

# SERVICE MANUAL

SOLID STATE  
14" COLOR TELEVISION  
RECEIVER

MODEL: GT- 613A

NTSC-M

AV-IN

181 CH. 1ST



# SYSTEM

## SPECIFICATION

: NTSC-M

### ----- TV SECTION -----

CHANNEL COVERAGE	VHF LOW	:	2-6	CH.
	VHF HIGH	:	7-13	CH.
	UHF	:	14-83	CH.
FREQUENCY RANGE	VHF LOW	:	54-88	MHz
	VHF HIGH	:	174-216	MHz
	UHF	:	470-890	MHz
VISION/SOUND SEPARATION		:	4.5	MHz
FREQUENCY VIDEO IF		:	45.75	MHz
	SOUND IF	:	41.25	MHz
SENSITIVITY	VHF LOW	:	47	dBuV
(AT 30dB S/N)	VHF HIGH	:	47	dBuV
	UHF	:	50	dBuV
SCANNING LINES		:	625	lines
	HORIZONTAL	:	15625	Hz
	VERTICAL	:	50/60	Hz
OUTPUT POWER MAXIMUM		:	1000 mW	
	10% THD	:	800 mW	
C R T .		:	14" DIAGONAL, 90 DEGREES DEFLECTION ANGLE	
SPEAKER		:	3" 16 OHM 2W	
ANTENNAL EXTERNAL		:	75	OHM
POWER CONSUMPTION		:	60	WATTS



1. PLEASE READ BEFORE ATTEMPTING SERVICE

1. Do not connect any antenna plug directly to the tuner socket and do not connect any equipments directly to the TV chassis, otherwise it may be burnt out the TV or equipment, except an isolation transformer is used for main power source of the TV sets.
2. Never disconnect any leads while receiver is in operation.
3. Disconnect all power before attempting any repairs.
4. Do not short any portion of the circuit while power is on.
5. For safety reasons, all parts replaced should be identical, (for parts and part numbers see parts list).
6. Before alignment the set must be pre-heated for 30 minutes or more and erase magnetism thoroughly from CRT front chassis frame by erase coil.

II. TEST EQUIPMENT

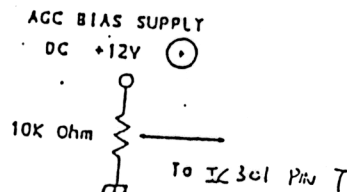
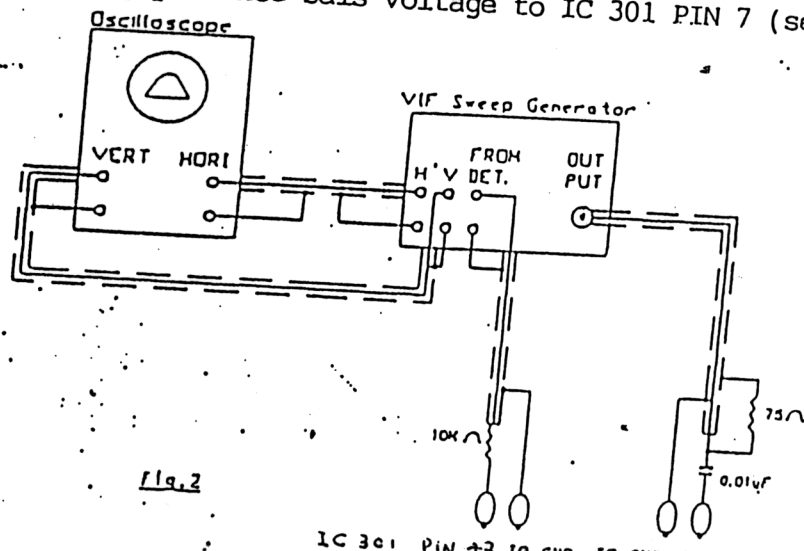
- |                               |  |
|-------------------------------|--|
| 1. VIF Sweep Generator        | 6. Vacuum Tube Voltmeter                 |
| 2. SIF Sweep Generator        | 7. Volt Ohmmeter                         |
| 3. Colour Bar/Dot/Cross Hatch | 8. High Voltage Meter                    |
| 4. DC Power Supply (24V)      | 9. Ampere Meter (0.5 Class, DC 3mA Max.) |
| 5. Oscilloscope               | 10. Demagnetizing Coil                   |

NOTE: Unsolder the solder link (A) on the foil side of main board before alignment steps. (See bottom view of component diagram on main board.)

