

Haier

CAUTION:

READ THIS MANUAL CAREFULLY
TO DIAGNOSE TROUBLE CORRECTLY
BEFORE OFFERING SERVICE

SERVICE MANUAL

COLOR TV

MODEL: HTAF21C



TV-8888-141



WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product deal with in this service information by anyone else could result in serious injury or death.

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1.Warning

	WARNING RISKELECTRIC SHOCK DONOT OPEN	
<p>WARNING:To reduce the risk of electric shick don't remove cover or back.</p> <p>No user-serviceable parts inside refer service to qualified service personnel.</p>		

Safety of operators has been taken into consideration at the design and manufacture phase, but inappropriate operation may cause electric shock or fire. To prevent the product from being damaged, the following rules should be observed for the installation, use and maintenance of the product. Read the following safety instruction before starting the operation.

The User Manual uses the following symbols to ensure a safe operation and prevent damage to operators or properties:

	THIS SYMBOL INDICATES THAT HIGH VOLTAGE IS PRESENT INSIDE . IT IS DANGEROUS TO MAKE ANY KING OF CONTACT WITH ANY INSIDE PART OF THIS PRODUCT.
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	THIS SYMBOL INDICATES THAT THERE ARE IMPORTANT OPERATING AND MAINTENANCE INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THE APPLIANCE.
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FCC STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rule. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, use and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However ,there is no guarantee that interference with not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encourage to try to correct the interference by one or more of the following measures:

- *Reorient or relocate the receiving antenna.
- *Increase the separation between the equipment and receiver.
- *Connect the equipment into an outlet on a circuit different from that to which the receivers connected.
- *Consult the dealer or an experienced radio/TV technician for help.

This device compiles with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may be not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC CAUTION:

To assure continued compliance and possible undesirable interference, the provided ferrite cores must be used when connecting this plasma display to video equipment; and maintain at least 40cm spacing to other peripheral device.

CANADIAN NOTICE:

This Class B digital apparatus compiles with Canadian ICES-003.

IMPORTANT SAFETY INSTRUCTIONS

Read all of the instructions before using this appliance. When using this appliance, always exercise basic safety precautions, including the following:

- 1) Save these Instructions ---the safety and operating instructions should be retained for future reference.
- 2) All warning on the appliance and in the operating instructions should be followed.
- 3) Cleaning --- Unplug from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use only dry cloth for cleaning.
- 4) Attachments ---do not use attachments not recommended by the manufacturer as they may cause hazards.
- 5) Water and moisture -- do not place this product near water, for example, near a bathtub, wash bowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool.
- 6) Accessories ---do not place this unit on an unstable cart, stand, tripod, bracket, or table. Use only with a cart, stand, tripod, bracket, or table recommend by the manufacture, or sold with the unit.
- 7) Ventilation ---Slots and openings in the cabinets and the back or bottom are provided for ventilation. These openings must not be blocked. In a built in installation such a bookcase or rack do not install product unless proper ventilation is provided.
- 8) Power Source ---this TV should be operated only from the type of power source indicated on the rating label. If you are not sure of the type of power supply to your home, consult your appliance dealer or local power company.
- 9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet. To prevent electric shock, ensure the grounding pin on the AC cord power plug is securely connected.
- 10) Power cord protection ---Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords or plugs, convenience receptacle, and the point where they exit from the appliance.
- 11) Lighting precaution ---for added protection for this product during a lighting storm or when it is left unattended for long period of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lighting and power line surges.
- 12) Never push objects of any kind into this product through openings as they may touch dangerous voltage point or short out parts that could result in a fire or electric shock. Avoid spilling liquid of any kind on the product.
- 13) Servicing ---do not attempt to service the product by yourself, as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to authorized service personnel.
- 14) Unplug this unit from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - a. When the power supply cord or plug is damaged or frayed.

- b. If liquid has been spilled, or objects have been fallen into the unit.
 - c. If the unit has been exposed to rain or water.
 - d. If the unit does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the unit to its normal operation.
 - e. If the unit has been dropped or damaged in any way.
 - f. When the unit exhibits a distinct change in performance; this indicates a need for service.
- 15) Heat --- The product should be situated away heat source such as radiators, heat registers, stoves, or other products (Including amplifiers) that product heat.
- 16)Overloading ---Do not overload wall outlets and extension cord as this can result in a risk of fire or electric shock.

