TOSHIBA

FILE NO. 030-200310

SERVICE MANUAL

Colour Television

ZH37 Chassis

28ZH37P
32ZH37P

PUBLISHED IN JAPAN Feb., 2004 So

SERVICE MODE

1. ENTERING TO SERVICE MODE

1) Press 🔇 button once on Remote Control.

2) Press 🔇 button again to keep pressing.

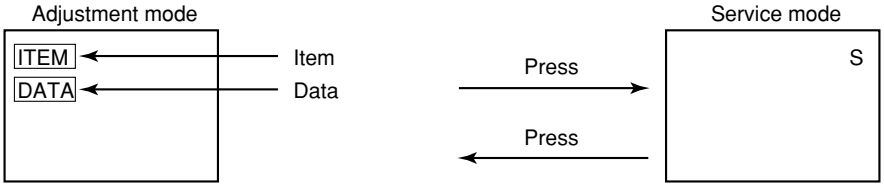
3) While pressing the 🔇 button, press MENU button on TV set.



(Service mode display)

2. DISPLAYING THE ADJUSTMENT MENU

1) Press MENU button on TV.



3. KEY FUNCTION IN THE SERVICE MODE

The following key entry during display of adjustment menu provides special functions.

A single horizontal line ON/OFF:	INFO button (on Remote) or ⊖ button (on TV)
Test signal selection :	⊖ button (on Remote)
Selection of the adjustment items :	Channel ▲/▼ (on TV or Remote)
Change of the data value :	Volume ◿ +/– (on TV or Remote)
Adjustment menu mode ON/OFF :	MENU button (on TV)
Initialization of the memory (QA02) :	CALL + Channel button on TV (▲)
Reset the count of operating protect circuit to “00”:	CALL + Channel button on TV (▼)
“RCUT” selection :	1 button
“GCUT” selection :	2 button
“BCUT” selection :	3 button
“CNTX” (or “SCNT”) selection :	4 button
“COLC” selection :	5 button– – – – – Color thickness correction
“TNTC” selection :	6 button
Self diagnostic display ON/OFF :	9 button

note: Displayed differently as shown below, depending on the setting of the receiving color system.
COLP (PAL)
COLC (NTSC)
COLS (SECAM)

CAUTION : Never try to perform initialization unless you have changed the memory IC.

4. SELECTING THE ADJUSTING ITEMS

1) Every pressing of CHANNEL ▲ button in the service mode changes the adjustment items in the order of table-2. (▼ button for reverse order)

Refer to table-2 for preset data of adjustment mode.
(See SETTING & ADJUSTING DATA on page 13)

5. ADJUSTING THE DATA

1) Pressing of VOLUME ◿ +/– button will change the value of data in the range from 00H to FFH. The variable range depends on the adjusting item.

6. EXIT FROM SERVICE MODE

1) Pressing POWER button to turn off the TV once.

■ INITIALIZATION OF MEMORY DATA OF QA02

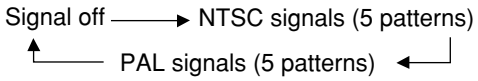
After replacing QA02, the following initialization is required.

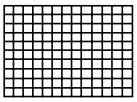
1. Enter the service mode, then select any register item.
2. Press and hold the CALL button on the Remote, then press the CHANNEL ▲ button on the TV. The initialization of QA02 has been complated.
3. Check the picture carefully. If necessary, adjust any adjustment item above. Perform “Auto search Memory” on the owner’s manual.

CAUTION: Never attempt to initialize the data unless QA02 has been replaced.

7. TEST SIGNAL SELECTION

1) Every pressing of ⊖ button on the Remote Control changes the built-in test patterns on screen as described below in SERVICE MODE.

