



## SERVICE MANUAL

### Model Series:

Product Type:	Commercial Color TV
Chassis	CL
Manual Series:	SR25
Manual Part #:	3828VD0171B
Model Line:	F
Product Year:	2005

H19F34DT  
H20F34DT  
H24F34DT  
H25F34DT  
H24F39DT  
H25F39DT  
H27F34DT  
H27F39DT  
H24F36DT  
H25F36DT  
H27F36DT  
H32F36DT  
H27F36S

## CONTENTS

General Information/Remote Controls.....	1
Installer 's Menu .....	2
Servicing/Troubleshooting .....	3
Model/Module Parts List .....	4
Exploded Views .....	5
Schematics .....	6

Published by  
Technical Publications  
Zenith Electronics Corporation  
P.O. Box 240007  
Huntsville, AL 35824

Copyright© May 2005 by Zenith Electronics Corporation

Printed in U.S.A.

# PRODUCT SAFETY SERVICING GUIDELINES FOR AUDIO-VIDEO PRODUCTS

## IMPORTANT SAFETY NOTICE

This Manual was prepared for use only by properly trained audio-visual service technicians.

When servicing this product, under no circumstances should the original design be modified or altered without permission from Zenith Electronics Corporation. All components should be replaced only with types identical to those in the original circuit and their physical location, wiring and lead dress must conform to original layout upon completion of repairs.

Special components are also used to prevent x-radiation, shock and fire hazard. These components are indicated by the letter "x" included in their component designators and are required to maintain safe performance. No deviations are allowed without prior approval by Zenith Electronics Corporation.

Circuit diagrams may occasionally differ from the actual circuit used. This way, implementation of the latest safety and performance improvement changes into the set is not delayed until the new service literature is printed.

**Caution:** Do not attempt to modify this product in any way. Never perform customized installations without manufacturer's approval. Unauthorized modifications will not only void the warranty, but may lead to property damage or user injury.

Service work should be performed only after you are thoroughly familiar with these safety checks and servicing guidelines.

## Graphic symbols



The exclamation point within an equilateral triangle is intended to alert the service personnel to important safety information in the service literature.



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the service personnel to the presence of noninsulated "dangerous voltage" that may be of sufficient magnitude to constitute a risk of electric shock.



The pictorial representation of a fuse and its rating within an equilateral triangle is intended to convey to the service personnel the following fuse replacement caution notice: CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ALL FUSES WITH THE SAME TYPE AND RATING AS MARKED NEAR EACH FUSE.

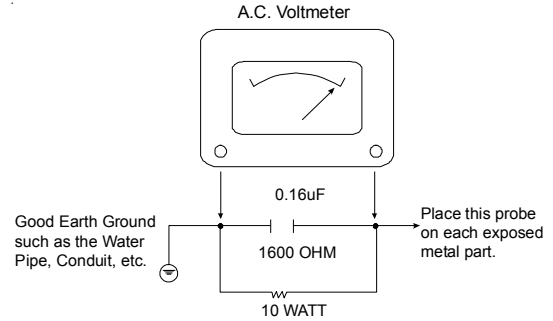
## SERVICE INFORMATION

While servicing, use an isolation transformer for protection from AC line shock.

After the original service problem has been corrected, make a check of the following:

### FIRE AND SHOCK HAZARD

1. Be sure that all components are positioned to avoid a possibility of adjacent component shorts. This is especially important on items transported to and from the repair shop.
2. Verify that all protective devices such as insulators, barriers, covers, shields, strain reliefs, power supply cords, and other hardware have been reinstalled per the original design. Be sure that the safety purpose of the polarized line plug has not been defeated.
3. Soldering must be inspected to discover possible cold solder joints, solder splashes, or sharp solder points. Be certain to remove all loose foreign particles.
4. Check for physical evidence of damage or deterioration to parts and components, for frayed leads or damaged insulation (including the AC cord), and replace if necessary.
5. No lead or component should touch a receiving tube or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces must be avoided.
6. After re-assembly of the set, always perform an AC leakage test on all exposed metallic parts of the cabinet (the channel selector knobs, antenna terminals, handle and screws) to be sure that set is safe to operate without danger of electrical shock. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST. Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner: Connect a 1500 ohm, 10 watt resistor, paralleled by .15 mfd 150V AC type capacitor between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and .15mfd capacitor. Reverse the AC plug by using a non-polarized adaptor and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.75 volts RMS. This corresponds to 0.5 milliamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



## X-RADIATION

1. Be sure procedures and instructions to all service personnel cover the subject of x-radiation. The only potential source of x-rays in current TV receivers is the picture tube. However, this tube does not emit x-rays when the HV is at the factory-specified level. The proper value is given in the applicable schematic. Operation at higher voltages may cause a failure of the picture tube or high-voltage supply and, under certain circumstances may produce radiation in excess of desirable levels.
2. Only factory-specified CRT anode connectors must be used.
3. It is essential that the service personnel have available an accurate and reliable high-voltage meter.
4. When the high-voltage circuitry is operating properly, there is no possibility of an x-radiation problem. Every time a color chassis is serviced, the brightness should be run up and down while monitoring the high voltage with a meter, to be certain that the high voltage does not exceed the specified value and that it is regulating correctly.
5. When troubleshooting and making test measurements in a product with a problem of excessively high voltage, avoid being unnecessarily close to the picture tube and the high voltage power supply. Do not operate the product longer than necessary to locate the cause of excessive voltage.
6. Refer to HV, B+, and shutdown adjustment procedures described in the appropriate schematics and diagrams (where used).

## IMPLOSION

1. All direct view picture tubes are equipped with an integral implosion protection system; take care to avoid damage during installation.
2. Use only the recommended factory replacement tubes.

## TIPS ON PROPER INSTALLATION

1. Never install any receiver in a closed-in recess, cubbyhole, or closely fitting shelf space over, or close to, a heat duct, or in the path of heated air flow.
2. Avoid conditions of high humidity such as: outdoor patio installations where dew is a factor, near steam radiators where steam leakage is a factor, etc.
3. Avoid placement where draperies may obstruct venting. The customer should also avoid the use of decorative scarves or other coverings that might obstruct ventilation.
4. Wall- and shelf-mounted installations using a commercial mounting kit must follow the factory-approved mounting instructions. A product mounted to a shelf or platform must retain its original feet (or the equivalent thickness in spacers) to provide adequate air flow across the bottom. Bolts or screws used for fasteners must not touch any parts or wiring. Perform leakage tests on customized installations.
5. Caution customers against mounting a product on a sloping shelf or in a tilted position, unless the receiver is properly secured.
6. A product on a roll-about cart should be stable in its mounting to the cart. Caution the customer on the hazards of trying to roll a cart with small casters across thresholds or deep pile carpets.
7. Caution customers against using a cart or stand that has not been listed by Underwriters Laboratories, Inc. for use with its specific model of television receiver or generically approved for use with TVs of the same or larger screen size.
8. Caution customers against using extension cords. Explain that a forest of extensions, sprouting from a single outlet, can lead to disastrous consequences to home and family.

# PRODUCT SAFETY SERVICING GUIDELINES FOR AUDIO-VIDEO PRODUCTS

## X-Radiation

To prevent possible exposure to x-radiation caused by excessive CRT anode voltage, the CL chassis incorporate a "High Voltage Shut-down" circuit. This circuit senses the level of a flyback pulse from the "Flyback Transformer" representative of the actual high voltage on the CRT anode. When this level exceeds a predetermined voltage, the circuit shuts down the TV set, preventing further generation of anode voltage.

## Shutdown Circuit Operation

(Refer to Figure below)

The flyback pulse voltage from pin 6 of TX3204 (Flyback Transformer) is peak detected (rectified) by the action of diode DX3006 and capacitor CX3003. This forms a DC voltage appearing on CX3003 representative of the CRT anode voltage (HV) produced by TX3204. This voltage is divided down by precision resistors RX3013, RX3015, RX3016 and RX3022. This lower voltage appears on the zener diode ZDX3004; when this voltage exceeds by 3.5 Vdc the "zener voltage" the HV shutdown occurs (pin 29 of ICX2200).

## CRT Anode High Voltage Measurement Procedure

**Each CRT screen size has its own safe operating anode and shutdown voltage. Critical safety component (designated with an 'X' in the component designator) are designed to operate the CRT at a safe operating anode voltage and provide proper shutdown thresholds. If replacement of any of these components are deemed necessary, it is important to use original type Zenith components. After replacement is made, confirm proper anode voltage using the following procedure.**

Measurement of the CRT anode voltage must be performed using a high impedance-high voltage meter, with no raster on the screen, and operating at nominal horizontal frequency, 15.75 KHz (NTSC signal).

After discharging the CRT, connect a high impedance-high voltage meter to the CRT anode. Turn the television 'on' and confirm a good signal is being displayed. Reduce Brightness and Contrast settings until the picture is well extinguished.

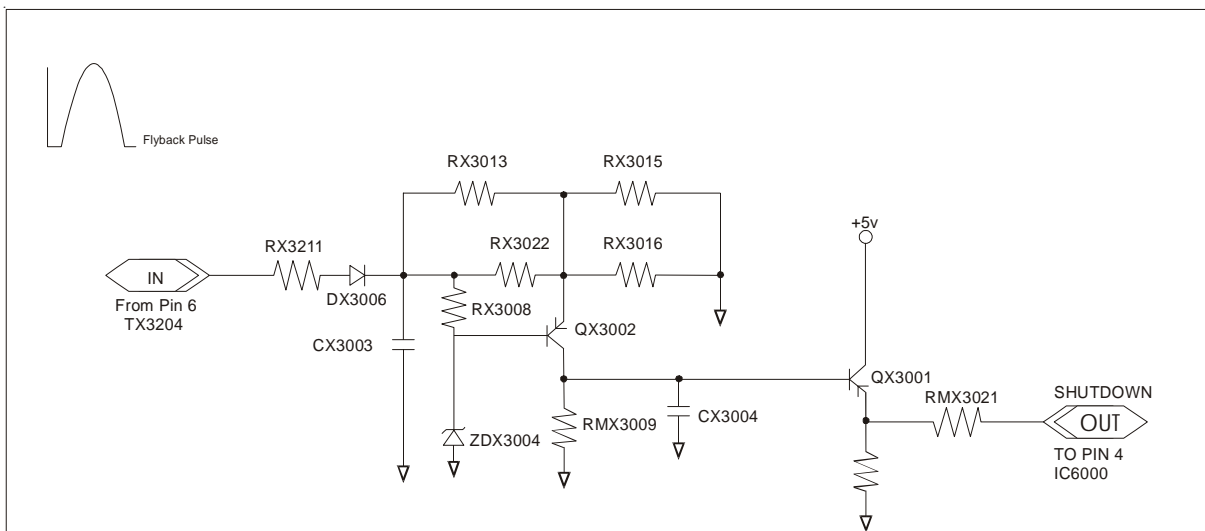
Observe the anode voltage meter reading and compare with the table below for the proper CRT screen size. If the voltage reading is higher than the maximum, verify circuit component values and proper operation.

CRT anode Voltage		
CRT Screen Size	Nominal Anode Voltage (KV)	Max. Shutdown Voltage (KV)
19"	26 ± 1.0	32
20"	26 ± 1.0	32
24"/25"	28 ± 1.0	34
27"	28 ± 1.0	34
32"	30 ± 1.0	36

COMPONENTS WITH ANY INFLUENCE IN HV INCREASE	
Fly-Back Transformer	
Deflection Yoke	
CX3216	RX3015
CX3210	RX3013
CX3212	ZDX3004
CX3252	RX3704
CX3256	RX3703
RX3022	RX3705
RX3016	RX3706

## HV SHUTDOWN PROCEDURE.

- After discharging the CRT, connect a high impedance-high voltage meter to the CRT anode
- Access **Video Menu** and adjust Brightness and Contrast controls for minimum screen luminance (beam current to 0 mA).
- Wait until the **Video Menu** or display disappear.
- Connect a variable Resistor (1 MW) in parallel with RX3704, and decrease slowly the resistance value until shutdown occurs.
- Measure High Voltage shutdown.



# TABLE OF CONTENTS

## SECTION 1.....GENERAL INFO

<b>PRODUCT SAFETY SERVICING GUIDELINES</b>	<b>i-ii</b>
<b>INTRODUCTION</b>	<b>1-1</b>
OVERVIEW	1-1
<b>INTERFACES</b>	<b>1-2</b>
SUPERPORT - MPI	1-2
MULTIPLE PROTOCOL INTERFACE	1-2
EBC (EDGE BOARD CARD)	1-2
CONNECTION CENTER ON BACK OF TV	1-2
<b>REMOTE CONTROL</b>	<b>1-4</b>
<b>LT-2000/02 CLONE PROGRAMMER</b>	<b>1-5</b>
QUICKSET II PROGRAMMER	1-5
LEARN FROM TV	1-5
WRITE TO TV	1-5
SET CLONE CLOCK FROM TV	1-6
SET TV CLOCK FROM CLONE	1-6
DISPLAY TV SETUP	1-6
DISPLAY CLONE SETUP	1-6
OPERATION NOTES	1-6
<b>USER MENUS</b>	<b>1-7</b>
SETUP MENU	1-7
AUTOPROGRAM	1-7
ADD/DEL/BLNK	1-7
CHANNEL LABELS	1-7
CLOCK SET	1-8
TIMER	1-8
CAPTIONS	1-8
LANGUAGE	1-8
AUDIO MENU	1-9
VIDEO MENU	1-9
PARENTAL CONTROL	1-10
ON-SCREEN DISPLAYS	1-11
CHANNEL/TIME/AUDIO DISPLAY	1-11
CH PREVIEW MENU	1-11
CAPTIONS DISPLAY	1-12
SOURCE MENU	1-12

## SECTION 2.....FACTORY & INSTALLERS MENU

<b>ACCESSING INSTALLERS MENU</b>	<b>2-1</b>
INSTALLERS MENU ADJUSTMENTS	2-1
ADJUSTMENT CHART	2-6
<b>ACCESSING FACTORY MENU (34-36 SERIES)</b>	<b>2-8</b>
FACTORY MENU OPTIONS	2-8
<b>ACCESSING FACTORY MENU (39 SERIES)</b>	<b>2-11</b>
FACTORY MENU OPTIONS	2-11

## SECTION 3.....SERVICING

<b>SERVICING</b>	<b>3-1</b>
GENERAL INFORMATION	3-1
MODULE-LEVEL SERVICING	3-1
SERVICING THE POWER SUPPLY	3-1
IF SERVICING	3-4

AGC DELAY	3-4
G2 ADJUSTMENT	3-4
FOCUS ADJUSTMENT	3-4
ADJUSTMENT OF RGB CUTOFF	3-4
SWITCHING PROCESS	3-5
SENSING AND PRIORITIES	3-5
PRELIMINARY SETUP	3-6
PURITY ADJUSTMENT	3-6
CONVERGENCE ADJUSTMENT	3-6
VERTICAL-TILT WEDGE ADJUSTMENT	3-7
HORIZONTAL-TILT WEDGE ADJUSTMENT	3-7
UNUSUAL TILT CASE	3-7
IMPROVING CRT CORNER PURITY	3-7
MODIFICATION	3-7

## SECTION 4.....MODEL PARTS

H19F34DT	4-1
H20F34DT	4-1
H25F34DT	4-1
H25F39DT	4-1
H27F34DT	4-2
H27F39DT	4-2
H25F36DT	4-2
H27F36DT	4-2
H27F36S	4-2
H32F36DT	4-2
H24F/34DT/36DT/39DT	4-3

## SECTION 5.....DIAGRAMS

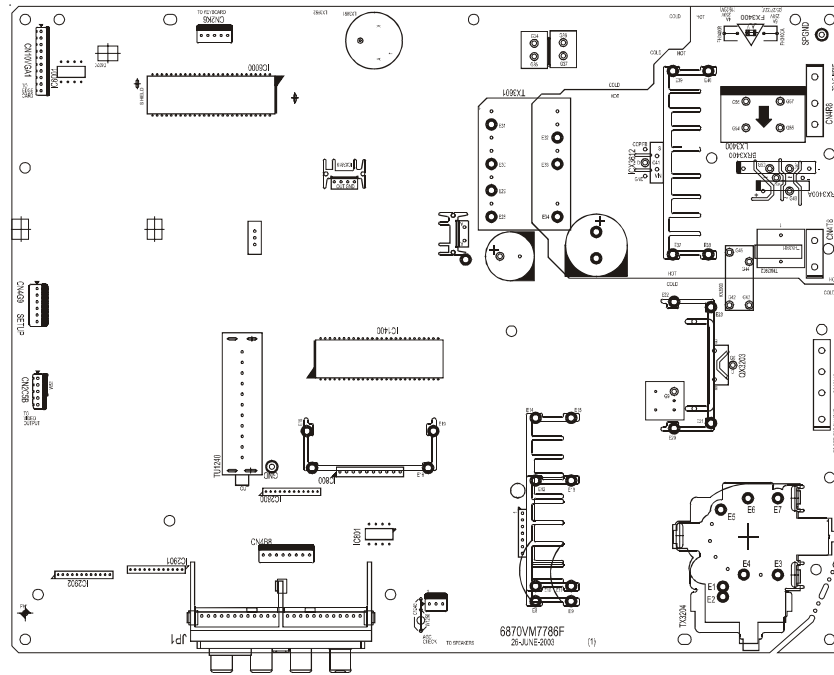
H19F34DT EXPLODED VIEW	5-1
H20F34DT EXPLODED VIEW	5-2
H24F34DT/36DT/39DT EXPLODED VIEW	5-3
H25F34DT/36DT/39DT EXPLODED VIEW	5-4
H27F34DT/36DT/36S/39DT EXPLODED	5-5
H32F36DT EXPLODED VIEW	5-6

## SECTION 6.....SCHEMATICS

POWER SUPPLY	6-1
MAIN MICRO CIRCUIT	6-2
DEFLECTION CIRCUIT	6-3
VIDEO PROCESSOR CIRCUIT	6-4
AUDIO PROCESSOR	6-5
A/V SWITCH	6-6
MPI CARD CIRCUIT	6-7
VIDEO OUTPUT	6-8
EDGE CARD CIRCUIT	6-9
AUDIO AMPLIFIER	6-10
COMB FILTER	6-11
BLOCK DIAGRAM	6-12
PCB TOP LAYOUT	6-13
PCB BOTTOM LAYOUT	6-14
PCB TOP LAYOUT	6-15
PCB BOTTOM LAYOUT	6-16



# OVERVIEW



## INTRODUCTION

This manual covers the CL Chassis Commercial Sets. All suffix 36 models have stereo, surround, MPI, and super video ports. The CL series chassis features nine ICs for all signal, sync, and sweep processing.

**ICM2200** - Audio/video, sync and sweep drive processing.

**IC6000** - Main microprocessor. It is tied directly to the keyboard and the infrared detector.

**IC6001** - System memory.

**IC2100** - Vertical sweep amplifier.

**IC2901** - Video switch.

**ICX3612** - Power supply. This is a switching type supply powered by a bridge rectifier circuit. At turn on, voltages for the vertical and video output circuit are derived from the sweep circuit.

**IC1400** - Stereo audio processing.

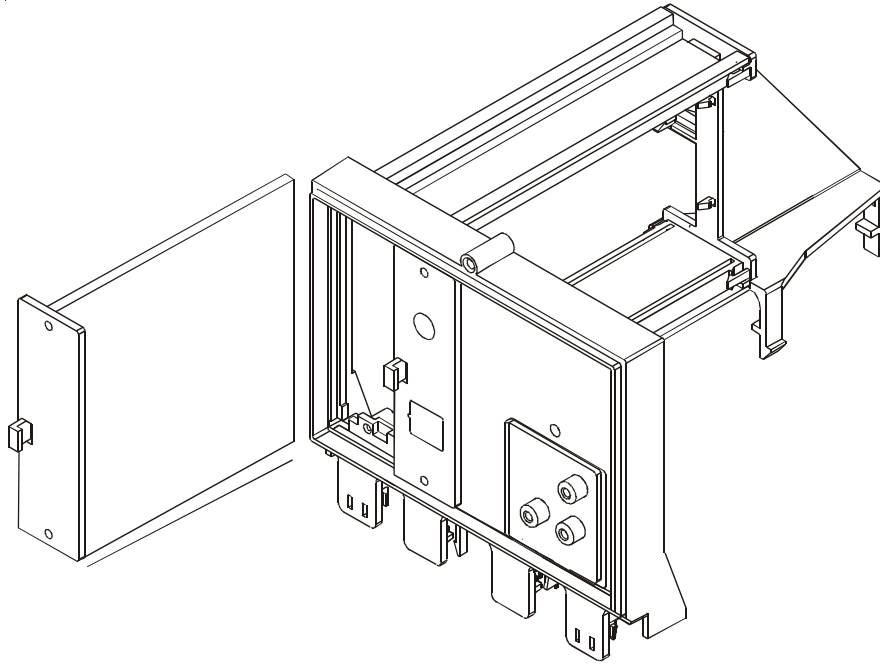
**IC2902** - Y/C switch.

**IC2800** - Audio switch.

F-Line CL Chassis Model Information								
MODEL	SCR	FRONT JACKS	REAR JACKS	AUDIO	EXTRA FEATURES	REMOTE	MICRO	OP GUIDE
MODULE LEVEL REPAIR ONLY								
H19F34DT	19	N/A	3	MONO	SuperPort Slot, MPI Card	6710V00108A	0IMCRM1038A	3828VA0A30A
H20F34DT'	20	N/A	3	MONO	SuperPort Slot, MPI Card	6710V00108A	0IMCRM1038A	3828VA0A30A
H24/25F34DT	25	3	3	MONO	SuperPort Slot, MPI Card	6710V00108A	0IMCRM1038A	3828VA0A30A
H24/25F39DT	25	3	3	MONO	N/A	6710V00108A	0IMCRM1039A	3828VA0A30A
H27F34DT	27	3	3	MONO	SuperPort Slot, MPI Card	6710V00108A	0IMCRM1038A	3828VA0A30A
H27F39DT	27	3	3	MONO	N/A	6710V00108A	0IMCRM1039A	3828VA0A30D
H24/25F36DT	25	3	7	Stereo MTS	SuperPort Slot, MPI Card	6710V00108A	0IMCRM1038A	3828VA0A30C
H27F36DT	27	3	7	Stereo MTS	SuperPort Slot, MPI Card	6710V00108A	0IMCRM1038A	3828VA0A30C
H32F36DT	32	3	7	Stereo MTS	SuperPort Slot, MPI Card	6710V00108A	0IMCRM1038A	3828VA0A30C

## OVERVIEW (continued)

---



### INTERFACES

#### **CAMPORT**

Some models have video and right/left audio input jacks at the front of the receiver. These jacks can be used to view videotapes from a VCR or Camcorder. When the video cable is plugged into the jack, the shorting jumper J1 opens, placing a high at pin 10 of the IC6000 microprocessor. This switches the TV into the auxiliary mode. As long as the cables are attached, the TV set will be locked in auxiliary mode. Use of a remote control or buttons on the front of the set will not permit switching into tuner mode until the video cable is disconnected.

#### **SUPERPORT - MPI**

Zenith Commercial Product receivers are now being adapted to interact with other equipment. Prime examples of this can be found in Lodging and Health Care situations where the set is controlled from the main office.

All this is made possible by the new technology that is being built into these receivers. The SuperPort and Multiple Protocol Interface (MPI) jack and associated circuitry allow remote control of the set.

#### **MULTIPLE PROTOCOL INTERFACE**

Television functions and features are controlled by the communication of commands and status information through a SuperPort by the MPI interface.

#### **EBC (EDGE BOARD CONNECTOR)**

Allows easy access for removing/installing accessory modules providing a rail mounted slide-through card. These cards might contain one of the above features.

#### **CONNECTION CENTER ON BACK OF TV**

The connection on the back of the TV contains the input and output interfaces.

## OVERVIEW (continued)

### CONNECTION CENTER ON BACK OF TV

The connection center on the rear of the TV allows for connection of the viewing source. The diagrams list the use of each jack on the connection center.

#### 1. ANTENNA/CABLE JACK

Use the jack for 75-ohm antenna-type signal connections to the TV. Attach antenna, cable TV line, or other video equipment to jack. The input cable may come from an outdoor or master antenna, cable TV line, cable decoder box, or the RF output from a VCR.

#### 2. SUPERPORT LOCATION

Provides for easy installation of local service provider accessory module without removing the cabinet back. Module is housed inside the TV cabinet and receives operating power and all necessary interface signals through internal connections.

#### 3. MPI (MULTIPLE PROTOCOL INTERFACE) JACK

Standard RJ11 jack that provides interface with in-room entertainment and video services. Also used with installer's programmer (page 1-5) for programming other TVs in the system with the same features as the master TV.

#### 4. S-VIDEO IN AND OUT

These jacks are for input and output connections to SUPER-VHS video equipment. Use the input jack for viewing S-Video. Use the output jack to loop the S-Video signal to an additional TV or monitor. The right and left audio jacks are used for stereo input or output paired with the S-Video Signal.

#### 5. VIDEO IN AND AUDIO IN

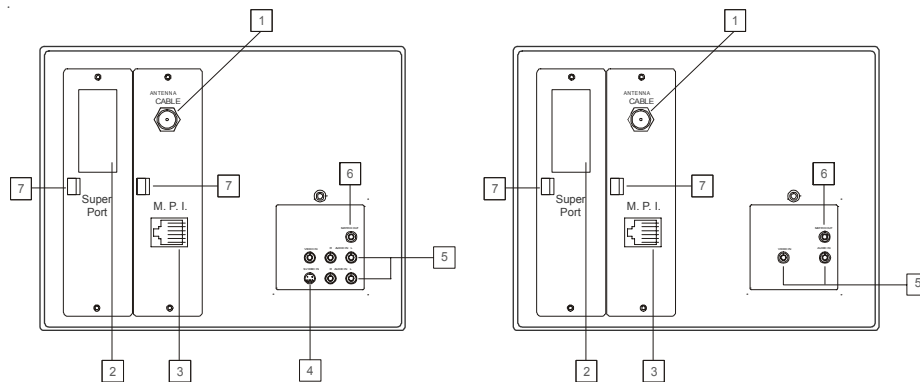
Use the Video and Audio In jacks for baseband video and audio input signals from a VCR or other signal source.

#### 6. MATRIX SPEAKER OUT

Use this jack for connection of an 8-ohm extension speaker to get television sound at a remote location. The speaker in the TV remains active, while a monaural audio output is heard from the remote speaker.

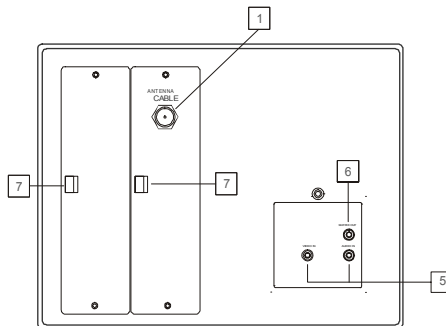
#### 7. EBC KNOB

For handling/removal of EBC (Edge Board Card).