III. TANK COIL ALIGNMENT

A. PREPARATION STEP (SEE FIG.2)

1. Connect OUTPUT lead of VIF Sweep Generator between tuner test point TP and tuner case.
2. Connect lead of FROM DET between IC 301 PIN 43 and GND.
3. supply DC + 14V to (+) lead of D404
4. Supply RE AGC bias voltage to IC 301 PIN 7 (see fig. 1)

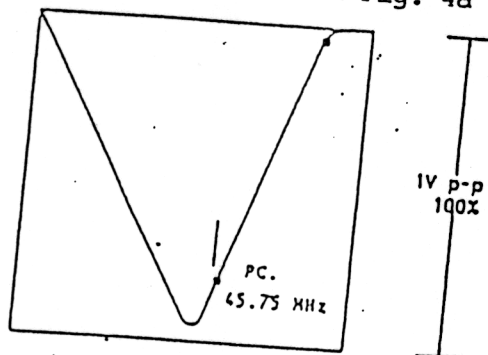




### B. ALIGNMENT STEP (See FIG. 3)

1. Adjust AGC bias voltage for maximum amplitude of waveform.
2. Adjust the level of Sweep Generator to achieve 1Vp-p output.
3. Adjust T303 to obtain maximum amplitude of response cause at PC. (45.75 MHz)
4. Adjust T301 to obtain maximum the waveform Fig. 4a

Fig. 3



## IV. VIF ALIGNMENT

### A. PREPARATION STEP (SEE FIG. 2)

1. Connect output lead of VIF Sweep Generator between tuner test point TP and tuner case.
2. Connect resistor (100 Ohm) between TP301 and TP302.
3. Connect lead of FROM DET between IC301 PIN 43 and GND.
4. Supply DC + 14V to (+) lead of D404
5. Supply RF AGC bias voltage to IC301 PIN 7 (See fig. 1)

### B. ALIGNMENT STEP

1. Adjust AGC bias voltage for maximum amplitude of waveform.
2. Adjust the level of Sweep Generator to achieve 1Vp-p output.
3. Decrease the output level of Sweep Generator in 30 dB.
4. Adjust tuner converter coil to obtain the waveform as in Fig. 4a

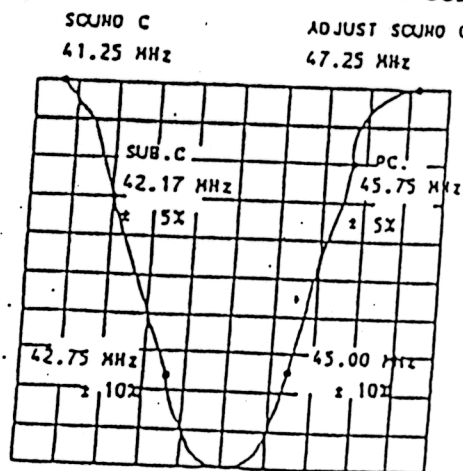


Fig. 4a



## V AFC ALIGNMENT

### A PREPARATION STEP

1. Remove the damping resistor (100 Ohm) at TP101.
2. Connect output lead of Sweep Generator to tuner point TP & tuner case.
3. Connect lead of FROM DET between IC 301 PIN 48 and GND.
4. Supply DC + 14V to (+) lead of D404.
5. Supply RF AGC bias voltage to IC 301 PIN 7. (See fig. 1)

### B ALIGNMENT STEP

1. Adjust the AGC bias voltage for maximum amplitude of waveform 9Vp-p output.
2. Adjust T304 so that picture carrier 45.75 MHz is centered as in Fig. 5a.
3. Adjust VR303 obtain the waveform is balance as in Fig. 5b.

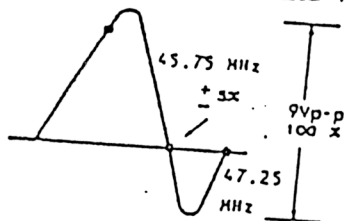


Fig. 5a

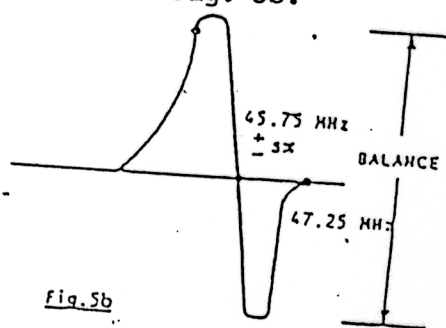


Fig. 5b

## VI. SIF ALIGNMENT

### A PREPARATION STEP (SEE FIG. 6)

1. Connect output lead of SIF Sweep Generator between IC 301 PIN 43 and GND.
2. Connect lead of FROM DET between IC 301 PIN # and GND.
3. Supply DC + 14V to (+) lead of D 404.
4. Supply RF AGC bias voltage to IC 301 PIN 7 (See fig. 1).