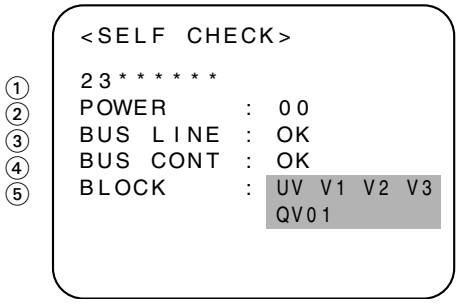


Signals	Picture
• Red raster • Green raster • Blue raster • All White	
• Black cross-hatch	

***** The signals marked with ■ are not usable to display in the Test signal for some model.

8. SELF DIAGNOSTIC FUNCTION

1) Press “9” button on Remote Control during display of adjustment menu in the service mode.
   The diagnosis will begin to check if interface among IC’s are executed properly.
2) During diagnosis, the following displays are shown.



① Part number of microcomputer (QA01)
② Operation number of protecting circuit ----“00” is normal.
When indication is other than “00”, overcurrent apts to flow, and circuit parts may possibly be damaged.
③ BUS LINE CHECK ----“OK” is normal.
“SDA1-GND” ---------- SDA-GND short circuit.
“SCL1-GND” ---------- SCL-GND short circuit.
“SCL1-SDA1” ---------- SCL-SDA short circuit.
④ BUS CONT ----“OK” is normal.
When indication shows “Q○○○ NG”, the device with the number may possibly be damaged.
⑤ BLOCK
UV : TV reception mode
V1 : VIDEO 1 input mode (→①)
V2 : VIDEO 2 input mode (→②)
V3 : VIDEO 3 input mode (→③)

Indicated color of mode now selected : Green and Red
Indicated color of other modes : White

Green : Normal
Red : The microcomputer operates to provide judgement of no video signal. The red color is still indicated though the signal is input, failure may exist in input signal line including QV01.
QV01 : In case of indication green ---Normal
In case of indication red with input signal----
Failure may exist in output line including QV01.

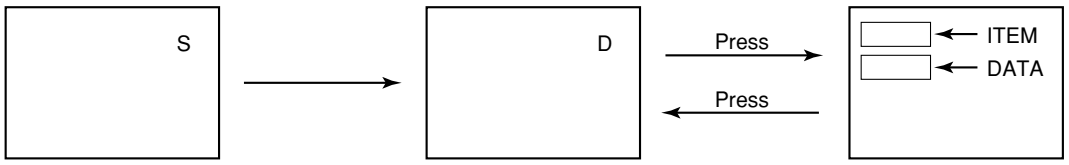
NOTE: Component which controls character display on screen is ICF01 (TELETEXT IC.). If this display function fails to operate due to damage in ICF01, self diagnosis procedure is as follows.
(1) In case that power indicator is blinking with interval of 0.5 seconds; it means protecting circuit (Current limiter) is operating, and circuit components may possibly be damaged. Check related components.
(2) In case that power indicator is blinking with interval of 1 second; Protecting circuit does not operate, but a part of Bus line does not operate normally. Check Bus line.

***** The items marked with ■ are not usable to display in the SELF DIAGNOSTIC FUCTION for some model.

DESIGN MODE

1. ENTERING TO DESIGN MODE

1) Select the Service mode. 2) While pressing 🔇 or CALL button on Remote and press MENU button on TV. 3) Press MENU button on TV.



(Design mode) (Adjustment mode)

When QA02 is initialized, items “OPT0” and “OPT1” of DESIGN MODE are set to the data of the representative model of this chassis family.
Therefore, because ON-SCREEN specification remains in the state of the representative of model. This model is required to reset the data of items “OPT0” and “OPT1”.

