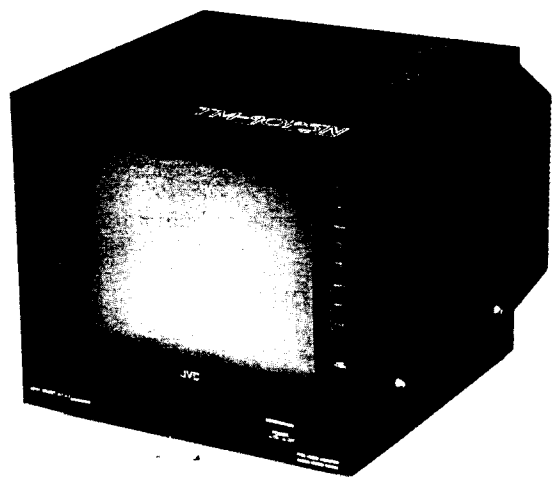
JVC

SERVICE MANUAL

MODEL

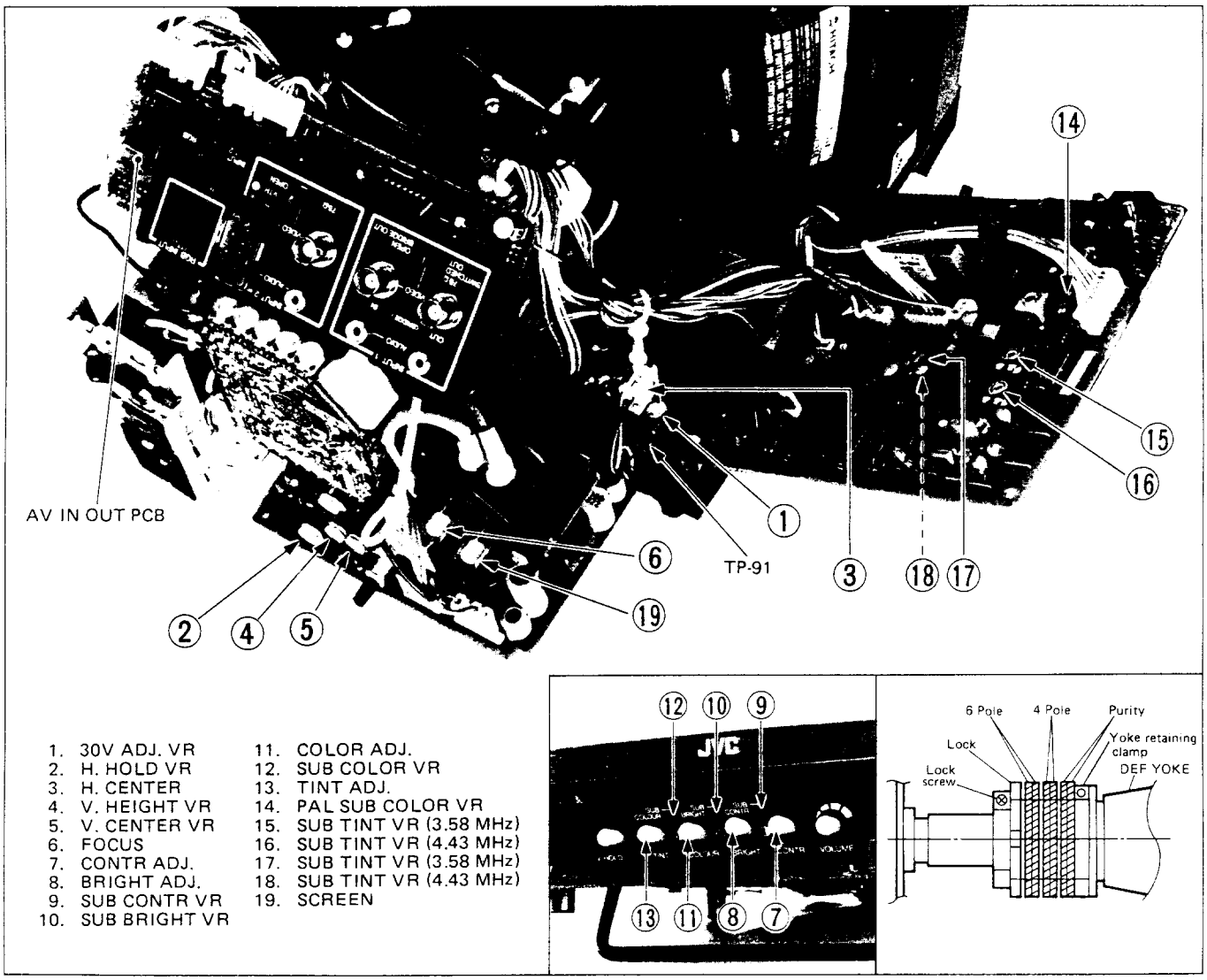
TM-90PSN

10" COLOR VIDEO MONITOR



No. 5418
Apr. 1983

2. SERVICE ADJUSTMENTS



1. 30V ADJ. VR
2. H. HOLD VR
3. H. CENTER
4. V. HEIGHT VR
5. V. CENTER VR
6. FOCUS
7. CONTR ADJ.
8. BRIGHT ADJ.
9. SUB CONTR VR
10. SUB BRIGHT VR
11. COLOR ADJ.
12. SUB COLOR VR
13. TINT ADJ.
14. PAL SUB COLOR VR
15. SUB TINT VR (3.58 MHz)
16. SUB TINT VR (4.43 MHz)
17. SUB TINT VR (3.58 MHz)
18. SUB TINT VR (4.43 MHz)
19. SCREEN

Fig. 2-1

PURITY

Loosen the yoke retaining clamp. PAINT is used to lock the tabs of the purity/convergence magnet assembly in place. The paint must be removed with the end of a screwdriver, and then unfasten the magnet locking ring counterclockwise (Fig. 2-1) before any adjustments are attempted.

1. Display a monochrome pattern.
2. Let the PURITY MAGNET TABS come in line horizontally. A long tab should be in the same direction as the other short tab. (Fig. 2-2).
3. Move the yoke slowly backward.
4. Turn the GREEN CUT-OFF VR maximum and the RED and BLUE CUT-OFF VR's to minimum. Then adjust the SCREEN VR so that the green band can be seen best. (Fig. 2-1, 2-7)
5. Rotate the PURITY MAGNET TABS in the opposite directions and with them kept at an angle, together in either direction so that the green band is centered on the picture tube. (Fig. 2-3)

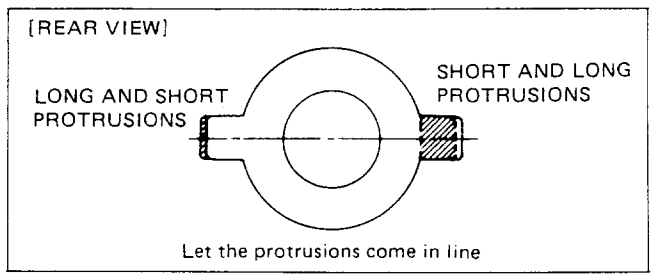


Fig. 2-2

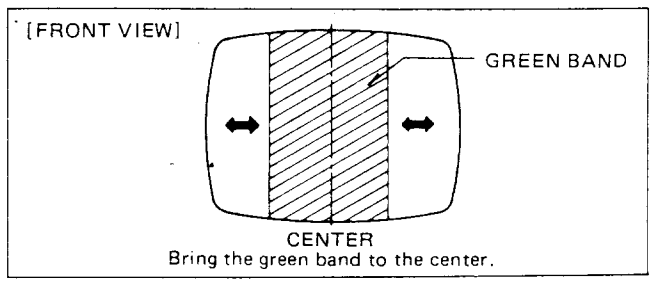


Fig. 2-3

6. Check the vertical center position by displaying a horizontal line. Unless correct, bring it to the center by rotating the two tabs, kept at an angle, together in either direction. (Fig. 2-4, 2-7)
7. Repeat steps 5 and 6 alternately until the green band and the vertical center come to the center.
8. Move the yoke slowly towards the bell of the tube so that the whole surface of the picture tube is filled with a green pure raster.
9. Turning RED or BLUE CUT-OFF VR to maximum and GREEN CUT-OFF VR to minimum, make sure of a red or blue pure raster.
10. Secure the yoke retaining clamp.

STATIC CONVERGENCE

1. Display a crosshatch pattern and adjust BRIGHTNESS and CONTRAST control for a distinct pattern.
2. Rotate the front pair of tabs (4 POLE CONVERGENCE MAGNETS) as a unit to minimize separation of the red and blue lines around the center of the screen.
   To adjust the convergence of red and blue, vary the angle between the tabs. (Fig. 2-5)
3. Rotage the rear pair of tabs (6 POLE CONVERGENCE MAGNETS) as a unit to minimize separation of the magenta (R/B) and green lines. (Fig. 2-6)
4. Adjust the spacing of the rear tabs to converge the magenta and green lines.
5. Apply paint to fix 6 magnets.
6. Fasten the magnet locking ring clockwise.

WHITE BALANCE

1. Display a monochrome pattern.
2. Set the RED and GREEN DRIVE VR's for their mechanical center (Fig. 2-7)
3. Turn the RED, GREEN and BLUE CUT-OFF VR's and the SCREEN VR fully counterclockwise. (Fig. 2-1, 2-7)
4. By referring to Fig. 2-7, set a horizontal line on the screen.
5. Turn SCREEN VR slowly clockwise until a very faint horizontal line appears.
6. First, turn clockwise by about 10° the CUT-OFF VR of the color which has appeared and then adjust the SCREEN VR again so that the color may shine faintly.
7. Turn the other color CUT-OFF VR's slowly clockwise until a reasonable white line appears.
8. By referring to Fig. 2-7, turn the horizontal line screen to normal screen status.
9. Adjust the RED and GREEN DRIVE VR's for best white highlights.

