



SERVICE MANUAL

Product Type: Directview HDTV
Chassis: AB
Manual Series: CM154
Manual Part #: 923-03497
Model Line: E
Product Year: 2002

Model Series:

C32V23

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PRODUCT SAFETY SERVICING GUIDELINES FOR AUDIO-VIDEO PRODUCTS

IMPORTANT SAFETY NOTICE

This manual was prepared for use only by properly trained audio-video 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:

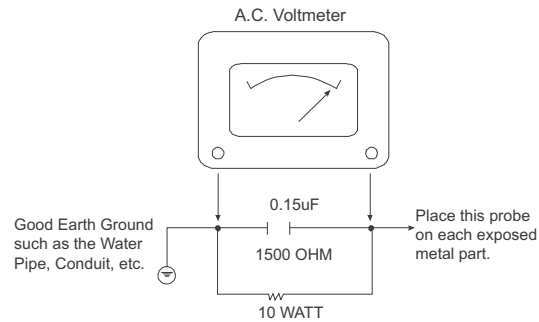
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ALL FUSES WITH THE SAME TYPE AND RATING AS MARKED NEAR EACH FUSE.

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 high current device or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces must be avoided.
6. After reassembly 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 a .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 .15 mfd 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 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 AB Chassis incorporate a "High Voltage Shutdown" circuit. This circuit senses the level of 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 horizontal drive, preventing further generation of anode voltage. In this condition, the horizontal drive is "latched" off for about 5 seconds, after which, restart is attempted.

SHUTDOWN CIRCUIT OPERATION

The flyback pulse voltage from Pin 6 of TX3201 (Flyback Transformer) is peak detected (rectified) by the action of diode D3000 and capacitor C3001. This form a DC voltage appearing on C3001 representative of the CRT anode voltage (HV) produced by T3201. This voltage is divided down by precision resistors RX3001, RX3002, & RX3003. This lower voltage, appear on the positive input (pin 5) of IC3101.

If the even CRT anode voltage become excessive, in IC3101 the positive input (pin 5) will be higher than negative input of pin 6 and therefore his output (pin 7) will go to high level, at approximately 15 volts. This signal (SHUTDOWN) is send to Base of Q3201 causing Horizontal Drive to be disabled and latched causing HV goes down. In about 5 seconds, the shutdown reset circuit (Pins 8, 9 & 14 of IC3100) enable again the Horizontal Drive and HV must be reestablished. If the shutdown condition persist the circuit goes into hiccup mode.

The circuit formed by Q3104, C3113, C3108, D3107, R3131, R3132, R3133 and R3134 disable the HV compensation output (Q3102-B signal) during turn on and shutdown conditions (transients).

CRT ANODE HIGH VOLTAGE MEASUREMENT PROCEDURE

Each CRT screen size has it's 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, 33.75 KHz (HDTV 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)
32"	30 ± 0.5	36
36"	30 ± 0.5	36
34" Wide	30 ± 0.5	36

HV SHUTDOWN PROCEDURE

Adjust beam current to 0 mA. Connect a variable Resistor (10 MW) between pin 2 and pin 3 of 2W6 connector, and decrease slowly the resistance value from 10 MW to 0 W. Measure shutdown HV. Increase the resistance value to 10 MW. After 5 seconds, approximately, verify that the HV must be reestablished (High Voltage Reset).

Components and Factory Menu registers with any influence in HV increase.

- C3109
- C3115
- CX3204
- CX3208
- CX3210
- L3200
- RX3335
- TX3100
- 40 Vcd
- H_SIZE REGISTER

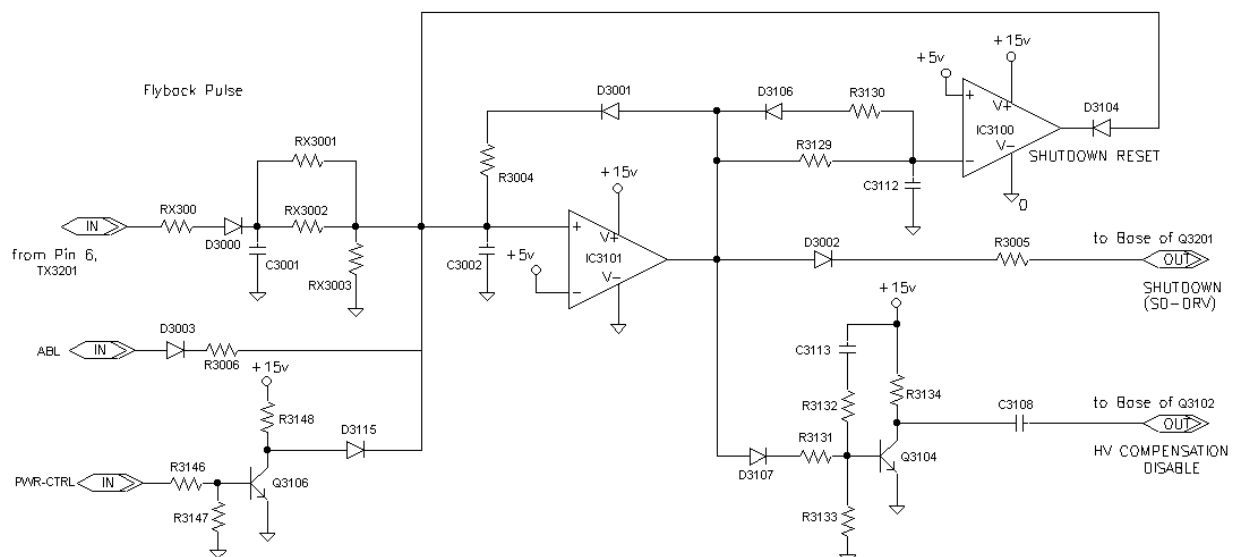


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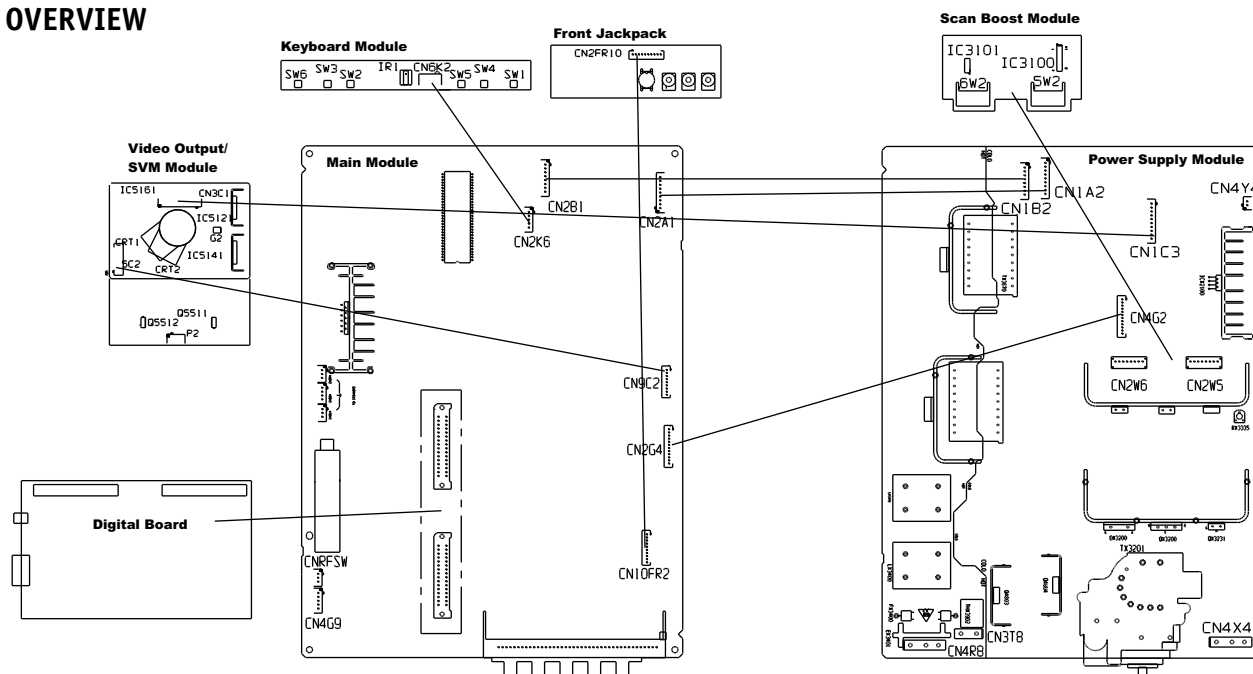
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OVERVIEW

OVERVIEW



INTRODUCTION

The affordable Digital High Definition Television (ADTV) uses the Zenith AB chassis series. This manual covers the 32, 36, and 34 inch screen sizes. The chassis consists of two boards, the large signal and small signal. The large signal module uses a daughter board for the deflection section and the small signal board uses a shielded board for HDTV signal decoding. Currently the AB chassis is module level repair only. Schematics and PCB layouts are provided to assist in troubleshooting.

These models are HDTVs and have a built-in ASTC tuner. They can receive off-air analog and/or digital broadcasts. The 34 inch models feature a 16:9 aspect ratio screen and the 32 and 36 inch are standard 4:3 aspect ratio. More features and specifications are listed below.

FEATURES

INTEGRATED ATSC TUNER WITH 1080I

A fully integrated ATSC tuner offers users the ability to receive off air high definition broadcasts (up to 1080i resolution) without the need for an external set-top box.

ADVANCED 8-VSB CHIPSET TECHNOLOGY

Offers better indoor reception of off-air DTV broadcasts and makes the processing of broadcasted data possible.

FLAT FINE PITCH PICTURE TUBE

View HD content in it's highest resolution. Fine pitch picture tube with Invar mask provides the sharpest and clearest picture possible.

16:9/4:3 ASPECT RATIO CORRECTION

Allows users to view feature length movies in their original wide screen format (16:9) or in regular TV format (4:3).

3D Y/C COMB FILTER

Combines the adaptive digital processing of a 3-line digital comb filter with 3-D motion detection. Eliminates hanging dots and color noise on stationary images. Reduces "dot crawl" and overall picture noise.

SCAN VELOCITY MODULATION

Dynamically varies the scanning speed of the electron beam to create clear, well defined images for the sharpest picture possible.

DYNAMIC FOCUS

Ensures accurate side-to-side focus. Red, green, and blue color beams are accurately aligned in the center of the screen.

COLOR TEMPERATURE CONTROL

Users can select between "warm" or "cool" presets to control the ambiance and mood of the picture on the screen.

FRONT SURROUND SOUND

Audio signals are manipulated to simulate three dimensional sound delivered through two front speakers.

MTS STEREO WITH SAP

Multi-Channel Television Sound (MTS) produces crisp, clear stereo broadcasts. Second Audio Programming, or SAP, is a separate audio signal that allows networks to broadcast audio in different languages.

OVERVIEW

PARENTAL CONTROL WITH V-CHIP

Uses an advisory system to exclude viewing of specific programs or program types.

CABINET

Dimensions and weight:

C32V23: 35.97" w x 26.64" h x 23.28" d @158Lbs

C34W23: 41.73" w x 24.7" h x 23.2" d @188Lbs

C36V23: 39.92" w x 29.67" h x 24.14" d @226.5Lbs

Finish Metallic Silver/Grey

SERVICE/LIMITED WARRANTY

Service Support Level "M" Module Level

Warranty: Parts/CRT/Labor ... 1 Year/2 Years/90 Days

VIDEO

Display Format 1080i

Input Formats ATSC/NTSC

CRT Fine Pitch

Color Temperature Warm/Cool

Black Level Exp./White Level Compression Yes

Comb Filter 3D Y/C

Aspect Ratio Correction (4:3, 16:9) Yes

Other Features .. Scan Velocity Modulation, Invar Mask,
Dynamic Focus, Dark Tint Tube

AUDIO

Dolby Digital™ Yes

Mono/Stereo/MTS/SAP Yes

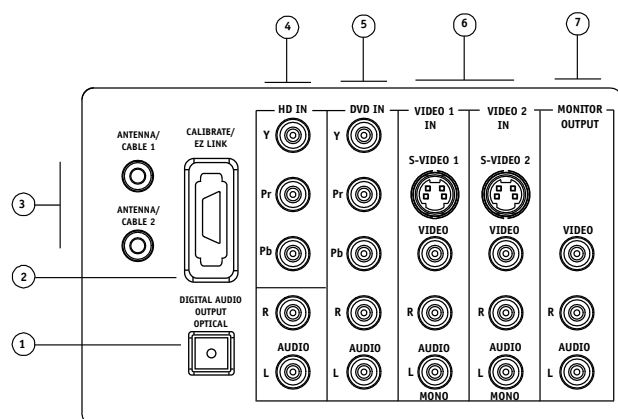
Total Audio (Watts) 14W (2 x 7W)

Speaker Size (Dimensions) 6 x 13 cm

Front Surround (SRS) Yes

CONNECTIONS

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



REAR JACKS

1. DIGITAL AUDIO OPTICAL OUTPUT

Connects to external audio equipment like a stereo system. The highest quality connection currently available for audio.

2. CALIBRATE

Service Port. Only to be use by qualified TV servicers and technicians.

3. ANTENNA/CABLE 1/2

Use the Antenna/Cable 1 to hookup an antenna or cable system.

4. HD IN

Connect High Definition equipment to these jacks.

5. DVD IN

Connect a DVD player with component output to these jacks. Use a Video In input for DVD players without component output.

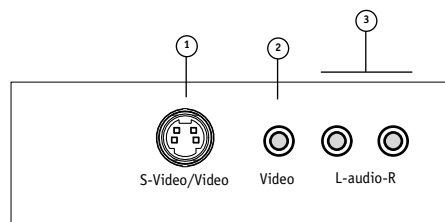
6. VIDEO 1 & VIDEO 2 INPUTS

Use these jacks for baseband video and audio input signals from a VCR or other signal source.

7. MONITOR OUTPUT

Use audio outputs for a stereo or amplifier. The composite video can be used for video monitor or VCR monitor.

FRONT JACKS



1. S-VIDEO/VIDEO

Use this jack for baseband video and audio input signals from a VCR or other signal source.

2. VIDEO

Use these jacks for baseband video and audio input signals from a VCR or other signal source.

3. AUDIO IN

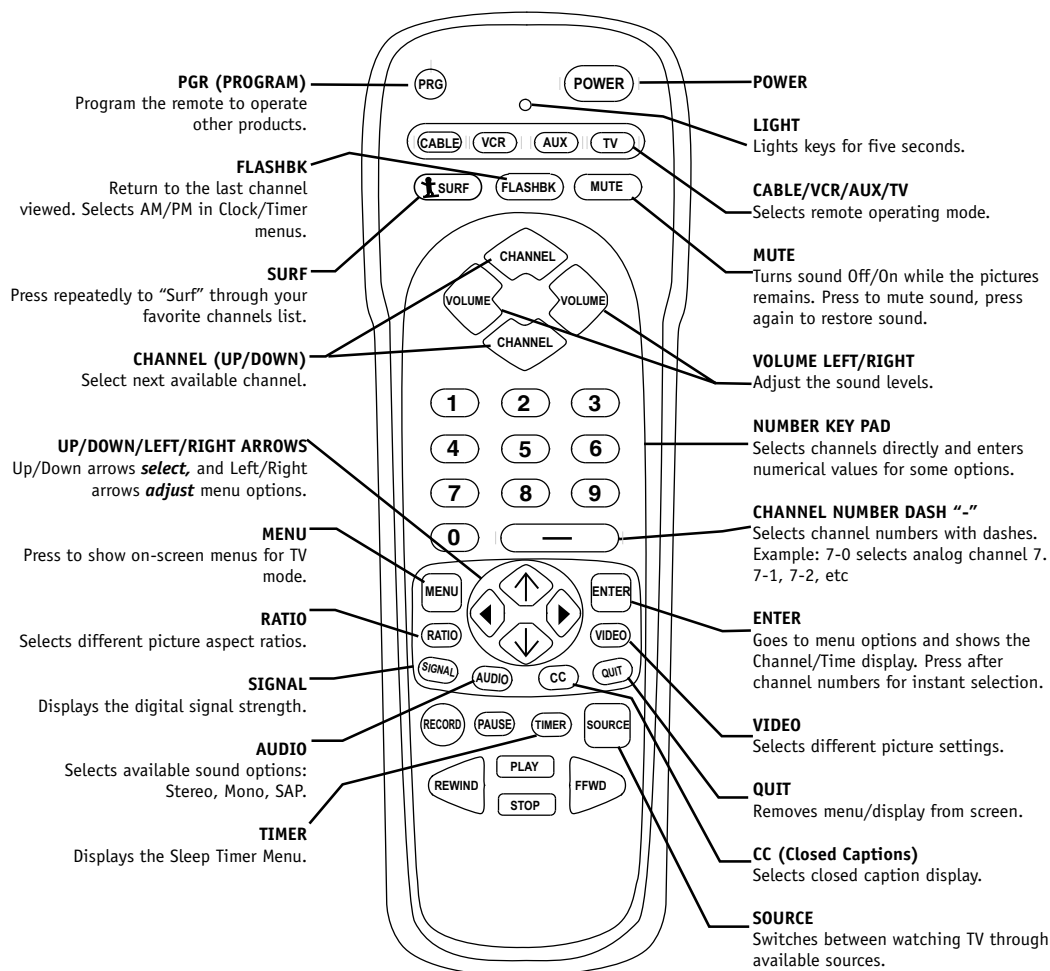
Use this jack to connect a stereo sound from external equipment.

NOTE: This product will not accept a progressive signal from a DVD or other source. Switch your DVD or source to interlaced (480i). See the owner's manual for more information.

REMOTE CONTROL

REMOTE CONTROL

REMOTE BUTTON DESCRIPTIONS



MBR-4286

PROGRAMMING THE REMOTE

If you're using Zenith products, the remote is already programmed for most common codes (TV = 101, VCR = 201, CABLE = 353, DVD = 960, and HD/STB = 800). For other brands, or if your remote fails to control your Zenith products, you'll need to program the remote.

Make sure the batteries are installed and follow these steps for each product:

1. Press the device button to be programmed (CATV, VCR, DVD, TV, or HD/STB).
2. Press and hold MUTE & FLSHBK. Release MUTE & FLSHBK after the indicator light turns on.
3. Enter the 3-digit product code from chart on next page.
4. Press ENTER to save the code.

5. Point the remote at product and press POWER to test the product's operation. If it does not turn on, re-program remote using a different code.
6. Write the codes on the label inside the battery compartment for future reference.

NOTE: Use the CABLE device button for satellite receivers. Use the AUX device button for home audio components.

REMOTE CONTROL

REMOTE CODES

T V's	
A MARK	112 143
ADMIRAL	072 081 161
AKAI	006 146
AMPRO	073 167
AMSTRAD	052
ANAM	043 054 056
	080 104 108
	112 115 118
	121 131
AOC	004 006 058
	112
BLAUPUNKT	088
CANDLE	002 003 004
	006
CAPEHART	058
CETRONIC	043
CITIZEN	002 003 004
	006 043 101
	103 143
CLASSIC	043
CONCERTO	004
CONTEC	039 043 050
	051
CORONADO	143
CRAIG	043 054
CROWN	043 143
CURTIS MATHES	004 006 101
	116 143
CXC	043
DAEWOO	004 016 017
	043 044 055
	071076 103
	107 111 114
	117 120 123
	125 127 128
	136 143
DAYTRON	004 116 143
DYNASTY	043
DYNATECH	062
ELECTROHOME	024 077 143
EMERSON	004 005 006
	028 043 047
	048 050 051
	096 116 143
	151 153 154
	155
FISHER	007 057
FUNAI	028 043
FUTURETECH	043
GE	004 006 008
	009 034 056
	073 074 091
	116 130 144
	155 160 161
	165
GOLDSTAR	004 102 106
	110 112 113
	116 119 122
	127 137 143
HALL MARK	004 116
HITACHI	004 006 009
	010 0110 12
	023 041075
	143 158 163
	166
INFINITY	164
INKEL	129
JBL	164
JCPENNY	004 006 008
	009 024 030
	065 101 143
	156 160
JENSEN	013
JVC	034 038 070

	083 145
KEC	043
KENWOOD	006 070
KLOSS	002 059
KMC	143
KTV	006 043 143
	154
LG	255
LODGENET	072
LOGIK	072
LUXMAN	004
LXI	007 015 052
	081 160 164
	166
MAGNAVOX	003 004 006
	022 059 060
	061 063 064
	127 143 160
	164
MARANTZ	006 077 164
MATSUI	164
MEMOREX	004 007 072
	116
METZ	088
MGA	004 006 024
	028 042 049
	077 116
MINERVA	088
MITSUBISHI	004 006 024
	028 040 042
	109 116 124
	146
MTC	004 006 062
	101
NAD	015 025
NEC	006 007 016
	019 024 040
	056 130 132
	134
NIKEI	043
ONKING	043
ONWA	043
OPTONICA	019 081
PADIO SHACK	004
PANASONIC	034 056 080
	164
PHILCO	003 004 006
	024 043 056
	059 060 063
	064 127 143
	164
PHILIPS	003 004 005
	006 038 059
	070 093 143
	160 164
PIONEER	006 018 023
	025 027 116
	135 176
PORTLAND	004 143
PROSCAN	144 160 161
	165 167
PROTON	004 058 116
	131 143 171
	173
QUASAR	034 056 092
RADIO SHACK	019 043 047
	116 127 143
RCA	004 006 023
	024 056 065
	074 144 152
	156 160 161
	165
REALISTIC	007 019 043
	047
ROCTEC	186

RUNCO	168 169
SAMPO	004 006 058
	116
SAMSUNG	004 050 089
	101 105 113
	116 127 133
	137 143 160
SANYO	007 020 021
	033 039 053
	057 082 166
SCOTT	004 028 043
	048 116 143
SEARS	004 007 015
	028 030 057
	082 094 101
	116 143 160
SHARP	004 014 019
	022 028 029
	081 143 170
	175
SIEMENS	088
SIGNATURE	072
SONY	041070 079
	085 126 139
	147 185
SOUNDESIGN	003 004 028
	043 116
SPECTRICON	112
SSS	004 043
SUPREMACY	002
SYLVANIA	003 004 006
	044 059 060
	063 064 116
	127 140 160
	164
TANDY	081
TATUNG	056 062
TECHNICS	034 080 084
TECHWOOD	004
TEKNIKA	002 003 004
	006 024 028
	031043 072
	077 101 103
	143
TELEFUNKEN	037 046 086
	087
TELERENT	072
TERA	172
TMK	004 116
TOSHIBA	007 015 030
	040 051062
	101 138
TOTEVISION	143
UNIVERSAL	008 009
VIDEO CONCEPTS	146
VIDIKRON	174
VIDTECH	004 116
WARDS	004 008 009
	019 028 060
	061063 064
	072 074 116
	143 164
YAMAHA	004 006
YORK	004 116
YUPITERU	043
ZENITH	001072 073
	095 103 157
ZONDA	112

VCR	
AIWA	034
AKAI	016 043 046
	124 125 146
AMPRO	072
ANAM	031033 103

AUDIO DYNAMICS	012 023 039
	043
BROKSONIC	035 037 129
CANON	028 031 033
CAPEHART	108
CRAIG	003 040 135
CURTIS MATHES	031 033 041
DAEWOO	005 007 010
	064 065 108
	110 111 112
	116 117 119
DAYTRON	108
DBX	012 023 039
	043
DYNATECH	034 053
ELECTROHOME	059
EMERSON	006 017 025
	027 029 031
	034 035 036
	037 046 101
	129 131 138
	153
FISHER	003 008 009
	010
FUNAI	034
GE	031 033 063
	072 107 109
	144 147
GO VIDEO	132 136
GOLDSTAR	012 013 020
	101 106 114
	123
HARMAN KARDON	012 045
HITACHI	004 018 026
	034 043 063
	137 150
INSTANTREPLAY	031 033
JCL	031 033
JCPENNY	012 013 015
	033 040 066
	101
JENSEN	043
JVC	012 031 033
	043 048 050
	055 060 130
	150 152
KENWOOD	014 034 039
	043 047 048
LG	154
LLOYD	034
LXI	003 009 013
	014 017 034
	101 106
MAGIN	040
MAGNAVOX	031 033 034
	041 067 068
MARANTZ	012 031 033
	067 069
MARTA	101
MATSUI	027 030
MEI	031 033
MEMOREX	003 010 014
	031 033 034
	053 072 101
	102 134 139
MGA	045 046 059
MINOLTA	013 020
MITSUBISHI	013 020 045
	046 049 051
	059 061 151
MTC	034 040
MULTITECH	024 034
NEC	012 023 039
	043 048
NORDMENDE	043

REMOTE CONTROL

OPTONICA	053 054
PANASONIC	066 070 074
	083 133 140
	145
PENTAX	013 020 031
	033 063
PHILCO	031 034 067
PHILIPS	031 033 034
	054 067 071
	101
PILOT	101
PIONEER	013 021 048
PORTLAND	108
PULSAR	072
QUARTZ	011 014
QUASAR	033 066 075
	145
RCA	013 020 033
	034 040 041
	062 063 107
	109 140 144
	145 147
REALISTIC	003 008 010
	014 031 033
	034 040 053
	054 101
RICO	058
RUNCO	148
SALORA	014
SAMSUNG	032 040 102
	104 105 107
	109 112 113
	115 120 122
	125
SANSUI	022 043 048
	135
SANYO	003 007 010
	014 102 134
SCOTT	017 037 112
	129 131
SEARS	003 008 009
	010 013 014
	017 020 031
	042 073 081
	101
SHARP	031 054 149
SHINTOM	024
SONY	003 009 031
	052 056 057
	058 076 077
	078 149
SOUNDESIGN	034
STS	013
SYLVANIA	031 033 034
	059 067
SYMPHONIC	034
TANDY	010 034
TATUNG	039 043
TEAC	034 039 043
TECHNICS	031 033 070
TEKNIKA	019 031 033
	034 101
THOMAS	034
TMK	006
TOSHIBA	008 013 042
	047 059 082
	112 131
TOTEVISION	040 101
UNITECH	040
VECTOR RESEARCH	012
VICTOR	048
VIDEO CONCEPTS	012 034 046
VIDEOSONIC	040
WARDS	003 013 017
	024 031 033

	034 040 053
	054 131
YAMAHA	012 034 039
	043
ZENITH	001034 048
	056 058 072
	080 101

VCR (DVD)	
APEX DIGITAL	222
DENON	220 2 14
GE	205 206
GOLDSTAR	2 10 2 16 225
HARMAN KARDON	227
JVC	2 12
LG	2012 10 2 16
	225
MAGNAVOX	2 13
MARANTZ	224
MITSUBISHI	202
NAD	223
ONKYO	208 2 17
PANASONIC	203 209
PHILIPS	2 13
PIONEER	204 226
PROCEED	221
PROSCAN	205 206
RCA	205 206
SAMSUNG	2 11 2 15
SONY	207
THOMPSON	205 206
TOSHIBA	2 19 208
YAMAHA	209 2 18
ZENITH	2 10 2 16 225

CABLE	
ABC	003 004 039
	042 046 052
	053
ANTRONIK	0 14
ARCHER	005007 0 14
	024
CABLE STAR	026
CENTURION	092
CENTURY	007
CITIZEN	007
COLOUR VOICE	065 090
COMBANO	080 081
COMTRONICS	0 19 030
DIAMOND	023
EAGLE	020 030 040
EASTERN	057 062 066
ELECTRICORD	032
GE	072
GEMINI	008 022 025
	054
GI	052 074
GOLDEN CHANNEL	030
HAMLIN	049 050 055
HITACHI	052 055
HOSPITALITY	070 077
JERROLD	002 003 004
	008 009 0 10
	052 069 074
LG	058 101
M-NET	037
MACOM	033
MAGNAVOX	0 10 0 12 064
	079
MEMOREX	001
MOVIE TIME	028 032
NSC	0 15 028 038
	071073
OAK	0 16 031037
	053

PANASONIC	044 047
PARAGON	001
PHILIPS	006 0 12 0 13
	020 065 085
	090
PIONEER	034 051052
	063 076
POST NEWS WEEK	0 16
PRUCER	059
PTS	011048 071
	072 073 074
PULSAR	001
RCA	047
REGAL	049 050
REGENCY	057
REMBRANT	025
RK	091
SAMSUNG	030 061068
	083
SCIENTIFIC ATLANTA	003 0 11 041
	042 043 045
	046
SHERITECH	022
SIGNAL	030
SIGNATURE	052
SL MARX	030
SPRUCER	047 078
STARCOM	002 004 008
	009
STARGATE	008 030
SYLVANIA	067
TADIRAN	030
TANDY	0 17
TEXSCAN	029 067
TOCOM	039 040 056
TOSHIBA	001
UNIKA	007 0 14 024
UNITED CABLE	004 053
UNIVERSAL	005007 0 14
	024 026 027
	032 035
VIEWSTAR	0 12 0 15 0 18
	086 087 088
	089
ZENITH	001021060
	93

CABLE (SAT)	
ALPHASTAR DSR	233
AMPLICA	160
BIRDVIEW	161236 239
BSR	163
CAPETRONICS	163
CHANNEL MASTER	123 124 125
	128 146 165
CHAPARRAL	118 119 122
	187
CITOH	164
CURTIS MATHES	160 228
DRAKE	115 116 117
	120 121 162
	222 226 183
DX ANTENNA	134 156 166
	186
ECHOSTAR	148 150 167
	168 203 204
	205 206 207
	208 209 2 10
	232
ELECTROHOME	199
EUROPLUS	224
FUJITSU	127 131 132
	137 243 244
GENERAL INSTRUMENT	113 114 126
	139 141 169

	211
HITACHI	144 177
HOUSTONTRACKER	143 147 149
	161 167 2 14
HUGHES	178
HYTEK	163
JANIEL	170 241
JERROLD	171
KATHREIN	2 18
LEGEND	167
LG	249
LUTRON	242
LUXOR	172 223
MACOM	120 169 173
	174 175
MEMOREX	167
NEXTWAVE	138 234 235
NCRSAT	179 180
PACE SKY SATELLITE	2 19
PANASONIC	170 202
PANSAT	231
PERSONAL CABLE	227
PHILIPS	181
PICO	2 15
PRESIDENT	129 2 12
PRIMESTAR	140 220 221
PROSAT	182
RCA	176 2 16
REALISTIC	153 184
SAMSUNG	233
SATELLITE SERVICE CO	138 145 157
	167 195
SCIENTIFIC ATLANTA	142 248
SONY	2 13
STARCAST	151
SUPER GUIDE	130 234 235
TEECOM	133 136 185
	197 198 200
	217 240 247
TOSHIBA	112 237
UNIDEN	126 135 152
	153 154 155
	158 159 188
	189 190 196
	211
UNIDEN	245 246
VIEWSTAR	225
WINEGARD	238 229
ZENITH	111 191 192
	193 194 201
	230

AUX (AUDIO)	
GOLDSTAR	005
HITACHI	0 10
JVC	006 039 049
	080
KENWOOD	001013 029
	031044
LUXMAN	0 17
MARANTZ	002 021028
	030 032 035
NAD	0 14
NAKAMICHI	051052
ONKYO	008 009 025
	040 041
OPTIMUS	011013 022
PANASONIC	003 0 15 036
	046
PIONEER	007 0 16 020
	023 024 026
	033 037 047
QUASAR	003 036
RCA	004
SHARP	013 029 043

REMOTE CONTROL

	045
SHERWOOD	0 12 0 19
SONY	027 034 038
	048 053
SOUNDESIGN	0 18
TOSHIBA	042
VICTOR	006 039

	141 160 161
	132 177 185
	161 197 201
YAMAHA	109 119 137
	143 194 211

AUX(CD)	
ADC	104
AIWA	149 178 189
	202 2 12
AKAI	134 165 200
DENON	101 190 221
	222 223
EMERSON	133 136 152
	166 175
FISHER	113 122 138
	140 168
GE	209
HITACHI	133 166
JVC	117 196 227
	228
KENWOOD	105 110 113
	118 144 154
	155 198 200
	2 16 2 17
LUXMAN	108 123 153
	173
MAGNAVOX	127 135 172
	179 180
MARANTZ	129 135 141
	159 224 225
	226
MCS	111 147 156
	169
MITSUBISHI	120 179 229
	230 231
ONKYO	125 126 130
	131 12 13 2 15
	232
OPTIMUS	100 107 110
	124 139 140
	145 146 162
	163 164 165
	170
PANASONIC	106 151 176
	184 203 2 19
	233
PHILIPS	127 135 195
	199 237
PIONEER	107 124 167
	171 179 187
	191 205 206
	207
QUASAR	106 176
RADIO SHACK	186 188
RCA	114 133 157
	166
SANYO	121 140 158
	168
SEARS	147
SHARP	110 141 150
	181 200 204
	2 10 150 2 17
SHERWOOD	102 115 116
	128 141 193
SONY	100 142 168
	174 182 183
	192 208 234
	235 236
TECHNICS	106 148 151
	176 184 203
	2 14 2 18
TEAC	103 112 132

USER MENUS

USER MENUS

The Affordable Digital HDTV supports two display formats: 4:3 for Analog, Video1, Video2, Front Video and DVD inputs, and 16:9 for DTV and HD inputs.