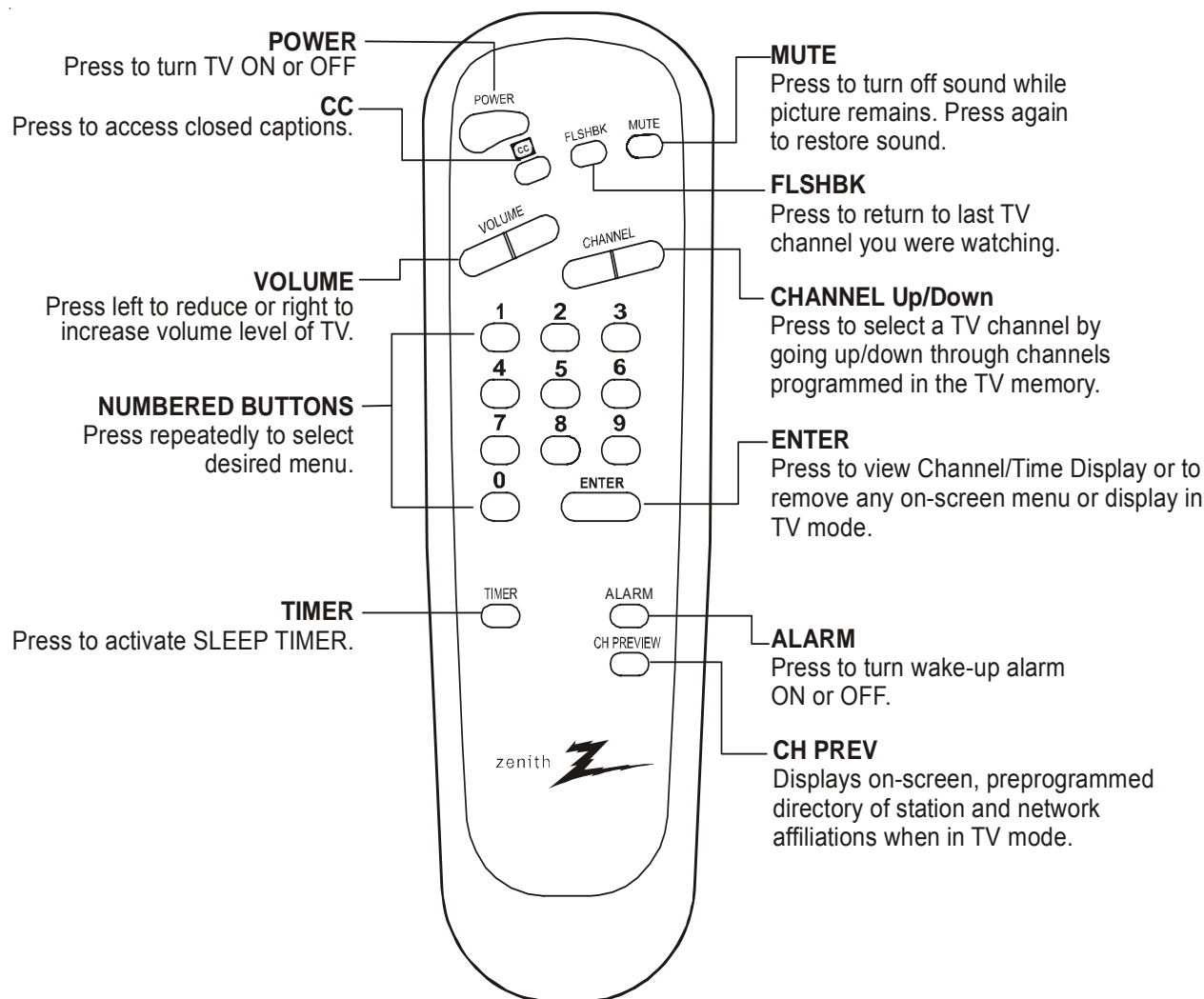
Used on HXXX36DT models

Used on HXXX34DT



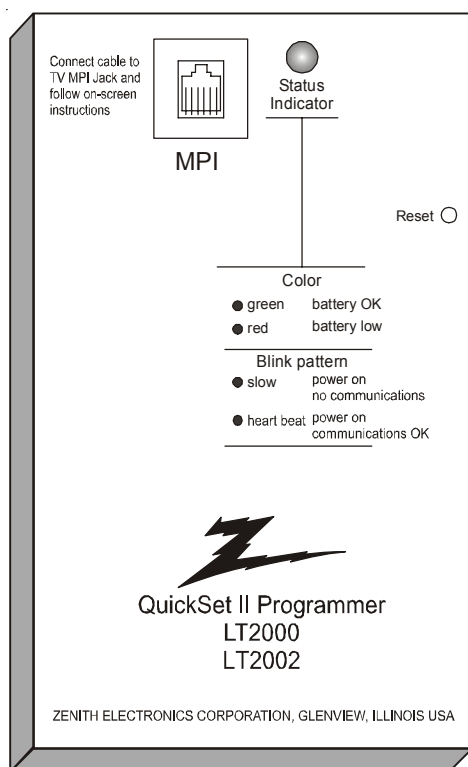
Used on HXXX39DT

# REMOTE CONTROL



**SC652Z**  
**6710V00108A**

# LT2000 & LT2002 CLONE PROGRAMMER



## QUICKSET II PROGRAMMER

The Quick Set II programmer LT2000 & LT2002 allows custom setup and programming information to be quickly copied from a master TV into multiple television sets. Once learned from the master, setup data is retained in the LT2002 for future use and recall.

When using the LT2002, operation will be easier if the TV is connected to a good quality signal and is displaying a stable picture. To operate the LT2002, use the indicated keys on an installer's remote or user's remote, or the front panel keys on the TV receiver.

### SETUP

Begin the programming process by setting up a master TV set using one of the installer's remotes or an MBR remote. Follow the instructions in the operating guide for the specific TV model. Remember to set all features that will be customized including the channel scan list, channel labels, and installer menu setups.

Next connect the LT2002 to the master TV set using the cable provided with the programmer. Connect the cable between the MPI jack on the TV and the programmer. The TV set automatically activates the programmer.

Once connected, check the "Status Indicator" LED on the programmer. If the indicator is green and flashing (a double-blink "heartbeat" pattern), proceed to the next step.

**NOTE:** A slowly flashing green light indicates there is a problem with the communications between TV and programmer. In this case, check for damaged cable, poor contacts, or other connection problems. If the status indicator is red, the programmer batteries are low.

If communications are good, the sign-on screen will be displayed on the TV screen as shown on the quick setup instructions. If the intention is to set the TV's or programmer's real-time clocks, and not the clone clock or TV clock time settings, then press a key to proceed to the main clone menu.

If a previously stored TV setup is in a particular clone memory, it may be changed if desired by overwriting it with a new setup. There is no need for a separated memory clear operation. Setups stored in programmer memory are nonvolatile and will be retained even after a battery change.

### LEARN FROM TV

Select "Learn From TV" then press ON/OFF, POWER, or ENTER to begin learning process. Alternatively, use the TV front panel CHANNEL UP or CHANNEL DOWN keys to highlight choice. Press ON/OFF, POWER, or ENTER to activate. The next screen will allow a choice of four available memories to store this TV setup. Four different TV setups can be stored in the LT2002.

Using the On-screen menu, choose a memory or choose to return to the main selection menu. Now press ON/OFF, POWER, or ENTER to activate your selection. The next screen allows one last opportunity to check the versions of TV and clone setups.

Press ON/OFF or POWER to activate the learning cycle, or press any other keys to return to the selection menu to make another choices.

Once a process has begun, the TV screen will display "LEARNING IN PROGRESS". Please wait for the process to complete. When the TV screen displays "LEARNING COMPLETED", press any key to end the learning process and return to the clone selection menu.

### WRITE TO TV

Select "WRITE TO TV", and then press ON/OFF, POWER, or ENTER to begin teaching process. Alternatively, use the TV front panel CHANNEL UP or DOWN keys to highlight the choice and then press ON/OFF, POWER, or ENTER to activate. The next screen displays a choice of the four available memories that can be copied to the TV. Select the desired memory number, and press ON/OFF, POWER, or ENTER to begin the teaching process. Alternatively, use the TV front panel CHANNEL UP or DOWN keys to highlight choice. Press ON/OFF, POWER, or ENTER to begin.

# LT-2000 & 2002 CLONE PROGRAMMER

---

Using the on-screen menu, select a memory or return to the main selection menu. Then press ON/OFF, POWER, or ENTER to activate the selection.

The next screen allows for one last opportunity to check the versions of TV and clone setups. Press ON/OFF or POWER to activate the teaching cycle, or any other key to return to the selection menu to make other choices.

Once a process has begun, the TV screen will display the "TEACHING IN PROGRESS" message. Please wait for the process to complete. When the TV screen displays "TEACHING COMPLETED", press any key to end the teaching process and return to the clone selection menu.

## **SET CLONE CLOCK FROM TV**

To set the real-time clock in the LT2002, select "SET CLONE FROM TV" and then press ON/OFF, POWER, or ENTER to copy current TV time to the clone clock. Alternatively, use the TV front panel CHANNEL UP or CHANNEL DOWN keys to highlight the choice. Then press ON/OFF, POWER, or ENTER to activate.

This process will return the LT2002 to the sign-on screen to display the clone and TV clock settings. Press a key to go to the clone selection menu and perform other functions, or simply disconnect if the time setting was the last task.

## **SET TV CLOCK FROM CLONE**

To set the real time clock in the, select "SET TV CLOCK FROM CLONE" and then press ON/OFF, POWER, or ENTER to copy current LT2002 time to the TV clock. Alternatively, use the TV front panel CHANNEL UP or CHANNEL DOWN keys to highlight the choice. Then press ON/OFF, POWER, or ENTER to activate.

This process will return the LT2002 to the sign-on screen to display the clone and TV clock settings. Press a key to go to the clone selection menu and perform other functions, or simply disconnect if the time setting was the last task.

## **DISPLAY TV SETUP**

Select "DISPLAY TV SETUP", and then press ON/OFF, POWER, or ENTER to begin the teaching process. Alternatively, use the TV front panel CHANNEL UP or CHANNEL DOWN keys to highlight your choice. Then press ON/OFF, POWER, or ENTER.

The TV screen will display the items in the service menu setups. Use this function to quickly check the TV for

correct setup. Press any key to clear display and return to the clone selection menu.

## **DISPLAY CLONE SETUP**

Select "DISPLAY CLONE SETUP" and then press ON/OFF, POWER, or ENTER to begin the teaching process. Alternatively, use the TV front panel CHANNEL UP or CHANNEL DOWN keys to highlight the choice, then press ON/OFF, POWER, or ENTER to begin.

The TV screen will display the memory selection menu. Select the desired memory number, and then press ON/OFF, POWER, or ENTER to display the contents of the selected memory. Alternatively, use the TV's CHANNEL UP or CHANNEL DOWN keys to highlight the choice, then press ON/OFF, POWER, or ENTER to begin.

The TV screen will display items in the factory menu setup. Use this function to quickly check contents of a particular clone memory for correct setup. Press any key to clear the display and return to the clone selection menu.

## **OPERATION NOTES**

Disconnect the LT2002 from the TV set when the desired task has been completed. Disconnecting the clone automatically switches it off. The real time clock continues to run when the main circuits are switched off.

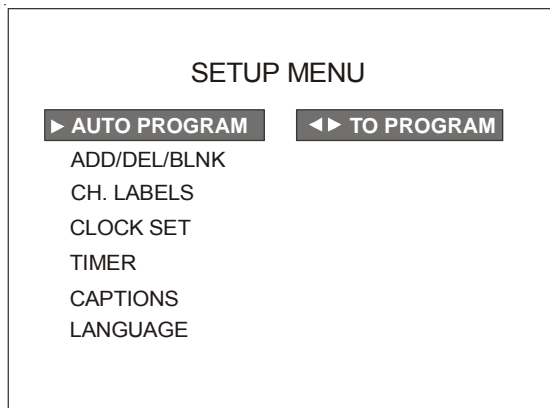
After replacing exhausted batteries, or if the programmer behaves strangely after a static shock, use a paper clip or similar instrument inserted through the small hole marked "RESET" to activate the internal reset switch and restore normal operation. After reset, check the real-time clock setting. It may be necessary to reset the clock from a TV programmed to the correct time.

The specific microprocessor used in any TV set may be determined by activating the service menu. The microprocessor part number appears at the top of the screen with the service menu is activated. Processors before the 221-01006 has limited screen display capability. They cannot display entire screens as shown in the quick setup instructions accompanying the LT2002 programmer. Use the printed menu illustrations on the quick setup sheet as an aid in making programming choices.

# USER MENUS

## SETUP MENU

Press the MENU key on the Installer's remote repeatedly so that the SETUP MENU appears on the screen.



### AUTO PROGRAM

Using the Up/Down arrows on the remote control, highlight AUTO PROGRAM on the screen. Then press a RIGHT/LEFT Adjust arrow button to reach the AUTO PROGRAM screen. Using the Up/Down arrows, choose either CABLE TV or OFF-AIR ANTENNA. Press the RIGHT or LEFT ADJUST arrows to begin the Channel Search. The receiver searches for available channels and stores them in memory for user access.

### ADD/DEL/BLNK

Press the Up Arrow repeatedly to highlight the ADD/DEL/BLNK option. Use the remote to select a channel. ADD/DELETE allows tailoring of the channel scan to eliminate unwanted channels and add desired channels that were not stored during Auto Programming.

Use the number keypad and ENTER to add a deleted channel. Using the Right/Left arrows, pick whether a channel is Added, Deleted, or Blank.

When BLNK is selected, screen will be black while audio continues.

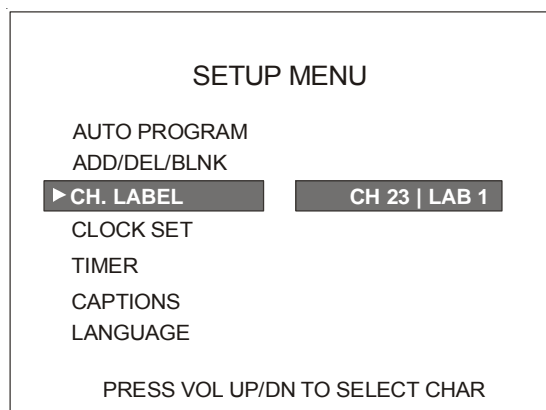
Select any other channels to be changed, and when finished, press ENTER to close the menu.

### CH LABELS (CHANNEL LABELS)

Press the MENU key on the remote so that the SETUP MENU reappears. Use the Up Arrow to choose the CH LABELS option. Pressing either the Right/Left arrow repeatedly, pick the label you want from the list of available selections shown in the chart. Select other channels, and when you are finished, press ENTER to remove the menu.

You also have the option of creating 20 programmable labels having five digits each.

In order to edit a programmable channel label, it must be selected or already present in the current channel, pressing Volume Up/Down keys any digit can be selected and edited, with the Channel Up/Down keys the blinking character can be edited, pressing the Volume Up/Down key again can select another character and also be edited. The channel label will be stored pressing Volume Up/Down keys until there is not any digit blinking.



## CHANNEL LABELS

A&E	CMTV	ESPN	HSE	NOS	TBN	VC
ABC	CNBC	ESP2	HSN	PBS	TELE	VCR
ACTS	CNN	ET	IC	PLAY	TLC	VH-1
ADC	COM	EWTN	INSP	PTL	TMC	VISN
AMC	CSPN	FAM	JCN	QVC	TNN	VJN
BCC	CSP2	FNN	LIFE	RDS	TNT	WB
BET	CTN	FOX	MAX	REQ	TRAV	WGN
BRAV	CTV	F&V	ME/U	SC	TSN	WTBS
CA	DIS	FX	MMT	SCFI	TVA	WWOR
CBC	DISC	GALA	MTV	SHOW	TWC	YTV
CBN	E!	HBO	NBC	SIN	UPN	- - - -
CBS	ENC	HN	NICK	TBS	USA	None

**Note:** Selecting "----" label option means the channel will not be displayed on the channel/time/audio signal display. Selecting the none option means the channel will not have a label.



## USER MENUS (continued)

### CLOCK SET

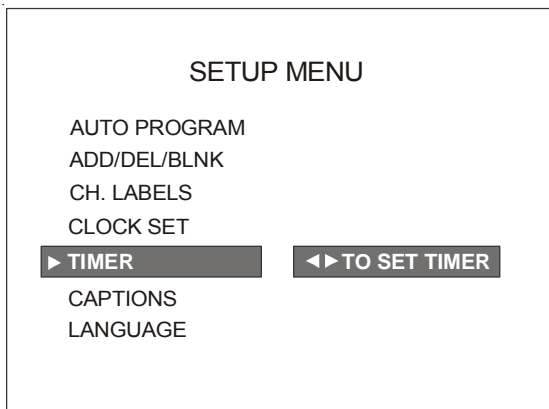
Press MENU repeatedly to show the Setup menu. Use the Up/Down Arrows to highlight Clock Set.

Set the current time; use the Number keypad to enter the hours, then minutes. For example, enter 06, then 30, to set 6:30 on the clock. Use the TIMER key to specify AM or PM. Press ENTER to start the clock and return to TV viewing.

### TIMER

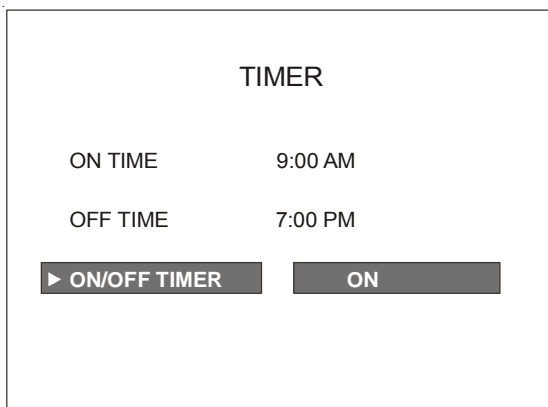
On the optional installer's remote, press MENU repeatedly until the Setup menu appears.

Press SELECT repeatedly to highlight the Timer option, press the right arrow.



Use SELECT to choose an option. Use the number keypad and/or the Left/Right ADJ arrows to enter the times. Use the timer key to set AM/PM.

Your options are:



### **• On time**

Sets a time that the TV will turn itself On each day.

### **• Off Time**

Sets a time that the TV will turn itself Off each day.

### **• On/Off Timer**

Enables or disables the On/Off Timer functions. (The On/Off Timer can be disabled but the setting will be retained).

Press ENTER to remove the menu and return to TV viewing.

**Note: The clock must be set before for the Timers to function.**

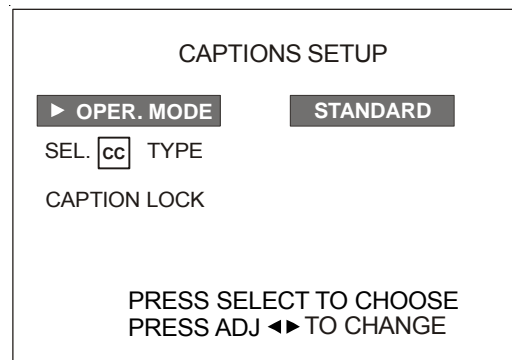
**The Off Timer can be used to turn the TV Off at the present time.**

**No On Timer setting is required to use the Off Timer feature.**

### CAPTIONS

Caption is a feature that allows the TV to receive closed captions and/or text options when made available by the broadcaster.

There are two operating modes for caption: quick/mute or standard: If quick mute is selected, pressing the cc key switches the current cc selection On/Off.



Use the Right/Left arrows to choose any of the following options: CAPTION 1, CAPTION 2, CAPTION 3, CAPTION 4, TEXT 1, TEXT 2, TEXT 3, TEXT 4 or OFF. Press ENTER to close the menu.

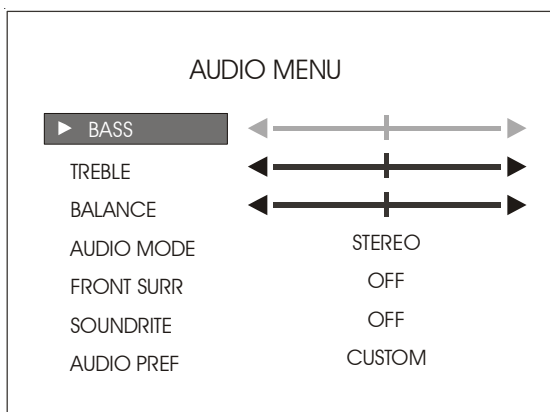
### LANGUAGE

## USER MENUS (continued)

In the Language menu, use the Right/Left arrow to choose one of the following options: English, Spanish, or French. Press ENTER to return to TV viewing.

### AUDIO MENU

Press MENU repeatedly on the remote control until the AUDIO MENU appears.



Using the Up Arrow on the remote control, highlight the setting you want to change. Choose from:

- **BASS:** Adjusts the amount of Bass (low frequency level) in the sound. It has 15 steps (0 to 14)
- **TREBLE:** Adjusts the amount of Treble (High frequency Level) in the sound. It has 15 steps (0 to 14)
- **BALANCE:** Adjusts the balance of sound between the left and right speakers. It has 29 steps (0 to 28).
- **AUDIO MODE:** Selects between Mono, Stereo and 2<sup>nd</sup> Audio/SAP. If 2<sup>nd</sup> Audio/SAP is selected, but the current channel does not support SAP either Stereo or Mono will be heard.
- **FRONT SURR:** The Front Surround gives spatial effect to the surround material.
- **SOUNDRIE:** Used to obtain a uniform volume level, particularly while changing channels.
- **AUDIO PREF:** This feature allows the customer to maintain two separate audio settings by selecting "custom" or "preset". The Factory gets the "Preset" setting and the customer sets "custom".

Press a RIGHT/LEFT ADJ arrow to adjust or change the option you have selected. Press ENTER to return to TV viewing, or press the Up Arrow to adjust another option.

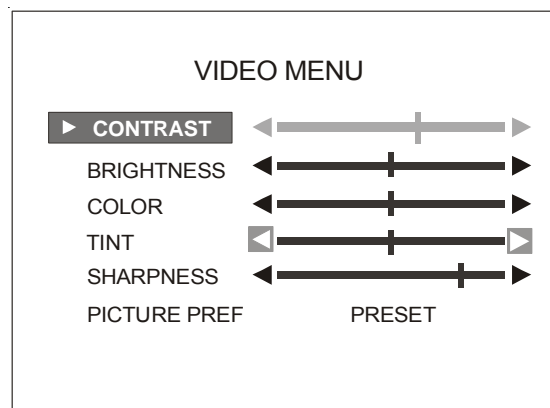
**Note:** Audio Menu is only available for 36 Series.

### VIDEO MENU

Press MENU repeatedly until the Video Menu appears.

Your options are:

- **CONTRAST:** Adjusts the contrast of the picture (difference between white and black). It has 64 steps (0 to 63).
- **BRIGHTNESS:** Adjusts the brightness of the picture (amount of white). It has 64 steps (0 to 63).
- **COLOR:** Adjusts the intensity of the color. It has 64 steps (0 to 63).
- **TINT:** Adjusts the tint of the color picture (balances between amounts of red and green in the TV picture). It has 64 steps (0 to 63).
- **SHARPNESS:** Raises or lowers the definition of the TV picture. The lower the level, the softer the images will appear (adjusts the sharpness of the picture). It has 64 steps (0 to 63).
- **PICTURE PREF:** Has two settings: PRESET and CUSTOM. In the Custom mode the brightness, contrast, color and tint can be set to a users particular liking. The preset settings brings up the factory setting for these controls. Preset is selected automatically after an AC power interruption.



Use the Up/Down arrows on the remote control to highlight the setting you want to change. Press Right/Left Arrow to adjust or change the option you have selected.

## USER MENUS (continued)

Press ENTER to return to TV viewing, or press the Up / Down Arrows to change other options in the video menu.

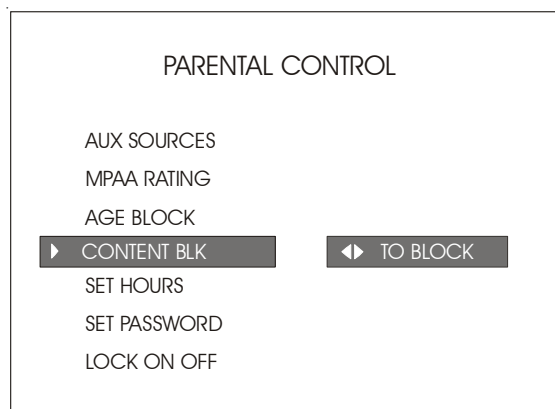
### **PARENTAL CONTROL**

This optional feature can be used to prevent (block) unwanted programming from appearing on your TV.

PARENTAL CONTROL offers the user a wide variety of options and settings that restrict or block programming that can appear on the TV. PARENTAL CONTROL allows users the capability of defining which program ratings they consider acceptable to younger or more sensitive viewers.

PARENTAL CONTROL can be preset and turned on or off by a user who specifies the 4 number password. The number of hours blocked must also be specified.

General audience and children viewer blocks can both be programmed into the TV's memory. Viewer ratings are specified for both the TV industry and the motion picture industry; both rating systems can be used. The ratings are based mainly on children's ages.



### **OVERVIEW**

To ensure complete coverage for all TV programs (movies and regular TV shows), choose ratings from the Motion Picture Association of America (MPAA) Rating System chart and the TV Parental Guidelines Rating System chart (both shown in next page). Use the AGE BLOCK option for General Audiences and for Children. You can also add additional restrictions from the CONTENT BLOCK menu.

Things to Consider before Setting Up Parental Control: Determine which ratings you consider acceptable for viewing. (For example, if you choose TV-PG, all of the more restrictive ratings will be blocked automatically: the viewer will not be able to see TV-PG, TV-14, or TV-MA rated programming.)

Select whether auxiliary video sources will be blocked

in the AUX SOURCES block option. (Blocks signals from VCRs, DVD players, etc. connected to the TV Audio/Video input jacks). You could also leave AUX SOURCES unblocked, and then choose allowable ratings.

In the CONTENT BLK option, you can block program Content based on individual parameters such as Strong Dialog, Bad Language, Sex Scenes, Violence Scenes, or Fantasy Violence Scenes.

You can set PARENTAL CONTROL to be active in the SET HOURS option for up to 12 hours. Use the number keys on the remote to select a secret password in the SET PASSWORD option.

Don't forget the password, as it is the only way you can access the PARENTAL CONTROL menu and change rating selections or turn PARENTAL CONTROL off.

If you do not want PARENTAL CONTROL to be active all the time, you can turn it on or off with the LOCK ON/OFF option.

#### **Notes:**

*You can set different PARENTAL CONTROL viewing restrictions for general audiences and for children - both can be active at the same time.*

*Simply specifying one content block such as Sex Scenes, will not automatically block another type of content in the programs from appearing.*

*Even if you choose to leave the AUX INPUTS unblocked, the ratings you specify will automatically restrict the programming that appears from the video sources.*

*You cannot disable PARENTAL CONTROL by disconnecting the TV from power. Block hours will automatically reset to the original block time setting specified if power is disconnected.*

*To reset the password, use the installer's remote control to deactivate the V-Chip in the Installer's menu (#21). Exit out of the Installer's Menu after deactivating the Parental Control. Then enter back in and reactivate the V-Chip.*

With the PARENTAL CONTROL menu on-screen, use the Up Arrow to choose an option, such as CONTENT BLOCK. Use the Left/Right arrow to show the CONTENT BLOCK menu, to adjust or set the rating for an option.

To block sex scenes, for example, use the "TV-PG and above" setting. To block dialog, use LEFT/RIGHT ADJ arrows to select among UNBLOCKED, TV-PG and above, or TV-14. (See the Ratings Charts for rating meanings.)