2. Specification

Model	HTAF21C
Screen size	20 inch
Aspect ratio	4:3
NO.of preset channels	181
OSD language	English
Color system	NTSC
Audio system	M
Audio output power(Built-in)(W)	2W×2
DVD	YES
Total power input (W)	80W
Voltage range (V)	AC110V~AC240V
Power frequency (Hz)	50~60Hz
Time of sleep timer(MINS)	120Min
Net weight(KG)	16.1
Gross weight(KG)	20

3. FEATURES AND TECHINICAL DESCRIPTION

1. N201 UOC TDA8377

SYMBOL	PIN	DESCRIPTION
STAND BY output.	1	In STAND BY mode, low level (Power OFF). For Power ON this pin will be high.
SCL	2	I ² C-bus clock line
SDA	3	I ² C-bus data line
TUNING	4	tuning Voltage (Vt) PWM output
KEY	5	Control keys input
SYSTEM	6	TV system control
VOL	7	Sound Volume control PWM output
MUTE	8	Sound mute output
VSSC/P	9	Digit ground for μ -controller core and periphery
CTL	10	DVD power control
STANDBY	11	STANDBY control
VSSA	12	Analog ground of digital ground of TV-processor
SECPLL	13	Internally connected
VP2	14	2 nd supply voltage TV-processor(+8V)
DECDIG	15	decoupling digital supply of TV-processor
PH2LF	16	Phase-2 filter
PH1LF	17	Phase-1 filter
GND3	18	Ground 3 for TV-processor
DECBG	19	Band gap decoupling
AVL/EWD	20	Automatic volume levelling
VDRB	21	Vertical drive B output
VDRA	22	Vertical drive A output
IFIN1	23	IF input 1
IFIN2	24	IF input 2
IREF	25	Reference current input
VSC	26	Vertical sawtooth capacitor
TUNER AGC	27	Tuner AGC output
AUDEEM/SIFIN1 *1	28	Audio deemphasize or SIF input
DECSDEM/SIFIN2	29	Decoupling sound demodulator
GND2	30	Ground 2 for TV processor
SNDPLL/SIFAGC *1	31	Narrow band PLL filter
AVL	32	Automatic Volume Levelling
HOUT	33	Horizontal output
FBISO	34	Flyback input/sandcastle output
AUDEXT	35	External audio output
EHTO	36	EHT/over voltage protection input
PLL IF	37	IF-PLL loop filter
IFVO/SVO	38	IF video output / selected CVBS output
VP1	39	supply voltage TV processor
CVBS INT	40	internal CVBS input

GND1	41	ground for TV processor
CVBS/Y	42	CVBS/SVHS(Y) input
CHROMA	43	SVHS (C) input
AUDOUT	44	Audio output
INSSW2	45	YUV insertion input
R2/VIN	46	R input / V (R-Y) input / PR input
G2/YIN	47	G input / Y input
B2/UIIN	48	B input / U (B-Y) input / PB input
BCLIN	49	Beam current limiter input
BLKIN	50	Black current input
RO	51	Red output
GO	52	Green output
BO	53	Blue output
VDDA	54	Analog supply of Closed Caption decoder and digital supply of TV-processor (3.3 V)
VPE	55	Ground
VDDC	56	Digital supply to core (3.3 V)
OSCGND	57	Oscillator ground supply
XTALIN	58	Crystal oscillator input
XTALOUT	59	Crystal oscillator output
RESET	60	Ground
VDDP	61	Digital supply to periphery (+3.3 V)
P1.0/INT1	62	AV1 / AV2 mode Output.
P1.1/T0	63	AV /S-VHS mode Output.
P1.2/INT0	64	Remote control signal input.