There are two main menus depending on the input source. When the input source is HD 1080i, a main menu called 'ATV Menu' is displayed; otherwise, the 'DTV Menu' is displayed

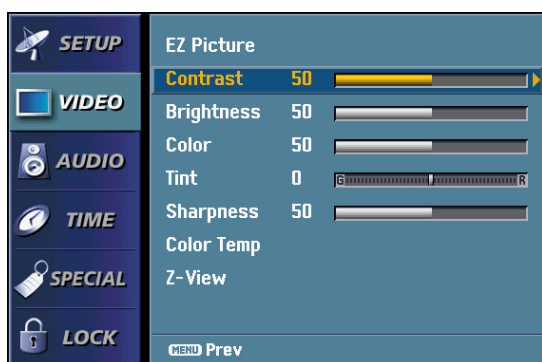
DTV SET UP MENU

The next figure shows the DTV Setup Menu when user is in Level 3 adjusting the Screen Source feature. Refer to Table 1.1 to see the navigation and proper colors used for selected, disabled and non-selected features.



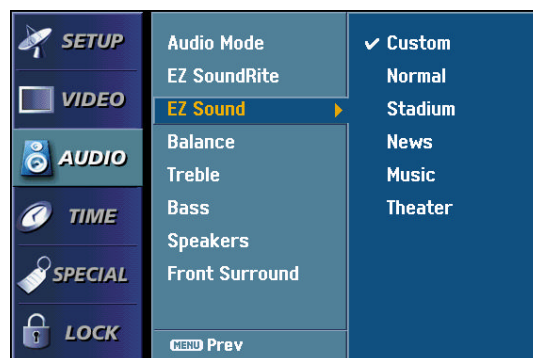
DTV VIDEO MENU

The next figure 1.2 shows the DTV Video Menu when user is in level 2 adjusting the Contrast Bar. Refer to Table 1.1 to see the navigation and proper colors used for selected, disabled and non-selected features.



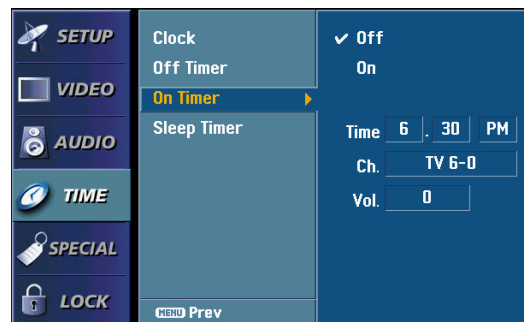
DTV AUDIO MENU

The next figure 1.3 shows the DTV Audio Menu when user is in Level 3, adjusting the EZ Sound feature. Refer to Table 1.1 to see the navigation and proper colors used for selected, disabled and non-selected features.



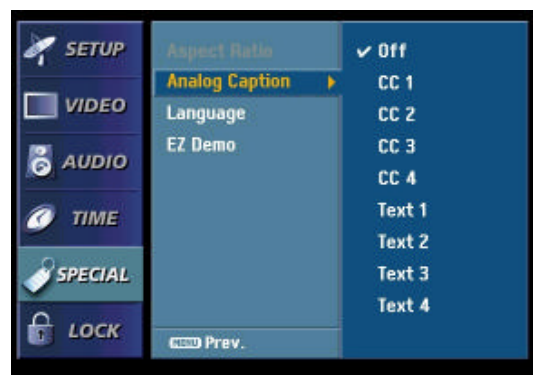
DTV TIME MENU

The next figure 1.4 shows the DTV Time Menu when user is in Level 3 Setting the On Timer. Refer to Table 1.1 to see the navigation and proper colors used for selected, disabled and non-selected features.



DTV SPECIAL MENU

The next figure 1.5.1 shows the DTV Special Menu when user is in Level 3 adjusting the Analog Closed Caption feature. Refer to Table 1.1 to see the navigation and proper colors used for selected, disabled and non-selected features.



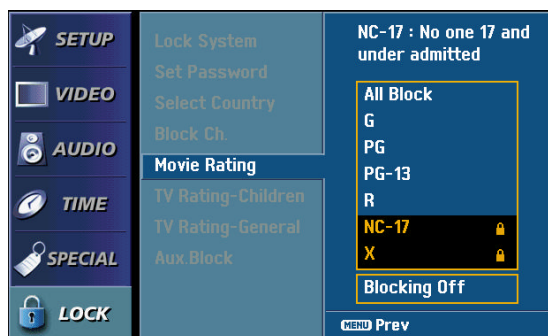
USER MENUS

This menu may appear in newest models, the earliest sets doesn't has Digital Closed Caption available.



DTV LOCK MENU

The next figure 1.6 shows the DTV Lock Menu when user is in Level 3, adjusting the Movie Rating. Refer to Table 1.1 to see the navigation and proper colors used for selected, disabled and non-selected features.

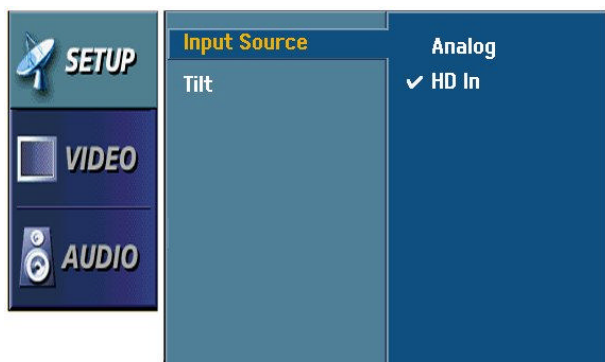


ATV USER'S INTERFACE

ATV User's Interface is displayed when the Input Source selected is HD In.

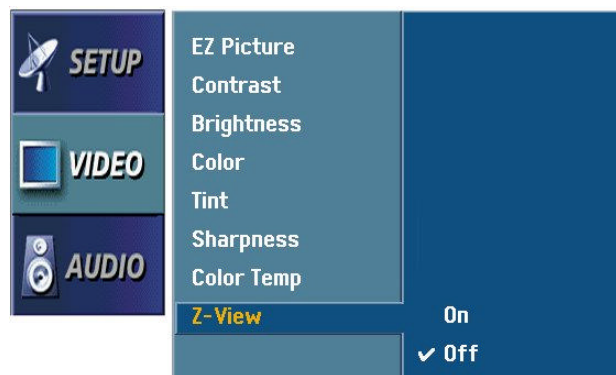
ATV SETUP MENU

Figure 2.1 shows the Setup Menu that allows you to select the Input Source. The Tilt function is also included as part of this menu.



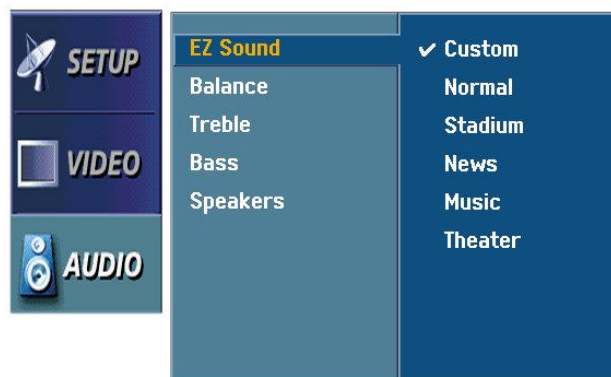
ATV VIDEO MENU

Figure 2.2 contains the Video Menu for HD 1080i External Input. Video Menu allows you to change video adjustments individually and also choose specific video preset values.



ATV AUDIO MENU

Figure 2.3 contains the Audio Menu for HD 1080i External Input when user is in Level 2, adjusting the EZ Sound feature. Audio Menu allows you to change audio adjustments individually and also choose specific audio preset values.



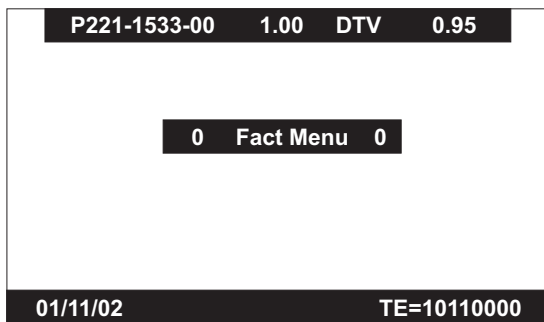
SERVICE MENU

SERVICE MENU

Access the Service Menu by using the Remote Control or the keyboard on the front of the set. With the remote: Press & hold MENU key until the clock appears, then press 9,8,7, 6 and ENTER.

Use the Select key to select item #00, which is the first item in the Service Menu. The Factory Mode item should always be left Zero. When left in this mode, only items from 0 to 27 are visible. Other menu items are displayed when factory mode is changed.

When the Factory Mode is on, the Service Menu line appears at the top of the screen to allow for proper setting of the video. When the Factory Mode is turned off, all TV functions are returned to normal.



Notes:

- *Settings Displayed in Customer Menus: When adjusting a bar graph setting in the Video and Audio Menus, a number is displayed showing the actual numeric value stored in EEPROM for that setting.*
- *Video Preference Settings Inhibited: in the Video Menu, the Custome video preference settings are inhibited while the Factory Mode is on and will NOT be store in EEPROM. (This allows the factory to temporarily change the settings and not store them premanently).*

SERVICE MENU

SERVICE MENU ADJUSTMENTS

NTSC Registers affect Analog, Video 1, Video 2, Front Video and DVD inputs. DTV Registers affect DTV (ATSC) source input. HD Registers affect HD 1080i external input. DTVNT Registers affect any source input except HD 1080i ext.input.

ITEM	RANGE	C32V23-8	C36V23	C34W23	C32V23-82	C36V23-2	C34W23-2	DESCRIPTION
00	Factory Mode	0-1	1	1	1	1	1	Factory mode pref.
01	ASCon	0-1	0	0	0	0	0	Automatic Sound Control. Enables saving of Normal Audio Preset to EEPROM.
02	Vpos	0-30					0	Moves captions and displays vertically on the screen
03	Hpos	0-45						Moves captions and displays horizontally on the screen
04	AC Power Only Off/On (0/1)	0-1	0	0	0	0	0	AC Power Only Off/On
05	Feature Level	0-1	1	1	1	1	1	Selects Zenith or private IR codes
06	Screen MUTE TIME	0-254	125	125	125	125	125	Screen Mute Time for both Audio and Video.
07	Audio processor VolClipping	0-3	0	0	0	0	0	Selects the volume clipping mode.
08	Audio processor SpatStrength	0-254	63	63	63	63	63	Spatial effect strength.
09	Audio processor SpatMode	0-2	0	0	0	0	0	Spatial effect mode.
10	Audio processor SpatGain	0-8	0	0	0	0	0	Spatial effect High-Pass Gain.
11	Audio processor PreAuxInput	0-127	25	25	25	25	25	Preset for auxiliary input signals.
12	Audio processor PreAudDemod	0-127	36	36	36	36	36	Preset for the demodulated BTSC signal.
13	Audio processor PreI2S	0-127	16	16	16	16	16	Preset for the digital I2S input signal.
14	Audio processor AVC	0-8	4	4	4	4	4	Decay time for the automatic volume correction.
15	Audio processor MdbSrt	0-254	0	0	0	0	0	Dynamic bass strength.
16	Audio processor MdbLim	0-254	0	0	0	0	0	Dynamic bass amplitude limit.
17	Audio processor MdbHmc	0-127	0	0	0	0	0	Dynamic bass harmonic content.
18	Audio processor MdbLP	0-30	0	0	0	0	0	Dynamic bass low pass corner frequency.
19	Audio processor MdbHP	0-30	0	0	0	0	0	Dynamic bass high pass corner frequency.
20	Avopre	0-3	0	0	0	0	0	Dephase the AV0 signal output from active video
21	SatCr	0-63	35	35	35	35	35	Saturation of the Cr component of the RGB/YCbCr DVD Input
22	SatCb	0-63	22	30	22	30	30	Saturation of the Cb component of the RGB/YCbCr DVD Input
23	CipTint	0-63	1	1	1	1	1	Tint control of the RGB/YCbCr DVD Input
24	CipCt	0-63	31	30	31	35	30	Contrast control of the RGB/YCbCr DVD Input
25	CipBr	0-254	69	73	69	73	75	Brightness control of the RGB/YCbCr DVD Input
26	LDLY (RF-Analog), (CV), (YC)	0-63	63	63	63	63	63	Luma/Chroma delay adjust for all Sources except DVD
27	AccSat BIT'S , (CV), (YC)	0-15	7	6	7	7	6	Color Saturation Control bits 8-11 for all Sources except DVD
28	AccSat BIT'S 0-7 , (CV), (YC)	0-254	32	32	32	45	32	Color Saturation Control bits 0-7 for all Sources except DVD
29	Tint BIT'S 8-15 , (CV), (YC)	0-254	15	15	15	15	15	Tint Control Bits 8-15 for all Sources except DVD
30	Tint BIT'S 0-7 , (CV), (YC)	0-254	175	175	175	175	175	Tint Control Bits 0-7 for all Sources except DVD

SERVICE MENU

ITEM		RANGE	C32V23-8	C36V23	C34W23	C32V23-82	C36V23-2	C34W23-2	DESCRIPTION
31	BR, (CV), (YC)	0-254	16	16	16	16	16	16	Brightness Control for all Sources except DVD
32	PK, (CV), (YC)	0-7	3	3	3	3	3	3	Peaking Gain Control for all Sources
33	PFS, (CV), (YC)	0-3	1	1	1	1	1	1	Horizontal Peaking Filter for all Sources
34	CT, (CV), (YC)	0-63	45	45	45	45	45	45	Contrast Register for all Sources except DVD
35	LPF2, (CV), (YC), (DVD)	0-3	1	1	1	1	1	1	Horizontal Low Pass Filter for Y/C
36	Nosel	0-3	3	3	3	3	3	3	Notch Filter Select for all Sources except DVD
37	DDR	0-3	0	0	0	0	0	0	Diagonal Dot Reduction for Antenna/Cable and Auxiliary video Sources
38	HDG	0-3	2	2	2	2	2	2	Horizontal Difference Gain for Antenna/Cable and Auxiliary video Sources
39	VDG	0-3	2	2	2	2	2	2	Vertical Difference Gain for Antenna/Cable and Auxiliary video Sources
40	VPK	0-15	0	0	0	0	0	0	Vertical Peaking Gain for Antenna/Cable and Auxiliary video Sources
41	LlcGain BIT'S 0-7	0-254	0	0	0	0	0	0	PLL Feedback Gain Bits 8-15 for all NTSC Sources
42	LlcGain BIT'S 0-7	0-254	8	8	8	8	8	8	PLL Feedback Gain Bits 0-7 for all NTSC Sources
43	LinLen BIT'S	0-7	3	3	3	3	3	3	Line Length in Pixels Bit 8-10
44	LinLen BIT'S 0-7	0-254	89	89	89	89	89	89	Line Length in Pixels Bit 0-7
45	LlcDFLimit BIT'S	0-254	0	0	0	0	0	0	PLL Frequency Limiter Bits 8-15
46	LlcDFLimit BIT'S 0-7	0-254	54	54	54	54	54	54	PLL Frequency Limiter Bits 0-7
47	LlcStart BIT'S	0-15	15	15	15	15	15	15	PLL Vertical Freeze Start Bits 8-11
48	LlcStart BIT'S 0-7	0-254	246	246	246	246	246	246	PLL Vertical Freeze Start Bits 0-7
49	LlcStop BIT'S	0-15	0	0	0	0	0	0	PLL Vertical Freeze Stop Bits 8-11
50	LlcStop BIT'S 0-7	0-254	4	4	4	4	4	4	PLL Vertical Freeze Stop Bits 0-7
51	LlcClock BIT'S	0-254	0	0	0	0	0	0	Must be 00h
52	LlcClock BIT'S 0-7	0-254	42	42	42	42	42	42	20 Bits PLL Clock Center Frequency Bits 16-19
53	LlcClock BIT'S	0-254	10	10	10	10	10	10	20 Bits PLL Clock Center Frequency Bits 8-15
54	LlcClock BIT'S 0-7	0-254	171	171	171	171	171	171	20 Bits PLL Clock Center Frequency Bits 0-7
55	LlcCLKC	0-63	5	5	5	5	5	5	Control Word for PLL Clock Generator
56	HplIAA BIT'S	0-254	1	1	1	1	1	1	Control Word for Horizontal PLL bits 8-15
57	HplIAA BIT'S 0-7	0-254	186	186	186	186	186	186	Control Word for Horizontal PLL bits 0-7
58	HplIAB BIT'S	0-254	2	2	2	2	2	2	Second Control Word for Horizontal PLL bits 8-15
59	HplIAB BIT'S 0-7	0-254	58	58	58	58	58	58	Second Control Word for Horizontal PLL bits 0-7
60	LowP	0-1	0	0	0	0	0	0	Enable Luma Low Pass Filter
61	HsInv	0-1	0	0	0	0	0	0	Positive/Negative Polarity for HS signal
62	HcInv	0-1	1	1	1	1	1	1	Positive/Negative Polarity for HC signal
63	Avoin	0-1	0	0	0	0	0	0	Positive/Negative Polarity for AVO signal
64	VsInv	0-1	1	1	1	1	1	1	Positive/Negative Polarity for VS signal
65	DbLnk	0-1	0	0	0	0	0	0	Disable Hor and Vert Blanking of invalid data in 656 Mode
66	VsMode	0-1	0	0	0	0	0	0	Vertical Sync Generation Mode

SERVICE MENU

ITEM	RANGE	C32V23-8	C36V23	C34W23	C32V23-82	C36V23-2	C34W23-2	DESCRIPTION
67	0-1	0	0	0	0	0	0	Enable Suppression of 656 Headers During Invalid Video lines
68	0-1	0	0	0	0	0	0	Peaking Filter Coring Enabled
69	0-15	7	15	15	7	15	15	Color gain control
70	0-63	15	15	15	15	15	15	Sub-brightness control
71	0-63	31	31	31	31	31	31	R channel drive gain control
72	0-63	31	31	31	31	31	31	G channel drive gain control
73	0-63	31	31	31	31	31	31	B channel drive gain control
74	0-63	5	5	5	5	5	5	R channel cutoff control (level control of IKIN (pin 44) R channel reference pulse)
75	0-63	5	5	5	5	5	5	G channel cutoff control (level control of IKIN (pin 44) R channel reference pulse)
76	0-63	5	5	5	5	5	5	B channel cutoff control (level control of IKIN (pin 44) R channel reference pulse)
77	0-3	0	0	0	0	0	0	RGB-OUT bottom limiter level control (valid when BLSW=1)
78	0-1	0	0	0	0	0	0	Disable AKB Control and put a black level controlled by cutoffs
79	0-1	0	0	0	0	0	0	Blanking Function ON+ C29/OFF
80	0-1	0	0	0	0	0	0	Control of gamma correction amount
81	0-3	3	3	3	3	3	3	Dynamic Color Control
82	0-3	0	0	0	0	0	0	Limited Level Control for Input
83	0-1	0	0	0	0	0	0	White Balance Offset ON/OFF
84	0-3	2	2	2	2	2	2	Control of gamma correction amount
85	0-3	1	1	1	1	1	1	Color Transients Improvement Mode
86	0-3	0	0	0	0	0	0	Adjust the amount of preshoot and overshoot
87	0-1	0	0	0	0	0	0	Sharpness Control for High color Saturation
88	0-3	2	2	2	2	2	2	Sharpness Filter Circuit
89	0-3	3	3	3	3	3	3	Sharpness Control for High color Saturation
90	0-1	0	0	0	0	0	0	Sharpness CD ON/OFF
91	0-3	1	1	1	1	1	1	Luminance signal edge enhancement setting
92	0-3	1	1	1	1	1	1	Luminance Transient Improvement Mode
93	0-3	2	2	3	2	2	3	Signal frequency band switching; select the band in accordance with the TV System
94	0-3	1	1	1	1	1	1	Y system DC transmission ratio setting
	0-3	1	1	1	1	1	1	Y system DC transmission ratio setting
	0-3	1	1	1	1	1	1	Y system DC transmission ratio setting
	0-3	1	1	1	1	1	1	Y system DC transmission ratio setting
	0-3	1	1	1	1	1	1	Y system DC transmission ratio setting
	0-3	1	1	1	1	1	1	Y system DC transmission ratio setting
	0-3	1	1	1	1	1	1	Y system DC transmission ratio setting
	0-3	1	1	1	1	1	1	Y system DC transmission ratio setting
95	0-15	7	7	7	7	7	7	Luma Offset
96	0-3	2	2	2	2	2	2	Dynamic Picture Level Control
97	0-15	7	7	7	7	7	7	OSD RGB Input 2 Level

SERVICE MENU

ITEM		RANGE	C32V23-8	C36V23	C34W23	C32V23-82	C36V23-2	C34W23-2	DESCRIPTION
98	AbIMode	0-3	0	0	0	0	0	0	Switching of ABL of ABL mode
99	AbITh	0-15	2	2	2	2	2	2	Adjustment of threshold voltage for ABL-IN (pin 44) input.
100	Pabl	0-15	15	15	15	15	15	15	RGB Peak ABL control
101	Sabl	0-3	3	3	3	3	3	3	S_ABL Gain Control
102	CbOffset (HD), (DTV), (NTSC)	0-63	31	31	31	31	31	31	Offset for Cb input
103	CrOffset (HD), (DTV), (NTSC)	0-63	31	31	31	31	31	31	Offset for Cr input
104	CoIAxis	0-3	2	2	2	2	2	2	Color Matrix Specifications
105	VmLev (HD), (DTV), (NTSC), (DVD)	0-3	2	2	2	2	2	2	Scan Velocity Modulation Level
106	VmDly (HD), (DTV), (NTSC), (DVD)	0-3	3	3	3	3	3	3	Scan Velocity Modulation Delay
107	VmCor (HD), (DTV), (NTSC), (DVD)	0-3	3	3	3	3	3	3	Scan Velocity Modulation Coring Level
108	VmFo (HD), (DTV), (NTSC), (DVD)	0-3	0	0	3	0	0	3	Scan Velocity Modulation Filter Circuit
109	VmLimt (HD), (DTV), (NTSC), (DVD)	0-3	3	3	3	3	3	3	Scan Velocity Modulation Limited Level Control
110	ClpPhase (HD), (DTV), (NTSC)	0-3	0	0	0	0	0	0	Internal Clamping Phase Control
111	ClpShift (HD), (DTV), (NTSC)	0-1	1	1	1	1	1	1	Internal Clamping Shift Control
112	ClpGate (HD), (DTV), (NTSC)	0-1	0	0	0	0	0	0	Switch to Mask the Clamp Pulse with HSync
113	LeftBlk	0-63	63	63	63	63	63	63	Left Blanking Control
114	RightBlk	0-63	30	30	30	30	30	30	Right Blanking Control
115	SyncPhase (HD), (DTV), (NTSC)	0-1	0	0	0	0	0	0	Hsync Delay Adjustment
116	HbIkSW	0-1	1	1	1	1	1	1	H Blanking Generation Mode
117	AkbTim (HD), (DTV), (NTSC)	0-63	18	18	18	18	18	18	AKB Timing Generation Control
118	Gamma (Z-View On),(Z-View Off)	0-3	0	0	0	0	0	0	RGB Gamma Correction Control
119	UpBlk (4:3)	0-15	2	2	2	2	2	2	Vertical blanking position control for top of picture
	UpBlk (16:9)	0-15	2	2	2	2	2	2	Vertical blanking position control for top of picture
120	LoBlk (4:3)	0-15	5	5	5	5	5	5	Vertical blanking position control for bottom of picture
	LoBlk (16:9)	0-15	5	5	5	5	5	5	Vertical blanking position control for bottom of picture
121	ZoomSW	0-1	0	0	0	0	0	0	Zoom mode ON/OFF switch for 16:9 CRT
122	JmpSW	0-1	1	1	1	1	1	1	Jump mode ON/OFF switch to select 16:9 or 4:3 aspect ratio
123	EwDC	0-1	0	0	0	0	0	0	EW_DVR signal DC level down
124	AfcMode	0-3	1	1	1	1	1	1	AFC loop gain control
125	AfcBow	0-63	31	31	31	31	31	31	Vertical line slope compensation amount adjustment
126	AfcAngle	0-63	31	31	31	31	31	31	Vertical line slope compensation amount adjustment
127	Vsize	0-63	18	40	19	18	40	19	Vertical amplitude adjustment Variable in factory menu
128	Vscroll (HD1080i Ext.)	0-63	28	28	28	28	28	28	Vertical picture scroll control
	Vscroll (DTV/NTSC)	0-63	28	28	28	28	28	28	Vertical picture scroll control
129	Vlin	0-15	7	7	7	7	7	7	Vertical linearity adjustment

SERVICE MENU

ITEM	RANGE	C32V23-8	C36V23	C34W23	C32V23-82	C36V23-2	C34W23-2	DESCRIPTION
130	Scorection	0-15	9	4	9	5	4	Vertical S correction
131	UpVlin	0-15	0	0	0	0	0	Vertical linearity control for top of picture
132	LoVlin	0-15	0	0	0	0	0	Vertical linearity control for bottom of picture
133	Vaspect (4:3)	0-63	47	0	47	47	0	Aspecto ratio control
134	VAspect16x9 (16:9)	0-63	53	0	53	53	0	Vertical size compensation on 16:9 mode
135	Vposition	0-63	31	31	31	31	31	Vertical position adjustment
136	Hsize	0-63	31	40	31	50	40	Horizontal amplitude adjustment Variable in factory menu
137	HSizeOffset	0-10	6	6	6	6	6	Horizontal size compensation on 16:9 mode
138	Hposition (HD1080i Ext.)	0-63	31	16	31	24	16	Horizontal position adjustment
	Hposition (DTV/NTSC)	0-63	31	16	31	24	16	Horizontal position adjustment
139	PinAmp	0-63	19	35	19	24	35	Horizontal pin distortion compensation amount adjustment
140	PinPhase	0-63	25	28	25	25	28	Horizontal trapezoidal distortion compensation adjustment
141	UpCpin	0-63	37	40	37	37	40	Horizontal pin distortion compensation amount adjustment for top edge of picture
142	LoCpin	0-63	37	44	37	37	44	Horizontal pin distortion compensation amount adjustment for bottom edge of picture
143	UpPol	0-1	0	0	0	0	0	Horizontal pin distortion compensation polarity setting for extreme top and bottom edge of picture
144	UpUcp	0-3	0	0	0	0	0	Horizontal pin distortion compensation position adjustment for extreme top edge of picture
145	LoUcp	0-3	0	0	0	0	0	Horizontal pin distortion compensation position adjustment for extreme bottom edge of picture
146	UpUcg	0-3	0	0	0	0	0	Horizontal pin distortion compensation amount adjustment for extreme top edge of picture
147	LoUcg	0-3	0	0	0	0	0	Horizontal pin distortion compensation amount adjustment for extreme bottom edge of picture
148	Vcomp	0-15	0	0	0	0	0	High voltage fluctuation compensation amount setting for vertical picture size
149	Hcomp	0-15	0	0	0	0	0	High voltage fluctuation compensation amount setting for horizontal picture size
150	PinComp	0-7	0	0	0	0	0	High voltage fluctuation compensation amount setting for horizontal pin distortion
151	AfcComp	0-7	0	0	0	0	0	High voltage fluctuation compensation amount setting for horizontal position
152	RstSW	0-1	0	0	0	0	0	Vertical drive retrace start setting switch
153	AspSW (HD), (DTV), (NTSC)	0-1	0	0	0	0	0	Switch to correspond to the signal with low effective video ratio
154	HcParaDc	0-63	0	0	0	0	0	Vertical parabola for raster center DC bias control
155	HcParaAmp	0-63	18	18	18	12	18	Vertical parabola for raster center amplitude control

SERVICE MENU

ITEM		RANGE	C32V23-8	C36V23	C34W23	C32V23-82	C36V23-2	C34W23-2	DESCRIPTION
156	HcParaPhase	0-63	31	31	31	31	31	31	Vertical parabola for raster center SAW component amplitude control
157	VTC	0-3	1	1	1	1	1	1	Vertical Time Constant for Sync Separation
158	Hwidth (HD), (DTV), (NTSC)	0-3	1	1	1	1	1	1	SELH_OUT Horizontal Sync Pulse Width
159	HsepSel	0-1	1	1	1	1	1	1	Set the Sync Separation Method
160	HdTc	0-1	0	0	0	0	0	0	Horizontal Time Constant for Sync Separation
161	HsMask	0-1	1	1	1	1	1	1	Mask or not the H-Sync at Vertical Pulse Period
162	Macro	0-1	1	1	1	1	1	1	Switch to Eliminate the Macrovision Signals
163	GainSel	0-3	1	1	1	1	1	1	Selects the Gain or Mute of the SelGr_Out, Sel_Cb_Out, Sely_Out.
164	CbGain	0-7	7	7	7	7	7	7	Sel_Cb Gain Control
165	CrGain	0-7	7	7	7	7	7	7	Sel_Cr Gain Control
166	Ygain	0-7	7	7	7	7	7	7	Sel_Y Gain Control
167	FixSync	0-3	1	1	1	1	1	1	Selects the Type of Sync at the input
168	34WChassis	0-1	0	0	1	0	0	1	Defines the TV set Model: (0)4:3 Screen[32" and 36"] (1)Wide Screen 16:9[30" and 34"]
169	V_Aspect_Wide	0-63	31	31	31	31	31	31	
170	CBW (RF-Analog)	0-3	3	3	3	3	3	3	Croma BandWidth for RF NTSC source
	CBW (CV)	0-3	3	3	3	3	3	3	Chroma Bandwidth for Composite Video Source
	CBW (YC)	0-3	3	3	3	3	3	3	Chroma Bandwidth for Y/C Video Source
171	KILVL	0-254	5	5	5	5	5	5	Color Killer Activation level for all NTSC Video Sources
172	KILHY	0-254	3	3	3	3	3	3	Color Killer Hysteresis for all NTSC Video Sources
173	Vsize Offset	0-15	5	5	0	5	5	0	
174	SBX3006 On/Off (1/0)	0-1	0	1	1	1	1	1	Enable the 3D comb filter.
175	SBX3006 3D On/Off (1/0)	0-1	1	1	1	1	1	1	Enable the 3D comb filter.
176	CDLRF	0-7	4	4	4	4	4	4	Croma-Luma delay for RF NTSC source.
177	CDLAUX	0-7	4	4	4	4	4	4	Croma-Luma delay for auxiliary video sources.
178	YPFT	0-3	0	0	0	0	0	0	Luma Peaking filter center frequency (BPF).
179	YPFG	0-15	4	4	4	4	4	4	Luma Peaking filter gain.
	Factory Option 2								
00	Factory menu	0-1	1	1	1	1	1	1	Factory mode pref.
01	APCOn	0-1	1	1	1	1	1	1	Easy Picture Video Presets Update
02	EZ Picture	0-7	1	1	1	1	1	1	Selection of the Video Preset to be adjusted.
03	Contrast	0-100	100	100	100	100	100	100	Adjust of the Contrast Reg. Value to be saved for the Video Preset selected in item 2.
04	Brightness	0-100	50	50	50	50	50	50	Adjust of the Brightness Reg. Value to be saved for the Video Preset selected in item 2.
05	Color	0-100	58	58	58	58	58	58	Adjust of the Color Reg. Value to be saved for the Video Preset selected in item 2.
06	Tint	0-100	50	50	50	50	50	50	Adjust of the Tint Reg. Value to be saved for the Video Preset selected in item 2.