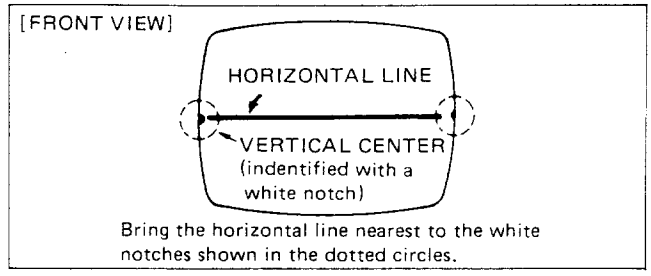


Fig. 2-4

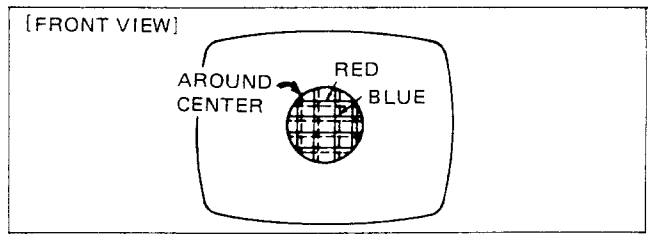


Fig. 2-5

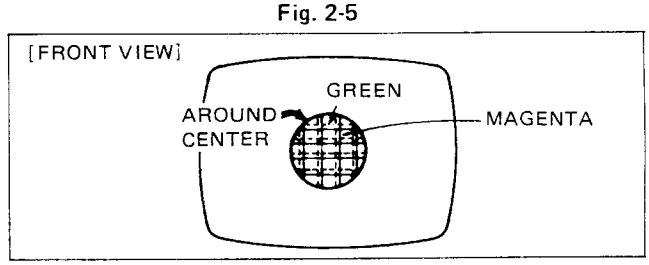
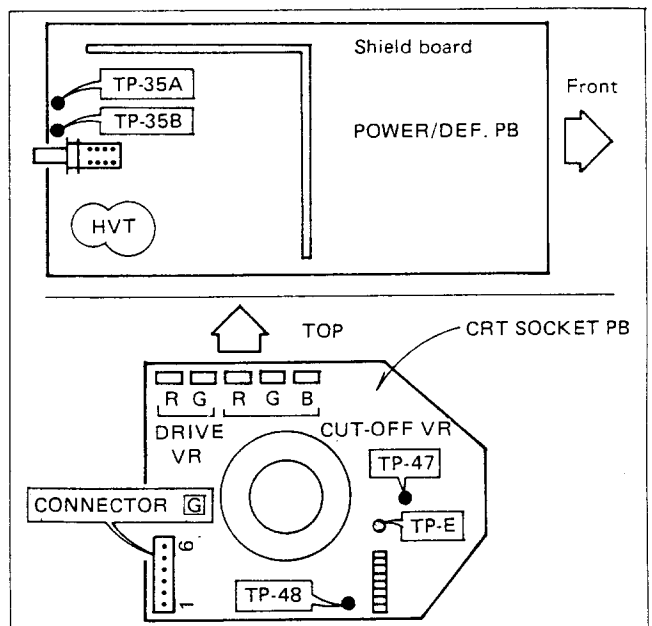


Fig. 2-6



Horizontal line display method

1. First, cause shorting between TP-48 and TP-E with a jumper wire.
2. Next, cause shorting on "1", "3", and "6" of CONNECTOR G .
3. Finally, cause shorting between TP-35A and TP-35B. These three steps will cause a horizontal line to appear on the screen.
4. When returning to the original status, disconnect the jumper wires in the sequence of Steps 3 → 2 → 1 above.

Fig. 2-7

B_1 VOLTAGE (30V ADJ.)

1. Cut off the picture by the BRIGHT VR and SUB BRIGHT VR.
2. Adjust the 30V ADJ. VR (R916) to obtain DC 30V between TP-91 and the ground.

HORIZONTAL OSCILLATOR

1. Set the H. HOLD VR (R506) to the mechanical center position.
2. Connect a jumper wire between TP-33 and ground.
3. Adjust H. HOLD VR (R506) until the picture is in view and locks or drift slowly back and forth.
4. Remove a jumper wire.
5. Confirm that the set maintains horizontal sync. when signals are changed.

H. CENTER

Centering is completed at the factory, although it may become distorted when the CRT is changed.
In such case, moving the CONNECTOR [U] (adj. point left, center and right) moves the picture left or right.

V. HEIGHT AND V. CENTER

1. Set the DISK SW to the AUTO side.
2. Display a picture that facilitates confirming vertical symmetry under 60 Hz (NTSC) vertical frequency.
3. Adjust the V. HEIGHT VR (R420) to obtain the optimum size of vertical oscillation width.
4. Adjust the V. CENTER VR (R429) to cause the picture to appear in the screen center.
5. Display a picture which facilitates confirming vertical symmetry under 50 Hz (PAL/SECAM) vertical frequency.
6. Adjust the 50 Hz V. HEIGHT VR (R122) to obtain the optimum size of vertical oscillation width.

FOCUS

Adjust FOCUS control for best overall difinition and picture detail at normal brightness and contrast.

RGB SYNC INVERTOR

By changing the setting of the SYNC SWITCH in the AV IN OUT PCB interior, the polarity of RGB sync signals can be reversed.

SUB CONTRAST AND SUB BRIGHTNESS

Display a picture, set the CONTRAST and BRIGHT knobs on the control panel to the central position respectively (where they click). Then align both the SUB CONT (R276) and SUB BRIGHT (R279) VR's until an ideal picture is obtained.

SUB COLOR (PAL, SECAM)

1. Display a SECAM color signal, and set the COLOR knob on the control panel to the central position.
2. Adjust the SUB COLOR VR (R324) until natural color density is obtained.
3. Next, display the PAL color signals.
4. Adjust the PAL SUB COLOR VR (R316) until similar natural color density is obtained.

NTSC COLOR CIRCUIT

SUB TINT AND SUB COLOR

Note: Adjustment of the SUB COLOR VR (PAL, SECAM) must be completed.

1. Display a color signal (4.43 MHz/3.58 MHz).
2. Set the TINT and COLOR knobs in the control panel interior at central positions.
3. Adjust the SUB TINT VR (R828/R827) and the SUB COLOR VR (R811/R813) until natural color is obtained.

COLOR SYNCHRONIZATION

1. Display a color bar signal (4.43/3.58 MHz).
2. Connect a jumper wire between TP-43 and TP-E.
3. Connect a jumper wire between TP-42 and pin 12 of IC801.
4. Use a nonmetallic driver to turn the TRIMMER CAPACITOR (C816/C815). Adjust so that the rolling color stripes become thick and the rolling slows or stops.
5. Disconnect the two jumper wires.
6. Confirm that color sync is not disrupted when signals are switched.

ALIGNMENTS LOCATION

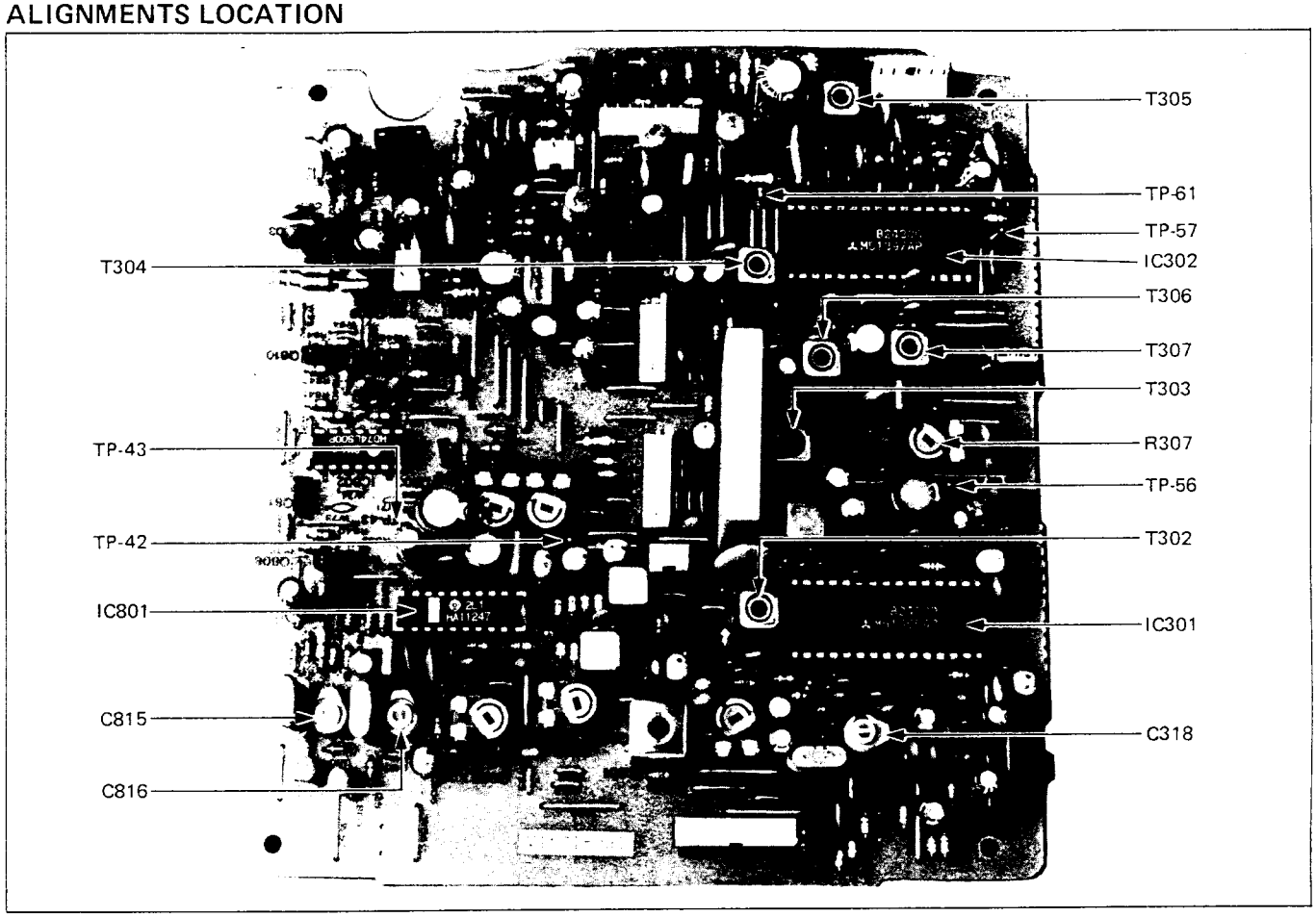


Fig. 2-8

PAL COLOR CIRCUIT (Fig. 2-8)

1. Display a PAL color bar signal.
2. Set the oscilloscope at the X-Y mode and connect Channel 1 (X axis) to TP-56 and Channel 2 (Y axis) to TP-57 respectively.
3. Short pin 4 (TP-53A) and pin 5 (TP-53B) of IC301 with a jump wire.
4. Supply bias to pin 26 (TP-52) of IC301 through 10 kΩ resistor from 12 V DC.
5. Adjust T302 (CW TRANSF) for the minimum figure.
6. Adjust R307 (DL AMP) so that the figure becomes (B) from (A). (Shown in Fig. 2-9)
7. Adjust T303 (DL P. TRANSF) so that the figure becomes (C) from (B).
8. Adjust C318 (OSC ADJ) so that the rolling color stripes become thick and the rolling slows or stops.

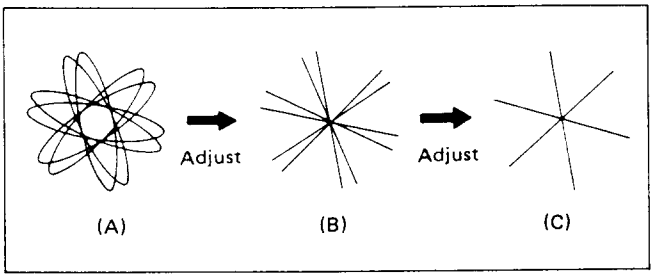


Fig. 2-9

SECAM COLOR CIRCUIT (Fig. 2-8)

Note : PAL color adjustment must be completed.

1. Display a SECAM color bar signal.
2. Connect an oscilloscope to pin 27 (TP-61) of IC302.
3. Adjust T304 (BEL TRANSF) for the flat waveform as shown in Fig. 3-10 (B).
4. Connect a digital voltmeter to pin 26 of IC302.
5. Adjust T305 (IDENT TRANSF) for the maximum DC voltage.
6. Adjust T306 (DISCRI. TRANSF) and T307 (DISCRI. TRANSF) until colors are eliminated from the black-and-white sections of the color bars.

