

Service
Service
Service



Family:
NAFTA-----ML1.2U AA
China/AP--ML1.2A AA
EU-----ML1.2E AA



Service Manual

Horizontal frequencies
30 - 50 KHz

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SAFETY NOTICE

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINES

◀◀ Go to cover page

Proper service and repair is important to the safe, reliable operation of all Philips Consumer Electronics Company** Equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

* *Hereafter throughout this manual, Philips Consumer Electronics Company will be referred to as Philips.

WARNING

Critical components having special safety characteristics are identified with a ▲ by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol ▲ on the schematics or exploded views.

Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability, express or implied, arising out of any unauthorized modification of design. Servicer assumes all liability.

* Broken Line



TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT, USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS, WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE MANUAL.

Take care during handling the LCD module with Backlight unit

- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.
- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.
- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).
- Make certain that treatment person's body are grounded through wrist band.
- Do not leave the module in high temperature and in areas of high humidity for a long time.
- Avoid contact with water as it may a short circuit within the module.
- If the surface of panel become dirty, please wipe it off with a soft material. (Cleaning with a dirty or rough cloth may damage the panel.)

FOR PRODUCTS CONTAINING LASER :

DANGER- Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.

CAUTION- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CAUTION- The use of optical instruments with this product will increase eye hazard.

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GENERAL PRODUCT SPECIFICATION

- . 23" Multifunction LCD monitor
- . PC 15 pins D-SUB analog interface
- . PC audio line in with mini-Jack
- . TV Tuner, S-Video, RCA AV input/output interface with R/L Audio-in
- . DVI digital interface with HDCP support (for TV only)
- . RCA connectors for YPbPr input
- . HD/Component YPbPr with L/R audio input (RCA connector)
- . NTSC, PAL TV system
- . PC graphic auto picture adjustment
- . 14 user modes
- . User-friendly OSD menu
- . User-friendly remote controller
- . Recommend resolution 1280 x 768 non-interlace at 60 Hz
- . WXGA 23" color TFT LCD flat panel
- . Easy tilt base
- . Anti-glare to reduce light reflection
- . Power management capability
- . VESA standard wall mount kit (option)

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CLASS NO.		23" Wide LCD Monitor/TV					
		BRAND: PHILIPS					
2005-07-01							
NAME	Yikuan YU	SUPERS.	25	590	—	1	10
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1.0 FOREWORD

This specification describes a 23" multifunction LCD Monitor, maximum resolution up to 1280x768/60Hz non-interlaced.

2.0 PRODUCT PROFILE

This 23" TFT LCD monitor/TV can connect to PC's analog D-SUB and TV's digital signal through DVI-D connector and it also have TV, Composite Video, S-Video, Component YPbPr, PVR output and HD YPbPr interface.

2.1 LCD

2.1.1. QDI panel

Type NR.	: QD23HL02 (QDI panel)
Display area(mm)	: 508.152mm x 285.696mm
Number of Pixels	: 1366(H) x 768(V)
Pitch (mm)	: 0.372(H) x 0.372(V)
Color pixel arrangement	: RGB vertical stripe
Display operating mode	: Normally white
Color depth	: 16,7 million color
Brightness (cd/m^2)	: 500(Center 1 points, Typ.)
Viewing angle(CR>10)	: Viewing angle free(R/L 70/70(Typ.),U/D 65/60(Typ.))
Surface treatment	: Hard coating(3H),Anti-glare treatment of the front polarize
Electrical interface	: LVDS
Response Time(ms, Typ)	: TrR:6 ,TrF:10
Contrast ratio	: Typical 450 : 1
Outline Dimension	: 546.0mm(H) x 318(V) (Typ.)
Module weight (g)	: 3300(Typ.)
Backlight	: 6 CCFT

2.2 Scanning frequencies : Hor. : 30 - 50KHz Ver.: 56 - 63 Hz

2.3 Video dot rate : <80 MHz

2.4 Power input : 90 - 264 Vac, 50/60 ± 2 Hz

2.5 Power consumption : 75 W/Typ. (at PC mode) , 95 W/Typ. (at TV mode).

2.6 Unit Dimensions : 615 mm W x 234 mm H x 318 mm D (Incl. Pedestal)

2.7 Unit Weight : 11.2 Kg

2.8 Chin speaker : 2 x 5 W

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2.9 Functions :

PC -15 pins D-sub analog interface with audio mini-Jack input (PC line in).

TV -DVI-D Digital interface (Support HDCP) with RCA jack L/R audio input.

-Tuner, Aerial input.

-Component YPbPr input and Composite Video input share with the same audio.

-HD/Component YPbPr input and audio input with RCA jack.

-Composite video input and S-Video input share with the same audio.

-PVR output (Composite Video and Audio output).

2.10 Ambient temperature: 5 ~ 35 °C

2.11 Regulatory compliance :

International Regulatory Specification

COUNT RY	DOM AIN	SAFETY / EMC / ERGONOMICS / STANDARDS	DOCUMENTS
-------------	------------	--	-----------

NAFTA + LATAM			
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USA	Sa	UL6500	UL
	E	FCC Part15	FCC DOC or FCC ID / Verification
	O	Energy Star	EPA registration
Canda	Sa	UL6500	cUL
	E	FCC Part15	FCC DOC or FCC ID / Verification
Panama Colombia Ecuador Venezuela Chile Peru	Sa	UL6500 /IEC60065	UL
	E	NO	NA

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Bolivia			
Argentina	Sa	IEC60065 (IRAM4029)	IRAM + SICM
	E	CISPR 13 , CISPR 20,IEC61000-3-2	
Paraguay	Sa	UL6500 /IEC60065	NA
	E	NO	
Uruguay	Sa	UL6500 /IEC60065	NA
	E	NO	
Mexico	Sa	NOM-001-SCFI-1993(derived from IEC 60065: 5th ed.+Amd.2&3)	NOM -NYCE
	E	CISPR 13 , CISPR 22	
AP			
CB report	Sa	IEC60065: national differences of all countries	CB Report
Singapore	Sa	IEC60065	PSB
	E	NO	
Hong Kong	Sa	IEC60065	Declaration Of Conformity
	E	CISPR 13	
Malaysia	Sa	IEC60065 (MS72)	SIRIM
	E	CISPR 13	
Indonesia	Sa	IEC60065	NA
	E	NO	
India	Sa	IEC60065	NA
	E	NO	
Thailand	Sa	IEC60065 (TIS 1195-2536)	Register with Thai Industrial Standards Institute (TISI)
	E	NO	
Middle East	Sa	IEC60065	SASO Registration / KSS Registration
	E	CISPR 13	

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Bolivia			
Argentina	Sa	IEC60065 (IRAM4029)	IRAM + SICM
	E	CISPR 13 , CISPR 20,IEC61000-3-2	
Paraguay	Sa	UL6500 /IEC60065	NA
	E	NO	
Uruguay	Sa	UL6500 /IEC60065	NA
	E	NO	
Mexico	Sa	NOM-001-SCFI-1993(derived from IEC 60065: 5th ed.+Amd.2&3)	NOM -NYCE
	E	CISPR 13 , CISPR 22	
AP			
CB report	Sa	IEC60065: national differences of all countries	CB Report
Singapore	Sa	IEC60065	PSB
	E	NO	
Hong Kong	Sa	IEC60065	Declaration Of Conformity
	E	CISPR 13	
Malaysia	Sa	IEC60065 (MS72)	SIRIM
	E	CISPR 13	
Indonesia	Sa	IEC60065	NA
	E	NO	
India	Sa	IEC60065	NA
	E	NO	
Thailand	Sa	IEC60065 (TIS 1195-2536)	Register with Thai Industrial Standards Institute (TISI)
	E	NO	
Middle East	Sa	IEC60065	SASO Registration / KSS Registration
	E	CISPR 13	

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Length : 1.5 M +/- 50 mm

AV cable (option)
Length : 1.5M +/- 50 mm

Mini Jack stereo cable (option)
Length : 1.5 M +/- 50 mm

YPbPr cable (option)
Length : 1.5M +/- 50mm

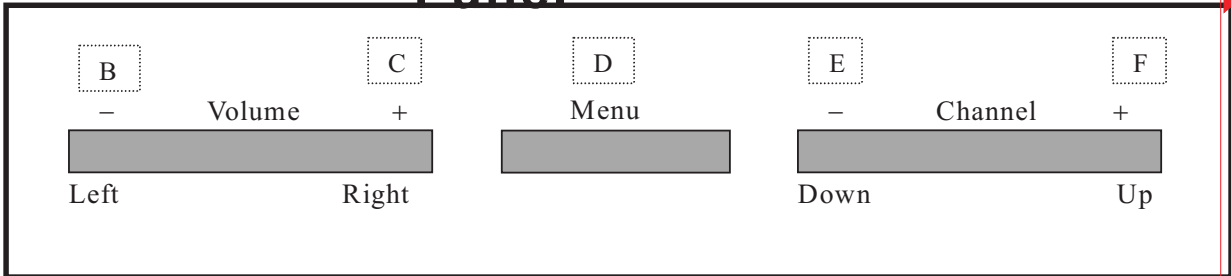
Power cord
Length : 1.8 M +/- 50 mm

3.2 User interface

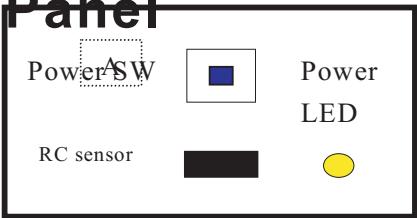
On screen display user control via keypad and remote control for PC and TV OSD.

3.2.1 Keypad definition

Top Control
Panel



Front Control
Panel



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3.2.1 Key Function definition:

Key	Function	VGA mode	TV/video mode
<A>	Power	DC Power	DC Power
	Left	Left/Volume down	Left/Volume down
<C>	Right	Right/Volume up	Right/Volume up
<D>	Menu	Enter /Exit OSD menu	Enter /Exit OSD menu
<E>	Menu Down/channel down	Menu line Down	Menu Down/Channel Down
<F>	Menu Up/Channel up	Menu line Up	Menu Up/Channel up

1. Press ☐ MENU ☐ key to call main menu.
2. By ☐ Up/Down ☐ to select function and ☐ Left/Right ☐ to adjust.
3. ☐ Left/Right ☐ also is Volume Hot Key (TV and PC mode).
4. ☐ Up/Down ☐ also is Channel Hot Key (TV mode).
5. Press hot Key and <C> can auto-adjust picture position, phase and clock in PC mode.

Power LED:

Normal working: Green

Power saving: Red

3.2.2 Remote control

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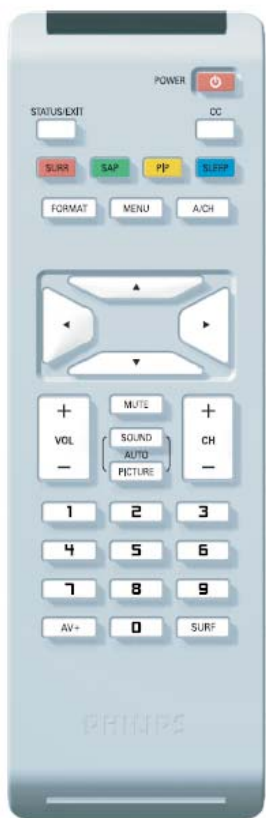
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- | | |
|-------------------------------|--|
| 1.Power | : Power On/Standby |
| 2.Numerica keys | : (0~9) ,Channel setting |
| 3.Mute | : Sound mute function |
| 4.Prev-CH | : Recall previous CH |
| 5.Menu | : Main menu select and OK key |
| 6.VOL- | : Left/Volume Down |
| 7.OK | : no key define |
| 8.Source | : Source select |
| 9.Closed cap. | : Closed caption on/off |
| 10.SAP(2 nd audio) | : Sound select |
| 11.CH- | : Down/Channel Down |
| 12.PIP | : PIP size select (Small/Medium/Large/PBP) |
| 13.VOL+ | : Right/Volume Up |
| 14.CH+ | : Up/ Channel Up |
| 15.Display Format | : Select display format |
| 16.Smart Sound | : Select sound effect |
| 17.Smart Picture | : Select picture effect |
| 18.Sleep Timer | : Sleep timer 15,30,60,120,180,240 OFF |

All PC or TV OSD menu function could be accomplished by remote control.

3.3 PC and TV requirement

3.3.1 PC interface

3.3.1.1 Mode storing capacity

Pre-set : 6
User modes : 8

3.3.1.2 Horizontal scanning

Sync polarity : Positive or Negative
Scanning frequency : 30 - 50 KHz

3.3.1.3 Vertical scanning

Sync polarity : Positive or Negative
Scanning frequency : 56 - 63 Hz

3.3.1.4 Input connectors

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Input analog D-sub connector pin assignment

PIN No.	SIGNAL b(PC)
1	Red
2	Green
3	Blue
4	Self test
5	GND
6	Red GND
7	Green GND
8	Blue GND
9	+5V (Supply from PC)
10	Sync GND
11	GND
12	Bi-directional data
13	H-sync
14	V-sync
15	Data clock

- 1.8m 15Pins, D-sub male with DDC2B Pin assignments.

3.3.1.5 Available timings

Factory pre-set timing, size and centering are according to the reference timing charts, The list is as below:

MODE NO.	1	2	3
RESOLUTION	640 x 480	800 x 600	800 x 600
Dot clock(MHz)	25.175	36.000	40.000
f h	31.469kHz	35.156kHz	37.879kHz
A (us)	31.778 (800 dots)	28.44 (1024 dots)	26.40 (1056 dots)
B (us)	3.813 (96 dots)	2.000 (72 dots)	3.200 (128 dots)
C (us)	1.907 (48 dots)	3.556 (128 dots)	2.200 (88 dots)
D (us)	25.422 (640 dots)	22.22 (800 dots)	20.00 (800 dots)
E (us)	0.636 (16 dots)	0.667 (24 dots)	1.000 (40 dots)
f v	60Hz (59.940)	56Hz (56.25)	60Hz (60.317)
O (ms)	16.683 (525 lines)	17.78 (625 lines)	16.58 (628 lines)
P (ms)	0.064 (2 lines)	0.057 (2 lines)	0.106 (4 lines)
Q (ms)	1.049 (33 lines)	0.626 (22 lines)	0.607 (23 lines)
R (ms)	15.253 (480 lines)	17.07 (600 lines)	15.84 (600 lines)
S (ms)	0.317 (10 lines)	0.028 (1 line)	0.026 (1 line)
SYNC. H/V POLARITY	- / -	+ / +	+ / +
SEP . SYNC	Y	Y	Y

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MODE NO.	4	5	6
RESOLUTION	1024 x 768	1280X720	1280 x 768
Dot clock(MHz)	65.000	CVT 74.5	CVT 79.50
f h	48.363kHz	44.772kHz	47.776kHz
A (us)	20.677(1344 dots)	22.336(1664 dots)	20.931(1664 dots)
B (us)	2.092(136 dots)	1.718(128 dots)	1.610(128 dots)
C (us)	2.462(160 dots)	2.577(192 dots)	2.415(192 dots)
D (us)	15.754(1024 dots)	17.181(1280 dots)	16.101(1280 dots)
E (us)	0.369(24 dots)	0.859(64 dots)	0.805(64 dots)
f v	60Hz (60.004)	60Hz (59.855)	60Hz (59.87)
O (ms)	16.666(806 lines)	16.707(748 lines)	16.703(798 lines)
P (ms)	0.124(6 lines)	0.111678(5 lines)	0.1455(7 lines)
Q (ms)	0.600(29 lines)	0.4467(20 lines)	0.4186(20 lines)
R (ms)	15.880(768 lines)	16.082(720 lines)	16.075(768 lines)
S (ms)	0.062(3 lines)	0.067(3 lines)	0.0628(3 lines)
SYNC. H/V	-/-	-/+	-/+
POLARITY			
SEP . SYNC	Y	Y	Y

A: H-Total
B: H- Sync width
C: H- Back porch
D: H- Video width
E: H- Front porch

O: V-Total
P: V- Sync width
Q: V- Back porch
R: V- Video length
S: V- Front porch

3.3.2 I/O interface

Connect:

1. Tuner: RTMA M/N system reception.
2. DVI IN: DVI input (TV digital signal support HDCP) with audio R/L.
3. PC IN: VGA input (D-SUB connectors) with audio R/L(mini-jack).
4. HD IN: HDTV input with YPbPr format and audio R/L(RCA jack).
5. AV IN2: Component video YPbPr and composite video(Video 2) share with same audio R/L.
6. AV OUT: Composite video output (CVBS) and audio R/L(RCA jack).
7. AV IN1: Video1 (CVBS) and S-Video 1 share with same audio R/L.

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Location:

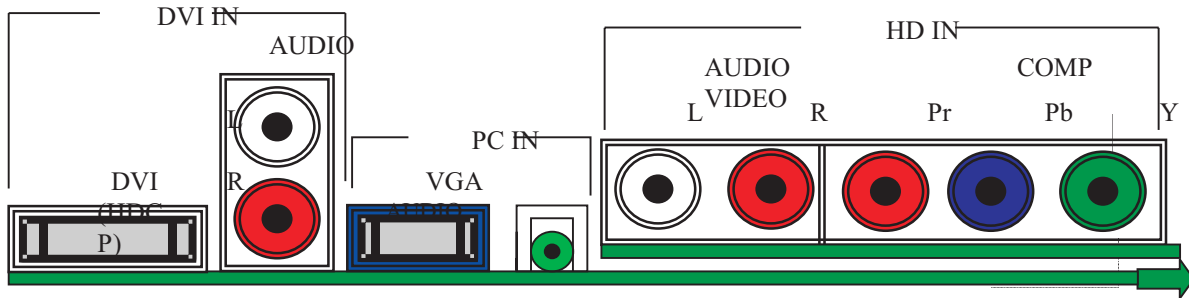


Fig. 2-1

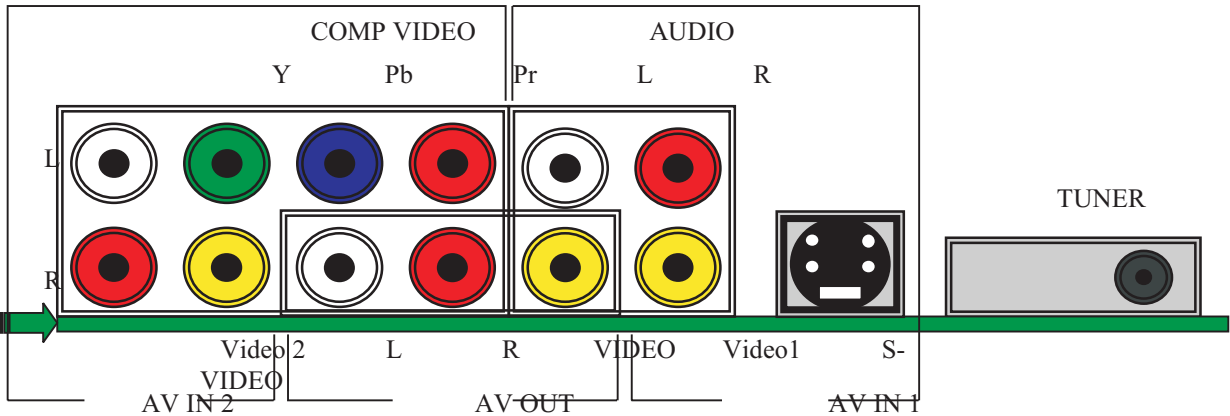


Fig. 2-2

Following table is the deviation of main TV system.

Item	W EUROPE	America	AP	China
TV Color system	PAL, SECAM	NTSC	PAL/NTSC	PAL
Tuner	FQ1216ME5 Picture carrier 38.9MHz	FQ1236/F H- 5 Picture carrier 45.75MHz	FQ1216ME/H5 Picture carrier 38.9MHz	FQ1256/I Picture carrier 38MHz
V system	B/G, D/K, I, L	M	B/G, NTSC-M	D/K
Sound decoder	MSP3410G	MSP3440G	MSP3410G	MSP3410G
CVBS, YC Color system	Multi	Multi	Multi	Multi
Scaler MCU	WE version	NAFTA version	AP version	China version
Closed caption	N	Y	N	N
V-chip	N	Y	N	N
Teletext	N	N	N	N
Remote controller(RC5)	Europe version	NAFTA version	AP version	CHINA version
Channel number	100	US Air 68, cable 125	100	100

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Following table is the detail TV System list.

TV system	Position of sound carrier (MHz)	Sound system	Color system	Country
M	4.5/4.724212	FM-Stereo (A2)	NTSC	Korea
	4.5	FM-FM (EIA-J)	NTSC	Japan
	4.5	BTSC-stereo SAP	NTSC	USA
N	4.5	BTSC-stereo SAP	PAL	Argentina
B/G	5.5/5.7421875	FM-stereo (A2)	PAL	Germany, Austria, Switzerland, Italy, Netherlands.
	5.5/5.85	FM-Mono/NICAM	PAL	Belgium, Spain, Denmark, Finland, Norway, Sweden.
L	6.5/5.85	AM-Mono/NICAM	SECAM-L	France
I	6.0/6.552	FM-Mono/NICAM	PAL	Great Britain, Hong Kong, Ireland.
D/K	6.5/6.2578125	FM-Stereo (A2, D/K1)	SECAM-East	Slovak. Rep.
	6.5/6.7421875	FM-Stereo (A2, D/K2)	PAL	None
	6.5/5.7421875	FM-Stereo (A2, D/K3)	SECAM-East	Poland
	6.5/5.85	FM-Mono/NICAM (D/K, NICAM)	PAL	China, Hungary

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3.3.2.1 TV special setting

Close Caption, V-chip (NAFTA Tuner, CVBS input source only)

- CC-1, CC-4 decoding and display
- TXT1, TXT4 Text mode
- No Extended Data Services (EDS)
- Support violence rating and checking
- Automatic CC-1 selection at user mute

3.3.3 Electric characteristics of I/O

3.3.3.1 PC Signal type

Analog Video : 0.7 Vp-p linear, positive polarity
 Separate Sync. : TTL level, separate, positive or negative polarity
 Audio signal : Mini-jack audio input,
 Level: Nominal : 0.5 V rms.
 Maximum : 1.5 V rms.
 Impedance > 10 k ohm

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Signal source : pattern generator format as attachment. (table 1 to 6)
Reference generator: CHROMA 2200 or 2250

3.3.3.2 TV Signal type

RF signal : Aerial input / 10mV(80dBuV)
Video signal : Video(RCA CVBS input) / 1Vpp (300mV-sync, 700mV-video.)
S video input / 1VppY-signal, 300mVpp C-signal
COMP Video(YPbPr input)/ 1Vpp Y signal, 350mVpp Pb,Pr signal
DVI : Digital interface with 4 channels TMDS signal
Audio signal : Audio (1) R/L for AV IN1 (Video1 and S-video).
Level: Nominal : 0.5 V rms.
Maximum : 1.5 V rms.
Impedance > 10 k ohm.
Audio (2) R/L for AV IN3 (Video2 and Comp video).
Level: Nominal : 0.5 V rms.
Maximum : 1.5 V rms.
Impedance > 10 k ohm.
Audio (3) R/L for DVI IN.
Level: Nominal : 0.5 V rms.
Maximum : 1.5 V rms.
Impedance > 10 k ohm.

3.3.3.3 PVR output (CVBS output)

Video: CVBS output 1Vpp / Impedance : 75ohm.

Audio: R/L output (from CVBS)
Level: Nominal : 0.5 V rms.
Maximum : 1.5 V rms.
Impedance < 1 k ?

3.4 Power input connection

Power cord length : 1.8 M
Power cord type : 3 leads power cord with protective earth plug.

3.5 Power management

PC mode

The power consumption and the status indication of the set with power management function are as follows:

Power Spec

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<u>STATUS</u>	<u>Horizontal</u>	<u>Vertical</u>		<u>230V_{AC}</u>	<u>LED</u>
On	Pulse	Pulse	Typical	75W	Green
Stand-by	No Pulse	Pulse		< 1W	Red
Suspend	Pulse	No Pulse		< 1W	Red
Off	No Pulse	No Pulse		< 1 W	Red
Power switch off	-	-		< 1 W	-

TV mode

The power consumption and the status indication of the set with power management function are as follows,

<u>STATUS</u>		<u>Power Spec</u>	<u>230V_{AC}</u>	<u>LED</u>
On	Typical	95W		Green
Stand-by		< 1 W		Red
Power switchoff		< 1 W		-

In Monitor power saving mode,

Which no H&V sync or absent either H-sync or V-sync input via VGA connector. The monitor will enter □Monitor saving mode□. The way to wake up or change source:

1. H-sync and V-sync have signal again.
2. Press □AV□ key on remote control, change to video source directly via OSD tree.

In TV power saving mode,

Which switched off by RC □Power□ key, SLEEP TIMER function or no TV signal input for 30 minutes, the monitor will enter □TV standby mode□ and LED shows Red color. The way to wake up:

Press □Power□ key on remote control to return original video source.

4.0 Visual characteristics

4.1 Test conditions

Unless otherwise specified, this specification is defined under the following conditions.

- (1) Input signal : As defined in 3.3.1.5, 1280 x 768 x 60Hz non-interlaced mode (47.776kHz), signal sources must have 75 ohm output impedance.
- (2) Luminance setting: controls to be set to 500 Nits (typical) with full screen 700mv white signal.

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- (3) Warm up: more than 30 minutes after power on with signal supplied.
 (4) Ambient light: 400 ~ 600 lux.
 (5) Ambient temperature: 25 ± 2 °C

4.2 PC Resolution

	Resolution	Frequency	Pixel rate	Sync	Comment
1	640X480	31.469K/59.94Hz	25.175MHz	(-/-)	IBM VGA
2	800X600	35.156K/56.25Hz	36MHz	(+/-)	VESA
3	800X600	37.879K/60.317Hz	40MHz	(+/-)	VESA
4	1024X768	48.363K/60.004Hz	65MHz	(-/-)	VESA
5	1280X720	44.772K/59.855Hz	74.5MHz	(-/+)	CVT
6	1280X768	47.776K/59.87Hz	79.5MHz	(-/+)	CVT

4.3 Brightness

>400 nits at maximum contrast and Brightness. (At center of the screen, Fig. 1)

4.4 Image size

4.4.1 Actual display size 508.125mmx285.696mm

4.5 Brightness uniformity

Set contrast at 100% and turn the brightness to Max. (At original color)
 Apply the Fig 1, it should comply with the following formula:

$$\frac{\text{Maximum luminance of five points (brightness)}}{\text{Minimum luminance of five points (brightness)}} < 1.3$$

4.6 PC White color adjustment

Apply 1280x768@60Hz mode set smart picture to □Normal□,
 Apply full white pattern, with brightness in 90 % position and the contrast control
 at 50% position.

The 1931 CIE Chromaticity (color triangle) diagram (X, Y)
 coordinate for the screen center should be:

$$\begin{aligned} \text{8500K CIE coordinates} \quad X &= 0.292 \pm 0.030 \\ Y &= 0.293 \pm 0.030 \end{aligned}$$

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4.7 TV White color adjustment

Smart picture set to personal for TV RF signal (80dB μ v).
 Use FLUKE 54200 pattern generator with full white pattern.
 Use The 1931 CIE Chromaticity (color triangle) diagram (X, Y) coordinate for the screen
 center should be: X=0.292 $\pm$ 0.030, Y=0.293 $\pm$ 0.030.

4.8 TV picture centering

Use CVBS (PAL and NTSC) input with cross hatch pattern to check the picture centering and should be

Left (size)-Right (size) < $\pm$ 2mm.

Up (size)-Down (size) < $\pm$ 2mm.

5.0 Mechanical characteristic

5.1 Controls

Top Control :

- Up key
- Down key
- Menu key
- Right key
- Left key
- RC sensor
- DC power switch

Front

Rear I/O :

- AC inlet
- DVI (Support HDCP) input
- L/R audio input for DVI
- PC D-sub
- Mini jack PC audio input
- L/R audio input for HD
- YPbPr video input for HD
- Tuner RF input
- S-Video1 input
- Composite video input (VIDEO 1)
- L/R audio input
(S-video1 and Video1 share with same audio)
- Composite video output
- L/R audio output
- YPbPr video input for component
- Composite video input (Video 2)
- L/R audio input

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(Component and Video 2 share with same audio)

5.2 Unit dimension / Weight

Set dimension (incl. pedestal): 615 mm W x 234 mm H x 318 mm D

Net weight : 11.2 Kg

5.3 Tilt base

Tilt angle : 0 to 10 degree

5.4 Transportation packages

5.4.1 Shipping dimension/Weight

Carton dimension : 672 mm W x 550 mm H x 308 mm D

Gross weight : 14 Kg

5.4.2 Block unit / Palletization (Sea shipment)

Container	layers/block	sets/layer	sets/block unit
34	6	2	12

Detail please refer to sheet 560

6.0 Environmental characteristics

The following sections define the interference and susceptibility condition limits that might occur between external environment and the display device.

6.1 Susceptibility of display to external environment

Operating

- Temperature : 0 to 40 °C
- Humidity : 10 to 95%(non □condensing)
- Altitude : 0 to 12000 feet
- Air pressure : 600 to 1100 mBAR
- (guaranteed optical performance): 5 to 35 °C
- (guaranteed functional performance): 5 to 40°C

Storage

- Temperature : -20 to 50 °C
- Humidity : 10 to 95% (non □condensing)
- Air pressure : 600 to 1100 mBAR

Note: recommend at 0 to 35°C, Humidity less than 60 %

Shipping

- Temperature :(-20 to 50 °C)
- Humidity : 10 to 95% (non □condensing)

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- Altitude : 0 to 40000 feet (non operating)
- Air pressure : 600 to 1100 mBAR

6.2 Transportation tests

Standard		UAN-D1534/01
Drop Test	Height	Bottom 45 & other 25 cm
	Sequence	Bottom x3 Left, front side, right, back, top
	Test Result	Electrical function ok Mechanical function ok No serious damage on set appearance (room temp./-10° c, humidity 70 %)
Vibration	Sequence	--- PACKAGING sine vibration - frequency: 7HZ, - acceleration: 1.05g - test duration : 30 min. - direction: Y transport direction only
Test	Test Result	Electrical function ok Mechanical function ok No serious damage on set appearance

Detail follow the UAN-D1534/01

6.3 Display disturbances from external environment

According to IEC 801-2 for ESD disturbances

7.0 Reliability

7.1 Mean Time Between Failures

System MTBF (Excluding the LCD panel and CCFL) : 50,000 hrs
CCFL MTBF : 50,000 hrs

8.0 Quality assurance requirements

8.1 Acceptance test

According to MIL-STD-105D Control II level

AQL : 0.65 (major) 2.5 (minor)

(Please also refer to annual quality agreement)

8.2

Cosmetic and dot defect of panel refer to the IIS specification of panel.

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9.0 Serviceability

The serviceability of this monitor should fulfill the requirements which are prescribed in UAW-0346 and must be checked with the check list UAT-0361.

Fig 1: Brightness and Uniformity measure points

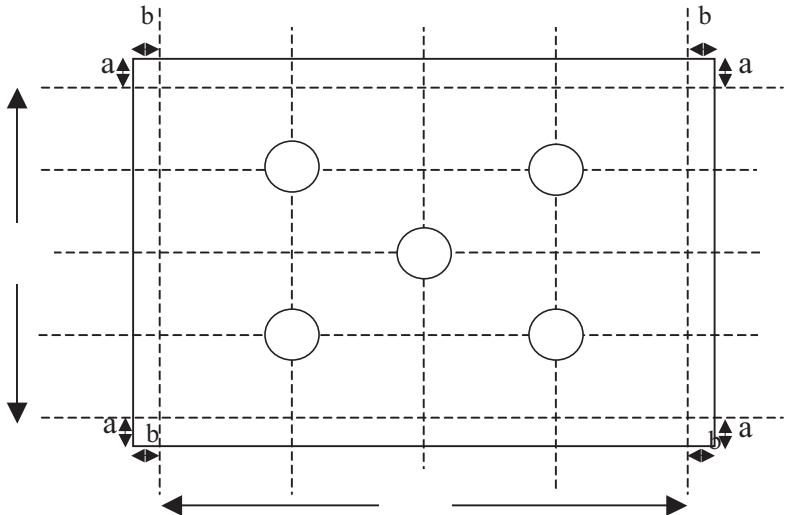


Table 1.