2. SELECTING THE ADJUSTING ITEMS

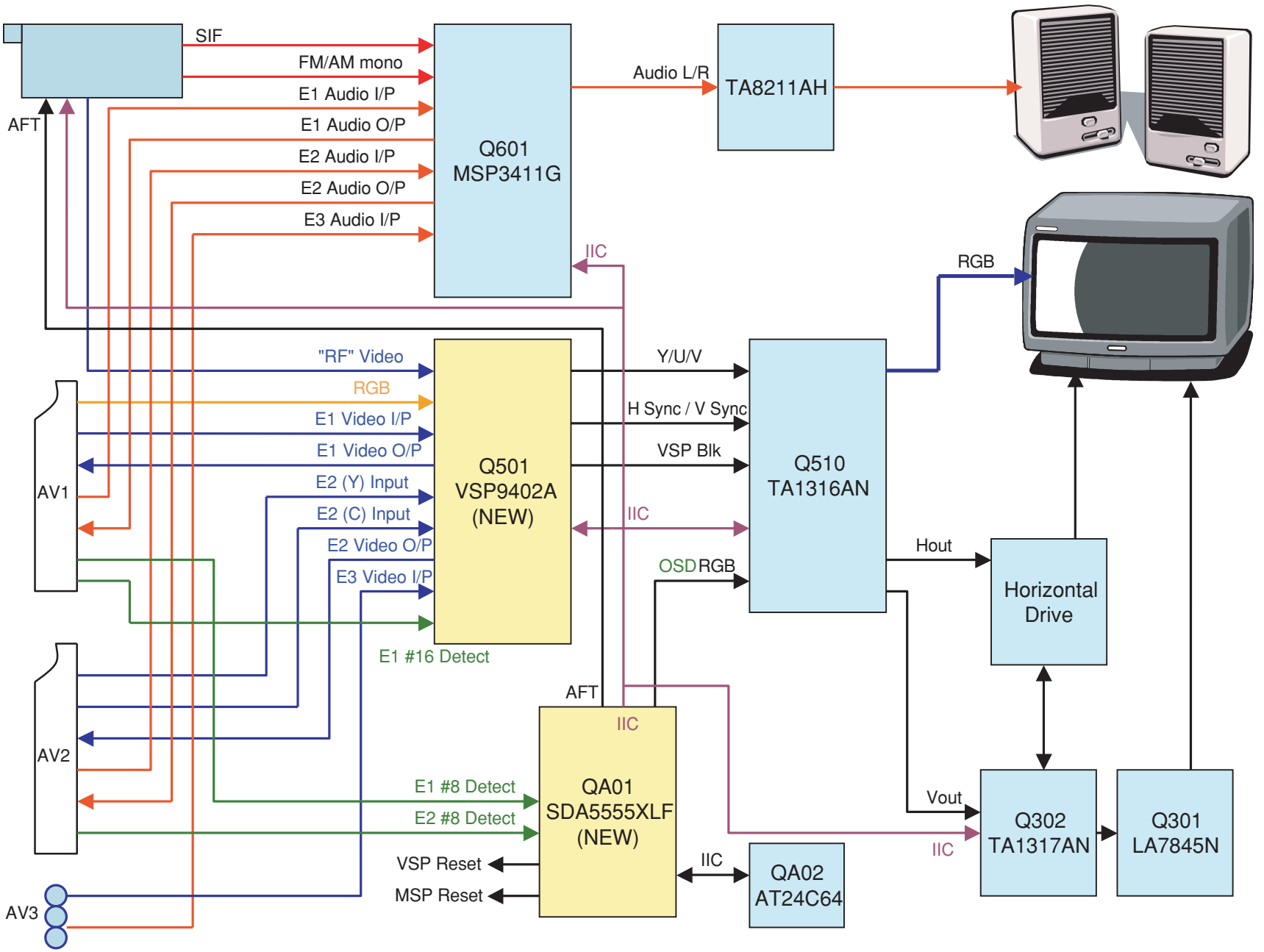
Every pressing of CHANNEL ▼ button in the design mode changes the adjustment items in the order of table-3.
(▲ button for reverse order)

Refer to table-3 for data of design mode.
(See SETTING & ADJUSTING DATA on page 13)

3. ADJUSTING THE DATA

Pressing of VOLUME ▲ or ▼ button will change the value of data.

