

## General Information

1994

**Covers Models:**

**DTT-21C1/21B1**

**2195/2172/2166**

**DTT-20C1/20B1**

**2075/2072/2066**

**UK: T204/T514**

**CRT:**

**20"- A48JLL90/A48ECR11X16/**

**A48EEV33X01**

**21"- A51JSW90X/**

**A51EAL55X01/A51EER11X01**

**Remote Control:**

**48B2823A01 (R-23A01)**

**48B2823A02 (R-23A02)**

**48B2822A01 (R-22A01)**

**48B2822A02 (R-22A02)**

**Door Flap:**

**4852810701 (2066)**

**4852813904 (2075)**

**4852811701 (2166)**

**Main Power button:**

**4845814400 (2066,2075,2166)**

**4845836801 (20C1)**

**4845836901 (2195)**

**4854836901 (21B1)**

**4854837402 (21C1)**

## Specifications

Main Voltage	220-240V AC, 50Hz	Aux Terminal	21 pin Euro-SCART x2,
	110-260V AC, 50/60Hz (Option)		Headphone (option),
Power Consumption	90W approx. (20")		S-VHS (option),
	95W approx. (21")		RCA Jack (option)
Sound Output Power	2W + 2W (60% MOD)	Stereo System	Two carrier stereo, NICAM
Speaker	5W 8 ohms x2		stereo (option)
Antenna Impedance	75 ohm unbalanced	Indication	On-Screen display
	300 ohm unbalanced with		- Program No. (00 - 99)
	supplied balun		- Sleep (15 - 120)
Tuning System	Voltage Synthesizer		- Mute
	Tuning System		- AV
Number of Program	100		- Normal (Normal I, Normal II,
Reception channel	VHF: ch 2-12		Favourite)
	UHF: ch 21 - 69		Main Menu (Contrast,
	CATV: chS1', S2', S3' and S1 - S20		Brightness, Colour,
	HYPER: ch S21 - S41		Sharpness, Tint (NTSC option))
Remote Control	Type R-22 or R-23 or R-28		- Time Menu (Clock, On/Off Timer)
Screen Size (Diagonal)	20": 480mm		- Preset Menu (FAS, Auto Search,
	21": 510mm		Fine Tuning, Renumber)
Teletext System	8 page memory FASTEXT		- Auto Search Menu (Skip, search,
	(TOP/FLOF of LIST)		station name)

## Service Adjustments

### Safety Instructions.

#### X-Ray Radiation Precaution

- Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not exceed the specified limit. The nominal value of the high voltage of this receiver is 25.5kv (21": 26.5kv) at max beam current. The high voltage must not, under any circumstances, exceed 27.5kv (21": 29.5kv). Each time a receiver needs servicing, the high voltage should be checked following the HIGH VOLTAGE CHECK. It is recommended the reading of the high voltage be recorded as part of the service records. It is important to use an accurate and reliable high voltage meter.
- The only source of X-RAY RADIATION in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as recommended in the parts list.

### Installation and Service Adjustments

#### High Voltage Check

- Connect an accurate high voltage meter to the anode of the picture tube.
- Turn on the receiver. Set the BRIGHTNESS and CONTRAST controls to minimise (zero beam current).
- High voltage should be below 27.5kv (21": 29.5kv).

#### Dynamic Convergence Adjustment

Dynamic convergence (convergence of the three colour field at the edges of the CRT

screen) is accomplished by proper insertion and positioning of three rubber wedges between the edges of the deflection yoke and the funnel of the CRT. This is accomplished as follows:

- Switch the receiver on, allow it to warm up for 15 minutes.
- Apply crosshatch pattern from dot/bar generator to the receiver. Observe spacing between lines around edges of the CRT screen.
- Tilt the deflection yoke up and down, and insert tilt adjustment wedges 1 and 2 between the deflection yoke and CRT until the mis-convergence illustrated in fig. 2 (A) has been corrected.
- Tilt the deflection yoke right and left, and insert tilt adjustment wedge 3 between the deflection yoke and CRT until mis-convergence illustrated in fig. 2 (B) has been corrected.
- Alternately change spacing between, and depth of the insertion of, the three wedges until proper dynamic convergence is obtained.
- Use a strong adhesive tape to firmly secure latch of the three rubber wedges to the funnel of the CRT.
- Check purity and readjust, if necessary.

### Static (centre) Convergence Adjustment (Orion, Samsung, WF CRT)

- Switch the receiver on and allow to warm up for 15 minutes.
- Connect the output of a crosshatch generator to the receiver and concentrating on the centre of the CRT screen, proceed as follows:
- Locate the pair of 4 pole magnet rings. Rotate individual rings (change spacing between tabs) to converge the vertical red and blue lines. Rotate the pair of rings (maintaining space between tabs) to converge the horizontal red and blue lines. (Refer to fig. 1(A)).
- After completing red and blue centre convergence, locate the pair of 6 pole magnet rings. Rotate individual rings (change spacing between tabs) to converge the vertical red and blue (Magenta) and green lines. Rotate the pair of rings (maintaining spacing between tabs) to converge the horizontal red and blue (Magenta) and green lines. (Refer to fig. 1(B)).

### Colour Purity Adjustment (Orion, Samsung, WF CRT)

For the best result, it is recommended that the purity adjustment is made in final receiver location. If the receiver will be moved, perform adjustment with it facing east. The receiver must have been operating 15 minutes prior to this procedure and the faceplate of the CRT must be at room temperature. The receiver is equipped with an automatic degaussing circuit. But, if the CRT shadow mask has come excessively magnetised, it may be necessary to degauss it with manual coil. Do not switch the coil. The following procedure is recommended while using a dot generation.

- Check for correct location of all neck components (see fig. 5).
- Rough-in the static convergence at the centre of the CRT, as explained in the static convergence procedure.

- Rotate the picture control to centre of its rotation range, and rotate brightness control to max. CW position.
- Apply green colour signal to procedure a green raster.
- Loosen the deflection yoke tilt adjustment wedges (3), loosen the deflection yoke clamp screw and push the deflection yoke as close as possible to the CRT screen.
- Begin the following adjustment with the tabs on the round purity magnet rings set together, initially move the tabs on the round purity magnet rings to the side of the CRT neck. Then, slowly separate the two tabs while at the same time rotating them to adjust for a uniform green vertical band at the CRT screen.
- Carefully slide the deflection yoke backward to achieve green purity (uniform green screen). Centre purity was obtained by adjusting the tabs on the round purity magnet rings, outer edge purity was obtained by sliding the deflection yoke forward. Tighten the deflection yoke clamp screw.
- Check for red and blue field purity by applying red signal and touch up adjustments, if required.
- Perform black and white tracking procedure.

