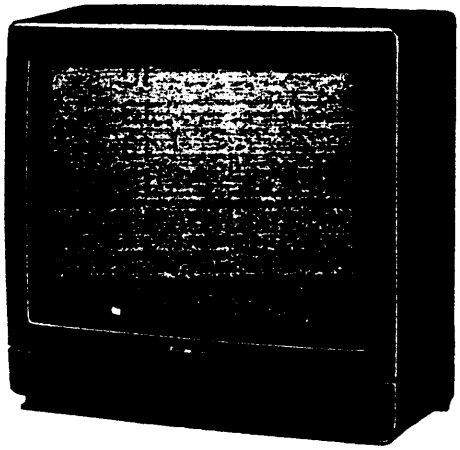
ORDER NO. ITD9106059C6

Service Manual

Color Television

TC–21L1PX

NMX–M16SA chassis



Specifications

Power Source : AC Automatic Voltage Selection 120 – 240 V, 50 / 60 Hz

Power Consumption : 125 W (Max.) 17.0 W (Stand–by condition)

Aerial Impedance : 75 Ω unbalanced, Coaxial type

Receiving System : 21 Systems

Receiving Channels :

VHF Band	2 – 12	(PAL / SECAM – B)
	1 – 12	(PAL / SECAM – D)
	1 – 12	(NTSC – M Japan)
	2 – 13	(NTSC – M U. S. A.)
UHF Band	21 – 69	(PAL – G , I / SECAM – G)
	21 – 69	(SECAM – K)
	13 – 56	(PAL – D)
	13 – 62	(NTSC – M Japan)
	14 – 69	(NTSC – M U. S. A.)
CATV	U. S. A.	
	VHF Band	(4 + (formerly 5A), ICC5, ICC6)
	Mid Band	(A – 5 ~ A–1, A ~ I)
	Super Band	(J –W)
	Hyper Band	(AA ~ ZZ, AAA, BBB)
	Ultra Band	(65 –94)
	Europe	S1 ~ S3, M1 ~ M10

Intermediate Frequency :

Video	38.0 MHz	
Sound	31.5 MHz	(D, K)
	32.0 MHz	(I)
	32.5 MHz	(B, G)
	33.5 MHz	(M)
Color	33.57 MHz	(PAL)
	33.60 MHz	(SECAM)
	33.75 MHz	(SECAM)
	34.42 MHz	(NTSC)

Video / Audio Terminals :

AV IN	Video (Phono)	1 Vp–p 75 Ω
	S–Video	Y : 1.0 Vp–p 75 Ω
		C : 0.3 Vp–p 75 Ω
	Audio (Phono)	Approx. 400mV
Monitor OUT	Video (Phono)	1 V p–p 75 Ω
	Audio (Phono)	Approx. 400mV

High Voltage : 27.9 kV (+1.0, –1.0) kV at zero beam current

Picture Tube : A51JCC90X Type 21 (54 cm) measured diagonally , 90° deflection

Audio Output :

Internal Speaker: 3 W (Max.) Impedance 16 Ω

Speaker : 2 speaker system

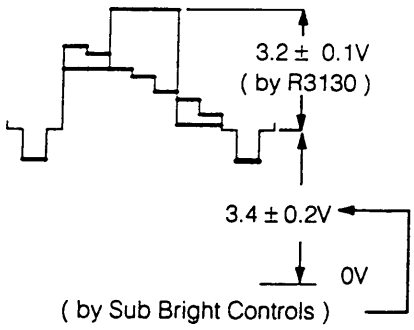
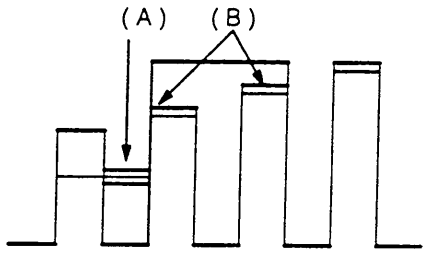
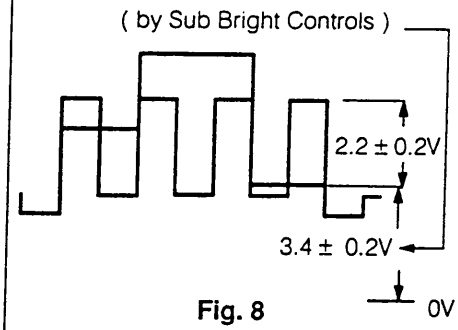
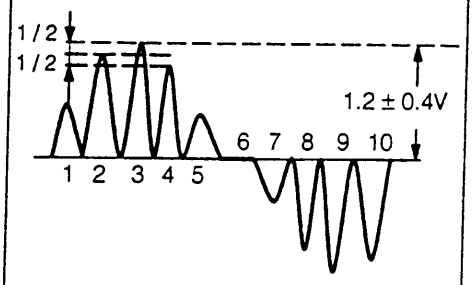
Dimensions : Height : 47.5 cm Width : 51.0 cm Depth : 43.7 cm