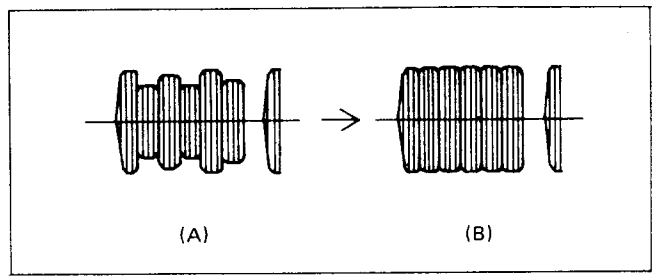
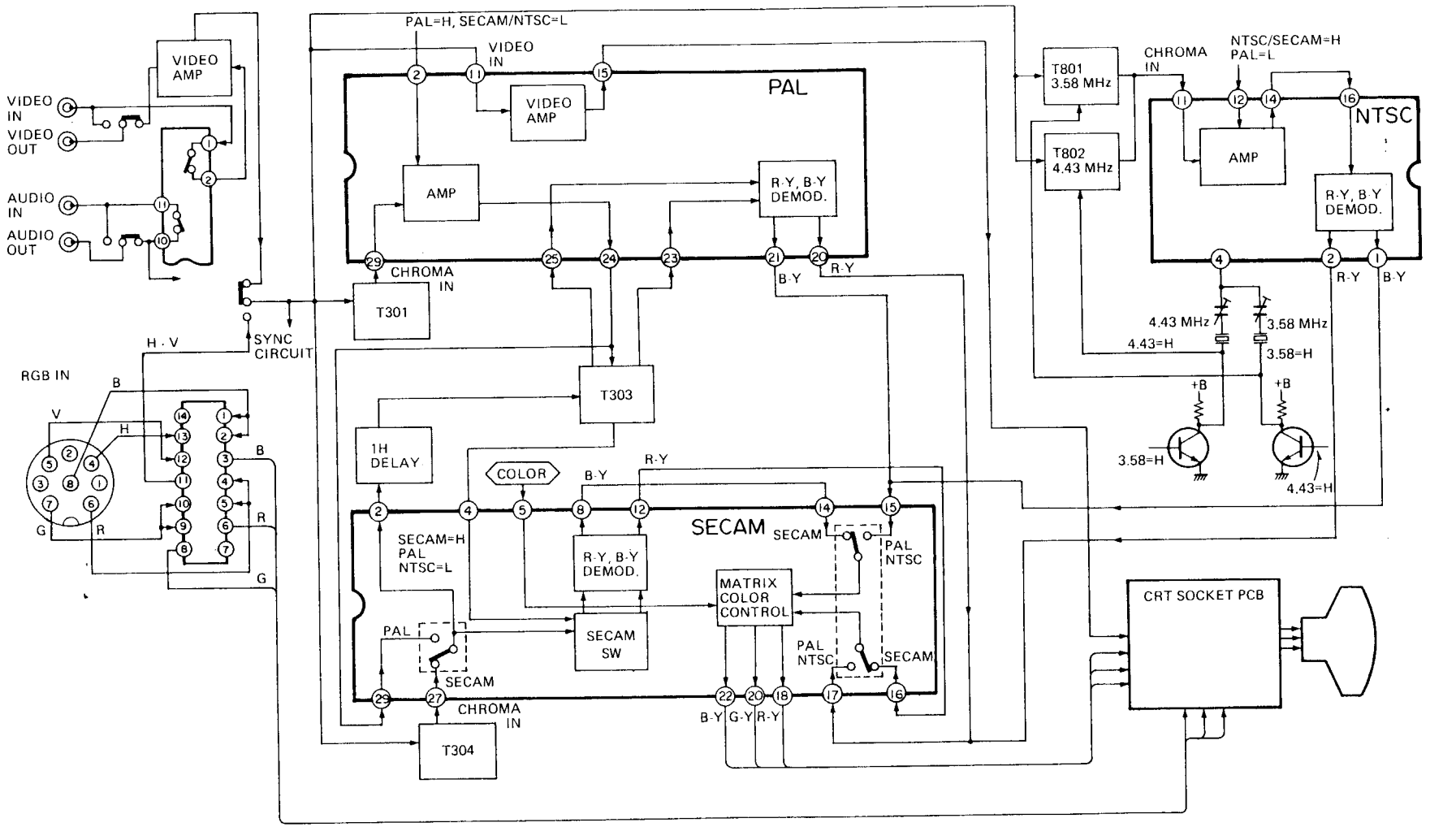


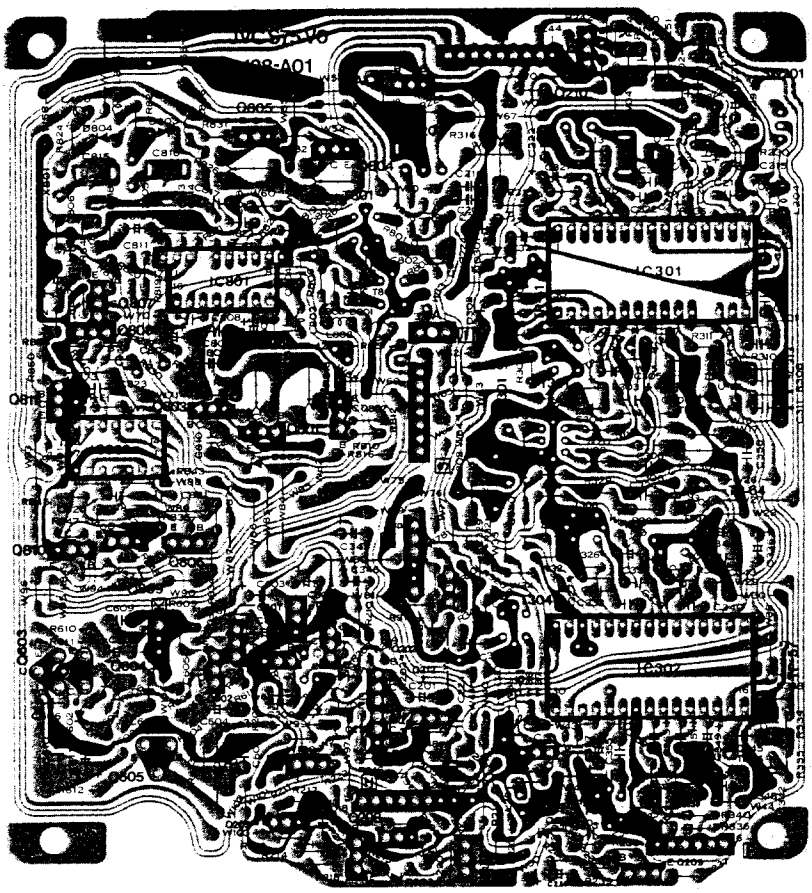
Fig. 2-10

3. BLOCK DIAGRAM

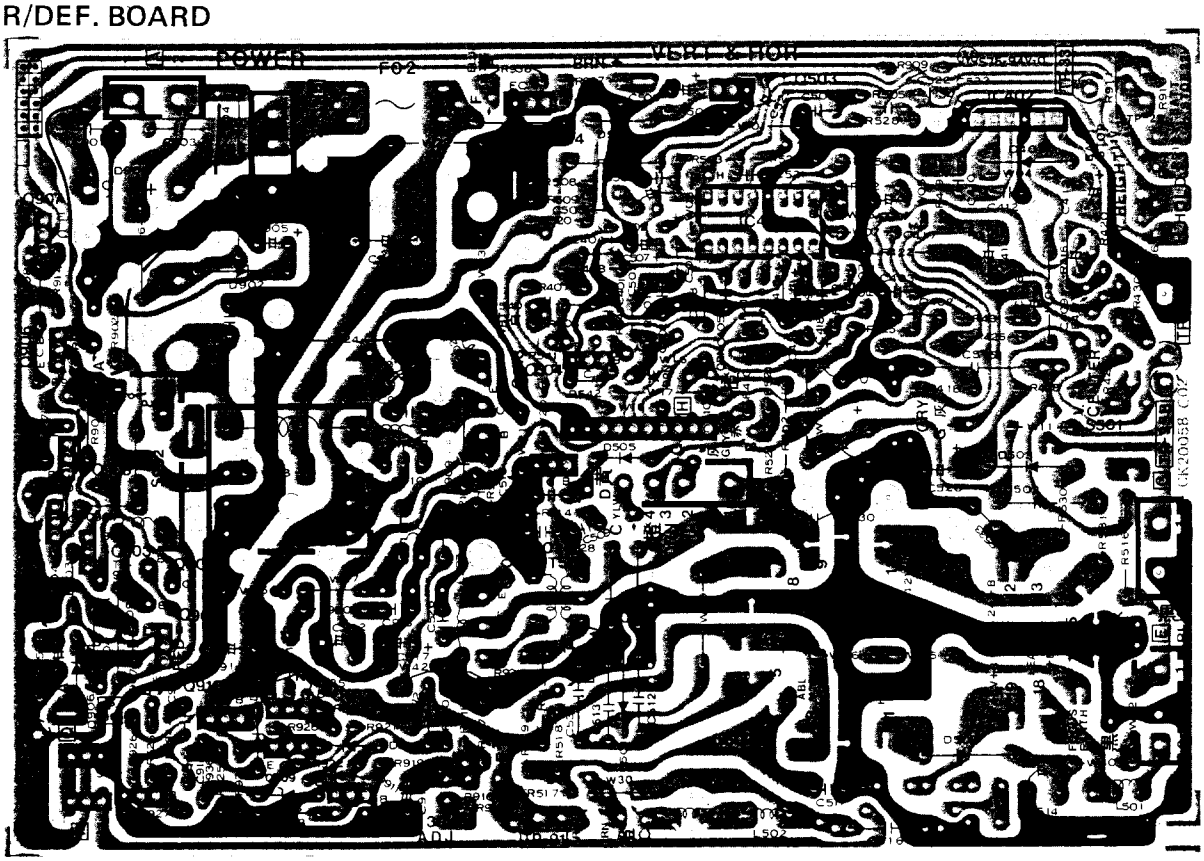


6. CIRCUIT BOARD

SIGNAL BOARD



POWER/DEF. BOARD



* The figures of the signal circuits may be more or less different after adjustments, so use the figures simply for reference.

○ Slince the circuit diagram is a standard one, the circuit and circuit constants may be subject to change for improvement without any notice.

