

# PHILIPS

## **Curso LC04**

## **00. Introducción**

Philips Ibérica – Electrónica de Consumo

Departamento Técnico

Cristina Senallé - Gabriel Arianes

Noviembre 2004

# **AGENDA**

- 01. Gama 2004
- 02. Diagrama de bloques
- 03. Alimentación
- 04. Sintonizador
- 05. Video
- 06. Audio
- 07. Scaler del chasis LC4.2
- 08. Sistema
- 09. Chasis LC4.6
- 10. Servicio



# PHILIPS

## **Curso LC04**

## **01. Gama 2004**

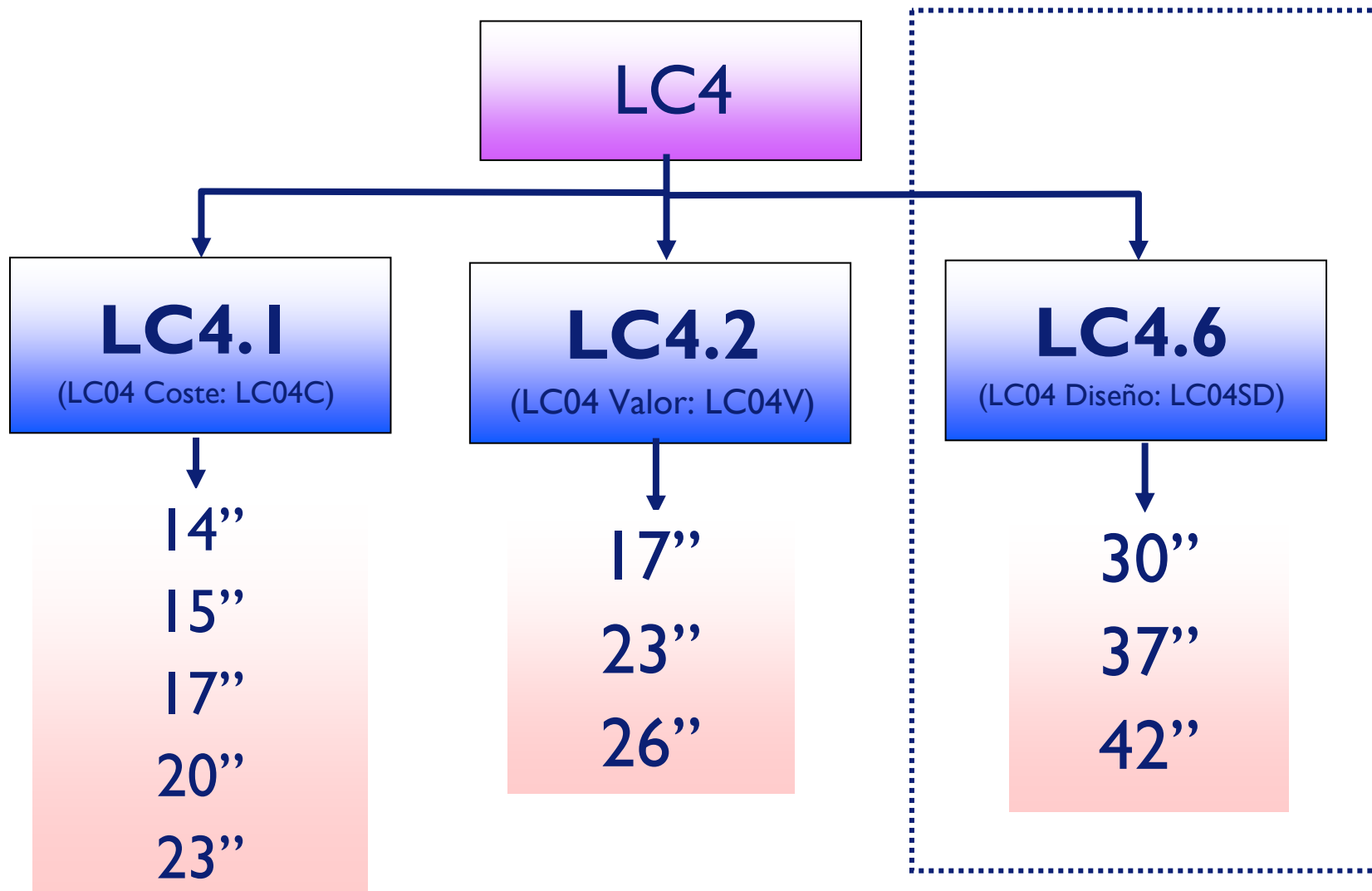
Philips Ibérica – Electrónica de Consumo

Departamento Técnico

Cristina Senallé - Gabriel Arianes

Noviembre 2004

# Diversidad de chasis



## Gama 2004 de Flat TV

### Especificaciones

#### Top range

Disc B, LC4.2,F Stand

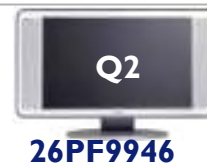
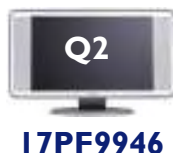


#### Top DAS

DMR (17w)  
Pixel + (23w, 26W)  
DCC, Active Control+  
FM Radio RDS  
DVI



Disc S, LC4.2



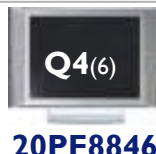
#### Top DAS

DCC, Active Control+  
FM Radio RDS  
DVI (23w, 26w)



#### Step range

Arch 3, LC4.1

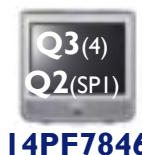


#### Step DAS

Comb Filter for 20", 23"  
Flat speakers  
FM Radio  
PC in (DB15) except 20"

#### Entry range

SP2 ,LC4.1  
SPI,LC03



#### Entry Sym

Comb Filter for 20"  
FM Radio

#### Basic range

**Fighter**

**14PF6826**

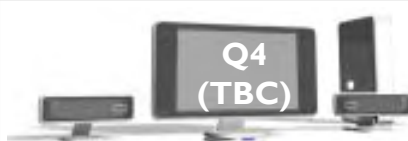
*\*Not in Ops Plan*

#### Promotion

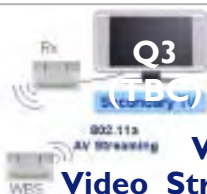
Basic Spec

#### New Applications

Emotive  
Wireless)





**HES 6000 (23w)**




#### Emotive/Accessories

- HES 6000
- Wireless Video Streaming

## Especificaciones técnicas

	TOP	STEP
<a href="#">Back To List</a>		
<b>FLAT TV</b>		
<b>Type no.</b>	<b>LCD TV</b>	<b>LCD TV</b>
<b>Update Flat TV</b>	<b>26PF9956</b>	<b>26PF9946</b>
<b>Chassis</b>	<b>LC04 V</b>	<b>LC04 V</b>
<b>PICTURE QUALITY</b>		
Panel	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT
Number of Pixels	1280x768 ("3)	1280x768 ("3)
Brightness	450 cd/m²	450 cd/m²
Contrast Ratio	400:1	400:1
Response Time	16 ms	16 ms
Viewing Angles H/V	176/176	176/176
Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass
Pixel Plus	<b>Pixel Plus</b>	-
Progressive Scan	Progressive Scan	Progressive Scan
Digital Crystal Clear/Crystal Clear III	Digital Crystal Clear	Digital Crystal Clear
Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor
Combiner	2D Comb Filter	2D Comb Filter
<b>SOUND QUALITY</b>		
Dolby Virtual	Dolby Virtual	Dolby Virtual
Incredible Surround	-	-
Power output (RMS Watts)	10 W RMS	10 W RMS
Number of on board Speakers	2 on board speakers	2 on board speakers
<b>EASE OF USE INSTALLATION</b>		
Plug & Play	Plug & Play	Plug & Play
PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning
100 Presets Channels	100 Presets Channels	100 Presets Channels
Autostore	Autostore	Autostore
Fine Tuning	Fine Tuning	Fine Tuning
Sorting	Sorting	Sorting
Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI
<b>EASE OF USE UTILISATION</b>		
Top Controls	Top Controls	Top Controls
RC suitable for	Rc (DVD/AUX)	Rc (DVD/AUX)
RC Reference	RCAE049_FRP	RCAE049_FRP
Program List	-	-
Smart controls	Smart controls	Smart controls
Smart Listening (AVL + Delta Volume)	Smart Listening	Smart Listening
Dual Hi	Dual Hi	Dual Hi
6 Widescreen Modes	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen
16:9 compress/4:3 expand	-	-
Continuous zoom	-	-
WSSB	WSSB	WSSB
Smart Clock	-	-
Wake up Clock	-	-
Sleep Timer	-	-
Smart Lock (child + parental)	-	-



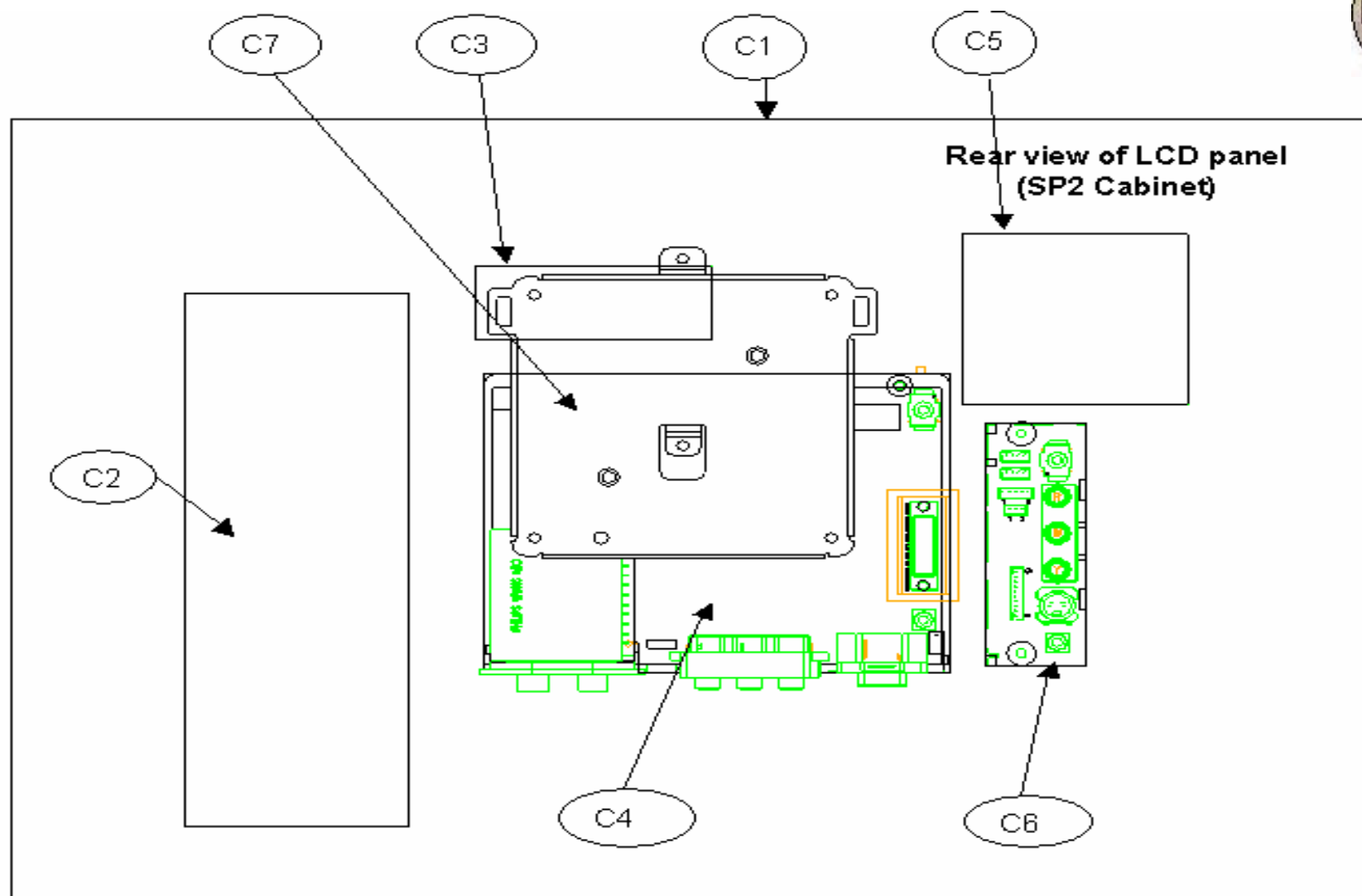
	TOP	STEP
<a href="#">Back To List</a>		
<b>FLAT TV</b>		
<b>Type no.</b>	<b>LCD TV</b>	<b>LCD TV</b>
<b>Update Flat TV</b>	<b>26PF9956</b>	<b>26PF9946</b>
<b>Chassis</b>	<b>LC04 V</b>	<b>LC04 V</b>
<b>PICTURE QUALITY</b>		
Panel	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT
Number of Pixels	1280x768 ("3)	1280x768 ("3)
Brightness	450 cd/m²	450 cd/m²
Contrast Ratio	400:1	400:1
Response Time	16 ms	16 ms
Viewing Angles H/V	176/176	176/176
Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass
Pixel Plus	<b>Pixel Plus</b>	-
Progressive Scan	Progressive Scan	Progressive Scan
Digital Crystal Clear/Crystal Clear III	Digital Crystal Clear	Digital Crystal Clear
Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor
Combiner	2D Comb Filter	2D Comb Filter
<b>SOUND QUALITY</b>		
Dolby Virtual	Dolby Virtual	Dolby Virtual
Incredible Surround	-	-
Power output (RMS Watts)	10 W RMS	10 W RMS
Number of on board Speakers	2 on board speakers	2 on board speakers
<b>EASE OF USE INSTALLATION</b>		
Plug & Play	Plug & Play	Plug & Play
PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning
100 Presets Channels	100 Presets Channels	100 Presets Channels
Autostore	Autostore	Autostore
Fine Tuning	Fine Tuning	Fine Tuning
Sorting	Sorting	Sorting
Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI
<b>EASE OF USE UTILISATION</b>		
Top Controls	Top Controls	Top Controls
RC suitable for	Rc (DVD/AUX)	Rc (DVD/AUX)
RC Reference	RCAE049_FRP	RCAE049_FRP
Program List	-	-
Smart controls	Smart controls	Smart controls
Smart Listening (AVL + Delta Volume)	Smart Listening	Smart Listening
Dual Hi	Dual Hi	Dual Hi
6 Widescreen Modes	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen
16:9 compress/4:3 expand	-	-
Continuous zoom	-	-
WSSB	WSSB	WSSB
Smart Clock	-	-
Wake up Clock	-	-
Sleep Timer	-	-
Smart Lock (child + parental)	-	-



# Plataforma LC4.I

Hay 2 variantes en la plataforma LC4.I que se pueden diferenciar por el tipo de soporte, la medida de la pantalla y las características del producto.

Commercial Range	Housing	Panel Size					
		14"	15"	17"	20"	23"	
Q3-Step	Arch III		15PF8946	17PF8946	20PF8846	23PF8946	
Q2-Entry	SP2	14PF7846			20PF7846		





# Tipos de muebles

En el chasis LC4.I hay dos tipos de muebles:

- **Arch III:**

- *Cubierta delantera:* igual que el LC03.
- *Cubierta trasera:* adaptada para satisfacer los requisitos del chasis LC4.I.

- **SP2:**

- *Cubierta delantera:* igual que el LC03SP.
- *Cubierta trasera:* adaptada para satisfacer los requisitos de conectividad trasera del chasis LC4.I.

# Tipos de muebles: Arch III

Arch III



# Tipos de muebles: SP2



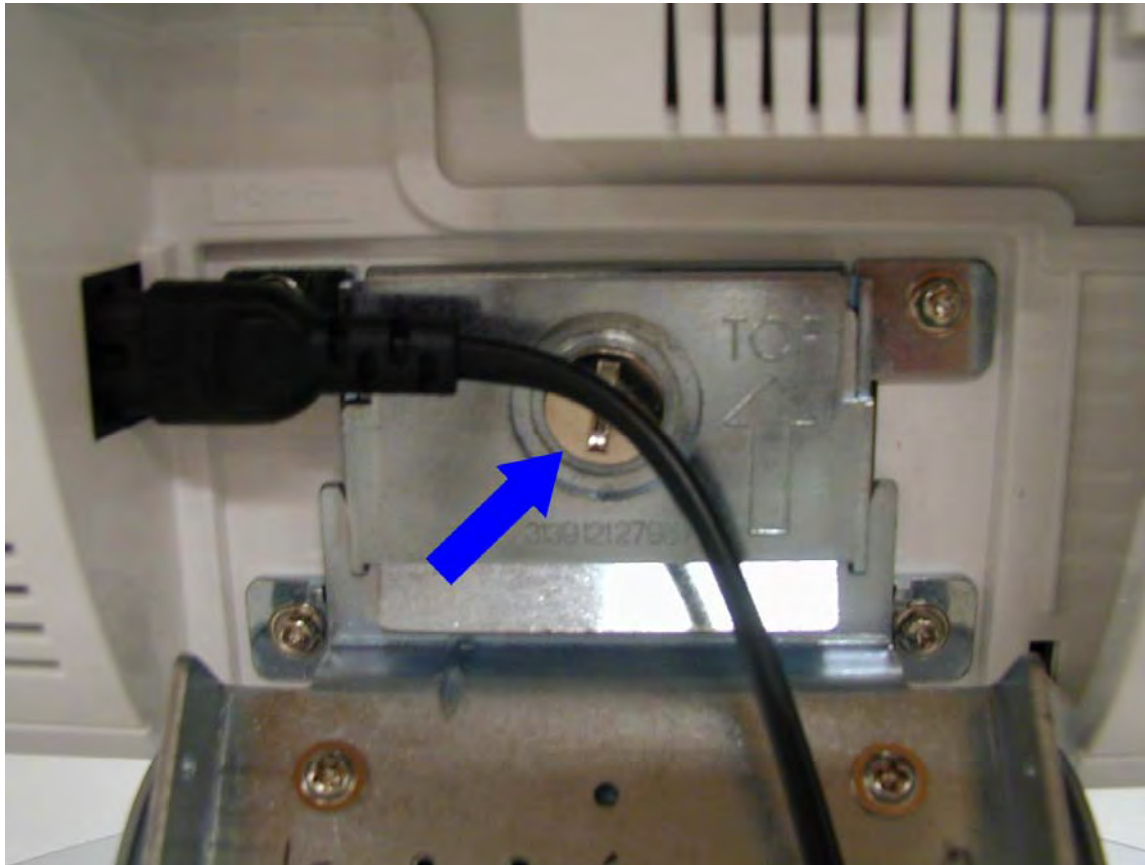
# Tipos de muebles: SP2

## Gestión del cableado

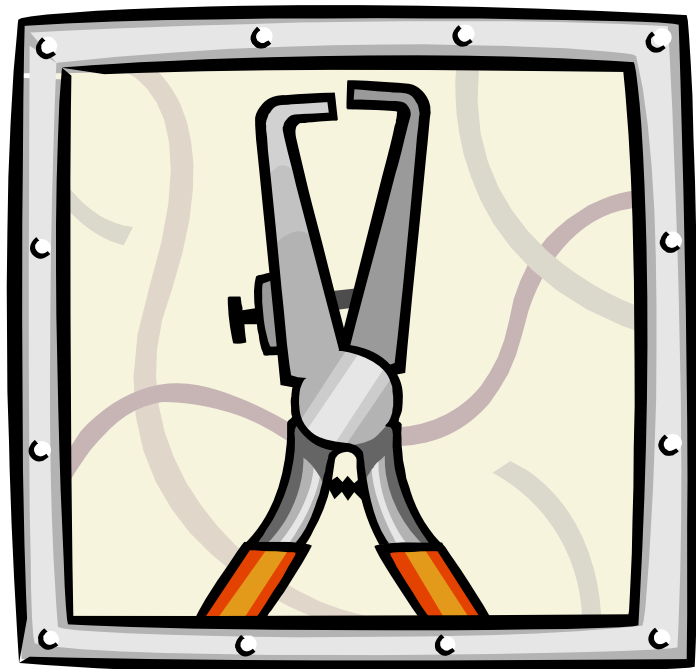


# Tipos de muebles: SP2

## *Extracción de la base*



# Política de servicio



- **Pantalla**
  - Sustitución
- **Fuente de alimentación**
  - Sustitución en LC4.1 y LC4.2
  - Reparable a nivel de componentes en LC4.6
- **Placas**
  - Reparables a nivel de componentes

# PHILIPS

## **Curso LC04**

## **02. Diagrama de bloques**

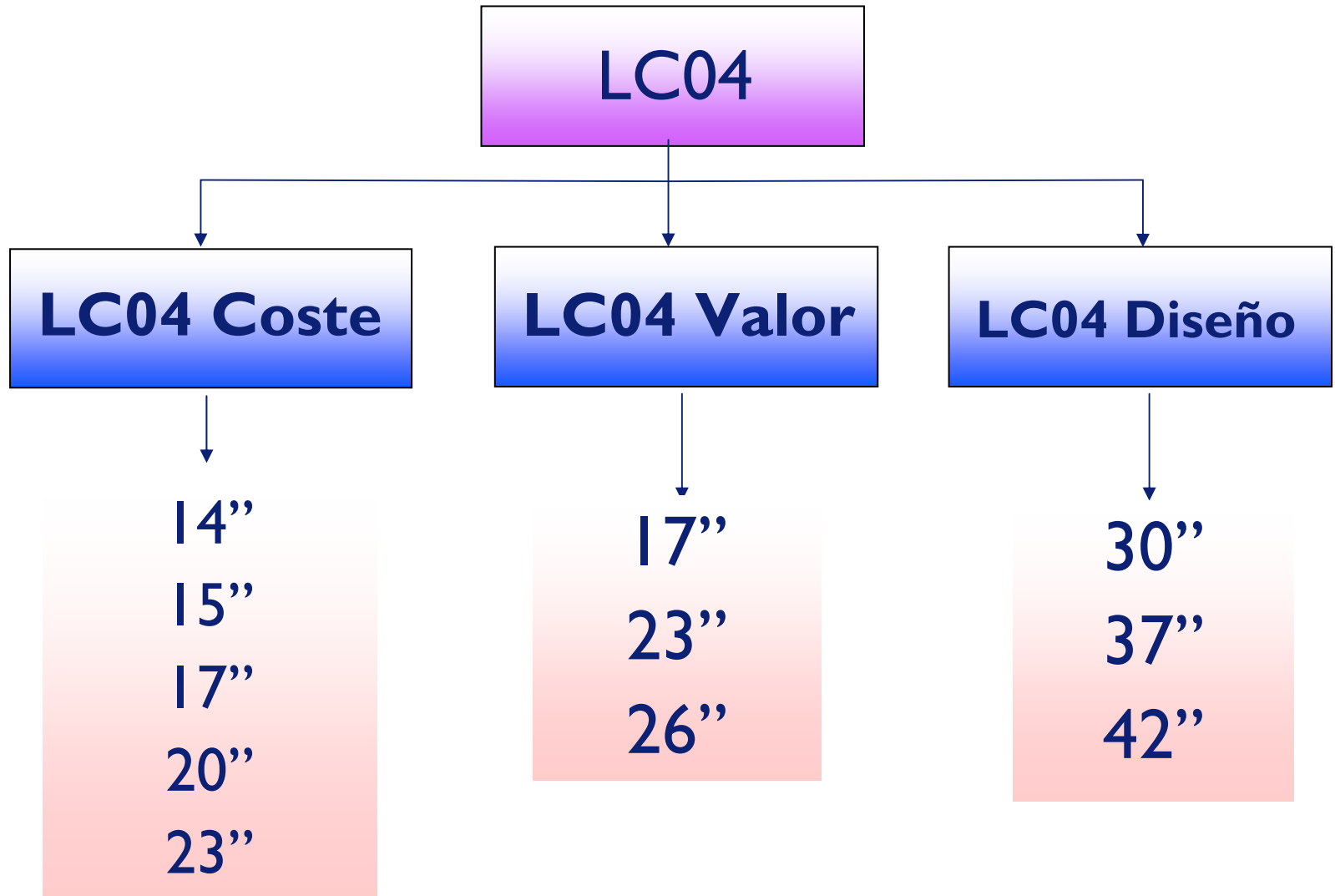
Philips Ibérica – Electrónica de Consumo

Departamento Técnico

Cristina Senallé - Gabriel Arianes

Noviembre 2004

# Diversidad de chasis





## Panel TV-Scaler

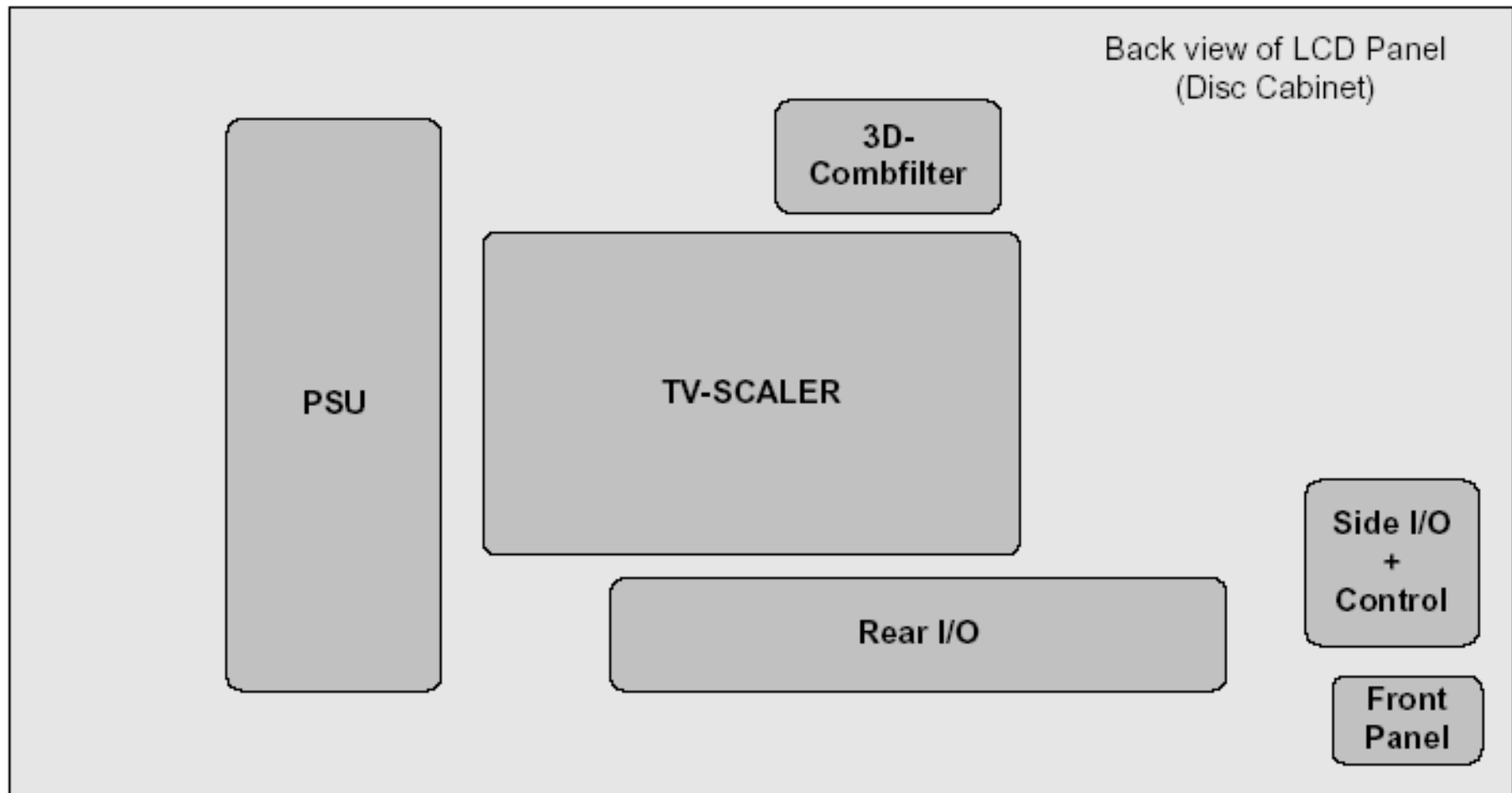
El procesador de TV y el procesador Scaler en el chasis LC4 están en la misma placa.

Para el procesador de TV se utiliza un nuevo chip denominado **Hercules**.

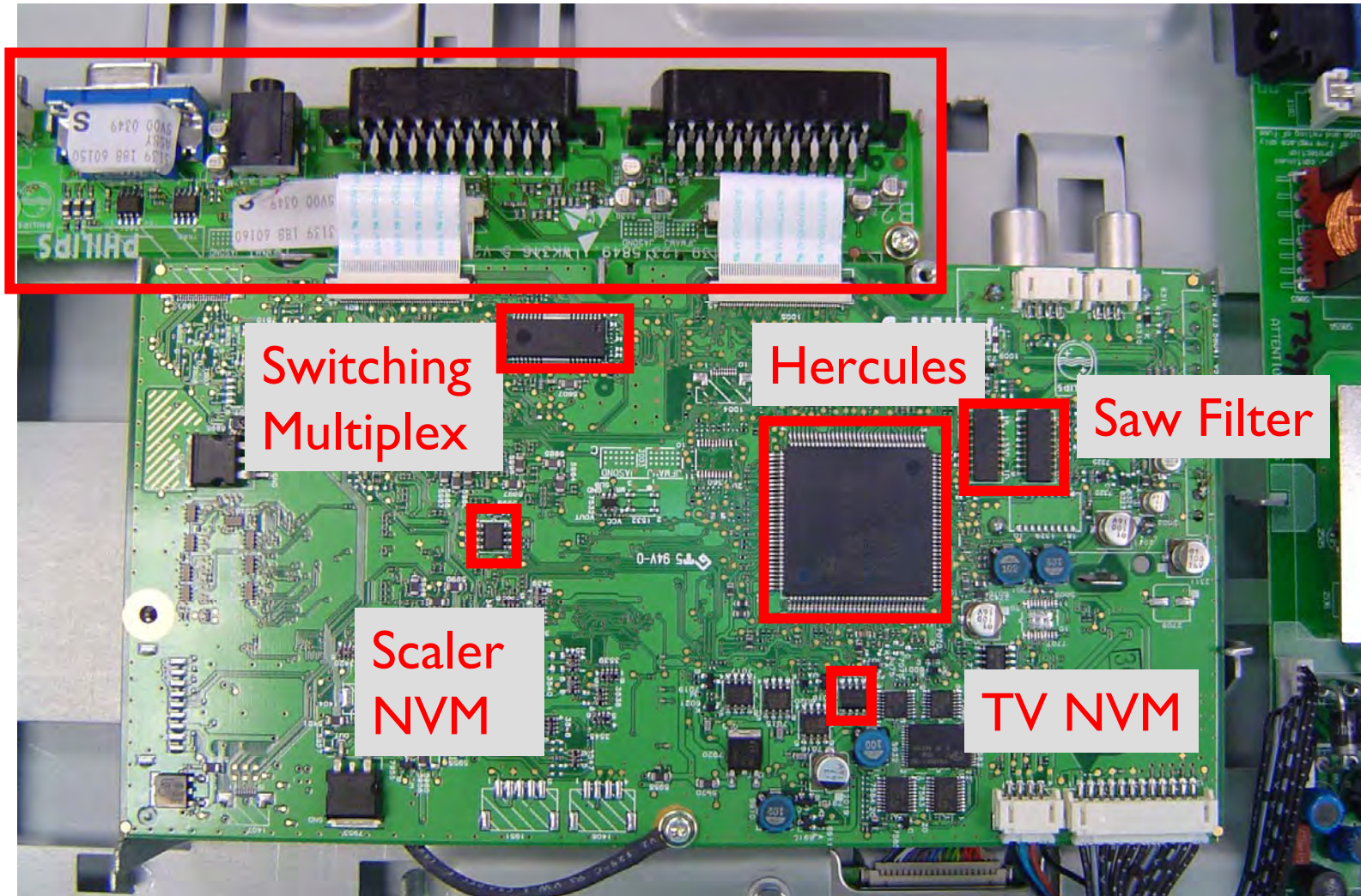
El procesador Scaler es el **GM 1501** (BGA) para los chasis LC4.2 y LC4.6 y el **GM 5221** (QFP) para el chasis LC4.1.



# Revisión de Paneles

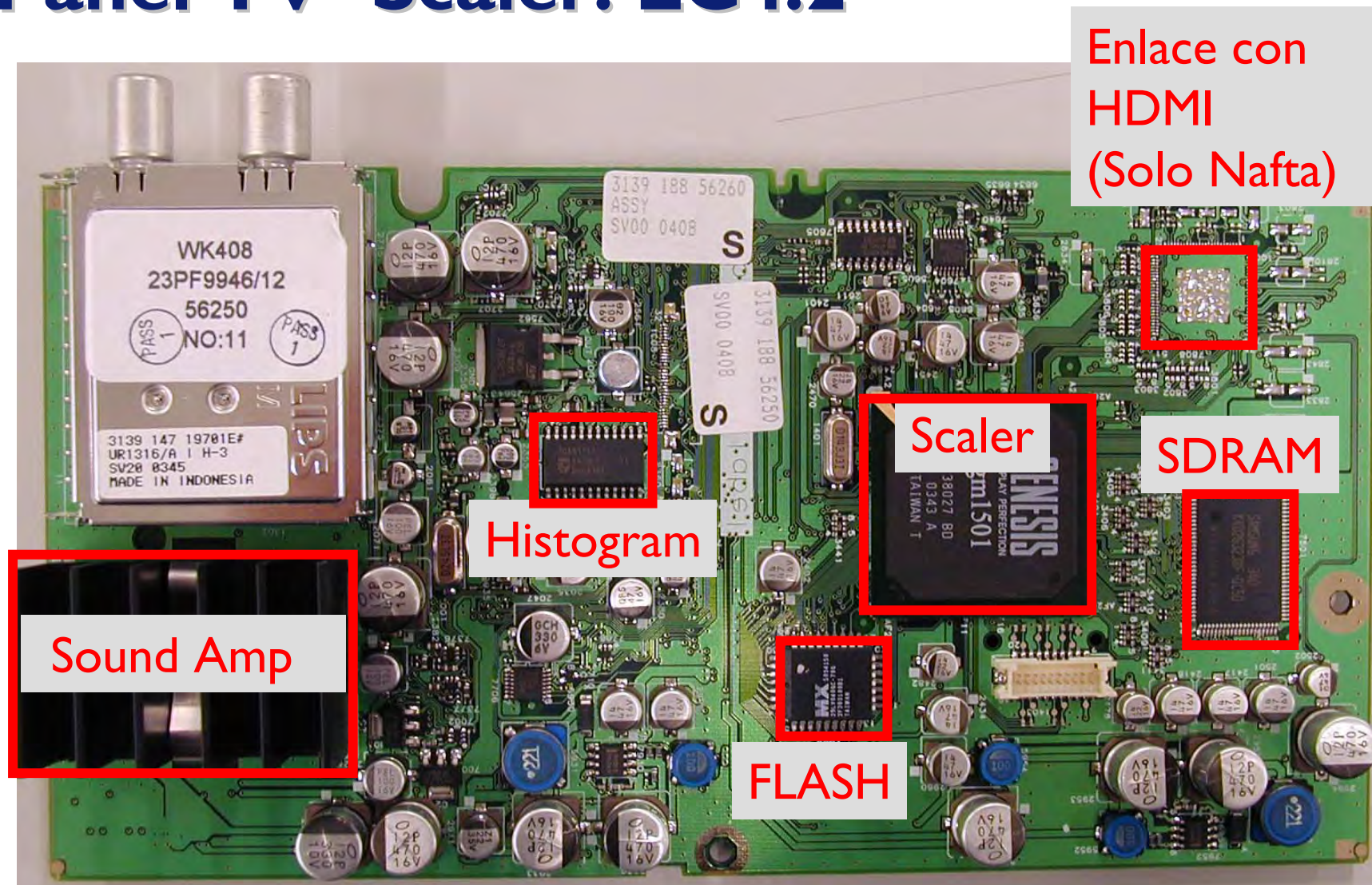


# Panel TV- Scaler. LC4.2





# Panel TV- Scaler. LC4.2

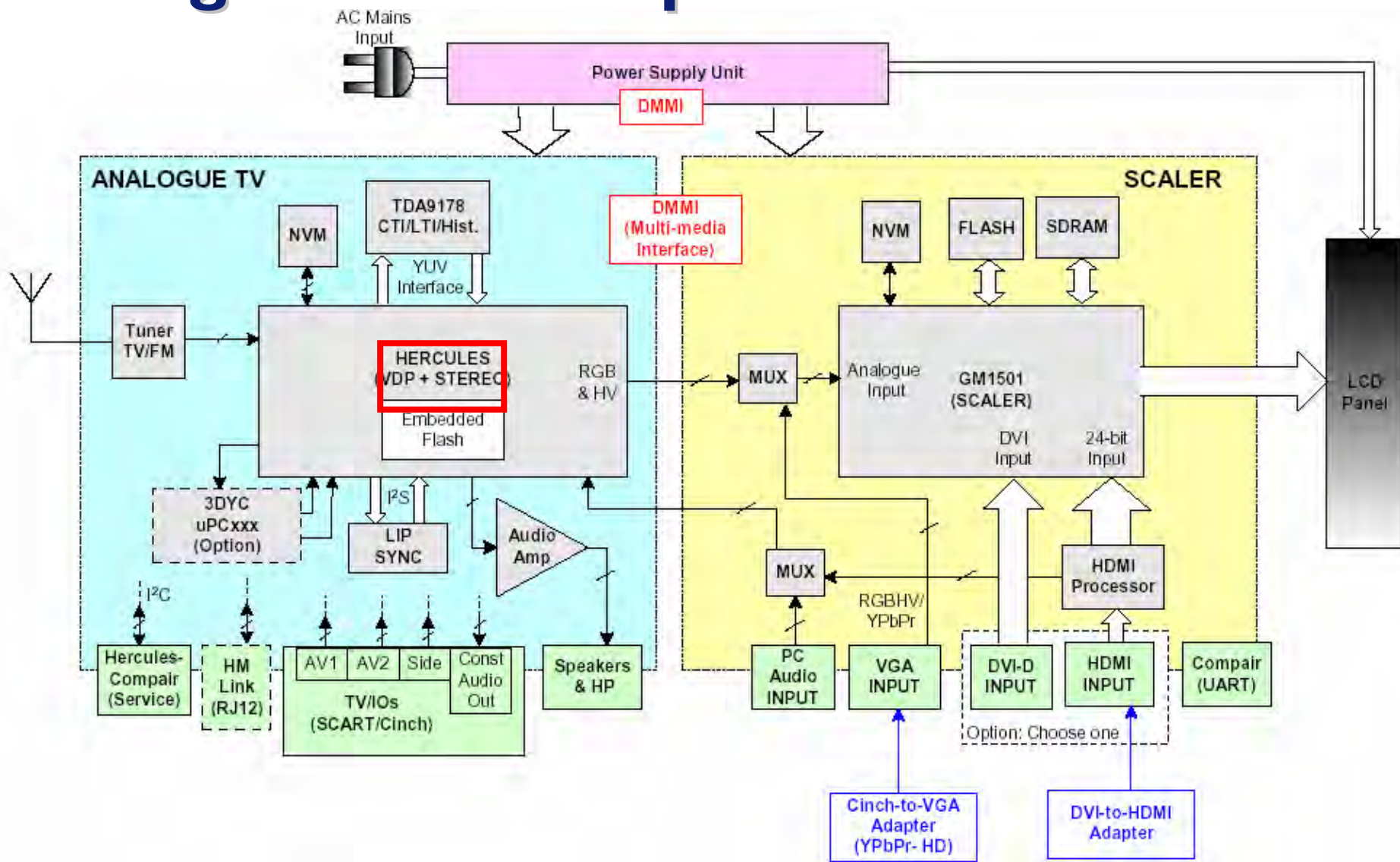


# Panel de TV y Scaler

Solamente hay un panel para soportar todo el rango. La tabla muestra diferentes versiones del Hercules utilizado en diferentes regiones, debido a características y coste.

Platform Solution	Region	Analogue TV	Scaler	PCB
<b>LC04C</b>	Europe (/12, /58)	Hercules TDA12021H/N1B10	<b>Gm 5221</b>	1
	LATAM	Hercules TDA12011H/N1B50		
	AP/69	Hercules TDA12021H/N1B10		
	AP/61	Hercules TDA12011H/N1B50		
	NAFTA	Hercules TDA12001H/N1B50		

# Diagrama de bloques





# Conectividad de E/S

Screen Size	Region	AV1		AV2		Const. Level Out	HD/PC (Analog)	PC-Audio In	HD/PC (Digital)		PCB
		CVBS	YPbPr (1Fh)	CVBS	SVHS		VGA		HDMI	DVI	
17"	NAFTA	Mini Jack (CVBS,L,R)	3 Cinch	Mini Jack(CVBS,L,R)			15p-Dsub	Mini Jack	HDMI		1
	AP/LATAM	Mini Jack (CVBS,L,R)	3 Cinch	Mini Jack(CVBS,L,R)			15p-Dsub	Mini Jack		DVI-D	2
	EUR	SCART		SCART		Mini Jack	15p-Dsub	Mini Jack			3
23 / 26"	NAFTA	3 Cinch	3 Cinch	Mini Jack (CVBS+L+R)	S-VHS		15p-Dsub	Mini Jack	HDMI		4
	AP/LATAM	3 Cinch	3 Cinch	Mini Jack (CVBS+L+R)	S-VHS		15p-Dsub	Mini Jack		DVI-D	5
	EUR	SCART		SCART		Mini Jack	15p-Dsub	Mini Jack		DVI-D	6

# PHILIPS

## **Curso LC04**

### **03. Alimentación**

Philips Ibérica – Electrónica de Consumo

Departamento Técnico

Cristina Senallé - Gabriel Arianes

Noviembre 2004



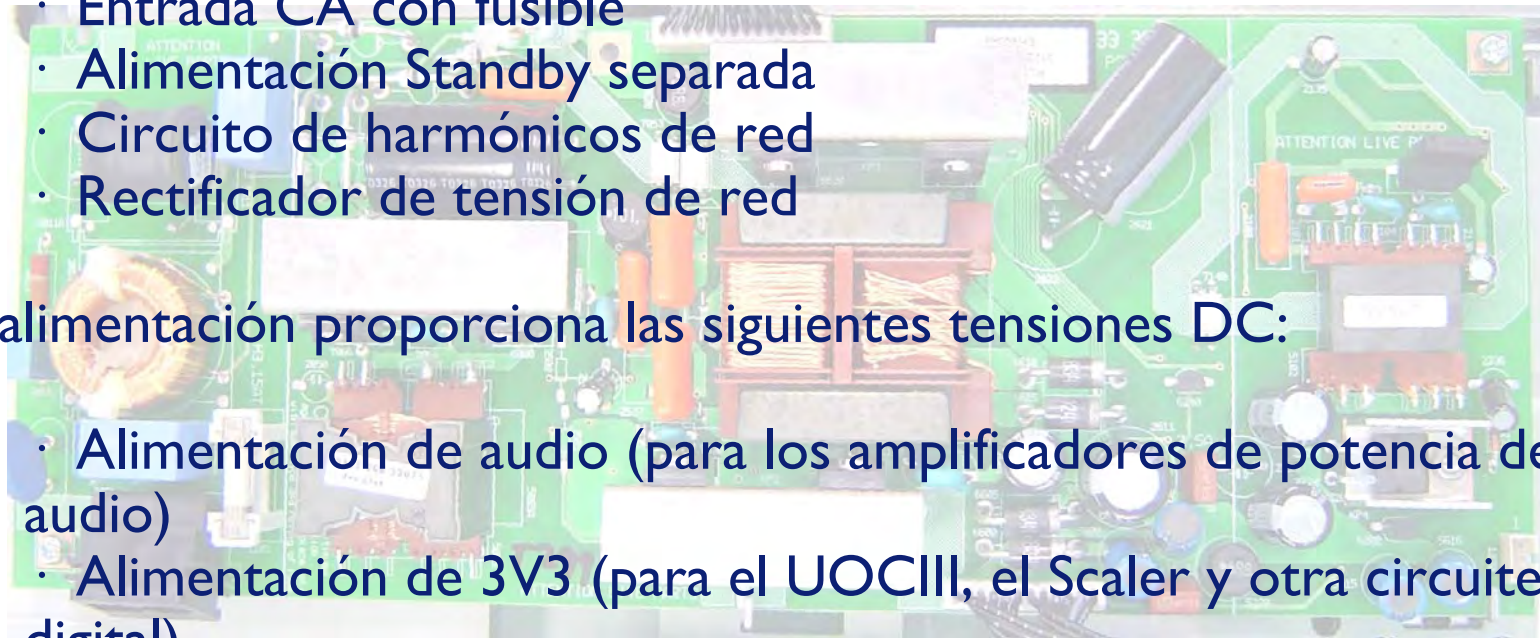
# Descripción de la alimentación

El sistema de alimentación se compone de:

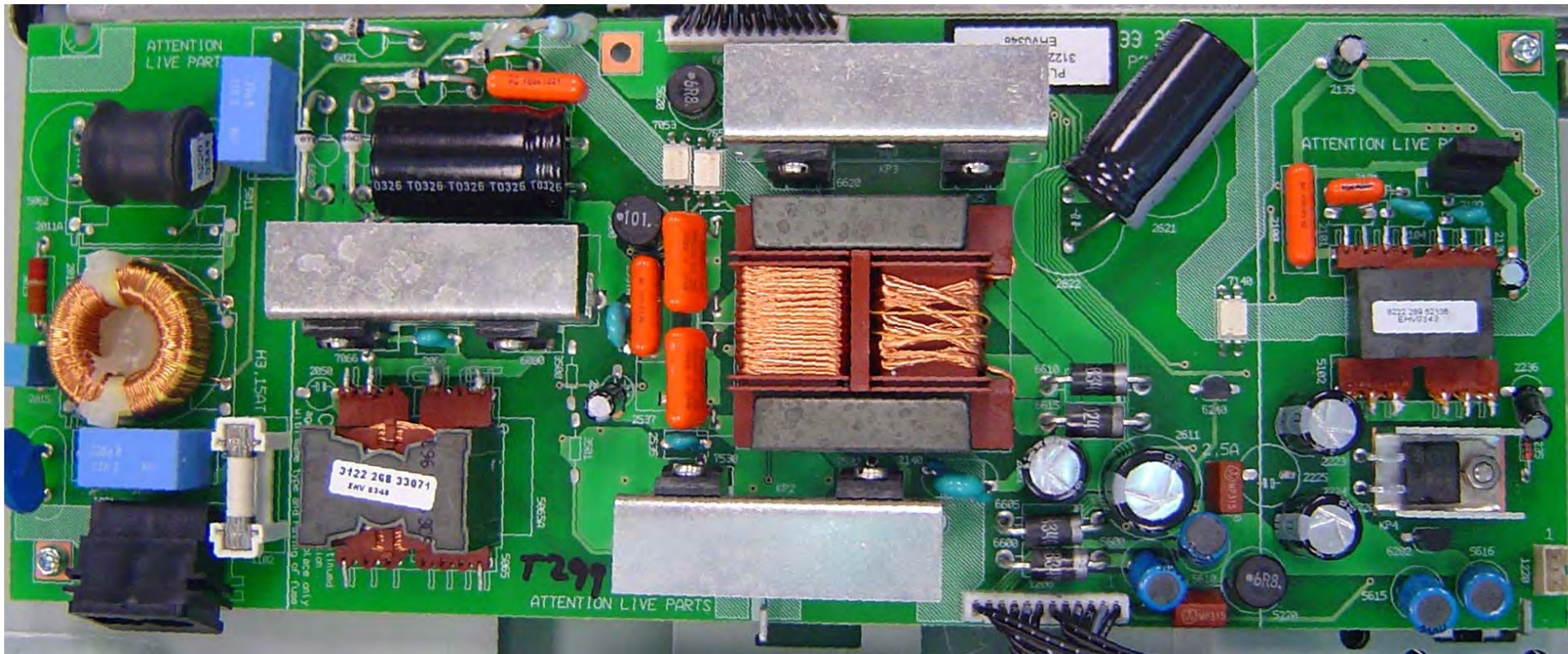
- Entrada CA con fusible
- Alimentación Standby separada
- Circuito de armónicos de red
- Rectificador de tensión de red

La alimentación proporciona las siguientes tensiones DC:

- Alimentación de audio (para los amplificadores de potencia de audio)
- Alimentación de 3V3 (para el UOCIII, el Scaler y otra circuitería digital)
- 13V sin regular, a partir de los que se generan 5V, 8V y 12V regulados
- Alimentación Bolt-on (para los módulos Bolt-on como por ejemplo, iDTV, DVD-Combi, ITV, HMR,...)