After you have selected and adjusted the PARENTAL CONTROL menu options to your preferences:

- Set the number of hours Parental Control will be on.
- Set a 4 number password.
- Set the Lock On/Off option to either on or off.

## USER MENUS (continued)

### ON-SCREEN DISPLAYS

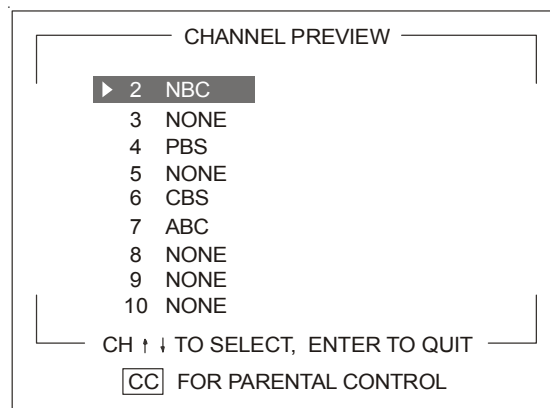
#### CHANNEL/TIME/AUDIO DISPLAY

Press ENTER. Shows currently selected channel or source, current time if the clock has been set, and incoming audio signal.

#### CH PREVIEW MENU

Press SURF. Displays list of the available TV Channels, Guest Parental Control menu (if active) and Video Channel access.

Press CHANNEL UP/DOWN to select a channel, and then ENTER to go to that channel. Pressing CC will activate the Parental Control menu.



### MOTION PICTURE ASSOCIATION OF AMERICA (MPAA) RATING SYSTEM

G	General Audiences	Content not offensive to most viewers.
PG	Parental Guidance Suggested	Content is such that parents may not want their children to view the program.
PG-13	Parental Guidance Suggested	Program is inappropriate for preteens, with a greater degree of offensive material than a PG-rated program.
R	Restricted viewing	Not for children under age 17. Strong elements of sex and/or violence.
NC-17	Restricted Viewing	Not for children under age 17 under any circumstances. Strong sexual content.
X	Hard Core Films	Same as NC-17 rating.

**Note:** Zenith Electronics Corporation is not liable for any program content that appears when using this rating system; as always, user discretion is advised.

### TV PARENTAL GUIDELINE RATING SYSTEM

G	General Audiences	Content not offensive to most viewers.
TV-G	General Audience	Considered suitable for all audiences; children may watch unattended.
TV-PG	Parental Guidance Suggested	Unsuitable for younger children, may contain: Suggestive Dialog, Bad Language, Sex, and Violence Scenes.
TV-14	Parents Strongly Cautioned	Unsuitable for children under 14, may contain: Strong Dialog, Bad Language, Sex, and Violence Scenes.
TV-MA	Mature Audience Only	Adults only, may contain: Strong Dialog, Bad Language, Sex, and Violence Scenes.

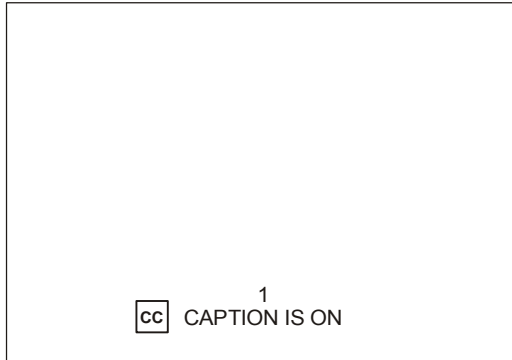
### CHILDREN'S CLASSIFICATIONS

TV-Y	Children	Considered suitable for all children under 7 years old.
TV-Y7	Children 7 and over	Considered suitable for children over 7, may contain Fantasy Violence Scenes.

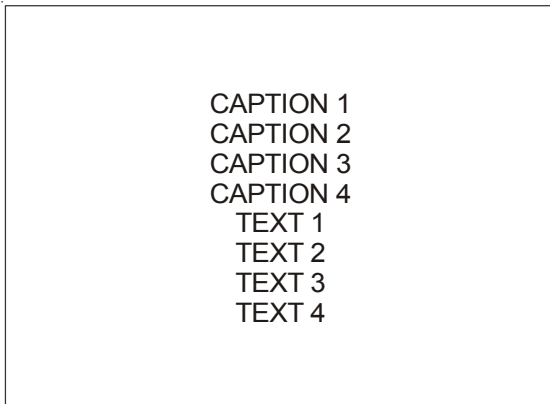
## USER MENUS (continued)

### CAPTIONS DISPLAY

Pressing CC in Quick Mode shows the current Caption selection, or Caption Off:

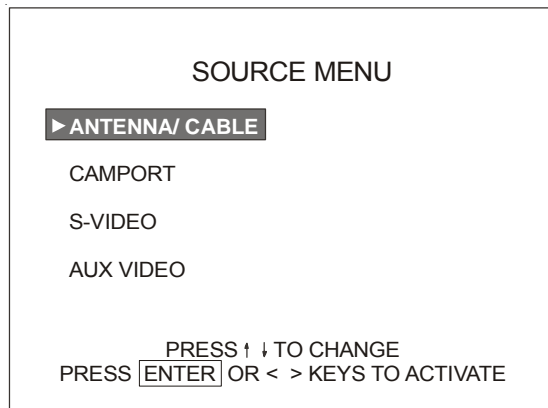


In the Standard Mode, it displays all the Captions and Text mode selections as below:



### SOURCE MENU

Scrolling the menus using the Menu key can access the Source Menu.



Use the Up/Down Arrows to navigate among Source options and use Select, Enter or Right/Left Arrows to enter a desired source.

The Camport & S-Video sources are not displayed in the Source Menu when they are disabled from Installer Options 34-I or 37-I or the autosenses are enabled options 40-I or 43-I.

**Note: Source Menu is not available in Series 39.**

# MODEL SERIES 34/36/39 INSTALLERS MENU

## INSTALLERS MENU ADJUSTMENTS

**Note:** There are two microcontrollers available for the 39 series: OIMCRM1039A and OIMCRM1039B.

To access the Installer's Menu, press and hold the MENU key until the User Menu display disappears, then press 9876, and then ENTER to access the Installer's Menu. Note that the "9876" sequence could be changed with the installers menu option number zero (0-I INSTALLER SEQ) to 4321, 1478 or 3698 respectively.

To access the Factory Menu, press and hold the MENU key until the User Menu display disappears, then press 1937, and then ENTER.

The black bar near the top of the screen indicates the part number of the micro installed on the set, the next number to the right is the software version running and the last number is the Font Version Used in the TV set. The black square near the bottom of the screen indicates the Serial number of the TV Set (SN), then the User Programmable Number (UPN) and at the lowest part indicates the date the module went through the factory and the Test Equipment status (TE).

<b>0IMCRM1039B</b>	<b>1.83</b>	<b>01</b>
Microcontroller part number	Program Revision	Font Revision
<b>0-I</b>	INSTALLER SEQ.	
SN: 0321-43390001 UPN: 067-057-000-001		
<b>05/03/03</b>		<b>TE = 10110000</b>

<b>OIMCRM1039A</b>	<b>1.66</b>	<b>01</b>
Microcontroller part number	Program Revision	Font Revision
<b>0-I</b>	INSTALLER SEQ.	
SN: 0321-43390003 UPN: 069-059-000-001		
<b>06/05/03</b>		<b>TE = 10110000</b>

Use the SELECT UP/DOWN keys to toggle through all of the adjustments. Use ADJUST to make a change to the selected item.

## INSTALLERS MENU OPTIONS

**0-I INSTALLER SEQ:** Range is 0-3. Determines the Sequence used to access Installers Menu.

Inst. Seq.	Sequence
0	Menu (Until CH-Time appears), 9, 8, 7, 6, Enter.
1	Menu (Until CH-Time appears), 4, 3, 2, 1, Enter.
2	Menu (Until CH-Time appears), 1, 4, 7, 8, Enter.
3	Menu (Until CH-Time appears), 3, 6, 9, 8, Enter.

**1-I POWER MANAGE (Power Management):** Determines hours of no activity before automatic shutdown. The POWER MANAGE function is for saving energy. When set to 0, Power Manage is OFF. Settings range from 0 - 7, with 1 - 7 representing the hours that the TV will remain on, unless there has been activity from either the control panel or remote control.

**2-I AC ON:** Allows the TV to turn ON just by applying AC power. Pressing the ON button is not necessary. This is desirable when the TV is plugged into a cable box or a power outlet controlled by a wall switch. Use ADJUST to select 0 or 1, where 0 is the default is OFF, and 1 is ON.

**Note:** When set to 1 (ON), the TV does not respond to ON/OFF commands from either the remote or the control panel, and the SLEEP TIMER is also nonfunctional.

**3-I BAND/AFC:** There are eight positions as shown below and is used to set the band of the tuning process:

0 is Broadcast fixed	4 is Broadcast afc
1 is CATV afc	5 is CATV fixed
2 is HRC afc	6 is HRC fixed
3 is ICC afc	7 is ICC fixed

Channels are accessed faster when fixed modes are used. The AFC (search modes) should only be used when some channels are not on nominal frequencies. If some channels were not found by the "AUTO PROGRAM" process, select the appropriate AFC setting here and add the channels using the ADD/DEL option in the Setup Menu.

**Note:** The "BAND" is automatically set by "AUTO PROGRAM".

## MODEL SERIES 34/36/39 INSTALLERS MENU (continued)

---

**4-I STRT CHANNEL:** Determines the channel that is selected automatically each time the TV is turned on. Range is 0-255. 0 is the Aux position and 255 is off. Use ADJUST to change the channel number. This feature is useful for an in-house information channel, since the TV would always tune the selected channel when the TV turns on. When inactive the TV retains the channel when the set was last used.

**5-I CHAN LOCK:** Defeats tuning operations. Changing channels with the Channel Up/Down or keypad numbers is impossible. This feature is ideal if a cable box (or similar) that must be always on the same channel or source is used with the TV set. Range is 0-1. 0 is off and 1 is on. In combination with the START CHANNEL, it can lock-on a particular channel.

**Note:** *When channel lock is active AUTO PROGRAM and CH. ADD/DEL in the SETUP MENU are not active.*

**6-I GHOST CH:** Either with or without signal present, the channel number will stay on screen at all times, unless captions are on. The number moves slightly to prevent damage to the screen. Range is from 0 to 1. The default is "0" or OFF.

**Note:** *When captions are on, the "ghost channel" is not displayed.*

**7-I START VOLUME:** This function allows the Installer to determine the initial volume level setting when the TV is turned ON. This feature is useful for an in-house information channel, since the TV would always select the same volume when it is turned on. The range of values are 0 - 63, 255. If 255 is set, the volume level is retained when the set was last used.

**8-I MIN VOLUME:** This function determines the adjustment of minimum volume level allowable with the keys VOLUME Up/Down. In this way, for example, someone cannot set the volume too low to hear. The range is from 0 to 63. When this item is set to 0, the sound level can be adjusted down to zero. Change values with ADJUST keys. The factory default is 0. It may be best to set the same value on every TV.

**Note:** *The minimum volume level cannot have a value setting higher than in the MAX VOLUME level (described below).*

**9-I MAX VOLUME:** This function determines the adjustment of maximum volume level allowable with the keys

VOLUME Up/Down. In this way, for example, someone cannot set the volume level high enough to disturb others. The range is from 0 to 63. When this item is set to 63, the user has full adjustment capability. Change values with ADJUST keys. The factory default is 63. It may be best to set the same value on every TV.

**Note:** *The maximum volume level cannot have a value setting lower than the MIN VOLUME level (described above).*

**10-I MUTE DISABLE:** Adjust Disable sound mute key operation. Range is 0-1. Set to 1, sound cannot be muted. Set to 0, sound can be muted.

**11-I KEY DEFEAT:** When set to 1 it prevents the end user from accessing screen menus with the front panel MENU, SELECT and adjust do not function. When set to zero, those keys are functional. The menus can always be accessed with Menu on the remote control

**12-I IR BANKS EN:** For direct access to a particular Channel Bank . When enabled installer can access a channel bank by inputting the IR code for the bank

**13-I SCAN MODE:** Range is 0-1. This setting allows to have two characteristics when using the channel Up/Down keys to navigate through the favorite channel list.

### Scan Mode Characteristics

0 TV, VCR3, VCR4, AUX

1 TV, VCR3, VCR4, AUX, ON/OFF

**14-I STARTCH IN SM:** When set to 1, installs TV on/off event below the start channel at turn on

**15-I SLEEP TIMER:** When set to 1, the SLEEP TIMER feature may be used (but no message is displayed prior to turn-off). When set to 0, the sleep timer is not available.

**16-I EN. TIMER:** Set to 1, timer function is available to user. Set to 0 to disable Timer functions. (Clock must be set in order to use Timers.)

**17-I ALARM:** Gives you the option of making the alarm function available to the user. Set to 1, alarm function is available to user. Set to 0 to disable the Alarm function. Note: Clock must be set in order to set the Alarm.

**18-I NOT USED**

**19-I NOT USED**



## MODEL SERIES 34/36/39 INSTALLERS MENU (continued)

---

**20-I FEATURE LEVEL:** Default set to ZEN 1 for Zenith IR remote control operation. Set 0, P LBL for Zenith Private Label IR remote control operation. Warning: Do not set to "0" or remote will not control TV.

**21-I V-CHIP:** Set to 1 to activate V-Chip (Parental Control), have it available for the user to filter, control or restrict programming content. Set to 0 to turn V-Chip feature off, not available to user; no programming restrictions can be set.

**22-I MAX BLK HRS:** Set from 0 to 99 for the maximum V-Chip (Parental Control) block hours. Default is 12 blocking hours.

**23-I CAPTION LOCK:** Zero is off, 1 is on. Set to 1 to restore previous caption On/Off state after TV turns off. When set to 0, captions are always off, when TV is initially turned on.

**24-I TEXT MODE:** Turns text mode on or off in the users menu. Range is 0-1. Zero is off and one is on. In on mode, user can call up text mode. Set to 0 unless text is being used.

**25-I FUNCTION PRE:** (Function Menu Channel Preview) Range is 0-3. Zero is off and one is on. Set to 0 to suppress channel preview screen in the function menu with some pay per view systems.

**0** = Channel Preview **disabled** in function menu, caption **lock enabled**.

**1** = Channel Preview **enabled** in function menu, caption **lock enabled**.

**2** = Channel Preview **disabled** in function menu, caption **lock enabled**.

**3** = Channel Preview **enabled** in function menu, caption **lock disabled**.

*Note: Item 25-I. is not used in Series 39.*

**26-I NOT USED**

**27-I NOT USED**

**28-I CH OVER RIDE:** Zero is off and one is on. In on mode, the TV works normally. This item is generally set to off so it can be controlled with entertainment unit. In off mode, Auto Program and Channel Add/Delete do not function. Changing to channels not added in the favorites list with the keypad numbers is impossible.

**29-I OLD OCV:** (On Command **Video TM**) Zero is off and one is on. Set to one for operation with "Spectramate" systems from On Command Corporation.

**30-I ACK MASK:** Ignores the acknowledge flag that is sent from the local service provider. This is used with the "Spectramate" (SN: 0583358) cable box to mask the acknowledge in MPI communications.

M.P.I. Communication Parameter. Leave at default setting unless changed by Pay-Per-View provider.

**31-I POLL RATE:** Used to adjust the polling rate in the MPI communications. Range is 20-168. M.P.I. Communication Parameter. Leave at default setting unless changed by Pay-Per-View provider.

**32-I TIMING PULSE:** Used to vary the standard width of the pulses in the MPI Communications.

Range is 186 - 227.

M.P.I. Communication Parameter. Leave at default setting unless changed by Pay-Per-View provider.

**33-I NOT USED**

**34-I CAMPORT EN:** Set to 1 to enable front Video (Camport) input. Set to 0 to disable front Video input. Enables Camport Source. Range is 0-1. Zero is disabled and 1 is enabled.

**35-I NOT USED.**

**36-I NOT USED**

**37-I REAR Y/C EN:** Set to 1 to enable rear Y/C Video input. Set to 0 to disable rear Y/C Video input.

**38-I NOT USED.**

**39-I NOT USED**

**40-I AUTO CAMPORT:** Set to 1 to automatically switch to camport when equipment is connected to front audio/video input.

Set to 0 to disable front audio/video automatic source selection.

**41-I NOT USED**

**42-I NOT USED**

**43-I AUTO REAR Y/C:** Set to 1 to automatically switch viewing source to Rear Y/C input when equipment is connected. Set to 0 to disable Rear Y/C automatic source selection.

**44-I NOT USED**

## MODEL SERIES 34/36/39 INSTALLERS MENU (continued)

### 45-I NOT USED

**46-I STRT AUX SRCE:** Determines the Aux that is selected automatically each time the TV goes to the aux channel. There are 3 possible values depending on the Enables switches. 0 is the Campport position and 255 is off (See the table). Use ADJUST to change the Auxiliary number.

0 Campport	255 Disabled
1 Rear Aux	
2 Rear Y/C	

**47-I AUX STATUS:** Set to 1 for MPI AUX source to be reported as a channel number 13X or 9X, if the "old OCV" flag is set to 1; Set to 0 to disable AUX identification change and so the answer is always channel 0.

**48-I DIS. SETUP M.:** Disable/Enable displaying Setup Menu. Zero is enable and 1 is disable menu.

**49-I DIS. AUDIO M.:** Disable/Enable displaying Audio Menu. Zero is enable and 1 is disable menu.

**Note:** Items 29-I, 30-I, 31-I, 32-I, 34-I, 37-I, 43-I, 46-I, 47-I & 49-I are NOT USED in Series 39.

**50-I DIS. VIDEO M.:** Disable/Enable displaying Video Menu. Zero is enable and 1 is disable menu.

**51-I DIS. VCHIP M.:** Disable/Enable displaying Parental Menu. Zero is enable and 1 is disable menu.

**52-I DIS. SOURCE M.:** Disable/Enable displaying Sources Menu. Zero is enable and 1 is disable menu.

**53-I DIS. CH-TIME:** Disable/Enable displaying CH-TIME. Zero is enable and 1 is disable CH-TIME.

**54-I EN. SET. COL.:** Disable/Enable use custom colors for Setup Menu. Zero is disable and 1 is enable.

**55-I FOR. SETUP M.:** Select between (0 to7) to set foreground color for Setup Menu. *See Table 1.*

**56-I BCK. SETUP M.:** Select between (0 to7) to set the background color for Setup Menu. *See Table 1.*

**57-I EN. AUD. COL.:** Disable/Enable use custom colors for Audio Menu. Zero is disable and 1 is enable.

**58-I FOR. AUDIO M.:** Select between (0 to7) to set foreground color for Audio Menu. *See Table 1.*

**59-I BCK. AUDIO M.:** Select between (0 to7) to set the background color for Audio Menu. *See Table 1.*

**60-I EN. VID. COL.:** Disable/Enable use custom colors for Video Menu. Zero is disable and 1 is enable.

**61-I FOR. VIDEO M.:** Select between (0 to7) to set foreground color for Video Menu. *See Table 1.*

**62-I BCK. VIDEO M.:** Select between (0 to7) to set the background color for Video Menu. *See Table 1.*

**63-I EN. PTL. COL.:** Disable/Enable use custom colors for Parental Menu. Zero is disable and 1 is enable.

**64-I FOR. PTL. M.:** Select between (0 to7) to set foreground color of Parental Menu. *See Table 1.*

**65-I BCK. PTL. M.:** Select between (0 to7) to set the background color of Parental Menu. *See Table 1.*

**66-I EN. SRC. COL.:** Disable/Enable use custom colors of Sources Menu. Zero is disable and 1 is enable.

**67-I FOR. SRC. M.:** Select between (0 to7) to set the foreground color of the Sources Menu. *See Table 1.*

**68-I BCK. SRC. M.:** Select between (0 to7) to set the background color of the Sources Menu. *See Table 1.*

**69-I EN. CH-T COL.:** Disable/Enable use custom colors for CH-TIME display. Zero is disable and 1 is enable.

**Note:** If foreground and background color are the same, menu background is transparent.

**70-I FOR. CH-T COL:** Select between (0 to7) to set foreground CH-TIME display color. *See Table 1.*

**71-I BCK. CH-T COL:** Select between (0 to7) to set the background color for CH-TIME display. *See Table 1.*

0.- Black	4.- Blue
1.- Red	5.- Magenta
2.- Green	6.-Cyan
3.- Yellow	7.- White

Table 1

### 72-I NOT USED

**73-I CH NOT AVBLE:** When set to 1 and channel override is set to 0, "NOT AVAILABLE" message is displayed when direct accessing a channel not in the favorite channel list. Range is 0-1. Zero is disable and 1 is enable.

## MODEL SERIES 34/36/39 INSTALLERS MENU (continued)

---

**74-I CH-TIME SIZE:** When set to 1 and transparent background is selected for Channel-Time display, (foreground color = background color and custom color enabled) a large channel number is displayed instead of the normal Channel-Time display, however just the Ch number is displayed. Range is 0-1. Zero is disable and 1 is enable.

### 75-I NOT USED

**76-I DEFEAT XDS:** If active disables the XDS displaying, although the decoding is still available for V-Chip. Range is 0-1. Zero is disable and 1 is enable.

*Note: Items 52-I, 57-I, 58-I, 59-I, 66-I, 67-I & 68-I are NOT USED in Series 39.*

### 77-I NOT USED

**78-I UPN MSB:** User definable number, most significant byte readable by MPI command. This number is displayed at the lower part of the Installers / Factory Menu. Range is 0-255.

**79-I UPN MSB-1:** User definable number, most significant byte-1 readable by MPI command. This number is displayed at the lower part of the Installers / Factory Menu. Range is 0-255.

**80-I UPN MSB-2:** User definable number, most significant byte-2 readable by MPI command. This number is displayed at the lower part of the Installers / Factory Menu. Range is 0-255.

**81-I UPN LSB:** User definable number, least significant byte readable by MPI command. This number is displayed at the lower part of the Installers / Factory Menu. Range is 0-255.

**82-I CHKSM ERROR:** Enables the checksum validation when every MPI command is executed. Range is 0-1. Zero is disabled and 1 is enabled.

M.P.I. Communication Parameter. Leave at default setting unless changed by Pay-Per-View provider.

**83-I HANDSHK TIME:** Changes the hand shaking time of MPI communications in steps of 25 milliseconds. Range is 0 to 5. 0 is disable.

M.P.I. Communication Parameter. Leave at default setting unless changed by Pay-Per-View provider.

**84-I PERMANENT BLK:** Enables the parental control permanent blocking time. Range is 0-1. Zero is disable and 1 is enable. When this feature is active the blocking time can be selected between: [permanent block, 1 hour,..., MAX BLK HRS (**Item 22-1**)].

**85-I A. MUTE TIME:** This Item contains the amount of time that the audio will be muted only when changing between auxiliary sources. Range is 0 to 254 and the default value is 35.

**86-I V. MUTE TIME:** This Item contains the amount of time that the video will be muted only when changing between auxiliary sources. Range is 0 to 254 and the default value is 40.

# MODEL SERIES 34/36/39 INSTALLERS MENU (continued)

CL Chassis Installers Menu Settings

ITEM	VALUE RANGE	DEFAULT VAL	DESCRIPTION
0-I. INSTALLER SEQ	0-3	0	Leave default set to 0.
1-I. POWER MANAGE	0-7	0	Sets number of hours of no activity before auto shutoff.
2-I. AC ON	0-1	0	Set to 1 to enable auto turn on at power up.
3-I. BAND/AFC	0-7	0	Tuning band, see detailed descriptions.
4-I. STRT CHANNEL	0-255	255	Channel at auto turn-on (255 last viewed at turn off).
5-I. CHAN LOCK	0-1	0	When set to 1, cannot tune from current channel.
6-I. GHOST CH.	0-1	0	Set to 1 to enable ghost channel display.
7-I. STRT VOLUME	0-63,255	255	Volume level at TV turn-on (set 255 to retain last volume level).
8-I. MIN VOLUME	0-63	0	Minimum volume setting.
9-I. MAX VOLUME	0-63	63	Maximum volume setting.
10-I. MUTE DISABLE	0-1	0	Set to 1 to disable mute function.
11-I. KEY DEFEAT	0-1	0	Set to 1 to disable Menu, Select, and Adj Keys on front panel.
12-I. IR BANKS EN.	0-1	0	Set to 1: enables to respond to IR codes to change Channel Bank directly.
13-I. SCAN MODE	0-1	0	Channel scanning modes with Ch. Up/Down.
14-I. STRT CH IN SM	0-1	0	Set to 1 to put TV On/Off below start channel number.
15-I. SLEEP TIMER	0-1	1	Set to 1 to enable Sleep Timer.
16-I. EN. TIMER	0-1	1	Set to 1 to enable Timer.
17-I. ALARM	0-1	1	Set to 1 to enable Alarm.
18-I. NOT USED			
19-I. NOT USED			
20-I. FEATURE LEVEL	0-1	1 Zen 1	Leave default set to 1 (1 Zen 1).
21-I. V-CHIP	0-1	1	Set to 1 to enable V-Chip.
22-I. MAX BLK HRS	0-99	12	Select number of Parental Control blocking hours.
23-I. CAPTION LOCK	0-1	0	Set to 1 to retain Caption setting at turn off.
24-I. TEXT MODE	0-1	1	Set to 1 to add Text option to Closed Caption Menu.
25-I. FUNCTION PRE	0-3	0	Controls channel preview in Pay Per View function.
26-I. NOT USED			
27-I. NOT USED			
28-I. CH. OVERRIDE	0-1	1	When set to 0, limits direct access to favorite channels.
29-I. OLD OCV	0-1	0	OCV should be set to 1.
30-I. ACK MASK	0-1	0	M. P. I. Communication parameter.
31-I. POLL RATE	20-169	94	M. P. I. Communication parameter.
32-I. TIMING PULSE	186-227	207	M. P. I. Communication parameter.
33-I. NOT USED			
34-I. CAMPORT EN.	0-1	1	Set to 1 to enable the front AUX (Campot) input.
35-I. NOT USED			
36-I. NOT USED			
37-I. REAR Y/C EN.	0-1	1	Set to 1 to enable the rear S-Video input.
38-I. NOT USED			
39-I. NOT USED			
40-I. AUTO CAMPORT	0-1	1	Set to 1 to automatically switch to Campot.
41-I. NOT USED			
42-I. NOT USED			
43-I. AUTO REAR Y/C	0-1	0	Set to 1 to automatically switch to rear S-Video input.
44-I. NOT USED			
45-I. NOT USED			
46-I. START AUX SRCE	0-2,255	255	Set the starting AUX source.
47-I. AUX STATUS	0-1	0	Set to 1 for M. P. I., AUX source reported as Channel number instead of Channel 0.
48-I. DIS. SETUP M.	0-1	0	Set to 1 to disable Setup menu.
49-I. DIS. AUDIO M.	0-1	1	Set to 1 to disable Audio menu.
50-I. DIS. VIDEO M.	0-1	0	Set to 1 to disable Video menu.

