les options de service.

Appuyez sur « program + » et « program - » pour mettre l'option « Service » en surbrillance.

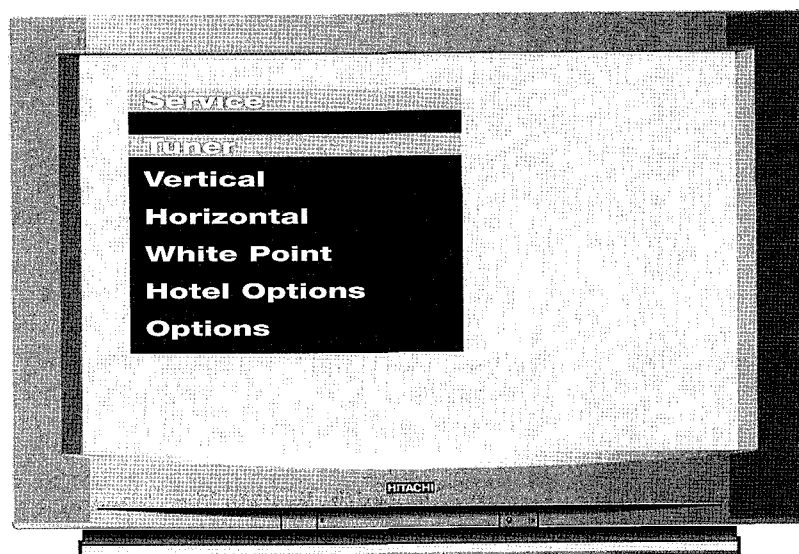
Appuyez sur « volume + » ou « volume - » pour accéder au mode de service.

WARTUNGSMODUS

Um vom Hauptmenü zum Wartungsmenü überzugehen müssen Sie beide Lautstärkereglern am Fernsehgerät gedrückt halten, bis auch die Wartungsoptionen auf dem Menü erscheinen.

Bedienen Sie zur Markierung der Wartungsoption (SERVICE) die Tasten 'Programm +' und 'Programm -'.

Bedienen Sie zur Bestätigung ihrer Auswahl einen der beiden Lautstärkereglern.



SERVICE MENU

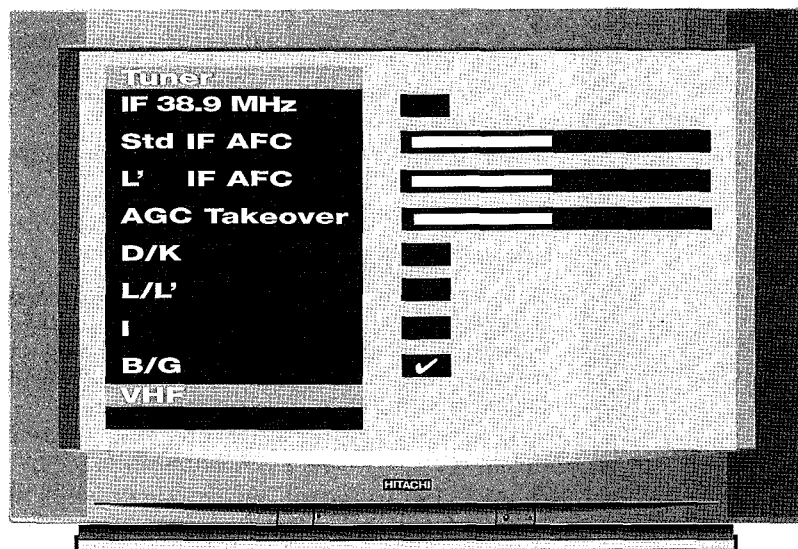
Highlight choice of service by pressing 'program +' or 'program -' on your handset, then 'volume +' or '-' to enter.

MODE DE MENU

Mettez l'option de votre choix en surbrillance en appuyant sur la touche « program + » ou « program - » de votre télécommande, puis appuyez sur « volume + » ou « volume - » pour accéder à l'option.

WARTUNGSMENÜ

Markieren Sie den gewünschten Wartungsvorgang, indem Sie die Tasten 'Programm +' oder 'Programm -' auf Ihrer Fernbedienung drücken und bestätigen Sie mit einem der beiden Lautstärkereglern.



PRESS MENU BUTTON TO RETURN TO MAIN SERVICE MENU
 APPUYEZ SUR LA TOUCHE MENU POUR REVENIR AU MENU DE SERVICE
 PRINCIPAL
 ZUR RÜCKKEHR ZUM HAUPTWARTUNGSMENU BITTE DIE MENÜTASTE
 BEDIENEN

TUNER ADJUSTMENT SERVICE MODE

IF 38.9 MHz ☒ for non-U.K.