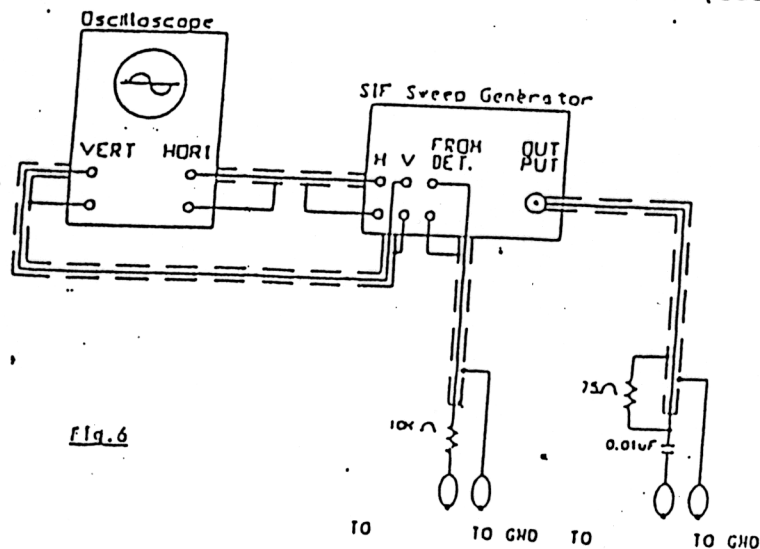


Fig. 6

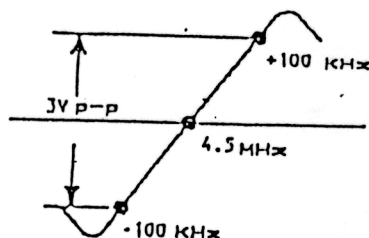


### B ALIGNMENT STEP

1. Adjust output of Sweep Generator to achieve  $gVp-p$  between markers of 100 KHz.
2. Adjust T 302 that sound carrier is centered as in Fig. 7.
3. Confirm the waveform as in Fig. 7.

NOTE : Input Level : -30 to 0 dB.

Fig. 7



NOTE : Solder the solder link (A) on the foil side of main board before signment steps. (See bottom view of component diagram on main board).

### B+ ADJUSTMENT

- 1) Connect a digital volt meter to TPB+ and ground.
- 2) Set Brightness, contrast and colour to minimum.
- 3) Adjust VR901 and obtain a reading of 112v.

### VERTICAL CIRCUIT ADJUSTMENT

- 1) Receive the Monoscope Pattern.
- 2) Adjust V-size (VR401) to obtain a normal picture.

### WHITE BALANCE ALIGNMENT STEP

(deguss the picture by deguassing coil if necessary)

- 1) Turn the brightness, contrast and picture control to minimum value.
- 2) Turn VR 503, 504, 506 to middle position. Turn VR 501, 502 to middle position.
- 3) Turn VR 101 to middle position.
- 4) Receive a black and white pattern.
- 5) Connect a digital meter between G2 and Grund on CRT Board.
- 6) Adjust screen volume on FBT to obtain a 320V
- 7) Adjust VR 502, 503, 504, 506 to obtain a uniformly white picture (9300°K)

### SUB-BRIGHNESS ALIGNMENT

- 1) Receive a colour bar pattern.
- 2) Turn the brightness, contrast and colour to minimum.
- 3) Adjust VR101 until the brightest bar can just be screen.

### FOCUS ALIGNMENT

- 1) Set the brightness and contrast to middle position.
- 2) Receive a monoscope pattern.
- 3) Adjust focus control to obtain sharpest picture.

### AGC ALIGNMENT

- 1) Receive CH69 (UHF) and input field strength in 63dB  $\pm$  3dB input.
- 2) Adjust VR 303 to the point where noise is disappeared.