# MODEL SERIES 34/36/39 INSTALLERS MENU (continued)

CL Chassis Installers Menu Settings			
ITEM	VALUE RANGE	DEFAULT VAL	DESCRIPTION
51-I. DIS. V-CHIP M.	0-1	0	Set to 1 to disable V-Chip (Parental Control) menu.
52-I. DIS. SOURCE M.	0-1	0	Set to 1 to disable Source Menu.
53-I. DIS. CH-TIME M.	0-1	0	Set to 1 to disable Channel-Time display.
54-I. EN. SET. COL.	0-1	0	Set to 1 to enable Custom Color for the Setup menu.
55-I. FOR. SETUP M.	0-7	6	Custom foreground color for the Setup menu.
56-I. BCK SETUP M.	0-7	4	Custom background color for the Setup menu.
57-I. EN. AUDIO COL.	0-1	0	Set to 1 to enable custom color for the Audio menu.
58-I. FOR. AUDIO M.	0-7	1	Custom foreground color for the Audio menu.
59-I. BCK AUDIO M.	0-7	7	Custom background color for the Audio menu.
60-I. EN. VIDE COL.	0-1	0	Set to 1 to enable custom color for the Video menu.
61-I. FOR. VIDEO M.	0-7	4	Custom foreground color for the Video menu.
62-I. BCK VIDEO M.	0-7	7	Custom background color for the Video menu.
63-I. EN. PTL. COL.	0-1	0	Set to 1 to enable custom color for the V-Chip (Parental Control) menu.
64-I. FOR. PTL. M.	0-7	6	Custom foreground color for the V-Chip (Parental Control) menu.
65-I. BCK. PTL. M.	0-7	4	Custom background color for the V-Chip (Parental Control) menu.
66-I. EN. SCR. COL.	0-1	0	Set to 1 to enable custom color for the Source menu.
67-I. FOR. SCR. M.	0-7	3	Custom foreground color for the Source menu.
68-I. BCK SCR. M.	0-7	4	Custom background color for the Source menu.
69-I. EN. CH-T COL.	0-1	1	Set to 1 to enable custom color for the Channel Time display.
70-I. FOR. CH-T COL	0-7	1	Custom foreground color for the Channel Time display.
71-I. BCK CH-T COL	0-7	1	Custom background color for the Channel Time display.
72-I. NOT USED			
73-I. CH NOT AVBLE	0-1	0	When set to 1 and channel override is 0, "NOT AVAILABLE" message is displayed when direct accessing a channel not in the channel list.
74-I. CH-TIME SIZE	0-1	0	When set to 1 and transparent background is selected for Channel-Time display, (foreground color = background color and custom color enabled) a large channel number is displayed instead of the normal Channel-Time display.
75-I. NOT USED			
76-I. DEFEAT XDS	0-1	0	When set to 1, XDS display program information will not appear.
77-I. NOT USED			
78-I. UPN MSB	0-255	255	User defined number, most significant byte.
79-I. UPN MSB-1	0-255	255	User definable, most significant byte-1.
80-I. UPN MSB-2	0-255	255	User definable, most significant byte-2.
81-I. UPN LSB	0-255	255	User definable, least significant byte.
82-I. CHKSM ERROR	0-1	1	Enforces rigid M. P. I. checksum.
83-I. HANDSHK TIME	0-5	0	Relaxes M. P. I. timing to be compatible with PC Windows controlled systems.
84-I. PERMANENT BLK	0-1	0	Removes block hour settings for Parental Control and makes blocks permanent.
85-I. A. MUTE TIME	0-254	50	Controls muting audio delay time when switching between AUX sources.
86-I. V.MUTE TIME	0-254	50	Controls muting video delay time when switching between AUX sources.

# CL MODEL SERIES 34 & 36 FACTORY MENU

## FACTORY MENU DESCRIPTION FOR SERIES 34 & 36

**0-F FACT MENU:** Use SELECT UP and DOWN Keys to select item 00, the Factory Mode. The Factory uses this item when the module is being tested. It has two positions: 0 and 1. In the field, this item should always be left off (Zero is off).

When the Factory Menu is on, the AC Power On feature is always enabled regardless of the setting of AC ON in the Installer's Menu.

The TV set will automatically come on when AC is applied. Use the remote to reenter the Factory Menu to turn the Factory Menu off. The Factory Mode may also be turned off by setting the clock or running the Auto Program feature in the customer Set Up menu.

<b>0IMCRM039A</b>	<b>1.83</b>	<b>01</b>
Microcontroller part number	Program Revision	Font Revision
<b>01-F      PRESET PX</b>		
Build Date	TE Status	
<b>05/03/03</b>	<b>TE = 10110000</b>	

**1-F PRESET PX:** Stores the video customer menu adjustments in the nonvolatile memory of the EARAM. Settings for Contrast, Brightness, Color, Tint and Sharpness are stored in this manner. 0 is custom and 1 is preset stored.

**2-F PRESET AX:** Stores customer Audio menu adjustments in the nonvolatile memory of the EARAM. Settings for Bass, Treble, Balance, Audio mode, Front Surr and SoundRite are stored in this manner. 0 is custom and 1 is preset stored.

**3-F VERT POS:** Moves On-Screen Displays vertically. The Range is from 0-30. This adjustment is generally set at 15.

**4-F HORZ POS:** Moves On-Screen Displays horizontally. Range is from 1-45.

**5-F RF DELAY ADJ:** (RF automatic Gain Control) Range is from 0-127. 35 is a general setting. Tune in weakest available channel and adjust for a snow-free picture.

**6-F VIF VCO ADJ:** (PIF Voltage Oscillator). Range is 0-63.

**7-F VIF VOUT GAIN:** VIF video detector output level adjustment at pin 58. Range is 0-7, typical value is 2.

**8-F AFT DEFEAT:** AFT OUT On/Off; 0=AFT on, 1=DEFEAT.

**9-F VIF DEFEAT:** VIF AGC GAIN Normal/Minimum, Switch 0=AGC Function & 1=Defeat (Min Gain).

**10-F VOL CLIPPING:** Selects the volume clipping mode.

**11-F PRE AUXINPUT:** Prescale for auxiliary input signals.

**12-F PRE AUDDMOD:** Prescale for the demodulated BTSC signal.

**13-F SPAT STREIGHT:** Spatial effect strength.

**14-F SPAT MODE:** Spatial effect Mode.

**15-F SPAT GAIN:** Spatial effect high Pass GAIN.

**16-F AVC:** Delay time for Automatic Volume Correction.

**17-F RED CUTOFF:** B&W tracking adjustment. Range is 0-254. Typical value is 70.

**18-F GREEN CUTOFF:** B&W tracking adjustment. Range is 0-254. Typical value is 70.

**19-F BLUE CUTOFF:** B&W tracking adjustment. Range is 0-254. Typical value is 70.

**20-F RED DRIVE:** B&W tracking adjustment. Range is 0-127. Typical value is 70.

**21-F BLUE DRIVE:** B&W tracking adjustment. Range is 0-127. Typical value is 70.

**22-F RF S-BRIGHT:** Sets adjustment range of customer for brightness in RF Mode. Range is 0-63. A typical value is 31.

**23-F AUX B-OFFSET:** (Auxiliary Brightness Offset). This offset value is to increase and decrease brightness level on AUX Mode with relation to RF sub-brightness.



## CL MODEL SERIES 34 & 36 FACTORY MENU

---

**24-F MAX CONTRAST:** See adjustment range of customer control for contrast. Range is 0-63. Typical value is 63.

**25-F TRAP 3.58:** 0=Off & 1=On. Set 1 to normal TV operation. Set to 0 is Y/C is being used at chassis with a comb filter.

**26-F TRAP 3.58F:** Fine-tuning adjustment for notch 3.58 filter on RF mode. Range is 0-3. Set to 3.

**27-F RF Y DL TIME:** Luma signal delay time adjustment on RF mode. Range is 0-6. Set to 3.

**28-F RF CHROMA BP:** Chroma Band Pass Filter RF Mode. 0= BPF is on, 1=Take off. Typically set in 0.

**29-F AUX Y DL TIME:** Luma signal delay time adjustment on Aux Mode. Range is 0-6. Typically set to 3.

**30-F AUX CHROMA BP:** Chroma Band Pass Filter for Aux Mode. 0= BPF is On, 1=Take off. Typically set in 0.

**31-F AUX SUBTINT:** Hue adjustment on Aux Mode. Range is 0-15. Set to 8.

**32-F C KILL LEVEL:** Color killer sensitivity switch. Typical value is 0.

**33-F Y SW LPF:** Luma switch output. 0=FLAT, 1=LPF (Fc=700 KHz).

**34-F ACL ABCL:** ABCL ON/OFF switch; 0=Off, 1=ABCL On. Typically set to 1.

**35-F ABCL SENS:** ABCL sensitivity low/ high switch. 0= low; 1= high. Typically set to 0.

**36-F H SIZE:** Horizontal size adjustment. The range is 0-254 and the default is value is 50.

*Note: This item is only available for 32" models.*

**37-F V SIZE:** Vertical ramp amplitude adjustment. The range is 0-254, typically set to 32.

**38-F H PHASE:** Horizontal Phase adjustment. The range is 0-32 and the typical setting is at 9.

**39-F V PHASE:** Vertical Phase adjustment. The Range 0-7 is typically set to 1.

**40-F AFC1 GAIN:** Horizontal AFC1 Gain switch. The range is 0-1.

**41-F AFC2 GAIN:** Horizontal AFC2 Gain switch. The range is 0-1.

**42-F HVCO ADJ:** Horizontal free running frequency adjustment. Range 0-7, typically set at 4.

**43-F H FREE:** Forced horizontal free running mode, the range is 0-1, typically set to 0.

**44-F V FREE:** Forced vertical free running mode, the range is 0-1, typically set to 0.

**45-F SLICE DOWN1:** Sync det. slice level section. The range is 0-1 typically set to 0.

**46-F SLICE DOWN2:** Sync det. slice level switch. The range is 0-1 typically set to 0.

**47-F A-SLICE DOWN:** Sync det. slice level switch during video period. The range is 0-1 typically set to 0.

**48-F FBP VTH L:** Flyback pulse slice voltage. The range is 0-1, typically set to 0.

**49-F HV BLK OFF:** Horizontal and vertical blanking Off/ On RGB out switch. The range is 0-1, typically set at 0 = On blanking output.

**50-F V SYNC DET:** Vertical sync det minimum width switch. Default 1, typically set at 1.

**51-F 1 WINDOW:** Vertical Sync det mode. Range is 0-1, typically set to 0.

**52-F BGP FBP OFF:** BGP output without FBP input. The range is 0-1 and the default setting is 0.

**53-F RF SUBTINT:** Hue adjustment on RF Mode. Range is 0-15, set to 7.

**54-F S-V SUBTINT:** Hue adjustment on S-Video Mode. Range 0-15. Typically set at 10.

**55-F MAX COLOR:** For limiting the color range at maximum. Range is 0-127. Typically set at 52.

**56-F SUB COLOR:** For limiting the color range at minimum. Range is 0-63. Typically set at 27.

**57-F AIR AFT:** Force to AFC in Air Band. Range is 0-1. Typical value is 0.



# CL MODEL SERIES 34 & 36 FACTORY MENU

CL Chassis Series 34 & 36 Factory Menu Settings										
ITFM	RANGF	H25F36DTH	27F36DTH	32F36DTH	19F34DTH	20F34DTH	25F34DTH	27F34DTH	DESCRIPTION	
00-F. FACT MENU	0-1	0	0	0	0	0	0	0	Factory mode, refer to page 2-8	
01-F. PRESET PX	0-1	1	1	1	0	0	1	1	Used to store video adjustments	
02-F. PRESET AX	0-1	1	1	1	1	1	1	1	Used to store audio adjustments	
03-F. VERT. POS	0-30	15	15	15	15	15	15	15	Moves On Screen display vertically	
04-F. HORZ POS	0-45	24	20	20	20	20	20	20	Moves On Screen display horizontally	
05-F. RF DELAY ADJ	0-127	35	35	35	35	35	35	35	Weak channel adjustment	
06-F. IF VCO ADJ	0-63	33	33	33	33	33	33	33	PIF Voltage Controlled Oscillator	
07-F. VIF VOUT GAIN	0-7	2	2	2	0	0	2	2	Video detector output level	
08-F. AFT DEFEAT	0-1	0	0	0	0	0	0	0	AFT Out On/Off SW	
09-F. VIF DEFEAT	0-1	0	0	0	0	0	0	0	VIF AGC Gain Normal/Minimun switch	
10-F. VOL CLIPPING	0-15	0	0	0	0	0	0	0	Selects the Volume Clipping mode	
11-F. PRE AUX INPUT	0-254	26	26	26	26	26	26	26	Prescale for Auxiliary Input signals	
12-F. PRE AUX DEMOD	0-254	24	24	24	24	24	24	24	Prescale for the demodulated BTSC signal	
13-F. SPAT STRENGTH	0-254	63	63	63	63	63	63	63	Spatial Effect Strength	
14-F. SPAT MODE	0-15	0	0	0	0	0	0	0	Spatial Effect Mode	
15-F. SPAT GAIN	0-15	2	2	2	2	2	2	2	Spatial Effect High-Pass Gain	
16-F. AVC	0-15	4	4	4	4	4	4	4	Delay time for automatic Volume correction	
17-F. RED CUTOFF	0-127	70	80	70	70	70	70	70	B/W tracking	
18-F. GREEN CUTOFF	0-127	70	90	70	70	70	70	70	B/W tracking	
19-F. BLUE CUTOFF	0-127	70	70	70	70	70	70	70	B/W tracking	
20-F. RED DRIVE	0-254	70	70	70	70	70	70	70	B/W tracking	
21-F. BLUE DRIVE	0-254	70	70	70	70	70	70	70	B/W tracking	
22-F. RF S-BRIGHT	0-63	31	31	31	31	31	31	31	Brightness for RF Mode	
23-F. AUX B-OFFSET	0-63	31	31	31	31	31	31	31	Auxiliary brightness offset value	
24-F. MAX CONTRAST	0-63	63	63	63	63	63	63	63	Set maximum customer control for contrast	
25-F. TRAP 3.58	0-1	0	1	1	0	0	0	0	Trap 3.58 filter, 0=On 1=Off	
26-F. TRAP 3.58F	0-3	2	1	1	2	2	2	2	Fine tuning adjustments for Trap 3.58	
27-F. RF Y DLTIME	0-6	3	2	2	3	3	3	3	Luma delay time adjustments for RF Mode	
28-F. RF CHROMA BP	0-1	1	1	1	1	1	1	1	Band Pass filter for RF Mode	
29-F. AUX Y DL TIME	0-7	3	2	2	3	3	3	3	Luma delay time adjustments for Aux Mode	
30-F. AUX CHROMA BP	0-1	0	1	1	0	0	0	0	Chroma Band Pass filter for Aux Mode	
31-F. AUX SUBTINT	0-15	7	9	9	7	7	7	7	Tint adjustment for Aux Mode	
32-F. C KILL LEVEL	0-1	0	0	0	0	0	0	0	Color killer level	
33-F. Y SW LPF	0-1	1	1	1	1	1	1	1	Low Pass filter Luminance	
34-F. ACL ABCL	0-1	1	1	1	1	1	1	1	Brightness/Contrast limiter	
35-F. ABCL SENS	0-1	0	0	0	0	0	0	0	ABCL sensitivity	
36-F. H SIZE	0-254	N/A	N/A	50	N/A	N/A	N/A	N/A	Horizontal size adjustment	
37-F. V SIZE	0-254	32	32	32	32	32	32	32	Vertical ramp amplitude adjustment	
38-F. H-PHASE	0-32	9	9	9	9	9	9	9	Horizontal Phase adjustment	
39-F. V-PHASE	0-7	1	1	1	1	1	1	1	Vertical Phase adjustment	
40-F. AFC1 GAIN	0-1	0	0	0	0	0	0	0	Horizontal AFC1 Gain switch	
41-F. AFC2 GAIN	0-1	0	0	0	0	0	0	0	Horizontal AFC2 Gain switch	
42-F. HVCO ADJ	0-7	4	4	4	4	4	4	4	Horizontal free running frequency adjustment	
43-F. H FREE	0-1	0	0	0	0	0	0	0	Forced horizontal free running mode	
44-F. V FREE	0-1	0	0	0	0	0	0	0	Forced vertical free running mode	
45-F. SLICE DOWN1	0-1	0	0	0	0	0	0	0	Sync det. slice level section	
46-F. SLICE DOWN2	0-1	0	0	0	0	0	0	0	Sync det. slice level switch	
47-F. A-SLICE DOWN	0-1	0	0	0	0	0	0	0	Sync det. slice level switch during video period	
48-F. FBP VTH L	0-1	0	0	0	0	0	0	0	Flyback pulse slice voltage	
49-F. HV BLK OFF	0-1	0	0	0	0	0	0	0	Horizontal and vertical blanking Off/On RGB out switc	
50-F. V SYNC DET	0-1	1	1	1	1	1	1	1	Vertical sync det minimum width switch	
51-F. 1 WINDOW	0-1	0	0	0	0	0	0	0	Vertical Sync det mode	
52-F. BGP FBP OFF	0-1	0	0	0	0	0	0	0	BGP output without FBP input	
53-F. RF SUBTINT	0-15	11	8	8	11	11	11	11	Subtint adjustment for RF Mode	
54-F. S-V SUBTINT	0-15	10	11	11	7	7	7	7	Subtint adjustment for S-Video	
55-F. MAX COLOR	0-127	50	52	55	56	56	56	56	For limit color range at maximum	
56-F. SUB COLOR	0-63	18	25	30	18	18	18	18	For limit color range at minimum	
57-F. AIR AFT	0-1	0	0	0	0	0	0	0	Force to AFC in Air Band	

# CL MODEL SERIES 39 FACTORY MENU

## FACTORY MENU DESCRIPTION FOR 39 SERIES.

**Note:** There are two microcontrollers available for the 39 series: OIMCRM1039A and OIMCRM1039B.

**00-F FACT MENU:** Use SELECT UP and DOWN Keys to select item 00, the Factory Mode. The Factory uses this item when the module is being tested. It has two positions: 0 and 1. In the field, this item should always be left off (Zero is off).

When this item is off, only the first twenty-four items in the Installer's Menu can be accessed. They appear one at a time near the middle left of the screen. When this item is set to 1, 91 or 92 (Healtview) menu items are available. In the Factory Menu, only the selected menu item is displayed, near the top of the screen.

OIMCRM1039A	1.66	01
Microcontroller part number	Program Revision	Font Revision
01-F	PRESET PX	
Build Date	TE Status	
05/03/03	TE = 10110000	

When the Factory Menu is on, the AC Power-On feature is always enabled regardless of the setting of AC ON in the Installer's Menu. The TV set will automatically come on when AC is applied.

Use the remote to reenter the Installer's Menu to turn the Factory Menu off. Setting the clock, or running the Auto Program feature in the customer Set Up menu may also turn off the Factory Mode.

**01-F PRESET PX:** Stores the video customer menu adjustments in the nonvolatile memory of the EAROM. Selections are Custom and Preset-Store. Settings for Contrast, Brightness, Color and Tint are stored in this manner. 0 is custom and 1 is preset stored.

**02-F VERT POS:** Moves On-Screen Displays vertically. The Range is from 0-30. This adjustment is generally set at 15.

**03-F HORZ POS:** Moves On-Screen Displays horizontally. Range is from 0-45.

**04-F RF DELAY ADJ:** (RF automatic Gain Control) Range is from 0-127. 35 is a general setting. Tune in weakest available channel and adjust for a snow-free picture.

**05-F VIF VCO ADJ:** (PIF Voltage Oscillator). Range is 0-63.

**06-F VIF VOUT GAIN:** VIF video detector output level adjustment at pin 58. The range is 0-7, typical value is 2.

**07-F AFT DEFEAT:** AFT OUT On/Off; 0=AFT on, 1=DEFEAT.

**08-F VIF DEFEAT:** VIF AGC GAIN Normal/Minimum, Switch 0=AGC Function & 1=Defeat (Min Gain).

**09-F RED CUTOFF:** B&W tracking adjustment. Range is 0-254. Typical value is 70.

**10-F GREEN CUTOFF:** B&W tracking adjustment. Range is 0-254. Typical value is 70.

**11-F BLUE CUTOFF:** B&W tracking adjustment. Range is 0-254. Typical value is 70.

**12-F RED DRIVE:** B&W tracking adjustment. Range is 0-127. Typical value is 70.

**13-F BLUE DRIVE:** B&W tracking adjustment. Range is 0-127. Typical value is 70.

**14-F RF S-BRIGHT:** Sets adjustment range of customer for brightness in RF Mode. Range is 0-63. A typical value is 31.

**15-F AUX B-OFFSET:** (Auxiliary Brightness Offset). This offset value is to increase and decrease brightness level on AUX Mode with relation to RF sub-brightness.

**16-F MAX CONTRAST:** See adjustment range of customer control for contrast. Range is 0-63. Typical value is 63.

**17-F TRAP 3.58:** 0=Off & 1=On. Set 1 to normal TV operation. Set to 0 is Y/C is being used at chassis with a comb filter.

**18-F TRAP 3.58F:** Fine-tuning adjustment for notch 3.58 filter on RF mode. Range is 0-3. Set to 3.

**19-F Y DL TIME RF:** Luma signal delay time adjustment on RF mode. Range is 0-6. Set to 3.

**20-F CHROMA BP-RF:** Chroma Band Pass Filter RF Mode. 0= BPF is on, 1=Take off. Typically set in 0.

# CL MODEL SERIES 39 FACTORY MENU

---

**21-F Y DL TIME AUX:** Luma signal delay time adjustment on Aux Mode. Range is 0-6. Typically set to 3.

**22-F CHROMA BP-AUX:** Chroma Band Pass Filter for Aux Mode. 0= BPF is On, 1=Take off. Typically set in 0.

**23-F AUX SUBTINT:** Hue adjustment on Aux Mode. Range is 0-15. Set to 8.

**24-F C KILL LEVEL:** Color killer sensitivity switch. Typical value is 0.

**25-F Y SW LP:** Luma switch output. 0=FLAT, 1=LPF (Fc=700 KHz).

**26-F ACL ABCL:** ABCL ON/OFF switch; 0=Off; 1=ABCL On. Typically set to 1.

**27-F ABCL SNS:** ABCL sensitivity low/ high switch. 0= low, 1= high. Typically set to 0.

**28-F AFC1 GAIN:** Horizontal AFC1 Gain switch. The range is 0-1.

**29-F AFC2 GAIN:** Horizontal AFC2 Gain switch. The range is 0-1.

**30-F HVCO ADJ:** Horizontal free running frequency adjustment. Range 0-7, typically set at 4.

**31-F V SIZE:** Vertical ramp amplitude adjustment. The range is 0-254, typically set to 32.

**32-F H FREE:** Forced horizontal free running mode, the range is 0-1, typically set to 0.

**33-F V FREE:** Forced vertical free running mode, the range is 0-1, typically set to 0.

**34-F SLICE DOWN1:** Sync det. slice level section. The range is 0-1 typically set to 0.

**35-F SLICE DOWN2:** Sync det. slice level switch. The range is 0-1 typically set to 0.

**36-F A-SLICE DOWN:** Sync det. slice level switch during video period. The range is 0-1 typically set to 0.

**37-F FBP VTH L:** Flyback pulse slice voltage. The range is 0-1, typically set to 0.

**38-F HV BLK OFF:** Horizontal and vertical blanking Off/ On RGB out switch. The range is 0-1, typically set at 0 = On blanking output.

**39-F V SYNC DET:** Vertical sync det minimum width switch. Default 1, typically set at 1.

**40-F 1 WINDOW:** Vertical Sync det mode. Range is 0-1, typically set to 0.

**41-F BGP FBP OFF:** BGP output without FBP input. The range is 0-1 and the default setting is 0.

**42-F AIR AFT:** Force to AFC in Air Band. Range is 0/1. Typical value is 0.

**43-F H PHASE:** Horizontal Phase adjustment. The range is 0-32 and the typical setting is at 9.

**44-F V PHASE:** Vertical Phase adjustment. The Range 0-7 is typically set to 1.

**45-F SUB COLOR:** For limiting the color range at minimum. Range is 0-63. Typically set at 27.

**46-F MAX COLOR:** For limiting the color range at maximum. Range is 0-127. Typically set at 52.

**47-F RF SUBTINT:** Hue adjustment on RF Mode. Range is 0-15, set to 7.

# CL MODEL SERIES 39 FACTORY MENU

CL Chassis Series 39 Factory Menu Settings				
ITEM	RANGE	H25F39DT	H27F39DT	DESCRIPTION
00-F. FACT MENU	0-1	0	0	Factory mode - refer to page 2-11
01-F. PRESET PX	0-1	1	1	Used to store video menu adjustments
02-F. VERT POS	0-30	15	15	Moves On Screen display vertically
03-F. HORZ POS	0-45	20	20	Moves On Screen display horizontally
04-F. RF DELAY ADJ	0-127	35	35	Weak channel adjustment
05-F. VIF VCO ADJ	0-63	33	33	VIF Voltage Controlled Oscillator
06-F. VIF VIDEO OUT GAIN	0-7	2	2	Video Detector output level
07-F. AFT DEFEAT	0-1	0	0	AFT Out On/Off sw
08-F. VIF DEFEAT	0-1	0	0	VIF AGC normal/minimum sw
09-F. RED CUTOFF	0-254	70	70	B&W tracking adjustment
10-F. GREEN CUTOFF	0-254	70	70	B&W tracking adjustment
11-F. BLUE CUTOFF	0-254	70	70	B&W tracking adjustment
12-F. RED DRIVE	0-127	70	70	B&W tracking adjustment
13-F. BLUE DRIVE	0-127	70	70	B&W tracking adjustment
14-F. RF SUB BRT	0-63	31	31	Brightness for RF mode
15-F. AUX BRT OFFSET	0-63	31	31	Auxiliar brightness offset value
16-F. MAX CONTRAST	0-63	63	63	Sets maximum customer control for contrast
17-F. TRAP 3.58	0-1	0	0	3.58 MHz Trap; 0=On, 1=Off
18-F. TRAP 3.58 F	0-3	2	2	Fine adjustment for Trap 3.58
19-F. Y DL TIME RF	0-7	3	3	Luma delay time for RF Mode
20-F. CHROMA BP RF	0-1	1	1	Bandpass filter for RF Mode
21-F. Y DL TIME AUX	0-7	3	3	Luma delay time for Aux Mode
22-F. CHROMA BP-AUX	0-1	0	0	Bandpass filter for Aux Mode
23-F. AUX SUBTINT	0-15	13	13	Subtint Adj for Aux Mode
24-F. CKILL LEVEL	0-1	0	0	Color killer level
25-F. YSW LPF	0-1	1	1	Low pass filter for luminance
26-F. ABCL	0-1	1	1	Bright/Contrast limiter
27-F. ABCL SNS	0-1	0	0	ABCL sensitivity
28-F. AFC1 GAIN	0-1	0	0	Horizontal AFC1 Gain switch
29-F. AFC2 GAIN	0-1	0	0	Horizontal AFC2 Gain switch
30-F. HVCO ADJ	0-7	4	4	Horizontal free running frequency adjustment
31-F. V SIZE	0-254	32	32	Vertical ramp amplitude adjustment
32-F. H FREE	0-1	0	0	Forced horizontal free running mode
33-F. V FREE	0-1	0	0	Forced vertical free running mode
34-F. SLICE DOWN1	0-1	0	0	Sync det. slice level section
35-F. SLICE DOWN2	0-1	0	0	Sync det. slice level switch
36-F. A-SLICE DOWN	0-1	0	0	Sync det. slice level switch during video period
37-F. FBP VTH-L	0-1	0	0	Flyback pulse slice voltage
38-F. HV BLK OFF	0-1	0	0	Horizontal and vertical blanking Off/On RGB out switch
39-F. V SYNC DET	0-1	1	1	Vertical sync det minimum width switch
40-F. I WINDOW	0-1	0	0	Vertical Sync det mode
41-F. BGP FBP OFF	0-1	0	0	BGP output without FBP input
42-F. AIR AFT	0-1	0	0	Force to AFC in Air Band
43-F. H PHASE	0-32	9	9	Horizontal Phase adjustment
44-F. V PHASE	0-7	1	1	Vertical Phase adjustment
45-F. SUBCOLOR	0-63	23	23	For limit color range at minimum
46-F. MAX COLOR	0-127	50	50	For limit color range at maximum
47-F. RF SUBTINT	0-15	11	11	Subtint Adj for RF Mode

# SERVICING

## GENERAL INFORMATION

Servicing the CL chassis is the same as with other Zenith single-board chassis. If the set is dead, first check the standby and switched voltages. If the switched voltages do not appear, check the power "On" circuit. If the power supply is OK and the set will turn on, the Horizontal sweep circuit should be checked next. Is horizontal drive available from the video processor chip? If the sweep system does not start up, sweep-derived voltages will not be generated.