### Screen and White Balance Adjustment

- This adjustment is to be made only after warming up for at least 15 minutes.
- Receive B/W pattern signal.
- Set the RGB Bias VR (R522, R512, R502) to MINIMUM.
- Set the G, B Drive VR (R515, R505) to CENTRE.
- Set the CONTRAST, BRIGHTNESS and COLOUR control to MIN, and Sub-brightness control to CENTRE.
- Connect a short clip to P301.
- Rotate the SCREEN control to clockwise or CCW so as to obtain dim horizontal line of one colour in R, G or B.
- Rotate the R, G, and B Bias VR of the other colour which did not appear on the screen clockwise, until a dim white line is obtained.
- Rotate the Screen control gradually anti-clockwise until the last horizontal line disappears on the screen.
- Remove the short clip and set the CONTRAST, BRIGHTNESS, COLOUR control to MAX.
- Set the G, B Drive VR to obtain the best white uniformity on the screen.
- Rotate the CONTRAST, BRIGHTNESS, COLOUR controls until a dim raster is obtained and touch-up adjustment of RGB Bias VR to obtain the best white uniformity on the screen.

### Sub-Brightness Adjustment.

- White balance adjustment must proceed this procedure.
- Set the CONTRAST, BRIGHTNESS, COLOUR controls to MIN.
- Rotate the SUB-BRIGHTNESS VR (VR201) gradually CCW until the last beam disappears on the screen.

### Vertical Height Adjustment

- Receive RETMA pattern signal.
- Set the BRIGHTNESS and CONTRAST control to Max., and COLOUR control to the centre.

- Adjust VR302 for the optimum vertical height and over scanning.

### Vertical Centre Adjustment

- Receive RETMA pattern signal.
- Adjust VR301 so that the vertical centre of the picture may be coincident with the mechanical centre of CRT.

### Horizontal Centre Adjustment

- Receive RETMA pattern signal.
- Adjust VR401 so that the horizontal centre of the picture may be coincident with the mechanical centre of CRT.

### Focus Voltage Adjustment

- Receive RETMA pattern signal.
- Adjust the FOCUS VOLUME on the FBT and make the picture on the screen be finest.

### RF AGC Adjustment

- Receive PAL COLOUR BAR signal in the VHF high band where the strength of signal can be 60 - 65 dB.
- Set the CONTRAST control to MAX., the BRIGHTNESS control to provide adequate black and grey scales.
- Maintain the fine tuning on the screen, and adjust VR101 (AGC DELAY CONTROL VR.) in order that it may be located on the position which the picture noise disappear on the image.

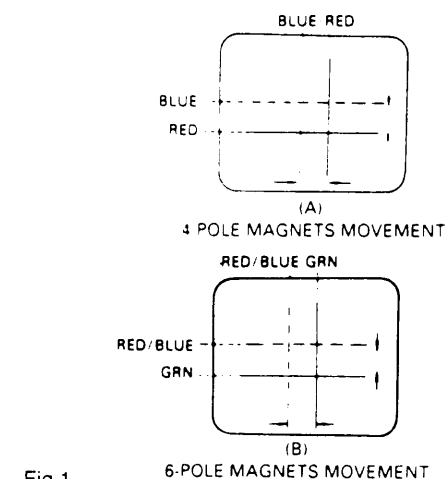


Fig 1.

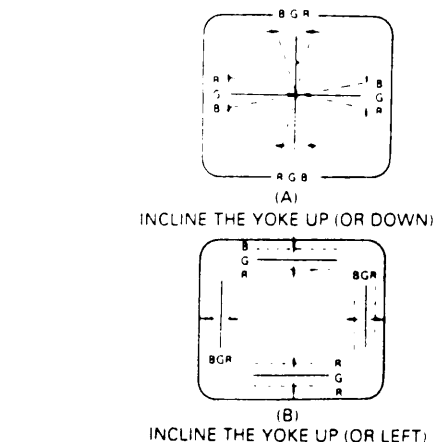


Fig 2.

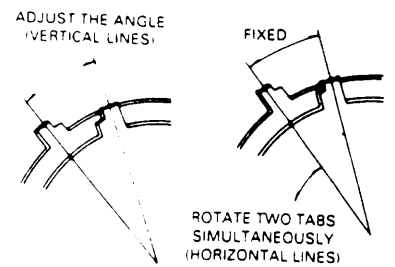


Fig 3.

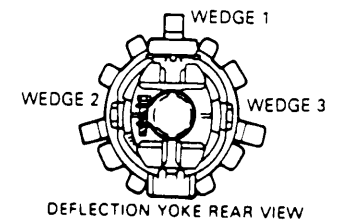


Fig 4.

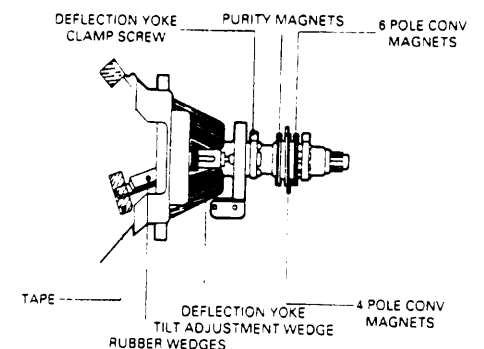


Fig 5.

### PIF Adjustment

#### Apparatus Connection and Presetting

##### 1: Connection:

- Disconnect SLIT 1.
- Connect H-out of LSW-480 to X-axis of the oscilloscope and V-out of LSW-480 to Y-axis of the oscilloscope.
- Connect the sweep signal output to TP1.
- Set ATTENUATOR of LSW-480 to 30dB.
- Supply 15v D.C. voltage (B+) to TP4.
- Supply 4-5v D.C. voltage to TP3.
- Connect wire lead between cathode of D401 and I402 #3.

##### Preset:

- Oscilloscope Scaling:
  - Put the scale of X and Y of the oscilloscope to D.C. level.
  - Set the horizontal time display to X-Y.
  - Put horizontal axis (X) to 1V/div. and the vertical axis (Y) to 2V/div.

##### 2: LSW-480 MARKER FREQ. SETTING

	f <sub>(n+1)</sub>	f <sub>s</sub>	f <sub>c</sub>	f <sub>p-2</sub>	f <sub>p</sub>	f <sub>s(n-1)</sub>
P.S. B/G. LL	31.9	33.4	34.47	36.9	38.9	40.4
P.S. B/G. P-I	31.9	33.4	34.47	36.9	38.9	40.4
P-I	31.9	33.5	35.07	37.5	39.5	41

##### 2: Adjustment of AFT (B/G, L)

- Connect the test point of LSW-480 to TP2.
- Adjust L103 (AFT COIL) so that the P marker point is located on the reference level.