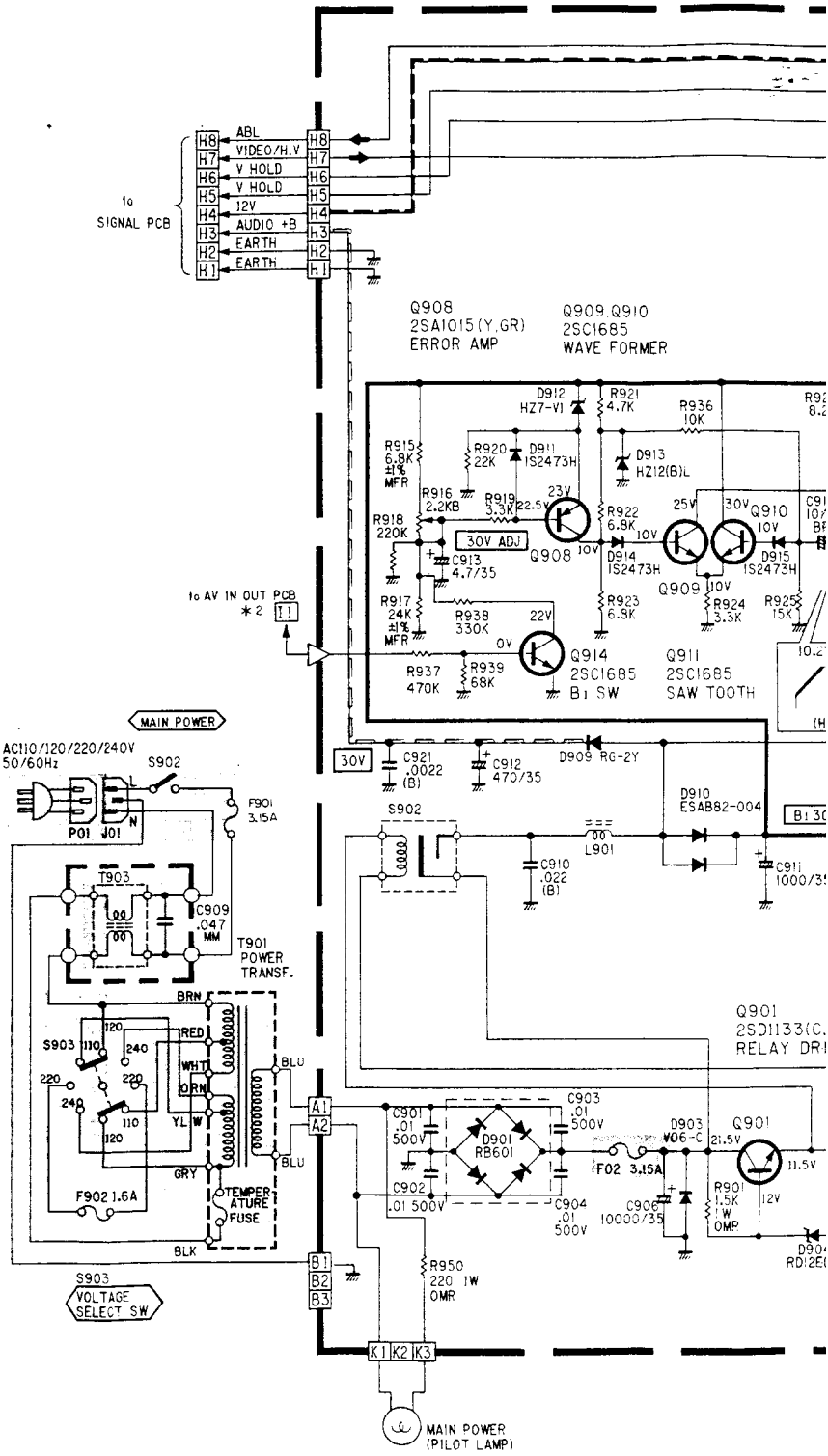
■ FOR SAFETY AND CONTINUED GOOD PERFORMANCE

○ FR is an abbreviation of Fusible Resistor (~~~~), and operates as Fuse. Replacing Fuse, FR and shaded ( ) parts, be sure to use parts specified for safety purposes.

○ For maximum reliability and performance, all other replacement parts should be identical to those specified.

■ PARTS LIST (SHADED PARTS IN THE SCHEMATIC DIAGRAM)

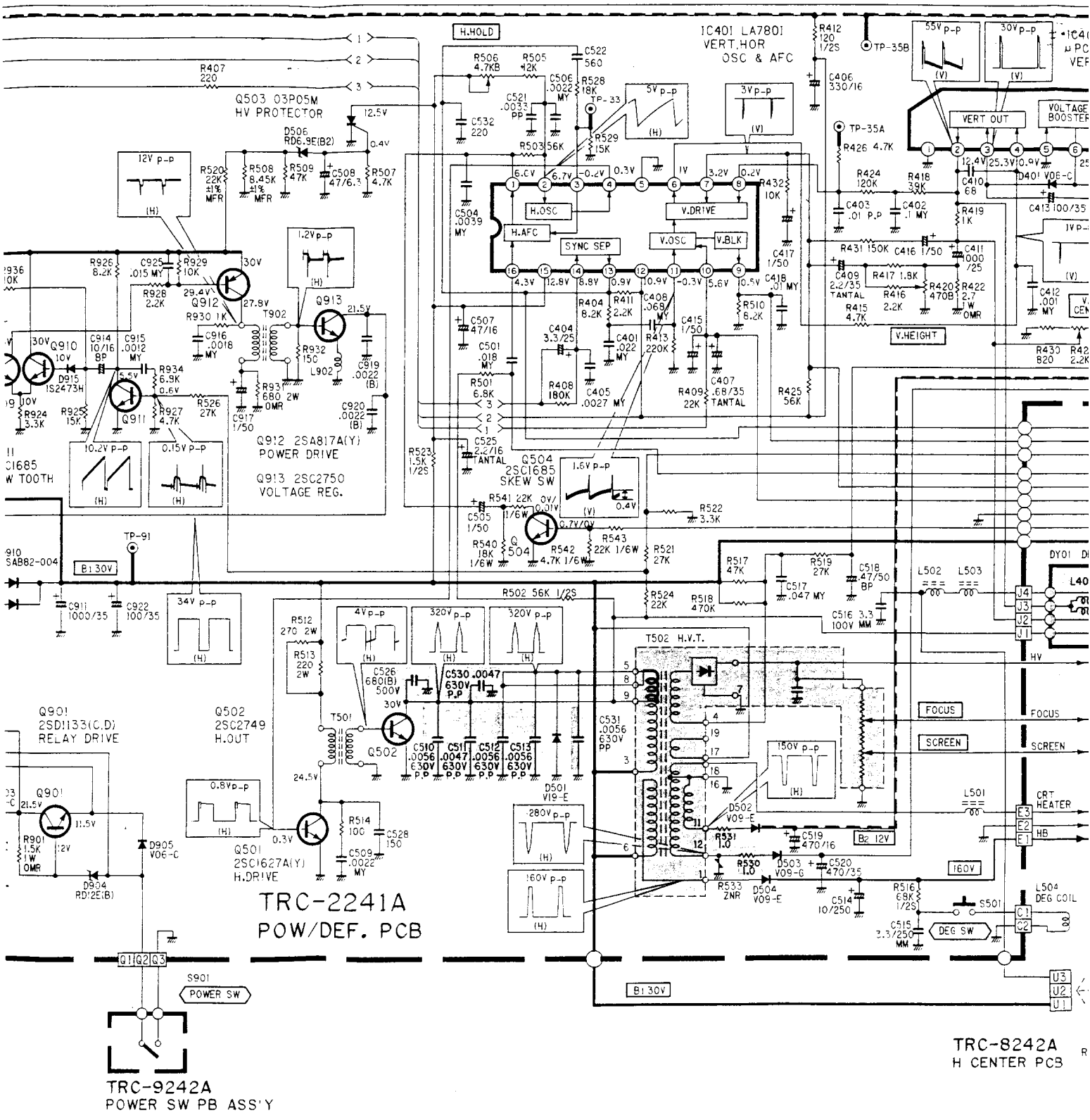
Symbol No.	Part No.	Part Name
TRC-1241A (SIGNAL PCB ASS'Y)		
FR1201	QRZ0054-2R7M	FR
1601	QRH124J-220H	"
TRC-2241A (POWER/DEF. PCB ASS'Y)		
R2530	QRD149J-1R0R	CR
2531	"	"
C2510	QFP42JJ-562M	PP Cap.
2511	" -472M	"
2512	" -562M	"
2513	" -562M	"
2526	QCY32HK-681M	C Cap.
2530	QFP42JJ-472M	PP Cap.
2531	" -562M	"
F02	QMF51A2-3R15S	Fuse
TRC-3141B (CRT SOCKET PCB ASS'Y)		
	CE40228-00A	CRT Socket
TRC-8242A (H. CENTER PCB ASS'Y)		
R8551	QRZ0054-220M	F.R
8553	" -330M	"
OUTSIDE OF PCBs		
V01	250ATB22(E)	Picture Tube
DY01	CJ26001-00A	Def. Yoke
T502	CJ26055-00A	HV Transf.
T901	CE30077-A0A	Power Transf.
S902	QSE2135-002	Seesaw SW.
S903	CEX40285-001	Voltage Selector
J01	QMC0335-003R	AC Socket
T903	CE40180-00A	Line Filter
C909	QFZ9017-473M	MM Cap.
F901	QMF51A2-3R15S	Fuse
F902	" -1R6S	"
	CEX40321-200	Power Cord

