Service Manual

Multi-Scan Color CRT Display
MODEL TX-D2162 Series

Chassis No. HV8SA

Chassis Family No.21HV8SA

CONTENTS

Panasonic

CRT CUT- OFF ADJUSTMENT

WARNING

Do not turn the screen VR after this adjustment.

Conditions

Signal : Turn off the R,G,B (sync signal only)

Adjust Menu : 4) Adjust OTHER setting

Using by Color Analyzer for M11 and M12 adjustment

M4 Set screen VR fully counterclockwise (Min).

M5 Set BRIGHTNESS to center point by using the OSD

M6 Set data value to "20" for R, G, B LOW LIGHT

M7 Turn screen VR until the raster appears with any one of three (R,G,B) colors

If Red appears in M7

M8 Set Value to "FF" for < R. LOW LIGHT >

M9 Turn screen VR until the raster appears with any one of two (G or B) colors.

If Green appears in M9

M10 Set Value to "FF" for < G. LOW LIGHT >

M11 Adjust Screen VR to "0.50" cd/m² for Blue raster

M12 Adjust < R. LOW LIGHT > < G. LOW LIGHT > to [x=0.283 y=0.298]

If Blue appears in M9

M10 Set Value to "FF" for < B. LOW LIGHT >

M11 Adjust Screen VR to "3.51" cd/m² for Green raster

M12 Adjust < R. LOW LIGHT > < B. LOW LIGHT > to [x=0.283 y=0.298]

If Green appears in M7

M8 Set Value to "FF" for < G. LOW LIGHT >

M9 Turn screen VR until the raster appears with any one of two (R or B) colors.

If Red appears in M9

M10 Set Value to "FF" for < R. LOW LIGHT >

M11 Adjust Screen VR to "0.50" cd/m² for Blue raster

M12 Adjust < R. LOW LIGHT > < G. LOW LIGHT > to [x=0.283 y=0.298]

If Blue appears in M9

M10 Set Value to "FF" for < B. LOW LIGHT >

M11 Adjust Screen VR to "1.00" cd/m² for Red raster

M12 Adjust < G. LOW LIGHT > < B. LOW LIGHT > to [x=0.283 y=0.298]

If Blue appears in M7

M8 Set Value to "FF" for < B. LOW LIGHT >

M9 Turn screen VR until the raster appears with any one of two (R or G) colors.

If Red appears in M9

M10 Set Value to "FF" for < R. LOW LIGHT >

M11 Adjust Screen VR to "3.51" cd/m² for Green raster

M12 Adjust < R. LOW LIGHT > < B. LOW LIGHT > to [x=0.283 y=0.298]

If Green appears in M9

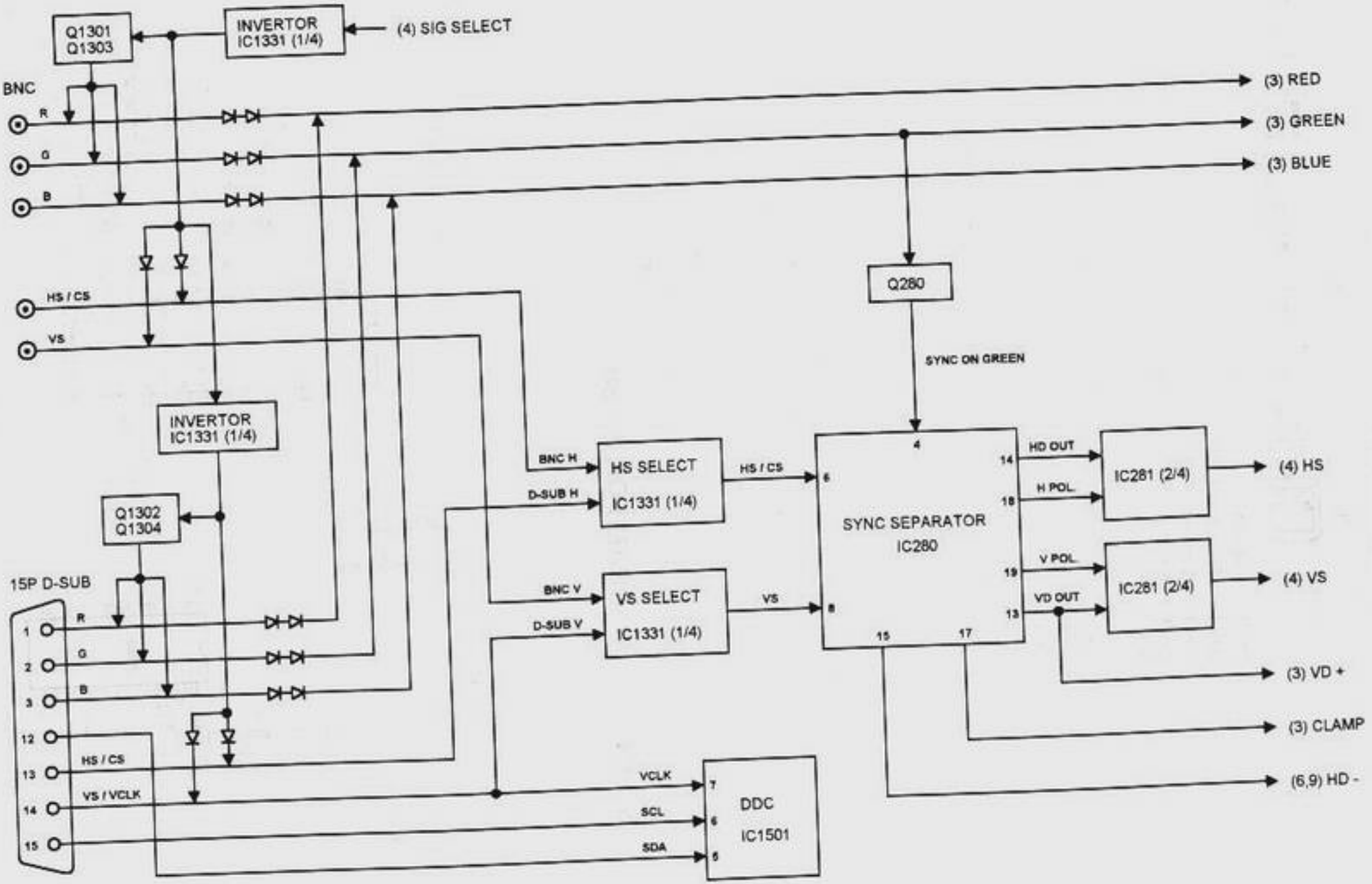
M10 Set Value to "FF" for < G. LOW LIGHT >

M11 Adjust Screen VR to "1.00" cd/m² for Red raster

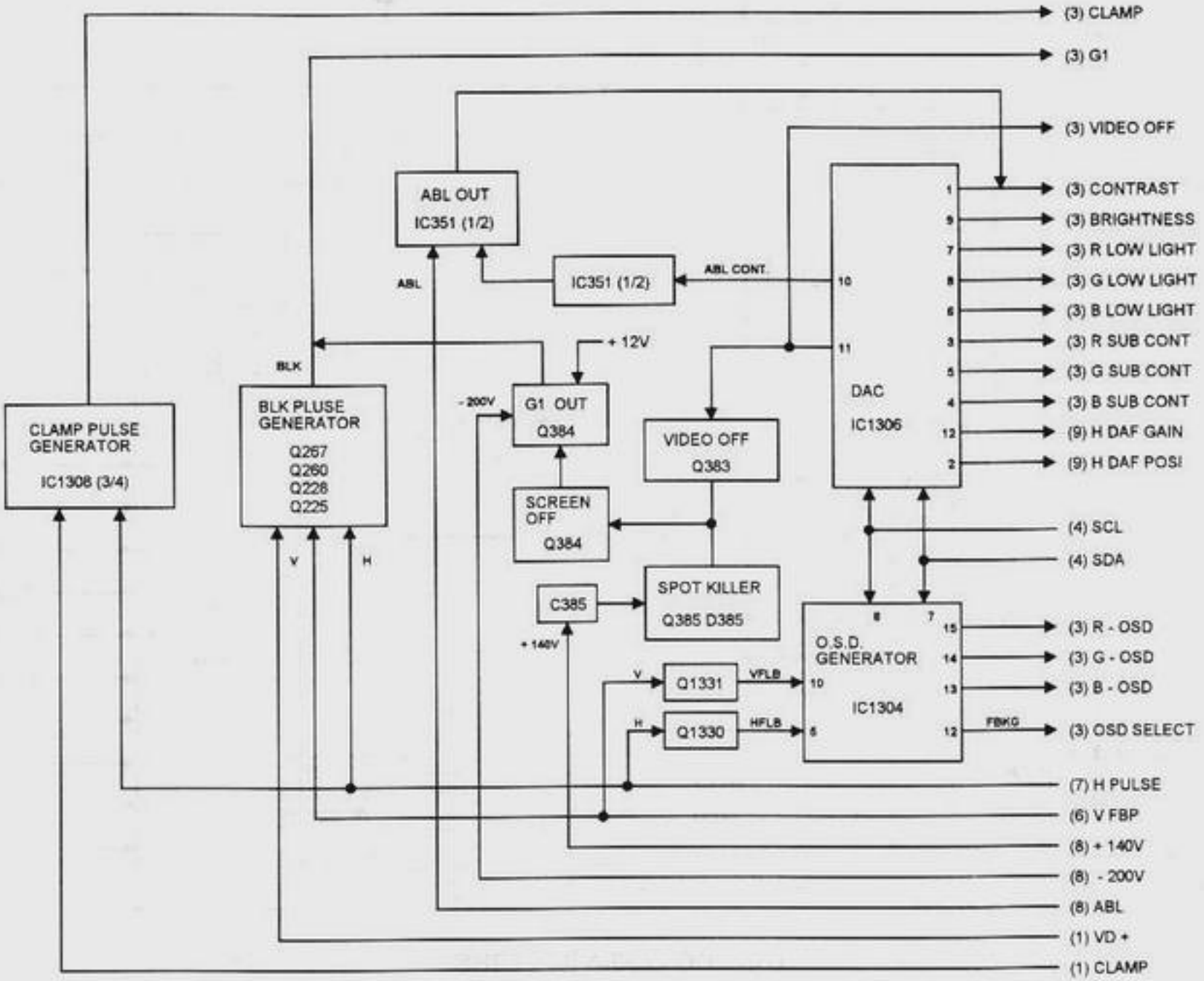
M12 Adjust < G. LOW LIGHT > < B. LOW LIGHT > to [x=0.283 y=0.298]

M13 Test Pattern : 16 gradation grayscale Adjust screen VR so the 2nd level of gray appears slightly.

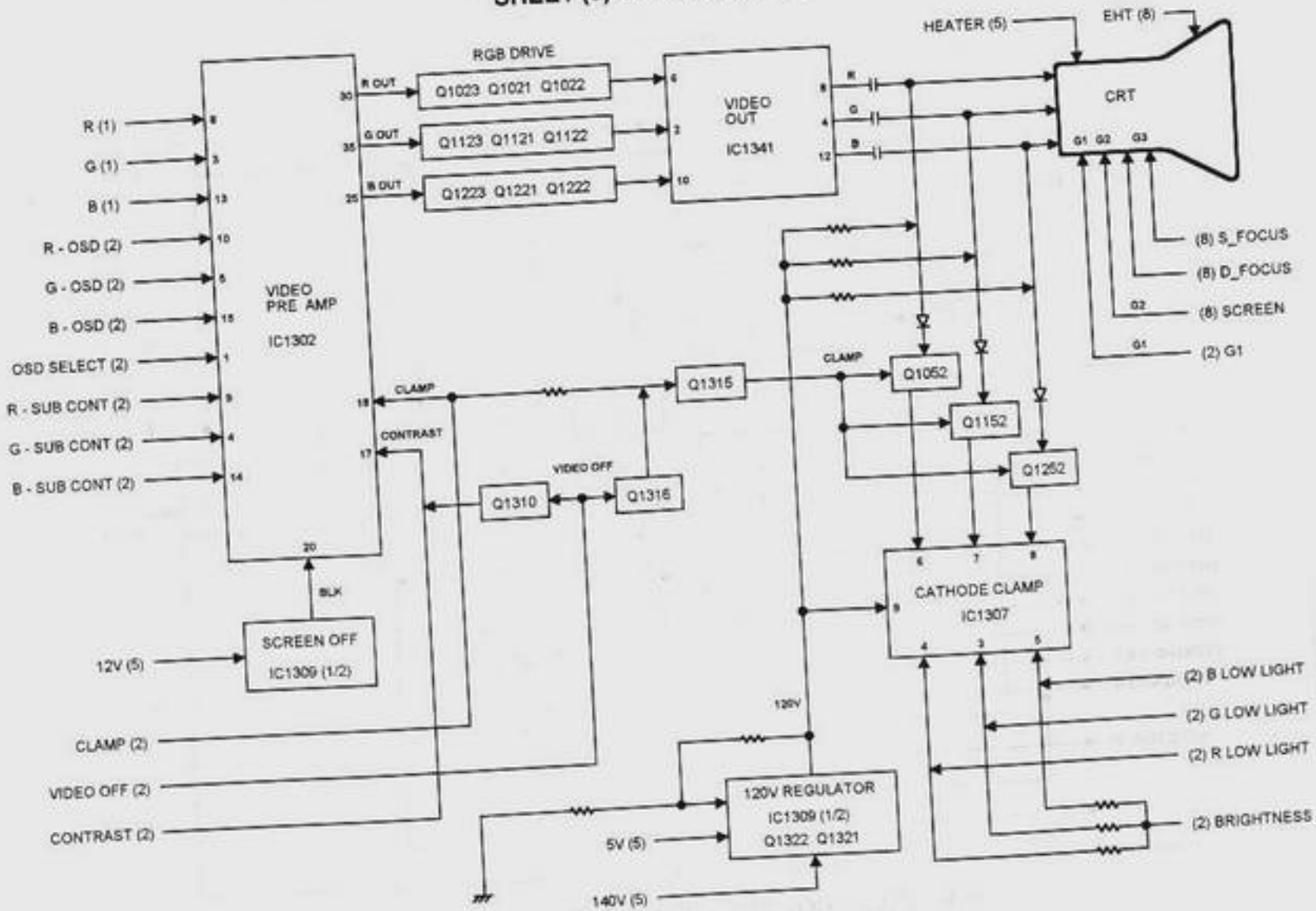
SHEET (1) SIGNAL SELECT / SYNC SEPARATE



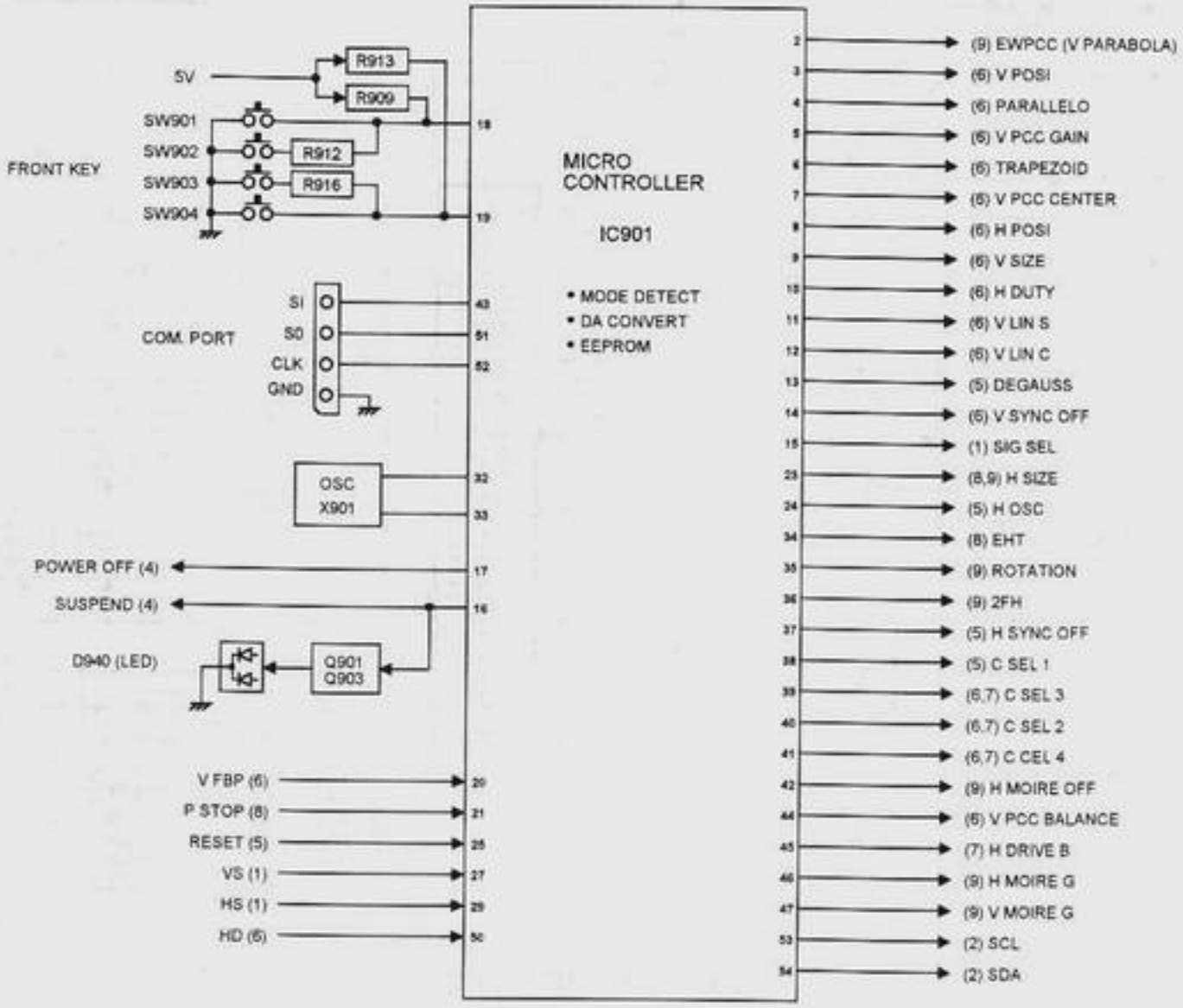
SHEET (2) O.S.D. GENERATOR / DAC FOR VIDEO / BLK