## Service Adjustments Cont'd.

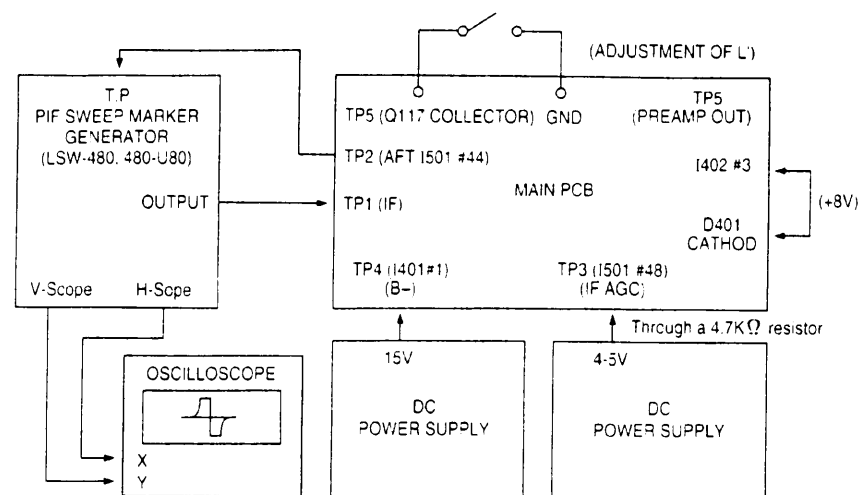


Fig 6. Connection for PIF Adjustment

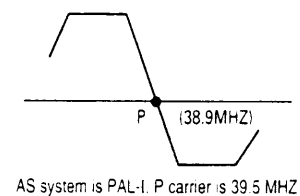


Fig 7.

## 3: Adjustment of SECAM -L' AFT

- 1: Connect TP5 (Q117 COLLECTOR) to GND.

- 2: Adjust VC101 (L'AFT TRIMMER) so that the C marker point (34.47MHz) is located on the reference level.

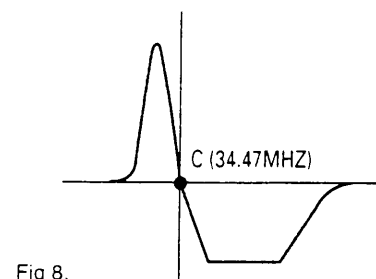
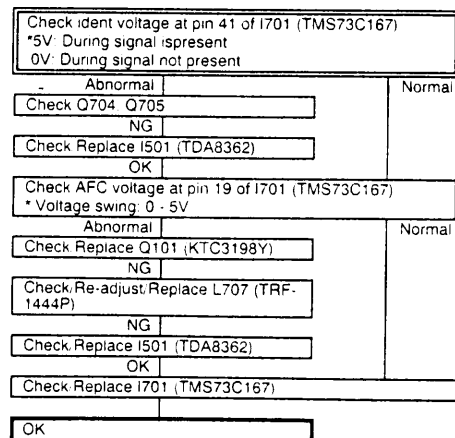


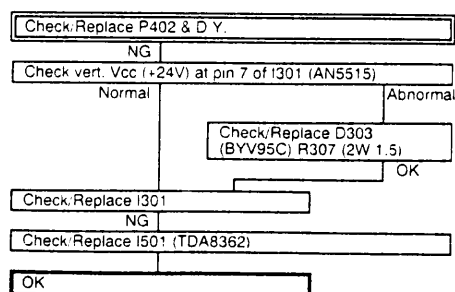
Fig 8.

## Trouble Shooting Guides

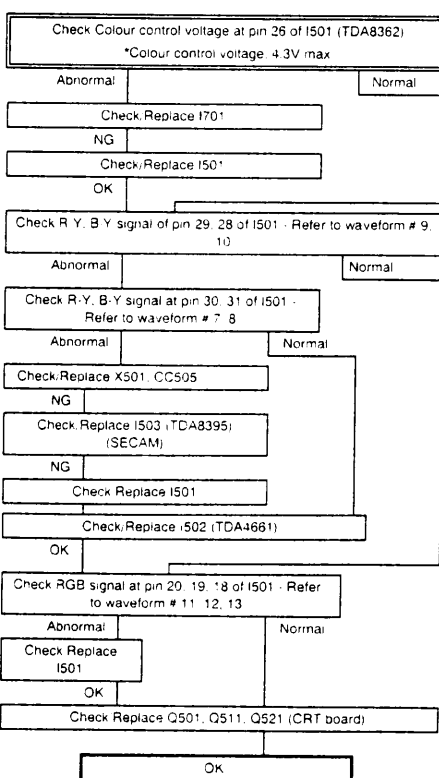
## Auto Search Trouble (Channel Skip)



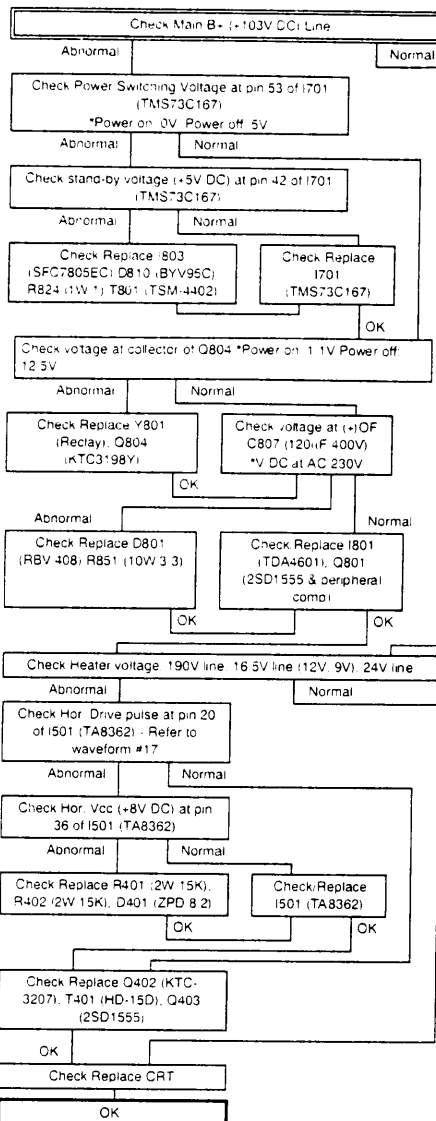
## No Vertical Scanning (One horizontal line on screen)



