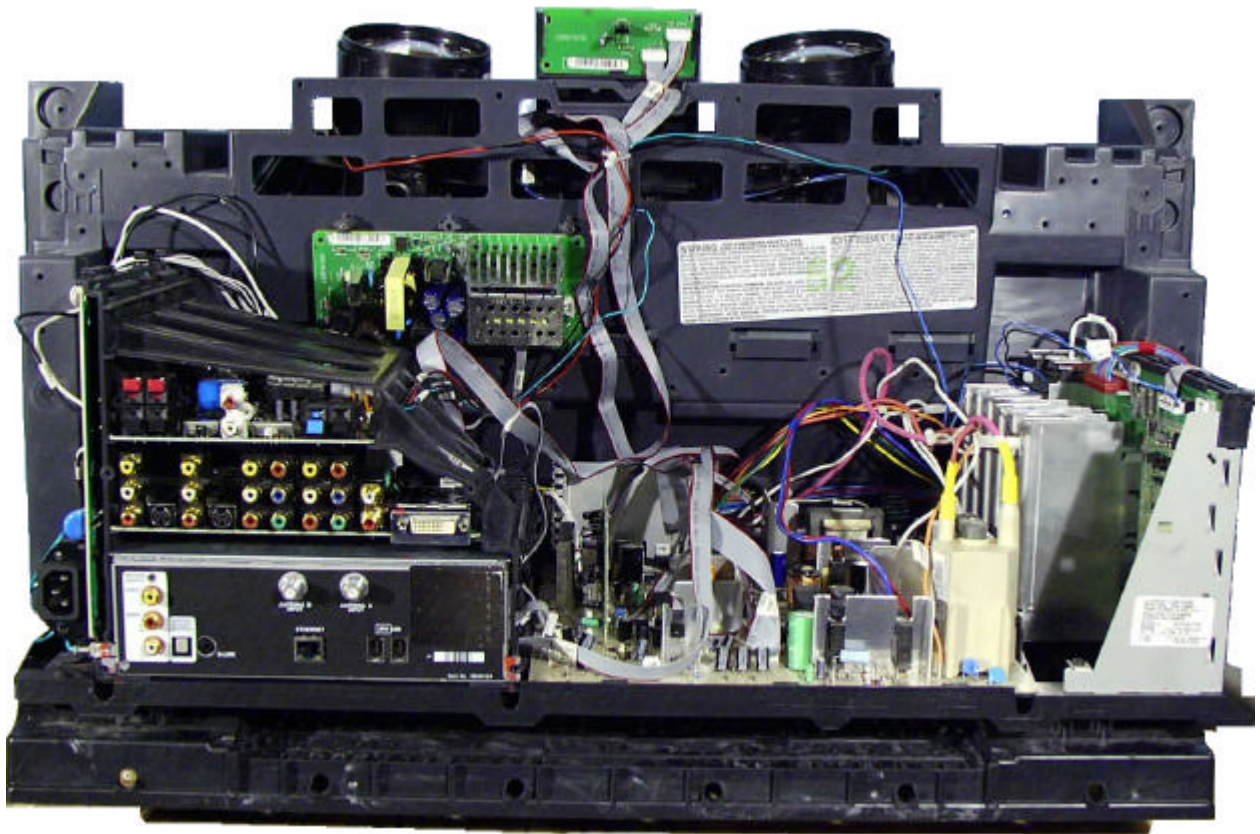


ATC311 Technical Training Manual



RCA SCENIUM



THOMSON

TECHNICOLOR 

 grass valley

RCA

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FOREWORD

The ATC311 training course is an objective based training course designed to provide the service technician with information key to the servicing of the chassis. This training course is to be used in conjunction with the service data and additional information found in the ESI Service Data. Upon completion of this training course the service technician will:

- Have a basic understanding of features and menu's
- Be able to place the chassis and CBA's into a service position
- Gain a block diagram understanding of major systems and their function
- Learn Chipper Check and service menu operations
- Identify key circuits and use troubleshooting procedures to service those circuits
- Isolate a dead set condition to a defective circuit or component area.

SAFETY INFORMATION CAUTION

Safety information is contained in the appropriate Thomson Consumer Electronics Service Data. All product safety requirements must be complied with prior to returning the instrument to the consumer. Servicers who defeat safety features or fail to perform safety checks may be liable for any resulting damages and may expose themselves and others to possible injury.



