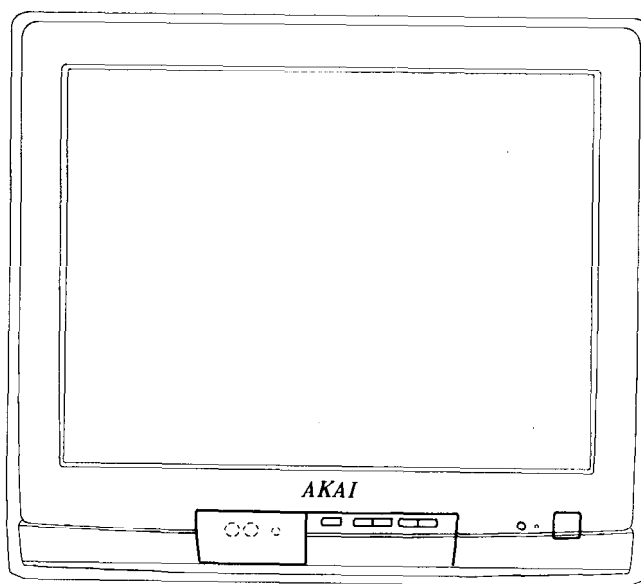


CT-2159U/UT
(B20)

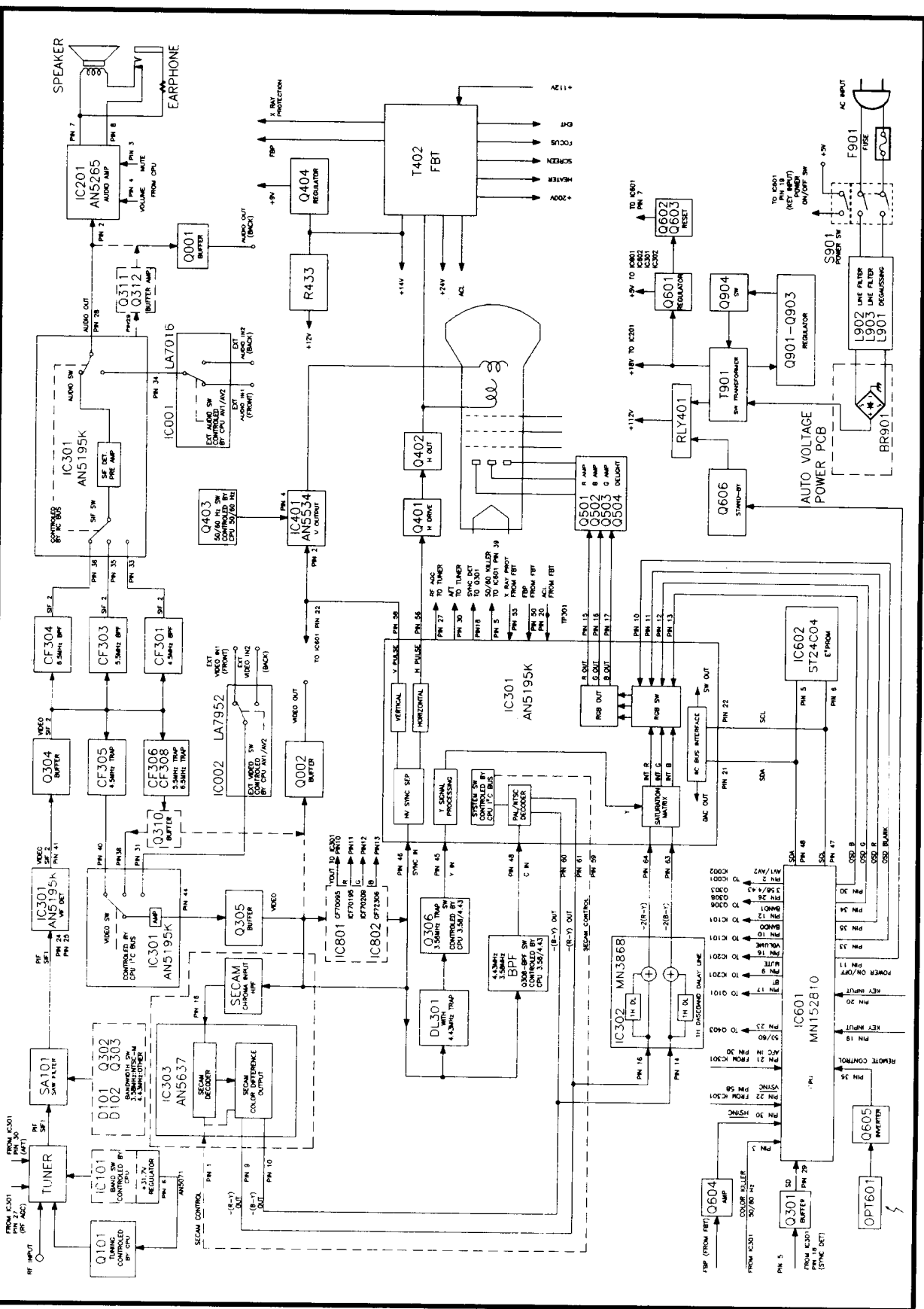
AKAI SERVICE MANUAL



Solid State 21" Colour Television Receiver

MODEL: CT-2159U/UT **B20**

NOTE: " — — — " STANDS FOR OPTIONAL.