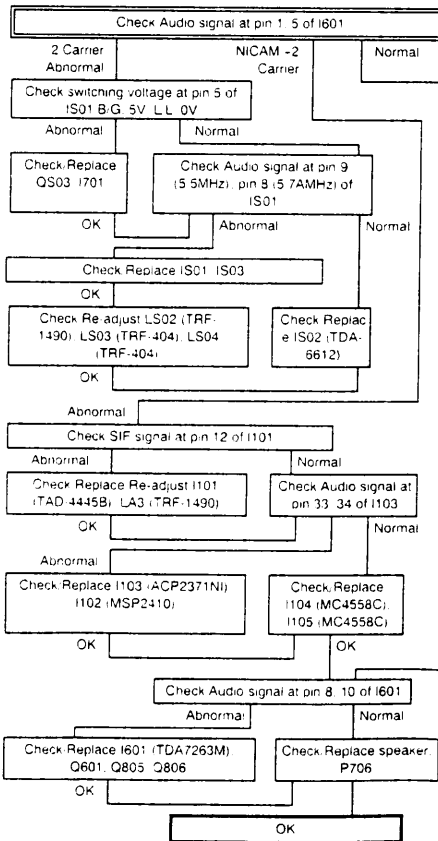
## No Colour



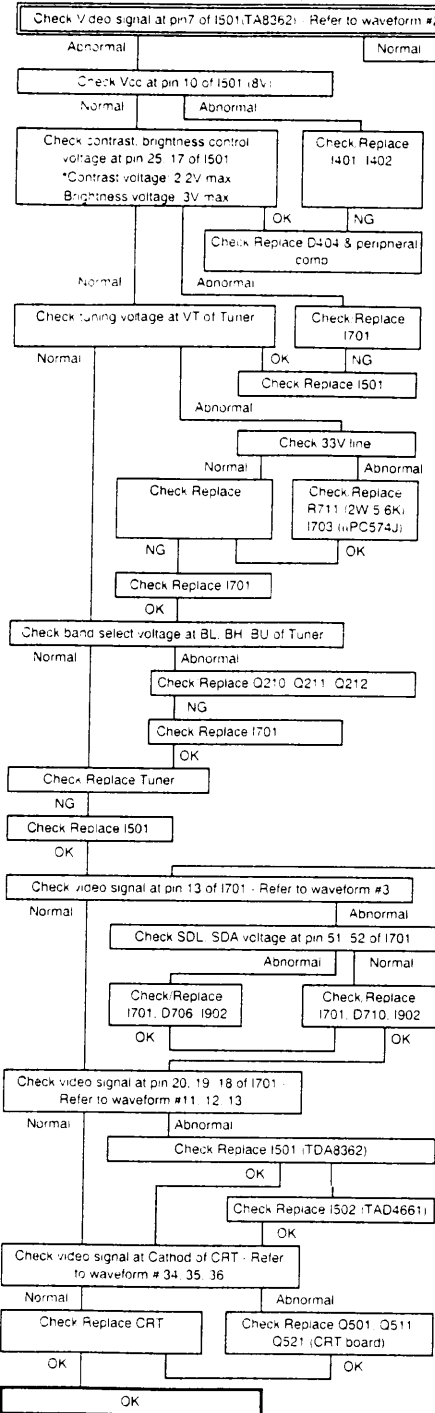
## No Raster



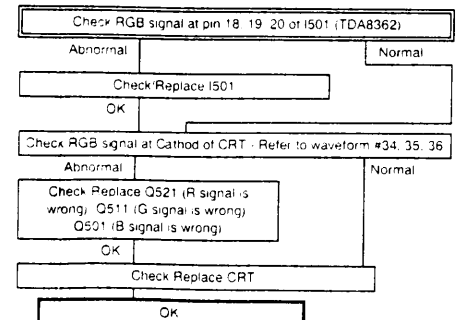
## No Sound (Picture OK)



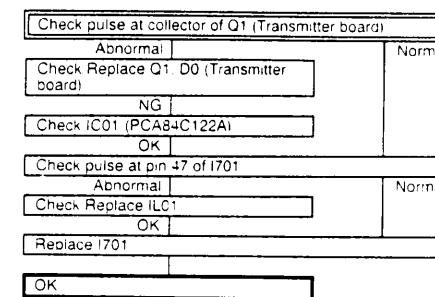
## No Picture (Raster OK)



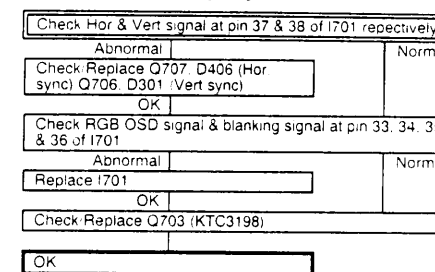
## No Specific colour



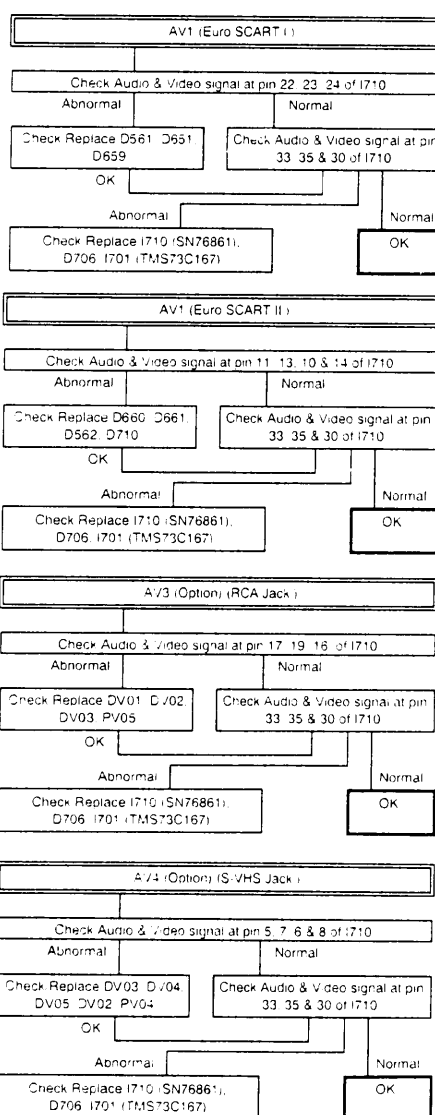
## Remote Control Trouble (Local Control OK)



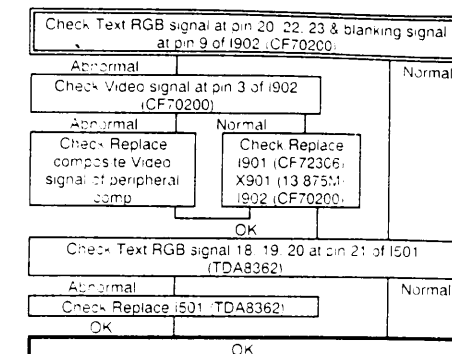
## On-screen Display



## No External AV



## No Teletext



## IC/TR DC Voltage Charts

IC 1702 (TDA8362)		IC 1701 (TMS73C167)	
Pin No.	V (DC)	Pin No.	V (DC)
1	3	1	4
2	5.9	2	0
3	5.9	3	4
4	0	4	4
5	0	5	4
6	0	6	4.4
7	3.2	7	1.3
8	1.9	8	0
9	0	9	0
10	0	10	0
11	0	11	11
12	3.5	12	11
13	0	13	0
14	4.7	14	0
15	4	15	0
16	8	16	0
17	3	17	0
18	1.5	18	0
19	1.5	19	2.8
20	1.9	20	0
21	0.3	21	5
22	4	22	5
23	4	23	5
24	5	24	5
25	2.2	25	5
26	4.3	26	5
27	5.7	27	5
28	3.9	28	0
29	3.9	29	5
30	1.5	30	5
31	1.5	31	5
32	1.7	32	5
33	4.7	33	0
34	2.9	34	0
35	2.1	35	0
36	8.2	36	0
37	0.4	37	0
38	0.5	38	5
39	2.7	39	5
40	3.8	40	5
41	2.2	41	0
42	2.9	42	5
43	2.6	43	0
44	3.8	44	1.9
45	4	45	2.5
46	4	46	5
47	3.2	47	0
48	4.3	48	5
49	1.5	49	5
50	3.7	50	5
51	4.6	51	5
52	6.6	52	5
		53	0
		54	5