NAFTA TV Channels
US- Air broadcast channel

Broadcast Channel	Video Carrier (MHz)	Audio Carrier (MHz)	Range (MHz)
2	55.25	59.75	54-60
3	61.25	65.75	60-66
4	67.25	71.75	66-72
5	77.25	81.75	76-82
6	83.25	87.75	82-88
7	175.25	179.75	174-180
8	181.25	185.75	180-186
9	187.25	191.75	186-192
10	193.25	197.75	192-198
11	199.25	203.75	198-204
12	205.25	209.75	204-210
13	211.25	215.75	210-216
14	471.25	475.75	470-476
15	477.25	481.75	476-482
16	483.25	487.75	482-488
17	489.25	493.75	488-494

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18	495.25	499.75	494-500
19	501.25	505.75	500-506
20	507.25	511.75	506-512
21	513.25	517.75	512-518
22	519.25	523.75	518-524
23	525.25	529.75	524-530
24	531.25	535.75	530-536
25	537.25	541.75	536-542
26	543.25	547.75	542-548
27	549.25	553.75	548-554
28	555.25	559.75	554-560
29	561.25	565.75	560-566
30	567.25	571.75	566-572
31	573.25	577.75	572-578
32	579.25	583.75	578-584
33	585.25	589.75	584-590
34	591.25	595.75	590-596
35	597.25	601.75	596-602
36	603.25	607.75	602-608
37	609.25	613.75	608-614
38	615.25	619.75	614-620
39	621.25	625.75	620-626
40	627.25	631.75	626-632
41	633.25	637.75	632-638
42	639.25	643.75	638-644
43	645.25	649.75	644-650
44	651.25	655.75	650-656
45	657.25	661.75	656-662
46	663.25	667.75	662-668
47	669.25	673.75	668-674
48	675.25	679.75	674-680
49	681.25	685.75	680-686
50	687.25	691.75	686-692
51	693.25	697.75	692-698
52	699.25	703.75	698-704
53	705.25	709.75	704-710
54	711.25	715.75	710-716
55	717.25	721.75	716-722
56	723.25	727.75	722-728
57	729.25	733.75	728-734
58	735.25	739.75	734-740
59	741.25	745.75	740-746
60	747.25	751.75	746-752
61	753.25	757.75	752-758
62	759.25	763.75	758-764
63	765.25	769.75	764-770
64	771.25	775.75	770-776
65	777.25	781.75	776-782
66	783.25	787.75	782-788
67	789.25	793.75	788-794
68	795.25	799.75	794-800
69	801.25	805.75	800-806

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US-Cable channel

Cable Channel	Video carrier MHz	Audio carrier MHz	Range MHz
2	55.25	59.75	54-60
3	61.25	65.75	60-66
4	67.25	71.75	66-72
1	73.25	77.75	72-78
5	79.25	83.75	76-82
6	85.25	89.75	82-88
95	91.25	95.75	90-96
96	97.25	101.75	96-102
97	103.25	107.75	102-108
98	109.25	113.75	108-114
99	115.25	119.75	114-120
14	121.25	125.75	120-126
15	127.25	131.75	126-132
16	133.25	137.75	132-138
17	139.25	143.75	138-144
18	145.25	149.75	144-150
19	151.25	155.75	150-156
20	157.25	161.75	156-162
21	163.25	167.75	162-168
22	169.25	173.75	168-174
7	175.25	179.75	174-180
8	181.25	185.75	180-186
9	187.25	191.75	186-192
10	193.25	197.75	192-198
11	199.25	203.75	198-204
12	205.25	209.75	204-210
13	211.25	215.75	210-216
23	217.25	221.75	216-222
24	223.25	227.75	222-228
25	229.25	233.75	228-234
26	235.25	239.75	234-240
27	241.25	245.75	240-246
28	247.25	251.75	246-252
29	253.25	257.75	252-258
30	259.25	263.75	258-264
31	265.25	269.75	264-270
32	271.25	275.75	270-276
33	277.25	281.75	276-282
34	283.25	287.75	282-288
35	289.25	293.75	288-294
36	295.25	299.75	294-300
37	301.25	305.75	300-306
38	307.25	311.75	306-312
39	313.25	317.75	312-318
40	319.25	323.75	318-324
41	325.25	329.75	324-330
42	331.25	335.75	330-336
43	337.25	341.75	336-342
44	343.25	347.75	342-348
45	349.25	353.75	348-354

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47	361.25	365.75	360-366
48	367.25	371.75	366-372
49	373.25	377.75	372-378
50	379.25	383.75	378-384
51	385.25	389.75	384-390
52	391.25	395.75	390-396
53	397.25	401.75	396-402
54	403.25	407.75	402-408
55	409.25	413.75	408-414
56	415.25	419.75	414-420
57	421.25	425.75	420-426
58	427.25	431.75	426-432
59	433.25	437.75	432-438
60	439.25	443.75	438-444
61	445.25	449.75	444-450
62	451.25	455.75	450-456
63	457.25	461.75	456-462
64	463.25	467.75	462-468
65	469.25	473.75	468-474
66	475.25	479.25	474-480
67	481.25	485.75	480-486
68	487.25	491.75	486-492
69	493.25	497.75	492-498
70	499.25	503.75	498-504
71	505.25	509.75	504-510
72	511.25	515.75	510-516
73	517.25	521.75	516-522
74	523.25	527.75	522-528
75	529.25	533.75	528-534
76	535.25	539.75	534-540
77	541.25	545.75	540-546
78	547.25	551.75	546-552
79	553.25	557.75	552-558
80	559.25	563.75	558-564
81	565.25	569.75	564-570
82	571.25	575.75	570-576
83	577.25	581.75	576-582
84	583.25	587.75	582-588
85	589.25	593.75	588-594
86	595.25	599.75	594-600
87	601.25	605.75	600-606
88	607.25	611.75	606-612
89	613.25	617.75	612-618
90	619.25	623.75	618-624
91	625.25	629.75	624-630
92	631.25	635.75	630-636
93	637.25	641.75	636-642
94	643.25	647.75	642-648
100	649.25	653.75	648-654
101	655.25	659.75	654-660
102	661.25	665.75	660-666
103	667.25	671.75	666-672
104	673.25	677.75	672-678
105	679.25	683.75	678-684
106	685.25	689.75	684-690



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108	697.25	701.75	696-702
109	703.25	707.75	702-708
110	709.25	713.75	708-714
111	715.25	719.75	714-720
112	721.25	725.75	720-726
113	727.25	731.75	726-732
114	733.25	737.75	732-738
115	739.25	743.75	738-744
116	745.25	749.75	744-750
117	751.25	755.75	750-756
118	757.25	761.75	756-762
119	763.25	767.75	762-768
120	769.25	773.75	768-774
121	775.25	779.75	774-780
122	781.25	785.75	780-786
123	787.25	791.75	786-792
124	793.25	797.75	792-798
125	799.25	803.75	798-804

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On Screen Display

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PC MODE			
1st Layer	2nd Layer	3rd Layer	
PICTURE			
	COLOR TEMP	NORMAL COOL WARM	
	BRIGHTNESS CONTRAST		
	AUTO ADJUST	YES IN PROGRESS STORE?	YES NO
	MANUAL ADJUST	PHASE CLOCK HORIZONTAL VERTICAL	
AUDIO			
	AUTO SOUND	PERSONAL VOICE MUSIC THEATRE	
	SETTINGS	TREBLE BASS BALANCE	
	STEREO		
	INCREDIBLE SURROUND	INCREDIBLE SURROUND OFF	
	AVL	OFF ON	
FEATURES			
	PICTURE FORMAT	FULLSCREEN 4:3	
	PIP	SIZE	OFF SMALL LARGE PBP
		VIDEO	TV AV1 AV2 S-VIDEO COMPONENT
		AUDIO	PC PIP
		DISPLAY	ICON1 ICON2 ICON3 ICON4
INSTALL			
	LANGUAGE	ENGLISH FRANçAIS ESPAñOL PORTUGUÊS	
	FACTORY RESET	NO YES	

TV / AV / S-VIDEO / HDTV MODE				
1st Layer	2nd Layer	3rd Layer	4th Layer	5th Layer
PICTURE				
	AUTO PICTURE	PERSONAL RICH NATURAL SOFT MULTIMEDIA		
	BRIGHTNESS COLOR CONTRAST SHARPNESS TINT			
AUDIO				
	AUTO SOUND	PERSONAL VOICE MUSIC THEATRE		
	SETTINGS	TREBLE BASS BALANCE		
	STEREO	STEREO SAP MONO		
	INCREDIBLE SURROUND	OFF INCREDIBLE SURROUND		
	AVL	OFF ON		

FEATURES					
	PICTURE FORMAT	WIDESCREEN 4:3 ZOOM 14:9 ZOOM 16:9 SUBTITLE ZOOM SUPER WIDE	(4:3) (HD 4:3)		
	PICTURE ALIGNMENT				
	AUTO LOCK	LOCK PROGRAM			
		CHANGE CODE	YES		
		CLEAR ALL	ON OFF		
		BLOCK OPTION	ON OFF		
		MOVIE RATING	G PG PG13 R NC17 X	ON/OFF ON/OFF ON/OFF ON/OFF ON/OFF ON/OFF	
		TV RATING	Y	ON/OFF	
			Y7		BLOCK ON/OFF FV ON/OFF
			G	ON/OFF	
			PG		BLOCK ON/OFF V ON/OFF S ON/OFF L ON/OFF D ON/OFF
			14		BLOCK ON/OFF V ON/OFF S ON/OFF L ON/OFF D ON/OFF
			MA		BLOCK ON/OFF V ON/OFF S ON/OFF L ON/OFF
	CLOSED CAPTION	CAPTION MODE	CC1 CC2 CC3 CC4 TXT1 TXT2 TXT3 TXT4 CC MUTE		
		CC DISPLAY	ON OFF		
	COLOR TEMP	NORMAL COOL WARM			
INSTALL					
	LANGUAGE	ENGLISH FRANçAIS ESPAñOL PORTUGUêS			
	TUNER MODE	ATENNA CABLE			

◀◀ Go to cover page

NO VIDEO INPUT

This screen appears if there is no video signal input. Please check that the signal is properly connected to the video card of PC and make sure PC is on

ATTENTION
NO VIDEO INPUT

Access Aging.. Mode

Step 1 : Select the source "PC" and then turn off LCD-TV, and disconnect Interface Cable between Monitor and PC.

Step 2 : [Push "power " button and then push the "VOL- " and "VOL+" buttons at the same time immediately and hold it] untill comes out " AGING screen" then release all buttons.

Bring up:



After 55 seconds, bring up:



After 5 seconds, bring up:



After 55 seconds, bring up:



repatly

Connect Signal cable again=> go back to normal display

Warning Message

ME5P 23"

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OUT OF RANGE

CANNOT DISPLAY THIS VIDEO MODE, CHANGE
COMPUTER DISPLAY INPUT TO 1024 X 768 @ 60 Hz

NO VIDEO INPUT

NO VIDEO INPUT

OSD LOCK

OSD MAIN MENU LOCKED

OSD MAIN MENU UNLOCKED

Factory Mode

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Access factory. Mode

how to get into factory mode menu

Step 1 : Select the source "PC" and then turn off LCD-TV.

Step 2 : [Push "power " button and then push the "VOL- " and "VOL+" buttons at the same time immediately and hold it] about five seconds then release all buttons.

Press "menu"button and bring up factory mode indication as shown in Fig.1

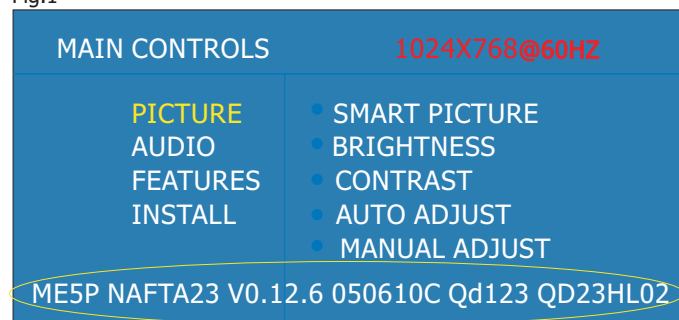


Fig.1



Use the CHNNEL- and CHNNEL+ to select the "ME5P NAFTA20 V0.45.1 050527 AU20SVGA" and then press the "VOL +" button

Menu Item	Description
Scalar Gain R G B	Scalar Gain for Normal/Warm/Cool in PC mode.
Auto-Color	Adjust color from received signal (either in PC or HDTV mode).
ADC Offset R G B	Adjust AD 9883 for PC ADC offset.
ADC Gain R G B	Adjust AD 9883for PC ADC gain.
PC Offset R G B	PC analog scalar offset.
711X SDTV Brightness	Adjust SA 7119 SDTV brightness.
711X SDTV SAT.	Adjust SA 7119 SDTV saturation.
711X SDTV Contrast	Adjust SA 7119 SDTV contrast.
711X SDTV TINT	Adjust SA 7119 SDTV tint (hue).
TV Shift H V	Adjust TV screen position horizontally/vertically.
HD Shift H V	Adjust HDTV screen position horizontally/vertically.
Show Lock Message	Show OSD lock message.
HDTV ADC Offset R G B	Adjust AD 9883 for HDTV ADC offset.
HDTV ADC Gain R G B	Adjust AD 9883 for HDTV ADC gain.
Video Scalar Gain R G B	Adjust scalar gain for Video mode.
Scalar Hue	Adjust scalar hue.

No Power

- .Check the TV power cord. Disconnect the power cord from the power outlet for 10 seconds, then reinsert the plug into the outlet. Press POWER to turn on the TV again.
- .Make sure the outlet is not on a wall switch.
- .Make sure a fuse has not blown at the power outlet.

No Picture

- .Check the antenna or Cable TV connections. Connect the antenna or Cable TV signal securely to the TV's 75ohm jack on the rear of the TV.
 - .Set TUNER MODE correctly. Details are on page 15.
 - .Activate AUTO PROGRAM to find all available channels.
- In case you hear only sound and don't see any picture in S-Video or Video (CVBS) mode. Please check if you have connected Video signal to S-Video or Video (CVBS) input. Only one of the two video inputs can be connected to sound. This means that the same sound can be heard in S-Video and Video (CVBS) mode.

No Sound

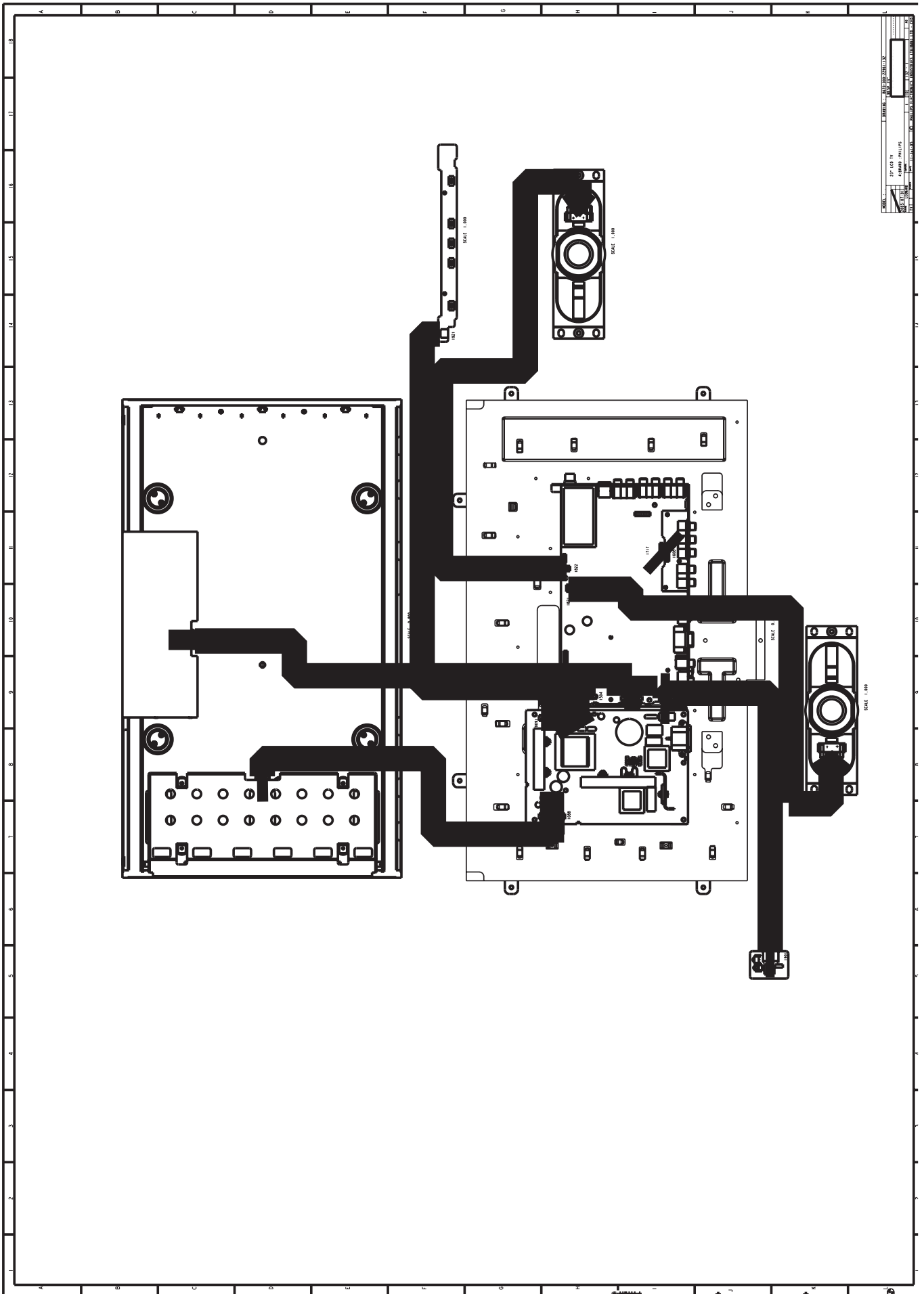
- .Press the VOL+ and VOL- buttons to adjust the volume.
 - .Press the MUTE button on the remote control to cancel or restore the volume.
 - .If you have connected other equipment to the TV (such as a VCR or DVD Player), make sure the audio cables are connected securely between the TV and the other equipment.
 - .Check the SOUND settings.
 - .In case you hear wrong sound in S-Video or Video (CVBS) mode. Please check if you have connected the right sound signal to AV in (S-Video or Video input). Only one of the two video inputs can be connected to sound, but both video signals can be connected. This means that only one of the two sound inputs can be heard in S-Video and Video (CVBS) mode.
- ### Remote Control does not work.
- .Check the batteries. If necessary, replace them with two AAA heavy duty (zinc chloride) or alkaline batteries.
 - .Clean the remote control as well as the remote control sensor on the front of the TV.
 - .Check the TV power cord. Disconnect the power cord from the power outlet for 10 seconds, then reinsert the plug into the outlet. Press POWER to turn on the TV again.
 - .Make sure the outlet is not on a wall switch.
 - .Make sure a fuse has not blown at the power outlet.
 - .Always point the remote control toward the front of the TV (toward the remote sensor).
 - .Make sure that you use the supplied Magnavox Remote control, only the supplied Magnavox Remote control can be used with this LCD-TV set.
- ### TV displays wrong channel or no channels.
- .Repeat channel selection.
 - .Add the channel number(s) into the TV's memory. Use STORE.
 - .Make sure TUNER MODE is set correctly.
- Then activate AUTO PROGRAM to set up all available channels.

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Quick reference for failure mode of LCD panel

this page presents problems that could be made by LCD panel.
It is not necessary to repair circuit board. Simply follow the mechanical instruction on this manual to eliminate failure by replace LCD panel.

Failure description	Phenomenon		
		Polarizer has bubbles	
Vertical block defect		Polarizer has bubbles	
Vertical dim lines			
Vertical lines defect (Always bright or dark)		Foreign material inside polarizer. It shows liner or dot shape.	
Horizontal block defect		Concentric circle formed	
Horizontal dim lines		Bottom back light of LCD is brighter than normal	
Horizontal lines defect (Always bright or dark)		Back light un-uniformity	
Has bright or dark pixel		Backlight has foreign material. Black or white color, liner or circular type	



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Front View



Fig.1

Back View



Fig.2

1. Remove the base & back cover
 - Remove the three screws 1,2,3 as shown in Fig.3, then remove the base.
 - Remove the other screws as shown in Fig.3 and Fig.4, then remove the back cover



Fig.3



Fig.4

4. Remove the metal frame board
 - Remove the screws as shown in Fig.6-8
 - Remove the metal frame board as Fig.9



Fig.5

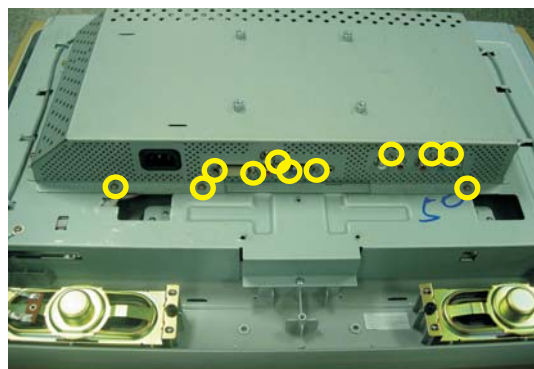


Fig.6



Fig.7

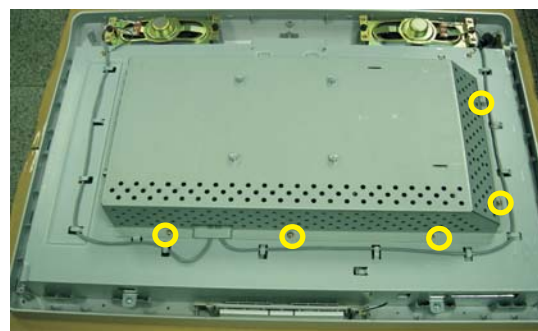


Fig.8



Fig.9

5. Remove all PCB
 - Remove all screws as shown in Fig.10
 - Remove all PCB as shown in Fig.11

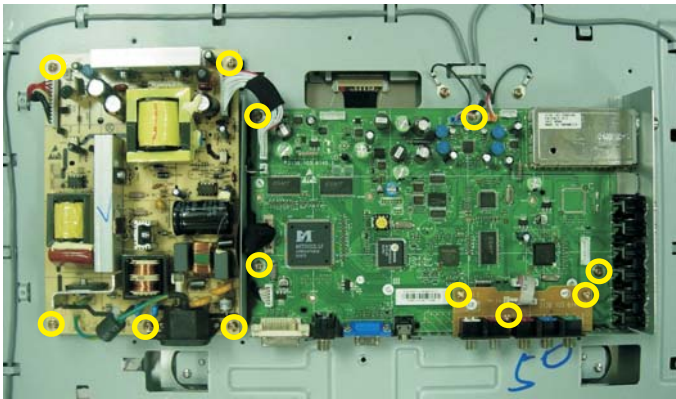


Fig.10

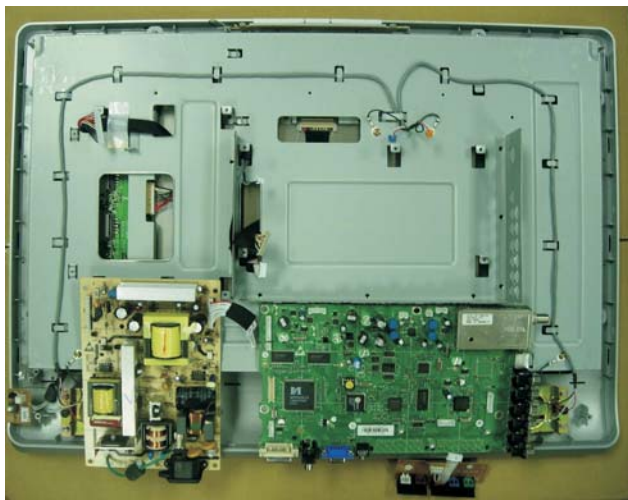


Fig.11

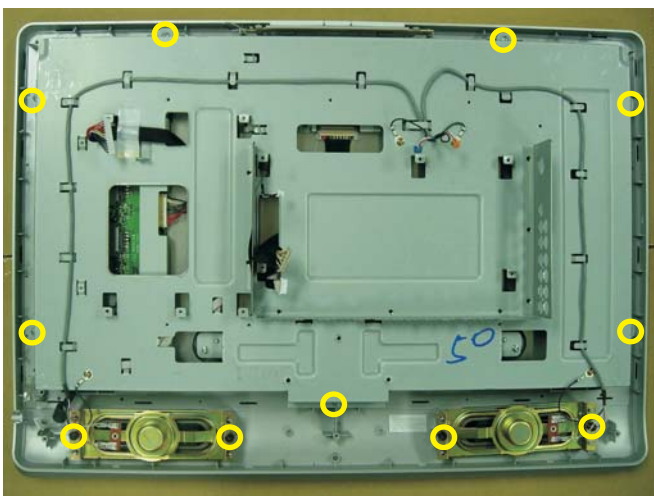


Fig.12

6. Remove the speakers and the panel from the bezel
 - Remove the screws as shown in Fig.12
 - Remove the speakers from the bezel
 - Remove the panel from the bezel

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1. General points

1.1 During the test and measuring, supply a distortion free AC mains voltage to the apparatus via an isolated transformer with low internal resistance.

1.2 All measurements mentioned hereafter are carried out at a normal mains voltage (90 - 132 VAC for NAFTA version, 195 -264 VAC for EUROPEAN AP version, or 90 - 264 VAC for the model with full range power supply, unless otherwise stated.)

1.3 All voltages are to be measurement or applied with respect to ground, unless otherwise stated.

1.4 The test has to be done on a complete set including LCD panel in a room with temperature of 25 +/- 5 degree C.

1.5 All values mentioned in these test instruction are only applicable of a well aligned apparatus, with correct signal.

1.6 The letters symbols (B) and (S) placed behind the test instruction denotes

(B): carried out 100% inspection at assembly line

(S): carried out test by sampling

1.7 The white balance (color temperature), has to be tested in subdued lighted room.

1.8 Repetitive power on/off cycle are allowed except it should be avoided within 6 sec.

2. Input and output signal

2.1.1 PC Signal type

Analog Video : 15 pin D-sub ,0.7 Vp-p linear, positive polarity

Separate Sync. : TTL level, separate, positive or negative polarity

Audio signal : 3.5mm stereo mini-jack

Level: Nominal : 0.5 V rms.

- Maximum : 1.5 V rms.

- Impedance > 10 kohm

Signal source: pattern generator format as attachment

(table 1 to 5) Reference generator : CHROMA 2200 or 2250

2.1.2 TV Signal type

RF Signal : Aerial input / 10mV(80dBuV)

Video signal : Video(RCA jack, CVBS input) / 1Vpp (300mV-sync, 700mV-video.)

S video input / 1VppY-signal, 300mVpp C-signal

COMP Video(RCA jack , YPbPr input) / 1Vpp,Y signal , 350mVpp Pb , Pr signal

DVI : Digital interface with 4 channels TMDS signal

Audio signal : Audio (1) R/L(RCA jack) for AV IN1 (share with Video and S-video1).

Level: - Nominal : 0.5 V rms.

- Maximum : 1.5 V rms.

- Impedance > 10 kohm

Audio (2) R/L (RCA jack)for AV IN2 (share with Video2 and Comp video).

Level: - Nominal : 0.5 V rms.

- Maximum : 1.5 V rms.

- Impedance > 10 kohm

Audio (3) R/L(RCA jack) for DVI IN.

Level: - Nominal : 0.5 V rms.

- Maximum : 1.5 V rms.

- Impedance > 10 kohm

2.1.3 PVR output (CVBS output):

Video: CVBS output 1Vpp / Impedance : 75ohm

Audio: R/L output (from CVBS)

Level: - Nominal : 0.5 V rms.

- Maximum : 1.5 V rms.

- Impedance < 1 kohm

2.2 PC Input signal mode

2.2.1 PRESET VIDEO RESOLUTION

The analogue color LCD monitor must be capable of displaying standard resolutions within the vertical frequency range of 58 – 63 Hz, and horizontal scan range of 30 - 50 KHz . Use the CHROMA-2250 generator as the standard signal timing source.

The standard signal timing table:						
Dot rate (MHz)		H.freq (KHz)	Mode	Resolution	V.freq (Hz)	Remark
1	25.175	31.469	IBM VGA	640 * 480	59.940	
2	36.000	35.156	VESA	800 * 600	56.250	
3	40.000	37.879	VESA	800 * 600	60.317	
4	65.000	48.363	VESA	1024 * 768	60.004	
5	74.500	44.772	WXGA	1280 * 720	59.855	CVT
5	79.500	47.776	WXGA	1280 * 768	59.87	CVT

Resolution recommend on 1280 X 768 @ 60Hz

2.3 TV input signal Channel and pattern for NAFTA model (Table1)

Signal Distribution Table (NTSC)

CH	Frequency Carriers		TV System	Pattern
	Video	Sound		
A 03	61.25MHz	65.75MHz	NTSC M	Color Circle
A 06	83.25MHz	87.75MHz	NTSC M	Red Raster
A 09	187.25MHz	191.75MHz	NTSC M	Circle Pattern
A 11	199.25MHz	203.75MHz	NTSC M	Cross Hatch
A 13	211.25MHz	215.75MHz	NTSC M	Two White Window
A 52	699.25MHz	703.75MHz	NTSC M	Color Bar
A 69	801.25MHz	805.75MHz	NTSC M	100% White
C 70	499.25MHz	503.75MHz	NTSC M	Checkerboard

Table 1

2.4 HD input mode

2.4.1 HD detail timing

(For Quantune Data setting with Q801GD or 802G in YpbPr mode)

Item	1920X1080i 60Hz	1280X720P 60Hz	1920X1080i 50Hz	1280X720P 50Hz
Pixel rate	74.25MHz (13.468 ns)	74.25MHz (13.468 ns)	74.25MHz (13.468ns)	74.25MHz (13.468 ns)
Horizontal Frequency	33.75KHz	45KHz	28.125KHz	37.5KHz
Active	1920 pixels (25.859 us)	1280 pixels (17.239 us)	1920 pixels (25.859 us)	1280 pixels (17.239 us)
Blank	280 pixels (3.771 us)	370 pixels (4.983 us)	720 pixels (9.697 us)	700 pixels (9.428 us)
Period	2200 pixels (29.630 us)	1650 pixels (22.222 us)	2640 pixels (35.556 us)	1980 pixels (26.667 us)
Pulse delay	44 pixels (0.593 us)	70 pixels (0.943 us)	484 pixels (6.519 us)	400 pixels (5.387 us)
Pulse width	44 pixels (0.593 us)	40 pixels (0.539 us)	44 pixels (0.593 us)	40 pixels (0.539 us)
Vertical Frequency	60 Hz	60 Hz	50 Hz	50 Hz
Active	1080 lines (32.000 ms)	720 lines (16.0 ms)	1080 lines (38.4 ms)	720 lines (19.2 ms)
Blank	45 lines (1.333 ms)	30 lines (0.667 ms)	45 lines (1.6 ms)	30 lines (0.8 ms)
Period	1125 lines (33.333 ms)	750 lines (16.667 ms)	1125 lines (40 ms)	750 lines (20 ms)
Pulse delay	2 lines (0.059 ms)	5 lines (0.111 ms)	2 lines (0.071 ms)	5 lines (0.133 ms)
Pulse width	5 lines (0.148 ms)	5 lines (0.111 ms)	5 lines (0.178 ms)	5 lines (0.133 ms)
EQ before	0 line	0 line	0 line	0 line
EQ after	1 line	0 line	1 line	0 line
Scan	Interlace	Progressive	Interlace	Progressive
Sync type	ACS	ACS	ACS	ACS
Video kind	Analog YPbPr (ITU-R BT.709)	Analog YPbPr (ITU-R BT.709)	Analog YPbPr (ITU-R BT.709)	Analog YPbPr (ITU-R BT.709)

Item	720X576P 50Hz	720X480P 60Hz	720X576i 50Hz	720X480i 60Hz
Pixel rate	27 MHz (37.037 ns)	27.027MHz (37.000 ns)	13.5MHz (74.074 ns)	13.5MHz (74.074 ns)
Horizontal Frequency	31.25 KHz	31.5KHz	15.625KHz	15.734KHz
Active	720 pixels (26.667 us)	720 pixels (26.640 us)	720 pixels (53.333 us)	720 pixels (53.333 us)
Blank	144 pixels (5.333 us)	138 pixels (5.106 us)	144 pixels (10.667 us)	138 pixels (10.222 us)
Period	864 pixels (32.000 us)	858 pixels (31.746 us)	864 pixels (64.00 us)	858 pixels (63.556 us)
Pulse delay	12 pixels (0.444 us)	16 pixels (0.592 us)	12 pixels (0.889 us)	19 pixels (1.407 us)
Pulse width	64 pixels (2.370 us)	62 pixels (2.294 us)	63 pixels (4.667 us)	62 pixels (4.593 us)
Vertical Frequency	50 Hz	60 Hz	50 Hz	59.94 Hz
Active	576 lines (18.432 ms)	480 lines (15.238 ms)	576 lines (36.864 ms)	480 lines (30.507 ms)
Blank	49 lines (1.568 ms)	45 lines (1.429 ms)	49 lines (3.136 ms)	45 lines (2.860 ms)
Period	625 lines (20.000 ms)	525 lines (16.667 ms)	625 lines (40 ms)	525 lines (33.367 ms)
Pulse delay	5 lines (0.160 ms)	9 lines (0.287 ms)	2 lines (0.128 ms)	4 lines (0.254 ms)
Pulse width	5 lines (0.160 ms)	6 lines (0.190 ms)	3 lines (0.192 ms)	3 lines (0.191 ms)
EQ before	0 line	0 line	2 line	3 line
EQ after	0 line	0 line	2 line	3 line
Scan	Progressive	Progressive	Interface	Interface
Sync type	ACS	ACS	ACS	ACS
Video kind	Analog YPbPr (SMPTE RP177)	Analog YPbPr (SMPTE RP177)	Analog YPbPr (SMPTE RP177)	Analog YPbPr (SMPTE RP177)

3. Power supply

Table 2

3.1 Setup the AC I/P at 264 VAC and 90VAC , and power board provide two DC Output

1. The DC output voltage is 24V +/- 1V DC for Inverter and Scaler board

Measured point between pin3(+24V) and pin6(GND) at item 1001 of scaler board

2. The DC output voltage is 16V +/- 1 V DC for Scaler and Audio board
Measured point between pin1(+16V) and pin6(GND) at item 1001 of scaler board

3.2 Any adjustment is not needed.

4. TV Mode display adjust

The adjustment process must be primary with TV mode

4.1 White balance adjustment (B)

4.1.1 General set-up :

Equipment Requirements: Color analyzer.

Input requirements:

Input Signal Type : RF signal

- Set to NTSC system, frequency=187.25MHz (for NAFTAmode) with white pattern of 100%
- Select smart picture to PERSONAL MODE and check the x, y data.

Input Signal Strength : 10mV (80 dBuV) terminal voltage.

Input Injection Point : TV Tuner input

Alignment method:

Initial Set-up :

- Set TV(7119) Brightness=134; Saturate =58, Contrast =64, Tint=24 in Factory mode
- Set Smart picture as [Personal] (Brightness=56; Saturate =62, Contrast =68, Sharpness=50, Tint=50)
- Apply [100% Full White] pattern by TV pattern generator.

Alignment :

- Keep Gain R of video SCALER GAIN equals to 131
- Adjust the VIDEO SCALER GAIN RG B in Factory Mode [NORMAL] (See Fig 1.)
[Enter factory menu : press VOL+ and VOL- keys together around six seconds]

- Check (X, Y) co-ordinates as below:

	Normal/ (8500°K)
x (center)	0.292 ± 0.015
y (center)	0.293 ± 0.015

Table 3: Reading with Minolta CA-110.

2. Check Gain R of video SCALER GAIN, It shall be R=131

3. Check the gray pattern should be distinguish and color bar is correct

4.1.2 Set TV Color temperature in Factory mode as [WARM], and [COOL]

The VIDEO SCALER GAIN R/G/B value will be followed below

	Normal	WARM	COOL
R gain	131	131	131
G gain	G	G-4	G+1
B gain	B	B-10	B+12

FACTORY ADJUST MENU

ORIGINAL PANNEL COLOR

SCALER GAIN R G B
 AUTO-COLOR (OK)
 ADC OFFSET R G B
 ADC GAIN R G B
 PC OFFSET R G B
 7119 SDTV ? SAT TINT
 DVI SHIFT H V
 TV SHIFT H V
 HD SHIFT H V
 ■ SHOW LOCK MESSAGE
 HDTV ADC OFFSET R G B
 HDTV ADC GAIN R G B
 VIDEO SCALER GAIN R G B
 SCALER HUE

Value

EXIT

5. PC mode Display Adjustment

5.1 Display quality adjustment

Use timing mode as describe in 2.2, and use the POPO (pixel on pixel off) pattern to adjust the clock until no stripe and adjust the phase until clear picture. Check all pre-set 6 modes.

5.2 WHITE-D adjustment (B)

5.2.1 At factory mode apply 1280X768 @60Hz mode with 32 gray pattern. Set smart picture at [Normal], and Brightness to 90% and Contrast to 50%. Press AUTO-COLOR function for auto ADC offset and gain setup.

5.2.2 Adjustment

- Apply a 1280*768 / 60Hz signal with full white pattern, set brightness control at 90%, and contrast control at 50%.
- Keep Gain R of scaler gain R G B equals to 131, then adjusting scaler gain R G B.
- Check (X, Y) co-ordinates as below:

	Normal/ (8500°K)
x (center)	0.292 ± 0.020
y (center)	0.293 ± 0.020

Table 4: Reading with Minolta CA-110.

4. Check Gain R of video SCALER GAIN, It shall be R=131

5. Check the gray level color poor & noise condition and chromaticity

Note: 1. Use Minolta CA-110 for color coordinates and luminance check.

2. Luminance > 400 cd/m² in the center of the screen at (NORAML)color and PC Brightness control; Contrast control at 100%

5.2.3 Set Smart picture as [WARM], and [COOL]

The SCALER GAIN R/G/B value will be followed below

	Normal	WARM	COOL
R gain	131	131	131
G gain	G-3	G-7	G-3
B gain	B-5	B-16	B+9

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5.3 Check the digital interface cable (B)

Check the 64 gray level color poor & noise condition.

6. HDTV Mode display adjust

6.1 White balance adjustment (B)

General set-up:

Equipment : Quantum Data Pattern Generator 801GD or 802G.

Apply 1080i, RGBW(177=Infocus2) gray pattern.



Or FLUKE 54200, apply 576i, DIGITAL SCAN/DIGI_ADC1 pattern.



Alignment method:

Initial Set-up : 1.Set Smart picture as [Personal] (Brightness=56, Color=62, Contrast=68, Sharpness=50, Tint=50 for ONLY Factory Alignment)

2.Press AUTO-COLOR process.

Alignments :

1.Set HD VIDEO SCALER GAIN R/G/B = the following table

For Normal, Cool and Warm color temperature.

Note: The G1 and B1 are TV's VIDEO SCALER GAIN G/B

	Normal.	WARM	COOL
R gain	131	131	131
G gain	G	G -5	G+1
B gain	B+3	B-8	B+14

2. Apply 100% Full White pattern by Quantum DATA 802G pattern generator.

Check (X, Y) co-ordinates as below:

	Normal/ (8500°K)
x (center)	0.292 ± 0.020
y (center)	0.293 ± 0.020

If chromaticity (X, Y) co-ordinates is out of specification, re-alignment Video scalar R/G/B gain from 131/127/127.

2. Check the gray pattern should be distinguish and color bar is correct

7. Preset DVI HDCP Key

7.1 Download HDCP Key

The 284 bytes HDCP key should be download to the TV set via IF cable using ATE at factory Alignment tools

7.2 DVI Video HDCP Key Test

7.2.1 Use pattern generator

Equipment: Quantum 802R or 802BT or equivalent equipments.