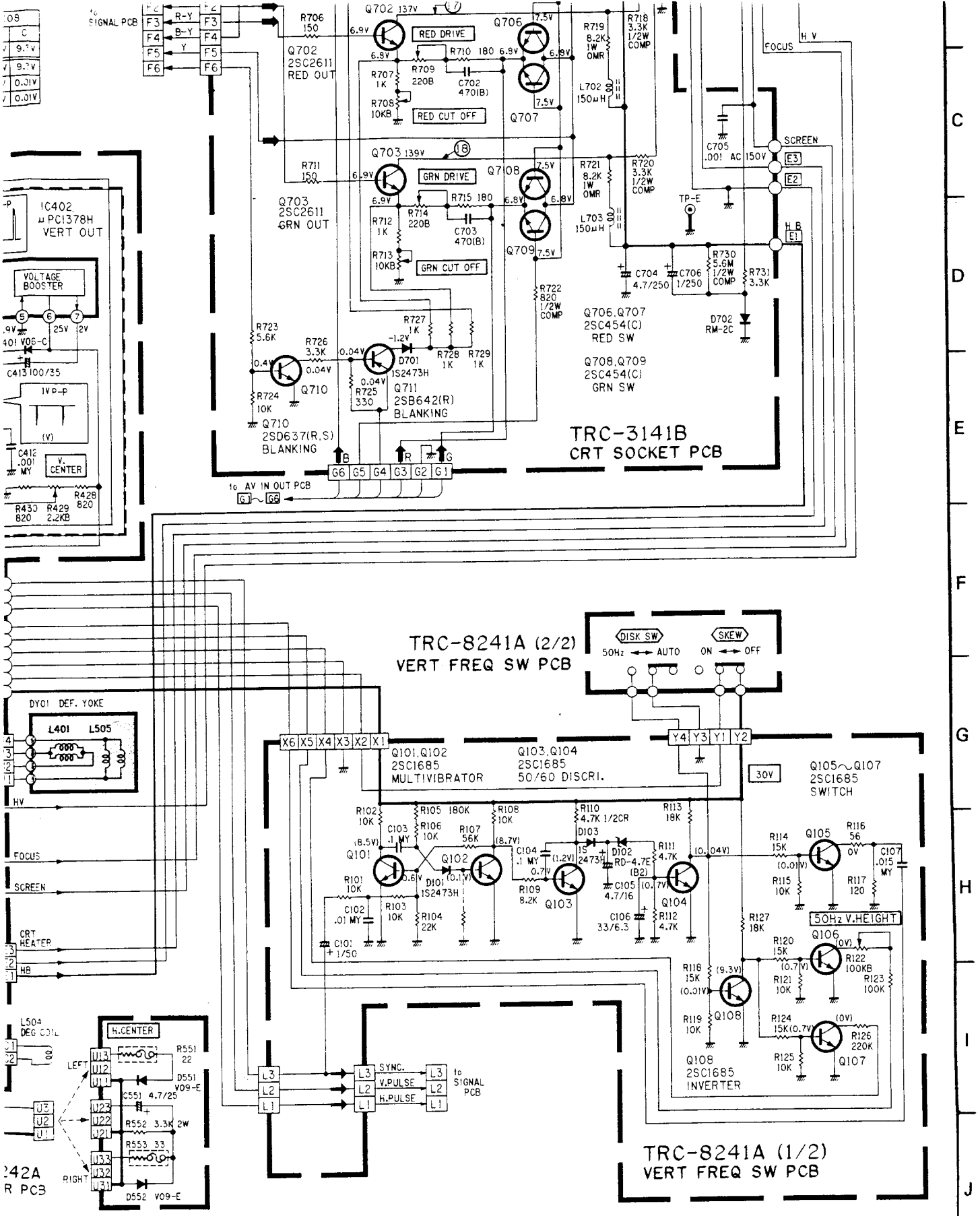


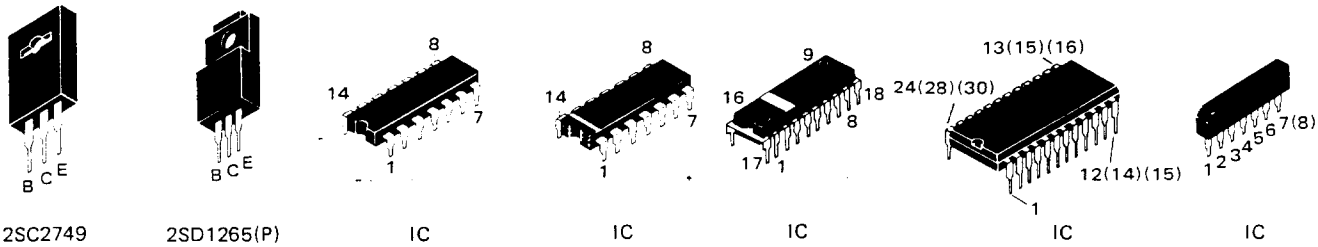
JVC

VICTOR COMPANY OF JAPAN, Ltd.

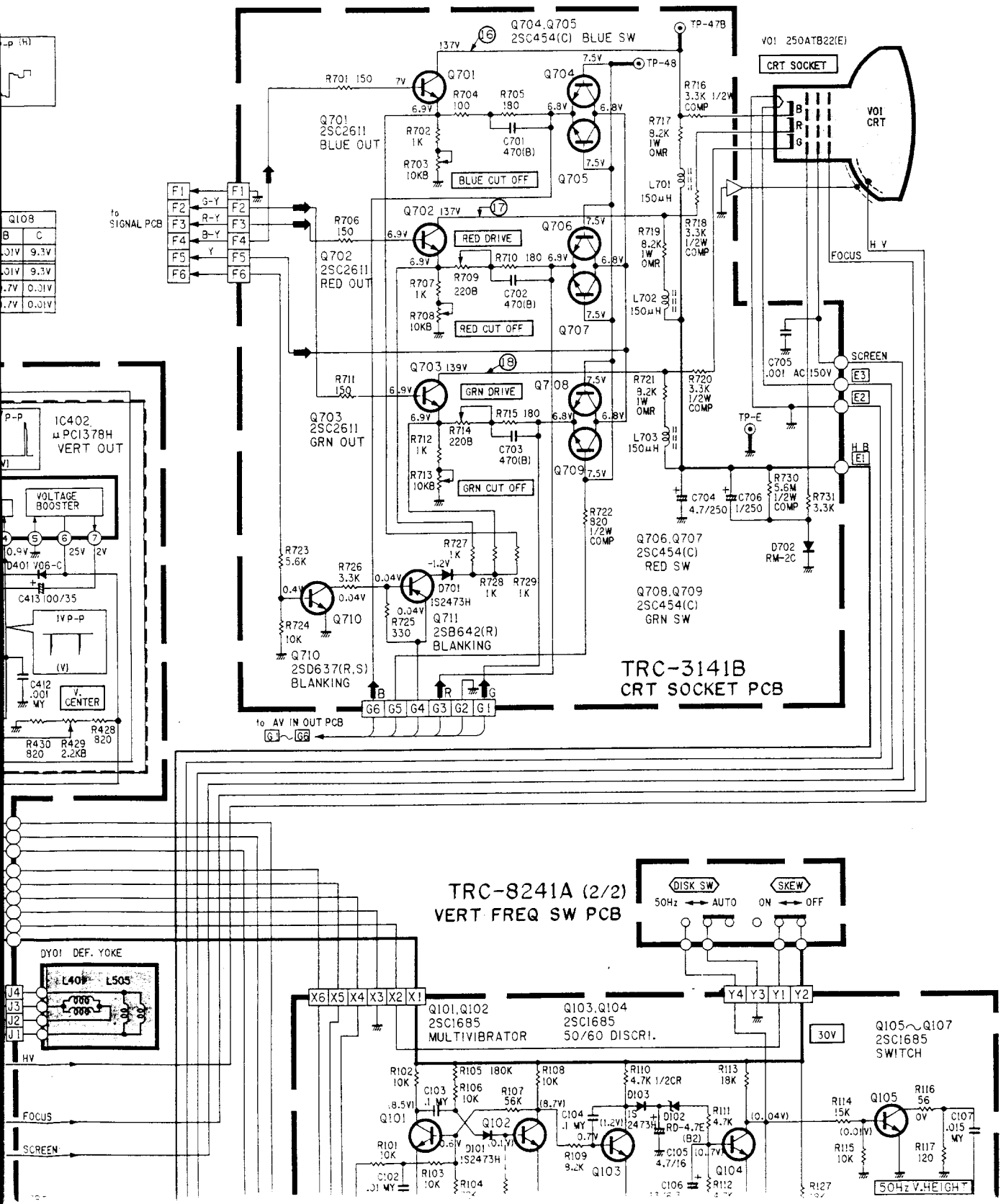
System SW Position	C	B	C	C	B	C	B	B	C	B	C	B	C
PAL	8.5V	0.1V	8.7V	1.2V	0.7V	0.04V	0.01V	0.7V	0V	0.7V	0V	0.01V	9.7V
SECAM	8.5V	0.1V	8.7V	1.2V	0.7V	0.04V	0.01V	0.7V	0V	0.7V	0V	0.01V	9.7V
NTSC(3.58MHz)	4.8V	-0.7V	10.1V	0.5V	0.2V	9.3V	0.7V	0V	3.1V	0V	5.4V	0.7V	0.01V
NTSC(4.43MHz)	4.8V	-0.3V	10.2V	0.5V	0.2V	9.3V	0.7V	0V	3.1V	0V	5.4V	0.7V	0.01V




TRC-3141B
CRT SOCKET PCB
TRC-8241A (2/2)
VERT FREQ SW PCB
TRC-8241A (1/2)
VERT FREQ SW PCB
IC402
μPC1378H
VERT OUT
Q702 2SC2611 RED OUT
Q703 2SC2611 GRN OUT
Q706,Q707 2SC454(C) RED SW
Q708,Q709 2SC454(C) GRN SW
Q710 2SD637(R,S) BLANKING
Q711 2SB642(R) BLANKING
RED DRIVE
RED CUT OFF
GRN DRIVE
GRN CUT OFF
VOLTAGE BOOSTER
V. CENTER
H.CENTER
FOCUS
SCREEN
CRT HEATER
HV
HB
DY01 DEF. YOKE
L401 L505
L504 DEG COIL
to SIGNAL PCB
to AV IN OUT PCB
DISK SW
50Hz ↔ AUTO
SKEW
ON ↔ OFF
Q101,Q102 2SC1685 MULTIVIBRATOR
Q103,Q104 2SC1685 50/60 DISCRI.
Q105~Q107 2SC1685 SWITCH
Q108 2SC1685 INVERTER
50Hz V.HEIGHT
SYNC.
V.PULSE
H.PULSE
to SIGNAL PCB
D701 1S2473H
D702 RM-2C
D101 1S2473H
D103 1S2473H
D102 RD-4.7E (B2)
D551 V09-E
D552 V09-E
C413 100/35
C705 .001 AC 150V
C704 4.7/250
C706 1/250
C702 470(B)
C703 470(B)
L702 150μH
L703 150μH



)	2SC2749 2SC2750	2SD1265(P)	IC	IC	IC	IC	IC



C : capacitance value [μF] / working voltage [V], BP → bi-polar (or non-polar) electrolytic cap.

arts list in the SERVICE t the detailed indications

ate test point connections.
sis ground.
es per second.

■ BASINGS OF TRANSISTORS AND ICs

2SA562TM(Y)
2SC458(C)
2SC1627A(Y)
2SA817A(Y)
2SC1685
2SA1015(Y,GR)

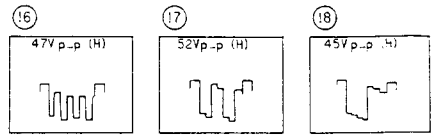
2SC454(C)
2SC1213A(D,C)

2SD637(R,S)
2SB642(R)

2SC2611

2SD1133(C,D)