U.K. and export sets where the factory has not fitted L501 38.9 MHz option should be ticked and STD IF AFC option not used.

Highlight option by pressing 'program +' or '-' and 'volume +' or '-' to adjust.

Note: AFC alignment for 'standard' and 'L' is automatic when user presses 'volume +' or '-'.

REGLAGE DU TUNER EN MODE DE SERVICE

FI 38,9 MHz ☒ pour les appareils non destinés au Royaume-Uni.

Les téléviseurs destinés au Royaume-Uni et à l'export dans lesquels l'usine n'a pas installé l'option L501 38,9 MHz doivent être marqués du signe ☒ et l'option STD FI AFC ne doit pas être utilisée.

Mettez l'option en surbrillance en appuyant sur les touches « program + » ou « program - » et appuyez sur « volume + » ou « volume - » pour régler.

Remarque : l'alignement AFC pour « standard » et « L » est automatique lorsque l'utilisateur appuie sur la touche « volume + » ou « - ».

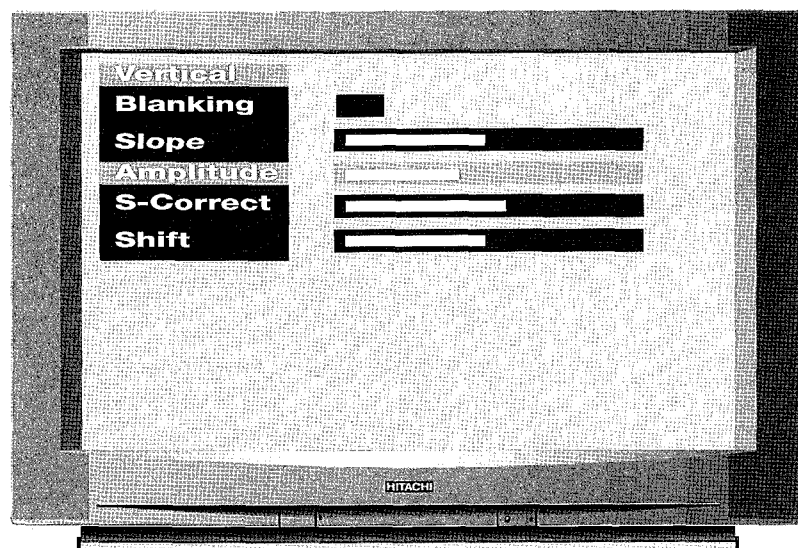
WARTUNGSMODUS TUNEREINSTELLUNG

ZF 38,9 MHz ☒ für Länder außerhalb Großbritanniens.

An britischen Geräten und Geräten für den Export, die nicht mit L501 ausgestattet sind, sollte die 38,9 MHz-Option ausgewählt und die 'STD IF AFC'-Option nicht angewandt werden.

Sie wählen die Option an, indem Sie die Tasten 'Programm +' oder 'Programm -' bedienen. Der eingestellte Wert wird geändert, indem Sie die Lautstärkeregler bedienen.

Hinweis: Der Abgleich der Scharfeinstellung (AFC) für 'Standard' und 'L' erfolgt automatisch, wenn Sie die Lautstärkeregler bedienen.



PRESS MENU BUTTON TO RETURN TO MAIN SERVICE MENU
 APPUYEZ SUR LA TOUCHE MENU POUR REVENIR AU MENU DE SERVICE
 PRINCIPAL
 ZUR RÜCKKEHR ZUM HAUPTWARTUNGSMENU BITTE DIE MENÜTASTE
 BEDIENEN

VERTICAL ADJUSTMENT SERVICE MODE

Press 'program +' or '-' to highlight option.

Press 'volume +' or '-' to adjust.