Pattern : Standard HDCP Pattern (It's color bar)

Timing : 720 X 480P 60Hz

720 X 576P 50Hz

1280X 720P 50Hz

1280X 720P 60Hz

1920X1080i 50Hz

1920X1080i 60H

Result : The PASS information should be shown on the screen.

7.2.2 Use DVD Player:

Equipment: 1.Pioneer (model: DV-S969AVi) or equivalent equipments.

2.DVD disk with Macro Vision protection.

Result : The picture should be shown Normally.

8. Preset EEPROM data

EEPROM data has to be preset data according following table.

8.1 Factory mode preset.

Function	Preset value			
SCALER GAIN	131	127	127	
ADC Offset R/G/B	127	127	127	
ADC Gain R/G/B	127	127	127	
PC OFFset R/G/B	127	127	127	
7119 ? brightness	#1			
7119 Saturation	#1			
7119 contrast	#1			
7119 TINT	#1			
DVI SHIFT H	#2	#2		
DVI SHIFT V	#2	#2		
	NTSC	PAL-N		
TV shift H	Regular	175	186	
TV shift V		15	0	
HD SHIFT H		#3	#3	
HD SHIFT V		#3	#3	
HD ADC OFFset R G B	127	127	127	
HD ADC GAIN R G B	127	127	127	
Video Scaler Gain	131	127	127	
Scaler Hue		50		

#1

PERSONAL/ NORMAL	?	SAT.		TINT
TV	127	58	64	24
AV	127	58	64	24
S-Video	134	64	64	24
Component	134	70	62	--

#2

	480 P	576 P	720P /50Hz	720P /60Hz	1080i /50Hz	1080i /60Hz
DVI shift H	22	22	96	55	103	48
DVI shift V	44	50	40	40	60	60

#3

	480i	480P	576i	576P	720P /50Hz	720P /60Hz	1080i /50Hz	1080i /60Hz
HD shift H	155	154	167	167	108	107	79	79
HD shift V	39	40	49	53	39	39	58	58

8.2 Smart picture setting

RF	PERSONAL	RICH	NATURE	SOFT	MULTIMEDIA
Brightness	56	63	47	42	61
Color	62	58	52	50	67
Contrast	68	72	68	52	78
Sharpness	50	66	58	66	66
Tint	50	50	50	50	50

AV1/AV2/S-video	PERSONAL	RICH	NATURE	SOFT	MULTIMEDIA
Brightness	56	63	50	40	57
Color	62	60	52	50	70
Contrast	68	72	67	52	78
Sharpness	87	87	75	62	79
Tint	50	50	50	50	50

HD/Component	PERSONAL	RICH	NATURE	SOFT	MULTIMEDIA
Brightness	56	56	50	43	56
Color	64	64	60	60	75
Contrast	68	68	58	50	75
Sharpness	59	59	59	59	59
Tint	50	50	50	50	50

DVI	PERSONAL	RICH	NATURE	SOFT	MULTIMEDIA
Brightness	56	56	47	40	56
Color	64	75	70	70	85
Contrast	68	58	48	40	65
Sharpness	50	63	61	59	79
Tint	50	50	50	50	50

8.3 Smart sound setting

Smart Sound : Personal
 SOUND VOLUME : 50
 BASE : 50
 TREBLE : 50
 Balance : 0
 Virtuel SURROUND : OFF
 AVL : OFF

All Source Input	Voice	Theater	Music	Personal
EQ Band1 120Hz	-19	+25	+16	0
EQ Band2 500Hz	+25	+40	+30	0
EQ Band3 1.5KHz	+57	+10	-10	0
EQ Band4 5KHz	+17	+54	+56	0
EQ Band5 10KHz	+14	+56	+50	0

8.4 Out of Box Setting (B)

The OSD Controls shall have the following factory default values after finishing all the adjustment.

1. Volume= 50
2. Smart Sound = Theater
3. Smart Picture = RICH
4. RF Channel = Channel 2
5. Tuner Mode = Auto
6. Format = Wide Screen
7. incredible surround = off
8. AVL = off
9. color temp = Normal
10. language = English

Region	Model	Volume	Smart Sound	Smart Picture	RF Channel	Format	Virgin Mode Installation
NAFTA / LATAM	23PF5320/28	50	Theater	Rich	Channel 2 (Auto)	Wide Screen	N
	20PF5120/28	50	Theater	Rich	Channel 2 (Auto)	4 : 3	N
	15PF5120/28	50	Theater	Rich	Channel 2 (Auto)	4 : 3	N
CHINA	23PF5320/93	50	Theater	Rich	Channel 1	Wide Screen	N
	20TA1000/93	50	Theater	Rich	Channel 1	4 : 3	N
	15TA1000/93	50	Theater	Rich	Channel 1	4 : 3	N
AP	23PF5320/79, /98	50	Theater	Rich	Channel 1	Wide Screen	N
	20TA1000/79, /98	50	Theater	Rich	Channel 1	4 : 3	N
	15TA1000/79, /98	50	Theater	Rich	Channel 1	4 : 3	N

Display adjustment

◀◀ Go to cover page

Display adjustment

Access factory. Mode

how to get into factory mode menu

Step 1 : Select the source "PC" and then turn off LCD-TV.

Step 2 : [Push "power " button and then push the "VOL- " and "VOL+" buttons at the same time immediately and hold it] about five seconds then release all buttons.

Press "menu" button and bring up factory mode indication as shown in Fig.1

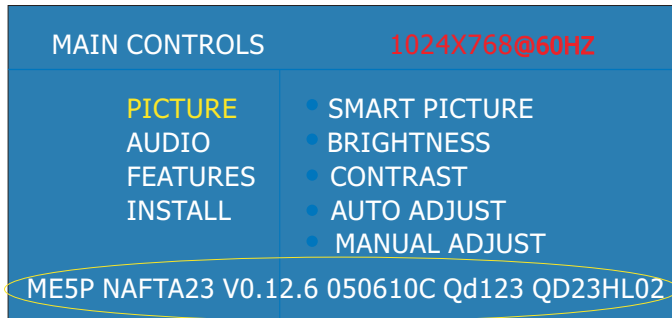


Fig. 1

Use the CHNNEL- and CHNNEL+ to select the "F1/FL1 NAFTA V1.01.05 041208 LG15XGA" and then press the "VOL +" button



Fig.2

PC mode WHITE-D adjustment (B)

1 Apply 1024X768/60Hz mode with 5 block pattern as Fig 3. Set main controls brightness control at 50% and contrast to 50% on User mode. Set color setting at natural color on User mode. Move cursor to "AUTO-color" item on factory mode, press "menu" key to active this function, then scaler will adjust RGB and Color RGB automatically by it self.

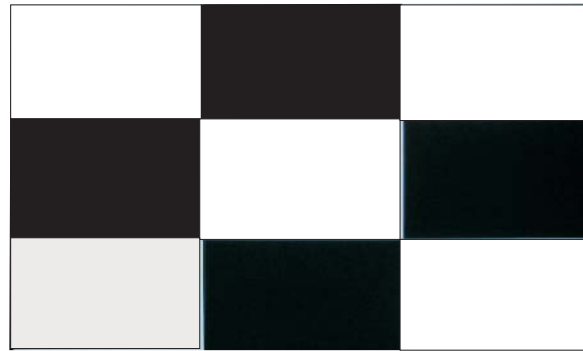


Fig.3

2. Apply a 1024x768/60Hz signal with white pattern. Set brightness control at 50% and contrast control at 50%. Adjust the R.G.B gain to reach special color temperature on center of screen.

2.1 Aim the probe CA-A30 at the center of screen as Fig. 4

2.2 Remove the lens protective cover of probe CA-A30.

2.3 Set Measuring/viewing selector to Measuring position for reset analyzer. (Zero calibration) as Fig. 5

2.4 Turn on the colour analyzer (CA-110).

2.5 Press 0-CAL button to start reset analyzer. See Fig. 6



Fig.4

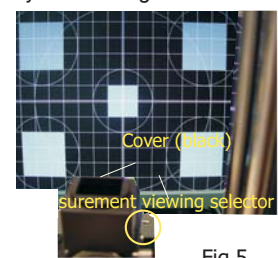


Fig.5

O-CAL

Fig.6



2.6 Switch light probe to Viewing position.

2.7 Move the Lens barrel forward or backward to get clear image as shown in Fig. 7

2.8 Switch light probe to Measuring position. It should be able to indicate colour value on the CA-110.

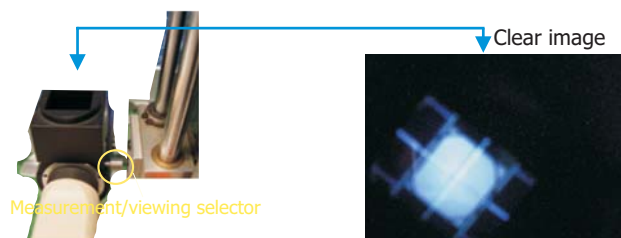


Fig.7

2.9 Set smart picture as "NORMAL"

Set SCALER GAIN R G B = VIDEO SCALER GAIN R G B(alignment done).

The 1931 CIE chromaticity (X, Y) co-ordinates shall be:

	Normal/
x (center)	0.292 ± 0.020
y (center)	0.293 ± 0.020

Readings with Minolta CA-110.

2.10 Set Smart picture as "WARM", and "COOL" The SCALER GAIN R G B =

	Normal/ the R\G\B are gain after alignment.	WARM	COOL
R gain	131	131	131
G gain	G-3	G -3	G -7
B gain	B-5	B -16	B+9

Safety Test Requirements

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All units that are returned for service or repair must pass the original manufactures safety tests. Safety testing requires both *HiPot* and *Ground Continuity* testing.

HI-POT TEST INSTRUCTION

1. Application requirements

- 1.1 All mains operated products must pass the Hi-Pot test as described in this instruction.
- 1.2 This test must be performed again after the covers have been refitted following the repair, inspection or modification of the product.

2. Test method

2.1 Connecting conditions

- 2.1.1 The test specified must be applied between the parallel-blade plug of the mainscord and all accessible metal parts of the product.
- 2.1.2 Before carrying out the test, reliable conductive connections must be ensured and thereafter be maintained throughout the test period.
- 2.1.3 The mains switch(es) must be in the "ON" position.

2.2 Test Requirements

All products should be HiPot and Ground Continuity tested as follows:

Condition	HiPot Test for products where the mains input range is Full range(or 220V AC)	HiPot Test for products where the mains input is 110V AC(USA type)	Ground Continuity Test requirement
Test voltage	2820VDC (2000VAC)	1700VDC (1200VAC)	Test current: 25A,AC Test time: 3 seconds(min.) Resistance required: $\leq 0.09 + R_{ohm}$, R is the resistance of the mains cord.
Test time (min.)	3 seconds	1 second	
Trip current (Tester)	set at 100 uA for Max. limitation; set at 0.1 uA for Min. Limitation	5 mA	
Ramp time (Tester)	set at 2 seconds		

2.2.1 The minimum test duration for Quality Control Inspector must be 1 minute.

2.2.2 The test voltage must be maintained within the specified voltage + 5%.

2.2.3 There must be no breakdown during the test.

2.2.4 The grounding blade or pin of mains plug must be conducted with accessible metal parts.

3. Equipments and Connection

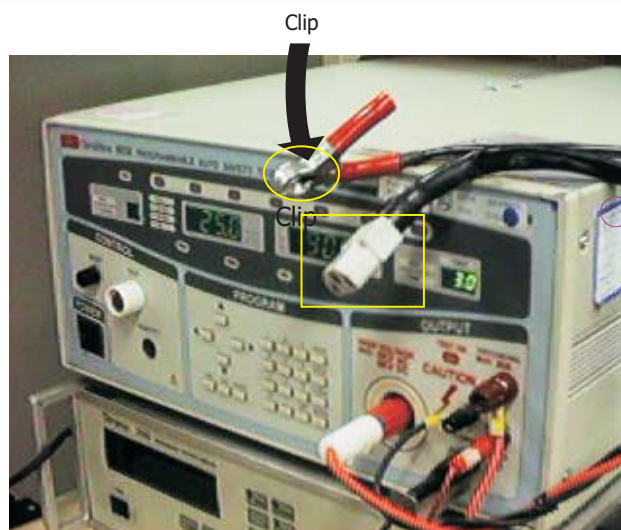
3.1. Equipments

For example :

- ChenHwa 9032 PROGRAMMABLE AUTO SAFETY TESTER
- ChenHwa 510B Digital Grounding Continuity Tester
- ChenHwa 901 (AC Hi-pot test), 902 (AC, DC Hi-pot test) Withstanding Tester

3.2. Connection

- * Turn on the power switch of monitor before Hipot and Ground Continuity testing.



(ChenHwa 9032 tester)

Video cable



Grounding screw



Power outlet

(Rear view of monitor)

Hipot and Ground Continuity testing records have to be kept for a period of 10 years.

General

DDC Data Re-programming

In case the DDC data memory IC or main EEPROM which storage all factory settings were replaced due to a defect, the serial numbers have to be re-programmed "Analog DDC IC, & EEPROM".

It is advised to re-soldered DDC IC and main EEPROM from the old board onto the new board if circuit board have been replaced, in this case the DDC data does not need to be re-programmed.

Additional information

Additional information about DDC (Display Data Channel) may be obtained from Video Electronics Standards Association (VESA). Extended Display Identification Data (EDID) information may be also obtained from VESA.

System and equipment requirements

1. An i486 (or above) personal computer or compatible.
2. Microsoft operation system Windows 95/98 .
You have to Install the EDID_PORT_Tool under Win2000/XP . As Fig. 1 .

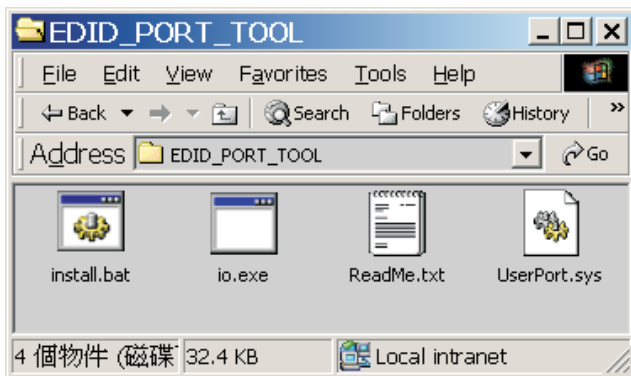


Fig. 1

- A. Copy the "UserPort.sys" to C:\WINNT\system32\drivers(win2000)
C:\WINDOWS\system32\drivers(winXP)
 - B. Running "io.exe" everytime, Before you start to programming edid data .
3. EDID45.exe program .
 4. DDC 2BI-ISP TOOL:

Inclusion :

- A. DDC2BI-ISP TOOL(3138 106 10396) x1 (as Fig. 2)
- B. Printer cable x1
- c. (D-Sub) to (D-Sub) cable x2
- D. D-SUB to DVI cable X1

Note: The EDID46.EXE is a windows-based program, which cannot be run in MS-DOS.



Fig. 2

Pin Assignment

The digital only connector contains 24 signal contacts organized in three rows of eight contacts. Signal pin assignments are listed in the following table:

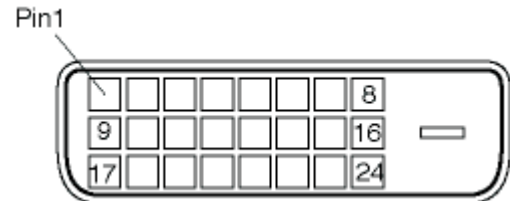


Fig. 3

Pin No.	Description
1	RX2-
2	RX2+
3	GND
4	GND
5	GND
6	DDC clock
7	DDC data
8	GND
9	RX1-
10	RX1+
11	GND
12	GND
13	GND
14	+5V
15	DVI-D self test
16	+5V
17	RX0-
18	RX0+
19	GND
20	GND
21	GND
22	GND
23	RXC+
24	RXC-

Fig. 4

PIN No.	SIGNAL
1	Red
2	Green
3	Blue
4	GND
5	Self test
6	Red GND
7	Green GND
8	Blue GND
9	+5V (Supply from PC)
10	Sync GND
11	GND
12	Bi-directional data
13	H-sync
14	V-sync
15	Data clock

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Configuration and procedure

There are 3 chips contained OSD string, serial number.etc on the circuit board, main EEPROM which storage all factory settings, OSD string. DDC IC which storage 128byte EDID data(serial number ..etc.). Following descriptions are the connection and procedure for Analog /Digital and main EEPROM can be re-programmed along with Analog/Digital IC by enable factory memory data write function on the DDC program (EDID45.EXE).

Initialize alignment box

In order to avoid that monitor entering power saving mode due to sync will cut off by alignment box, it is necessary to initialize alignment box before running programming software (EDID45.EXE). Following steps show you the procedures and connection.

Step 1: Supply 8-12V DC power source to the Alignment box by plugging a DC power cord or using batteries.

Step 2: Connecting printer cable and D-Sub cable of monitor as Fig. 5

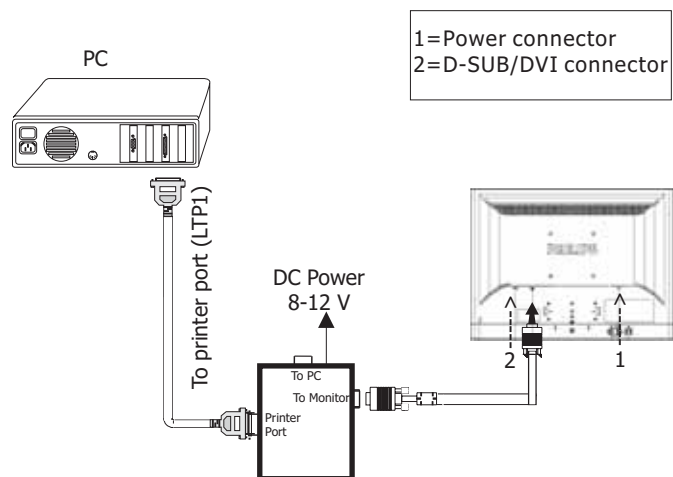


Fig. 5

Step 3: Installation of EDID45.EXE

Method 1: Start on DDC program

Start Microsoft Windows.

1. The Program "EDID45.EXE" in service manual cd-rom be copied to C:\.
2. Click **Start**, choose Run at start menu of Windows as shown in Fig. 6.

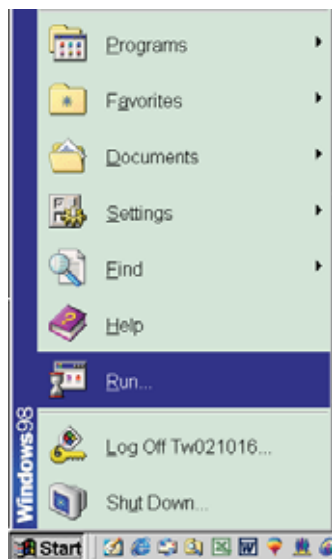


Fig. 6

3. At the submenu, type the letter of your computer's hard disk drive followed by :EDID45 (for example, C:\EDID45, as shown in Fig. 7).

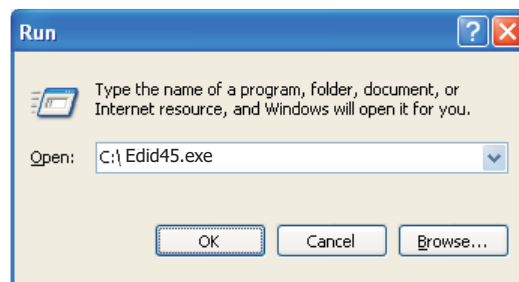


Fig. 7

4. Click OK button. The main menu appears (as shown in Fig. 8). This is for initialize alignment box.

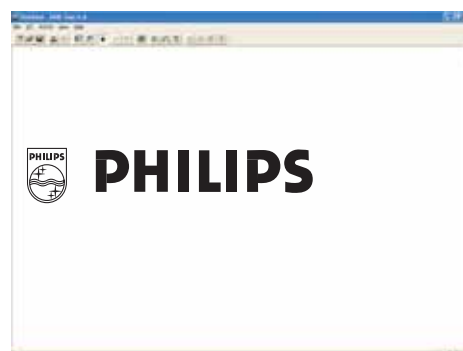


Fig. 8

Note 1: If the connection is improper, you will see the following error message (as shown in Fig. 9) before entering the main menu. Meanwhile, the (read EDID) function will be disable. At this time, please make sure all cables are connected correctly and



Fig. 9

Note 2: During the loading, EDID45 will verify the EDID data which just loaded from monitor before proceed any further function, once the data structure of EDID can not be recognized, the following error message will appear on the screen as below. Please confirm following steps to avoid this message.

1. The data structure of EDID was incorrect.
2. DDC IC that you are trying to load data is empty.
3. Wrong communication channel has set at configuration setup

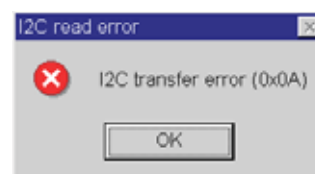


Fig. 10

Re-programming Analog DDC IC

Step 1: After initialize alignment box, connecting all cables and box as shown in Fig. 11

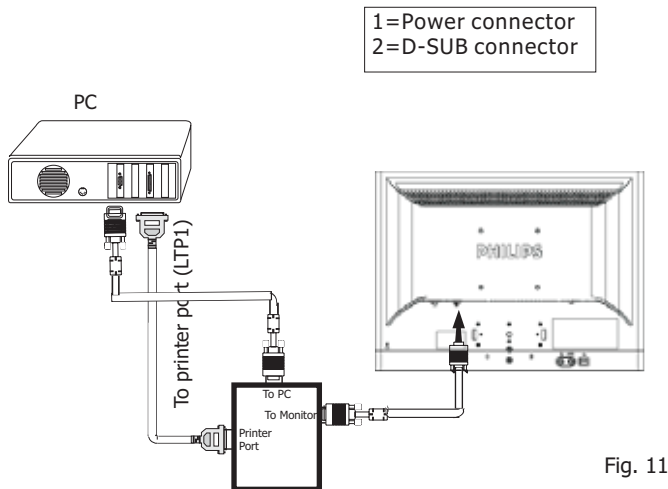


Fig. 11

Step 2: Read DDC data from monitor

1. Click  icon as shown in Fig. 11 from the tool bar to bring up the Channels "Configuration Setup" windows as shown in Fig. 12.



Fig. 12

2. Select the DDC2Bi as the communication channel. As shown in Fig. 13.



Fig. 13

3. Click OK button to confirm your selection.
4. Click  icon (Read EDID function) to read DDC EDID data from monitor. The EDID codes will display on screen as shown in Fig. 14.

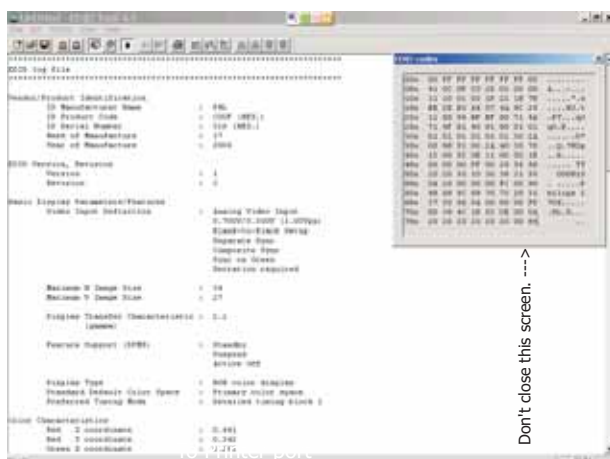


Fig. 14

Step 3: Modify DDC data (verify EDID version, week, year)

1. Click  (new function) icon from the tool bar, bring up Step 1 of 9 as shown in Fig. 15. EDID45 DDC application provides the function selection and text change (select & fill out) from Step 1 to Step 9.

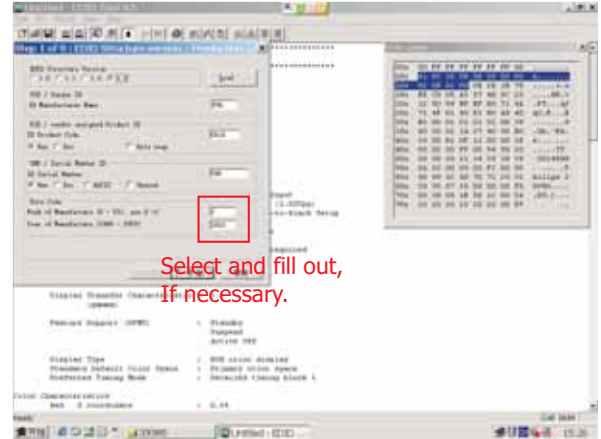


Fig. 15

Step 4: Modify DDC data (Monitor Serial No.)

1. Click Next to step7, bring up Fig. 16.
- Serial number can be filled up or be changed at this moment.
- Click next, Finish to exit the Step window.

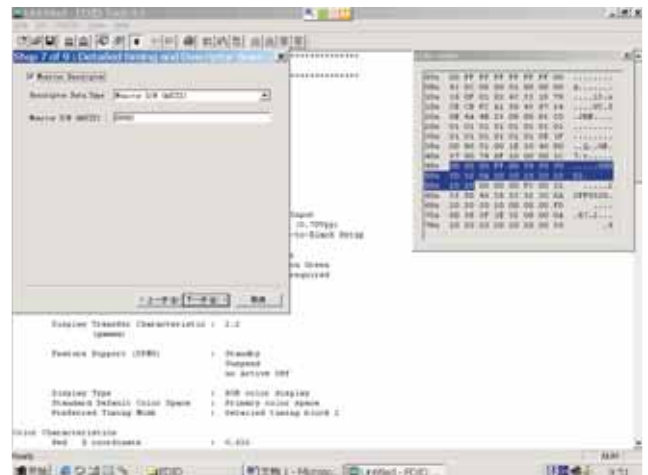


Fig. 16

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Step 5: Write DDC data

1. Configuration should be as Fig. I. And press OK.

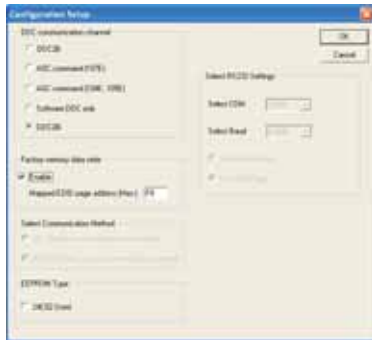


Fig. I

Access factory. Mode

- Step 1 : Select the source "PC" and then turn off LCD-TV.

Step 2 : [Push "power " button and then push the "VOL- " and "VOL+" buttons at the same time immediately and hold it] about five seconds then release all buttons.

Press "menu"button and bring up factory mode indication

3. Click  (Write EDID) icon from the tool bar to write DDC data. Bring up "Writing 0%~100%, ready" a progressing bar on the left down corner.
4. Turn off/on monitor

Step 7: Exit DDC program

Pull down the File menu and select Exit as shown in Fig. III.

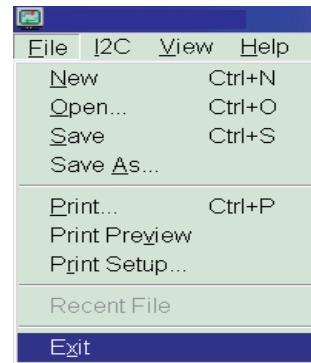


Fig. III

Step 6: Save DDC data

Sometimes, you may need to save DDC data as a text file for using in other IC chip. To save DDC data, follow the steps below:

1. Click  (Save) icon (or click "file"-> "save as") from the tool bar. And give a file name as shown in Fig. II. The file type is EDID45 file (*.ddc) which can be open in WordPad. By using WordPad, the texts of DDC data & table (128 bytes, hex code) can be modified. If DDC TEXTS & HEX Table are completely correct, it can be saved as .ddc file to re-load it into DDC IC for DDC Data application.

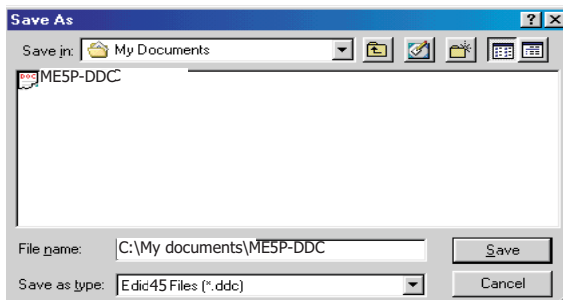


Fig. II

2. Click Save.

Re-programming Digital DDC IC

Step 1: After initialize alignment box, connecting all cables and box as shown in Fig. 17

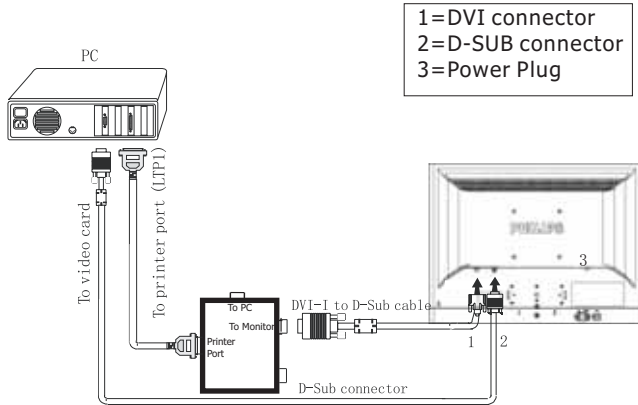


Fig.17

Step 2: Read DDC data from monitor

1. Click icon as shown in Fig. 18 from the tool bar to bring up the Channels "Configuration Setup" windows as shown in Fig. 19.



Fig. 18

2. Select the DDC2Bi as the communication channel. As shown in Fig. 19.



Fig. 19

3. Click OK button to confirm your selection.
4. Click icon (Read EDID function) to read DDC EDID data from monitor. The EDID codes will display on screen as shown in Fig. 20.

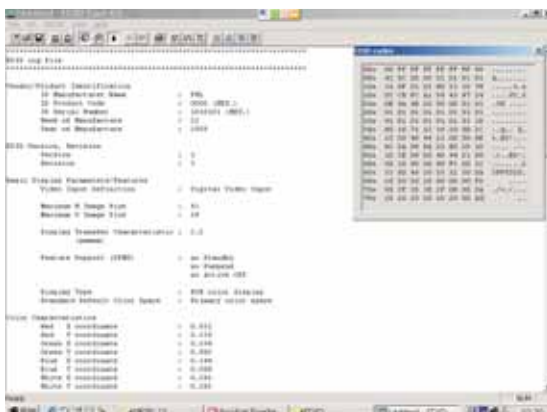


Fig. 20

Step 3: Modify DDC data (verify EDID version, week, year)

1. Click (new function) icon from the tool bar, bring up Step 1 of 9 as shown in Fig. 21. EDID45 DDC application provides the function selection and text change (select & fill out) from Step 1 to Step 9.

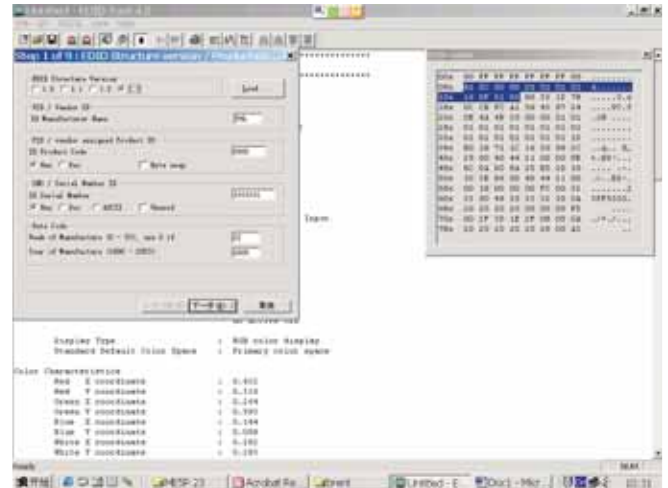


Fig. 21

Step 4: Modify DDC data (Monitor Serial No.)

1. Click Next, bring up Fig. 22. Then select Digital Signal as below

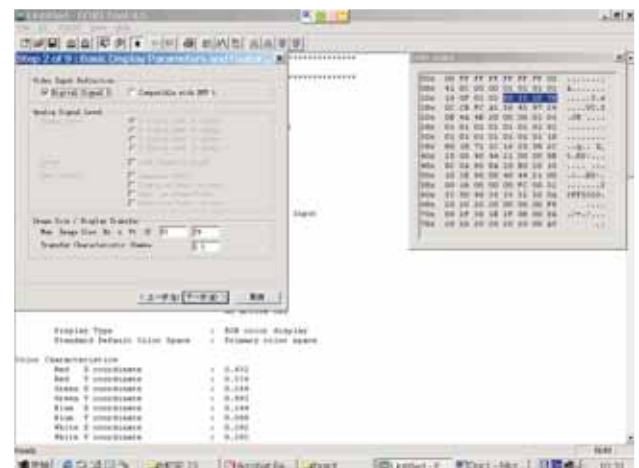


Fig. 22

2. Click Next to step7, bring up Fig. 23.
 - Serial number can be filled up or be changed at this moment.
 - Click Next, Finish to exit the Step window.

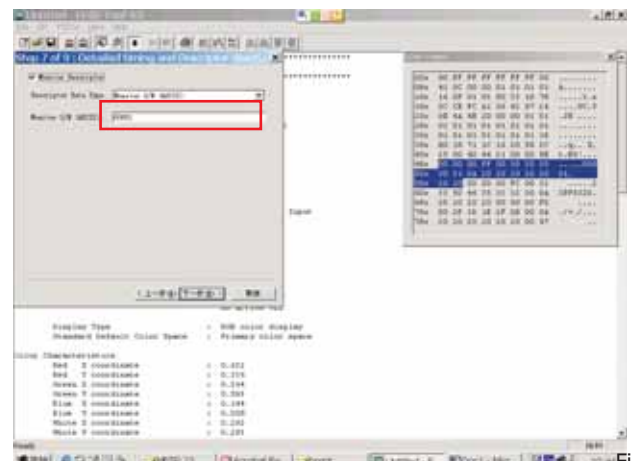


Fig. 23

◀◀ Go to cover page

Step 5: Write DDC data

1. Configuration should be as Fig. 24. And press OK.

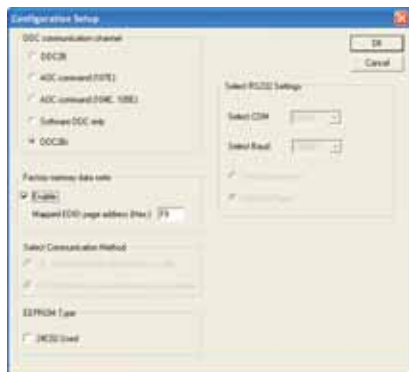


Fig. 24

2. Access factory mode

Step 1 : Select the source "PC" and then turn off LCD-TV.

Step 2 : [Push "power " button and then push the "VOL- " and "VOL+" buttons at the same time immediately and hold it] about five seconds then release all buttons.

Press "menu" button and bring up factory mode indication

3. Click  (Write EDID) icon from the tool bar to write DDC data.

Step 6: Save DDC data

Sometimes, you may need to save DDC data as a text file for using in other IC chip. To save DDC data, follow the steps below:

- Click  (Save) icon (or click "file"-> "save as") from the tool bar. And give a file name as shown in Fig. 25. The file type is EDID46 file (*.ddc) which can be open in WordPad. By using WordPad, the texts of DDC data & table (128 bytes, hex code) can be modified. If DDC TEXTS & HEX Table are completely correct, it can be saved as .ddc file to re-load it into DDC IC for DDC Data application.

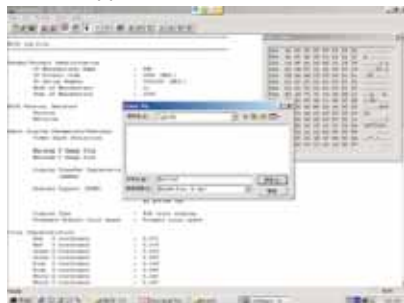


Fig. 25

2. Click Save.

Step 7: Exit DDC program

Pull down the File menu and select Exit as shown in Fig. 26.