ALIGNMENT INSTRUCTION

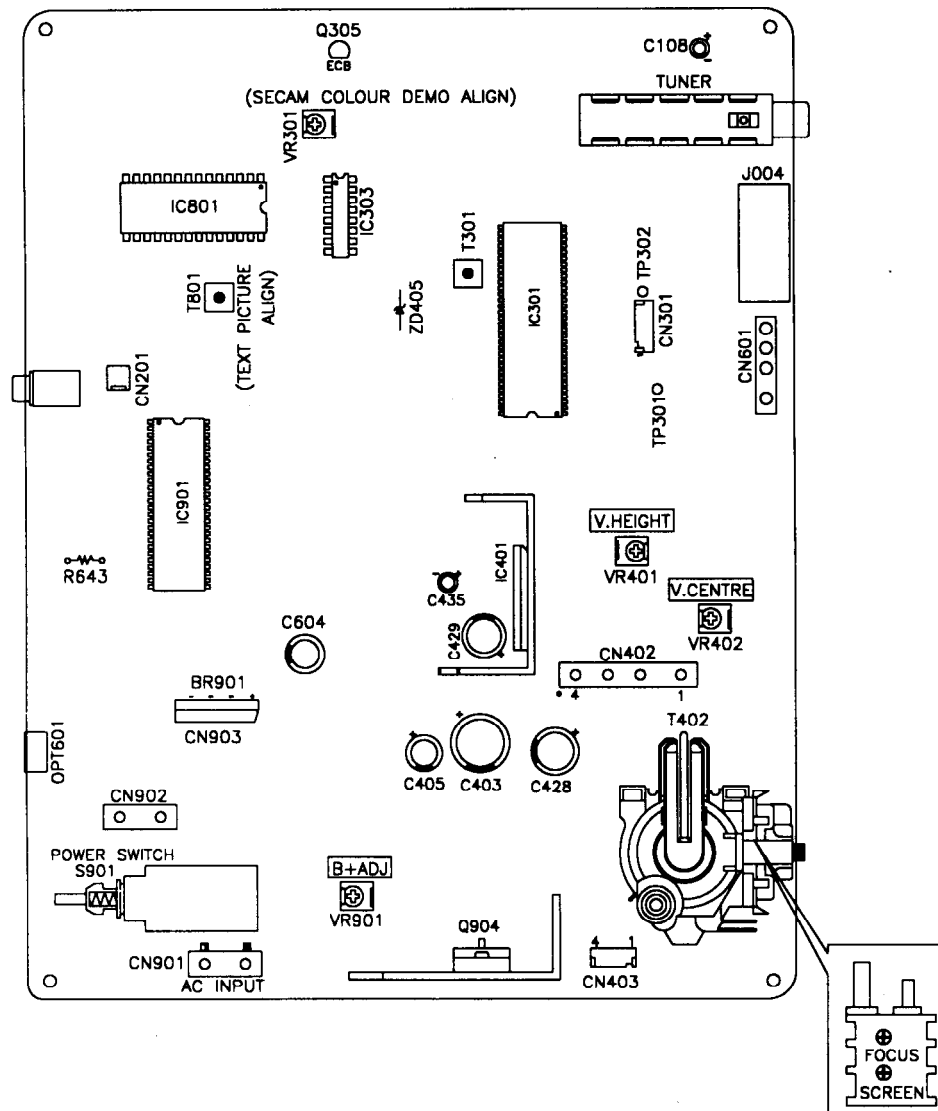
I. Before Adjustment and Maintenance

- A. Don't short any two soldering points or connect any component while TV set is power on.
- B. Pull out power plug before maintenance.
- C. In order to ensure safety all components replaced should be identical with originals. (For further details, refer to the component name and component No. in PARTS LIST.)
- D. Must warm up for 30 minutes or more and degauss CRT thoroughly with demagnetiser before alignment.

II. Equipments for Adjustment

- a. Pattern Generator (PHILIPS PM 5518)
- b. Digital Voltmeter (Inner Resistance $\geq 10M\Omega$)
- c. High Voltage Meter
- d. Demagnetiser
- e. DC Regulated Power Supply
- f. Oscilloscope

III. ADJUSTMENT LOCATION



ALIGNMENT INSTRUCTION

IV. SETUP EEPROM (IC602)

A. OPTION (W/INITIATE CHANNEL) LIST FOR AKAI 1-CHIP MODEL

In order to maintain the option code.

The IC602 EEPROM is absolutely necessary to replace with the following item according to the destination, when the IC602 EEPROM in the Main PCB is replace for any reason. When placing an order for EEPROM be sure to list the option code and Ref No. of EEPROM which is required for ordering instead of part number.

MODEL			OPTION CODE	REF No. of EEPROM
14"	20"	21"		
CT-1419P	---	CT-2159P	50010040	001
CT-1419PT	---	CT-2159PT	50010050	002
CT-1419U	---	CT-2159U	51010140	003
CT-1419UT	---	CT-2159UT	51010150	004
CT-1419A	CT-2019A	CT-2119A	52010040	005
CT-1419AT	CT-2019AT	CT-2119AT	52010050	006
CT-1419PD	CT-2019PD	CT-2119PD	52012440	007
CT-1419PDT	CT-2019PDT	CT-2119PDT	52012450	008
CT-1419DM	CT-2019DM	CT-2119DM	52513240	009
CT-1419DS	CT-2019DS	CT-2119DS	52613040	010
CT-1419D	CT-2019D	CT-2119D	52612440	011
CT-1419DT	CT-2019DT	CT-2119DT	52612450	012
CT-1419DTR	CT-2019DTR	CT-2119DTR	52612470	013
CT-1419M	CT-2019M	CT-2119M	52712640	014
CT-1419UE	---	CT-2159UE	50011140	015
CT-1419UET	---	CT-2159UET	50011150	016

B. Check each pairs of power supply and if normal then go on to do following alignment

Check Point	C403+	C405+	C108+	C429+	C428+	C435+	ZD405-	C604+
Voltage Value	+B	+16V(14") +18V(20"/21")	+31.7V	+24V	+14V	+9V	+5VM	+5V

C. Press key "NORMAL" on REMOTE HANDSET to set each analogue (Brightness, Contrast Colour and Tint) value at normal position.