SERVICE MENU

ITEM		RANGE	C32V23-8	C36V23	C34W23	C32V23-82	C36V23-2	C34W23-2	DESCRIPTION
07	Sharp	0-100	55	55	55	55	55	55	Adjust of the Sharpness Reg. Value to be saved for the Video Preset selected in item 2.
08	Color Temp	0-1	0	0	0	0	0	0	Adjust of the Color Temp Reg. Value to be saved for the Video Preset selected in item 2.
09	MinBr_t_4x3 (NTSC)	0-100	6	6	6	6	6	6	Minimum Brightness for 4x3 Aspect Ratio
	MinBr_t_4x3 (HD)	0-100	6	6	6	6	6	6	Minimum Brightness for 4x3 Aspect Ratio
10	MaxBr_t_4x3 (NTSC)	0-100	100	100	100	100	100	100	Maximum Brightness for 4x3 Aspect Ratio
	MaxBr_t_4x3 (HD)	0-100	100	100	100	100	100	100	Maximum Brightness for 4x3 Aspect Ratio
11	MinCont_4x3 (NTSC)	0-100	6	6	6	6	6	6	Minimum Contrast for 4x3 Aspect Ratio
	MinCont_4x3 (HD)	0-100	6	6	6	6	6	6	Minimum Contrast for 4x3 Aspect Ratio
12	MaxCont_4x3 (NTSC)	0-100	100	100	100	100	100	100	Maximum Contrast for 4x3 Aspect Ratio
	MaxCont_4x3 (HD)	0-100	100	100	100	100	100	100	Maximum Contrast for 4x3 Aspect Ratio
13	MinCont_16x9 (NTSC)	0-100	6	6	6	6	6	6	Minimum Contrast for 16x9 Aspect Ratio
	MinCont_16x9 (HD)	0-100	6	6	6	6	6	6	Minimum Contrast for 16x9 Aspect Ratio
14	MaxCont_16x9 (NTSC)	0-100	100	100	100	100	100	100	Maximum Contrast for 16x9 Aspect Ratio
	MaxCont_16x9 (HD)	0-100	100	100	100	100	100	100	Maximum Contrast for 16x9 Aspect Ratio
15	OCPTIME	0-254	1	1	1	1	1	1	Reserved: Design stage.

SERVICING

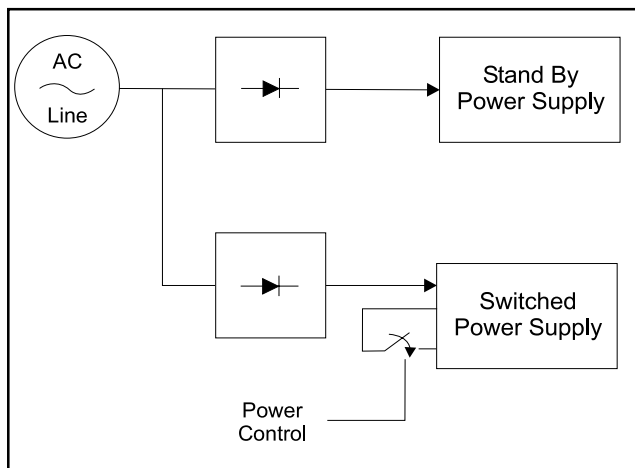
CIRCUIT OVERVIEW

LARGE SIGNAL MODULE

The AB Large signal module is a COLD chassis consisting of a single sided circuit board. It has two SMPSs (One Stand-by and other switched) sections, one Horizontal & Vertical Deflection section, and one daughter board. The power supply section features nineteen IC's for voltage sources.

Voltage ICs		
Description	Qty	P/N
LDO Voltage Regulator 5V w/ ON-OFF switch	4	221-01460-03
LDO Voltage Regulator 15V w/ ON-OFF switch	2	221-01460-10
Voltage Regulator 12V	2	P221-01527-08
Error Amplifiers	2	221-00265-03A
Step Down Regulators	2	P221-01534
Opto-couplers	4	01L1817000G
Switch Mode Regulator	2	223-00061-01

A new feature has been added that switches from the master power supply to a slave power supply.



This chassis uses two switching regulator to develop up to 150 Watts each using the quasi-resonant topology. The AC line voltage is supplied via fuse FX3400 and an EMI filter consisting of CX3401, LX3400, CX3402, LX3401, and CX3405 and delivered to two bridge rectifiers BR3400 and BRX3450 (which is 212-00172-04). The AC operation range is between 90 Vrms to 132 Vrms. The output voltage from the rectifiers (+VM and +VSLV) is supplied to the Main Power Regulator and Switched Power Regulator.

MAIN POWER SUPPLY

The MASTER SMPS consists mainly of ICX3612 and three circuits that regulate its behavior. TX3612 is the chopper transformer that performs the power conversion. The three circuits mentioned modify the response of the main regulator according to the power supply condition.

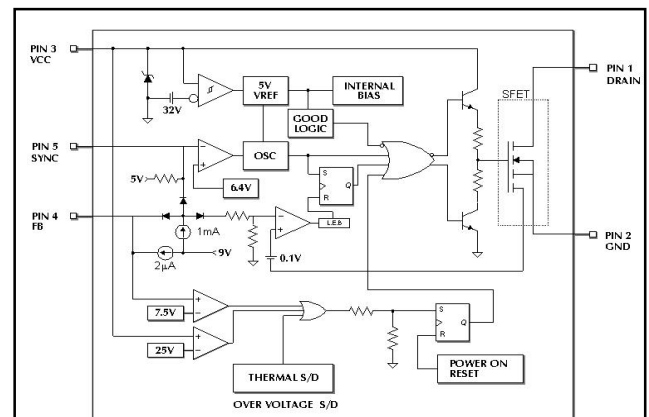
There two possibilities: Quasi-Resonant Mode and 20 kHz. The Quasi-Resonant mode handles the power when the application is turned on. When off, the 20 kHz mode allows minimum power consumption. The third circuit corresponds to the power down detector. The MASTER SMPS handles 4 output voltages (see next page for reference).

SWITCHED POWER SUPPLY

The second SMPS is switched on/off through relay KX3870, which receives the POWER-CTRL 2 signal from the microcontroller IC6000. The +VSLV is a non-regulated voltage from the second bridge rectifier (mentioned above), but switched from the KX3850. When the KX3850 is switched on, the switched power supply provides seven main switched voltages (see next page for reference).

Other voltages are generated from the Main SMPS output voltages and driven by two Step Down Regulators in order to provide reliable output voltages intended for the digital card.

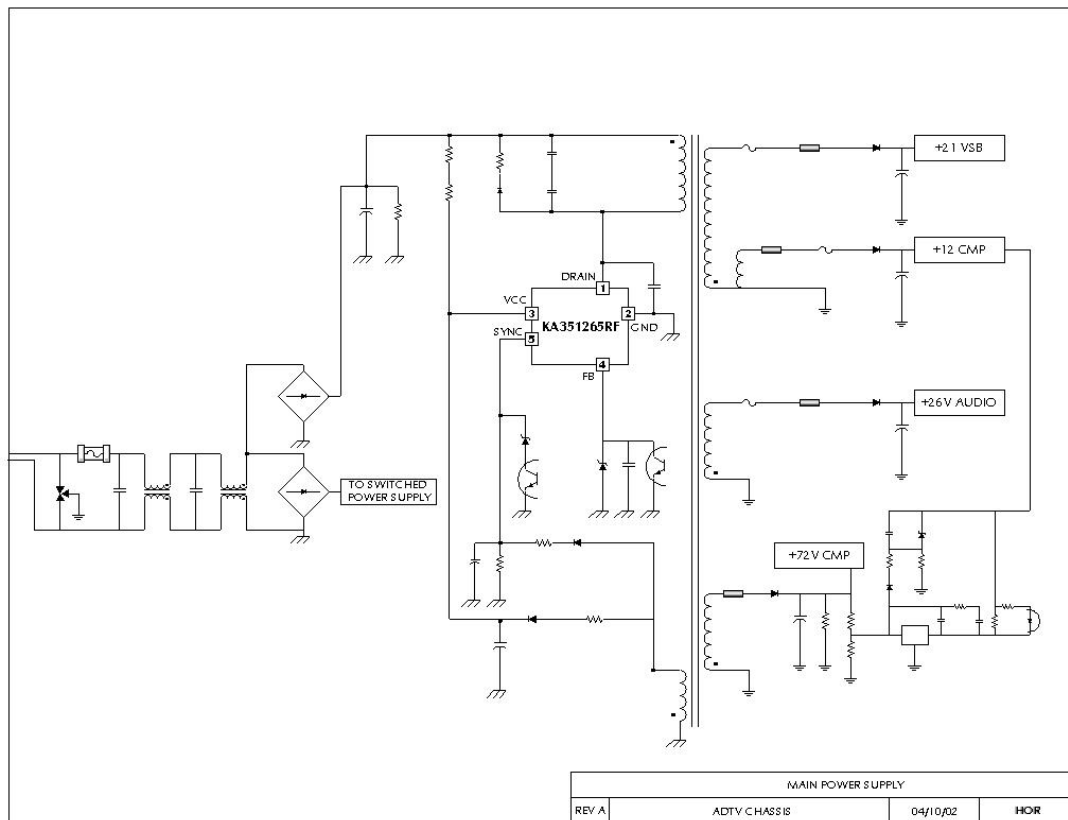
ICX3612 & ICX3670 SWITCH MODE REGULATOR



PIN DESCRIPTIONS

Pin	Label	Function
1	DRAIN	To drive the chopper xfmr
2	GND	Refers to hot ground
3	VCC	To power the circuit
4	FB	Voltage regulation
5	SYNC	Used to control the operation mode

SERVICING



SMPS, BASIC CIRCUIT FOR MASTER SMPS

VOLTAGE SOURCES

Stand-By Voltages from MAIN SMPS:

□ 21 V Stand by

5.1VPD	Power Down Detector
15 VDBA	Daughter Board
12 V TLT	Through ICX3815

□ 12 V Stand by

12 VCMP	Used as a reference
15 VSB	Daughter Board
5V UP	Through ICX3810

□ 72 V Stand by

72 VCMP	Used as a reference
72 VSB	Deflection & Scan Boost

□ 26 V Stand by

Used for Audio Section

SWITCHED VOLTAGES FROM SWITCHED SMPS:

□ 215 V Switched

Used for driving the Video output

□ 100 V Switched

100 SVM	Scan Velocity Modulation circuitry
33 TNR	Tuner section through ZDX3881

□ 24 V Switched

24 SVM	Scan Velocity Modulation circuitry
18 HD	Horizontal Drive

□ 11 V Switched

11 CMP	Used as a reference
6.2 FIL	Filaments in the CRT

□ 40 V Switched

40 CMP	Used as a reference
40 HVC	Compensation for HV

□ +15 VDF and -15VDF

These switched voltages are used for driving the vertical circuitry and dynamic focus

SERVICING

DEGAUSSING

The ADTV chassis employs an innovative method of degaussing, just like former Zenith TVs it is performed through software in order to obtain a proper demagnetization for these screens.

IC6000 generates a pulse about 1 second on pin 48 set to high (about 4.8 VDC) through RX3900 (4.7K 5% ¼ watt).

It is applied to QX3900, which drives the 12 VCD relay KX3900 in series with a current limiting resistor. So the degaussing is performed when the degauss coil is plugged to the 4T8 connector ends.

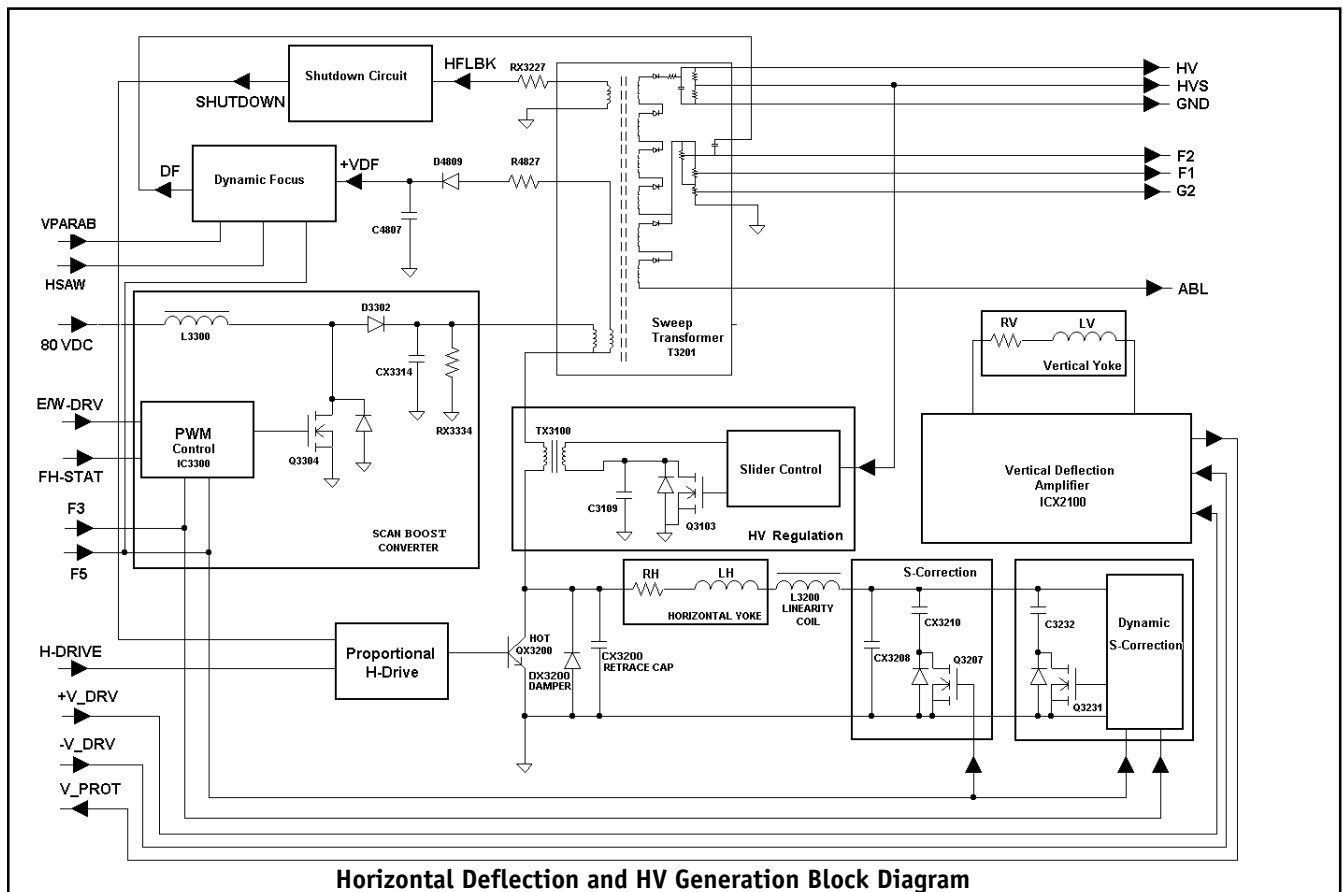
HORIZONTAL & VERTICAL DEFLECTION

The AB chassis was designed to support only one horizontal frequency for DTV, 33.75Khz. It supplies horizontal and vertical currents to the deflection yoke coil and the high voltage generation for the CRT. This section is dependent on other circuits in the main chassis to provide drive signal, DC control voltage,s and deflection corrections. This section can be divided into 6 functional blocks:

- Horizontal Deflection and HV Generation
- Base Drive
- HV Compensation
- Shutdown Circuit
- Vertical Deflection

HORIZONTAL DEFLECTION AND HV GENERATION

The Horizontal Deflection circuitry is a common flyback topology used in many television and monitor applications. QX3200 is the Horizontal Output Transistor. When QX3200 is initially turned on, current is allowed to flow from the B++ supply through TX3100, TX3201, and QX3200. This allows energy to be stored in TX3201. When QX3200 is turned off some of this energy is returned to charge the S-capacitor(s) CX3208, CX3210, and C3232. After several cycles (repeating at scanning frequency) sufficient voltage appears across the S-capacitors providing an additional path producing current flow through the horizontal deflection yoke coil (connector 4X4). The negative current path is provided by the damper diode DX3200. The result is a positive and negative sawtooth current through the horizontal deflection coils (approximately 11 to 17 Amps peak to peak). When QX3200 is turned off, about 1100 Volts peak of flyback voltage is produced resulting from the stored energy in the horizontal deflection coils and TX3201. This voltage is induced to secondary windings of TX3201 to generate the high voltage from 28 to 30 KV. The flyback (or retrace) period is about 5.0 s.



A sensing resistor inside of TX3201 provides a DC voltage proportional to the CRT anode voltage and is used like a primary feedback for the HV compensation circuit. A secondary winding on TX3201 (pin 6) provides a low voltage flyback pulse (H-FLYBK) used for synchronization of the Scan Boost Converter and the HV Compensation circuit. A capacitive divider, CX3205 and CX3206, provide a low voltage flyback pulse (H-FBP) used for synchronization, phase comparison, etc.

The linearity coil L3200 is saturating inductor skewed by a permanent magnet bonded to the coil. It produces a non-linear inductance curve vs current. This characteristic cancels non-linearity in the deflection current caused by horizontal deflection coil resistance.

BASE DRIVE

(Refer to figure on the next page). The Base Drive (Proportional Drive) circuit provides high forward and reverse current to drive the base of the horizontal output transistor QX3200 from a low level input (H-DRV from the deflection processor ICX2600 in main chassis). This signal is approximately 9 Volts peak to peak at the operating frequency and has a duty cycle of about 40% high, 60% low.

Current from H-DRV is amplified by transistors Q3203 and Q3204 providing low impedance to rapidly drive the gate of the driver transistor Q3205. This action results in an alternating current flow in the primary of driver transformer T3200. During Q3205 on time energy is stored in T3200 and rapid turn off of QX3200 is initiated. During Q3205 off time the energy previously stored in T3200 is used to drive the base of QX3200. A winding in T3200 from the emitter of QX3200 to ground provides pulse shaping to optimize the base drive and improve efficiency.

HV COMPENSATION

A resistor inside of the sweep transformer senses the CRT anode voltage (Pin 14). The DC voltage appearing on this resistor is used in one of the operational amplifiers of IC3101 to provide the error voltage needed to regulate the HV to a specified level.

The error voltage is compared with a ramp signal generated in one comparator of IC3100 and synchronized by the flyback pulse (H-FLYBK) at horizontal scanning frequency to modulate the pulse width in the output to drive the gate of the switching transistor Q3103. This ramp signal is present only during the flyback pulse.

Q3103 is on during the scan time and as long as the error voltage is higher than the ramp signal. This allows energy to be stored in TX3100. When Q3103 is turned off, the resonant circuit formed by C3109 and the primary inductance of TX3100 produce a flyback voltage of about 400 volts peak resulting from the stored energy in TX3100.

This voltage is induced to the secondary windings of TX3100 to add to the voltage generated in the horizontal deflection circuit. This induced voltage is used to compensate load variation (beam current variation) in the HV flyback transformer TX3201. RX3335 (potentiometer) is used to adjust the high voltage to a specified level. (Refer to the figure on the next page).

SHUTDOWN CIRCUIT OPERATION

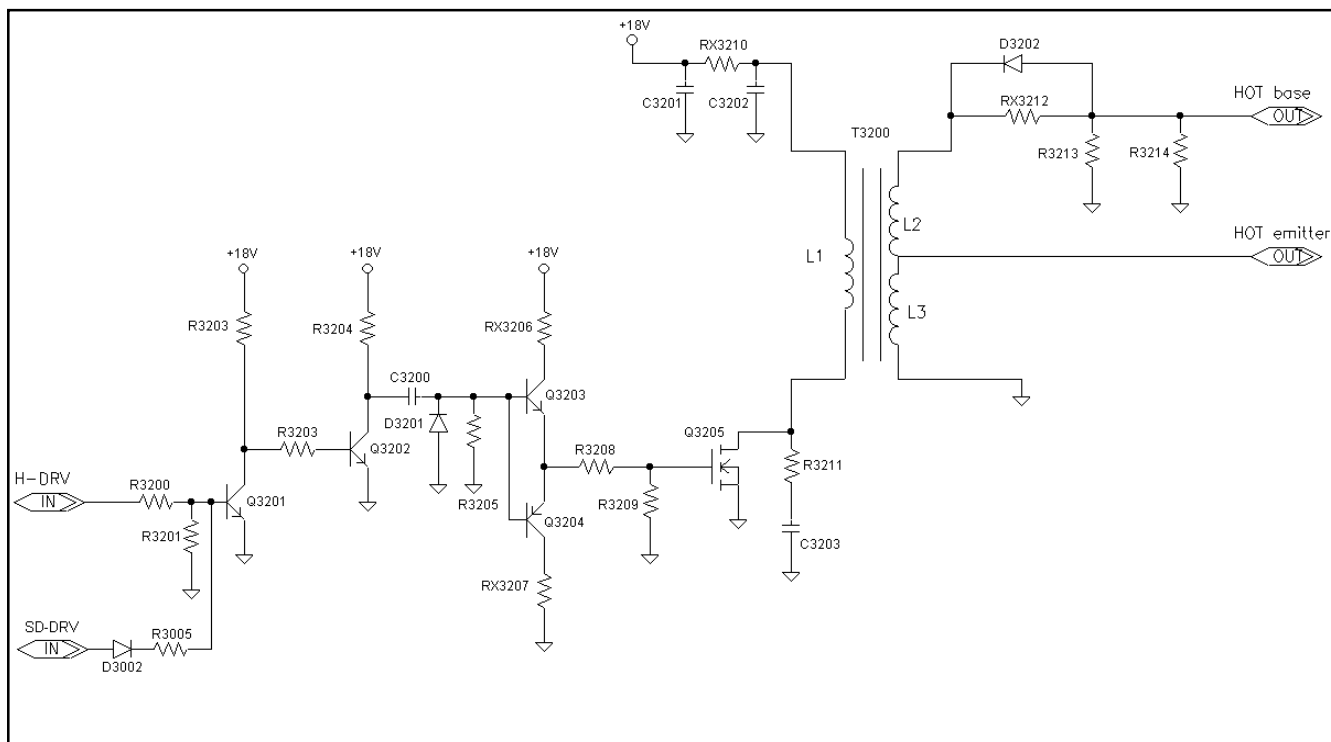
(Refer to figure on the next page). The flyback pulse voltage from pin 6 of TX3201 (flyback transformer) is peak detected (rectified) by the action of diode D3000 and capacitor C3001. This forms a DC voltage appearing on C3001 representative of the CRT anode voltage (HV) produced by TX3201. This voltage is divided down by precision resistors RX3001, RX3002, and RX3003. This lower voltage appears on the positive input (pin 5) of IC3101. In the event the CRT anode voltage becomes excessive, in IC3101 the positive input (pin 5) will be higher than negative input (pin 6) and therefore this output (pin 7) will go to high level at approximately 15 volts. This signal (SD-DRV) is sent to the base of Q3201 causing the horizontal drive to be disabled and latched causing HV to go down. In about 5 seconds the shutdown reset circuit (Pins 8, 9 & 14 of IC3100) enables the horizontal drive and HV must be reestablished. If the shutdown condition persists, the circuit goes into hiccup mode. The circuit formed by Q3104, C3113, C3108, D3107, R3131, R3132, R3133, and R3134 disable the HV compensation output (Q3102-B signal) during turn on and shutdown conditions (transients).

VERTICAL DEFLECTION

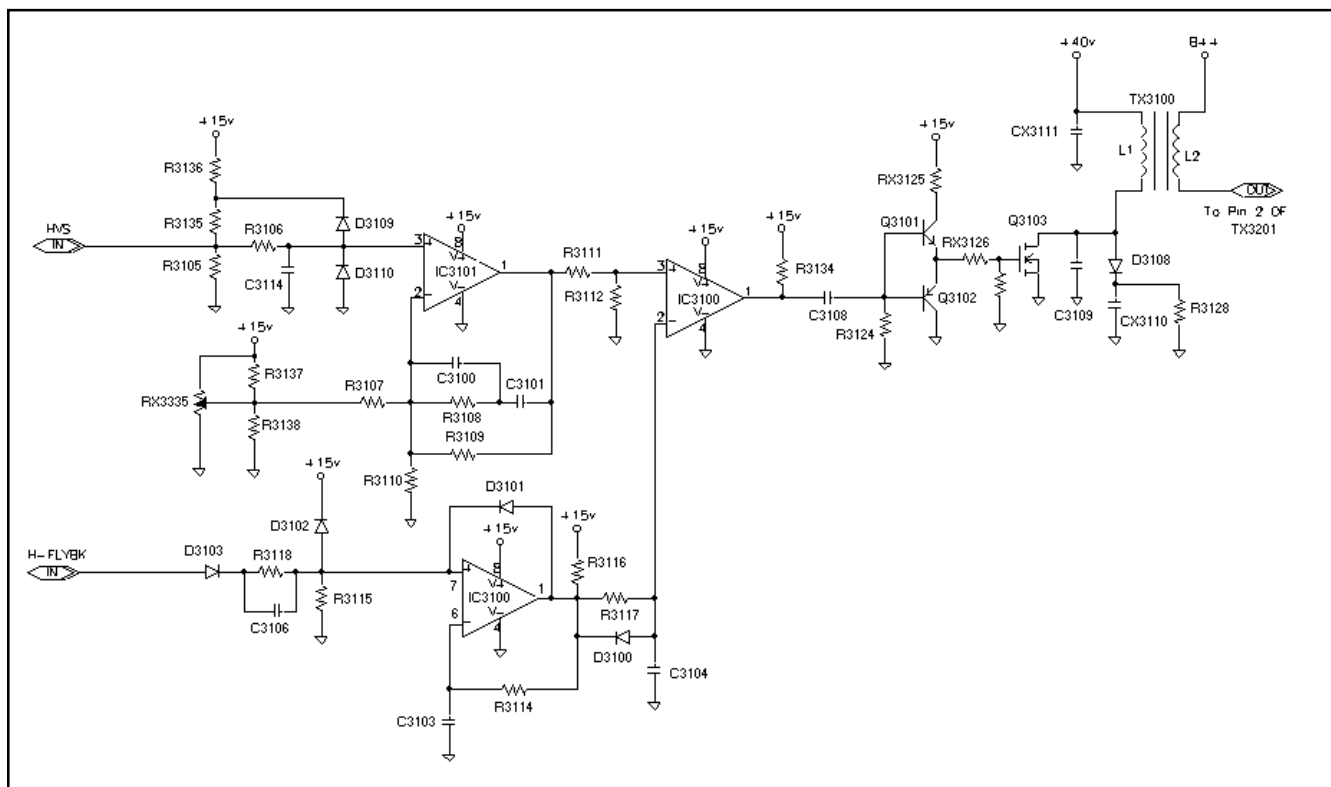
(Refer to figure on the next page). The vertical deflection circuit (ICX2100) is a linear amplifier that can directly drive the yoke current (including the required DC component). The sawtooth waveforms needed as inputs by ICX2100 are generated in the Deflection Processor ICX2600. V-PROT is an image of vertical deflection current and it is used by the Deflection Processor to protect the CRT.

SERVICING

BASE DRIVE

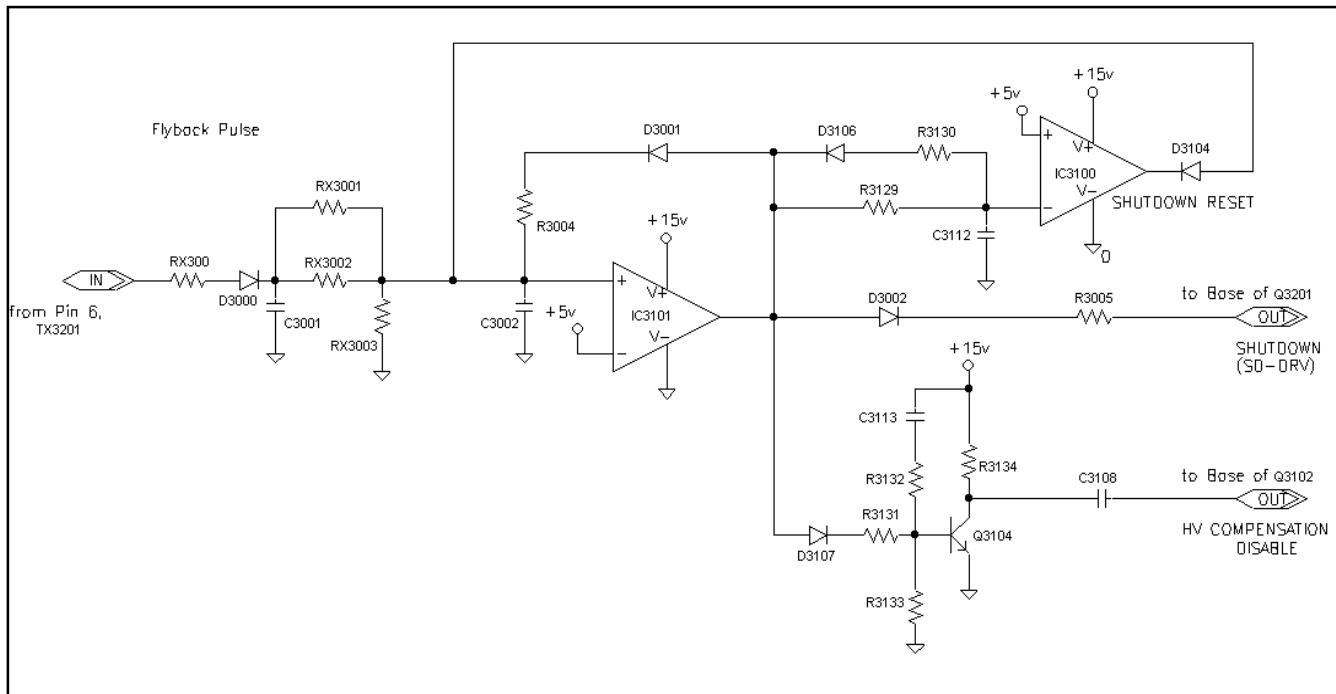


HV COMPENSATION

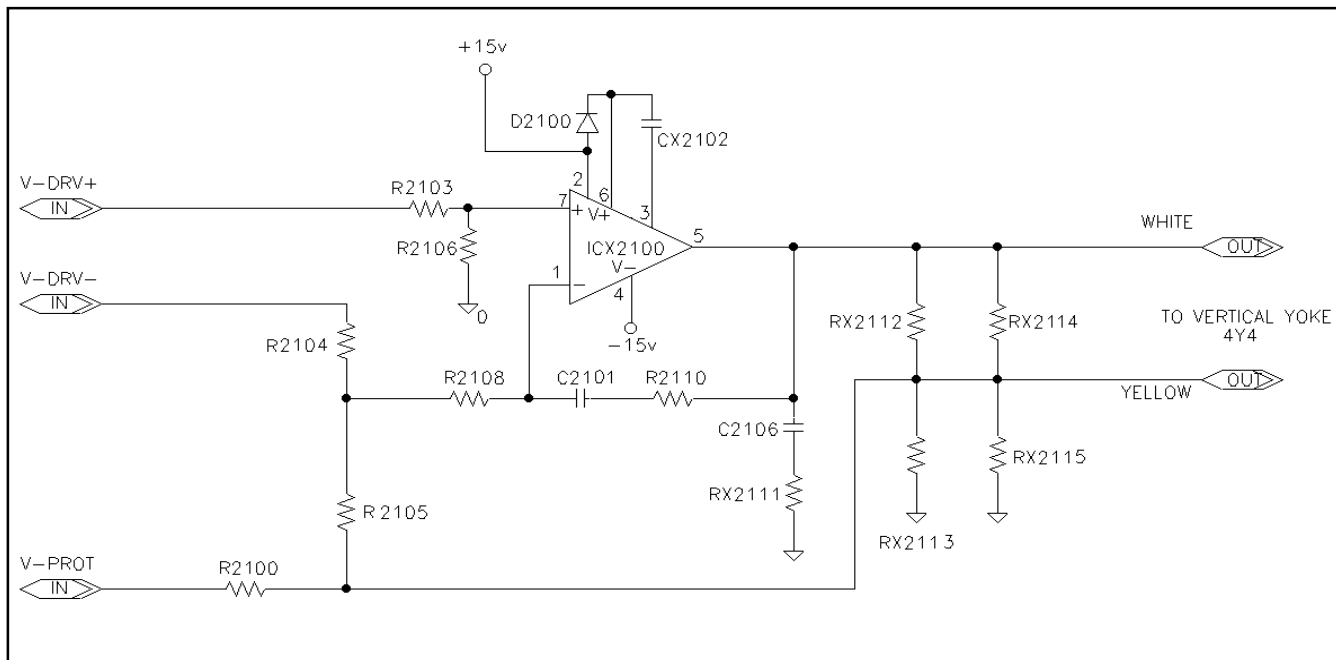


SERVICING

SHUTDOWN CIRCUIT OPERATION



VERTICAL DEFLECTION



SERVICING

Once the audio is processed the audio stereo amplifier IC800 TDA7263 (OISG726300B) delivers the sound through the speakers.