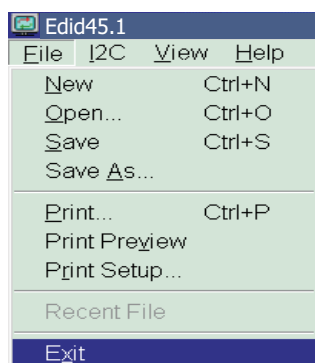


Fig. 26

For D-SUB

: Positive Vertical Sync.
: Negative Horizontal Sync.

EDID log file (31052005_Me5P23_A_V1)

Vendor/Product Identification

ID Manufacturer Name : PHL
ID Product Code : 0000 (HEX.)
ID Serial Number : 1 (DEC.)
Week of Manufacture : 22
Year of Manufacture : 2005

EDID Version, Revision

Version : 1
Revision : 3

Basic Display Parameters/Features

Video Input Definition : Analog Video Input
0.700V/0.000V (0.70Vpp)
without Blank-to-Black Setup
Separate Sync
Composite Sync
without Sync on Green
no Serration required

Maximum H Image Size : 51
Maximum V Image Size : 29
Display Transfer Characteristic : 2.2
(gamma)

Feature Support (DPMS) : Standby
Suspend
no Active Off

Display Type : RGB color display
Standard Default Color Space : Primary color space
Preferred Timing Mode : Detailed timing block 1

Color Characteristics

Red X coordinate : 0.632
Red Y coordinate : 0.336
Green X coordinate : 0.264
Green Y coordinate : 0.593
Blue X coordinate : 0.144
Blue Y coordinate : 0.058
White X coordinate : 0.292
White Y coordinate : 0.293

Established Timings

Established Timings I : 640 x 480 @60Hz (IBM,VGA)
800 x 600 @56Hz (VESA)
800 x 600 @60Hz (VESA)

Established Timings II : 1024 x 768 @60Hz (VESA)

Manufacturer's timings :

Standard Timing Identification #1

Horizontal active pixels : 1280
Aspect Ratio : 16:9
Refresh Rate : 60

Detailed Timing #1

Pixel Clock (MHz) : 79.5
H Active (pixels) : 1280
H Blanking (pixels) : 384
V Active (lines) : 768
V Blanking (lines) : 30
H Sync Offset (F Porch) (pixels): 64
H Sync Pulse Width (pixels) : 128
V Sync Offset (F Porch) (lines) : 3
V Sync Pulse Width (lines) : 7
H Image Size (mm) : 372
V Image Size (mm) : 223
H Border (pixels) : 0
V Border (lines) : 0
Flags : Non-interlaced
: Normal Display, No stereo
: Digital Separate sync.

Monitor Descriptor #2

Serial Number : 00001

Monitor Descriptor #3

Monitor Name : 23PF5320

Monitor Descriptor #4

Monitor Range Limits
Min. Vt rate Hz : 56
Max. Vt rate Hz : 63
Min. Horiz. rate kHz : 30
Max. Horiz. rate kHz : 50
Max. Supported Pixel : 80

No secondary GTF timing formula supported.

Extension Flag : 0

Check sum : 37 (HEX.)

EDID data (128 bytes)

```

0: 00 1: ff 2: ff 3: ff 4: ff 5: ff 6: ff 7: 00
8: 41 9: 0c 10: 00 11: 00 12: 01 13: 00 14: 00 15: 00
16: 16 17: 0f 18: 01 19: 03 20: 6c 21: 33 22: 1d 23: 78
24: ce 25: cb 26: fc 27: a1 28: 56 29: 43 30: 97 31: 24
32: 0e 33: 4a 34: 4b 35: 23 36: 08 37: 00 38: 81 39: c0
40: 01 41: 01 42: 01 43: 01 44: 01 45: 01 46: 01 47: 01
48: 01 49: 01 50: 01 51: 01 52: 01 53: 01 54: 0e 55: 1f
56: 00 57: 80 58: 51 59: 00 60: 1e 61: 30 62: 40 63: 80
64: 37 65: 00 66: 74 67: df 68: 10 69: 00 70: 00 71: 1c
72: 00 73: 00 74: 00 75: ff 76: 00 77: 30 78: 30 79: 30
80: 30 81: 31 82: 0a 83: 20 84: 20 85: 20 86: 20 87: 20
88: 20 89: 20 90: 00 91: 00 92: 00 93: fc 94: 00 95: 32
96: 33 97: 50 98: 46 99: 35 100: 33 101: 32 102: 30 103: 0a
104: 20 105: 20 106: 20 107: 20 108: 00 109: 00 110: 00 111: fd
112: 00 113: 38 114: 3f 115: 1e 116: 32 117: 08 118: 00 119: 0a
120: 20 121: 20 122: 20 123: 20 124: 20 125: 20 126: 00 127: 37

```

◀◀ Go to cover page

For DVI-D

EDID log file (31052005_Me5P23_D_V1)

Vendor/Product Identification

ID Manufacturer Name : PHL
ID Product Code : 0000 (HEX.)
ID Serial Number : Unused
Week of Manufacture : 22
Year of Manufacture : 2005

EDID Version, Revision

Version : 1
Revision : 3

Basic Display Parameters/Features

Video Input Definition : Digital Video Input

Maximum H Image Size : 51
Maximum V Image Size : 29

Display Transfer Characteristic : 2.2
(gamma)

Feature Support (DPMS) : no Standby
no Suspend
no Active Off

Display Type : RGB color display
Standard Default Color Space : Primary color space

Color Characteristics

Red X coordinate : 0.632
Red Y coordinate : 0.336
Green X coordinate : 0.264
Green Y coordinate : 0.593
Blue X coordinate : 0.144
Blue Y coordinate : 0.058
White X coordinate : 0.292
White Y coordinate : 0.293

Established Timings

Established Timings I : 640 x 480 @60Hz (IBM,VGA)

Established Timings II :

Manufacturer's timings :

Standard Timing Identification : Unused

Detailed Timing #1

Pixel Clock (MHz) : 74.25
H Active (pixels) : 1920
H Blanking (pixels) : 280
V Active (lines) : 540
V Blanking (lines) : 22
H Sync Offset (F Porch) (pixels): 88
H Sync Pulse Width (pixels) : 44
V Sync Offset (F Porch) (lines) : 2
V Sync Pulse Width (lines) : 5
H Image Size (mm) : 576
V Image Size (mm) : 324
H Border (pixels) : 0
V Border (lines) : 0
Flags : Interlaced
: Normal Display, No stereo
: Digital Separate sync.

: Positive Vertical Sync.
: Positive Horizontal Sync.

Detailed Timing #2

Pixel Clock (MHz) : 27
H Active (pixels) : 720
H Blanking (pixels) : 138
V Active (lines) : 480
V Blanking (lines) : 45
H Sync Offset (F Porch) (pixels): 16
H Sync Pulse Width (pixels) : 62
V Sync Offset (F Porch) (lines) : 9
V Sync Pulse Width (lines) : 6
H Image Size (mm) : 576
V Image Size (mm) : 324
H Border (pixels) : 0
V Border (lines) : 0
Flags : Non-interlaced
: Normal Display, No stereo
: Digital Separate sync.
: Negative Vertical Sync.
: Negative Horizontal Sync.

Monitor Descriptor #3

Monitor Name : 23PF5320

Monitor Descriptor #4

Monitor Range Limits
Min. Vt rate Hz : 47
Max. Vt rate Hz : 61
Min. Horiz. rate kHz : 30
Max. Horiz. rate kHz : 47
Max. Supported Pixel : 80

No secondary GTF timing formula supported.

Extension Flag : 0

Check sum : A3 (HEX.)

EDID data (128 bytes)

0: 00 1: ff 2: ff 3: ff 4: ff 5: ff 6: ff 7: 00
8: 41 9: 0c 10: 00 11: 00 12: 01 13: 01 14: 01 15: 01
16: 16 17: 0f 18: 01 19: 03 20: 80 21: 33 22: 1d 23: 78
24: 0c 25: cb 26: fc 27: a1 28: 56 29: 43 30: 97 31: 24
32: 0e 33: 4a 34: 4b 35: 20 36: 00 37: 00 38: 01 39: 01
40: 01 41: 01 42: 01 43: 01 44: 01 45: 01 46: 01 47: 01
48: 01 49: 01 50: 01 51: 01 52: 01 53: 01 54: 01 55: 1d
56: 80 57: 18 58: 71 59: 1c 60: 16 61: 20 62: 58 63: 2c
64: 25 65: 00 66: 40 67: 44 68: 21 69: 00 70: 00 71: 9e
72: 8c 73: 0a 74: d0 75: 8a 76: 20 77: e0 78: 2d 79: 10
80: 10 81: 3e 82: 96 83: 00 84: 40 85: 44 86: 21 87: 00
88: 00 89: 18 90: 00 91: 00 92: 00 93: fc 94: 00 95: 32
96: 33 97: 50 98: 46 99: 35 100: 33 101: 32 102: 30 103: 0a
104: 20 105: 20 106: 20 107: 20 108: 00 109: 00 110: 00 111: fd
112: 00 113: 2f 114: 3d 115: 1e 116: 2f 117: 08 118: 00 119: 0a
120: 20 121: 20 122: 20 123: 20 124: 20 125: 20 126: 00 127: a3

Configuration and procedure

"Easywriter " The software is provided by Novatek to upgrade the firmware of CPU.

It is a windows-based program, which cannot be run in MS-DOS.
DDC2BI_ISP TOOL (3138 106 10396) is for the interface between "Parallel Port of PC" and "15 pin-D-SUB connector of Monitor".

System and equipment requirements

1. An i486 (or above) personal computer or compatible.
2. Microsoft operation system Windows 95/98/2000/XP.
3. ISP Software " Easywrite "
4. DDC2BI_ISP TOOL (3138 106 10396) as shown in Fig. 1

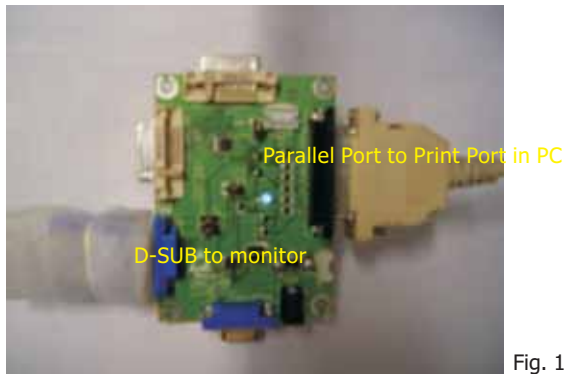


Fig. 1

5. Connect DDC2BI_ISP TOOL and Mains cord to Monitor as shown in Fig. 2.

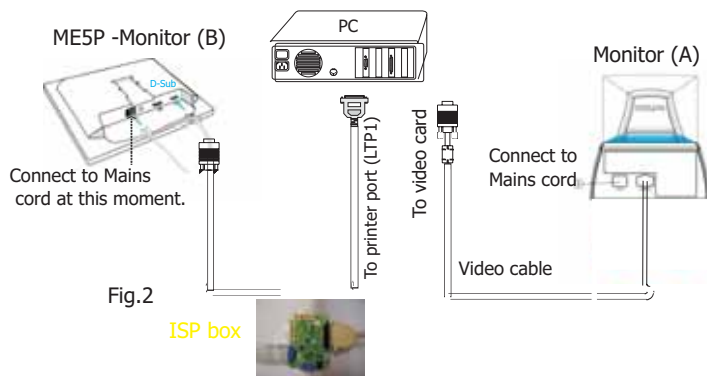


Fig.2

6. Install and setup the Easywriter program

Step 1 : Make a folder in your PC as shown in Fig. 3.

For example : C:\ME5P

Step 2 : Copy ISP Software Easywriter.zip into your folder as shown in Fig.3.

Step 3 : Unzip Easywriter.zip into your folder as shown in Fig. 3.

Step 4 : Double click the EasywriterV2.09.exe icon to install the Application as Fig. 4.

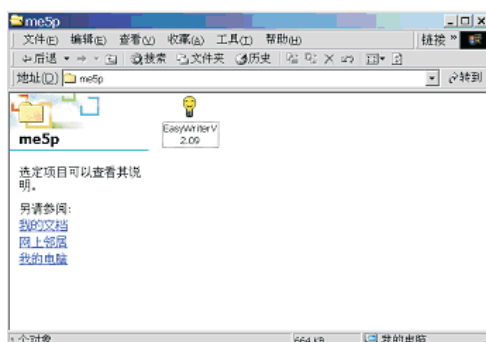


Fig. 4



Click the next till complete the setup

Step 5 :Copy the hex code to C:\ME5P as shown in Fig. 5 .

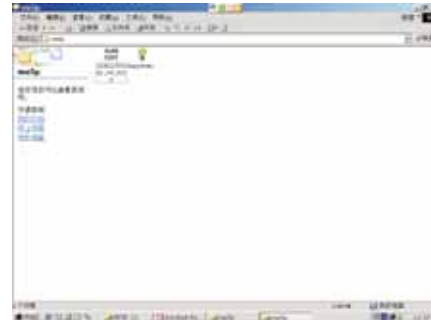


Fig. 5

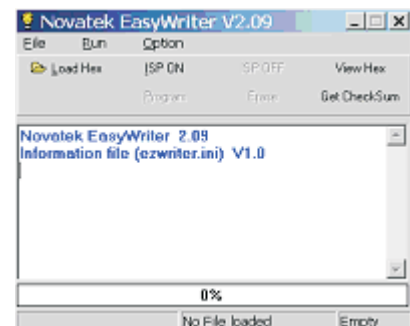
Update the firmware

1. Double click the Easywriter.exe icon in desktop then appears window as shown in Fig.7 .



Fig. 6

Fig. 7



◀◀ Go to cover page

2. Press the Load hex then select the HEX CODE

as shown in Fig. 8.

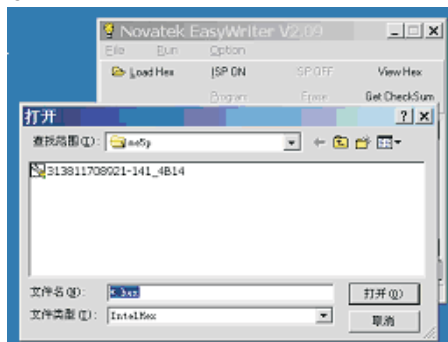


Fig. 8

3. Press the AUTO to running program , the firmware be updated as shown in Fig. 9.

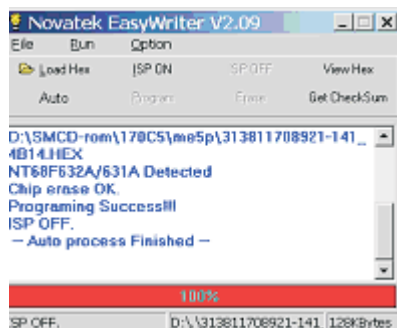


Fig.9

4. Press the file --> exit to end program , as shown in Fig. 10.

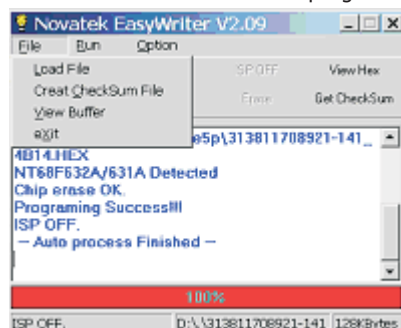


Fig. 10

If there is a warning message coming as shown in Fig 11. , you have to check the AC power, Video cable, or Novatek MCU.

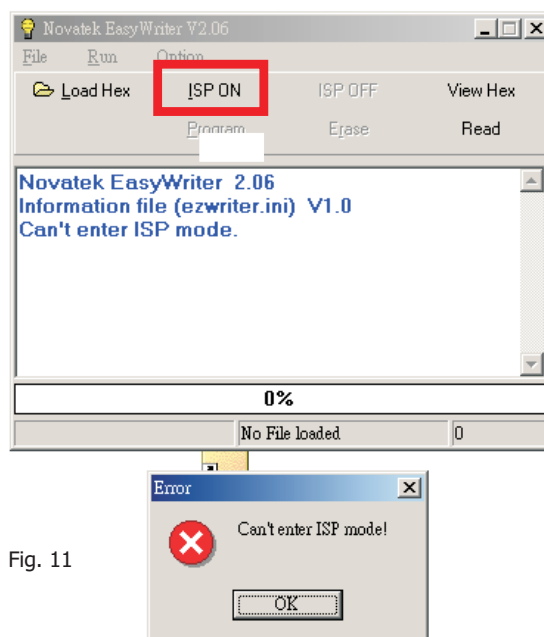


Fig. 11

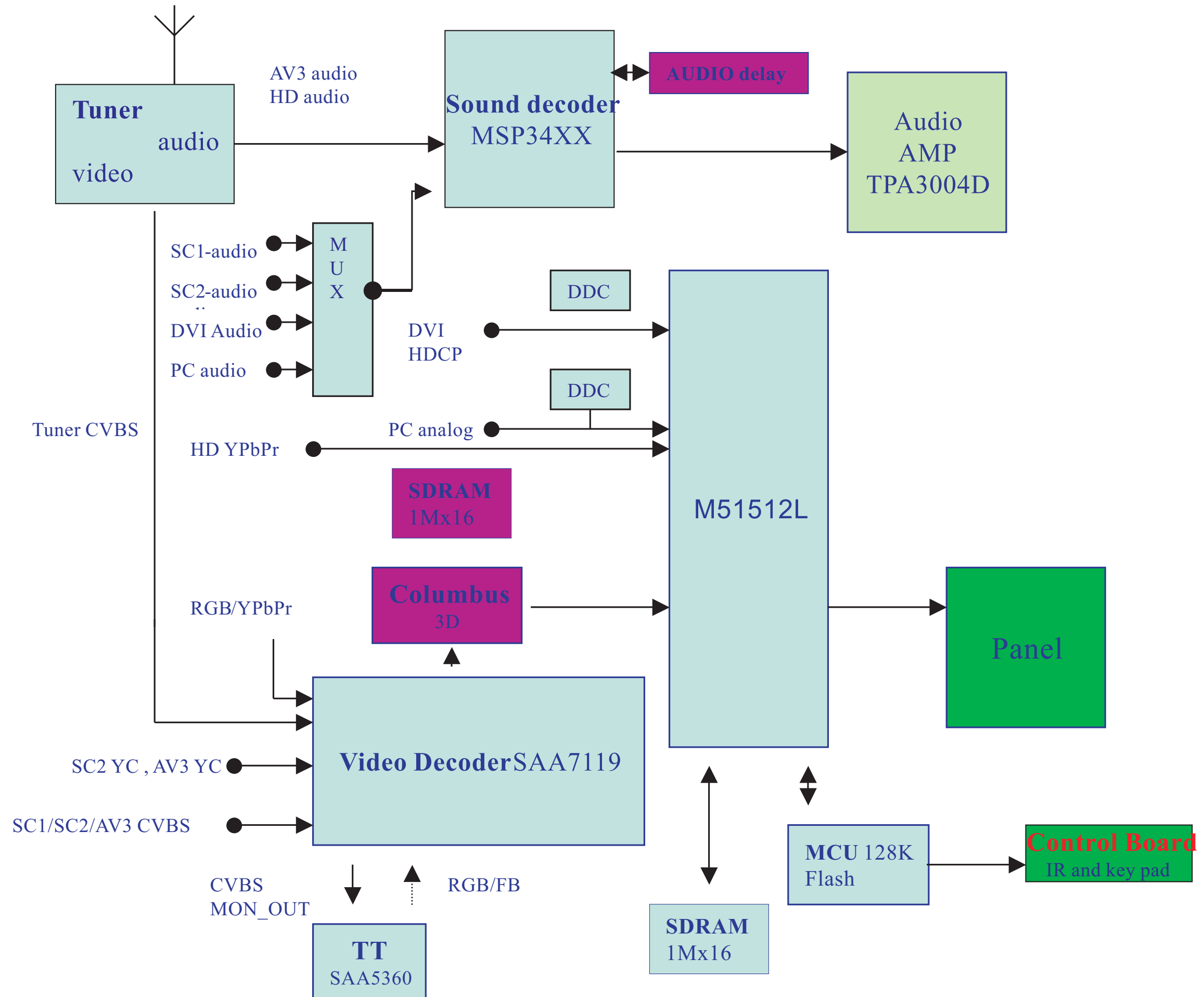
Access factory. Mode to confirm the version
Step 1 : Select the source "PC" and then turn off LCD-TV.

Step 2 : [Push "power " button and then push the "VOL- " and "VOL+" buttons at the same time immediately and hold it] about five seconds then release all buttons.

Press "menu"button and bring up factory mode indication as shown in following

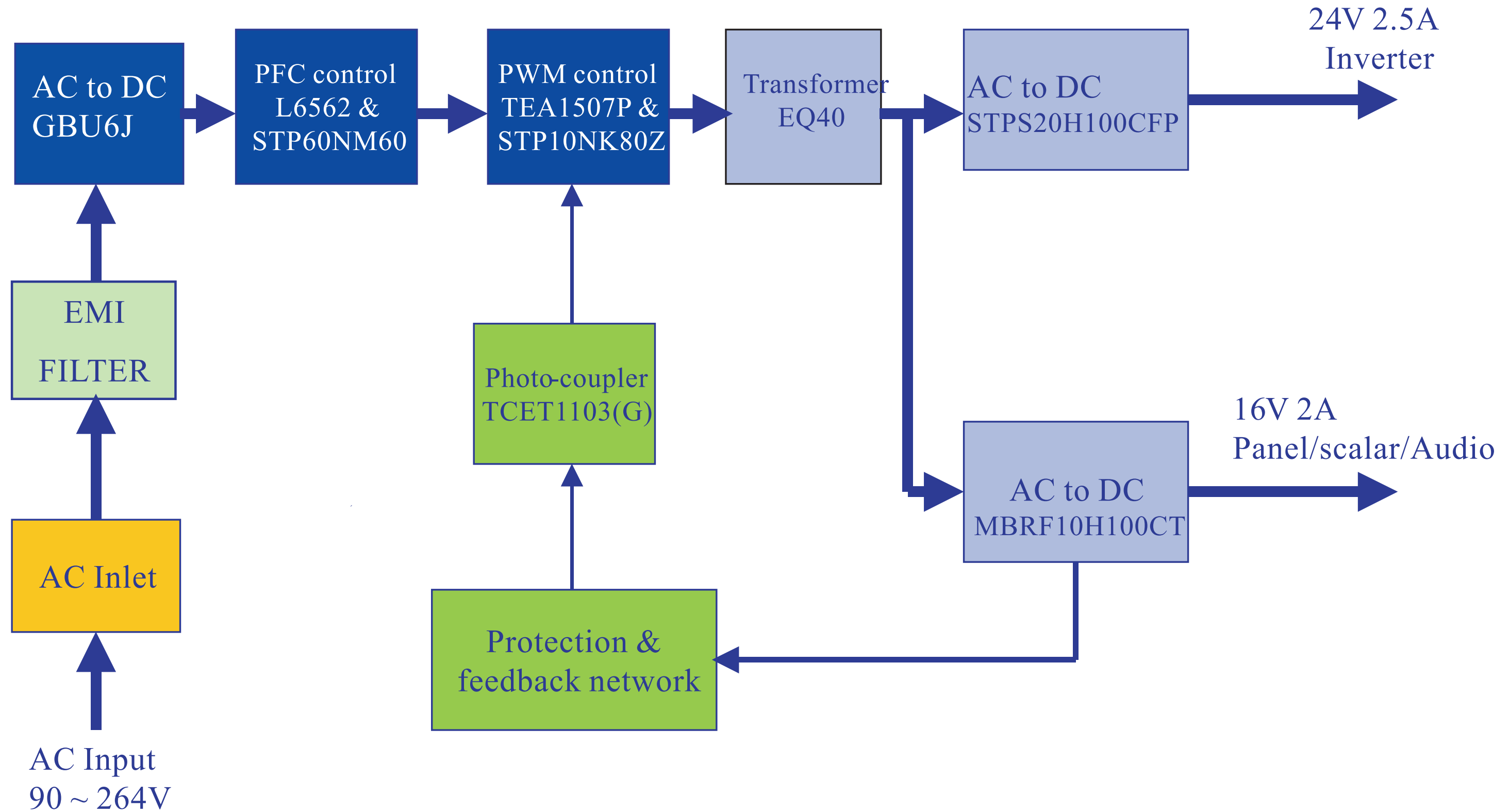


BLOCK DIAGRAM



Block diagram

Power

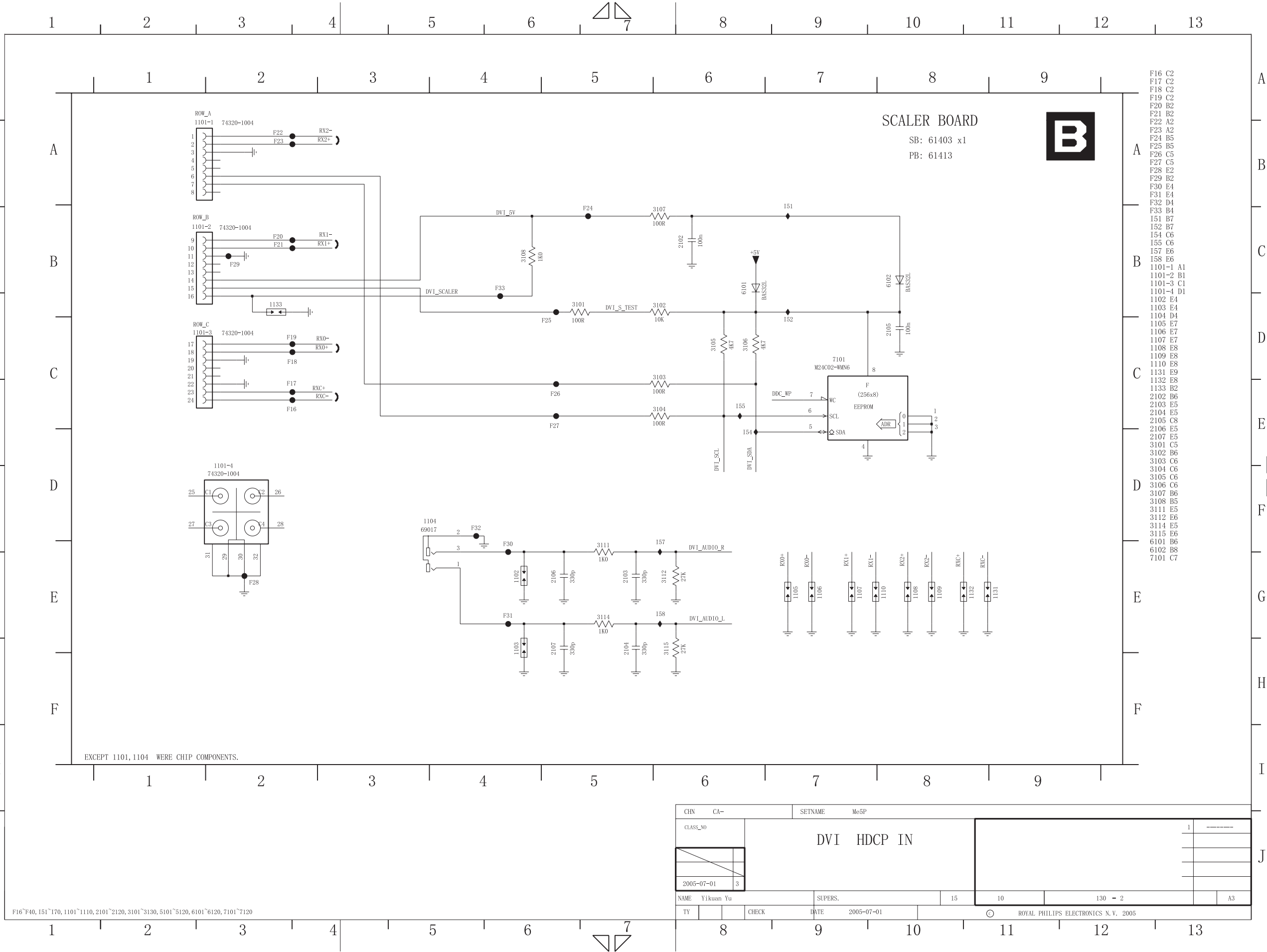


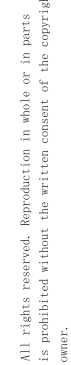
CHN		CA--		SETNAME		Me5P			
CLASS_NO				POWER				1	
2005-07-01		3							
NAME		Yikuan Yu		SUPERS.		15		10	
								130 - 1	
TY				CHECK		DATE		2005-07-01	
								ROYAL PHILIPS ELECTRONICS N.V. 2005	

SCALER DIAGRAM

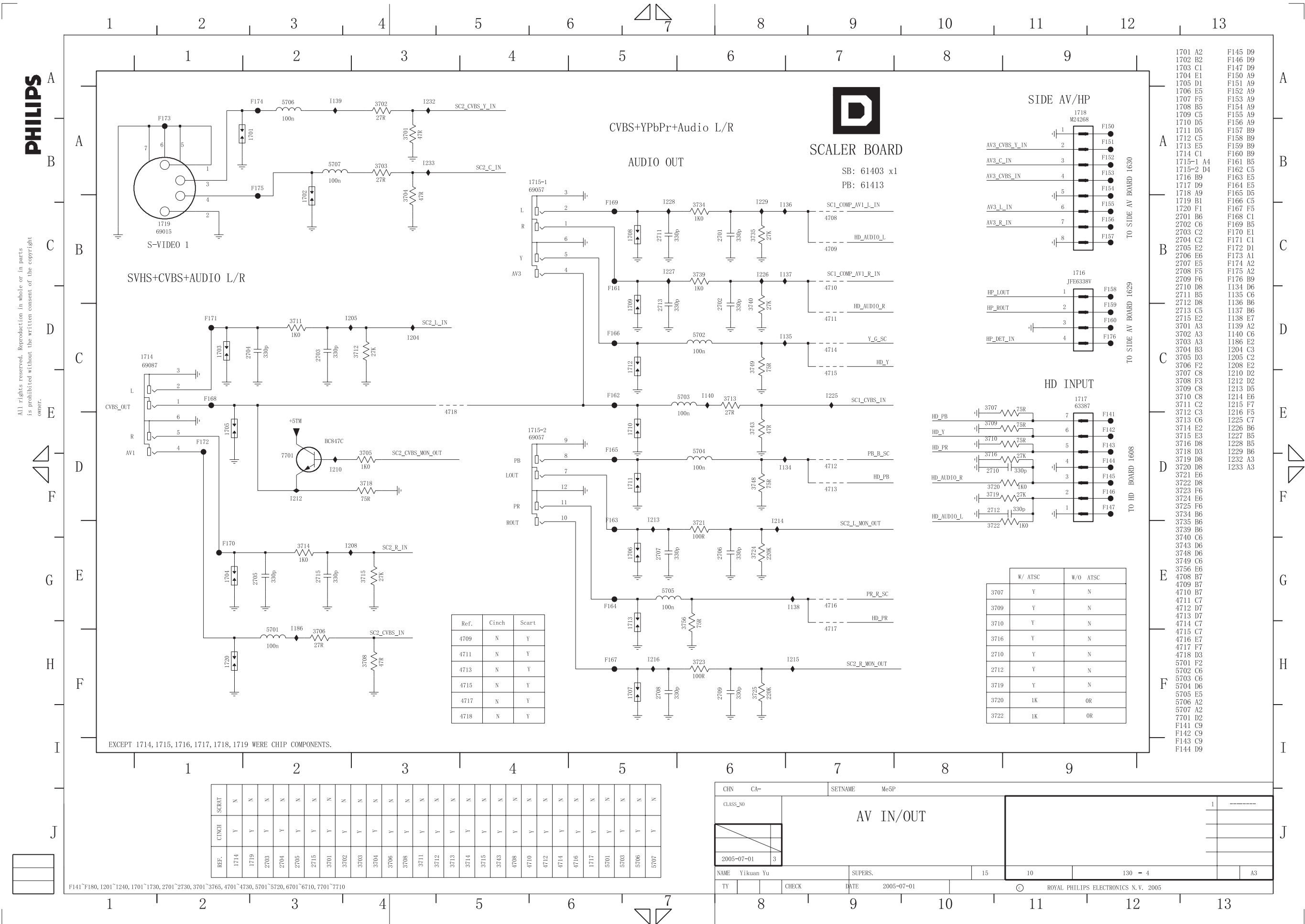
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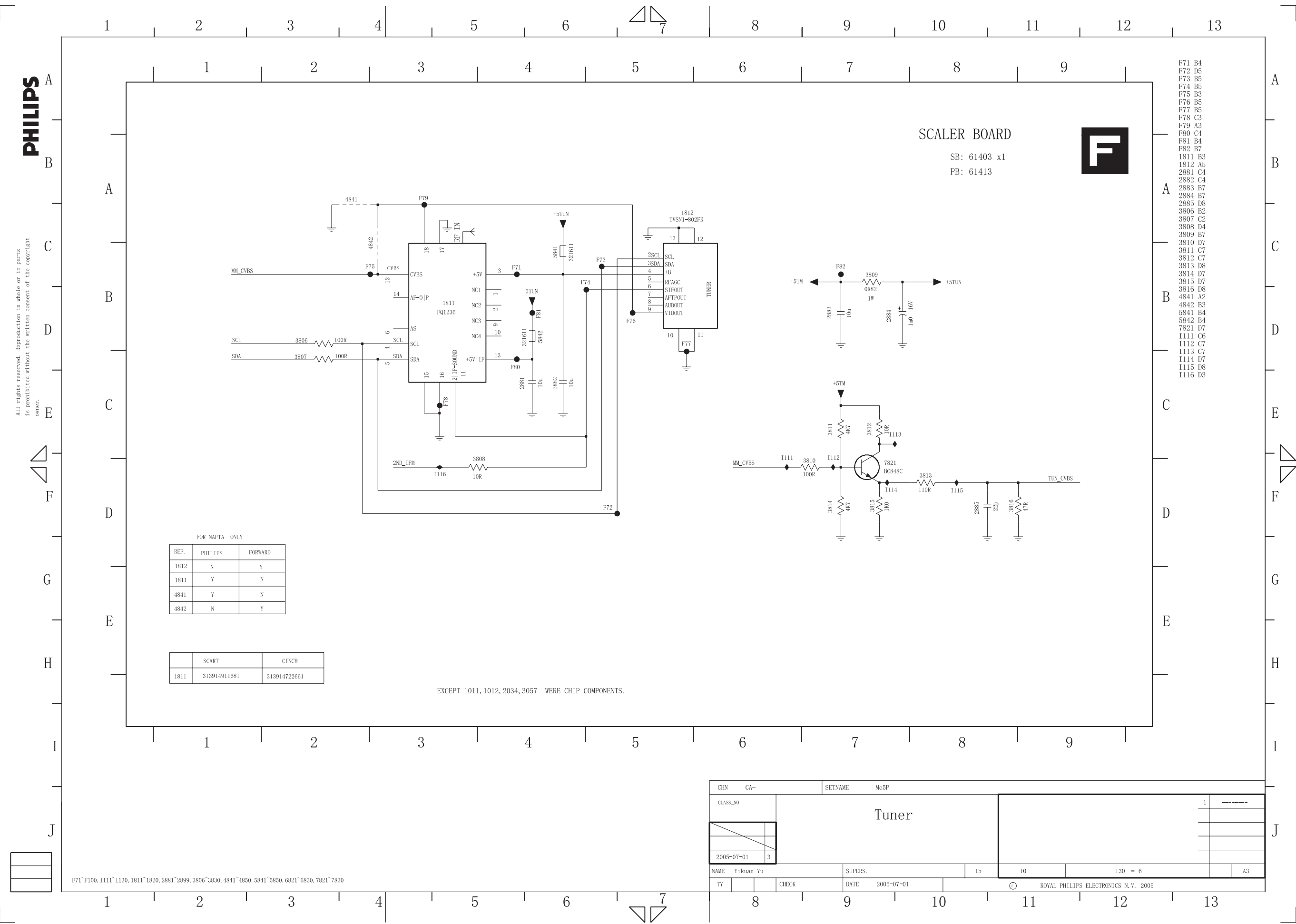
SCALER DIAGRAM