# Alimentación



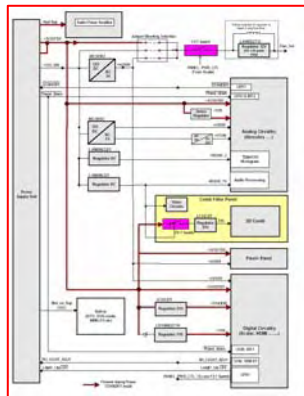
# Alimentaciones del LC04 según panel

	14"	15"	17"	20"	23"	26"
Power	50W	50W	70W	70W	150W	170W
Inverter	Yes	Yes	Yes	Yes	No	No
Sound	2X3W	2X3W	2X3W	2X5W	2X5W	2X5W
L*W*H(mm)	170X105X20	170X105X20	220X75X20	220X75X20	228X100X22	260X100X26

SIZE	Type	Man	LCD Panel Typical Drive				TYPICAL LAMP CHARACTERISTICS				INVERTER(ma x)			DC-DC conve rter	Panel power supply position diversity								GPIO port			
			V	A	W	A (ma x)	NO.	V	mA	W	V	A	W		5955	5956	5957	5959	5960	1951	7953	2959	3425	3426	3427	3428
14	T140VN01	AUO	5	0.6	3	1.8	4	940	6					Yes		Y		Y		Y						
15	LC150X02-A5	LPL	5				4		6	20.2				Yes		Y		Y		Y					Y	
17	LC171W03	LPL	12	0.18	2.16		6	670	7	28.2						Y		Y			Y	Y	Y		Y	
20	LC201V02	LPL	12	0.15	1.79		6	720	7	30.2						Y		Y			Y	Y			Y	
20	T201VN01	AUO	5	1.5	7.5		12	760	5		12	4.5	55	Yes		Y		Y		Y			Y		Y	
23	LC230W01	LPL	12	0.28	2.76		12				24	3.2	77			Y	Y						Y	Y		
23	QD23WL01	QDI	12	0.35		0.55	12	1000	5	60	24					Y	Y							Y		

# Arquitectura de la alimentación

Arquitectura



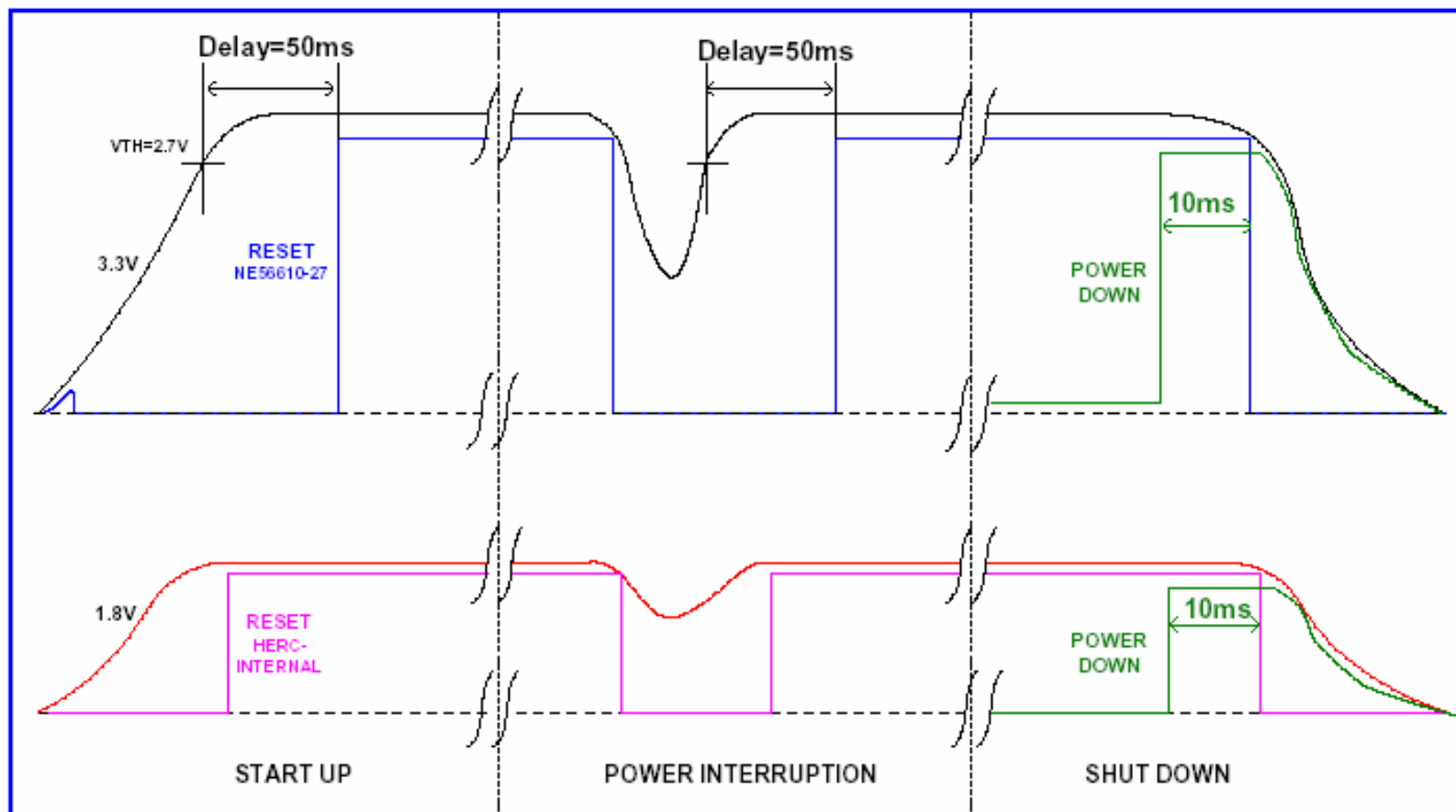
Estados



<b>Off</b>	<b>Activo</b>
	<b>Pasivo</b>
<b>On</b>	<b>Normal</b>
	<b>PC</b>
<b>Stand By Normal</b>	<b>Protección</b>
	<b>Sleep</b>



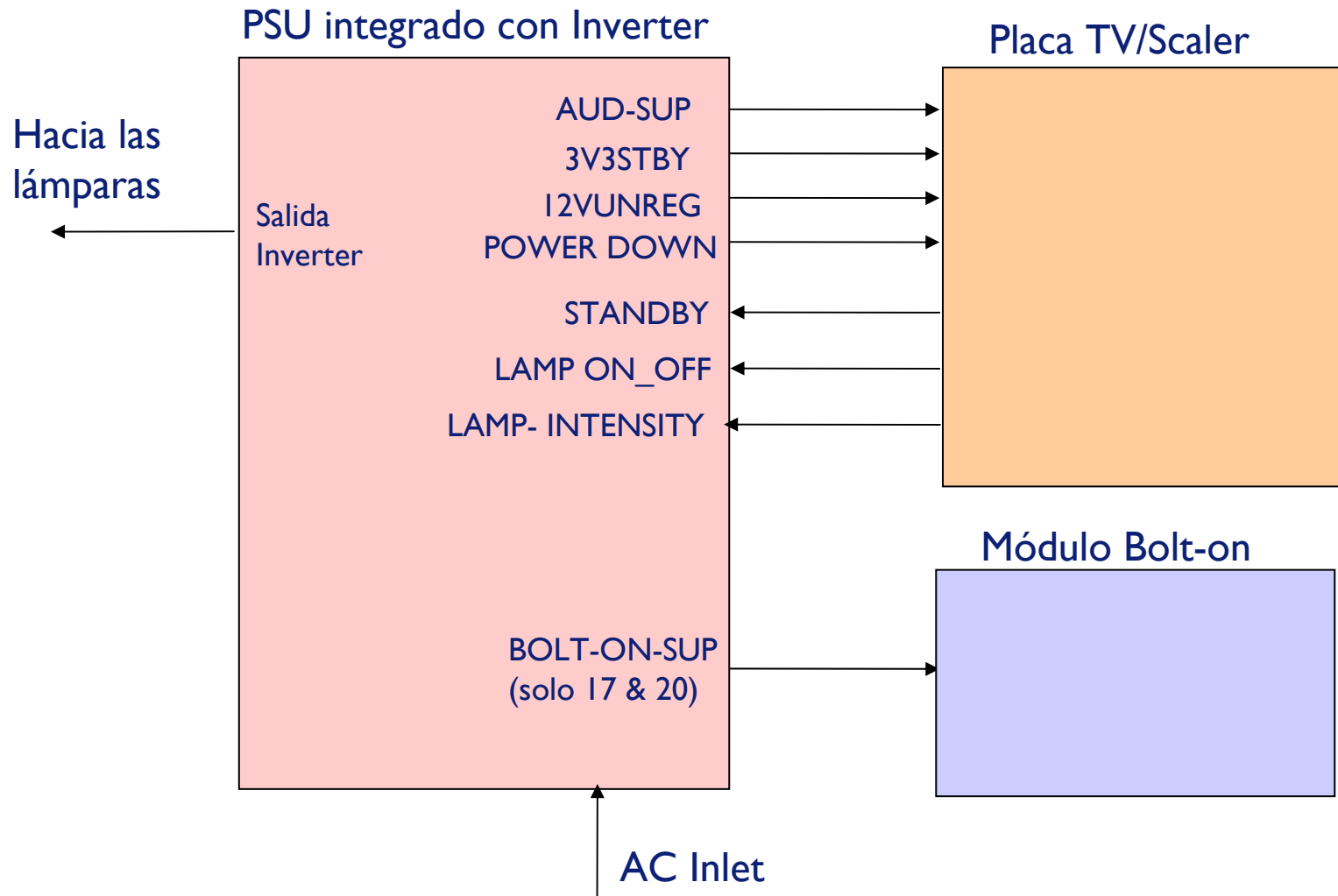
# Sistema de reset



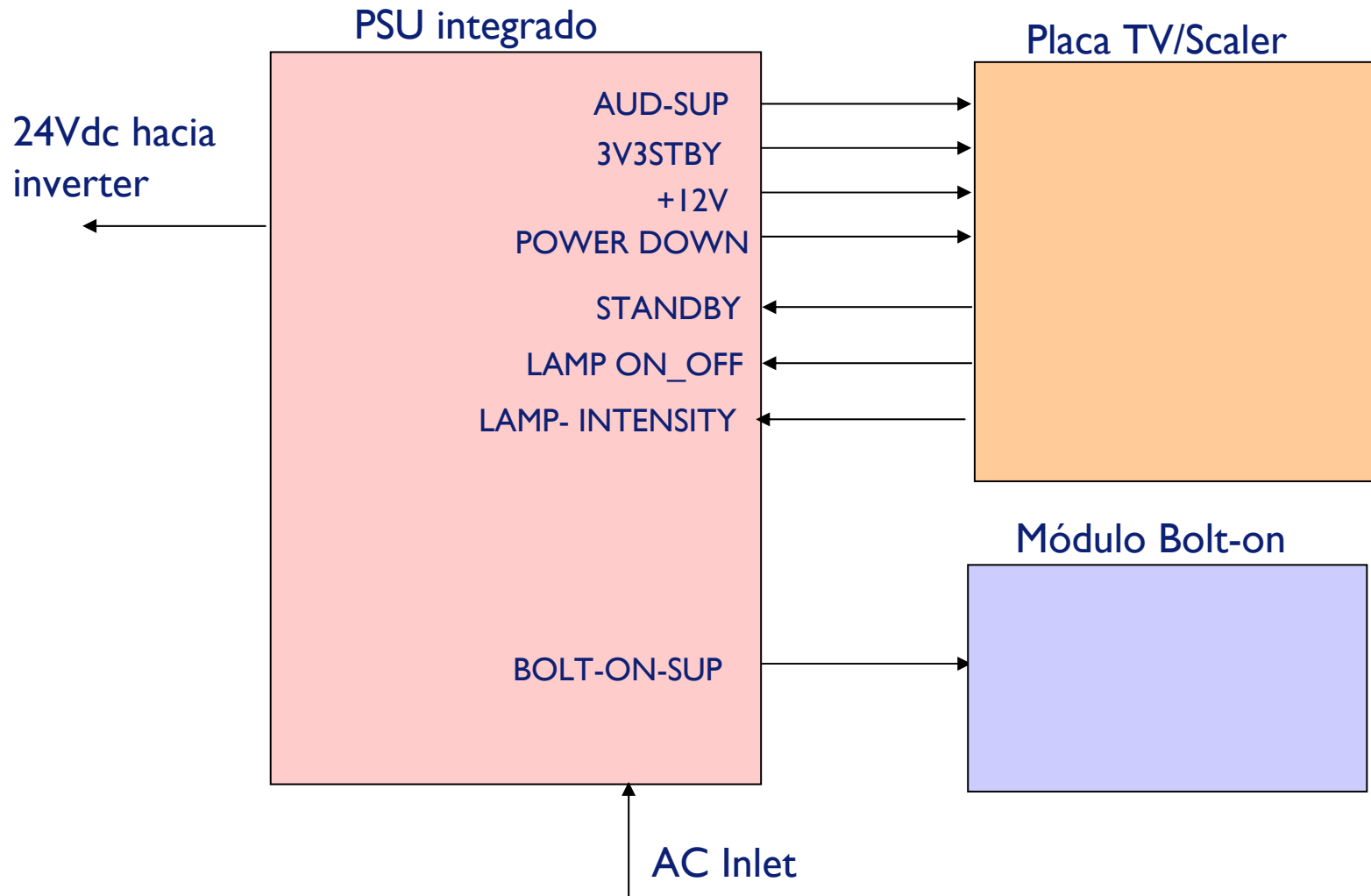
Sistema de reset



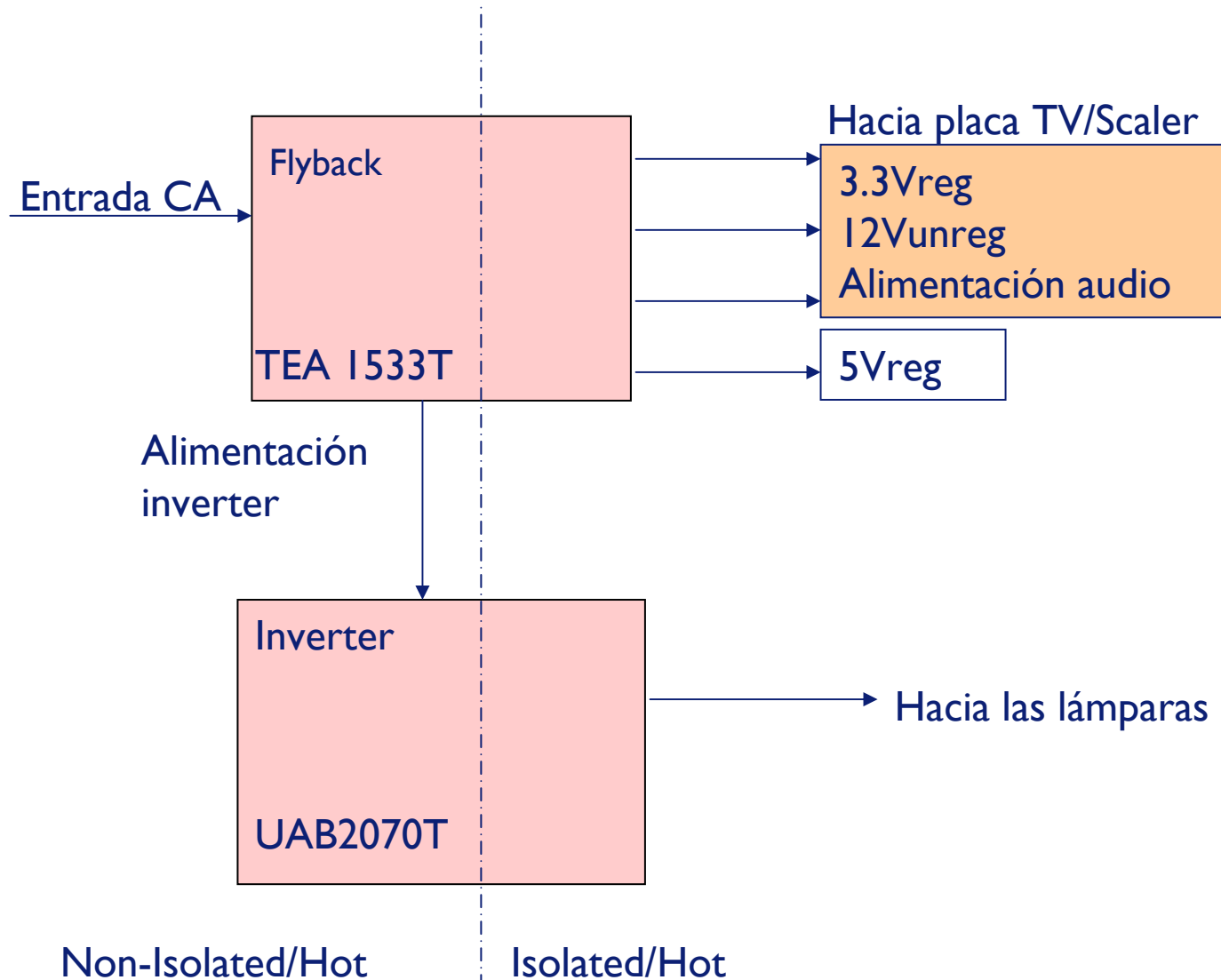
## De 14" a 20"



23" y 26"

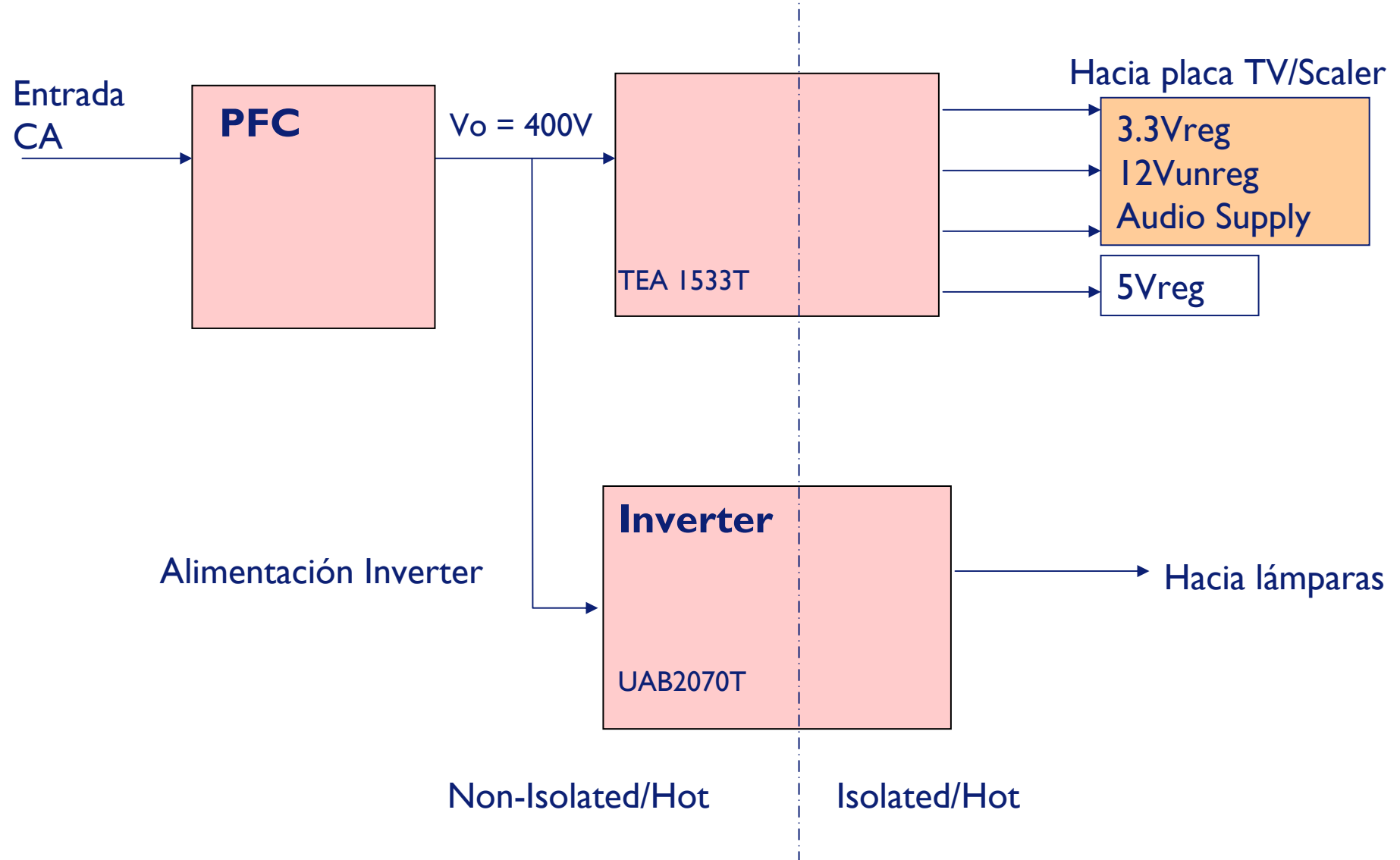


## 14" y 15" PSU

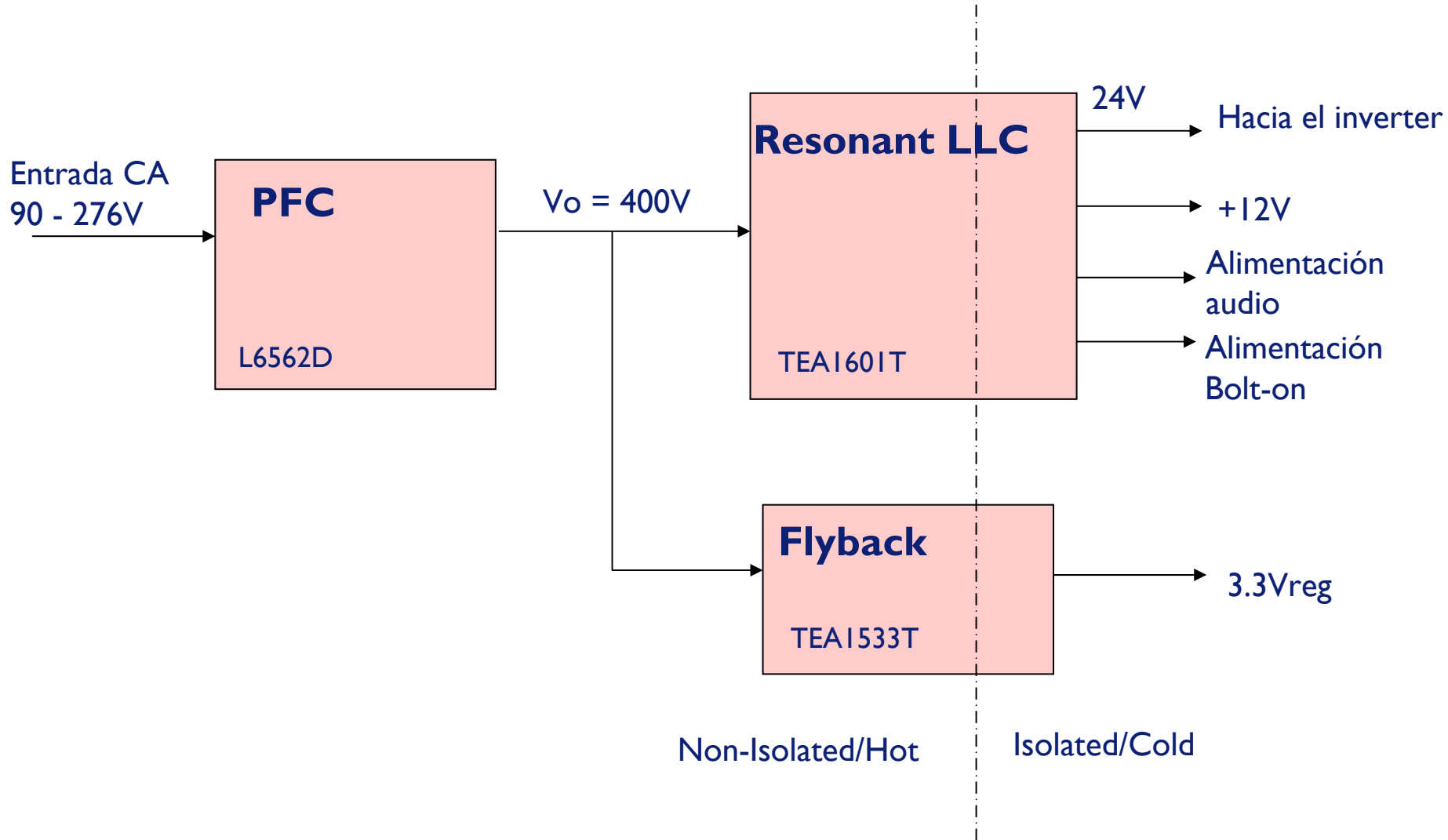




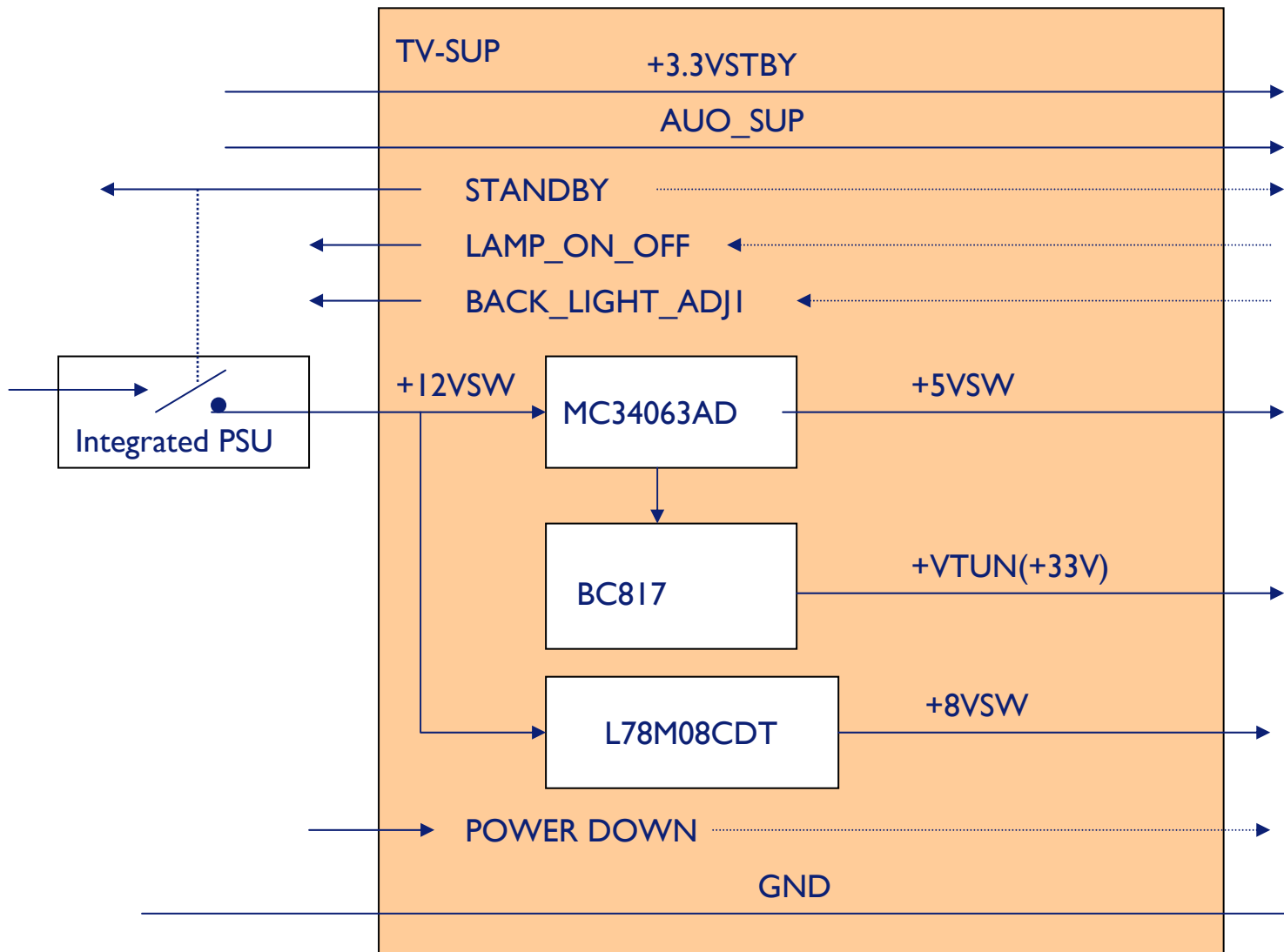
## 17" & 20" PSU



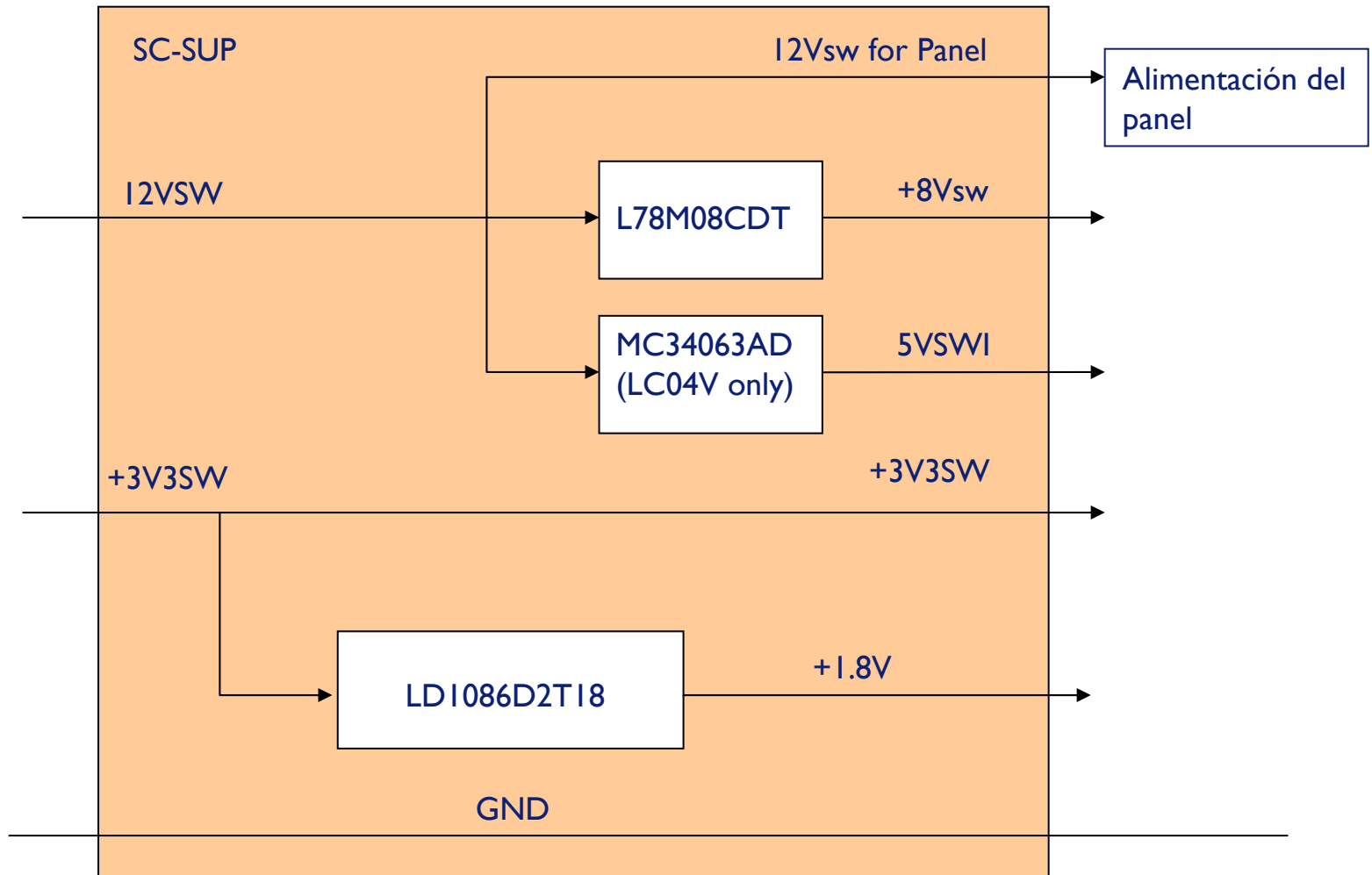
## 23" y 26" PSU interno



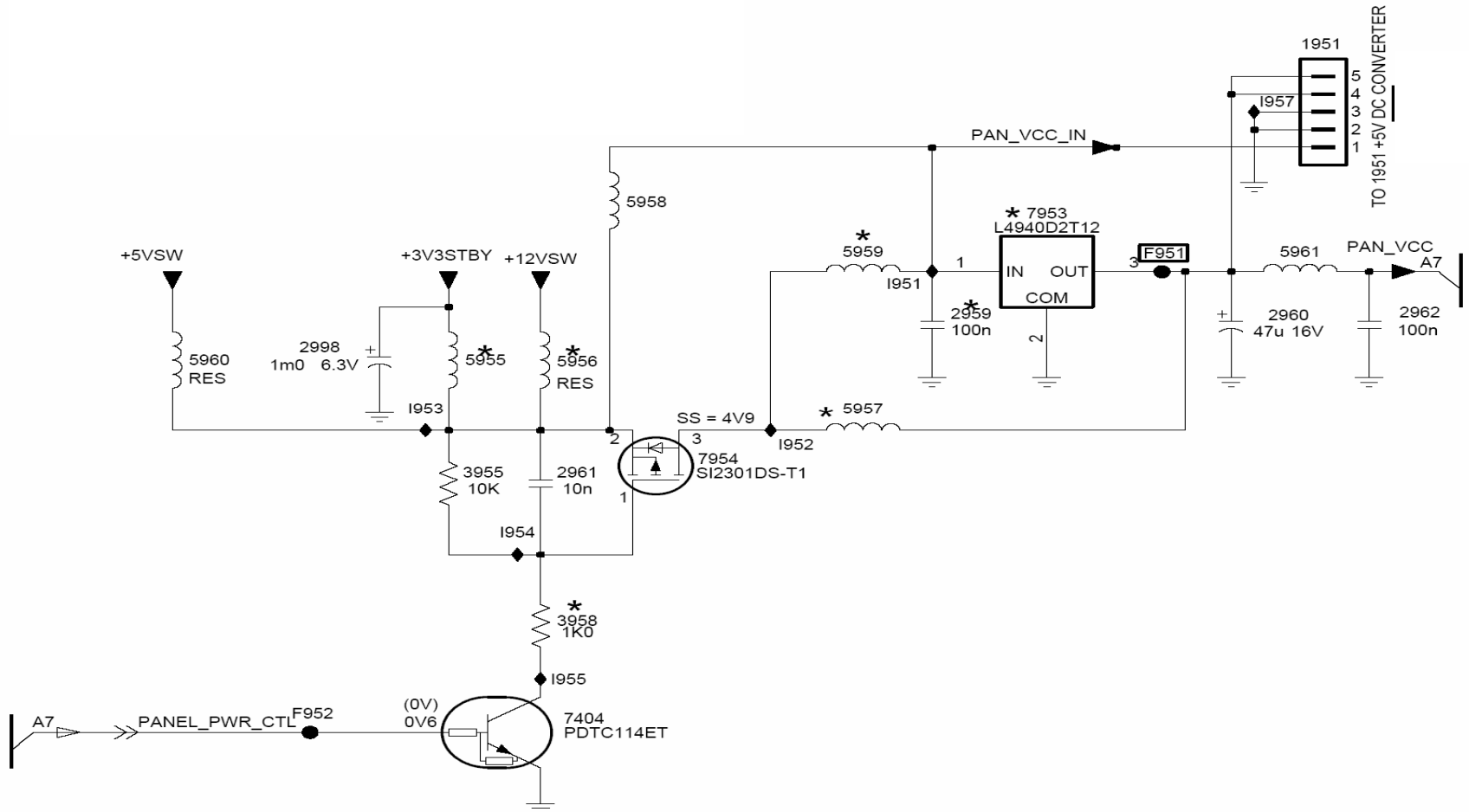
# Alimentación TV



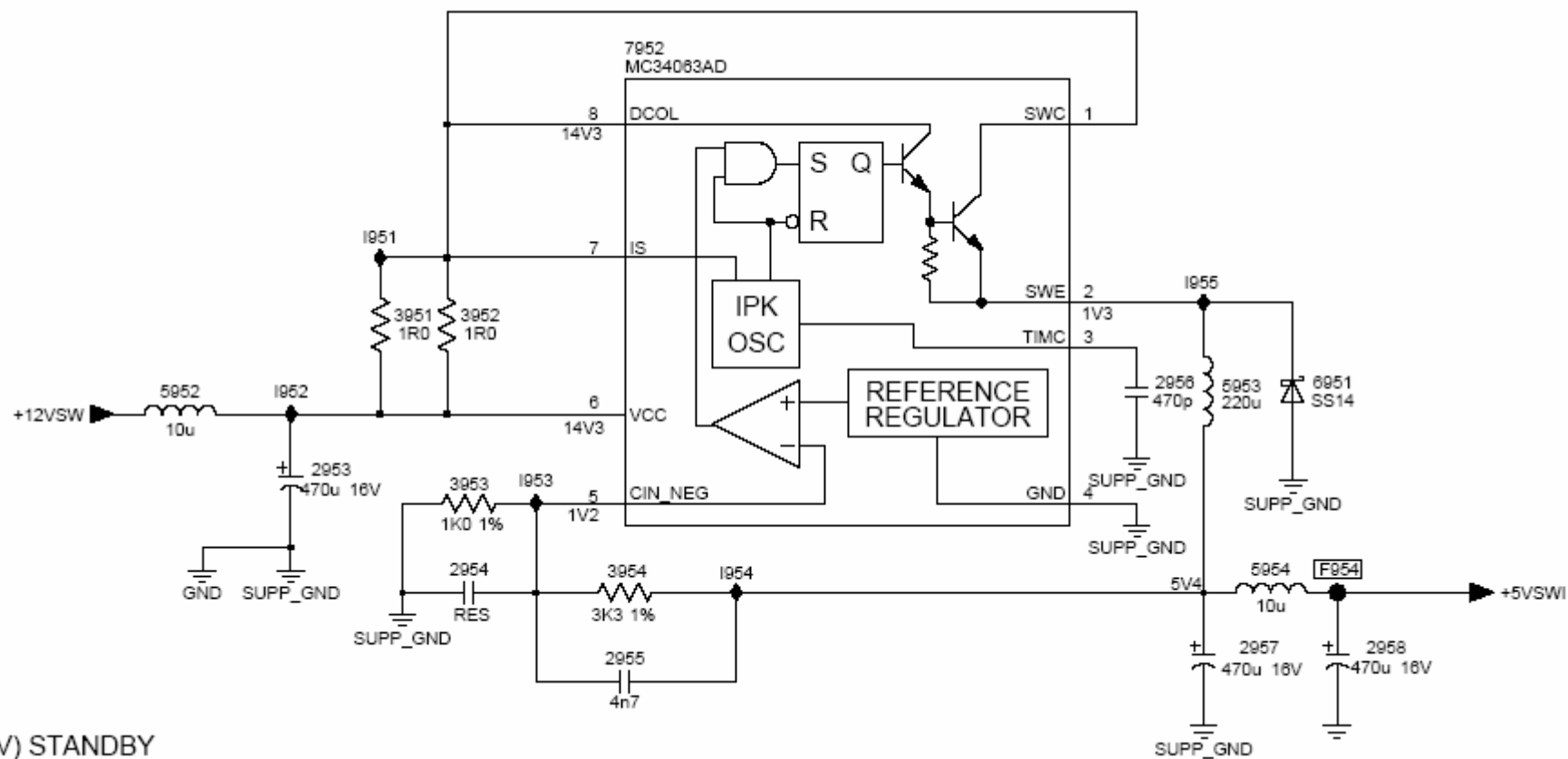
# Alimentación del Scaler



# Panel de alimentación



# MC34063AD



# Paneles LCD & PSU

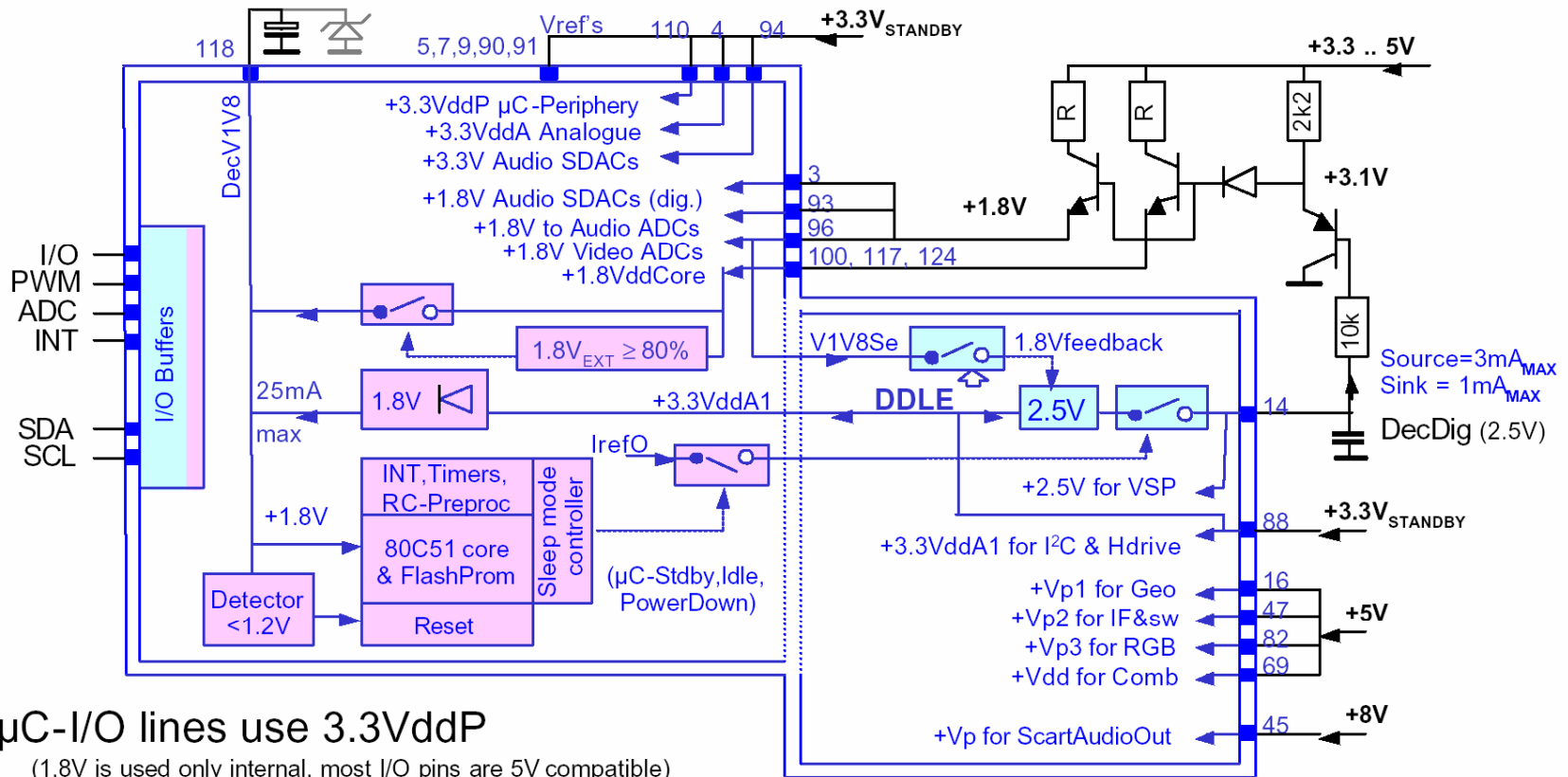
[illegible]

		Panel			PSU					Audio		DC/DC Converter		
	First Source	Second Source												
14PF6826	T140VN01	9322 207 49682			BL4L50P2	3341	101	20011		2X2W	4 ohm		Yes	
14PF7846	T140VN01	9322 207 49682			BL4L50P2	3341	101	20011		2X2W			Yes	
15PF7946	LC150X02-A5	9322 207 48682			BL4L50P3	3341	101	20021		2X2W			Yes	
15PF8946	LC150X02-A5	9322 207 48682			BL4L50P3	3341	101	20021		2X2W			Yes	
15HF8946	LC150X02-A5	9322 207 48682			BL4L50P3	3341	101	20021		2X2W			Yes	
15FT3011	LC150X02-A5	9322 207 48682			BL4L50P3	3341	101	20021		2X2W			Yes	
17PF8946	LC171W03-A4	9322 196 32682			BL6L70P1	3122	1137	23041		2X2W				
20 PF7846	LC201V02-A3	9322 197 44682			BL6L70P3	3122	137	23101		2X5W	8 ohm			
20PF8846	LC201V02-A3	9322 197 44682			BL6L70P3	3122	137	23101		2X5W				
20HF7846	LC201V02-A3	9322 197 44682			BL6L70P3	3122	137	23101		2X5W				
23PF8946	QD23WL01	9322 207 27682			PLCD150P1	3122	137	23071		2X5W				

# Which Vdd goes where:

QFP128, MCM

□ = 3.3V logic  
□ = 1.8V logic



- **All** μC-I/O lines use 3.3VddP  
(1.8V is used only internal, most I/O pins are 5V compatible)
- **ALL** 3.3V supply inputs **must** be connected to the **same** net (all 5V inputs also to one net)
- Self-controlled 1.8V loop, **no** external stabilisers needed



# PHILIPS

## **Curso LC04**

### **04. Sintonizador**

Philips Ibérica – Electrónica de Consumo

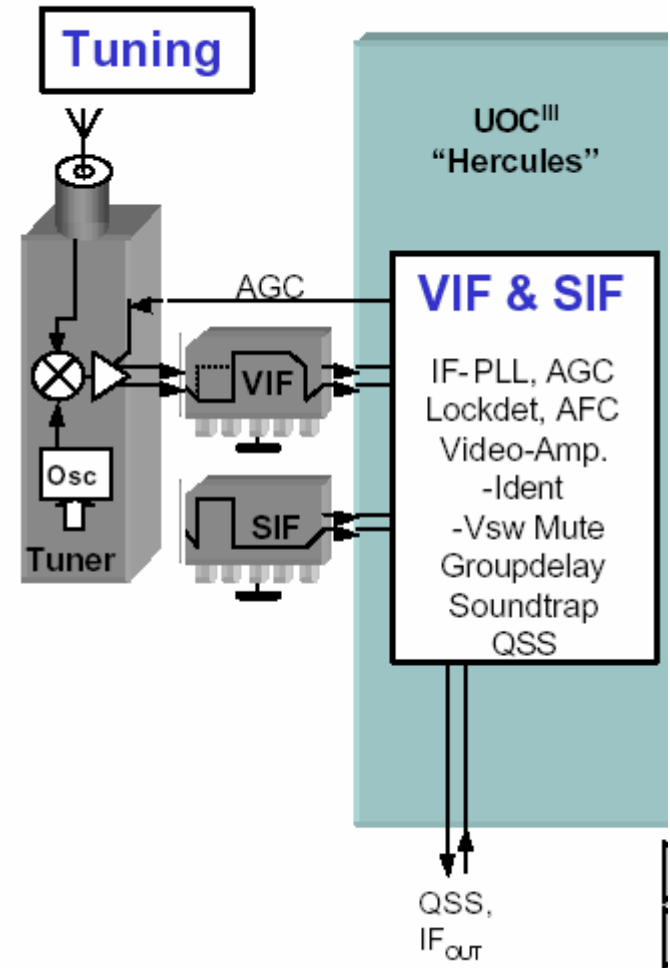
Departamento Técnico

Cristina Senallé - Gabriel Arianes

Noviembre 2004

# Contenido

1. Diversidad de sintonizadores
2. Asignación de pines en el sintonizador
3. Diversidad de filtros SAW
4. Asignación de pines en los filtros SAW
5. Diagrama de bloques Tuner/IF
6. Tabla de opciones
7. Ajustes AGC



# Diversidad de sintonizadores

Sintonizador	Sistema	Conector
<b>URI 316 MK3</b>	<b>PAL/SECAM</b> <b>10.7MHz FM IF</b>	<b>IEC plug</b>
<b>URI 336 MK3</b>	<b>NTSC/LATAM</b> <b>10.7MHz FM IF</b>	<b>F plug</b>

# Asignación de pines del sintonizador

Número de pin	Descripción	Tensión DC
1	Tensión AGC	4.0-5.0VDC señal débil o sin señal <4.0V para señal fuerte
2	Sin conectar	-
3	Selección de bus de dirección I2C	1.0V
4	SCL	0 a 3.3V
5	SDA	0 a 3.3V
6, 7	Tensión de alimentación	5VDC +/- 0.25V
8	Sin conectar	-
9	Tensión de sintonía	33VDC +/- 2V
10	Salida radio FM IF	-
11	Salida IF TV	-

# Diversidad de filtros SAW

<b>País</b>	<b>#1328 (Video)</b>	<b>#1329 (Video2)</b>	<b>#1330 (Audio)</b>
EUROPE	OFWK3953L	-	OFWK9656L
AP	OFWK7265L	-	OFWK9361L
CHINA	OFWK3956L	OFWK3955L	OFWK9352L
NAFTA	OFWMI967L	-	-

# Diversidad de filtros SAW

La conmutación de los filtros SAW se realiza a través de la línea SEL\_IF

Región	SEL_IF	Sistema
Europa	I	L'
	0	Otros
AP	I	M/N
	0	B/G, D/K, I
CHINA	I	B/G, D/K
	0	M/N
NAFTA	Sin uso	NTSC

# Asignación de pines de los filtros SAW de video

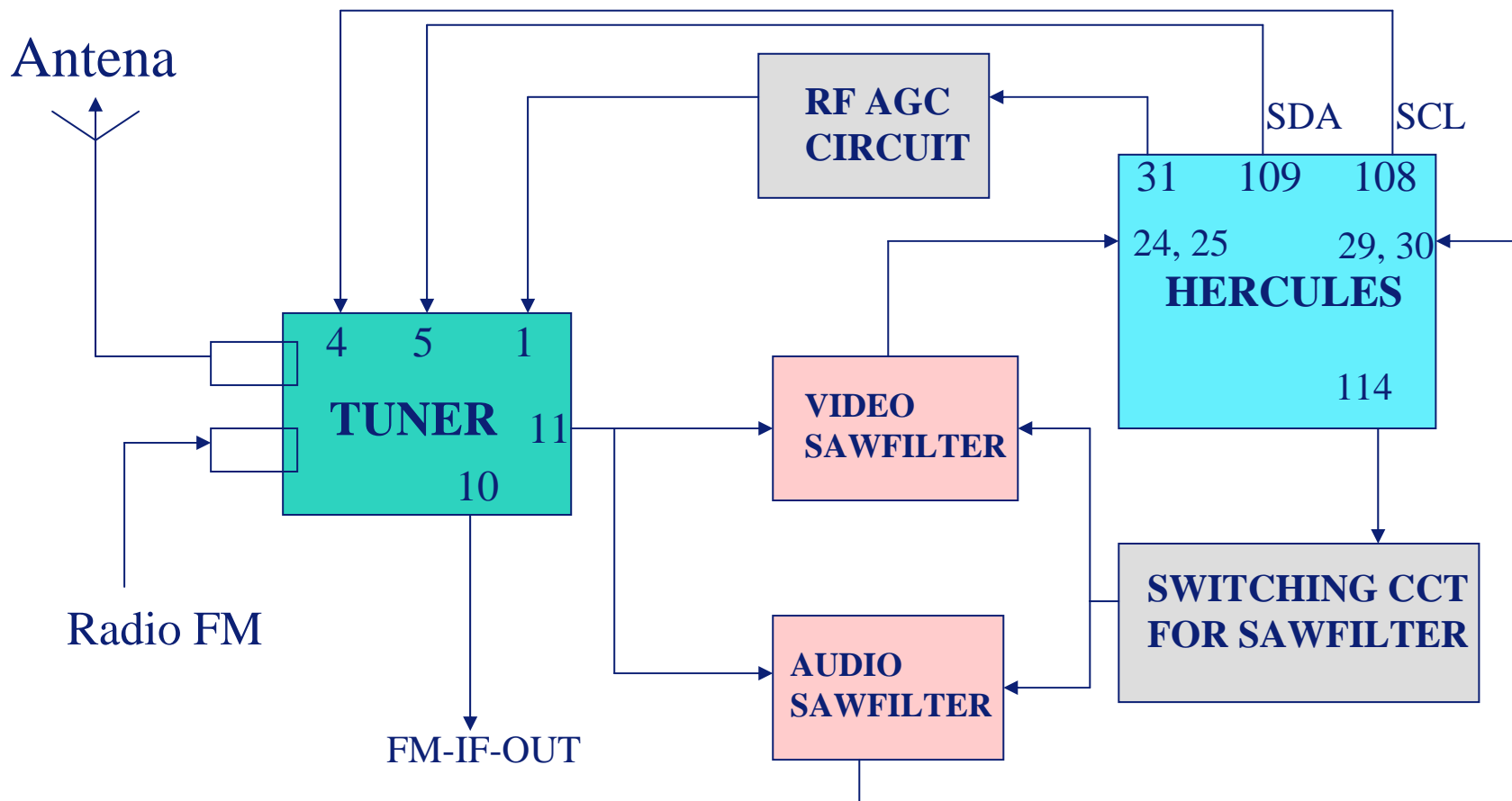
Número de pin	K3953L	K7265L	K3956L	K1967L	K3955L
2	Entrada	Entrada	Entrada	Entrada	Entrada
3	Entrada - Masa	Entrada conmutable (B/G, D/K, I: a masa M/N: a Pin 2)	Entrada - Masa	Entrada - Masa	Entrada - Masa
7	Salida	Salida	Salida	Salida	Salida
8	Salida	Salida	Salida	Salida	Salida

# Asignación de pines de los filtros SAW de audio

Número de pin	K9656L	K9361L	K9352L
2	Entrada	Entrada	Entrada
3	Entrada conmutable (B/G, D/K, I: a masa M/N: a pin 2)	Entrada - Masa	Entrada - Masa
7	Salida	Salida	Salida
8	Salida	Salida	Salida



# Diagrama de bloques



# Ajuste AGC

Dos ajustes:

- Para L'
- Para el resto de sistemas
  - Activar el menú SAM
  - En el submenú AFC Window del menú Tuner ajustar el valor a 100 KHz
  - Seleccionar el submenú AGC
  - Conectar el multímetro al punto de test F306 (pin 1 del sintonizador)
  - Ajustar el AGC hasta que la tensión sea 3.3VDC +0.5/ -1.0
  - Para almacenar el dato pasar el aparato a Standby

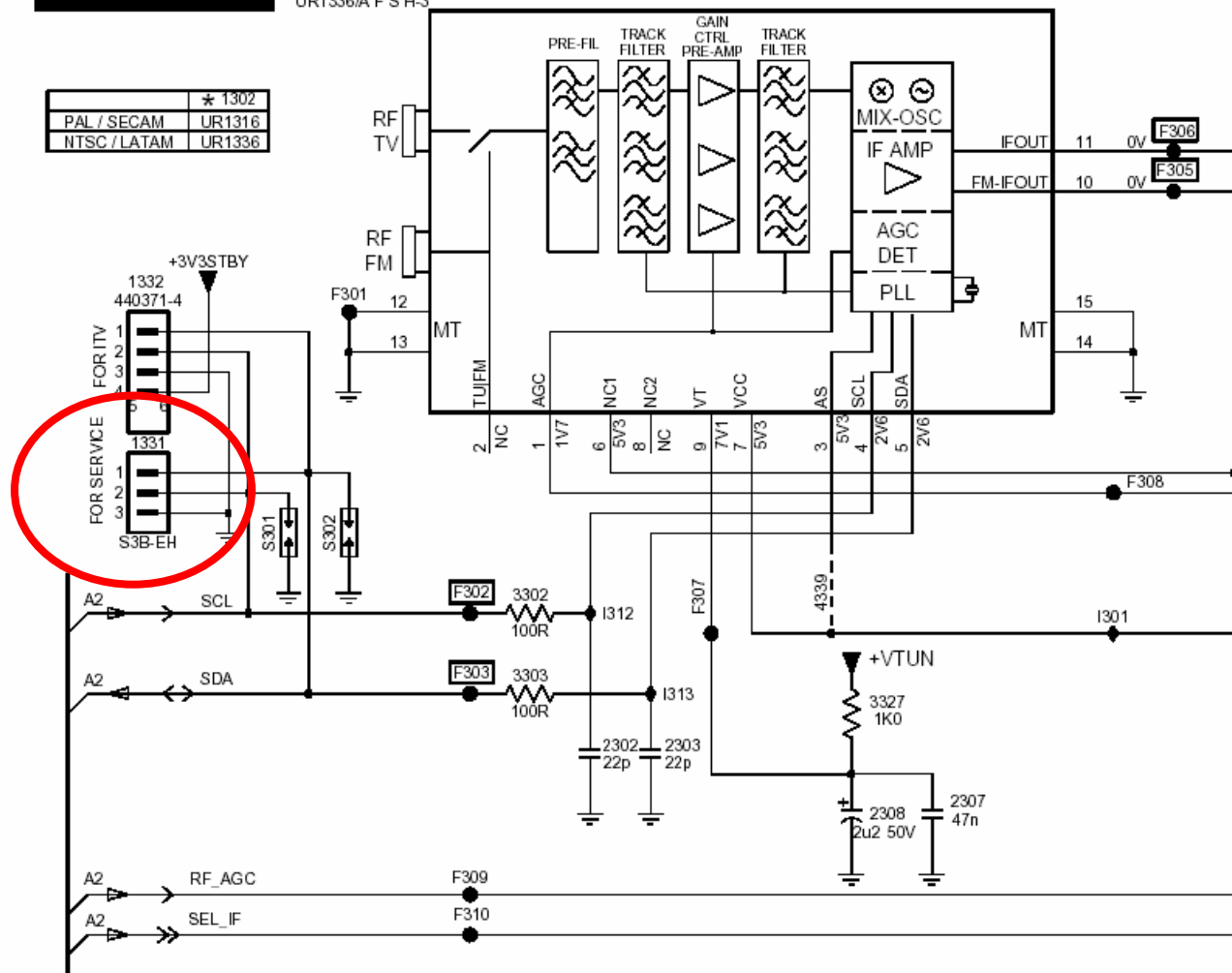
## Diagrama

Conector  
ComPair

### A 1 TUNER + VIF

\* 1302  
UR1336/A F S H-3

	* 1302
PAL / SECAM	UR1316
NTSC / LATAM	UR1336

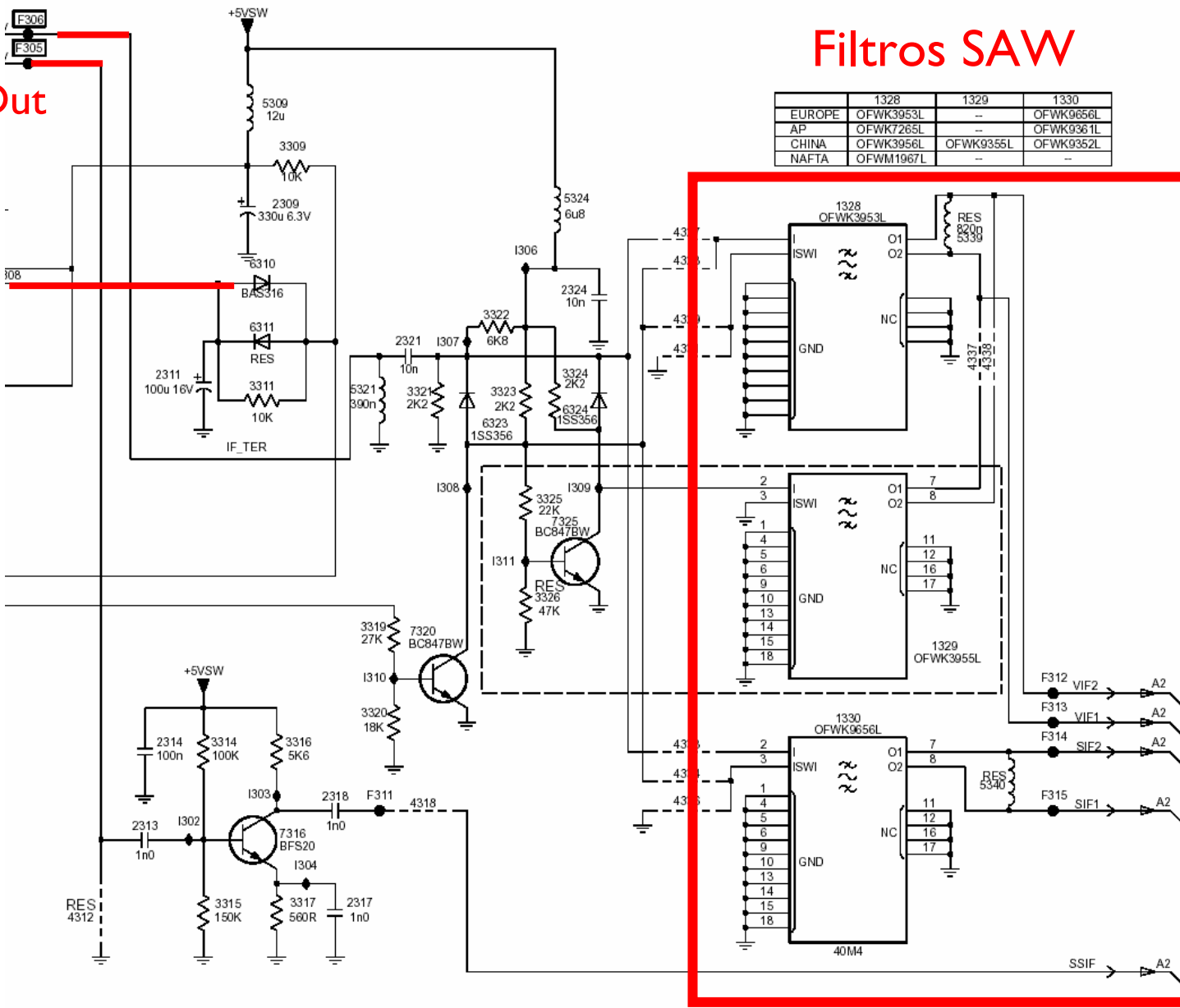


IF Out  
FM Out

AGC

## Filtros SAW

	1328	1329	1330
EUROPE	OFWK3953L	--	OFWK9656L
AP	OFWK7265L	--	OFWK9361L
CHINA	OFWK3956L	OFWK9355L	OFWK9352L
NAFTA	OFWM1967L	--	--



# PHILIPS

## **Curso LC04**

### **05. Video - Hércules**

Philips Ibérica – Electrónica de Consumo

Departamento Técnico

Cristina Senallé - Gabriel Arianes

Noviembre 2004



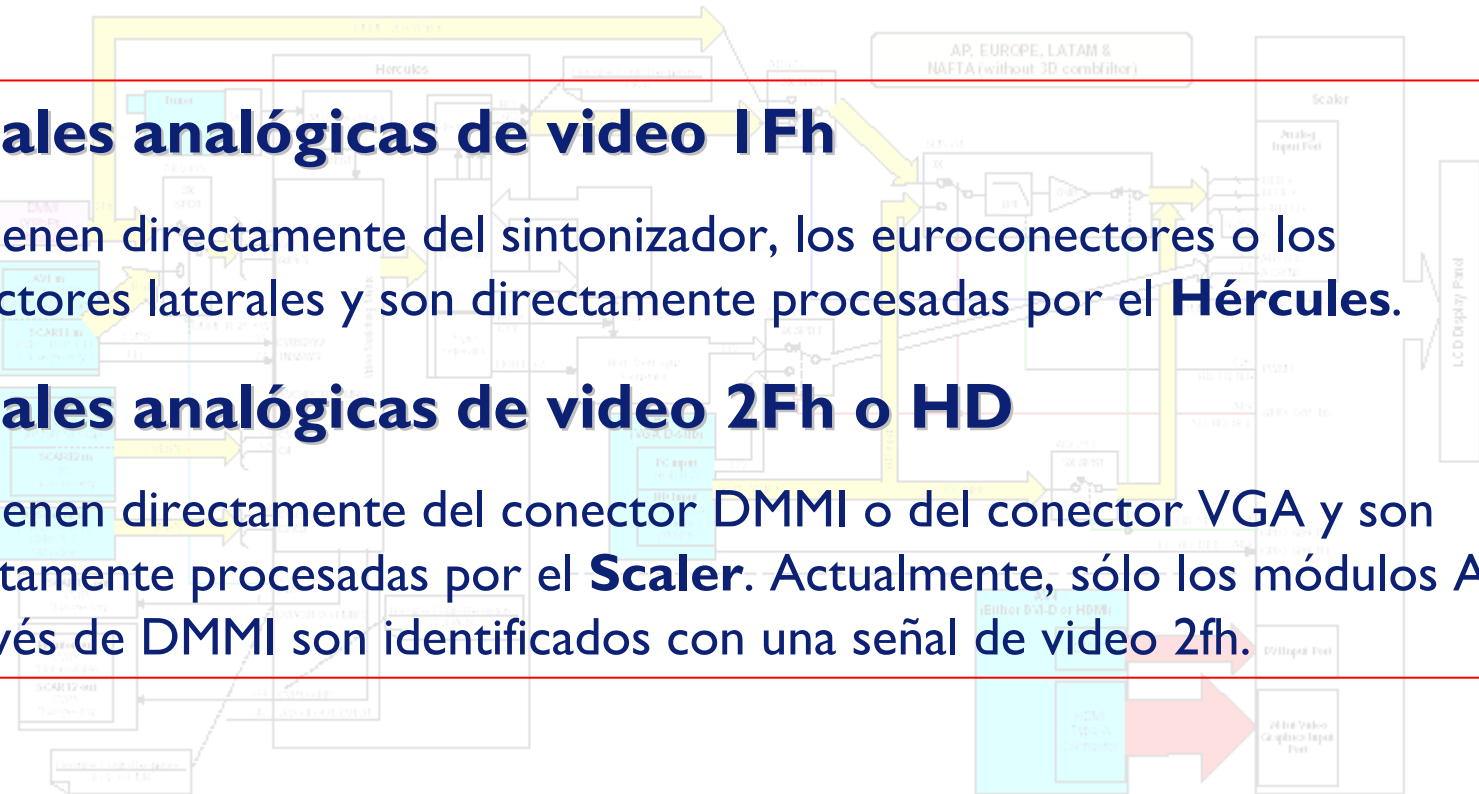
# Fuentes de video

## Señales analógicas de video 1Fh

Proviene directamente del sintonizador, los euroconectores o los conectores laterales y son directamente procesadas por el **Hércules**.