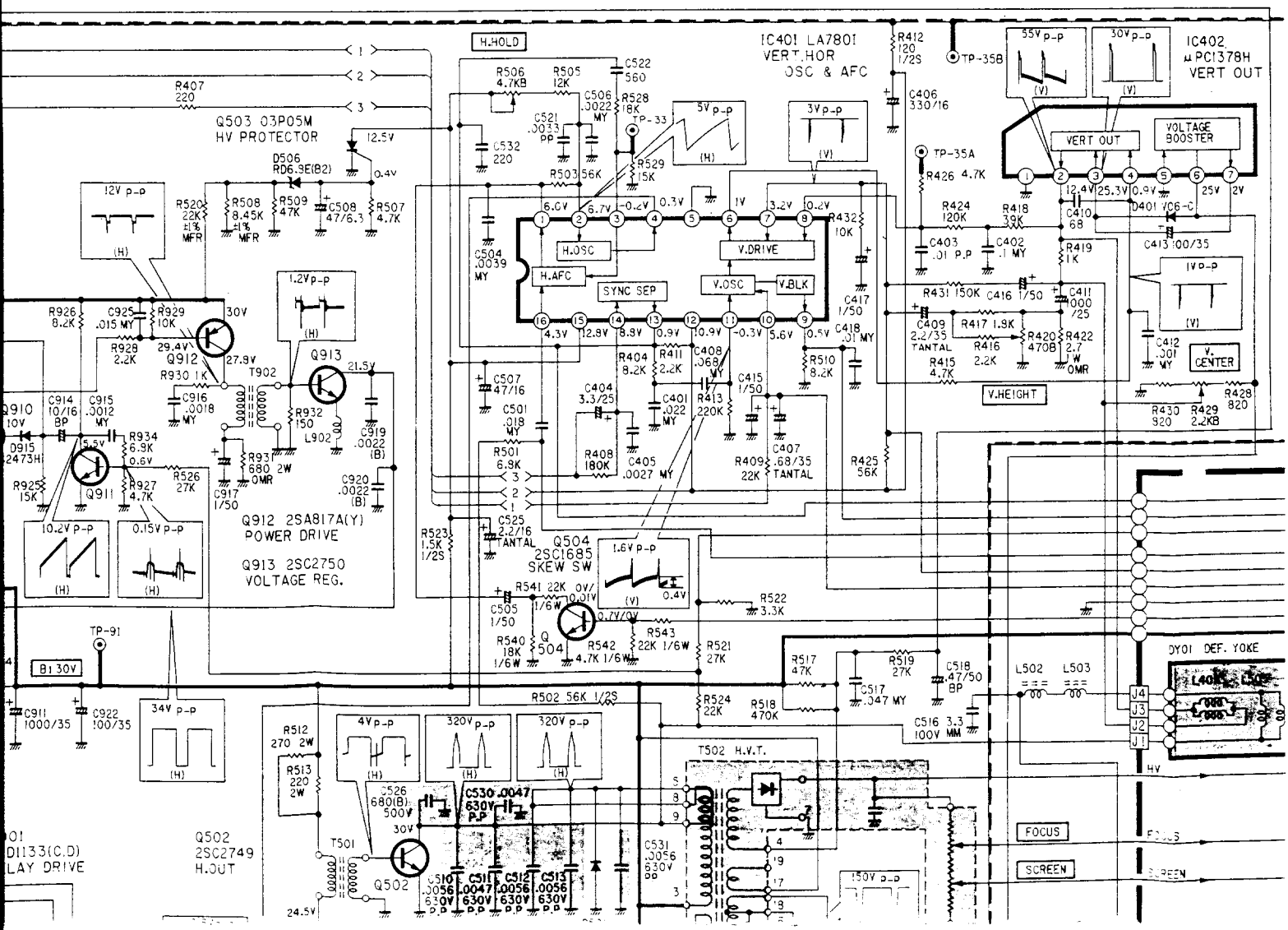
2SC2749
2SC2750



VERT FREQ SW PCB

Transistor / System SW Position	Q101	Q102		Q103	Q104		Q105	Q106		Q107		Q108	
	C	B	C	C	B	C	B	B	C	B	C	B	C
PAL	8.5V	0.1V	8.7V	1.2V	0.7V	0.04V	0.01V	0.7V	0V	0.7V	0V	0.01V	9.3V
SECAM	8.5V	0.1V	8.7V	1.2V	0.7V	0.04V	0.01V	0.7V	0V	0.7V	0V	0.01V	9.3V
NTSC(3.58MHz)	4.8V	-0.3V	10.1V	0.5V	0.2V	9.3V	0.7V	0V	3.1V	0V	5.4V	0.7V	0.01V
NTSC(4.43MHz)	4.8V	-0.3V	10.2V	0.5V	0.2V	9.3V	0.7V	0V	3.1V	0V	5.4V	0.7V	0.01V

to SIGNAL



■ NOTICE

○ Measurement of voltage values and waveforms was conducted by creating picture displays from color bar video signals of PAL, SECAM, and NTSC (3.58 MHz/4.43 MHz) respectively after setting the SYSTEM SWITCH at the AUTO position.

[Voltage value description method]
The described voltage values denote those obtained when pictures are created from PAL signals. However, at positions where the voltage values vary depending on input signal types (SECAM/NTSC), special marks [Example: (3.5 V)] are applied and descriptions are given outside the circuit diagrams.

Multimeter used
DC20kΩ/V
Given figures are all DC voltages.
Sweep speed of oscilloscope
H → 20μS/div.
V → 5mS/div.
Others → sweep speed specified

* The figures of the signal circuits may be more or less different after adjustments, so use the figures simply for reference.

○ Slince the circuit diagram is a standard one, the circuit and circuit constants may be subject to change for improvement without any notice.

■ FOR SAFETY AND CONTINUED GOOD PERFORMANCE

○ FR is an abbreviation of Fusible Resistor (⌇⌇⌇), and operates as Fuse. Replacing Fuse, FR and shaded ( ) parts, be sure to use parts specified for safety purposes.

○ For maximum reliability and performance, all other replacement parts should be identical to those specified.

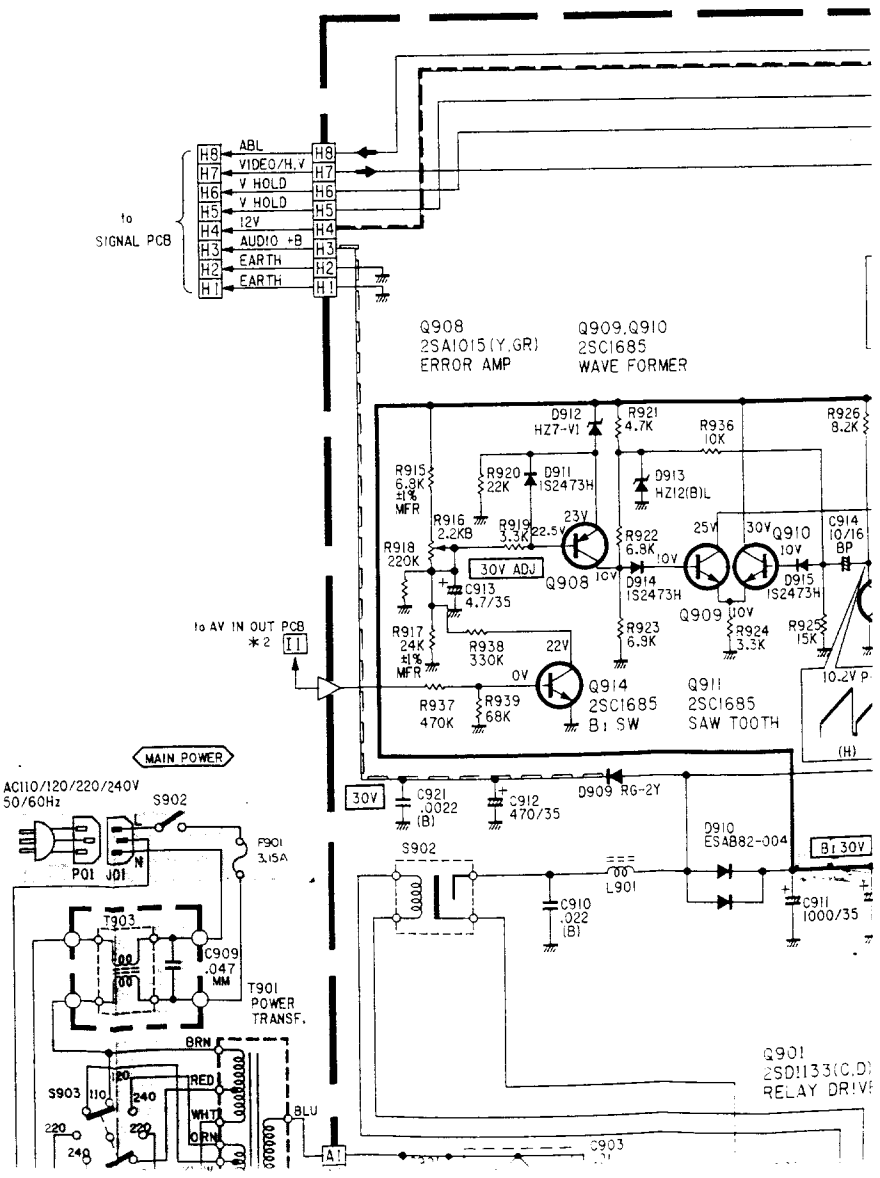
■ PARTS LIST (SHADED PARTS IN THE SCHEMATIC DIAGRAM)

Symbol No.	Part No.	Part Name
TRC-1241A (SIGNAL PCB ASS'Y)		
FR1201	QRZ0054-2R7M	FR
1601	QRH124J-220H	"
TRC-2241A (POWER/DEF. PCB ASS'Y)		
R2530	QRD149J-1R0R	CR
2531	"	"
C2510	QFP42JJ-562M	PP Cap.
2511	" -472M	"
2512	" -562M	"
2513	" -562M	"
2526	QCY32HK-681M	C Cap.
2530	QFP42JJ-472M	PP Cap.
2531	" -562M	"
F02	QMF51A2-3R15S	Fuse
TRC-3141B (CRT SOCKET PCB ASS'Y)		
	CE40228-00A	CRT Socket
TRC-8242A (H. CENTER PCB ASS'Y)		
R8551	QRZ0054-220M	F R
8553	" -330M	"
OUTSIDE OF PCBs		
V01	250ATB22(E)	Picture Tube
DY01	CJ26001-00A	Def. Yoke
T502	CJ26055-00A	HV Transf.
T901	CE30077-A0A	Power Transf.
S902	QSE2135-002	Seesaw SW.
S903	CEX40285-001	Voltage Selector
	QMC0335-003B	AC Socket

■ SCHEMATIC NOTES

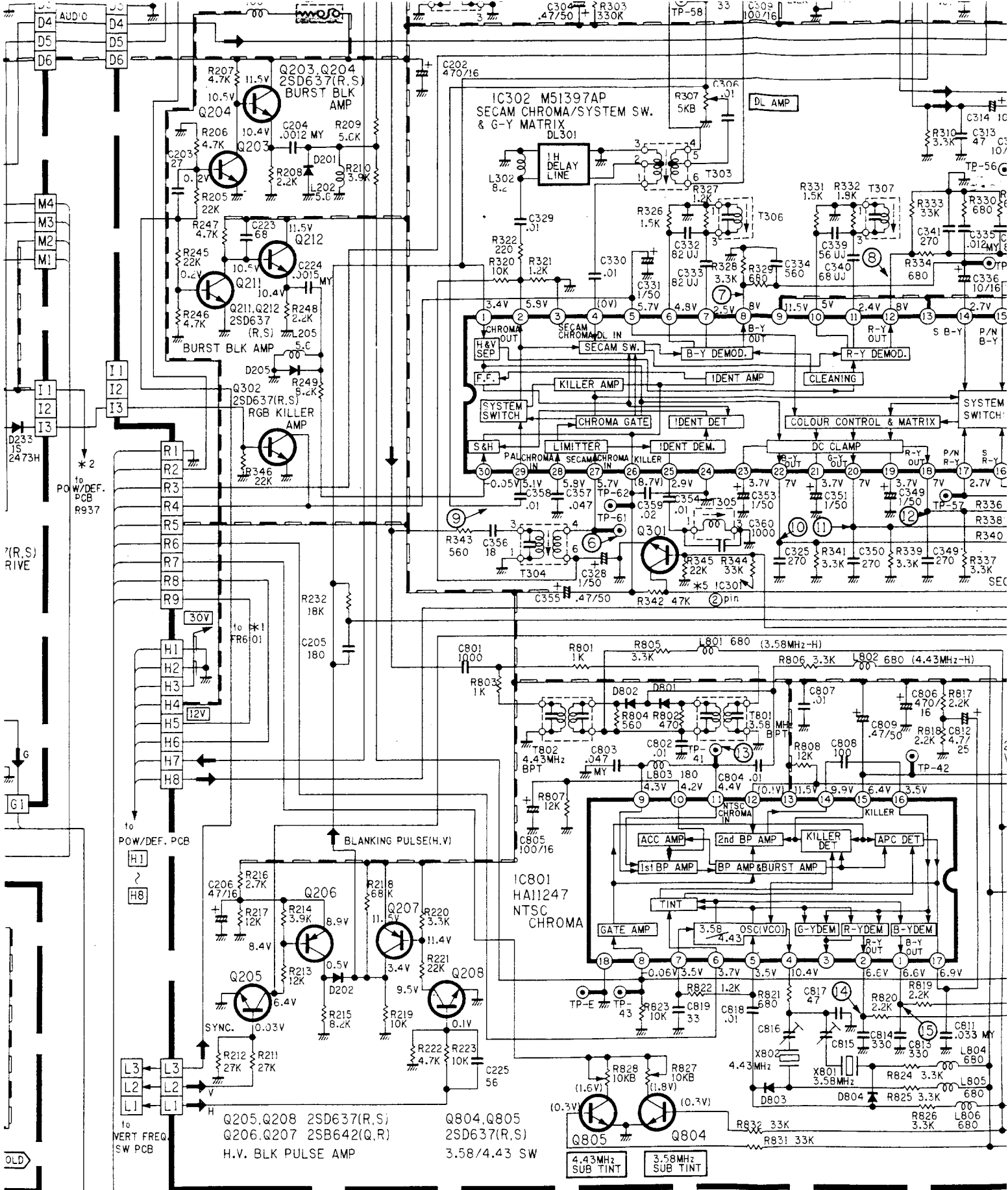
UNLESS OTHERWISE SPECIFIED
Resistance : [Ω] (K→KΩ, M→MΩ), 1/4 or 1/6 [W] carbon resistor
Capacitance : 1 or higher → [pF], less than 1 → [μF], working voltage → 50 [V], ceramic capacitor
Inductance : [μH]