VOLTAGE TABLE FOR IC

SYMBOL PIN NO.	TA8690AN IC301	MN15151FEQ IC601	TA8445K IC401	IC901	IC902
1	3.9	4.7	9.0	-41.4	72.58
2	4.0	4.7	0	0.35	21.84
3	4.6	4.7	1.5	292.2	-41.37
4	3.0	0.2	1.5	0.07	-1.6
5	3.7	0	4.0	-35.5	
6	5.4	0	3.8		
7	5.4	5.1	24.9		
8	GND	4.6	1.7		
9	4.0	4.5	0.8		
10	4.0	4.5	0		
11	4.4	4.6	12.6		
12	5.2	4.5	25.6		
13	9.0	0			
14	6.5	0			
15	3.2	0			
16	5.4	0			
17	5.4	4.5			
18	5.4	4.4			
19	3.8	4.6			
20	0	4.6			
21	1.1	2.5			
22	2.1	4.9			
23	7.2	0.3			
24	4.9	0.1			
25	9.1	4.6			
26	2.0	4.6			
27	2.0	4.6			
28	2.0	4.6			
29	6.0	0.1			
30	0.1	4.6			

NOTE : VOLTAGE ARE TAKEN UNDER TUNED CONDITION WITH  
 CONTRAST : MIDDLE POSITION  
 BRIGHTNESS : MIDDLE POSITION  
 COLOUR : MIDDLE POSITION  
 SINGAL INPUT : 80 dBV  
 CAANNEL SETTING : THE LAST CHANNEL OF UHF HIGH  
 SIGNAL PATTERN : COLOUR BAR



VOLTAGE TABLE FOR IC

SYMBOL PIN NO.	TA8690AN	MN15151FEQ			
	IC301	IC601			
31	2.9	3.9			
32	4.4	4.3			
33	6.0	0			
34	4.4	0			
35	1.1	0			
36	3.2	4.8			
37	GND	2.6			
38	7.4	2.7			
39	5.3	2.5			
40	4.4	2.3			
41	4.4	2.5			
42	3.2	4.7			
43	3.4	4.7			
44	9.0	1.9			
45	6.6	2.1			
46	6.6	GND			
47	3.0	4.8			
48	4.7	0			
49	3.0	1.1			
50	0.6	4.7			
51	3.5	0.1			
52	1.9	GND			
53	4.2				
54	2.7				

NOTE : VOLTAGE ARE TAKEN UNDER TUNED CONDITION WITH  
 CONTRAST : MIDDLE POSITION  
 BRIGHTNESS : MIDDLE POSITION  
 COLOUR : MIDDLE POSITION  
 SINGAL INPUT : 80 dBV  
 CAANNEL SETTING : THE LAST CHANNEL OF UHF HIGH  
 SIGNAL PATTERN : COLOUR BAR