CHN		CA-		SETNAME		Me5P	
CLASS_N0		SCART I/O		1		-----	
2005-07-01		3					
NAME		Yikuan Yu		SUPERS.		15	
TY				CHECK		DATE 2005-07-01	
						© ROYAL PHILIPS ELECTRONICS N.V. 2005	

SCALER DIAGRAM



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D

F

G

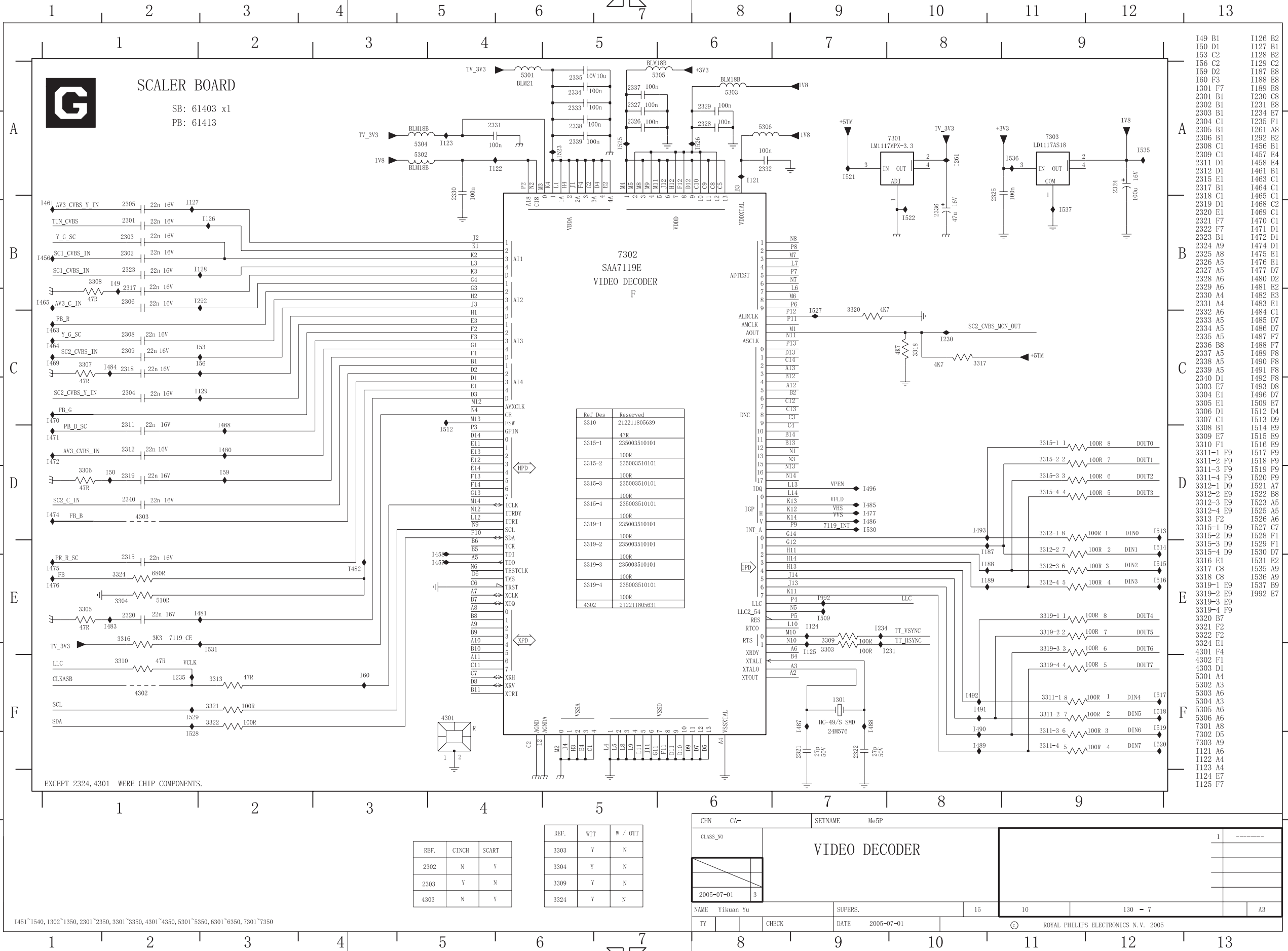
E

H

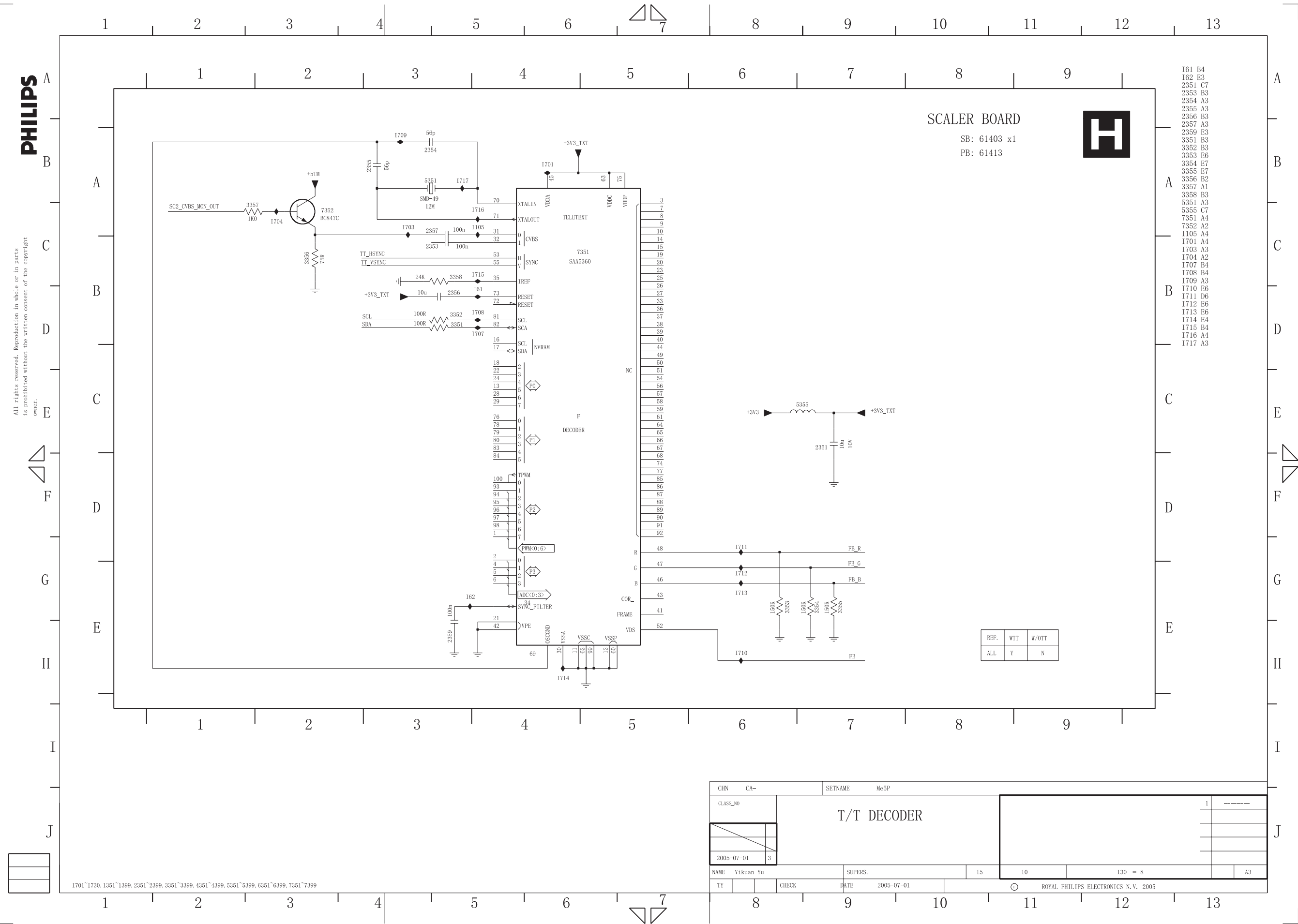
F

I

J

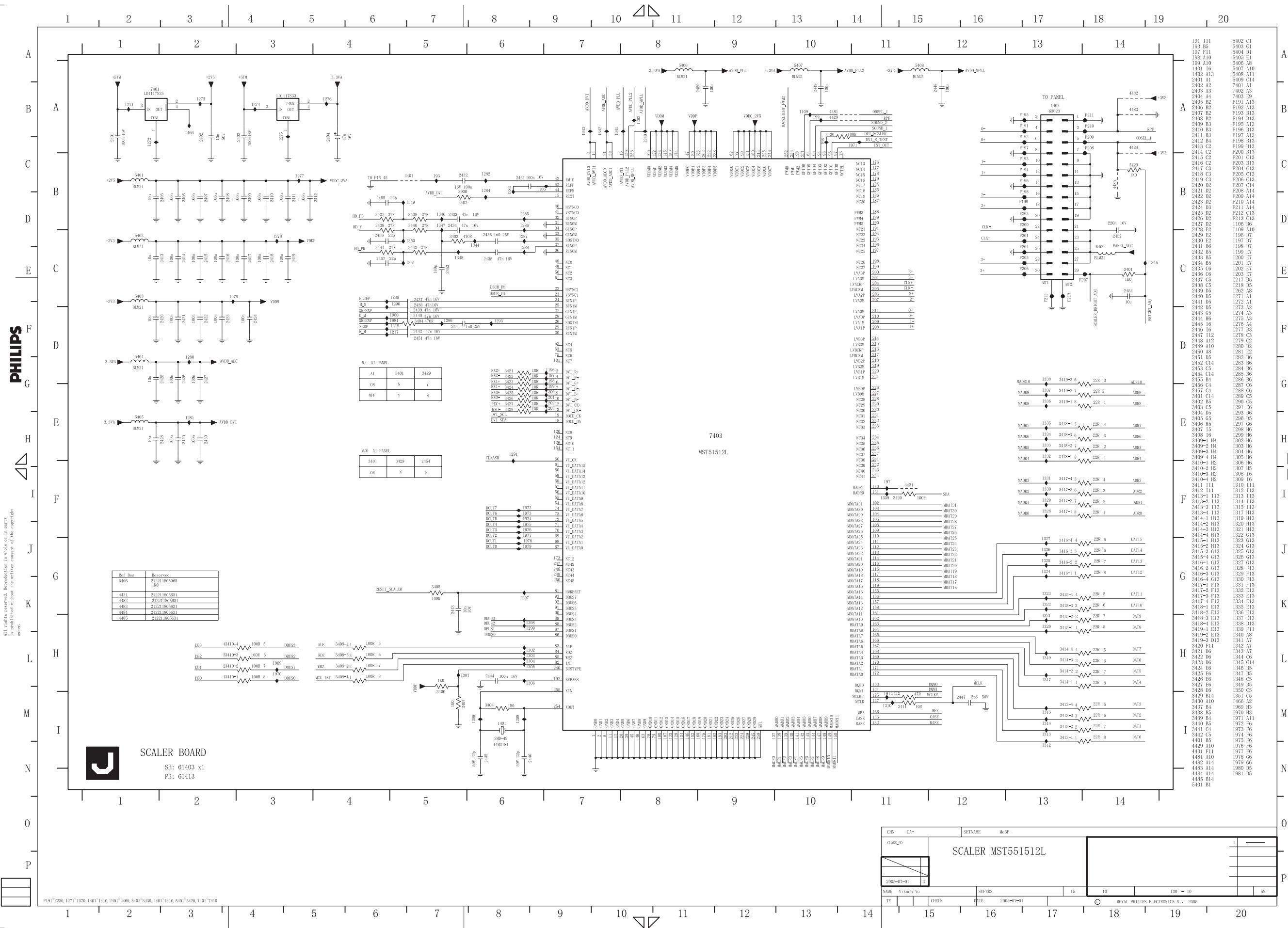


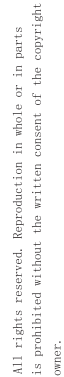
SCALER DIAGRAM





SCALER DIAGRAM

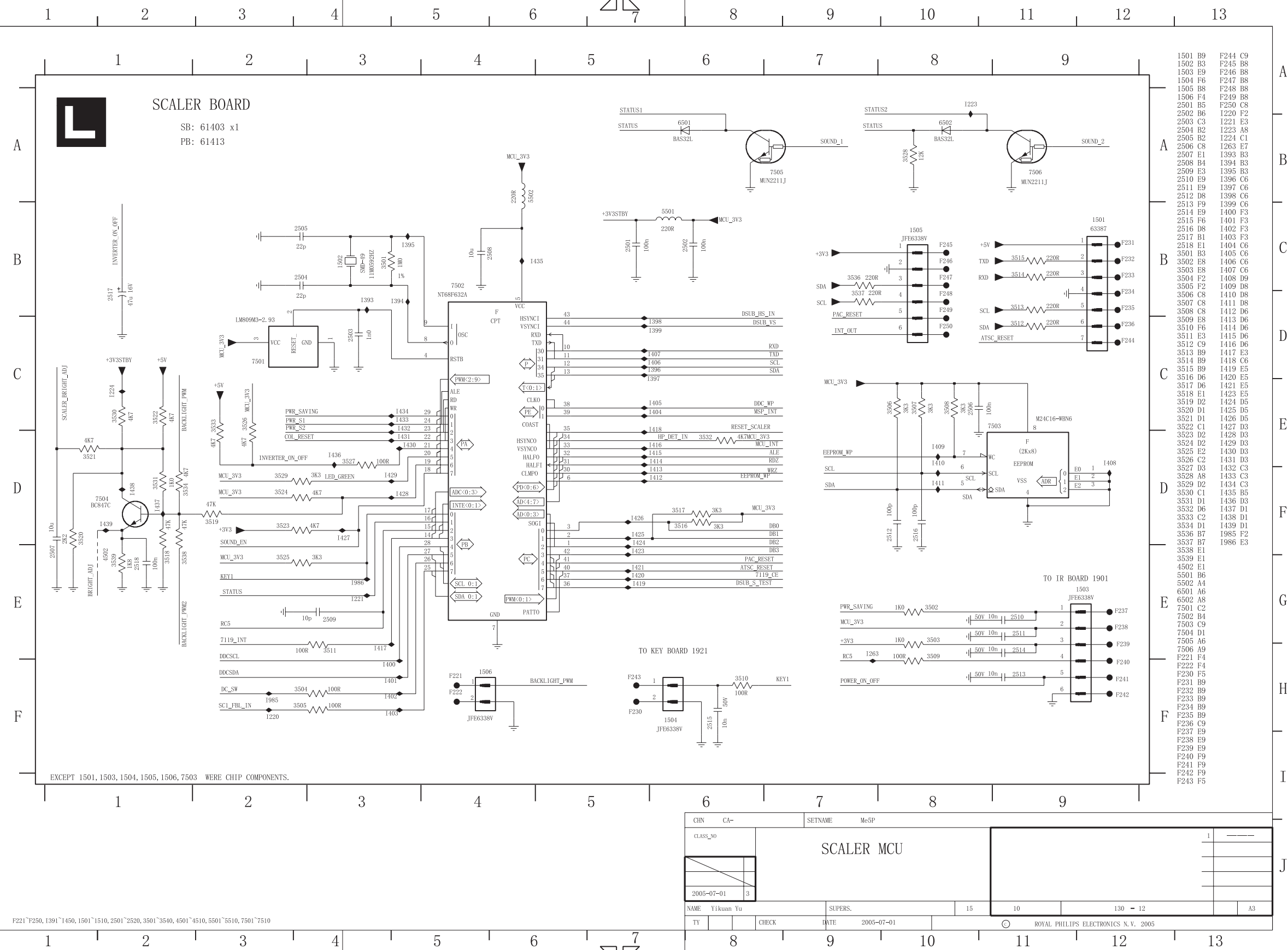
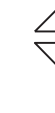




SCALER DIAGRAM

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Ref Des	Reserved
1505	313816872061 JFE6338V
1506	313816872031 JFE6338V
3520	212211805661 2K2
3531	212211805656 1K0

REF.	CINCH	SCART
3528	N	Y
6501	N	Y
6502	N	Y
7505	N	Y
7506	N	Y

PWM SWITCH		W/O PACIFIC		
REF.	W/PACIFIC	LPL 26"	OTHER	QDI 23"
3534	Y	N	N	N
3538	N	Y	N	Y
3519	N	N	Y	N
2507	Y	N	Y	N
3521	Y	N	Y	N
3539	OR	1K8	OR	1K8
4502	N	Y	N	Y
2518	N	Y	N	N
3518	Y	N	Y	N
3524	N	N	Y	N

BRIGHT MAX VOLTAGE				
REF.	OTHERS	CPT	LPL 26"	QD1 23"
3522	N	Y	N	N
3530	4K7	N	OR	OR

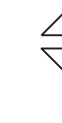
INVERTER		ON/OFF	
REF.	26"	32"	QD1 23"
3526	N	Y	N
3533	Y	N	Y
2517	N	Y	N

1501 B9 F244 C9
1502 B3 F245 B8
1503 E9 F246 B8
1504 F6 F247 B8
1505 B8 F248 B8
1506 F4 F249 B8
2501 B5 F250 C8
2505 B6 F251 C8
2503 C3 F252 C8
2504 R2 F223 A8
2505 E2 F224 C1
2506 C8 F263 E7
2507 E1 F393 B3
2508 B4 F394 B3
2509 B3 F395 B3
2510 B9 F396 C3
2511 E9 F397 C6
2512 B8 F398 C6
2513 F9 F399 C6
2514 E9 F400 F3
2515 F6 F401 F3
2516 B8 F402 F3
2517 B1 F403 F3
2518 E1 F404 C6
3501 B3 F405 C6
3502 B8 F406 C6
3503 E8 F407 C6
3504 F2 F408 D9
3505 F2 F409 D8
3506 C8 F410 D8
3507 C8 F411 D8
3508 E8 F412 D6
3509 B8 F413 D6
3510 F6 F414 D6
3511 E3 F415 D6
3512 C9 F416 D6
3513 B9 F417 F3
3514 B9 F418 C6
3515 E9 F419 E5
3516 D6 F420 E5
3517 F6 F421 E5
3518 E1 F423 E5
3519 D2 F424 E5
3520 D1 F425 E5
3521 D1 F426 E5
3522 C1 F427 B3
3523 D2 F428 B3
3524 D2 F429 B3
3525 E2 F430 B3
3526 C2 F431 B3
3527 D3 F432 C3
3528 A8 F433 C3
3529 D2 F434 C3
3530 C1 F435 E5
3531 E1 F436 B3
3532 D6 F437 D1
3533 C2 F438 D1
3534 D1 F439 D1
3536 B7 F985 F2
3537 B7 F986 F3
3538 E1
3539 E1
4502 E1
4501 B6
4502 A4
5502 A4
6501 A6
6502 A8
7501 C2
7502 B4
7503 C9
7504 D1
7505 A6
7506 A9
F221 F4
F222 F4
F223 F5
F224 B9
F225 B9
F226 B9
F227 B9
F228 E9
F229 E9
F230 F9
F231 F9
F232 F9
F233 F9
F234 B9
F235 B9
F236 C9
F237 E9
F238 E9
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F242 F9
F243 F5

SCALER DIAGRAM

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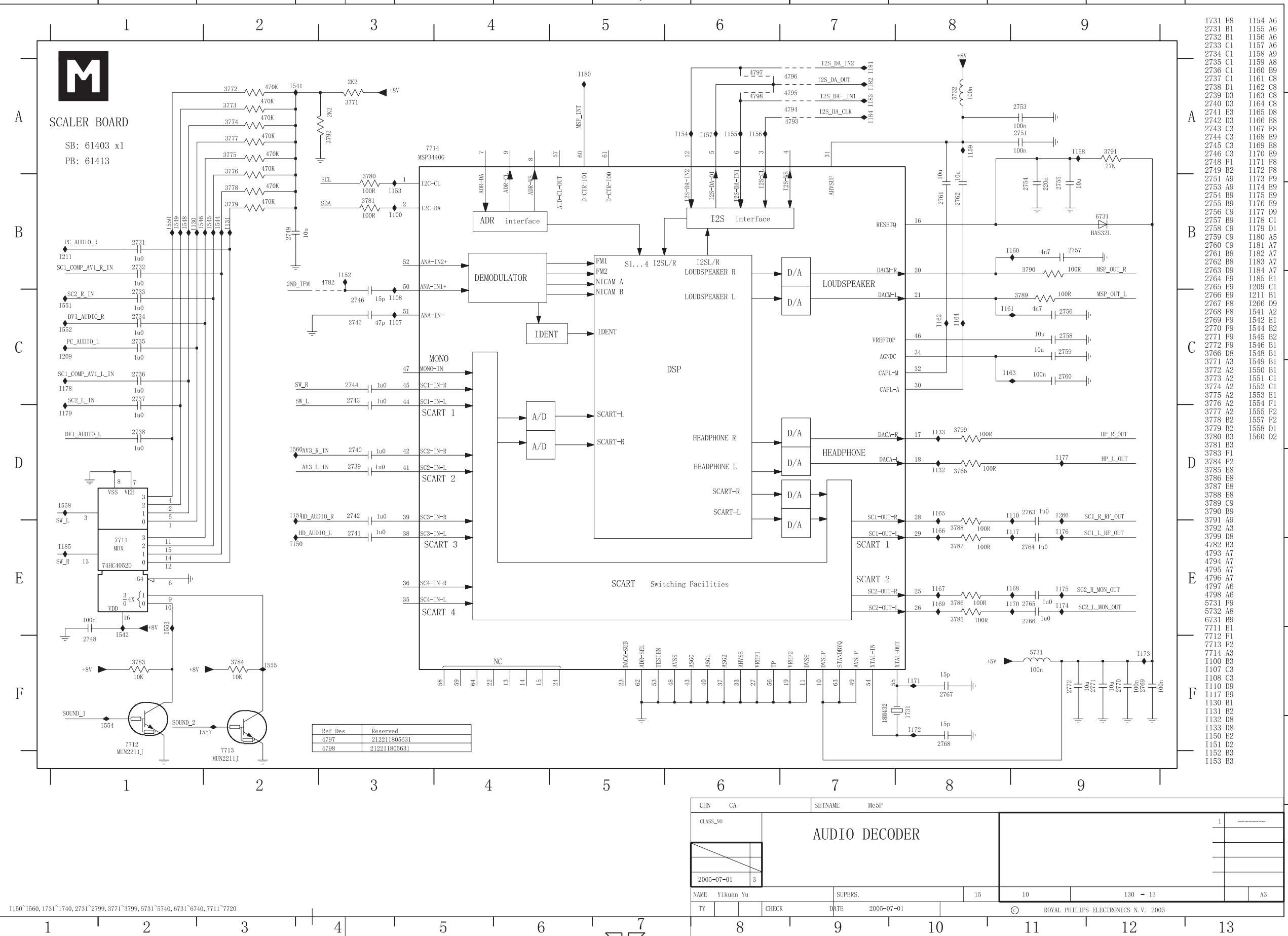
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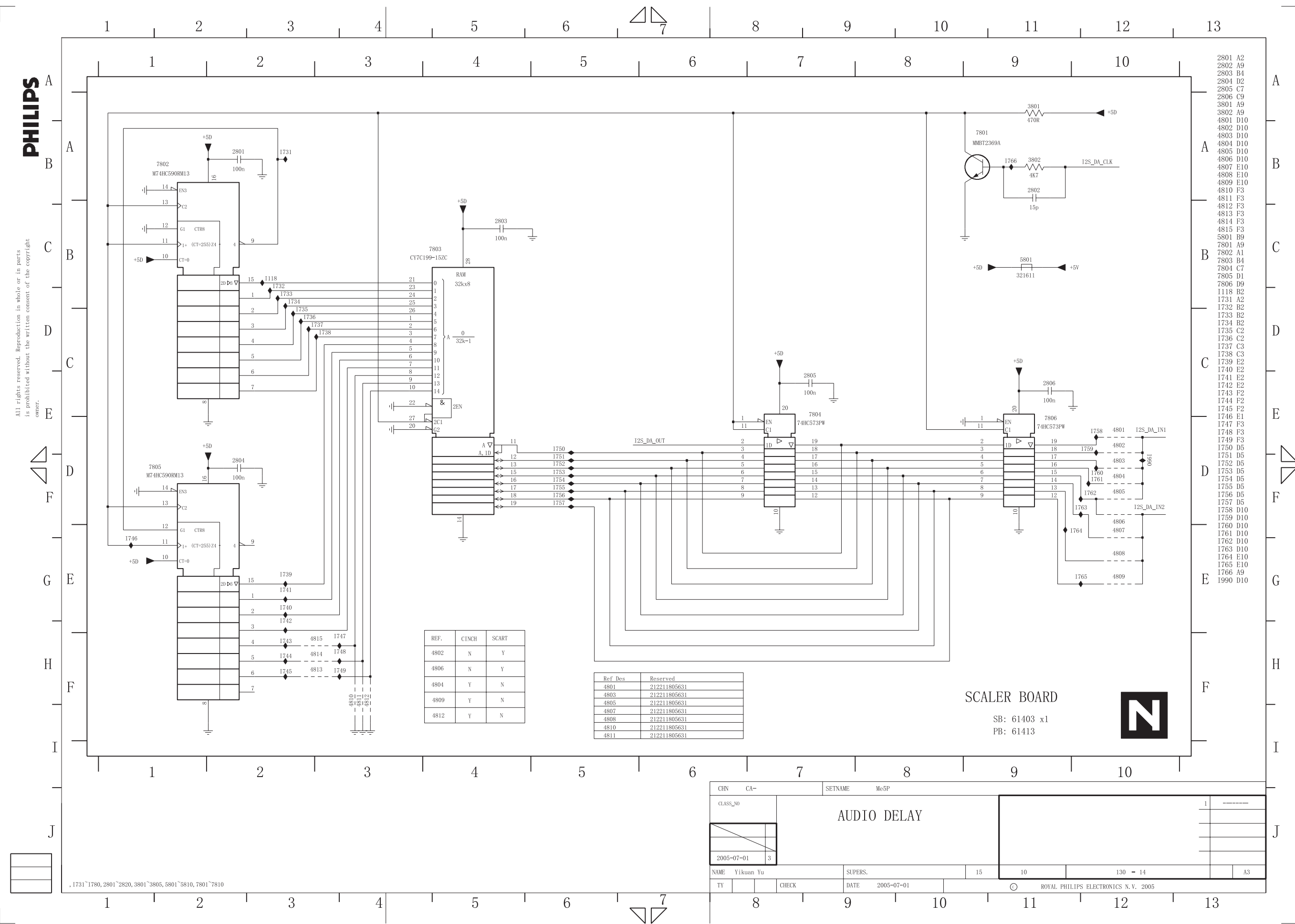
E

H

J

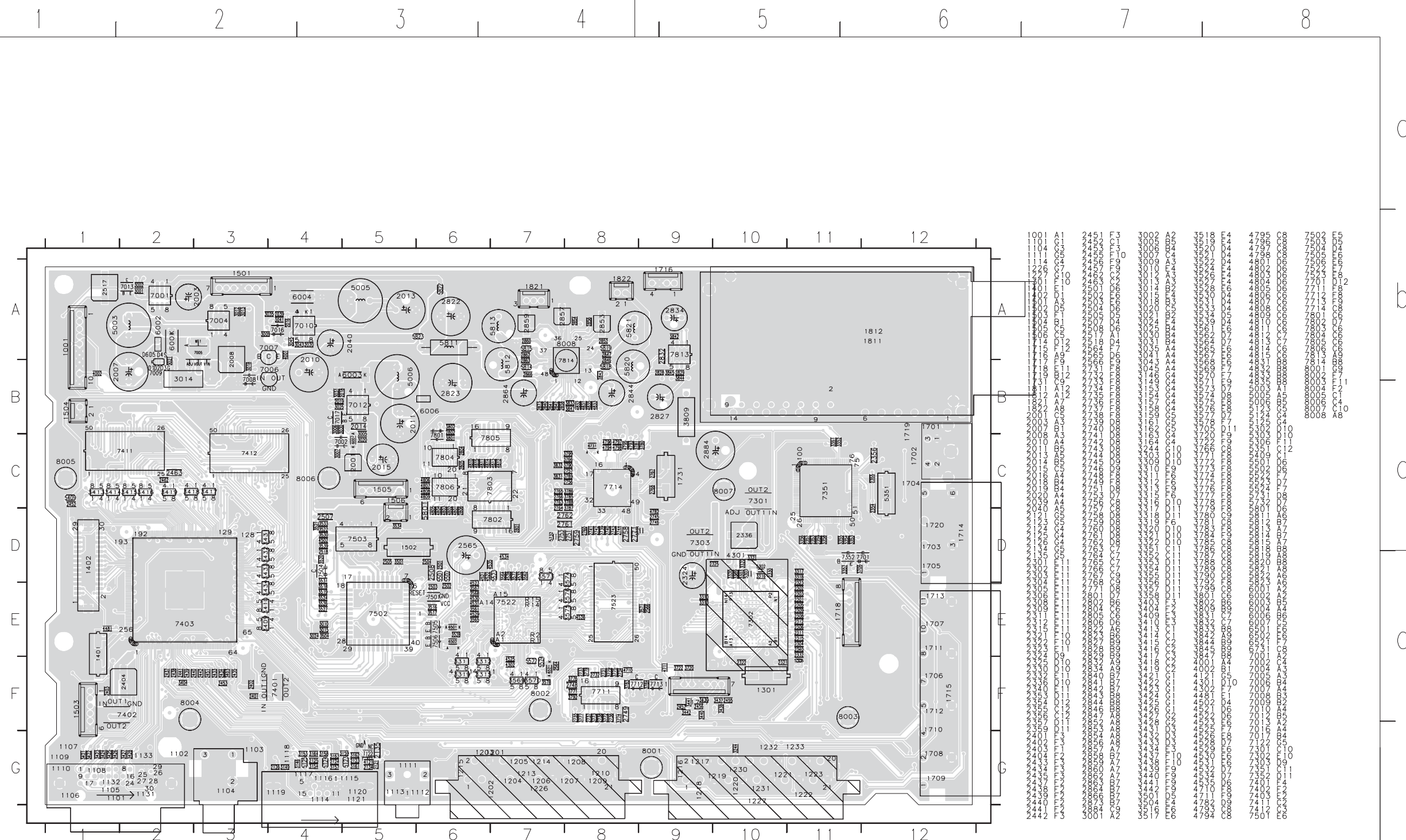


SCALER DIAGRAM



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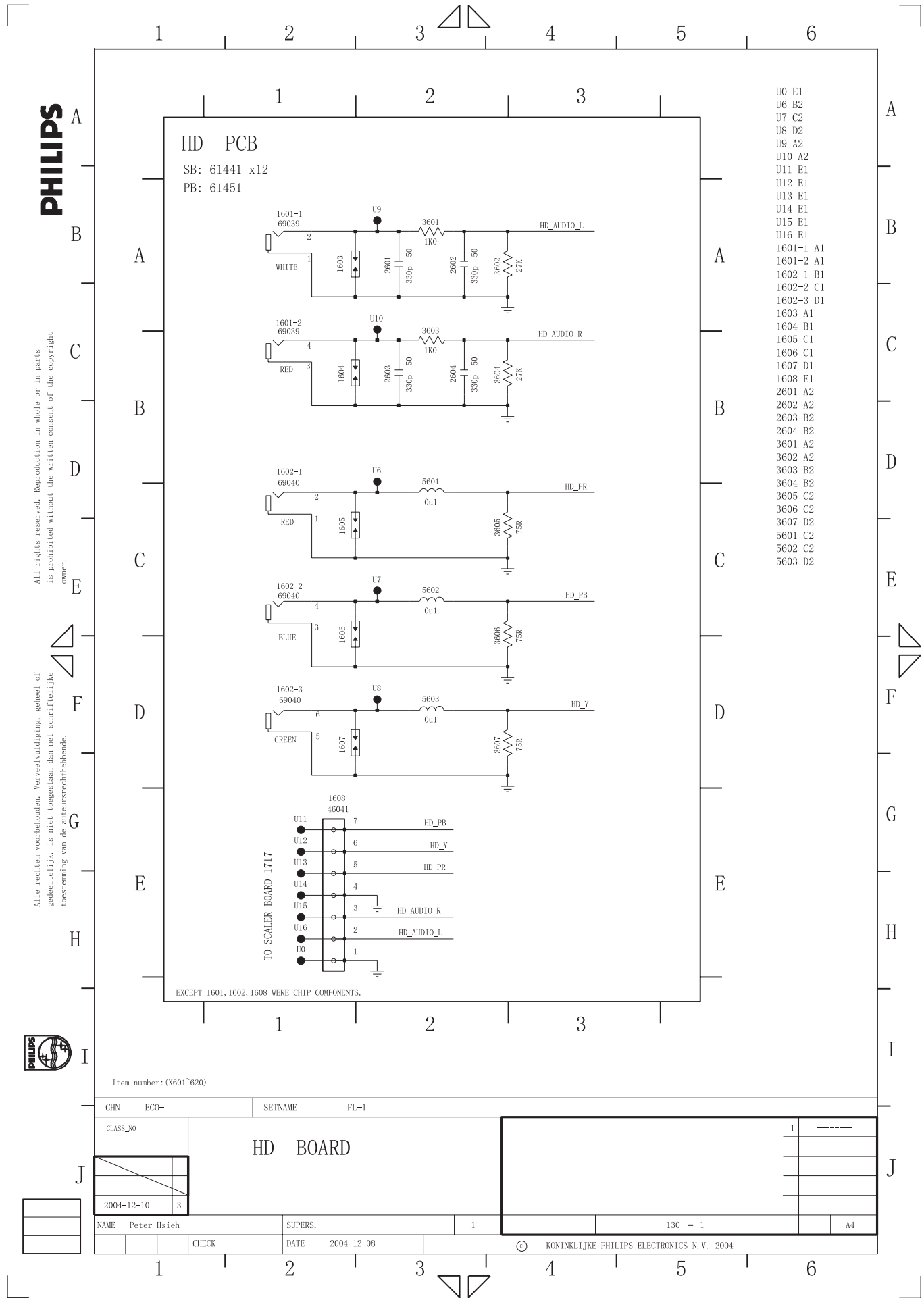
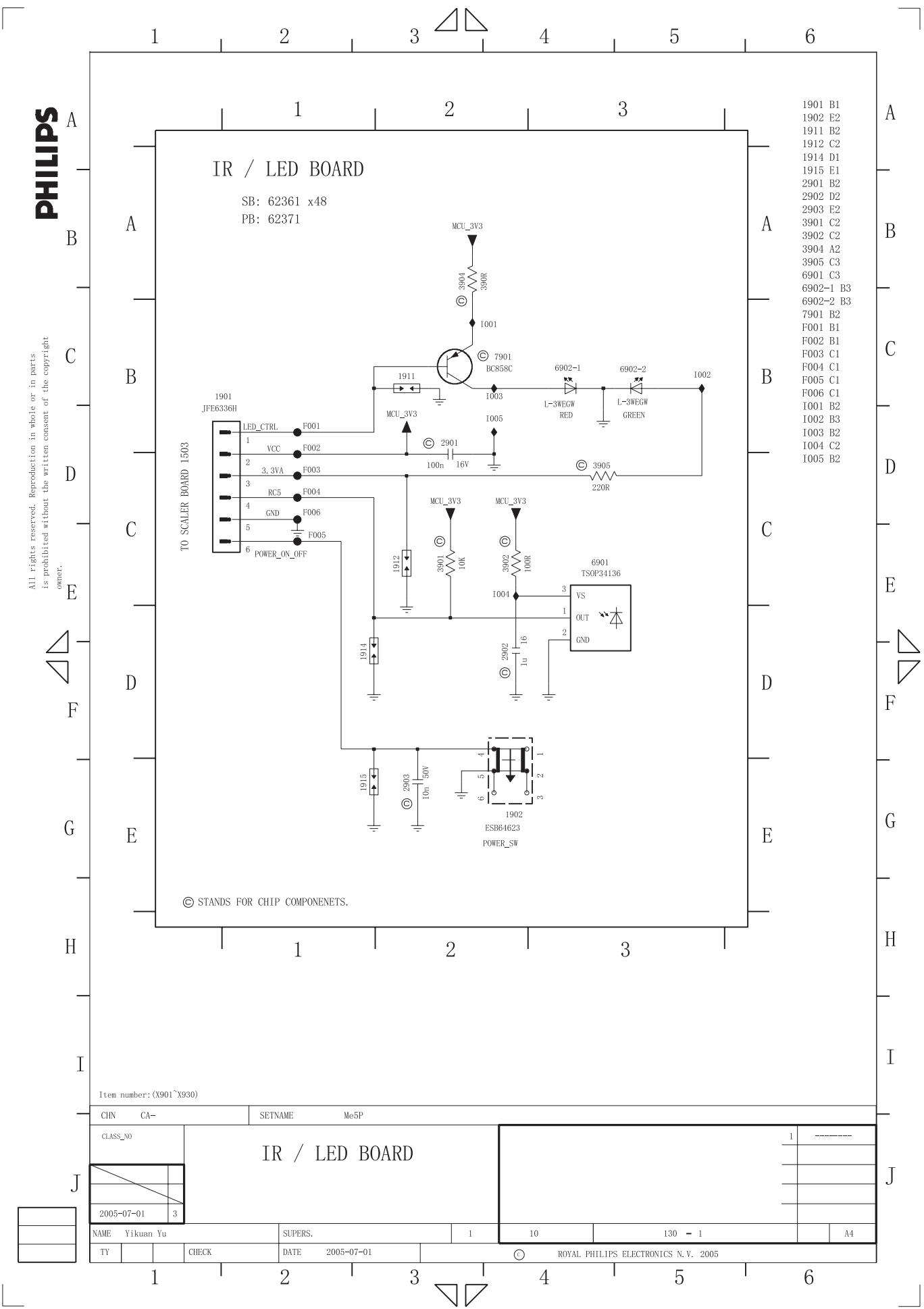