CIRCUIT BLOCK DIAGRAM



E1

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

E2

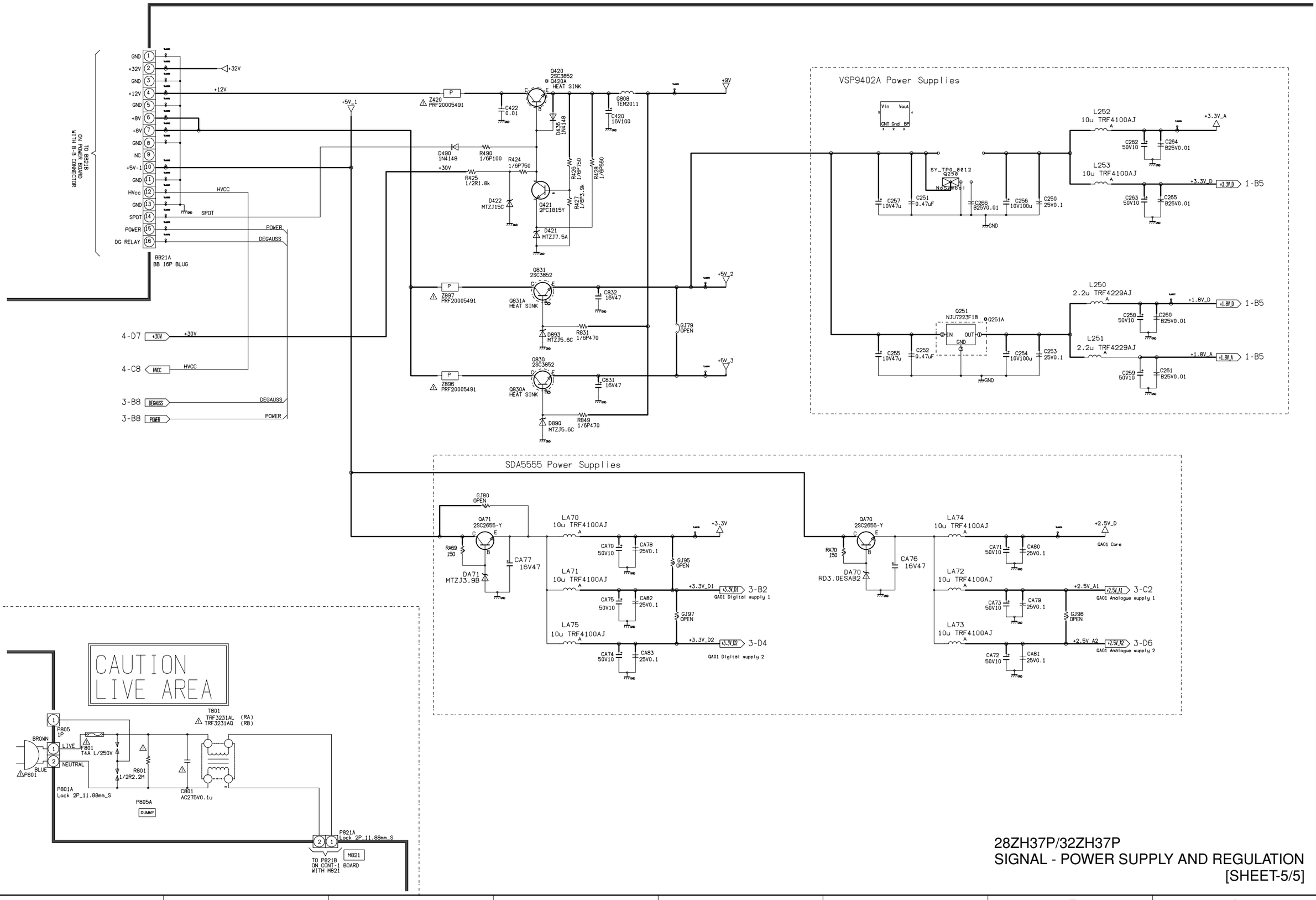
21	SHIELD EARTH
20	S-VIDEO/Y
19	VIDEO OUT
18	EARTH
17	VIDEO EARTH
16	NC
15	S-VIDEO/C
14	EARTH
13	EARTH
12	NC
11	NC
10	NC
9	EARTH
8	EXT/TV
7	NC
6	AUDIO IN(L)
5	EARTH
4	AUDIO EARTH
3	AUDIO OUT(L)
2	AUDION IN(R)
1	AUDIO OUT(R)