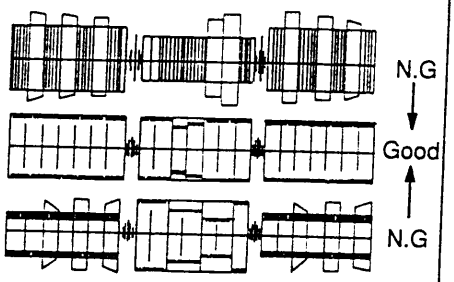
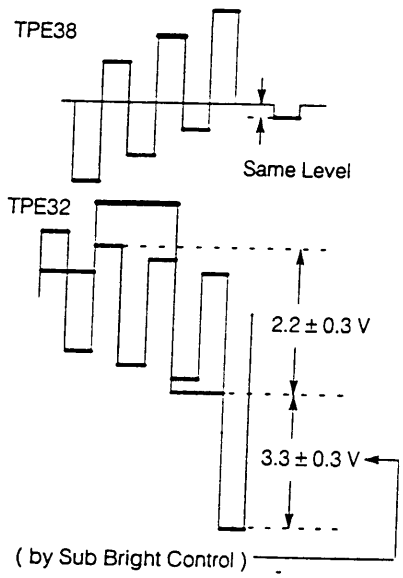
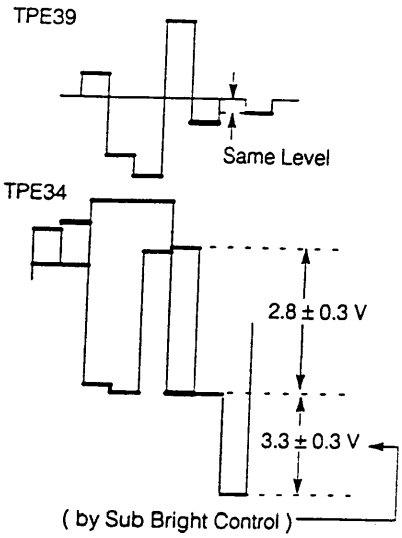
Mass : 22.5 kg (Net)

Accessories supplied : Remote Controller x 1 " R6 " Battery x 2

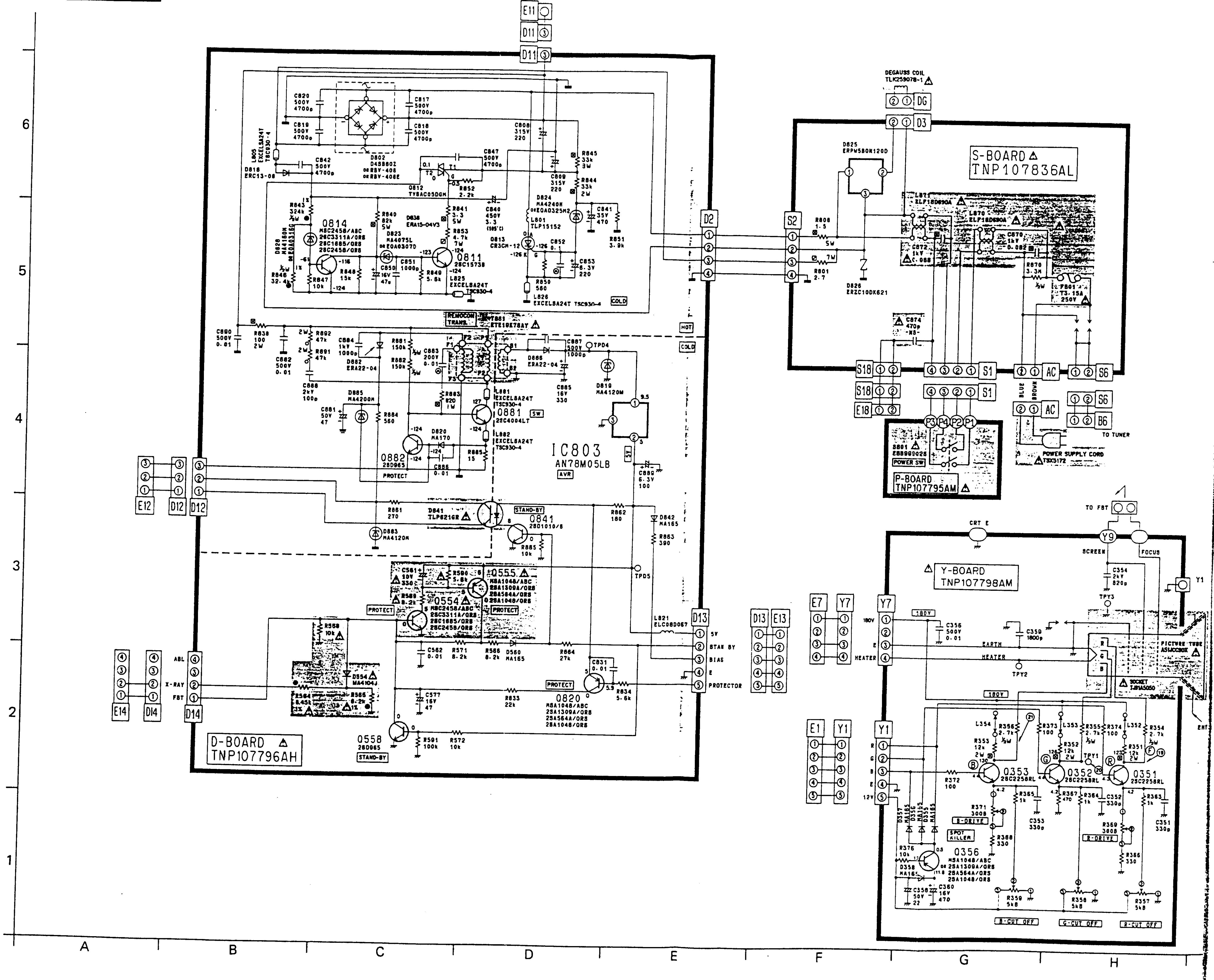
Specifications are subject to change without notice.
Mass and dimensions shown are approximate.

Panasonic.