ALIGNMENT INSTRUCTION

D DATA SETTING

Address Key	Parameter	Value		Range Dec. (Hex.)
		Dec.	Hex.	
★	Colour	31	1F	0-63 (0-3F)
★	TINT	31	1F	0-63 (0-3F)
9	Sub-Brightness (S-B)	63	3F	31-95 (1F-5F)
★	Use-Brightness	31	1F	0-63 (0-3F)
★	Contrast	47	2F	0-63 (0-3F)
4	Cut off R (C-R)	31	1F	0-225 (0-FF)
5	Cut off G (C-G)	31	1F	0-225 (0-FF)
6	Cut off B (C-B)	31	1F	0-225 (0-FF)
7	Drive R (D-R)	63	3F	0-127 (0-7F)
8	Drive B (D-B)	63	3F	0-127 (0-7F)
1	AFT (AFT)	223	DF	0-511 (0-1FF)
2	RFAGC (RF)	31	1F	0-63 (0-3F)
0	Video Adjust (VAD)	3	3	0-7 (0-7)
Mute	H Center (H-C)	3	3	0-7 (0-7)
3	VCO Cont. (VCO)	63	3F	0-127 (0-7F)

★ : These settings are able to be set by "normal" adjustment (Colour, Brightness and Contrast)

Engaging the "TEST MODE" or "ADJUST MENU".

To set the CTV to test mode (adjust menu), turn on the power switch while pressing and holding volume "+" and "-" buttons on the front cabinet.

The "ADJUST MENU" is indicated with each parameter on the screen.

To disengage the "TEST MODE" (ADJUST MENU), turn off the power switch or press the power key on the hand set.

Pressing the above address key can select the corresponding parameter. The parameter value can be changed by pressing volume "+" and "-" keys.

V. Method to enter into ADJUST MENU

- Turn off the Main Power Switch, then keep down Volume Buttons "UP" and "DOWN" on the Main PCB Simultaneously and turn on the Main Power Switch again "ADJUST MENU" will be displayed on the screen.
- Corresponding Functions of keys on REMOTE HANDSET

Keys	1	2	3	4	5	6	7	8	9	0	MUTE
Functions	AFT	RF	VCO	C-R	C-G	C-B	D-R	D-R	S-B	VAD	H-C

VI. Adjustment of AFC

- Preparation Procedure
 - Set digital voltmeter at DC, then connect its probes to terminal of R643 and GND.
 - Enter into ADJUST MENU.

ALIGNMENT INSTRUCTION

5. Remove the jumper wire which from TP301 to TP302, then adjust values of D-R, D-B to make bright area of Black White pattern become normal white.
6. Repeat above step 2, 3, 4, 5, until both bright area and area meet white balance.
7. Power off to exit from ADJUST MENU.

IX. TV video signal amplitude Adjustment (VAD)

A. Preparation procedure

1. Receive standard colour bar RF signal.
2. Connect the probe of oscilloscope to the emitter of Q305 and GND.
3. Switch off, then enter into ADJUST MENU.

B. Method of Adjustment

1. Press key "0" on REMOTE HANDSET and following be displayed on screen:
2. Press key "+" or "-" on REMOTE HANDSET to change value of VAD to make the amplitude of video signal on oscilloscope to be $2V_{p-p} \pm 5\%$.
3. Power off to exit.

X. SECAM Colour Demodulator Alignment.

(FOR M/D/DT/DTR/DS)

1. Turn TV SET to AV mode.
2. Input SECAM (-BG/DK) COLOUR BAR signal.
3. Connect the Oscilloscope's probe to PIN. 10 of IC303 (AN5637) and GND.
4. Adjust VR301 to obtain the waveform as in Fig.1.

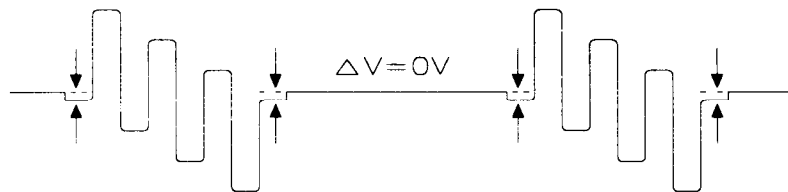


FIG. 1

XI. Adjustment of RF AGC

1. Receive RF signal ($62 \pm 3\text{dBuV}$).
2. Enter into ADJUST MENU.
3. Press key "2" on REMOTE HANDSET, and following will be displayed on the screen:

```
RF-----1-----  
ADJUST MENU                                XX
```

4. Press key "+" or "-" on REMOTE HANDSET change the value of RF AGC until snow noise on the screen just disappeared.
5. Exit from ADJUST MENU

XII. Adjust of Sub-brightness

1. Receive Moonscape Pattern.
2. Press key "NORMAL" on REMOTE HANDSET to set Brightness and Contrast at normal.
3. Enter into ADJUST MENU.
4. Press key "9" on REMOTE HANDSET, the display on screen will be:

```
ADJUST MENU                                XX  
S-B-----1-----
```

ALIGNMENT INSTRUCTION

5. Press key "+" or "-" on REMOTE HANDSET to change the value of S-B until eight and half of portions indicated in Fig.2 is just visible.

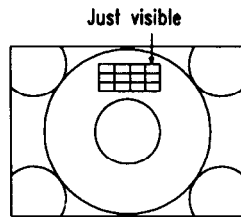


Fig.2

XIII. Teletext picture Alignment. (FOR PT/UT/UET/AT/PDT/DT MODELS)

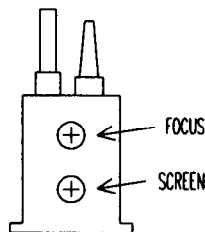
1. Receive a pattern with teletext signal.
2. Select a teletext page.
3. Connect DC voltage meter to IC801 PIN 28 and GND.
4. Adjust T801 to obtain $2.5 \pm 0.1V$.

XIV. Adjust for Horizontal Centre (H-C) and V-HIGHNESS & V-CENTER

1. Receive  pattern signal.
2. Enter then change the value of "H-C" to make the centre of picture to be on top of the center of screen.
3. Adjust VR401 to get a normal picture.
4. Adjust VR402 to get a get V-CENTER picture.