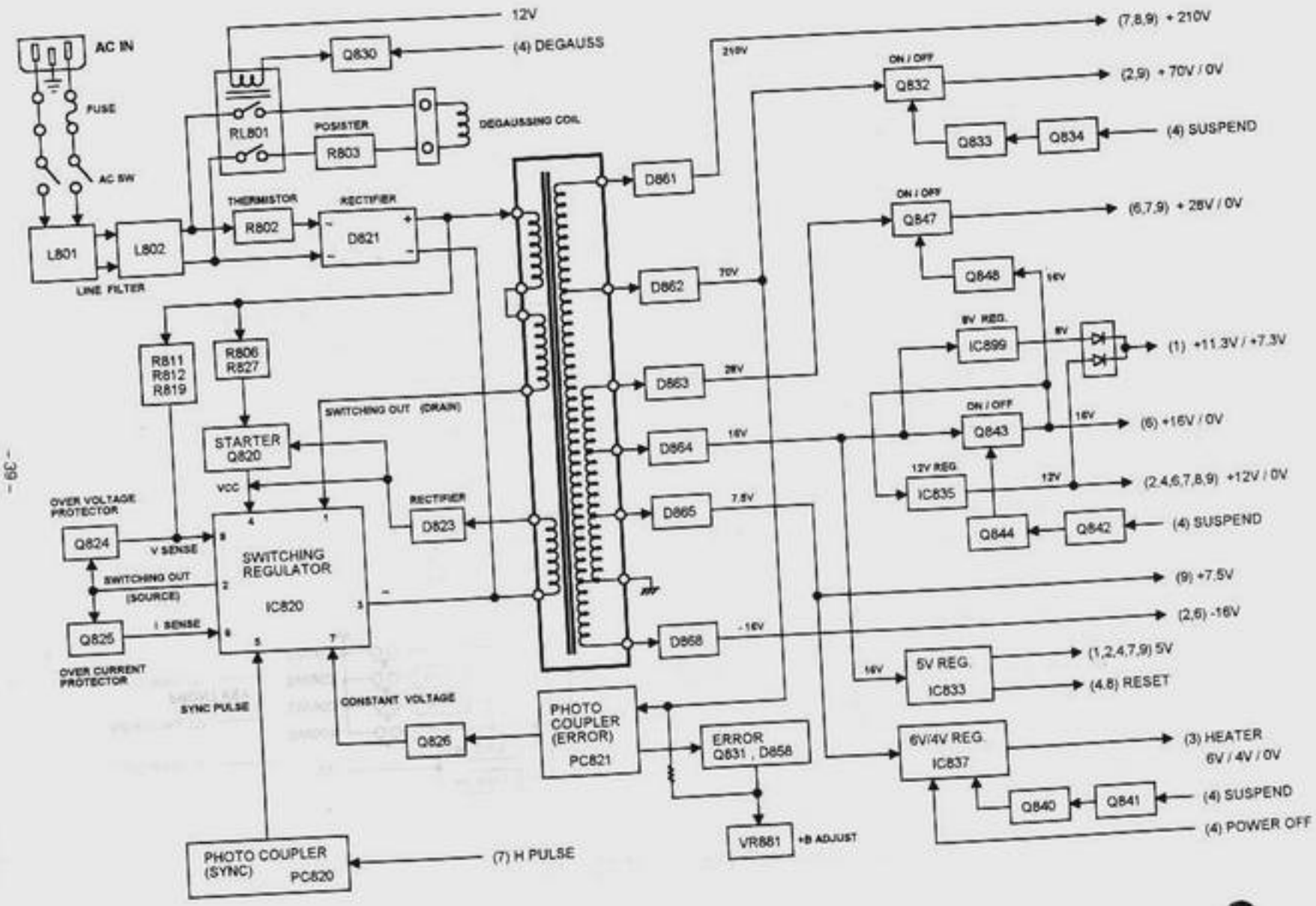
SHEET (3) VIDEO OUT PUT



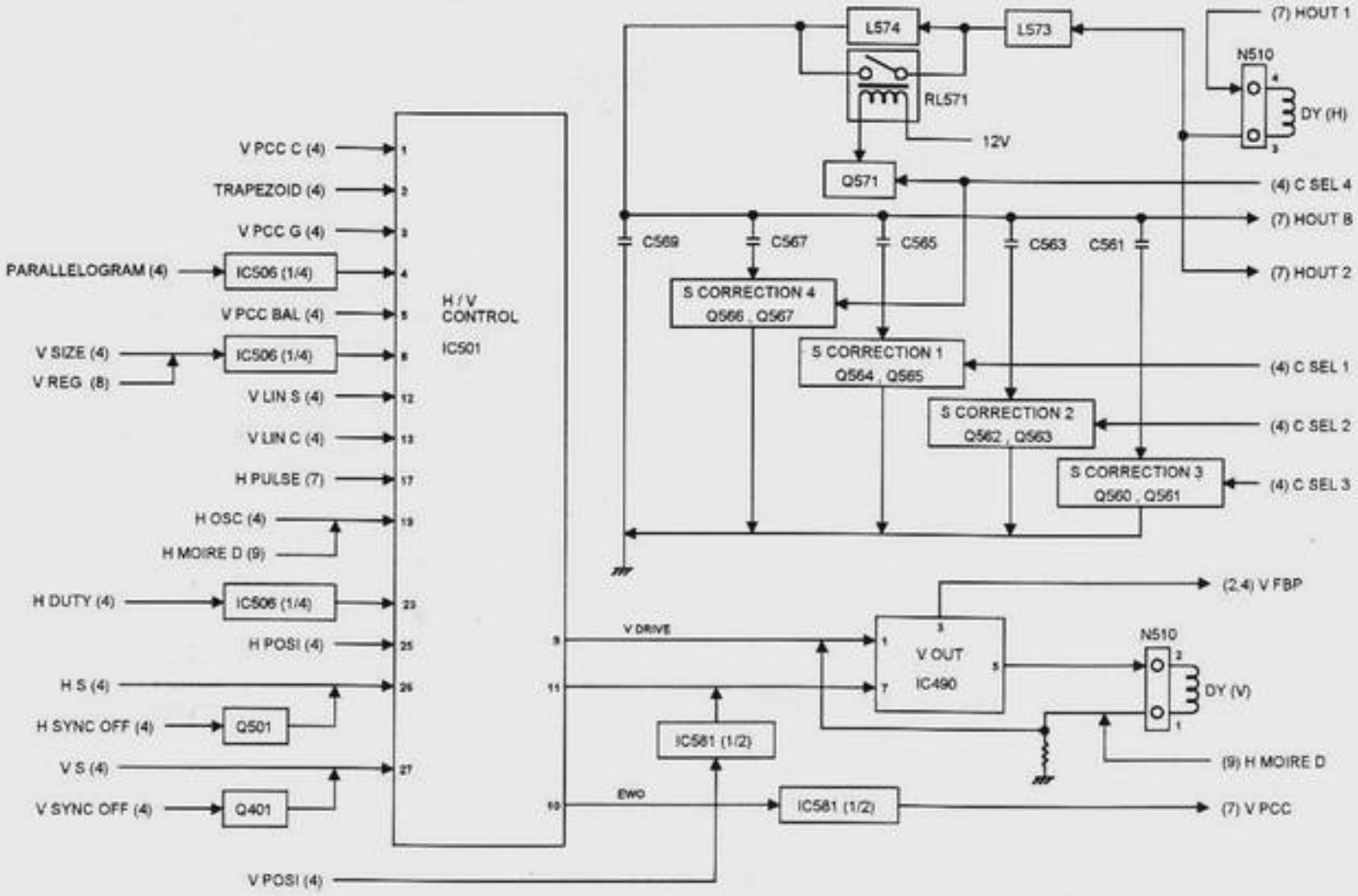
SHEET (4) MICRO CONTROLLER



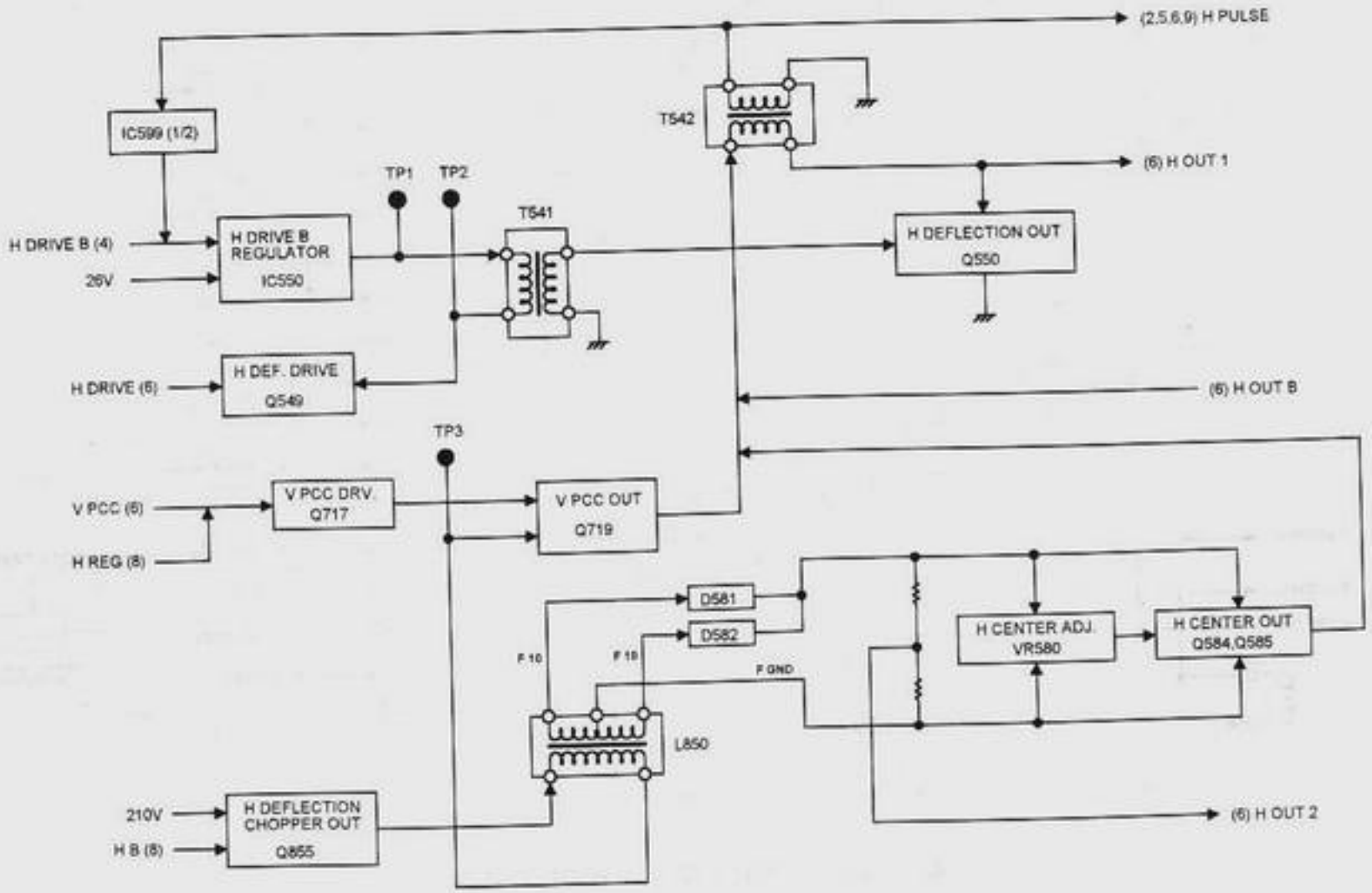
SHEET (5) POWER SUPPLY



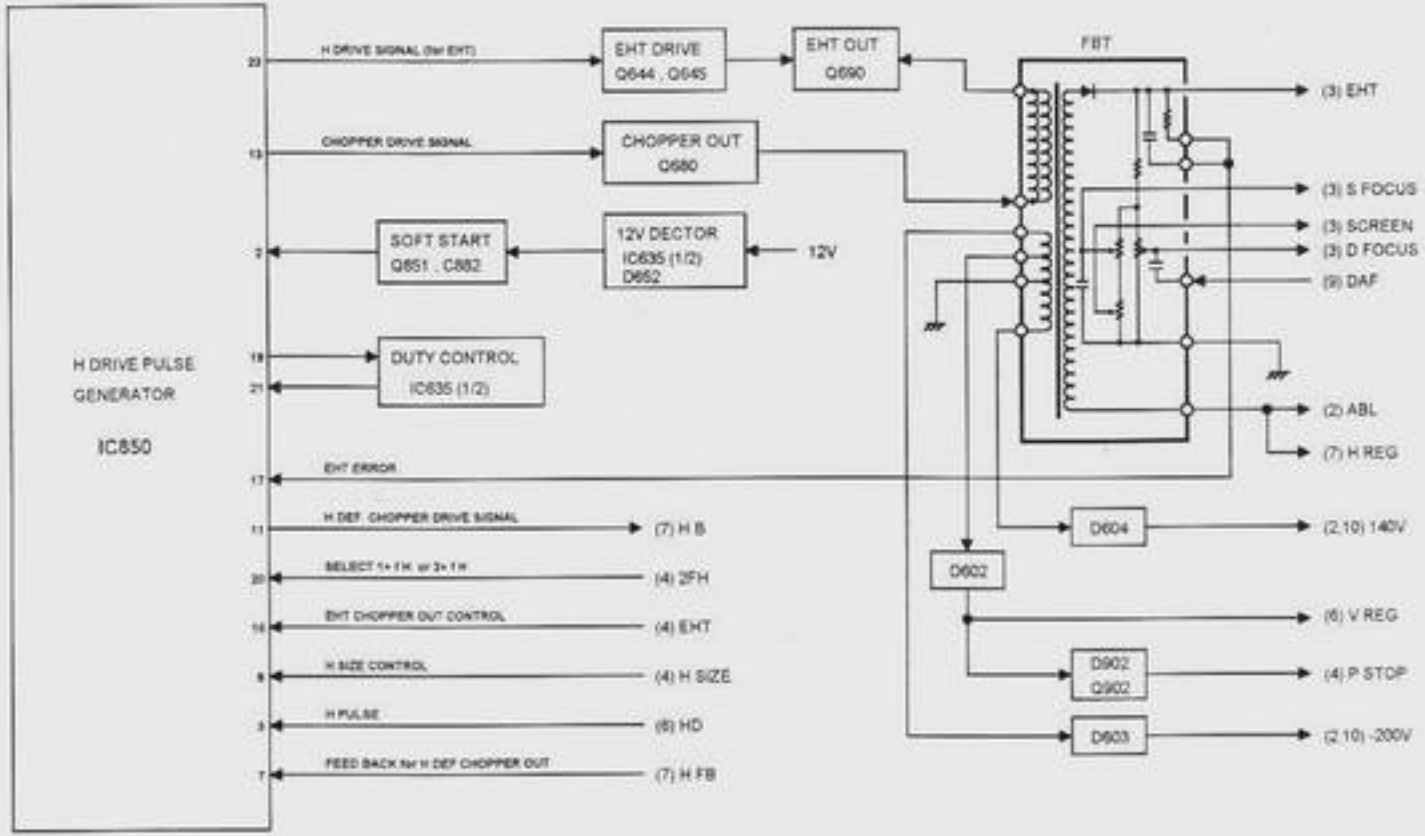
SHEET (6) H. V. CONTROL / H LIN / V. OUT