Item / Preparation	Adjustment Procedure	Waveform
Sub Contrast 1. Receive a color bar pattern. 2. Connect an oscilloscope to TPE32. 3. Connect a short jumper between TPD11 and TPD12. 4. Select the " PICTURE 1 " (Standard) by picture menu button and push Normal button.	1. Adjust Sub Bright Control : 3.4 ± 0.2 V 2. Adjust Sub Contrast control (R3130) : 3.2 ± 0.1 V (Waveform should not be saturated.)	 **Fig. 6**
Delay Line 1. Receive PAL color bar pattern. 2. Connect an oscilloscope to TPE32. 3. Select the " PICTURE 1 " (Standard) by picture menu button and push Normal button.	1. Adjust the position (A) shown in **Fig. 7** to zero level by R611. 2. Minimize the difference (B) shown in **Fig. 7** by L601.	 **Fig. 7**
PAL Color Output 1. Receive PAL color bar pattern. 2. Connect an oscilloscope to TPE32. 3. Connect a short jumper between TPD11 and TPD12. 4. Select the " PICTURE 1 " (Standard) by picture menu button and push Normal button.	1. Adjust Sub Bright Control : 3.4 ± 0.2 V 2. Adjust Sub Color control (R672) : 2.2 ± 0.2 V 3. Connect the oscilloscope to TPE34. 4. Confirm that the amplitude of waveform 2.8 ± 0.5 V	 **Fig. 8**
NTSC / Modified NTSC Color Adjustment 1. Apply NTSC rainbow pattern. 2. Connect an oscilloscope to TPE34. 3. Connect a short jumper between TPD11 and TPD12. 4. Select the " PICTURE 1 " (Standard) by picture menu button and push Normal button.	1. Confirm that the amplitude of waveform 1.2 ± 0.4 V o–p 2. Set Color control to maximum and confirm that the color level is saturated enough. 3. Set Tint control (DAC) to centre and adjust Sub Tint control (R674) to obtain waveform at TPE34 as shown in **Fig. 9**. 4. Set Tint control to maximum and confirm that the variable range is more than 15°. 5. Set Tint control to minimum and confirm that the variable range is more than 15°.	 **Fig. 9**

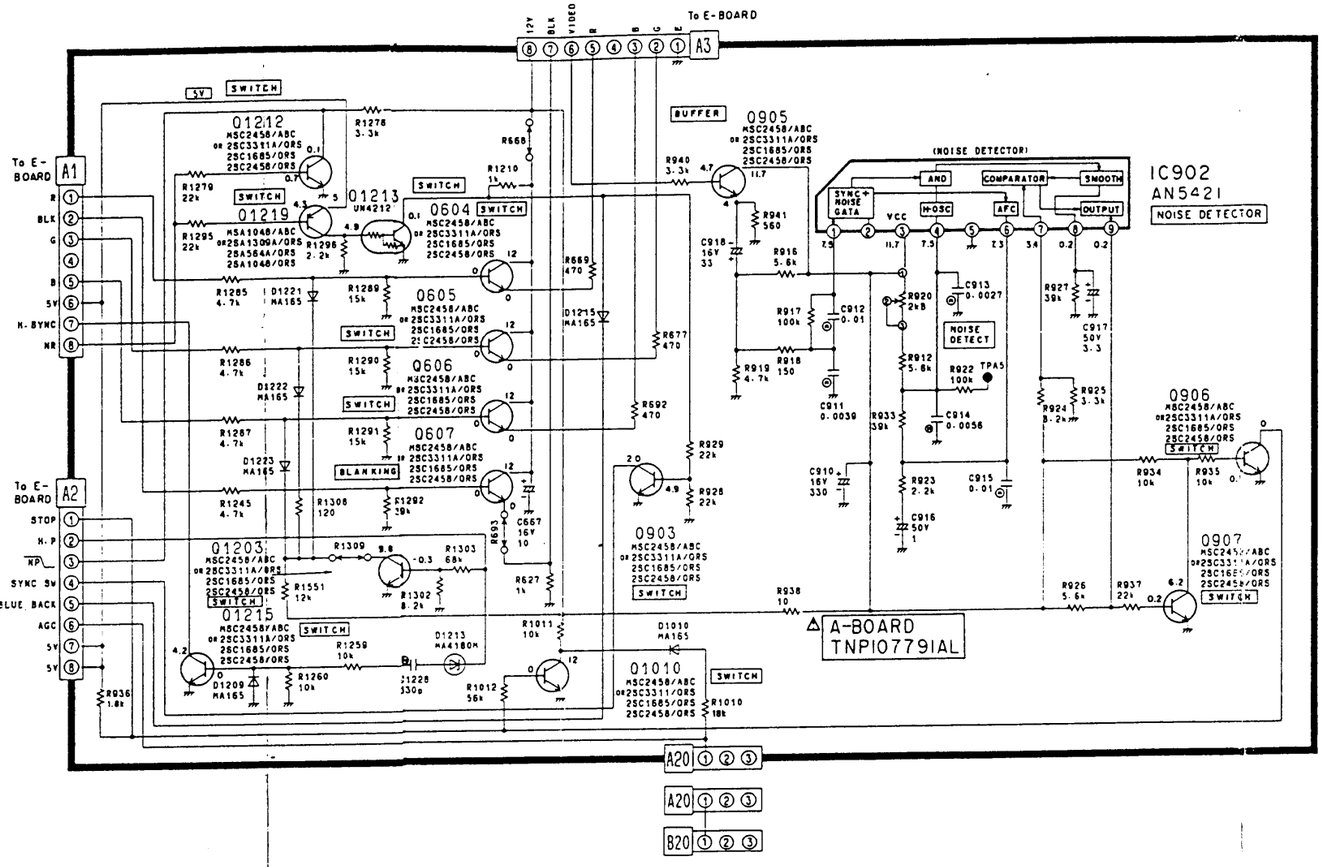
Item / Preparation	Adjustment Procedure	Waveform
Bell Filter / Line Discriminator 1. Receive SECAM color bar pattern. 2. Connect an oscilloscope to TPE36 through 10 kΩ resistor. 3. Set the System II switch to 5.5 MHz. 4. Push the Normal button for normal condition.	1. Adjust L653 to obtain waveform as shown in **Fig. 10** . 2. Connect a DC voltmeter to TPE35. 3. Adjust L652 to obtain voltage at TPE35 for maximum. 4. Make sure the voltage is more than 7V. 5. Confirm that the color output is normal.	 **Fig. 10**
SECAM Demodulator / Color Output – Blue 1. Receive SECAM color bar pattern. 2. Set the System I switch to SECAM. 3. Set the System II switch to 5.5 MHz. 4. Select PICTURE 1 (Standard) from picture menu and push the Normal button. 5. Connect an oscilloscope to TPE32 and TPE38.	1. Adjust L650 to obtain waveform at TPE38 as shown in **Fig. 11** . 2. Connect the oscilloscope to TPE32. 3. Adjust SECAM B–Color Gain control (R651) : 2.2 ± 0.3 V 4. Connect the oscilloscope to TPE38. 5. Confirm that the waveform is as shown in **Fig. 11** .	 **Fig. 11**
SECAM Demodulator / Color Output – Red **Note :** Before making this adjustment, " SECAM Demodulator / Color Output– Blue " adjustment must be finished. 1. Receive SECAM color bar patern. 2. Push the Normal button for normal condition. 3. Connect an oscilloscope to TPE34 and TPE39.	1. Adjust L651 to obtain waveform at TPE39 as shown in **Fig. 12**. 2. Connect the oscilloscope to TPE34. 3. Adjust SECAM R–color Gain control (R652) : 2.8 ± 0.3 V 4. Connect the oscilloscope toTPE39. 5. Confirm that the waveform is as shown in **Fig. 12**.	 **Fig. 12**