If the sweep and high-voltage circuits are OK and video or audio are missing, then the audio/video/tuner circuits should be checked. If the receiver is working but some feature is not working, check the Service Menu. Bring up the Service menu and check to be sure that all items are set correctly.

## MODULE-LEVEL SERVICING

The CL Chassis is Module Level repair only. Replacement modules are available on an exchange basis.

If the CRT or Video processor IC are replaced, Black/White tracking must be reset. Refer to the Service Menus section of this book for Black/White tracking adjustments.

When troubleshooting video circuits, remember that all video travels through the Video/Audio switcher IC. A defect in either of these IC's can result in no video.



***DO NOT disconnect the Video output module from the CRT when troubleshooting 32" receivers. If the video output module is removed on these sets while power is ON, the CRT will arc and can be permanently damaged. Also, the technician is in danger of serious shock. There is a termination circuit (W5101) on the CRT module to prevent this from happening.***

## SERVICING THE POWER SUPPLY

Check the standby voltages first:

+VM at CX3415 (usually 169.7 VDC when 120 VCA)

B+ at CX3801

***Note: B+ 124 VDC for 32" & 27", B+ 126 VDC for 25" and B+ 120 VDC for 19" & 20".***

+12 VSB at CX3613

+14 at CX3610

+5 VSB at CX3841

Check the following:

Keyboard input at IC6000 pins 7 and 8

IR input at IC6000 pin 15

Power On output at IC6000 pin 32

Check the switched voltages:

+9 VSW DC at CX3811

+14 VAUD DC for the Audio Amp at 2X3510

+8 VSW DC CX3831

## SWEEP DERIVED VOLTAGES

+28 volts DC at (+) CX2114

+35 volts DC at the junction of CX3253 and DX3252

+215 volts DC at the junction of CX3208 and RX3208

+33 volts DC at the junction of RX3216 and ZD6001

## CRT FILAMENT

Check at pin 3 and 4 of connector CN2C5A. This should read voltages between 6.0 and 6.4 volts AC on a true RMS meter.

## VIDEO PROCESSOR ICX2200

Check the following key operating signals and voltages:

Luminance at ICX2200 pin 43

Chroma at ICX2200 pin 45

Horizontal drive at pin 32

Vertical drive at pin 24

R Out pin 19

G Out pin 20

B Out pin 21

Serial Clock, Serial Data pins 27 and 28 respectively

VCC 9 volts pins 9, 26, 46 & 48

R in from micro (IC6000) at pin 15

G in from micro (IC6000) at pin 16

B in from micro (IC6000) at pin 17

## SERVICE ADJUSTMENTS (continued)

### MICROPROCESSOR

Check the following:

IR in on pin 15

+5 volts on pins 27 and 18

Serial Data, Serial Clock on pins 36 and 38

Reset at pin 30

Horiz. SYNC at pin 1, Vertical SYNC at pin 2

R Out at pin 52, G Out at pin 51 and B Out at pin 50

### VERTICAL CIRCUIT

Check the following at ICX2100:

Vertical drive at pin 4.

Vertical out at pin 2.

+28 VDC at pin 6.

### HORIZONTAL CIRCUIT

Check the following:

Horizontal drive to base of Q3201 predriver.

Driver transformer output at base of QX3203.

Shutdown voltage at RM6009.

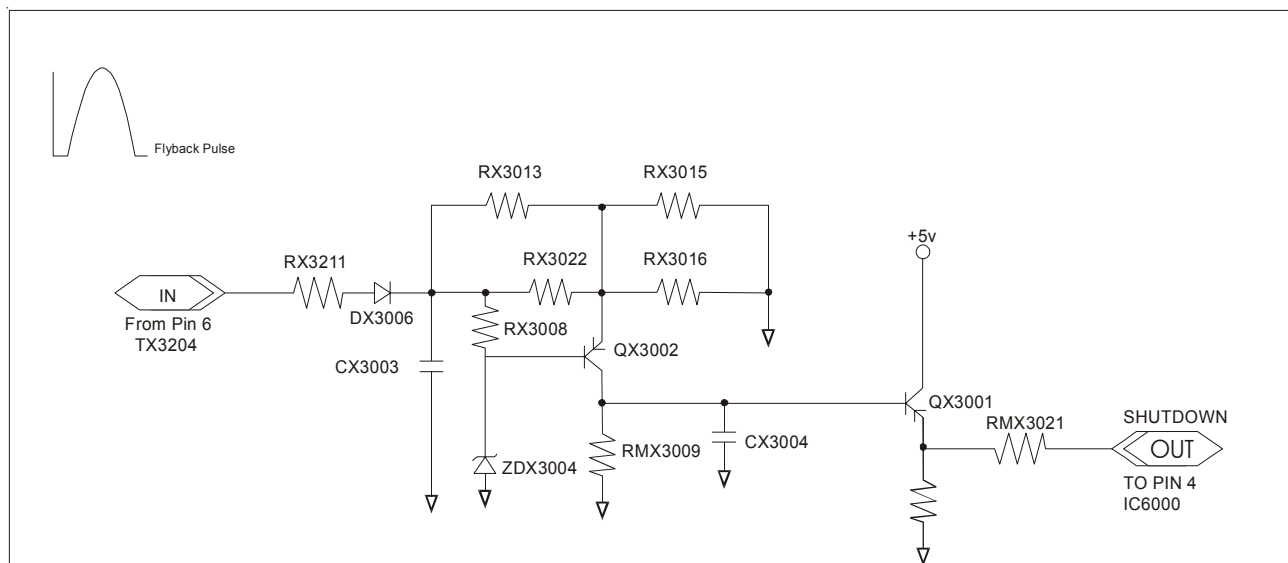
### SHUTDOWN CIRCUIT OPERATION

(Refer to figure below)

The flyback pulse voltage from pin 6 of TX3204 (flyback transformer) is peak detected (rectified) by the action of the diode DX3006 and capacitor CX3003. This is from a DC voltage appearing on CX3003 representative of the CRT anode voltage (HV) produced by TX3204. Precision resistors RX3013, RX3015, RX3016, and RX3022 divide this voltage down. This lower voltage appears on the input (QX3002 collector) of a comparator circuit formed by RX3008, ZDX3004, QX3002, RMX3009, CX3004, QX3001, RMX3017 and RMX3021. In the event the CRT anode voltage becomes excessive, the comparator output (QX3001 emitter) will go to high level, at approximately 5 volts. This signal (SHUTDOWN) is sent to pin 4 of IC6000 (microprocessor), and used to turn off the TV set.

### CRT ANODE HIGH VOLTAGE MEASUREMENT PROCEDURE

Each CRT screen size has its own safe operating anode and shutdown voltage. Critical safety component (designated with an 'X' in the component designator) are designed to operate the CRT at a safe operating anode voltage and provide proper shutdown thresholds. If replacement of any of these components is deemed necessary, it is important to use original type Zenith



## SERVICE ADJUSTMENTS (continued)

components. After replacement is made, confirm proper anode voltage using the following procedure.

Measurement of the CRT anode voltage must be performed using a high impedance-high voltage meter, with no raster on the screen, and operating at normal horizontal frequency. 15.75 KHz. (NTSC signal).

After discharging the CRT, connect a high impedance-high voltage meter to the CRT anode. Turn the television "on" and confirm a good signal is being displayed. Reduce Brightness and Contrast setting until the procedure is well extinguished.

Observe the anode voltage on the meter reading and compare with the table below for the proper CRT screen size. If the voltage reading is higher than the maximum, verify circuit component values and proper operation.

CRT anode Voltage		
CRT Screen Size	Nominal Anode Voltage (KV)	Max. Shutdown Voltage (KV)
19"	26 ± 1.0	32
20"	26 ± 1.0	32
24"/25"	28 ± 1.0	34
27"	28 ± 1.0	34
32"	30 ± 1.0	36

### COMPONENTS WITH ANY INFLUENCE IN HV INCREASE

COMPONENTS WITH ANY INFLUENCE IN HV INCREASE	
<i>Fly-Back Transformer</i>	
<i>Deflection Yoke</i>	
CX3216	RX3015
CX3210	RX3013
CX3212	ZDX3004
CX3252	RX3704
CX3256	RX3703
RX3022	RX3705

### HV SHUTDOWN PROCEDURE

- 1 After discharging the CRT, connect a high impedance-high voltage meter to the CRT anode.
- 2 Access Video Menu and adjust the brightness and contrast controls for minimum screen luminance (beam current to 0mA).
- 3 Wait until the Video Menu or display appears.
- 4 Connect a variable Resistor (1M ohm) in parallel with RX3703, and decrease slowly the resistance value until shutdown occurs.
- 5 Measure high voltage shutdown.



## SERVICE ADJUSTMENTS (continued)

### IF SERVICING

#### VIDEO DETECTOR

If there is no viewable picture on screen, access the Service Menu and check default settings for the following items:

#5 RF ADJ should be at least 30.

#6 VIF VCO ADJ set to 63.

Tune in a good off-the-air signal. Place a high-impedance voltmeter at pin 2 of ICM2200. Set VIF defeat to (#9) to "1", reset VIF defeat (#9) to "0". Adjust item VIF VCO (#6) to 2.5 volts DC.

#### AGC DELAY

With a strong noise-free antenna signal, adjust RF DELAY ADJ (#5) to a higher setting until the signal gets noisier. Decrease the setting again for a noise-free picture.

**Note: If the setting is too low (under 20) the tuner input will overload. Under certain conditions, beats may also appear in the picture (Typical value is 35).**

#### G2 ADJUSTMENT

Use the following procedure when resetting G2.

1. Set brightness and contrast in the Video menu to mid range.
2. Set color level minimum.
3. Connect the output of an NTSC generator to the antenna input on the receiver.
4. Select a color bar signal and turn color off. Adjust the G2 control so that the range of bar pattern starts from completely white (not overdriven) to black. Leave visible 6 of 8 bars.
5. Return color level control to its normal setting.

#### FOCUS ADJUSTMENT

1. Connect the output of an NTSC generator to the antenna input on the receiver.
2. Select white raster pattern.
3. Push menu key of remote control to observe the OSD.
4. Adjust focus potentiometer to obtain the best focus at letters of menu.

#### ADJUSTMENT OF RGB CUTOFF

**Note: If the Main Module or the CRT has been replaced, G2 must be readjusted before adjusting the RGB Cutoff.**

1. Enter the Service menu to gain access to the cutoff adjustments. (Factory mode item 00 must be set to 1 to gain access to this adjustment).
2. Set R Gain (Red) and B Gain (Blue) registers in the Service menu to the default setting for the screen size as listed in the service menu. See table.
3. Set color level and contrast to minimum. Set tint to mid range.

Control:	34 & 36 Series register (39 Series)	All series & sizes
Red Gain	20 (12)	70
Blue Gain	21 (13)	70

4. Connect the output of an NTSC generator to the antenna input of the receiver. Set the generator to a pure white signal, chroma off.
5. Set Factory menu registers #17/(9), #18(10), and #19(11) to adjust cutoff controls for 34,36 & 39 series.
6. Carefully observe which color is predominant on the CRT: Red, Green or Blue. Do not change the value of cutoff control of this color.
7. Adjust the other two cutoff controls to obtain color balance on the screen.
8. Select the color bars pattern from the Video generator and turn the chroma off. Check that the TV set displays 3/4 of gray scale from white to black. If black level is too high, readjust register #22, RF Sub Brightness for Series 34 & 36. Readjust #14 RF Sub Brightness for Series 39. Do not move Aux B Offset resistor.
9. Return the color level control to preset.
10. Disable the factory menu (Factory Mode item 0 must be set to 0). Select "Preset" in the Video Menu under picture preference.

## SERVICE ADJUSTMENTS (continued)

### SWITCHING PROCESS

Video switching is done between the CV inputs and the Y/C inputs. There are three CV signals to consider:

CAMPART VIDEO enters at pin 7 of IC2901.

REAR VIDEO enters at pin 5 of IC2901.

IF Video enters at TV pin 12 of IC2901.

These signals exit from VOUT1 (pin 11) to be processed and returned to the switch as Y/C signals (Y-COMB and IC2902).

The second part of the switching is between:

Y/C COMB signals enter at pins 10 and 7 of IC2902 and Y/C EXT signals entering at pins 12 & 5 of IC2902.

The selected Y/C signals exit from pins 11 & 8 to be sent to the video processor as main signals.

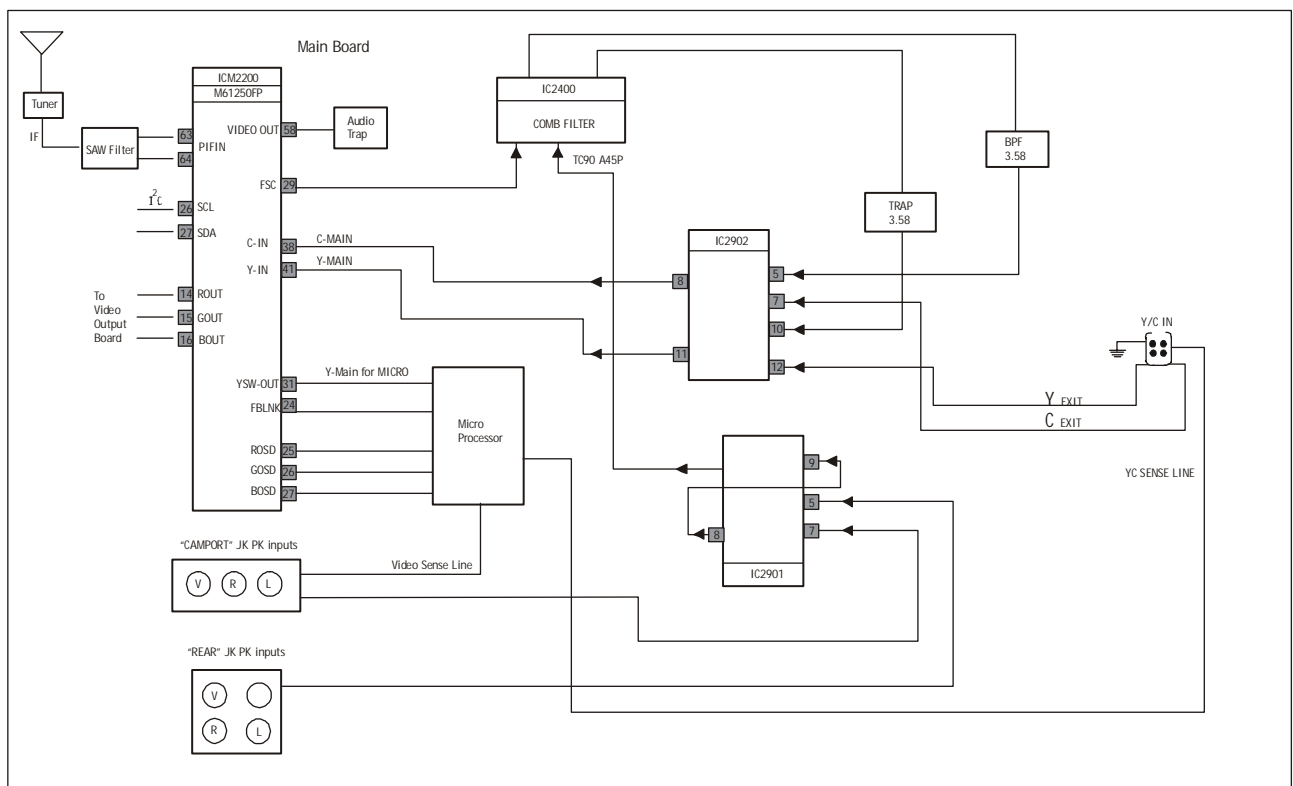
Close caption is achieved by taking a signal from the YSW-OUT pin (31) of the video processor.

### SENSING AND PRIORITIES

CL-Series 34 & 39 models do not have a source menu. Software sensing the inputs based on their priorities does switching between sources.

The campart input always has first priority, it is sensed directly through the microprocessor. The S-Video input has the second level. The Y/C connector does the S-Video sensing. The third level corresponds to rear video and antenna signal (RF), they would be selected by remote control.

### VIDEO PROCESSING & SWITCHING WITH Y/C INPUT



# SERVICE ADJUSTMENTS (continued)

## PURITY & CONVERGENCE SETUP PROCEDURE

### PRELIMINARY SETUP

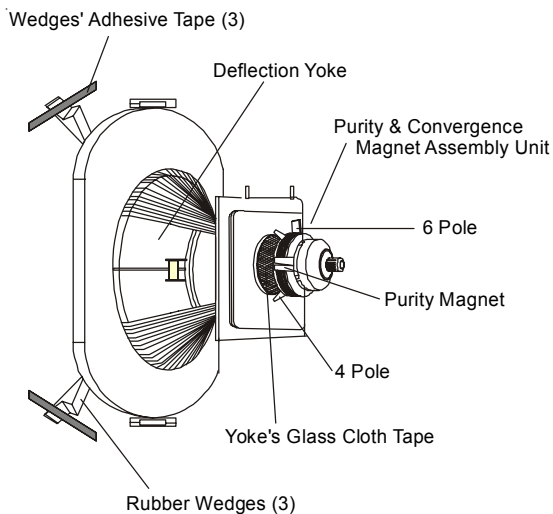
1. Allow the receiver to warm up for 15 to 20 minutes.
2. Degauss the CRT.
3. Connect a crosshatch generator to the receiver and "rough in" the static (center) convergence. Follow the Convergence Procedure.
4. Adjust for best focus.

### PURITY ADJUSTMENT

1. Purity tab positioning. Set the 2 pole purity tabs together in the 3 or 9 o'clock positions and the 4- and 6-pole purity tabs together in the 12 or 6 o'clock positions.
2. Move yoke to the maximum forward funnel position.
3. Next, switch the crosshatch generator to a red field.
4. Pull the yoke toward the rear of the CRT neck, keeping it centered, until a red raster is displayed.
5. If the red raster is not displayed as a pure red field, adjust the 2-pole purity tabs until a pure field is obtained.
6. Check for proper yoke tilt setting.

### CONVERGENCE ADJUSTMENT

1. Release locking assembly.
2. Connect crosshatch generator to the receiver and adjust static (center) convergence as follows:
  - a. Adjust the 4-pole static control by moving the two tabs separately to converge the red and blue lines horizontally. Move the two tabs together around the neck of the CRT (in a 45° arc) from the top-dead-center position to converge the red and blue lines vertically.
  - b. After the 4-pole control has been adjusted to superimpose the red and blue lines on top of one another. Use the 6-pole static adjustment to place the converged red and blue lines over the green line. Move the two tabs together around the neck of the CRT (in a 30° arc) from the top-dead-center position to move the lines vertically. Adjusting the two tabs separately will move the converged beam to the left or right. Using a crosshatch generator capable of producing individual fields, adjust the generator to produce a red field. Use the purity tabs to center a red stripe.



CRT Ring Location Purity  
Adjust Tabs Beam Movement  
for Convergence

Ring Pairs	Rotation direction of Both Tabs	Movement of Red and Blue Beams
6 Pole	Opposite	 
Convergence R&B over G	Same	 
4 Pole	Opposite	 
Convergence R over B	Same	 

## SERVICE ADJUSTMENTS (continued)

### VERTICAL-TILT WEDGE ADJUSTMENT

The vertical lines at 6 and 12 o'clock are converged by vertically tilting the yoke and inserting a wedge at the top of the yoke until it is firmly seated between the CRT glass and the horizontal coils.

### HORIZONTAL-TILT WEDGE ADJUSTMENT

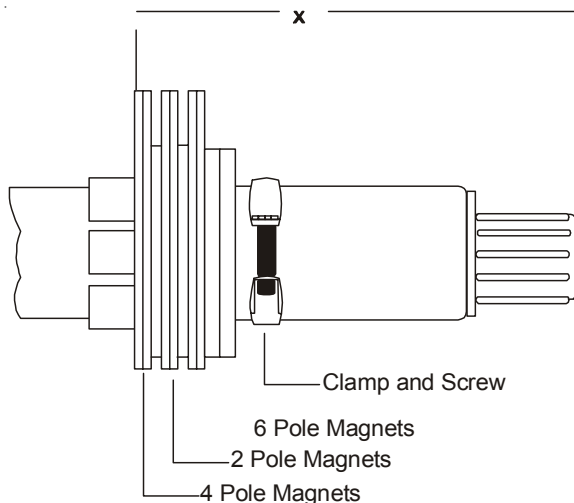
The vertical lines at 3 o'clock and 9 o'clock are converged by horizontally tilting the yoke and inserting a wedge.

Adjust first at 4 or 8 o'clock, whichever has the larger space, until the wedge is firmly seated between the CRT glass and yoke coils. Then, insert the 3rd wedge in the remaining horizontal tilt position until it is firmly seated between the CRT glass and yoke coils. Convergence at the 3 and 9 o'clock should be maintained during this operation.

When the 3 wedges are firmly installed and positioned for acceptable convergence, lock the wedges in place by applying a 2.5 inches long strip of tape across the tabs of each wedge firmly against the CRT glass. The CRT glass surface should be clean and free of dust and other foreign material.

### UNUSUAL TILT CASE

There may be some instances where the picture tube and yoke will require vertical tilt in the opposite (up) direction to obtain convergence. In such cases, insert the vertical tilt wedge at the bottom (6 o'clock) position. Follow through on the horizontal tilt adjustment by using the 2 and 10 o'clock positions and secure each wedge with a piece of tape, as described above.



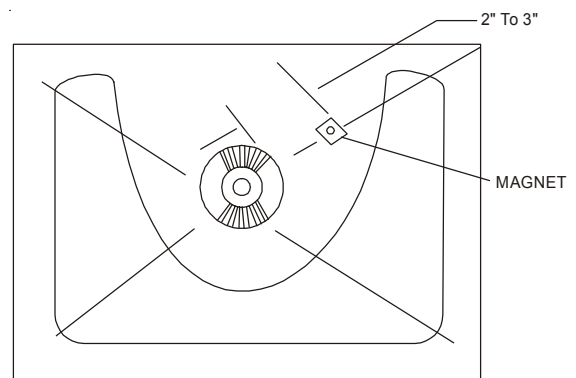
### IMPROVING CRT CORNER PURITY

CRTs that display corner purity problems even after following the service procedures can be modified with a picture correction kit (P/N 949-00050). The purity can be improved by placing a picture-correction magnet (included in the kit) on the CRT funnel. Refer to the following modification steps and illustration to place the magnet properly. Fully degauss the CRT before installing correction magnets.

### MODIFICATION

1. Place the magnet on the CRT funnel as shown in the figure displayed below, in the quadrant exhibiting impurity.
2. Rotate the magnet in place to the position shown for best purity.
3. Place a piece of 1/2" by 2" long Fiberglass tape over the magnet to hold it in place.
4. Degauss the CRT once magnet is in place to insure that the magnet is not over the internal magnet shield.