Note

Pin	TV	SVHS	AV1	AV2
62	1	0	0	1
63	1	1	0	0

2. N202 24C08/PCF8598

PIN	Function
1	GND
2	GND
3	Upper resistance
4	GND
5	SDA data wire
6	SCL clock wire
7	GND
8	+5V Power

3. N601: Sound power amplify (AN7522N)

Symbol	PIN	Function	Symbol	PIN	Function
Vcc	1	Power supply	GND	7	ground
Out 1 (+)	2	Ch 1 output (+)	In 2	8	Ch 2 input

GND(out 1)	3	Ch 1 Ground	VOL	9	Volume Control
Out 1 (-)	4	Ch 1 output (-)	Out 2 (-)	10	Ch 2 output (-)
Standby	5	Mute input	GND(out 2)	11	Ch 2 Ground
In 1	6	Ch 1 input	Out 2 (+)	12	Ch 2 output (+)

4. N301: Vertical output (TDA8357A)

Symbol	PIN	Function	Symbol	PIN	Function
INV IN	1	Input	PUMP UP	6	Pump up power
INV IN	2	Input	V OUT	7	Vertical output
Vcc	3	Pump up power	V PRO	8	Vertical protection
V OUT	4	Vertical output	V FEEDBACK	9	Vertical feedback
GND	5	Ground			

5. U101: Tuner

PIN	Function	PIN	Function
1	AGC	7	+5V
2	vacant	8	vacant
3	Gnd	9	Vt 33V
4	SCL	10	Gnd
5	SDA	11	IF Out
6	+5V		

4. ADJUSTMENT

Specific operation: use remote controller

Press “MUTE” → “CALL” → “-\\-“ → “CALL” → “MUTE” buttons in sequence to enter into factory mode.

Press [Program+] / [Program-] to select items and press [VOLUME+] / [VOLUME-] key, to make data adjustment of corresponding factory menus.

Press “EXIT” key to exit factory mode.

Focus adjustment

1. Receive a crosshatch signal.
2. While watching the screen, adjust the FOCUS VR on the FBT to make the vertical and horizontal lines as fine and sharp as possible.

Geometrical adjustment

Receive PAL standard complete pattern signal.

Adjustment steps:

- a) Adjust VSL, to the centre horizontal line just appears from half bottom shadow.
- b) Adjust VAM, to get 92% of vertical picture contents would be displayed on CRT.
- c) Adjust VSH, the centre horizontal line corresponds to CRT vertical centre.
- d) Adjust SCL, to the linearity of P card field is in proper condition.
- e) Adjust HSH, to get the picture horizontal centre correspond to CRT horizontal centre.

Receive NTSC signal and repeat above adjustment.

AGC Adjustment

Receive 60dB μ (1mV) VH colour bar pattern signal.

Select TOP item.

Adjust value, to noise reduce gradually and just disappeared point.

CRT cut off and white balance adjustment

a) CRT cut off adjustment

1. Select item VG2B, then adjust value to 32.
2. PRESS "0" key, when the screen shows "VG2" adjust the SCREEN control on Fly back transformer to make the screen show alternating flashing characters of "INSIDE HIGH INSIDE LOW".

b) White balance adjustment

1. Receive a Black and White pattern.
2. Adjust WRP, WRG, WRB items to get colour temperature 9300K \pm 3 JND.

Direct access key	Items	Description	Preset	Remark
"1"	5/6HSH	Horizontal shift	ON	A
"2"	5/6VSL	Vertical slop	32	A
	5/6VAM	Vertical amplitude	23	A
	5/6SCL	S-correction	17	A
	5/6VSH	Vertical shift	27	A
	5/6VOF	OSD Vertical offset	37	A
	HOF*	OSD Horizontal offset	42	A
"3"	RED	Black level offset R	32	A
	GRN	Black level offset G	32	A
	WPR	White point R	30	A
	WPG	White point G	26	A
	WPB	White point B	38	A
"4"	TOP	AGC Take-over point	20	A
	VOL	Volume	42	
	9860	Sub-volume of TDA9860/59	18	
	HDOL	Cathode drive level	59	
	AGC	IF AGC speed	1	
	VG2B	VG2 Brightness	42	
	IFFS		2	
"5"	Picture preset 1			
	0CON	Listen: Contrast	0	A
	0BRI	Listen: Brightness	0	A
	0COL	Listen: Colour	50	A
	0SHP	Listen: Sharpness	50	A
	1CON	Soft: Contrast	45	A
	1BRI	Soft: Brightness	45	A