XV. Adjust for FOCUS

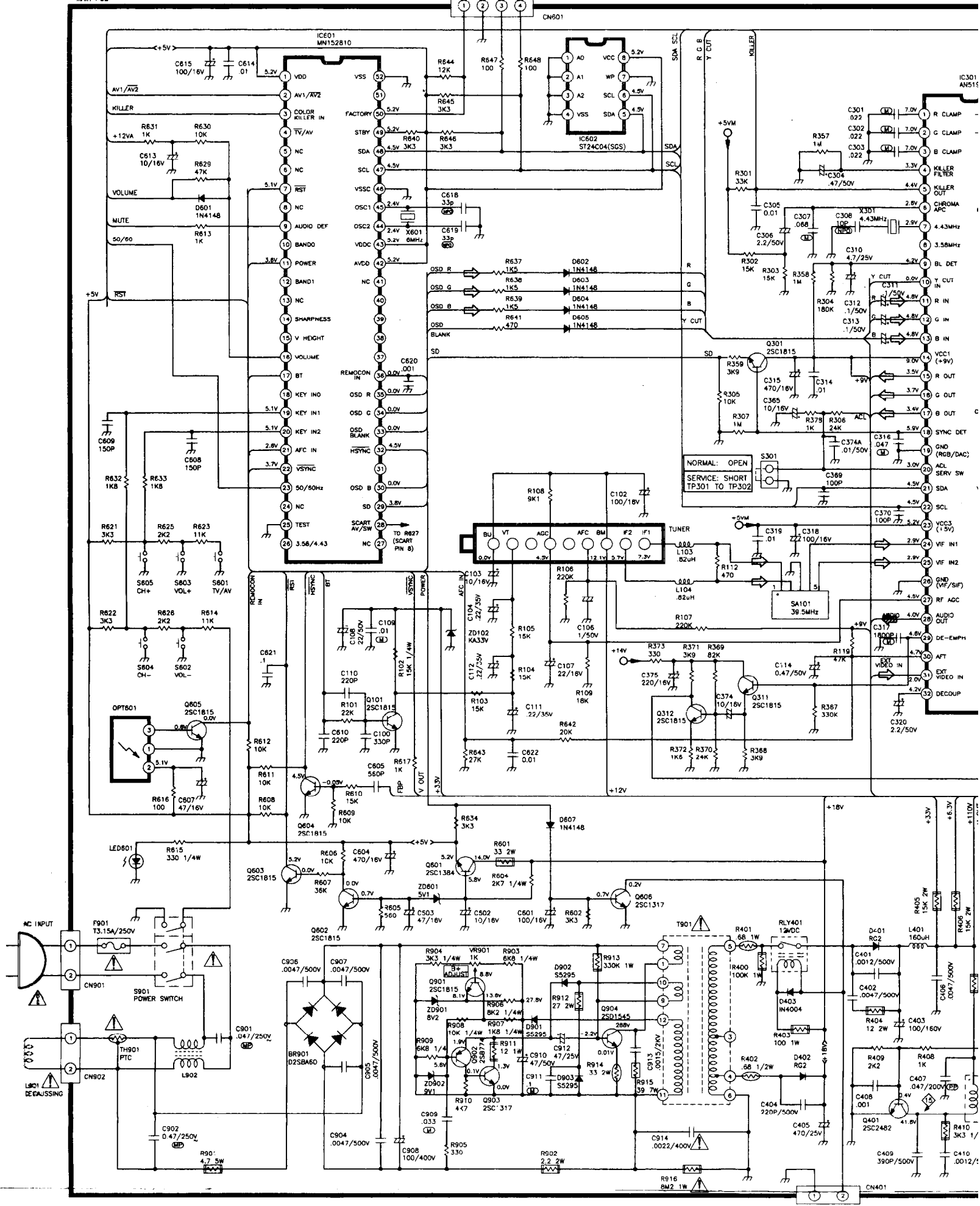
1. Press key "NORMAL" on remote handset to set brightness and contrast both at normal position.
2. Adjust knob "FOCUS" on FBT to make the picture on the screen to be the most distinct.



XVI. COLOUR PURITY ADJUSTMENT (See Fig.3)

BEFORE ANY ADJUSTMENTS DESCRIBED BELOW ARE ATTEMPTED, V-HIGH, B+ VOLTAGE AND FOCUSING ADJUSTMENT MUST BE COMPLETED.