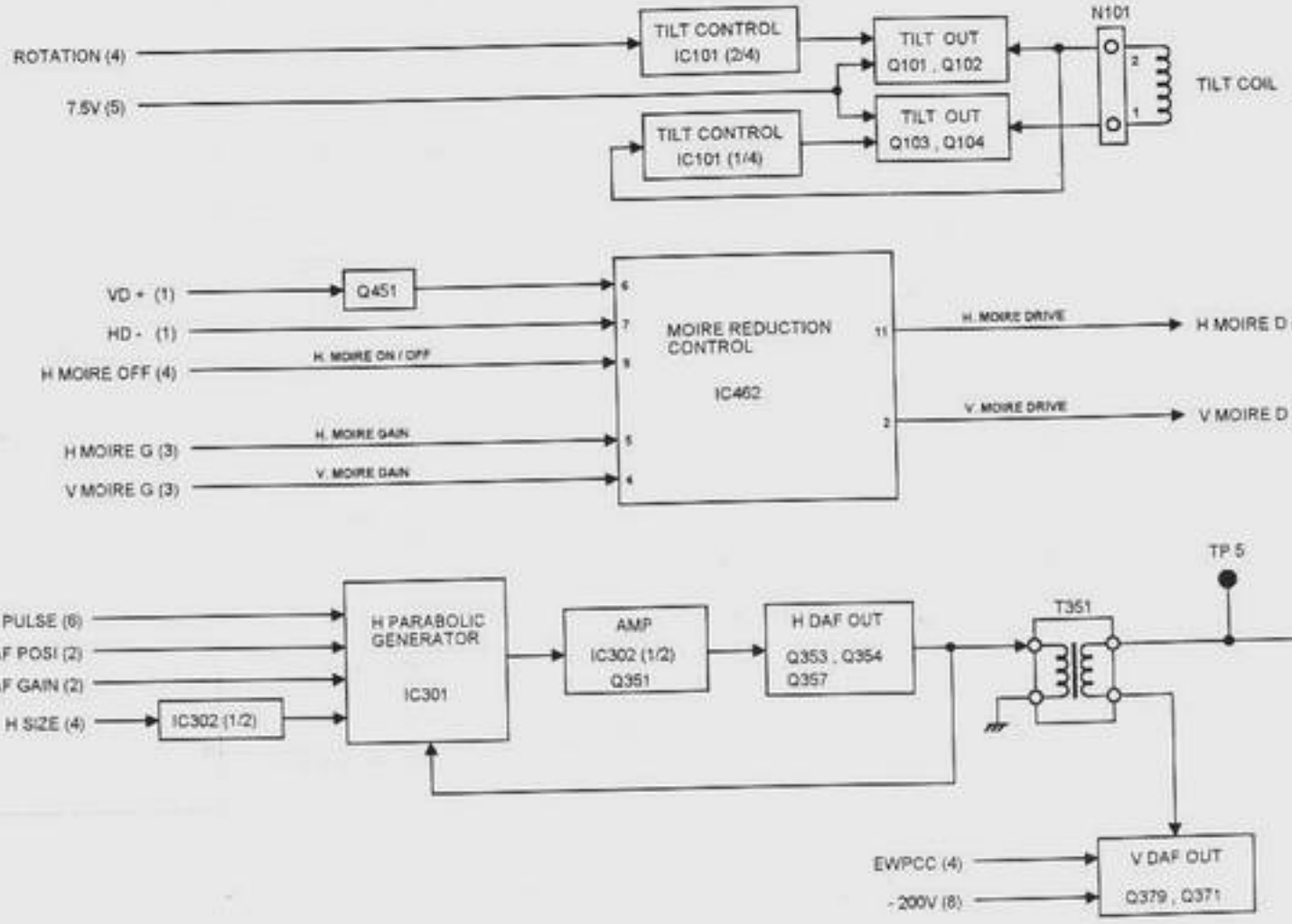
SHEET (7) H DEFLECTION OUT



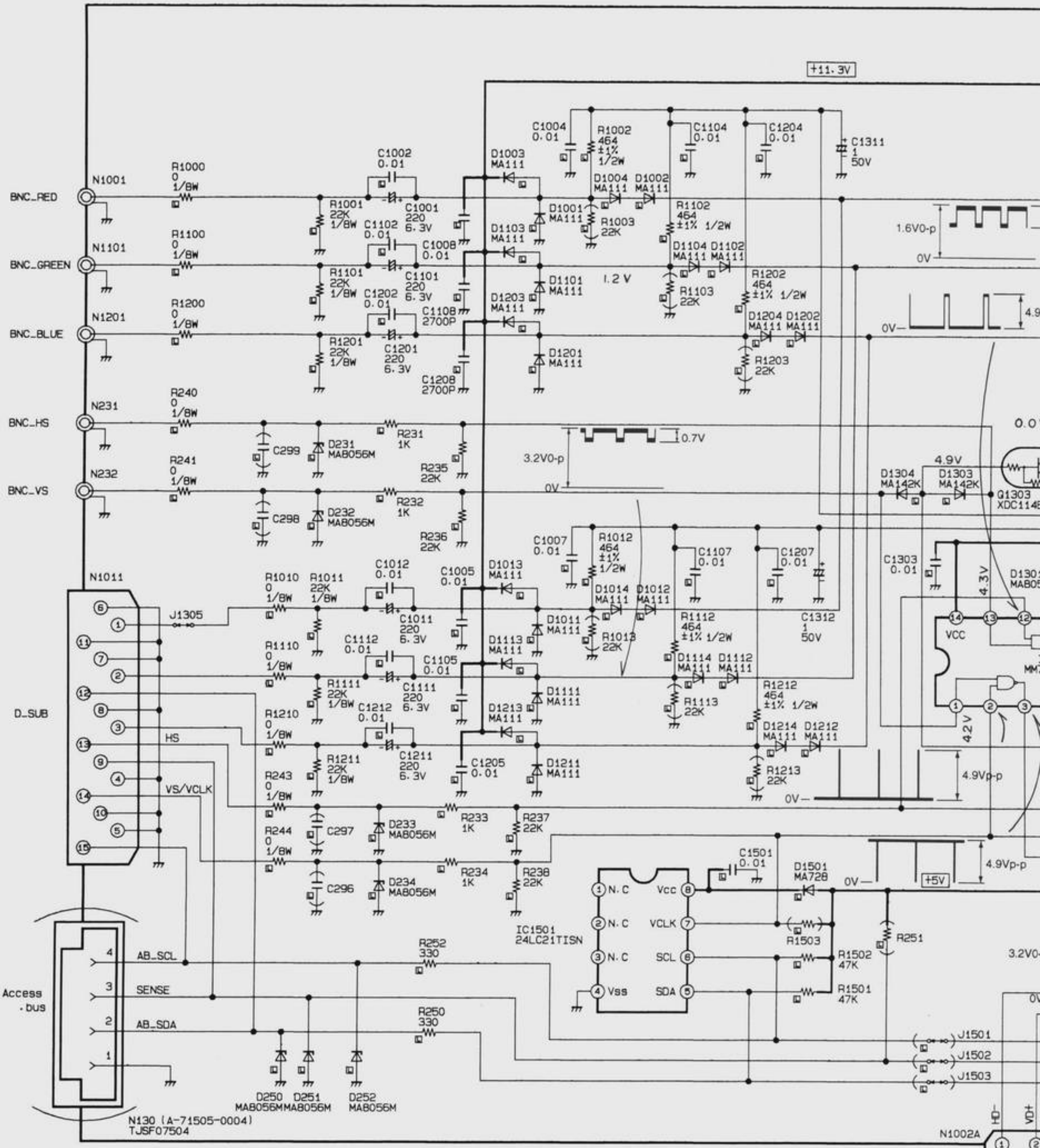
SHEET (8) H DRIVE / EHT OUT



SHEET (9) TILT / DAF / MOIRE REDUCTION



SIGNAL : MODE 1 (fH 93.8 kHz)
SIGNAL IN : 15P D-SUB

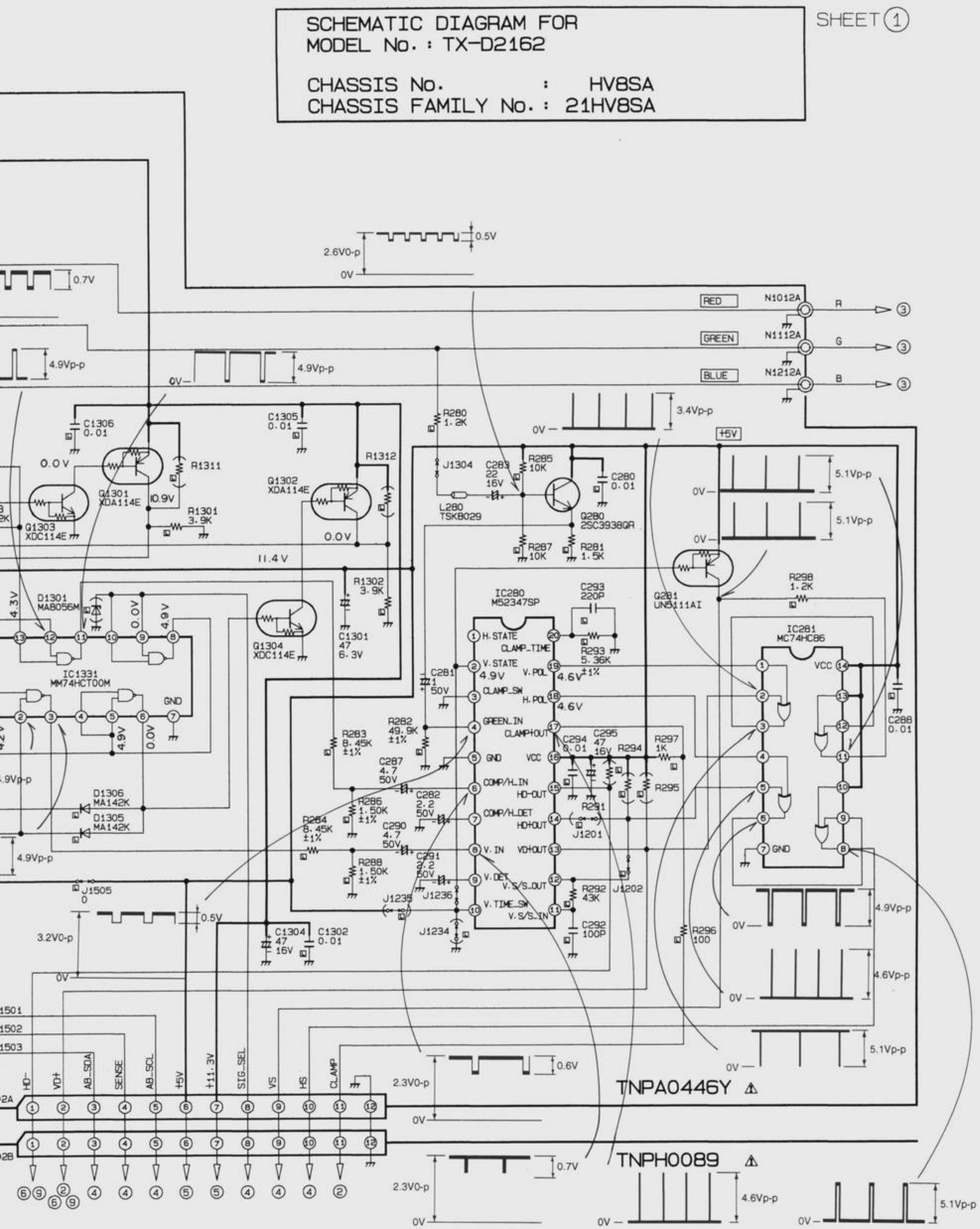


IC1331 < SIGNAL SELECT >

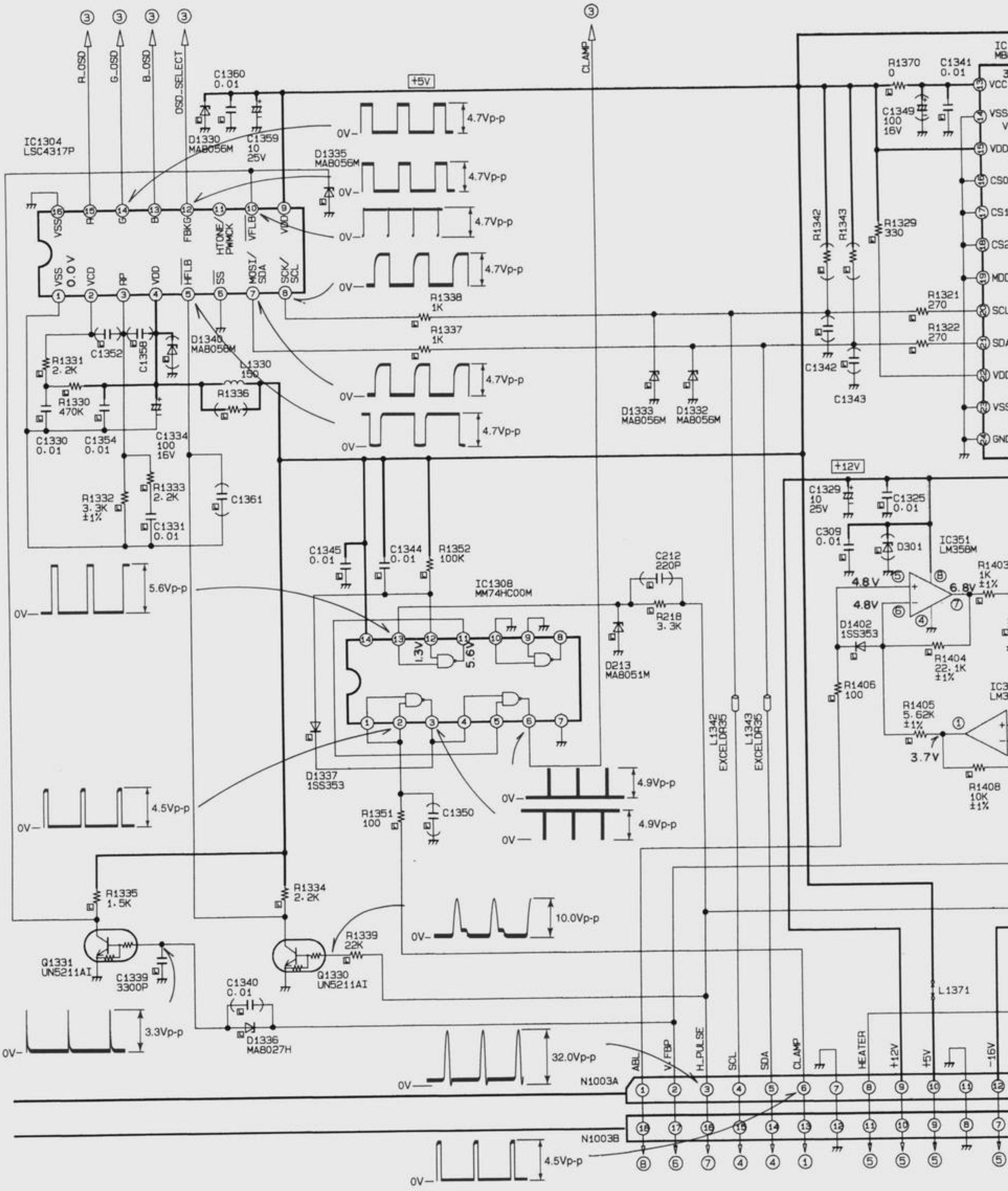
SELECT	6 pin	8 pin	9 pin
D-SUB	0 V	4.9 V	0 V
BNC	4.6 V	0 V	4.9 V

SCHEMATIC DIAGRAM FOR
MODEL No. : TX-D2162

CHASSIS No. : HV8SA
CHASSIS FAMILY No. : 21HV8SA



SIGNAL : MODE 1 (fH 93.8 kHz)
OSD : ON



SHEET ②

IC1306
MB88141

R1304 100
D1311 MA8056M

3.4V AO12 H. DAF. GAIN
0.0V AO11 VIDEO_OFF
1.8V AO10 ABL
2.5V AO9 BRIGHT
1.2V AO8 G.L.L
1.1V AO7 R.L.L
0.7V AO6 B.L.L
3.2V AO5 G.S.C
2.9V AO4 B.S.C
3.2V AO3 R.S.C
2.3V AO2 H.DAF. POSI
4.7V AO1 CONT

VCC ⑭ VSS2 ⑬ VDD2 ⑮ CS0 ⑯ CS1 ⑰ CS2 ⑱ MOD ⑲ SCL ⑳ SDA ㉑ VDD1 ㉒ VSS1 ㉓ GND ㉔

VIDEO_OFF ③
BRIGHTNESS_DAC ③
G_L_L_DAC ③
R_L_L_DAC ③
B_L_L_DAC ③
G_S_C_DAC ③
B_S_C_DAC ③
R_S_C_DAC ③
CONTRAST_DAC ③
+12V ③

R1128 0
R1228 0
R1028 0
C1127
C1227
C1027
R1303 100
D1310 MA8056M
R1344 2.49K ±1%

R384 4.7K
Q381 2SA1767PQ
11.5V
12.1V
R382 1.5K
R380 200K ±1%
D380 HZT33_09
D381 HZT33_09
D382 MA8091H
R385 88.7K ±1%
R381 1K
D383 EU02Z
R387 10K
R388 1.2M 1/2W
R228 1K 1/2W
R225 2.2K 1/8W
R260 3.3K 1/2W 0V
2.6Vp-p
0V
-48.0V 0-p
-28.0V
2.2Vp-p
0V