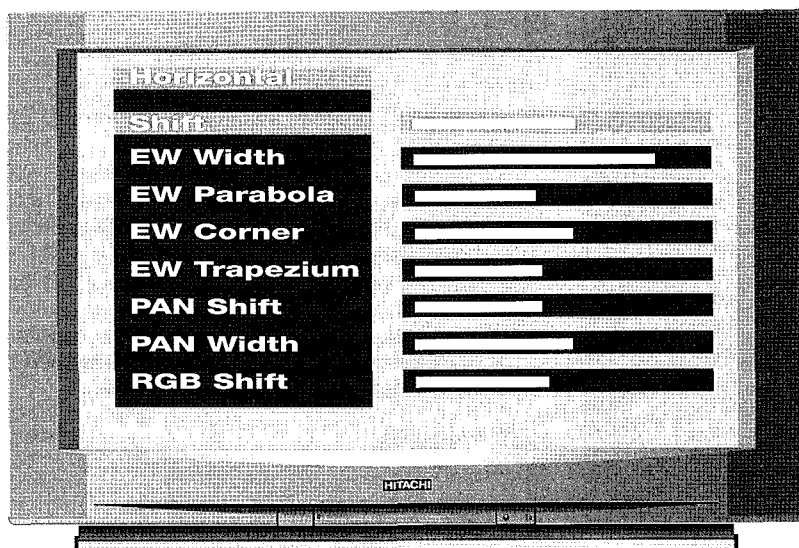
REGLAGE VERTICAL EN MODE DE SERVICE

Appuyez sur la touche « program + » ou « program - » pour mettre l'option en surbrillance.

Appuyez sur la touche « volume + » ou « volume - » pour régler.

WARTUNGSMODUS VERTIKALEINSTELLUNG

Sie wählen eine Option an, indem Sie die Tasten 'Programm +' oder 'Programm -' bedienen. Der eingestellte Wert wird geändert, indem Sie die Lautstärkeregler bedienen.



PRESS MENU BUTTON TO RETURN TO MAIN SERVICE MENU
 APPUYEZ SUR LA TOUCHE MENU POUR REVENIR AU MENU DE SERVICE PRINCIPAL
 ZUR RÜCKKEHR ZUM HAUPTWARTUNGSMENU BITTE DIE MENÜTASTE BEDIENEN

HORIZONTAL ADJUSTMENT SERVICE MODE

Press 'program +' or '-' to highlight option.

Press 'volume +' or '-' to adjust option.

Note: For 16:9 models please set-up geometry once in 16:9 mode and then select "panoramic" and adjust 'pan shift' and 'pan width' for desired result.

REGLAGE HORIZONTAL EN MODE DE SERVICE

Appuyez sur la touche « program + » ou « program - » pour mettre l'option en surbrillance.

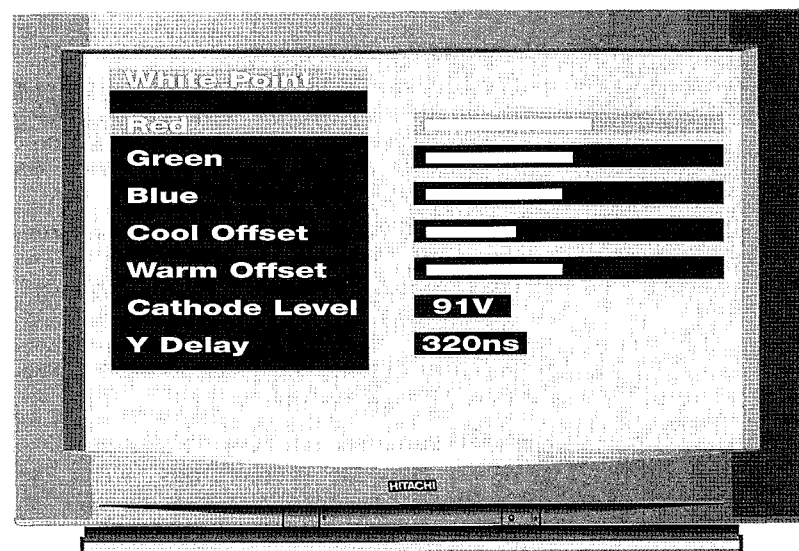
Appuyez sur « volume + » ou « volume - » pour régler l'option.

Remarque : Pour les modèles 16:9, réglez la géométrie une fois en mode 16:9, puis sélectionnez « panoramic » et réglez les paramètres « pan shift » (changement panoramique) et « pan width » (largeur panoramique) pour obtenir le résultat souhaité.

WARTUNGSMODUS HORIZONTALEINSTELLUNG

Sie wählen eine Option an, indem Sie die Tasten 'Programm +' oder 'Programm -' bedienen. Der eingestellte Wert wird geändert, indem Sie die Lautstärkereger bedienen.

Hinweis: Nehmen Sie bei 16:9 Modellen Einstellungen an der Bildgeometrie erst vor, wenn sie im 16:9 Modus sind. Wählen Sie dann 'Panoramic' an und verstellen Sie für das gewünschte Resultat 'PAN Shift' und 'PAN Width'.