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SIGNAL - SCART/VIDEO FRONT END
[SHEET-1/5]

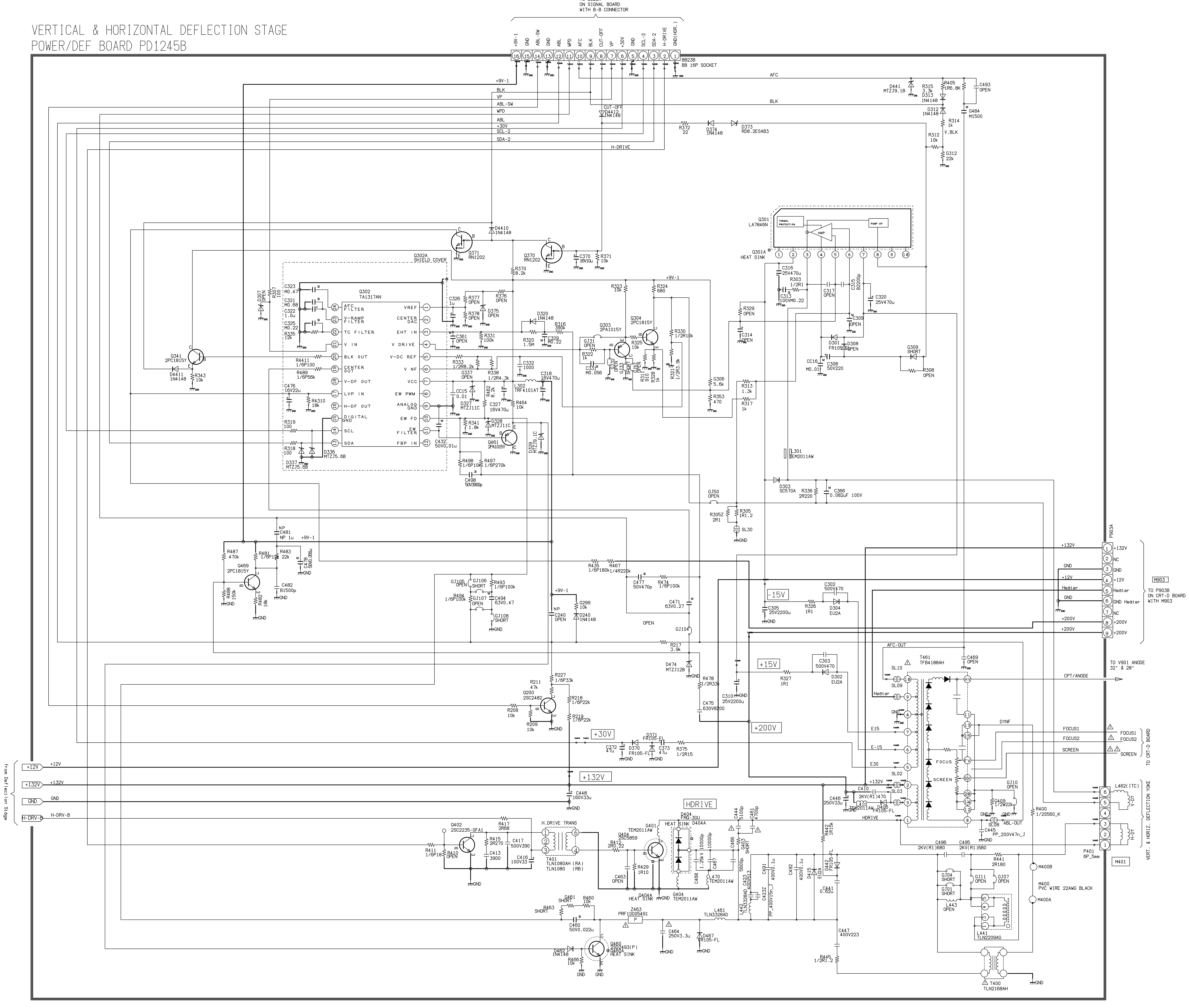
28ZH37P/32ZH37P
SIGNAL - AUDIO PROCESSING AND MUTING
[SHEET-2/5]