IC 1502 (TDA4661)		IC 1503 (TDA8395)	
Pin No.	V (DC)	Pin No.	V (DC)
1	5.6	1	1.7
2	0	2	1.2
3	0	3	8.2
4	0	4	0
5	0.5	5	0
6	0	6	0
7	0	7	3
8	0	8	4.2
9	5.6	9	1.5
10	0	10	1.5
11	3.3	11	0
12	3.3	12	0
13	0	13	0
14	0	14	0
15	0.5	15	0.5
16	5.7	16	5.7

IC/TR DC Voltage Charts Cont'd.

IC 1504 (LA7950)

Pin No.	V (DC)
1	5
2	11.8
3	11
4	11.2
5	0
6	0
7	0
8	0
9	0
10	0

IC 1901 (CF72306)

Pin No.	V (DC)
1	0.9
2	1.2
3	1.3
4	0
5	2
6	3
7	5
8	1.1
9	0
10	1.7
11	0
12	0
13	0
14	0
15	2.6
16	5
17	3.5
18	0
19	0
20	0

IC 1601 (TDA7263M)

Pin No.	V (DC)
1	1.5
2	1.5
3	12
4	1.5
5	1.5
6	0
7	0
8	10.8
9	22
10	10.8
11	0

IC 1301 (AN5515)

Pin No.	V (DC)
1	0
2	11.7
3	27
4	1.4
5	0
6	0.9
7	27

IC 1801 (TDA4601)

Pin No.	V (DC)
1	4
2	0
3	2
4	2.3
5	7
6	0
7	2
8	1.9
9	13

IC 1701 (SN76861)

Pin No.	V (DC)
1	6.3
2	2.3
3	6.3
4	1.9
5	6.3
6	6.3
7	6.3
8	0
9	5.3
10	1.9
11	6.3
12	1.9
13	6.3
14	3
15	5.3
16	1.9
17	1.3
18	1.9
19	6.3
20	3.0
21	5.3
22	6.3
23	1.9
24	6.3
25	0
26	5
27	5
28	0
29	0
30	3.8
31	0
32	0
33	5.8
34	0
35	5.8
36	5.8
37	6.2
38	2.5
39	11.8
40	3.2

Main board

Loc No.	V (DC)		
	E	C	B
Q101	3.3	7.7	0
Q102	1	8.9	1.7
Q113	0.8	4.9	1.4
Q116	0	0.5	0
Q117	11.8	0	11.8
Q118	11.7	0	11.7
Q202	0	0	0
Q203	0	7.7	0
Q204	0	3.7	0
Q205	2	7.4	2.6
Q210	11.6	0	11
Q211	11.6	11	11.6
Q212	11.6	0	11
Q221	0	4.7	0
Q250	0	6.3	0
Q401	0	2	0
Q402	0	3.6	0.5
Q601	1.8	11.6	2
Q610	0	13	0
Q701	0	6.5	1.4
Q702	0	1.4	1.4
Q703	0	5	0
Q704	0	0	5
Q705	1	0	5
Q706	0	4.7	0
Q707	0	4	0
Q709	7.8	7.8	7.2
Q710	0	0	0.6
Q711	3.1	11.3	3.7
Q712	0	0	5
Q803	0	0.6	0
Q804	0	0.6	0
Q805	12	12	0
Q806	0	13	0