**Note: If the magnet is placed over the internal magnet shield, any apparent purity correction will disappear after degaussing. Reposition the correction magnet off the internal shield and degauss again.**



# MODEL PARTS

## PARTS

All CL models are module level repair only. Parts contact information is below:

Voice: 1-888-3-ZENITH

Fax: 1-888-6-ZENITH

Mail: ZENITH NATIONAL PARTS

P O Box 240007

Huntsville, AL 35824-6407

H19F34DT	
<i>Item number</i>	<i>Part description</i>
4810V00739A	Cabinet tray
3091V00B81B	Cabinet Front
3809V00B08B	Cabinet Rear (Back Cover Asse)
6140VC8003A	Coil, Degausser
6400VSNX01A	Speaker, Oval, 6 X 13 cm
3790V00712A	Crystal Window
3828VA0A30A	Instr Book, Operation Guide
5016V20002A	Magnet Assembly, Static Convergence
6411VUH003A	Power Cord Assembly Line Cord and Terminals Assembly
6335V20A03A	CRT Assembly with Deflection Yoke
170-A01Q	CPT Earth_Gnd Strap Assy, CRT
3141VSNC61A	Keyboard Assy, 6 Key
3141VMNP44A	Module, Main
6631V25014G	Connector & Cable Assembly, Speaker Interconnect
6710V00108A	Space Command Transmitter (Remote Controller)
5016V20002A	Convergence Helper
H20F34DT	
<i>Item number</i>	<i>Part description</i>
4810V00739A	Cabinet Tray
3091V00485A	Cabinet Front
3809V00334A	Cabinet Rear (Back Cover Asse)
6140VC8003A	Coil, Degaussing
6400VESU01A	Speaker, Oval, 6 X 13 cm
3790V00715A	Crystal Window
3828VA0A30A	Instr Book, Operation Guide
5016V20002A	Magnet Assembly, Static Convergence
6411VUH003A	Power Cord Assembly Line Cord and Terminals Assembly
6335V20A03A	CRT Assembly with Deflection Yoke
170-A01Q	CPT Earth_Gnd Strap Assy, CRT
3141VSNC61B	Keyboard Assy, 6 Key
3141VMNP44A	Module, Main
6631V25014G	Connector & Cable Assembly, Speaker Interconnect
6710V00108A	Space Command Transmitter (Remote Controller)
5016V20002A	Convergence Helper

H25F34DT	
<i>Item number</i>	<i>Part description</i>
4810V00739A	Cabinet Tray
3091V00B80A	Cabinet Front
3809V00B07A	Back Cover Asse (Cabinet Rear)
6140VC8003B	Coil, Degaussing
6400VSNX01A	Speaker, Oval, 6 X 13 cm
3790V00711A	Crystal Window
3828VA0A30A	Instr Book, Operation Guide
5016V20003A	Magnet Rubber (Magnet Assembly, Static Convergence)
6411VUH003A	Power Cord Assembly Line Cord and Terminals Assembly
6335V27003A	CRT Assembly with Deflection Yoke
170-844G	CPT Earth_Gnd Strap Assy, CRT
3141VSNC61C	Keyboard Assy, 6 Key
3141VMNP44B	Module, Main
6631V25014G	Connector & Cable Assembly, Speaker Interconnect
6710V00108A	Space Command Transmitter (Remote Controller)
5016V20002A	Magnet, Stick Ferrite (Convergence Helper)
H25F39DT	
<i>Item number</i>	<i>Part description</i>
3091V00B80A	Cabinet Front
3809V00B07A	Back Cover Asse (Cabinet Rear)
6140VC8003B	Coil, Degaussing
6400VSNX01A	Speaker, Oval, 6 X 13 cm
3790V00711A	Crystal Window
3828VA0A30A	Instr Book, Operation Guide
5016V20003A	Magnet Rubber (Magnet Assembly, Static Convergence)
6411VUH003A	Power Cord Assembly Line Cord and Terminals Assembly
6335V27003A	CRT Assembly with Deflection Yoke
170-844G	CPT Earth_Gnd Strap Assy, CRT
3141VSNC61C	Keyboard Assy, 6 Key
3141VMNP45A	Module, Main
6631V25014G	Connector & Cable Assembly, Speaker Interconnect
6710V00108A	Remote Controller (Space Command Transmitter)
5016V20002A	Magnet, Stick Ferrite (Convergence Helper)
6871VSMV33A	PWB(PCB) Assembly, Sub Front Jack CL 25-32V

# MODEL PARTS

## H27F34DT

Item number	Part description
4810V00739A	Cabinet Tray
3091V00B66A	Cabinet Front
3809V00332A	Back Cover Asse (Cabinet Rear)
6140VC8003C	Coil, Degaussing
6400VSNX01A	Speaker, Oval, 6 X 13 cm
3790V00711A	Crystal Window
3828VA0A30A	Instr Book, Operation Guide
6411VUH003A	Power Cord Assembly Line Cord and Terminals Assembly
6335V27001A	CPT Assembly with Deflection Yoke
170-844J	CPT Earth_Gnd Strap Assy, CRT
3141VSN61C	Keyboard Assy, 6 Key
3141VMNP44C	Module, Main
6631V25014G	Connector & Cable Assembly, Speaker Interconnect
6710V00108A	Remote Controller (Space Command Transmitter)
6871VSMV33A	PWB(PCB) ASSEMBLY,SUB FRONT JACK CL 25-32V

## H27F39DT

Item number	Part description
3091V00B66A	Cabinet Front
3809V00332A	Back Cover Asse (Cabinet Rear)
6140VC8003C	Coil, Degaussing
6400VSNX01A	Speaker, Oval, 6 X 13 cm
3790V00711A	Crystal Window
3828VA0A30D	Instr Book, Operation Guide
6411VUH003A	Power Cord Assembly Line Cord and Terminals Assembly
6335V27001A	CPT Assembly with Deflection Yoke
170-844J	CPT Earth_Gnd Strap Assy, CRT
3141VSN61C	Keyboard Assy, 6 Key
3141VMNP45B	Module, Main
6631V25014G	Connector & Cable Assembly, Speaker Interconnect
6710V00108A	Remote Controller (Space Command Transmitter)
6871VSMV33A	PWB(PCB) ASSEMBLY,SUB FRONT JACK CL 25-32V

## H25F36DT

Item number	Part description
4810V00739A	Cabinet Tray
3091V00B80A	Cabinet Front
3809V00B07A	Back Cover Asse (Cabinet Rear)
6140VC8003B	Coil, Degaussing
6400VSNX01A	Speaker, Oval, 6 X 13 cm
3790V00711A	Crystal Window
3828VA0A30C	Instr Book, Operation Guide
6411VUH003A	Power Cord Assembly Line Cord and Terminals Assembly
6335V27003A	CPT Assembly with Deflection Yoke
170-844G	CPT Earth_Gnd Strap Assy, CRT
3141VSN61C	Keyboard Assy, 6 Key
3141VMNP46A	Module, Main
6631V25014G	Connector & Cable Assembly, Speaker Interconnect
6710V00108A	Remote Controller (Space Command Transmitter)
5016V20002A	Magnet, Stick Ferrite (Convergence Helper)
6871VSMV33A	PWB(PCB) ASSEMBLY,SUB FRONT JACK CL 25-32V

## H27F36DT

Item number	Part description
4810V00739A	Cabinet Tray
3091V00B66A	Cabinet Front
3809V00332A	Back Cover Asse (Cabinet Rear)
6140VC8003C	Coil, Degaussing
6401VC0134J	Speaker, Oval, 6 X 13 cm
3790V00711A	Crystal Window
3828VA0A30C	Instr Book, Operation Guide
6411VUH003A	Power Cord Assembly Line Cord and Terminals Assembly
6335V27001A	CPT Assembly with Deflection Yoke
170-844J	CPT Earth_Gnd Strap Assy, CRT
3141VSN61C	Keyboard Assy, 6 Key
3141VMNP46B	Module, Main
6631V25014G	Connector & Cable Assembly, Speaker Interconnect
6710V00108A	Remote Controller (Space Command Transmitter)
6871VSMV33A	PWB(PCB) ASSEMBLY,SUB FRONT JACK CL 25-32V

## H27F36S

Item number	Part description
4810V00739A	Cabinet Tray
3091V00B66D	Cabinet Front
3809V00332B	Back Cover Asse (Cabinet Rear)
6140VC8003C	Coil, Degaussing
6401VC0134J	Speaker, Oval, 6 X 13 cm
3790V00711A	Crystal Window
3828VA0A30C	Instr Book, Operation Guide
6411VUH003A	Power Cord Assembly Line Cord and Terminals Assembly
6335V27001A	CPT Assembly with Deflection Yoke
170-844J	CPT Earth_Gnd Strap Assy, CRT
3141VSN61G	Keyboard Assy, 6 Key
3141VMNP46B	Module, Main
6631V25014G	Connector & Cable Assembly, Speaker Interconnect
6710V00108A	Remote Controller (Space Command Transmitter)
6871VSMV33A	PWB(PCB) ASSEMBLY,SUB FRONT JACK CL 25-32V

## H32F36DT

Item number	Part description
4810V00739A	Cabinet Tray
3091V00B56A	Cabinet Front
3809V00B09A	Back Cover Asse (Cabinet Rear)
6140VC2008A	Coil, Degaussing
6400VSNX01A	Speaker, Oval, 6 X 13 cm
3790V00711A	Crystal Window
3828VA0A30C	Instr Book, Operation Guide
6411VUH003A	Power Cord Assembly Line Cord and Terminals Assembly
6335V32012A	CPT Assembly with Deflection Yoke
170-797Y	CPT Earth_Gnd Strap Assy, CRT
3141VSN61C	Keyboard Assy, 6 Key
3141VMNP46C	Module, Main
6631V25014G	Connector & Cable Assembly, Speaker Interconnect
6710V00108A	Remote Controller (Space Command Transmitter)
5016V20002A	Magnet, Stick Ferrite (Convergence Helper)
6871VSMV33A	PWB(PCB) ASSEMBLY,SUB FRONT JACK CL 25-32V

# MODEL PARTS

## H24F36DT

Item number	Part description
4810V00739A	Bracket, Jack Pack
3091V00B80A	Cabinet Front
3809V00B07A	Back Cover Asse (Cabinet Rear)
6140VC8003B	Coil, Degaussing
5016V20002A	Magnetic, Stick Ferrite (Convergence Helper)
3790V00711A	Crystal Window
3828VA0A30P	Instr Book, Operation Guide
6411VUH003A	Power Cord Assembly Line Cord and Terminals Assembly
6335V24002A	CPT Assembly with Deflection Yoke
170-844G	CPT Earth_Gnd Strap Assy, CRT
3141VSN61C	Keyboard Assy, 6 Key
3141VMNP46P	Module, Main
6631V25014G	Connector & Cable Assembly, Speaker Interconnect
6710V00108A	Remote Controller (Space Command Transmitter)
6871VSMV33A	PWB(PCB) ASSEMBLY,SUB FRONT JACK CL. 25-32V

## H24F39DT

Item number	Part description
4810V00740A	Bracket, Jack Pack
3091V00B80A	Cabinet Front
3809V00B07A	Back Cover Asse (Cabinet Rear)
6140VC8003B	Coil, Degaussing
5016V20002A	Magnetic, Stick Ferrite (Convergence Helper)
3790V00711A	Crystal Window
3828VA0A30q	Instr Book, Operation Guide
6411VUH003A	Power Cord Assembly Line Cord and Terminals Assembly
6335V24002A	CPT Assembly with Deflection Yoke
170-844G	CPT Earth_Gnd Strap Assy, CRT
3141VSN61C	Keyboard Assy, 6 Key
3141VMNP45K	Module, Main
6631V25014G	Connector & Cable Assembly, Speaker Interconnect
6710V00108A	Remote Controller (Space Command Transmitter)
6871VSMV33A	PWB(PCB) ASSEMBLY,SUB FRONT JACK CL. 25-32V

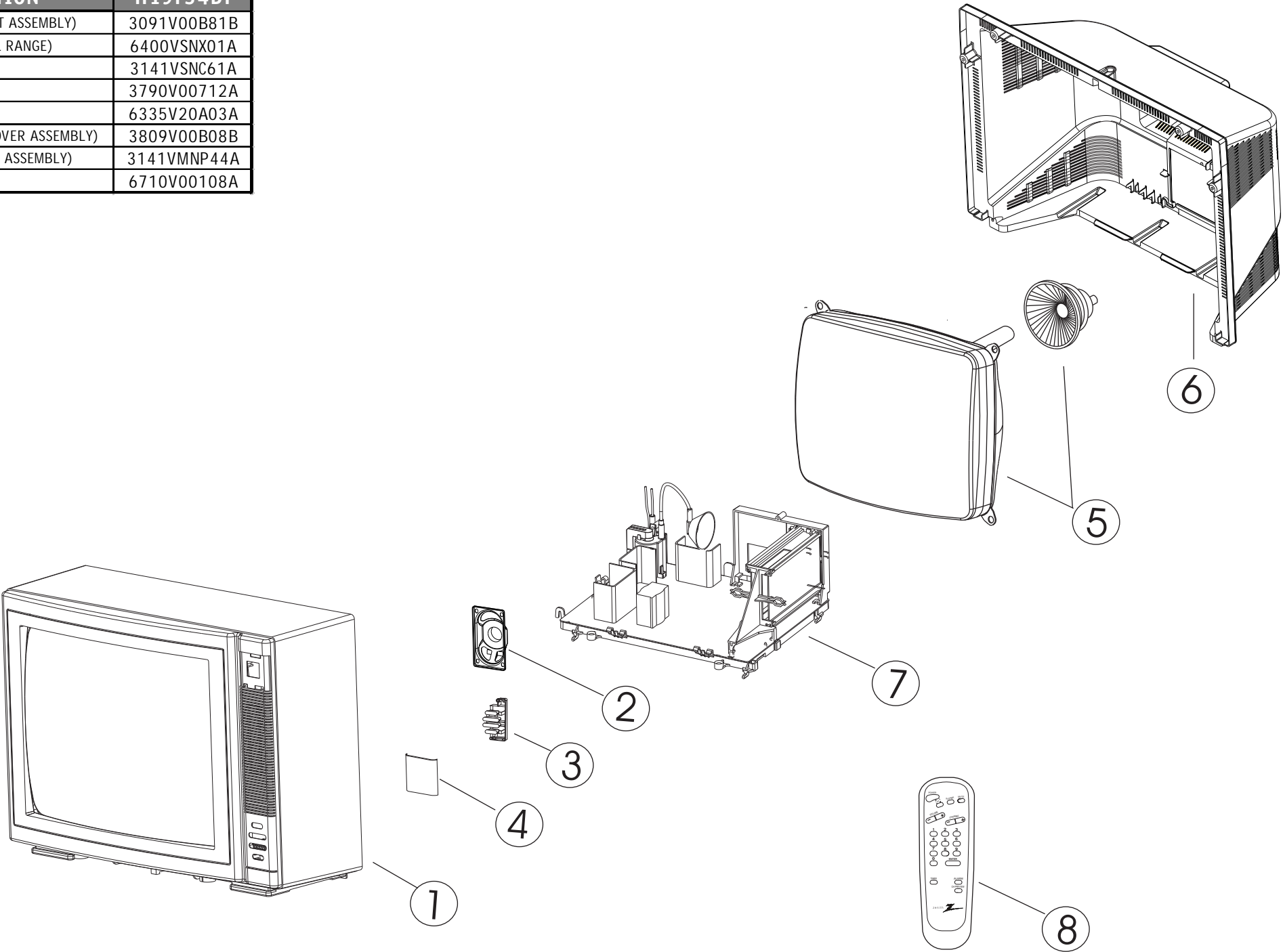
## H24F34DT

Item number	Part description
4810V00739A	Bracket, Jack Pack
3091V00B80A	Cabinet Front
3809V00B07A	Back Cover Asse (Cabinet Rear)
6140VC8003B	Coil, Degaussing
5016V20002A	Magnetic, Stick Ferrite (Convergence Helper)
3790V00711A	Crystal Window
3828VA0A30N	Instr Book, Operation Guide
6411VUH003A	Power Cord Assembly Line Cord and Terminals Assembly
6335V24002A	CPT Assembly with Deflection Yoke
170-844G	CPT Earth_Gnd Strap Assy, CRT
3141VSN61C	Keyboard Assy, 6 Key
3141VMNP44H	Module, Main
6631V25014G	Connector & Cable Assembly, Speaker Interconnect
6710V00108A	Remote Controller (Space Command Transmitter)
6871VSMV33A	PWB(PCB) ASSEMBLY,SUB FRONT JACK CL. 25-32V



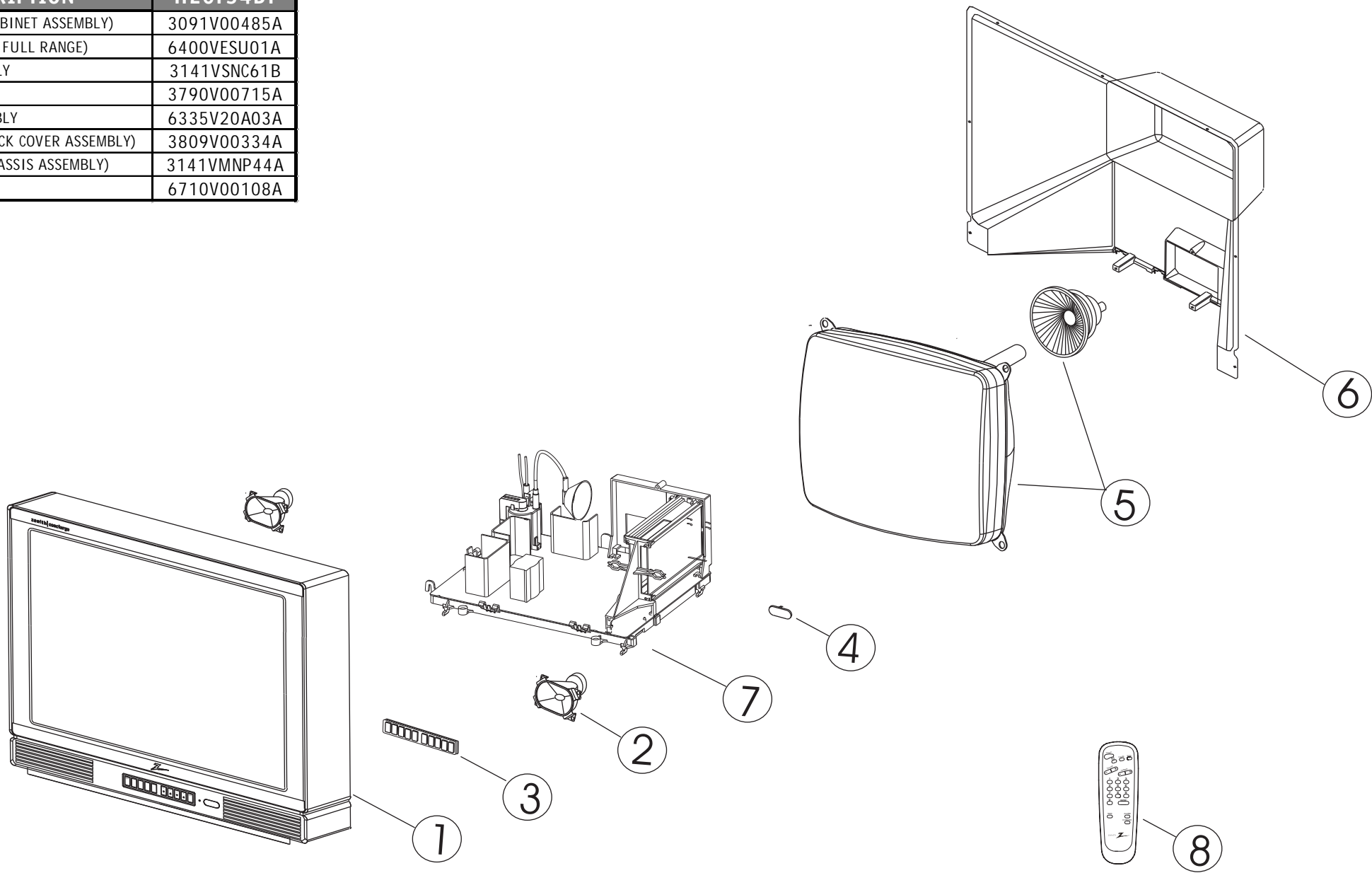
# Cl Commercial 19" Exploded View

REF	DESCRIPTION	H19F34DT
1	FRONT CABINET (CABINET ASSEMBLY)	3091V00B81B
2	SPEAKER (SPEAKER FULL RANGE)	6400VSNX01A
3	KEYBOARD ASSEMBLY	3141VSNC61A
4	IR LENS	3790V00712A
5	CPT & YOKE ASSEMBLY	6335V20A03A
6	REAR CABINET (BACK COVER ASSEMBLY)	3809V00B08B
7	MAIN MODULE (CHASSIS ASSEMBLY)	3141VMNP44A
8	REMOTE CONTROL	6710V00108A



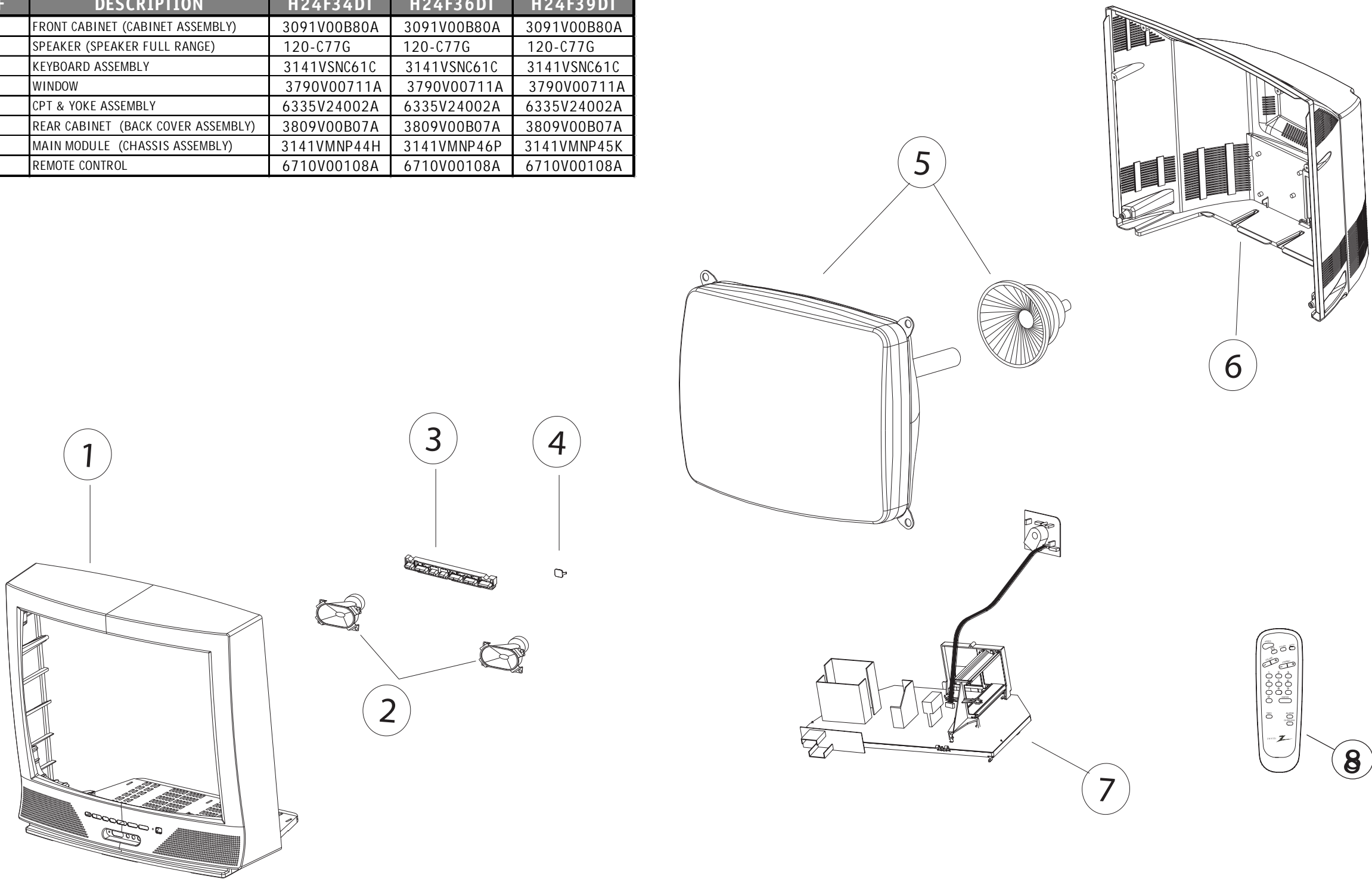
Cl Commercial 20"Exploded View

REF	DESCRIPTION	H20F34DT
1	FRONT CABINET (CABINET ASSEMBLY)	3091V00485A
2	SPEAKER (SPEAKER FULL RANGE)	6400VESU01A
3	KEYBOARD ASSEMBLY	3141VSNC61B
4	IR LENS	3790V00715A
5	CPT & YOKE ASSEMBLY	6335V20A03A
6	REAR CABINET (BACK COVER ASSEMBLY)	3809V00334A
7	MAIN MODULE (CHASSIS ASSEMBLY)	3141VMNP44A
8	REMOTE CONTROL	6710V00108A



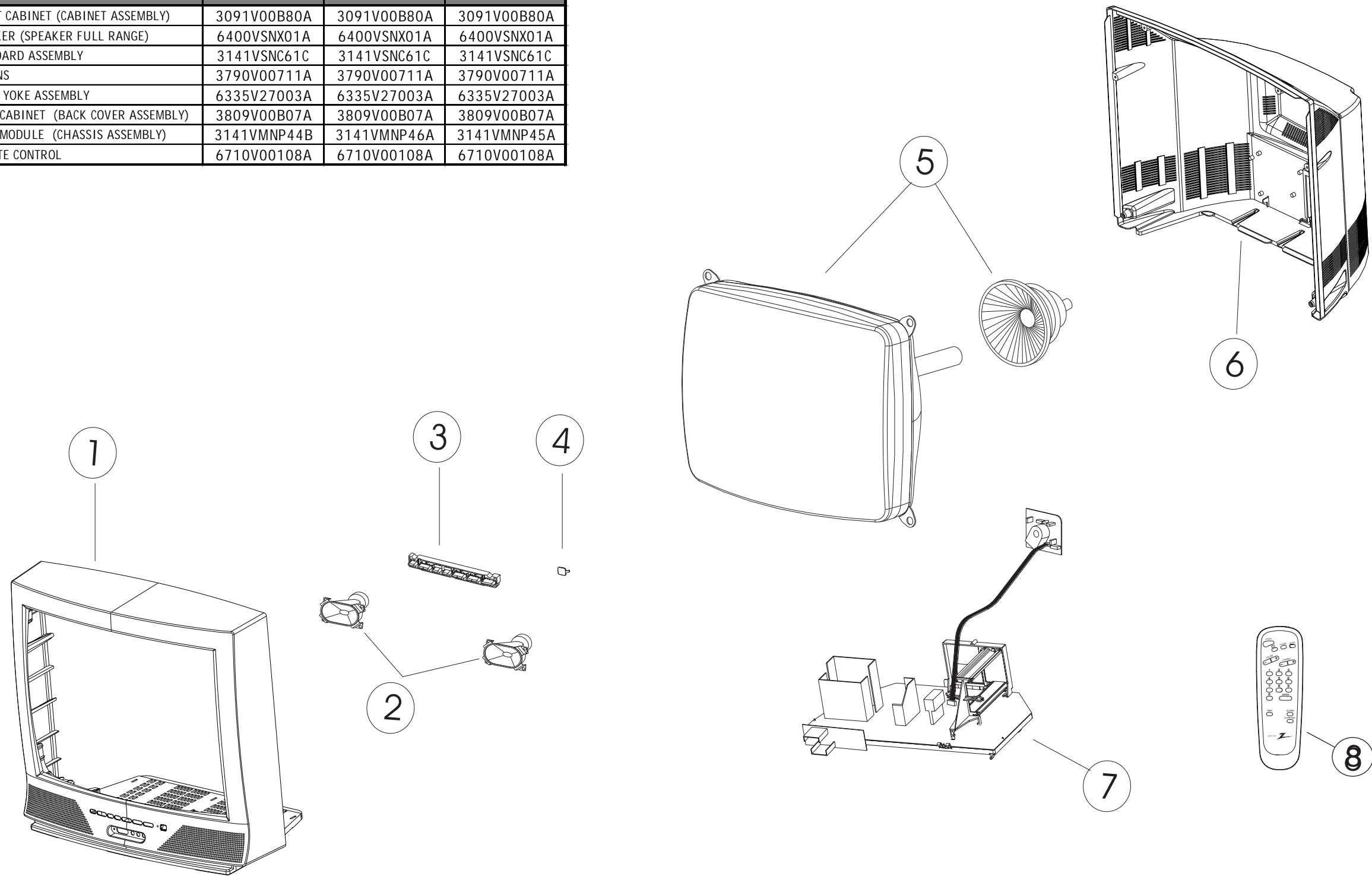
# CL Commercial 24"Exploded View

REF	DESCRIPTION	H24F34DT	H24F36DT	H24F39DT
1	FRONT CABINET (CABINET ASSEMBLY)	3091V00B80A	3091V00B80A	3091V00B80A
2	SPEAKER (SPEAKER FULL RANGE)	120-C77G	120-C77G	120-C77G
3	KEYBOARD ASSEMBLY	3141VSNC61C	3141VSNC61C	3141VSNC61C
4	WINDOW	3790V00711A	3790V00711A	3790V00711A
5	CPT & YOKE ASSEMBLY	6335V24002A	6335V24002A	6335V24002A
6	REAR CABINET (BACK COVER ASSEMBLY)	3809V00B07A	3809V00B07A	3809V00B07A
7	MAIN MODULE (CHASSIS ASSEMBLY)	3141VMNP44H	3141VMNP46P	3141VMNP45K
8	REMOTE CONTROL	6710V00108A	6710V00108A	6710V00108A