ELECTROLYTIC CAP. : capaci
workir
BP → b
polar)
Refer to the parts list i
MANUAL about the det
of parts.
◉ symbols indicate test po
⏚ indicates chassis ground.
Hz indicates cycles per seco



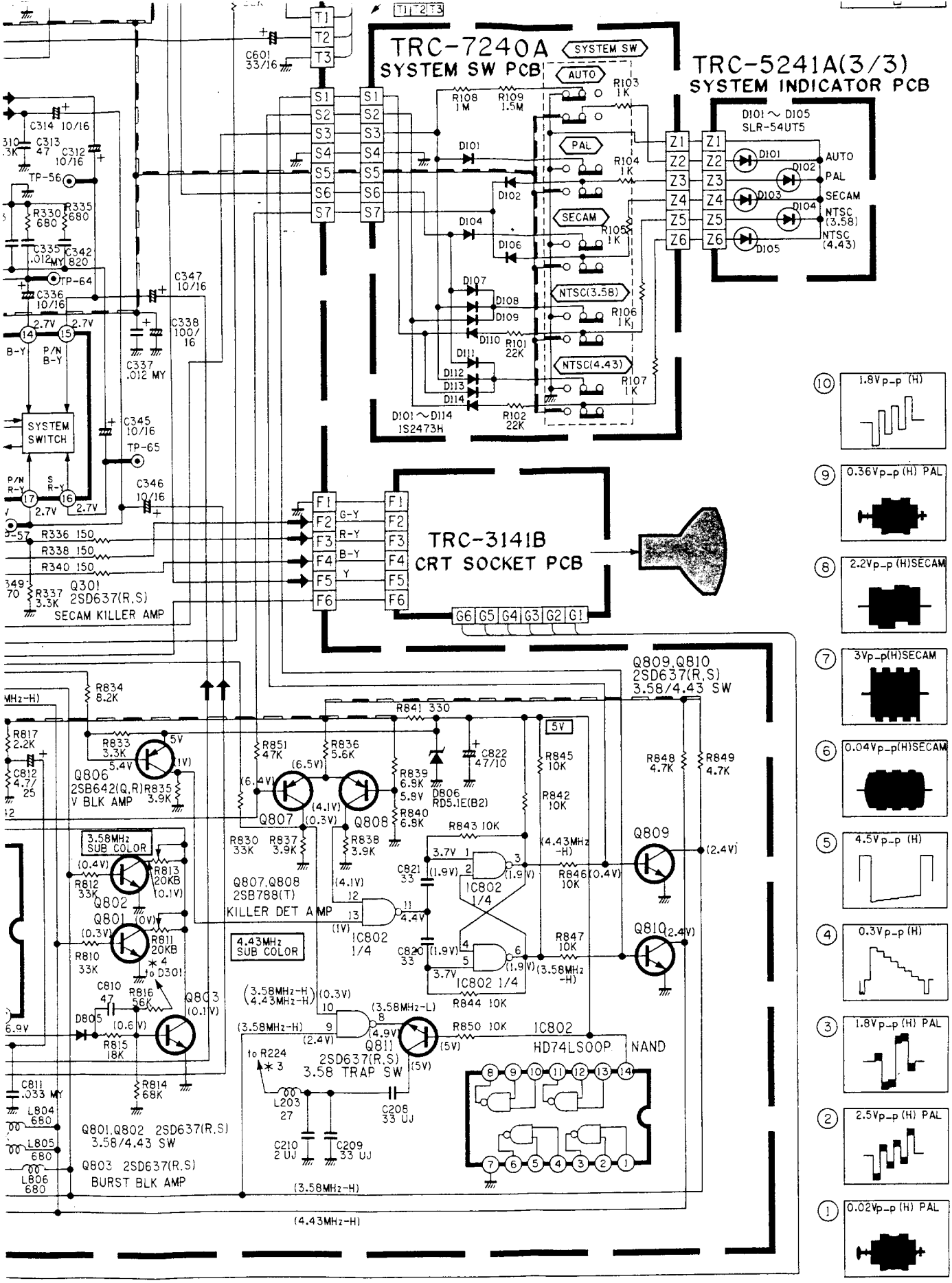
SIGNAL PCB

IC & IC pin No. / System SW Position	IC301		IC302		IC801		
	2	26	4	26	12	15	2
PAL	4.9V	9.5V	0V	8.7V	0.1V	6.4V	1.9V
SECAM	0.1V	8.9V	2.9V	9.3V	4.9V	7.2V	1.9V
NTSC(3.58MHz)	0.1V	8.9V	0V	8.6V	4.9V	5.4V	3.7V
NTSC(4.43MHz)	0.1V	8.9V	0V	8.6V	4.9V	5.4V	0.2V

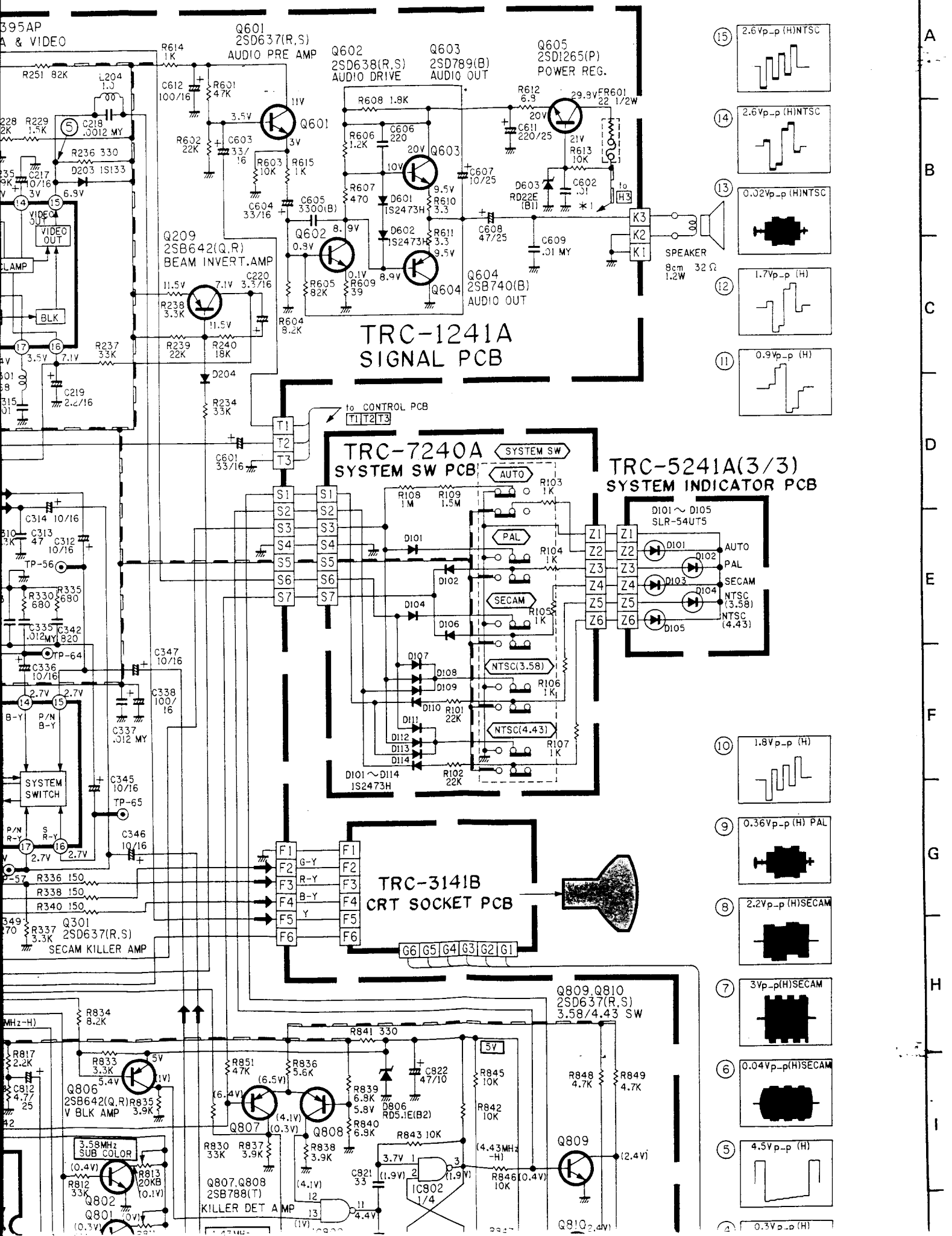


IC801		IC802								
12	15	2	3	4	6	8	9	10	12	13
0.1V	6.4V	1.9V	1.9V	1.9V	1.9V	4.9V	2.4V	0.3V	4.1V	1V
4.9V	7.2V	1.9V	1.9V	1.9V	1.9V	4.9V	2.4V	0.3V	4.1V	1V
4.9V	5.4V	3.7V	0.2V	0.2V	3.7V	0.2V	4.7V	4.5V	0.3V	0.6V
4.9V	5.4V	0.2V	3.7V	3.7V	0.2V	4.8V	0.04V	4.5V	0.3V	0.6V