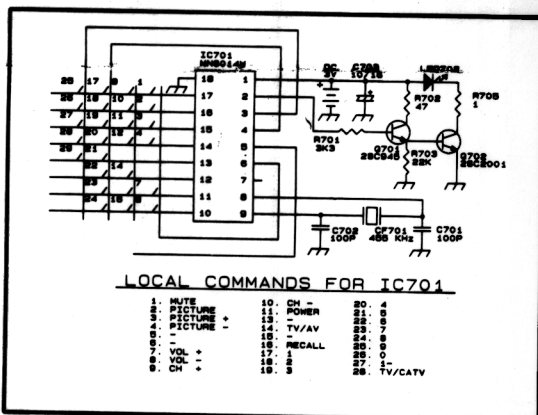
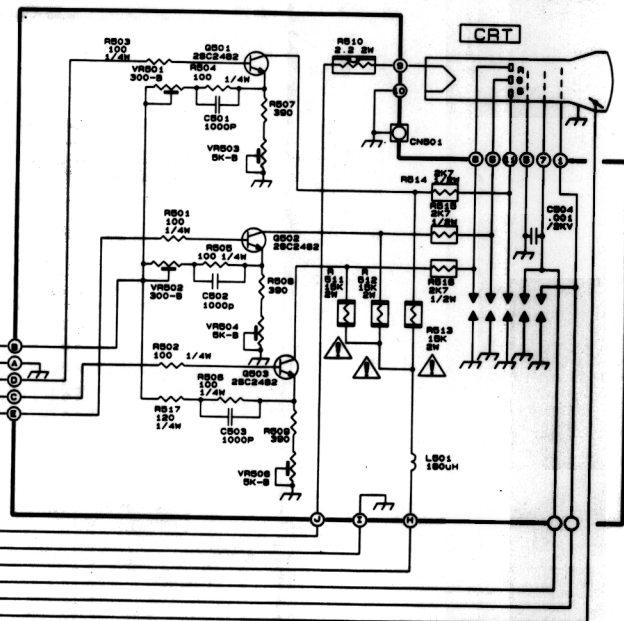
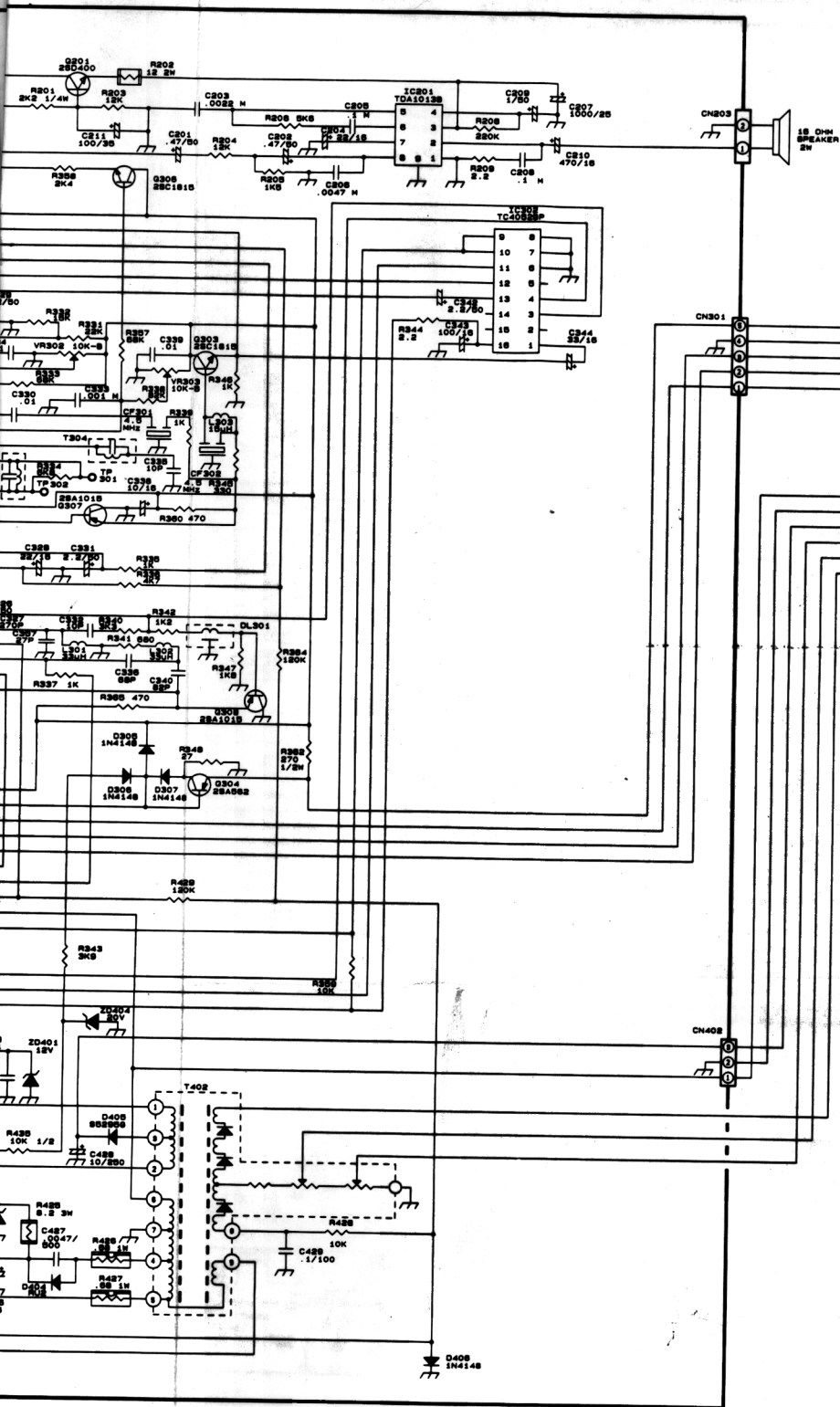


**VOLTAGE TABLE FOR TRANSISTOR (AUTO-VOLTAGE)**

SYMBOL	B (V)	C (V)	E (V)	SYMBOL	B (V)	C (V)	E (V)
Q101	0.1	4.8	0	Q601	0	4.1	0
Q102	0.6	0.1	0	Q602	4.2	0	4.6
Q103	0	4.5	0	Q604	0.4	5.4	1.1
Q104	0.6	4.4	0	Q605	-0.5	2.8	0
Q105	8.8	1.4	9.0	Q606	-0.4	2.5	0
Q106	1.3	9.0	0.5	Q607	-0.1	4.3	0
Q201	17.6	21.1	17.0	Q608	0	5.1	0
				Q609	0.6	0	0
				Q610	-0.6	5.0	0
Q303	4.1	9.0	3.4	Q611	0	2.0	0
Q304	3.8	0.8	4.0	Q612	0	4.3	0
Q307	3.4	0	4.1	Q901	0.3	0.06	0.31
Q308	0.2	0	0.9	Q902	0.06	0.3	GND
Q401	0.4	62.4	0	Q903	-1.18	0.28	0.31
Q402	1.0	145.7	0	Q904	0.018	71.8	GND
Q403	10.0	11.8	9.4	Q905	0.7	0.018	GND
Q404	0	1.5	0	Q906	72.5	14.7	75.2
Q501	5.4	109.0	5.1				
Q502	5.4	110.0	5.1				
Q503	5.4	107.0	5.1				