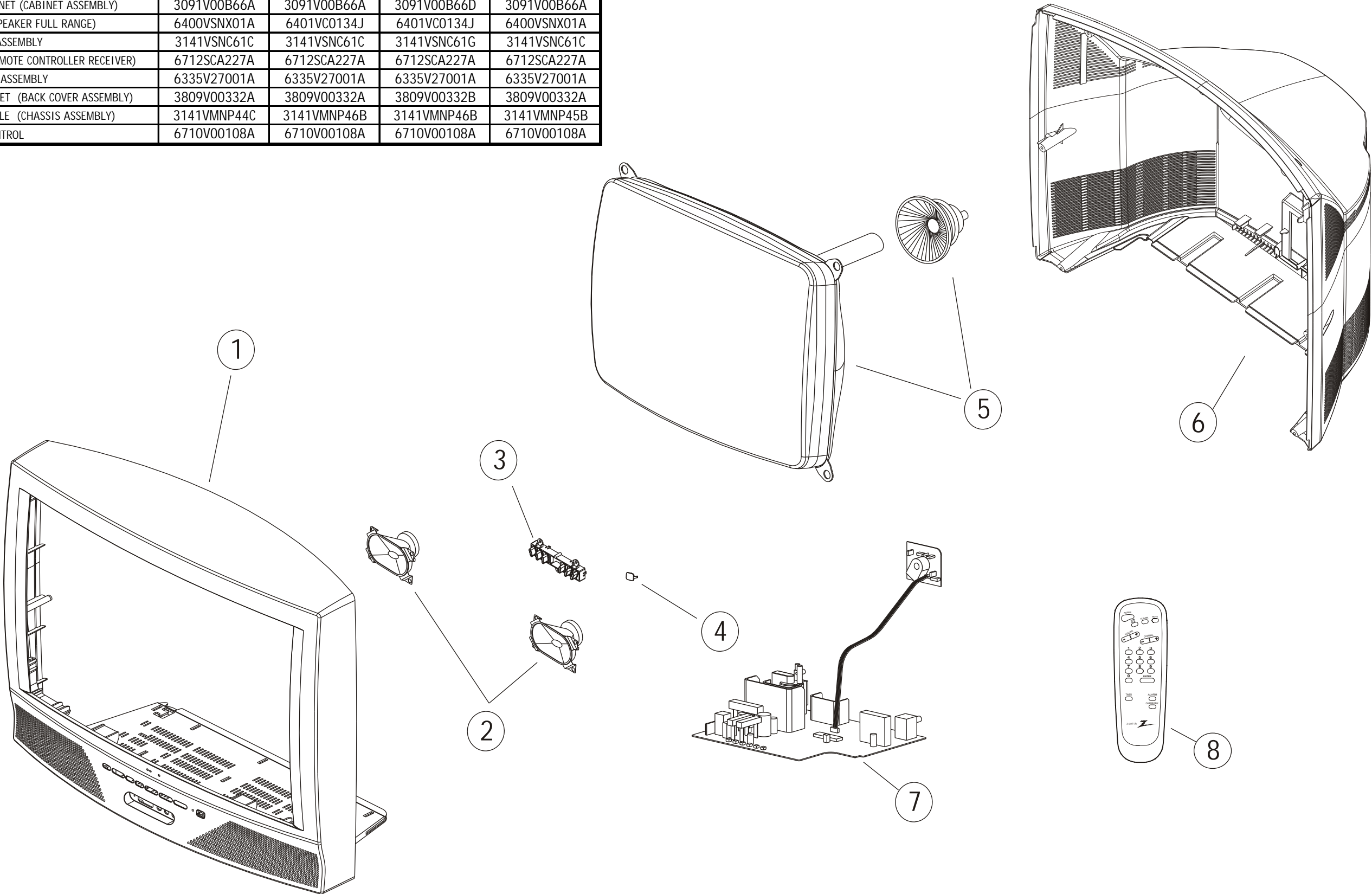
CL Commercial 25" Exploded View

REF	DESCRIPTION	H25F34DT	H25F36DT	H25F39DT
1	FRONT CABINET (CABINET ASSEMBLY)	3091V00B80A	3091V00B80A	3091V00B80A
2	SPEAKER (SPEAKER FULL RANGE)	6400VSNX01A	6400VSNX01A	6400VSNX01A
3	KEYBOARD ASSEMBLY	3141VSNC61C	3141VSNC61C	3141VSNC61C
4	IR LENS	3790V00711A	3790V00711A	3790V00711A
5	CPT & YOKE ASSEMBLY	6335V27003A	6335V27003A	6335V27003A
6	REAR CABINET (BACK COVER ASSEMBLY)	3809V00B07A	3809V00B07A	3809V00B07A
7	MAIN MODULE (CHASSIS ASSEMBLY)	3141VMNP44B	3141VMNP46A	3141VMNP45A
8	REMOTE CONTROL	6710V00108A	6710V00108A	6710V00108A



CL Commercial 27" Exploded View

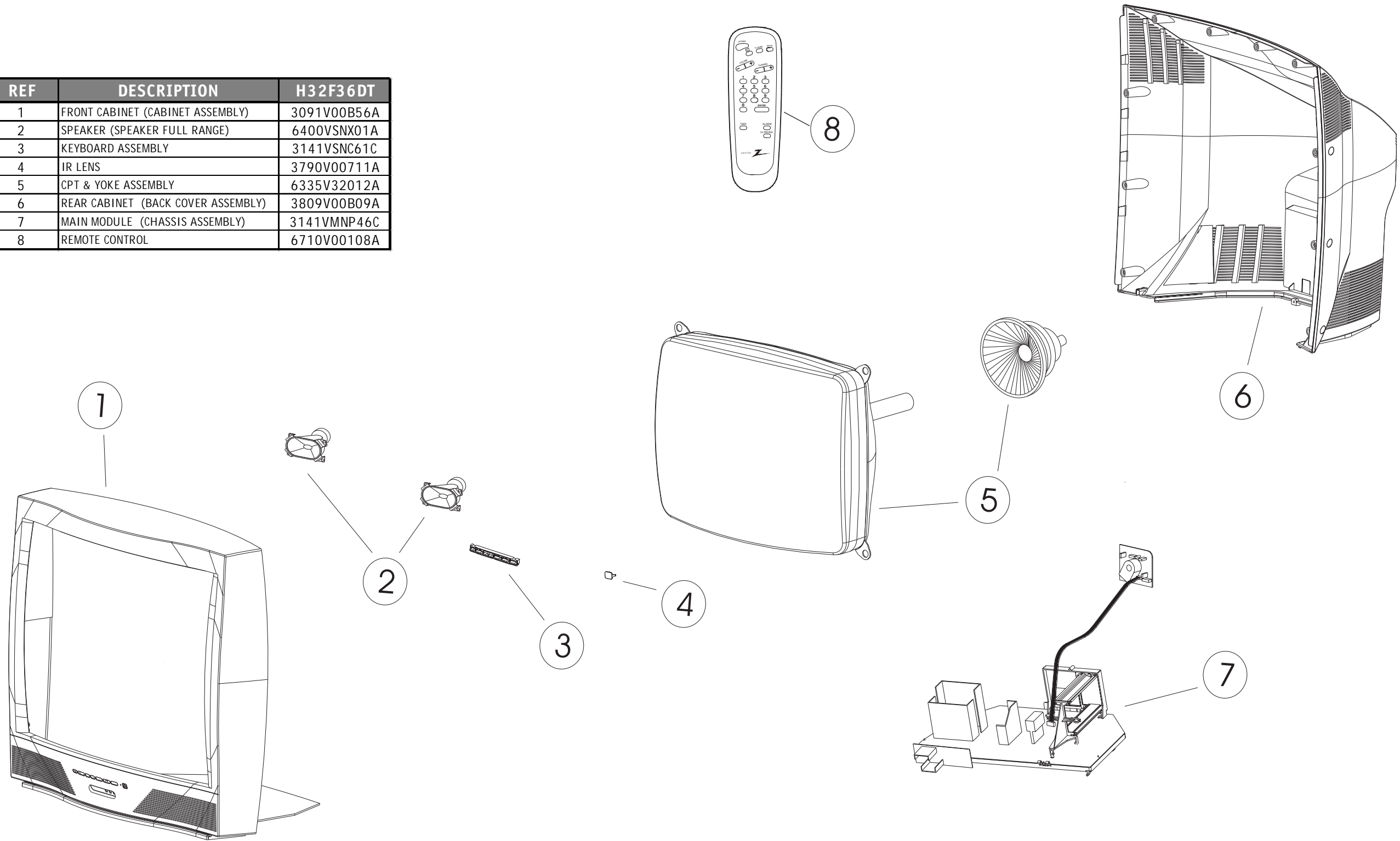
REF	DESCRIPTION	H27F34DT	H27F36DT	H27F36S	H27F39DT
1	FRONT CABINET (CABINET ASSEMBLY)	3091V00B66A	3091V00B66A	3091V00B66D	3091V00B66A
2	SPEAKER (SPEAKER FULL RANGE)	6400VSNX01A	6401VC0134J	6401VC0134J	6400VSNX01A
3	KEYBOARD ASSEMBLY	3141VSNC61C	3141VSNC61C	3141VSNC61G	3141VSNC61C
4	IR LENS (REMOTE CONTROLLER RECEIVER)	6712SCA227A	6712SCA227A	6712SCA227A	6712SCA227A
5	CPT & YOKE ASSEMBLY	6335V27001A	6335V27001A	6335V27001A	6335V27001A
6	REAR CABINET (BACK COVER ASSEMBLY)	3809V00332A	3809V00332A	3809V00332B	3809V00332A
7	MAIN MODULE (CHASSIS ASSEMBLY)	3141VMNP44C	3141VMNP46B	3141VMNP46B	3141VMNP45B
8	REMOTE CONTROL	6710V00108A	6710V00108A	6710V00108A	6710V00108A





CL Commercial 32" Exploded View

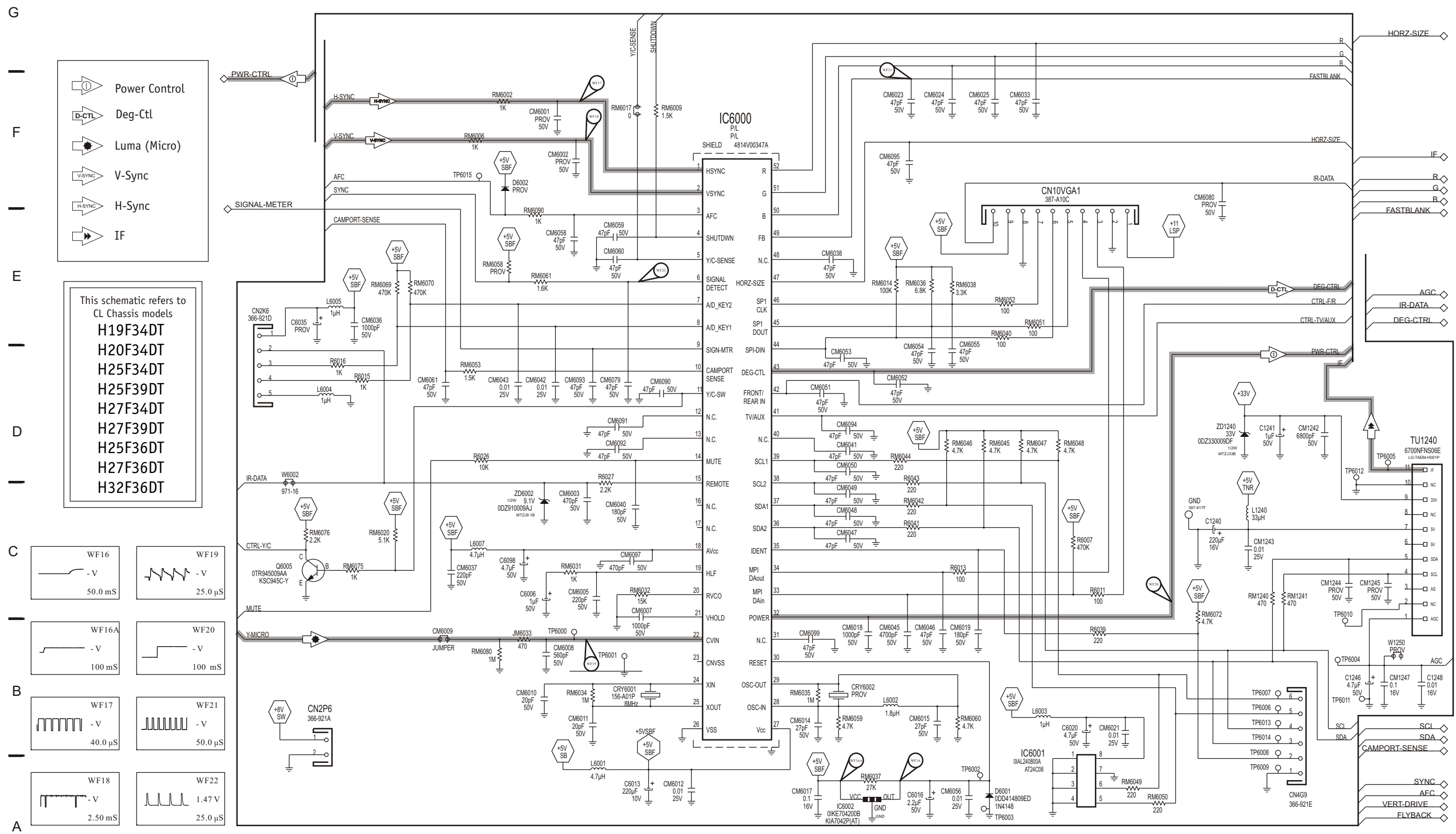
REF	DESCRIPTION	H32F36DT
1	FRONT CABINET (CABINET ASSEMBLY)	3091V00B56A
2	SPEAKER (SPEAKER FULL RANGE)	6400VSNX01A
3	KEYBOARD ASSEMBLY	3141VSNC61C
4	IR LENS	3790V00711A
5	CPT & YOKE ASSEMBLY	6335V32012A
6	REAR CABINET (BACK COVER ASSEMBLY)	3809V00B09A
7	MAIN MODULE (CHASSIS ASSEMBLY)	3141VMNP46C
8	REMOTE CONTROL	6710V00108A



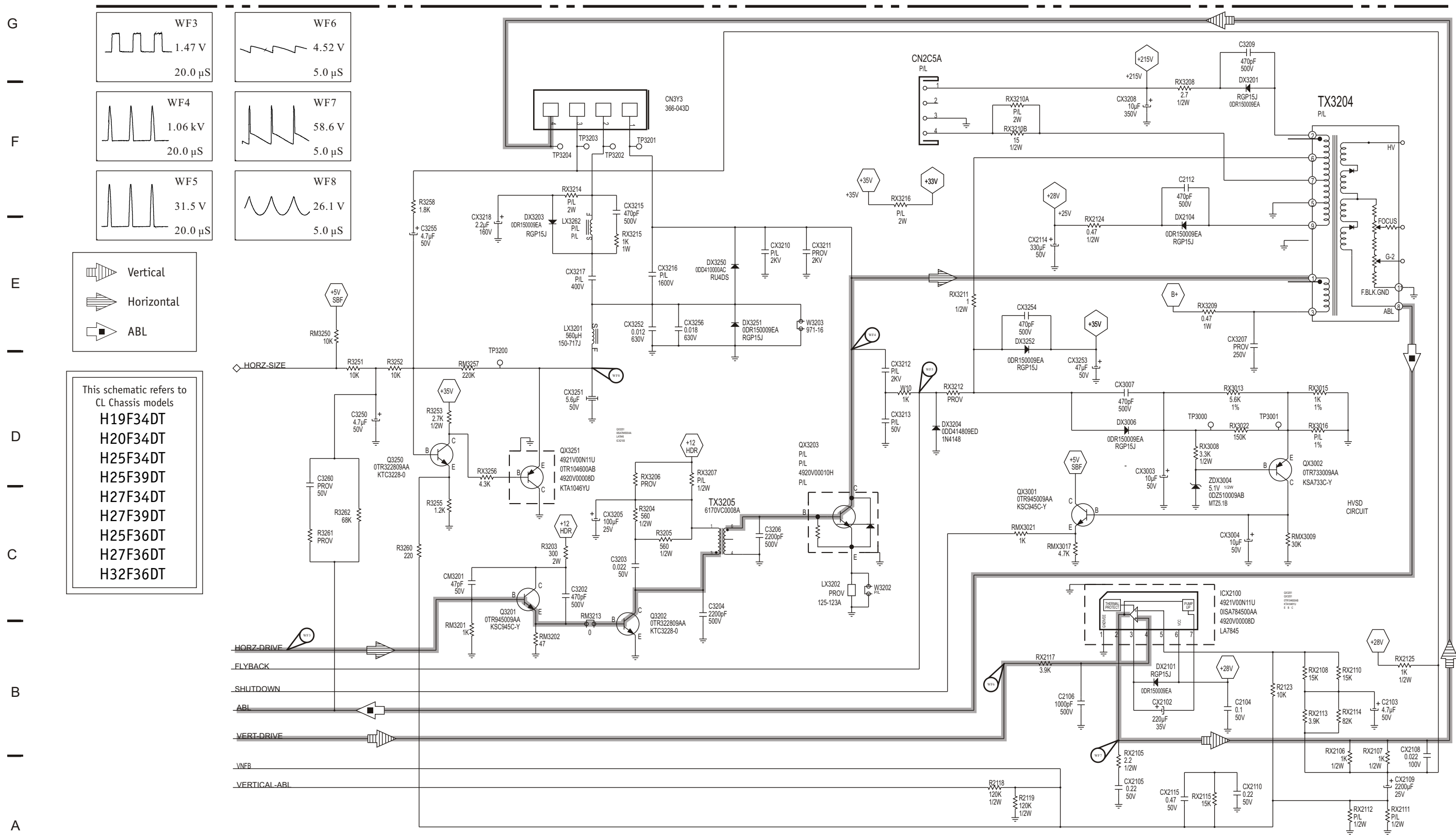




# Main Micro Circuit



## Deflection Circuit



# Video Processor Circuit

G

—

F

—

E

—

D

—

C

—

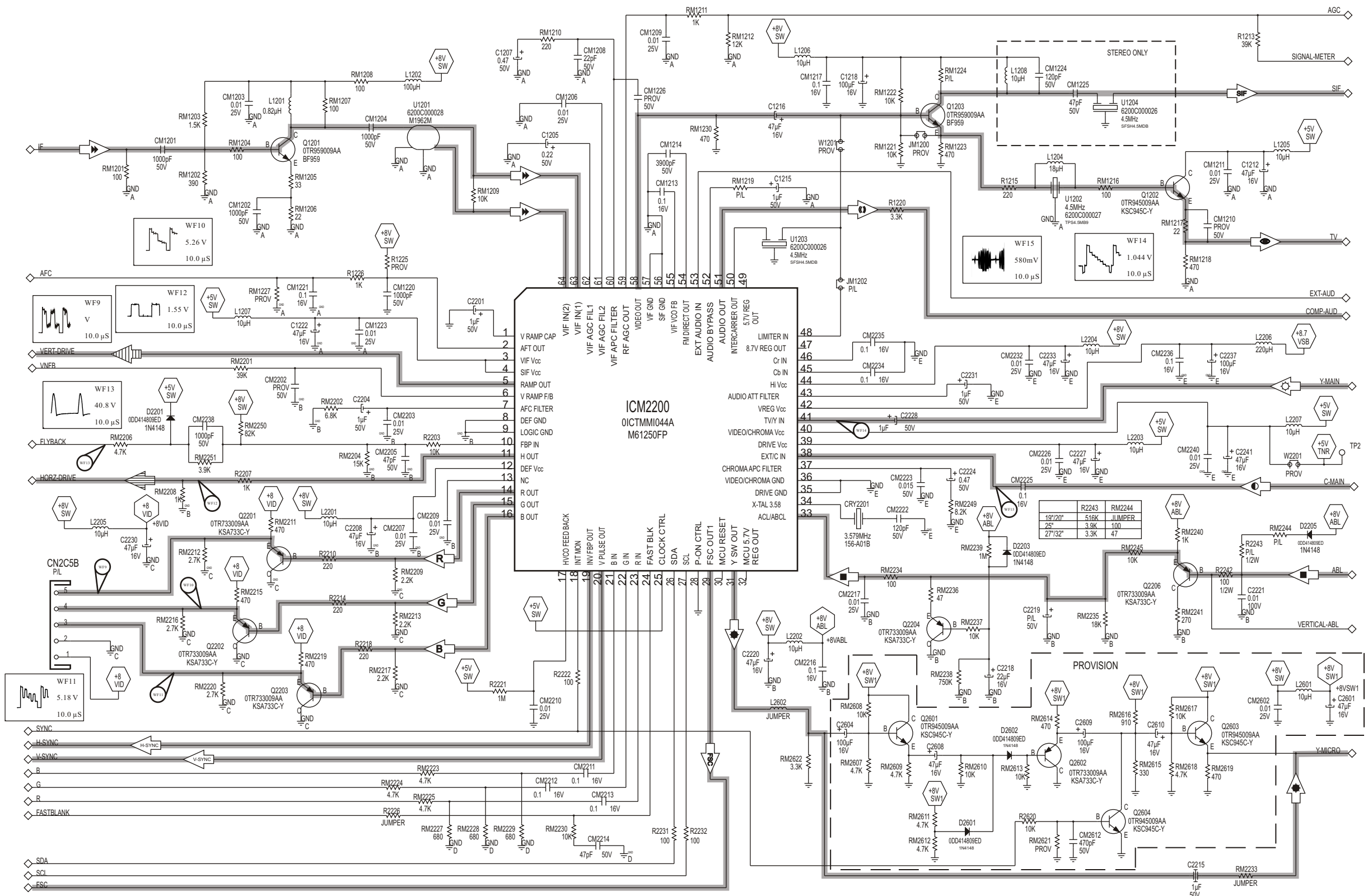
B

—

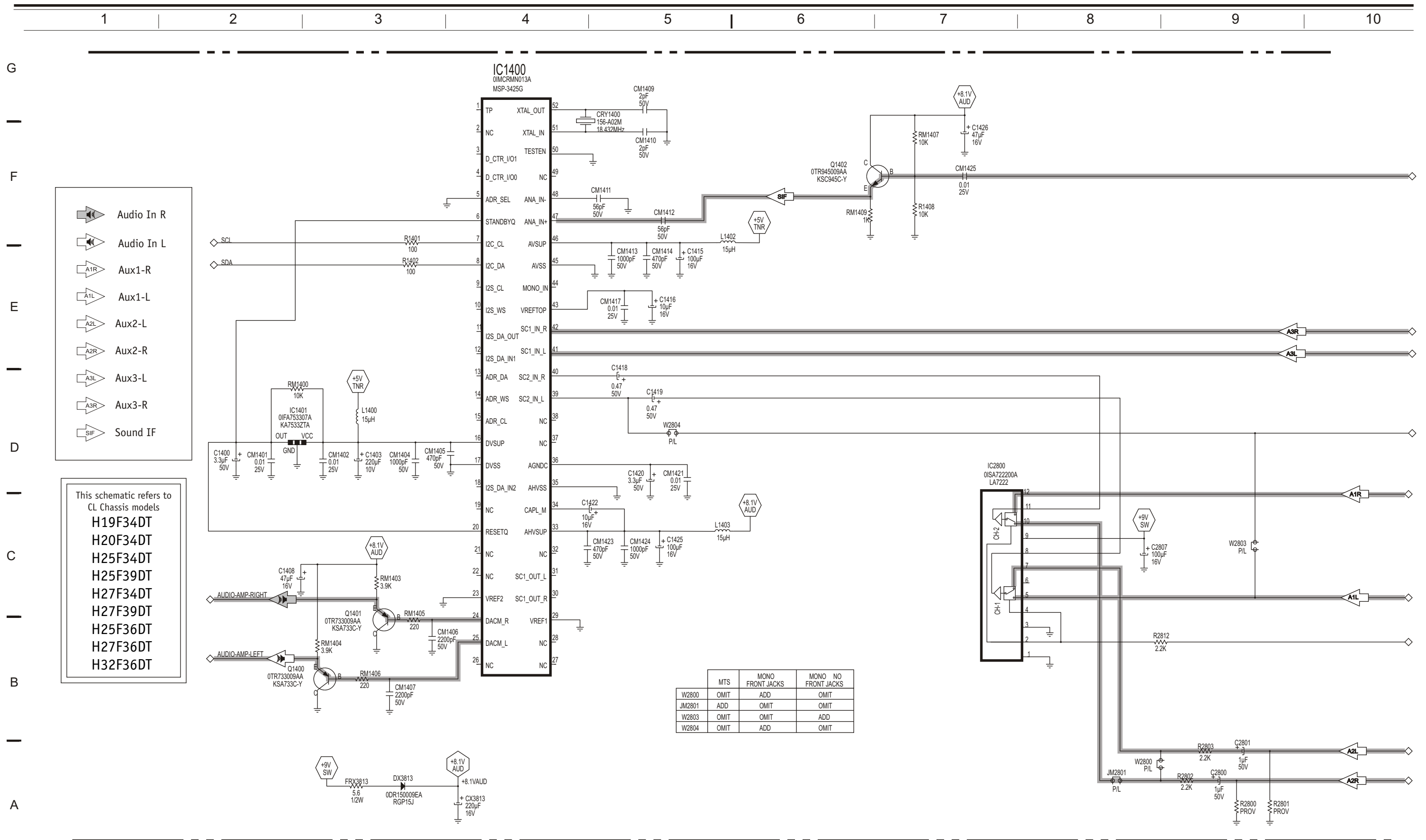
A

- Red
- Blue
- Green
- Chroma (C-IN)
- Luma (Y-IN)
- Composite Video IF
- Sound IF
- Composite Audio
- ABL
- Luma (Micro)
- Subcarrier Signal
- IF
- Vertical
- Horizontal
- V-Sync
- H-Sync

This schematic refers to  
CL Chassis models  
H19F34DT  
H20F34DT  
H25F34DT  
H25F39DT  
H27F34DT  
H27F39DT  
H25F36DT  
H27F36DT  
H32F36DT