28ZH37P/32ZH37P
SIGNAL - PROCESSOR AND MEMORY
[SHEET-3/5]

28ZH37P/32ZH37P
SIGNAL - VIDEO BACK-END PROCESSING
[SHEET-4/5]



28ZH37P/32ZH37P
SIGNAL - POWER SUPPLY AND REGULATION
[SHEET-5/5]



28ZH37P/32ZH37P
POWER/DEFLECTION - VERTICAL & HORIZONTAL DEFLECTION STAGE
[SHEET-1/2]

POWER STAGE
POWER/DEF BOARD PD1245B

L901 DEGAUSSING COIL
DG +VE 45
DG -VE 46
P910
1.5-2P
28" TSB-2397AM
32" TSB-2397CM (RA) TSB-2414AT (RB) TSB-2395AM (RC)

R808 RZ92P2E4R5M (RA) RZ92P2E4R5M1 (RB)
R852 2.2M
SR83 G5PA-2 RELAY
D855 1N4148
Q805 2PC1815Y
R851 1k
R850 10k
DEGAUSS
+12V

SR82 DLS5D1-D(M)
Q830 2PC1815Y
D845 1N4148
C845 50V0.1
RB30 10k
+5V-1

C813 AC250V1000
C814 AC250V1000
Q807 RN1206
L805 TEM2011AW
T863 TPW3501AG

F889 T5A L/250V
C885 500V470
L889 TLN2026 TLN2026
AUDIO+27V
Z871 PRF50005491
L886 TEM2011AW
D885 RU4Z
C889 50V2200
L876 TRF4100AT
D871 FR105-FL
C872 50v 220u
+16V
AUDIO GND

C898 OPEN
GJ109 SHORT 2kV(R1)220
C893
C884 160V220u
+B +132V
L883 TRF9253D
TRF9253D
D883 RU-4AM
L824 TLN3312D TLN2026
CC80 47
+B GND

Z890 PRF50005491
C899 500V470
L891 TEM2011AW
D891 RK46
L897 TLN2026 TLN2026
+8V
C897 25V4700

Z891 PRF50005491
C896 500V470
L892 TEM2011AW
D892 RU4Z
L893 TLN2026 TLN2026
+12V
C890 25V2200u

R899 1R8.2M
RA 24005015L
RB 24005014L
RC 24005007C
P498 GT-PIN
+16V
L895 TLN2026 TLN2026
R828 820
Q826 TLP421F(GR) TLP621(GR-F2)
R827 680
Q827 SE125N
D844 MTZJ9.1A

T802 TRF3231AL
D801 LNGS860-F05 DGS860L
C805 AC250V4700
C806 AC250V4700
F802 T2.5A L/250V
C810
P499 GT-PIN

Q801A Q801 HEAT SINK STR-F6268S
OCP GND D Vin FB
L811 TEM2011AW
C818 1250V#2200p
R824 10K0.8
C823 500V470
C817 2KV(R1)330
C822 500V470
D817 MTZJ3.3B
C816 0.47
R816 1/2R47k
C819 0.47
R817 1/2R47k
C820 35V4.7
R803 1R68k
R815 1/2R1k
C821 500VB470
R819 1/2R82
D806 FR105-FL
C808 35V100u
R818 2R0.1
R820 2R0.1
R822 1/2W 1/6P220
R805
D807 1SS244
D808 1N4148
LIVE GND
R806 1/2R47k
R823 1/2R2.7k
R814 1/6P5.6k
D805 1SS244
C820 50V2700p

L801 TPW2023BS
P831A 2P 11.8mm
AC NEUTRAL 1
AC LIVE 2
to P831B on CBN1 board with M831
M831