C269 100P 500V
C260 0.1 250V
Q267 2SC3938QR
D267 MA165
R266 0
R267 6.8K
D266 MA111
D268 MA165
G1 ③

C261 0.068 25V
C263 22P
R262 4.7K
Q260 2SC3938QR
R261 6.8K
D260 MA111

R227 1K
R226 2.2K
Q228 2SC3938QR
Q225 2SC3938QR
D261 1SS353
D262 1SS353
R263 3.9K
R264 3.9K
C262 1000P

R216 8.2K
D210 1SS353
R217 1K
D211 1SS353
C210 220P
D212 1SS353
R222 4.7K
R219 15K

Q385 UN5111AI
5.5V
D385 MA8056M
0.0V
Q384 UN5211AI
R386 100K 1/2W
Q383 UN5211AI 0.0V
C385 4.7 160V
R389 240K

R1403 1K ±1%
R1401 330
D1401 1SS353
R1402 10K ±1%
6.8V
IC351 LM358M 1.9V
R1341 100
1.8V
R1408 10K ±1%
R1409 10K ±1%

V.FBP
VD+
H_PULSE
-16V ③
+140V ③
+70V ③

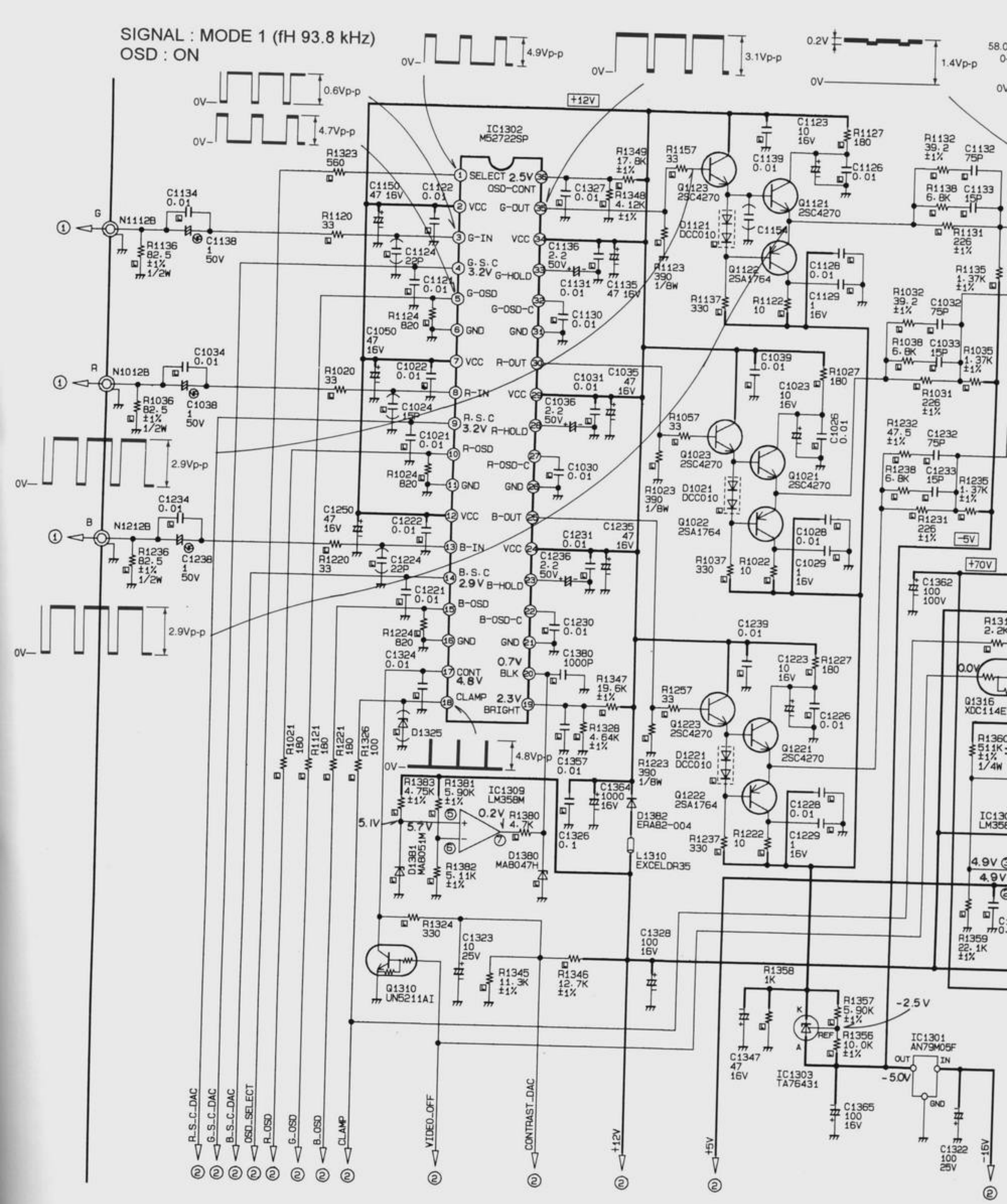
L1320 EXCELDR35
C1321 0.01 200V
0.8Vp-p
HEATER ③
0.7Vp-p
2.0Vp-p

-16V ⑫ VD+ ⑬ +70V ⑭ +140V ⑮ H.DAF_GAIN_DAC ⑯ H.DAF_POSI_DAC ⑰ -200V ⑱

TNPA0446X ⚠

TNPH0089 ⚠

SIGNAL : MODE 1 (fH 93.8 kHz)
OSD : ON



SHEET ③

58.0V 0-p 13.0V 0V

75.0V 0-p 43.0V 0V

0V -48.0V 0-p -28.0V

IC1341 MHW3628

CY: TLCB006

DY: MEY51LHB

M51KYY540X
21"FS
0.25mm

N381 TJSF08600

kR kG kB

6.1V h h G1 G2 G3 -1 G3 -2 a

400V – 500V

EHT ⑧

L1360 TSKB029

S381 TAX125X103M

S290 TAG10003

C1363 1000P 500V

C396

C397

C398

S382 ERZTC4AK201

N106

S_FOCUS (BLACK) ⑧

D_FOCUS (RED) ⑧

2.0V

78.0V 0-p

0V

SCREEN ⑧

R395 0

L383 EXCELDR35

C393 3300P 2KV

N382

R1399 0

R1372 0

C1372

N107

GND ⑧

GND ⑧

C1132 75P

C1133 15P

R1131 226 ±1%

R1135 1.37K ±1%

R1035 1.37K ±1%

R1235 1.37K ±1%

-5V

C1137 0.01 200V

C1143 10 100V

C1037 0.01 200V

C1043 10 100V

C1237 0.01 200V

C1243 10 100V

D1140 1SS376

D1141 1SS376

D1040 1SS376

D1041 1SS376

D1240 1SS376

D1241 1SS376

R1152 220K 1/4W

R1052 220K 1/4W

R1252 220K 1/4W

C1373 0.01 500V

R1142 1K 1/4W

R1144 1.8K 1/4W

C1140 0.47 100V

C1142 1000P 500V

L1140 180n

R1143 22 1/2W

R1042 1K 1/4W

R1044 2.7K 1/4W

C1040 0.47 100V

C1042 1000P 500V

L1040 180n

R1043 22 1/2W

R1242 1K 1/4W

R1244 3.9K 1/4W

C1240 0.47 100V

C1242 1000P 500V

L1240 150n

R1243 22 1/2W

S1201 TAG0SP201M

S1101 TAG0SP201M

S1001 TAG0SP201M

D1152 MA167A

D1052 MA167A

D1252 MA167A

+70V

D1320 ERA1502

R1320 33K 1/4W

78.0V

R1150 220

Q1152 2SC4412-45

Q1052 2SC4412-45

Q1252 2SC4412-45

R1050 220

R1250 220

R1151 10K

R1051 10K

R1251 10K

C1153 0.068 250V

C1053 0.068 250V

C1253 0.068 250V

C1152 1 160V

C1052 1 160V

C1252 1 160V

R1315 560 1/2W

D1315 MA8056M

R1316 2.2K

0.7V 1.5V

Q1315 2SA1739

0.0V

Q1316 XDC114E

D1316 MA8056M

+120V

C1355 10 160V

R1360 511K ±1% 1/4W

C1370 470P 500V

C1371 0.01 200V

C1374 0.01 200V

D1321 1SS376

78.0V

5.1V 5.1V 5.1V

IC1309 LM358M

C1368 0.01

Q1321 2SC1473A

117.0V

4.9V

4.9V

7.8V

Q1322 2SC1473A

R1350 10K 1/2W

R1361 2.7K

C1369 0.01

R1359 22.1K ±1%

C1151

C1051

C1251

R1156 28.7K ±1%

R1056 28.7K ±1%

R1256 28.7K ±1%

2.5V

R1155 22.6K ±1%

R1055 22.6K ±1%

R1255 22.6K ±1%

IC1307 STK190-110

C1356 0.01 200V

C1366 0.01 200V

C1367 1 250V

C1351 10 25V

C1353 0.1

L1350 EXCELDR35

L381 EXCELDR35

R383 39 1/2W

C1322 100 25V

+70V

+140V

-16V

G-L-L-DAC

R-L-L-DAC

B-L-L-DAC

BRIGHTNESS-DAC

HEATER

G1

TNPA0446X ⚠

SIGNAL : MODE 1 (fH 93.8 kHz)

+12V, +5V, +8.2V

R980 150 1/2W
D980 MA4082NM
C901 47 16V
C902
L901 100
R936 10K 1/8W
R932 10K
R970 3.3K
R934 22.1K ±1%
R930 4.7K
R931 2.2K

IC901 TVRB016 or TVRB017 or TVSA0095

4.3Vp-p

EWPCC
V_POSI_DAC
PARALLELOGRAM_DAC
V_PCC_GAIN_DAC
TRAPEZOID_DAC
V_PCC_CENTER_DAC
H_POSI_DAC
V_SIZE_DAC
H_DUTY_DAC
V_LIN_S_DAC
V_LIN_C_DAC
DEGAUSS
V_SYNC_OFF
SIG_SEL
POWER_OFF
P_STOP

R951 4.7K
R952 8.25K ±1%
C951 2.2 50V
C952 1 50V
R953 1K
C953 1 50V
R954 4.7K
C954 1 50V
R955 1K
C955 1 50V
R956 2.2K
C956 47 50V
R957 1K
C957 1 50V
R958 2.2K
C958 2.2 50V
R959 1K
C959 1 50V
R960 33K
C960 1 50V
R950 15K

5.4Vp-p

D906 MAB056M

R912 (-W-)
R911
R909 15K 1/8W
R913 10K

IC901 (16,17) < DPMS >

SYNC	16 pin	17 pin
Normal	0 V	4.9 V
H or V off	4.7 V	0 V

16 pin : SUSPEND
17 pin : POWER OFF

R988 1K
4.9V
R961 0
Q903 UN5211AI
R910 0
R920 2.2K
R921 2.2K
Q901 UN5111AI
R905 330
R906 330
0.0V
D923 MAB056H

R962 1K
C962 1 50V
R963 4.7K
C963 33 50V

4.9Vp-p

D901
C904 0.01
C903 1500 6.3V
C202 100P
C907 0.01

TNPA0446Z ⚠

D942 D941 D940 SML1816W
AMBER
GREEN

SW901 EVQPB005K
R912 15K 1/4W
R916 10K 1/4W
SW904 EVQPB005K
SW902 EVQPB005K
SW903 EVQPB005K

N22B N22A

D920 MA8056H
D922 MA8056H
D921 MA8056H

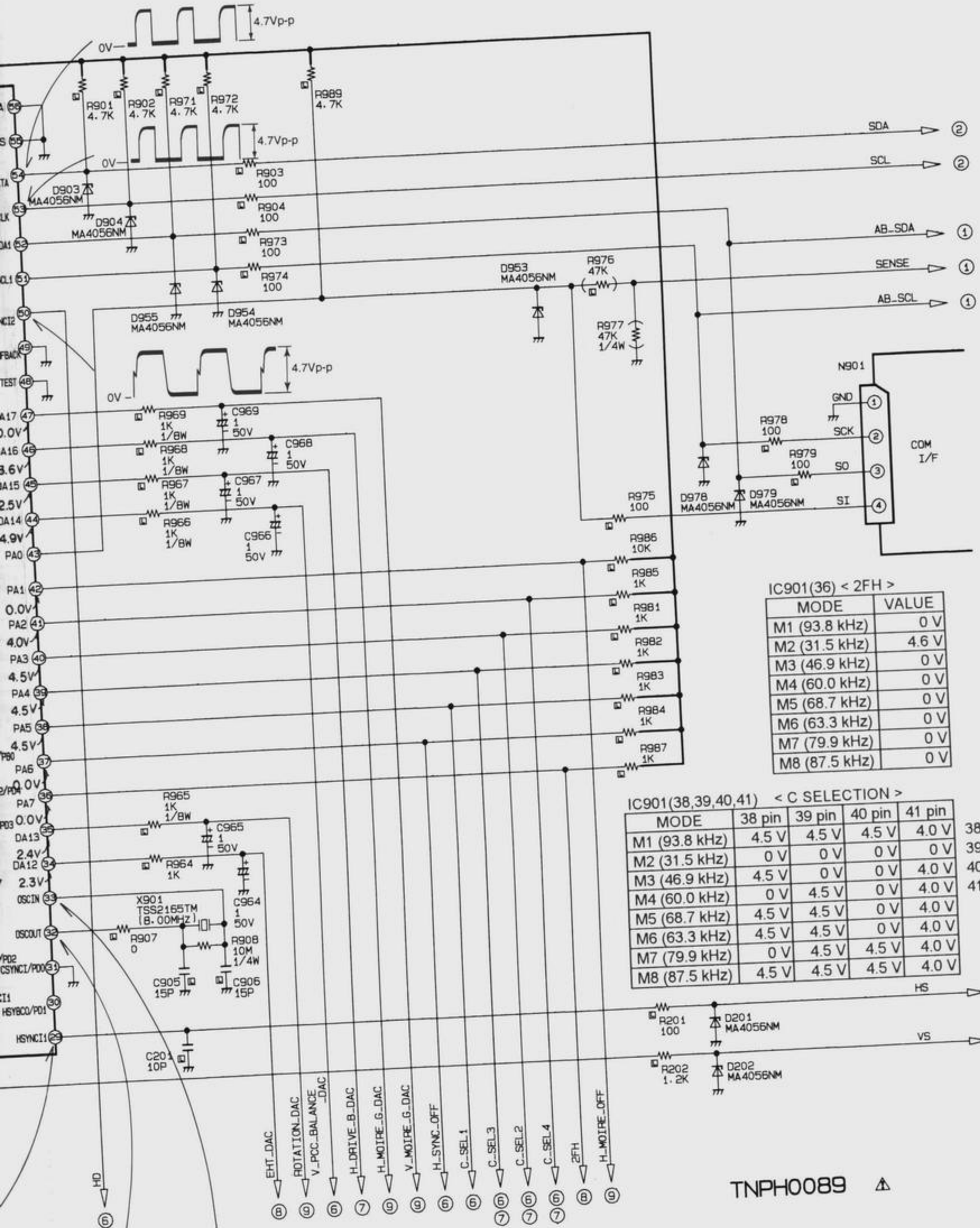
SUSPEND
H_OSC_DAC
H_SIZE_DAC
V_FBP
RESET
HD

4.9Vp-p

4.1V

1	VDDA	VSSA	56
2	EWPCC	VSS	55
3	DA0(12) 2.1V	PC5/DATA	54
4	DA1(12) 0.5V	PC4/CLK	53
5	DA2 2.5V	PC3/SDA1	52
6	DA3 2.7V	PC2/SCL1	51
7	DA4 2.5V	PC1/HSYNCI2	50
8	DA5 1.9V	PC0/DCMP/HFBACK	49
9	DA6 2.9V	VPP/TEST	48
10	DA7 3.9V	DA17 0.0V	47
11	DA8 2.6V	DA16 3.6V	46
12	DA9 2.2V	DA15 2.5V	45
13	PB7	DA14 4.9V	44
14	PB6	PA0	43
15	PB5 0.0V	PA1 0.0V	42
16	PB4 0.0V	PA2 4.0V	41
17	PB3 4.9V	PA3 4.5V	40
18	PB2	PA4 4.5V	39
19	PB1	PA5 4.5V	38
20	VFBACK/PB0	PA6 0.0V	37
21	VSINCI2/PD4 5.1V	PA7 0.0V	36
22	CLMPO/PD3	DA13 2.4V	35
23	DA10 3.7V	DA12 2.3V	34
24	DA11 4.1V	OSCIN	33
25	RESET	OSCOUT	32
26	VSYNCO/PD2	CSYNCI/PD0	31
27	VSYNCI1	HSYNCO/PD1	30
28	VDD	HSYNCI1	29

R901 4.7K
D903 MA4056NM
D904 MA4056NM



IC901(36) < 2FH >

MODE	VALUE
M1 (93.8 kHz)	0 V
M2 (31.5 kHz)	4.6 V
M3 (46.9 kHz)	0 V
M4 (60.0 kHz)	0 V
M5 (68.7 kHz)	0 V
M6 (63.3 kHz)	0 V
M7 (79.9 kHz)	0 V
M8 (87.5 kHz)	0 V

IC901(38,39,40,41) < C SELECTION >

MODE	38 pin	39 pin	40 pin	41 pin
M1 (93.8 kHz)	4.5 V	4.5 V	4.5 V	4.0 V
M2 (31.5 kHz)	0 V	0 V	0 V	0 V
M3 (46.9 kHz)	4.5 V	0 V	0 V	4.0 V
M4 (60.0 kHz)	0 V	4.5 V	0 V	4.0 V
M5 (68.7 kHz)	4.5 V	4.5 V	0 V	4.0 V
M6 (63.3 kHz)	4.5 V	4.5 V	0 V	4.0 V
M7 (79.9 kHz)	0 V	4.5 V	4.5 V	4.0 V
M8 (87.5 kHz)	4.5 V	4.5 V	4.5 V	4.0 V

38 pin : C SEL 1
39 pin : C SEL 3
40 pin : C SEL 2
41 pin : C SEL 4

TNPH0089 ⚠

SIGNAL : MODE 1 (fH 93.8 kHz)
AC IN : 100V

PRIMARY

SECONDARY

DEGAUSSING COIL
TSPA026_6

N802

R803
9

D830
1SS353

D801
TVSD0003

RL801
TSEH0004

Q830
2SD1949

R831
1K

R830
10K
1/2W

C830
4.7
50V

T801 (1) < +B >

AC IN	VALUE
100 V	121 V
120 V	148 V
220 V	270 V
240 V	312 V

230.0Vp-p
0V

N902

SW801
ESB91234A

FB01
XBA2C40TB15L
FS801 FS802

L801
ELF18D656Y

L808
TLPF066

C802
0.33
250V

J803

D821
RBV606

R805
220K
1/2W

FG1

R801
390K
1/2W

C804
4700P

C806
0.1
250V

R802
ERTB6SFL100P

C821
390
400V

R808
33K
3W

C819
0.15
250V

C822
0.15
250V

FB02
XBA2C40TB15L
FS803 FS804

C807
0.22
250V

C801

C803
4700P

L802
ELF18D656Y

R804
220K
1/2W

R806
22K
2W

C823
100P
1KV

D822
RG2A2

N801
TJS9A867A

J800

J801

AC100-240V
50/60Hz

FS801 - FS804: TJC85502T

L806
TSK8031

R824
680

Q825
2SB1220RS

R822
1.8K

R817
0.18
2W

R812
220K
1/2W

R811
220K
1/2W

R826
430K
1/2W

R819
47K
1/2W

D824
MA8056M

R827
22K
2W

125.0V

25.0V

R800
1K

D812
MA111

R825
820

C827
680P

L807
TSK8031

R834
0.15
2W

C833
4700P

R823
1K

Q820
2SC4620

D811
MA111

R866
100K

R848

R839
2.2K

C811
2200P

C812
0.022

C824
10
50V

D823
EG01

D820
MA8180H

C820
220
35V

Q824
2SD1820AGR

R815
680

R813
1.5K

R814
150

C828
47
50V

C829
4.7
50V

C818
0.22

R818
27K

C832
3300P

D810
MA8240M

R807
5.6K
1/8W

R809
220
1/4W

C813
0.1

R828
3.9K

D809
MA111

C826
0.022

IC820
STR-S6531

R840
470

Q826
2SB1320AR

25.0V

R829
10K

R832
10K

C835
0.1

PC821
PC123FYB

C825
3.3
50V

R816

R838

PC820
TLP750

6.1Vp-p
0V

C834
47P

Q820 (C)