	1COL	Soft: Colour	50	A
	1SHP	Soft: Sharpness	50	A
"6"	Picture preset 2			
	2CON	Standard: Contrast	75	A
	2BRI	Standard: Brightness	50	A
	2COL	Standard: Colour	50	A
	2SHP	Standard: Sharpness	60	A
	3CON	Dynamic: Contrast	85	A
	3BRI	Dynamic: Brightness	60	A
	3COL	Dynamic: Colour	60	A
	3SHP	Dynamic: Sharpness	80	A

NOTE: THE ITEMS WITH REMARK "A" IS ADJUSTABLE DATA.

Optional data

1. OP1

Bit	Function	Description	Preset	Remark
Bit 0	AV1	1=Enable	1	EA
Bit 1	SVHS	1=Enable	0	EA
Bit 2	COMB FILTER	1=Enable	0	EA
Bit 3	DVD	1=Enable	0	EA
Bit 4	RGB	1=Enable	0	EA
Bit 5	HALFTONE	1=Enable	0	EA
Bit 6	AV2	1=Enable	1	EA
Bit 7	RESERVE	1=Enable	0	EA

2. OP2

Bit	Function	Description	Preset	Remark
Bit 7	RESERVE	1=Enable	0	EA
Bit 6	TILT	1=Enable	0	EA
Bit 5	OSO	1= Enable	0	EA
Bit 4	RESERVE	1=Enable	0	EA
Bit 3	RESERVE	1=Enable	0	EA
Bit 2	FMWS	1=Enable	1	EA
Bit 1	CCC LOOP	1=Enable	0	EA
Bit 0	AVL	1=Enable	1	EA

3. OP3

Bit	Function	Description	Preset	Remark
Bit 7	TDA9377	1=Enable	1	EA
Bit 6	RESERVE	1=Enable	0	EA
Bit 5	RESERVE	1=Enable	0	EA

Bit 4	OSD STABLE	1=Enable	1	EA
Bit 3	Y PB PR	1=Enable	1	EA
Bit 2	Blue/Black BACK	1=blue 0=black	1	EA
Bit 1	BH2004D	1=Enable	0	EA
Bit 0	WOOFER	1=Enable	0	EA

4. OP4

Bit	Function	Description	Preset	Remark
Bit 7	RESERVE	1=Enable	0	EA
Bit 6	VCHIP	1=Enable	1	EA
Bit 5	RESERVE	1=Enable	0	EA
Bit 4	SOFT CHANGE	1=Enable	0	EA
Bit 3	RESERVE	1=Enable	0	EA
Bit 2	FMUS1	1=Enable	0	EA
Bit 1	MVK	1=Enable	0	EA
Bit 0	RED	1=Enable	0	EA

5. OP5

Bit	Function	Description	Preset	Remark
Bit 7	AUTO	1= Enable	1	EA
Bit 6	FREQ	1= Enable	0	EA
Bit 5	AV SOUND	1=Enable	0	EA
Bit 4	RESERVE	1=Enable	0	EA
Bit 3	RESERVE	1=Enable	0	EA
Bit 2	SPANISH	1= Enable	1	EA
Bit 1	FRENCH	1= Enable	1	EA
Bit 0	ENGLISH	1=Enable	1	EA

6. OP6

Bit	Function	Description	Preset	Remark
Bit 7	RESERVE	1=Enable	0	EA
Bit 6	RESERVE	1=Enable	0	EA
Bit 5	SOFT CHANGE AV	1=Enable	0	EA
Bit 4	LISTEN	1=Enable	1	EA
Bit 3	INNER DVD	1=Enable	0	EA
Bit 2	RESERVE	1=Enable	0	EA
Bit 1	9860	1=Enable	0	EA
Bit 0	MENU STYLE	1=Enable	0	EA

Note: *Don't adjust any OPTION items, please inform the engineer about any change.*