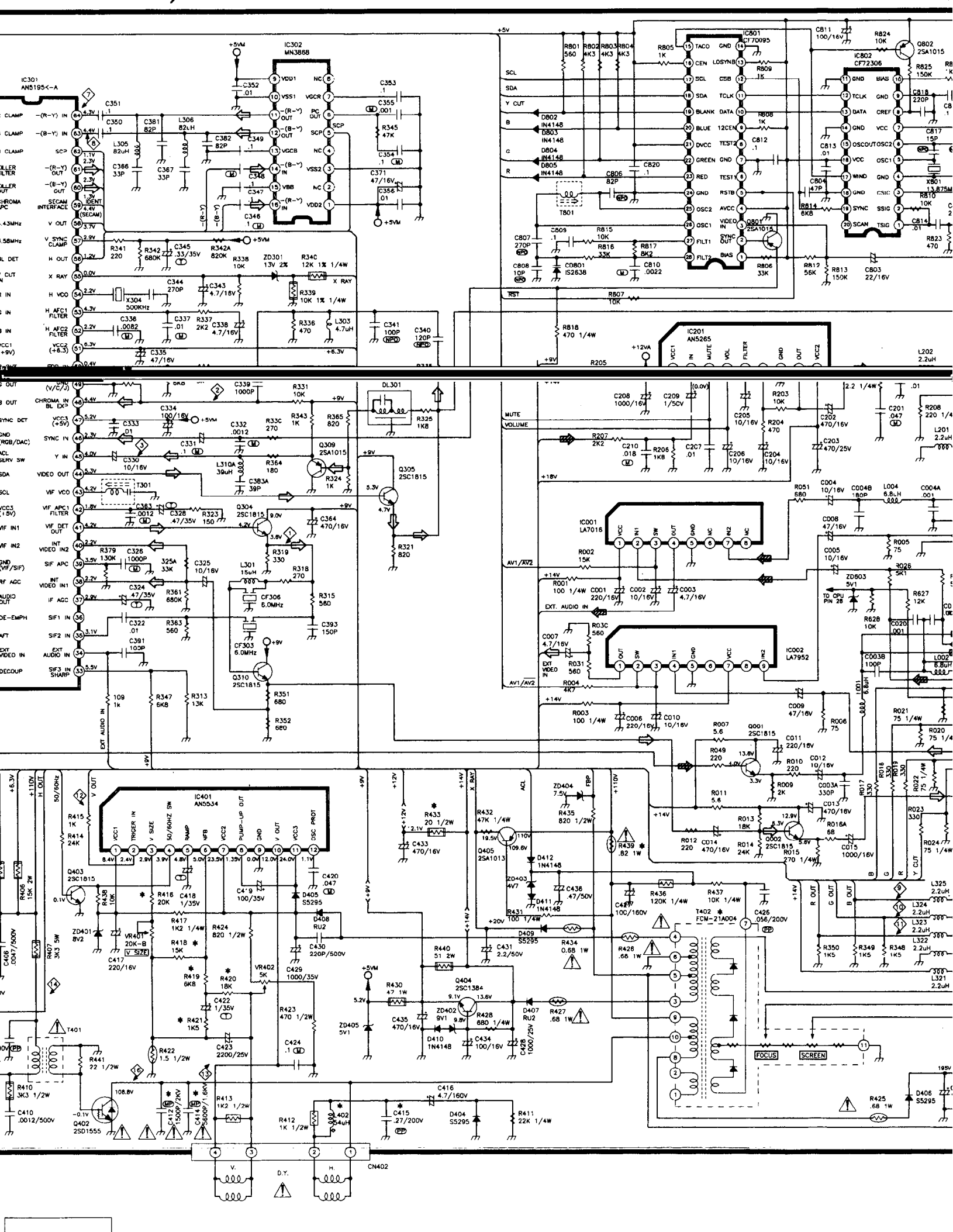
1. Place the TV receiver facing NORTH or SOUTH.
2. Plug in TV receiver and turn it on.
3. Operate the TV receiver over 30 minutes.
4. Fully degauss the TV receiver by using an external degaussing coil.
5. Receive a crosshatch pattern and adjust the static convergence control roughly.
6. Loosen the clamp screw of the deflection yoke and pull the deflection yoke towards you.
7. Enter into ADJUST MENU. Set the values of C-R, C-G, C-B to "00".
8. Adjust the purity magnets so that green field is obtained at the center of the screen.
9. Slowly push the deflection yoke toward cone of CRT and set it where a uniform green field is obtained.
10. Tighten the clamp screw of the deflection yoke.
11. After COLOUR PURITY ADJUSTMENT, you must adjust the WHITE BALANCE again.