AC IN	VALUE
100 V	125 V
120 V	142 V
220 V	250 V
240 V	298 V

TNPH0089 ⚠

PRIMARY

T801
ETS42AF145AD

121.0V

L861
EXCELDR35
D861
FMC-26UA
R861
0.33
1/2W
+210V
C861
330
250V
R836
150K
1/2W
R837
150K
1/2W
L867
DEGAUSS ④
+ 210V ⑦⑧⑨
+ 70V ②⑨

R867
12K
2W
Q832
2SB940P
R841
47K
Q833
2SD1821S
D831
ERA1502
R842
22K
1W
R820
1.5K
R821
2.2K
R843
22K
1/8W
Q834
UN5211AI
IC899
AN78L08

D862
ERC3806
L862
EXCELDR35
R862
0.47
1/2W
+70V
C862
330
100V

R895
1.5K
1/2W
R810
100K
C897
1
16V
D898
MA142WK
C873
+ 11.3V ①

D863
RG2
L863
EXCELDR35
R863
0.47
1/2W
+28V
C863
1000
35V

R858
10K
Q847
2SB1417PQ
R859
3.9K
1/2W
D832
MA167
+28V ⑥⑦⑨

D864
FML-G12S
L864
EXCELDR35
R864
0.12
1/2W
+16V
C864
1800
25V

R856
10K
Q843
2SB941PQ
R857
1.2K
1/2W
IC835
M5F7812L
+16V ⑥

D865
ERC91-02
L865
EXCELDR35
R865
0.12
1/2W
+7.5V
C865
1800
16V

Q844
2SD1949
R845
330
R846
22K
R844
2.2K
C874
Q848
2SD1949
+12V ②④⑥⑦⑧⑨
C869
330
16V

+7.5V ⑨
HEATER ②

4.9V
6.3V
2.6V
IC837
SI-3025F
R852
3.74K
±1%
R850
4.53K
±1%
R851
10K
R849
6.04K
±1%
R854
0.68
1/4W
R847
1K
Q840
2SD1949
0.6V
0.0V
SUSPEND ④
Q841
UN5211AI
R855
2.2K
1/2W
R853
1K
Q842
UN5211AI
POWER_OFF ④

D868
RN3Z014-305
L868
EXCELDR35
R868
0.47
1/2W
-16V
C868
2200
25V

C832
3300P
C831
3300P

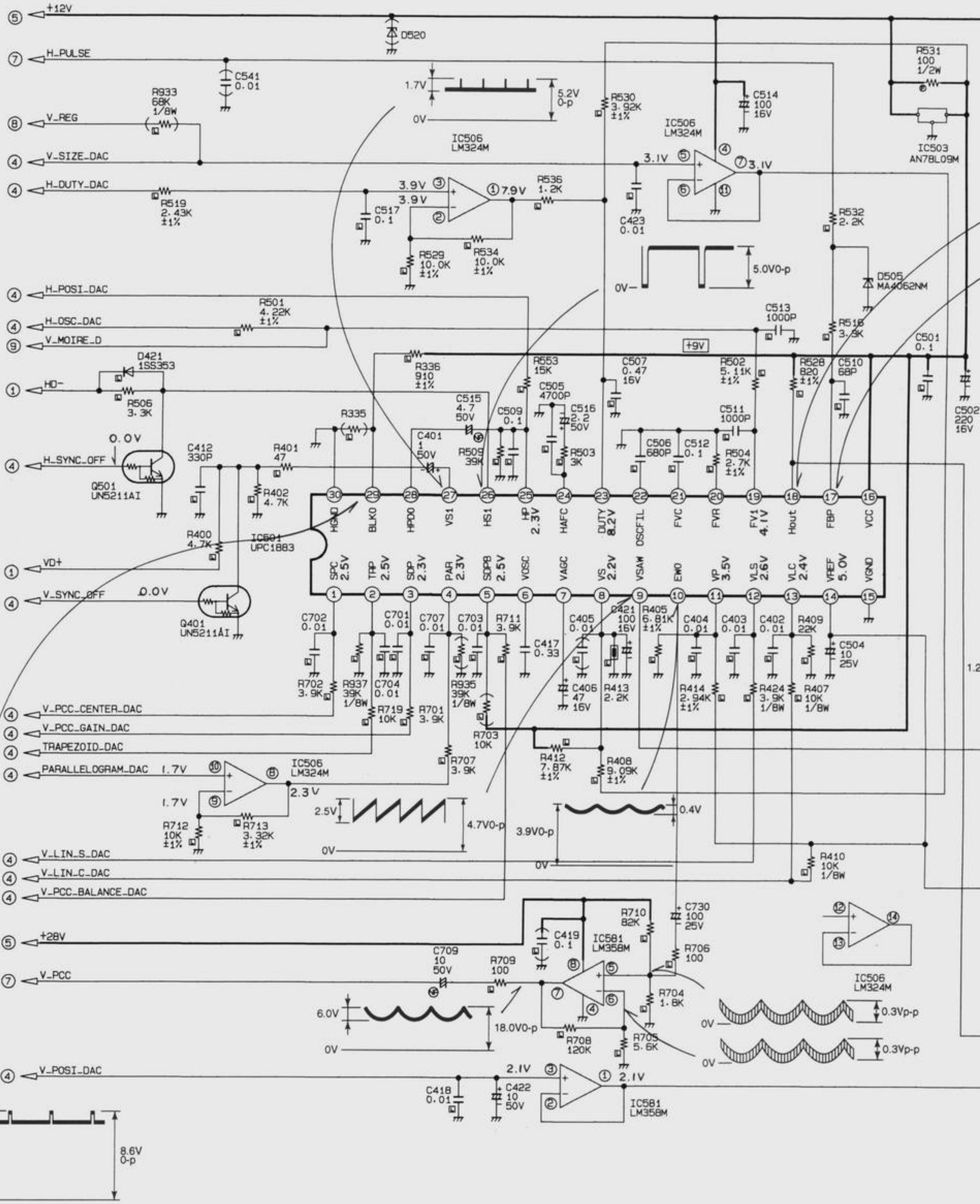
TP4
R894
18K
1/2W
+70V
R891
47K
1/2W
C879
0.022
100V
R896
100
+B.ADJ
VR881
1KB
R892
4.87K
±1%

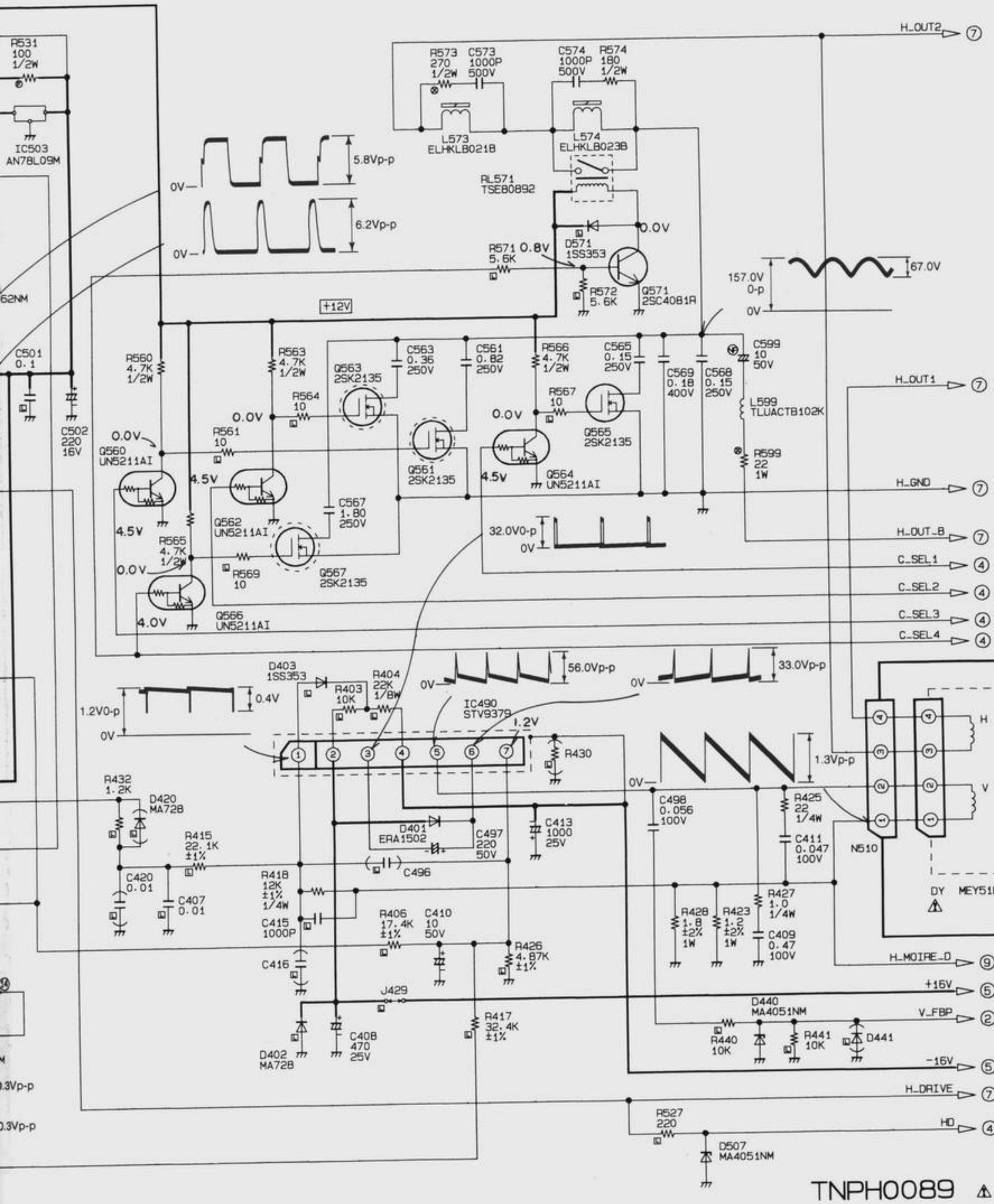
PC821
PC123FY8
55.0V
R893
68K
C851
0.22
100V
Q831
2SD1821S
7.2V
C855
0.022
PC820
TLP750
C834
47P
D858
MA4068NL
C865
1
16V
R869
6.8K
1/4W
R897
1.2K
1/2W
5.6Vp-p
0V

+ 5V ①②④⑦⑨
IC833
L78MR05
C870
330
6.3V
D907
MA4056NM
C872
0.1
C871
0.01
RESET ④⑧
R835
2.7
1/2W
-16V ②⑤
H_PULSE ⑦

PRIMARY
SECONDARY

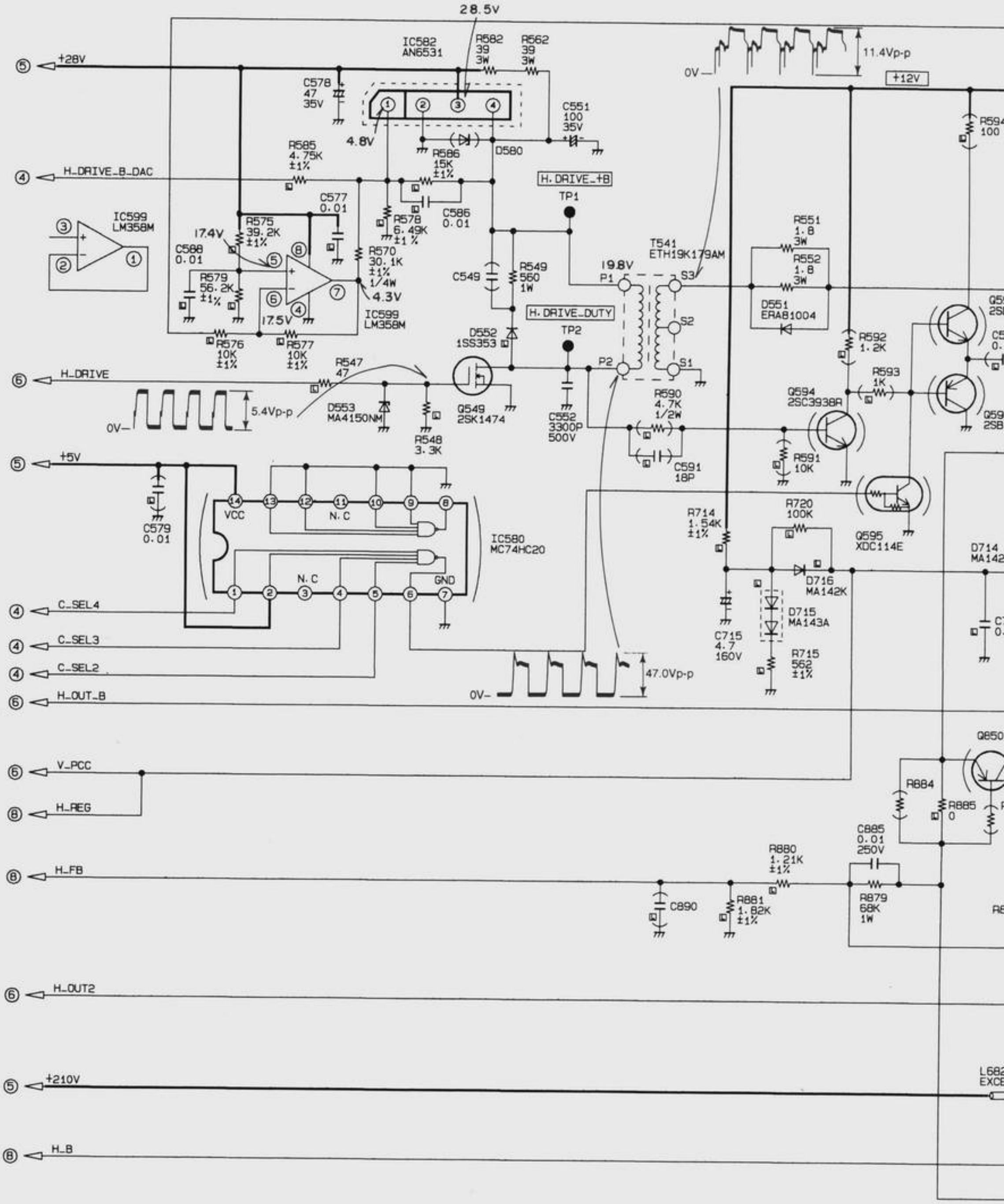
SIGNAL : MODE 1 (fH 93.8 kHz)




R531 100 1/2W
IC503 AN78L09M
62NM
C501 0.1
C502 220 16V
R573 270 1/2W
C573 1000P 500V
L573 ELHKLB0218
C574 1000P 500V
R574 180 1/2W
L574 ELHKLB023B
RL571 TSE80892
D571 1SS353
R571 5.6K
0.8V
R572 5.6K
Q571 2SC4081R
0.0V
5.8Vp-p
6.2Vp-p
0V
+12V
H_OUT2 ⑦
157.0V 0-p
67.0V
R560 4.7K 1/2W
R563 4.7K 1/2W
Q563 2SK2135
C563 0.36 250V
C561 0.82 250V
R566 4.7K 1/2W
C565 0.15 250V
C569 0.18 400V
C568 0.15 250V
C599 10 50V
L599 TLUACTB102K
R599 22 1W
R564 10
R567 10
Q565 2SK2135
Q561 2SK2135
Q564 UN5211AI
R561 10
Q560 UN5211AI
Q562 UN5211AI
C567 1.80 250V
R565 4.7K 1/2W
R569 10
Q567 2SK2135
Q566 UN5211AI
4.5V
4.0V
32.0V0-p
H_OUT1 ⑦
H_GND ⑦
H_OUT_B ⑦
C_SEL1 ④
C_SEL2 ④
C_SEL3 ④
C_SEL4 ④
D403 1SS353
R403 10K
R404 22K 1/8W
IC490 STV9379
1.2V0-p
0.4V
56.0Vp-p
33.0Vp-p
1.2V
R430
R432 1.2K
D420 MA728
R415 22.1K ±1%
C420 0.01
C407 0.01
R418 12K ±1% 1/4W
C415 1000P
C416
D401 ERA1502
C497 220 50V
C496
C413 1000 25V
R406 17.4K ±1%
C410 10 50V
R426 4.87K ±1%
J429
R417 32.4K ±1%
D402 MA728
C408 470 25V
C498 0.056 100V
R425 22 1/4W
C411 0.047 100V
N510
DY MEY51LHB
H
V
1.3Vp-p
R428 1.8 ±2% 1W
R423 1.2 ±2% 1W
R427 1.0 1/4W
C409 0.47 100V
H_MOIRE_D ⑨
+15V ⑤
D440 MA4051NM
R440 10K
R441 10K
D441
V_FBP ② ④
-15V ⑤
H_DRIVE ⑦ ⑧
R527 220
D507 MA4051NM
H0 ④ ⑧

TNPH0089 ⚠

SIGNAL : MODE 1 (fH 93.8 kHz)