CN: CA-003455				MMD FL1			
CLASS NO. 3XX000		Scaler Board				3	2005-06-14
1 2 2004-12-13						2	2005-03-08
						1	2004-12-13
						3	
NAME P Hsieh/D Tai		SUPERS		2	10	132 - 1	
	CHECK	DATE 2004-12-13		©	Philips Electronics N.V.		
					A3		



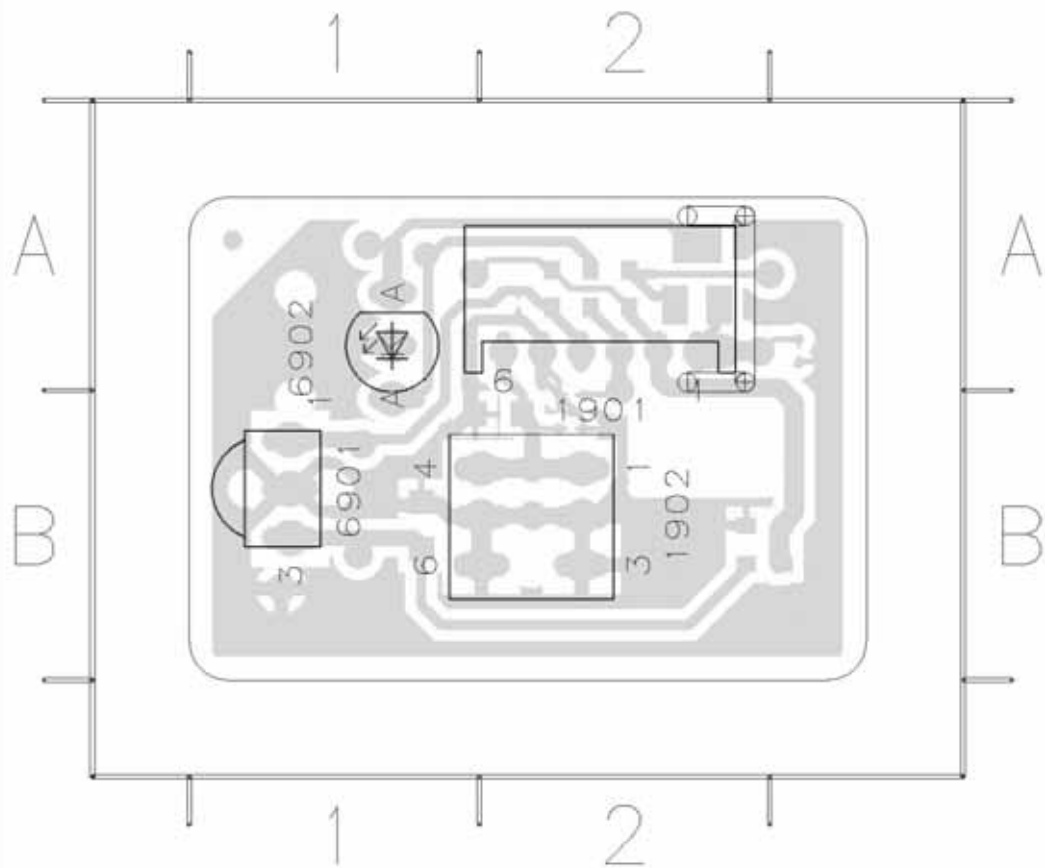
IR&HD DIAGRAM



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1901 B2 6901 B1
1902 B2 6902 A1

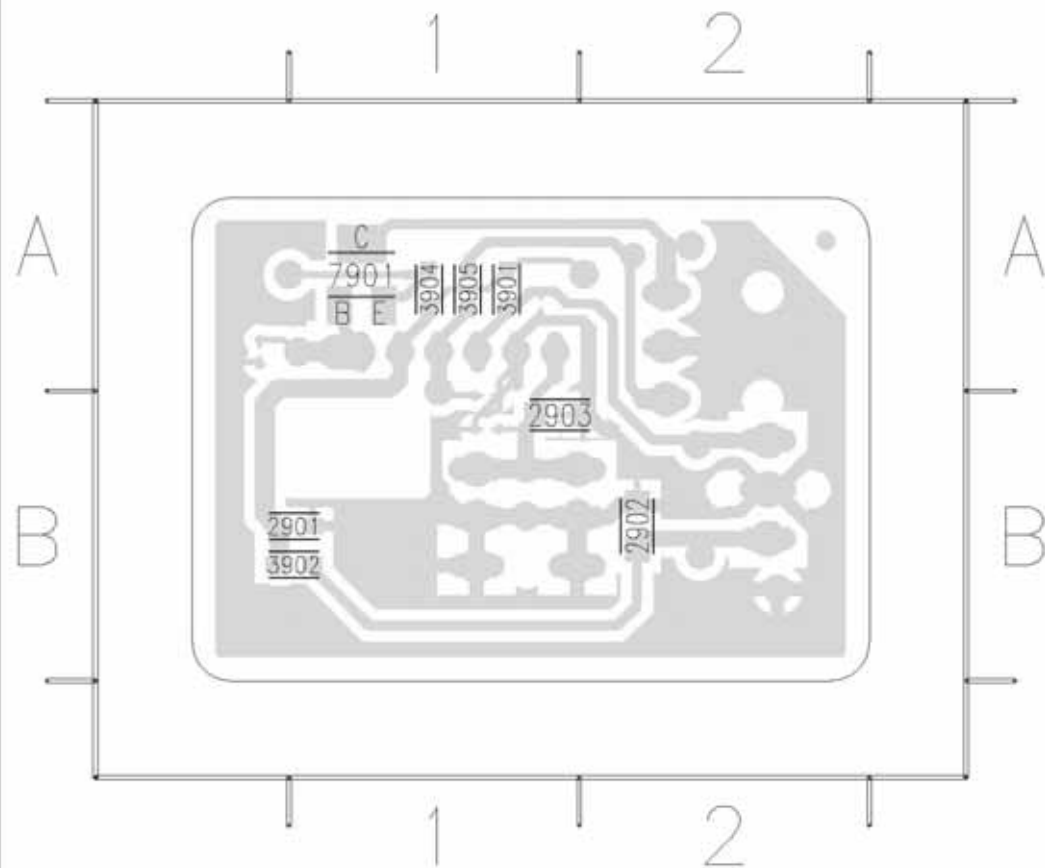


CN: CA-		MMD ME5P			
CLASS NO. 3XX000		IR+LED Board		1	2005-06-17
2005-06-17					
NAME DS Yu/IF Chang		SUPERS	2	10	132 - 1
TY		CHECK	DATE 2005-06-17	©	ROYAL PHILIPS ELECTRONICS N.V.

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2901 B1 3901 A1 3905 A1
2902 B2 3902 B1 7901 A1
2903 B1 3904 A1



CN: CA-		MMD ME5P			
CLASS NO. 3XX000		IR+LED Board		1	2005-06-17
2005-06-17					
NAME DS Yu/IF Chang		SUPERS	2	10	132 - 2
TY		CHECK	DATE 2005-06-17	©	ROYAL PHILIPS ELECTRONICS N.V.

HD BOARD C.B.A

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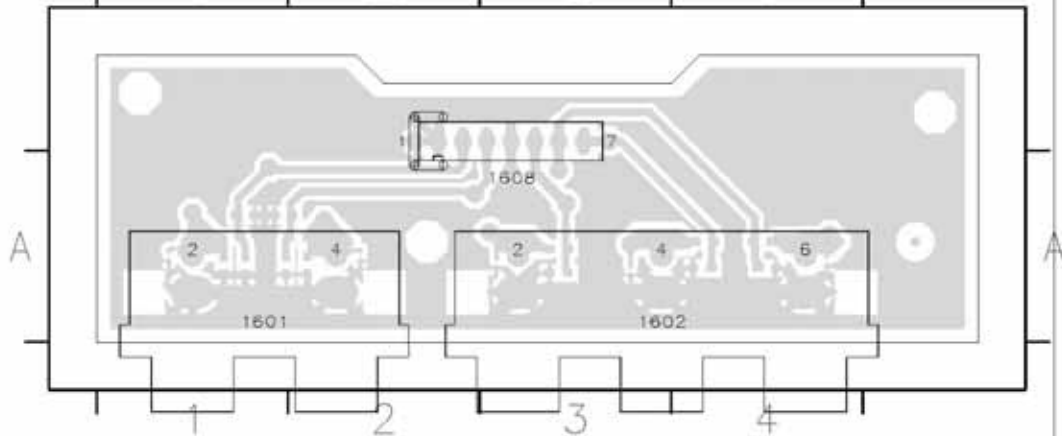


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1601 A1 1602 A3 1608 A3

1 2 3 4



CN: ECO-		MMD FLI			
CLASS NO. 3XX000		HD Board		1	2004-12-10
2004-12-10					
NAME Peter Hsieh/IF		SUPERS	2	10	132 - 1
		CHECK			A4
		DATE	2004-12-10	© Philips Electronics N.V.	

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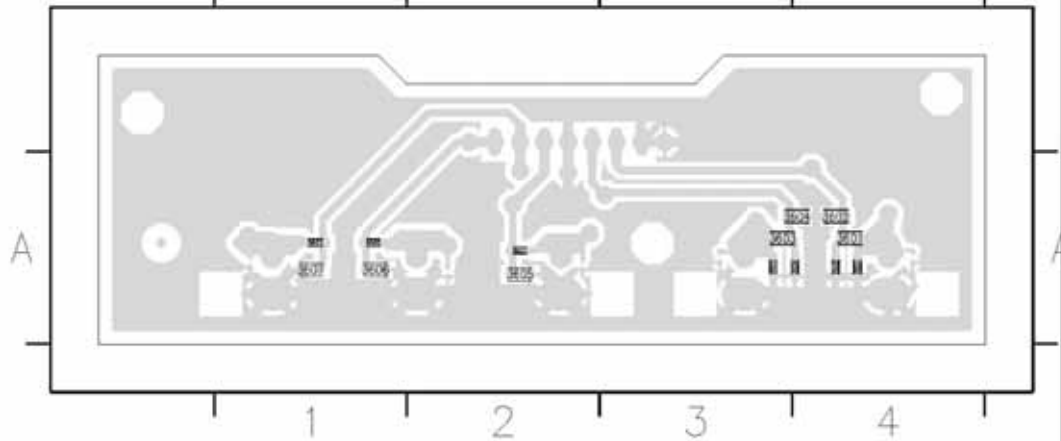


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2601 A4 2603 A3 3601 A4 3603 A3 3605 A2 3607 A1 5602 A1
2602 A4 2604 A4 3602 A4 3604 A4 3606 A1 5601 A2 5603 A1

1 2 3 4

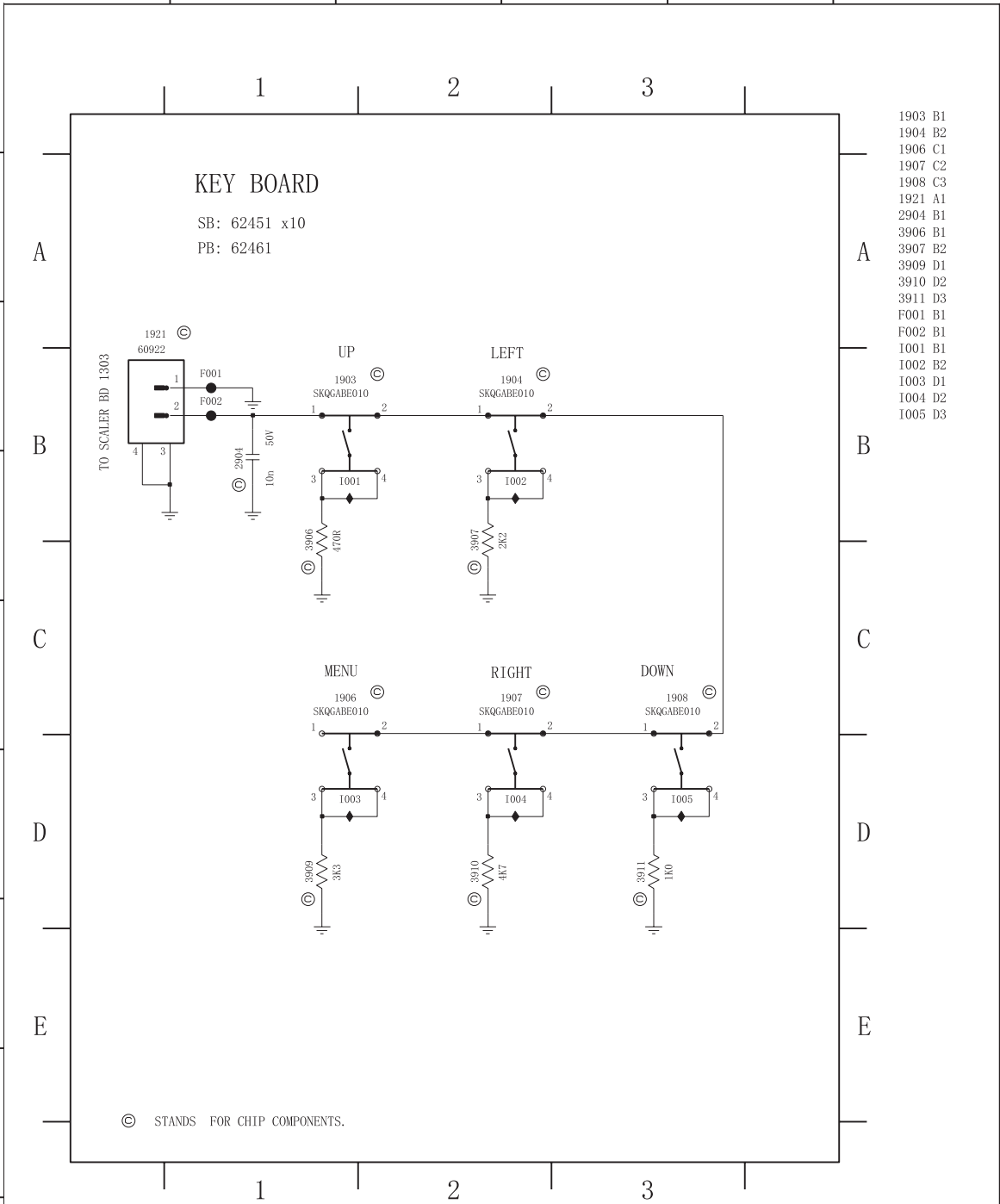


CN: ECO-		MMD FLI			
CLASS NO. 3XX000		HD Board		1	2004-12-10
2004-12-10					
NAME Peter Hsieh/IF		SUPERS	2	10	132 - 2
		CHECK			A4
		DATE	2004-12-10	© Philips Electronics N.V.	

KEY DIAGRAM

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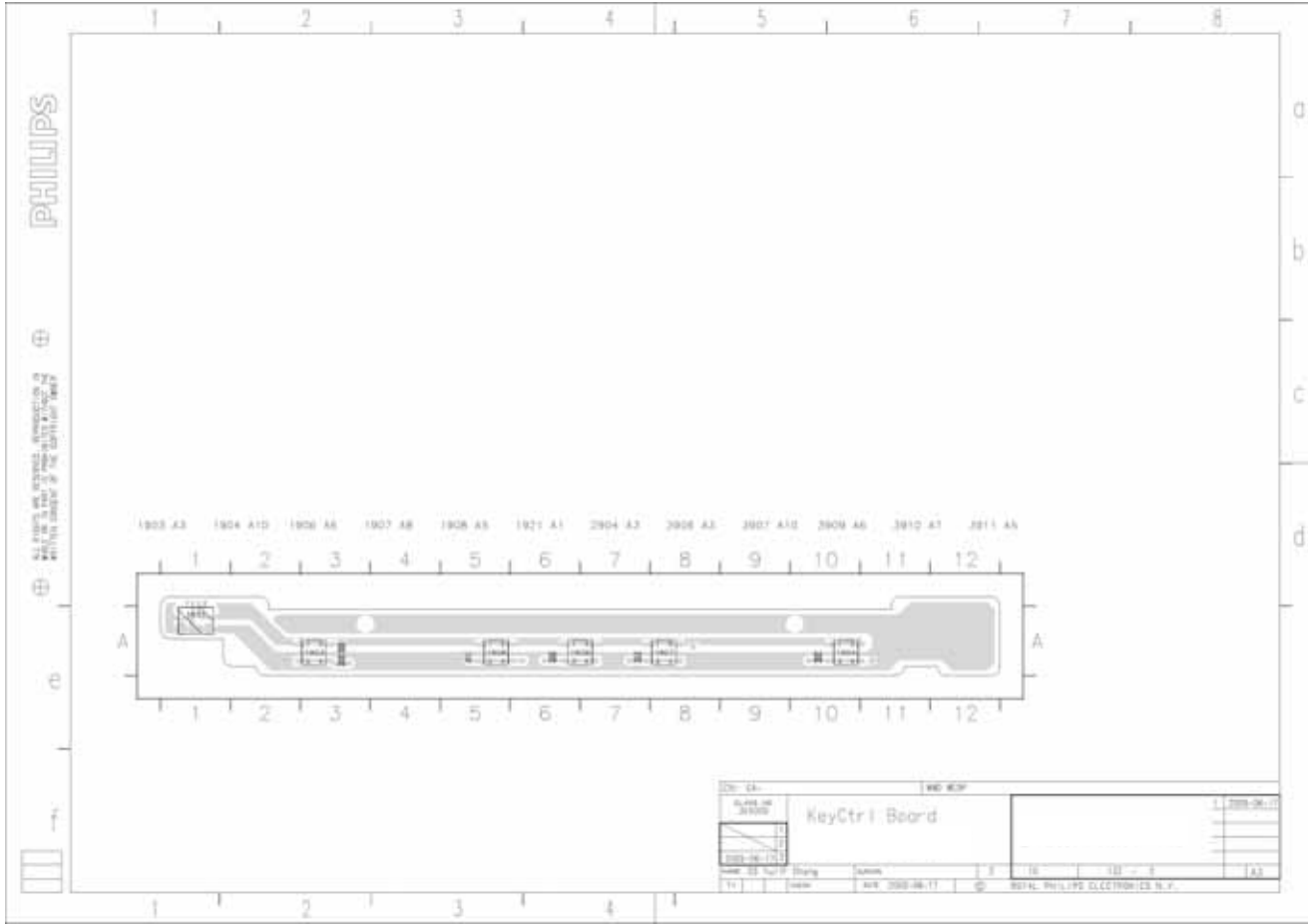
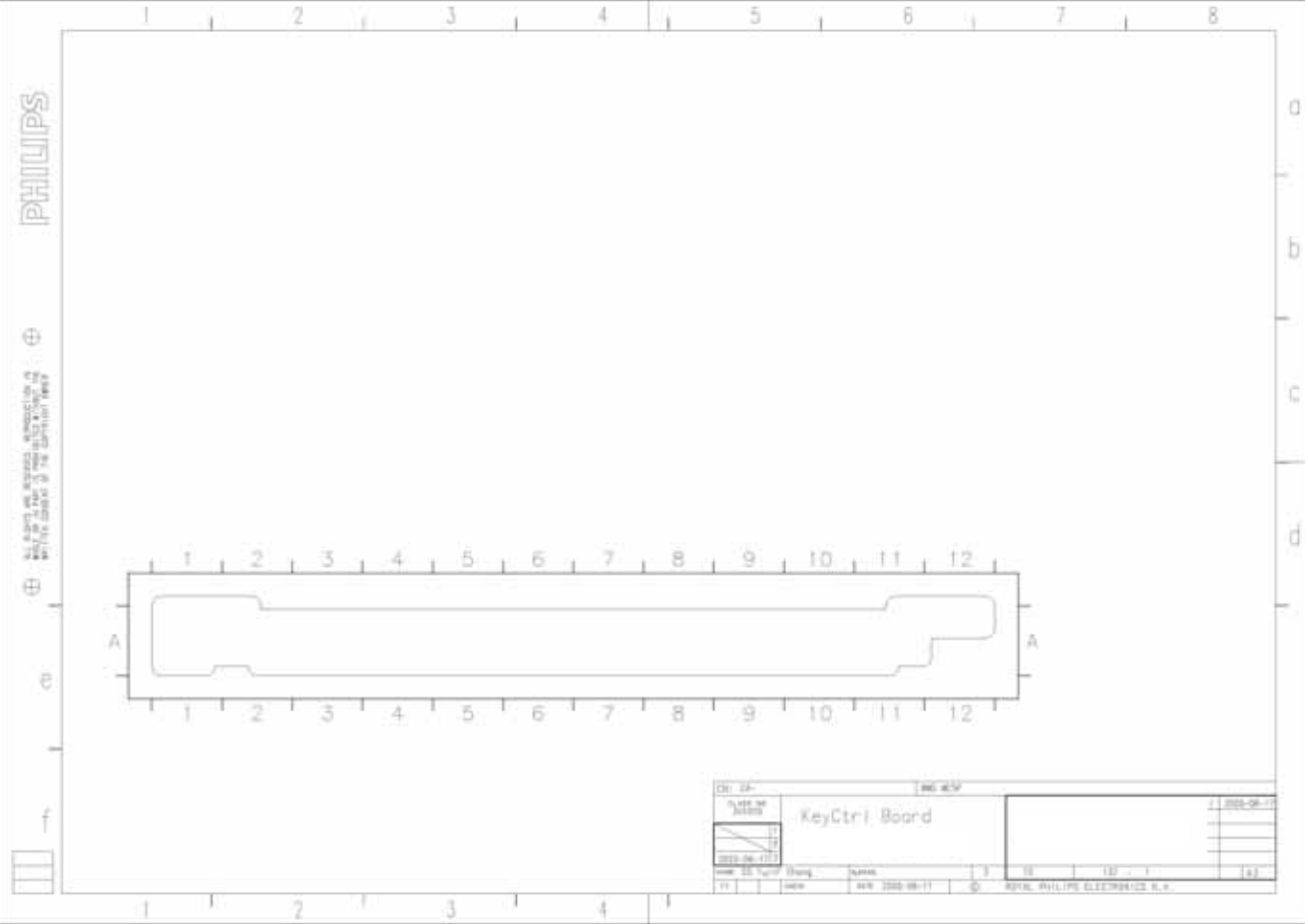
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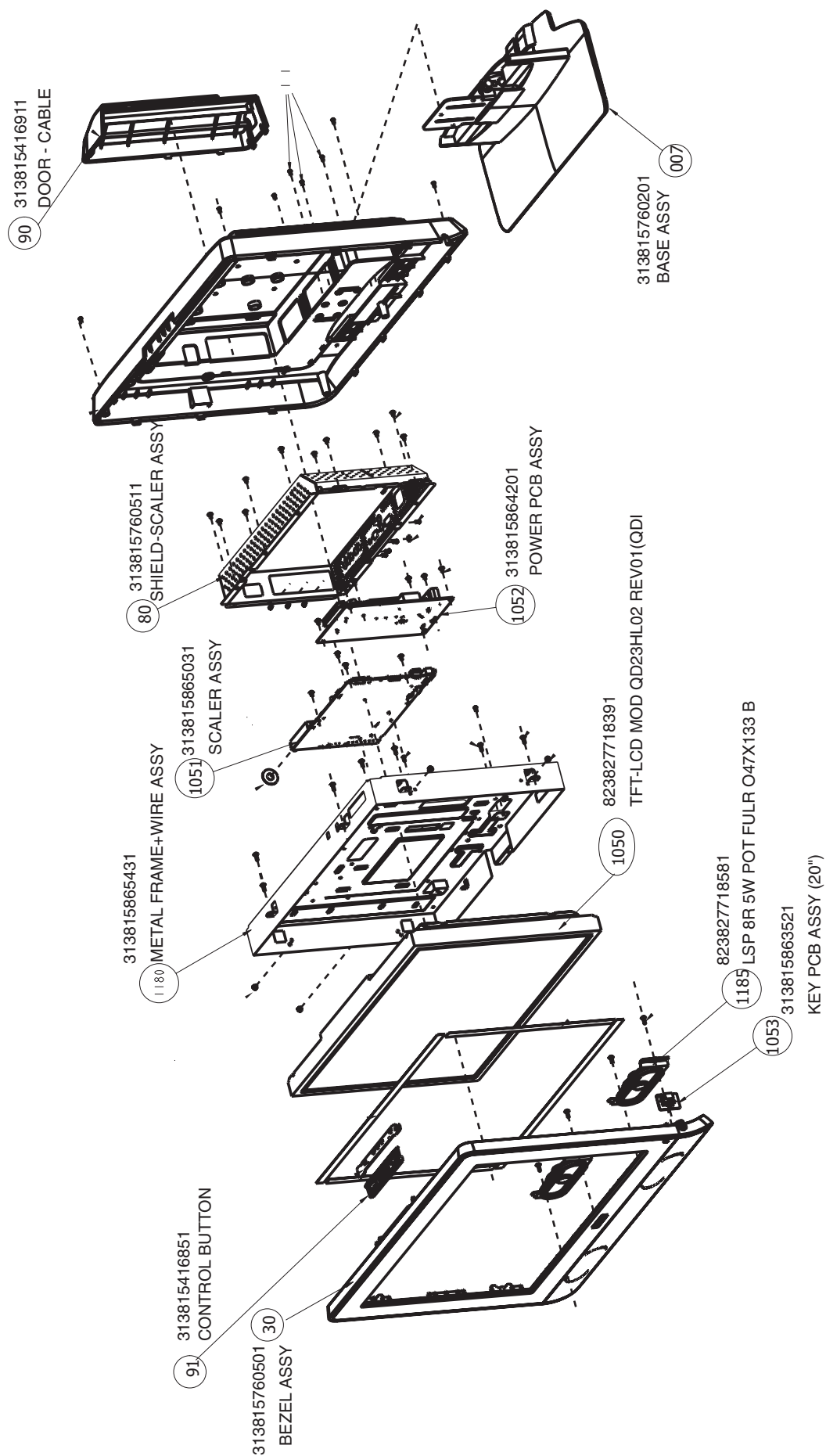
CHN	CA-	SETNAME	ME5P
CLASS_NO	KEY BOARD		
2005-06-17	3	1	10
NAME	Ison Kuo	SUPERS.	1
TY	CHECK	DATE	2005-06-17
		ROYAL PHILIPS ELECTRONICS N.V. 2005	
		130 - 1	A4

KEY BOARD DIAGRAM

Go to cover page



EXPLODED VIEW



Recommended Parts List

 Go to cover page

7056	932222284682	IC L6562N (ST00) L
7057	932217923687	FET POW STP20NM60 (ST00) L
7061	935267356112	IC TEA1507P/N1 (PHSE) L
7062	932219657687	FET POW STP10NK80ZFP (ST00) L
7063	933953410676	TRA SIG TBC328-40 (TOSJ) A
7072	932214014667	OPT CP TCET1103(G) (VISH) L
7073	932208697676	IC TL431ACZ S (ST00) A
7074	932214014667	OPT CP TCET1103(G) (VISH) L
7076	933237790126	TRA SIG BC547C (PHSE) A
8051	313811871211	GROUND WIRE ASSY
8052	313811871211	GROUND WIRE ASSY
8053	313811871211	GROUND WIRE ASSY
7001	932211529668	FET POW SM SI9433DY-E3 (VISH)R
7002	932217438685	TRA SIG SM BC847C (KEC0) R
7003	932209265685	TRA SIG SM MUN2211JG (ONSE) R
7004	932219076668	IC SM L5972D (ST00) R
7005	932218295668	IC SM LD1117S (ST00) R
7006	932213067676	IC L78L08ACZ (ST00) A
7009	932216638668	FET POW SM SI5441DC-E3 (VISH)R
7010	932219076668	IC SM L5972D (ST00) R
7012	932219076668	IC SM L5972D (ST00) R
7013	932209265685	TRA SIG SM MUN2211JG (ONSE) R
7015	932209265685	TRA SIG SM MUN2211JG (ONSE) R
7016	932209265685	TRA SIG SM MUN2211JG (ONSE) R
7017	932217438685	TRA SIG SM BC847C (KEC0) R
7101	932216972682	IC SM AT24C02N-10SC-2.7(ATME)L
7122	935245720165	IC SM 74HCT1G14GW (PHSE) R
7124	932216972682	IC SM AT24C02N-10SC-2.7(ATME)L
7301	932222076668	IC SM AME1117CCGTZ (AME0) R
7302	935276561518	IC SM SAA7119E/V2/G (PHSE) R
7303	932222077668	IC SM AME1117ECGTZ (AME0) R
7401	932222075668	IC SM AME1117BCGTZ (AME0) R
7402	932222076668	IC SM AME1117CCGTZ (AME0) R
7403	932222013671	IC SM MST51512L-LF (MSTA) Y
7411	823827716781	1M16-42S16100A1
7412	823827716781	1M16-42S16100A1
7501	932219183685	IC SM LM809M3-2.93 NOPB(NSC0)R
7502	313815865061	CPU IC ASSY
7502	932222010682	IC SM NT68F632ALG (NOVA) L
7503	313815865091	EEPROM ASSY
7503	932212209682	IC M24C32-WBN6P (ST00) L
7504	932217438685	TRA SIG SM BC847C (KEC0) R
7522	932220476671	IC SM T6TU5XBG-0001(O2) Y
7523	823827716781	1M16-42S16100A1
7701	932217438685	TRA SIG SM BC847C (KEC0) R
7711	933714830653	IC SM 74HC4052D (PHSE) R
7712	932209265685	TRA SIG SM MUN2211JG (ONSE) R
7713	932209265685	TRA SIG SM MUN2211JG (ONSE) R
7714	932220047702	IC SM MSP3440G-QI-B8V3 (MIAS)Y
7801	933828890215	TRA SIG SM PMBT2369 (PHSE) R
7802	932219513668	IC SM M74HC590M (ST00) R
7803	932215366668	IC SM CY7C199-15ZC (CYPR) R
7804	935187000118	IC SM 74HC573PW (PHSE) R
7805	932219513668	IC SM M74HC590M (ST00) R
7806	935187000118	IC SM 74HC573PW (PHSE) R
7813	935273874115	IC SM TDA1308T/N2 (PHSE) R
7814	932222035668	IC SM TPA3005D2PHP (TI00) R
7821	933967310685	TRA SIG SM BC848CLG (ONSE) R

Spare Parts List

ME5P 23"

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Model:23PF5320/28

Mechanical Parts:

0007	313815760201	BASE ASSY
0030	313815760501	BEZEL ASSY
0031	313815416891	BEZEL
0032	313815416861	LENS-IR
0033	313815416841	POWER BUTTON
0035	313815416921	DECO FRONT
0036	313912001861	WORDMARK 46.7 X 10.2 BLACK HG
0051	313815137591	MAIN FRAME
0080	313815760511	SHIELD-SCALER ASSY
0082	313815321741	NON-WOVEN FABRIC-120X20
0083	313815137601	SHIELDING
0084	313815321661	NON-WOVEN FABRIC-150X13
0091	313815416851	CONTROL BUTTON

LCD Panel

1050	823827718391	TFT-LCD MOD QD23HL02 REV01(QDI
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Packing

0129	313810650281	P.E. BAG (INSTR. BOOK)
0450	313815640961	CARTON
0451	313815640831	CUSHION-LEFT
0452	313815640841	CUSHION-RIGHT
0453	313815640141	P.E. FOAM BAG(750 X 800)
0458	313815636362	P.E.BAG 275x320 mm

Accessory

0090	313815416911	DOOR - CABLE
0126	313815568141	RATING LABEL
0141	313815523761	QUICK SETUP GUIDE-ENGLISH
0142	313815523811	OWNER'S MNAUAL-ENGLISH
0143	312123346091	Philips Product Reg. Card
0144	313912525031	WORLD WIDE GUARANTEE CARD
0145	313501508061	LABEL WARRENTY CARD

PCB ASSY

1051	313815865031	SCALER ASSY
1052	313815864201	POWER PCB ASSY
1053	313815863521	KEY PCB ASSY (20")
1054	313815865561	IR / LED PCB ASSY
1056	313815861021	HDP PCB ASSY(FL1-NA)

Miscellanea

0176	313815161771	COPPER BOSS
0181	313815416971	IR HOLDER
0182	313815416991	LED HOLDER
0291	313815568151	LABEL-(QDI-NAFTA)
0292	313815568151	LABEL-(QDI-NAFTA)
0615	313811708921	HEX CODE OF F/W(ME5P 23"NAFTA)
1101	242203300374	SOC DVI H 29P F 1.91DVI-I B
1104	242202605736	SOC CINCH H 2P F 2L1 WHRD Y
1111	242202605769	SOC PHONE H 1P F 3.5 ST BK B
1114	242202518432	SOC SUBD H 15P F SBFR Y
1172	313818870491	MAINSCORD UL 10A 1M8 DET BK
1176	313923811451	PROD ASSY RC1683301/01 PKD
1177	313818876621	CON ACC ADP V 01P M 0.00/NTSC
1180	313815865431	METAL FRAME+WIRE ASSY
1185	823827718581	LSP 8R 5W POT FULLR O47X133 B
1251	313815859171	DIODE ASSY GBU6J 6051
1252	313815859181	DIODE ASSY STTH5L06 6052
1253	313815859191	DIODE ASSY(6071,6076)
1254	313815859211	POW TRANS ASSY 7057/ 7062
1301	243854300089	RES XTL SM 24M576 16P HC49/S R
1401	243854300086	RES XTL SM 14M318 18P HC49/S R
1402	242202518804	CON V 30P M 1.25 SM 60948 R
1411	313815861221	SDRAM ASSY(ISSI)7411,7412
1501	242202518819	CON V 7P M 2.00 63387 B
1502	242254301508	RES XTL SM 11M059 20P SMD-49 R
1503	242202518818	CON V 6P M 2.00 63386 B
1504	242202518814	CON V 2P M 2.00 63382 B
1509	243803100435	SOC IC V 8P F 2.54 DIL L
1714	823827716601	CHINCH CONNECTOR 69444
1715	242202605554	SOC CINCH H 8P F 2L4 B
1716	242202518816	CON V 4P M 2.00 63384 B
1717	242202518819	CON V 7P M 2.00 63387 B
1718	242202518821	CON V 8P M 2.00 63388 B
1731	242254301364	RES XTL SM 18M432 16P SMD-49 R
1811	313914722661	FRONTEND FQ1236/F H-5
1822	242202518814	CON V 2P M 2.00 63382 B
1951	313815863451	IR+HOLDER
1952	313815863531	LED+HOLDER(20")
4444	312278515690	CD ROM - SERVICE MANUAL
8161	313819876331	CBLE-130 30/220/30-033 AWG28
8162	313819876291	CBLE-392 12/200/14 -024 AWG26
8163	313819876301	CBLE-390 10/75/10-020 AWG26