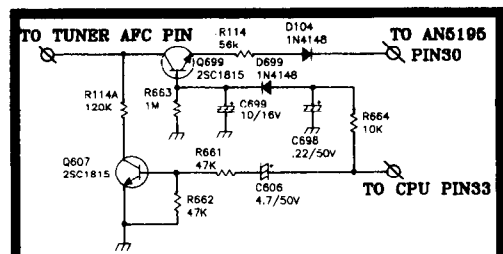
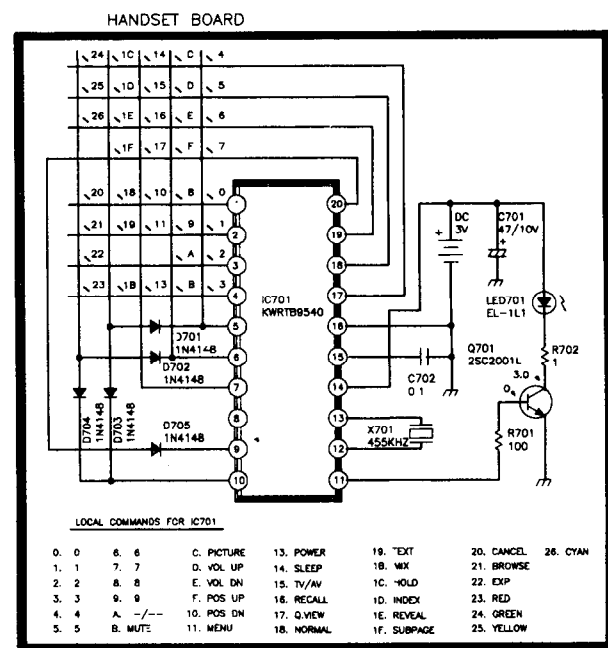
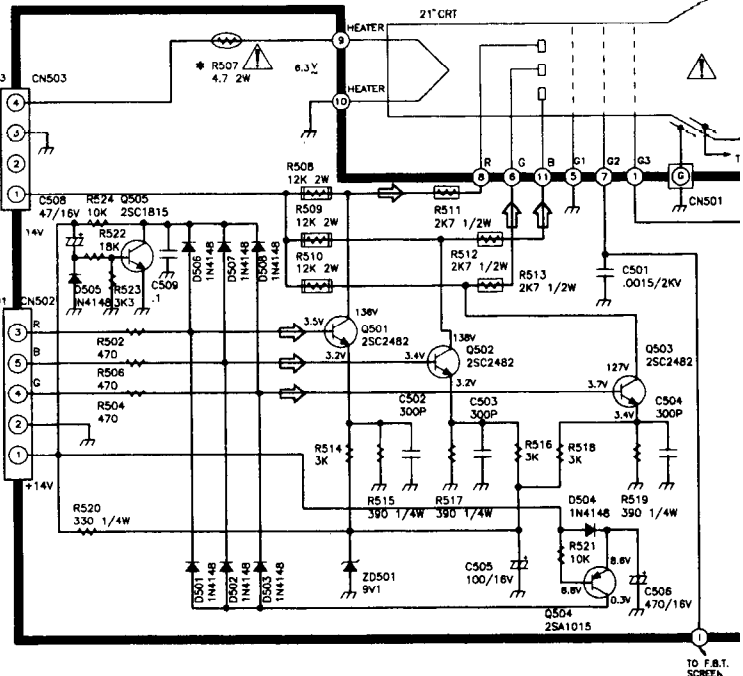
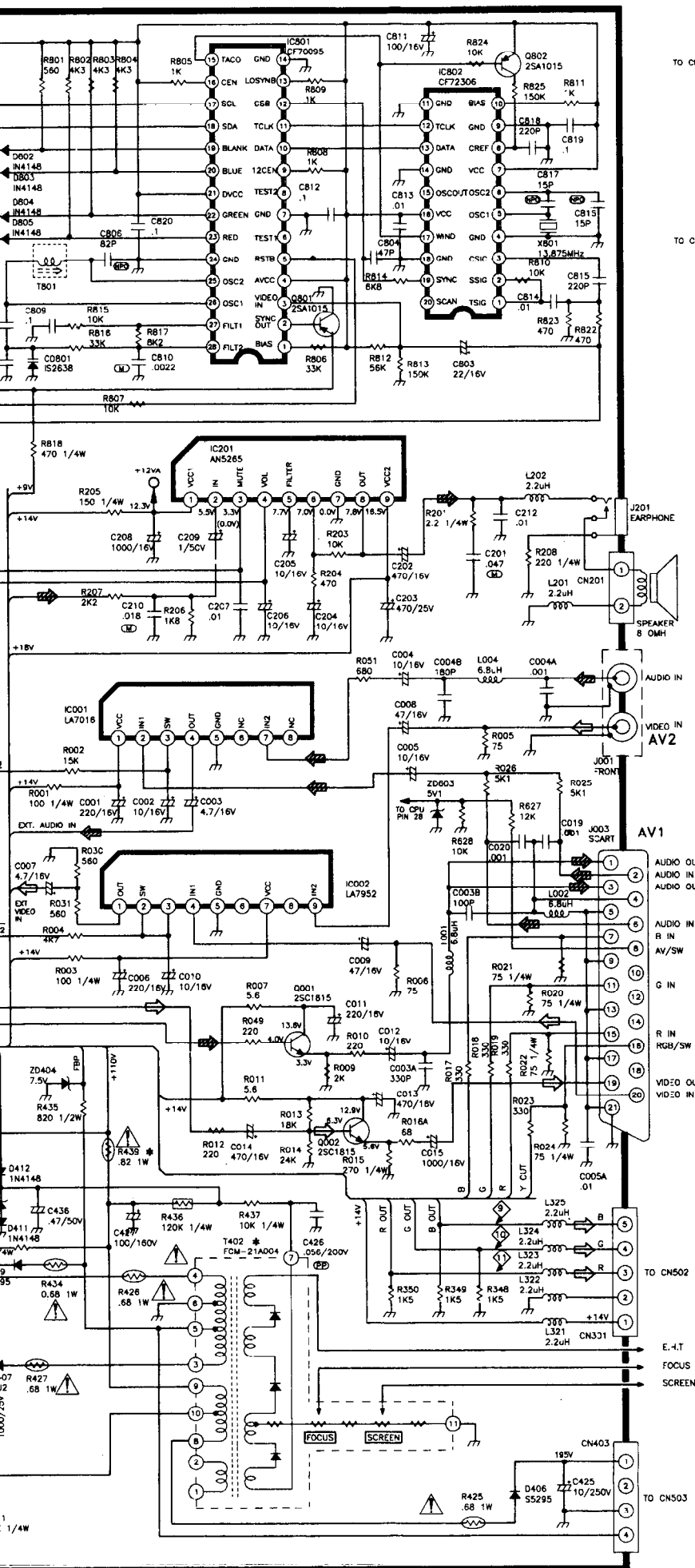