CRT Board

Loc No.	V (DC)		
	E	C	B
Q501	2	145	2.6
Q511	2	145	2.6
Q521	2	145	2.6
Q502	2	146	2.6
Q512	2.9	0	2.2
Q522	2.9	0	2.2

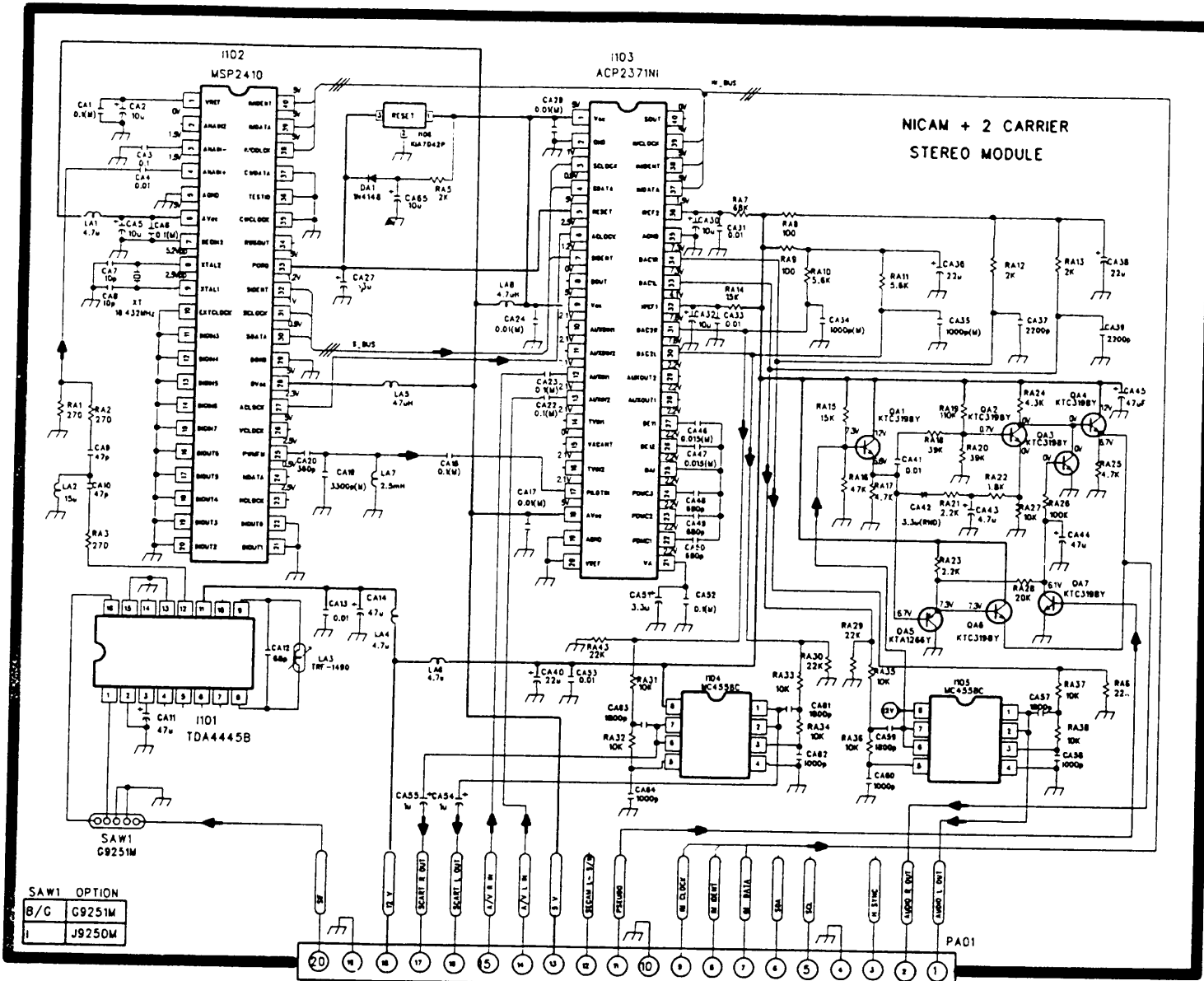
NICAM Board

Loc No.	V (DC)		
	E	C	B
QA01	6.6	12	7.3
QA02	0	0	0.7
QA03	0	0	0
QA04	6.7	12	0
QA06	6.7	12	7.3
QA07	0	6.1	-

Carrier Board

Loc No.	V (DC)		
	E	C	B
QS01	0	0.1	0.6
QS02	0	2.6	0
QS03	0	4.8	0

NICAM Diagram



Different Parts for System / Size Model & Diode Option

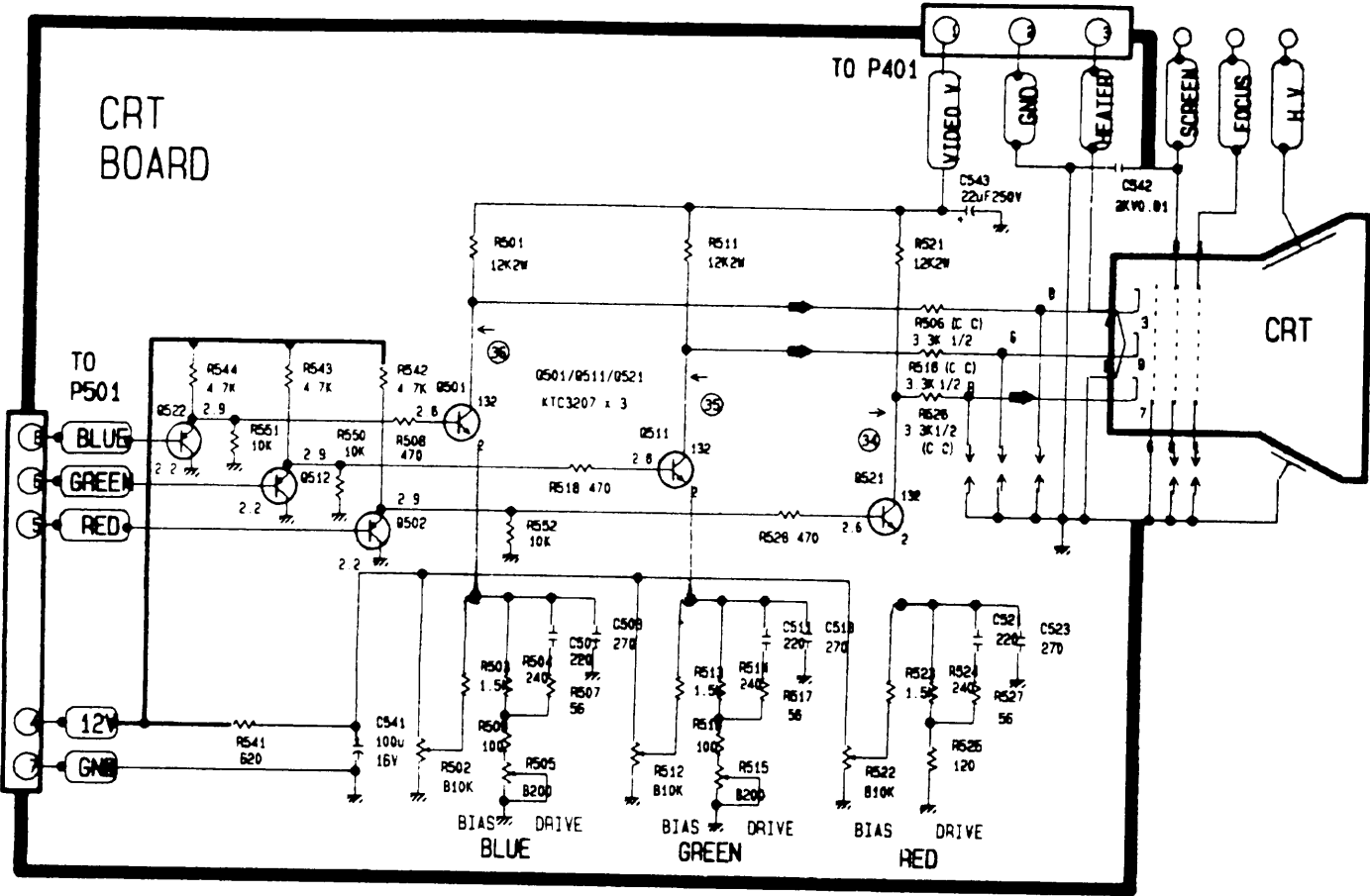
No.	Loc.	20"		
1	CRT	Orion	Samsung	Polikolor
		A48JLL90	A48ECR11X16	A48EEV33X01
2	CRT Socket	ISM-01	CTV3240-0501	CTV3240-0501
3	D/Coil	DC-2050	DC-2050	DC-2050
4	L402	DCF-2217J	FSA17013M	FSA26012M
5	L402	L-102	L-62	L-76
6	R414	2W 6.8(F)	2W 2.7(F)	2W 2.7(F)
7	Ground Assy	48519A2010	-	-
8	C407	1.6KV 6900	1.6KV 8200	1.6KV 7500
9	C408	2KV 1000	2KV 470	-
10	C409	2000V 0.47	200V 0.15	200V 0.39
11	R801	PTH451C202 BG180N270	PTH451C202 BG180N270	PTH451C202 BG180N270

No.	Loc.	21"		
1	CRT	Orion	Philips	Samsung
		A51JSW90X	A51EAL55X01	A51EER11X40
2	CRT Socket	ISM-03	CTV3240-0501	CTV3240-0501
3	D/Coil	DC-2070	DC-2070	DC-2070
4	L402	DCF-2217L	FSA17013M	FSA17013M
5	L402	L-102	L-76	L-102
6	R414	2W 6.8(F)	2W 6.8(F)	2W 6.8(F)
7	Ground Assy	4851900410	-	-
8	C407	1.6KV 8200	1.6KV 8200	1.6KV 8200
9	C408	-	-	-
10	C409	2000V 0.33	200V 0.47	200V 0.36
11	R801	PTH451C262 BF140M270	PTH451C262 BF140M270	PTH451C262 BF140M270