NOTE : VOLTAGE ARE TAKEN UNDER TUNED CONDITION WITH  
 CONTRAST : MIDDLE POSITION  
 BRIGHTNESS : MIDDLE POSITION  
 COLOUR : MIDDLE POSITION  
 SIGNAL INPUT : 80dBV  
 CAANNEL SETTING : THE LAST CAANNEL OF OHF HIGH  
 SIGNAL PATTERN : COLOUR BAR

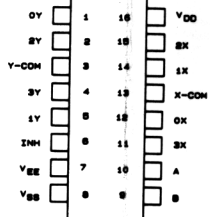




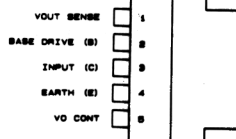
#### NOTE:

- (1) ALL CAPACITORS ARE IN  $\mu F$  UNLESS OTHERWISE NOTED.
- (2) ALL CAPACITORS ARE 50V UNLESS OTHERWISE NOTED.
- (3) CAPACITORS NOT SPECIFICALLY DESIGNATED ARE CERAMIC CAPACITORS.
- (4) ELECTROLYTIC CAPACITOR
- (5) BI-POLAR ELECTROLYTIC CAPACITOR
- (6) TANTALUM CAPACITOR
- (7) NYLON CAPACITOR
- (8) METALLIZED POLYESTER
- (9) POLYESTER FILM CAPACITOR
- (10) POLYPROPYLENE CAPACITOR
- (11) ALL RESISTORS ARE IN OHM  $1/16 W$  UNLESS OTHERWISE NOTED.
- (12) RESISTORS NOT SPECIFICALLY DESIGNATED ARE CARBON FILM RESISTORS.
- (13) METAL OXIDE RESISTOR
- (14) CEMENT RESISTOR
- (15) FUSIBLE RESISTOR
- (16) THERMISTOR
- (17) CARBON COMPOSITION RESISTOR
- (18) SAFETY CRITICAL DEVICE
- (19) DC VOLTAGE ARE MEASURED FROM POINTS INDICATED TO THE CIRCUIT GROUND WITH A DIGITAL MULTIMETER TEST.
- (20) WAVEFORMS ARE TAKEN WITH SETTING CONTROLS TO A NORMAL CONDITIONS (COLOUR BAR PATTERN).
- (21) THIS CIRCUIT DIAGRAM IS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.
- (22) ON THE SCHEMATIC SHOULD BE REPLACED WITH EXACT MANUFACTURER RECOMMENDED PARTS.