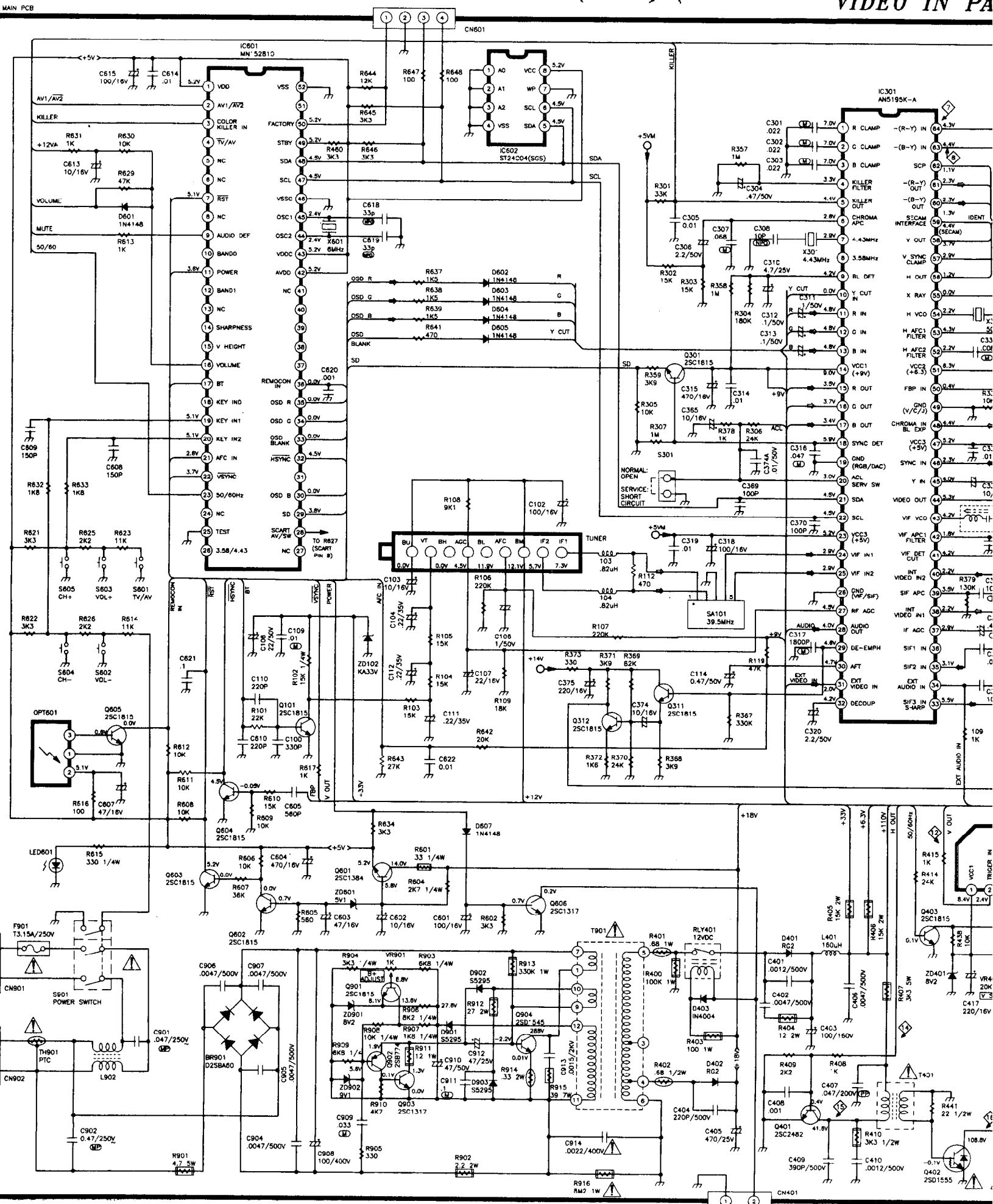
" " AUDIO SIGNAL FLOW

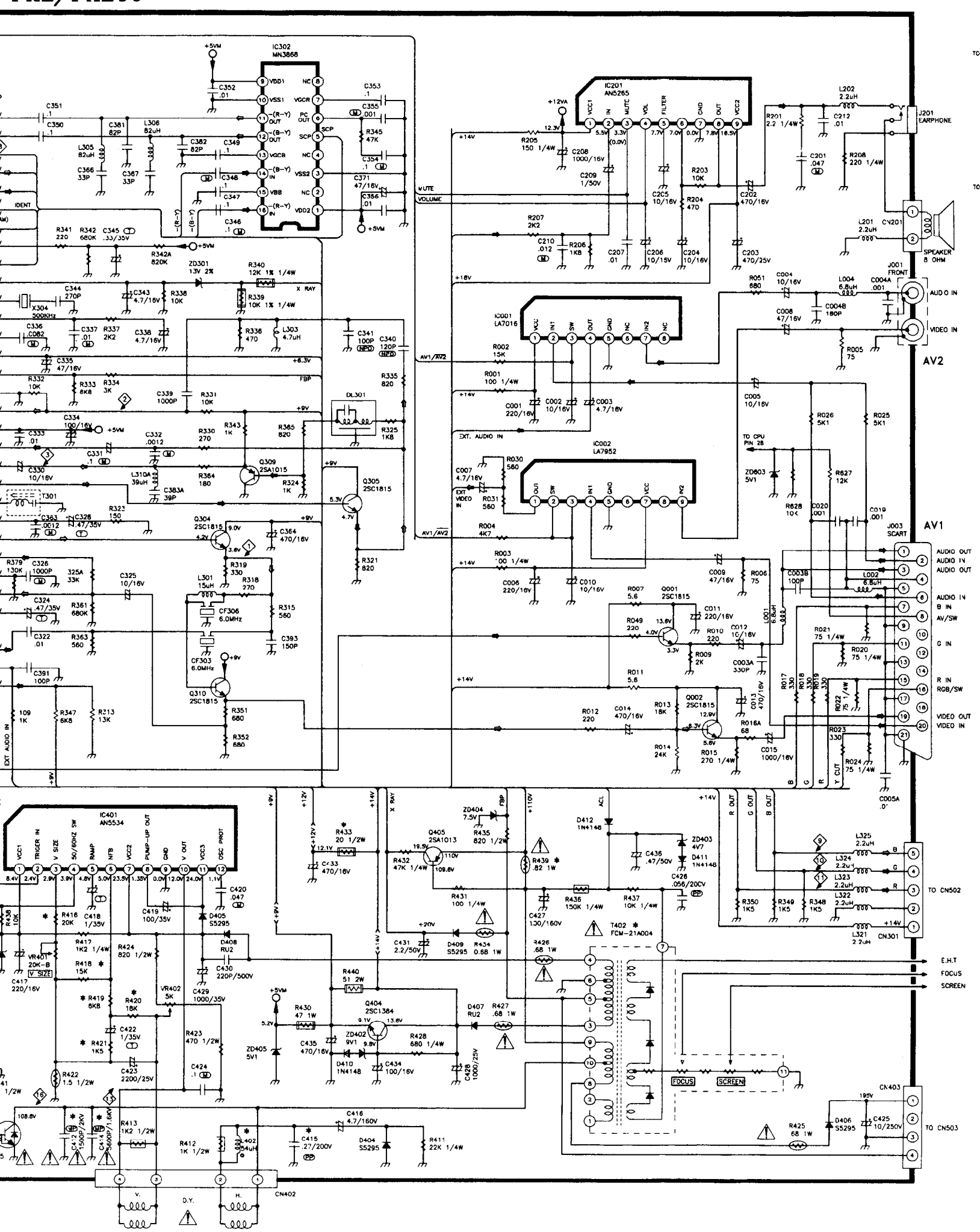
" " VIDEO & INCLUDE VIDEO(SUCH AS: VIF) SIGNAL FLOW

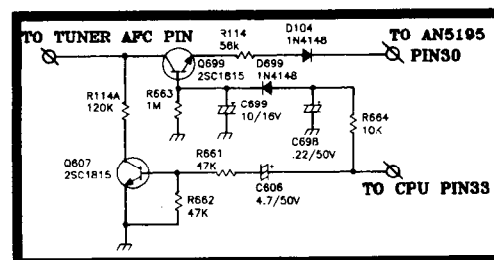