AUDIO AND VIDEO SWITCHING

FRONT JACK sources available:

- S- Video/ Video Front

REAR JACKS sources available:

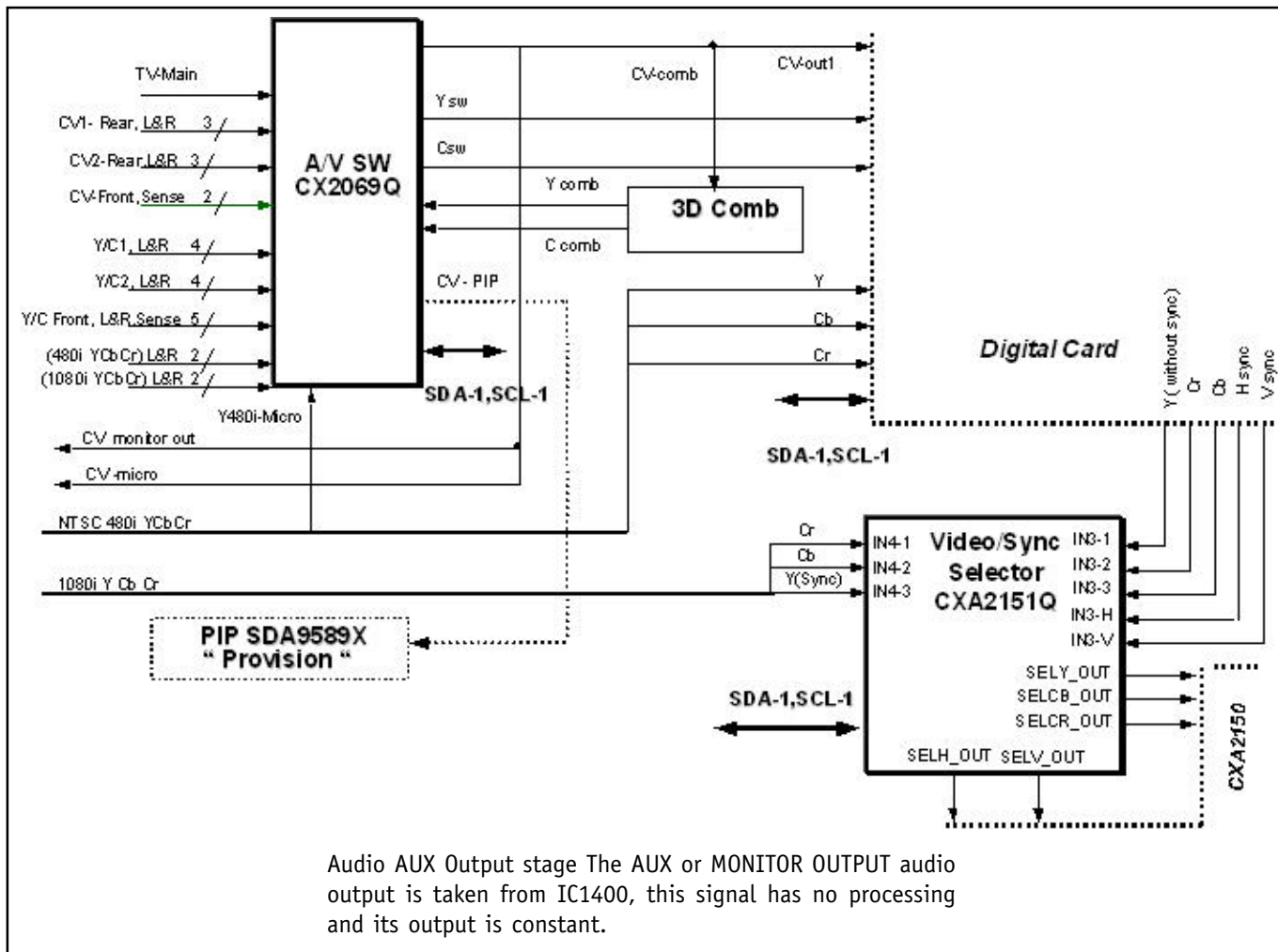
- Antenna/Cable1
- Antenna/Cable2
- S-Video/ Video 1
- S-Video/ Video 2
- DVD input (YUV)
- HD Setup BOX (YUV)
- MONITOR OUTPUT (Audio and Video)

RGB VIDEO OUTPUT AMPLIFIER

The video output module drives the RGB cathodes with video signal from the video drive ICX220M and has one IC for each color. This circuit includes the filament or heater G1 and G2 connections and grounds. Special circuitry senses the cathode current which controls the cut off gains.

Below is a simplified block diagram of the AB chassis video output circuit. The signal is first uncoupled at the output of the video processor. Then the signal is derived by the video drive and is applied to the three transistors Q2205, Q2206, & Q2207 (one per color). After that RGB signals are injected to the video output board, it is amplified to the levels required for an acceptable image on the screen. Each amplifier has a dedicated section for sensing the cathode current for the AKB system.

The resistor located at R5125 belongs to the Red color section. It has the same function of the R5145 of Green Color section. The three ICs mentioned use the TDA6120Q from Philips. Each IC can be seen as a operational amplifier but are configured as inverting amplifiers. The inverting input is on pin 2 and the non-inverting input is on pin 4. The Feedback resistor is R5125. It has a gain peaking network between pin 1 and pin 3. This network is internally connected to the collectors of the differential input transistors.



The input signal is connected to the inverting input of the amplifier through resistor R5121 to avoid Hi frequency oscillations. The non-inverting input is connected to a voltage bias formed by resistors R5101 and R5102. C5122 is for AC decoupling and C5123 is for hi frequency filter purposes (one for each IC). The IC takes this voltage bias as a reference voltage for the input signal. So, by means of moving this reference voltage the black level could be established. This reference voltage is the same for the three-color amplifiers.

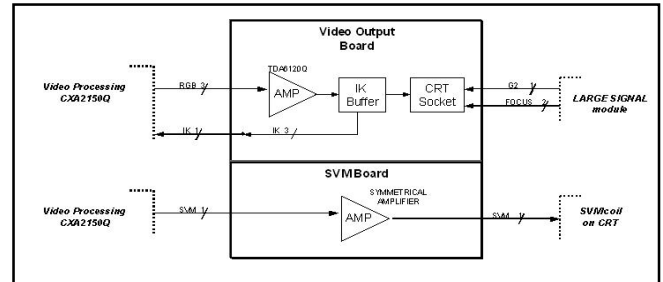
The cathode output is from pin 12 of the IC. This signal is passed through transistor Q5121 with the purpose of sampling the cathode current. This cathode output travels through resistors R5127, R5128, and the coil L5121 for peaking improvement.

TDA6120Q (221-01404) consists of one monolithic video output amplifier for each color. This amplifier can be split-up in two amplifier stages in series. This gives rise to the term trans-admittance trans-impedance amplifier. At the second stage voltage, the current feedback travels through resistor R5125 connected from OUT (pin 13) to IN (pin 5). The trans-admittance of the first stage is chosen by means of a resistor between pin 1 and pin 3, represented on this circuit by R5122.

The advantage of this amplifier configuration is that a higher bandwidth (around 30Mhz) can be realized with relation to the well know operational amplifier with voltage feedback. Furthermore, the amplifier has a differential input which makes the amplifier less sensitive to interference and flexible regarding DC-DC transfer. Also, this configuration has high input impedance with the advantage of not loading the drive stage. The signal input travels through a differential pair of transistors. The signal is connected on pin 2 of the inverting voltage input. The input configuration consists of a bipolar NPN transistor in a long tailed pair configuration. The input current is 30uA.

This IC is provided with a black current data pin. On this application pin 7 is not used. Instead of this pin the current is sensed externally by means of transistor Q5121. The frequency response is improved by means of a capacitor in series with a resistor connected between pins 1 and 3 of the IC. These are C5121 and R5123. The value of these elements is a compromise between bandwidth, overshoot, and ringing.

Block diagram for the video output circuit:



SCAN VELOCITY MODULATOR

The Scan Velocity Modulator is on a pair of coils installed under the purity magnets. These coils perform as a magnetic dipole delaying or accelerating the screen spot in the areas of brightness variation.

It is installed on the neck of the CRT near the Yoke assembly. This module has access to three signals: video, half tone, and fast blanking. This circuit has several sections to process the signals and to obtain a current signal which will be applied over the coil.

It has two inverter amplifiers, two push pull amplifiers, two follower emitter, one differential amp, one switch, and one commutator. There is a coil on the circuit which receives the current to produce an effect over the picture.

The video passes through an inverter amplifier to increase the level signal and then it is coupled by a follower emitter to be differentiated. Another inverter amplifier increases the signal generated by the differentiator and then two steps of push pull amplifiers drive the signal to feed the Coil.

All the time the video is working there is a SVM operation that improves and enhances the picture in each color transition. The magnetic field produced by the loaded coil affects the electron beams to achieve better definition between colors on the screen. The SVM performance can be adjusted through the factory menu with item #105, named VMLEVEL, which has three levels of intensity.

SERVICING

GEOMETRY ADJUSTMENTS

REGISTER #125 / NAME AFC-BOW

The "AFC-BOW" values can go from 0 up to 63. If you decrease the register value down to 0 you'll see the fig 1. If you increase the register value up to 63 you'll see fig. 2.

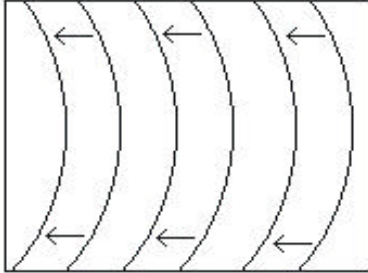


Fig 1

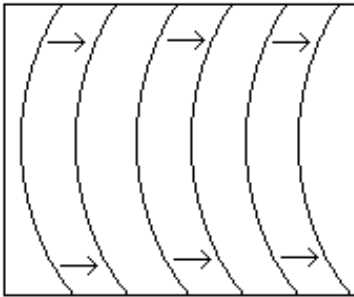


Fig 2

Figure 1: This image shows the result of decreasing the register down to 0. You can notice that top and bottom half of picture shift left respect to picture center, again image center remains unchanged.

Figure 2: This image shows the result of increasing register up to 63 . You can notice that top and bottom half of the picture shift right with respect to picture center. Center remains unchanged.

REGISTER #126 / NAME AFC-ANGLE

The "AFC-ANGLE" values can go from 0 up to 63. If the register value is increasing up to 63 you will see the fig 3. If you start decreasing the register value down to 0 you'll see the fig 4.

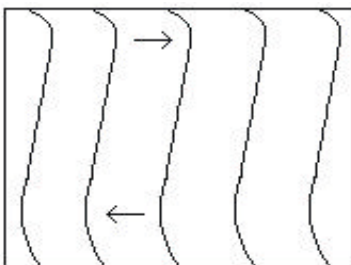


Fig 3

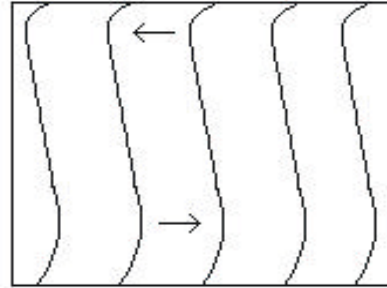


Fig 4

Figure 3: This image shows the result of increasing the register up to 63 look that the center area remains unchanged while top and bottom half are moving describing an inverted "S".

Figure 4: This image shows the result of decreasing the register value down to 0 look that center area remains unchanged while top and bottom half of picture are moving describing a "S".

REGISTER # 127 / NAME V-SIZE

The "V-SIZE" correction affected only vertical amplitude of picture. The register can take values from 0 up to 63. If you decrease the register value down to 0 you'll see the fig 5. If you increase the register value up to 63 you'll see fig. 6.

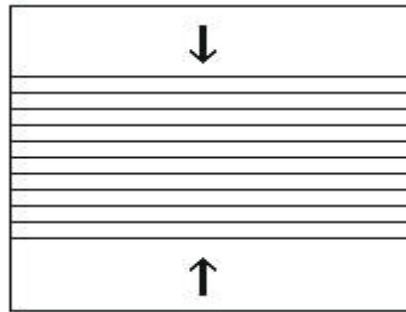


Fig 5

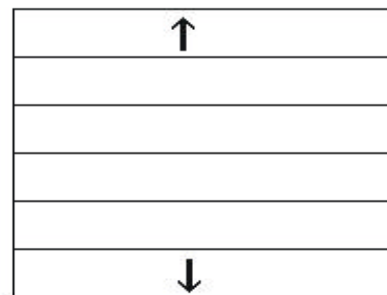


Fig 6

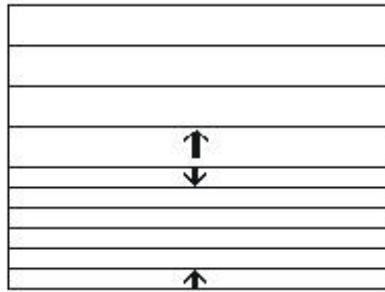


Fig 10

Figure 9: This image shows the result of decreasing the register value down to 0. You can notice that the top half of picture is shrinking and bottom half is expanding.

Figure 10: This image shows the result of increasing the register value up to 15. You can notice that top half of picture is expanding and bottom half is shrinking.

REGISTER # 128 / NAME V-SCROLL

"V-SCROLL". This correction affect full image, moving it upward or downward without affect the geometry. The register can take values from 0 up to 63,. If you decrease the register value down to 0 you'll see the fig 7. If you increase the register value up to 63 you'll see fig. 8

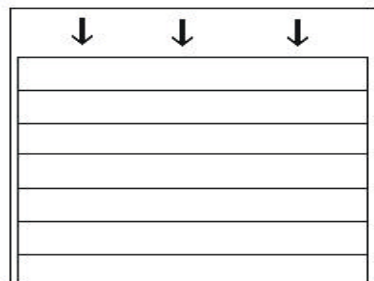


Fig 7

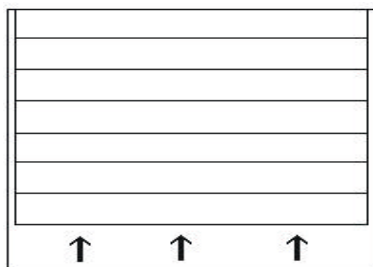


Fig 8

Figure 7: This image shows the result of decreasing the register value down to 0. You can notice that full image is moving downward without affect the geometry.

Figure 8: This image shows the result of increasing the register value up to 63. You can notice that full image is moving upward without affect the geometry.

REGISTER # 129 / NAME V-LIN

The "V-LIN". This correction affected vertical linearity of picture, shrink it or expand it. The register can take values from 0 up to 15. If you decrease the register value down to 0 you'll see the fig 9. If you increase the register value up to 15 you'll see fig. 10.

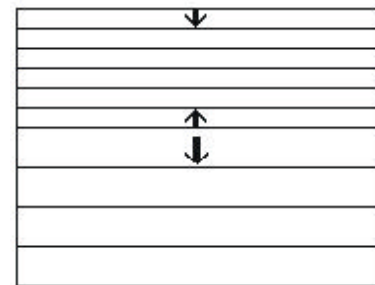


Fig 9

REGISTER # 130 / NAME S-CORRECTION

The "S-CORRECTION". This correction affected vertical linearity of picture. The register can take values from 0 up to 15. If you decrease the register value down to 0 you'll see the fig 11. If you increase the register value up to 15 you'll see fig. 12.

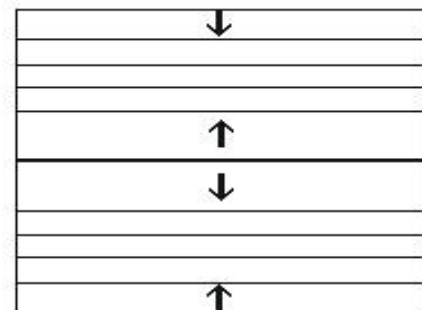


Fig 11

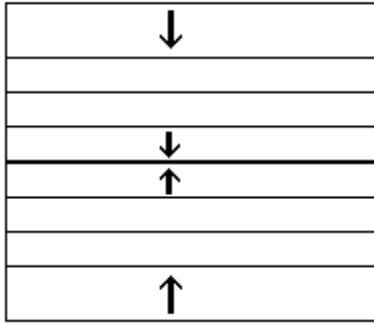


Fig 12

Figure 11: This image shows the result of increasing the register value up to 15. You can notice that top half and bottom half of picture are shrinking, while center is expanding.

Figure 12: This image show the result of decreasing the register value down to 0. You can notice that top half and bottom half are expanding to the center.

REGISTER # 131 / NAME UP-VLIN

The "UP-VLIN". This correction affected top half of picture, shrink or expand it. The register can take values from 0 up to 15. If you decrease the register value down to 0 you'll see the fig 13. If you increase the register value up to 15 you'll see fig. 14.

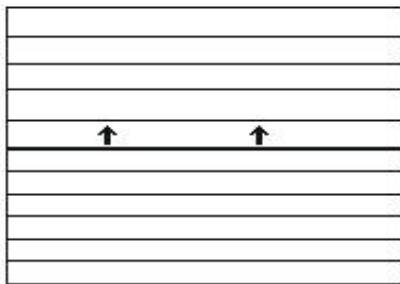


Fig 13

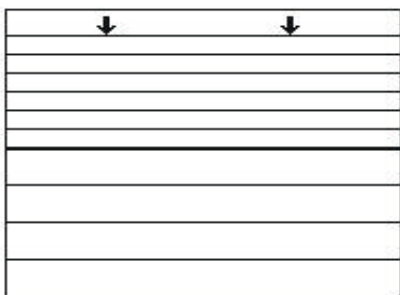


Fig 14

Figure 13: This image shows the result of decreasing the register down to 0. You can notice that top half of picture is fully open and the bottom half remains unaffected by the correction.

Figure 14: This image shows the result of decreasing the register value down to 0. You can notice that top half of picture is shrinking and bottom half of picture remains unaffected.

REGISTER # 132 / NAME LO-VLIN

"LO-VLIN". This correction affected bottom top of picture, shrink or expand it. The register can take values from 0 up to 15. If you decrease the register value down to 0 you'll see the fig 15. If you increase the register value up to 15 you'll see fig. 16.

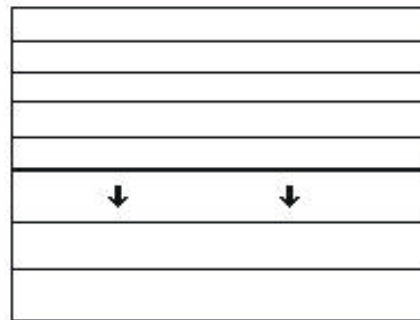


Fig 15

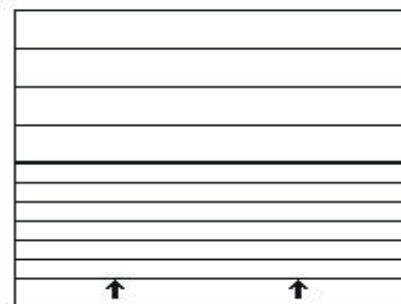


Fig 16

Fig. 15. This image shows the result of decreasing the register value down to 0. You can notice that bottom half of picture is slightly more open than top half, due to the fact that in this picture the nominal value is 1.

Fig. 16. This image shows the result of increasing the register value up to 15. You can notice that bottom half of picture is shrinking, while top half remains unaffected.

SERVICING

REGISTER #133 /NAME V-ASPECT

"V-ASPECT". This correction affect full image , shrink or expand it. It's very similar to Vsize because both do the same but Vaspect should be used to adjust the ratio 4:3 or 16:9. The register can take values from 0 up to 63. If you decrease the register value down to 0 you'll see the fig 17. If you increase the register value up to 63 you'll see fig. 18.

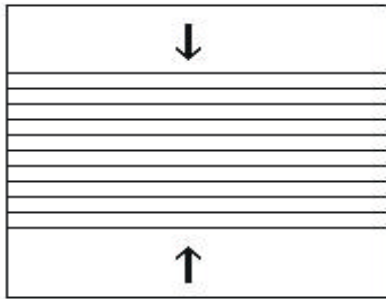


Fig. 17

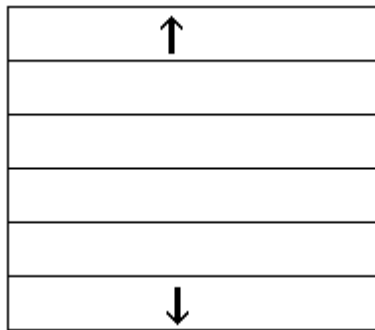


Fig. 18

Figure 17: This image show the result of decreasing the nominal register value down to 0. You can notice that full image is shrinking changing the ratio.

Figure 18: This image shows the result of increasing the nominal register value up to 63. You can notice that vertical height is fully open affecting the ratio.

REGISTER # 135 / NAME V-POSITION

The "V-POSITION". This correction affected vertical height and width size of picture. The register can take values from 0 up to 63. If you decrease the register value down to 0 you'll see the fig 19. If you increase the register value up to 63 you'll see fig. 20

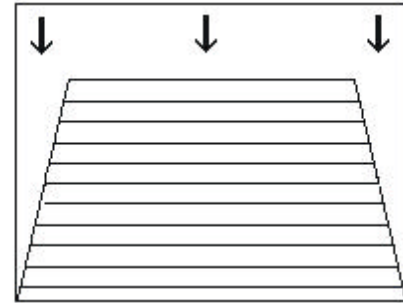


Fig. 19

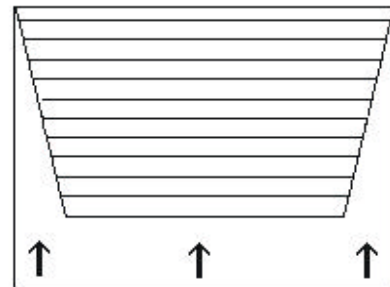


Fig.20

Fig. 19. This image shows the result of increasing the register value down to 0. You can notice that the full image is moving downward, while top half is shrinking, and bottom half is expanding

Fig. 20. This image shows the result of increasing the register value up to 63. You can notice that the full image is moving upward. While bottom half is shrinking, and top half is expanding.

REGISTER # 136/ NAME H-SIZE

This register controls the horizontal raster amplitude through the EW_DRIVE Pin (EW_DRIVE signal DC bias adjustment). The values in this register can go from 0 up to 63. If you decrease the register value down to 0 you'll see the fig. 21. If you increase the register value up to 63 you'll see the Fig 22.



Fig.21

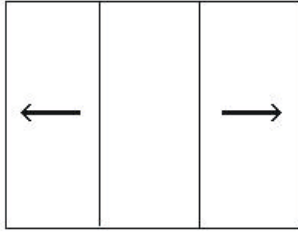


Fig.22

Fig. 21 This image shows the result of decreasing the register down to 0, notice that all the screen is shrinking horizontally

Fig. 22. This image shows the result of increasing the register up to 63, notice that horizontal width is fully open.

REGISTER # 138/ NAME H-POSITION

Horizontal position adjustment. Increasing the register value up to 63 the image start moving from right to left. If the register value decrease, the image starting moving from left to right.

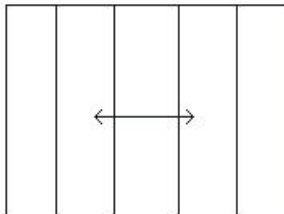


Fig.23

REGISTER # 139 NAME PIN-AMP

The "PIN-AMP" register can take values from 0 up to 63. If you decrease the register value down to 0 you'll see the fig 24. If you increase the register value up to 63 you'll see fig. 25.

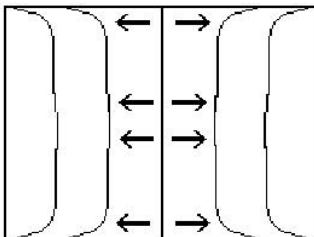


Fig.24

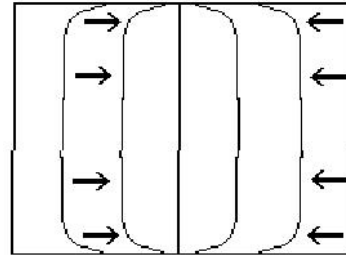


Fig.25

Fig 24. This image shows the result of decreasing the register value down to 0. This correction affect the top half of the picture as result the top half is bowed outward.

Fig. 25. This images shows the result of increasing the register value up to 63. Again this correction affected the raster but only the top half of the picture which is shrinking.

REGISTER # 140 /NAME PIN-PHASE

The "PIN-PHASE" register can take values from 0 up to 63. If you decrease the register value down to 0 you'll see the fig 26. If you increase the register value up to 63 you'll see fig. 27.

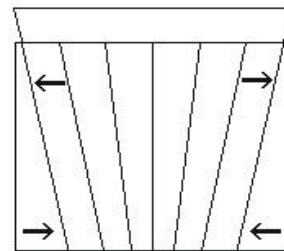


Fig.26

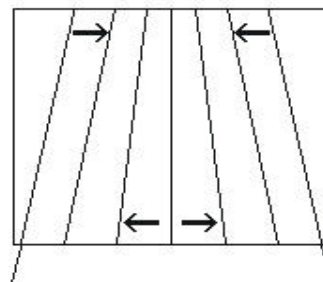


Fig.27

Fig. 26. This image shows the result of decreasing the register down to 0. You can notice that top of picture is widely open while the bottom is shrinking this correction create a trapezoid image.

Fig. 27. This image show the result of increase the register up to 63. You can notice that the top of the image is shrinking while the bottom is fully open, this create a trapezoid image.

REGISTER # 141/ NAME UP-CPIN

The "UP-CPIN" correction affected only upper right corner and upper left corner of picture. The register can take values from 0 up to 63. If you decrease the register value down to 0 you'll see the fig 28. If you increase the register value up to 63 you'll see fig. 29.

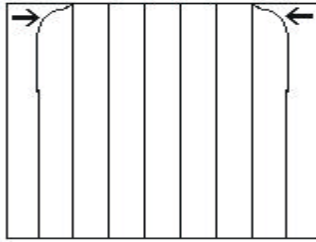


Fig.28

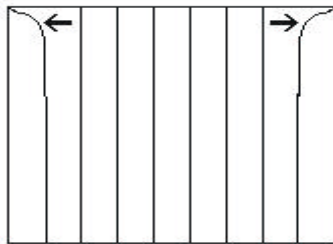


Fig.29

Fig. 28. This images shows the result of decreasing the register value down to 0. This correction affected only the upper corners which are bowed inward.

Fig. 29. This image shows the result of increasing the register value up to 63. This correction affected only the upper corners which are bowed outward.

REGISTER # 142/NAME LO-CPIN

The "LO-CPIN" correction affected only lower right corner and lower left corner of picture. The register can take values from 0 up to 63. If you decrease the register value down to 0 you'll see the fig 30. If you increase the register value up to 63 you'll see fig. 31.

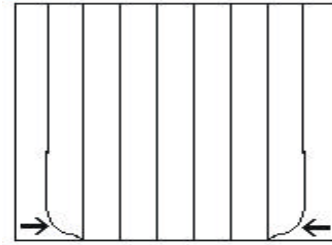


Fig.30

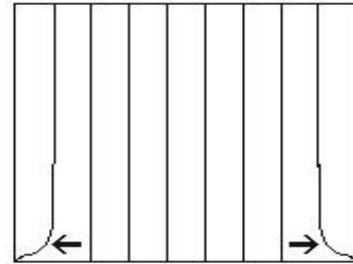


Fig.31

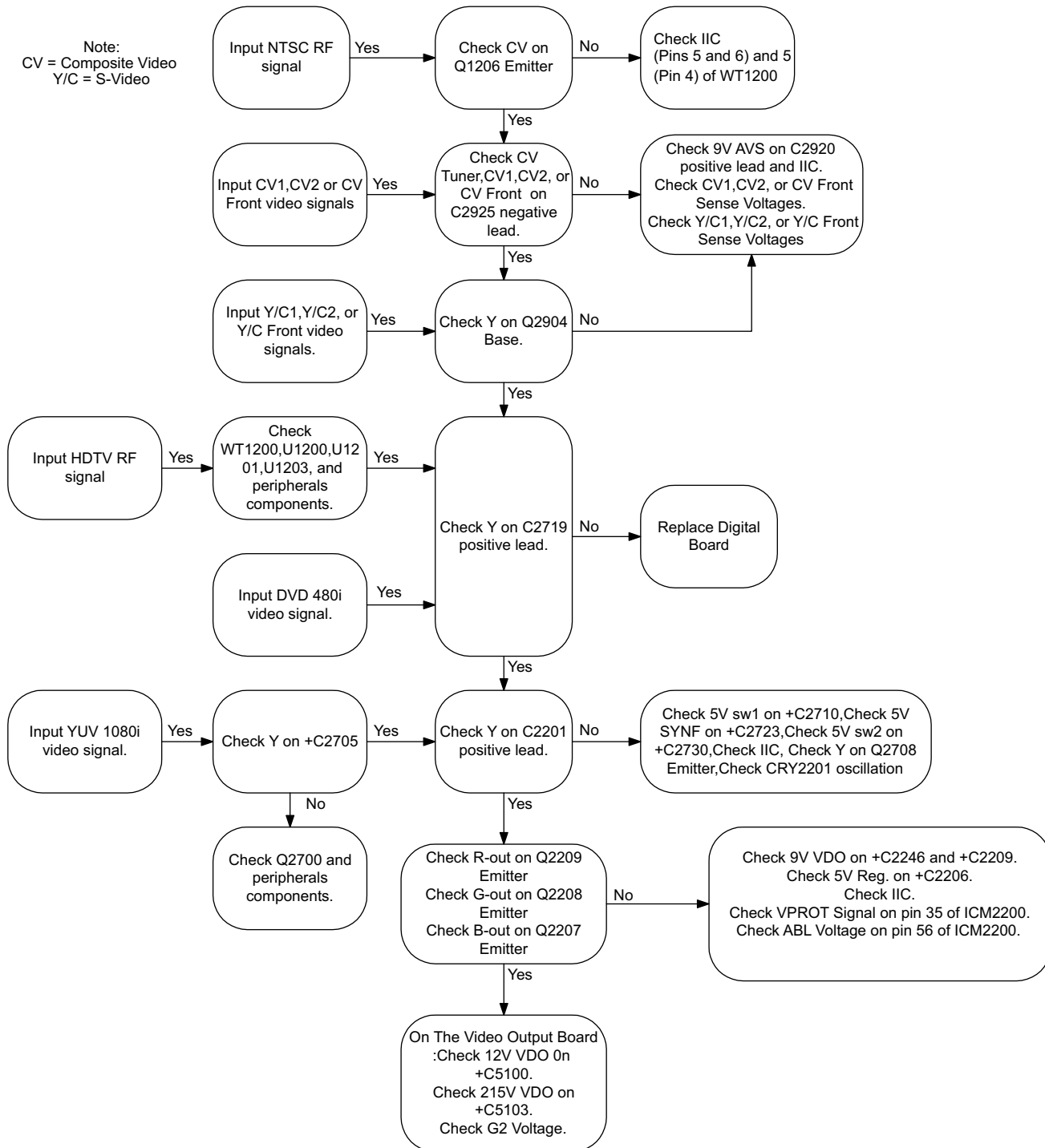
Fig 30. This image shows the result of decreasing the register value down to 0. This correction affected only the lower corners which are bowed inward.