8171	313819876271	CBLE-001 2/240/2-012 AWG28
8172	313819876281	CBLE-016 6/350/6-016 AWG28
8177	313819876321	CBLE FAST/570+625/2-392 AWG26
8178	313819876311	CBLE FAST/720+775/3-123 AWG26

PCB ASSY

1051	313815865031	SCALER ASSY
2001	202203100207	ELCAP SM RVS 16V 100U PM20 R
2003	203803513313	ELCAP RGA 25V S 100U PM20 B
2004	223858619812	CER2 0603 Y5V 50V 100N P8020 R
2005	223878616641	CER2 0603 X7R 16V 22N PM10 R
2006	223886715221	CER1 0603 NP0 50V 220P PM5 R
2007	202203100074	ELCAP KM 16V S 1000U PM20 B
2009	202055296507	CER2 1206 Y5V 10V 10U P8020 R
2010	202203100074	ELCAP KM 16V S 1000U PM20 B
2011	202203100074	ELCAP KM 16V S 1000U PM20 B
2013	202203100074	ELCAP KM 16V S 1000U PM20 B
2014	223858115649	CER2 1206 X7R 50V 100N PM10 R
2015	203803511407	ELCAP REA 35V S 100U PM20 B
2016	223886715221	CER1 0603 NP0 50V 220P PM5 R
2018	223886715221	CER1 0603 NP0 50V 220P PM5 R
2019	223858619807	CER2 0603 Y5V 50V 22N P8020 R
2020	223891619849	CER2 0603 Y5V 25V 100N P8020 R
2039	223858619807	CER2 0603 Y5V 50V 22N P8020 R
2040	203803513313	ELCAP RGA 25V S 100U PM20 B
2102	223878615649	CER2 0603 X7R 16V 100N PM10 R
2103	223886715331	CER1 0603 NP0 50V 330P PM5 R
2104	223886715331	CER1 0603 NP0 50V 330P PM5 R
2105	223878615649	CER2 0603 X7R 16V 100N PM10 R
2106	223886715331	CER1 0603 NP0 50V 330P PM5 R
2107	223886715331	CER1 0603 NP0 50V 330P PM5 R
2121	223886715109	CER1 0603 NP0 50V 10P PM5 R
2122	223886715101	CER1 0603 NP0 50V 100P PM5 R
2123	223886715568	CER1 0603 NP0 50V 5P6 PM0P5 R
2124	223886715568	CER1 0603 NP0 50V 5P6 PM0P5 R
2125	223886715568	CER1 0603 NP0 50V 5P6 PM0P5 R
2126	223878615649	CER2 0603 X7R 16V 100N PM10 R
2127	223891619849	CER2 0603 Y5V 25V 100N P8020 R
2128	223886715331	CER1 0603 NP0 50V 330P PM5 R
2129	223886715331	CER1 0603 NP0 50V 330P PM5 R
2130	223886715331	CER1 0603 NP0 50V 330P PM5 R
2132	223886715331	CER1 0603 NP0 50V 330P PM5 R
2134	223886715339	CER1 0603 NP0 50V 33P PM5 R
2135	202055296507	CER2 1206 Y5V 10V 10U P8020 R
2301	223878616641	CER2 0603 X7R 16V 22N PM10 R
2303	223878616641	CER2 0603 X7R 16V 22N PM10 R
2304	223878616641	CER2 0603 X7R 16V 22N PM10 R
2305	223878616641	CER2 0603 X7R 16V 22N PM10 R
2306	223878616641	CER2 0603 X7R 16V 22N PM10 R
2308	223878616641	CER2 0603 X7R 16V 22N PM10 R
2309	223878616641	CER2 0603 X7R 16V 22N PM10 R
2311	223878616641	CER2 0603 X7R 16V 22N PM10 R
2312	223878616641	CER2 0603 X7R 16V 22N PM10 R
2315	223878616641	CER2 0603 X7R 16V 22N PM10 R
2317	223878616641	CER2 0603 X7R 16V 22N PM10 R
2318	223878616641	CER2 0603 X7R 16V 22N PM10 R
2319	223878616641	CER2 0603 X7R 16V 22N PM10 R
2320	223878616641	CER2 0603 X7R 16V 22N PM10 R
2321	223886715279	CER1 0603 NP0 50V 27P PM5 R
2322	223886715279	CER1 0603 NP0 50V 27P PM5 R
2323	223878616641	CER2 0603 X7R 16V 22N PM10 R
2324	203803511203	ELCAP REA 16V S 100U PM20 B
2325	223878615649	CER2 0603 X7R 16V 100N PM10 R
2326	223878615649	CER2 0603 X7R 16V 100N PM10 R
2327	223878615649	CER2 0603 X7R 16V 100N PM10 R
2328	223878615649	CER2 0603 X7R 16V 100N PM10 R
2329	223878615649	CER2 0603 X7R 16V 100N PM10 R
2330	223878615649	CER2 0603 X7R 16V 100N PM10 R
2331	223878615649	CER2 0603 X7R 16V 100N PM10 R
2332	223878615649	CER2 0603 X7R 16V 100N PM10 R
2333	223878615649	CER2 0603 X7R 16V 100N PM10 R
2334	223878615649	CER2 0603 X7R 16V 100N PM10 R
2335	202055296507	CER2 1206 Y5V 10V 10U P8020 R
2336	202002191726	ELCAP SM RVS 16V 47U PM20 R
2337	223878615649	CER2 0603 X7R 16V 100N PM10 R
2338	223878615649	CER2 0603 X7R 16V 100N PM10 R
2339	223878615649	CER2 0603 X7R 16V 100N PM10 R
2340	223878616641	CER2 0603 X7R 16V 22N PM10 R
2401	223878615649	CER2 0603 X7R 16V 100N PM10 R
2402	223858615636	CER2 0603 X7R 50V 10N PM10 R
2403	223878615649	CER2 0603 X7R 16V 100N PM10 R
2404	202002191726	ELCAP SM RVS 16V 47U PM20 R

2405	202055296507	CER2 1206 Y5V 10V 10U P8020 R
2406	223878615649	CER2 0603 X7R 16V 100N PM10 R
2407	223878615649	CER2 0603 X7R 16V 100N PM10 R
2408	223878615649	CER2 0603 X7R 16V 100N PM10 R
2409	223878615649	CER2 0603 X7R 16V 100N PM10 R
2410	223878615649	CER2 0603 X7R 16V 100N PM10 R
2411	223878615649	CER2 0603 X7R 16V 100N PM10 R
2412	223878615649	CER2 0603 X7R 16V 100N PM10 R
2413	202055296507	CER2 1206 Y5V 10V 10U P8020 R
2414	223878615649	CER2 0603 X7R 16V 100N PM10 R
2415	223878615649	CER2 0603 X7R 16V 100N PM10 R
2416	223878615649	CER2 0603 X7R 16V 100N PM10 R
2417	223878615649	CER2 0603 X7R 16V 100N PM10 R
2418	223878615649	CER2 0603 X7R 16V 100N PM10 R
2419	223878615649	CER2 0603 X7R 16V 100N PM10 R
2420	202055296507	CER2 1206 Y5V 10V 10U P8020 R
2421	223878615649	CER2 0603 X7R 16V 100N PM10 R
2422	223878615649	CER2 0603 X7R 16V 100N PM10 R
2423	223878615649	CER2 0603 X7R 16V 100N PM10 R
2424	223878615649	CER2 0603 X7R 16V 100N PM10 R
2425	202055296507	CER2 1206 Y5V 10V 10U P8020 R
2426	223878615649	CER2 0603 X7R 16V 100N PM10 R
2427	223878615649	CER2 0603 X7R 16V 100N PM10 R
2428	202055296507	CER2 1206 Y5V 10V 10U P8020 R
2429	223878615649	CER2 0603 X7R 16V 100N PM10 R
2430	223878615649	CER2 0603 X7R 16V 100N PM10 R
2431	223878615649	CER2 0603 X7R 16V 100N PM10 R
2432	223878615649	CER2 0603 X7R 16V 100N PM10 R
2433	223878615645	CER2 0603 X7R 16V 47N PM10 R
2434	223878615645	CER2 0603 X7R 16V 47N PM10 R
2435	223878615645	CER2 0603 X7R 16V 47N PM10 R
2436	223891611549	CER1 0603 NP0 25V 1N PM5 R
2437	223878615645	CER2 0603 X7R 16V 47N PM10 R
2438	223878615645	CER2 0603 X7R 16V 47N PM10 R
2439	223878615645	CER2 0603 X7R 16V 47N PM10 R
2440	223878615645	CER2 0603 X7R 16V 47N PM10 R
2441	223891611549	CER1 0603 NP0 25V 1N PM5 R
2442	223878615645	CER2 0603 X7R 16V 47N PM10 R
2443	223858615636	CER2 0603 X7R 50V 10N PM10 R
2444	223878615649	CER2 0603 X7R 16V 100N PM10 R
2445	223886715229	CER1 0603 NP0 50V 22P PM5 R
2446	223886715229	CER1 0603 NP0 50V 22P PM5 R
2447	223886715568	CER1 0603 NP0 50V 5P6 PM0P5 R
2448	223878615649	CER2 0603 X7R 16V 100N PM10 R
2449	223878615649	CER2 0603 X7R 16V 100N PM10 R
2450	223878615649	CER2 0603 X7R 16V 100N PM10 R
2451	223878615645	CER2 0603 X7R 16V 47N PM10 R
2452	223878619854	CER2 0603 Y5V 16V 220N P8020 R
2453	223886715181	CER1 0603 NP0 50V 180P PM5 R
2455	223886715229	CER1 0603 NP0 50V 22P PM5 R
2456	223886715229	CER1 0603 NP0 50V 22P PM5 R
2457	223886715229	CER1 0603 NP0 50V 22P PM5 R
2461	223878615649	CER2 0603 X7R 16V 100N PM10 R
2462	223878615649	CER2 0603 X7R 16V 100N PM10 R
2463	202055296507	CER2 1206 Y5V 10V 10U P8020 R
2464	202055296507	CER2 1206 Y5V 10V 10U P8

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2550	223878615649	CER2 0603 X7R 16V	100N PM10 R	2835	223824619863	CER2 0603 Y5V 10V	1U P8020 R	3137	232270260101	RST SM 0603 RC21	100R PM5 R
2551	223878615649	CER2 0603 X7R 16V	100N PM10 R	2840	223878619854	CER2 0603 Y5V 16V	220N P8020 R	3139	232270260472	RST SM 0603 RC21	4K7 PM5 R
2552	223878615649	CER2 0603 X7R 16V	100N PM10 R	2841	223878619854	CER2 0603 Y5V 16V	220N P8020 R	3140	232270260472	RST SM 0603 RC21	4K7 PM5 R
2553	223878615649	CER2 0603 X7R 16V	100N PM10 R	2842	223878619854	CER2 0603 Y5V 16V	220N P8020 R	3141	232270260273	RST SM 0603 RC21	27K PM5 R
2554	223878615649	CER2 0603 X7R 16V	100N PM10 R	2843	223878615649	CER2 0603 X7R 16V	100N PM10 R	3142	232270260273	RST SM 0603 RC21	27K PM5 R
2555	223878615649	CER2 0603 X7R 16V	100N PM10 R	2844	203803513313	ELCAP RGA 25V S	100U PM20 B	3146	232270260101	RST SM 0603 RC21	100R PM5 R
2556	223878615649	CER2 0603 X7R 16V	100N PM10 R	2845	223891619849	CER2 0603 Y5V 25V	100N P8020 R	3149	232270260101	RST SM 0603 RC21	100R PM5 R
2557	223878615649	CER2 0603 X7R 16V	100N PM10 R	2846	223886715101	CER1 0603 NP0 50V	100P PM5 R	3153	232270260101	RST SM 0603 RC21	100R PM5 R
2558	223878615649	CER2 0603 X7R 16V	100N PM10 R	2847	223886715101	CER1 0603 NP0 50V	100P PM5 R	3154	212211805642	RST SM 0603 RC0603	75R PM5 R
2559	223878615649	CER2 0603 X7R 16V	100N PM10 R	2848	223891619849	CER2 0603 Y5V 25V	100N P8020 R	3156	232270260102	RST SM 0603 RC21	1K PM5 R
2560	223878615649	CER2 0603 X7R 16V	100N PM10 R	2849	223858119716	CER2 1206 Y5V 50V	470N PM20 R	3157	212211805642	RST SM 0603 RC0603	75R PM5 R
2561	223878615649	CER2 0603 X7R 16V	100N PM10 R	2850	223878619854	CER2 0603 Y5V 16V	220N P8020 R	3158	232270260101	RST SM 0603 RC21	100R PM5 R
2562	223878615649	CER2 0603 X7R 16V	100N PM10 R	2851	223878619854	CER2 0603 Y5V 16V	220N P8020 R	3159	232270260101	RST SM 0603 RC21	100R PM5 R
2563	223878615649	CER2 0603 X7R 16V	100N PM10 R	2852	223878615649	CER2 0603 X7R 16V	100N PM10 R	3160	232270260102	RST SM 0603 RC21	1K PM5 R
2564	223878615649	CER2 0603 X7R 16V	100N PM10 R	2853	202203100231	ELCAP SM HV 50V	1U PM20 R	3161	212211805642	RST SM 0603 RC0603	75R PM5 R
2566	223886715339	CER1 0603 NP0 50V	33P PM5 R	2854	223891619849	CER2 0603 Y5V 25V	100N P8020 R	3162	232270260689	RST SM 0603 RC21	68R PM5 R
2701	223886715331	CER1 0603 NP0 50V	330P PM5 R	2855	223858615636	CER2 0603 X7R 50V	10N PM10 R	3163	232270260689	RST SM 0603 RC21	68R PM5 R
2702	223886715331	CER1 0603 NP0 50V	330P PM5 R	2856	223886715221	CER1 0603 NP0 50V	220P PM5 R	3164	232270260689	RST SM 0603 RC21	68R PM5 R
2703	223886715331	CER1 0603 NP0 50V	330P PM5 R	2857	202203100182	ELCAP SM RVS 25V	10U PM20 R	3305	212211805639	RST SM 0603 RC0603	47R PM5 R
2704	223886715331	CER1 0603 NP0 50V	330P PM5 R	2858	223878619854	CER2 0603 Y5V 16V	220N P8020 R	3306	212211805639	RST SM 0603 RC0603	47R PM5 R
2705	223886715331	CER1 0603 NP0 50V	330P PM5 R	2859	202203100231	ELCAP SM HV 50V	1U PM20 R	3307	212211805639	RST SM 0603 RC0603	47R PM5 R
2706	223886715331	CER1 0603 NP0 50V	330P PM5 R	2860	223878615649	CER2 0603 X7R 16V	100N PM10 R	3308	212211805639	RST SM 0603 RC0603	47R PM5 R
2707	223886715331	CER1 0603 NP0 50V	330P PM5 R	2861	223891619849	CER2 0603 Y5V 25V	100N P8020 R	3311	235003510101	RST NETW SM ARV24	4X100R PM5 R
2708	223886715331	CER1 0603 NP0 50V	330P PM5 R	2862	223886715101	CER1 0603 NP0 50V	100P PM5 R	3312	235003510101	RST NETW SM ARV24	4X100R PM5 R
2709	223886715331	CER1 0603 NP0 50V	330P PM5 R	2863	223886715101	CER1 0603 NP0 50V	100P PM5 R	3313	212211805639	RST SM 0603 RC0603	47R PM5 R
2711	223886715331	CER1 0603 NP0 50V	330P PM5 R	2864	203803513313	ELCAP RGA 25V S	100U PM20 B	3316	232270260332	RST SM 0603 RC21	3K3 PM5 R
2713	223886715331	CER1 0603 NP0 50V	330P PM5 R	2865	223891619849	CER2 0603 Y5V 25V	100N P8020 R	3317	232270260472	RST SM 0603 RC21	4K7 PM5 R
2715	223886715331	CER1 0603 NP0 50V	330P PM5 R	2866	223878615649	CER2 0603 X7R 16V	100N PM10 R	3318	232270260472	RST SM 0603 RC21	4K7 PM5 R
2731	223824619863	CER2 0603 Y5V 10V	1U P8020 R	2867	223858119716	CER2 1206 Y5V 50V	470N PM20 R	3320	232270260472	RST SM 0603 RC21	4K7 PM5 R
2732	223824619863	CER2 0603 Y5V 10V	1U P8020 R	2868	223878619854	CER2 0603 Y5V 16V	220N P8020 R	3321	232270260101	RST SM 0603 RC21	100R PM5 R
2733	223824619863	CER2 0603 Y5V 10V	1U P8020 R	2869	223878619854	CER2 0603 Y5V 16V	220N P8020 R	3322	232270260101	RST SM 0603 RC21	100R PM5 R
2734	223824619863	CER2 0603 Y5V 10V	1U P8020 R	2873	223878619854	CER2 0603 Y5V 16V	220N P8020 R	3402	212211805651	RST SM 0603 RC0603	390R PM5 R
2735	223824619863	CER2 0603 Y5V 10V	1U P8020 R	2881	202055296507	CER2 1206 Y5V 10V	10U P8020 R	3403	232270260471	RST SM 0603 RC21	470R PM5 R
2736	223824619863	CER2 0603 Y5V 10V	1U P8020 R	2882	202055296507	CER2 1206 Y5V 10V	10U P8020 R	3404	232270260471	RST SM 0603 RC21	470R PM5 R
2737	223824619863	CER2 0603 Y5V 10V	1U P8020 R	2883	202055296507	CER2 1206 Y5V 10V	10U P8020 R	3405	232270260101	RST SM 0603 RC21	100R PM5 R
2738	223824619863	CER2 0603 Y5V 10V	1U P8020 R	2884	202203100074	ELCAP KM 16V S	1000U PM20 B	3407	232270260102	RST SM 0603 RC21	1K PM5 R
2739	223824619863	CER2 0603 Y5V 10V	1U P8020 R	2885	223886715229	CER1 0603 NP0 50V	22P PM5 R	3408	232270461005	RST SM 0603 RC22H	1M PM1 R
2740	223824619863	CER2 0603 Y5V 10V	1U P8020 R	3001	232270260473	RST SM 0603 RC21	47K PM5 R	3409	235003510101	RST NETW SM ARV24	4X100R PM5 R
2741	223824619863	CER2 0603 Y5V 10V	1U P8020 R	3002	212211805682	RST SM 0603 RC0603	82K PM5 R	3410	235003510101	RST NETW SM ARV24	4X100R PM5 R
2742	223824619863	CER2 0603 Y5V 10V	1U P8020 R	3003	212211805676	RST SM 0603 RC0603	33K PM5 R	3411	212211805635	RST SM 0603 RC0603	10R PM5 R
2743	223824619863	CER2 0603 Y5V 10V	1U P8020 R	3004	232270260101	RST SM 0603 RC21	100R PM5 R	3412	212211805639	RST SM 0603 RC0603	47R PM5 R
2744	223824619863	CER2 0603 Y5V 10V	1U P8020 R	3005	232270260473	RST SM 0603 RC21	47K PM5 R	3413	235003510229	RST NETW SM ARV24	4X 22R PM5 R
2745	223886715479	CER1 0603 NP0 50V	47P PM5 R	3006	212211805669	RST SM 0603 RC0603	10K PM5 R	3414	235003510229	RST NETW SM ARV24	4X 22R PM5 R
2746	223886715159	CER1 0603 NP0 50V	15P PM5 R	3007	232270260223	RST SM 0603 RC21	22K PM5 R	3415	235003510229	RST NETW SM ARV24	4X 22R PM5 R
2748	223858015649	CER2 0805 X7R 50V	100N PM10 R	3009	212211805676	RST SM 0603 RC0603	33K PM5 R	3416	235003510229	RST NETW SM ARV24	4X 22R PM5 R
2749	202055296507	CER2 1206 Y5V 10V	10U P8020 R	3010	212211805667	RST SM 0603 RC0603	6K8 PM5 R	3417	235003510229	RST NETW SM ARV24	4X 22R PM5 R
2751	223858015649	CER2 0805 X7R 50V	100N PM10 R	3011	232270260472	RST SM 0603 RC21	4K7 PM5 R	3418	235003510229	RST NETW SM ARV24	4X 22R PM5 R
2753	223858015649	CER2 0805 X7R 50V	100N PM10 R	3012	232270463092	RST SM 0603 RC22H	3K09 PM1 R	3419	235003510229	RST NETW SM ARV24	4X 22R PM5 R
2754	223824615654	CER2 0603 X7R 10V	220N PM10 R	3013	232270461003	RST SM 0603 RC22H	10K PM1 R	3420	232270260101	RST SM 0603 RC21	100R PM5 R
2755	202055296507	CER2 1206 Y5V 10V	10U P8020 R	3014	213810500082	RST MOX 1W RSS S	0R82 PM5 B	3421	212211805635	RST SM 0603 RC0603	10R PM5 R
2756	223858615632	CER2 0603 X7R 50V	4N7 PM10 R	3015	212211805667	RST SM 0603 RC0603	6K8 PM5 R	3422	212211805635	RST SM 0603 RC0603	10R PM5 R
2757	223858615632	CER2 0603 X7R 50V	4N7 PM10 R	3020	232270260473	RST SM 0603 RC21	47K PM5 R	3423	212211805635	RST SM 0603 RC0603	10R PM5 R
2758	202055296507	CER2 1206 Y5V 10V	10U P8020 R	3021	212211805669	RST SM 0603 RC0603	10K PM5 R	3424	212211805635	RST SM 0603 RC0603	10R PM5 R
2759	202055296507	CER2 1206 Y5V 10V	10U P8020 R	3024	232270260101	RST SM 0603 RC21	100R PM5 R	3425	212211805635	RST SM 0603 RC0603	10R PM5 R
2760	223878615649	CER2 0603 X7R 16V	100N PM10 R	3025	232270260101	RST SM 0603 RC21	100R PM5 R	3426	212211805635	RST SM 0603 RC0603	10R PM5 R
2761	202055296507	CER2 1206 Y5V 10V	10U P8020 R	3030	212211805669	RST SM 0603 RC0603	10K PM5 R	3427	212211805635	RST SM 0603 RC0603	10R PM5 R
2762	202055296507	CER2 1206 Y5V 10V	10U P8020 R	3031	232270260472	RST SM 0603 RC21	4K7 PM5 R	3428	212211805635	RST SM 0603 RC0603	10R PM5 R
2763	223824619863	CER2 0603 Y5V 10V	1U P8020 R	3033	232270260101	RST SM 0603 RC21	100R PM5 R	3430	232270260101	RST SM 0603 RC21	100R PM5 R
2764	223824619863	CER2 0603 Y5V 10V	1U P8020 R	3034	232270461002	RST SM 0603 RC22H	1K PM1 R	3431	235003510229	RST NETW SM ARV24	4X 22R PM5 R
2765	223824619863	CER2 0603 Y5V 10V	1U P8020 R	3035	232270461002	RST SM 0603 RC21	4K7 PM5 R	3432	235003510229	RST NETW SM ARV24	4X 22R PM5 R
2766	223824619863	CER1 0603 Y5V 10V	1U P8020 R	3036	232270260071	RST SM 0603 RC22H	200R PM1 R	3433	235003510229	RST NETW SM ARV24	4X 22R PM5 R
2767	223886715159	CER1 0603 NP0 50V	15P PM5 R	3041	232270260101	RST SM 0603 RC21	100R PM5 R	3434	232270260472	RST SM 0603 RC21	4K7 PM5 R
2768	223886715159	CER1 0603 NP0 50V	15P PM5 R	3042	232270463302	RST SM 0603 RC22H	3K3 PM1 R	3436	232270260472	RST SM 0603 RC21	4K7 PM5 R
2769	223858015649	CER2 0805 X7R 50V	100N PM10 R	3043	232270463302	RST SM 0603 RC22H	3K3 PM1 R	3437	212211806209	RST SM 0603 CR16	27R PM5 R
2770	223858015649	CER2 0805 X7R 50V	100N PM10 R	3044	232270465602	RST SM 0603 RC22H	5K6 PM1 R	3438	212211806209	RST SM 0603 CR16	27R PM5 R
2771	202055296507	CER2 1206 Y5V 10V	10U P8020 R	3045	232270462873	RST SM 0603 RC22H	28K7 PM1 R	3439	212211806209	RST SM 0603 CR16	27R PM5 R
2772	202055296507	CER2 1206 Y5V 10V	10U P8020 R	3101	232270260101	RST SM 0603 RC21	100R PM5 R	3440	212211806209	RST SM 0603 CR16	27R PM5 R
2801	223878615649	CER2 0603 X7R 16V	100N PM10 R	3102	212211805669	RST SM 0603 RC0603	10K PM5 R	3441	212211806209	RST SM 0603 CR16	27R PM5 R
2802	223886715159	CER1 0603 NP0 50V	15P PM5 R	3103	232270260101	RST SM 0603 RC21	100R PM5 R	3442	212211806209	RST SM 0603 CR16	27R PM5 R
2803	223878615649	CER2 0603 X7R 16V	100N PM10 R	3104	232270260101	RST SM 0603 RC21	100R PM5 R	3501	232270461005	RST SM 0603 RC22H	1M PM1 R
2804	223878615649	CER2 0603 X7R 16V	100N PM10 R	3105	232270260472	RST SM 0603 RC21	4K7 PM5 R	3502	232270260102	RST SM 0603 RC21	1K PM5 R
2805	223878615649	CER2 0603 X7R 16V	100N PM10 R	3106	2322702						

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3516	232270260332	RST SM 0603 RC21	3K3 PM5 R	3814	232270260472	RST SM 0603 RC21	4K7 PM5 R	5705	242253595853	IND FXD SM 0603	0U10 PM10 R
3517	232270260332	RST SM 0603 RC21	3K3 PM5 R	3815	232270260102	RST SM 0603 RC21	1K PM5 R	5706	242253595853	IND FXD SM 0603	0U10 PM10 R
3523	232270260472	RST SM 0603 RC21	4K7 PM5 R	3816	212211805639	RST SM 0603 RC0603	47R PM5 R	5707	242253595853	IND FXD SM 0603	0U10 PM10 R
3525	232270260332	RST SM 0603 RC21	3K3 PM5 R	3831	212211805669	RST SM 0603 RC0603	10K PM5 R	5731	242253595853	IND FXD SM 0603	0U10 PM10 R
3527	232270260101	RST SM 0603 RC21	100R PM5 R	3832	212211805669	RST SM 0603 RC0603	10K PM5 R	5732	242253595853	IND FXD SM 0603	0U10 PM10 R
3529	232270260332	RST SM 0603 RC21	3K3 PM5 R	3833	232270260472	RST SM 0603 RC21	4K7 PM5 R	5801	242254900451	IND FXD 1206 EMI	100MHZ 80R R
3530	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	3839	212211805669	RST SM 0603 RC0603	10K PM5 R	5811	243853598058	IND FXD BEAD EMI	100MHZ 80R A
3532	232270260472	RST SM 0603 RC21	4K7 PM5 R	3840	232270260223	RST SM 0603 RC21	22K PM5 R	5812	242253600782	IND FXD TSL0808 S	33U PM10 B
3533	232270260472	RST SM 0603 RC21	4K7 PM5 R	3841	232270260223	RST SM 0603 RC21	22K PM5 R	5813	242253600782	IND FXD TSL0808 S	33U PM10 B
3536	212211805647	RST SM 0603 RC0603	220R PM5 R	3842	232270260332	RST SM 0603 RC21	3K3 PM5 R	5814	242254900126	IND FXD 0805 EMI	100MHZ 120R R
3537	212211805647	RST SM 0603 RC0603	220R PM5 R	3843	232270260332	RST SM 0603 RC21	3K3 PM5 R	5815	242254900126	IND FXD 0805 EMI	100MHZ 120R R
3538	232270260473	RST SM 0603 RC21	47K PM5 R	3844	232270260223	RST SM 0603 RC21	22K PM5 R	5816	242253595853	IND FXD SM 0603	0U10 PM10 R
3539	212211805659	RST SM 0603 RC0603	1K8 PM5 R	3845	232270260223	RST SM 0603 RC21	22K PM5 R	5817	242253595853	IND FXD SM 0603	0U10 PM10 R
3561	232270260472	RST SM 0603 RC21	4K7 PM5 R	3846	212211805669	RST SM 0603 RC0603	10K PM5 R	5818	242254900126	IND FXD 0805 EMI	100MHZ 120R R
3566	232270260472	RST SM 0603 RC21	4K7 PM5 R	3849	212211805944	RST SM 0603 RC0603	120K PM5 R	5819	242254900126	IND FXD 0805 EMI	100MHZ 120R R
3567	232270260101	RST SM 0603 RC21	100R PM5 R	3850	212211805639	RST SM 0603 RC0603	47R PM5 R	5820	242253600782	IND FXD TSL0808 S	33U PM10 B
3568	232270260101	RST SM 0603 RC21	100R PM5 R	4001	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	5821	242253600782	IND FXD TSL0808 S	33U PM10 B
3569	235003510229	RST NETW SM ARV24	4X 22R PM5 R	4002	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	5822	242254900126	IND FXD 0805 EMI	100MHZ 120R R
3570	235003510229	RST NETW SM ARV24	4X 22R PM5 R	4401	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	5841	242254900451	IND FXD 1206 EMI	100MHZ 80R R
3571	212211805635	RST SM 0603 RC0603	10R PM5 R	4429	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	5842	242254900451	IND FXD 1206 EMI	100MHZ 80R R
3573	235003510689	RST NETW SM ARV24	4X 68R PM5 R	4481	212211805631	RST SM 0603 JUMP.	MAX 0R05 R				
3574	235003510689	RST NETW SM ARV24	4X 68R PM5 R	4502	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	6001	932221745685	DIO REC SM SSA34-E3	(VISH) R
3575	235003510689	RST NETW SM ARV24	4X 68R PM5 R	4521	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	6003	932208282668	DIO REC SM SS34-E3	(VISH) R
3576	235003510689	RST NETW SM ARV24	4X 68R PM5 R	4522	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	6004	93221745685	DIO REC SM SSA34-E3	(VISH) R
3577	232270260101	RST SM 0603 RC21	100R PM5 R	4523	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	6007	933913910115	DIO SIG SM BAS32L	(PHSE) R
3701	212211805639	RST SM 0603 RC0603	47R PM5 R	4524	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	6051	931900263671	BRIDGE GBUEJ-E3	(VISH) Y
3702	232270260279	RST SM 0603 RC21	27R PM5 R	4525	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	6052	932220958687	DIO REC STTH5L06FP	(ST00) L
3703	232270260279	RST SM 0603 RC21	27R PM5 R	4526	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	6101	933913910115	DIO SIG SM BAS32L	(PHSE) R
3704	212211805639	RST SM 0603 RC0603	47R PM5 R	4528	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	6102	933913910115	DIO SIG SM BAS32L	(PHSE) R
3705	232270260102	RST SM 0603 RC21	1K PM5 R	4529	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	6121	933913910115	DIO SIG SM BAS32L	(PHSE) R
3706	232270260279	RST SM 0603 RC21	27R PM5 R	4532	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	6123	933913910115	DIO SIG SM BAS32L	(PHSE) R
3708	212211805639	RST SM 0603 RC0603	47R PM5 R	4708	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	6731	933913910115	DIO SIG SM BAS32L	(PHSE) R
3711	232270260102	RST SM 0603 RC21	1K PM5 R	4710	212211805631	RST SM 0603 JUMP.	MAX 0R05 R				
3712	232270260273	RST SM 0603 RC21	27K PM5 R	4712	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7001	932211529668	FET POW SM SI9433DY-E3	(VISH)R
3713	232270260279	RST SM 0603 RC21	27R PM5 R	4714	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7002	932217438685	TRA SIG SM BC847C	(KECO) R
3714	232270260102	RST SM 0603 RC21	1K PM5 R	4716	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7003	932209265685	TRA SIG SM MUN2211JG	(ONSE) R
3715	232270260273	RST SM 0603 RC21	27K PM5 R	4782	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7004	932219076668	IC SM L5972D	(ST00) R
3718	212211805642	RST SM 0603 RC0603	75R PM5 R	4793	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7005	932218295668	IC SM LD1117S	(ST00) R
3720	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	4794	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7006	932213067676	IC L78L08ACZ	(ST00) A
3721	232270260101	RST SM 0603 RC21	100R PM5 R	4795	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7009	932216638668	FET POW SM SI5441DC-E3	(VISH)R
3722	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	4796	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7010	932219076668	IC SM L5972D	(ST00) R
3723	232270260101	RST SM 0603 RC21	100R PM5 R	4804	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7012	932219076668	IC SM L5972D	(ST00) R
3724	232270260224	RST SM 0603 RC21	220K PM5 R	4809	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7013	932209265685	TRA SIG SM MUN2211JG	(ONSE) R
3725	232270260224	RST SM 0603 RC21	220K PM5 R	4812	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7015	932209265685	TRA SIG SM MUN2211JG	(ONSE) R
3734	232270260102	RST SM 0603 RC21	1K PM5 R	4813	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7016	932209265685	TRA SIG SM MUN2211JG	(ONSE) R
3735	232270260273	RST SM 0603 RC21	27K PM5 R	4814	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7017	932217438685	TRA SIG SM BC847C	(KECO) R
3739	232270260102	RST SM 0603 RC21	1K PM5 R	4815	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7101	932216972682	IC SM AT24C02N-10SC-2.7	(ATME)L
3740	232270260273	RST SM 0603 RC21	27K PM5 R	4831	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7122	935245720165	IC SM 74HCT1G14GW	(PHSE) R
3743	212211805639	RST SM 0603 RC0603	47R PM5 R	4833	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7124	932216972682	IC SM AT24C02N-10SC-2.7	(ATME)L
3748	212211805642	RST SM 0603 RC0603	75R PM5 R	4841	212211805631	RST SM 0603 JUMP.	MAX 0R05 R	7301	932222076668	IC SM AME1117CCGTZ	(AMEO) R
3749	212211805642	RST SM 0603 RC0603	75R PM5 R					7302	935276561518	IC SM SAA7119E/V2/G	(PHSE) R
3756	212211805642	RST SM 0603 RC0603	75R PM5 R	5003	313818875771	COI CHOKE 35UH 82M OHM	DR10X8	7303	932222077668	IC SM AME1117ECGTZ	(AMEO) R
3766	232270260101	RST SM 0603 RC21	100R PM5 R	5004	242254900451	IND FXD 1206 EMI	100MHZ 80R R	7401	932222075668	IC SM AME1117BCGTZ	(AMEO) R
3771	232270260222	RST SM 0603 RC21	2K2 PM5 R	5005	313818875771	COI CHOKE 35UH 82M OHM	DR10X8	7402	932222076668	IC SM AME1117CCGTZ	(AMEO) R
3772	212211805687	RST SM 0603 RC0603	470K PM5 R	5006	313818875771	COI CHOKE 35UH 82M OHM	DR10X8	7403	932222013671	IC SM MST51512L-LF	(MSTA) Y
3773	212211805687	RST SM 0603 RC0603	470K PM5 R	5123	242254900449	IND FXD 0805 EMI	100MHZ 200R R	7411	823827716781	1M16-42S16100A1	
3774	212211805687	RST SM 0603 RC0603	470K PM5 R	5124	242254900449	IND FXD 0805 EMI	100MHZ 200R R	7412	823827716781	1M16-42S16100A1	
3775	212211805687	RST SM 0603 RC0603	470K PM5 R	5125	242254900449	IND FXD 0805 EMI	100MHZ 200R R	7501	932219183685	IC SM LM809M3-2.93	NOPB(NSCO)R
3776	212211805687	RST SM 0603 RC0603	470K PM5 R	5301	242254900449	IND FXD 0805 EMI	100MHZ 200R R	7502	313815865061	CPU IC ASSY	
3777	212211805687	RST SM 0603 RC0603	470K PM5 R	5302	242254900442	IND FXD 0603 EMI	100MHZ 600R R	7502	932222010682	IC SM NT68F632ALG	(NOVA) L
3778	212211805687	RST SM 0603 RC0603	470K PM5 R	5303	242254900442	IND FXD 0603 EMI	100MHZ 600R R	7503	313815865091	EEMPOR ASSY	
3779	212211805687	RST SM 0603 RC0603	470K PM5 R	5304	242254900442	IND FXD 0603 EMI	100MHZ 600R R	7503	932212209682	IC M24C32-WBN6P	(ST00) L
3780	232270260101	RST SM 0603 RC21	100R PM5 R	5305	242254900442	IND FXD 0603 EMI	100MHZ 600R R	7504	932217438685	TRA SIG SM BC847C	(KECO) R
3781	232270260101	RST SM 0603 RC21	100R PM5 R	5306	242254900442	IND FXD 0603 EMI	100MHZ 600R R	7522	932220476671	IC SM T6TU5XBG-0001(O2)	Y
3783	212211805669	RST SM 0603 RC0603	10K PM5 R	5401	242254944197	IND FXD 0805 EMI	100MHZ 220R R	7523	823827716781	1M16-42S16100A1	
3784	212211805669	RST SM 0603 RC0603	10K PM5 R	5402	242254944197	IND FXD 0805 EMI	100MHZ 220R R	7701	932217438685	TRA SIG SM BC847C	(KECO) R
3785	232270260101	RST SM 0603 RC21	100R PM5 R	5403	242254944197	IND FXD 0805 EMI	100MHZ 220R R	7711	933714830653	IC SM 74HC4052D	(PHSE) R
3786	232270260101	RST SM 0603 RC21	100R PM5 R	5404	242254944197	IND FXD 0805 EMI	100MHZ 220R R	7712	932209265685	TRA SIG SM MUN2211JG	(ONSE) R
3787	232270260101	RST SM 0603 RC21	100R PM5 R	5405	242254944197	IND FXD 0805 EMI	100MHZ 220R R	7713	932209265685	TRA SIG SM MUN2211JG	(ONSE) R
3788	232270260101	RST SM 0603 RC21	100R PM5 R	5406	242254944197	IND FXD 0805 EMI	100MHZ 220R R	7714	932220047702	IC SM MSP3440G-QI-BBv3	(MIAS)Y
3789	232270260101	RST SM 0603 RC21	100R PM5 R	5407	242254944197	IND FXD 0805 EMI	100MHZ 220R R	7801	933828890215	TRA SIG SM PMBT2369	(PHSE) R
3790	232270260101	RST SM 0603 RC21	100R PM5 R	5408	242254944197	IND FXD 0805 EMI	100MHZ 220R R	7802	932219513668	IC SM M74HC590M	(ST00) R
3791	232270260273	RST SM 0603 RC21	27K PM5 R	5409	242254944197	IND FXD 0805 EMI	100MHZ 220R R	7803	932215366668	IC SM CY7C199-15ZC	(CYPR) R
3792	232270260222	RST SM 0603 RC21	2K2 PM5 R	5421	242254900449	IND FXD 0805 EMI	100MHZ 200R R	7804	935187000118	IC SM 74HC573PW	(PHSE) R
3799	232270260101	RST SM 0603 RC21	100R PM5 R	5422	242254900449	IND FXD 0805 EMI	100MHZ 200R R	7805	932219513668	IC SM M74HC590M	(ST00) R
3801	232270260471	RST SM 0603									