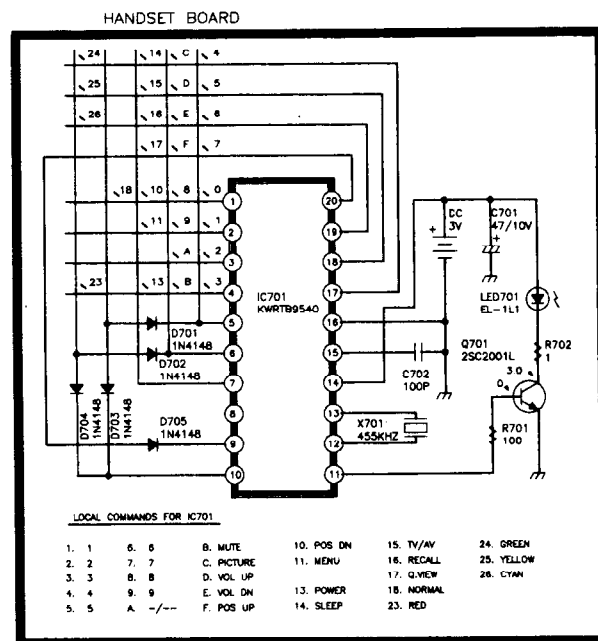
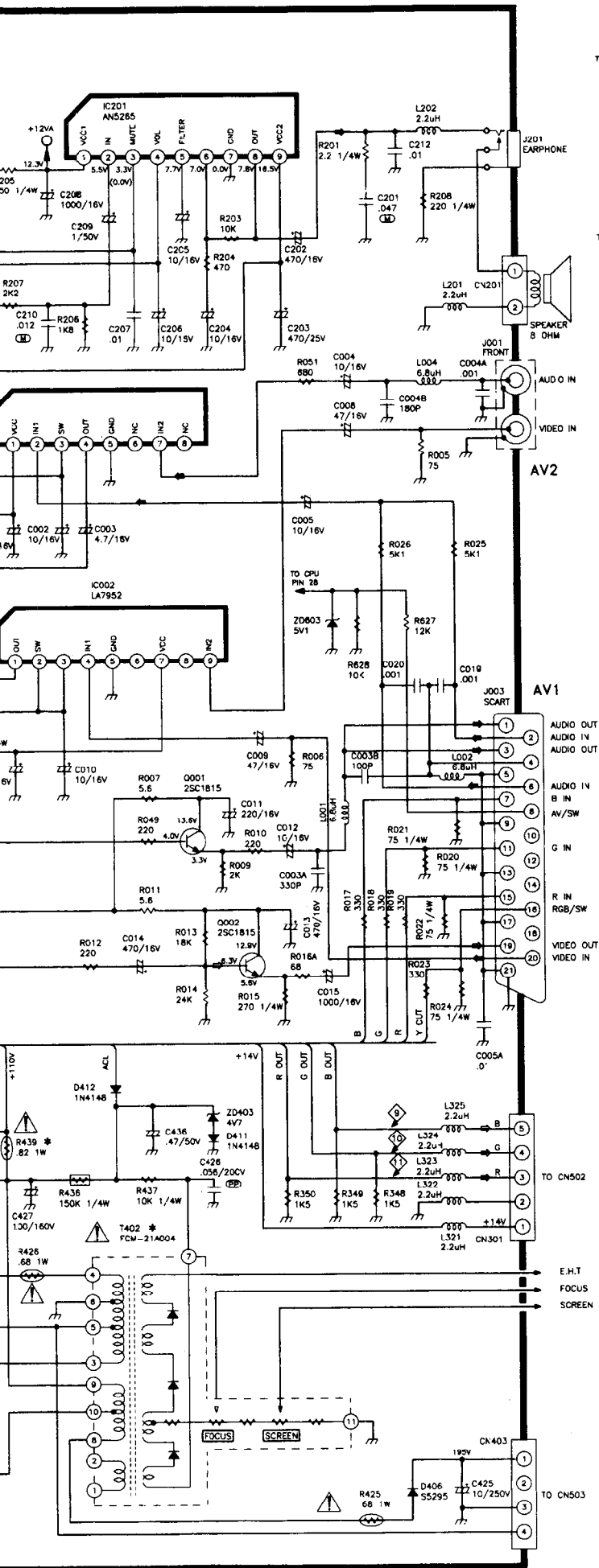
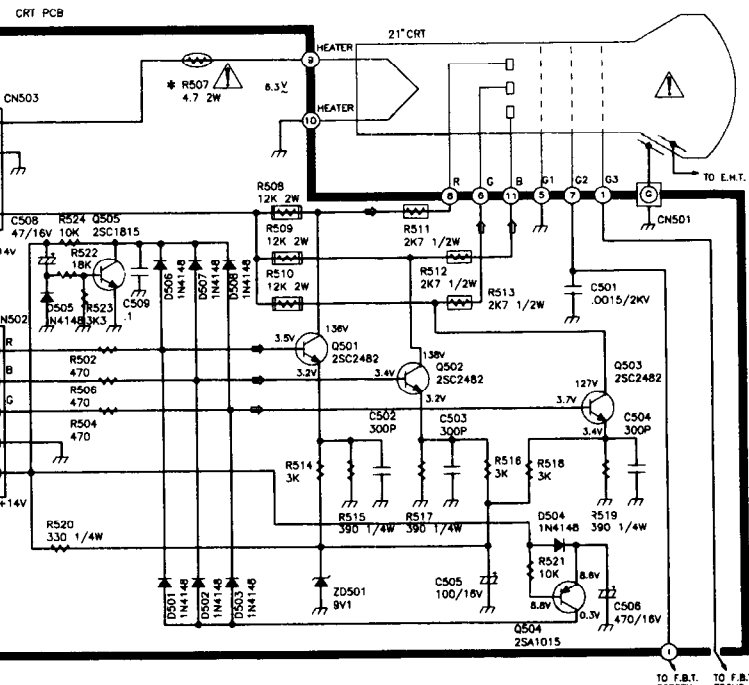
WAVEFORM











ANALOG AFT BOARD