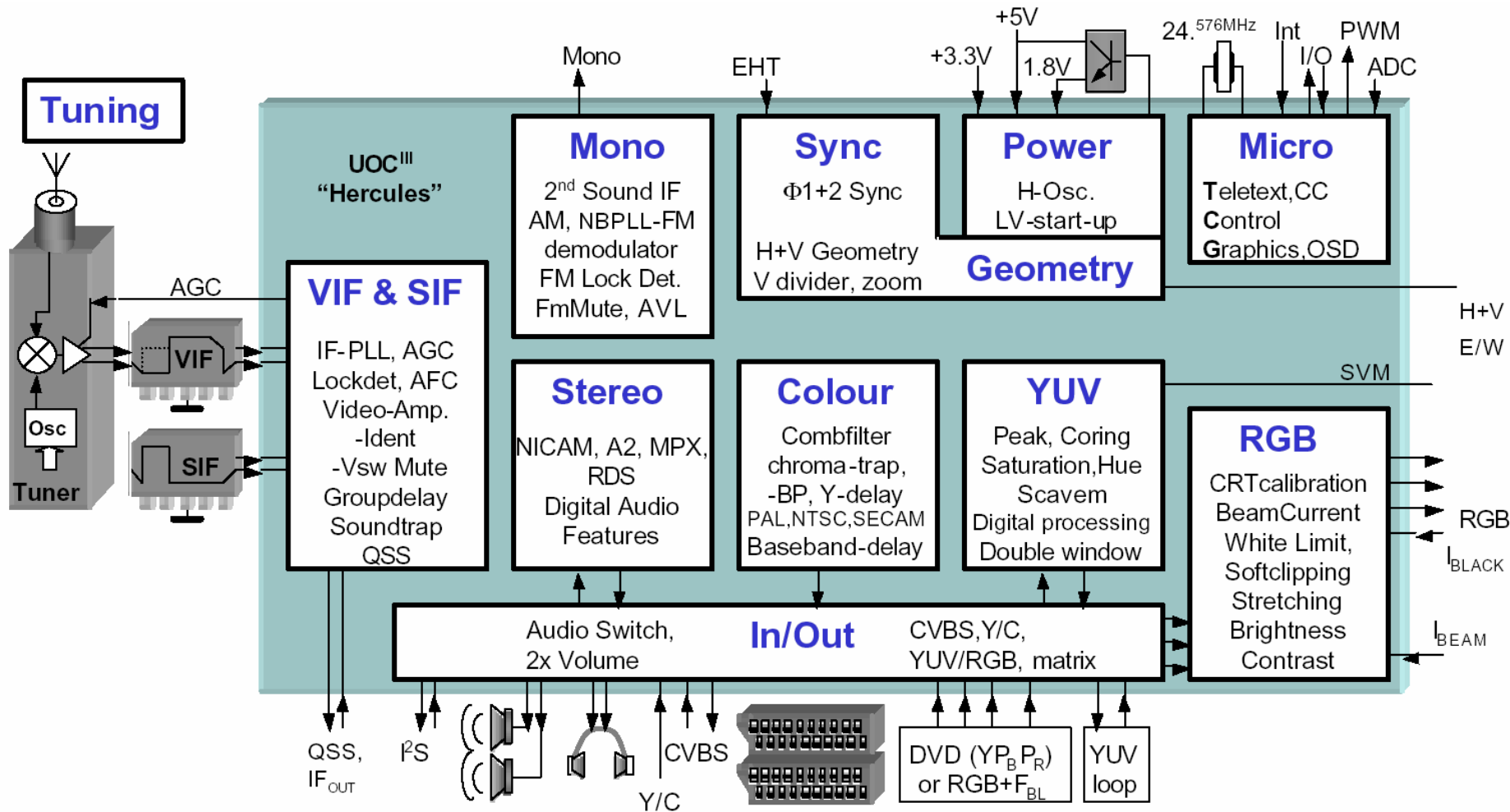
## Señales analógicas de video 2Fh o HD

Proviene directamente del conector DMMI o del conector VGA y son directamente procesadas por el **Scaler**. Actualmente, sólo los módulos ATSC a través de DMMI son identificados con una señal de video 2fh.

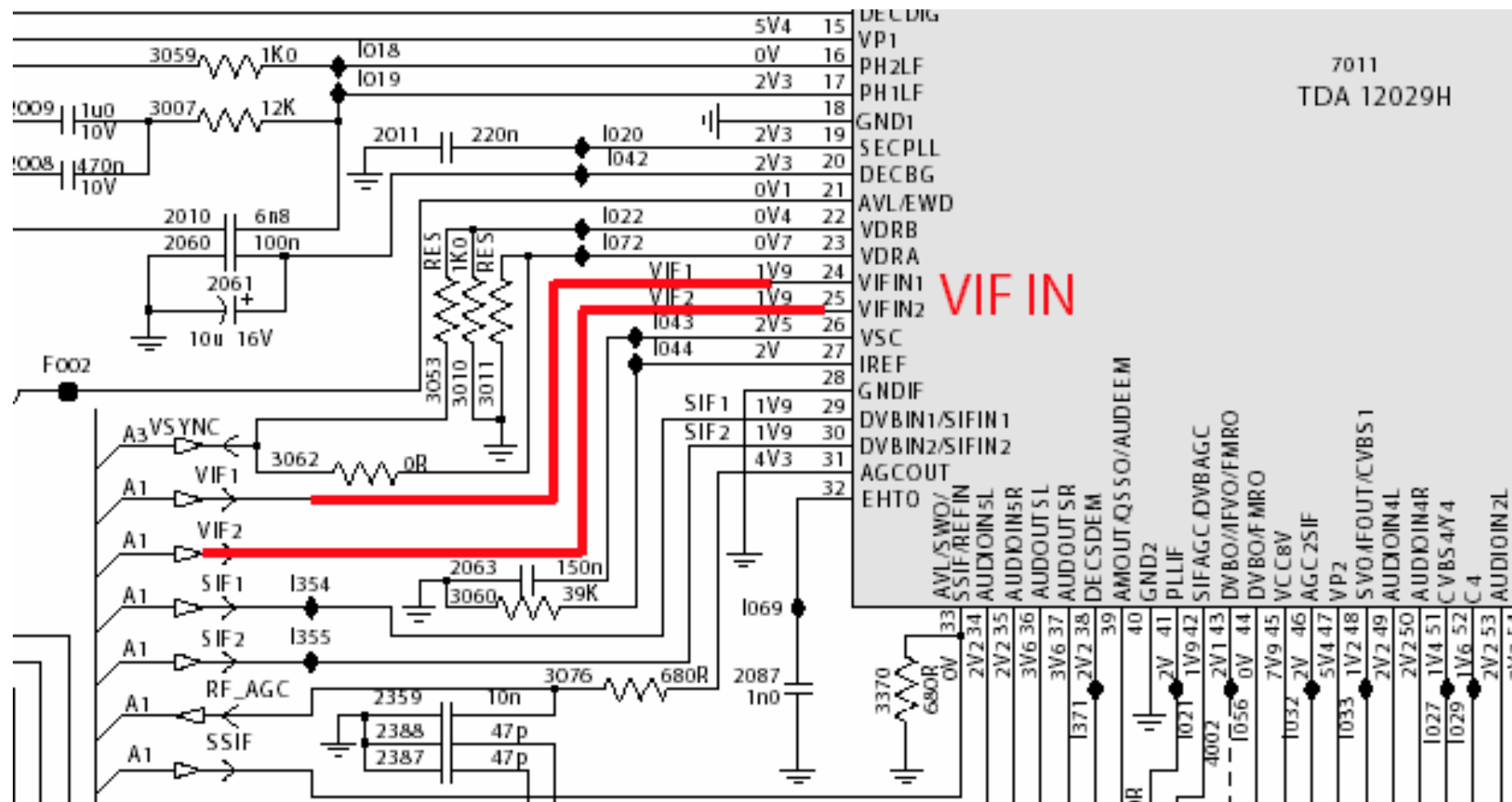


Selección de la fuente de video

# Hercules

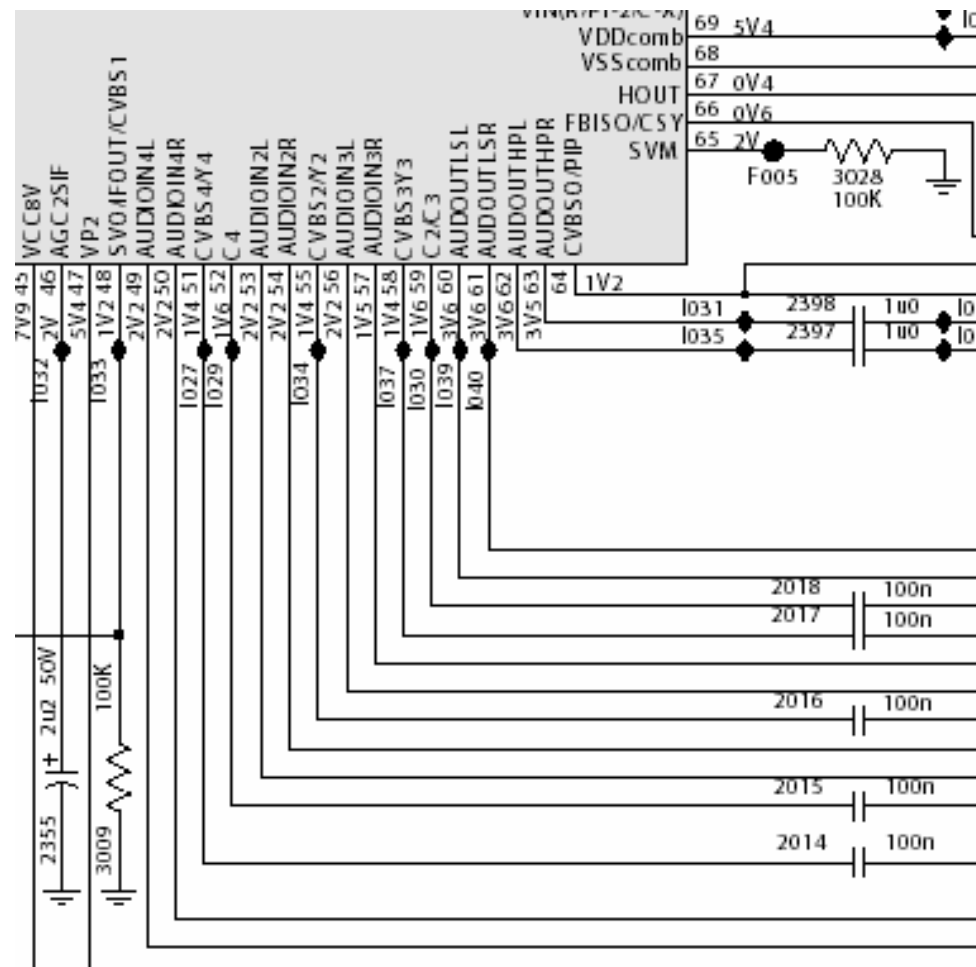
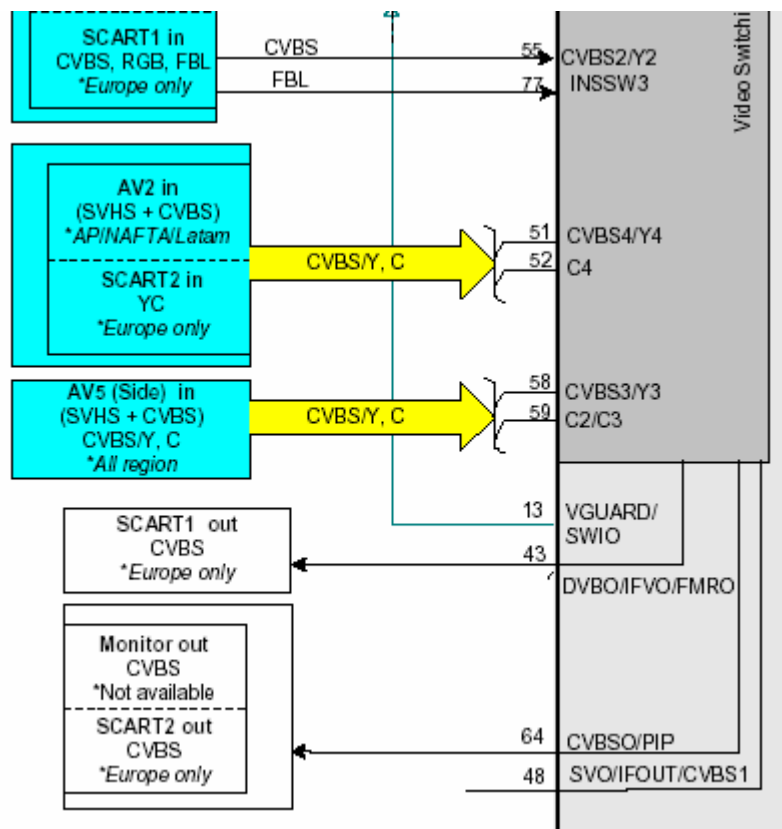


# Entrada de Frecuencia Intermedia

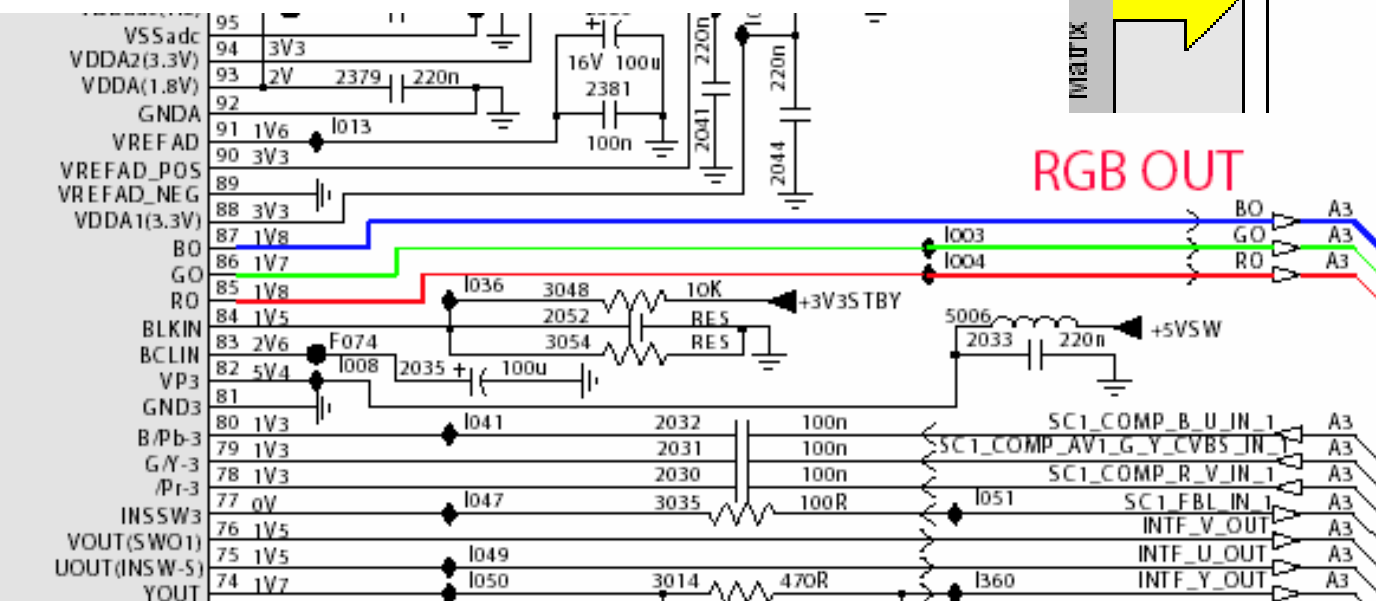
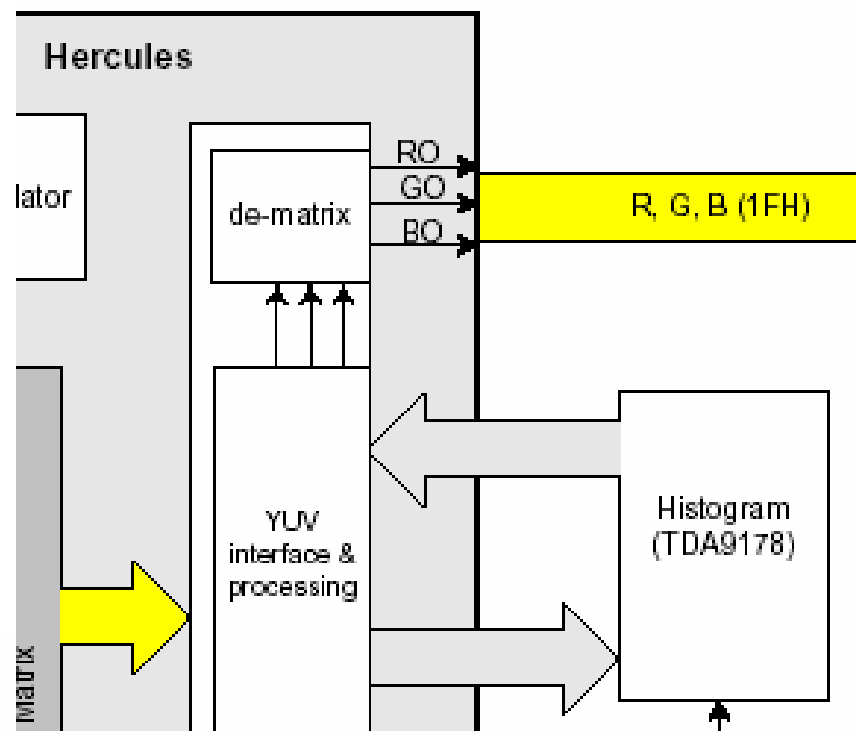




# Selección de fuente

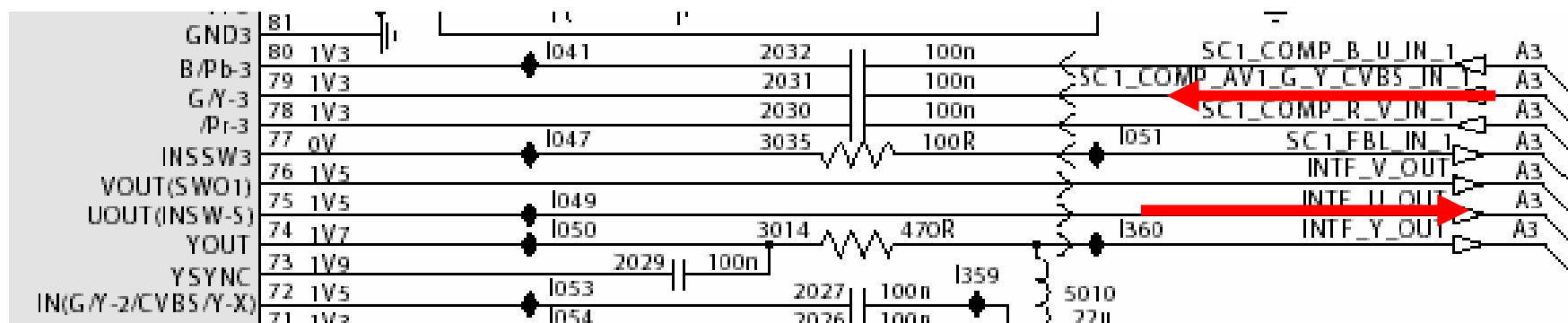
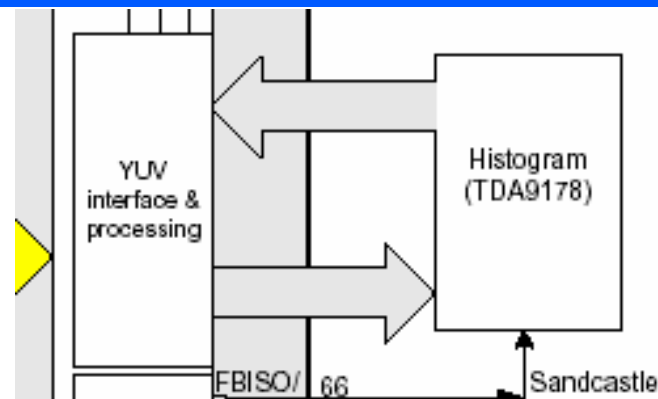


# Salida RGB



# Histograma

(Sólo en el chasis LC4.2)



# Solución de problemas

## Caso 1: Sin alimentación

Comprobar +12V y 3V3 en la posición **1910**. Si no hay alimentación, comprobar el conector 1910. Si está OK, comprobar la placa de alimentación .

## Caso 2: Hay alimentación pero no hay luz verde

Comprobar si los conectores **1005** y **1601** están bien conectados. En caso afirmativo, comprobar si los 3V3 están presentes.

## Caso 3: No hay imagen

Comprobar la señal RGB. Si está presente, comprobar el pin 3 del integrado **7016** (NE555).

- Hay salida: el problema está en la parte del Scaler.
- No hay salida: comprobar el pin 2 del integrado (señal H-out). Si hay señal pero no hay salida, el integrado falla.

# Solución de problemas

## **Caso 4: No hay imagen de TV pero sí de PC**

Comprobar HSYNC y VSYNC en el PIN3 de **7017** y **7015**. Si están presente comprobar la salida RGB. Si no hay salida RGB puede que el integrado TDA120xx (Hércules) falle.

## **Caso 5: El Comb Filter no funciona**

- Comprobar el bit de opciones 5 en el menú SAM
  - 17PF9946/12, 23PF9946/12 y 26PF9946/12: 252
  - 30PF9946/12: 224
- Comprobar los ajustes de la memoria NVM
  - Valor de la dirección I229: 0000 (para aparatos de Europa)

# PHILIPS

## **Curso LC04**

### **06. Audio**

Philips Ibérica – Electrónica de Consumo

Departamento Técnico

Cristina Senallé - Gabriel Arianes

Noviembre 2004

# Diferencias en los circuitos de audio entre **LC04V** y **LC04C**

- LC4.2 proporciona más características de audio que LC4.1.
- LC4.2 EU tiene dos Scarts, LC4.1 tiene solo uno.
- Amplificador de auriculares para LC4.2 pero no para LC4.1.

# Camino de la señal de Audio

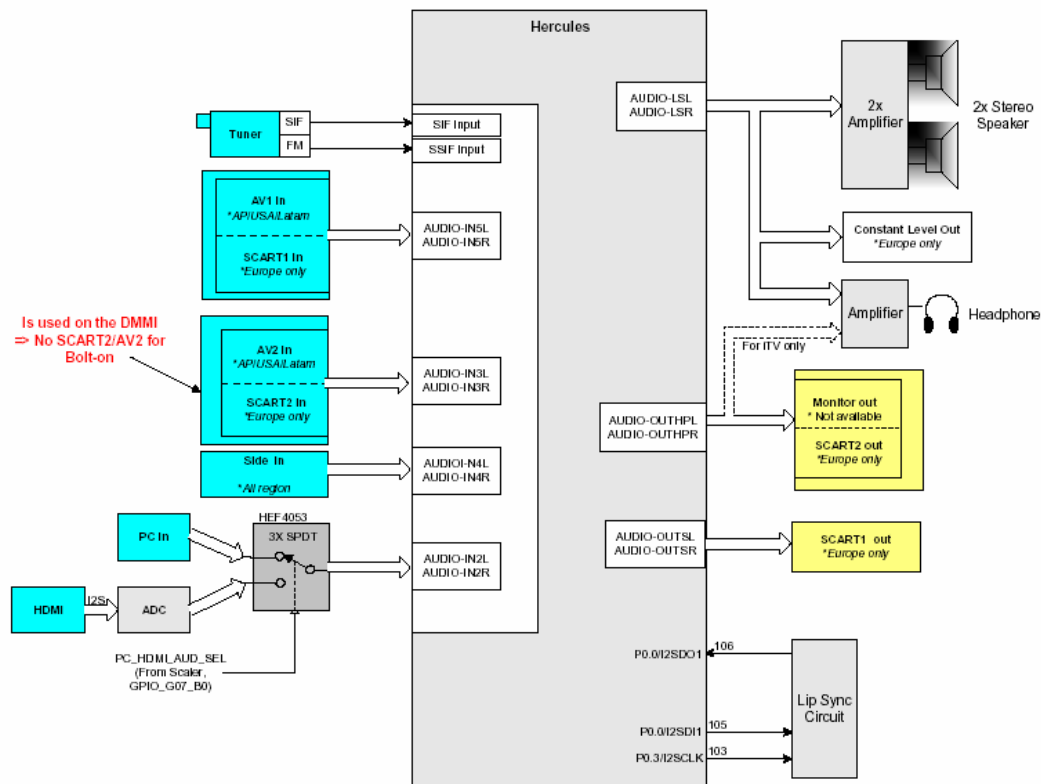
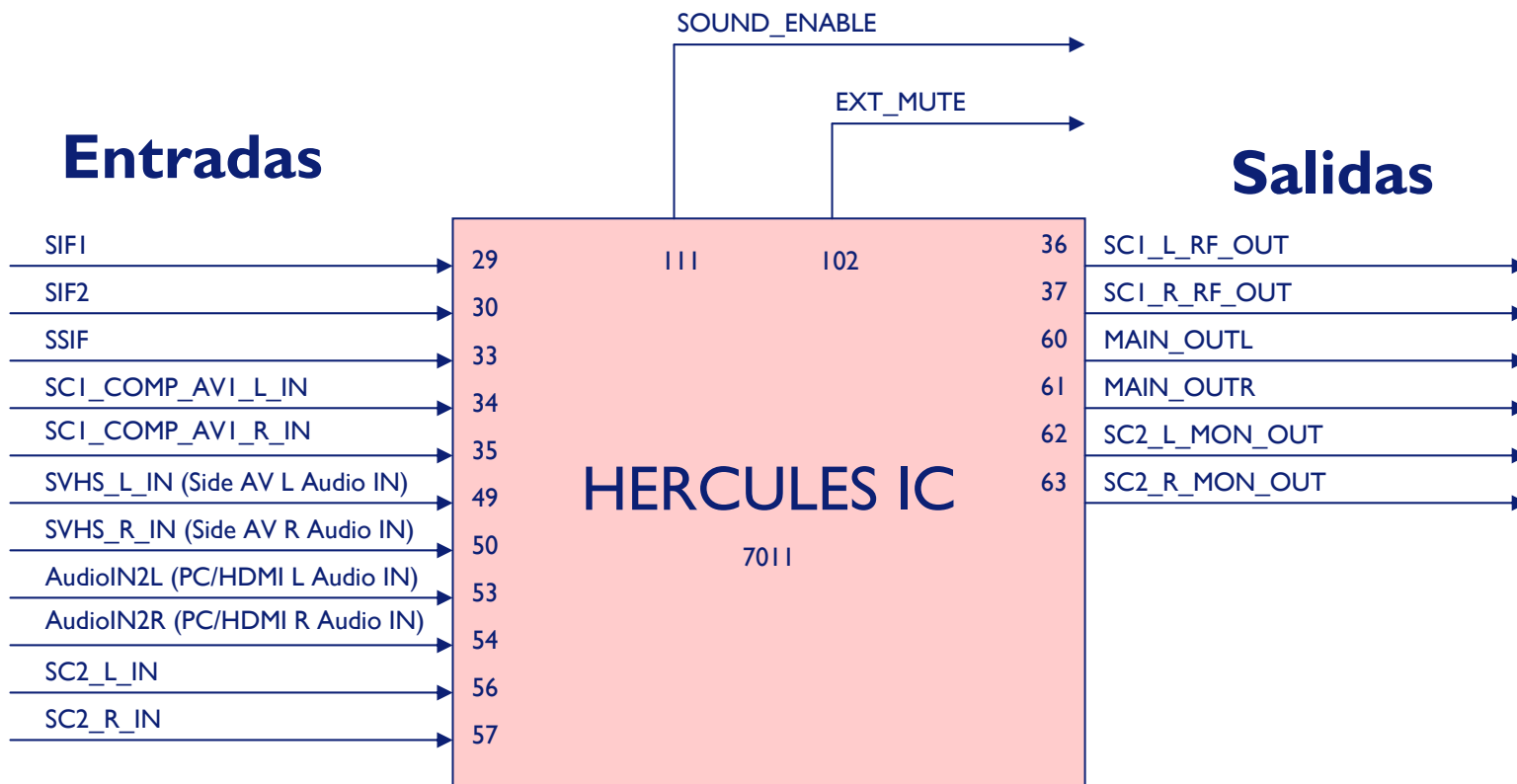


Diagrama de bloques  
selección de fuente de audio

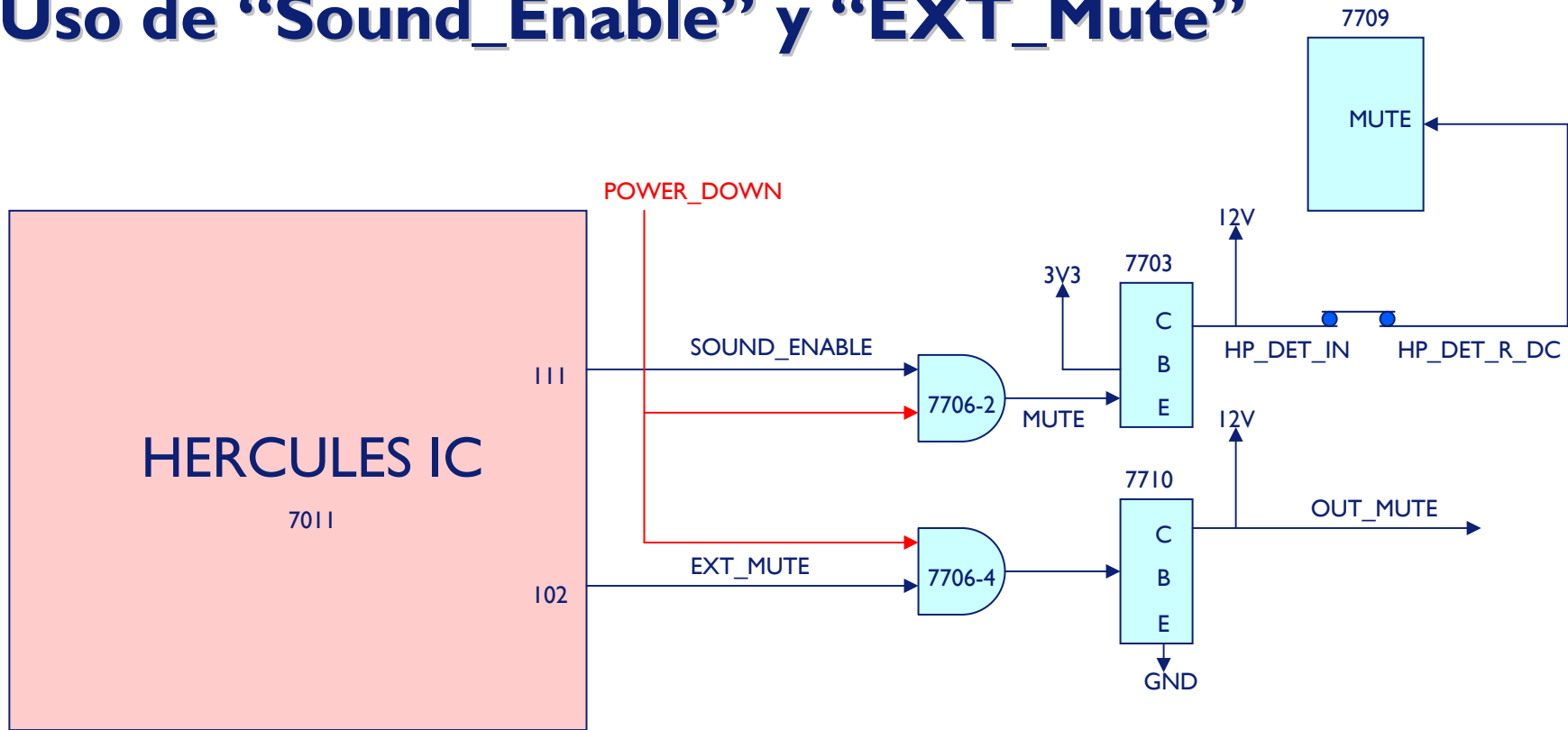




# Audio Entradas - Salidas

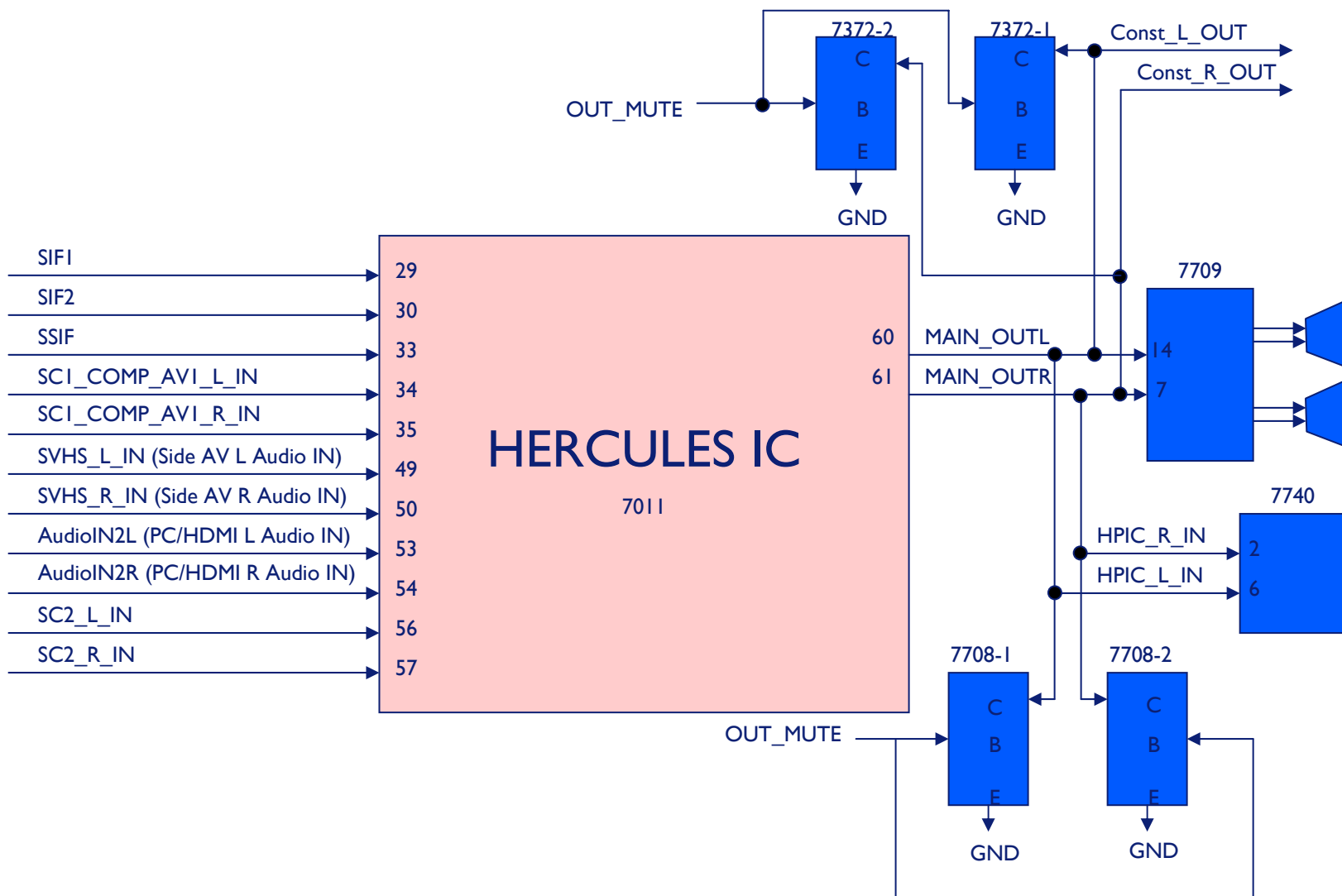


# Uso de “Sound\_Enable” y “EXT\_Mute”

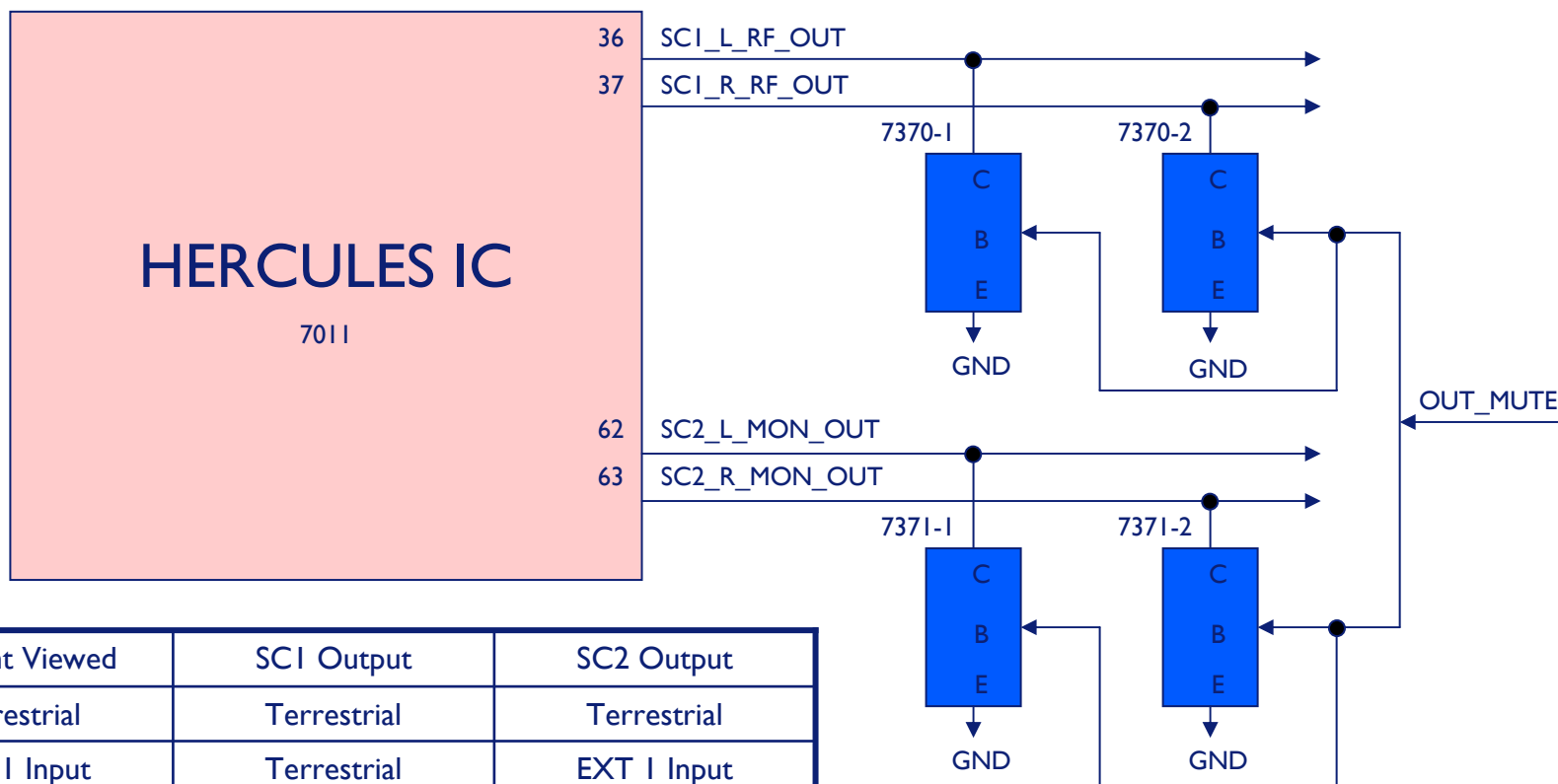


Sound Enable	Power Down	7706-2 O/P	7703 C	EXT MUTE	Power Down	7706-4 O/P	7710 C
L	L	L	L	L	L	L	H
L	H	L	L	L	H	L	H
H	L	L	L	H	L	L	H
H	H	H	H	H	H	H	L

# Main Output (Salida de Altavoces)

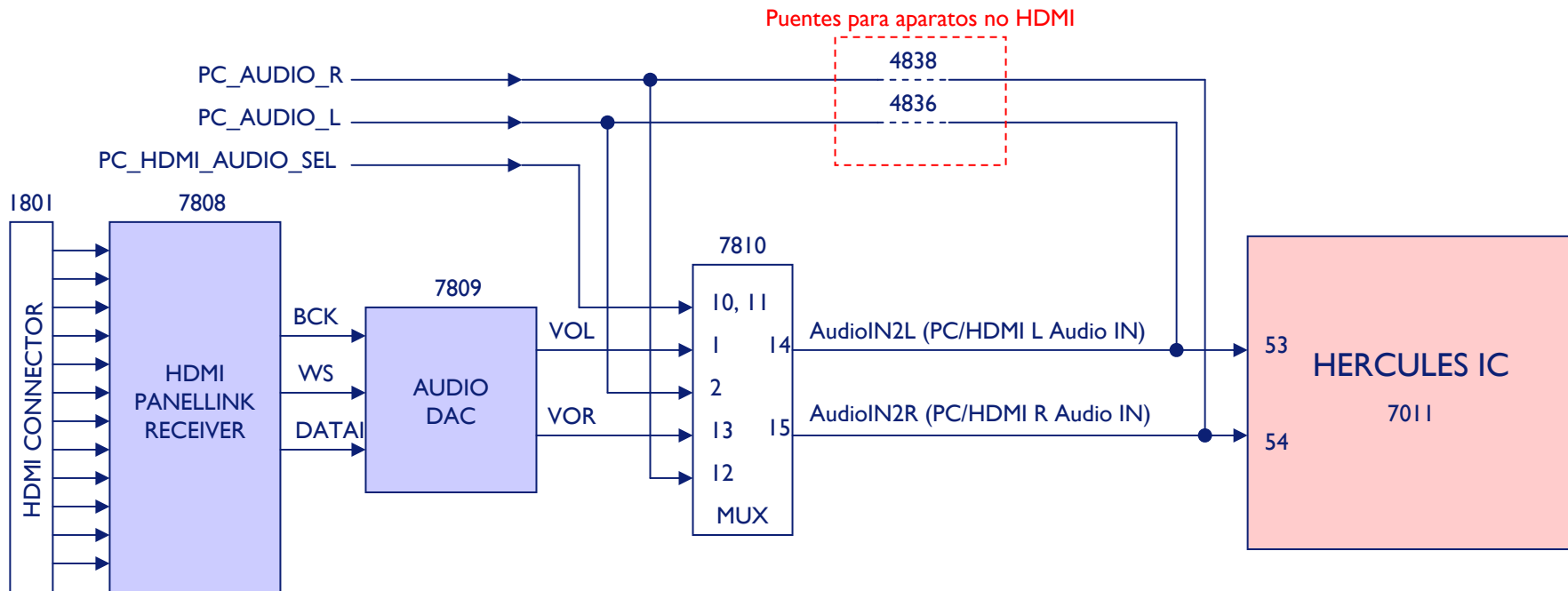


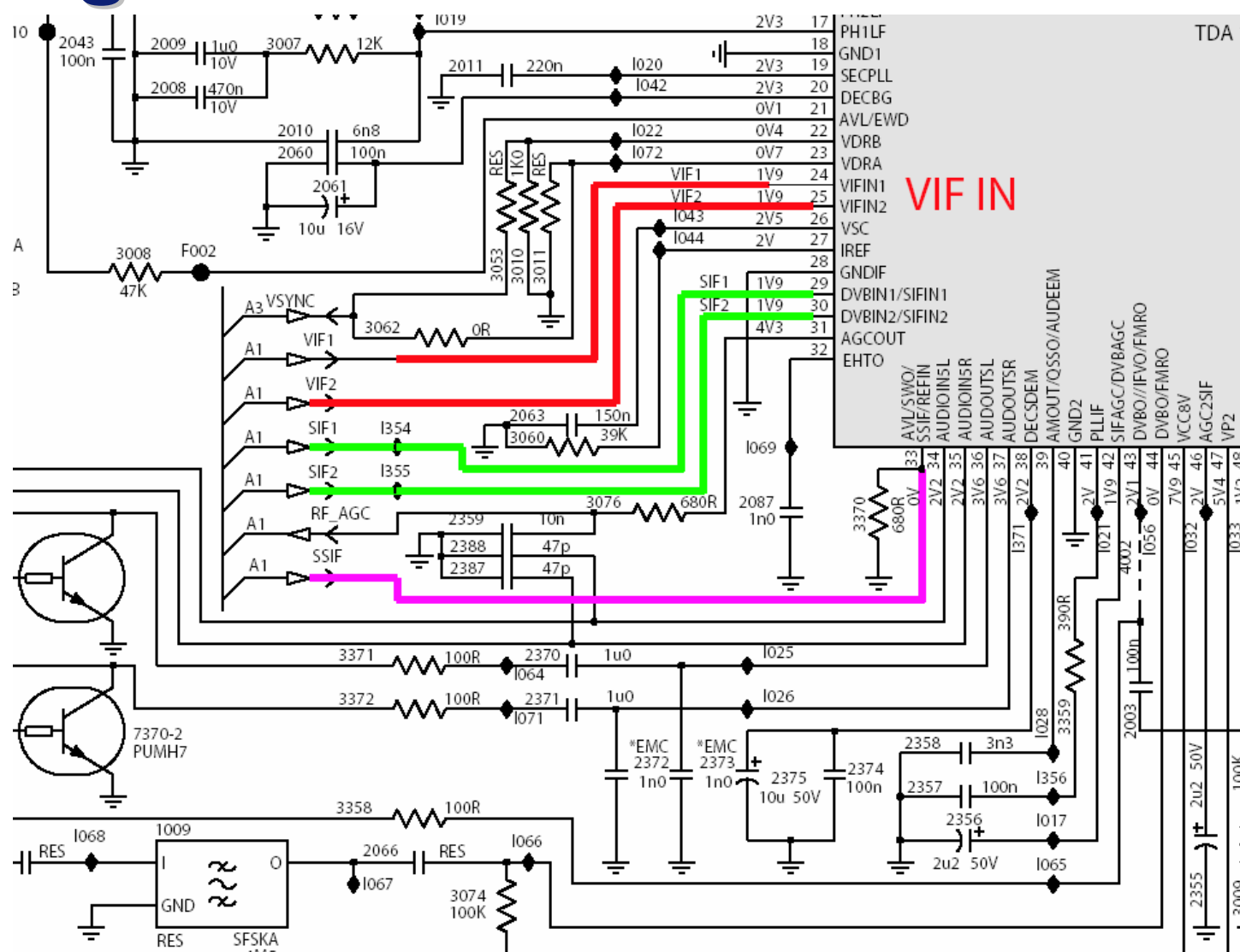
## EXT Outputs (SCI, SC2, AV1, AV2)

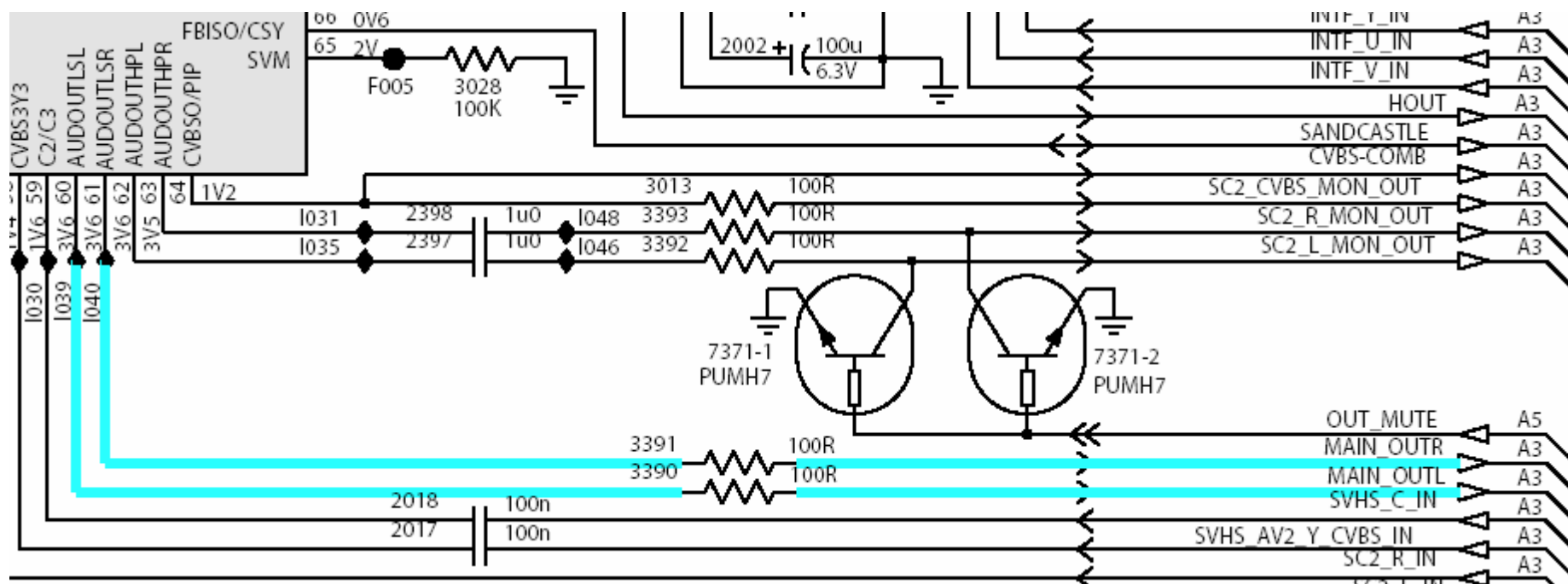


Current Viewed	SCI Output	SC2 Output
Terrestrial	Terrestrial	Terrestrial
EXT 1 Input	Terrestrial	EXT 1 Input
EXT 2 Input	Terrestrial	Terrestrial
Side AV Input	Terrestrial	Side AV Input

# PC\_HDMI Circuito de Audio







Salida al Amplificador.