Fig. 31 This image shows the result of increasing the register value up to 63. This correction affected only the lower corners which are bowed outward at the maximum value.

SERVICING

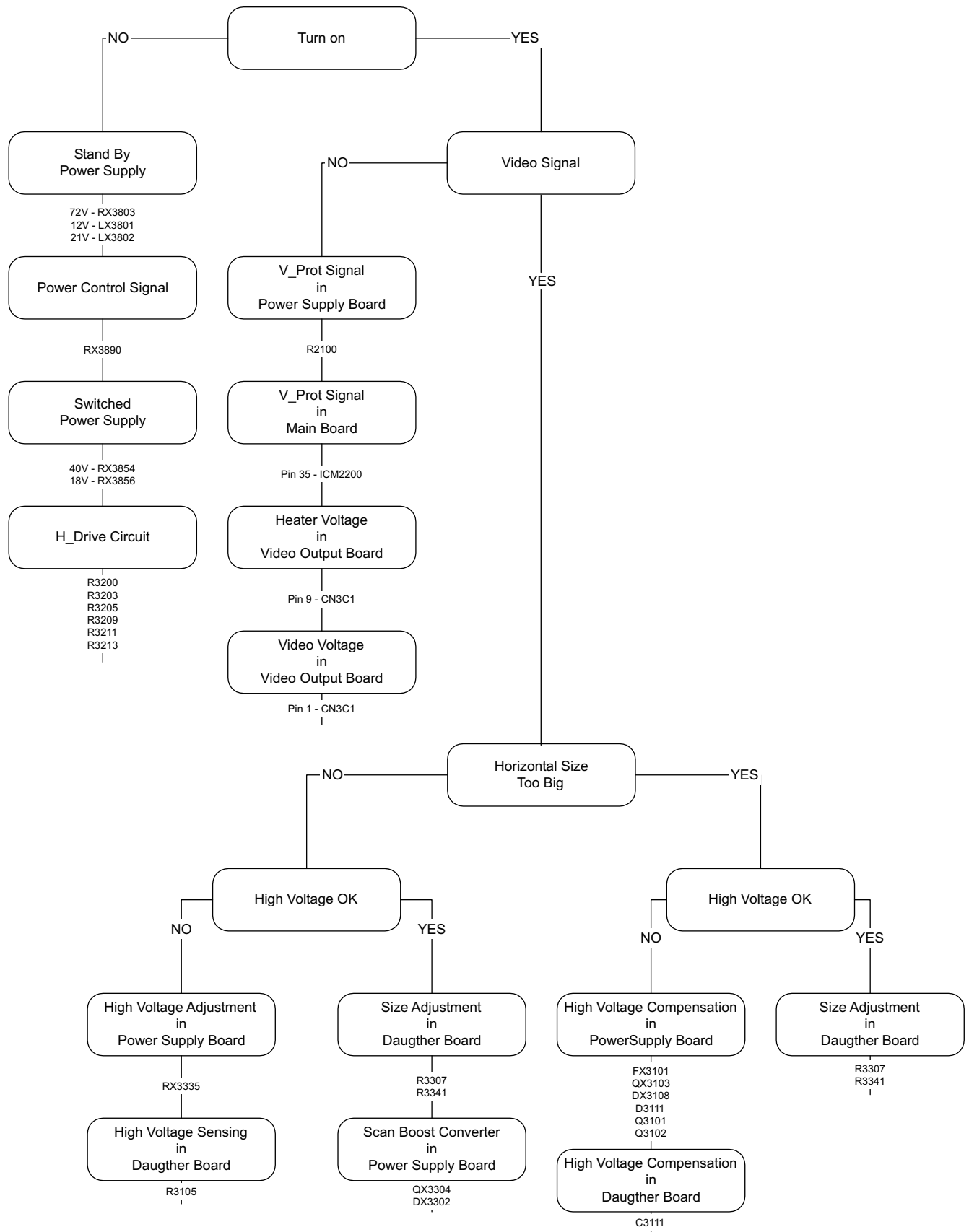
TROUBLESHOOTING

No Video, Raster and H.V. OK (main module)



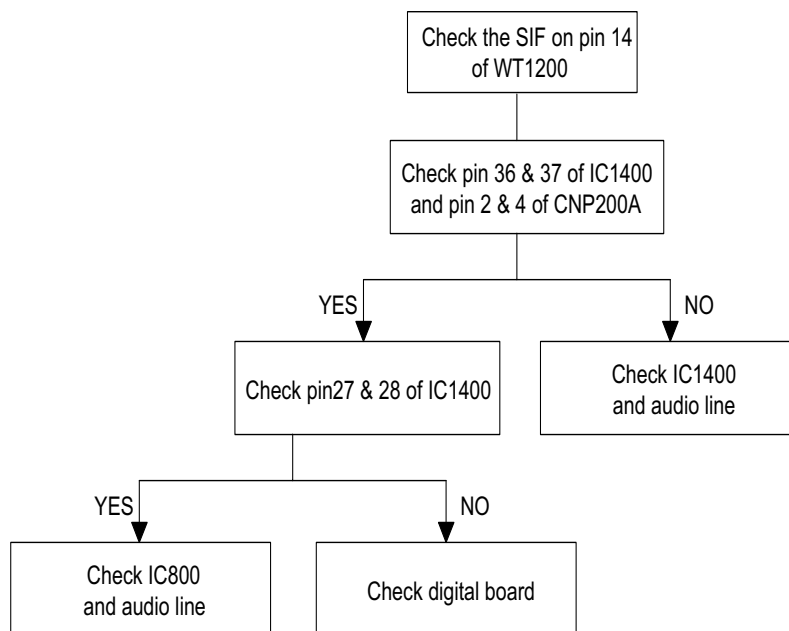
SERVICING

Horizontal Deflection and High Voltage

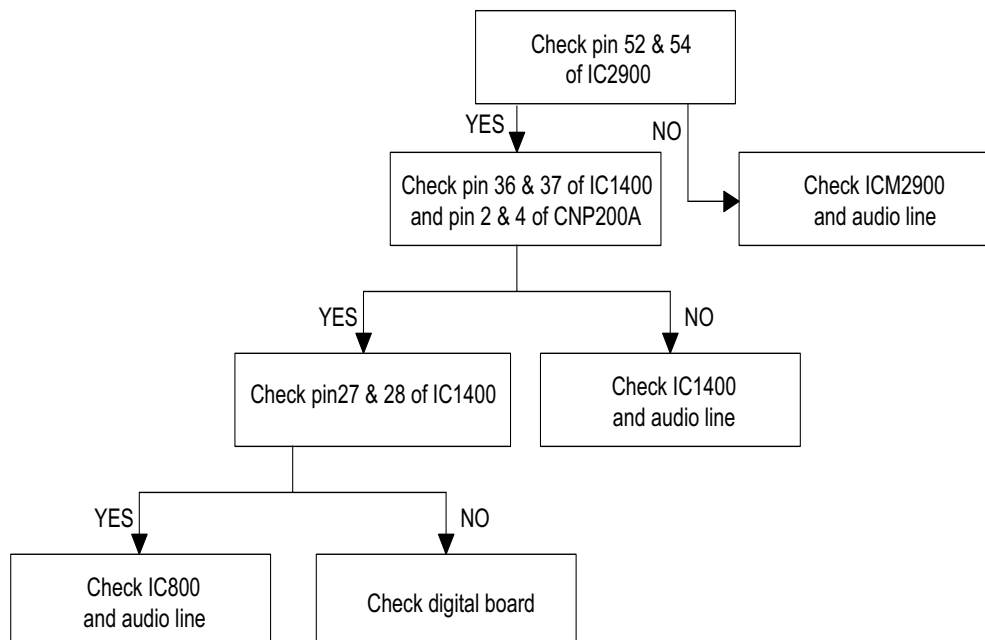


SERVICING

No Sound (Analog RF)

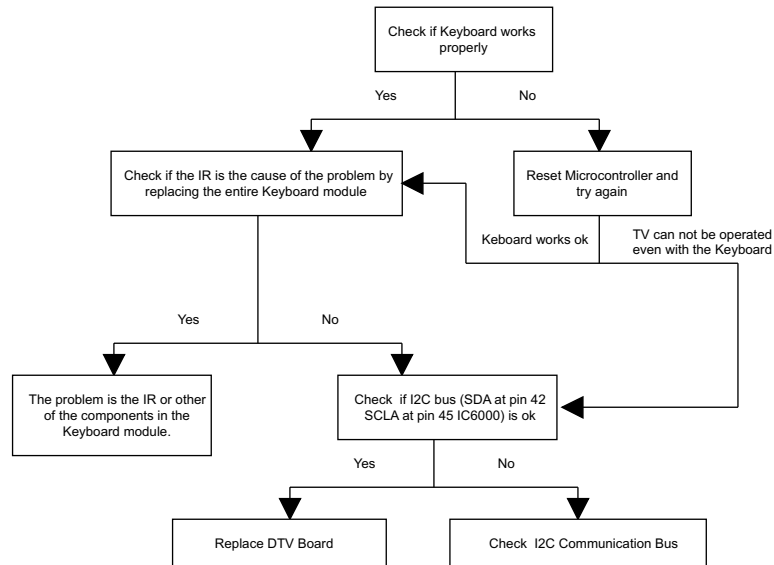


No Sound (auxiliary input)

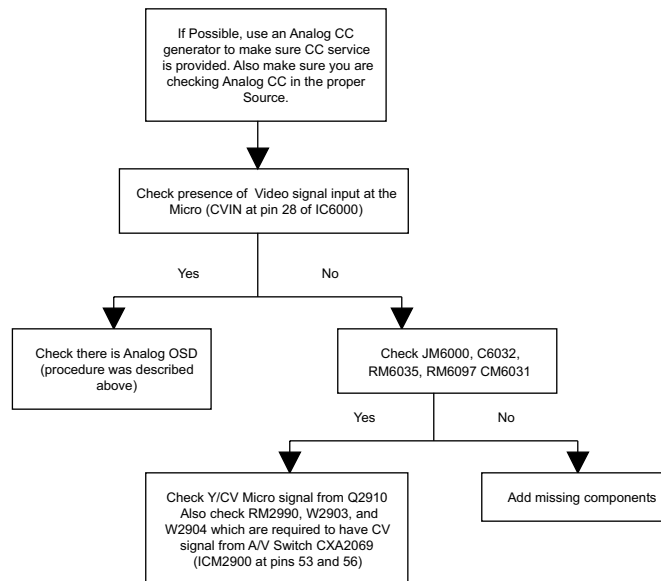


SERVICING

Remote does not work properly (micro section)

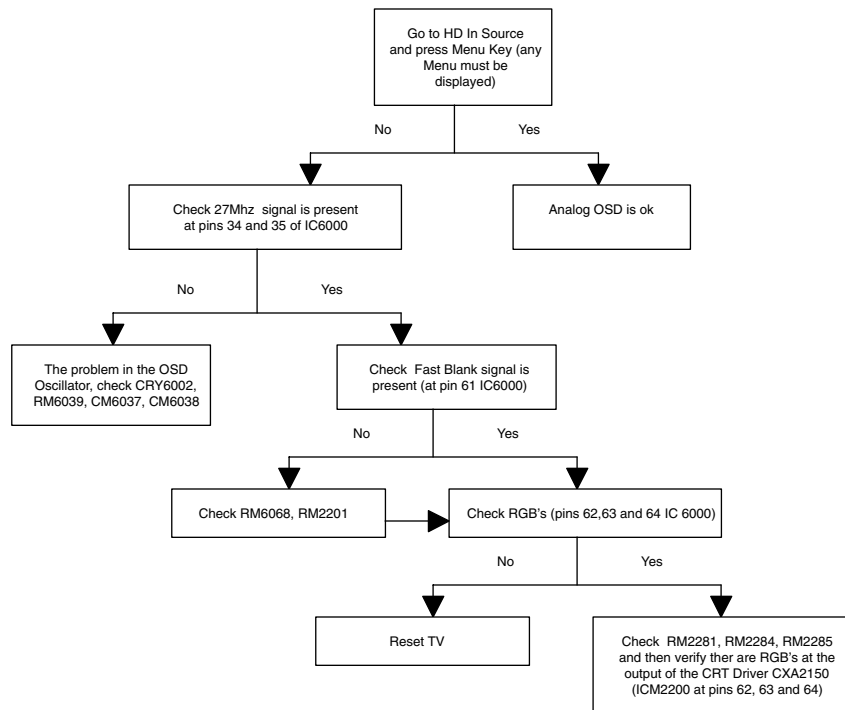


Analog CC / Analog Rating are not displayed (micro section)

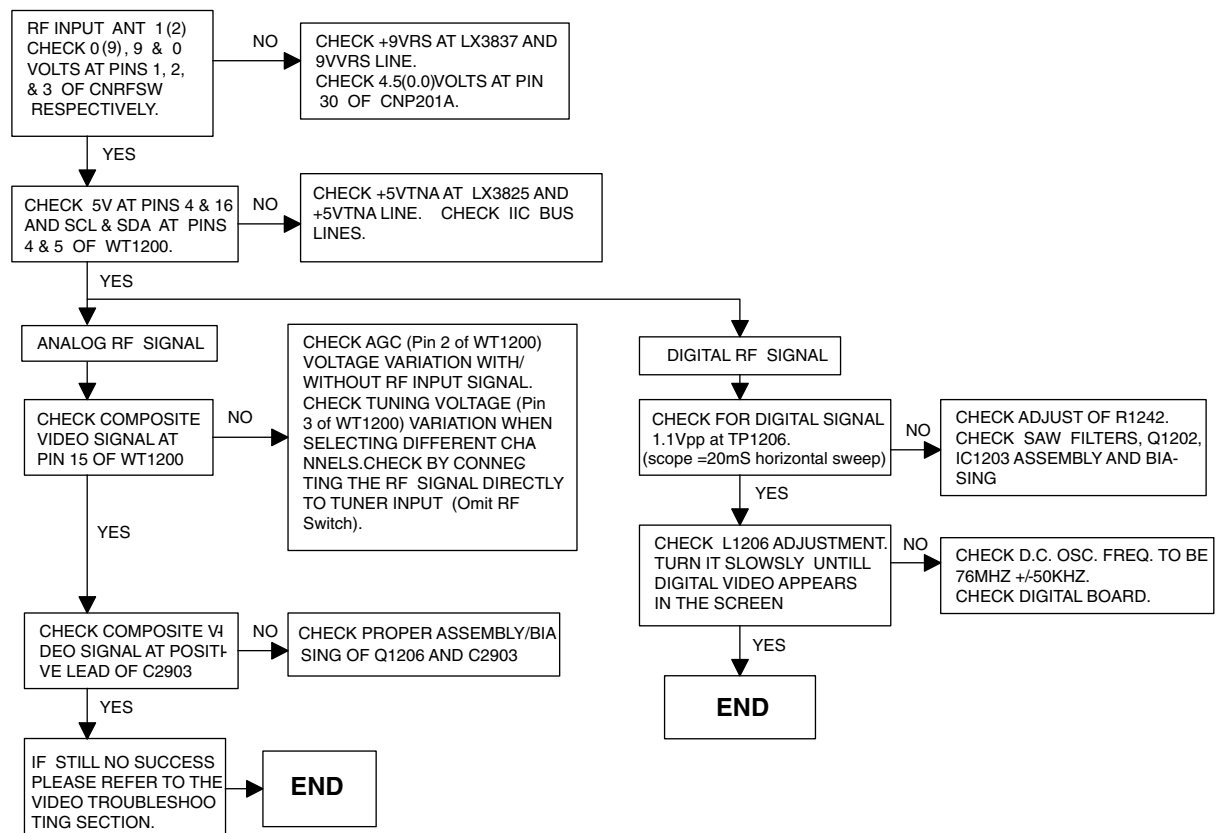


SERVICING

No Analog OSD (micro section)

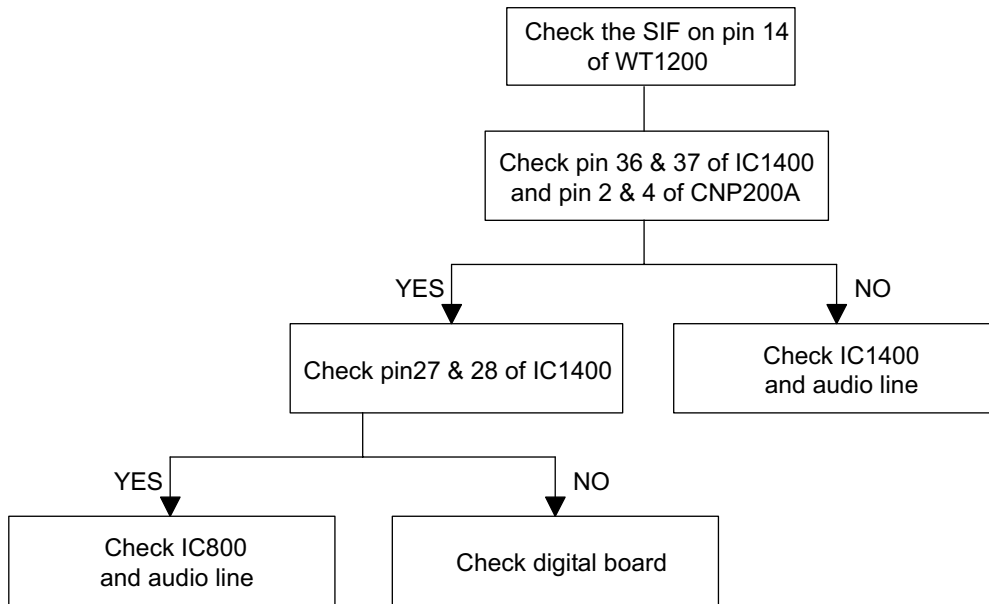


No Video (RF section)

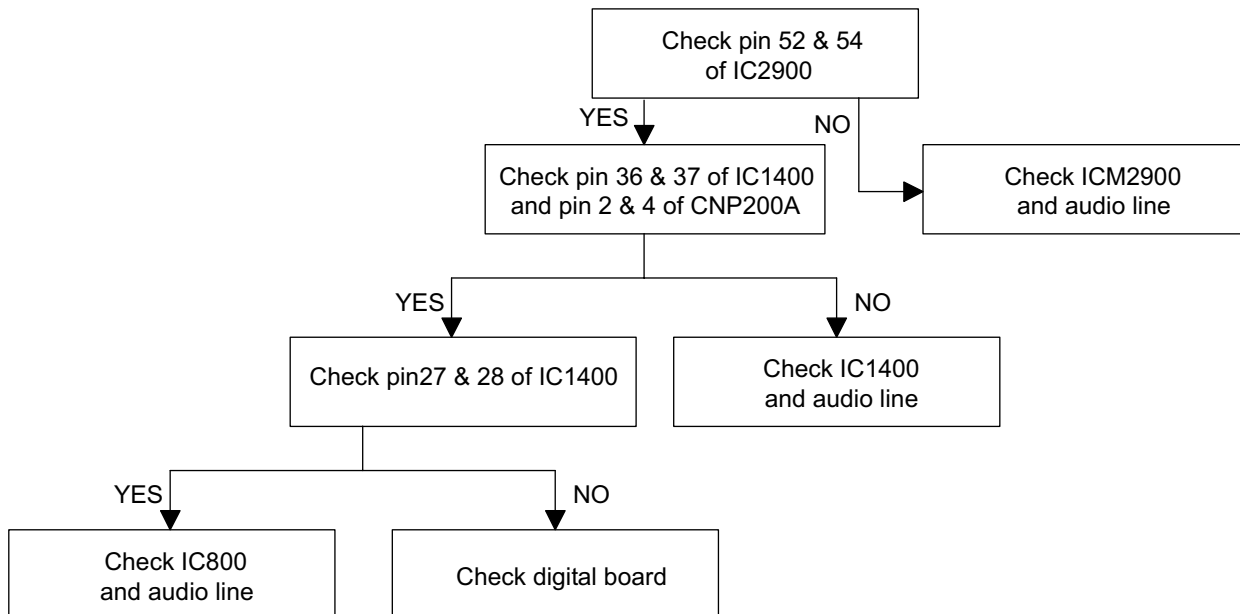


SERVICING

No Sound (Analog RF)



No Sound (auxiliary input)



MODEL PARTS

PARTS

MODEL PARTS

This model is module level repair (in and out of warranty) and is covered by a 90 days labor/one year parts limited warranty. Refer to the last page of the opguide for detailed warranty information.

Parts contact information:

Voice: 1-888-3-ZENITH

Fax: 1-888-6-ZENITH

Mail: Zenith National Parts
201 James Record Road
Huntsville, AL 35824-1513

C32V23

PART NUMBER	DESCRIPTION
150-D07G	Coil, Degausser, CU 38 In 370 Turn 106 Ohm
206-03767	Instr Book, Operating Guide
820-10588	Coil, Degausser
824-10108	Cover, Blank, Tweeter Opening
830-10009	Decorative Item
849-10049	Speaker Ass'y
852-10062	Connector and Cable Assembly, CTV Yoke
882-10019	Grounding Ass'y, White, Dag
882-10020	Gnd Strap Ass'y, CRT
900-10056	CRT w/Yoke Ass'y, (ITC A80ERF031X64)
992-10040	Lens, IR
A-18681-01	Line Cord Ass'y
P009-02291	Module, Video Output
P014-12361-04	Front Cabinet
P014-12362-03	Rear Cabinet
P050-02864-11	Connector & Cable Ass'y, Speaker Interconnect Harness
P124-00240	Space Command Transmitter, MBR4286
P138-01968-06	Cabinet Grille, Perforated Metal, Speaker
P149-00706	Magnet, Purity Correction, 'Chevron Magnet'
PA-19393-06	Cover, Front Jack
PA-19567	Module, One Panel
PA-19568	Module, Scan Boost
PF-54854	Keyboard Ass'y
PF-54857	Front Jacks Ass'y

C32V23-82

PART NUMBER	DESCRIPTION
020-04330-P72	Coil, Degausser
150-D07G	Coil, Degausser, CU 38 In 370 Turn 106 Ohm
206-03767-01	Instr Book, Operating Guide
830-10009	Decorative Item
849-10049	Speaker Ass'y
882-10019	Grounding Assy, Wire and Terminal, White, DAG
882-10020	Gnd Strap Ass'y, CRT
992-10040	Lens, IR
A-18681-01	Line Cord Ass'y with Yeonho Connector
P009-02289-04	Module, Main Ass'y
P009-02290-03	Module, Power Supply
P009-02291-03	Module, Video Output
P009-02292-02	Module, Digital Board with ACC & DCC

P014-12361-04	Front Cabinet
P014-12362-03	Rear Cabinet
P050-02864-11	Connector & Cable Ass'y, Speaker Interconnect Harness
P124-00240	Space Command Transmitter, MBR4286
P138-01968-06	Cabinet Grille, Perforated Metal
P149-00706	Magnet, Purity Correction, 'Chevron Magnet'
PA-19393-06	Cover, Front Jack
PA-19567-03	Module, One Panel
PA-19568-03	Module, Scan Boost
PA-19590	CRT with Yoke (2H), Flat 32V Panasonic M80LS
PF-54854	Keyboard Ass'y
PF-54857	Front Jacks Ass'y
PF-55008	Cover & RF Switch Ass'y

C34W23

PART NUMBER	DESCRIPTION
020-04330-P71	Coil, Degausser
150-D07G	Coil, Degausser, CU 38In 370Turn 106 Ohm,
206-03767	Instr Book, Operating Guide,
830-10009	Decorative Item
849-10049	Speaker Ass'y
882-10019	Grounding Ass'y, Wire and Terminal, White, Dag
949-10019	Convergence Helper
A-18681-01	Line Cord Ass'y with Yeonho Connector
A-18695-P29	Gnd Strap Ass'y, CRT
P009-02289-02	Module, Main
P009-02290-02	Module, Power Supply
P009-02291-02	Module, Video Output
P012-10921-03	Molded Plastic, Frame
P012-10933	Molded Plastic, Bracket, CRT Mounting
P014-12367	Front Cabinet
P014-12368	Rear Cabinet
P030-01541	Decorative Item, Overlay, Jack Pack
P050-02864-12	Connector & Cable Ass'y, Speaker Interconnect Harness
P050-02886-04	Connector and Cable Assembly, 36V CTV Yoke (Panasonic)
P050-02894	Connector and Cable Assembly, SVM To Yoke CRT
P124-00240	Space Command Transmitter, MBR4286
P192-00929	Crystal Window, IR
PA-19567-02	Module, One Panel
PA-19568-02	Module, Scan Boost
PA-19570	CRT with Yoke Ass'y, 34W, W86LQQ350X97 (Toshiba)
PA-19589	Power Control Ass'y
PF-54854-01	Keyboard Ass'y
PF-54857-01	Front Jacks Ass'y
PF-55008	Cover & RF Switch Ass'y

C34W23-2

PART NUMBER	DESCRIPTION
020-04330-P71	Coil, Degausser
150-D07G	Coil, Degausser, CU 38 In 370 Turn 106 Ohm,
206-03767-01	Instr Book, Operating Guide,
830-10009	Decorative Item
849-10049	Speaker Ass'y
949-10019	Convergence Helper
A-18681-01	Line Cord Ass'y with Yeonho Connector

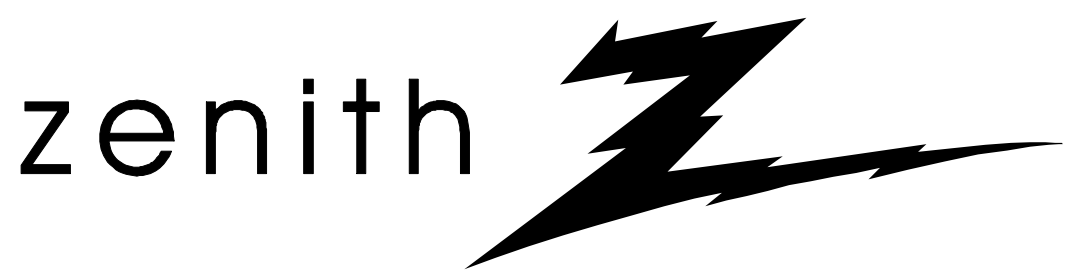
MODEL PARTS

A-18695-P29	Gnd Strap Ass'y, CRT
P009-02289-06	Module, Main Ass'y
P009-02290-02	Module, Power Supply
P009-02291-02	Module, Video Output
P009-02292-02	Module, Digital Board, with ACC & DCC
P014-12367	Front Cabinet
P014-12368	Rear Cabinet
P030-01541	Decorative Item, Overlay, Jack Pack
P050-02864-12	Connector & Cable Ass'y, Speaker Interconnect Harness
P050-02886-04	Connector and Cable Assembly, CTV Yoke
P050-02894-01	Connector and Cable Ass'y, SVM to Yoke
P124-00240	Space Command Transmitter, MBR4286
P192-00929	Crystal Window, IR
PA-19567-02	Module, One Panel
PA-19568-02	Module, Scan Boost
PA-19570	CRT with Yoke Assembly (ITC W86LQQ350X97)
PA-19589	Power Control Ass'y
PF-54854-01	Keyboard Ass'y
PF-54857-01	Front Jacks Ass'y
PF-55008	Cover & RF Switch Ass'y

C36V23

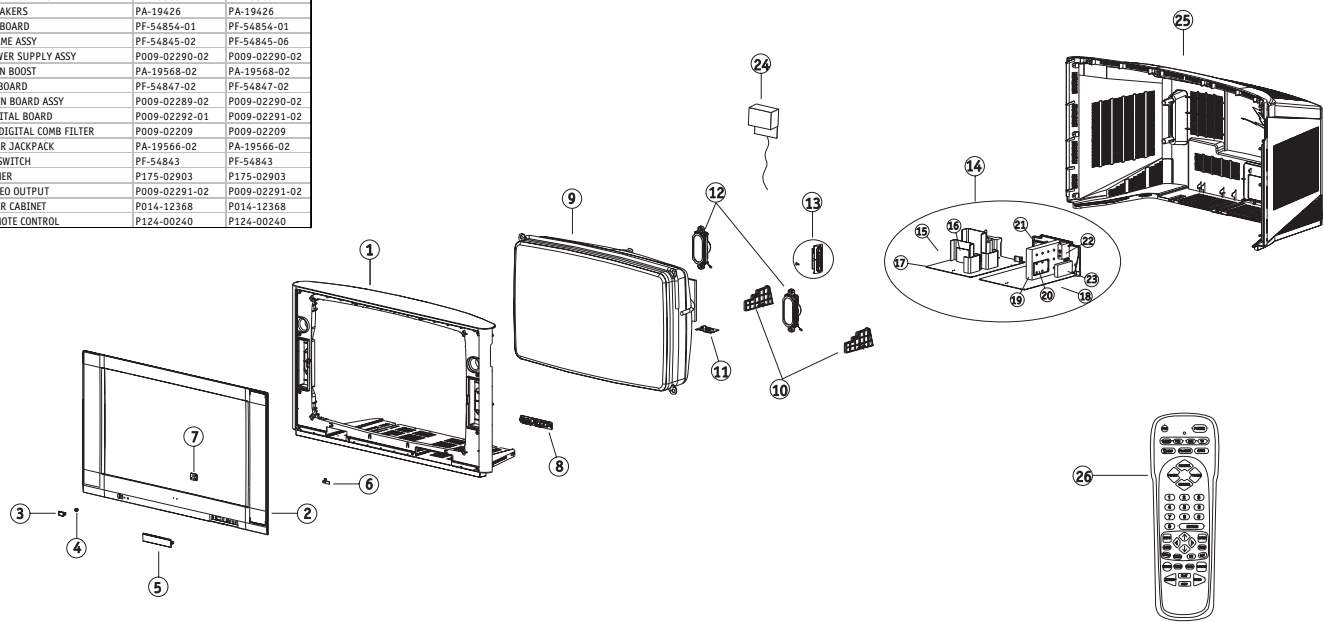
PART NUMBER	DESCRIPTION
150-D07G	Coil, Degausser, CU 38In 370Turn 106 Ohm
206-03722-01	Addendum, Connection Panel, HD-S
206-03767	Instr Book, Operating Guide
811-10047	Power Cord Ass'y, 2 Conductor
820-10657	Coil, Degausser
824-10102	Cover, Front Jack, Molded Plastic
824-10108	Cover, Blank, Tweeter Opening
830-10009	Decorative Item
849-10049	Speaker Ass'y
852-10066	Connector & Cable Assembly, Speaker Interconnect
882-10019	Grounding Ass'y, Wire and Terminal, White, Dag
882-10025	Gnd Strap Ass'y, CRT, 36V
901-10019	Instr Book, Operation Guide, MMI HD-S 51 Series
924-10113	Space Command Transmitter, MBR3457CT-A
949-10019	Convergence Helper
992-10040	Lens, IR
A-18681-01	Line Cord Ass'y with Yeonho Connector
A-18695-P30	Gnd Strap Ass'y, CRT (Toshiba) 36V
P009-02289-01	Module, Main
P009-02290-01	Module, Power Supply
P009-02291-01	Module, Video Output
P014-12363-04	Front Cabinet
P014-12364-03	Rear Cabinet, TV, Molded Plastic 36V
P050-02864-11	Connector & Cable Ass'y, Speaker Interconnect Harness
P050-02894	Connector and Cable Assembly, SVM To Yoke CRT
P124-00240	Space Command Transmitter, MBR4286
P138-01969-06	Cabinet Grille, Perforated Metal, Speaker
P149-00706	Magnet, Purity Correction, 'Chevron Magnet'
PA-19567-01	Module, One Panel
PA-19568-01	Module, Scan Boost
PA-19569	CRT with Yoke Ass'y, (Toshiba) A90AJZ90X30
PF-54843	Cover & RF Switch Ass'y