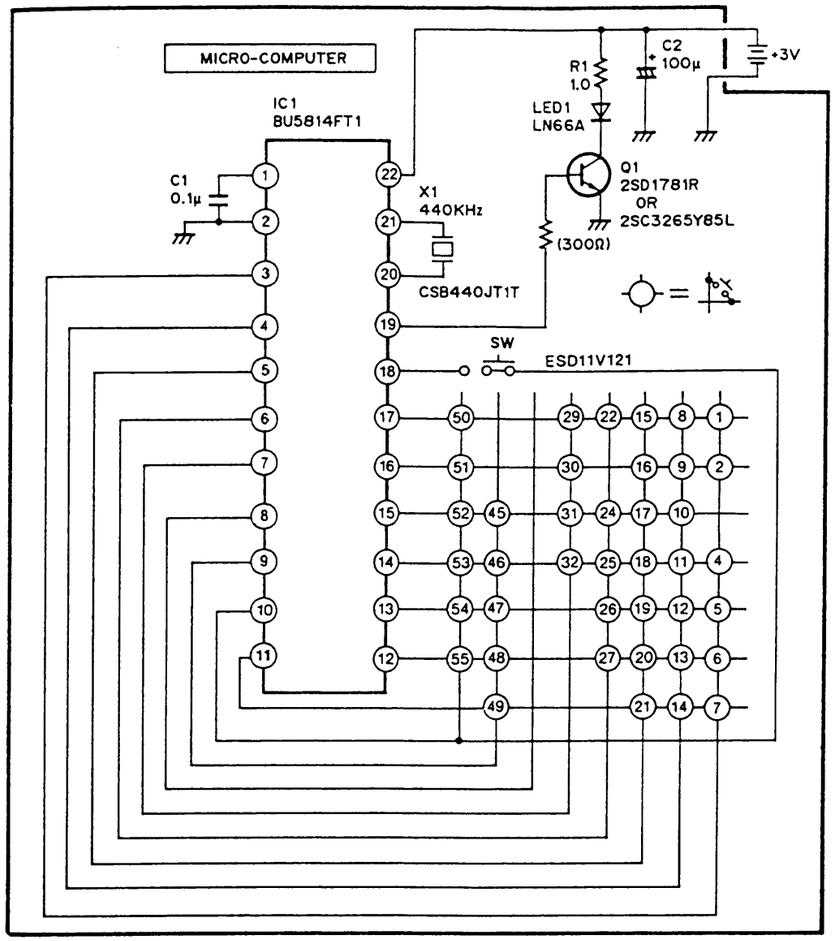
TC-21L1PX



D-BOARD TNP107796AH
S-BOARD TNP107836AL
P-BOARD TNP107795AM
Y-BOARD TNP107798AM
IC803
AN78M05LB
DEGAUSS COIL
POWER SUPPLY CORD
TO TUNER
PICTURE TUBE
HOT
COLD
PROTECT
STAND-BY
5V
STAND BY
BIAS
E
PROTECTOR
HEATER
EARTH
B-CUT OFF
G-CUT OFF
R-CUT OFF
A
B
C
D
E
F
G
H
1
2
3
4
5
6