5. CIRCUIT EXPLANATION

1. N201 UOC TDA8377

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STAND BY output.	1	In STAND BY mode, low level (Power OFF). For Power ON this pin will be high.
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PLL IF	37	IF-PLL loop filter
IFVO/SVO	38	IF video output / selected CVBS output
VP1	39	supply voltage TV processor
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GND1	41	ground for TV processor
CVBS/Y	42	CVBS/SVHS(Y) input
CHROMA	43	SVHS (C) input
AUDOUT	44	Audio output
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VPE	55	Ground
VDDC	56	Digital supply to core (3.3 V)
OSCGND	57	Oscillator ground supply
XTALIN	58	Crystal oscillator input
XTALOUT	59	Crystal oscillator output
RESET	60	Ground
VDDP	61	Digital supply to periphery (+3.3 V)
P1.0/INT1	62	AV1 / AV2 mode Output.
P1.1/T0	63	AV /S-VHS mode Output.
P1.2/INT0	64	Remote control signal input.

Note

Pin	TV	SVHS	AV1	AV2
62	1	0	0	1
63	1	1	0	0

2. N202 24C08/PCF8598

PIN	Function
1	GND
2	GND
3	Upper resistance
4	GND
5	SDA data wire
6	SCL clock wire
7	GND
8	+5V Power

3. N601: Sound power amplify (AN7522N)

Symbol	PIN	Function	Symbol	PIN	Function
Vcc	1	Power supply	GND	7	ground
Out 1 (+)	2	Ch 1 output (+)	In 2	8	Ch 2 input

GND(out 1)	3	Ch 1 Ground	VOL	9	Volume Control
Out 1 (-)	4	Ch 1 output (-)	Out 2 (-)	10	Ch 2 output (-)
Standby	5	Mute input	GND(out 2)	11	Ch 2 Ground
In 1	6	Ch 1 input	Out 2 (+)	12	Ch 2 output (+)

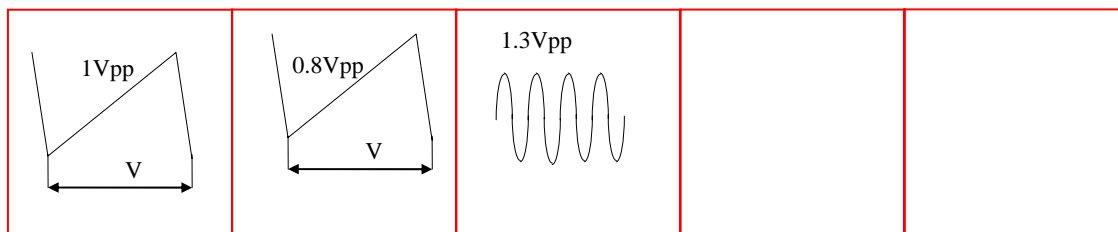
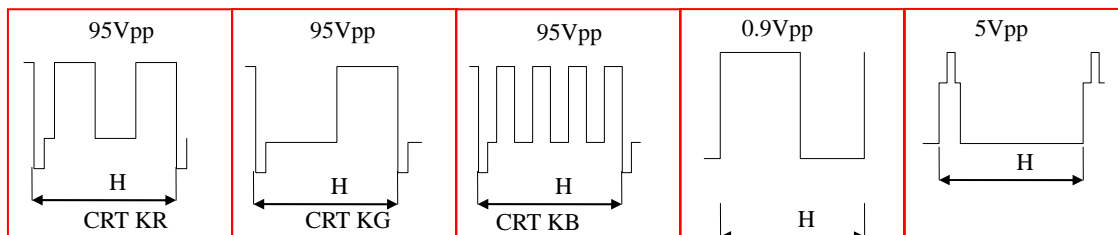
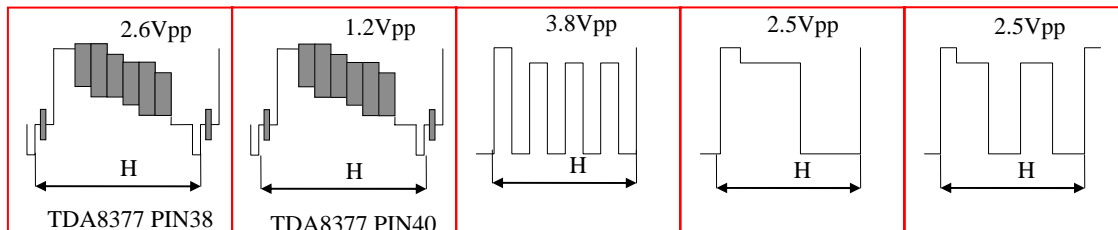
4. N301: Vertical output (TDA8357A)