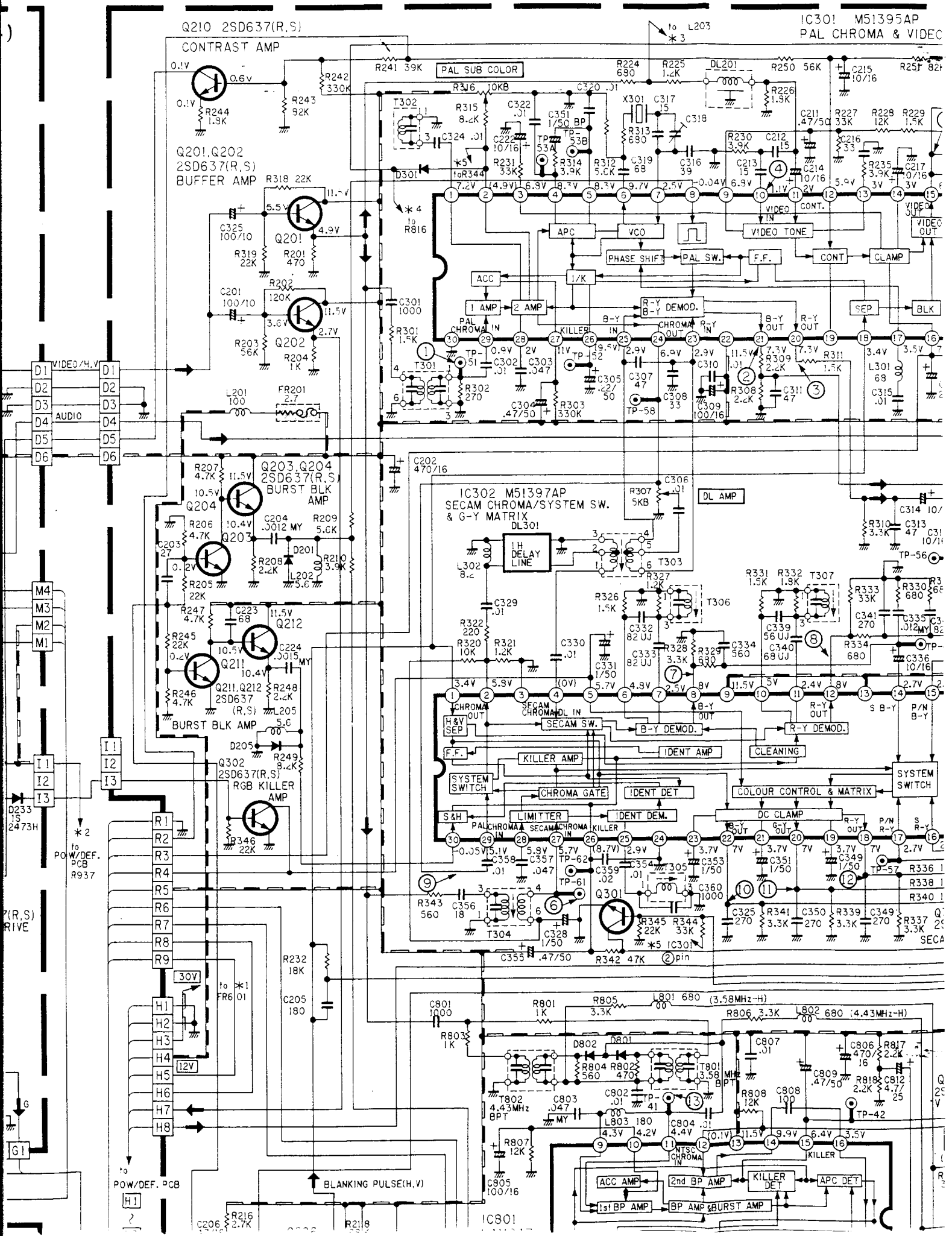
Transistor / System / SW Position	Q801		Q802		Q803		Q804		Q805		Q806	Q807			Q
	B	C	B	C	B	C	B	C	B	C	C	B	C	E	C
PAL	0.3V	0V	0.3V	0.1V	0.6V	0.1V	0.3V	1.8V	0.3V	1.6V	1V	6.4V	0.3V	6.5V	-4.1V
SECAM	0.3V	2.5V	0.3V	2.3V	0.2V	4.9V	0.3V	1.6V	0.3V	1.9V	1V	7.2V	0.3V	6.5V	4.1V
NTSC(3.58MHz)	0.03V	4.9V	0.6V	0.02V	0.2V	4.9V	0.6V	0.02V	0.03V	3.2V	0.6V	5.4V	4.5V	6.1V	0.3
NTSC(4.43MHz)	0.6V	0.02V	0.04V	4.9V	0.2V	4.9V	0.04V	3.6V	0.6V	0.01V	0.6V	5.4V	4.5V	6.1V	0.3

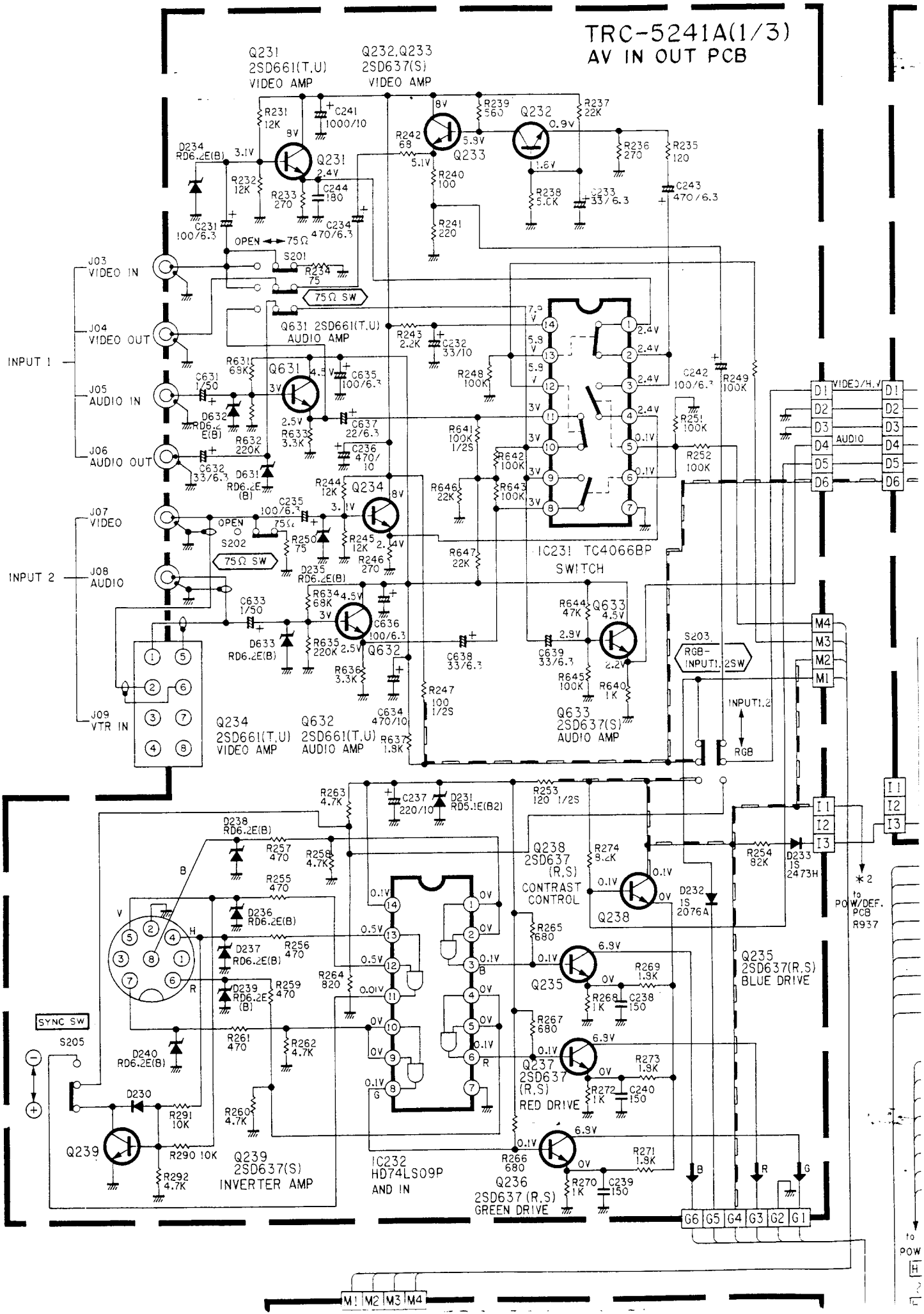


	Q808		Q809		Q810	
E	C	E	B	C	B	C
6.5V	4.1V	6.5V	0.4V	2.4V	0.4V	2.4V
6.5V	4.1V	6.5V	0.4V	2.4V	0.4V	2.4V
6.1V	0.3V	6.1V	0.2V	4.7V	0.7V	0.03V
6.1V	0.3V	6.1V	0.7V	0.04V	0.2V	4.7V


TRC-1241A
SIGNAL PCB
TRC-7240A
SYSTEM SW PCB
TRC-5241A(3/3)
SYSTEM INDICATOR PCB
TRC-3141B
CRT SOCKET PCB
Q601
2SD637(R,S)
AUDIO PRE AMP
Q602
2SD638(R,S)
AUDIO DRIVE
Q603
2SD789(B)
AUDIO OUT
Q605
2SD1265(P)
POWER REG.
Q604
2SB740(B)
AUDIO OUT
Q209
2SB642(Q,R)
BEAM INVERT.AMP
Q301
2SD637(R,S)
SECAM KILLER AMP
Q806
2SB642(Q,R)
V BLK AMP
Q807,Q808
2SB788(T)
KILLER DET AMP
Q809,Q810
2SD637(R,S)
3.58/4.43 SW
SPEAKER
8cm 32Ω
1.2W
SYSTEM SW
AUTO
PAL
SECAM
NTSC(3.58)
NTSC(4.43)
D101～D105
SLR-54UT5
D101～D114
1S2473H
SYSTEM SWITCH
3.58MHz SUB COLOR
IC802 1/4
to CONTROL PCB
T1 T2 T3
2.6Vp-p (H)NTSC
2.6Vp-p (H)NTSC
0.02Vp-p (H)NTSC
1.7Vp-p (H)
0.9Vp-p (H)
1.8Vp-p (H)
0.36Vp-p (H) PAL
2.2Vp-p (H)SECAM
3Vp-p(H)SECAM
0.04Vp-p(H)SECAM
4.5Vp-p (H)
0.3Vp-p (H)

JVC MODEL TM-90PSN SCHEMATIC DIAGRAM




TRC-5241A(1/3)
AV IN OUT PCB
Q231
2SD661(T,U)
VIDEO AMP
Q232,Q233
2SD637(S)
VIDEO AMP
Q231
Q232
Q233
J03
VIDEO IN
J04
VIDEO OUT
J05
AUDIO IN
J06
AUDIO OUT
J07
VIDEO
J08
AUDIO
J09
VTR IN
INPUT 1
INPUT 2
S201
75Ω SW
S202
75Ω SW
Q631 2SD661(T,U)
AUDIO AMP
Q631
Q234
Q632
IC231 TC4066BP
SWITCH
Q633
2SD637(S)
AUDIO AMP
S203
RGB-INPUT1.2SW
INPUT1.2
RGB
Q234
2SD661(T,U)
VIDEO AMP
Q632
2SD661(T,U)
AUDIO AMP
Q238
2SD637
(R,S)
CONTRAST
CONTROL
Q235
2SD637(R,S)
BLUE DRIVE
Q237
2SD637
(R,S)
RED DRIVE
Q236
2SD637(R,S)
GREEN DRIVE
Q239
2SD637(S)
INVERTER AMP
IC232
HD74LS09P
AND IN
SYNC SW
S205
D231
RD5.1E(B2)
D232
1S
2076A
D233
1S
2473H
to POW/DEF. PCB R937
VIDEO/H.V
AUDIO
D1
D2
D3
D4
D5
D6
M1
M2
M3
M4
I1
I2
I3
G1
G2
G3
G4
G5
G6
B
R
G