# PHILIPS

## **Curso LC04**

### **07. Scaler del chasis LC4.2**

Philips Ibérica – Electrónica de Consumo

Departamento Técnico

Cristina Senallé - Gabriel Arianes

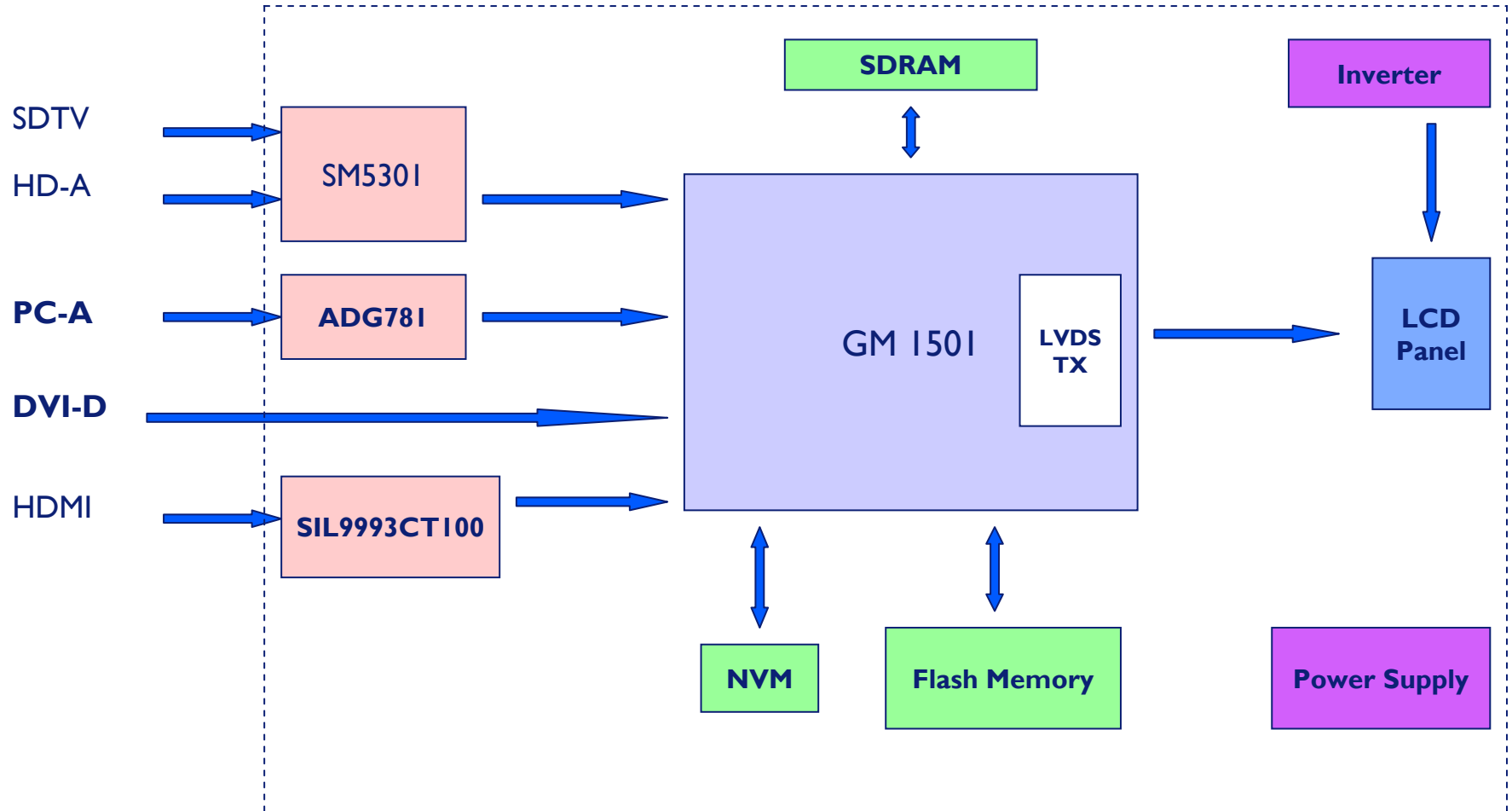
Noviembre 2004



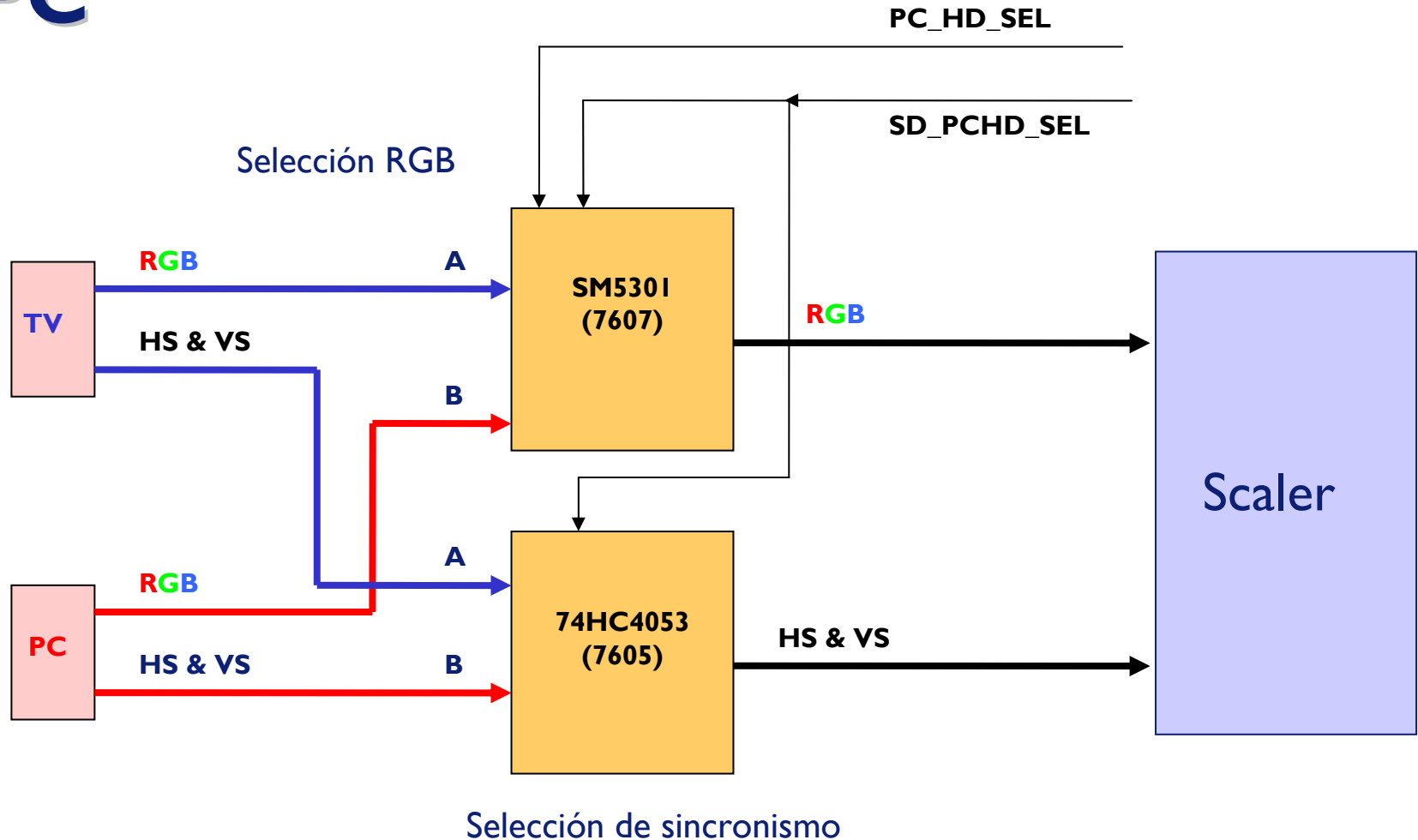
# Información general del Scaler

- Las señales analógicas de gráficos y las señales HD analógicas se soportan a través del conector D-Sub
- Las señales digitales de gráficos y video se soportan a través del conector DVI, que está directamente conectado al integrado GM-I50I.
- Las señales digitales HD y las señales de gráficos se soportan a través del conector HDMI.
- Las funciones de escalado y de-entrelazado se realizan en el integrado GM-I50I
- Para la conversión de la tasa de cuadro se usa una SDRAM DDR 4Mx32.
- Para el firmware del sistema, se usa una Flash Rom de 512kx8.
- Conexión directa, a través de los transmisores LVDS, al panel LCD.

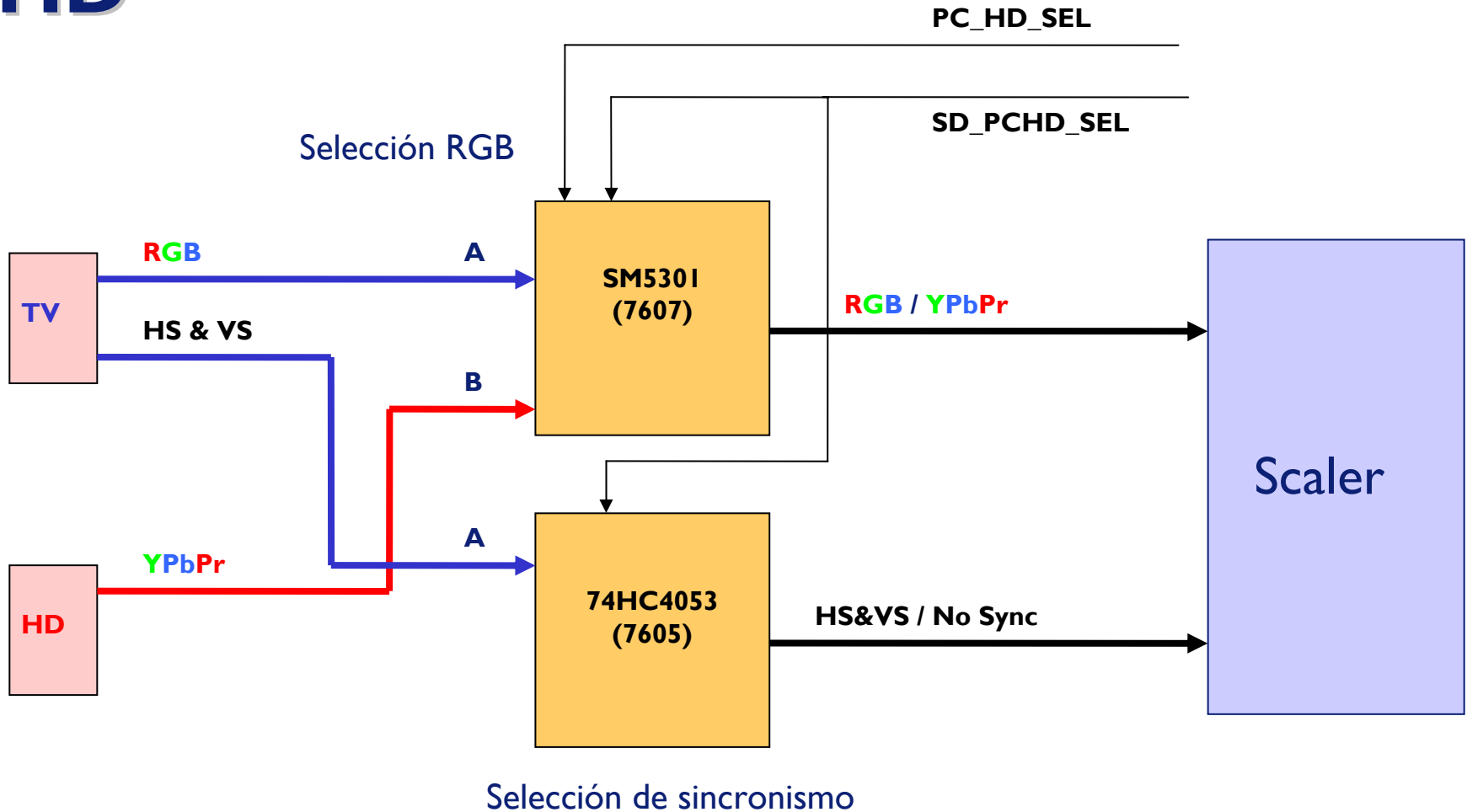
# Diagrama de bloques del Scaler



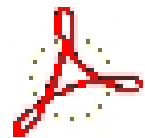
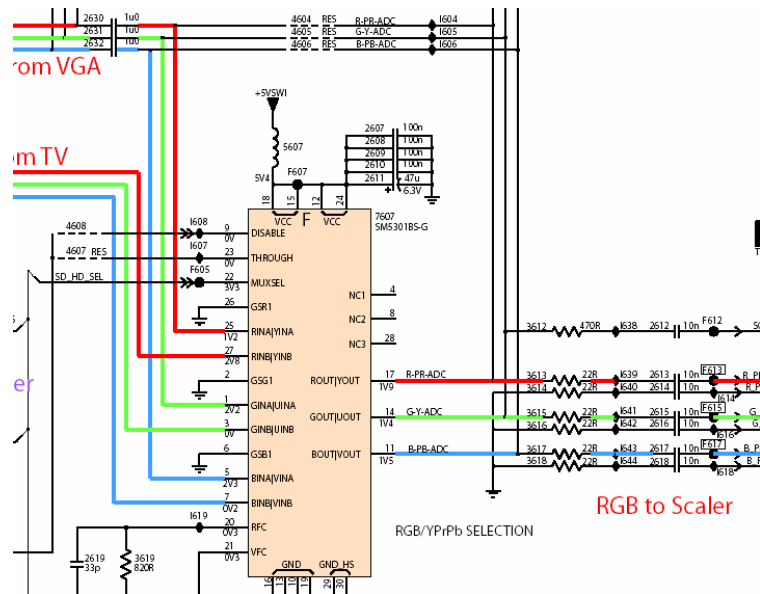
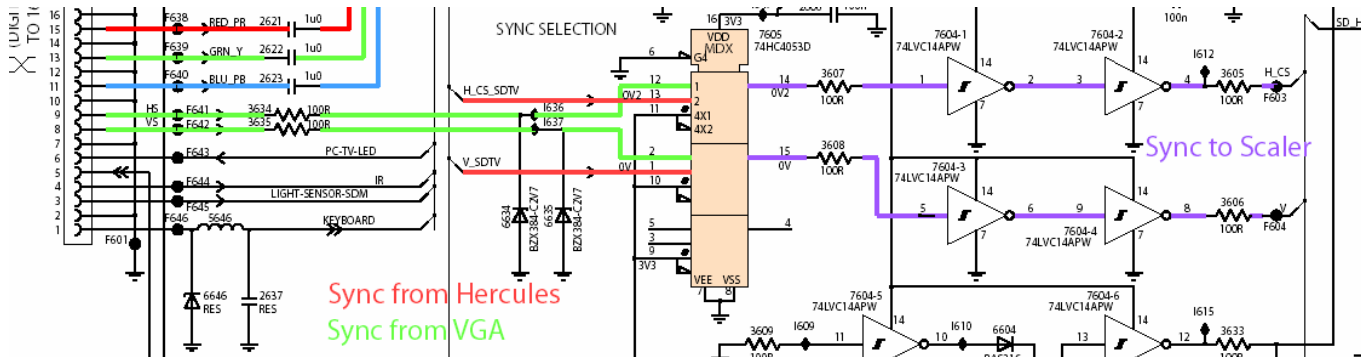
# Conmutación entre el modo TV & PC

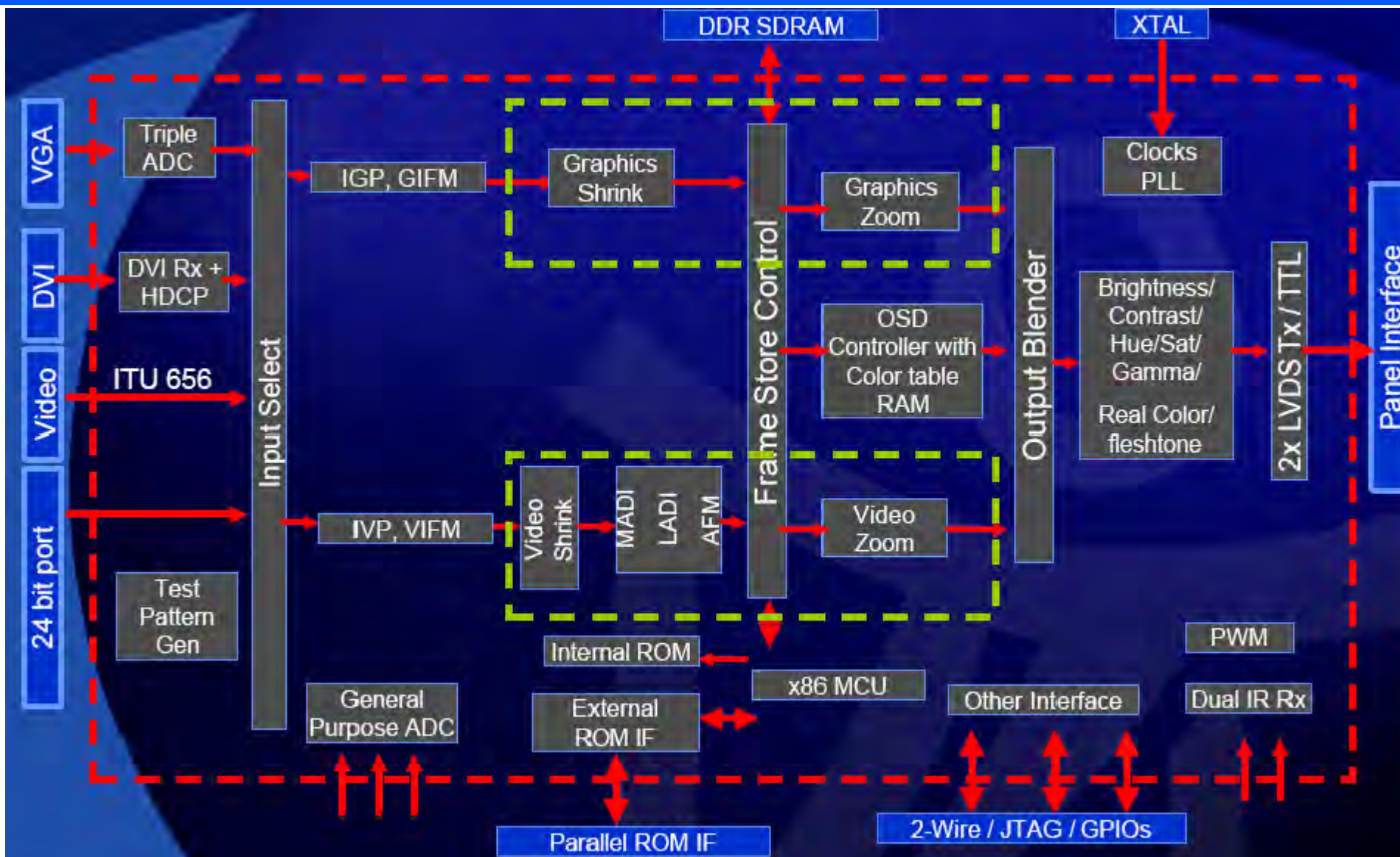


# Conmutación entre el modo TV & HD

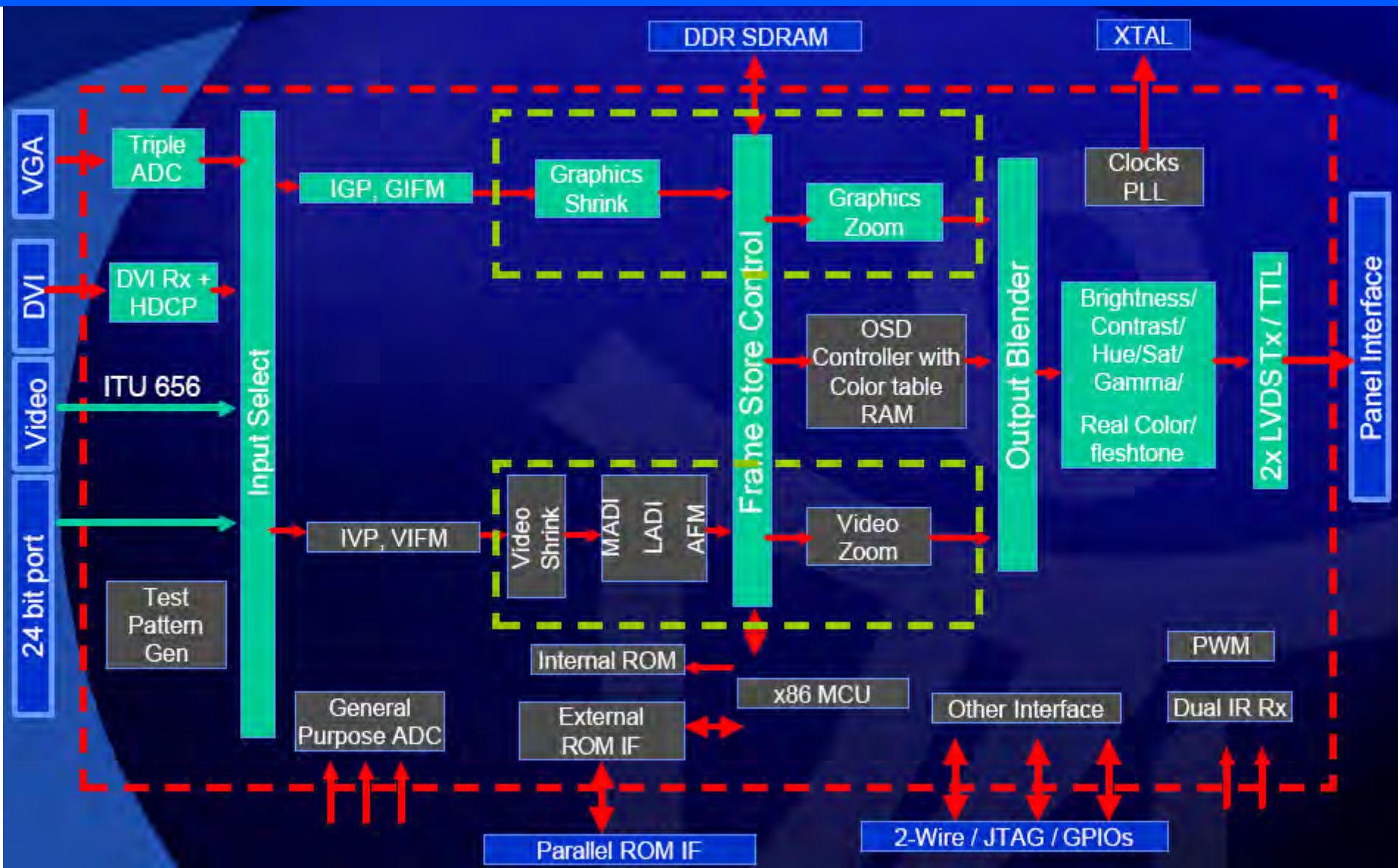


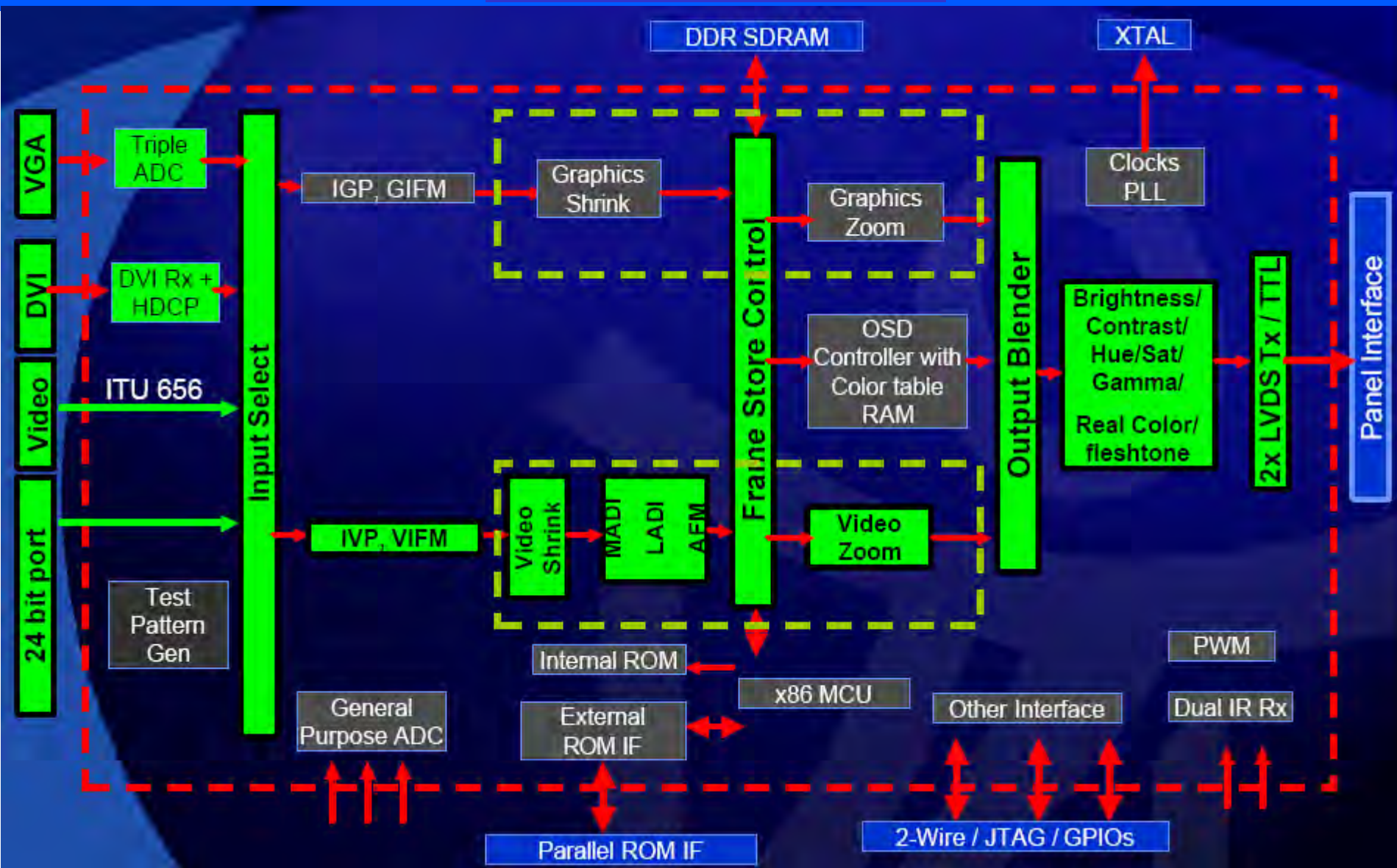
# Diagrama selección RGB/Sync







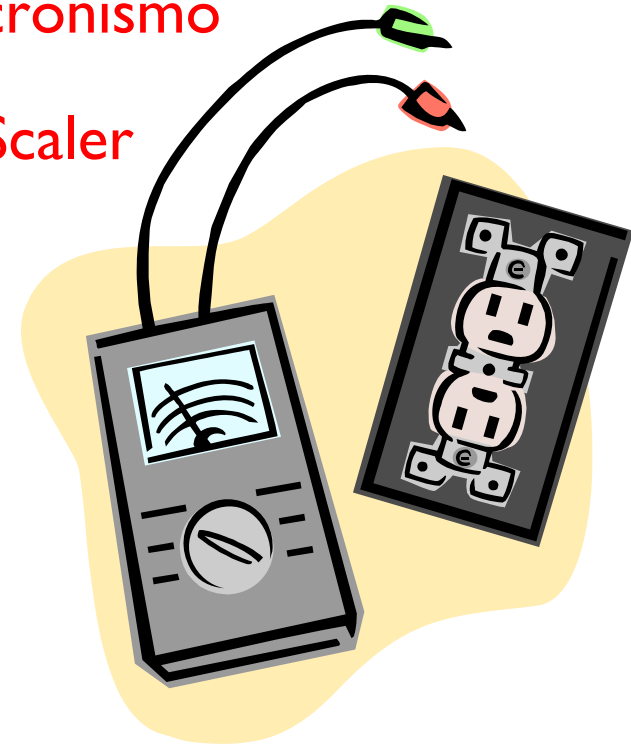






# Test Flow

- ❑ Paso 1: Chequeo de la alimentación
- ❑ Paso 2: Chequeo del control de señal
- ❑ Paso 3: Chequeo de la señal de dato y sincronismo
- ❑ Paso 4: Chequeo de la señal de salida del Scaler





## ❑ Paso I: Chequeo de la alimentación

### ➤ Alimentación Scaler

Conector 1910

**Pin 3** +3.3VSTBY

**Pin 10** Standby

**Pin 9** Power down

**Pin 8** +12VSW

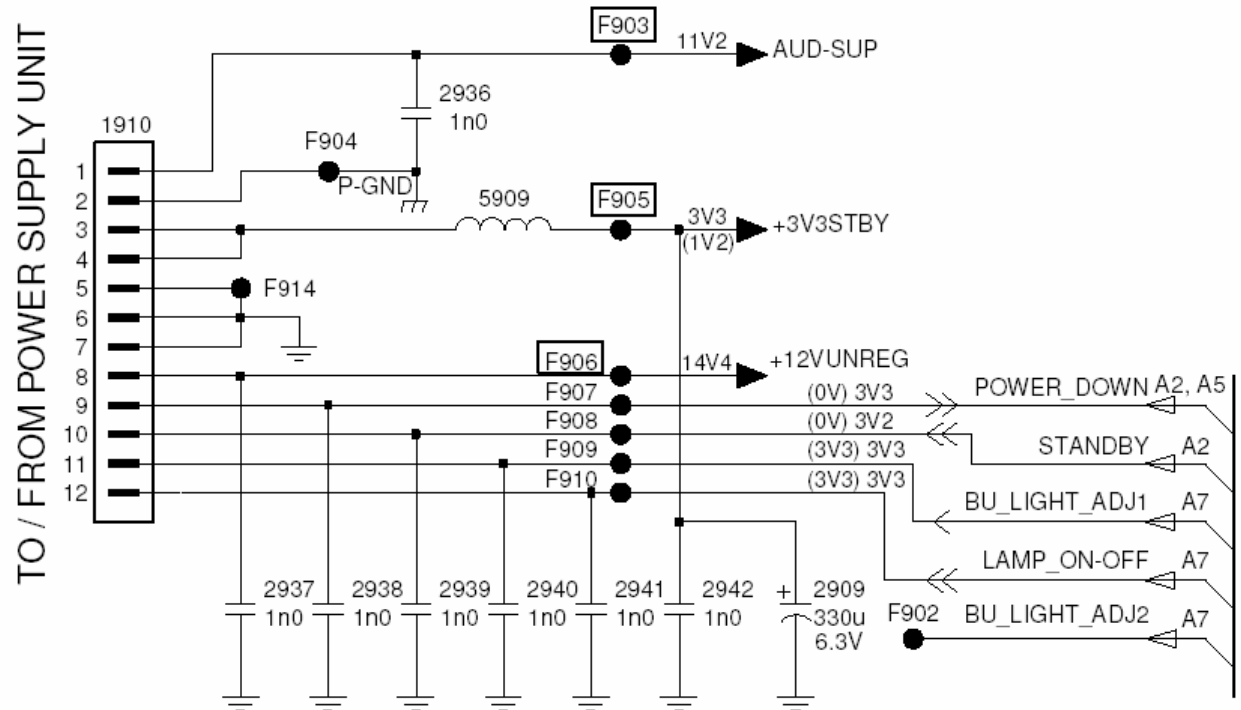
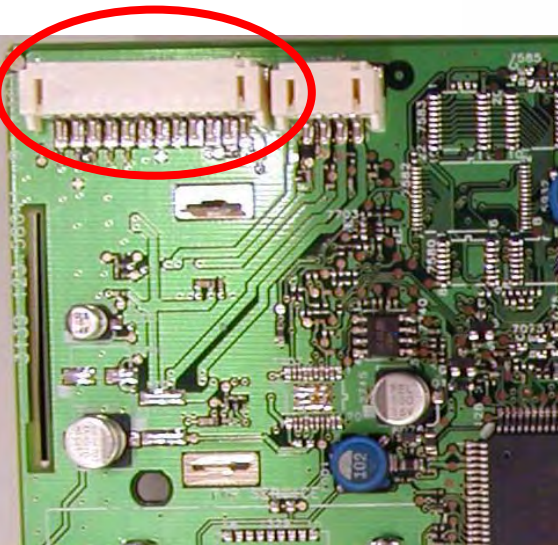
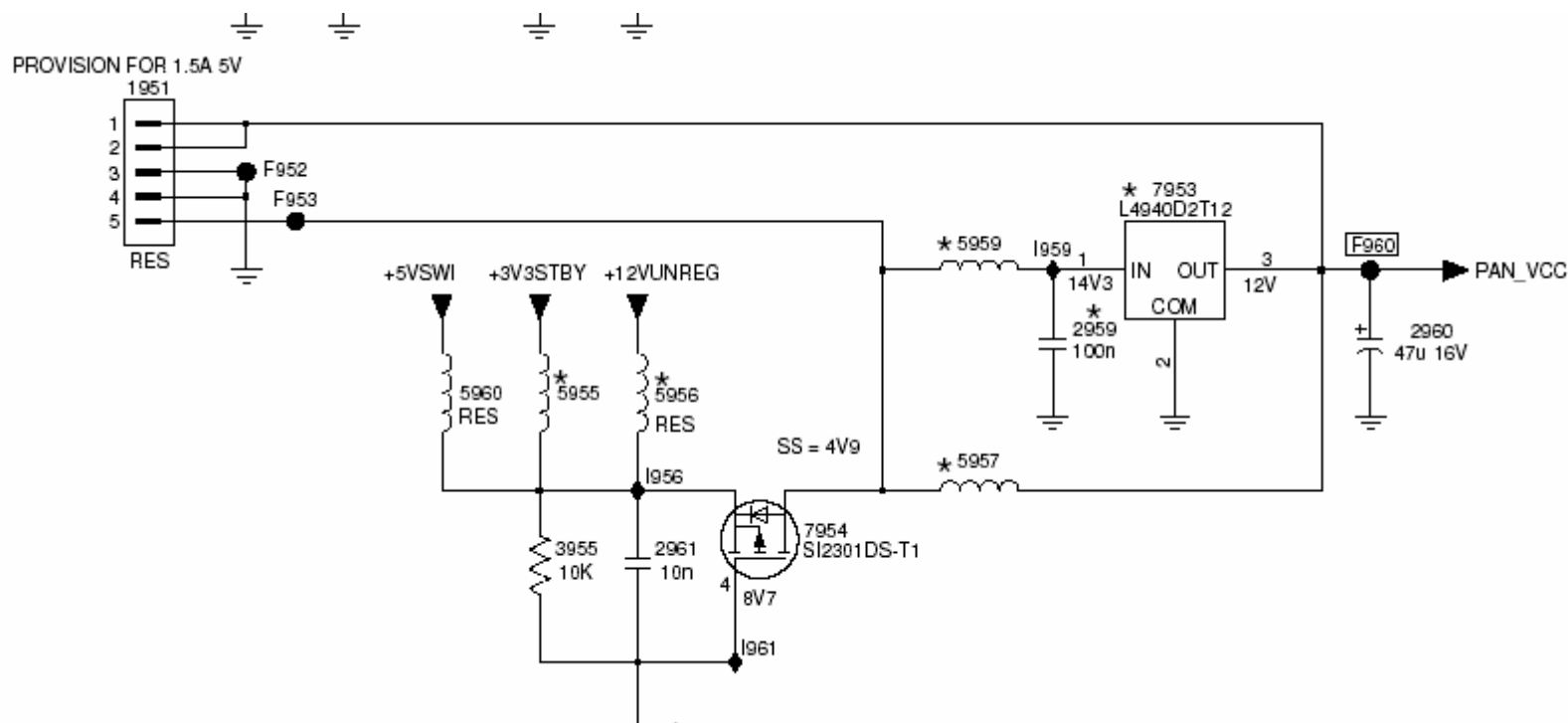


Diagrama A6

## ➤ Alimentación del panel LCD

Salida del *regulador 7953*



## ➤ Control de Backlight

Conector I910

**Pin 11** Backlight\_adjust

**Pin 12** Backlight\_on\_off

## ➤ Power On Reset Check

Comprobar el pin 4 integrado de reset

7532

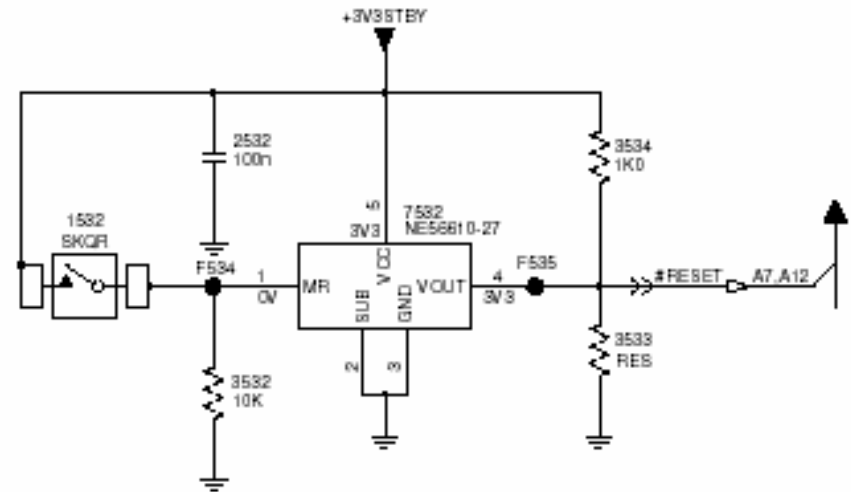
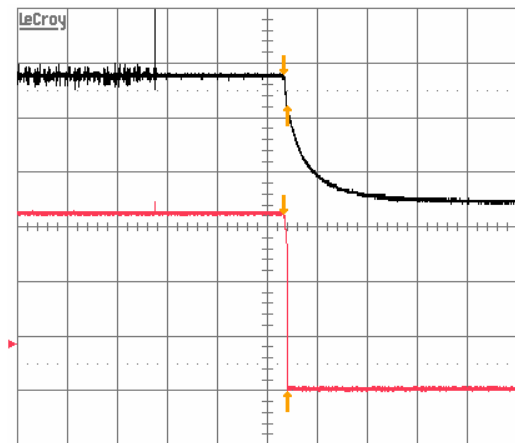
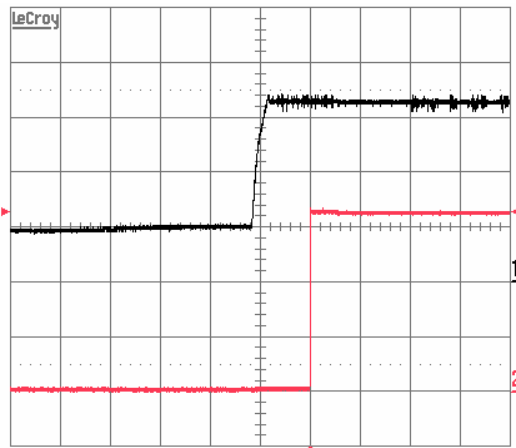


Diagrama A11

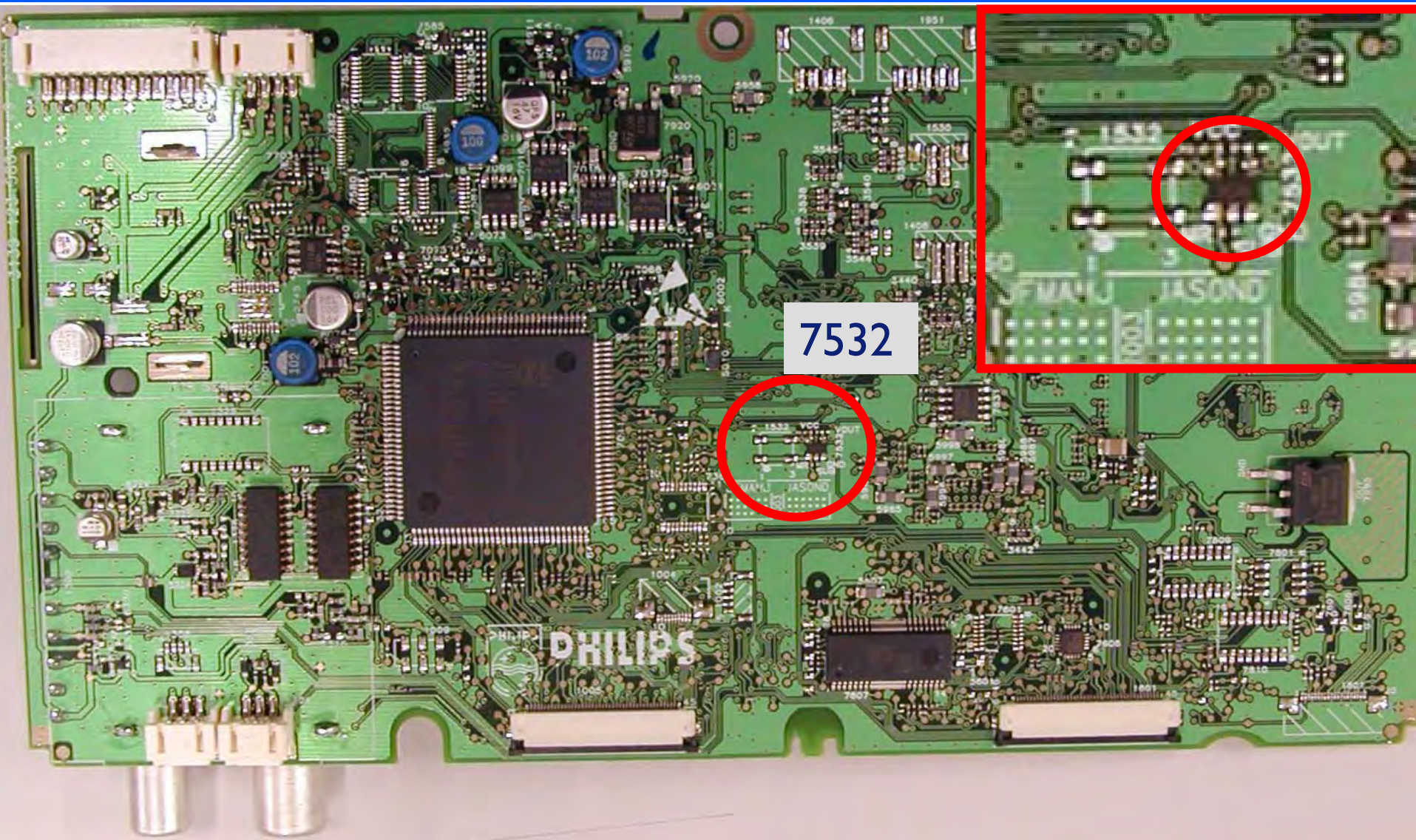


Al arrancar, el retardo de la salida del integrado de reset, con respecto +3V3STBY, es 50ms

Al apagar, el retardo de la salida del integrado de reset, con respecto +3V3STBY, es 3.8ms

El reset del Gm160I se realiza manteniendo el pin RESET bajo un mínimo de 1μs.





	Description	Test Location	Voltage			Unit
1	DC Supply		Min	Ty P	Max	
1.1a	+12V main supply	1910		12		V
1.1b	+3V3STBY	1910		3.3		V
1.1c	AUD_SUP	1910		10		V
1.2a	+5VSWTV Regulator out	5932 and 2935		5		V
1.2b	+VTUN Regulator out	2911				V
1.2c	+5VSW Regulator out	2958 and 5954		5		V
1.3	+6VSW_TV Regulator out	7920 out and 2921				V
1.4	+2V5 Regulator out	7992 out		2.5		V
1.5	+1V8Regulator out	7995 out		1.8		V



Chequeo alimentación Scaler

## ❑ Paso 2: Chequeo de la señal de control

- Actividad de la línea I2C (Hércules, Scaler NVM)
- Scaler PROM (memoria flash)

## ❑ Paso 3: Chequeo de la señal de datos y sincronismo

- Seguir el camino de señal de TV, HD & PC
- Chequear la señal control de conmutación

## ❑ Paso 4: Chequeo de la señal de salida del Scaler

- Salida LVDS (Low Voltage Differential Signal)
- Salida TTL

# Chequeos

- **Chequeo de la línea I2C**

Para chequear la robustez de la línea I2C se deben comprobar los buses:

1. Bus I2C entre el Scaler y el Hercules (pin 5-6 NVM 7099)
2. Bus I2C entre el Scaler y la NVM del Scaler (pin 5-6 NVM 7531)

- **Chequeo interconexión Entrada/Salida**

El objetivo es asegurar las siguientes condiciones de señal analógica y digital:

- Asegurar que todos los niveles de tensión son correctos en todas las etapas.
- Medir el ancho de banda de la entrada ADC.
- Medir las líneas de sincronismo y de reloj en tiempo de subida y bajada, nivel y frecuencia.
- Medir tiempos ajuste entre todos los dispositivos digitales



## SDTV input

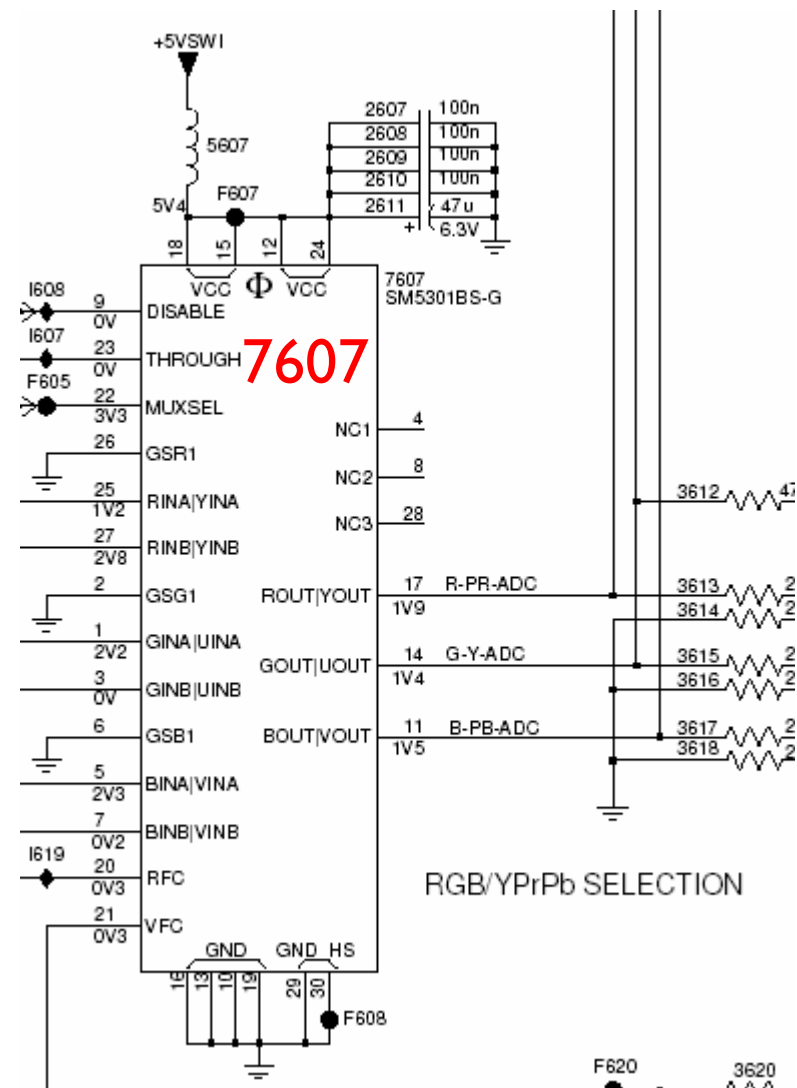
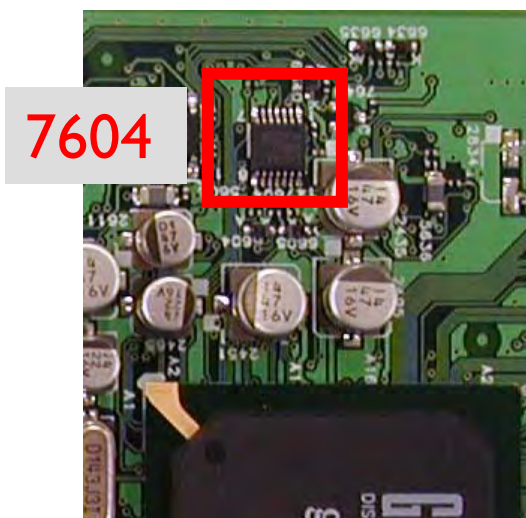
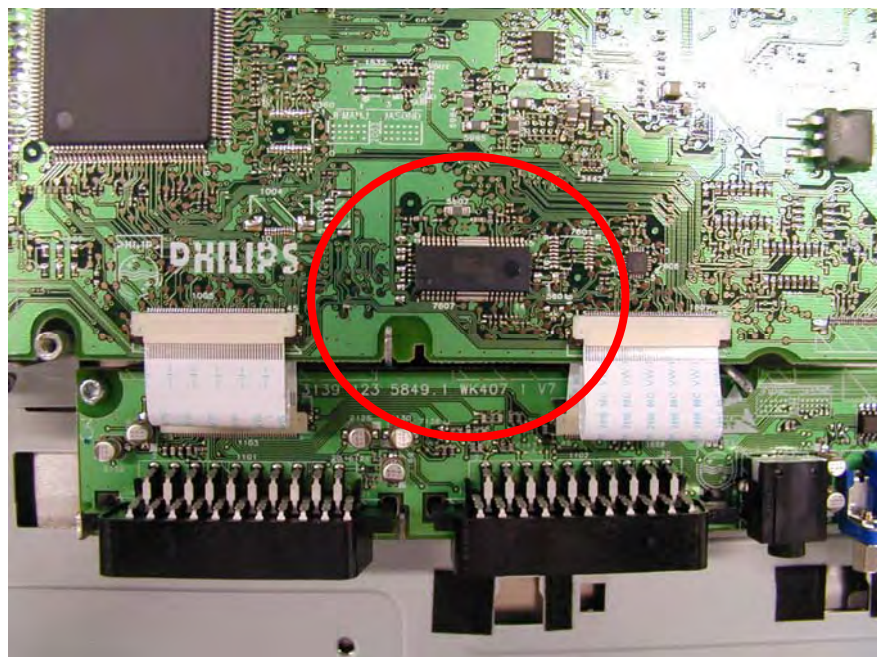
Condition: Patten#I Gray Scale pattern at **EXTI/AVI** input. PAL BG. SDTV Picture setting: Natural.

	Description	Test Location	Specs			Unit	
Scaler Input			Min	Typ	Max		
3.1a	R_SDTV input	7607 pin 17	680	700	710	mVpp	
3.1b	R_SDTV input -3dB Bandwidth		5		8	MHz	
3.2a	G_SDTV Input	7607 pin 14	680	700	710	mVpp	
3.2b	G_SDTV input -3dB Bandwidth		5		8	MHz	
3.3a	B_SDTV Input	7607 pin 11	680	700	710	mVpp	
3.3b	B_SDTV input -3dB Bandwidth		5		8	MHz	
3.5a	CS_H_SDTV freq	7604 pin 4		fH		KHz	
3.5b	CS_H_SDTV level		3.0	3.3		Vpp	
3.5c	CS_H_SDTV Tr				20	ns	
3.5d	CS_H_SDTV Tf				20	ns	
3.5e	CS_H_SDTV jitter				5	ns	
3.6a	V_SDTV freq	7604 pin 8		fV		Hz	
3.6b	V_SDTV level		3.0	3.3		Vpp	
3.6c	V_SDTV Tr				20	ns	
3.6d	V_SDTV Tf				20	ns	

Sync Signal Timing and Clamping Check

Condition: Patten#3 1Vpp CVBS video at RF and AV input. White Pattern. It should be tested under low to high temperature conditions.

	Description		Specs							
	HS Clamping period	7604 pin 4	2		7	μs	6.2			
	VS width	7604 pin 8	3H		12 H	μs	202us ≅ 3.2H		The sync width, leading edge and falling edge should not vary within a system	



## HDTV input

Condition: Patten#2 100% color bar at HD input. 1280x720p@50Hz. HD Picture setting: Brightness 50, Contrast 90, Color 50, Sharpness Medium,  
Input Source: 1) from D-sub connector; 2) from DVI connector (only check the functionality)

	Description	Test Location	Specs			Unit	Results	Remarks
Scaler			Min	Typ	Max			
4.1a	RED/Pr Input	7607 pin 25			700	mVpp		
4.1b	RED/Pr input -3dB Bandwidth		30			MHz		
4.2a	GREEN/Y Input	7607 pin 1			700	mVpp		
4.2b	GREEN/Y input -3dB Bandwidth		30			MHz		
4.3a	BLUE/Pb Input	7607 pin 5			700	mVpp		
4.3b	BLUE/Pb input -3dB Bandwidth		30			MHz		
4.5	SOG level			3.3		V		
4.5a	SOG Tr	7607 pin 14			20	ns		
4.6b	SOG Tf				20	ns		

T	Description	Test Location	Limits			Unit
			Min	Ty P	Max	
1	DC Supply					
1.1a	+12V main supply	1910		12		V
1.1b	+3V3STBY	1910		3.3		V
1.1c	AUD_SUP	1910		10		V
1.2a	+5VSWTV Regulator out	5932 and 2935		5		V
1.2b	+VTUN Regulator out	2911				V
1.2c	+5VSW Regulator out	2958 and 5954		5		V
1.3	+8VSW_TV Regulator out	7920 out and 2921				V
1.4	+2V5 Regulator out	7992 out		2.5		V
1.5	+1V8Regulator out	7995 out		1.8		V



## Test de señales de entrada de PC al Scaler

	SDRAM							
Condition: Patten#I Gray Scale pattern at PC input. 1024x768@60Hz. PC Picture setting: Brightness 100, Contrast 100, Color 50, Sharpness 50.								
	Description	Test Location	Specs			Unit	Results	Remarks
			Min	Typ	Max			
7.1a	FSCLK+ level	750I pin 55	0.98	1.25	1.51	V		
7.1b	FSCLK+ freq				200	MHz		
7.2a	FSCLK+ setup time							
7.2b	FSCLK+ hold time							
7.3	Check any one data line	750I data lines						

# Apéndice

## *Información de pines de conectores*

- **Conector Sub-D de 15 pines**

PIN	SIGNAL
1	RED
2	GREEN
3	BLUE
4	NC
5	GND
6	RED GND
7	GREEN GND
8	BLUE GND
9	+ 5V SUPPLY FROM PC
10	SYNC GND
11	SENSE GND
12	SDA
13	H- SYNC
14	V- SYNC
15	DATA CLOCK

• Conector DVI de 24 pines

Pin	Signal Assignment	Pin	Signal Assignment	Pin	Signal Assignment
1	T.M.D.S Data2-	9	T.M.D.S Data1-	17	T.M.D.S Data0-
2	T.M.D.S Data2+	10	T.M.D.S Data1+	18	T.M.D.S Data0+
3	T.M.D.S Data2/4 Shield	11	T.M.D.S Data1/3 Shield	19	T.M.D.S Data0/5 shield
4	NC	12	NC	20	NC
5	NC	13	NC	21	NC
6	DDC Clock	14	+5V Power	22	T.M.D.S Clock Shield
7	DDC Data	15	Hot Plug Detect	23	T.M.D.S Clock+
8	NC	16	Ground (return for +5 V)	24	T.M.D.S Clock-



# PHILIPS

## **Curso LC04**

### **08. Sistema**

Philips Ibérica – Electrónica de Consumo

Departamento Técnico

Cristina Senallé - Gabriel Arianes

Noviembre 2004

# Sistema de control

El sistema de buses de la placa tiene dos microprocesadores integrados:

- Embedded **x86** on-chip micro-controller (OCM) de Genesis LCD TV/Monitor Controller.
- On-chip **80C51** micro-controller de la serie UOC<sup>III</sup> (Hercules) de Philips Semiconductor.

Cada microprocesador tiene su propio bus **I<sup>2</sup>C** para comunicación con los dispositivos internos. Los dispositivos externos se comunican a través de los buses **I<sup>2</sup>C** listados a continuación.

# Buses I2C

**Bus I2C-I:** es un bus hardware I2C donde el UOCIII es el master. Los siguientes dispositivos están conectados a este bus:

- El sintonizador TV/FM analógico principal
- La NVM de la TV (EEPROM)
- Integrado de Histograma
- Herramienta de Compair (sólo Hercules)
- Sólo para NATFA, un 3D-Combfilter opcional
- El OCM. El OCM se comunica con el UOCIII como esclavo. Para evitar una sobrecarga en el buffer en el lado del OCM, la línea TV\_SC\_COM proporciona el control necesario. Para permitir comunicación bidireccional, el OCM puede efectuar una petición de interrupción al UOCIII a través de la línea TV\_IRQ.

**Bus I2C-2:** es un bus software I2C en el que el UOCIII es el master. Este bus se usa para conectar módulos bolt-on externos como módulos DVB o módulos ATSC.

**Bus I2C-3:** es un interface DDC I2C esclavo en el Sil9993. Una fuente externa HDMI conectada al conector HDMI es, normalmente, el master de este bus.

**Bus I2C-4:** el OCM es el master de este bus. La EEPROM (Scaler) y el receptor HDMI PanelLink (Sil9993) están conectados a este bus.

**Bus I2C-5:** es el interface DDC para comunicaciones DDC2B desde un conector DVI-D. La fuente DVI normalmente es el master de este bus.