SHEET ⑦

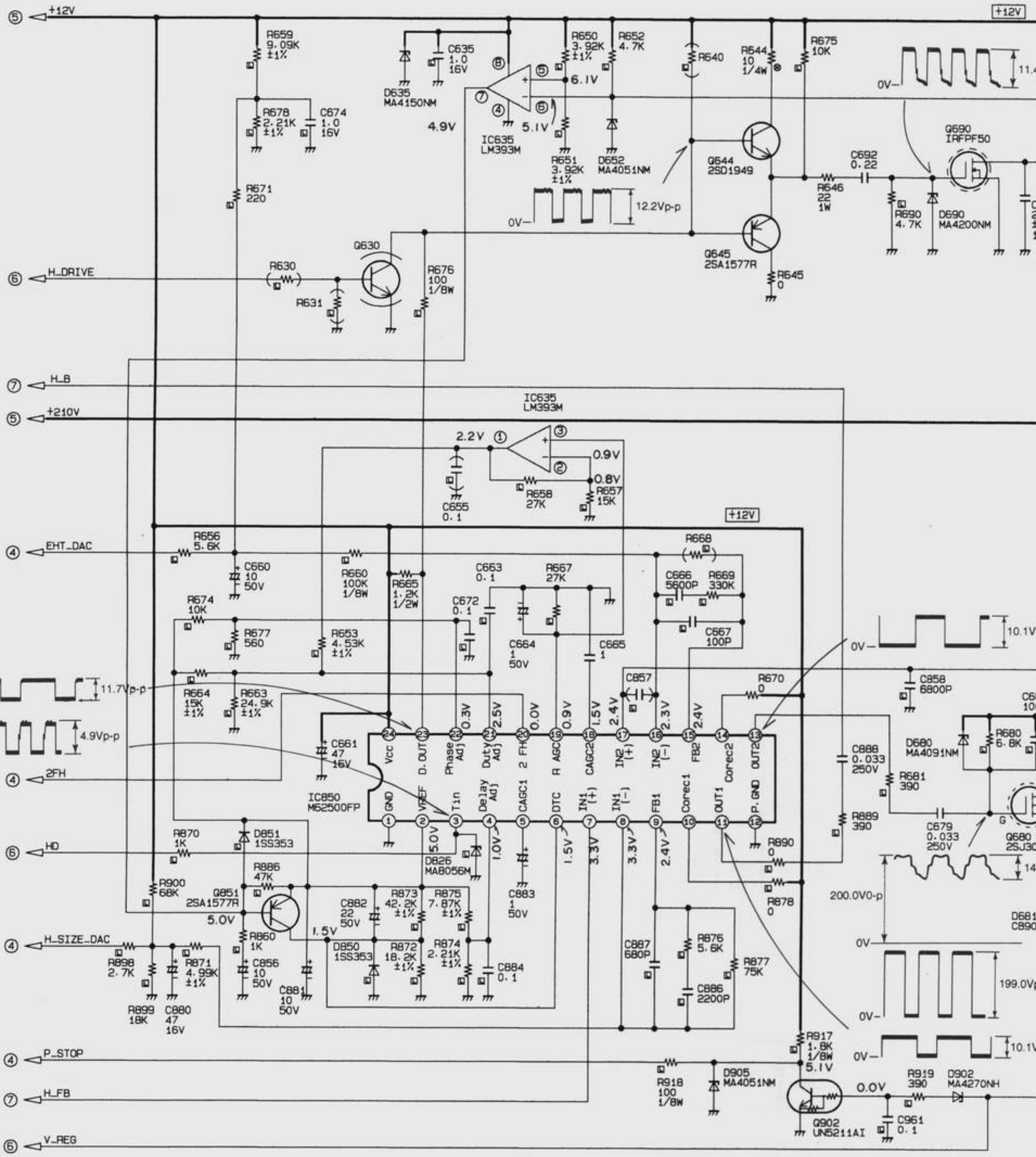
R559 100K
C592 1 50V
D584 MA162A
D585 MA162A
C593 1 50V
+12V ⑤
H_PULSE ②⑤⑥⑨
R594 100
C597 100 16V
R833 0.47 1/2W
C876 0.01
S3 S4 P4 P1
T542 ETS29AC1Z9AC
32.2Vp-p
0V
1070.0Vp-p
H_OUT1 ⑥
6.0V
130.0V 0-p
0V
Q597 2SD1820AQR
Q598 2SK1468
C598 1000 10V
R598 0.33 2W
C595 0.1
R595 10
D598 MA4120M
R596 10K
R597 100
Q596 2SB1219AQR
Q550 2SC5243
C554A
C554 2200P ±3% 1.5KV
C553 2200P ±3% 1.5KV
R554 6.8 3W
D550 FMQ_G5GS
L550 EXCELSR35
L551 EXCELSR35
H_GND ⑥
TP3 H. OUT_+B 121.0V
C555 3.3 250V
R718 3.3K 1/4W
C718 0.01
Q719 2SD1641
D719 EM01Z
Q717 2SC1473QR
D714 MA142K
C719 0.01 250V
C720 0.01 250V
R717 3.3K 1/2W
C712 0.01
D717 MA28T-A
0.6Vp-p
11.6Vp-p
5.0V
92.0V 0-p
R581 10 1/2W
Q850
R885 0
R882
R883
R583 100 1/4W
Q584 2SD2133S
C582 1000 25V
R587 3.3K 1/4W
C580 47 16V
VR580 1KB
H. CENT
C583 1 16V
C584 1 16V
R584 100 1/4W
Q585 2SB1413S
R588 15 5W
R589 15 5W
C581 0.22 250V
L575 TLH85815
L580 TLUACT82R2M
D581 ERC30-02
D582 ERC30-02
9.5V
R580 0.12 1/2W
F_GND
F_10
11 10 9
L850 TLP85709R
3.9-7.3V
2 121.5V 6
C889 68 200V
L680 EXCELDR35
D856 C8903_4
L682 EXCELSA35T
C859 1.0 250V
D855 MA4091NM
R888 10K
Q855 2SJ306
S D G
5.0V
200.0V 0-p
0V
200Vp-p

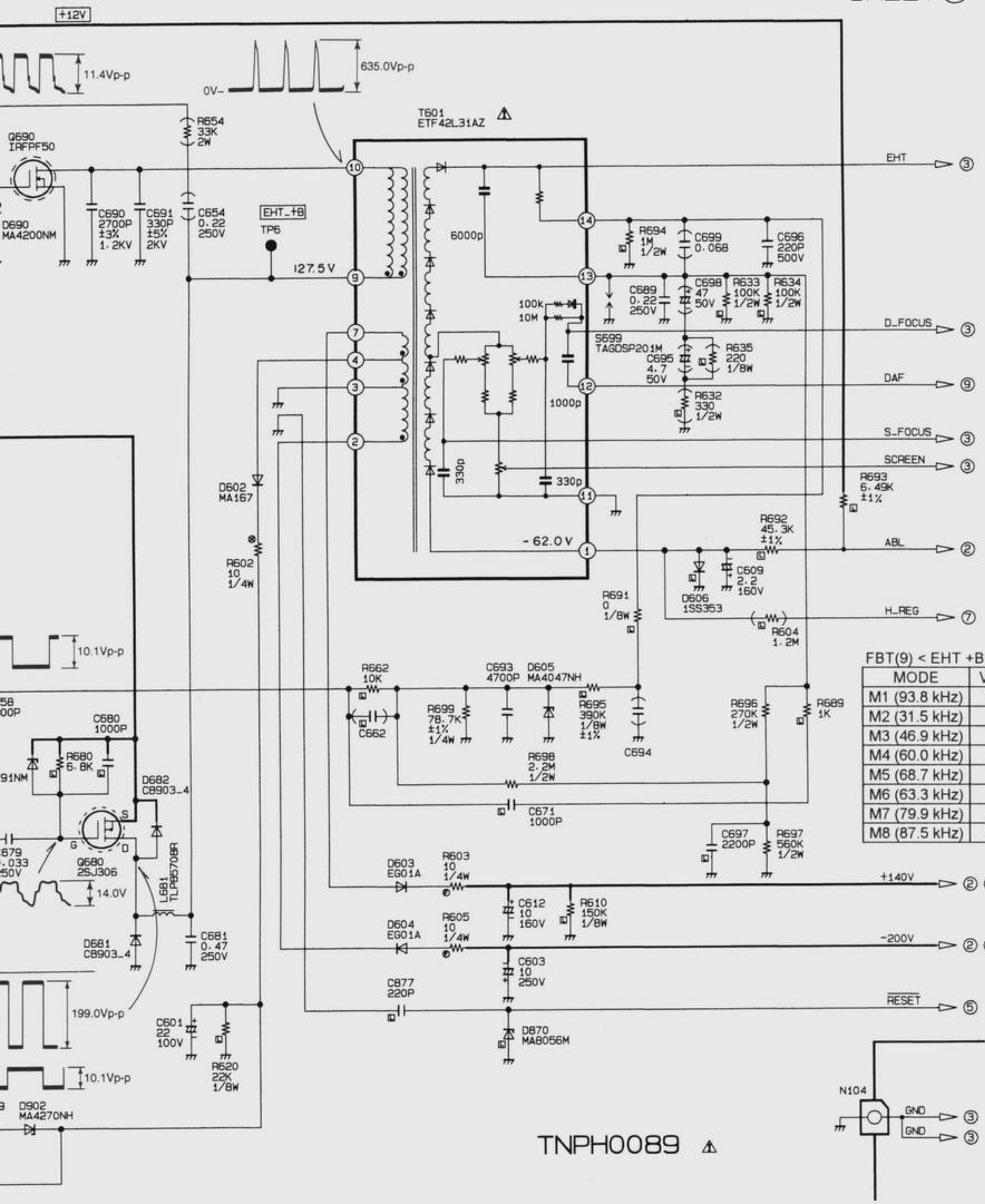
T541(P1) < H DRIVE +B >

MODE	VALUE
M1 (93.8 kHz)	19.8 V
M2 (31.5 kHz)	23.7 V
M3 (46.9 kHz)	23.0 V
M4 (60.0 kHz)	22.3 V
M5 (68.7 kHz)	22.1 V
M6 (63.3 kHz)	22.2 V
M7 (79.9 kHz)	20.8 V
M8 (87.5 kHz)	20.5 V

TNPH0089 ⚠

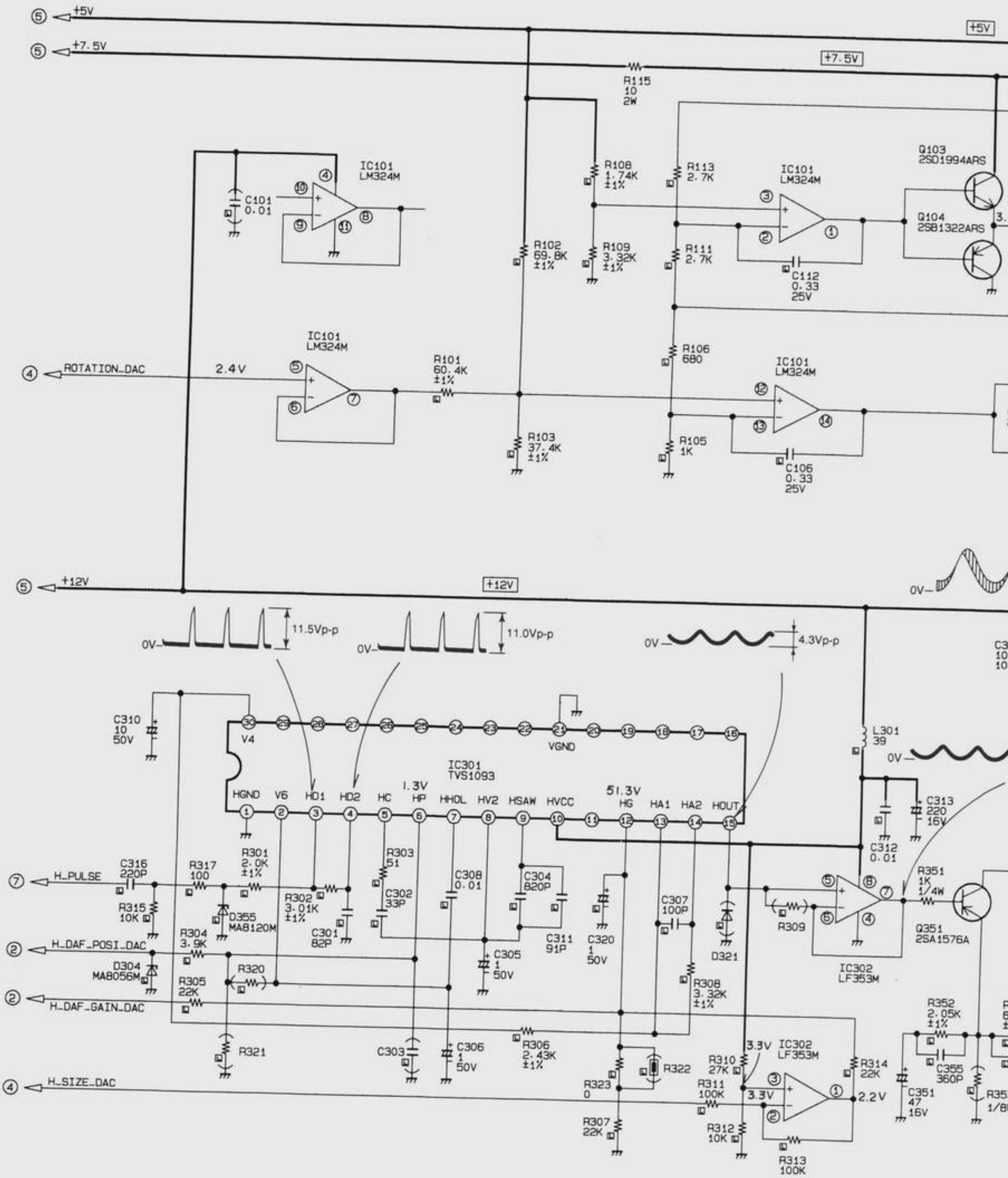
SIGNAL : MODE 1 (fH 93.8 kHz)




+12V
11.4Vp-p
0V
635.0Vp-p
T601
ETF42L31AZ
Q690
IRFPF50
R654
33K
2W
D690
MA4200NM
C690
2700P
±3%
1.2KV
C691
330P
±5%
2KV
C654
0.22
250V
EHT_+B
TP6
127.5V
EHT
③
6000p
R694
1M
1/2W
C699
0.068
C696
220P
500V
C689
0.22
250V
C698
47
50V
R633
100K
1/2W
R634
100K
1/2W
100k
10M
S599
TAGDSP201M
C695
4.7
50V
R635
220
1/8W
D_FOCUS
DAF
R632
330
1/2W
1000p
S_FOCUS
SCREEN
330p
330p
R693
6.49K
±1%
D602
MA167
R692
45.3K
±1%
ABL
②
- 62.0V
R602
10
1/4W
C609
2.2
160V
D606
1SS353
R691
0
1/8W
H_REG
⑦
R604
1.2M
10.1Vp-p
R662
10K
C693
4700P
D605
MA4047NH
R695
390K
1/8W
±1%
R699
78.7K
±1%
1/4W
C662
C694
R698
2.2M
1/2W
C671
1000P
R696
270K
1/2W
R689
1K
C697
2200P
R697
560K
1/2W
FBT(9) < EHT +B >
MODE | VALUE
M1 (93.8 kHz) | 127.5 V
M2 (31.5 kHz) | 74.3 V
M3 (46.9 kHz) | 53.5 V
M4 (60.0 kHz) | 70.8 V
M5 (68.7 kHz) | 83.4 V
M6 (63.3 kHz) | 75.4 V
M7 (79.9 kHz) | 101.3 V
M8 (87.5 kHz) | 115.6 V
C680
1000P
R680
6.8K
D682
C8903_4
S
G
D
Q680
2SJ306
14.0V
L681
TLP8570BR
D681
C8903_4
C681
0.47
250V
D603
EG01A
R603
10
1/4W
+140V
② ⑩
C612
10
160V
R610
150K
1/8W
D604
EG01A
R605
10
1/4W
-200V
② ⑨
C603
10
250V
C877
220P
RESET
⑤
D870
MA8056M
199.0Vp-p
C601
22
100V
R620
22K
1/8W
10.1Vp-p
D902
MA4270NH
N104
GND
③
GND
③

TNPH0089 ⚠

SIGNAL : MODE 1 (fH 93.8 kHz)