PF-54854	Keyboard Ass'y
PF-54857	Front Jacks Ass'y
PF-55008	Cover& RF Switch Ass'y



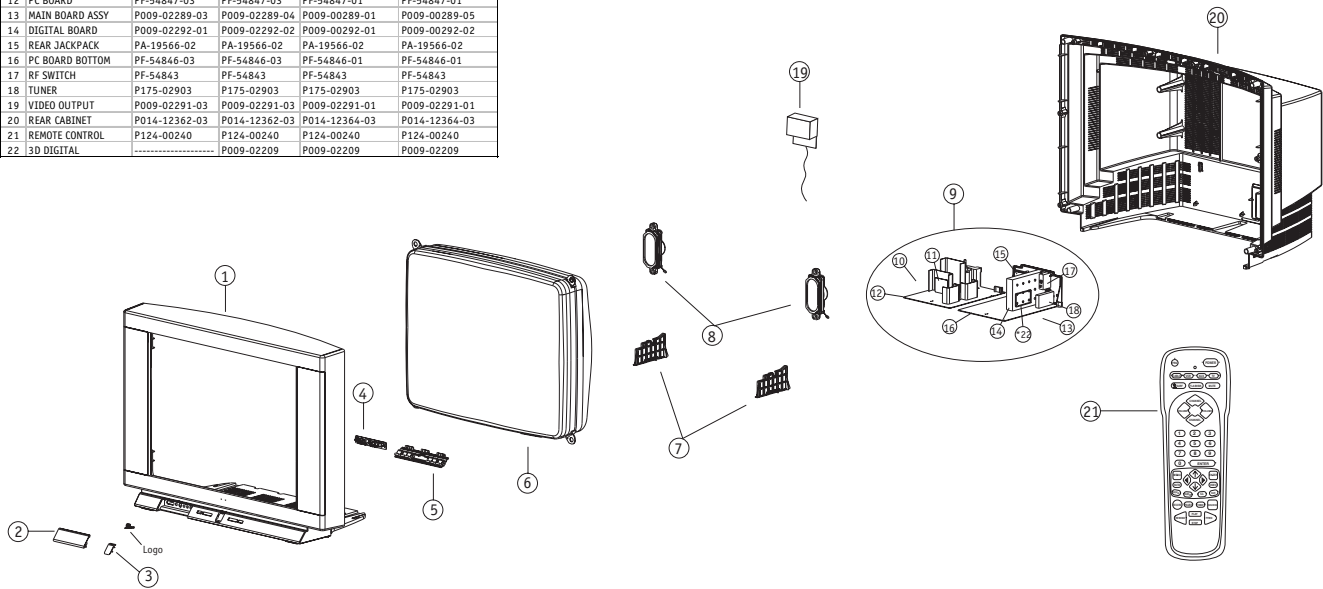
34" Exploded View

REF	DESCRIPTION	C34W23	C34W23-2
1	FRONT CABINET	P014-12367	P014-12367
2	FRONT FRAME	P014-12369	P014-12369
3	POWER BUTTON	P046-10598	P046-10598
4	SPRING COIL	320-062E	320-062E
5	FRONT DOOR	PA-19619	PA-19619
6	SPRING PLATE	4970V00020A	4970V00020A
7	IR LENS	P192-00929	P192-00929
8	FRONT JACK	PF-54857-01	PF-54857-01
9	CRT & YOKE ASSEMBLY	PA-19570	PA-19570
10	CRT SUPPORT	P012-10933	P012-10933
11	POWER CONTROL	PA-19589	PA-19589
12	SPEAKERS	PA-19426	PA-19426
13	KEYBOARD	PF-54854-01	PF-54854-01
14	FRAME ASSY	PF-54845-02	PF-54845-06
15	POWER SUPPLY ASSY	P009-02290-02	P009-02290-02
16	SCAN BOOST	PA-19568-02	PA-19568-02
17	PC BOARD	PF-54847-02	PF-54847-02
18	MAIN BOARD ASSY	P009-02289-02	P009-02290-02
19	DIGITAL BOARD	P009-02292-01	P009-02291-02
20	3D DIGITAL COMB FILTER	P009-02209	P009-02209
21	REAR JACKPACK	PA-19566-02	PA-19566-02
22	RF SWITCH	PF-54843	PF-54843
23	TUNER	P175-02903	P175-02903
24	VIDEO OUTPUT	P009-02291-02	P009-02291-02
25	REAR CABINET	P014-12368	P014-12368
26	REMOTE CONTROL	P124-00240	P124-00240

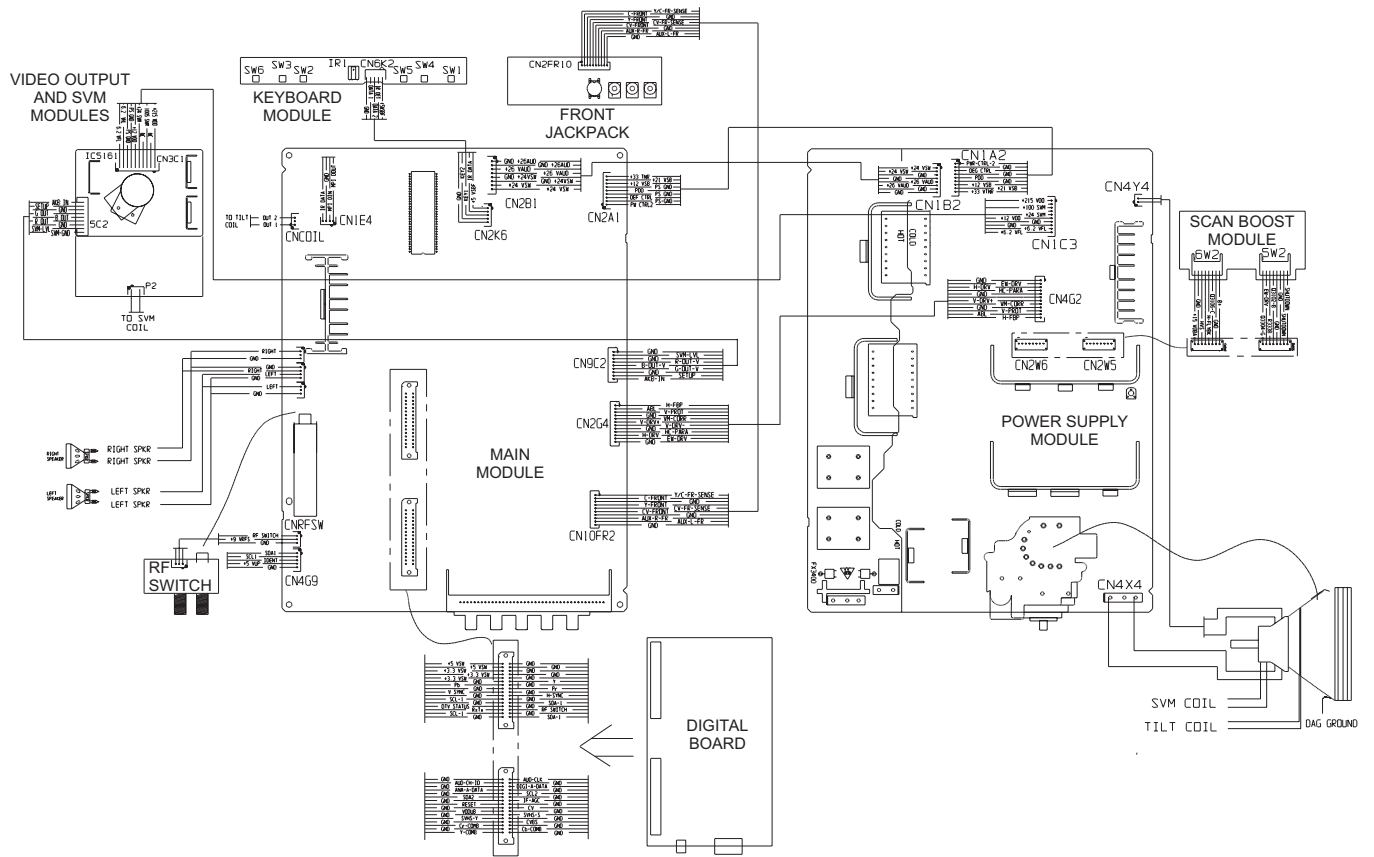


32/36" Exploded View

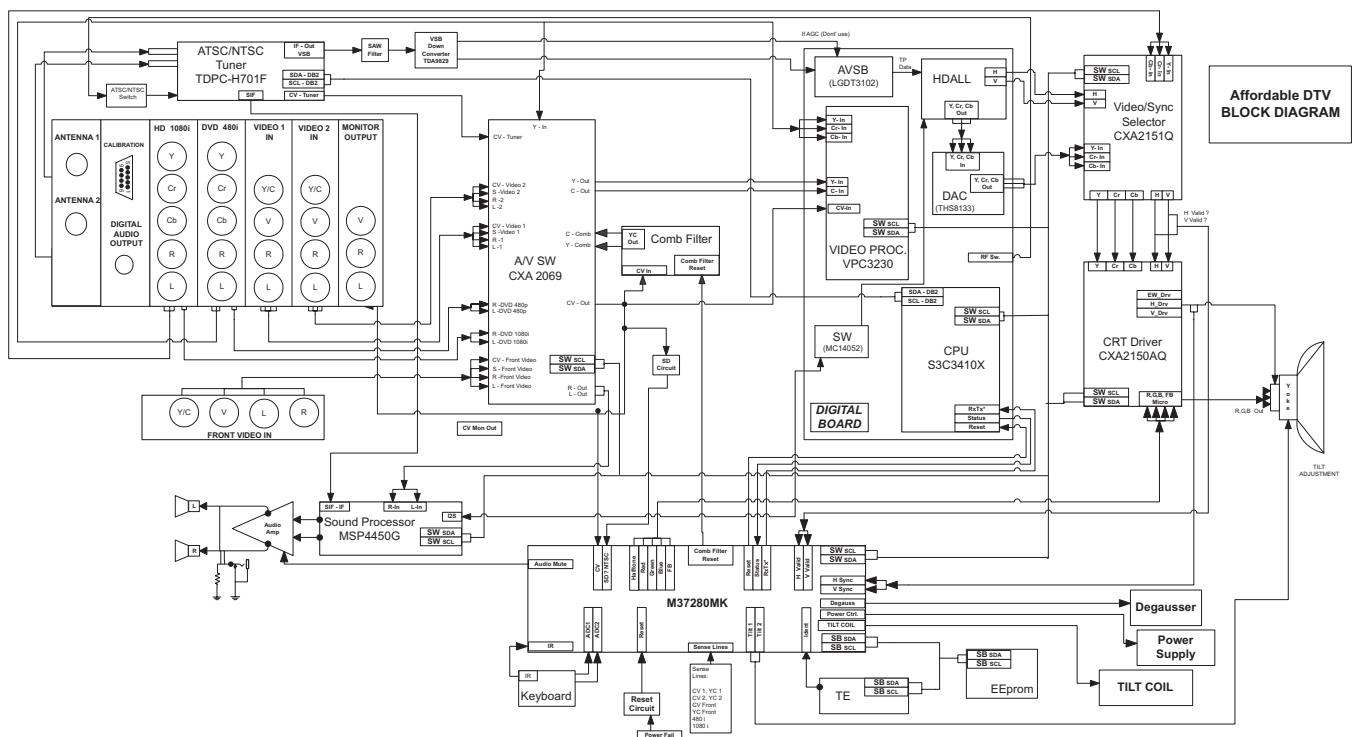
REF	DESCRIPTION	C32V23-8	C32V23-82	C36V23	C36V23-2
1	FRONT CABINET	P014-12361-04	P014-12361-04	P014-12363-04	P014-12363-04
2	FRONT DOOR	P024-03483-02	P024-03483-02	P024-03483-02	P024-03483-02
3	IR LENS	P192-00928	P192-00928	P192-00928	P192-00928
4	FRONT JACK	PF-54857	PF-54857	PF-54857	PF-54857
5	KEYBOARD	PF-54854	PF-54854	PF-54854	PF-54854
6	CRT & YOKE ASSEMBLY	PA-19590	PA-19590	PA-19569	PA-19569
7	CRT SUPPORT	P012-10922	P012-10922	P012-10922-01/02	P012-10922-01/02
8	SPEAKERS	PA-19426	PA-19426	PA-19426	PA-19426
9	FRAME ASSY	PF-54845-03	PF-54845-04	PF-54845-01	PF-54845-05
10	POWER SUPPLY ASSY	P009-02290-03	P009-02290-03	P009-02290-01	P009-02290-01
11	SCAN BOOST	PA-19568-03	PA-19568-03	PA-19568-01	PA-19568-01
12	PC BOARD	PF-54847-03	PF-54847-03	PF-54847-01	PF-54847-01
13	MAIN BOARD ASSY	P009-02289-03	P009-02289-04	P009-02289-01	P009-02289-05
14	DIGITAL BOARD	P009-02292-01	P009-02292-02	P009-02292-01	P009-02292-02
15	REAR JACKPACK	PA-19566-02	PA-19566-02	PA-19566-02	PA-19566-02
16	PC BOARD BOTTOM	PF-54846-03	PF-54846-03	PF-54846-01	PF-54846-01
17	RF SWITCH	PF-54843	PF-54843	PF-54843	PF-54843
18	TUNER	P175-02903	P175-02903	P175-02903	P175-02903
19	VIDEO OUTPUT	P009-02291-03	P009-02291-03	P009-02291-01	P009-02291-01
20	REAR CABINET	P014-12362-03	P014-12362-03	P014-12364-03	P014-12364-03
21	REMOTE CONTROL	P124-00240	P124-00240	P124-00240	P124-00240
22	3D DIGITAL	*****	P009-02209	P009-02209	P009-02209



Interconnect Diagram



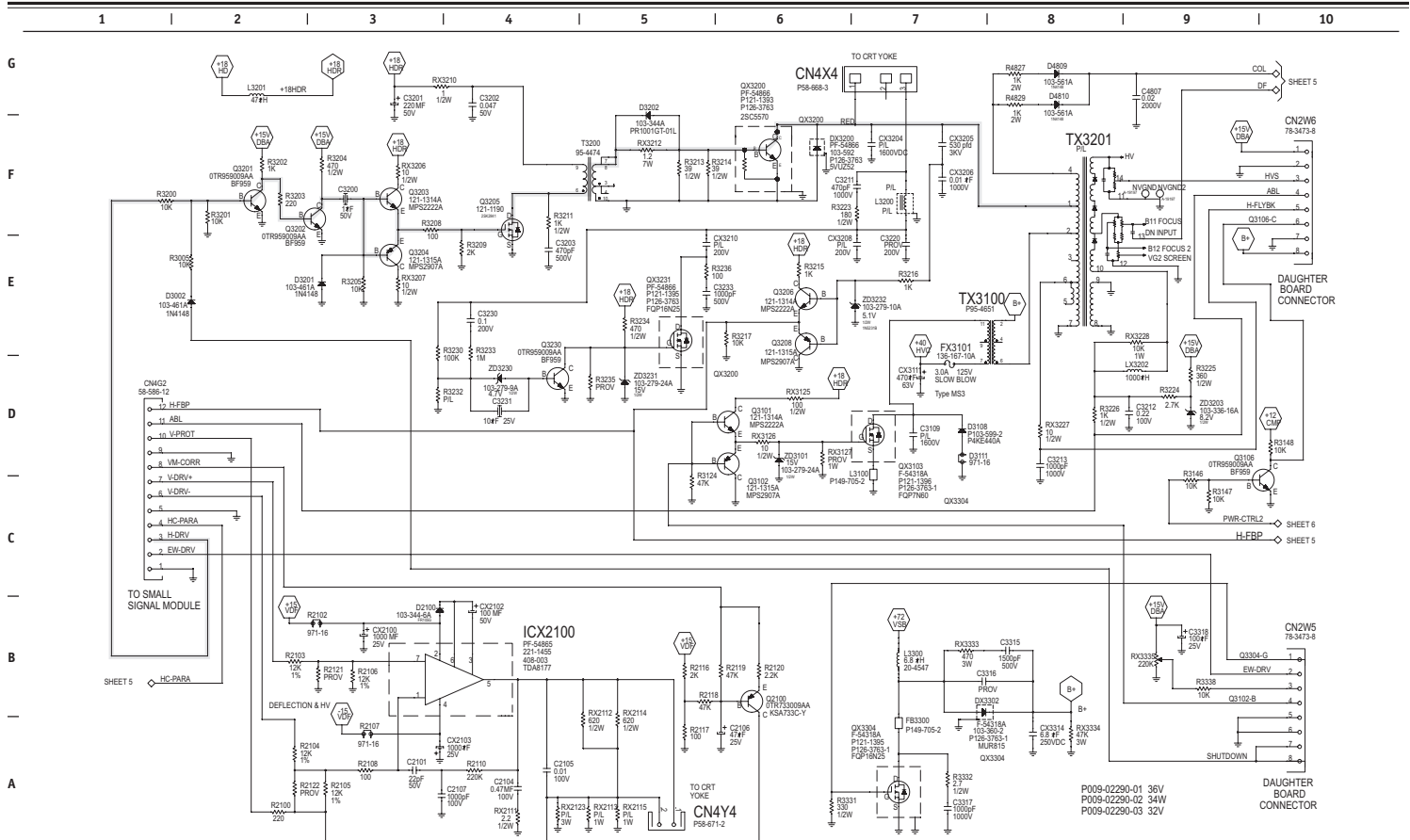
Block Diagram



1	2	3	4	5	6	7	8	9	10
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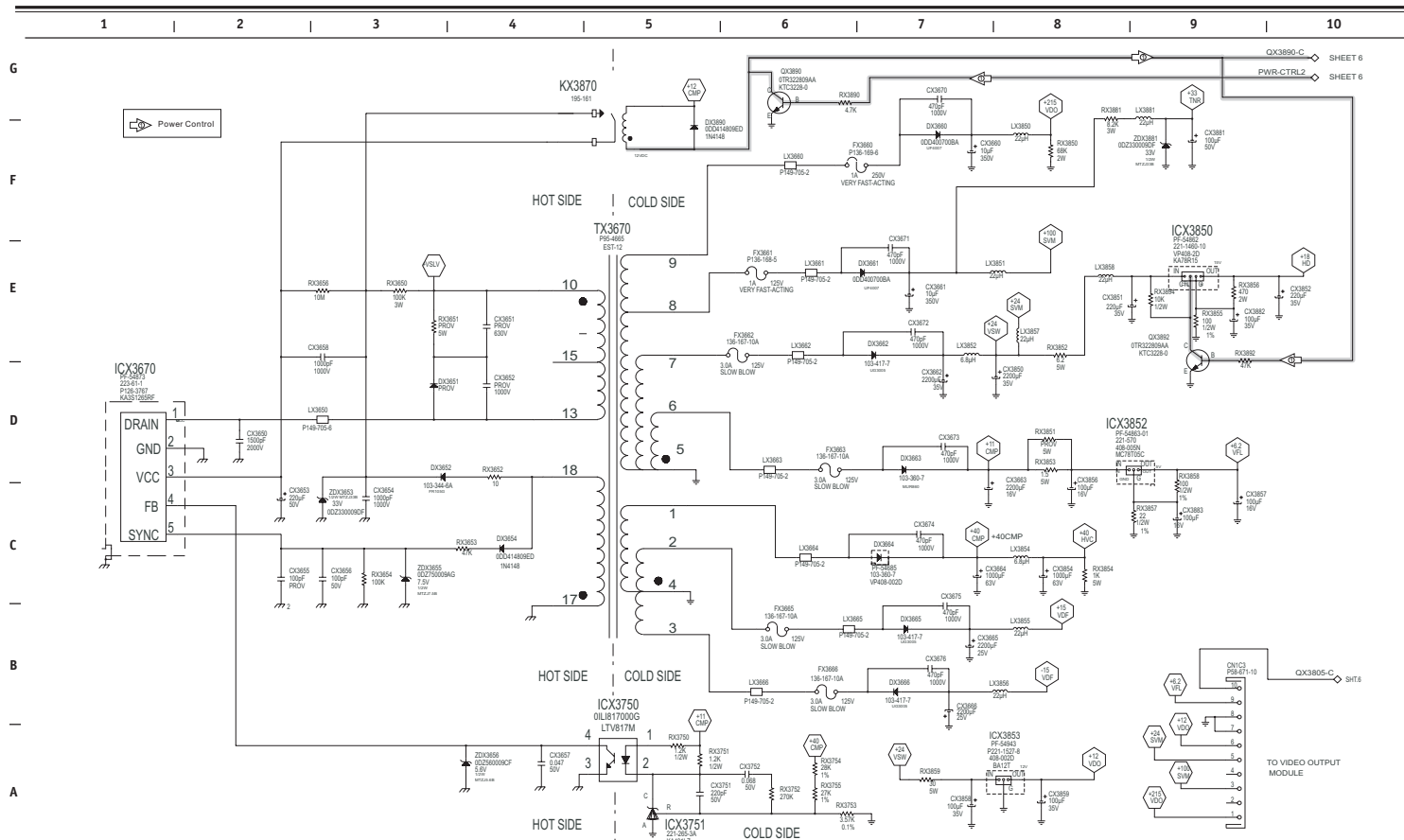
Deflection & HV Circuit



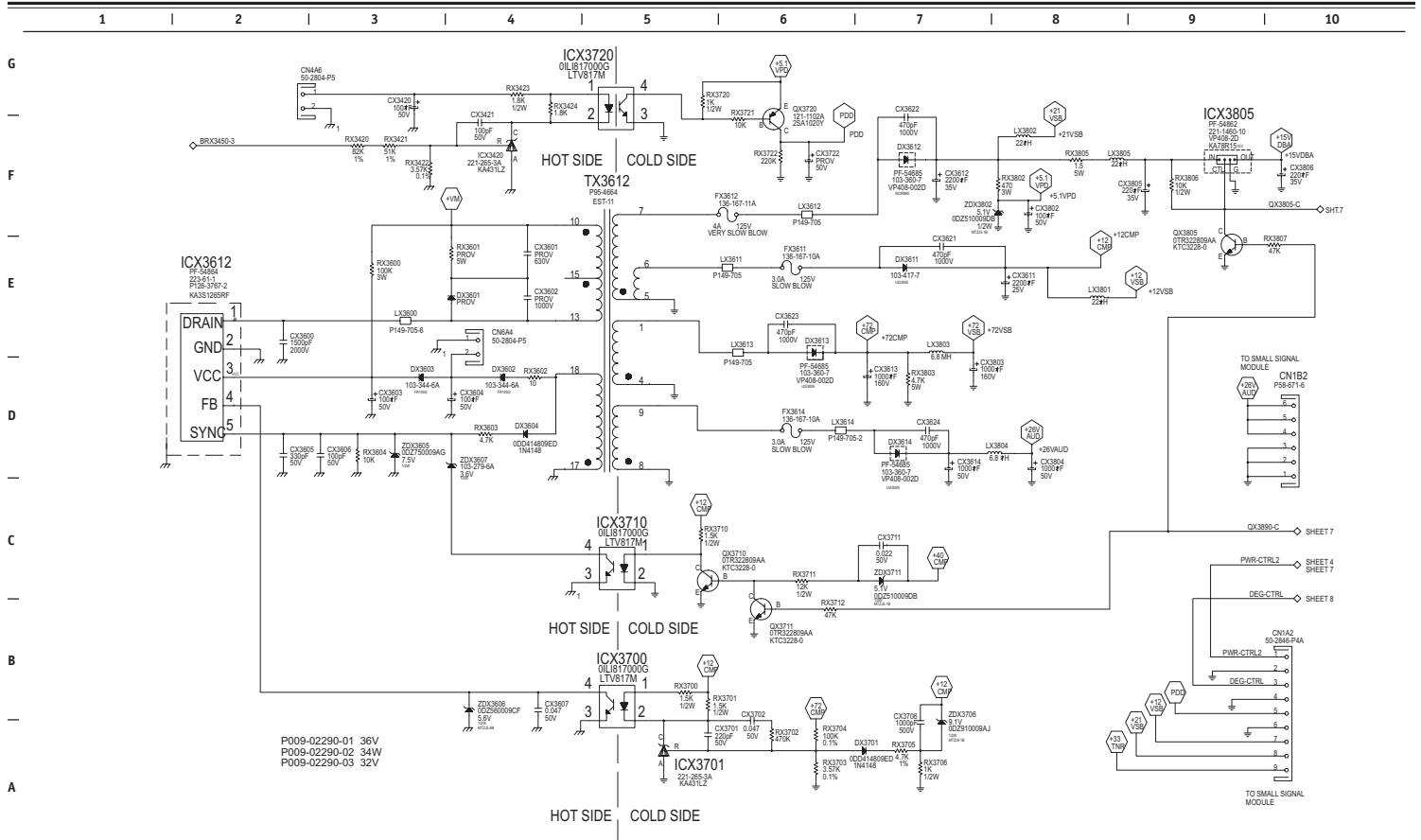
CRITICAL SAFETY COMPONENTS ARE IDENTIFIED BY THE LETTER "X" IN THEIR COMPONENT DESIGNATORS. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

ALL SYMBOLS WITH "M" ON END OF DESIGNATOR
INDICATE SURFACE MOUNTED COMPONENT

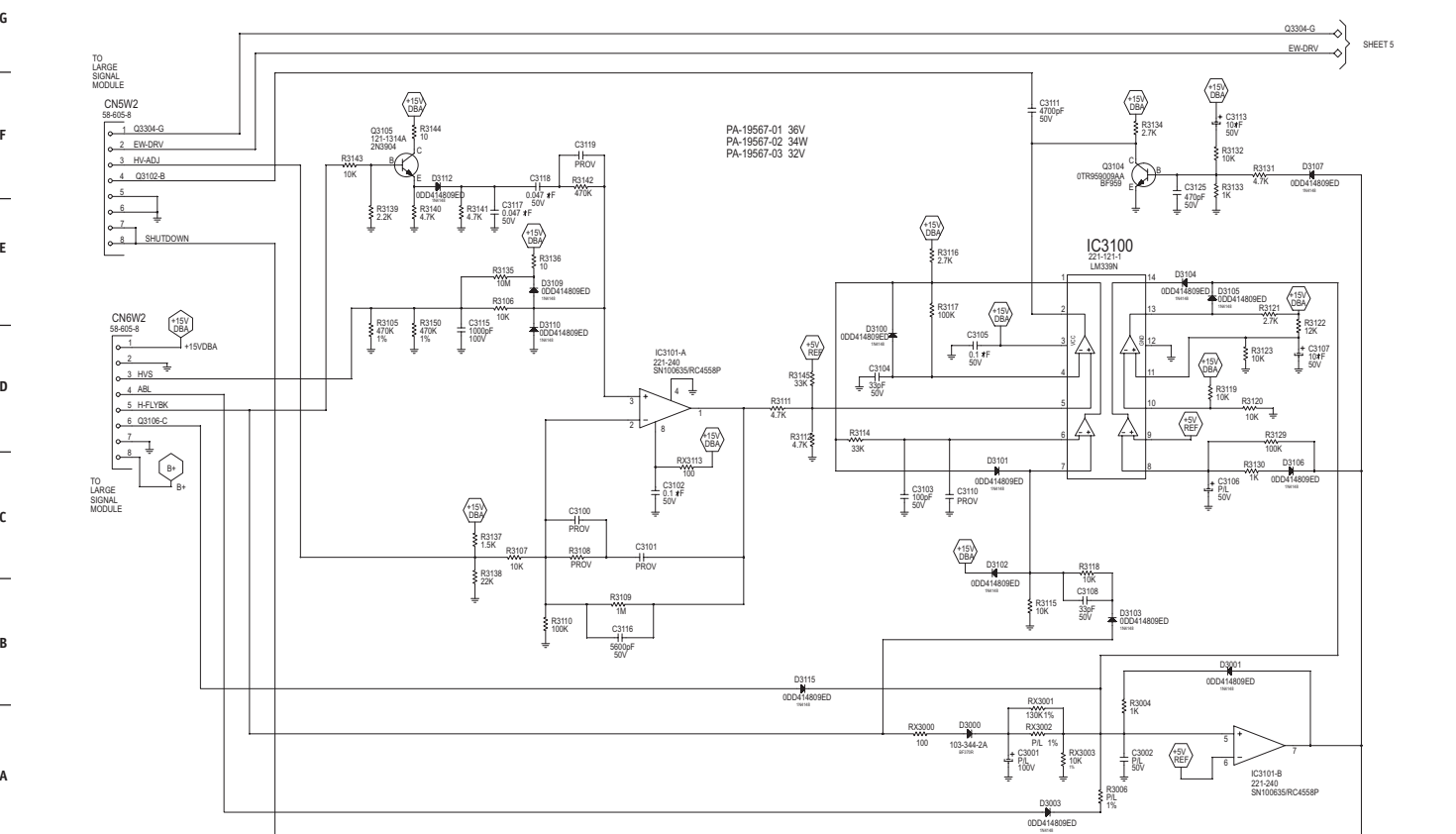
Slave Power Supply Circuit



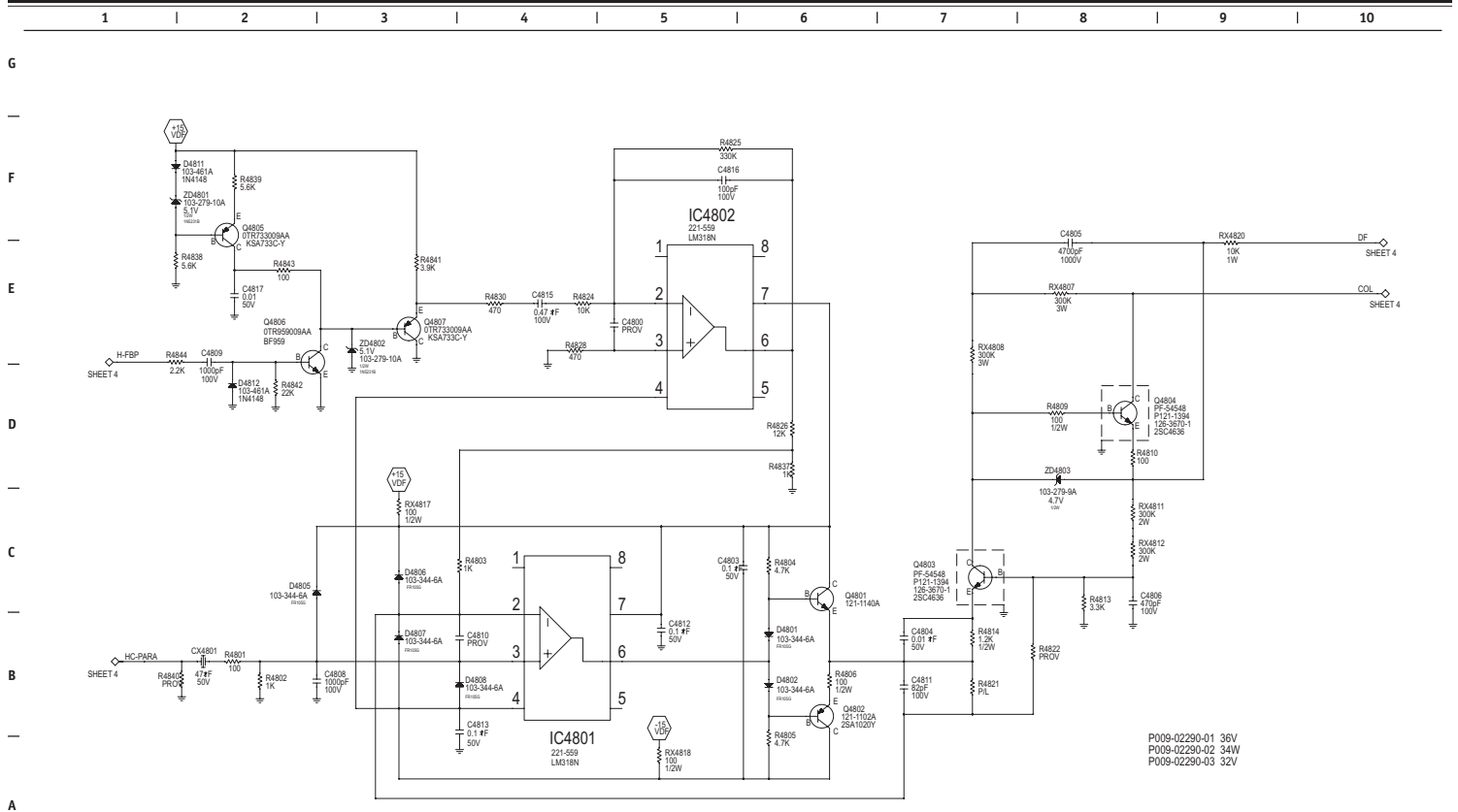
Master Power Supply Circuit



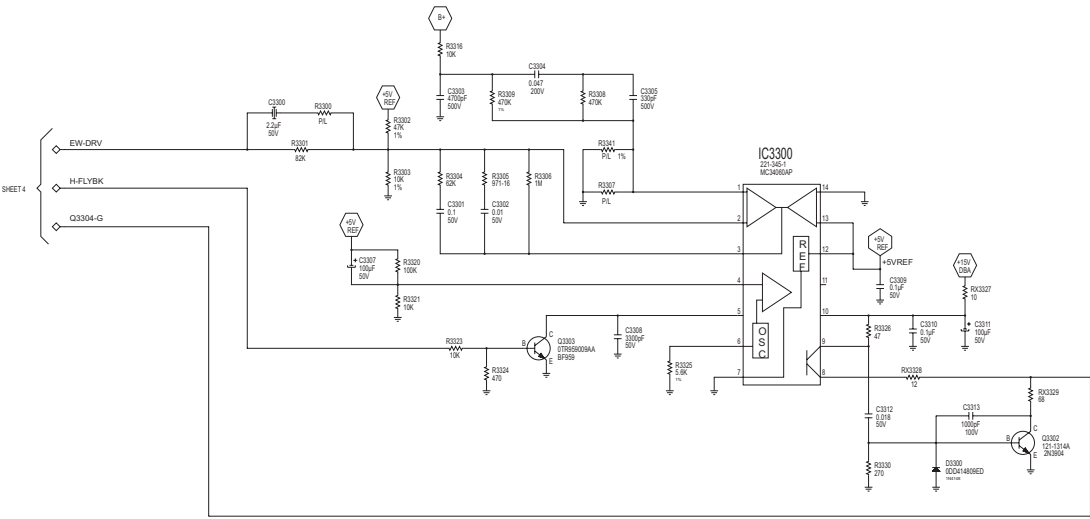
1	2	3	4	5	6	7	8	9	10
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Dymanic Focus Circuit