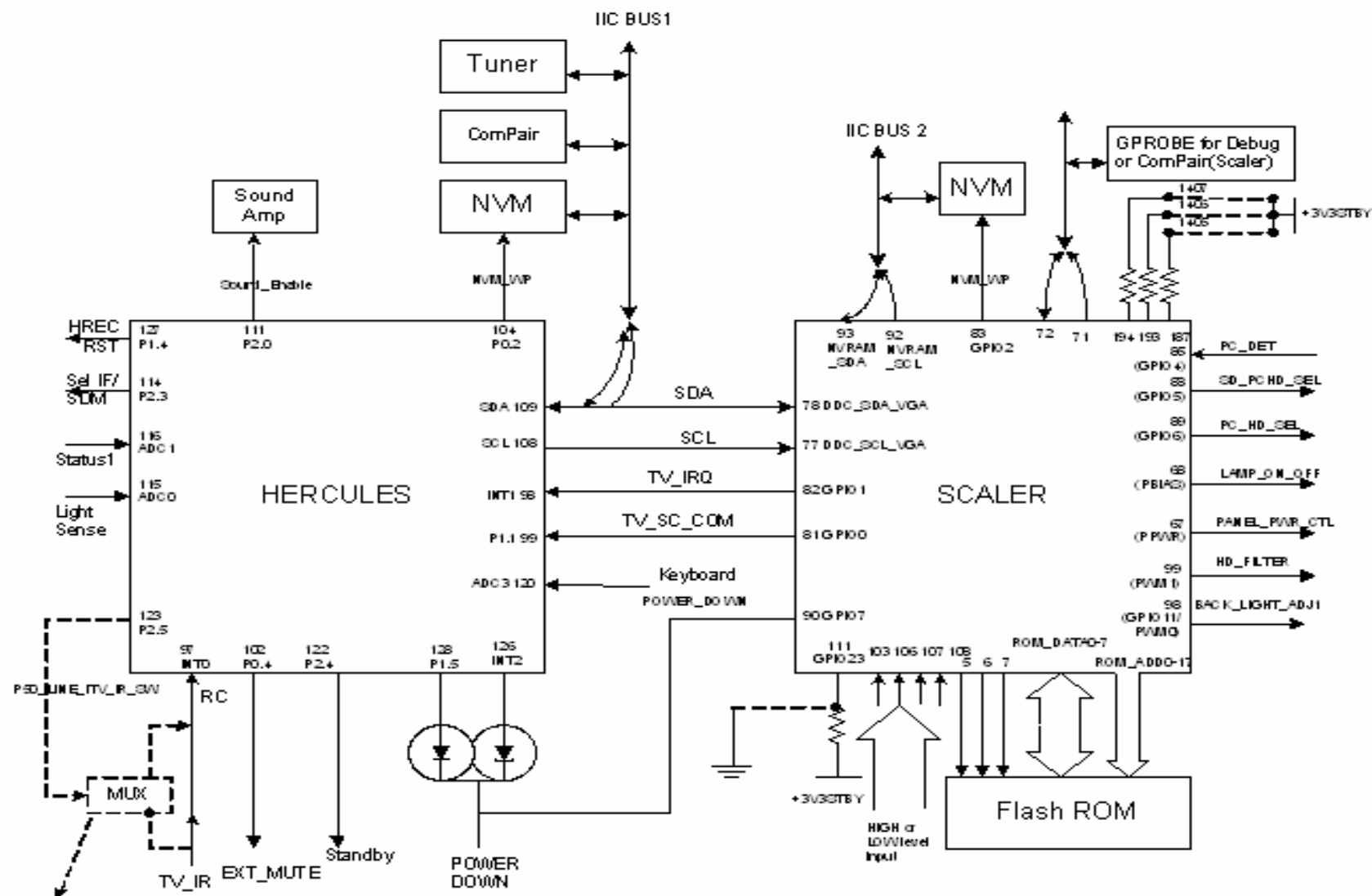
**Bus I2C-6:** sólo se usa en la fase de desarrollo para depurar el software.

**Bus I2C-7 ComPair-Scaler:** bus UART que se usa para diagnósticos de servicio en la parte del Scaler.

**Bus I2C-8 VGA:** bus DDC VESA que permite al PC leer la EEPROM que contiene la información EDID del monitor-TV LCD.



## Diagrama de bloques



## Interface del microprocesador

# PHILIPS

## **Curso LC04**

### **09. Chasis LC4.6**

Philips Ibérica – Electrónica de Consumo

Departamento Técnico

Cristina Senallé - Gabriel Arianes

Noviembre 2004

# PHILIPS

## **Curso LC04**

### **09A. Introducción LC4.6**

Philips Ibérica – Electrónica de Consumo

Departamento Técnico

Cristina Senallé - Gabriel Arianes

Noviembre 2004

# Chasis LC4.6

- Referencia: **xxPF9946/yy**
- Tecnología:
  - LCD : 30"
  - PDP : 37" y 42"
- Regiones:
  - Europa (/I2)
  - AP (/61, /69, /79, /93, /98)
  - NAFTA (/37)



# Resolución de la pantalla

- **LCD 30"**

AUO : 1280x768 (Europa)

LG(C5) : 1280x768 (NAFTA)

- **PDP 37"**

SDI : 852x480

- **PDP 42"**

SDI : 852x480

# Especificaciones (Europa)

- Audio : 2 x 15 W
- Modos de sonido:
  - Mono
  - Espacial
  - Estereo
  - Nicam / Dual I-II
  - Virtual Dolby surround
- Active control plus (con sensor de luz)
- 10 páginas de TXT
- Pantalla Twin-TXT (no dual teletexto)
- Plug 'n play
- Mando para controlar 5 dispositivos

# Limitaciones de software (Europa)

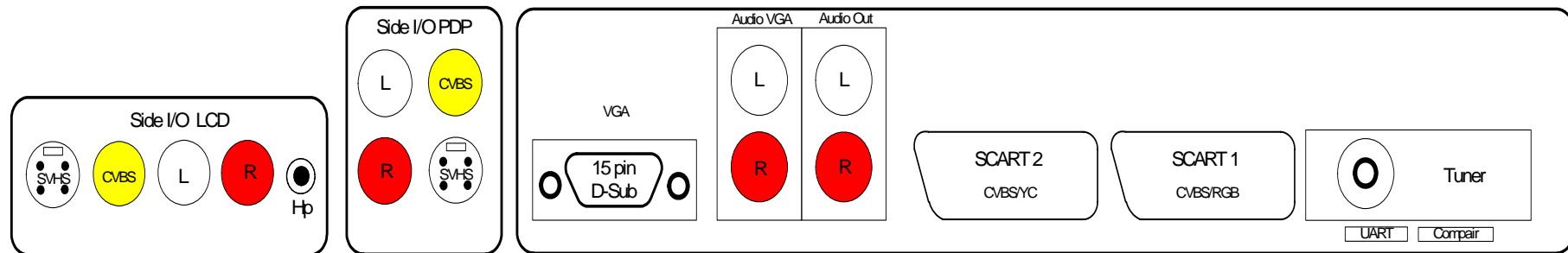
Debido a la ROM de 128Kb del Hercules:

- No TXT nivel 2.5
- No hue menu line
- Sin nombres en las presintonías
- Sin desplazamiento vertical de la imagen
- No se muestra .25Hz en las frecuencias de los canales
- Un único ‘deltavolume’ para presintonías del 41 al 99

# Modos de servicio

- **SDM:**
  - Entrada: 062596 + 'Menu'
  - Información: errores (borrado si se entra cortocircuitando los pines de servicio)
- **SAM:**
  - Entrada: 062596 + 'i+'
  - Información: errores/códigos opción/alineamientos
- **CSM:**
  - Entrada: 123654
  - Información: general y de los ajustes actuales

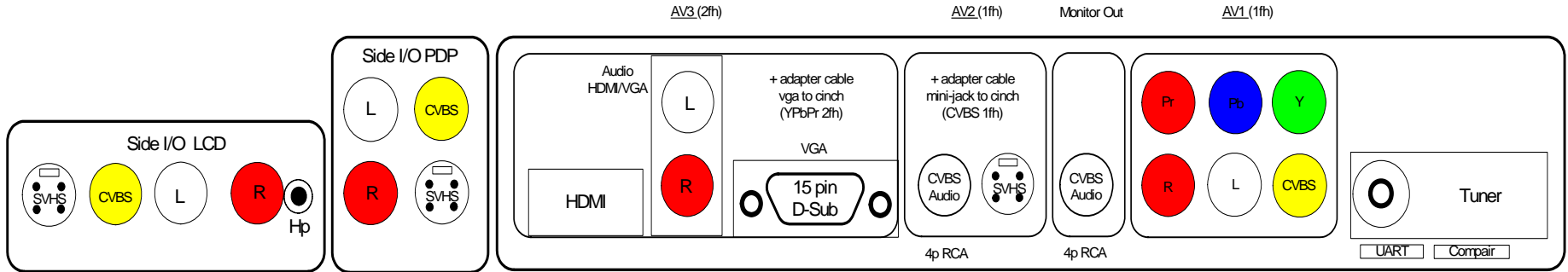
## Conexiones



# Conexiones

- **Modo TV**
  - Sintonizador
  - Euroconector 1:
    - Entrada RGB
    - Entrada/salida CVBS
  - Euroconector 2 :
    - Entrada YC
    - Entrada/salida CVBS
  - Conector lateral/posterior :
    - Entrada CVBS
    - Entrada SVHS + audio
    - Salida de audio de nivel variable
- **Modo PC**
  - Entrada VGA + Audio

## Conexiones cinch



# Conexiones cinch

- **Modo TV**

- AV1: entrada CVBS + audio
- CVI : entrada YPbPr + audio
- AV2: entrada CVBS/SVHS + audio (adaptador)
- Salida monitor: salida CVBS + audio (adaptador)
- Conector posterior: entrada CVBS + audio

- **Modo PC**

- Entrada VGA + audio

- **Modo HD**

- Entrada HDMI + audio
- Entrada YPbPr (2fh) + audio (adaptador)



# Paneles

- Control superior: usado 2K3
- Conector lateral LCD: usado 2K3
- Conector lateral PDP: nuevo (sin salida de auriculares!)
- Panel led/interruptor: usado 2K3
  - interruptor on/off (no interruptor táctil)
  - receptor IR = 3.3V en lugar de 5V
- Alimentación
  - LCD: usado 2K4 (Europa: 230 Vac)
  - PDP : integrado en el display
- Alimentación Standby LCD + audio: 2K4
- Amplificador audio Class D PDP: 2K4
- SSB

# PHILIPS

## **Curso LC04**

### **09B. SSB LC4.6**

Philips Ibérica – Electrónica de Consumo

Departamento Técnico

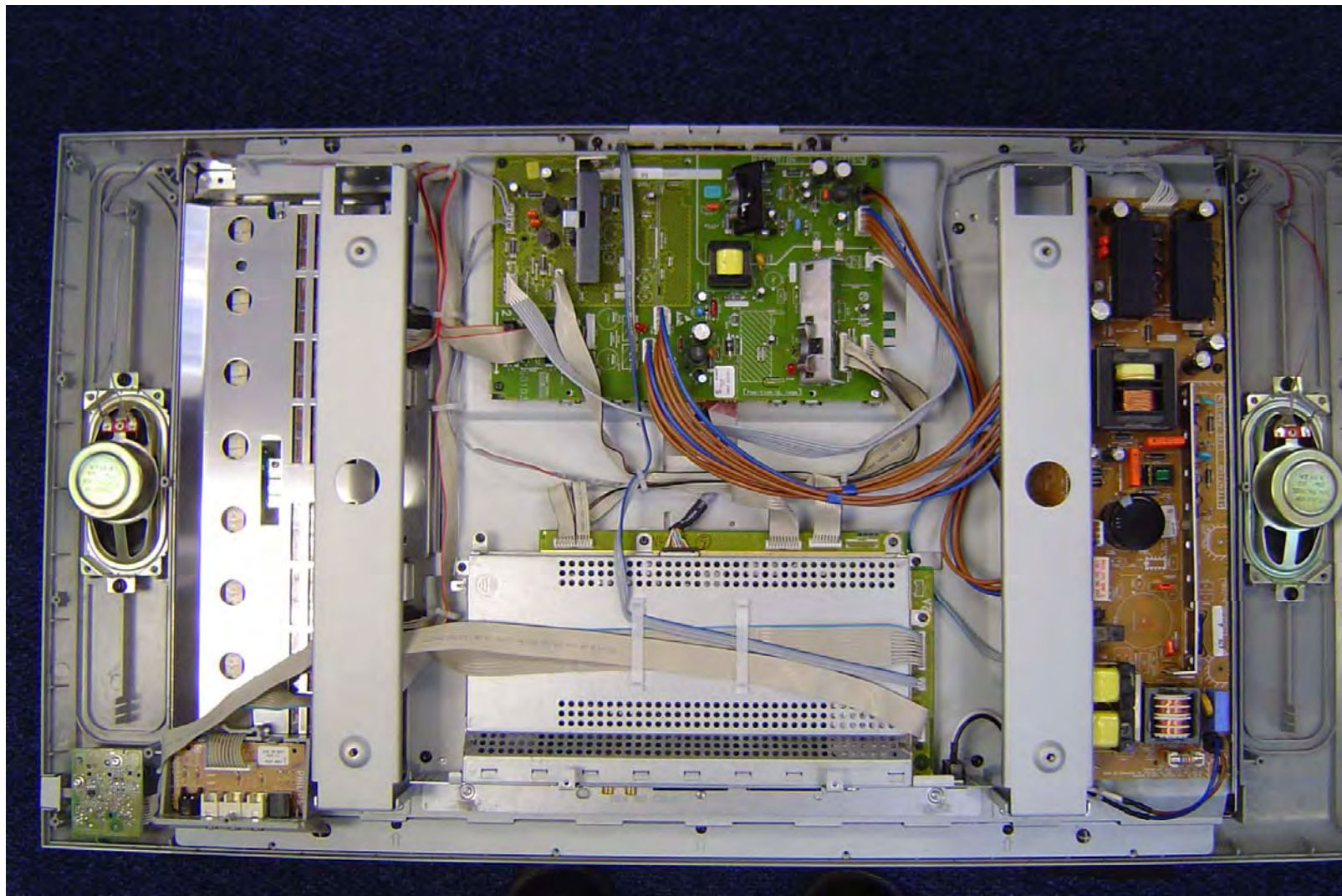
Cristina Senallé - Gabriel Arianes

Noviembre 2004

# Presentación

- Aparatos:
  - 30" LCD
  - 37" PDP
  - 42" PDP
- SSB de bajo coste:
  - 2 integrados: Hércules & Génesis
  - Mínimas E/S's: euroconector, HDMI, VGA ...
  - 4 diversidades (LCD Eur, LCD NAFTA/AP, PDP Eur, PDP Nafta/AP)
  - Alimentaciones de proyectos EMG Top o SDI de 2K4
  - E/S laterales de proyectos EMG Top 2K3
  - Panel Led&Interruptor de proyectos EMG Top de 2K3
  - Amplificador de audio de proyectos EMG Top de 2K4

# Foto del chasis







## Lado Génesis

- PCB de 4 capas (1,6 mm x 155 mm x 250 mm)
- Completamente blindada

## Lado Hércules



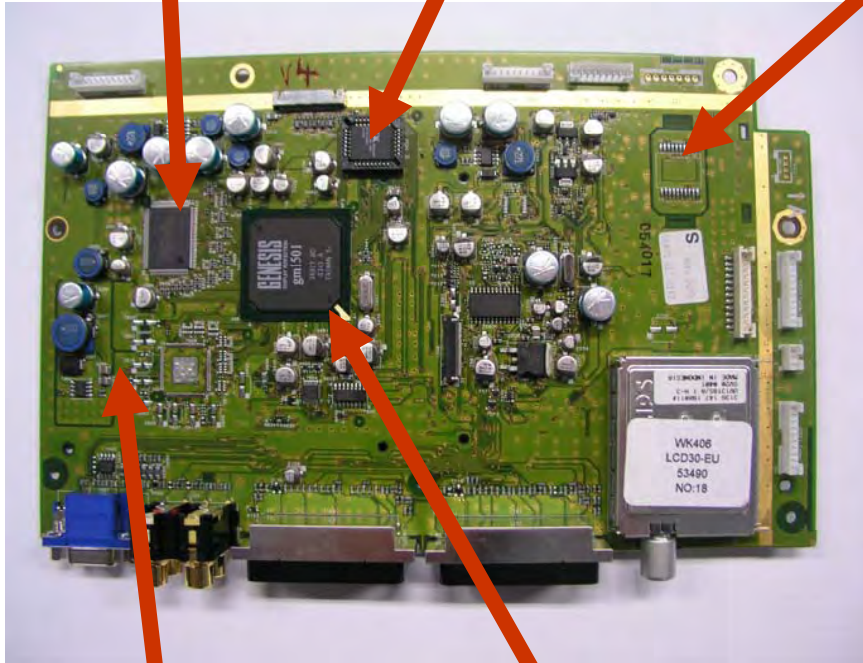
**SDRAM**

**Flash  
ROM**

**Audio  
(no  
incluido)**

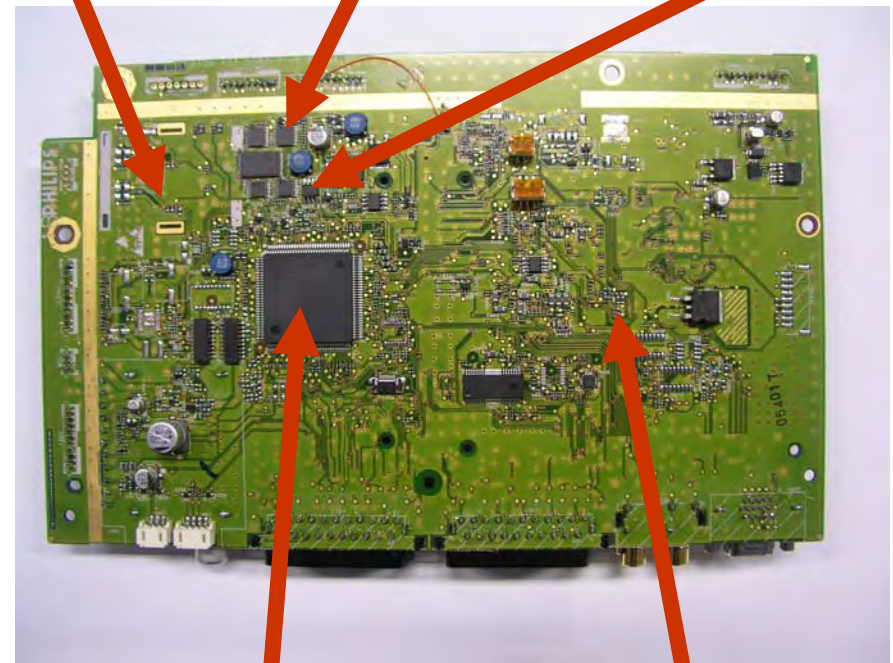
**Front  
processing**

**NVM**



**convertidor  
DC-DC**

**Scaler  
(Genesis)**



**Hercules**

**Scaling  
processing**

**IM46** (conector  
alimentación)

**IM03** (conector  
Control)

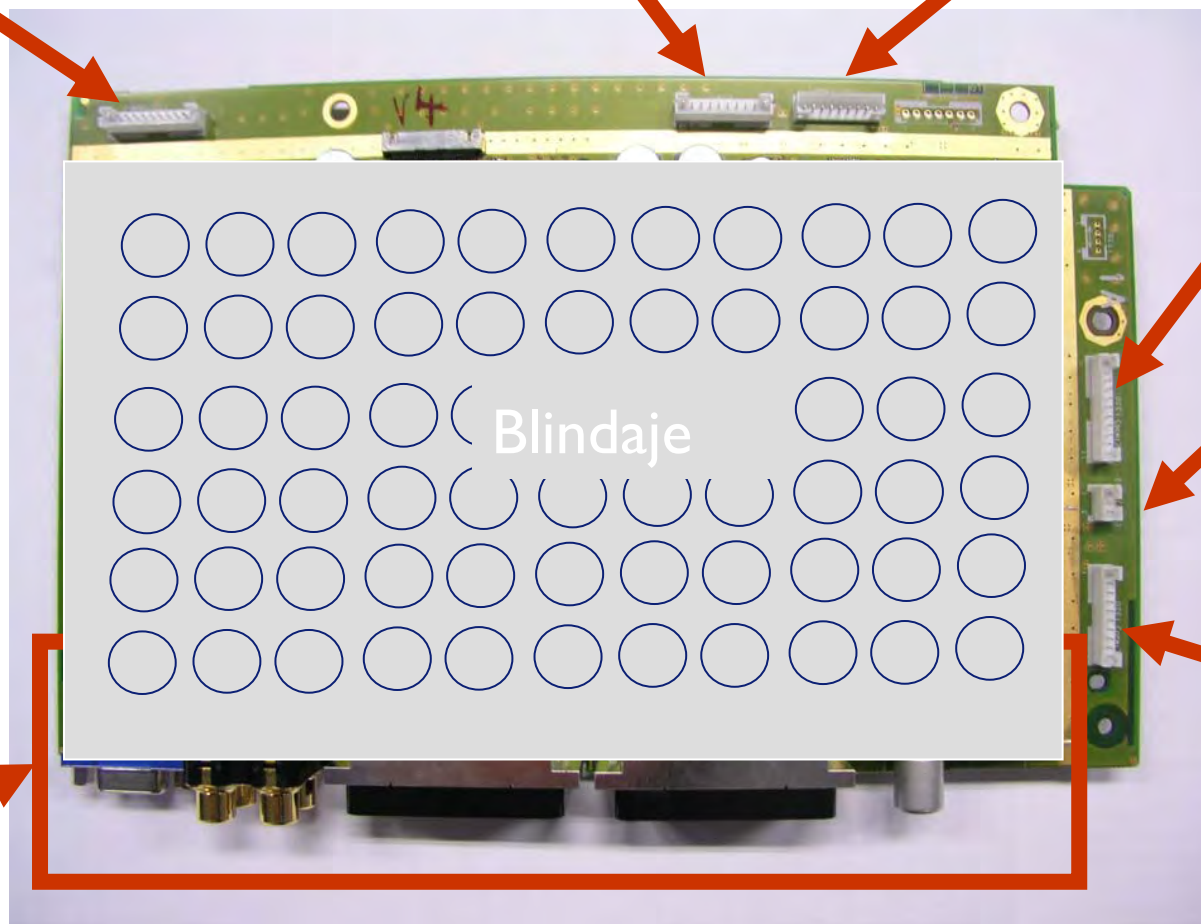
**IM52** (conector  
audio)

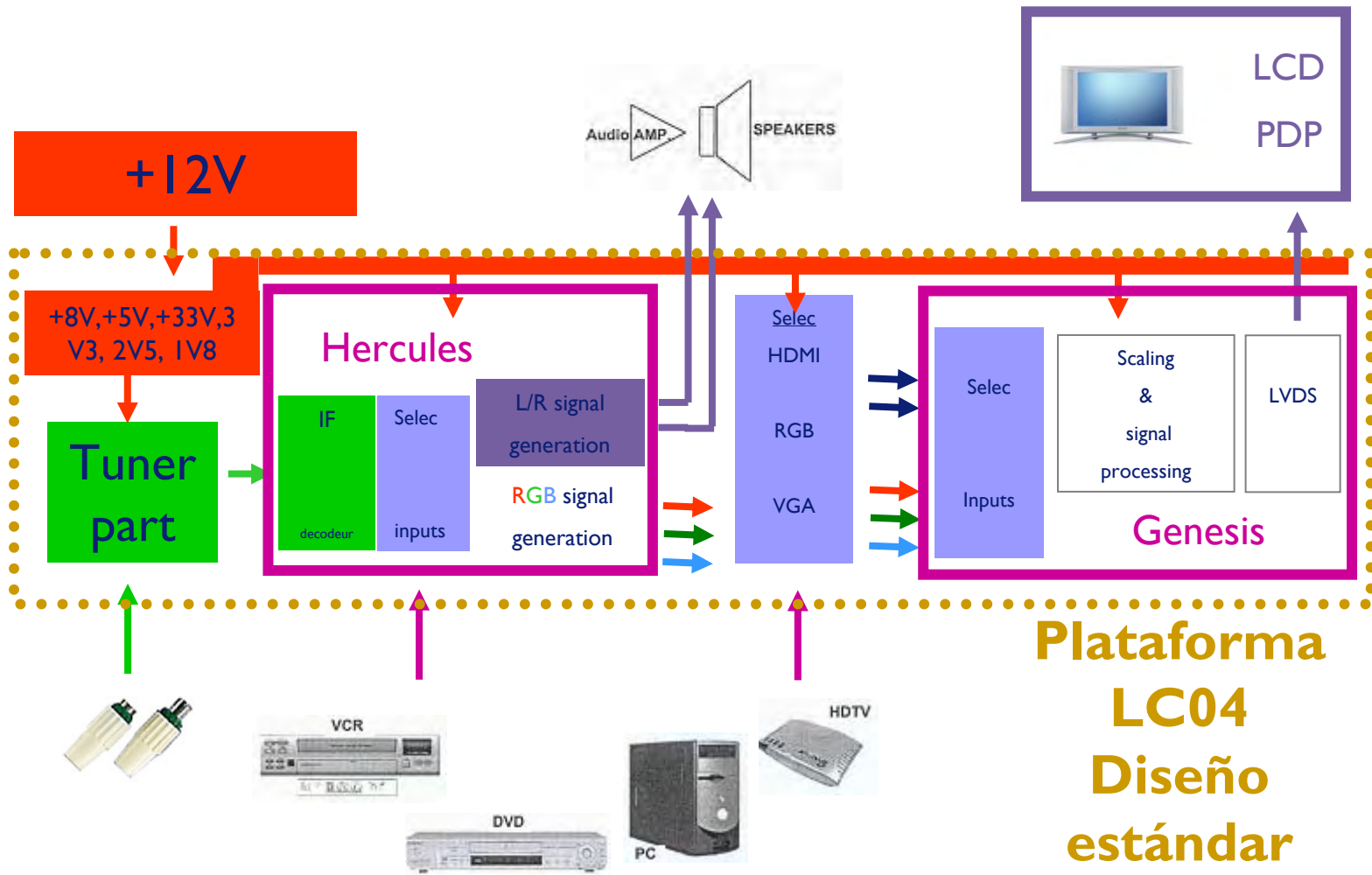
**IM36**  
(conector  
IO)

**IM01**  
(conector  
control  
superior)

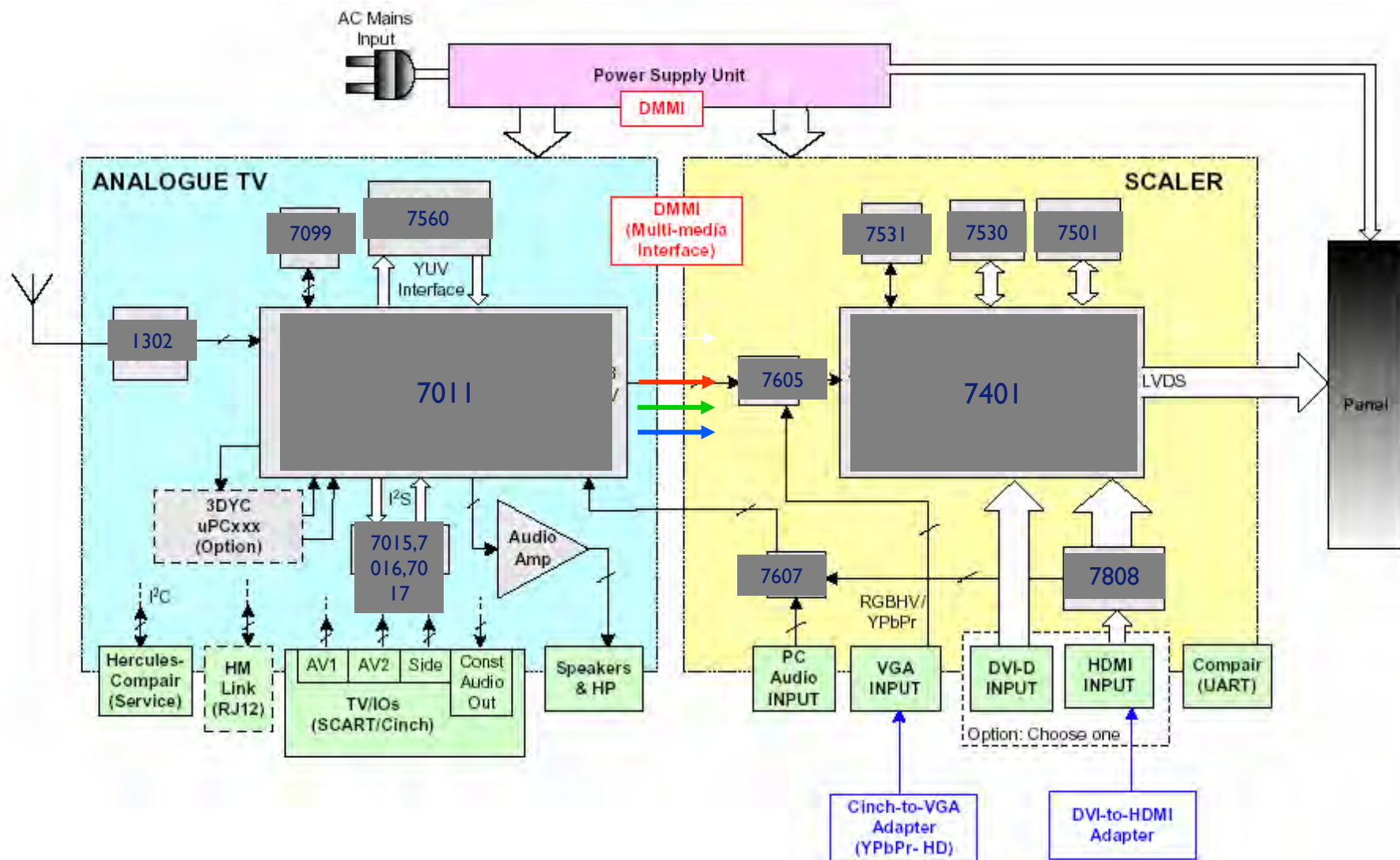
**IM20**  
(conector  
drive)

**Celda  
IO**









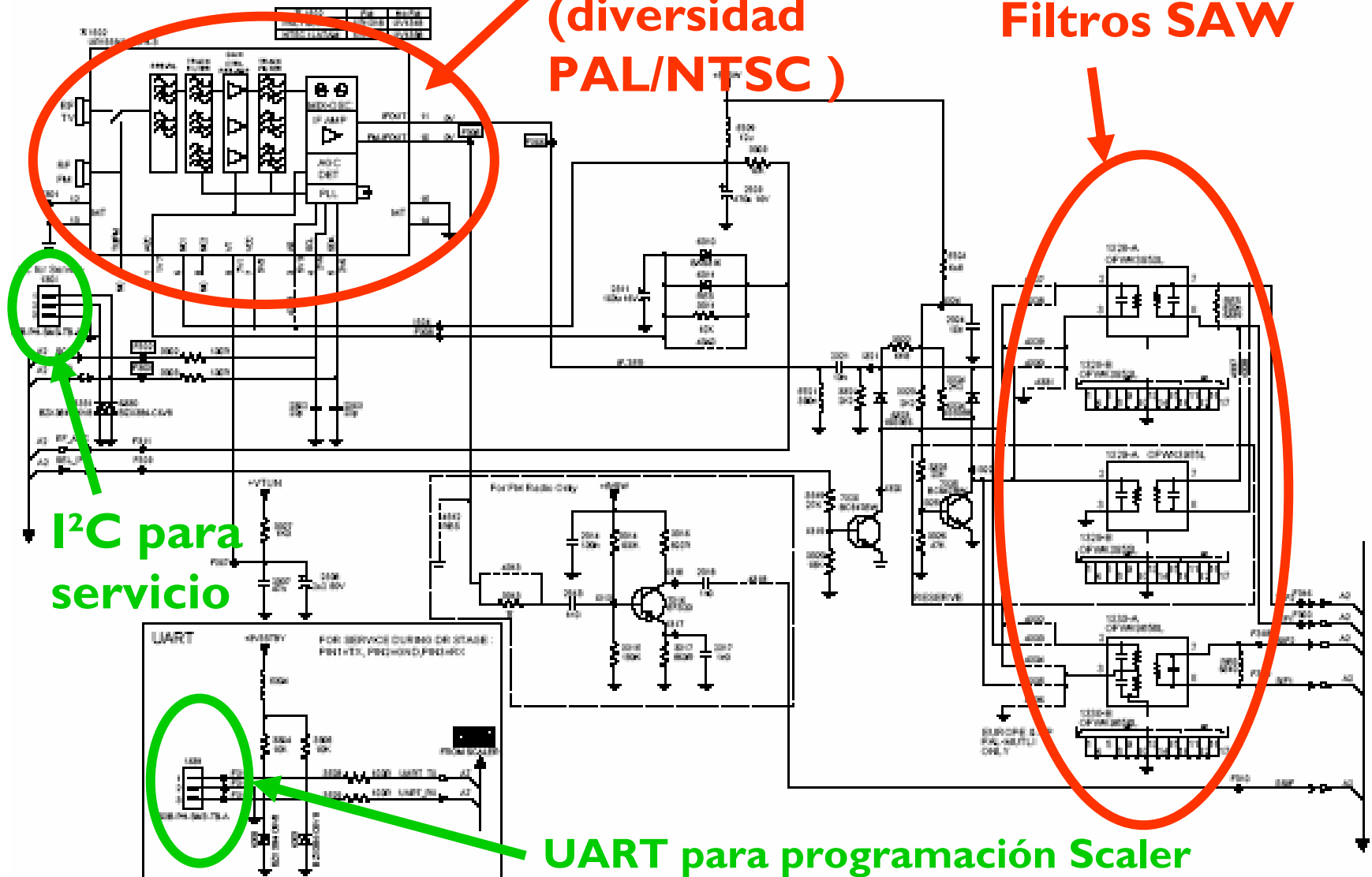
# Lista de esquemas

Posnr.	Short Panel description	12NC-naked PCB	12NC Schematic	Page
1101	LC04SD PCB SB TV-SCALER			
	cinch ssb	3139 123 5868*	3139 123 5868*	A17
	scart ssb	3139 123 5838*	3139 123 5838*	A18
				A1
				A2/A3
				A4
				A5
				A6
				A7/A8
				A9
				A10
				A11
				A12
				A13
				A14
				A15
				A16
1114	Top control	3104 303 3691*	8204 000 6604*	P
1116	SIDE IO	3104 303 3649*	8204 000 6393*	O
1006	30" LCD DLIM MAINS FILTER ST.	3104 303 3875*	3104 313 6009*	
			3104 313 6009*	
1005	30" LCD SLIM SUPPLY	3104 303 3876*	3104 313 6010*	
			3104 313 6010*	
1072	LED SWITCH panel	3104 303 3924*	8204 000 6676*	

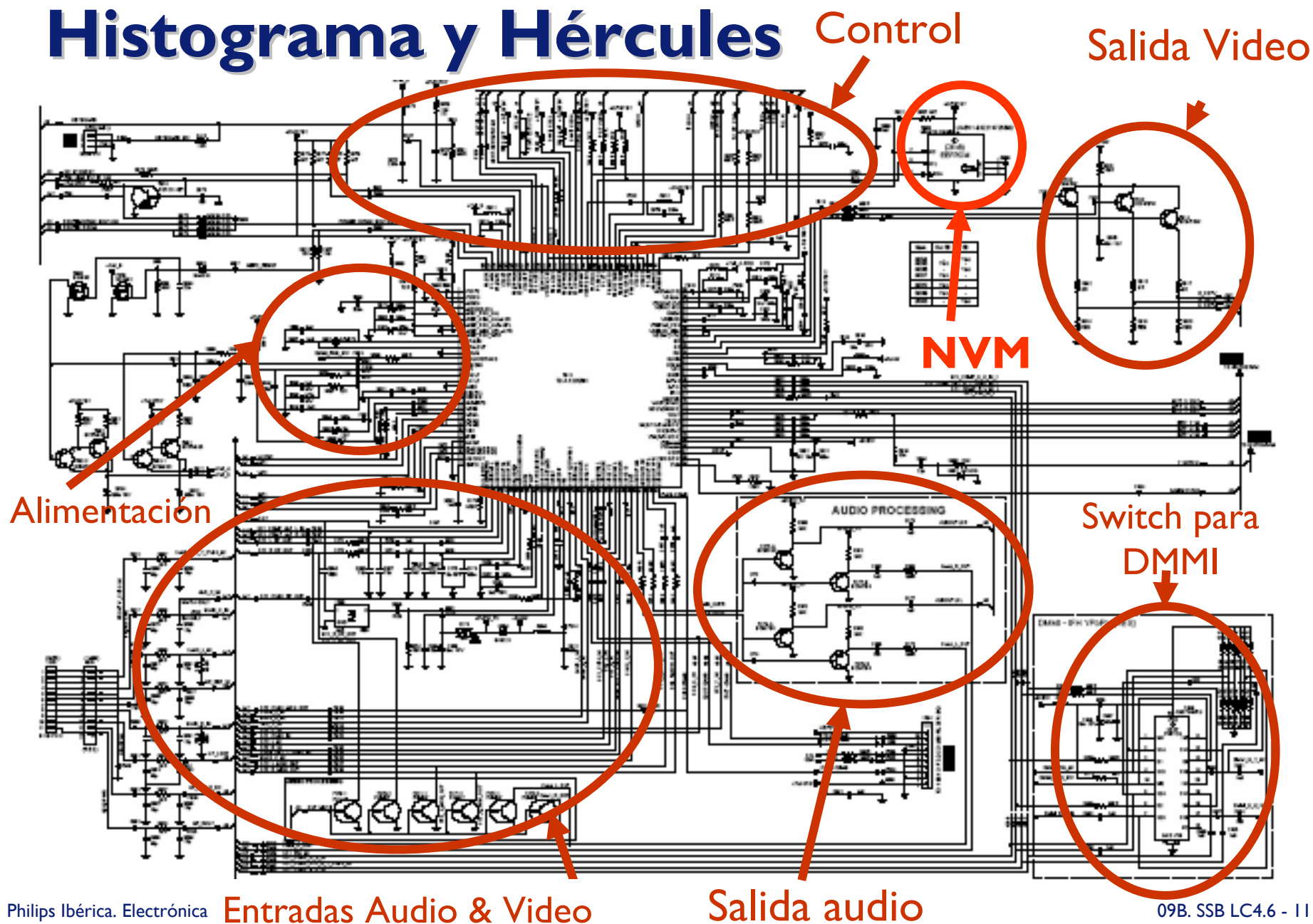
# Sintonizador

Sintonizador  
(diversidad  
PAL/NTSC)

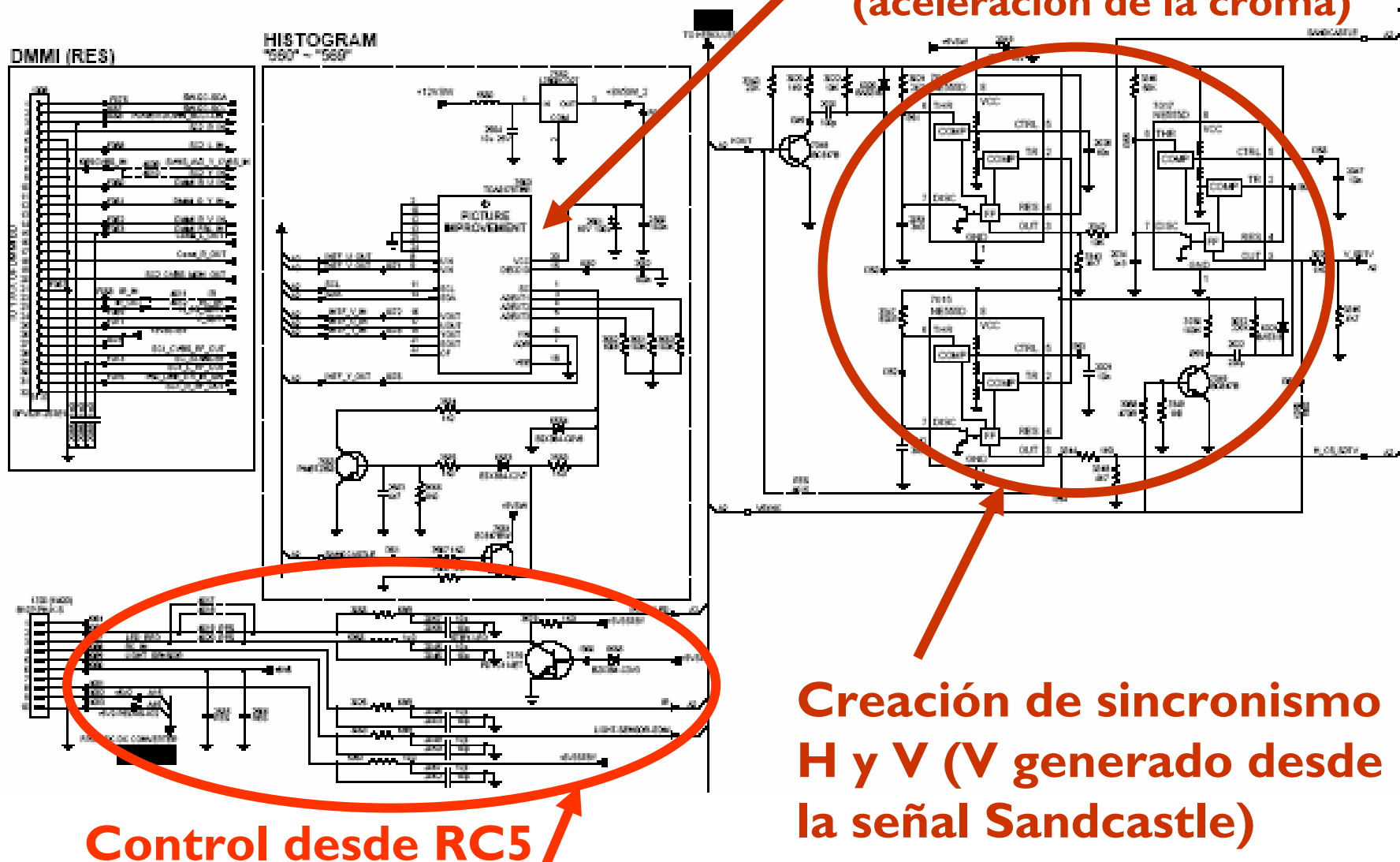
Filtros SAW



# Histograma y Hércules



# Procesado de Vídeo

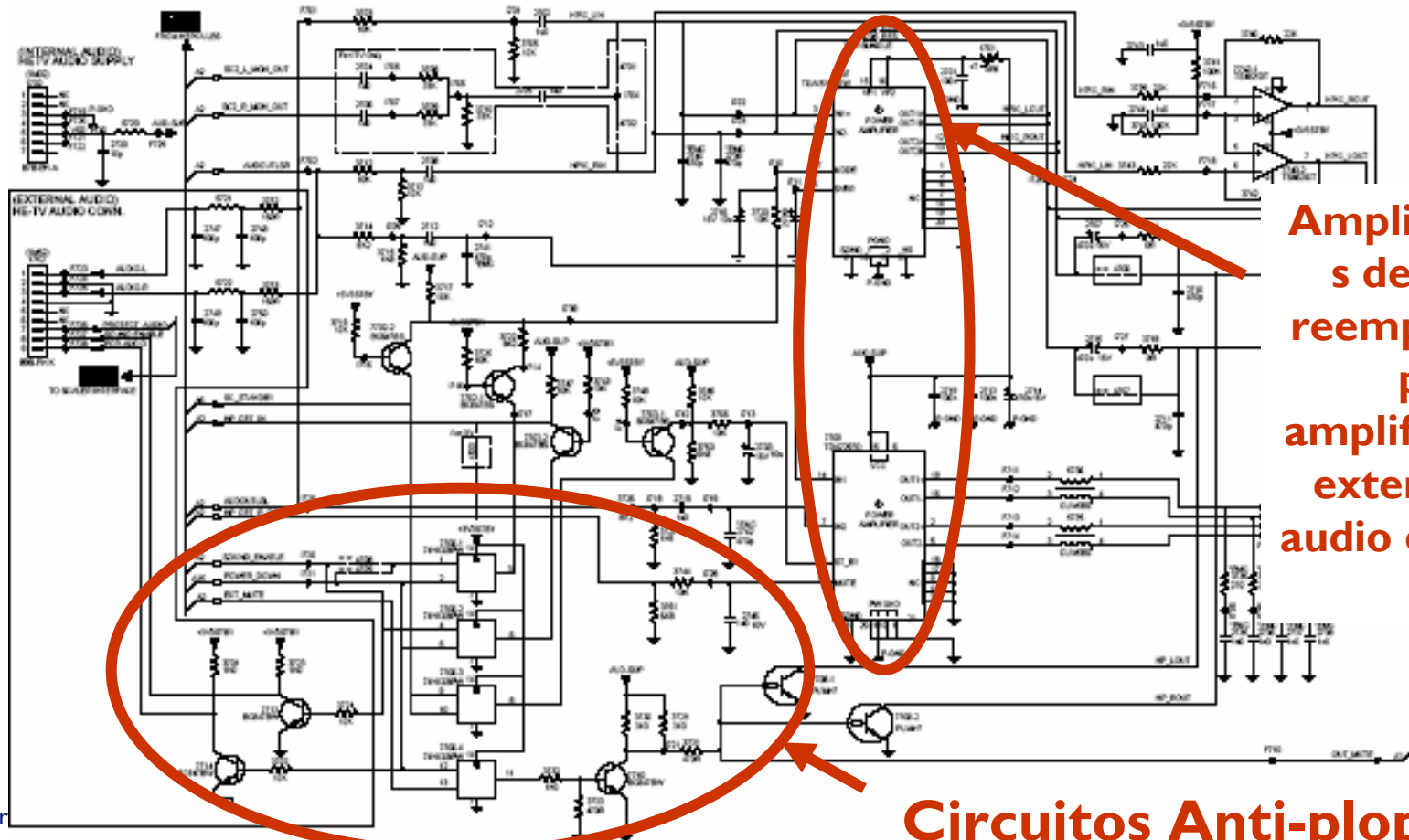


## Sólo en aplicaciones PDP



# Amplificador de audio

Para reparar ver los esquemas de alimentación de standby de LCD 2K4 / Audio PCB 2K4

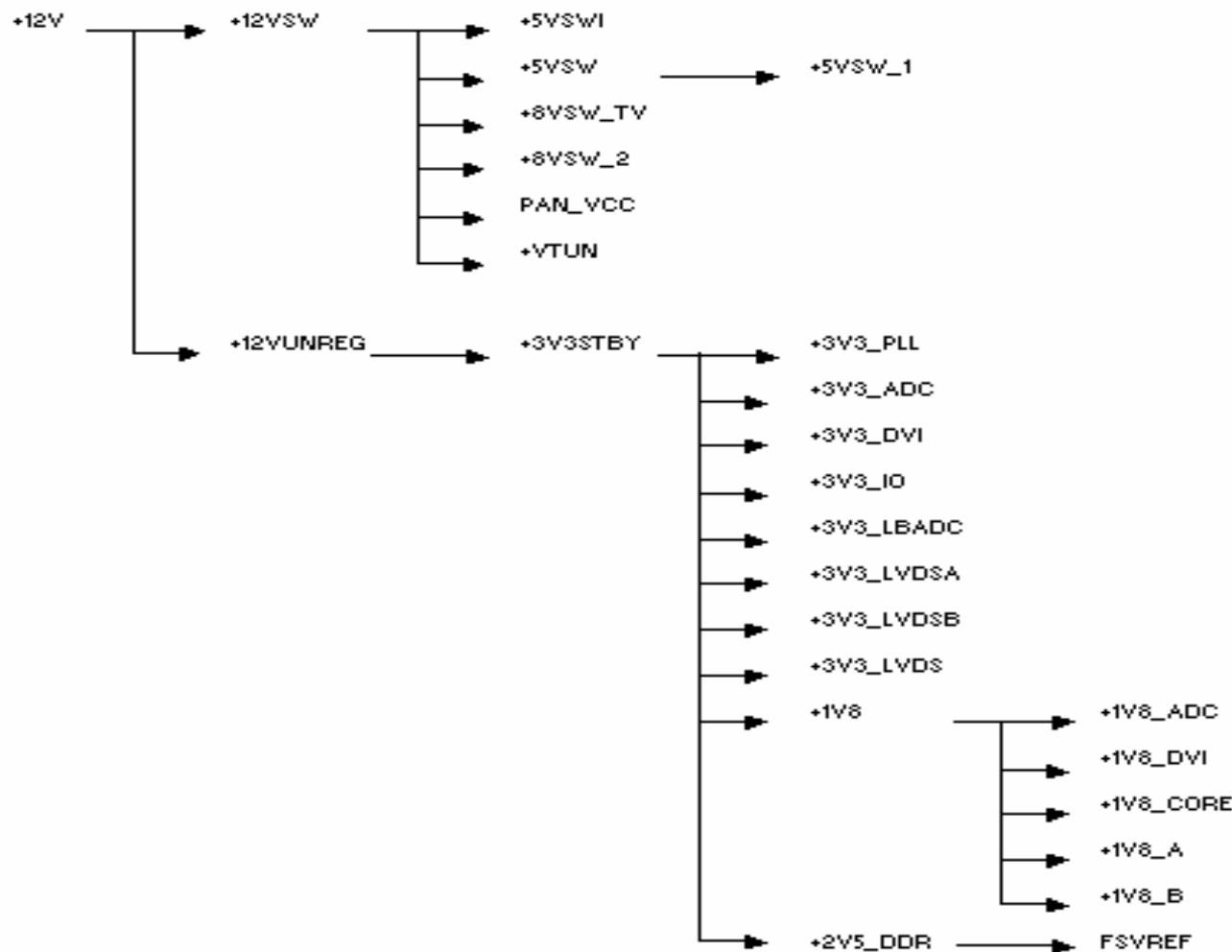


**Amplificadores de audio reemplazados por amplificadores externos de audio en LC4.6**

**Circuitos Anti-plops** B LC4.6 - 14 -

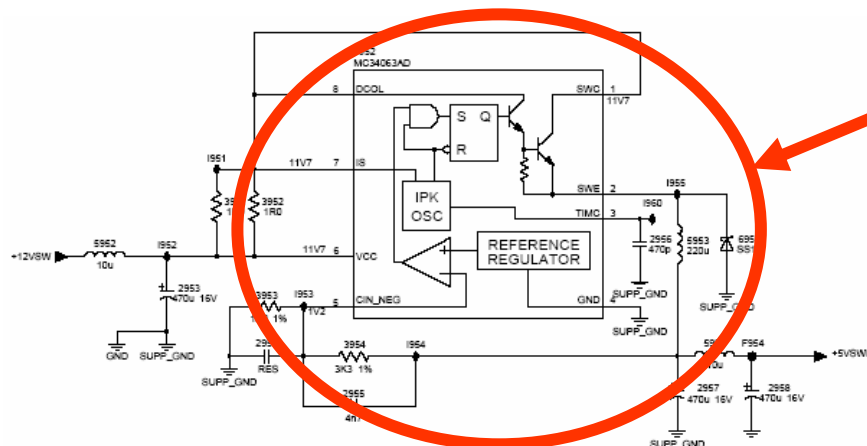
# Alimentación de la parte de TV

Cada tensión se deriva de 12V ( pin 4 de IM46 )



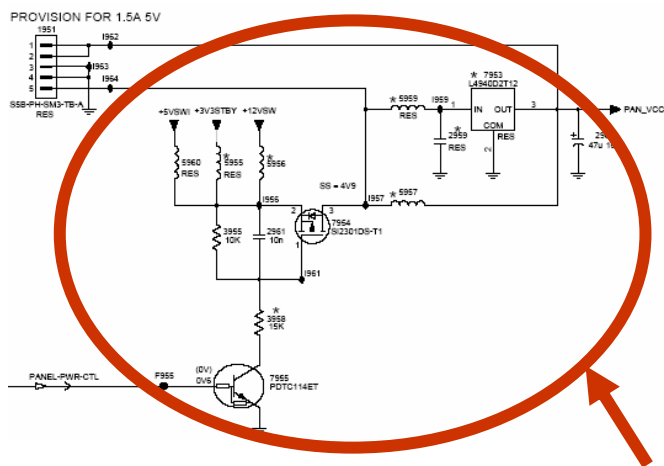


# Alimentación de la parte de TV

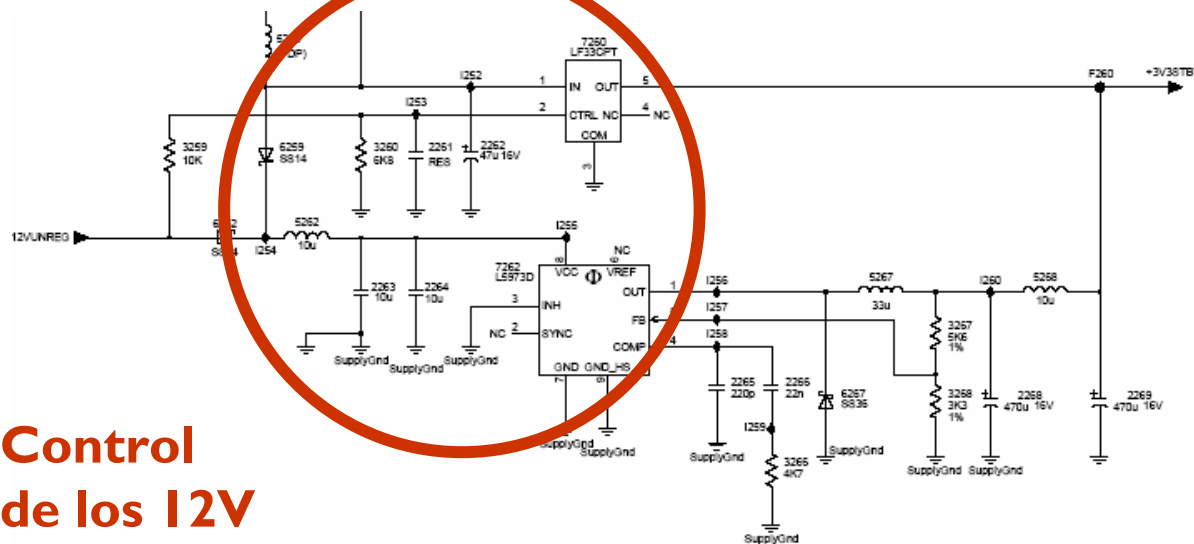


**Regulador  
conmutado  
para  
estabilidad  
de 5V**

**Generación de  
los +3V3STBY:  
primero via  
+5V2 y después  
via +12V**

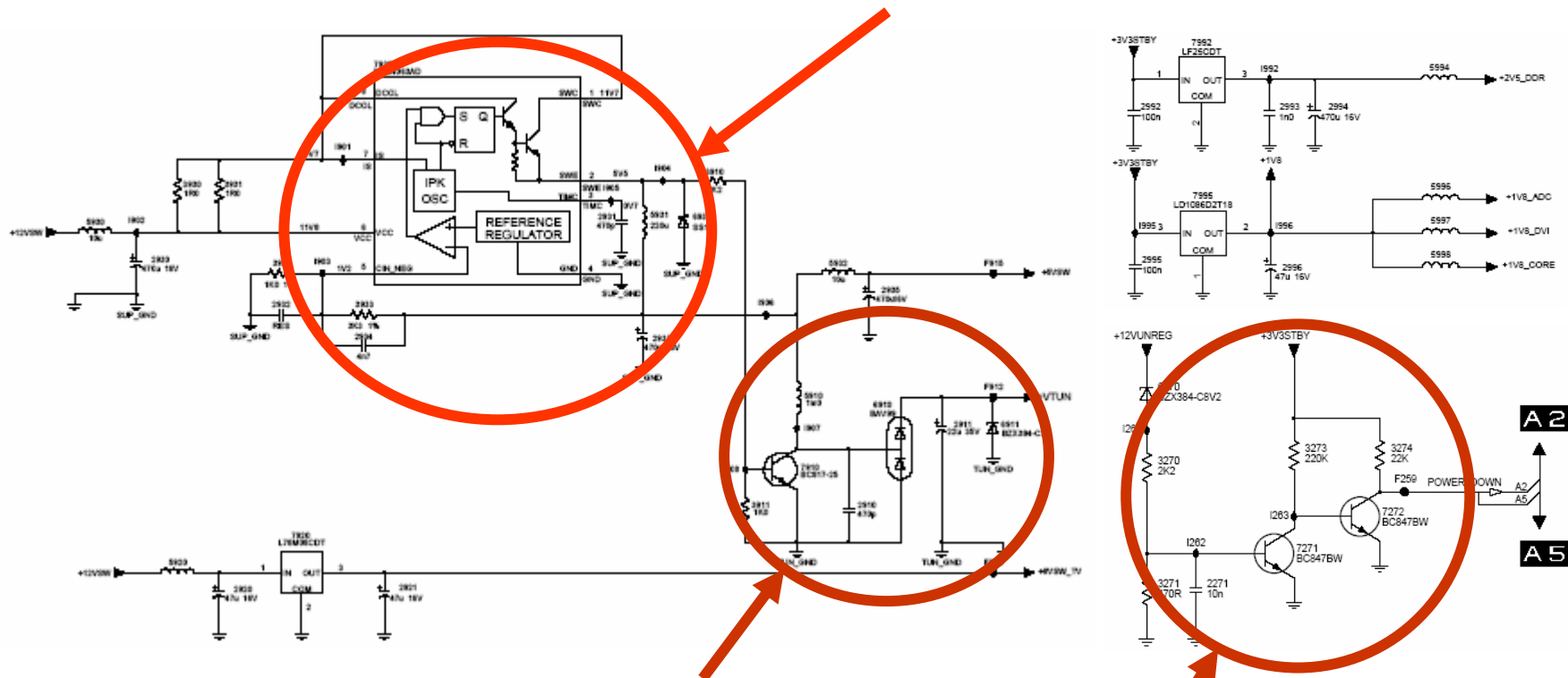


**Control  
de los 12V  
en LVDS**



# Alimentación de la parte de TV

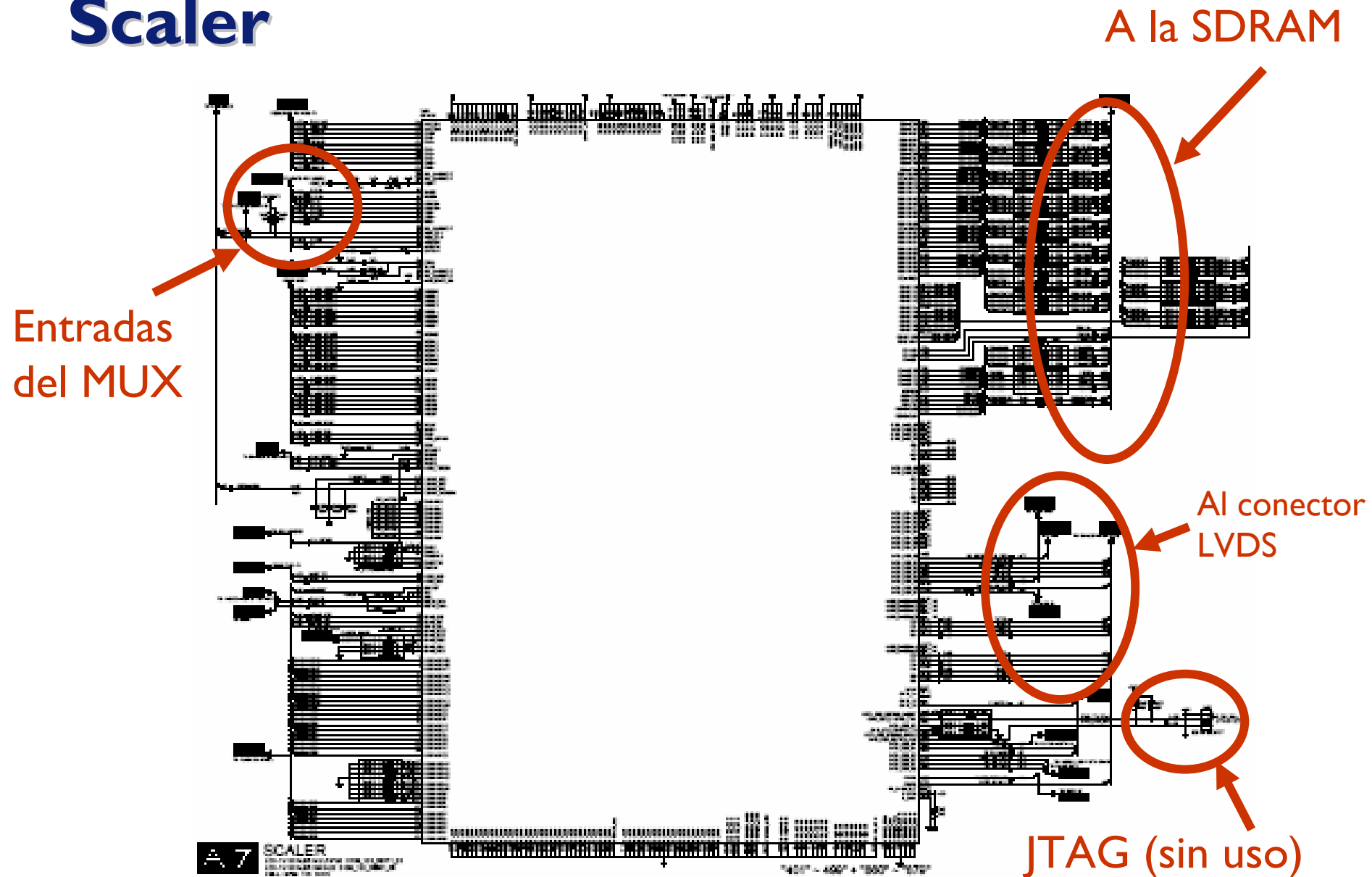
## Regulador conmutado para estabilizar 8V y 33V