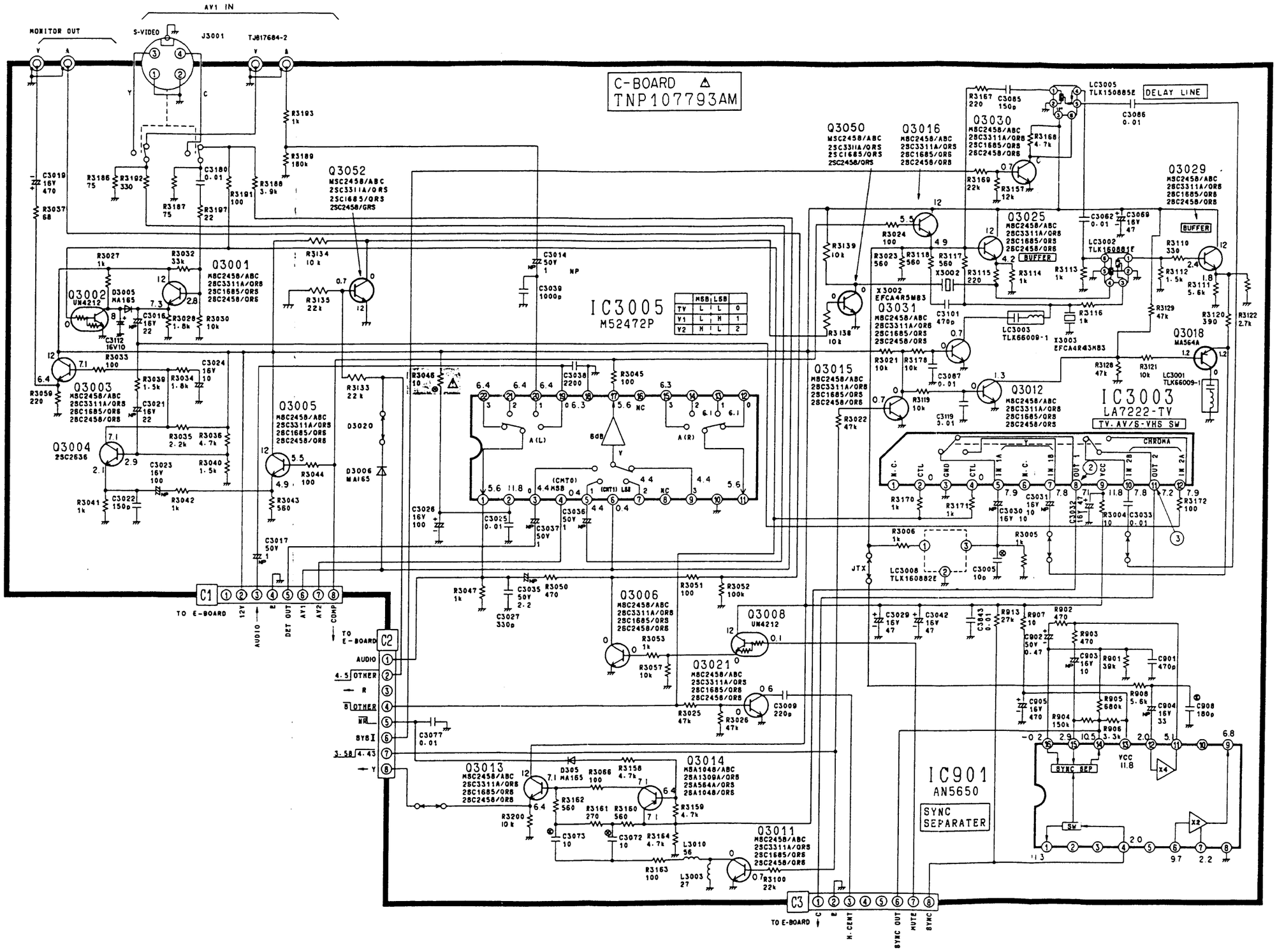
TC–21L1PX

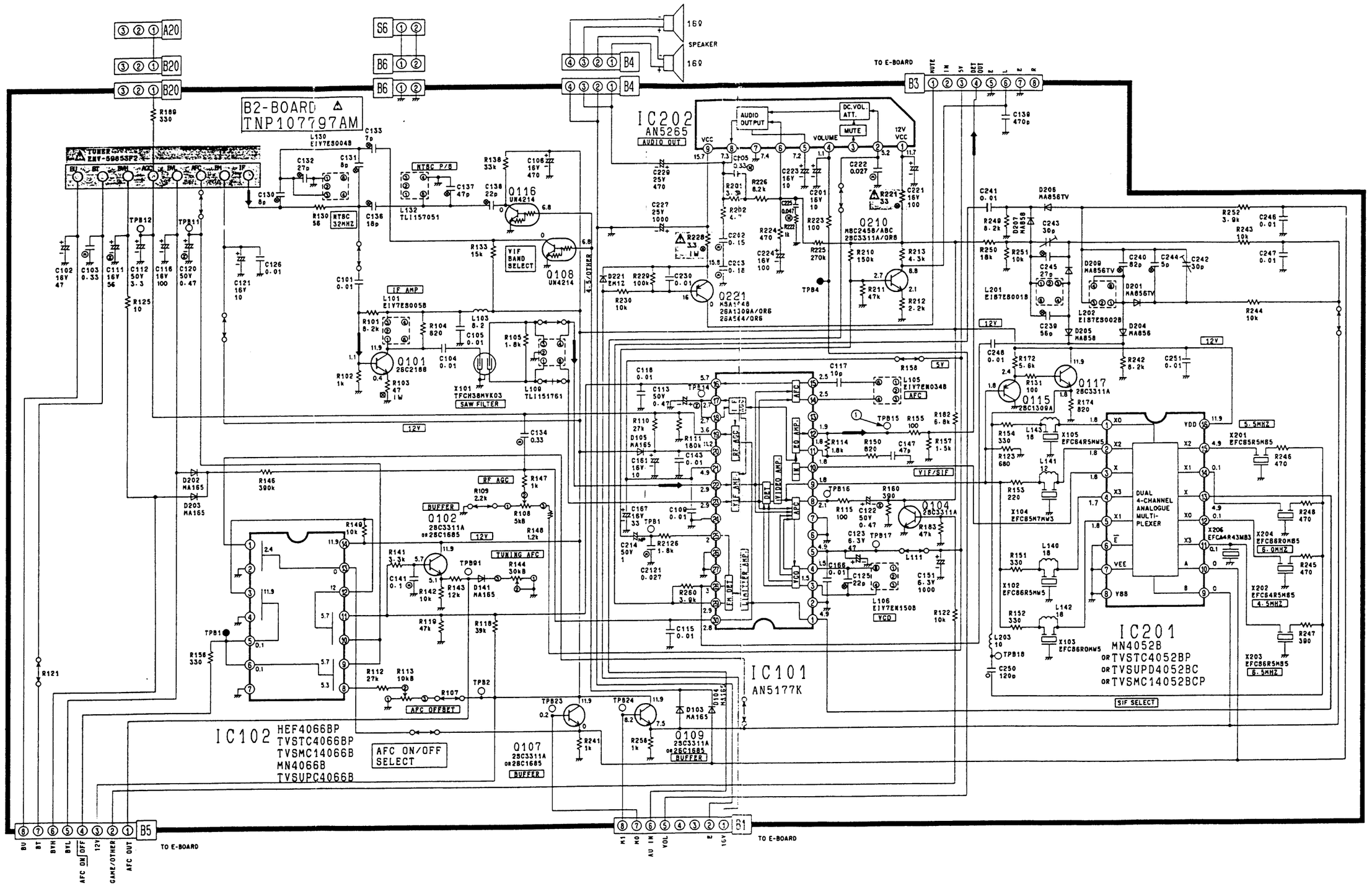


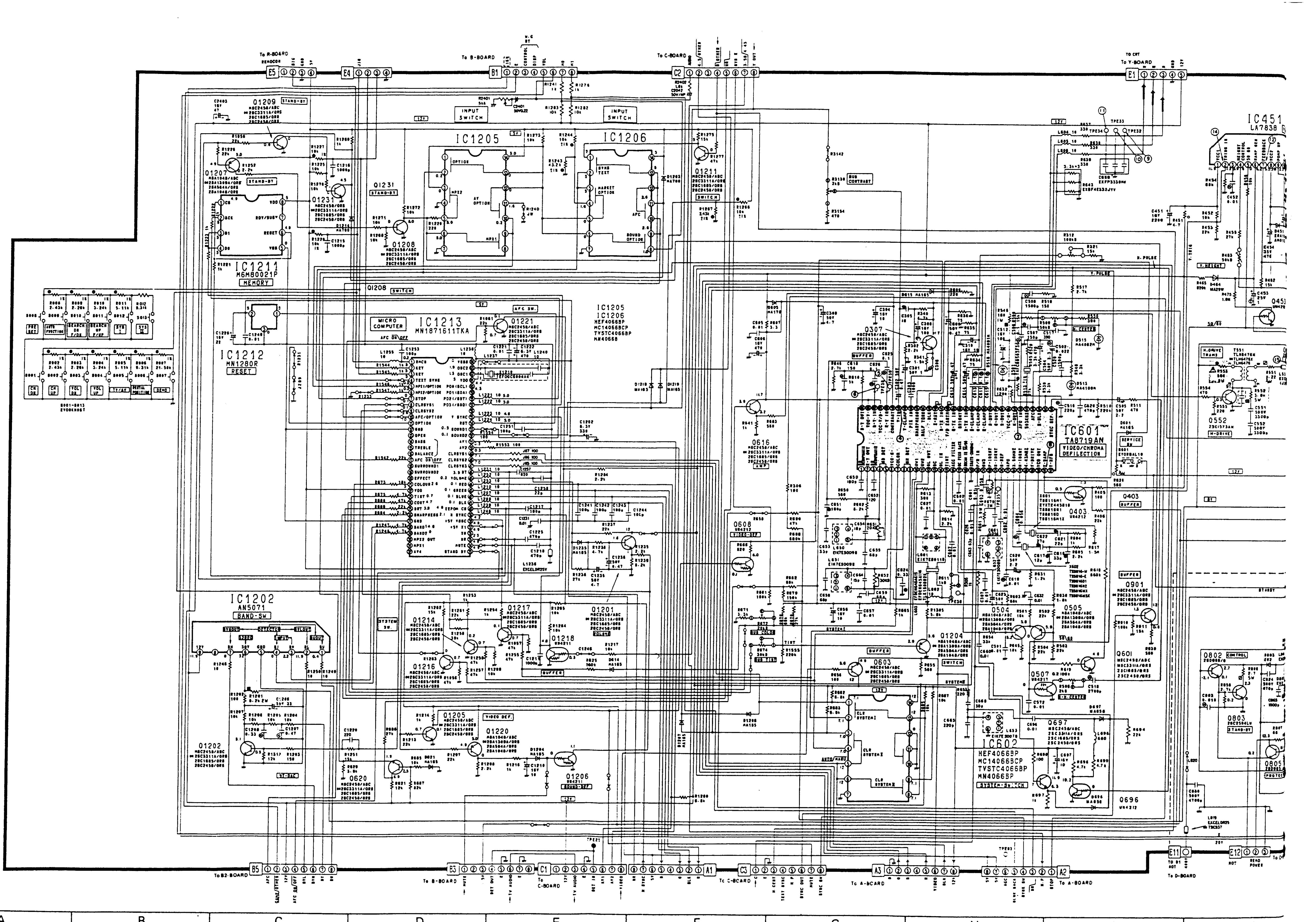


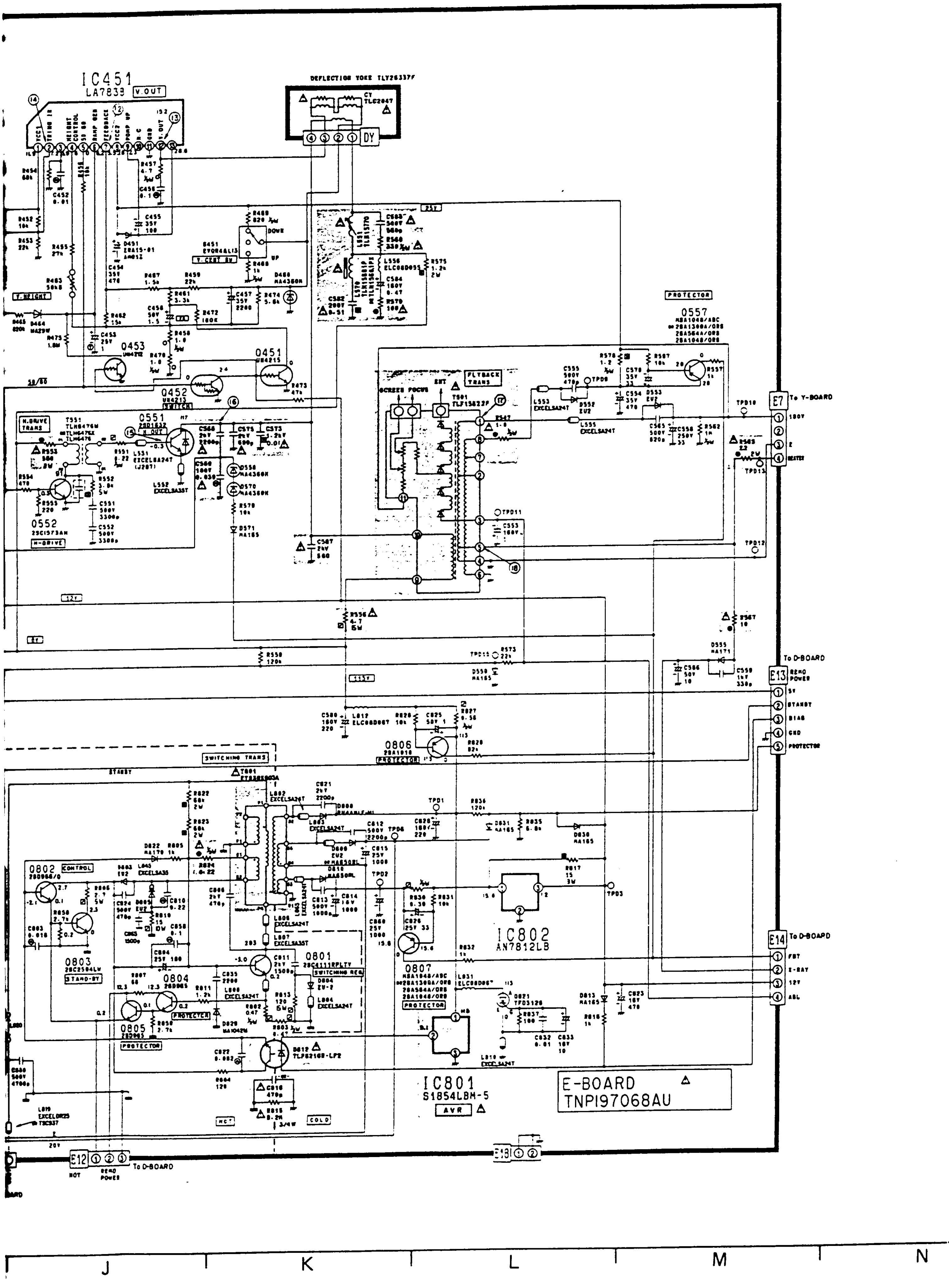
KEY FUNCTION TABLE

KEY NO.	DATA CODE	FUNCTION	KEY NO.	DATA CODE	FUNCTION	KEY NO.	DATA CODE	FUNCTION
1	0F	OFF TIMER	16	20	VOL. UP.	45	33	SOUND SELECT
2	05	TV/AV	17	39	RECALL	46	35	VCR CH. DN.