Symbol	PIN	Function	Symbol	PIN	Function
INV IN	1	Input	PUMP UP	6	Pump up power
INV IN	2	Input	V OUT	7	Vertical output
Vcc	3	Pump up power	V PRO	8	Vertical protection
V OUT	4	Vertical output	V FEEDBACK	9	Vertical feedback
GND	5	Ground			

5. U101: Tuner

PIN	Function	PIN	Function
1	AGC	7	+5V
2	vacant	8	vacant
3	Gnd	9	Vt 33V
4	SCL	10	Gnd
5	SDA	11	IF Out
6	+5V		

6. Test point Waveforms



TP 1.0255 N301

TP 1.0255 N302

TP 1.0255 N303

7. IC voltages

TDA8377

PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
V	0	3.8	3.6	3.3	3.5	4.4	5.1	1.8	0	0.18	0.17	0	2.3	8	5	3
PIN	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
V	4	0	4	0.5	0.7	0.8	1.9	1.9	3.9	3.8	1.6	3.2	2.3	0	2.3	0.2
PIN	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
V	0.5	0.3	0	1.7	2.4	3.4	8	3.9	0	3.3	0	3.6	1.4	2.5	2.5	2.5
PIN	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
V	1.9	5.0	2.4	2.4	2.4	3.1	0	3.2	0	1.8	1.7	0	3.2	5.1	3.3	5

TDA8357

PIN	1	2	3	4	5	6	7	8	9
V	0.8	0.7	16	6.9	0	43	7.2	0.3	7.2

AN 7522N









PIN	1	2	3	4	5	6	7	8	9	10	11	12	
V	10	4.4	0	4.4	2.75	1.4	0	1.4	0.35	4.4	0	4.4	









24C08/PCF8598

PIN	1	2	3	4	5	6	7	8
V	0	0	5.1	0	3.2	0	0	5.1

6. MAINTENANCE SERVICE AND TROUBLE SHOOTING

- To assist in location possible faults use help guide below.