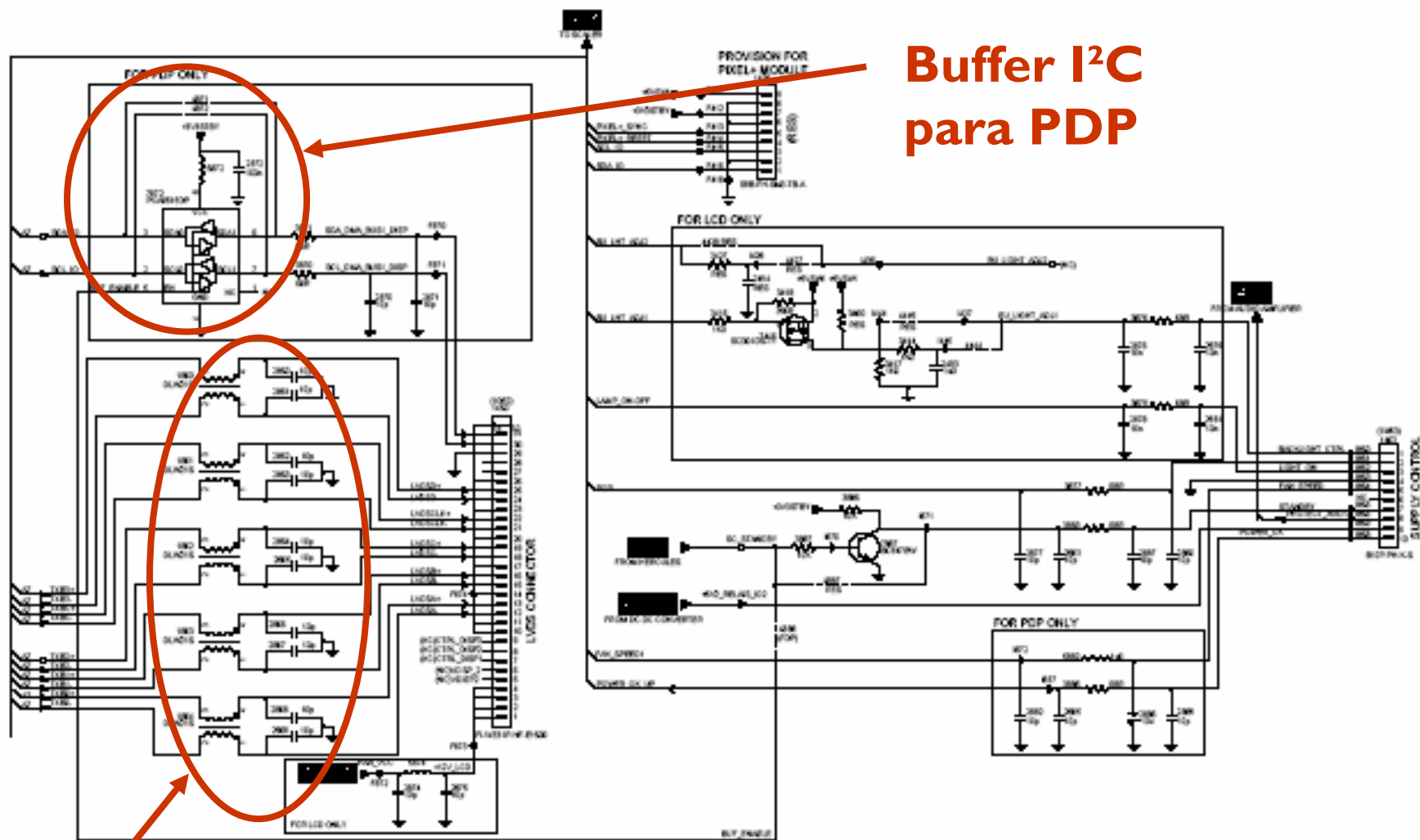
**Generación de +33V sintonizador**

**Detección de la ausencia de 12V para resetear al Hercules**

# Scaler



# Scaler y sus interfaces



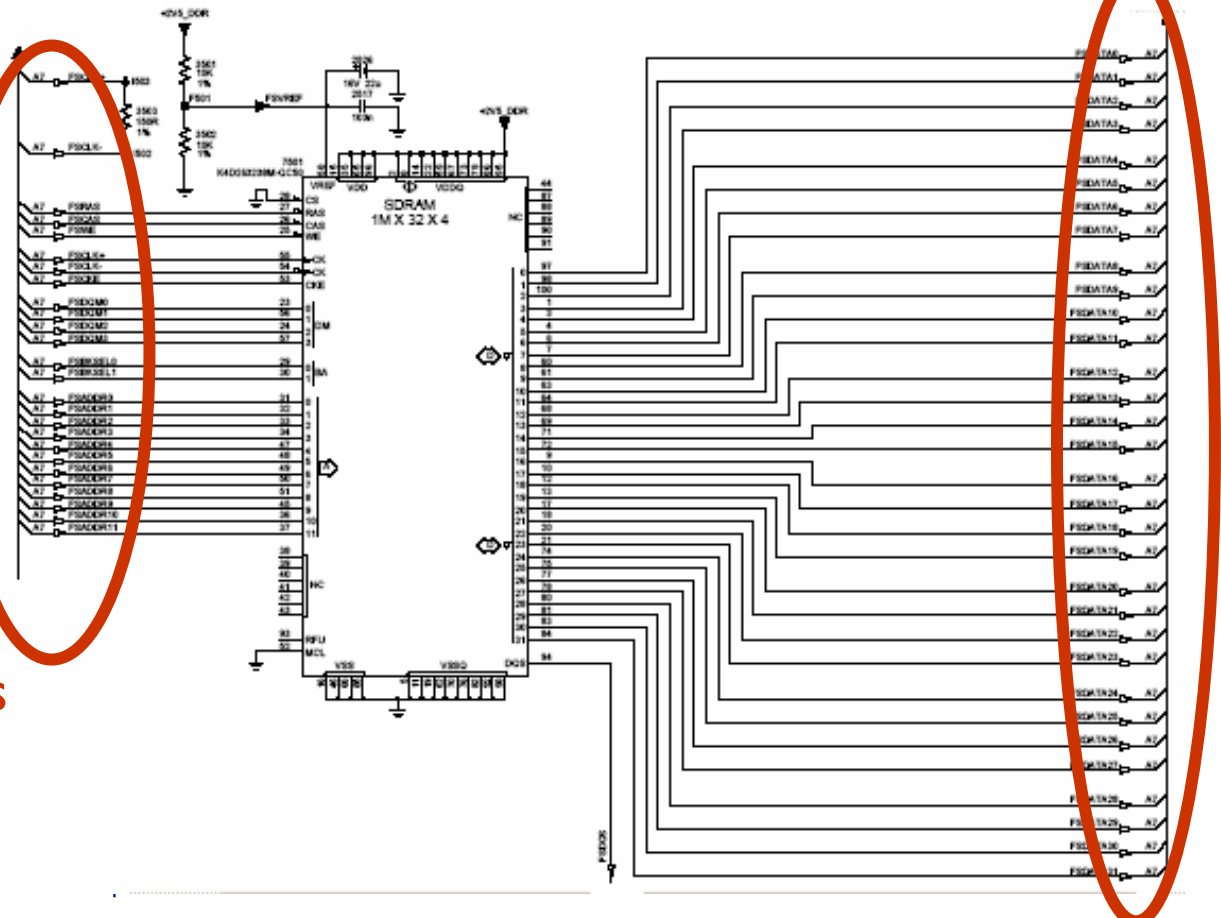
## Filtros EMC en LVDS

# SDRAM

## Comunicación hacia el Scaler

Hacia Genesis

Hacia Genesis



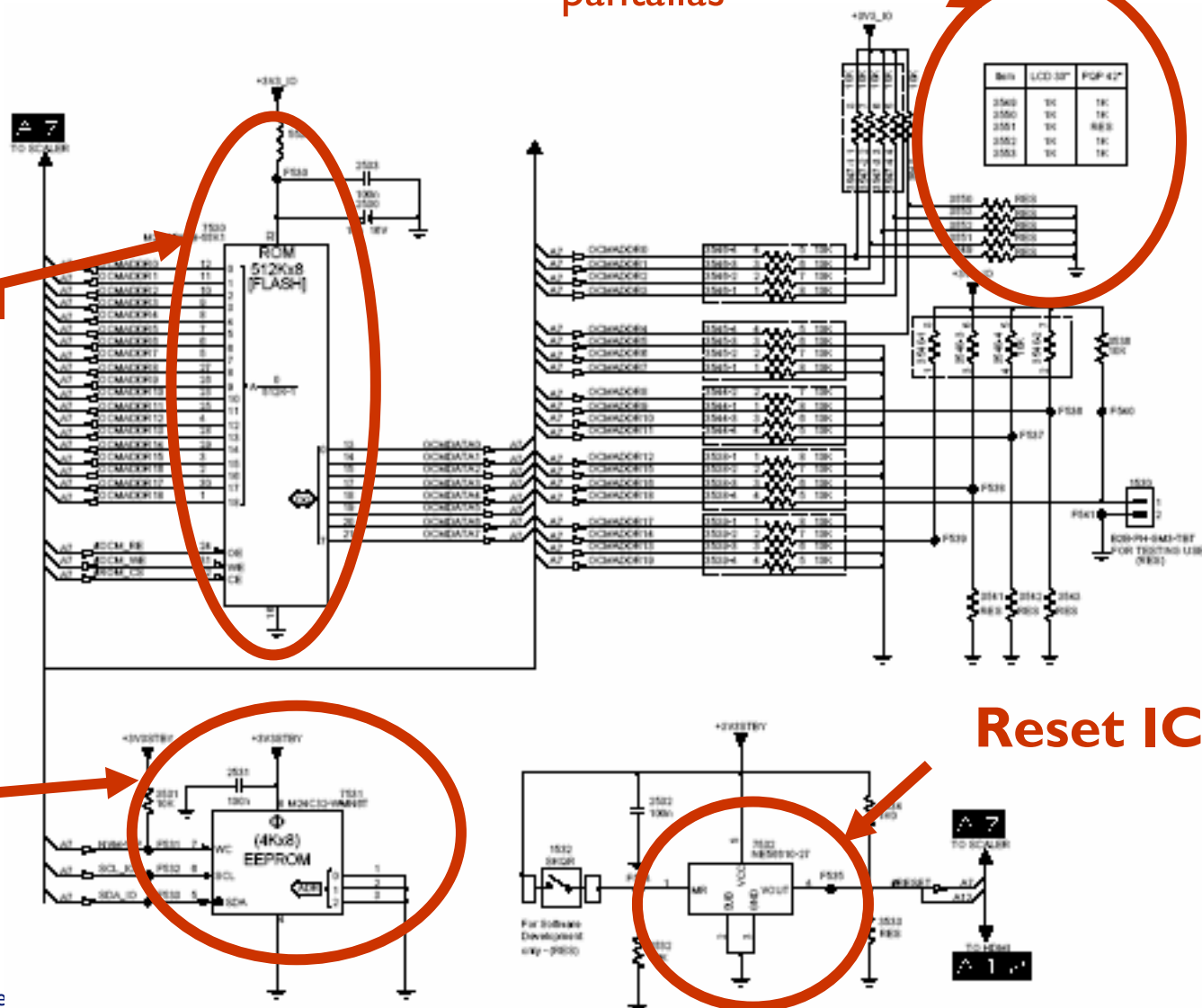
# Control de la Flash

Matriz de resistencias para diferenciar las pantallas

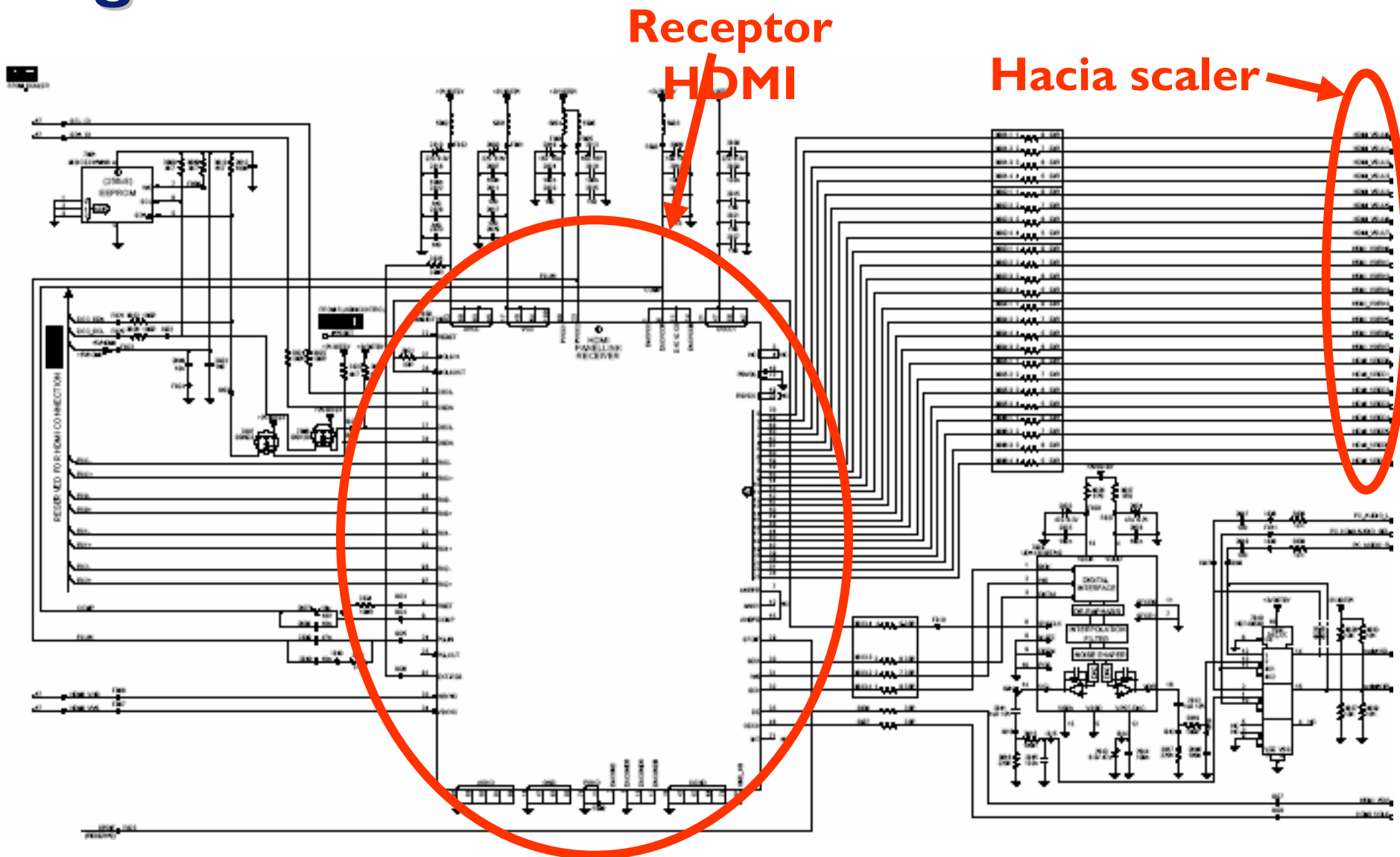
Flash ROM para datos del Genesis

NVM para almacenar todos los datos relacionados con Genesis

Philips Ibérica. Electrónica de



# High Definition Multimedia Interface



# PCHD MUX

Usado solo  
para DMMI

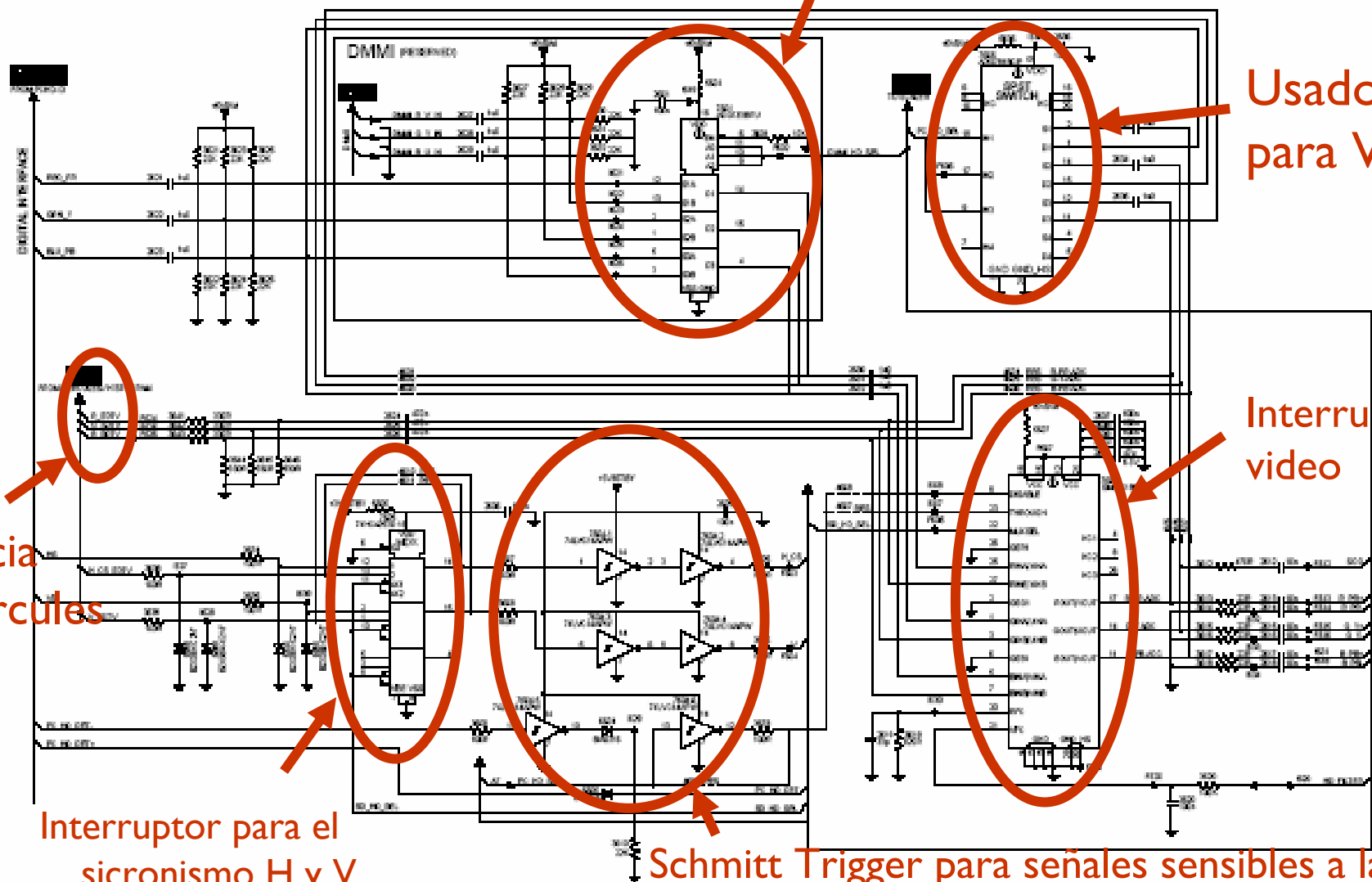
Usado  
para VGA

Interruptor  
video

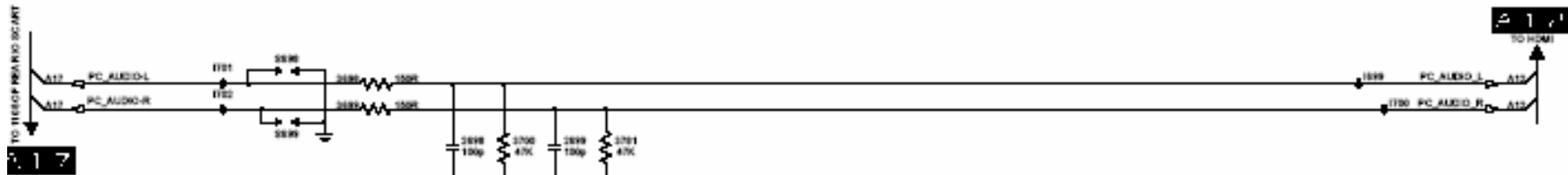
Hacia  
Hercules

Interruptor para el  
sincronismo H y V

Schmitt Trigger para señales sensibles a la  
entrada del Genesis





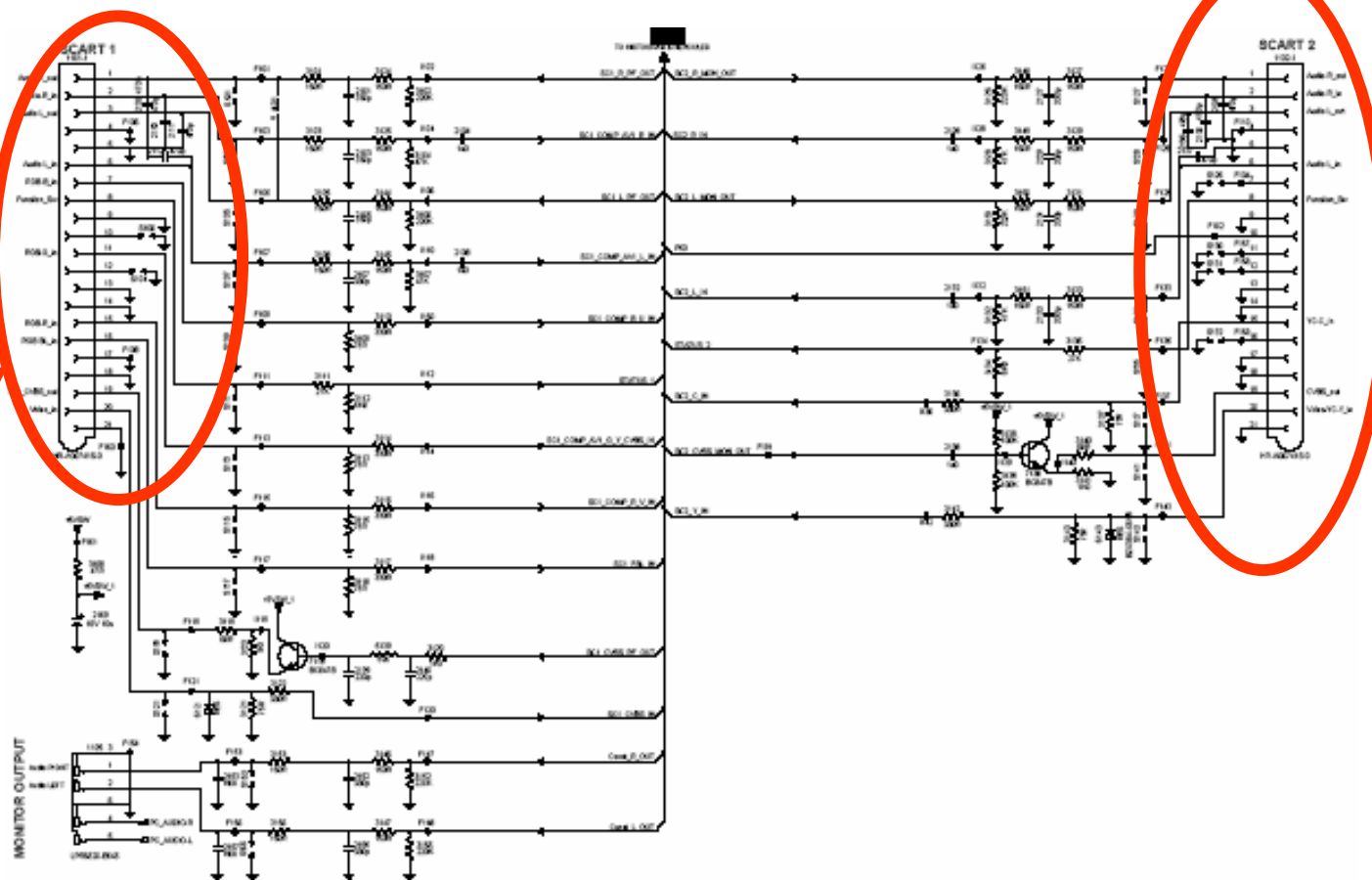


# Conexión trasera IO

2 Euroconectores + 1 salida monitor

RGB  
CVBS

CVBS  
YC



# PHILIPS

**Curso LC04**

**09C. 30'' AUO LC4.6**

Philips Ibérica – Electrónica de Consumo

Departamento Técnico

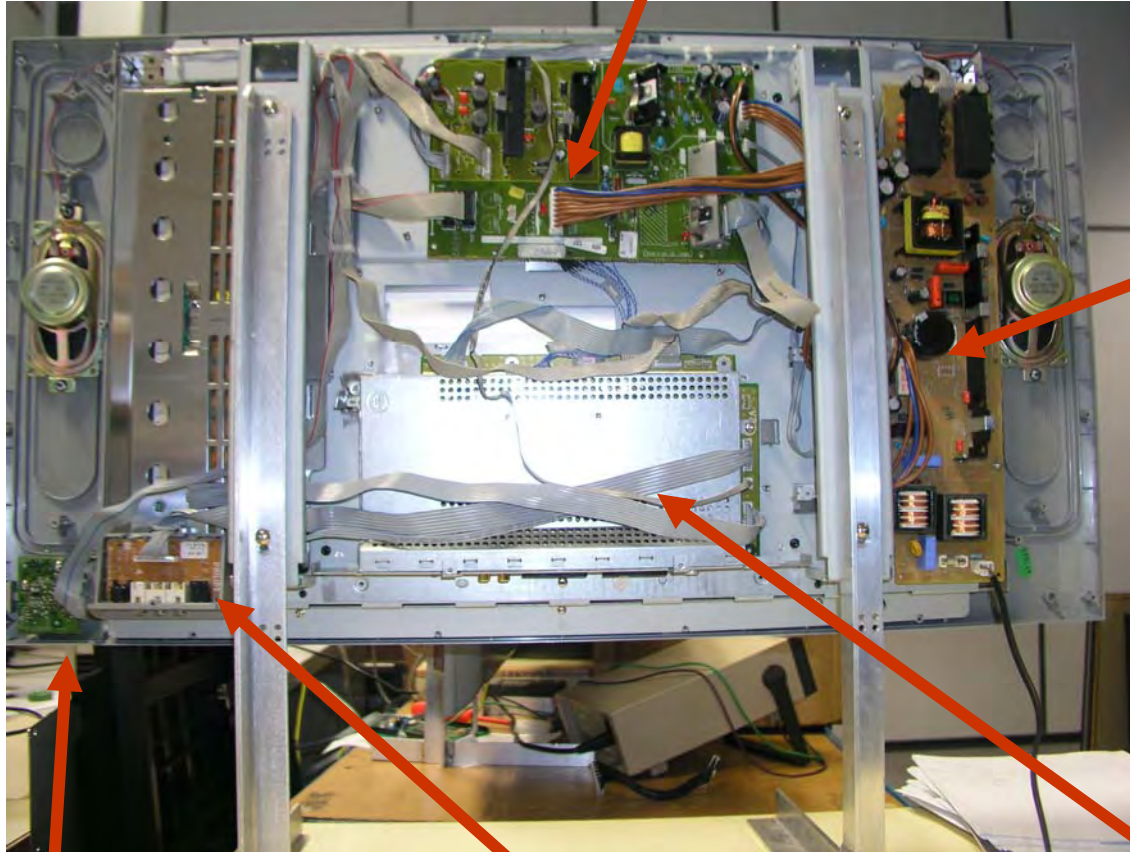
Cristina Senallé - Gabriel Arianes

Noviembre 2004

# Contenido

- Presentación del aparato de 30"
- Presentación de la SSB del aparato de 30"
- Secuencia de arranque del 30"

**Alimentación standby  
de EMGT 2K4**



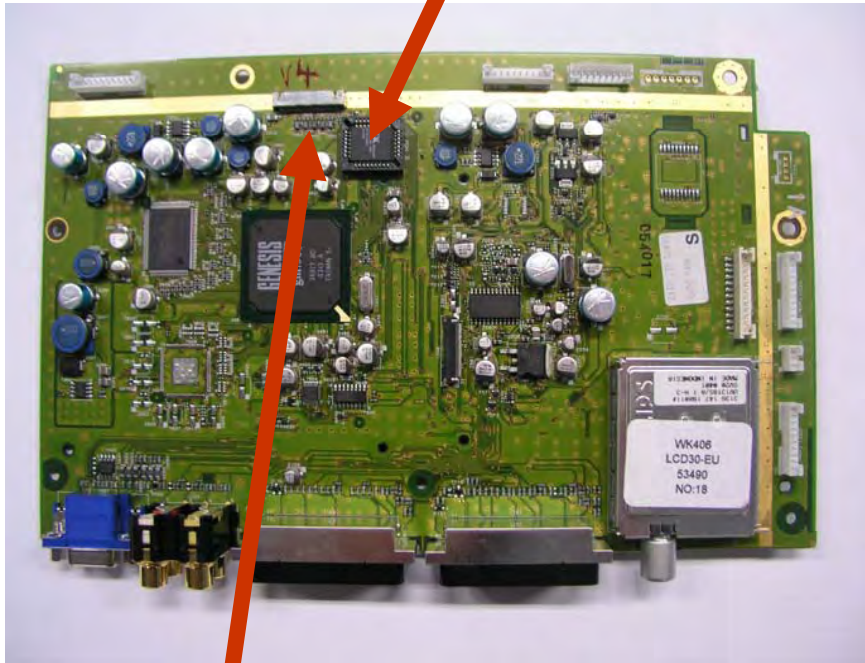
**Alimentación  
de EMGT  
2K4**

**LED&Interruptor  
de EMGT 2K3**

**E/S lateral de  
EMGT 2K3**

**LC4.6 SSB**

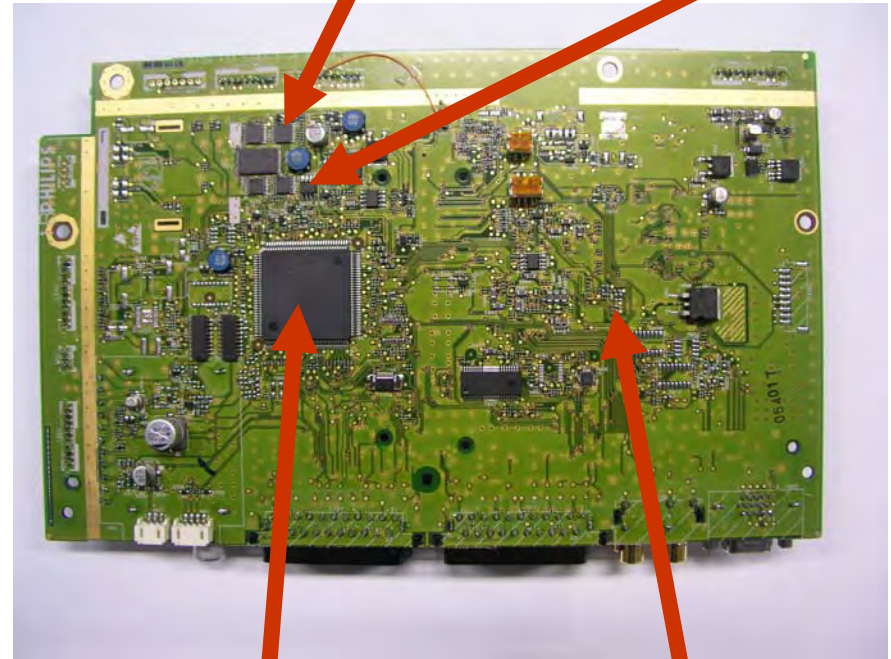
**Flash  
ROM SW**



**LVDS**

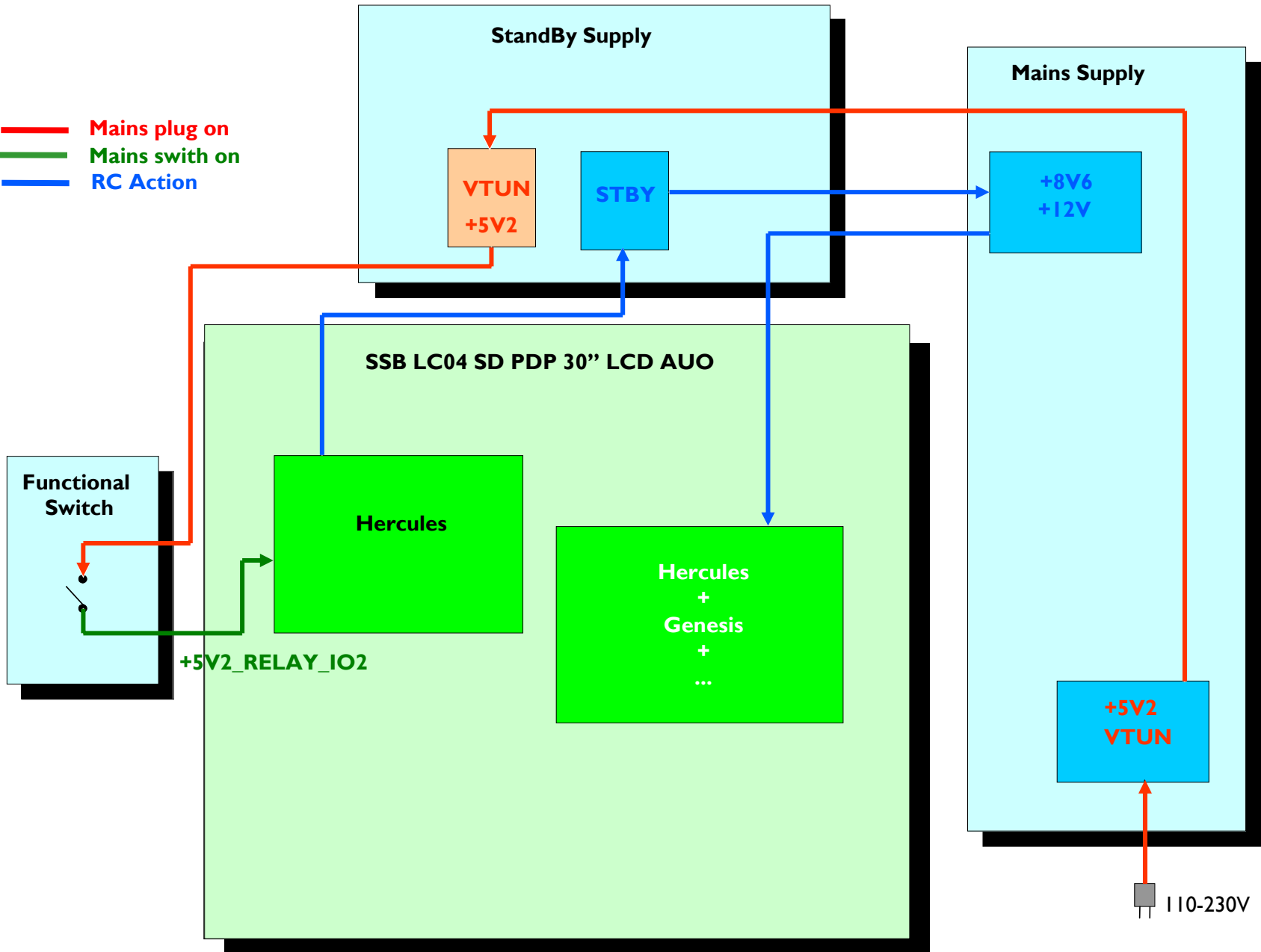
**Front  
processing**

**NVM**

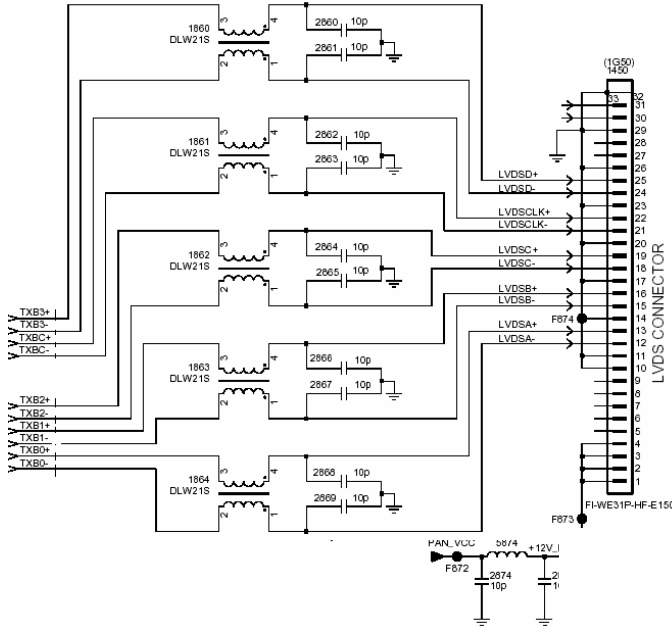


**Hercules**

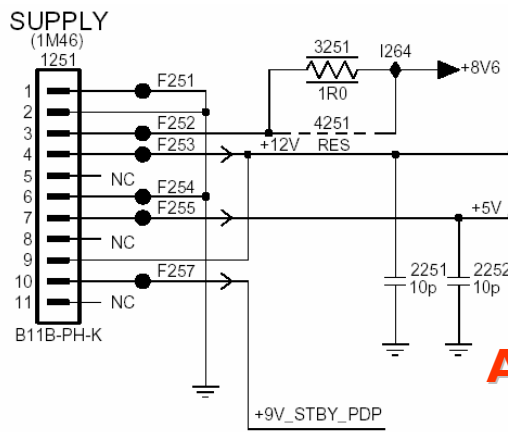
**Scaling  
processing**





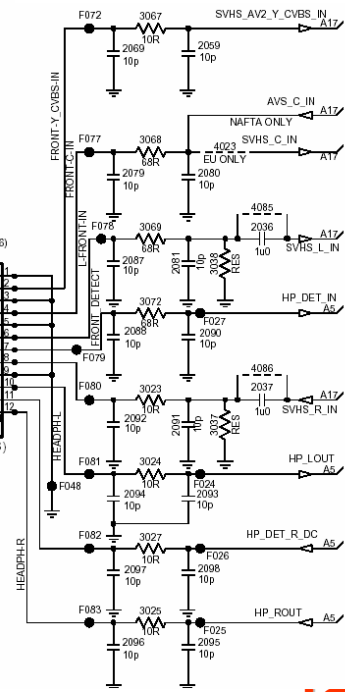
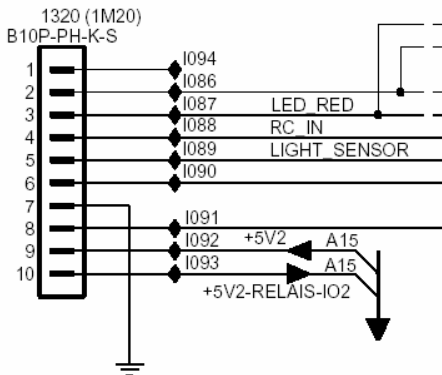


LVDS

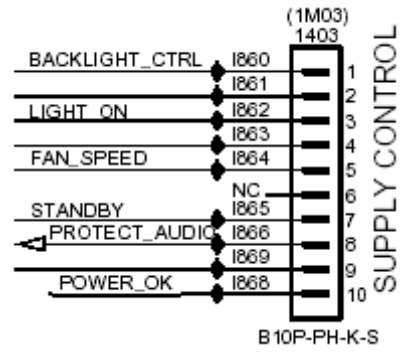


Alimentación

Control



IO lateral



Control



# PHILIPS

**Curso LC04**

**09D. 37” y 42” SDI LC4.6**

Philips Ibérica – Electrónica de Consumo

Departamento Técnico

Cristina Senallé - Gabriel Arianes

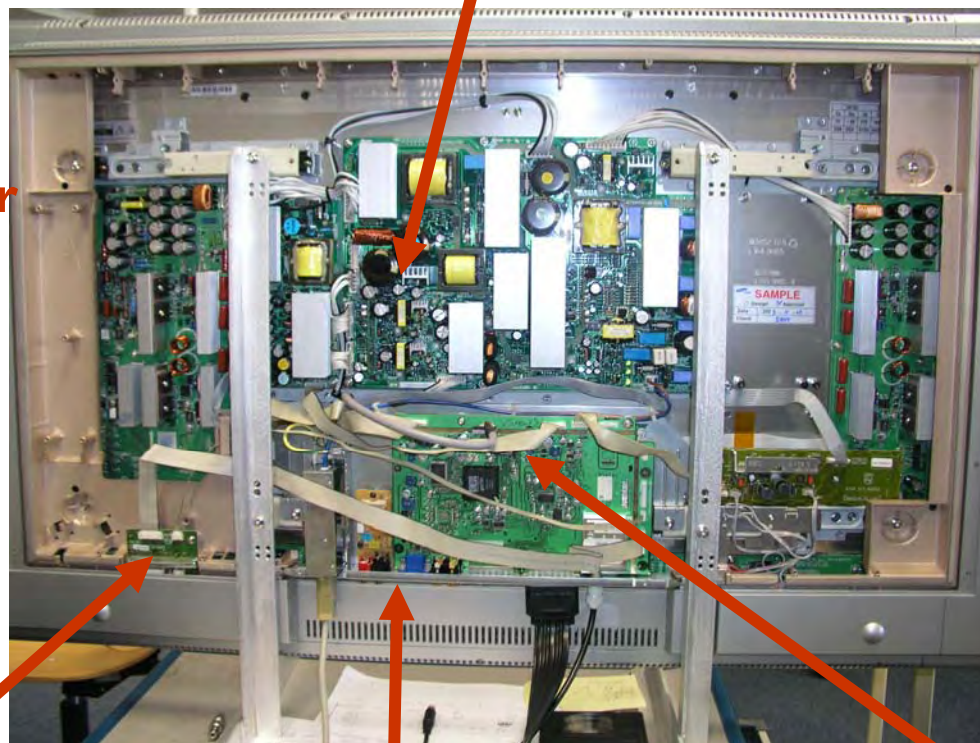
Noviembre 2004

# Contenido

- Presentación del aparato de 42"
- Presentación de la SSB de los aparatos 37"/42"
- Secuencia de arranque de los PDP

**Alimentación de  
SDI PDP**

**LED&Interruptor  
de EMGT 2K3**



**Interface de  
Eindhoven**

**IO lateral de  
EMGT 2K3**

**LC4.7 SSB**

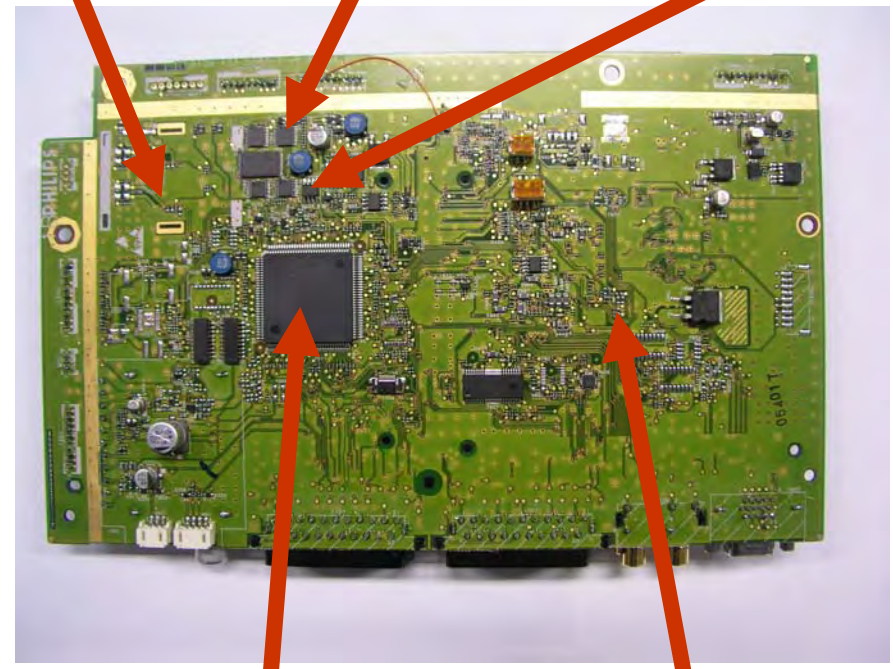
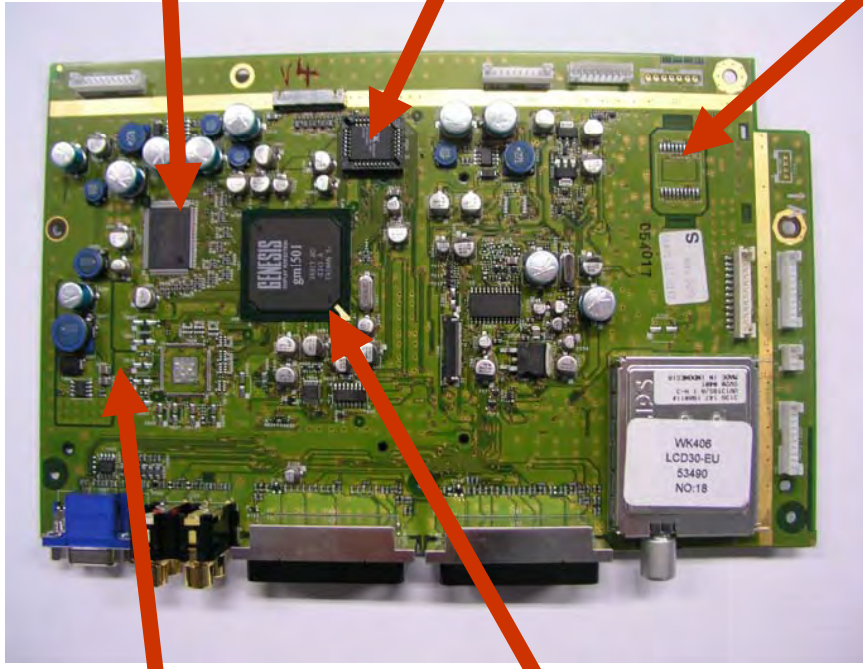
**SDRAM**

**Flash  
ROM**

**Audio  
(no  
incluido)**

**Front  
processing**

**NVM**



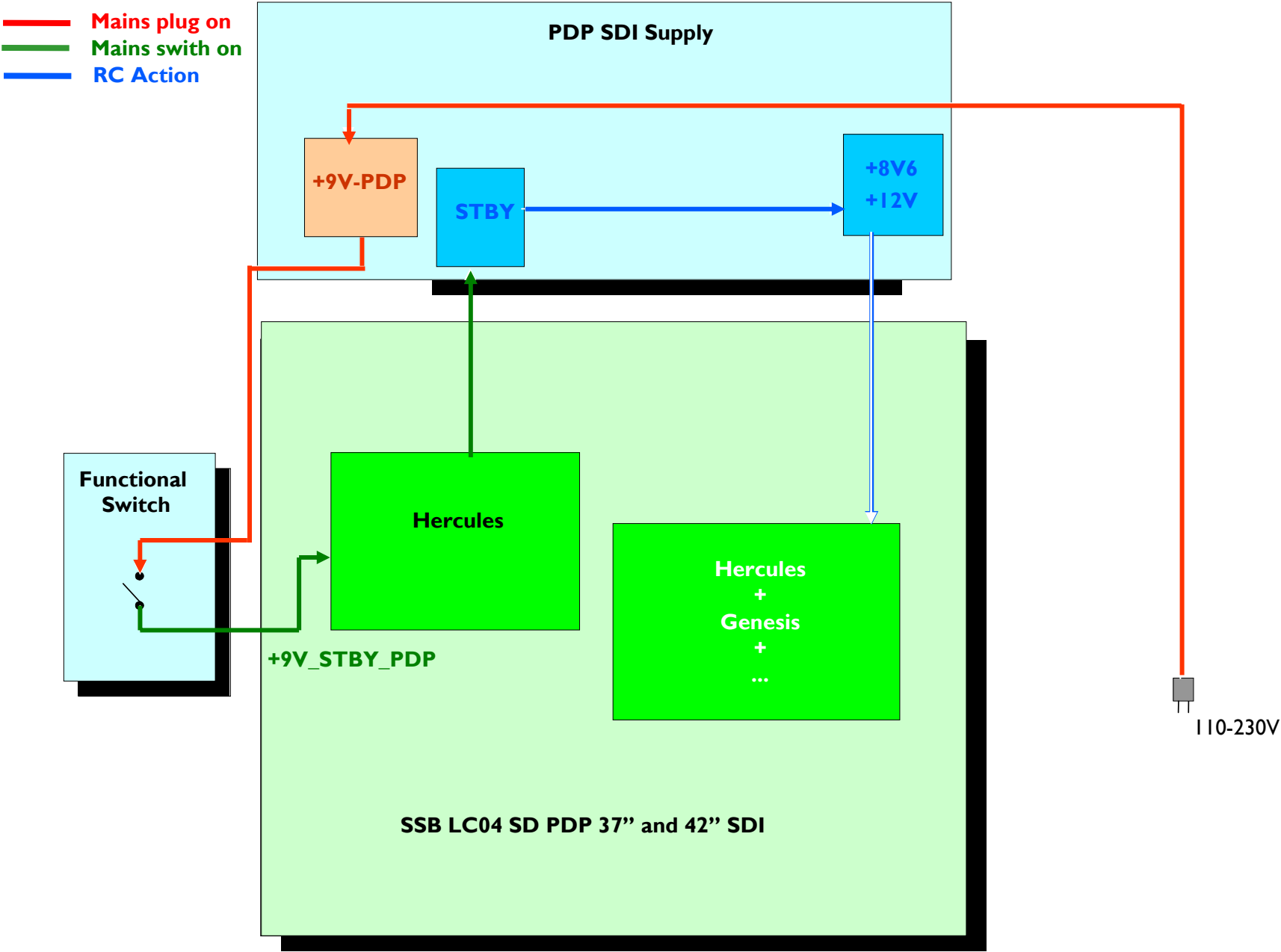
**Convertidor  
DC-DC**

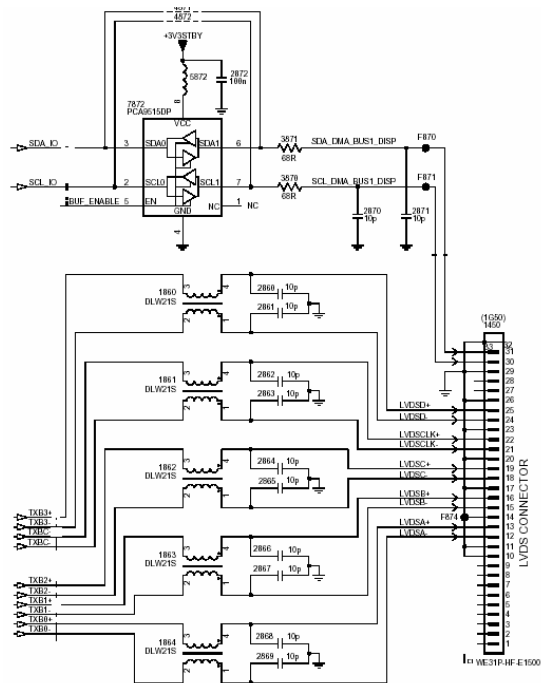
**Scaler:  
Genesis**

**Hercules**

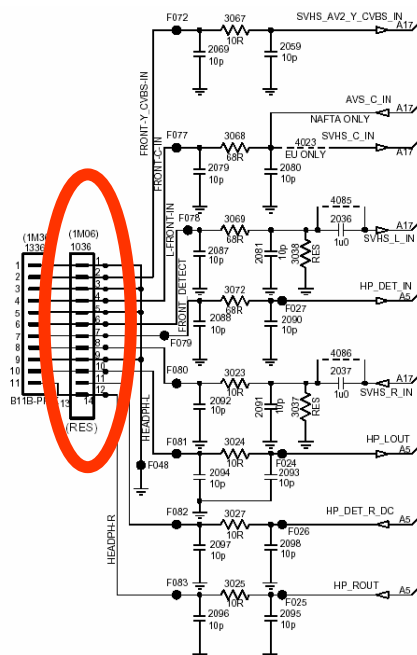
**Scaling  
processing**

- Mains plug on
- Mains switch on
- RC Action

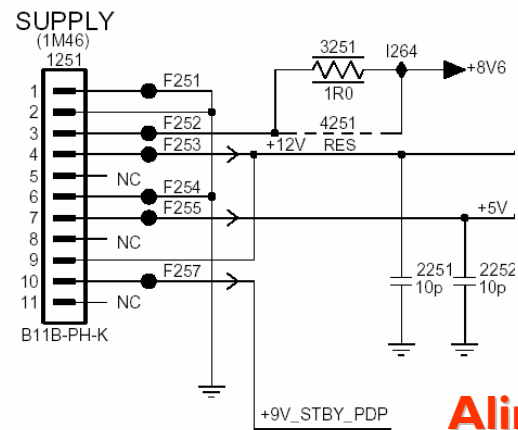




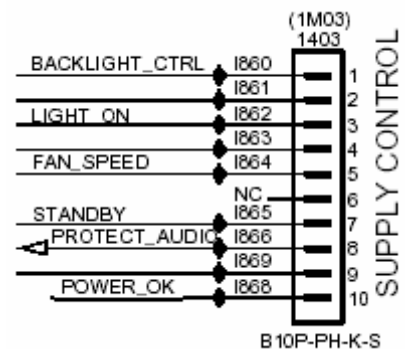
# LVDS



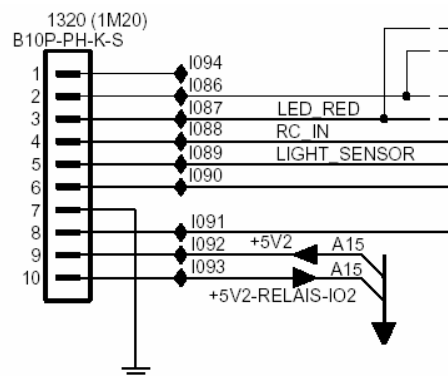
## IO lateral



# Alimentación



## Control



# PHILIPS

## **Curso LC04**

### **10. Servicio**

Philips Ibérica – Electrónica de Consumo


Departamento Técnico

Cristina Senallé - Gabriel Arianes

Noviembre 2004

# Modos de servicio

- **SDM**

- Entrada:
  - cortocircuitar pines (ver siguiente transparencia)
  - 062596<menu>
- Información: versión SW 
- Salida: Standby

- **SAM**

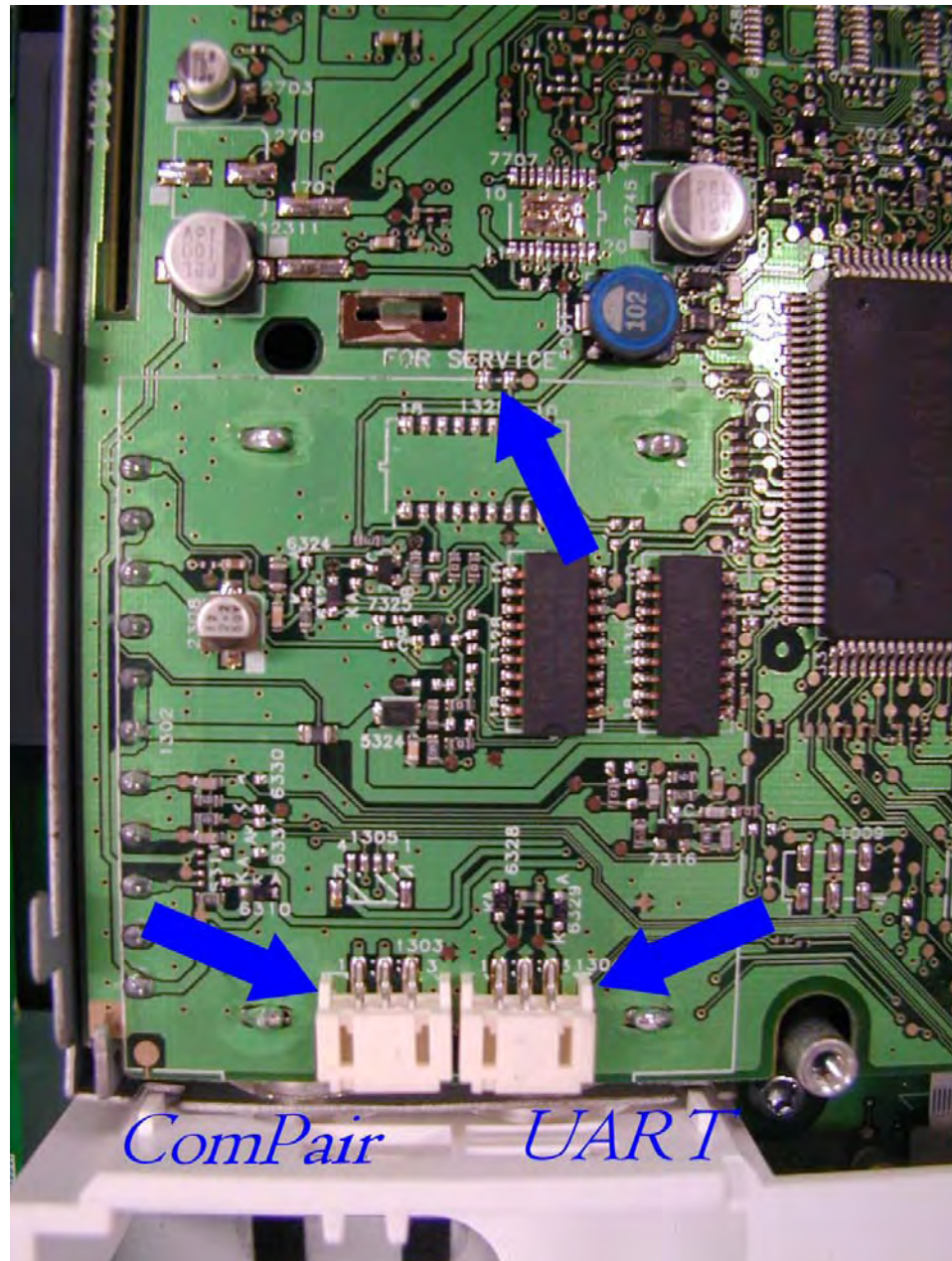
- Entrada:
  - Align,
  - 062596<info+>
- Información: ajustes, editor NVM (no cambiar los datos!)
- Salida: Standby

- **CSM**

- Entrada: 123654
- Información: versión SW, opciones, errores, ....
- Salida: presionar cualquier tecla en el mando a distancia



# Pines de Servicio



# Modos de servicio

- **Ajuste de la escala de grises**
  - Sólo disponible en tres fuentes:
    - TV
    - PC-A
    - HD-A (AP & NAFTA)
  - Procedimiento:
    - Conmutar al modo seleccionado (TV/PC/HD)
    - Presionar “mute”
    - Realizar los ajustes según modo:
      - TV: Smart Picture a suave
      - PC: brillo y contraste a 50
    - Presionar OSD-Mute-Mute-Mute-OSD-MENU-OSD

# Modos de servicio

- **Recarga de la NVM**

- TV (Hercules) NVM

- Cortocircuitar los pines de servicio, presionar CH+ y encender (necesario cuando se sustituye la NVM por una vacía)
    - Ir al SAM. Ir al editor NVM. Cambiar el valor del dato en la dirección 01 a 170 y guardar. Desconectar y volver a conectar a la corriente y esperar hasta que el LED se ponga rojo.