# Audio Processor Circuit



# A/V Switch Circuit

G

F

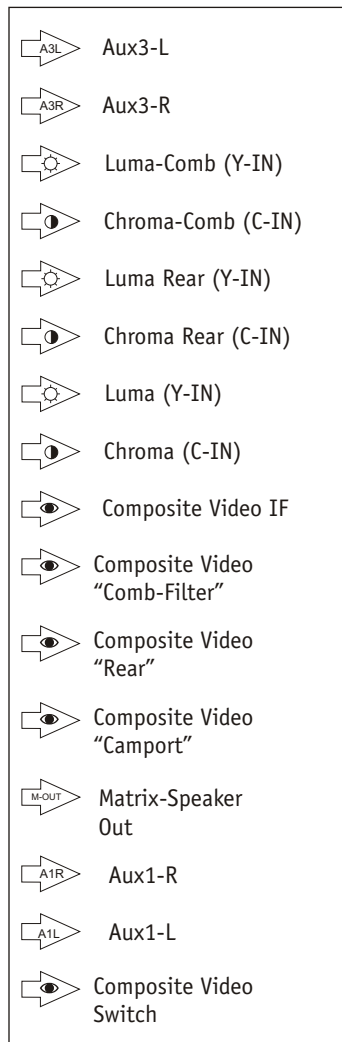
E

D

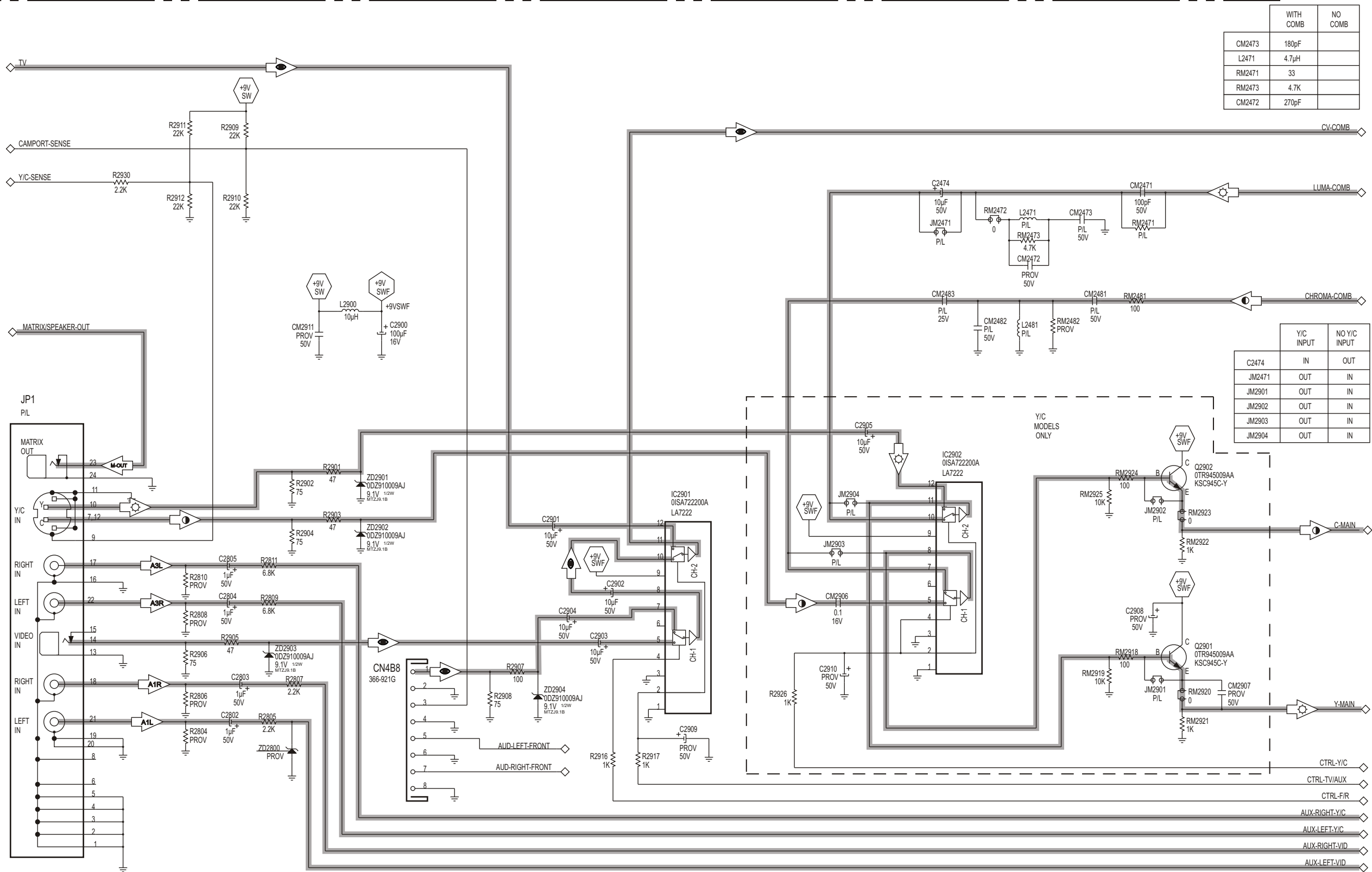
C

B

A



This schematic refers to  
CL Chassis models  
H19F34DT  
H20F34DT  
H25F34DT  
H25F39DT  
H27F34DT  
H27F39DT  
H25F36DT  
H27F36DT  
H32F36DT

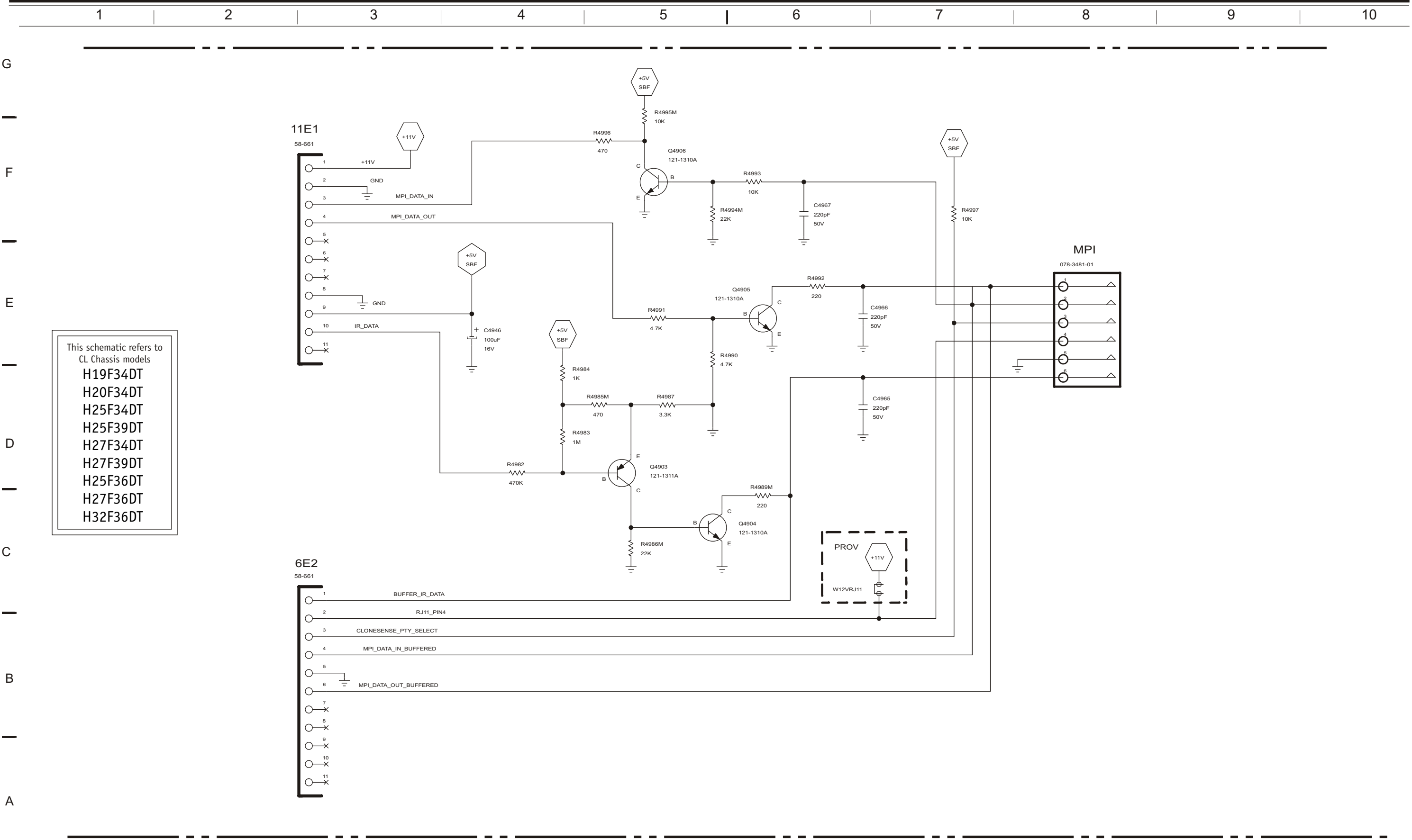


	WITH COMB	NO COMB
CM2473	180pF	
L2471	4.7μH	
RM2471	33	
RM2473	4.7K	
CM2472	270pF	

	Y/C INPUT	NO Y/C INPUT
C2474	IN	OUT
JM2471	OUT	IN
JM2901	OUT	IN
JM2902	OUT	IN
JM2903	OUT	IN
JM2904	OUT	IN



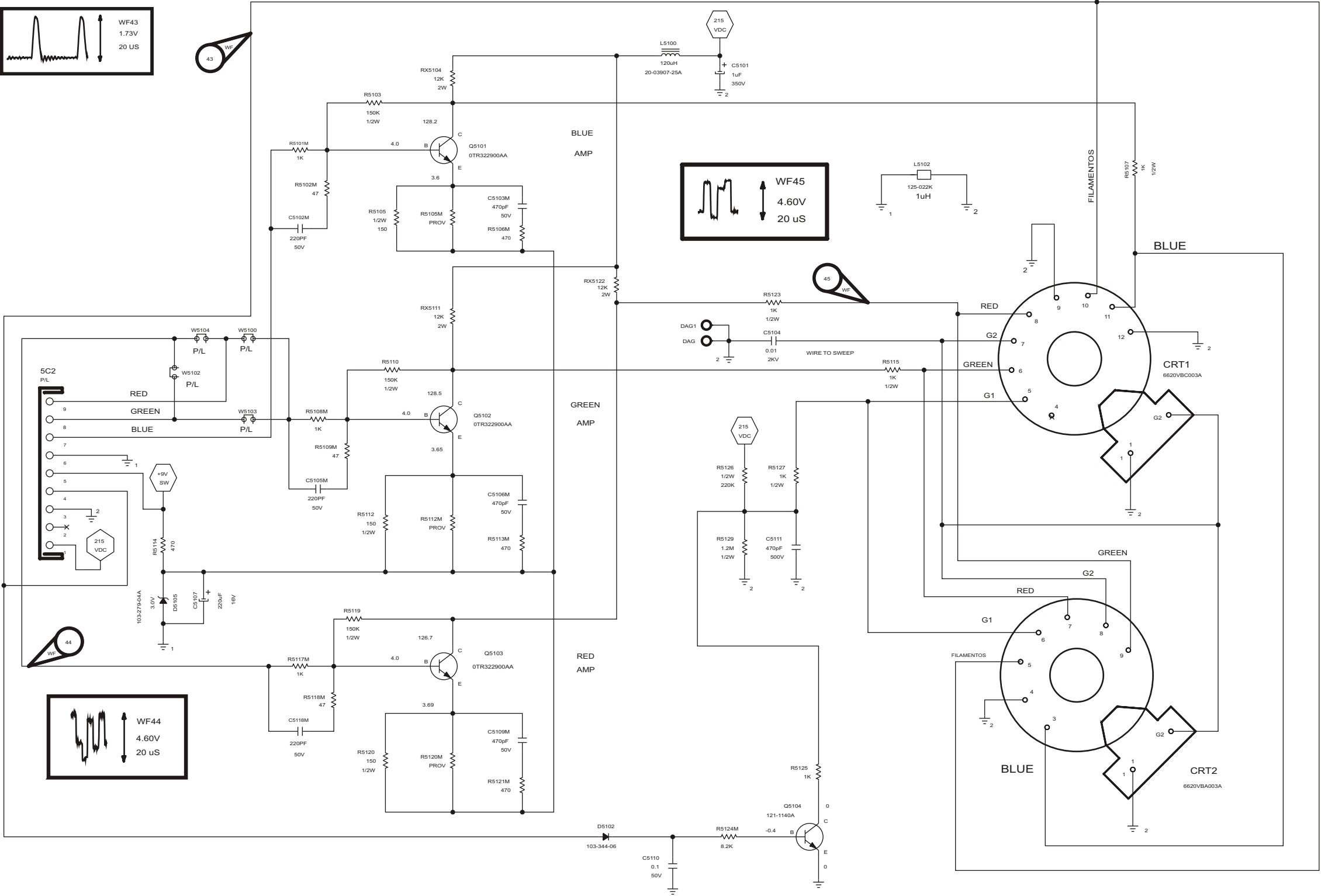
# MPI Card Circuit





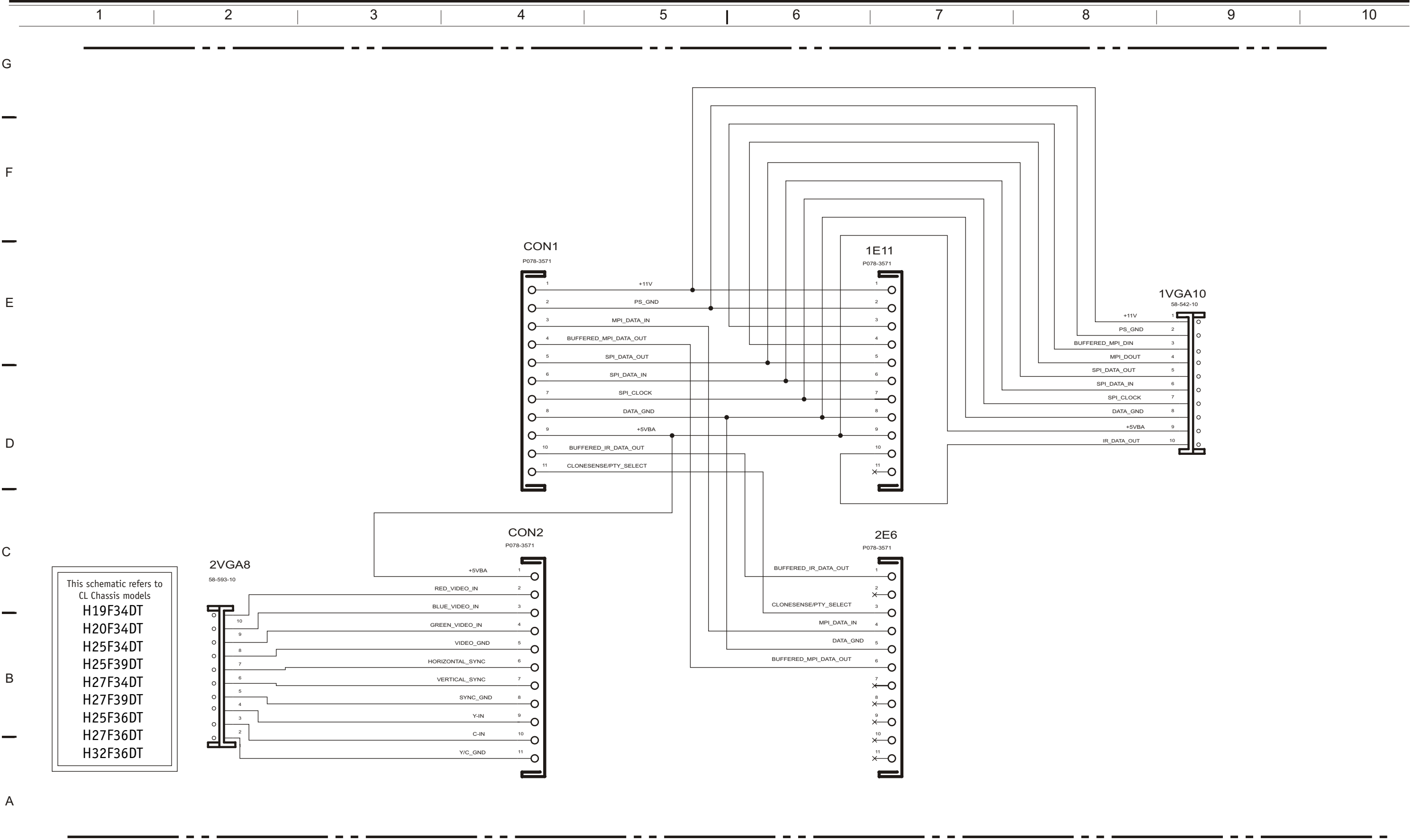
Video Output Circuit

G  
F  
E  
D  
C  
B  
A





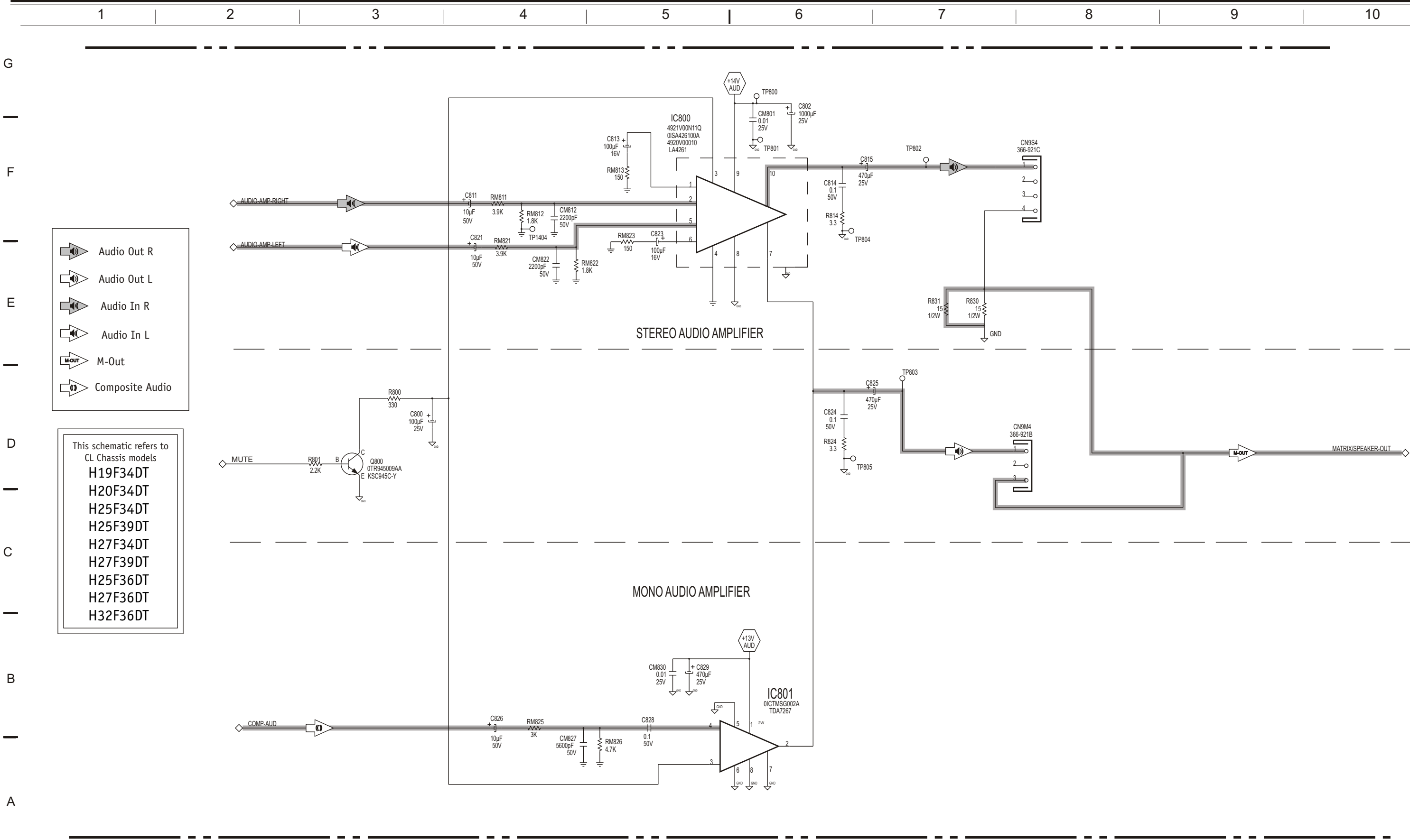
# Edge Card Circuit



This schematic refers to  
CL Chassis models  
H19F34DT  
H20F34DT  
H25F34DT  
H25F39DT  
H27F34DT  
H27F39DT  
H25F36DT  
H27F36DT  
H32F36DT



Audio Amplifier Circuit



## Comb Filter Circuit

2

4

6

8

10

F

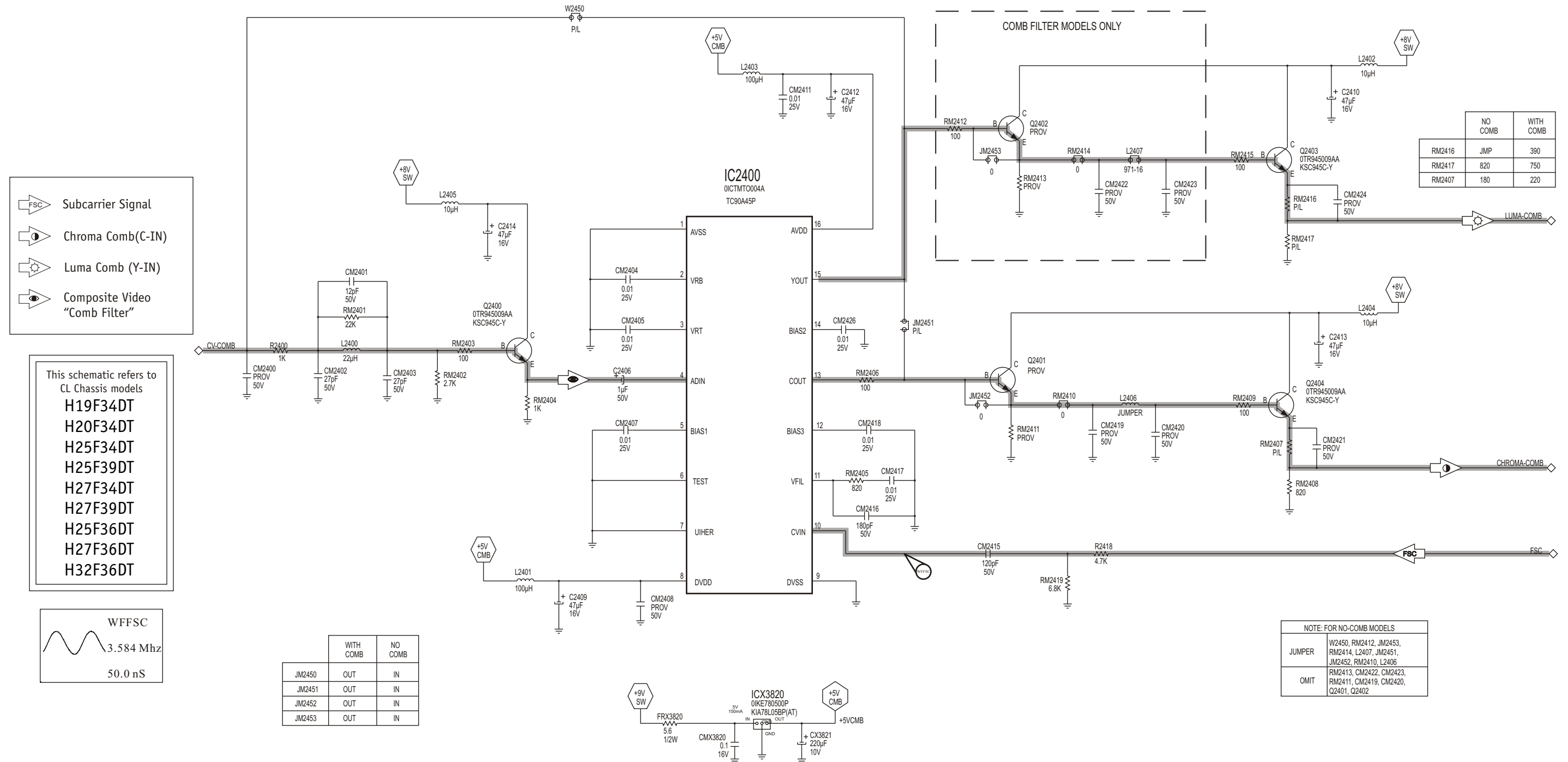
E

D

C

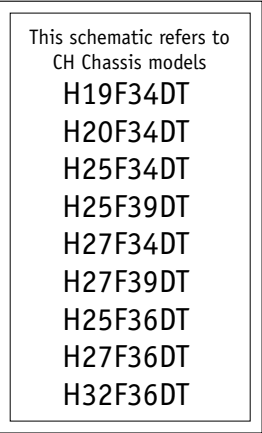
B

A

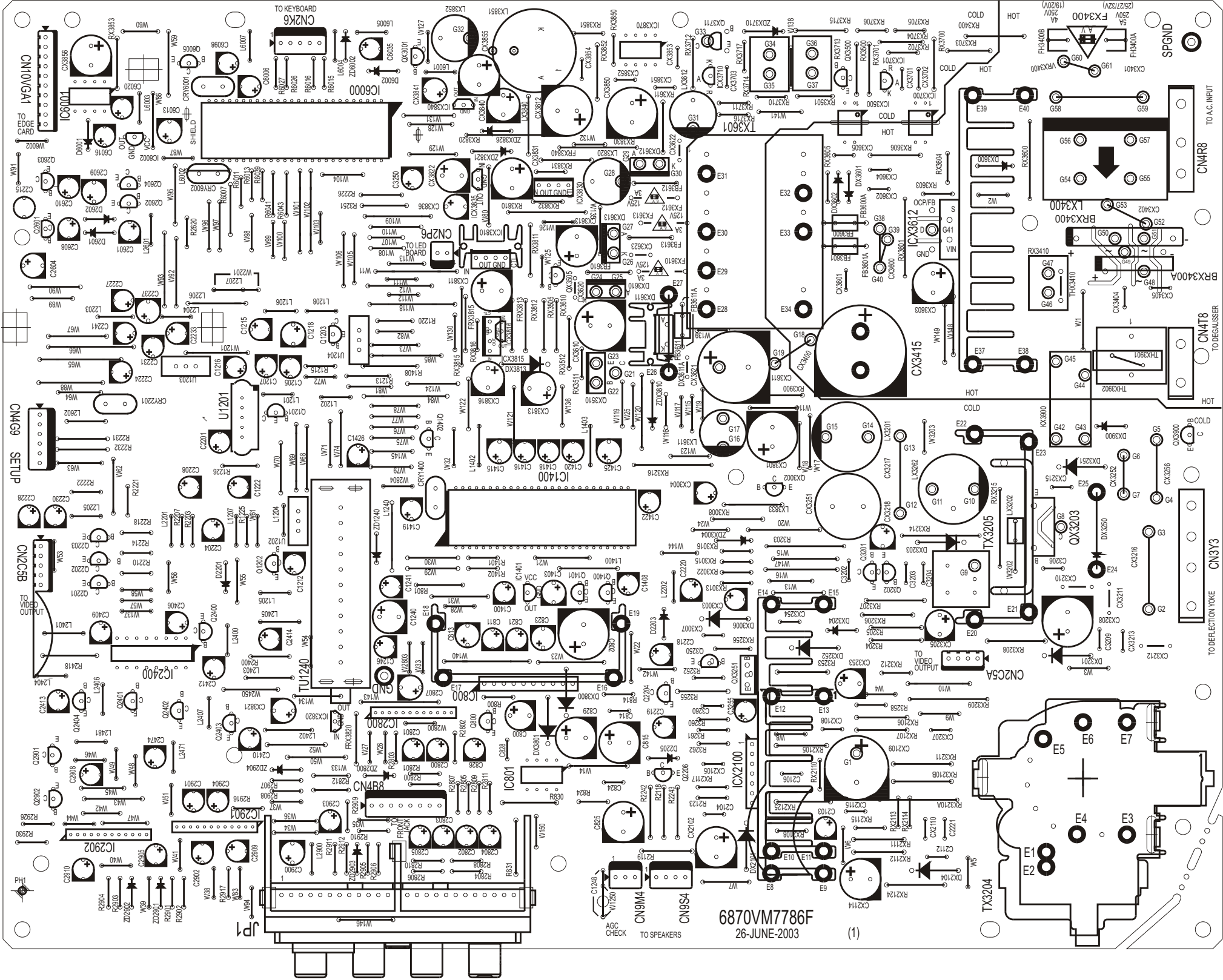


1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

*A*



# PCB Layout Top





# PCB Bottom Layout



# PCB Top Layout