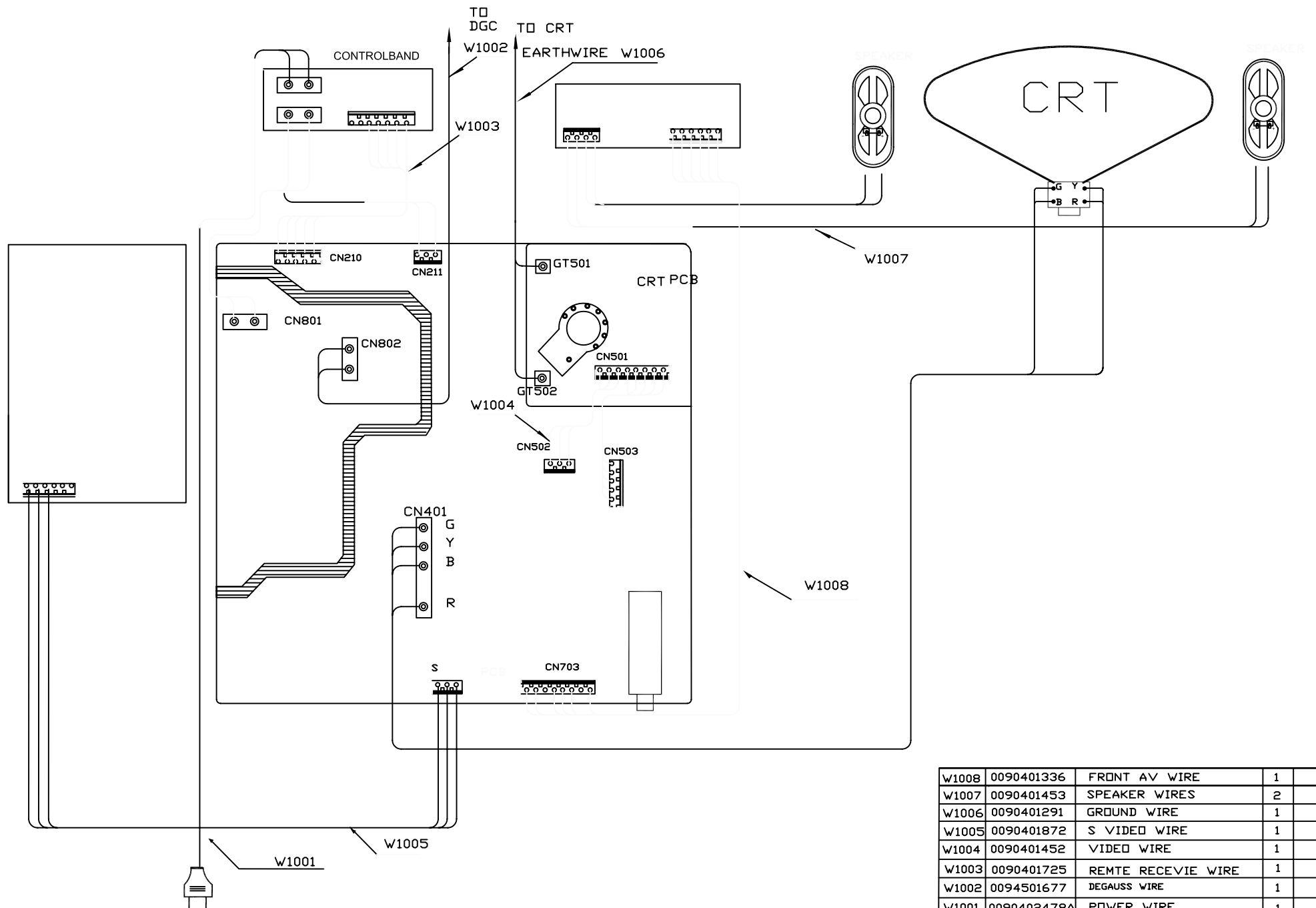
BREAKDOWN PHENOMENON		CHECKING
PICTURE	SOUND	
 Picture with snow	 Noise	The aerial direction and connection
 Double or Triple Image	 Normal	This is called "ghosting" and can be minimized with an outside aerial, and good quality cable and terminations. Altering the aerial direction can also minimize this effect.
 Disturb	 Noise	Electrical interference which can be caused by cars, motorbikes etc, Fluorescent lamps and dirty insulators on overhead power cables.
 Normal	 No sound	Volume Sound mute

 No Picture	 No sound	Ensure that the power supply is connected to the TV set and turned on. Also ensure that the TV set is not in "Listen Mode" or that the brightness and contrast are not turned down.
 No colour	 Normal volume	Adjust colour control
 Scramble	 Normal or Weak Volume	Adjust channel again
 Colour Spot	 Normal volume	Colour Purity is a fault that can be caused by moving the TV set, placing magnets near the TV screen or turning on/off house hold appliances such as vacuum cleaners near the TV set. Turn the TV off with the main power switch for 15 minutes. When the power is turned on again the TV set will automatically degauss the picture. In severe cases leave the TV set turned off over night.

Note:

- 1.If the fault can not be corrected using the above guide consult with your local authorized service center.
- 2.The TV set must only be repaired by a qualified registered service person. Never attempt to remove the back cover as TV set has dangerous voltages inside that may cause a fatality or fire.
3. The cabinet may produce the occasional "snapping sound" This is normal and caused by the materials in the cabinet expanding with room temperature changes.

7. CIRCUIT DIAGRAM AND WIRING CONNECTION DIAGRAM



W1008	0090401336	FRONT AV WIRE	1	
W1007	0090401453	SPEAKER WIRES	2	
W1006	0090401291	GROUND WIRE	1	
W1005	0090401872	S VIDEO WIRE	1	
W1004	0090401452	VIDEO WIRE	1	
W1003	0090401725	REMOTE RECEIVE WIRE	1	
W1002	0094501677	DEGAUSS WIRE	1	
W1001	0090402478A	POWER WIRE	1	
NO.	code name	NAME	Qty	REMARK

Sincere Forever