- Scaler NVM

- Una NVM vacía será recargada automáticamente
    - Enviar la orden de recarga desde ComPair

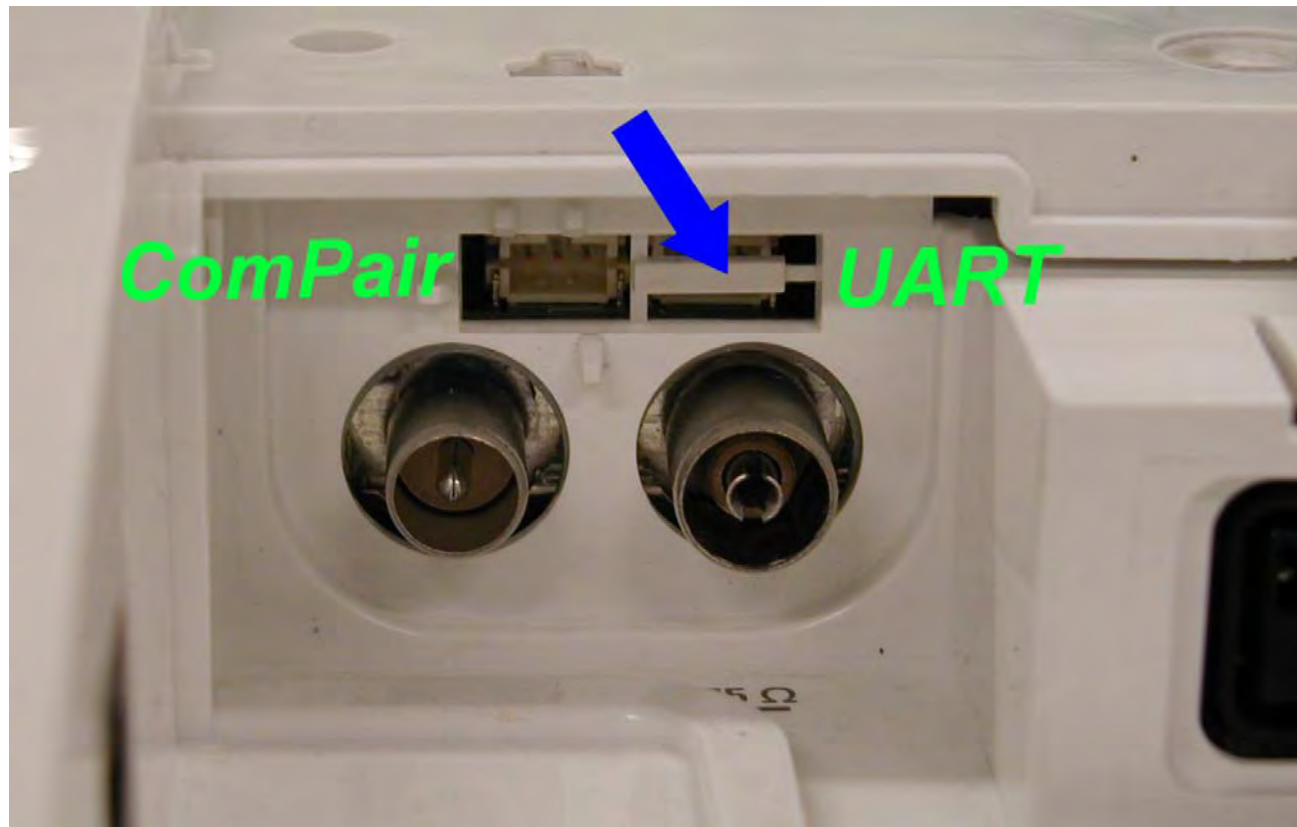
**Nota:** cuando la NVM se recarga, se deben ajustar los parámetros



# ComPair

- Dos accesos localizados en la PCB
  - A la placa de televisión mediante un conector integrado
  - Al Scaler vía un conector UART
- Ambos son accesibles con o sin la tapa posterior
- Cables especiales:
  - Compair
    - I2NC: 3139 131 03790 (sólo para LC4.2)
  - UART
    - I2NC: 3122 785 90630

# Conexiones ComPair



# Actualización de software

- **Hercules SW** a través del conector de ComPair.  
Procedimiento:
  - Ir al SAM
  - Cambiar en la dirección 01(dec)de la NVM el dato a 170 (AA<sub>hex</sub>)
  - Activar el modo ComPair (en el SAM)
  - Empezar el proceso de descarga
- **Scaler SW** a través del conector UART
  - En construcción!



# Instrucciones mecánicas



# Instrucciones mecánicas

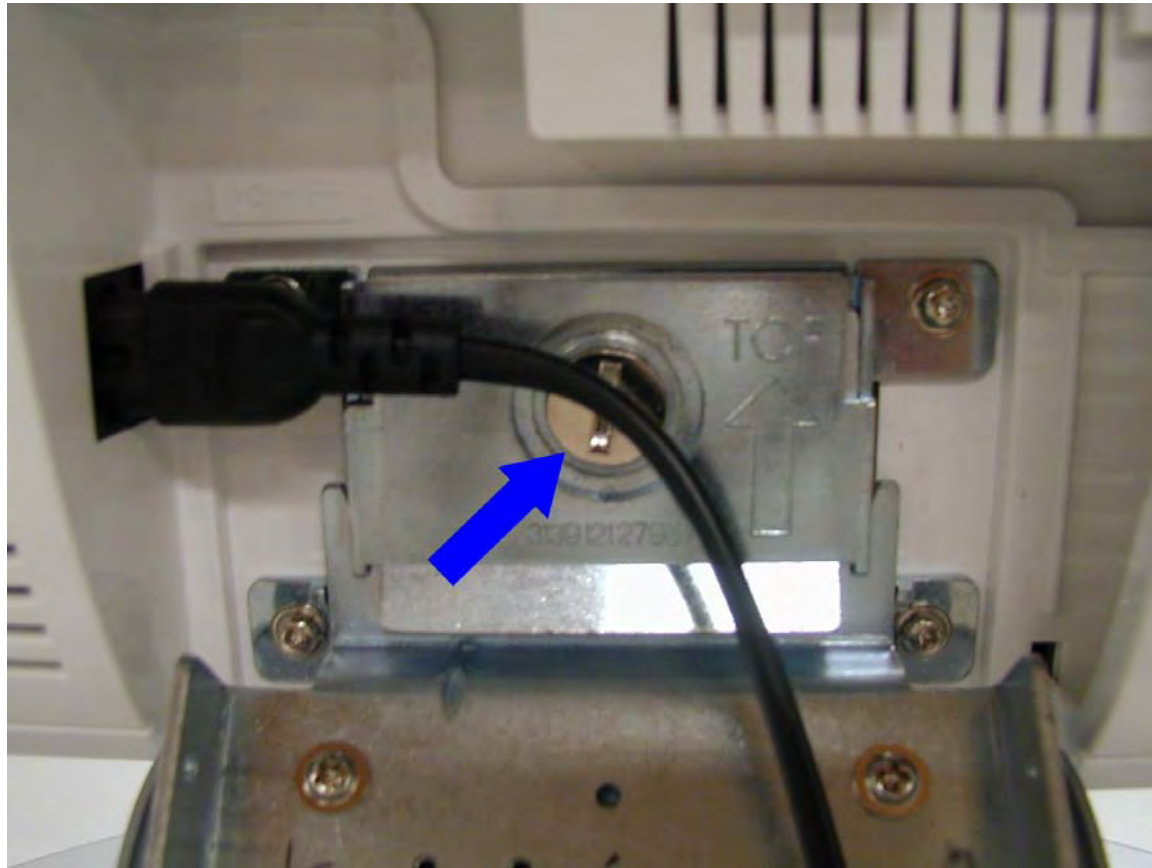




# Instrucciones mecánicas



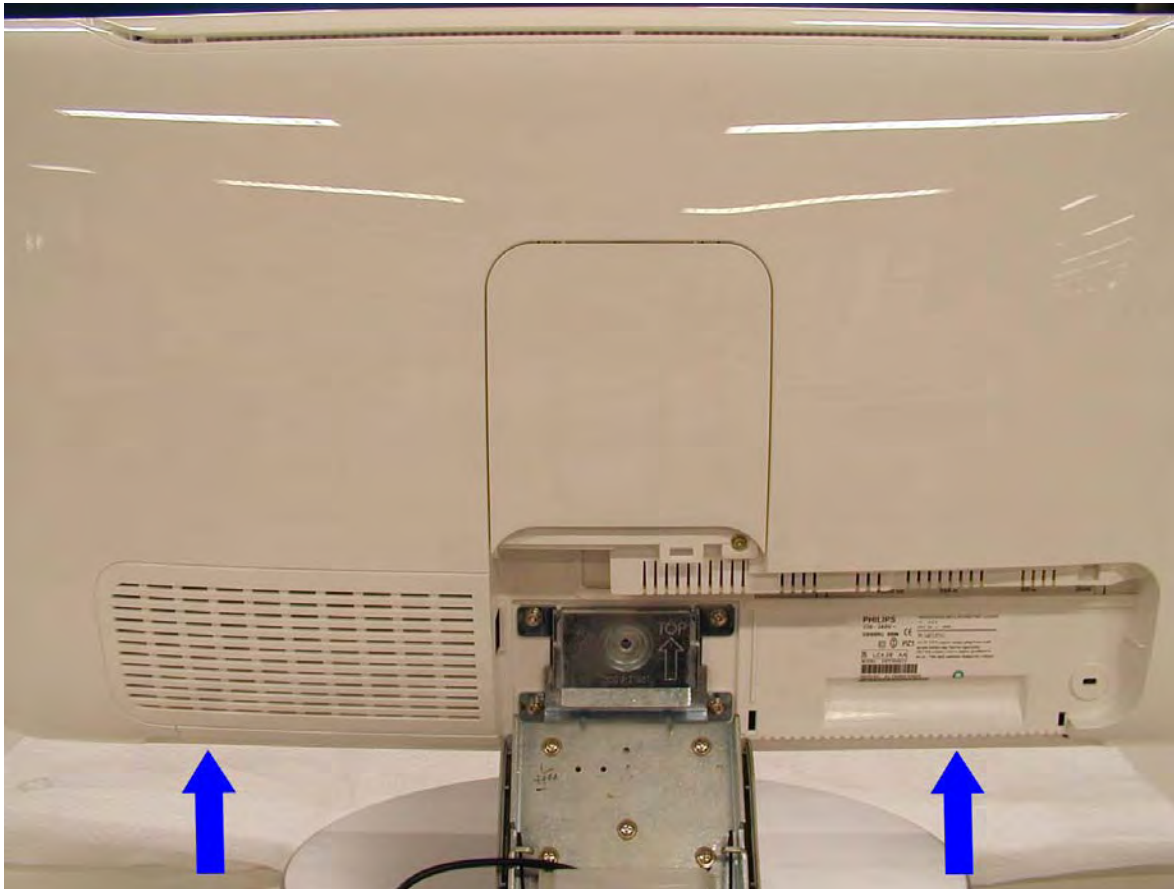
# Instrucciones mecánicas



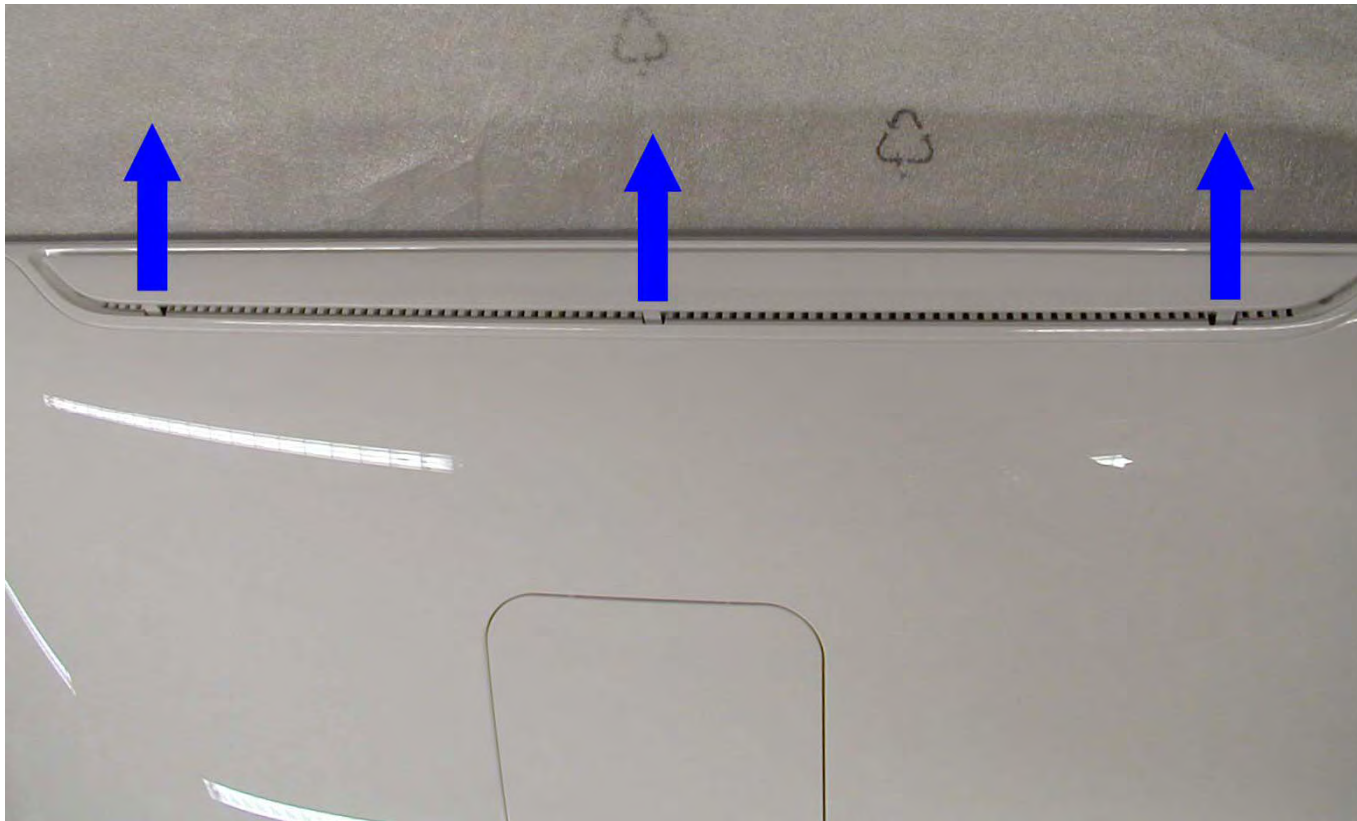
# Instrucciones mecánicas



# Instrucciones mecánicas

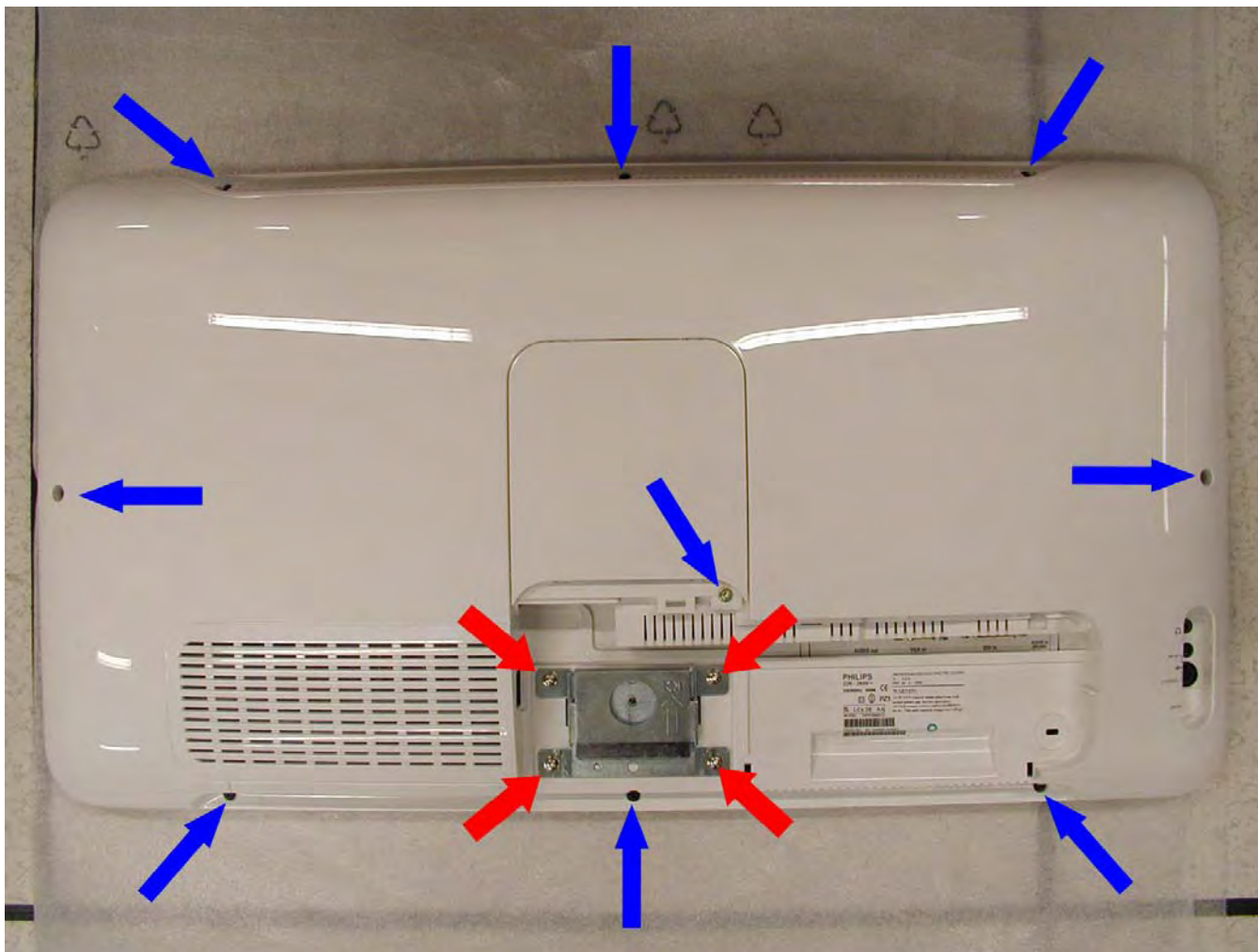


# Instrucciones mecánicas

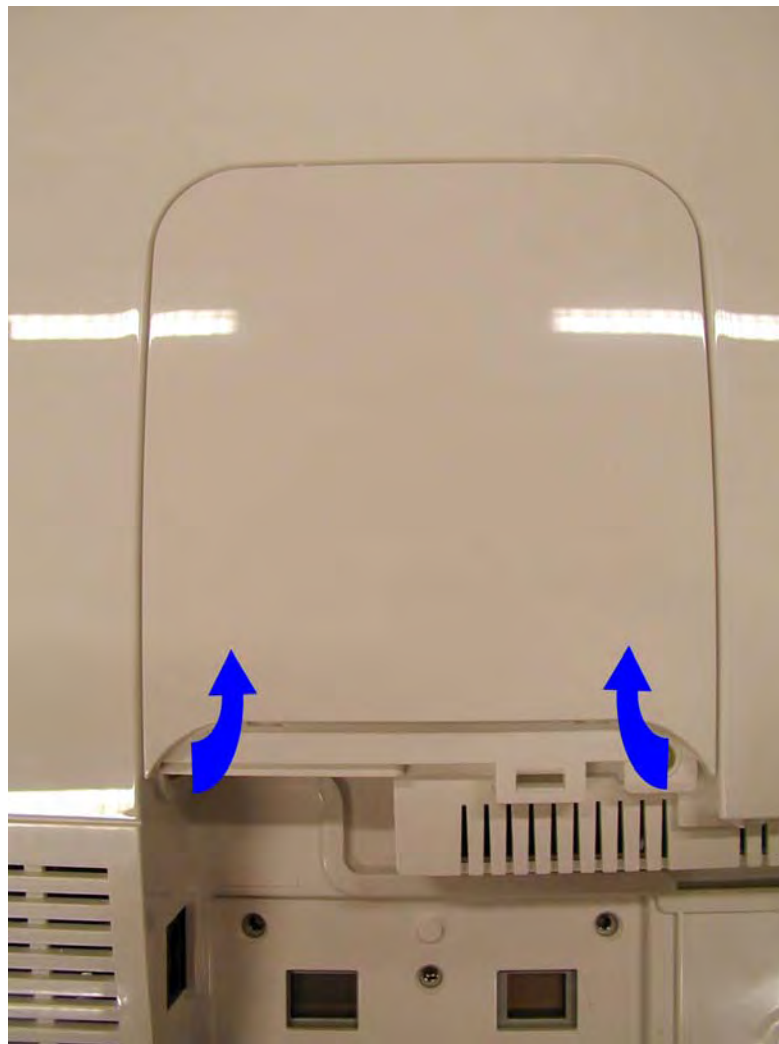




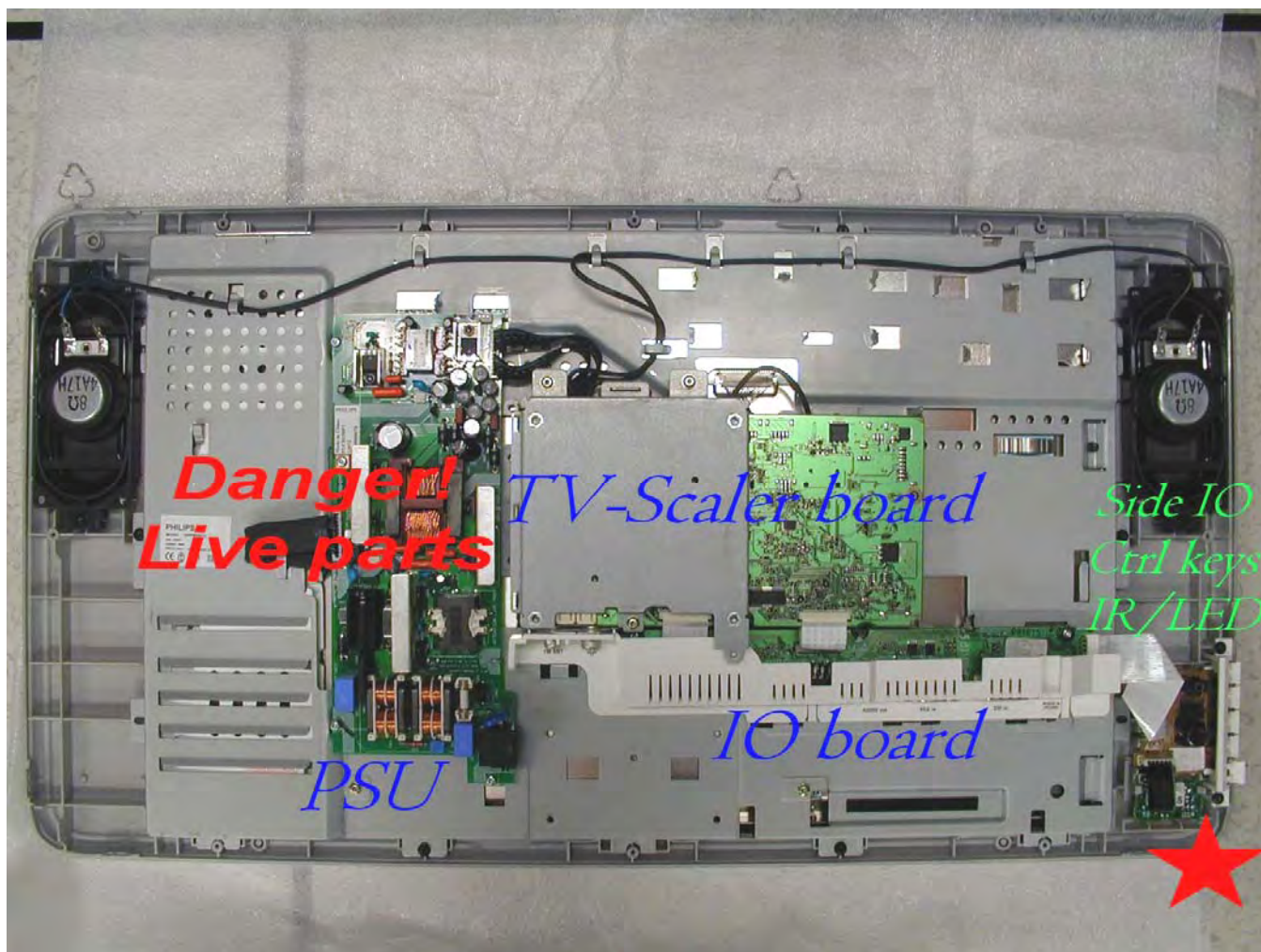
# Instrucciones mecánicas



# Instrucciones mecánicas

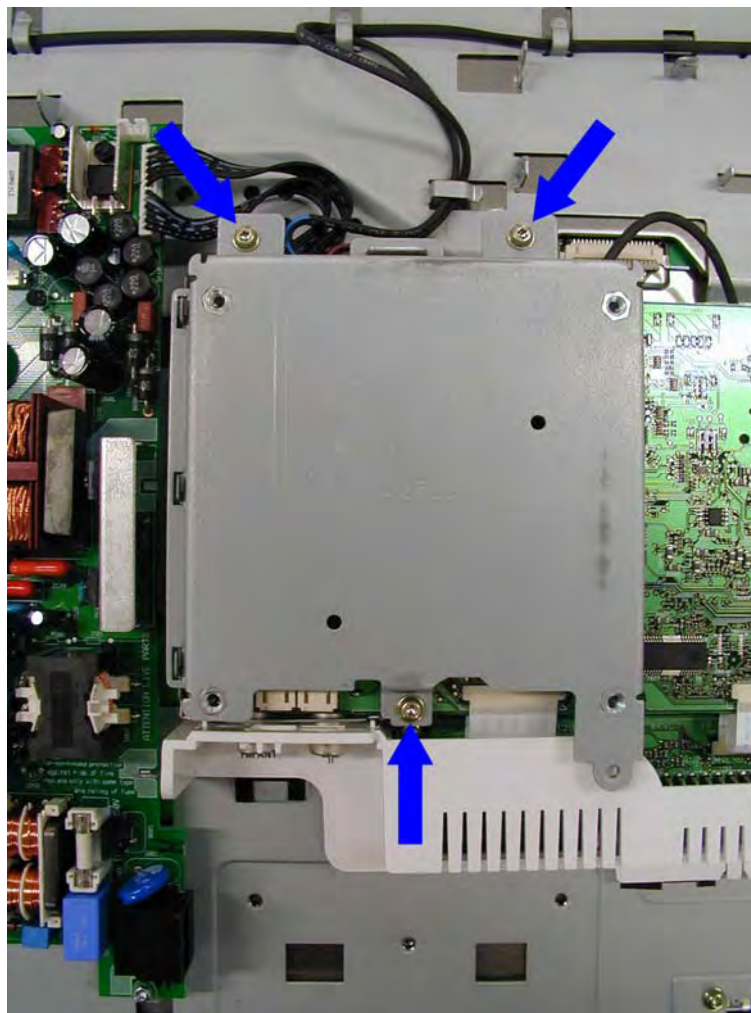


# Instrucciones mecánicas

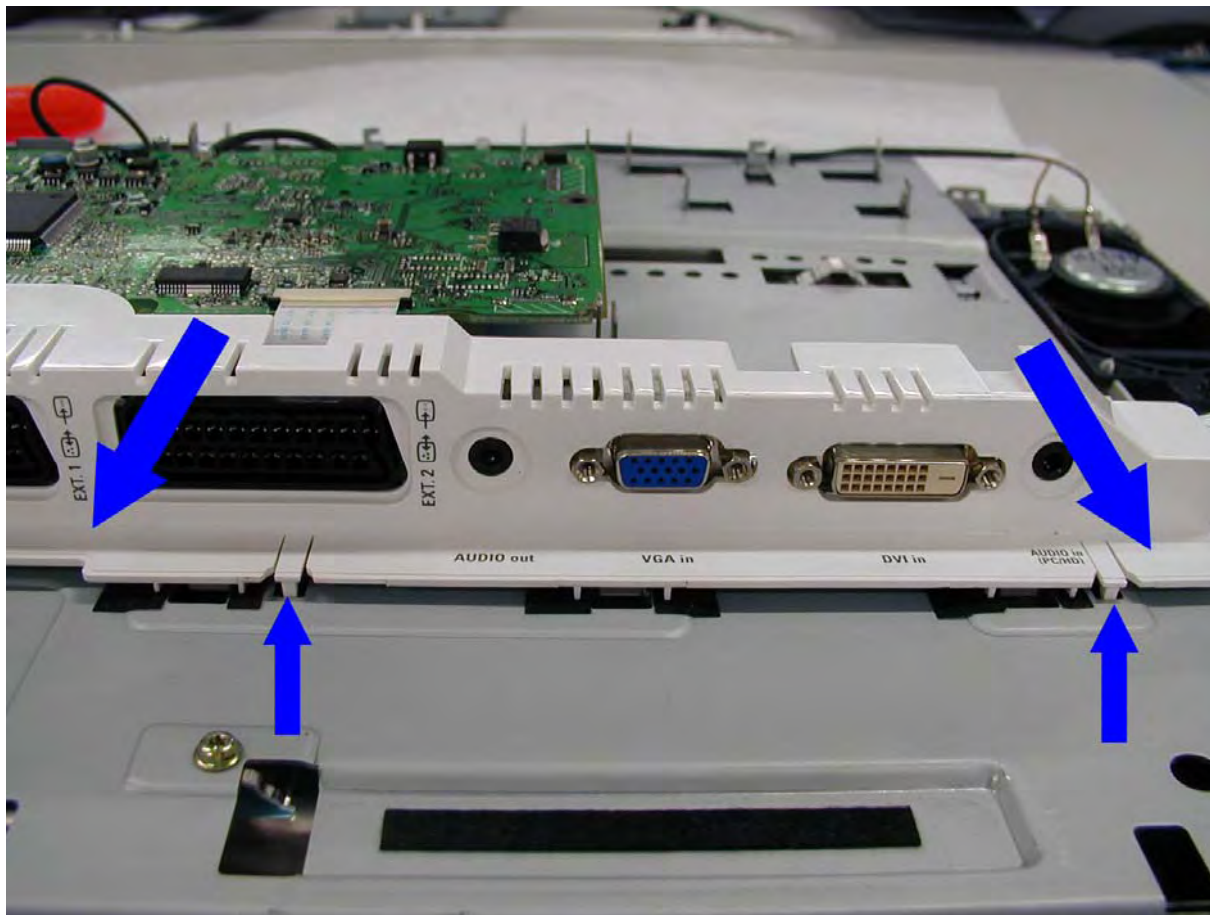




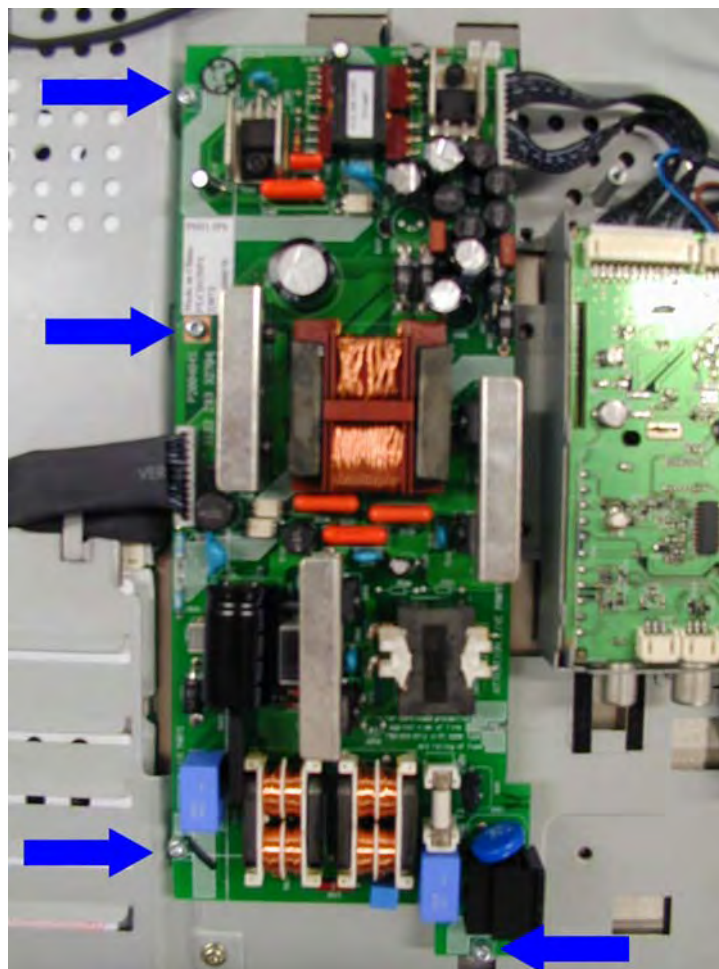
# Instrucciones mecánicas



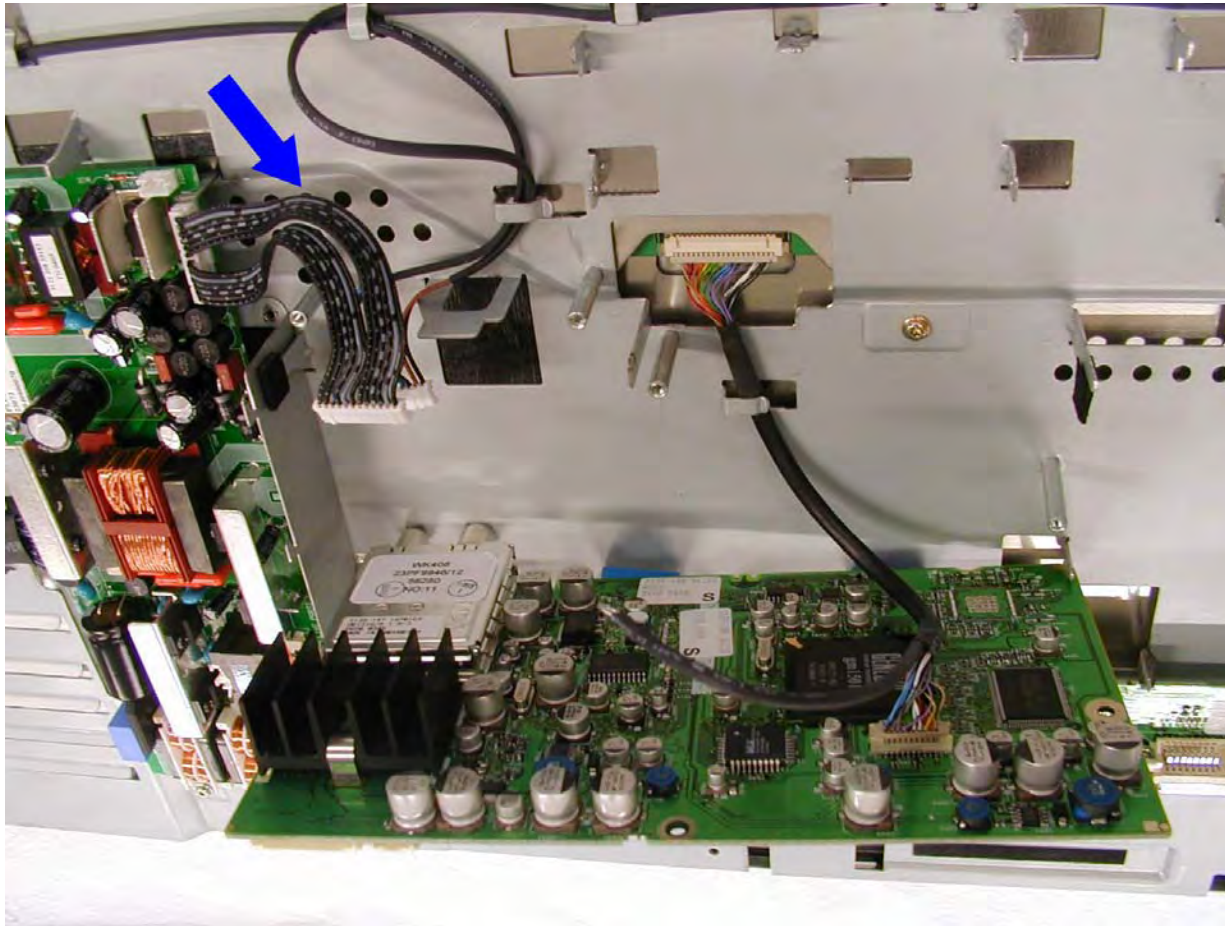
# Instrucciones mecánicas



# Instrucciones mecánicas



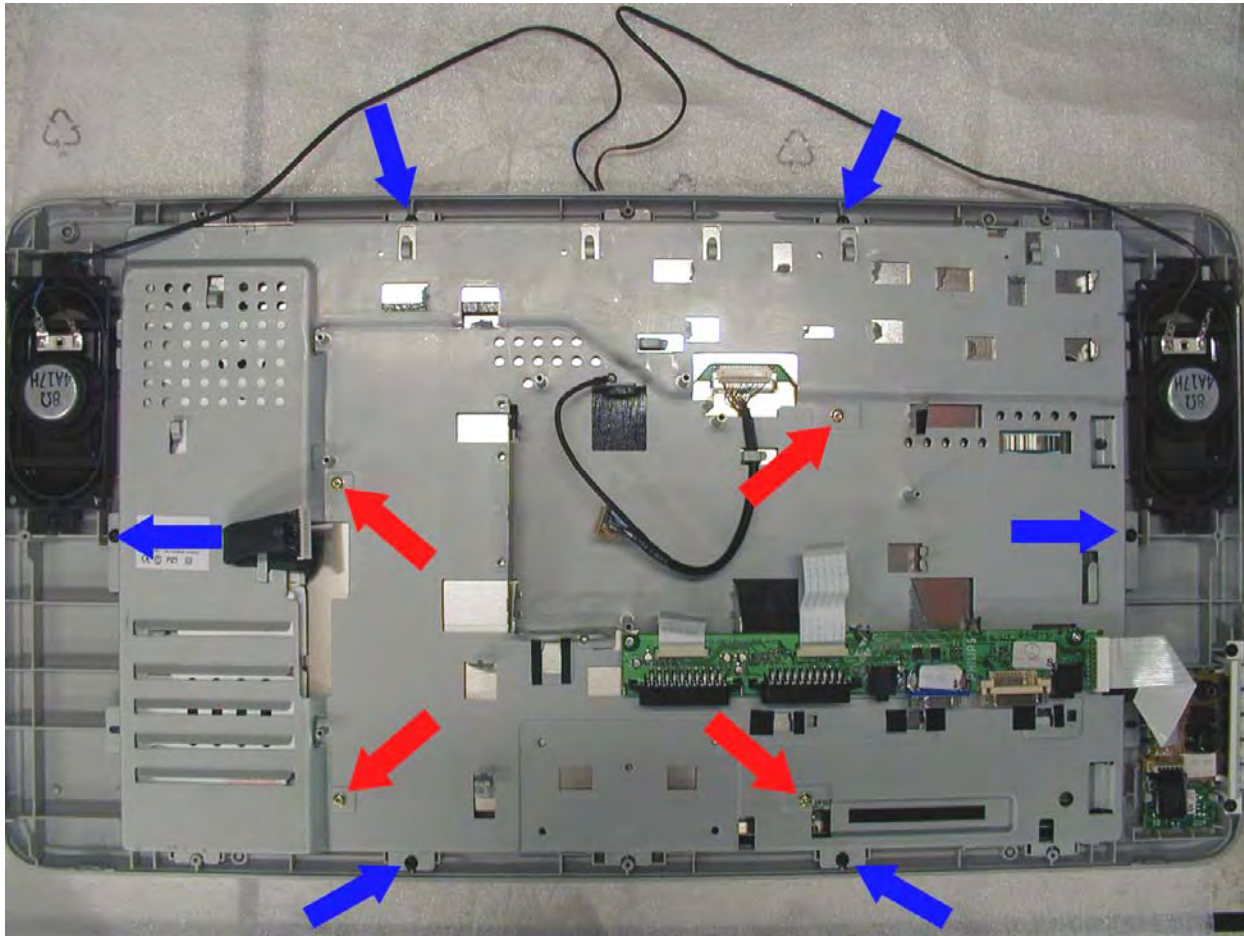
# Instrucciones mecánicas



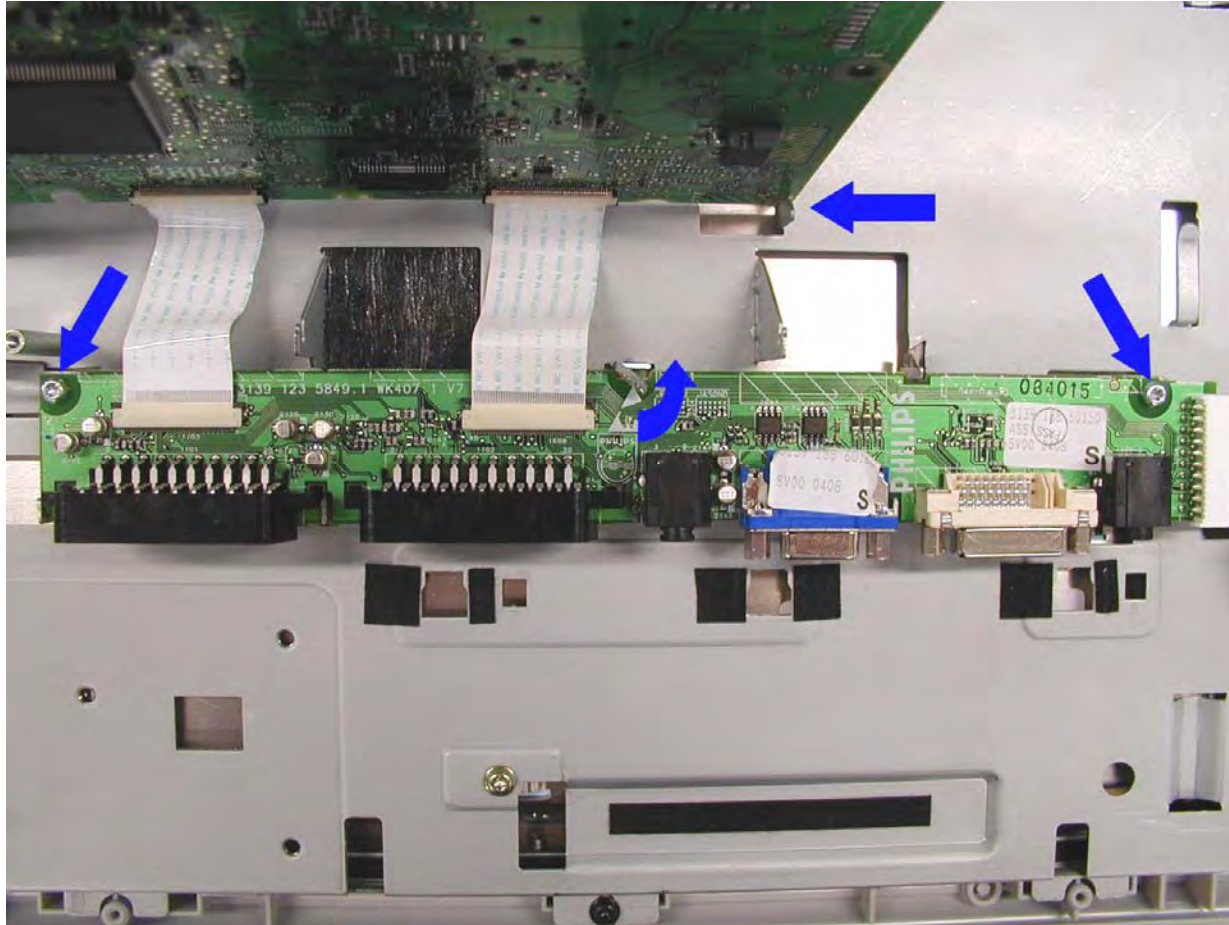
La conexión entre PSU y la placa TV-Scaler es demasiado corta para la posición de servicio. Se puede usar el extensor I2NC 3139 I10 28311.



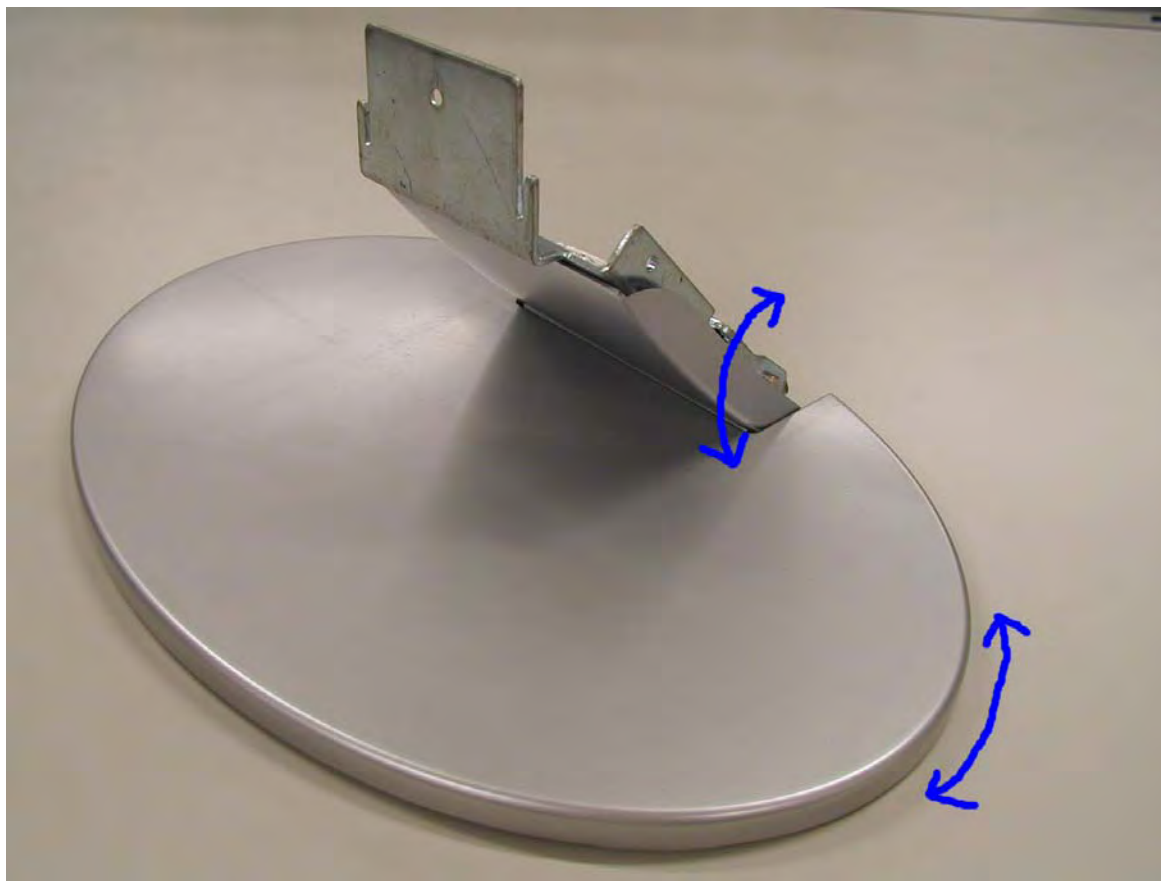
# Instrucciones mecánicas



# Instrucciones mecánicas



# Instrucciones mecánicas



PHILIPS

All rights reserved. Reproduction in whole or in parts is prohibited without the written consent of the copyright owner.

Alle rechten voorbehouden. Vervolgvulling, geheel of gedeeltelijk, is niet toegestaan dan met schriftelijke toestemming van de auteur/rechthebber.