#### IC002 TC4052BP

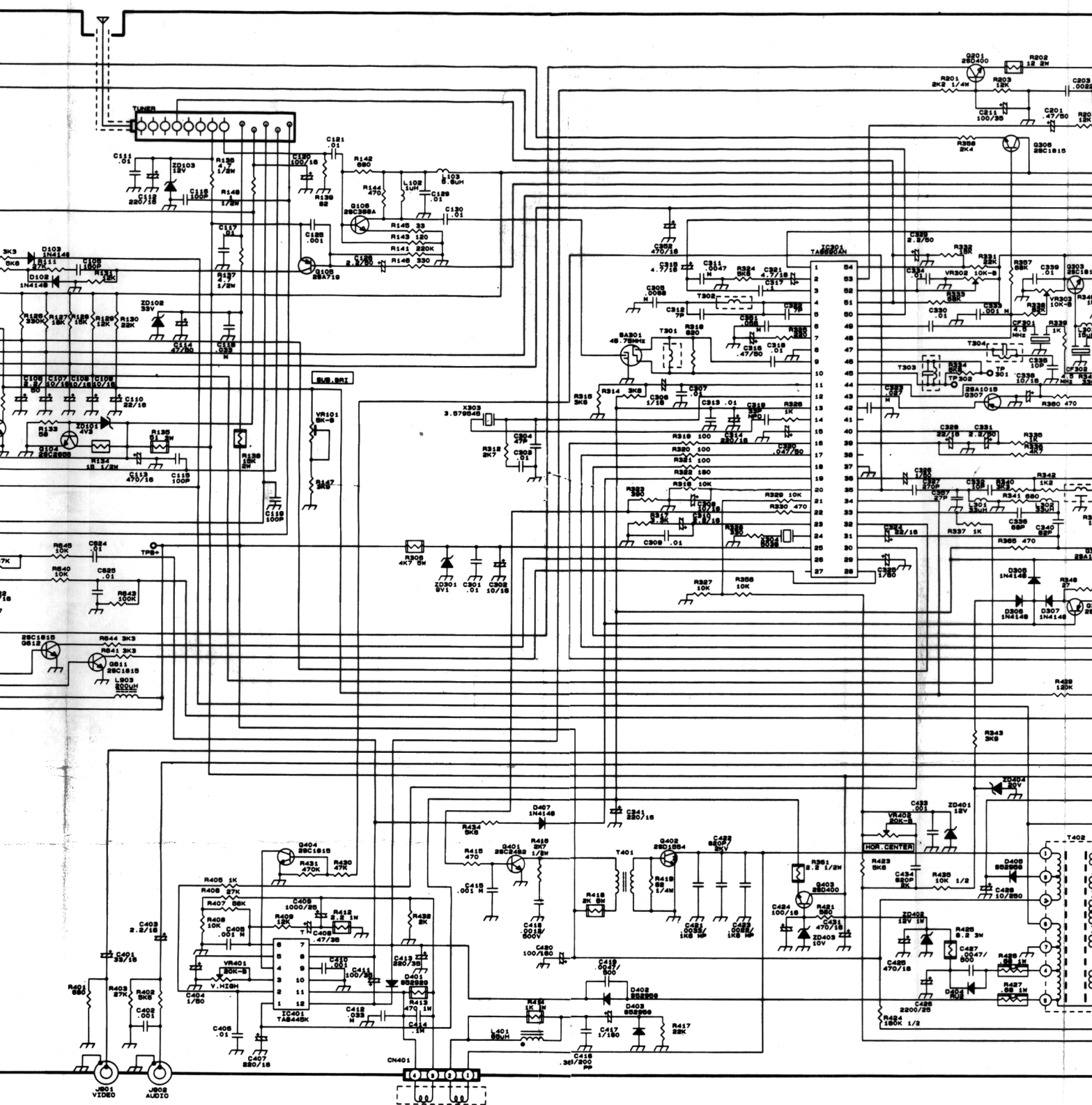


#### IC901 STR58041

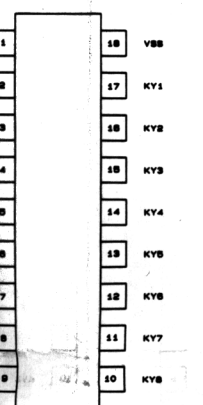


14D28A

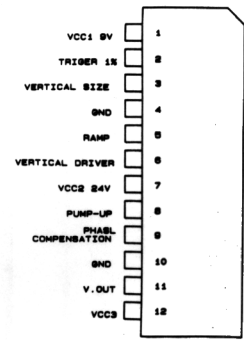




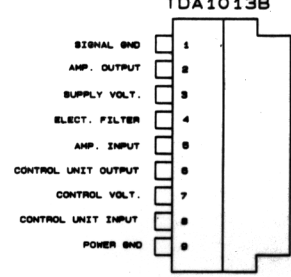
1 MN6014W



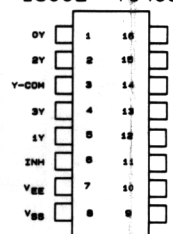
IC401 TAB445K



IC201 TDA1013B



IC002 TC400

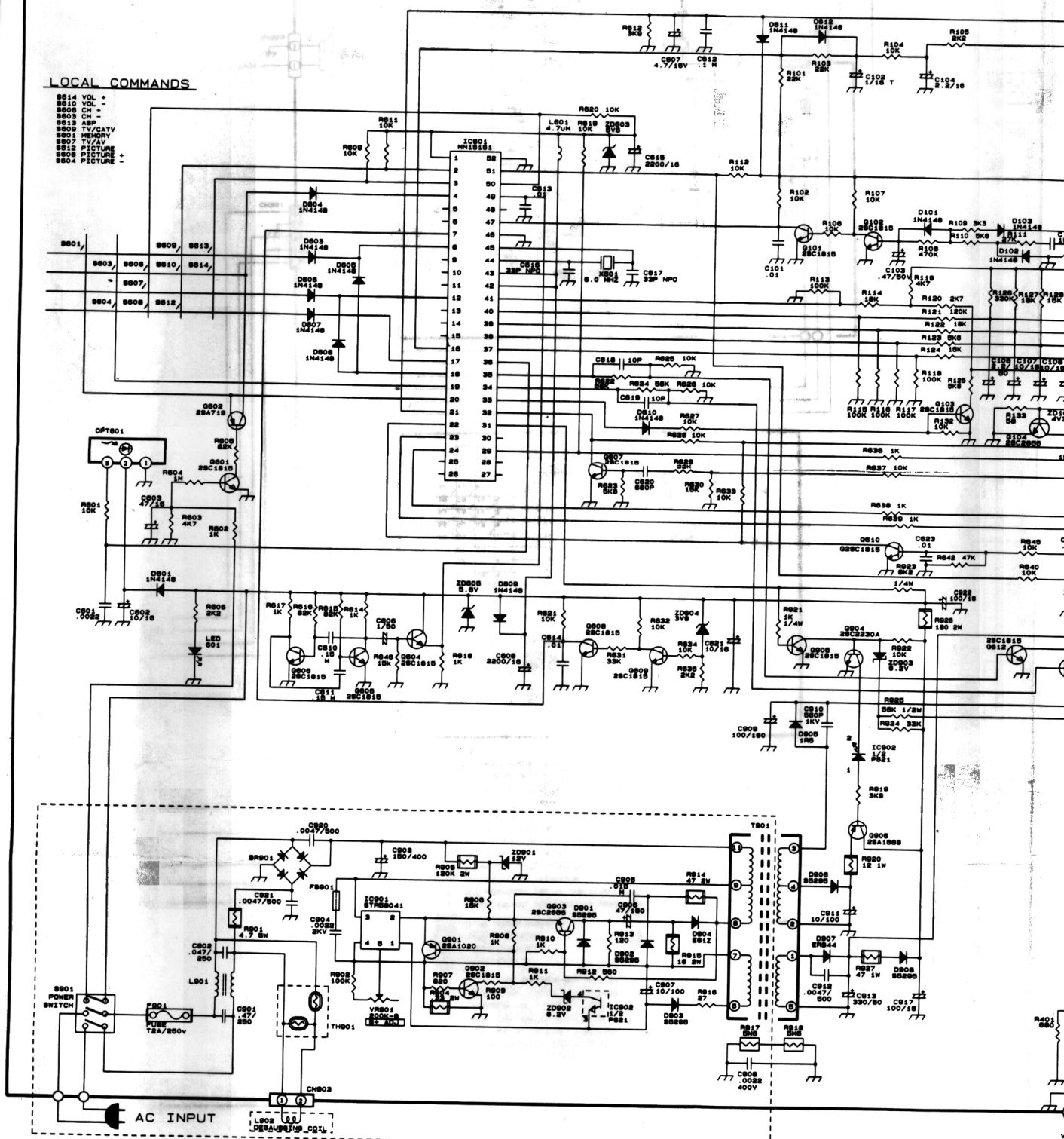




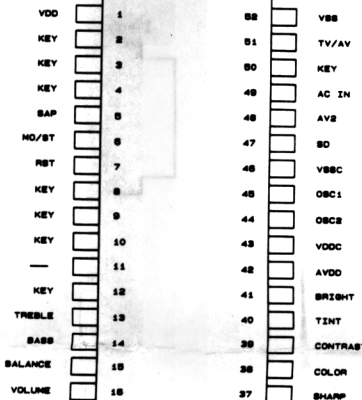
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SB14 VOL +  
SB10 VOL -  
SB09 CH +  
SB03 CH -  
SB13 ASP  
SB05 TV/CATV  
SB01 MEMORY  
SB07 TV/AV  
SB18 PICTURE +  
SB08 PICTURE -  
SB04 PICTURE

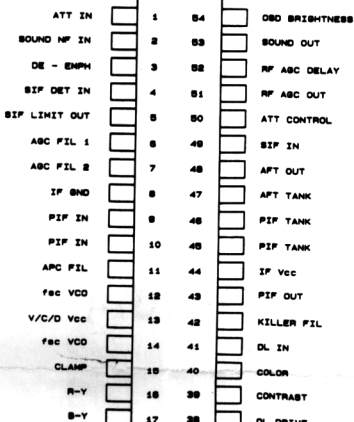
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SB07, SB12,  
SB04, SB08, SB12



IC601 MN15151



IC301 TA8690AN



IC701 MN601