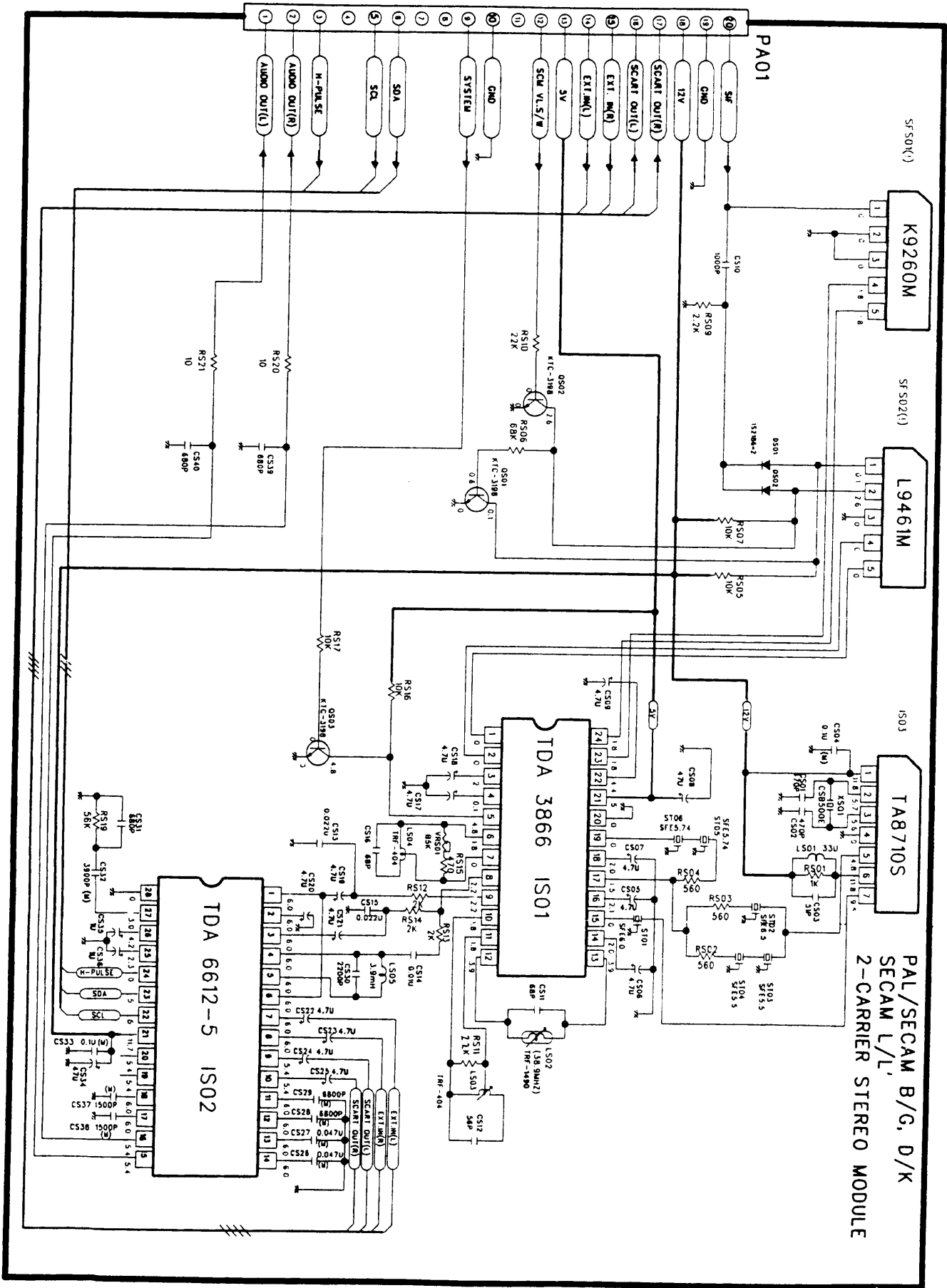
Diode Option		
D743/D744	X/X	3AV System
	X/O	2AV System
	O/X	1AV System
	O/O	4AV System
D746	X	2-Carrier
	O	NICAM + 2-Carrier
D747/D740	X/X	FLO1/Top (8 page)
	X/O	No Text
	O/X	FLOF (4 page)
D739/D750	X/X	West Text
	X/O	East
	O/X	Turkish
D749/D748	X/X	Three Band
	O/X	Four Band
	X/O	UHF Only
D741	O	OSD by character
	X	OSD by symbol
D738X	X	Single System
	O	SECAM UL

Loc	CRT	Head Phone Jack	Control Door	Independent Control PCB
TS	Orion CRT			
TSP	Philips CRT Samsung WF CRT			
TSP	Polikolor CRT			
Loc	Inch	Head Phone Jack	Control Door	Independent Control PCB
DTT-2195	21"	Yes	No	Yes
DTT-21C1	21"	Yes	No	Yes
DTT-21B1	21"	Yes	No	Yes
DTT-2166	21"	No	Yes	No
DTT-20C1	20"	No	No	Yes
DTT-20B1	20"	No	No	Yes
DTT-2066	20"	No	Yes	No
DTT-2075	20"	No	Yes	No