Spare Parts List

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2601	223886715331	CER1 0603 NP0 50V 330P PM5 R	3051	212211805971	RST SM 1206 RC1206 270K PM5 R	7062	932219657687	FET POW STP10NK80ZFP (ST00) L
2602	223886715331	CER1 0603 NP0 50V 330P PM5 R	3052	232271161334	RST SM 1206 RC01 330K PM5 R	7063	933953410676	TRA SIG TBC328-40 (TOSJ) A
2603	223886715331	CER1 0603 NP0 50V 330P PM5 R	3053	212211805971	RST SM 1206 RC1206 270K PM5 R	7072	932214014667	OPT CP TCET1103(G) (VISH) L
2604	223886715331	CER1 0603 NP0 50V 330P PM5 R	3054	232271161824	RST SM 1206 RC01 820K PM5 R	7073	932208697676	IC TL431ACZ S (ST00) A
3601	232270260102	RST SM 0603 RC21 1K PM5 R	3055	232271161824	RST SM 1206 RC01 820K PM5 R	7074	932214014667	OPT CP TCET1103(G) (VISH) L
3602	232270260273	RST SM 0603 RC21 27K PM5 R	3056	213811201822	RST SM 0805 RC05 8K2 PM5 R	7076	933237790126	TRA SIG BC547C (PHSE) A
3603	232270260102	RST SM 0603 RC21 1K PM5 R	3057	232273061333	RST SM 0805 RC11 33K PM5 R	8051	313811871211	GROUND WIRE ASSY
3604	232270260273	RST SM 0603 RC21 27K PM5 R	3058	212210101515	RST CRB CF1/6 A 390R PM5 A	8052	313811871211	GROUND WIRE ASSY
3605	212211805642	RST SM 0603 RC0603 75R PM5 R	3059	212010500027	RST MOX 1W RSS A 0R15 PM1 A	8053	313811871211	GROUND WIRE ASSY
3606	212211805642	RST SM 0603 RC0603 75R PM5 R	3060	232271161333	RST SM 1206 RC01 33K PM5 R			
3607	212211805642	RST SM 0603 RC0603 75R PM5 R	3061	213810113228	RST CRB CFR-12 A 2R2 PM5 A			
5601	242253595853	IND FXD SM 0603 0U10 PM10 R	3062	232273061689	RST SM 0805 RC11 68R PM5 R			
5602	242253595853	IND FXD SM 0603 0U10 PM10 R	3063	232271161108	RST SM 1206 RC01 1R PM5 R			
5603	242253595853	IND FXD SM 0603 0U10 PM10 R	3064	232273463304	RST SM 0805 RC12H 330K PM1 R			
			3065	232273463304	RST SM 0805 RC12H 330K PM1 R			
			3066	232273463304	RST SM 0805 RC12H 330K PM1 R			
			3067	232273466201	RST SM 0805 RC12H 620R PM1 R			
			3068	232273465602	RST SM 0805 RC12H 5K6 PM1 R			
			3069	212255000177	VDR DC 1MA/459V S MAX 845V R			
			3070	232273061102	RST SM 0805 RC11 1K PM5 R			
			3071	212261200074	NTC DC SCK-034 S 3R PM15 A			
			3072	823827718171	VDR DC 1MA/510 845V R			
			3073	213811201105	RST SM 0805 RC05 1M PM5 R			
			3074	213811201224	RST SM 0805 RC05 220K PM5 R			
			3075	232273061102	RST SM 0805 RC11 1K PM5 R			
			3076	232273061471	RST SM 0805 RC11 470R PM5 R			
			3077	232273061274	RST SM 0805 RC11 270K PM5 R			
			3078	213811201564	RST SM 0805 RC05 560K PM5 R			
			3079	213811201331	RST SM 0805 RC05 330R PM5 R			
			3080	213811201103	RST SM 0805 RC05 10K PM5 R			
			3081	212010500027	RST MOX 1W RSS A 0R15 PM1 A			
			3082	213811201151	RST SM 0805 RC05 150R PM5 R			
			3083	213810113228	RST CRB CFR-12 A 2R2 PM5 A			
			3084	213811201222	RST SM 0805 RC05 2K2 PM5 R			
			3085	232273061102	RST SM 0805 RC11 1K PM5 R			
			3090	232273461002	RST SM 0805 RC12H 1K PM1 R			
			3091	232273461803	RST SM 0805 RC12H 18K PM1 R			
			3092	213811201101	RST SM 0805 RC05 100R PM5 R			
			3093	212210102197	RST CRB CF1/6 A 4K7 PM5 A			
			3094	232273061223	RST SM 0805 RC11 22K PM5 R			
			3095	232273462202	RST SM 0805 RC12H 2K2 PM1 R			
			3096	232273061223	RST SM 0805 RC11 22K PM5 R			
			3098	213811201103	RST SM 0805 RC05 10K PM5 R			
			3198	232273061562	RST SM 0805 RC11 5K6 PM5 R			
			5051	242254900499	FIL MAINS 6MH 1A8 S42010 Y			
			5052	243853598026	IND FXD BEAD EMI 100MHZ 35R R			
			5053	243853598026	IND FXD BEAD EMI 100MHZ 35R R			
			5054	242254900498	FIL MAINS 5MH 2A S4103 Y			
			5055	242254900497	FIL PFC 430UH 0R19 S4084 Y			
			5056	313816875411	BEAD			
			5057	313816875411	BEAD			
			5058	243853598026	IND FXD BEAD EMI 100MHZ 35R R			
			5059	313816875411	BEAD			
			5060	313816875411	BEAD			
			5061	242253597072	IND FXD SP0305 A 6U8 PM10 B			
			5071	242254900503	TFM SMT LAYER HJC-S4143 WIRE Y			
			5072	243853598026	IND FXD BEAD EMI 100MHZ 35R R			
			5073	243853598026	IND FXD BEAD EMI 100MHZ 35R R			
			5074	242253601102	IND FXD OL1028H S 10U PM10 Y			
			5076	243853598026	IND FXD BEAD EMI 100MHZ 35R R			
			5077	243853598026	IND FXD BEAD EMI 100MHZ 35R R			
			5078	243853598026	IND FXD BEAD EMI 100MHZ 35R R			
			5079	242253601102	IND FXD OL1028H S 10U PM10 Y			
			5080	242253601102	IND FXD OL1028H S 10U PM10 Y			
			6053	933952580685	DIO SIG SM BAV103 (VISH) R			
			6055	932214069673	DIO SUP P6KE250A A (VISH) A			
			6056	932221086673	DIO REC BYV26EGP A (GULF) A			
			6061	933952580685	DIO SIG SM BAV103 (VISH) R			
			6062	933952580685	DIO SIG SM BAV103 (VISH) R			
			6063	933952580685	DIO SIG SM BAV103 (VISH) R			
			6064	933751660673	DIO REC RGP10D-E3 A (VISH) A			
			6065	933952580685	DIO SIG SM BAV103 (VISH) R			
			6066	933751660673	DIO REC RGP10D-E3 A (VISH) A			
			6067	932222228673	DIO SUP P4KE16A-E3 (VISH) A			
			6071	932219932687	DIO REC STPS10H100CFP (ST00) L			
			6075	933712760673	DIO REG BZX55-B18 A (VISH) A			
			6076	932219203687	DIO REC STPS20H100CFP (ST00) L			
			7056	932222284682	IC L6562N (ST00) L			
			7057	932217923687	FET POW STP20NM60 (ST00) L			
			7061	935267356112	IC TEA1507P/N1 (PHSE) L			
1053	313815863521	KEY PCB ASSY (20")						
1903	242212803035	SWI TACT SM 1P 1POS SKQGAB R						
1904	242212803035	SWI TACT SM 1P 1POS SKQGAB R						
1906	242212803035	SWI TACT SM 1P 1POS SKQGAB R						
1907	242212803035	SWI TACT SM 1P 1POS SKQGAB R						
1908	242212803035	SWI TACT SM 1P 1POS SKQGAB R						
1921	242202518985	CON H 2P M 1.25 SM 60922 R						
2904	223858615636	CER2 0603 X7R 50V 10N PM10 R						
3906	232270260471	RST SM 0603 RC21 470R PM5 R						
3907	232270260222	RST SM 0603 RC21 2K2 PM5 R						
3909	232270260332	RST SM 0603 RC21 3K3 PM5 R						
3910	232270260472	RST SM 0603 RC21 4K7 PM5 R						
3911	232270260102	RST SM 0603 RC21 1K PM5 R						
1054	313815865561	IR / LED PCB ASSY						
1901	242202518896	CON H 6P M 2.00 63366 B						
1902	243812800224	SWI PUSH 2P 0.2A 20V SFP1C2 B						
2901	223878615649	CER2 0603 X7R 16V 100N PM10 R						
2902	222278019763	CER2 0805 Y5V 16V 1U PM20 R						
2903	223858015636	CER2 0805 X7R 50V 10N PM10 R						
3901	212211805669	RST SM 0603 RC0603 10K PM5 R						
3902	232270260101	RST SM 0603 RC21 100R PM5 R						
3904	212211805651	RST SM 0603 RC0603 390R PM5 R						
3905	212211805647	RST SM 0603 RC0603 220R PM5 R						
6901	932220800667	IR RECEIVER TSOP34136 (VISH) L						
6902	932214603682	LED VS L-3WYWGW (KIEL) B						
7901	932217439685	TRA SIG SM BC857C (KECO) R						
1001	242202518823	CON V 10P M 2.00 63390 B						
1052	313815864201	POWER PCB ASSY						
1051	313819876041	SOC POW H 3P F AC CABL/100						
1052	242208600208	FUSE 5X20 HT 4A 250V IEC B						
1071	243803100099	CON V 2P M 2.50 63171 B						
1088	242202518904	CON V 12P M 2.50 64842 B						
1089	242202518903	CON V 10P M 2.50 64840 B						
2051	202233000078	CAP MPP 275V S 470N PM10 B						
2052	202055490156	CERSAF CD 250V S 1N PM20 B						
2053	202055490156	CERSAF CD 250V S 1N PM20 B						
2054	202233000078	CAP MPP 275V S 470N PM10 B						
2055	823827718501	1.5MF 450V MPP						
2056	222291019856	CER2 0805 Y5V 25V 330N P8020 R						
2057	222224119876	CER2 1206 Y5V 10V 10U P8020 R						
2058	223858015636	CER2 0805 X7R 50V 10N PM10 R						
2059	2323891015649	CER2 0805 X7R 25V 100N PM10 R						
2060	202203100426	ELCAP HS 450V S 120U PM20 B						
2061	202055790153	CER2 DC B 500V S 2N2 PM10 A						
2062	242254900673	SURGE PROTECT SPG-201M-A A						
2063	242254900673	SURGE PROTECT SPG-201M-A A						
2064	242254900673	SURGE PROTECT SPG-201M-A A						
2065	223858015643	CER2 0805 X7R 50V 33N PM10 R						
2066	203803521302	ELCAP GS 25V S 4U7 PM20 A						
2067	203803521307	ELCAP GS 25V S 68U PM20 A						
2068	202203100272	ELCAP PF 25V S 47U PM20 A						
2069	242254900673	SURGE PROTECT SPG-201M-A A						
2070	2323891015649	CER2 0805 X7R 25V 100N PM10 R						
2071	202055490138	CERSAF NSA 250V S 4N7 PM20 B						
2073	203830150151	CAP PP PPN 100V S 10N PM2 A						
2074	202203100387	ELCAP EB 25V S 2200U PM20 B						
2075	202203100273	ELCAP PF 25V S 100U PM20 A						
2078	203830150159	CAP PP PPN 100V S 12N PM5 A						
2079	202203100362	ELCAP LZ 35V S 1000U PM20 B						
2080	202203100362	ELCAP LZ 35V S 1000U PM20 B						
2081	203803527502	ELCAP KM 50V S 22U PM20 A						
2084	202055490138	CERSAF NSA 250V S 4N7 PM20 B						
2085	223858015625	CER2 0805 X7R 50V 1N5 PM10 R						
2086	202202000805	ELCAP GS 50V S 2U2 PM20 A						
2088	2238910							

Different Parts List

ME5P 23"

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Diversity of 23PF5320/79 compared with 23PF5320/28		
Item	12NC	Description
	867000022249	23PF5320/79
0041	313815416901	BACK COVER
0052	313815417261	METAL INSULATE
0126	313815568161	RATING LABEL
0141	313815524041	QSG (ENG, ZHS, ARA)
0142	313815524051	User's manual (ENG, ZHS, ARA)
0146	310431569962	3years WARRANTY CONDITIONS/79
0174	313815160891	HEATSINK
0185	313815161801	HEAT SINK - BRIGE DIODE
0187	252240189008	NUT HEX ST BLK M3
0191	313815161781	HEAT SINK-PW DIODE
0194	313815161791	HEAT SINK-PW TRANS
0197	313815321341	INSULATING PLATE
0289	313800992061	PROCESS BOX
0289	313800992071	PROCESS BOX
0289	313800992061	PROCESS BOX
0291	313815568171	LABEL-(QDI-AP)
0292	313815568171	LABEL-(QDI-AP)
0450	313815641391	CARTON
0615	313811708941	HEX CODE OF F/W(ME5P 23" AP)
1051	313815865041	SCALER ASSY
1172	313819872611	MAINSKORD AUS/NZ 7A5 1M8 BK
1176	313923809801	PROD ASSY RC1683801/01 PKD
1177	313818876601	CON ACC ADP V 01P M 0.00/PAL B
1719	242202605745	SOC MDIN H 4P F SH 1481-723 Y
1811	313914722641	FRONTEND FQ1216ME/I H-5
2072	223858015627	CER2 0805 X7R 50V 2N2 PM10 R
2076	223858015649	CER2 0805 X7R 50V 100N PM10 R
2082	203803513301	ELCAP RGA 25V S 47U PM20 A
2083	223858015649	CER2 0805 X7R 50V 100N PM10 R
2087	223858015636	CER2 0805 X7R 50V 10N PM10 R
2351	202055296507	CER2 1206 Y5V 10V 10U P8020 R
2353	223858619812	CER2 0603 Y5V 50V 100N P8020 R
2354	223886715569	CER1 0603 NP0 50V 56P PM5 R
2355	223886715569	CER1 0603 NP0 50V 56P PM5 R
2356	202055296507	CER2 1206 Y5V 10V 10U P8020 R
2357	223858619812	CER2 0603 Y5V 50V 100N P8020 R
2359	223858619812	CER2 0603 Y5V 50V 100N P8020 R
3069	212255000184	VDR DC 1MA/510V S MAX 845V R
3086	213811201152	RST SM 0805 RC05 1K5 PM5 R
3087	212210101518	RST CRB CF1/6 A 330K PM5 A
3088	232273061229	RST SM 0805 RC11 22R PM5 R
3089	213811201222	RST SM 0805 RC05 2K2 PM5 R
3097	232273061223	RST SM 0805 RC11 22K PM5 R
3099	213811201104	RST SM 0805 RC05 100K PM5 R
3197	213811201472	RST SM 0805 RC05 4K7 PM5 R
3199	232273061471	RST SM 0805 RC11 470R PM5 R
3303	232270260101	RST SM 0603 RC21 100R PM5 R
3304	232270260101	RST SM 0603 RC21 510R PM5 R
3309	232270260101	RST SM 0603 RC21 100R PM5 R
3324	232270260681	RST SM 0603 RC21 680R PM5 R
3351	232270260101	RST SM 0603 RC21 100R PM5 R
3352	232270260101	RST SM 0603 RC21 100R PM5 R
3353	212211805645	RST SM 0603 RC0603 150R PM5 R
3354	212211805645	RST SM 0603 RC0603 150R PM5 R
3355	212211805645	RST SM 0603 RC0603 150R PM5 R
3356	212211805642	RST SM 0603 RC0603 75R PM5 R
3357	232270260102	RST SM 0603 RC21 1K PM5 R
3358	232270260243	RST SM 0603 RC21 24K PM5 R
4303	212211805631	RST SM 0603 JUMP. MAX 0R05 R
5055	823827718691	FIL PFC 430UH
5351	243854300079	RES XTL SM 12MHZ 32P SMD-49 R
5355	242254944668	IND FXD 0805 EMI 100MHZ 120R R
6072	933952580685	DIO SIG SM BAV103 (VISH) R
6073	933952580685	DIO SIG SM BAV103 (VISH) R
6074	933712930673	DIO REG BZX55-C12 A (VISH) A
6077	823827718701	DIO REG EZX384-B22
6081	933712970673	DIO REG BZX55-C20 A (VISH) A
6902	932222560682	LED VS L-3WEGW (KIEL) B
7071	932222181687	FET POW STP45NF3LL (ST00) L
7075	933705890676	TRA SIG BF422 (TOSJ) A
7077	933829190126	THYRIS BT169D (PHSE) A
7078	932217438685	TRA SIG SM BC847C (KECO) R
7351	935274261518	IC SM SAA5360HL/M1/0004(PHSE)R
7352	932217438685	TRA SIG SM BC847C (KECO) R
7502	313815865071	CPU IC ASSY
7503	313815865101	EEPROM ASSY
7714	932220048702	IC SM MSP3410G-QI-B8V3 (MIAS)Y
8172	313819876282	CBLE-016 6/350/6-016 AWG28
8177	313819876322	CBLE FAST/570+625/2-392 AWG26
8178	313819876312	CBLE FAST/720+775/3-123 AWG26

Diversity of 23PF5320/98 compared with 23PF5320/28		
Item	12NC	Description
	867000021678	23PF5320/98
0041	313815416901	BACK COVER
0052	313815417261	METAL INSULATE
0126	313815568181	RATING LABEL
0141	313815524041	QSG (ENG, ZHS, ARA)
0142	313815524051	User's manual (ENG, ZHS, ARA)
0148	313912676114	GUARANTY CARD /57
0174	313815160891	HEATSINK
0185	313815161801	HEAT SINK - BRIGE DIODE
0187	252240189008	NUT HEX ST BLK M3
0191	313815161781	HEAT SINK-PW DIODE
0194	313815161791	HEAT SINK-PW TRANS
0197	313815321341	INSULATING PLATE
0289	313800992061	PROCESS BOX
0289	313800992071	PROCESS BOX
0289	313800992061	PROCESS BOX
0291	313815568171	LABEL-(QDI-AP)
0292	313815568171	LABEL-(QDI-AP)
0450	313815641391	CARTON
0615	313811708941	HEX CODE OF F/W(ME5P 23" AP)
1051	313815865041	SCALER ASSY
1171	313818871672	MAINSKORD UK 10A 1M8 DET BK
1172	313812874931	MAINSKORD
1176	313923809801	PROD ASSY RC1683801/01 PKD
1177	313818876601	CON ACC ADP V 01P M 0.00/PAL B
1719	242202605745	SOC MDIN H 4P F SH 1481-723 Y
1811	313914722641	FRONTEND FQ1216ME/I H-5
2072	223858015627	CER2 0805 X7R 50V 2N2 PM10 R
2076	223858015649	CER2 0805 X7R 50V 100N PM10 R
2082	203803513301	ELCAP RGA 25V S 47U PM20 A
2083	223858015649	CER2 0805 X7R 50V 100N PM10 R
2087	223858015636	CER2 0805 X7R 50V 10N PM10 R
2351	202055296507	CER2 1206 Y5V 10V 10U P8020 R
2353	223858619812	CER2 0603 Y5V 50V 100N P8020 R
2354	223886715569	CER1 0603 NP0 50V 56P PM5 R
2355	223886715569	CER1 0603 NP0 50V 56P PM5 R
2356	202055296507	CER2 1206 Y5V 10V 10U P8020 R
2357	223858619812	CER2 0603 Y5V 50V 100N P8020 R
2359	223858619812	CER2 0603 Y5V 50V 100N P8020 R
3069	212255000184	VDR DC 1MA/510V S MAX 845V R
3086	213811201152	RST SM 0805 RC05 1K5 PM5 R
3087	212210101518	RST CRB CF1/6 A 330K PM5 A
3088	232273061229	RST SM 0805 RC11 22R PM5 R
3089	213811201222	RST SM 0805 RC05 2K2 PM5 R
3097	232273061223	RST SM 0805 RC11 22K PM5 R
3099	213811201104	RST SM 0805 RC05 100K PM5 R
3197	213811201472	RST SM 0805 RC05 4K7 PM5 R
3199	232273061471	RST SM 0805 RC11 470R PM5 R
3303	232270260101	RST SM 0603 RC21 100R PM5 R
3304	232270260101	RST SM 0603 RC21 510R PM5 R
3309	232270260101	RST SM 0603 RC21 100R PM5 R
3324	232270260681	RST SM 0603 RC21 680R PM5 R
3351	232270260101	RST SM 0603 RC21 100R PM5 R
3352	232270260101	RST SM 0603 RC21 100R PM5 R
3353	212211805645	RST SM 0603 RC0603 150R PM5 R
3354	212211805645	RST SM 0603 RC0603 150R PM5 R
3355	212211805645	RST SM 0603 RC0603 150R PM5 R
3356	212211805642	RST SM 0603 RC0603 75R PM5 R
3357	232270260102	RST SM 0603 RC21 1K PM5 R
3358	232270260243	RST SM 0603 RC21 24K PM5 R
4303	212211805631	RST SM 0603 JUMP. MAX 0R05 R
5055	823827718691	FIL PFC 430UH
5351	243854300079	RES XTL SM 12MHZ 32P SMD-49 R
5355	242254944668	IND FXD 0805 EMI 100MHZ 120R R
6072	933952580685	DIO SIG SM BAV103 (VISH) R
6073	933952580685	DIO SIG SM BAV103 (VISH) R
6074	933712930673	DIO REG BZX55-C12 A (VISH) A
6077	823827718701	DIO REG EZX384-B22
6081	933712970673	DIO REG BZX55-C20 A (VISH) A
6902	932222560682	LED VS L-3WEGW (KIEL) B
7071	932222181687	FET POW STP45NF3LL (ST00) L
7075	933705890676	TRA SIG BF422 (TOSJ) A
7077	933829190126	THYRIS BT169D (PHSE) A
7078	932217438685	TRA SIG SM BC847C (KECO) R
7351	935274261518	IC SM SAA5360HL/M1/0004(PHSE)R
7352	932217438685	TRA SIG SM BC847C (KECO) R
7502	313815865071	CPU IC ASSY
7503	313815865101	EEPROM ASSY
7714	932220048702	IC SM MSP3410G-QI-B8V3 (MIAS)Y
8172	313819876282	CBLE-016 6/350/6-016 AWG28
8177	313819876322	CBLE FAST/570+625/2-392 AWG26
8178	313819876312	CBLE FAST/720+775/3-123 AWG26

Diversity of 23PF5320/93 compared with 23PF5320/28		
Item	12NC	Description
	867000022971	23PF5320/93
0030	313815760641	BEZEL ASSY
0041	313815416901	BACK COVER
0126	313815568191	RATING LABEL
0142	313815524021	OWNER'S MNAUAL-ENGLISH
0147	313912553585	CHINA GUARANTY CARD /93
0291	313815568201	LABEL-(QDI-CHINA)
0292	313815568201	LABEL-(QDI-CHINA)
0450	313815641031	CARTON
0451	313815641041	CUSHION-L
0452	313815641051	CUSHION-R
0615	313811708931	HEX CODE OF F/W(ME5P 23"CHINA)
1051	313815865051	SCALER ASSY
1172	313818871651	MAINSKORD CCEE 10A 1M8 DET BK
1176	313923809801	PROD ASSY RC1683801/01 PKD
1177	313818876601	CON ACC ADP V 01P M 0.00/PAL B
1719	242202605745	SOC MDIN H 4P F SH 1481-723 Y
1811	313914723781	FRONTEND FQ1256/I H-5
2072	223858015627	CER2 0805 X7R 50V 2N2 PM10 R
2076	223858015649	CER2 0805 X7R 50V 100N PM10 R
2082	203803513301	ELCAP RGA 25V S 47U PM20 A
2083	223858015649	CER2 0805 X7R 50V 100N PM10 R
2087	223858015636	CER2 0805 X7R 50V 10N PM10 R
3069	212255000184	VDR DC 1MA/510V S MAX 845V R
3086	213811201152	RST SM 0805 RC05 1K5 PM5 R
3087	212210101518	RST CRB CF1/6 A 330K PM5 A
3088	232273061229	RST SM 0805 RC11 22R PM5 R
3089	213811201222	RST SM 0805 RC05 2K2 PM5 R
3097	232273061223	RST SM 0805 RC11 22K PM5 R
3099	213811201104	RST SM 0805 RC05 100K PM5 R
3197	213811201472	RST SM 0805 RC05 4K7 PM5 R
3199	232273061471	RST SM 0805 RC11 470R PM5 R
5055	823827718691	FIL PFC 430UH
6072	933952580685	DIO SIG SM BAV103 (VISH) R
6073	933952580685	DIO SIG SM BAV103 (VISH) R
6074	933712930673	DIO REG BZX55-C12 A (VISH) A
6077	823827718701	DIO REG EZX384-B22
6081	933712970673	DIO REG BZX55-C20 A (VISH) A
6902	932222560682	LED VS L-3WEGW (KIEL) B
7071	932222181687	FET POW STP45NF3LL (ST00) L
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7078	932217438685	TRA SIG SM BC847C (KECO) R
7502	313815865081	CPU IC ASSY
7503	313815865111	EEPROM ASSY
7714	932220048702	IC SM MSP3410G-QI-B8V3 (MIAS)Y
8172	313819876282	CBLE-016 6/350/6-016 AWG28
8177	313819876322	CBLE FAST/570+625/2-392 AWG26
8178	313819876312	CBLE FAST/720+775/3-123 AWG26

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0. Warning

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the unit via a wrist wrap with resistance. Keep components and tools also at the same potential !

1. Servicing of SMDs (Surface Mounted Devices)

1.1 General cautions on handling and storage

- Oxidation on the terminals of SMDs results in poor soldering.

Do not handle SMDs with bare hands.

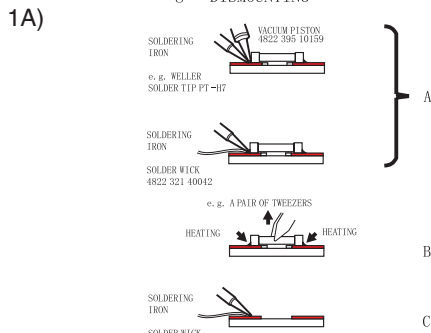
- Avoid using storage places that are sensitive to oxidation such as places with sulphur or chlorine gas, direct sunlight, high temperatures or a high degree of humidity. The capacitance or resistance value of the SMDs may be affected by this.

- Rough handling of circuit boards containing SMDs may cause damage to the components as well as the circuit boards. Circuit boards containing SMDs should never be bent or flexed. Different circuit board materials expand and contract at different rates when heated or cooled and the components and/or solder connections may be damaged due to the stress. Never rub or scrape chip components as this may cause the value of the component to change. Similarly, do not slide the circuit board across any surface.

1.2 Removal of SMDs

- Heat the solder (for 2-3 seconds) at each terminal of the chip. By means of litz wire and a slight horizontal force, small components can be removed with the soldering iron. They can also be removed with a solder sucker (see Fig. 1A).

Fig. 1 DISMOUNTING



While holding the SMD with a pair of tweezers, take it off gently using the soldering iron's heat applied to each terminal (see Fig. 1 B).

- Remove the excess solder on the solder lands by means of litz wire or a solder sucker (see Fig. 1 C).

1.3 Caution on removal

- When handling the soldering iron, use suitable pressure and be careful.
- When removing the chip, do not use undue force with the pair of tweezers.
- The soldering iron to be used (approx. 30 W) should

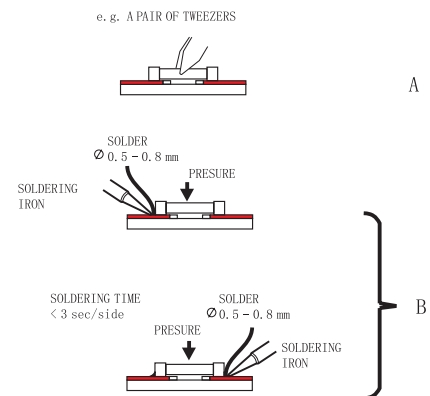
preferably be equipped with a thermal control (soldering temperature: 225 to 250 C).

- The chip, once removed, must never be reused.

1.4 Attachment of SMDs

- Locate the SMD on the solder lands by means of tweezers and solder the component on one side. Ensure that the component is positioned correctly on the solder lands (see Fig.2A).
- Next complete the soldering of the terminals of the component (see Fig. 2B).

Fig. 2 MOUNTING



2. Caution when attaching SMDs

- When soldering the SMD terminals, do not touch them directly with the soldering iron. The soldering should be done as quickly as possible, care must be taken to avoid damage to the terminals of the SMDs themselves.
- Keep the SMD's body in contact with the printed board when soldering.
- The soldering iron to be used (approx. 30 W) should preferably be equipped with a thermal control (soldering temperature: 225 to 250 C).
- Soldering should not be done outside the solder land.
- Soldering flux (of rosin) may be used, but should not be acidic.
- After soldering, let the SMD cool down gradually at room temperature.
- The quantity of solder must be proportional to the size of the solder land. If the quantity is too great, the SMD might crack or the solder lands might be torn loose from the printed board (see Fig. 3).

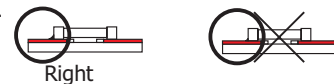
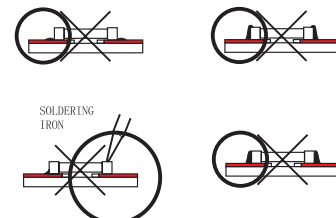


Fig.3 Examples



3. Lead-free product identification

You can identify lead-free product by Philips-lead-free logo on PCB.



4. Lead-free product repair instruction

4.1 Use only lead-free Solder Alloy 0622 149 00106(1.2mm SAC305) or 0622 149 00108(1.0mm SAC305).

Remark: For lead free soldering material, please visit www.alphametals.com website for details. This is recommended by Philips.

4.2 Use only adequate solder tools applicable for lead-free soldering-tin. The solder tool must be able to reach at least a solder-temperature of 400°C, to stabilize the adjusted temperature at the solder-tip and to exchange solder-tips for different applications.

Small Passives/Actives to be removed with thermal tweezers

Automated system for IC and BGA repair (Microscope, Camera, Beam split optics, Computer, Programmer, Heat controllers, Vacuum system, Laser pointer)

Solder Hand-Tool (Adjustable in temperature height, Temperature shall be held constant, Flexible tips)

4.3 Adjust your solder tool so that a temperature around 360°C-380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed.

Corrosion of Tool-Spikes can be avoided when using SAC305 and a temperature of less than 400°C.

4.4 Mix of lead-free solder-tin/parts with leaded soldering-tin/parts is possible but not recommended. If not to avoid clean carefully the solder-joint from old tin and re-solder with new tin.

4.5 Use only original spare-parts listed in the Service-Manuals. Standard-material (consumables) can also be purchased at external companies.

4.6 Special information for lead-free BGA-ICs: this ICs will be delivered in so-called dry-packaging to protect the IC against moisture and with lead-free logo on it. This packaging may only be opened shortly before it is used (soldered). Otherwise the body of the IC gets wet inside and during the heating time the structure of the IC will be destroyed due to high (steam-)pressure. If the packaging was opened before usage the IC has to be heated up for some hours (around 90°C) for drying (Take attention for ESD-protection!)

5. Rework on BGA (Ball Grid Array) ICs

General

Although (LF)BGA assembly yields are very high, there may still be a requirement for component rework. By rework, we mean the process of removing the component from the PWB and replacing it with a new component. If an (LF)BGA is removed from a PWB, the solder balls of the component are deformed drastically so the removed (LF)BGA has to be discarded.

Device Removal

As is the case with any component that, it is essential when removing an (LF)BGA, the board, tracks, solder lands, or surrounding components are not damaged. To remove an (LF)BGA, the board must be uniformly heated to a temperature close to the reflow soldering temperature. A uniform temperature reduces the chance of warping the PWB.

To do this, we recommend that the board is heated until it is certain that all the joints are molten. Then carefully pull the component off the board with a vacuum nozzle. For the appropriate temperature profiles, see the IC data sheet.

Area Preparation

When the component has been removed, the vacant IC area must be cleaned before replacing the (LF)BGA.

Removing an IC often leaves varying amounts of solder on the mounting lands. This excessive solder can be removed with either a solder sucker or solder wick. The remaining flux can be removed with a brush and cleaning agent. After the board is properly cleaned and inspected, apply flux on the solder lands and on the connection balls of the (LF)BGA

Note: Do not apply solder paste, as this has shown to result in problems during re-soldering.

Device Replacement

The last step in the repair process is to solder the new component on the board. Ideally, the (LF)BGA should be aligned under a microscope or magnifying glass. If this is not possible, try to align the (LF)BGA with any board markers. To reflow the solder, apply a temperature profile according to the IC data sheet. So as not to damage neighbouring components, it may be necessary to reduce some temperatures and times.

More Information

For more information on how to handle BGA devices, visit this URL: <http://www.atyourservice.ce.philips.com> (needs subscription). After login, select Magazine, then go to Workshop Information. Here you will find Information on how to deal with BGA-ICs.

Repair Flow Chart

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