Scan Boost Control



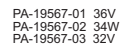
PA-19567-01 36V
PA-19567-02 34V
PA-19567-03 32V



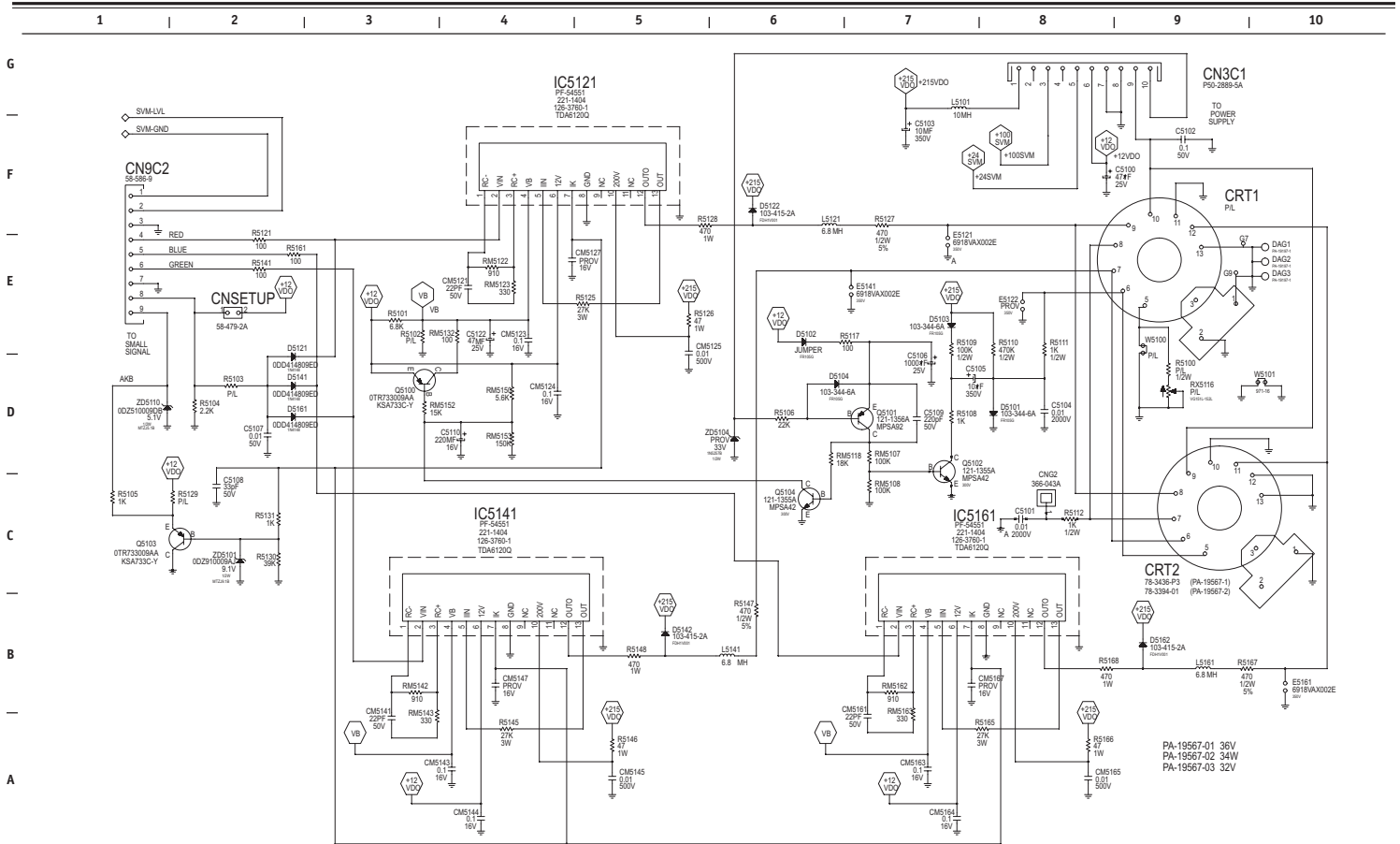
CRITICAL SAFETY COMPONENTS ARE IDENTIFIED BY THE LETTER "X" IN THEIR COMPONENT DESIGNATORS. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

ALL SYMBOLS WITH "M" ON END OF DESIGNATOR
INDICATE SURFACE MOUNTED COMPONENT

MVR2 Scan Velocity Circuit



Video Output Circuit



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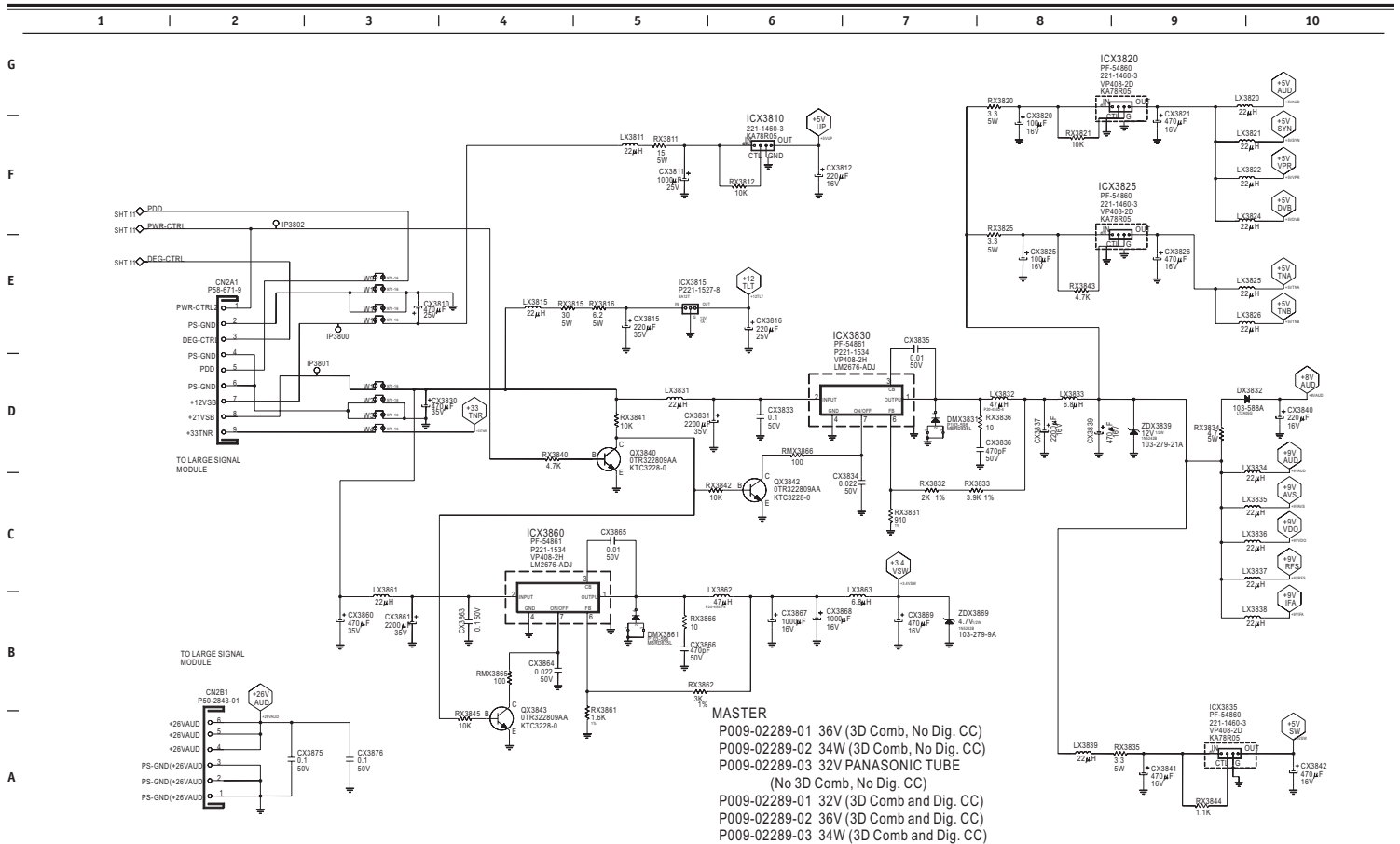
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6-9

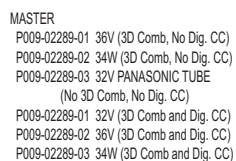
ALL SYMBOLS WITH "M" ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT

AB - SHEET 9

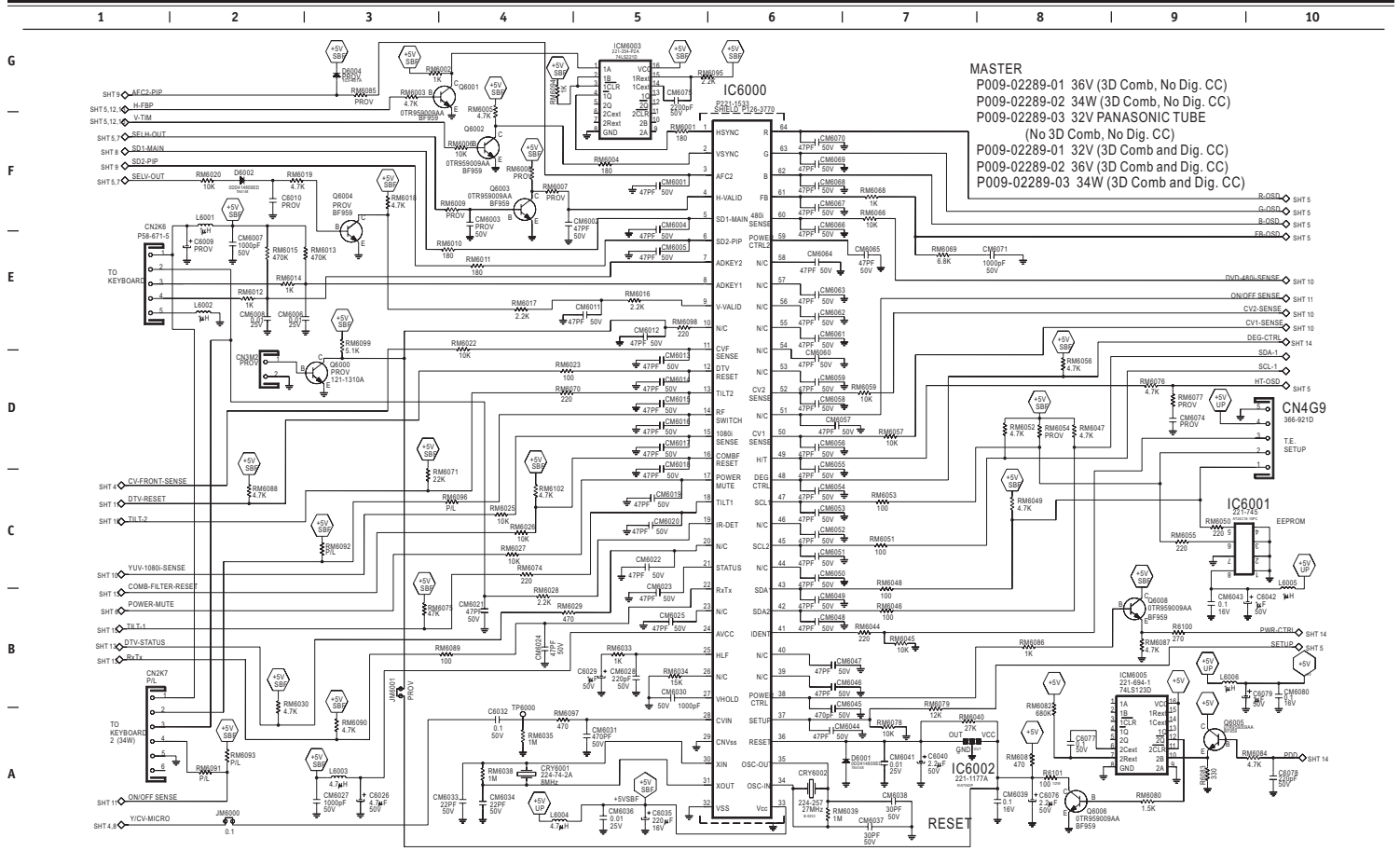
Signal Power Supply Circuit



1	2	3	4	5	6	7	8	9	10
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Micro Processor Circuit



CM154 - 923-03497



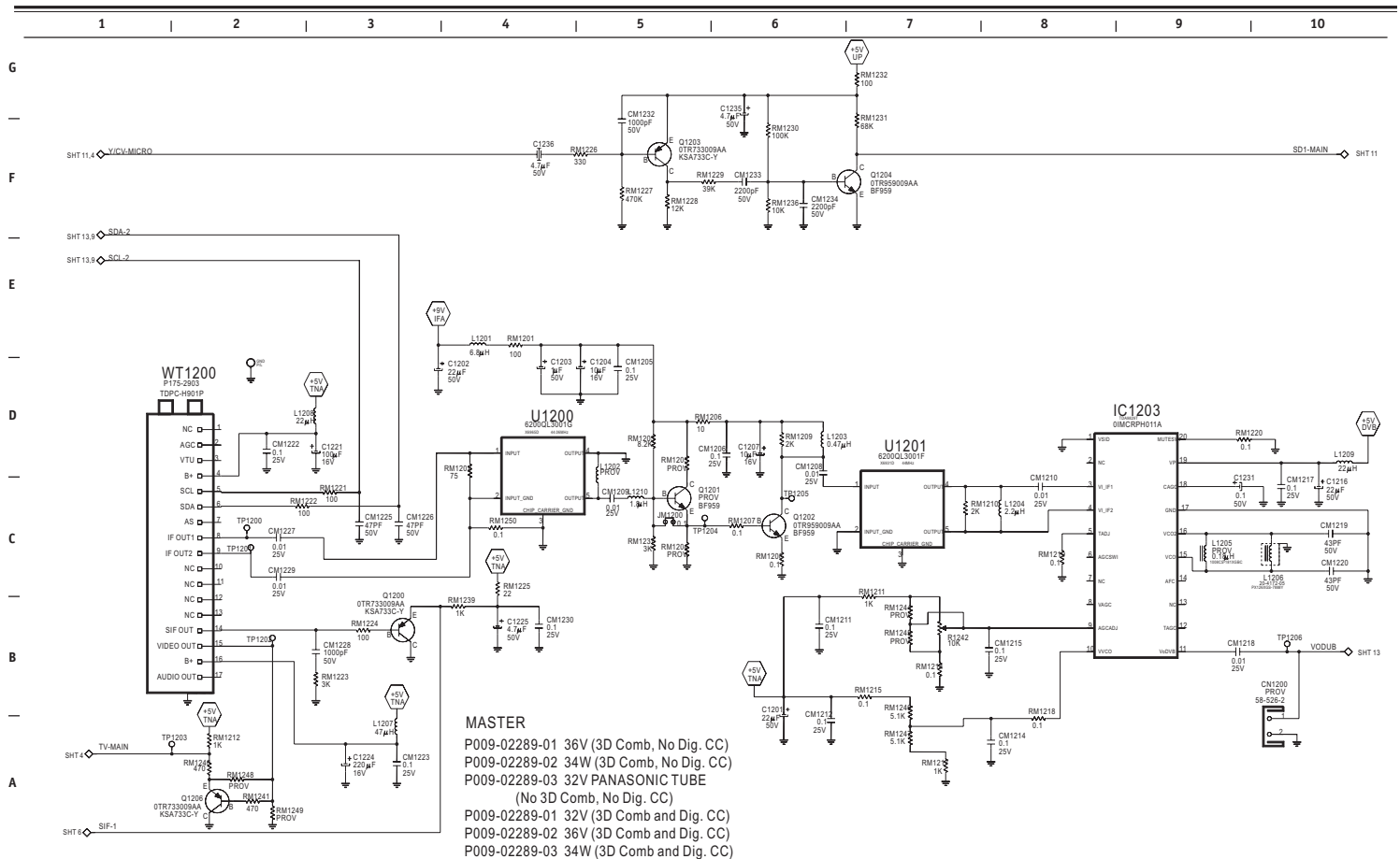
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6-12

ALL SYMBOLS WITH "M" ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT

AB - SHEET 12

Main Tuner Circuit



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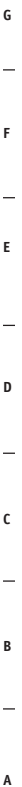
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6-13

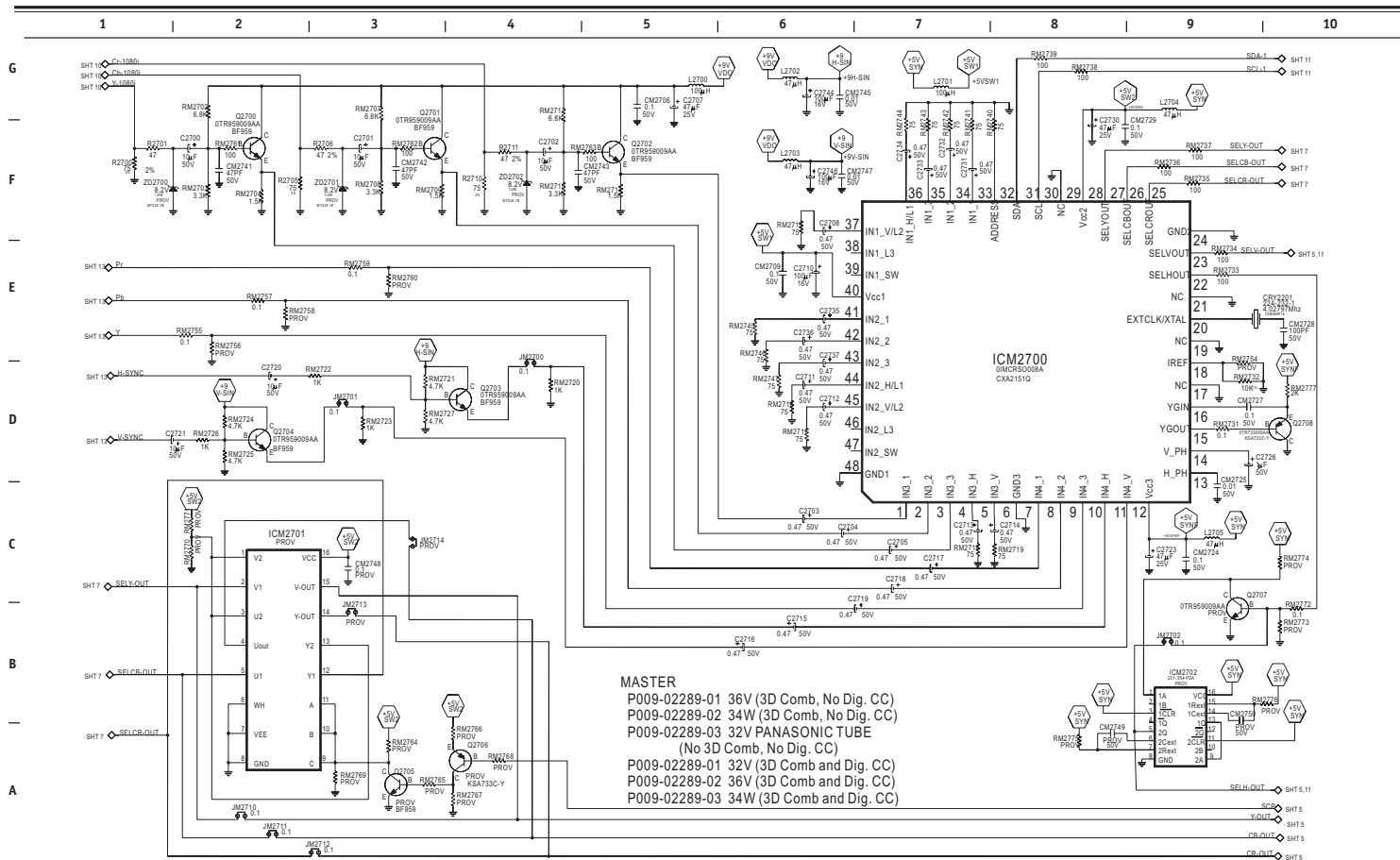
ALL SYMBOLS WITH "M" ON END OF DESIGNATOR
INDICATE SURFACE MOUNTED COMPONENT

AB - SHEET 13

1	2	3	4	5	6	7	8	9	10
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Sync Processor Circuit



CM154 - 923-03497



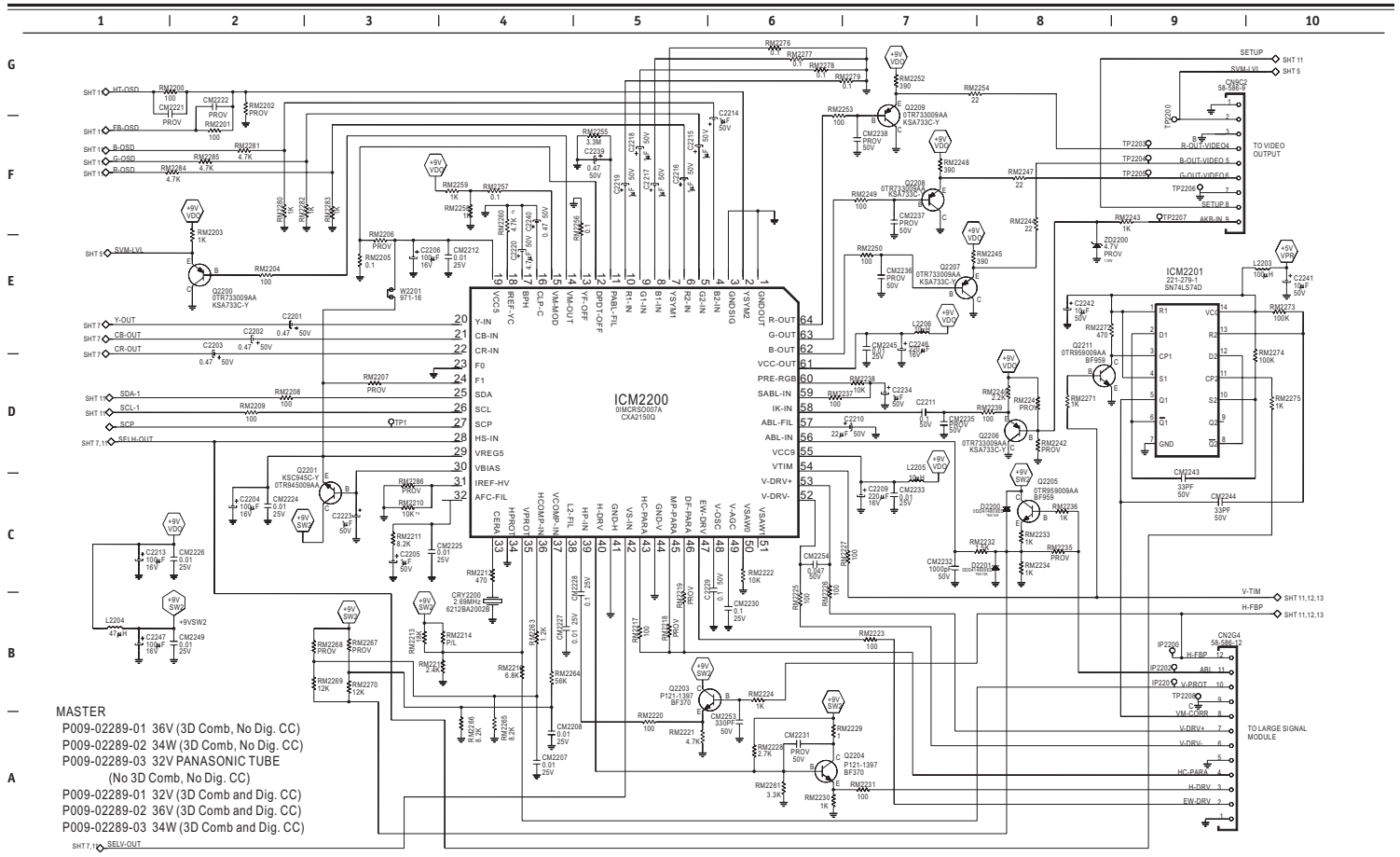
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6-15

ALL SYMBOLS WITH "M" ON END OF DESIGNATOR
INDICATE SURFACE MOUNTED COMPONENT

AB - SHEET 15

CRT Driver Circuit



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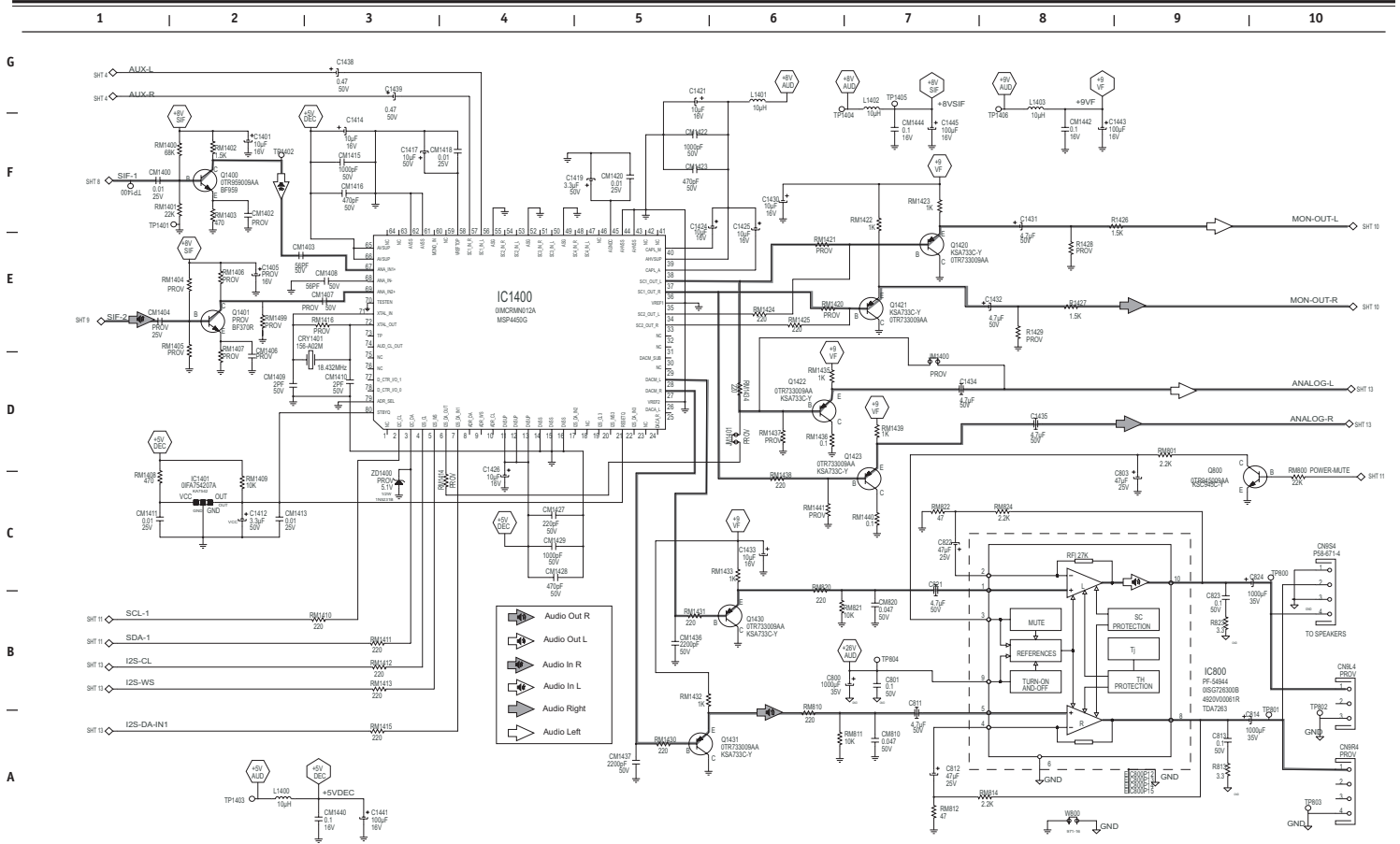
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6-16