—	—	———	18	19	0	47	34	VCR CH. UP.
4	3D	POWER	19	3B	–/– – (2DIGIT)	48	3D	VCR POWER
5	10	1	20	21	VOL. DN.	49	00	VCR STOP
6	11	2	—	—	———	50	06	VCR PAUSE
7	12	3	22	08	FUNC. UP.	51	0C	VCR ADVANCE
8	34	CH. UP.	24	0A	NR	52	08	VCR REC.
9	13	4	25	32	MUTE	53	02	VCR REW.
10	14	5	26	06	PICTURE FUNC.	54	0A	VCR PLAY
11	15	6	27	09	FUNC. DN.	55	03	VCR F.F.
12	35	CH. DN.	29	50	PICTURE MENU			
13	16	7	—	—	———			
14	17	8	—	—	———			
15	18	9	32	0C	NORMAL			


C-BOARD △
TNP107793AM
AV1 IN
MONITOR OUT
S-VIDEO
J3001
TJ817684-2
IC3005
M52472P
IC3003
LA7222-TV
TV. AV/S-VHS SW
IC901
AN5650
SYNC SEPARATER
DELAY LINE
BUFFER
Q3001
Q3002
Q3003
Q3004
Q3005
Q3006
Q3008
Q3011
Q3012
Q3013
Q3014
Q3015
Q3016
Q3018
Q3021
Q3025
Q3029
Q3030
Q3031
Q3050
Q3052
TO E-BOARD
C1
C2
C3