LIVE AREA

Z803 UEMV508SA 23148029
L840 TLN3239D
L842 TEM2011AW
DC/DC Converter Vo=5.2V+/-4%
+5V-1
GND
C841 16V820 2451702GE
C840 25V100
C842 50V22
R841 1/2W 1R8J
R842 1/2W 2R2J
D879 OPEN
D880 OPEN
R880 1/2R100
D841 MTZJ6.8A
D840 S1WBA60 LNJWBA60
Z831 125V_1A 23144536C
C802 AC275V0.1u
C846 450V4.7
R825 5W15
C847 CD12-E2GA222MYGS
C848 CD12-E2GA222MYGS

R880 FITTED AS TOP SIDE MOD BEFORE SOLDER BATH
STANDBY POWER

Q418 2SC3852
D418A HEAT SINK
D419 MTZJ30A
R416 1/2R56k
C419 B1000
D418 MTZJ10C
D420 MTZJ7.5C
C421 M0.1
+12V
H-DRV-B
+B +132V
to Deflection Stage
+12V
H-DRV-B
GND
+132V

R101 1R22k
to B821A on Signal Board with B-8 connector
1 GND
2 +32V
3 GND
4 +12V
5 GND
6 +8V
7 +8V
8 GND
9 N/C
10 +5V-1
11 GND
12 HVCC
13 GND
14 SPOT
15 POWER
16 DEGAUSS
B821B

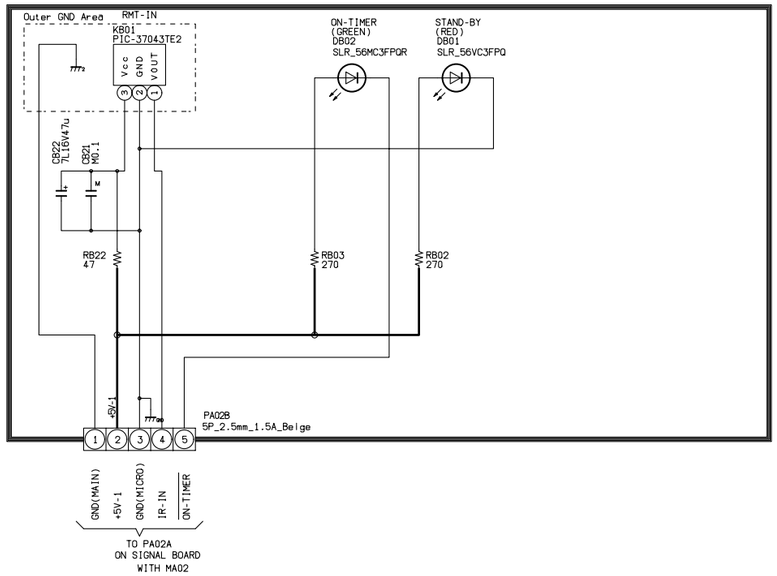
OCP
R475 2R0.56
L885 TLN3299D
SL80
F470 T1.25A L/250V
R479 1/2FR68
R843 330
Q470 2SA1320
C472 M0.47
D842 MTZJ15A
R471 1/2FR270
R433 680
R434 4.7k
2PA1015Y
R469 1/2P39k
R472 100
Q473
Q471 2PC1815Y
STANDBY PWR
C470 16V47u
D470 MTZJ5.1C
C473 1u
R477 1k
R473 18k
R476 470

to P681A on Signal Board with M681 cable
M681
1 GND-AUDIO
2 GND-AUDIO
3 N/C
4 N/C
5 VCC-AUDIO
6 VCC-AUDIO
P681B 2.5mm 6P