SHEET ⑨

+5V

R114
2.7
1/8W

C100

Q103
2SD1994ARS

3.2V

Q104
2SB1322ARS

C108
4.7
50V

Q101
2SD1994ARS

Q102
2SB1322ARS

3.2V

C107
4.7
50V

264.0Vp-p

0V

52.5Vp-p

0V

905.0Vp-p

0V

N101

ROTATION COIL
TSPF004_1

IC462
BX8318A

+28V ⑤

R455
3.3K
1/8W

D448

R454
2.2K

R420
8.66K
±1%

V_MOIRE_G_DAC ④

R421
845
±1%

H_MOIRE_G_DAC ④

R456
2.2K

VD+ ①

HD- ①

R457
2.2K

Q451
UN5211AI

H_MOIRE_OFF ④

R458
12K

V_MOIRE_D ⑥

R459
68.1K
±1%

H_MOIRE_D ⑥

+70V ⑤

+210V ⑤

R372
360K
1/2W

R350
33
1/4W

C352
10
100V

R356
3.3K
3W

Q353
2SD1264P

R358
10
1/4W

C353
0.47
100V

T351
TLHG010

4.3Vp-p

D351
1SS353

R359
10
1/4W

C313
220
16V

Q352
HBF422

Q354
2SB940P

R351
1K
1/4W

Q351
2SA1576A

R354
2.87K
±1%

R357
47
1/8W

-114.0V
0-p

0V

C375

-1.0V

R373
4.7M
1/8W

TP5 DAF

S372
TAGDSP751N

S371
TAGDSP751N

C372
470P
500V

D356
MA199

R371
3K
1/8W

C371
10
250V

-115.0V

Q371
2SC4620

R375
1.10K
±1%
1/8W

R374
68K
1/8W

R379
1K
1/8W

Q379
2SC4081R

C378

R378
868
±1%

R376
5.6K

R377
10K

EWPCC ④

-200V ⑧

R390
47K
1W

D352
MA4390NM

D353
MA4390NM

D354
MA4390NM

C357
0.1
250V

12.0V0-p

2.0V

0V

DAF ⑧

1.6Vp-p

0V

1.5Vp-p

0V

R352
2.05K
±1%

R355
69.8K
±1%

C355
360P

C356
8P

C351
47
16V

R353
1/8W

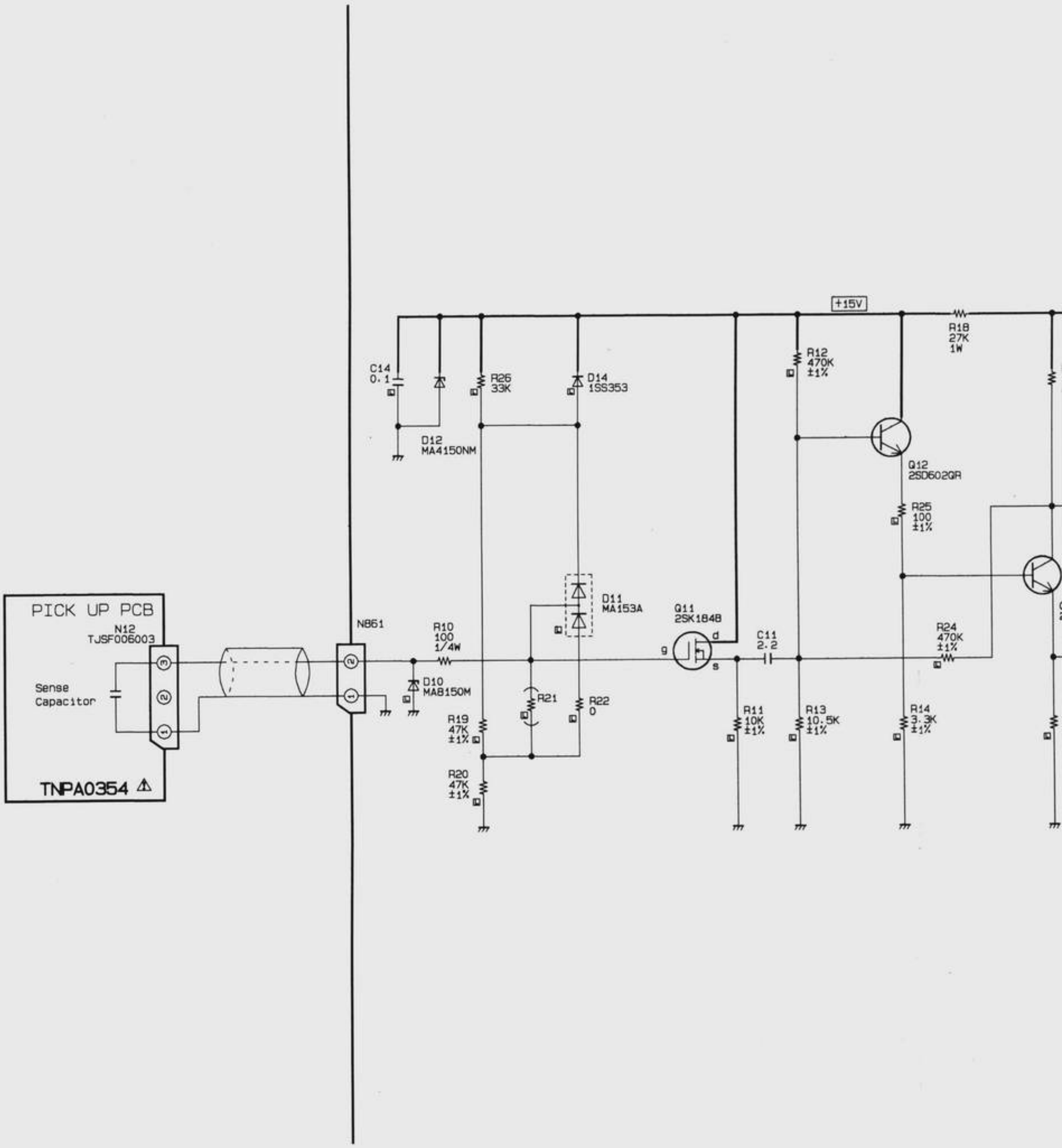
54.5Vp-p

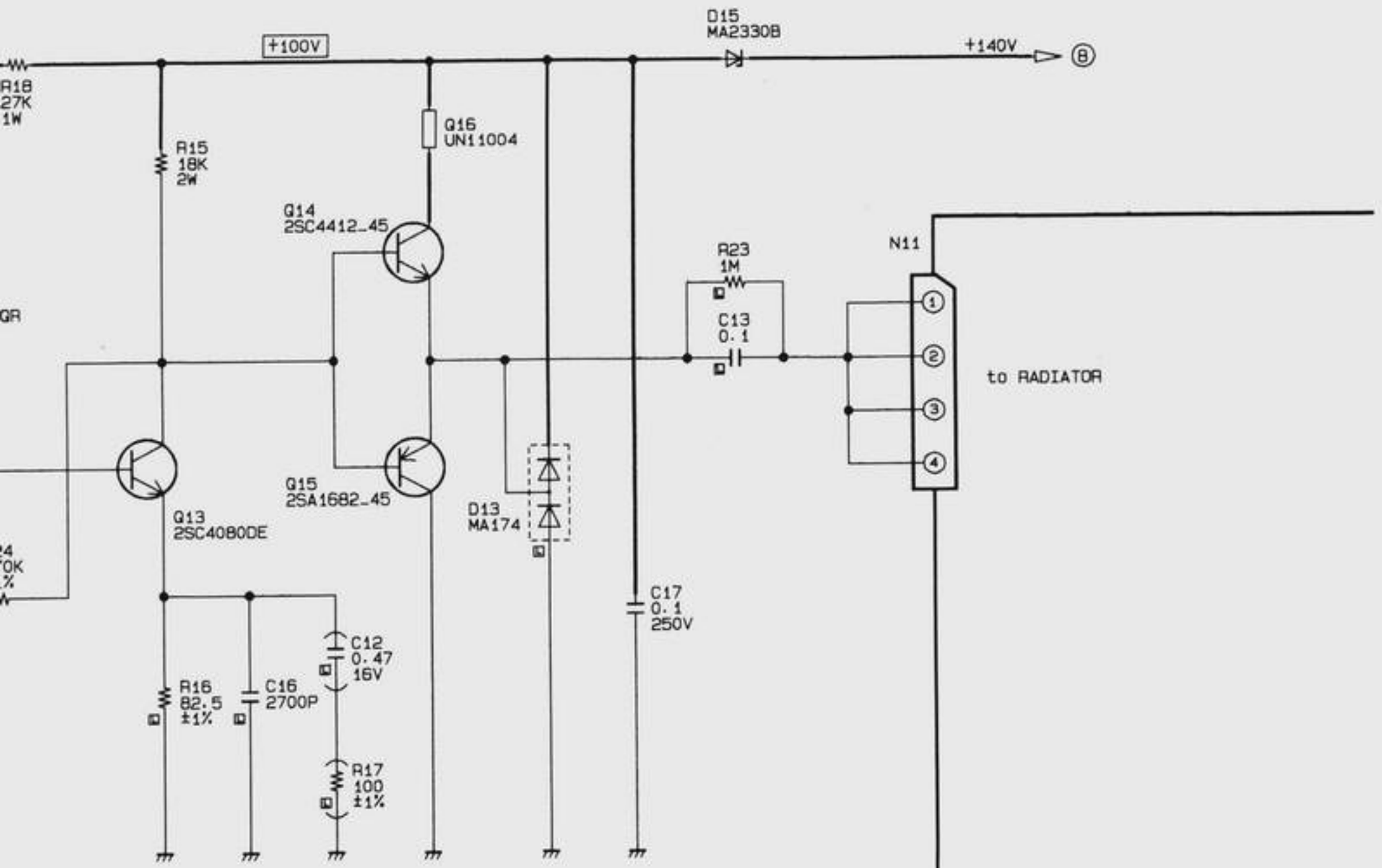
0V

0.9Vp-p

0V

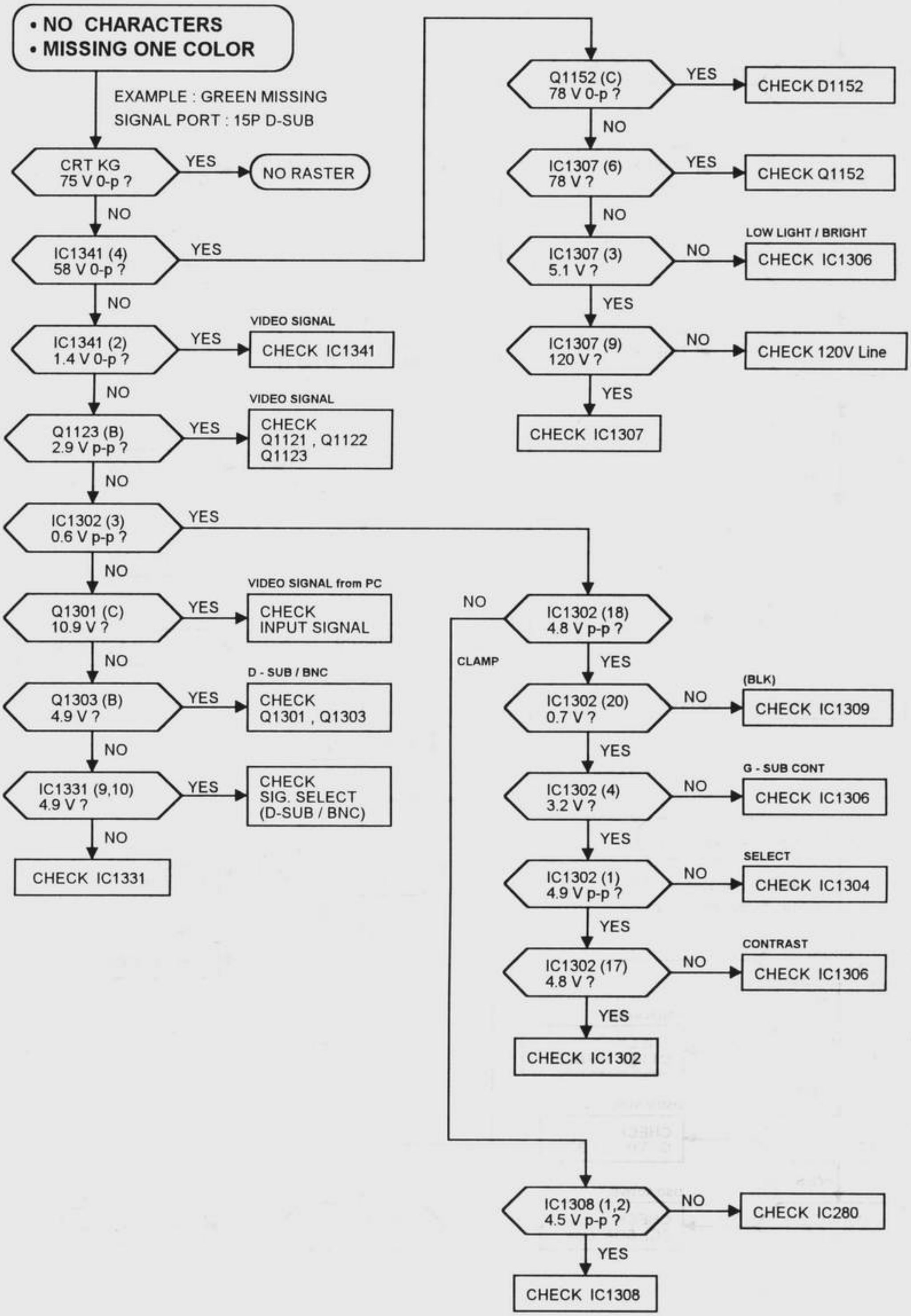
TNPH0089

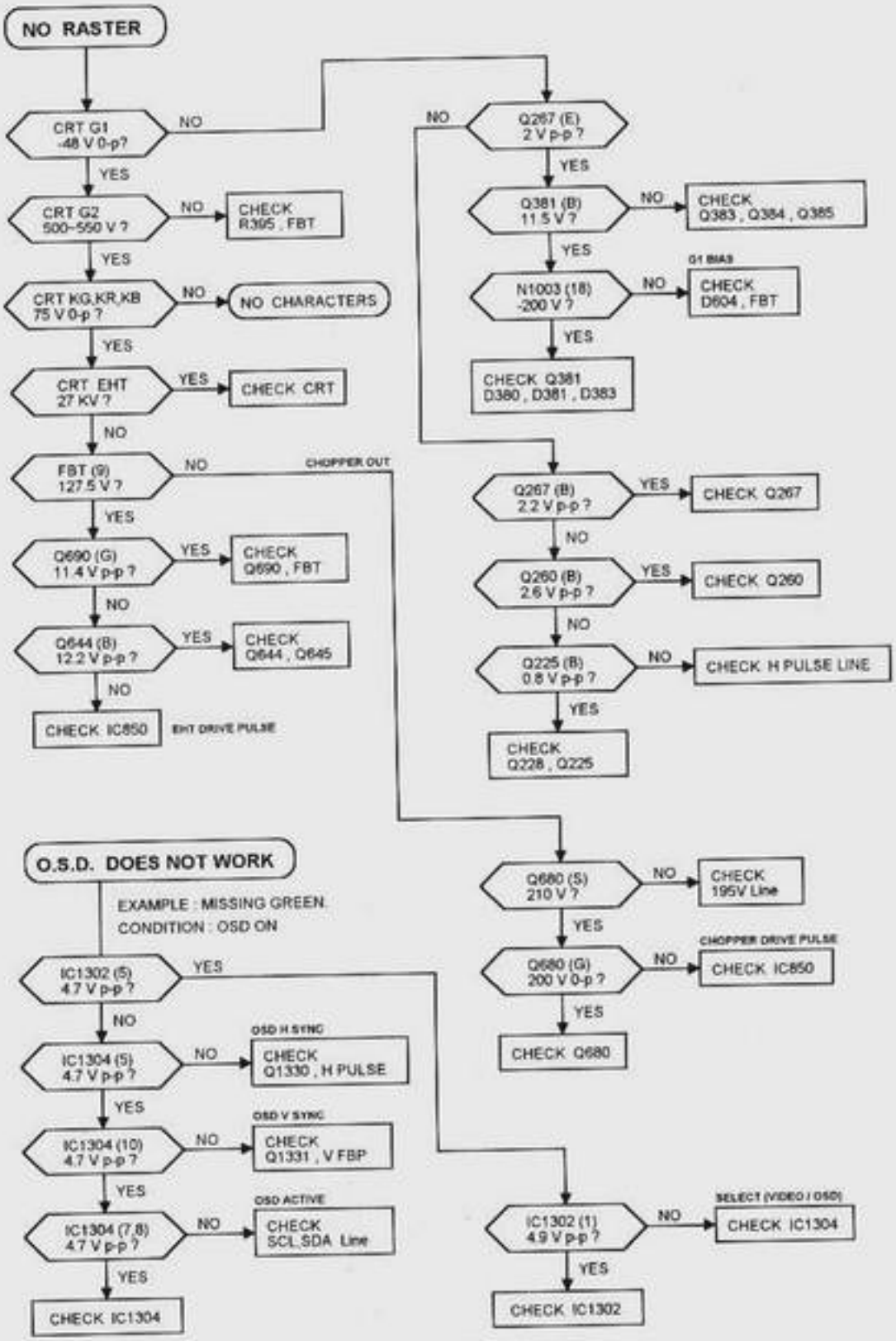

PICK UP PCB
N12
TJSF006003
Sense
Capacitor
TNPA0354
N861
C14
0.1
D12
MA4150NM
R26
33K
D14
1SS353
D11
MA153A
R10
100
1/4W
D10
MA8150M
R19
47K
±1%
R20
47K
±1%
R21
R22
0
+15V
R12
470K
±1%
R18
27K
1W
Q12
2SD602QR
R25
100
±1%
Q11
2SK1848
g
d
s
C11
2.2
R11
10K
±1%
R13
10.5K
±1%
R14
3.3K
±1%
R24
470K
±1%