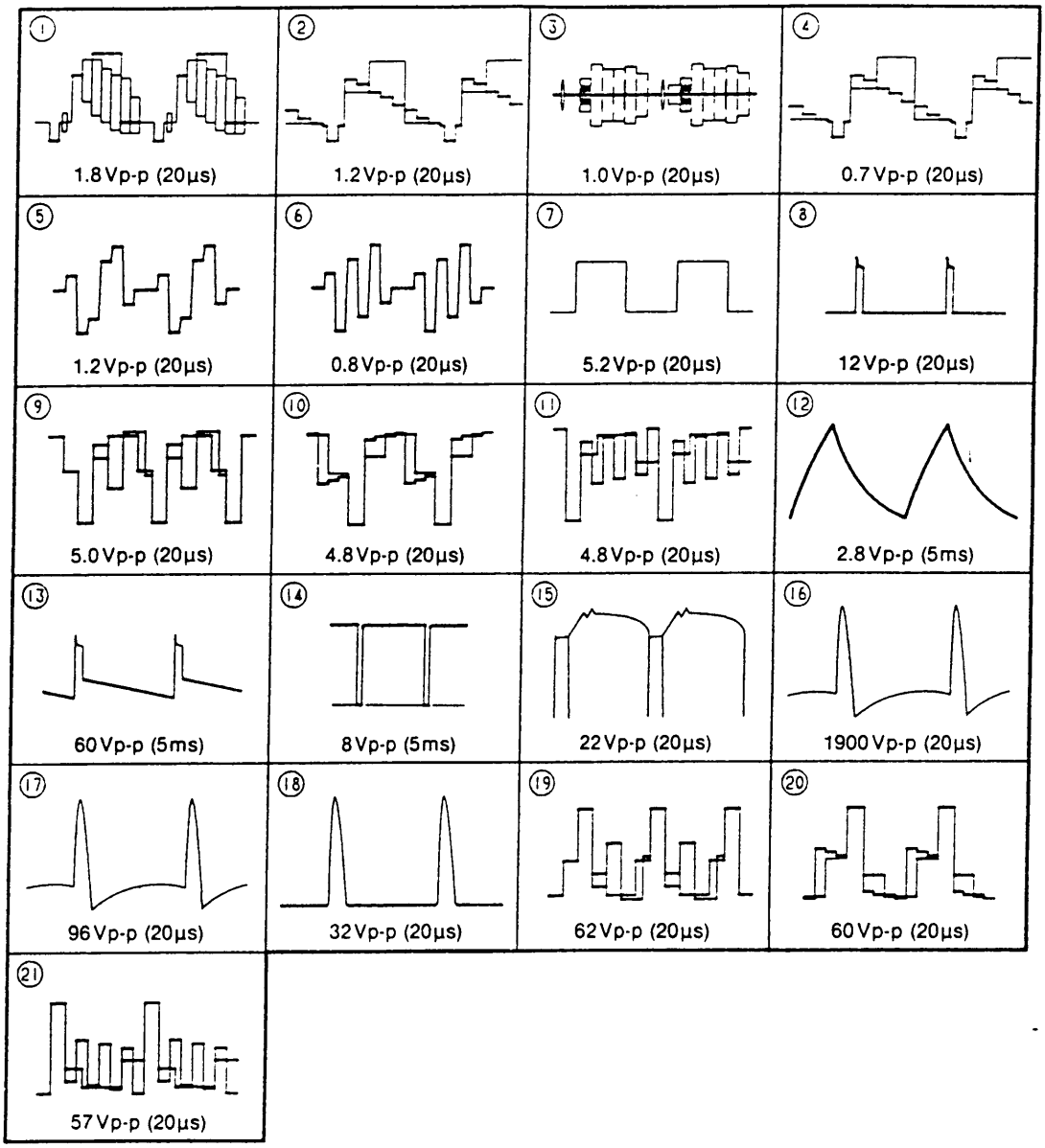

B2-BOARD △
TNP107797AM
IC202
AN5265
AUDIO OUT
IC101
AN5177K
IC102 HEF4066BP
TVSTC4066BP
TVSMC14066B
MN4066B
TVSUPC4066B
IC201
MN4052B
OR TVSTC4052BP
OR TVSUPD4052BC
OR TVSMC14052BCP
DUAL 4-CHANNEL ANALOGUE MULTI-PLEXER
SPEAKER
TO E-BOARD
SAW FILTER
AFC ON/OFF SELECT
SIF SELECT
VIF/SIF
VCO
BUFFER
TUNING AFC
RF AGC
AFC OFFSET
5.5MHZ
4.5MHZ
6.0MHZ
6.5MHZ


To R-BOARD
To B-BOARD
To C-BOARD
To CRT
To Y-BOARD
E5
E4
B1
C2
E1
INPUT SWITCH
IC1205
IC1206
IC451
LA7838
Q1209
STAND-BY
Q1207
Q1231
Q1211
Q1208
IC1211
M6M80021P
MEMORY
IC1212
MN1280R
RESET
MICRO COMPUTER
IC1213
MN1871611TKA
Q1221
AFC SW.
IC1205
IC1206
HEF4066BP
MC14066BCP
TV5TC4066BP
MN4066B
Q0307
BUFFER
Q0616
AMP
IC601
TA8719AN
VIDEO/CHROMA DEFLECTION
Q0552
H-DRIVE
SERVICE SW
Q0403
BUFFER
Q0608
VIDEO-DEF
Q0901
IC1202
AN5071
BAND-SW
Q1214
Q1217
Q1201
VOLUME
Q1218
Q1216
SYSTEM SW.
Q0504
Q0505
Q1204
Q0603
BUFFER
SWITCH
Q0507
Q0601
Q0802
CONTROL
Q0803
STAND-BY
Q0805
PROTECT
Q1205
VIDEO DEF.
Q1220
Q1202
Q0620
Q1206
SOUND-DEF
IC602
HEF4066BP
MC14066BCP
TV5TC4066BP
MN4066BP
SYSTEM-SWITCH
Q0697
Q0696
B5
E3
C1
A1
C3
A3
A2
E11
E12
To B2-BOARD
To B-BOARD
To C-BOARD
To A-BOARD
To D-BOARD
A
B
C
D
E
F
G
H
I
J



IC451
LA7833
V.OUT
DEFLECTION YOKE TLY26337F
DY
PROTECTOR
Q557
FLYBACK TRANS
T501 TLF15823F
SCREEN FOCUS
H.DRIVE TRANS
T551
Q551
H.OUT
Q552
2SC1573AN
H-DRIVE
Q453
Q451
Q452
SWITCH
V.HEIGHT
V.CENT SW
E7
To Y-BOARD
E13
To D-BOARD
E14
To D-BOARD
Q806
PROTECTOR
SWITCHING TRANS
T801
Q802
CONTROL
Q803
STAND-BY
Q804
PROTECTOR
Q805
PROTECTOR
Q801
SWITCHING REG
Q807
PROTECTOR
IC802
AN7812LB
IC801
S1854LBM-5
AVR
E-BOARD
TNP197068AU
HOT
COLD
E12
To D-BOARD
E18
J
K
L
M
N

WAVEFORM PATTERN TABLE



IC601 VOLTAGE

PIN No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
VOLTAGE	—	7.9	—	6.4	0.3	11.7	2.7	0.2	6.4	7.1	7.0	5.1	5.1	7.5	3.6	0.1	3.4	4.4	—	5.6	7.1	11.1	4.0	5.5	4.7	3.2	10.6	3.2	—	8.0	0.5	—
PIN No.	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
VOLTAGE	6.1	3.1	0.8	7.9	6.2	7.1	2.2	9.3	4.4	4.5	4.5	4.8	4.9	4.7	6.6	4.8	6.9	—	6.7	—	0	—	6.0	3.1	5.9	4.6	3.2	5.9	11.7	5.9	11.7	7.8