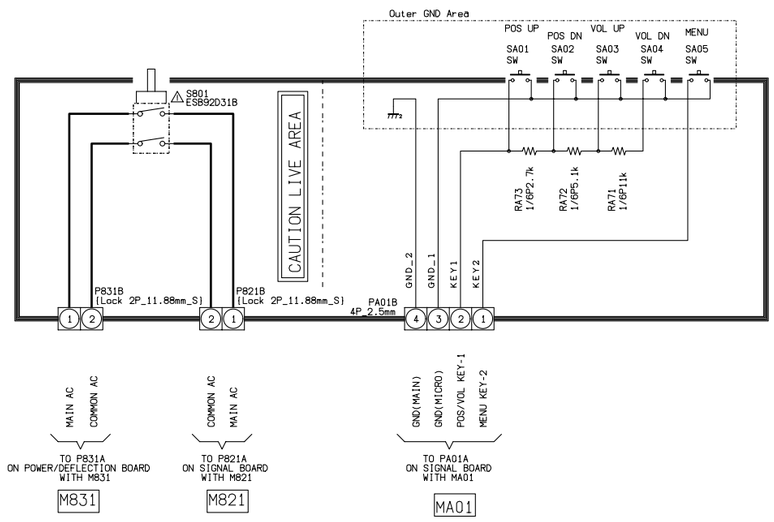
D4699 FR105-FL
Z404 PRF10005491
Q430 2SC3852
Q430A HEAT SINK
HVCC
R492 4.7k
C4699 25V2200
G443 1N4148
C431 0.01
R491 10Ω
C462 16V100uF
D431 MTZJ5.1B
D432 MTZJ5.1C

28ZH37P/32ZH37P
POWER/DEFLECTION - POWER STAGE
[SHEET-2/2]

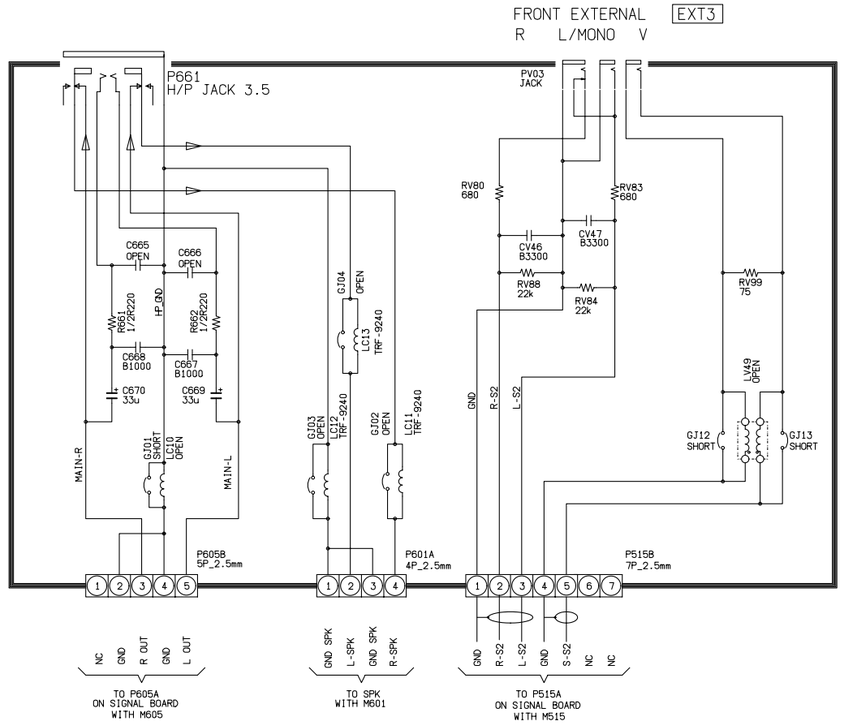
U904A
PW UNIT CONT-1&2-1 INDICATOR BOARD (FWECP076-1)



U904B
PW UNIT CONT-1&2-2 BUTTON BOARD (FWECP076-2)



U904C
PW UNIT CONT-1&2-3 AV BOARD (FWECP076-3)



28ZH37P/32ZH37P
INDICATOR/CONT/AV

U901 CRT-D BOARD PD0491L

M902

TO P902A ON SIGNAL BOARD WITH M902

P902B 8P_2.5mm

M903

TO P903A ON POWER BOARD WITH M903

P903B 9P_2.5mm

P703A 3P_2.5mm_SMK

V901 W66QDE991X816 FLAT WIDE CPT 28"

TO T461 ON DEF BOARD

28ZH37P/32ZH37P
CRT-D

NOTES



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