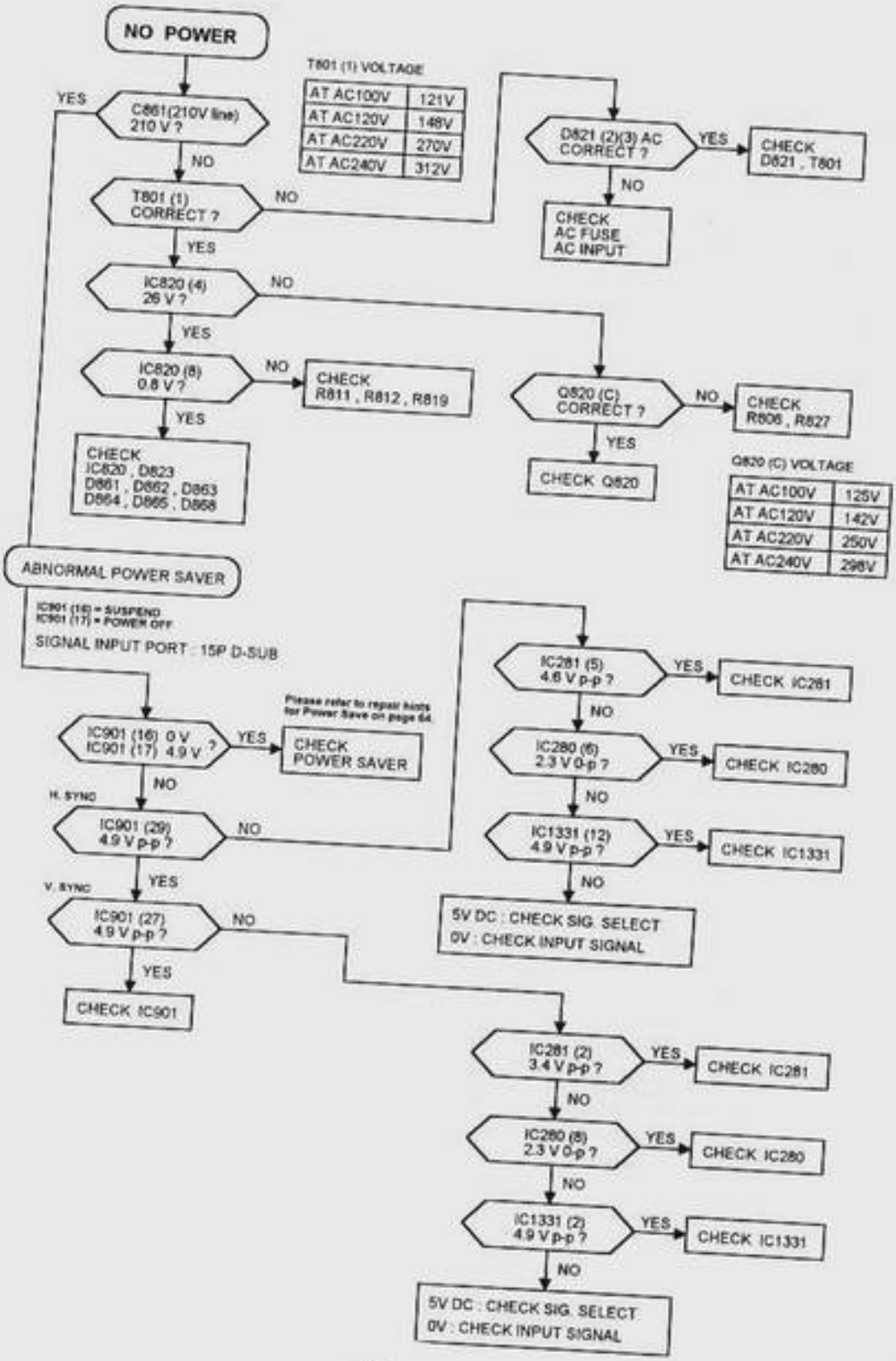

+100V
D15
MA2330B
+140V
⑧
R18
27K
1W
R15
18K
2W
Q16
UN11004
Q14
2SC4412_45
R23
1M
C13
0.1
N11
to RADIATOR
Q13
2SC4080DE
Q15
2SA1682_45
D13
MA174
C17
0.1
250V
C12
0.47
16V
R16
82.5
±1%
C16
2700P
R17
100
±1%

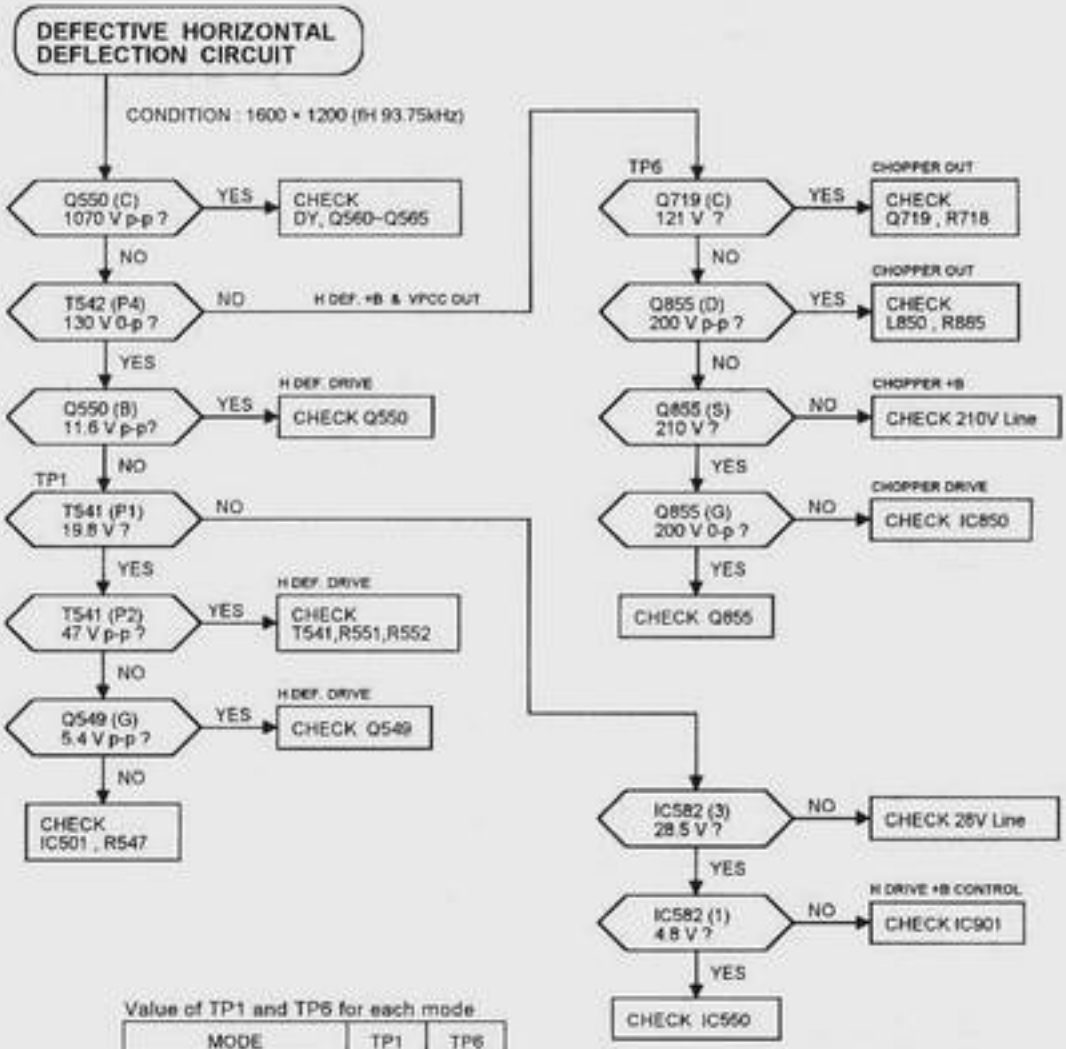
TNPH0089 ⚠

TROUBLE SHOOTING HINTS




NO RASTER
CRT G1 -48 V 0-p?
NO
YES
CRT G2 500~550 V ?
NO
CHECK R395 , FBT
YES
CRT KG,KR,KB 75 V 0-p ?
NO
NO CHARACTERS
YES
CRT EHT 27 KV ?
YES
CHECK CRT
NO
FBT (9) 127.5 V ?
NO
CHOPPER OUT
YES
Q690 (G) 11.4 V p-p ?
YES
CHECK Q690 , FBT
NO
Q644 (B) 12.2 V p-p ?
YES
CHECK Q644 , Q645
NO
CHECK IC850
EHT DRIVE PULSE
NO
Q267 (E) 2 V p-p ?
YES
Q381 (B) 11.5 V ?
NO
CHECK Q383 , Q384 , Q385
YES
N1003 (18) -200 V ?
NO
G1 BIAS
CHECK D604 , FBT
YES
CHECK Q381 D380 , D381 , D383
Q267 (B) 2.2 V p-p ?
YES
CHECK Q267
NO
Q260 (B) 2.6 V p-p ?
YES
CHECK Q260
NO
Q225 (B) 0.8 V p-p ?
NO
CHECK H PULSE LINE
YES
CHECK Q228 , Q225
O.S.D. DOES NOT WORK
EXAMPLE : MISSING GREEN
CONDITION : OSD ON
IC1302 (5) 4.7 V p-p ?
YES
NO
IC1304 (5) 4.7 V p-p ?
NO
OSD H SYNC
CHECK Q1330 , H PULSE
YES
IC1304 (10) 4.7 V p-p ?
NO
OSD V SYNC
CHECK Q1331 , V FBP
YES
IC1304 (7,8) 4.7 V p-p ?
NO
OSD ACTIVE
CHECK SCL,SDA Line
YES
CHECK IC1304
Q680 (S) 210 V ?
NO
CHECK 195V Line
YES
Q680 (G) 200 V 0-p ?
NO
CHOPPER DRIVE PULSE
CHECK IC850
YES
CHECK Q680
IC1302 (1) 4.9 V p-p ?
NO
SELECT (VIDEO / OSD)
CHECK IC1304
YES
CHECK IC1302


NO POWER
YES
C861(210V line) 210 V ?
NO
T801 (1) CORRECT ?
NO
YES
IC820 (4) 26 V ?
NO
YES
IC820 (8) 0.8 V ?
NO
CHECK R811 , R812 , R819
YES
CHECK IC820 , D823 D861 , D862 , D863 D864 , D865 , D868
T801 (1) VOLTAGE
AT AC100V 121V
AT AC120V 148V
AT AC220V 270V
AT AC240V 312V
D821 (2)(3) AC CORRECT ?
YES
CHECK D821 , T801
NO
CHECK AC FUSE AC INPUT
Q820 (C) CORRECT ?
NO
CHECK R806 , R827
YES
CHECK Q820
Q820 (C) VOLTAGE
AT AC100V 125V
AT AC120V 142V
AT AC220V 250V
AT AC240V 296V
ABNORMAL POWER SAVER
IC901 (16) = SUSPEND
IC901 (17) = POWER OFF
SIGNAL INPUT PORT : 15P D-SUB
IC901 (16) 0 V IC901 (17) 4.9 V ?
YES
CHECK POWER SAVER
Please refer to repair hints for Power Save on page 64.
NO
H. SYNC
IC901 (29) 4.9 V p-p ?
NO
YES
V. SYNC
IC901 (27) 4.9 V p-p ?
NO
YES
CHECK IC901
IC281 (5) 4.6 V p-p ?
YES
CHECK IC281
NO
IC280 (6) 2.3 V p-p ?
YES
CHECK IC280
NO
IC1331 (12) 4.9 V p-p ?
YES
CHECK IC1331
NO
5V DC : CHECK SIG. SELECT
0V : CHECK INPUT SIGNAL
IC281 (2) 3.4 V p-p ?
YES
CHECK IC281
NO
IC280 (8) 2.3 V p-p ?
YES
CHECK IC280
NO
IC1331 (2) 4.9 V p-p ?
YES
CHECK IC1331
NO
5V DC : CHECK SIG. SELECT
0V : CHECK INPUT SIGNAL



Value of TP1 and TP6 for each mode

MODE	TP1	TP6
MODE - 1 (f H 93.8kHz)	19.8 V	127.5 V
MODE - 2 (f H 31.5kHz)	23.7 V	74.3 V
MODE - 3 (f H 46.9kHz)	23.0 V	53.5 V
MODE - 4 (f H 60.0kHz)	22.3 V	70.8 V
MODE - 5 (f H 68.7kHz)	22.1 V	83.4 V
MODE - 6 (f H 63.3kHz)	22.3 V	75.4 V
MODE - 7 (f H 80.0kHz)	20.8 V	101.3 V
MODE - 8 (f H 87.5kHz)	20.5 V	115.6 V

INCORRECT H. POSITION CONTROL

CONDITION : 1600 × 1200 (fH 93.75kHz)

RASTER POSITION CENTER ? — YES → IC501 (25) 2.3 V ? — YES → CHECK IC501

NO → TURN VR580 3.9 V ~ 7.3 V ? — YES → CHECK Q584 , Q585

NO → Q584(B) - L850(10) → CHECK L850 , F 10 line VR580

IC501 (25) 2.3 V ? — NO → CHECK IC901 (#8) H POSI

INCORRECT SCREEN SIZE

CONDITION : 1600 × 1200 (fH 93.75kHz)

V SIZE OK ? — YES → DEFECTIVE H. DEF. CIRCUIT

NO → H SIZE OK ? — YES → CHECK V SIZE CONTROL

NO → FBT (9) 127.5 V ? — YES → CHECK FBT

NO → IC850 (13) CORRECT ? — YES → CHECK Q680

NO → IC850 (16) 2.3 V ? — YES → CHECK IC850

NO → CHECK IC901 (#34) EHT

IC506 (7) 3.1 V ? — YES → CHECK IC501 (#3) V POSI

NO → IC506 (5) 3.1 V ? — YES → CHECK IC506

NO → CHECK IC901 (#9) V SIZE

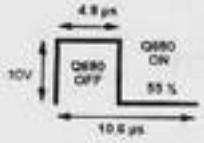
IC850 (13) Wave

IC850 (20) [2FH]	
30~40 kHz	HIGH
40~95 kHz	LOW

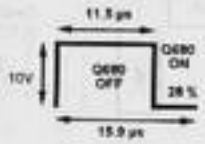
When Low level is applied to 20 pin, IC850 will supply ×2 1 H signal to Q680 and Q690.

(IC850 13 & 23 pin)

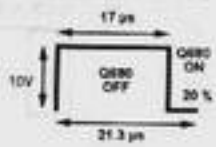
<MODE - 1 : 93.8 kHz>



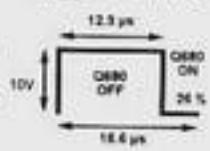
<MODE - 2 : 31.5 kHz>



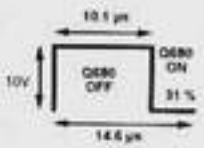
<MODE - 3 : 46.9 kHz>



<MODE - 4 : 60.0 kHz>

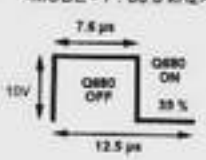


<MODE - 5 : 68.7 kHz>

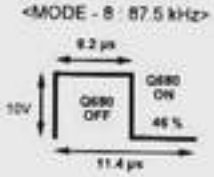


<MODE - 6 : 63.3 kHz>

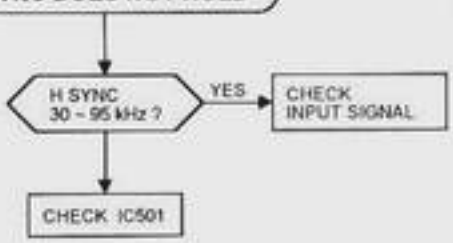
<MODE - 7 : 80.0 kHz>



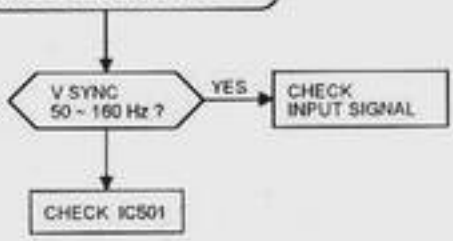
<MODE - 8 : 87.5 kHz>



H. SYNC DOES NOT HOLD

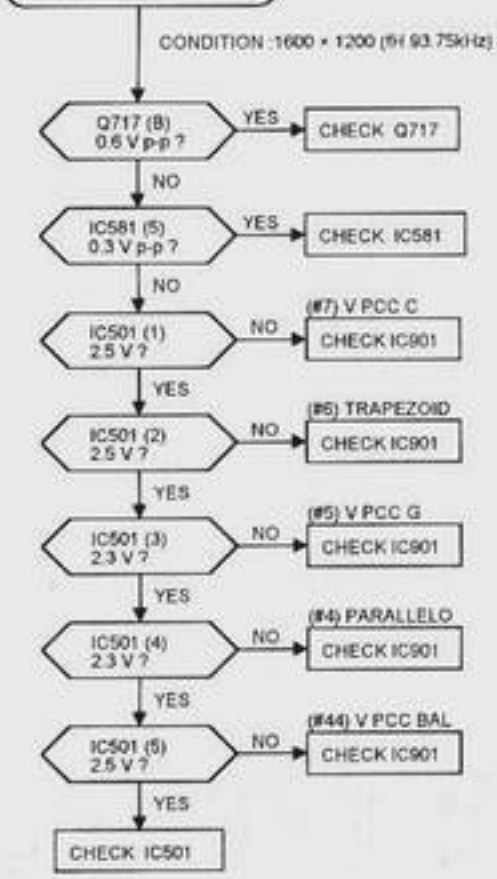


V. SYNC DOES NOT HOLD

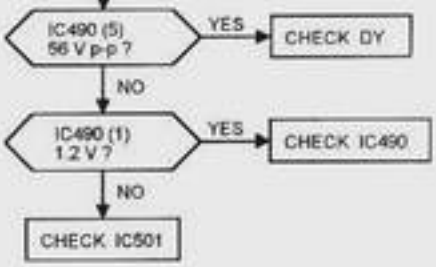


If no horizontal and/or vertical sync from PC, then the power save circuit becomes active.

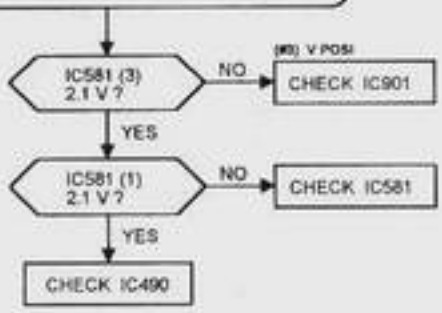
INCORRECT V.PCC



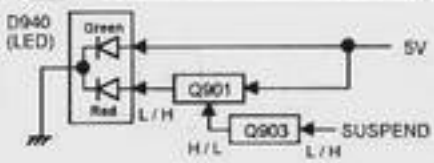
BRIGHT HORIZONTAL LINE APPEARS ON THE SCREEN



INCORRECT V. POSITION CONTROL



ABNORMAL POWER INDICATOR



HS	VS	SUSPEND	COLOR
ON	ON	LOW	GREEN
OFF	ON	HIGH	YELLOW
ON	OFF	HIGH	YELLOW
OFF	OFF	HIGH	YELLOW

REPAIR HINTS FOR POWER SAVE (HV8SA CHASSIS)