PRESS MENU BUTTON TO RETURN TO MAIN SERVICE MENU
 APPUYEZ SUR LA TOUCHE MENU POUR REVENIR AU MENU DE SERVICE PRINCIPAL
 ZUR RÜCKKEHR ZUM HAUPTWARTUNGSMENÜ BITTE DIE MENÜTASTE BEDIENEN

WHITE POINT ADJUSTMENT SERVICE MODE

Cathode level all models 84v
 except 28" + 32" widescreen 91v
 Y delay 320 ns for 'C' model
 160 ns for others

Press 'P+' or 'P-' to highlight option.

Press 'Vol. +' or 'Vol. -' to adjust option.

Press 'Vol. +' or 'Vol. -' to adjust option.

REGLAGE DES POINTS BLANCS EN MODE DE SERVICE

Niveau cathodique pour tous les modèles : 84v
 sauf écran 28 pouces et 32 pouces : 91v
 délai Y 320 ns pour le modèle « C »
 160 ns pour les autres

Appuyez sur « P + » ou « P - » pour mettre l'option en surbrillance.

Appuyez sur « Vol + » ou « Vol - » pour régler l'option.

Appuyez sur « Vol + » ou « Vol - » pour régler l'option.

WARTUNGSMODUS WEISSPEGELABGLEICH

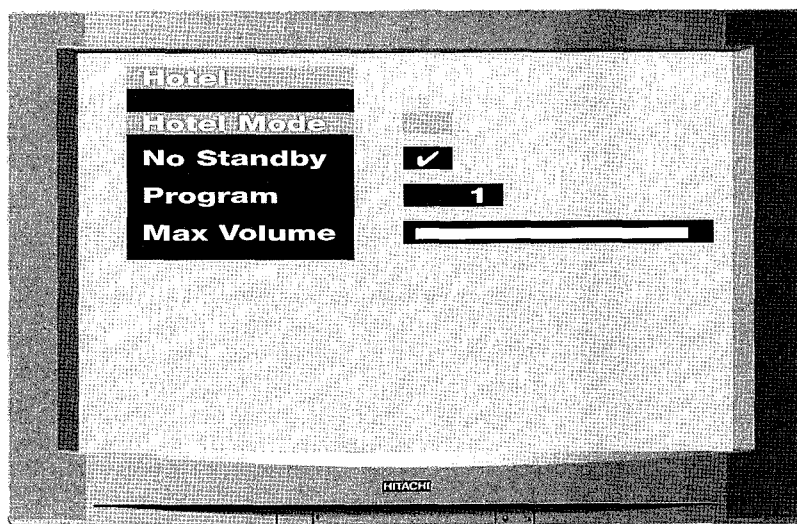
Kathodenpegel an allen Modellen beträgt 84 V; ausgenommen sind die 71 cm und 81 cm Breitwandmodelle mit 91 V.

Vertikallaufzeit für Modell 'C': 320 ns

Für alle anderen: 160 ns

Option mit 'P+' oder 'P-' markieren.

Option mit 'Vol. +' oder 'Vol. -' verstellen.



PRESS MENU BUTTON TO RETURN TO MAIN SERVICE MENU

FRENCH
GERMAN

HOTEL MODE

Press 'P+' or 'P-' to highlight option.

Press 'Vol. +' or 'Vol. -' to adjust option.

Hotel mode ☒ means installation menu can not be selected.

MODE HOTEL

Appuyez sur « P + » ou « P - » pour mettre l'option en surbrillance.

Appuyez sur « Vol + » ou « Vol - » pour régler l'option.

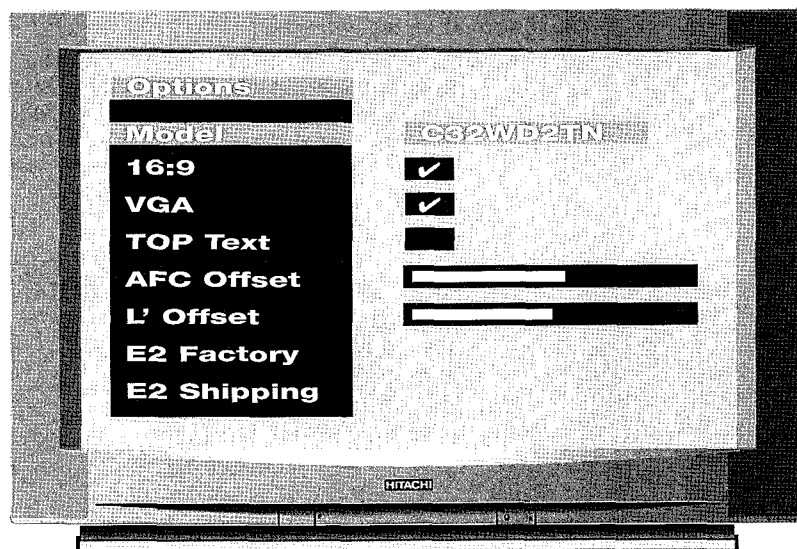
Lorsque le signe ☒ apparaît près de « Hotel Mode » (Mode Hôtel), cela signifie que le menu d'installation ne peut pas être sélectionné.