ALL SYMBOLS WITH "M" ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT

AB - SHEET 16

Audio Circuit



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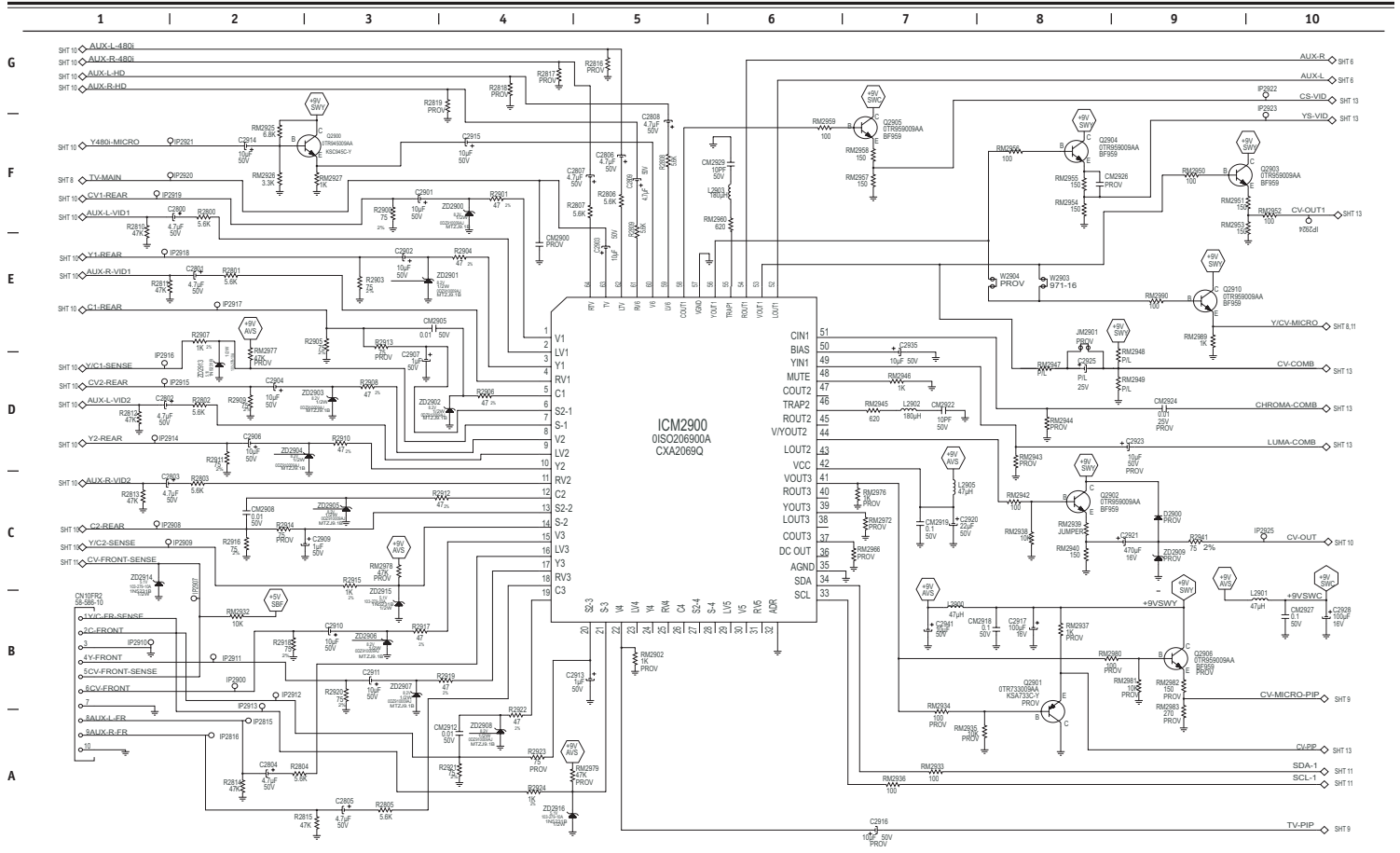
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5-17

ALL SYMBOLS WITH "M" ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT

AB - SHEET 17

AV Switch Circuit



CM154 - 923-03497



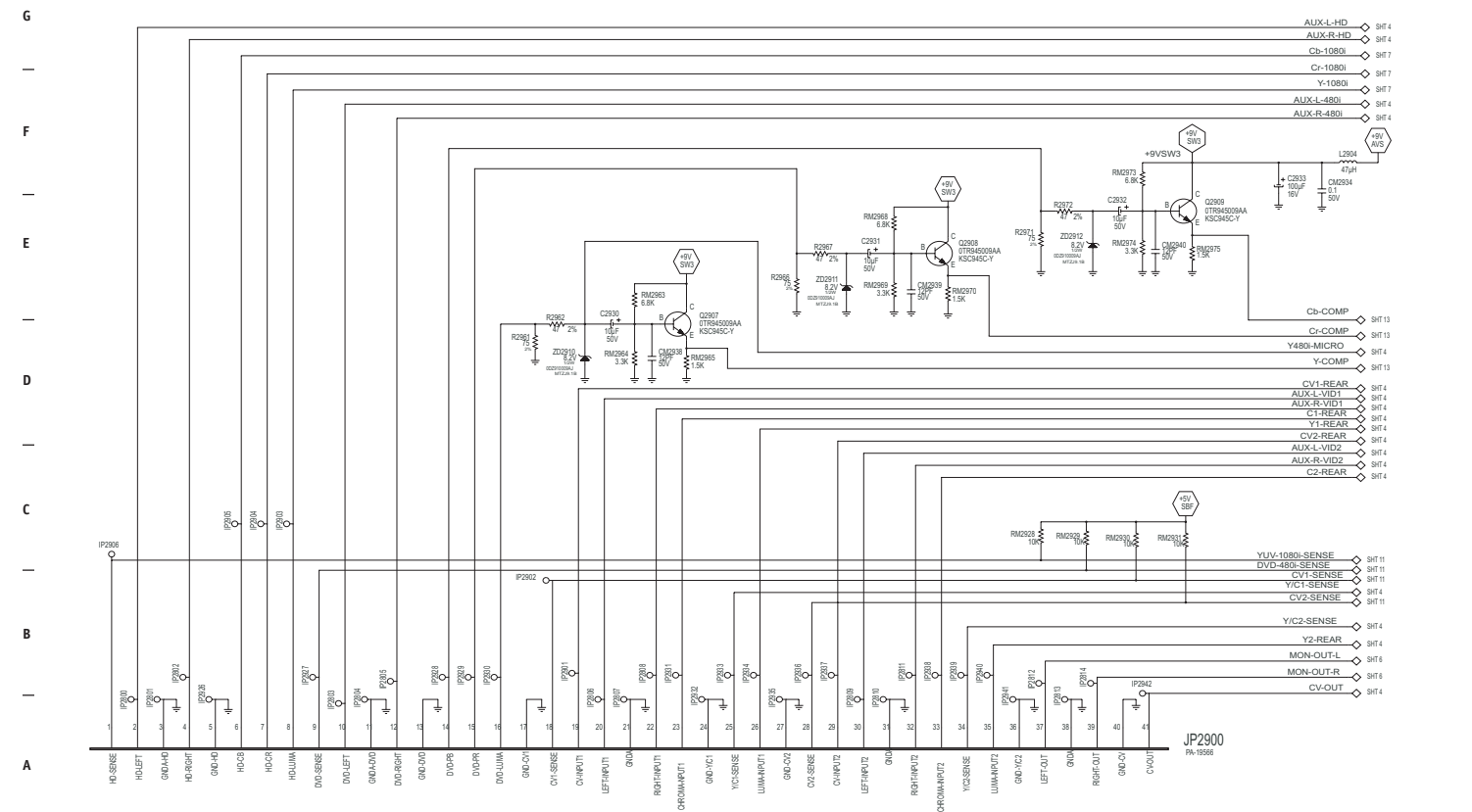
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6-18

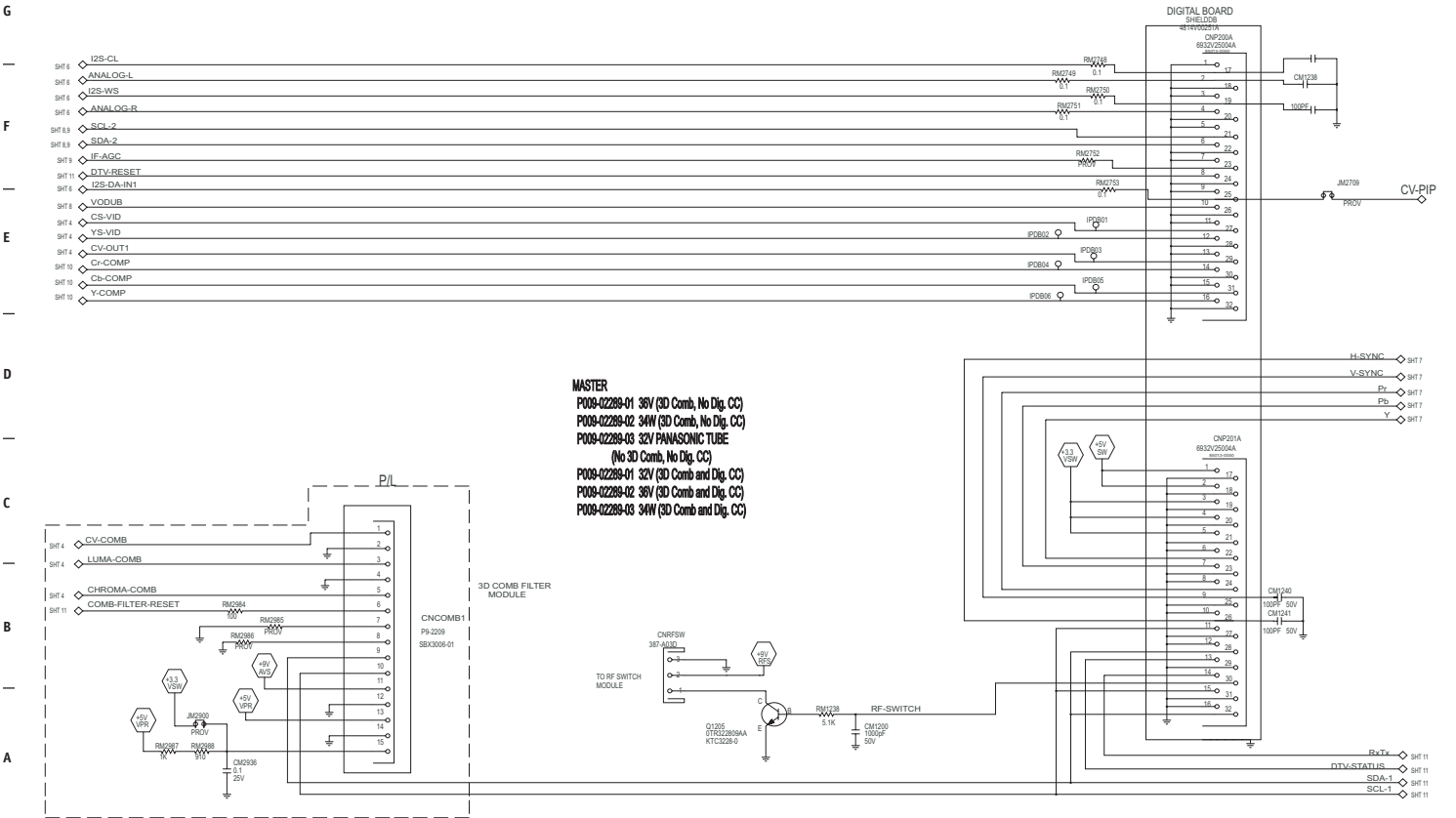
ALL SYMBOLS WITH "M" ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT

AB - SHEET 18

1 2 3 4 5 6 7 8 9 10



1	2	3	4	5	6	7	8	9	10
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AB - SHEET 20

1	2	3	4	5	6	7	8	9	10
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2

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4

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1

F

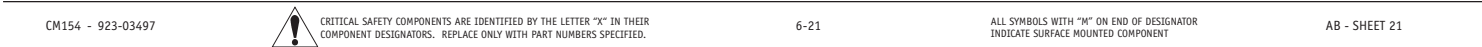
E

D

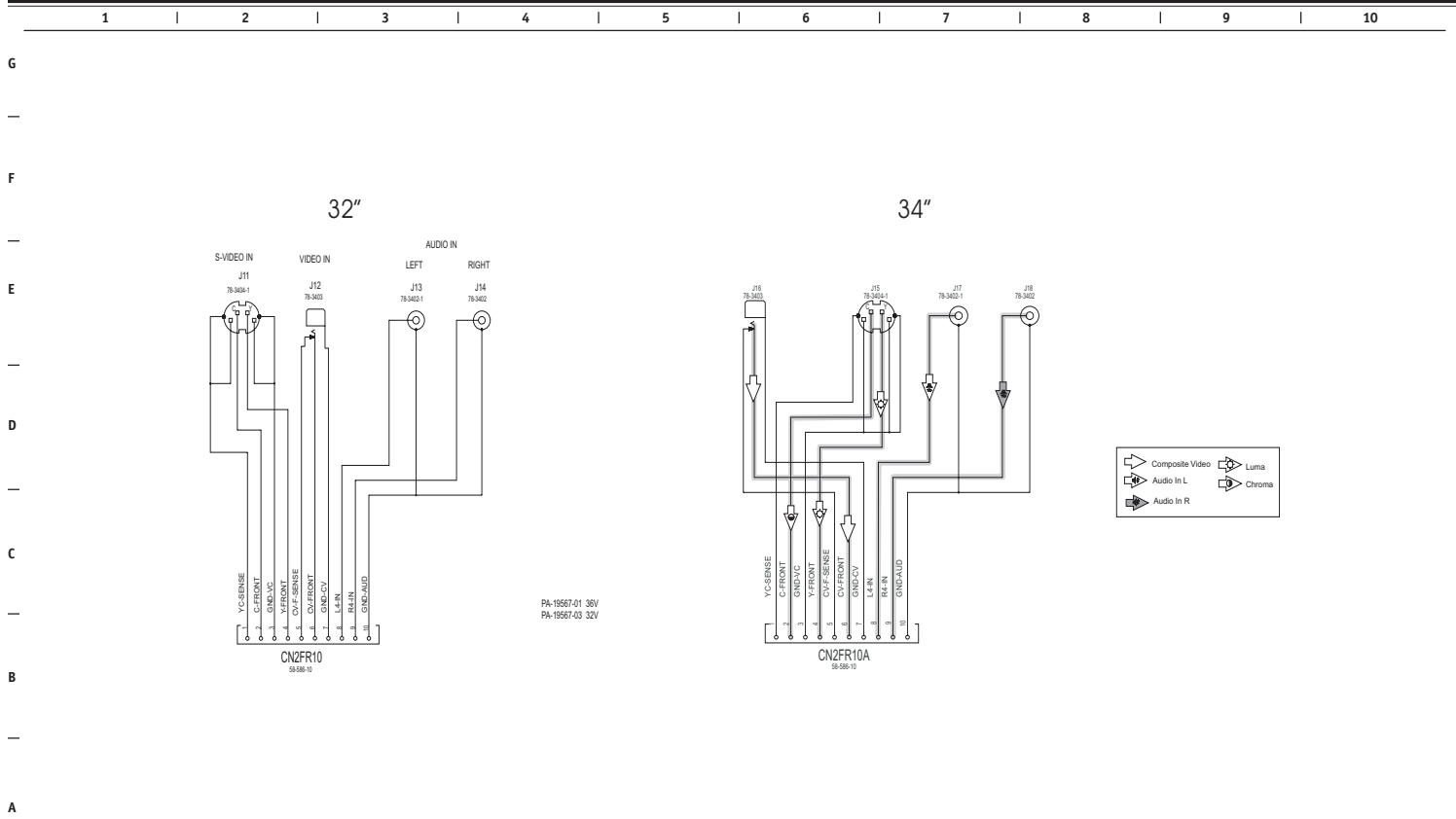
C

B

A



Front Jack Circuit

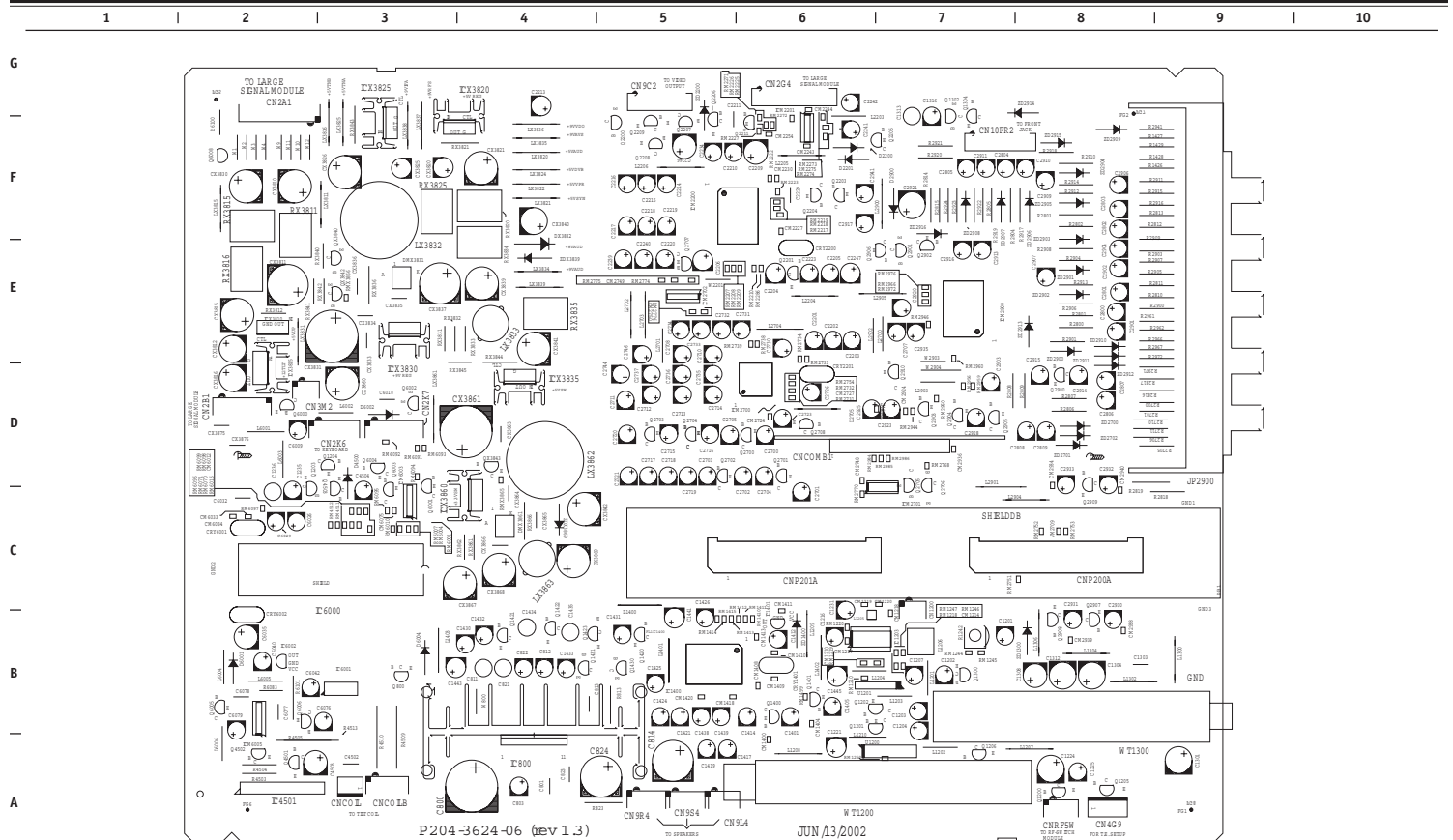


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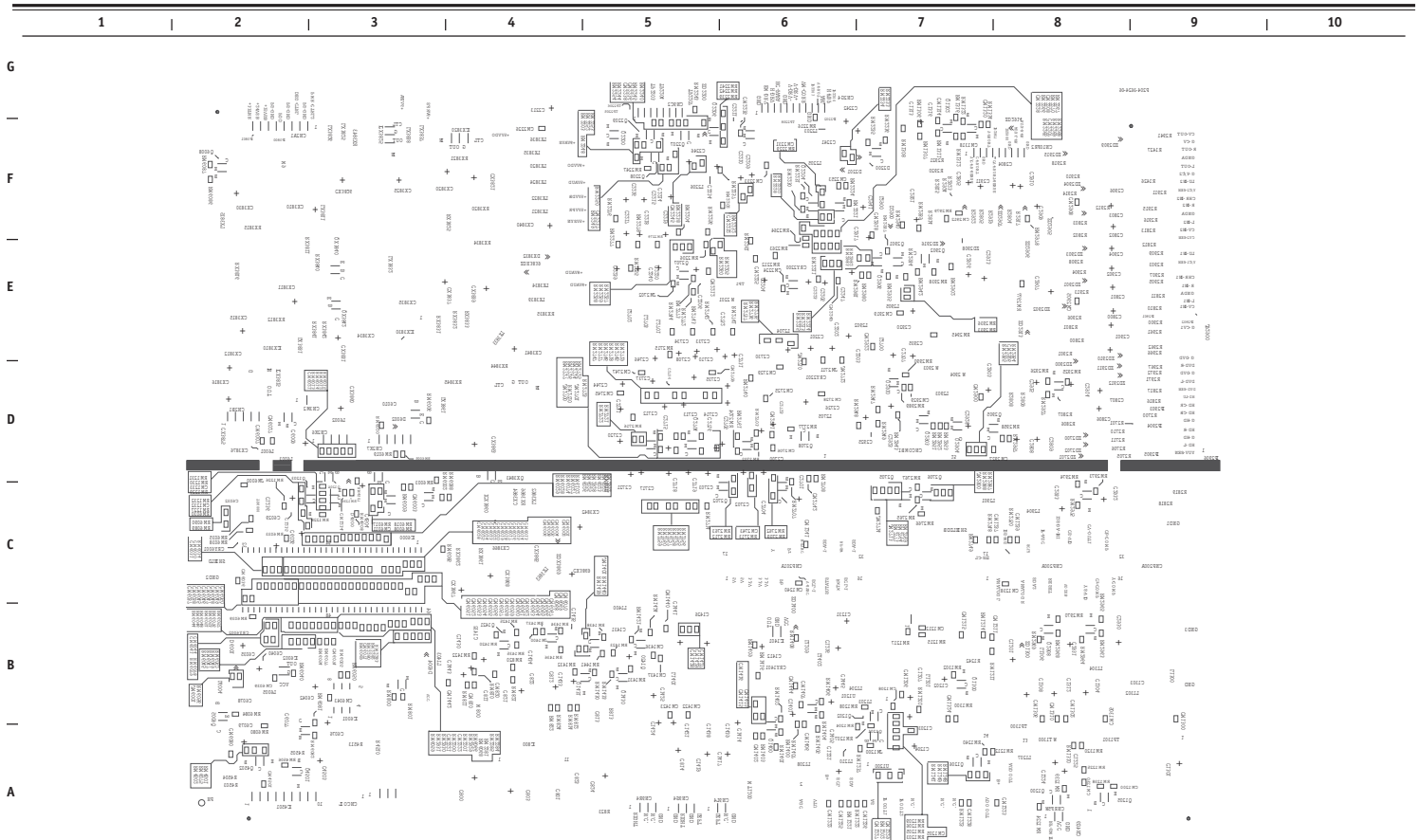
1

[illegible] Infrared

Main PCB Top



Main PCB Bottom



CM154 - 923-03497



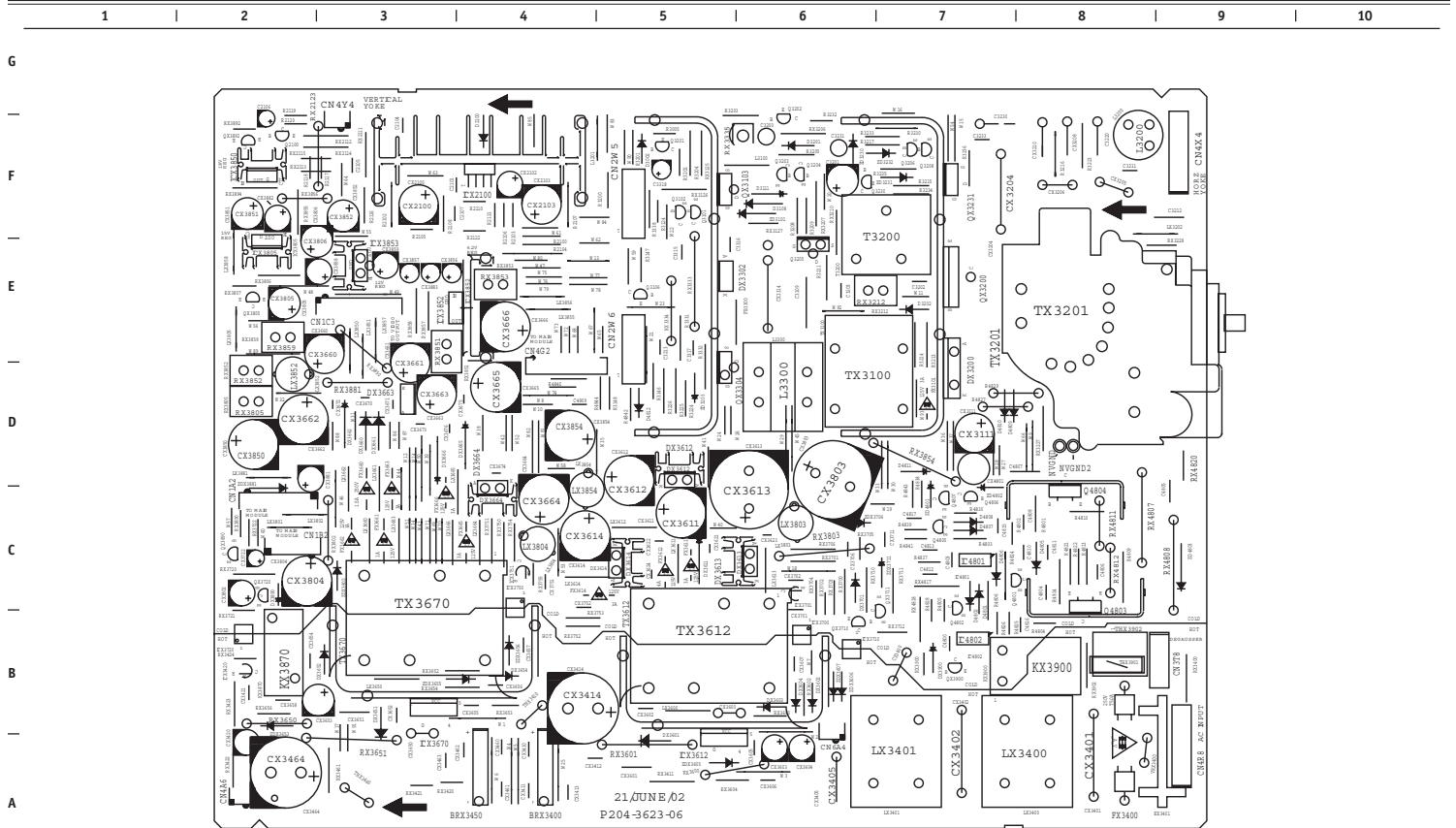
CRITICAL SAFETY COMPONENTS ARE IDENTIFIED BY THE LETTER "X" IN THEIR COMPONENT DESIGNATORS. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

6-25

ALL SYMBOLS WITH "M" ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT

AB - SHEET 25

Power Supply PCB Top



CM154 - 923-03497



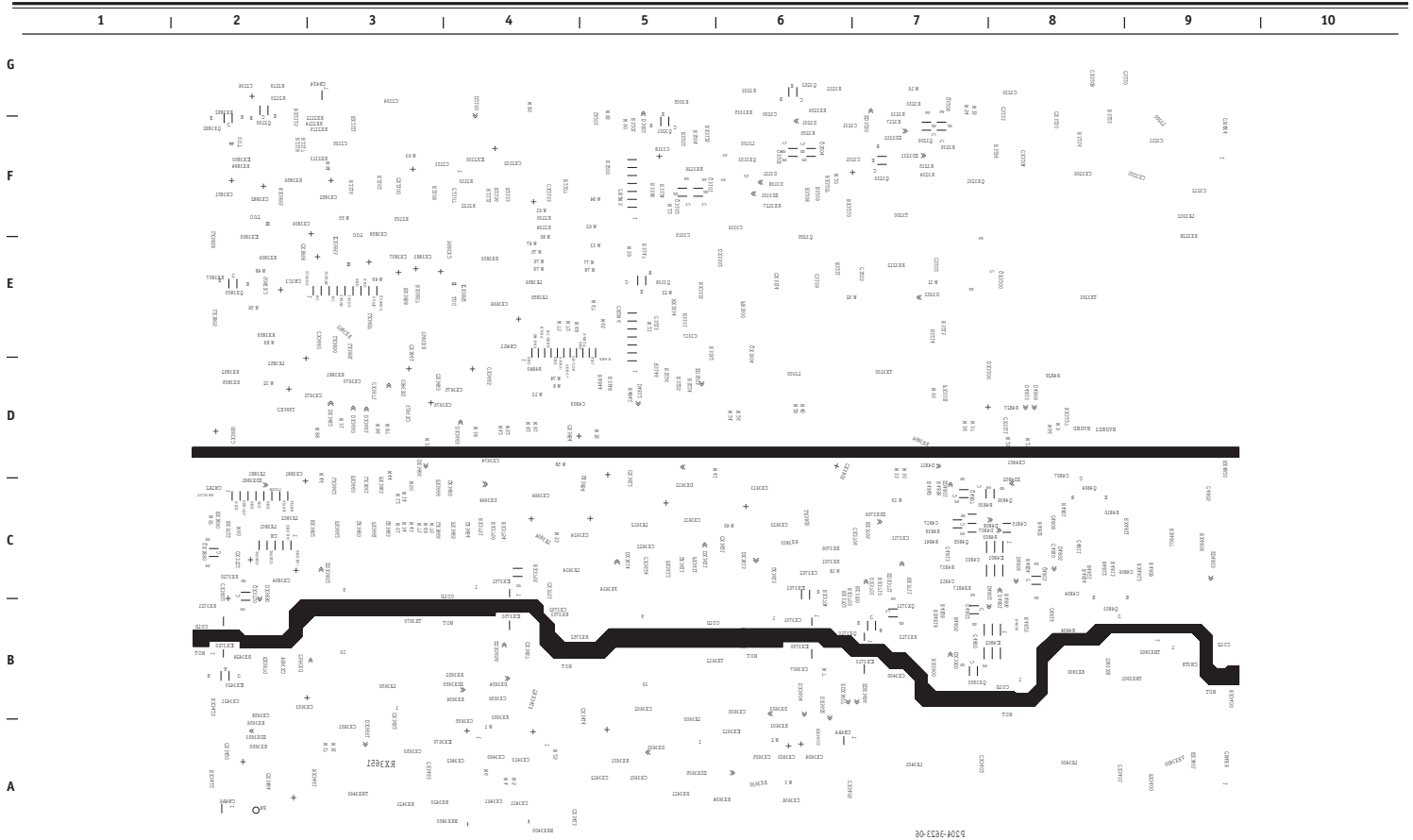
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6-26

ALL SYMBOLS WITH "M" ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT

AB - SHEET 26

Power Supply PCB Bottom



CM154 - 923-03497



CRITICAL SAFETY COMPONENTS ARE IDENTIFIED BY THE LETTER "X" IN THEIR COMPONENT DESIGNATORS. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

6-27

ALL SYMBOLS WITH "M" ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT

AB - SHEET 27

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