**A 1 3** PCHD-MUX

LCD-TV SCALER MULTIPLE : 3139\_123\_58031\_09  
LCD-TV SCALER SINGLE : 3139\_123\_58041\_09

Schmitt Trigger for sensitive signals at inputs of the Genesis

"601" ~ "679"

CHN	SVT 8792	SETNAME	*****
CLASS_NO	3PC332	LC04	
---	1	PCB SB LCD-TV SCALER	3139 123 5804
2003-12-08	2		
2004-02-06	3		
NAME	Win Naing	SUPERS.	*****
SV	CHECK	DATE	2003-06-26
			KONINKLIJKE PHILIPS ELECTRONICS N.V. 2000

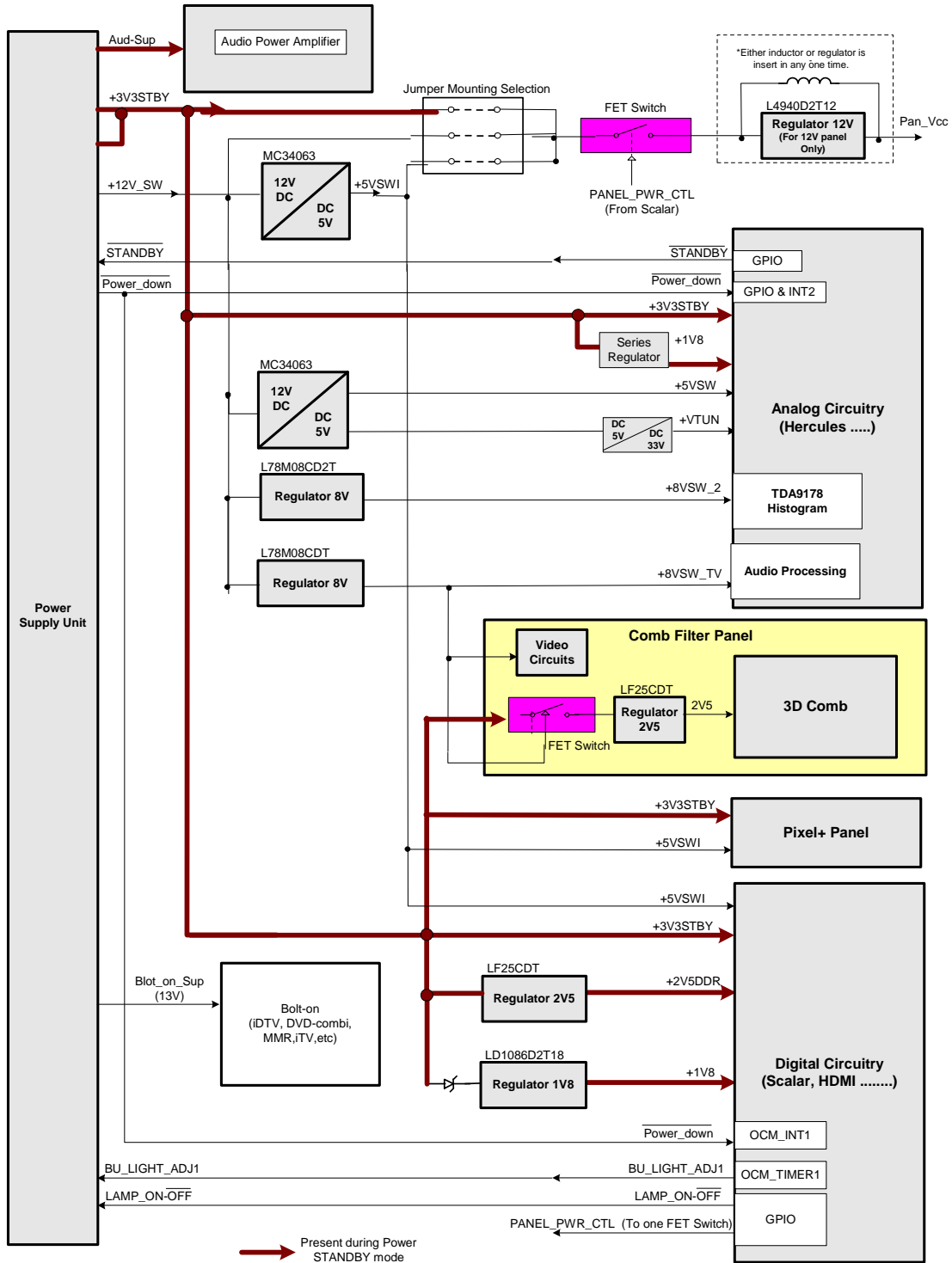
1601 B1	6640 G4
2601 A7	6646 F2
2602 D5	7601 A7
2603 D6	7604-1 E6
2604 D6	7604-2 E7
2605 E7	7604-3 E6
2606 E5	7604-4 F7
2607 D10	7604-5 F6
2608 D10	7604-6 F7
2609 D10	7605 E5
2610 D10	7606 A9
2611 D10	7607 D10
2612 E11	7640 G2
2613 E11	F601 F2
2614 E11	F602 B7
2615 F11	F603 E8
2616 F11	F604 F8
2617 F11	F605 E9
2618 F11	F606 B9
2619 F8	F607 D9
2620 G11	F608 G10
2621 E2	F609 C2
2622 E2	F610 C2
2623 E2	F612 E12
2624 D5	F613 E12
2625 D5	F615 E12
2626 D5	F617 F12
2627 A5	F618 C2
2628 B5	F619 C2
2629 B5	F620 G10
2630 C8	F621 C2
2631 C8	F622 C2
2632 C8	F624 D4
2633 B10	F625 D4
2634 B10	F626 D4
2635 B10	F627 C2
2636 A10	F628 C2
2637 F2	F629 D2
2638 D2	F630 D2
2639 D2	F631 D2
3601 B7	F632 D2
3602 D6	F633 D2
3603 D6	F634 D2
3604 D7	F635 D2
3605 E7	F636 D2
3606 F7	F637 D2
3607 E5	F638 E2
3608 E5	F639 E2
3609 F5	F640 E2
3610 G6	F641 E2
3612 E11	F642 E2
3613 E11	F643 E2
3614 E11	F644 F2
3615 F11	F645 F2
3616 F11	F646 F2
3617 F11	F647 G2
3618 F11	I601 B7
3619 F8	I604 C10
3620 G11	I605 C10
3621 B3	I606 C10
3622 C3	I607 E9
3623 B3	I608 D9
3624 C3	I609 F5
3625 B4	I610 F6
3626 C4	I611 G6
3627 A6	I612 E7
3628 A6	I614 E12
3629 A6	I615 F7
3630 B6	I616 F12
3631 B6	I618 F12
3632 B6	I619 F9
3633 F7	I620 G11
3634 E2	I621 B3
3635 E2	I622 B3
3636 G3	I623 C3
3640 G2	I624 D6
3641 D4	I625 D6
3642 D4	I626 D6
3643 D4	I627 A6
3644 D4	I628 B6
3645 D5	I629 B6
3646 D5	I633 B10
4601 C7	I634 B10
4602 C7	I635 B10
4603 C7	I636 E4
4604 C9	I637 E4
4605 C9	I638 E11
4606 C9	I639 E11
4607 E8	I640 E11
4608 D8	I641 E11
4609 G7	I642 F11
4636 G3	I643 F11
5601 A7	I644 F11
5605 E5	I645 A9
5607 D9	I646 A7
5636 A9	I647 E5
5646 F2	I648 D5
6604 F6	I649 D5
6605 G6	I650 D5
6634 F4	I651 G3
6635 F4	



CONFIDENTIAL

## Power Supply architecture

On standby, only the 3V3 and Audio supply are available from the PSU. This is shown in the below diagram highlighted in thick brown line.



LC04V Platform : Power Supply Block Diagram

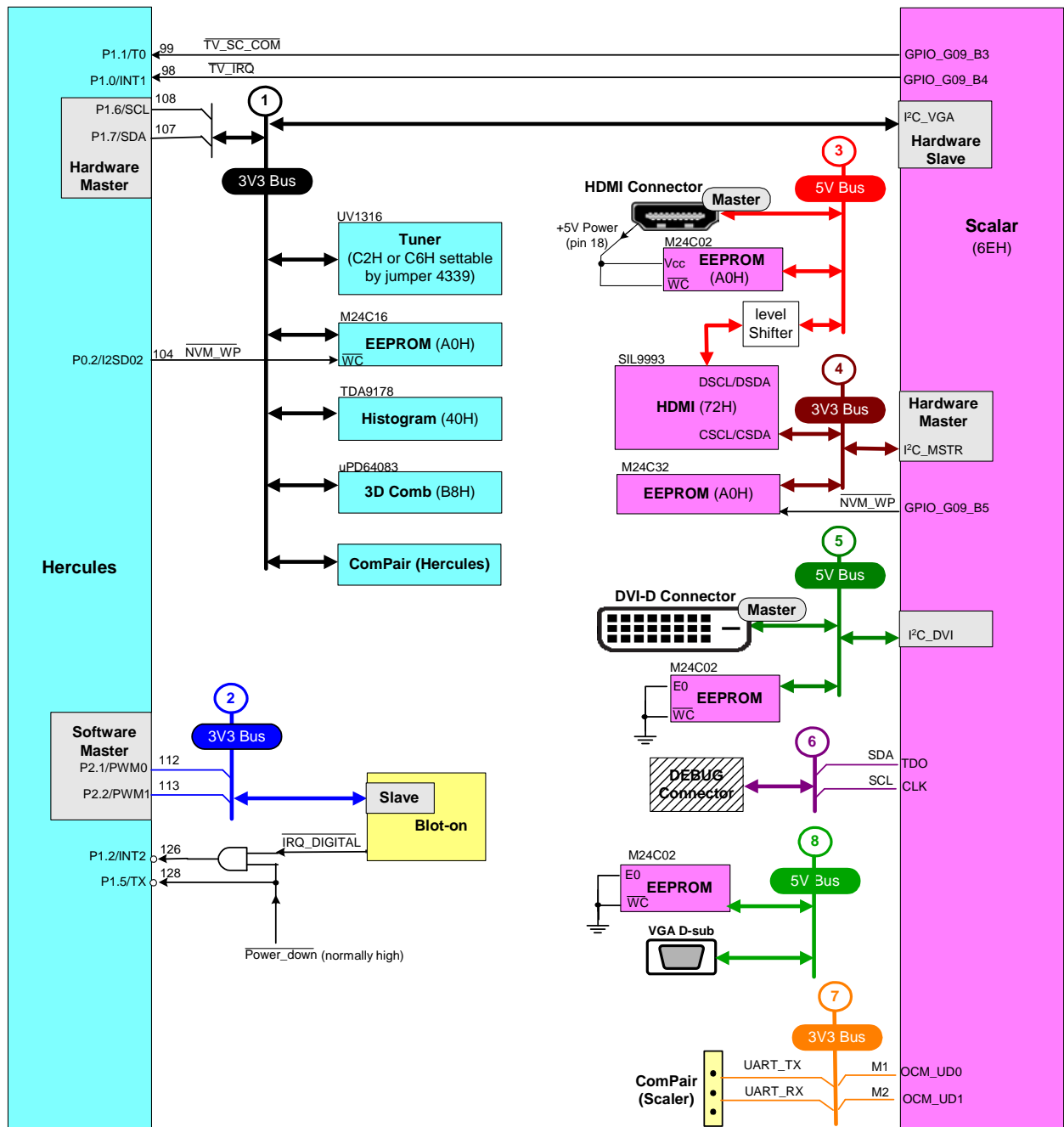
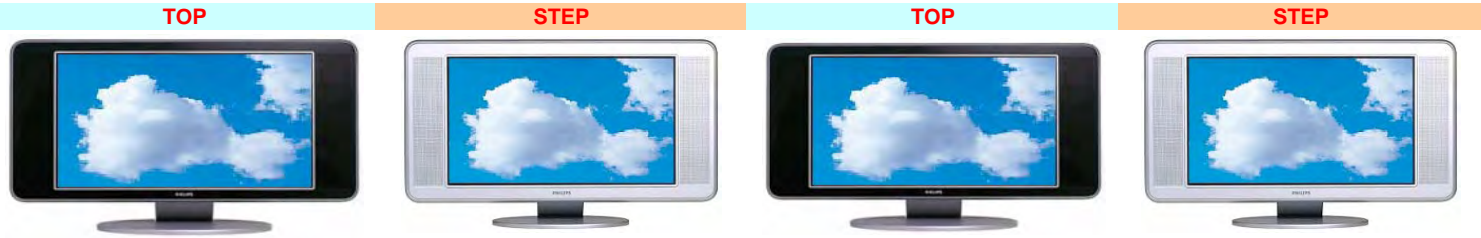


Figure Platform : I²C Bus Diagram

	Description	Test Location	Specs			Unit
1	DC Supply		Min	Typ	Max	
1.1a	+12V main supply	1910		12		V
1.1b	+3V3STBY	1910		3.3		V
1.1c	AUD_SUP	1910		10		V
1.2a	+5VSWTV Regulator out	5932 and 2935		5		V
1.2b	+VTUN Regulator out	2911				V
1.2c	+5VSW Regulator out	2958 and 5954		5		V
1.3	+8VSW_TV Regulator out	7920 out and 2921				V
1.4	+2V5 Regulator out	7992 out		2.5		V
1.5	+1V8Regulator out	7995 out		1.8		V
1.6	PAN-VCC	7953 out		12		V
1.7a	+3V3 at LVDS	5991		3.3		V
1.7b	+3V3 at LVDSA	5989		3.3		V
1.7c	+3V3 at LVDSB	5990		3.3		V
1.7d	+3V3 at LBADC	5988		3.3		V
1.7e	+3V3 at IO	5987		3.3		V

[Back To List](#)

FLAT TV



	TOP	STEP	TOP	STEP
				
Type no.	LCD TV	LCD TV	LCD TV	LCD TV
Chassis	26PF9956	26PF9946	23PF9956	23PF9946
	LC04 V	LC04 V	LC04 V	LC04 V
PICTURE QUALITY				
Panel	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT
Number of Pixels	1280x768 (*3)	1280x768 (*3)	1280x768 (*3)	1280x768 (*3)
Brightness	450 cd/m <sup>2</sup>	450 cd/m <sup>2</sup>	450 cd/m <sup>2</sup>	450 cd/m <sup>2</sup>
Contrast Ratio	400:1	400:1	400:1	400:1
Response Time	16 ms	16 ms	25 ms	25 ms
Viewing Angles H/V	176/176	176/176	176/176	176/176
Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass
Pixel Plus	Pixel Plus	-	Pixel Plus	-
Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan
Digital Crystal Clear/Crystal Clear III	Digital Crystal Clear	Digital Crystal Clear	Digital Crystal Clear	Digital Crystal Clear
Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor
Combfilter	2D Comb Filter	2D Comb Filter	2D Comb Filter	2D Comb Filter
SOUND QUALITY				
Dolby Virtual	Dolby Virtual	Dolby Virtual	Dolby Virtual	Dolby Virtual
Incredible Surround	-	-	-	-
Power output (RMS Watts)	10 W RMS	10 W RMS	10 W RMS	10 W RMS
Number of on board Speakers	2 on board speakers	2 on board speakers	2 on board speakers	2 on board speakers
EASE OF USE INSTALLATION				
Plug & Play	Plug & Play	Plug & Play	Plug & Play	Plug & Play
PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning
100 Presets Channels	100 Presets Channels	100 Presets Channels	100 Presets Channels	100 Presets Channels
Autostore	Autostore	Autostore	Autostore	Autostore
Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning
Sorting	Sorting	Sorting	Sorting	Sorting
Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI
EASE OF USE UTILISATION				
Top Controls	Top Controls	Top Controls	Top Controls	Top Controls
RC suitable for	Rc (DVD/AUX)	Rc (DVD/AUX)	Rc (DVD/AUX)	Rc (DVD/AUX)
RC Reference	RCAE049_FRP	RCAE049_FRP	RCAE049_FRP	RCAE049_FRP
Program List	-	-	-	-
Smart controls	Smart controls	Smart controls	Smart controls	Smart controls
Smart Listening (AVL + Delta Volume)	Smart Listening	Smart Listening	Smart Listening	Smart Listening
Dual I-II	Dual I-II	Dual I-II	Dual I-II	Dual I-II
6 Widescreen Modes	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen
16:9 compress/4:3 expand	-	-	-	-
Continuous zoom	-	-	-	-
WSSB	WSSB	WSSB	WSSB	WSSB
Smart Clock	-	-	-	-
Wake up Clock	-	-	-	-
Sleep Timer	-	-	-	-
Smart Lock (child + parental)	-	-	-	-
Screen Saver Digital Clock Display	Screen Saver Digital Clock Display	Screen Saver	Screen Saver Digital Clock Display	Screen Saver
CONNECTIONS				
Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback
AV Front/Side Connections	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in
Headphones	Headphones	Headphones	Headphones	Headphones
Number of Scart sockets	2 Scarts	2 Scarts	2 Scarts	2 Scarts
Audio out Constant Level	Audio out Constant Level	Audio out Constant Level	Audio out Constant Level	Audio out Constant Level
DVI-in	DVI-D in	DVI-D in	DVI-D in	DVI-D in
PC in	PC in	PC in	PC in	PC in
INFORMATION				
Smart Text	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)
Text Dual Screen	-	-	-	-
Twin Page Text	Twin Page Text	Twin Page Text	Twin Page Text	Twin Page Text
Picture In Picture	PIP, PBP, PIG	PIP, PBP, PIG	PIP, PBP, PIG	PIP, PBP, PIG
MISCELLANEOUS				
FM radio	FM radio	FM radio	FM radio	FM radio
MultiMedia Recorder	-	-	-	-
Operating power consumption	tbc	tbc	90W	90W
Standby power	1.5W	1.5W	1.5W	1.5W
Weight	15Kg	15 kg	11Kg	11 kg
Weight Including Packaging	19Kg	19 kg	15Kg	15 kg
Depth	11 cm (center)	11 cm (center)	9 cm	9 cm
Dimensions (w, h, d)	787x448x110 mm	787x448x110 mm	690x369x87 mm	690x369x87 mm
Box Dimensions (w,h,d)	881x578x313 mm	881x578x313 mm	784x504x270 mm	784x504x270 mm
Colour	Black semi gloss 80007	Pearl White Silver (11092)	Black semi gloss 80007	Pearl White Silver (11092)
Wall mounting bracket	VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)
Table top stand	Table top stand	Table top stand	Table top stand	Table top stand

**LEAD**

**TOP**

**STEP**

**LEAD**


LCD TV	LCD TV	LCD TV	LCD TV
23PF8946	17MF9946	17PF8946	17PF8946
LC04 C	LC04 V	LC04 V	LC04 C
LCD WXGA ASV Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA MVA Active Matrix TFT
1280x768 (*3)	1280x768 (*3)	1280x768 (*3)	1280x768 (*3)
450 cd/m <sup>2</sup>	450 cd/m <sup>2</sup>	450 cd/m <sup>2</sup>	450 cd/m <sup>2</sup>
500:1	400:1	400:1	600:1
21 ms	25 ms	25 ms	25 ms
176/176	176/176	176/176	170/170
Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass
-	-	-	-
Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan
Skin Tone Colour Correction	Digital Crystal Clear	Digital Crystal Clear	Skin Tone Colour Correction
-	Active Control / Light Sensor	Active Control / Light Sensor	-
2D Comb Filter	2D Comb Filter	2D Comb Filter	-
-	-	-	-
Dolby Virtual	Dolby Virtual	Dolby Virtual	Dolby Virtual
-	-	-	-
10 W RMS	6 W RMS	6 W RMS	4 W RMS
2 on board speakers	2 on board speakers	2 on board speakers	2 on board speakers
-	-	-	-
Plug & Play	Plug & Play	Plug & Play	Plug & Play
PLL	PLL Digital Tuning	PLL Digital Tuning	PLL
100	100 Presets Channels	100 Presets Channels	100
Autostore	Autostore	Autostore	Autostore
Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning
Sorting	Sorting	Sorting	Sorting
Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI
-	-	-	-
Top Controls	Top Controls	Top Controls	Top Controls
Rc (VCR/DVD)	Rc (DVD/AUX)	Rc (DVD/AUX)	Rc (VCR/DVD)
Zappa + (without hard cap)	RCAE049_FRP	RCAE049_FRP	Zappa + (without hard cap)
-	-	-	-
Smart controls	Smart controls	Smart controls	Smart controls
Smart Listening	Smart Listening	Smart Listening	Smart Listening
Dual I-II	Dual I-II	Dual I-II	Dual I-II
4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen
-	-	-	-
-	-	-	-
WSSB	WSSB	WSSB	WSSB
Smart Clock	-	Smart Clock	Smart Clock
Wake Up Clock	-	Wake Up Clock	Wake Up Clock
Sleep Timer	-	Sleep Timer	Sleep Timer
-	-	-	Smart Lock
Screen Saver	Screen Saver Digital Clock Display	Screen Saver Digital Clock Display	-
-	-	-	-
Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback
AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in
Headphones	Headphones	Headphones	Headphones
1 Scart	1 Scarts	2 Scarts	1 Scart
-	-	-	-
-	-	-	-
PC in	PC in	PC in	PC in
-	-	-	-
Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)
-	-	-	-
Twin Page Text	Twin Page Text	Twin Page Text	Twin Page Text
-	Picture In Graphic	PIP, PBP, PIG	-
-	-	-	-
FM radio	FM radio	FM radio	FM radio
-	Digital Media Recorder (DMR)	-	-
-	-	-	-
tbc	tbc	tbc	tbc
1.5W	1.5W	1.5W	1.5W
9,2 kg	6Kg	6 kg	6,4 kg
13,4 kg	8Kg	8 kg	9,4 kg
9cm	8 cm	8 cm	6 cm
704x373x87 mm	517x301x82 mm	517x301x82 mm	517x301x55 mm
798x507x280 mm	622x419x243 mm	622x419x243 mm	646x253x452 mm
Silver Gloss	Black semi gloss 80007	Pearl White Silver (11092)	Silver Gloss
VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)
Table top stand	Table top stand	Table top stand	Table top stand

**LEAD**



LCD TV	LCD TV	LCD TV	LCD TV	LCD TV	LCD TV	LCD TV
20PF8846 LC04 C	20PF7846 LC04 C	15PF8946 LC04 C	15PF7835 LC03 Special	14PF7835 LC03 Special	14PF7846 LC04 C	14PF6826 LC04 C
LCD VGA S-IPS Active Matrix TFT 640x480 (*3) 450 cd/m² 350:1 25 ms <b>176/176</b> Anti Reflex Coated Glass	LCD VGA S-IPS Active Matrix TFT 640x480 (*3) 450 cd/m² 350:1 25 ms <b>176/176</b> Anti Reflex Coated Glass	<b>LCD XGA TN Active Matrix TFT</b> 1024x768 (*3) 450 cd/m² 400:1 <b>16 ms tbc</b> <b>130/100</b> Anti Reflex Coated Glass	<b>LCD XGA TN Active Matrix TFT</b> 1024x768 (*3) 450 cd/m² 400:1 <b>16 ms tbc</b> <b>130/100</b> Anti Reflex Coated Glass	LCD VGA VA Active Matrix TFT 640x480 (*3) 450 cd/m² 500:1 16 ms 170/170 Anti Reflex Coated Glass	LCD VGA VA Active Matrix TFT 640x480 (*3) 450 cd/m² 500:1 16 ms 170/170 Anti Reflex Coated Glass	LCD VGA VA Active Matrix TFT 640x480 (*3) 450 cd/m² 500:1 16 ms 170/170 Anti Reflex Coated Glass
Progressive Scan Skin Tone Colour Correction -	Progressive Scan Skin Tone Colour Correction -	Progressive Scan Skin Tone Colour Correction -	Progressive Scan -	Progressive Scan DCDi by Faroudjia -	Progressive Scan Skin Tone Colour Correction -	Progressive Scan Skin Tone Colour Correction -
2D Comb Filter -	2D Comb Filter -	- -	DCDi by Faroudjia -	DCDi by Faroudjia -	- -	- -
Dolby Virtual -	Dolby Virtual -	Dolby Virtual -	Stereo -	Stereo -	Dolby Virtual -	Dolby Virtual -
<b>10 W RMS</b> 2 on board speakers	<b>10 W RMS</b> 2 on board speakers	<b>4 W RMS</b> 2 on board speakers	<b>6 W RMS</b> 2 on board speakers	<b>4 W RMS</b> 2 on board speakers	<b>4 W RMS</b> 2 on board speakers	<b>4 W RMS</b> 2 on board speakers
Plug & Play PLL 100 Autostore Fine Tuning Sorting Smart ATS/ACI	Plug & Play PLL 100 Autostore Fine Tuning Sorting Smart ATS/ACI	Plug & Play PLL 100 Autostore Fine Tuning Sorting Smart ATS/ACI	<b>Plug &amp; Play</b> PLL 100 Autostore Fine Tuning Sorting Smart ATS/ACI	<b>Plug &amp; Play</b> PLL 100 Autostore Fine Tuning Sorting Smart ATS/ACI	Plug & Play PLL 100 Autostore Fine Tuning Sorting Smart ATS/ACI	Plug & Play PLL 100 Autostore Fine Tuning Sorting Smart ATS/ACI
Top Controls Zappa (TV) tbc	Top Controls Zappa (TV) tbc	Top Controls Rc (VCR/DVD) <b>Zappa + (without hard cap)</b>	<b>Top Controls</b> RC TV RCAE038 -	<b>Top Controls</b> RC TV RCAE038 -	Top Controls Zappa (TV) tbc	Top Controls Zappa (TV) tbc
Smart controls Smart Listening Dual I-II -	Smart controls Smart Listening Dual I-II -	Smart controls Smart Listening Dual I-II -	Smart controls Delta volume AVL / Dual I-II -	Smart controls Delta volume AVL / Dual I-II -	Smart controls Smart Listening Dual I-II -	Smart controls Smart Listening Dual I-II -
16:9 compress tbc /4:3 expand -	16:9 compress tbc /4:3 expand -	16:9 compress tbc /4:3 expand -	16:9 compress tbc /4:3 expand -	16:9 compress tbc /4:3 expand -	16:9 compress tbc /4:3 expand -	16:9 compress tbc /4:3 expand -
<b>Smart Clock</b> <b>Wake Up Clock</b> <b>Sleep Timer</b> Smart Lock -	<b>Smart Clock</b> <b>Wake Up Clock</b> <b>Sleep Timer</b> Smart Lock -	<b>Smart Clock</b> <b>Wake Up Clock</b> <b>Sleep Timer</b> Smart Lock -	Smart Clock Wake up Clock Sleep Timer Smart Lock	Smart Clock Wake up Clock Sleep Timer Smart Lock	<b>Smart Clock</b> <b>Wake Up Clock</b> <b>Sleep Timer</b> Smart Lock -	<b>Smart Clock</b> <b>Wake Up Clock</b> <b>Sleep Timer</b> Smart Lock -
Full NTSC playback AV Connections / SVHS- in Headphones 1 Scart -	Full NTSC playback AV Connections / SVHS- in Headphones 1 Scart -	Full NTSC playback AV Connections / SVHS- in Headphones 1 Scart -	Full NTSC playback AV Connections / SVHS- in Headphones 1 Scart -	Full NTSC playback AV Connections / SVHS- in Headphones 1 Scart -	Full NTSC playback AV Connections / SVHS- in Headphones 1 Scart -	Full NTSC playback <b>AV Connections / SVHS- in tbc</b> Headphones 1 Scart -
Smart Text (10 page) -	Smart Text (10 page) -	Smart Text (10 page) -	<b>Smart Text (10 page)</b> -	<b>Smart Text (10 page)</b> -	Smart Text (10 page) -	Smart Text (10 page) -
<b>FM radio</b> -	<b>FM radio</b> -	<b>FM radio</b> -	<b>FM radio</b> -	<b>FM radio</b> -	<b>FM radio</b> -	<b>FM radio</b> -
tbc <b>1.5W</b> tbc tbc 7 cm tbc tbc	tbc <b>1.5W</b> 5.4 kg 10 kg 6 cm 477.6x442x55 mm 577x539x232 mm	tbc <b>1.5W</b> 7 kg tbc 7 cm 481x307x65 mm	50 W / 12 Volt compatibility 1 W 4.7 Kg 7.1 kg <b>5.5 cm</b> 377x361x55 mm 435x431x238 mm	tbc 1 W tbc tbc <b>5.5 cm</b> 377x361x55 mm 435x431x238 mm	tbc <b>1.5W</b> tbc tbc <b>5.5 cm</b> 377x361x55 mm 435x400x219 mm	tbc 1.5W 4.6 kg 7.0 kg 6 cm 333x325x55 mm 435x400x219 mm
<b>Silver Gloss</b> VESA 100 standard (optional) Table top stand	Silver Frost (11027) VESA 100 standard (optional) Table top stand	<b>Silver Gloss</b> VESA 100 standard (optional) Table top stand	Silver Frost (11027) <b>VESA standard (optional)</b> Table top stand	Silver Frost (11027) <b>VESA standard (optional)</b> Table top stand	Silver Frost (11027) VESA 100 standard (optional) Table top stand	Silver Frost (11027) VESA 100 standard (optional) Table top stand

[Back To List](#)

TOP

STEP

TOP

STEP

TOP



FLAT TV

	LCD TV	LCD TV	LCD TV	LCD TV	LCD TV
Type no.	<b>26PF9956</b>	<b>26PF9946</b>	<b>23PF9956</b>	<b>23PF9946</b>	<b>17MF9946</b>
Chassis	LC04 V	LC04 V	LC04 V	LC04 V	LC04 V
PICTURE QUALITY					
Panel	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT	LCD WXGA S-IPS Active Matrix TFT
Number of Pixels	1280x768 (*3)	1280x768 (*3)	1280x768 (*3)	1280x768 (*3)	1280x768 (*3)
Brightness	450 cd/m <sup>2</sup>	450 cd/m <sup>2</sup>	450 cd/m <sup>2</sup>	450 cd/m <sup>2</sup>	450 cd/m <sup>2</sup>
Contrast Ratio	400:1	400:1	400:1	400:1	400:1
Response Time	16 ms	16 ms	25 ms	25 ms	25 ms
Viewing Angles H/V	176/176	176/176	176/176	176/176	176/176
Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass	Anti Reflex Coated Glass
Pixel Plus	<b>Pixel Plus</b>	-	<b>Pixel Plus</b>	-	-
Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan	Progressive Scan
Digital Crystal Clear/Crystal Clear III	Digital Crystal Clear	Digital Crystal Clear	Digital Crystal Clear	Digital Crystal Clear	Digital Crystal Clear
Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor	Active Control / Light Sensor
Combfilter	2D Comb Filter	2D Comb Filter	2D Comb Filter	2D Comb Filter	2D Comb Filter
SOUND QUALITY					
Dolby Virtual	Dolby Virtual	Dolby Virtual	Dolby Virtual	Dolby Virtual	Dolby Virtual
Incredible Surround	-	-	-	-	-
Power output (RMS Watts)	10 W RMS	10 W RMS	10 W RMS	10 W RMS	6 W RMS
Number of on board Speakers	2 on board speakers	2 on board speakers	2 on board speakers	2 on board speakers	2 on board speakers
EASE OF USE INSTALLATION					
Plug & Play	Plug & Play	Plug & Play	Plug & Play	Plug & Play	Plug & Play
PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning	PLL Digital Tuning
100 Presets Channels	100 Presets Channels	100 Presets Channels	100 Presets Channels	100 Presets Channels	100 Presets Channels
Autostore	Autostore	Autostore	Autostore	Autostore	Autostore
Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning	Fine Tuning
Sorting	Sorting	Sorting	Sorting	Sorting	Sorting
Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI	Smart ATS/ACI
EASE OF USE UTILISATION					
Top Controls	Top Controls	Top Controls	Top Controls	Top Controls	Top Controls
RC suitable for	Rc (DVD/AUX)	Rc (DVD/AUX)	Rc (DVD/AUX)	Rc (DVD/AUX)	Rc (DVD/AUX)
RC Reference	RCAE049_FRP	RCAE049_FRP	RCAE049_FRP	RCAE049_FRP	RCAE049_FRP
Program List	-	-	-	-	-
Smart controls	Smart controls	Smart controls	Smart controls	Smart controls	Smart controls
Smart Listening (AVL + Delta Volume)	Smart Listening	Smart Listening	Smart Listening	Smart Listening	Smart Listening
Dual I-II	Dual I-II	Dual I-II	Dual I-II	Dual I-II	Dual I-II
6 Widescreen Modes	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen	4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen
16:9 compress/4:3 expand	-	-	-	-	-
Continuous zoom	-	-	-	-	-
WSSB	WSSB	WSSB	WSSB	WSSB	WSSB
Smart Clock	-	-	-	-	-
Wake up Clock	-	-	-	-	-
Sleep Timer	-	-	-	-	-
Smart Lock (child + parental)	-	-	-	-	-
Screen Saver Digital Clock Display	Screen Saver Digital Clock Display	Screen Saver	Screen Saver Digital Clock Display	Screen Saver	Screen Saver Digital Clock Display
CONNECTIONS					
Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback	Full NTSC playback
AV Front/Side Connections	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in	AV Connections / SVHS- in
Headphones	Headphones	Headphones	Headphones	Headphones	Headphones
Number of Scart sockets	2 Scarts	2 Scarts	2 Scarts	2 Scarts	<b>1 Scarts</b>
Audio out Constant Level	Audio out Constant Level	Audio out Constant Level	Audio out Constant Level	Audio out Constant Level	-
DVI-in	DVI-D in	DVI-D in	DVI-D in	DVI-D in	-
PC in	PC in	PC in	PC in	PC in	PC in
INFORMATION					
Smart Text	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)	Smart Text (10 page)
Text Dual Screen	-	-	-	-	-
Twin Page Text	Twin Page Text	Twin Page Text	Twin Page Text	Twin Page Text	Twin Page Text
Picture In Picture	PIP, PBP, PIG	PIP, PBP, PIG	PIP, PBP, PIG	PIP, PBP, PIG	Picture In Graphic
MISCELLANEOUS					
FM radio	<b>FM radio</b>	<b>FM radio</b>	<b>FM radio</b>	<b>FM radio</b>	<b>FM radio</b>
MultiMedia Recorder	-	-	-	-	<b>Digital Media Recorder (DMR)</b>
Operating power consumption	tbc	tbc	90W	90W	tbc
Standby power	<b>1.5W</b>	<b>1.5W</b>	<b>1.5W</b>	<b>1.5W</b>	<b>1.5W</b>
Weight	15Kg	15 kg	11Kg	11 kg	6Kg
Weight Including Packaging	19Kg	19 kg	15Kg	15 kg	8Kg
Depth	<b>11 cm (center)</b>	<b>11 cm (center)</b>	<b>9 cm</b>	<b>9 cm</b>	<b>8 cm</b>
Dimensions (w, h, d)	<b>787x448x110 mm</b>	<b>787x448x110 mm</b>	<b>690x369x87 mm</b>	<b>690x369x87 mm</b>	<b>517x301x82 mm</b>
Box Dimensions (w,h,d)	<b>881x578x313 mm</b>	<b>881x578x313 mm</b>	<b>784x504x270 mm</b>	<b>784x504x270 mm</b>	<b>622x419x243 mm</b>
Colour	Black semi gloss 80007	Pearl White Silver (11092)	Black semi gloss 80007	Pearl White Silver (11092)	Black semi gloss 80007
Wall mounting bracket	VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)	VESA 100 standard (optional)
Table top stand	Table top stand	Table top stand	Table top stand	Table top stand	Table top stand

**STEP**

<b>LCD TV</b>
<b>17PF9946</b>
LC04 V
LCD WXGA S-IPS Active Matrix TFT
1280x768 (*3)
450 cd/m²
400:1
25 ms
176/176
Anti Reflex Coated Glass
-
Progressive Scan
Digital Crystal Clear
Active Control / Light Sensor
2D Comb Filter
Dolby Virtual
-
6 W RMS
2 on board speakers
Plug & Play
PLL Digital Tuning
100 Presets Channels
Autostore
Fine Tuning
Sorting
Smart ATS/ACI
Top Controls
Rc (DVD/AUX)
RCAE049_FRP
-
Smart controls
Smart Listening
Dual I-II
4:3, Zoom 14:9, Zoom 16:9, Subtitle zoom, Super Zoom, 16:9, Wide Screen
-
-
WSSB
<b>Smart Clock</b>
<b>Wake Up Clock</b>
<b>Sleep Timer</b>
-
Screen Saver Digital Clock Display
Full NTSC playback
AV Connections / SVHS- in
Headphones
2 Scarts
-
-
PC in
Smart Text (10 page)
-
Twin Page Text
PIP, PBP, PIG
<b>FM radio</b>
-
<b>tbc</b>
<b>1.5W</b>
6 kg
8 kg
<b>8 cm</b>
<b>517x301x82 mm</b>
<b>622x419x243 mm</b>
Pearl White Silver (11092)
VESA 100 standard (optional)
Table top stand



## Overall Power States

In general there are three possible power super states for the LC04, each super-state is further break down into sub-states as follows:

- Power off
    - i. Passive-off
    - ii. Active-off
  - Power on
    - i. Normal (TV, FM or HD-mode)
    - ii. Factory
    - iii. Service
    - iv. PC
  - Standby
    - i. Normal (TV, FM or HD-mode)
    - ii. Protection
- C-Sleep

This section will describe the power states visible to the user. Entry to Factory and Service states are covered in the respective Requirement Specifications [4] and [5] respectively.

### OFF Mode (Passive)

Name	Description
Passive-OFF mode	Power supplies status in set OFF mode.

In Passive-OFF mode, the set is completely switched off from mains. This means disconnecting the TV from the mains by pulling out the mains cable. Depending upon the last Standby Status (stored in NVM), this mode can transit to "ON" mode, "STANDBY" mode or "ACTIVE-OFF" mode. For NAFTA, only transition to "Active-OFF" mode is allowed.

### OFF Mode (Active)

Name	Description
Active-OFF mode	Power supplies status in Active-OFF mode. All LED indicators is switch off. TV is not reproducing video/graphics or sound.

In Active-OFF mode, the set is connected to the mains and the set is consuming the minimum power possible. This is similar to the set in STANDBY-NORMAL mode, but all LED indicators are switch off. For NAFTA set, this mode can transit to "ON" via the Power ON/FF button or, via the IR's standby key. For all other regions, only the Power ON/OFF button allow the system to transit to the "ON" or "STANDBY" mode.

### ON Mode (Normal)

Name	Description
Power ON mode	Power supplies status in set ON mode. The TV is reproducing video (non-PC application), and/or audio to its speaker. Video sources include the DVI connector, HDMI connector and a HD(YPbPr) input via a RCA-to-VGA adaptor

This is the normal operating mode. All the power supply lines are available. All the circuits in the set are active. From this mode it shall be possible to transit to "STANDBY-NORMAL", "SEMI-STANDBY", "PROTECTION" or "OFF" mode.

### **ON Mode (PC)**

Name	Description
Power PC-ON mode	Power supplies status in set PC-ON mode. The TV is used as a PC monitor through the VGA or DVI-D or HDMI(via a DVI-HDMI adaptor) input connector.

This is the normal PC operating mode. All the power supply lines are available. All the circuits in the set are active. From this mode it shall be possible to transit to "PC-SLEEP" via DMPS or DMPM power management, or "OFF" mode.

### **STANDBY Mode (Normal)**

Name	Description
Power STANDBY-NORMAL mode	Power supplies status in set STANDBY-NORAML mode

The total power consumption of the TV set in this mode shall be equal or less than 3 Watts ("Energy Star" requirement up to 1 Jul 2005). The Standby-normal State will be indicated by the red LED. In this state only Hercules, Scaler, RAM, Program Memory, NVM and all means to wakeup the set are powered. Rest of the LC04 Sub-Systems shall be disconnected. A control port STAND-BY is defined to control to this effect (refer to LC04 Control HSI for details).

In this mode the UOC<sup>III</sup>, Scaler and peripherals shall be set to the lowest power consumption mode by software.

From this mode it shall be possible to transit to "ON" or "OFF" mode.

### **STANDBY Mode (Protection)**

Name	Description
Power PROTECTION mode	Power supplies status in set PROTECTION mode

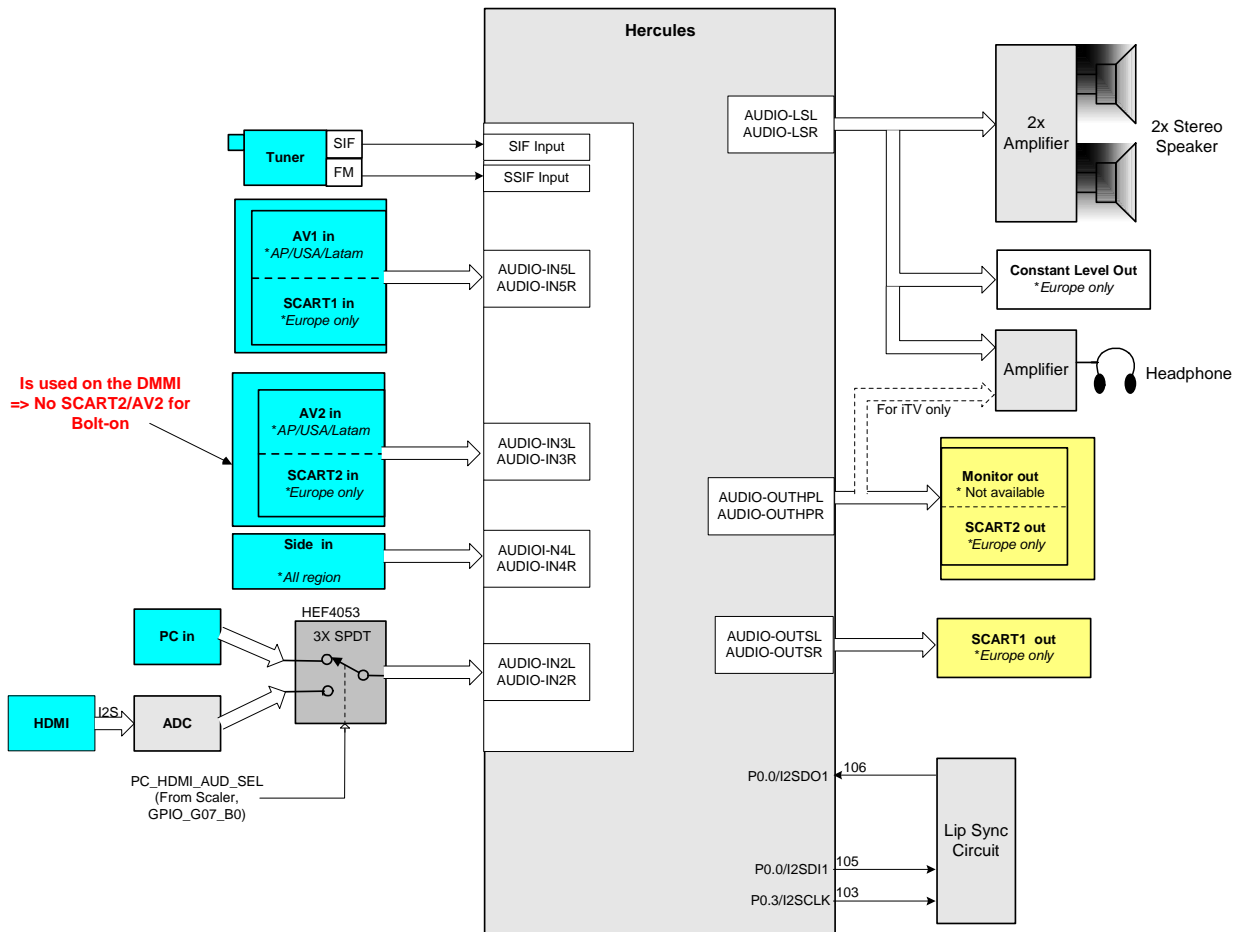
Power profile for PROTECTION mode shall be as low as required to allow "soft" diagnostics, error detection and to indicate LED flashes to flag the type of fault. The LCD panel shall be OFF in this mode. From the protection mode the only possible transition is to "OFF" mode.

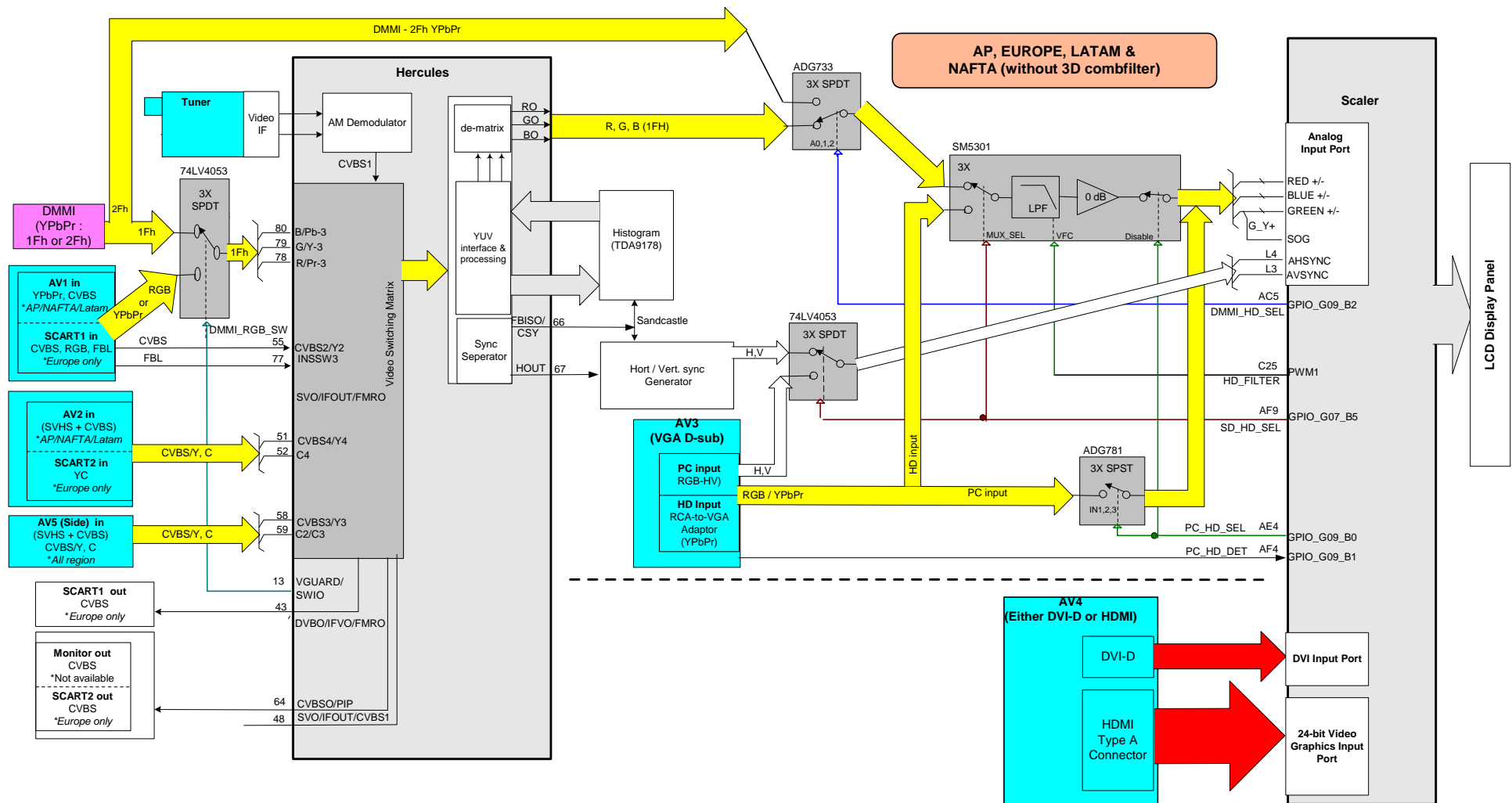
### **STANDBY Mode (Sleep)**

Name	Description
Power SLEEP mode	Power supplies status in set STANDBY mode

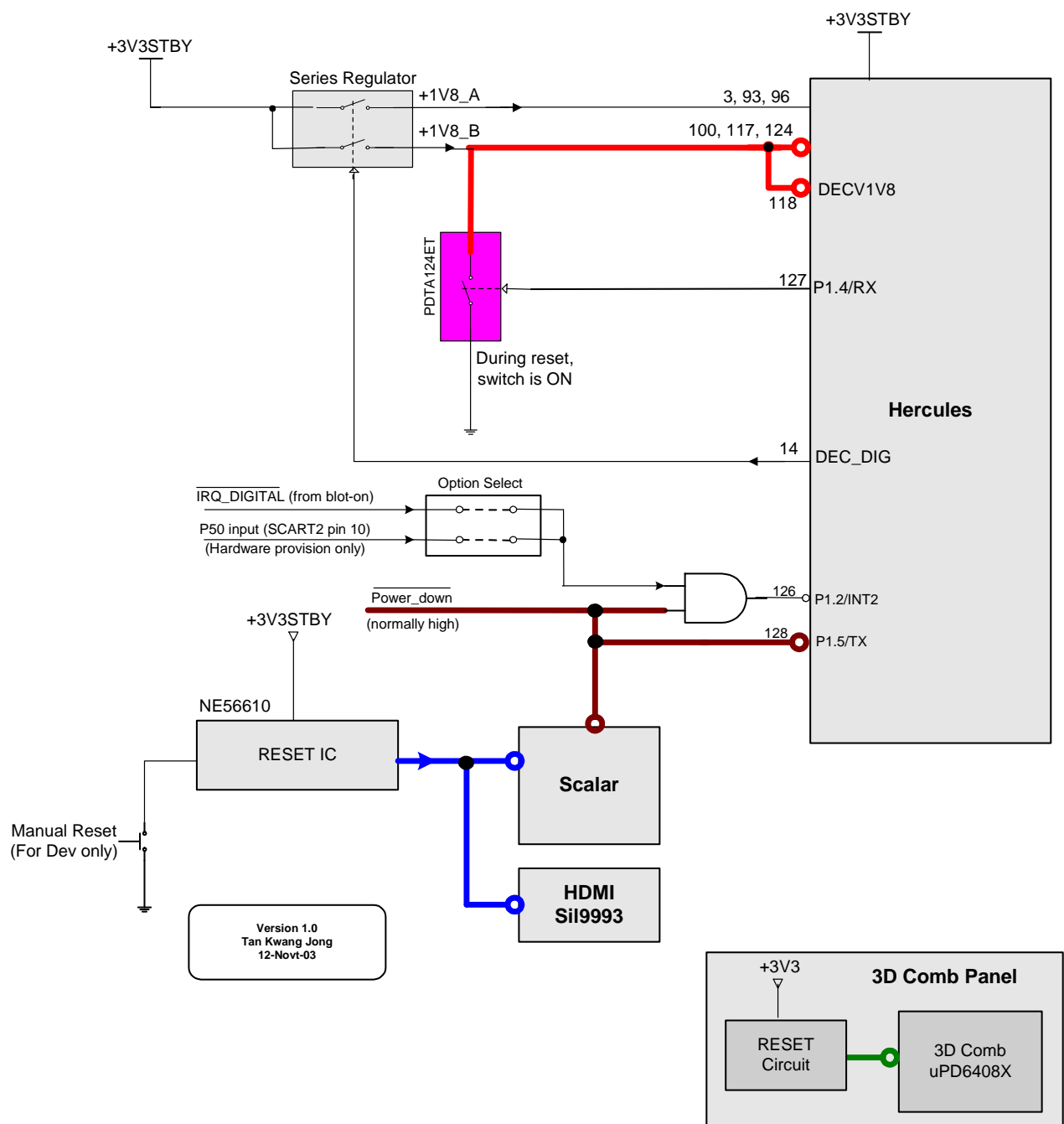
Similar to STANDBY (Normal) mode except that the system can only transit from this mode to PC-ON mode via VESA power management (DPMS) or DVI Digital Monitor Power Management (DVI-DMPM). However, if user selects TV (including wake-up keys), FM or HD mode via the remote controller, the system can transit out from PC-Sleep to the selected mode.

In this mode the UOC<sup>III</sup>, Scaler and peripherals shall be set to the lowest power consumption mode by software when appropriate.





Video Source Selection for All region without 3D-combfilter



Overview of System Reset

	PC Input								
Condition: Pattern#1 Gray Scale pattern at PC input. 1024x768@60Hz. PC Picture setting: Brightness 100, Contrast 100, Color 50, Sharpness 50. Input Source: 1) from D-sub connector; 2) from DVI connector									
	Description		Test Location	Specs			Unit	Results	Remarks
Scaler				Min	Typ	Max			
5.1a	RED/PR Input		7606 pin 12			700	mVpp		
5.1b	RED/PR input – 3dB Bandwidth			70			MHz		
5.2a	GREEN/Y Input		7606 pin 14			700	mVpp		
5.2b	GREEN/Y input – 3dB Bandwidth			70			MHz		
5.3a	BLUE/PB Input		7606 pin 2			700	mVpp		
5.3b	BLUE/PB input – 3dB Bandwidth			70			MHz		
5.4	HS freq		7604 pin 4		48.4		kHz		
5.4a	HS level				3.3		Vpp		
5.4b	HS Tr					20	ns		
5.4c	HS Tf					20	ns		
5.4d	HS jitter					5	ns		
5.5a	VS freq		7604 pin 8			60	Hz		
5.5b	VS level				3.3		Vpp		
5.5c	VS Tr					20	ns		
5.5d	VS Tf					20	ns		

## Software ID

### Hercules

**LC4.2V**      **AAAABBC\_x.yy**      (**AAAA**=chassis name, **BB**=region + function,  
**C**=language cluster, **x**=main version number, **yy**=sub version number)

**LC42EP1\_1.00**

**LC42UN1\_1.00**

**LC42AP1\_1.00**

**LC42AN1\_1.00**

**LC42LP1\_1.00**

**LC42EX1\_1.00**      **(Pixel Plus)**

**LC42UX1\_1.00**      **(Pixel Plus)**

**LC42AX1\_1.00**      **(Pixel Plus)**

### Scaler

**AAABBC\_x.yy** (**AAA**=chassis name, **BB**=region + function, **C**=language cluster,  
**x**=main version number, **yy**=sub version number)

**S42GV1\_1.00**      (for LC4.2 scaler global)

**S42GTD\_1.00**      (for LC4.2 DMR scaler global, understood that  
the UI have to be adapted)

**S42GTP\_1.00**      (for LC4.2 Pixel Plus scaler global)

(where S42=Scaler SW version of LC4.2, G=Global, V= Value, T=Top, D=DMR,  
P=Pixel Plus, 1=not used at this moment as not region dependent)

Note: we assumed no change in Hercules sw for DMR & Pixel Plus set.

### Hercules

**LC4.1**      **AAAABBC\_x.yy**      (**AAAA**=chassis name, **BB**=region + function, **C**=language cluster, **x**=main version number, **yy**=sub version number)

**LC41EP1\_1.00**      (Western Europe)

**LC41EP2\_1.00**      (Eastern Europe)

**LC41UN1\_1.00**

**LC41AP1\_1.00**

**LC41AN1\_1.00**

**LC41LP1\_1.00**

(where LC41=LC4.1, E/U/A/L= regions, P=PAL/PAL-NM/PAL-Multi, N=NTSC)

### Scaler

**AAABBC\_x.yy** (**AAA**=chassis name, **BB**=region + function, **C**=language cluster, **x**=main version number, **yy**=sub version number)

**S41EV1-1.00**      (for Scaler (1) West Eu VGA)

**S41EV2-1.00**      (for Scaler (2) East Eu VGA)

**S41RV1-1.00**      (for Scaler RoW VGA)

**S41EX1-1.00**      (for Scaler (1) West Eu XGA)

**S41EX2-1.00**      (for Scaler (2) East Eu XGA)

**S41RX1-1.00**      (for Scaler RoW XGA)

(S41=Scaler SW version of LC4.1, E=Eu, R=Rest of the world, V=VGA, X=XGA, 1=West Eu in combination with region Europe, 2=East Eu in combination with region Europe (in case region is R=rest of world then language cluster 1 has no meaning))