HOTELMODUS

Option mit 'P+' oder 'P-' markieren.

Option mit 'Vol. +' oder 'Vol. -' verstellen.

'Hotel mode ☒' bedeutet, daß das Installationsmenü nicht angewählt werden kann.



PRESS MENU BUTTON TO RETURN TO MAIN SERVICE MENU

FRENCH
GERMAN

OPTION SERVICE MODE

- Select E2 factory when default values to E² need to be downloaded, usually after IC005 change.
- Select E2 shipping to set shipping preferences in E².

WARNING: Selecting either of these options will lose some or all of the adjustments for the T.V. and full alignment may be necessary. Refer to attached shipping specification for individual model settings.

OPTION MODE DE SERVICE

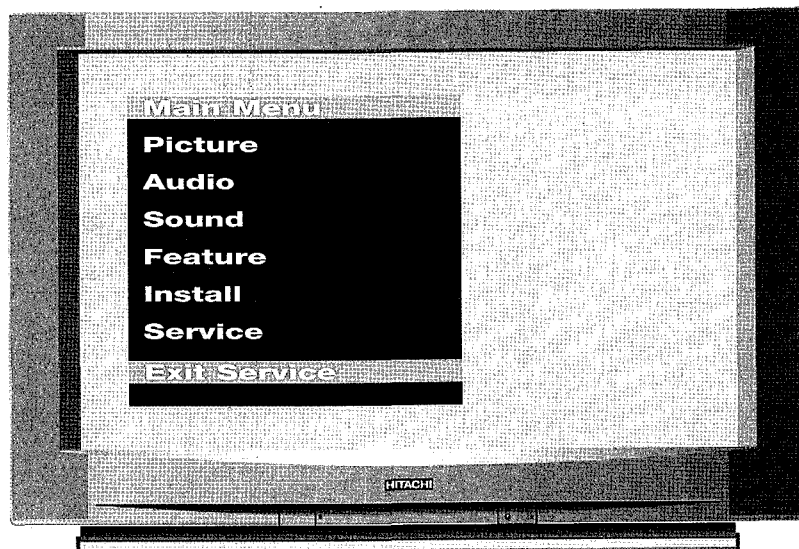
- Sélectionnez E2 usine lorsque les valeurs par défaut de E² doivent être téléchargées, habituellement lorsque IC005 a été remplacé.
- Sélectionnez E2 expédition pour régler les options d'expédition préférées dans E².

AVERTISSEMENT: la sélection de l'une ou l'autre de ces options entraînera la perte de certains des réglages (voire de tous les réglages) du téléviseur, et il sera peut-être nécessaire de réaliser un alignement complet. Consultez les spécifications d'expédition ci-jointes pour connaître les réglages adaptés à chaque modèle.

OPTION WARTUNGSMODUS

- Wählen Sie 'E2 Factory' aus, wenn die Standardwerte in das EEPROM geladen werden müssen (normalerweise ist dies nach dem Austausch des IC005 notwendig).
- Wählen Sie 'E2 Shipping' zur Eingabe der für die Auslieferung gewünschten Werte in das EEPROM ein.

ACHTUNG: Die Auswahl einer dieser beiden Optionen hat den Verlust aller oder eines Teiles der am Gerät vorgenommenen Einstellungen zur Folge, so daß ein Gesamtabgleich notwendig werden kann. Nehmen Sie zu den Einstellungen für die jeweiligen Modelle bitte Einsicht in die Lieferdatenliste im Anhang.



EXIT SERVICE MODE

Press 'program +' or 'program -' to highlight 'exit service option'.

Press 'volume +' or '-' to memorise, putting set into standby.

QUITTER MODE SERVICE

Appuyez sur « Program + » ou « Program - » pour mettre l'option « exit service » (quitter service) en surbrillance.

Appuyez sur la touche « Volume + » ou « Volume - » pour mémoriser, en mettant le téléviseur en état de veille.

AUSGANG WARTUNGSMODUS

Option 'Exit Service Mode' mit 'P+' oder 'P-' markieren.

Option mit 'Vol. +' oder 'Vol. -' speichern. Gerät kehrt automatisch in den Standby-Modus zurück.

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