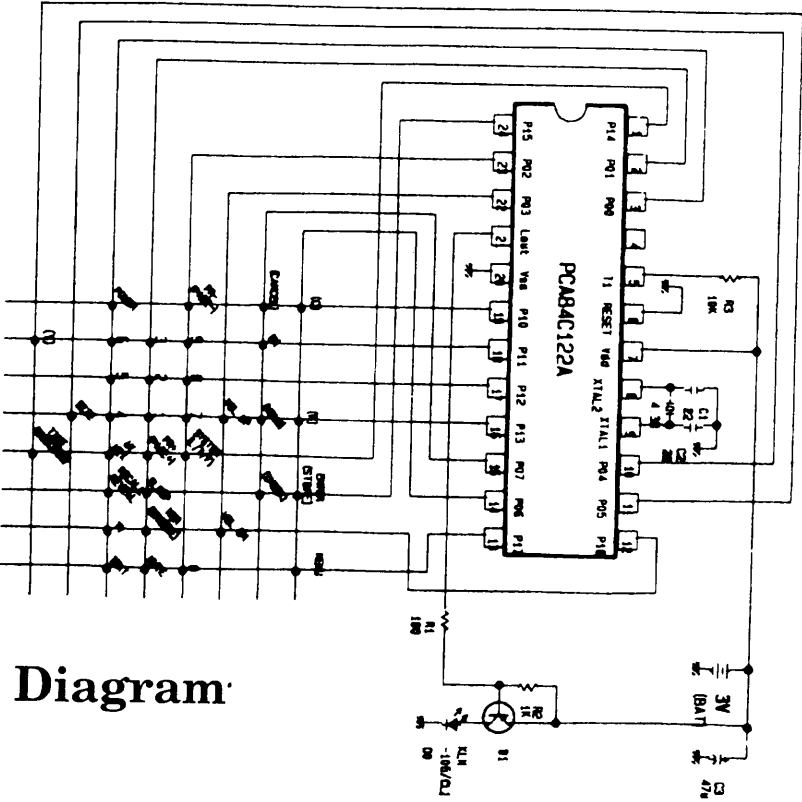
CRT Diagram



PAL Secam Diagram



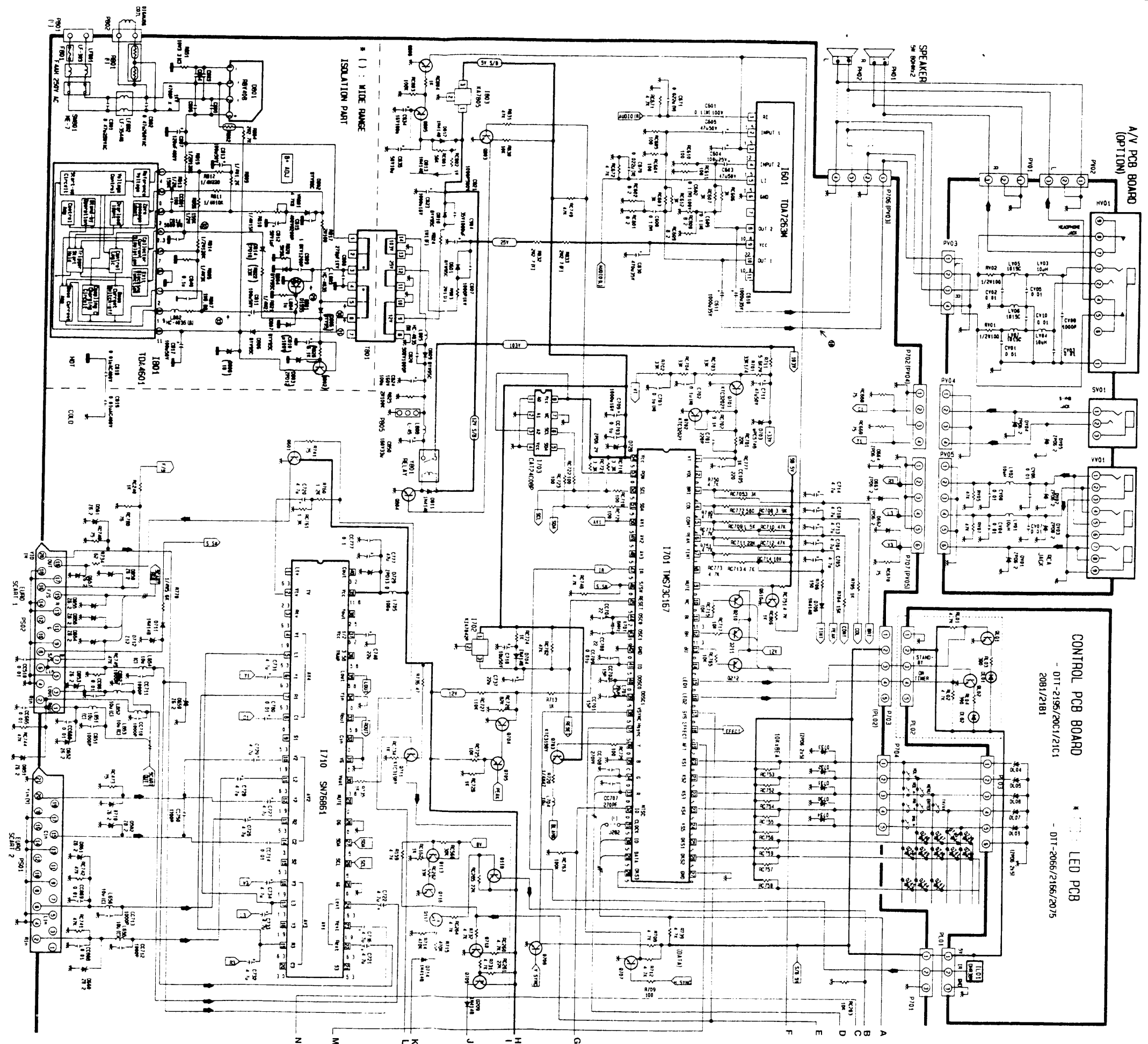
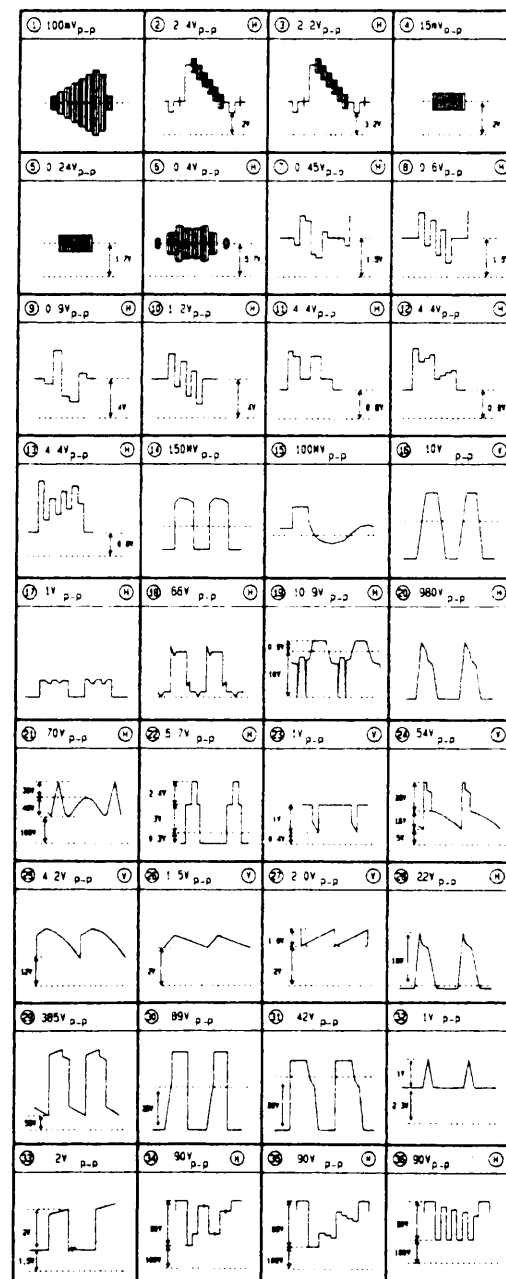
Remote Control Diagram



## Main Diagram

## Waveforms

INPUT SIGNAL : PAL SYSTEM  
VIDEO : 8 STEP COLOR BAR 87.5% AM  
AUDIO : 1KHZ SINE WAVE 60% FM





## Main Diagram Cont'd.