All integrated circuits, all surface mounted devices, and many other semiconductors are electrostatically sensitive and therefore require special handling techniques.

First Edition - First Printing
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Printed in U.S.A.

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Introduction

The ATC311 chassis is used in the 16X9 HDTV rear projection set developed by Thomson. The ATC311 chassis adds many features to the HDTV product line. The main features are:

- DVI (Digital Video Interface input)
- 2 Y Pr Pb inputs or CV w/Audio
- 2 S-Video inputs or CV w/Audio
- Center Speaker input
- Record Output A/V (includes HDTV converted to composite)*
- Digital Audio Out *
- 2 DTV Link inputs (IEEE1394) *
- Ethernet RJ-45 (IEEE802.3) communication *
- ATSC / NTSC Tuner *
- Web Browser *
- PIP Tuner (NTSC only) *

* = Internal of DM2 Module

The connections menu has antenna info, channel search, software upgrade, signal source, signal type, auto tuning, special features, and Ethernet setup. Under special features is setup for commercial applications. Ethernet Setup allows the user to change the Ethernet settings required to communicate with an ISP (Internet Service Provider).

The Web Browser feature requires a keyboard (optional) to surf the Internet. The remote has limited browser functions and the Web Browser feature will only function if a valid Ethernet connection is established. Watching TV while surfing the Web is also

possible by pushing the format key while in the web browser.

Features in the *Preference* menu are: Closed Captioning, Screen Format, Record Output, Color Scheme, Translucency, Menu Language, and Digital Channel Info. The screen format allows the user to select how a 4:3 NTSC signal will be displayed on the 16:9 screen. Record output allows the user to select how a 16:9 image will be recorded. A 16:9 signal can be recorded in one of two ways: Cropped Recording (Center Cut) and Anamorphic Mode Recording. Cropped Recording records the center of a 16:9 signal and the Anamorphic Mode Recording compresses the 16:9 signal into a 4:3 area.

Horizontal drive for the ATC311 is 2-2.14H with vertical locked at 60Hz. Digital convergence is contained on a single CBA with the amplifiers and power supply. The chassis is laid out in a modular fashion with most CBA's mounted to the lower cabinet assembly. The main sections are:

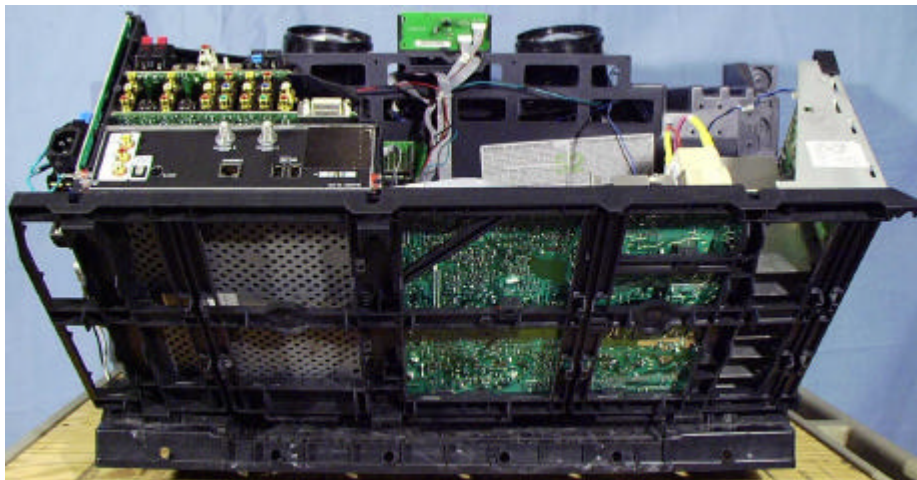
- Main Chassis and Back End Processor (BEP)
- AC In Standby power supply
- Audio
- A/V In
- DM2 System control
- Convergence
- Subwoofer Amp

The main chassis CBA is married to the back end processor (BEP) and replacement of either requires both to be replaced. The AC In supplies power to the main chassis, audio, A/V in, subwoofer amp, and the DM2. The main chassis supplies power to the convergence CBA.

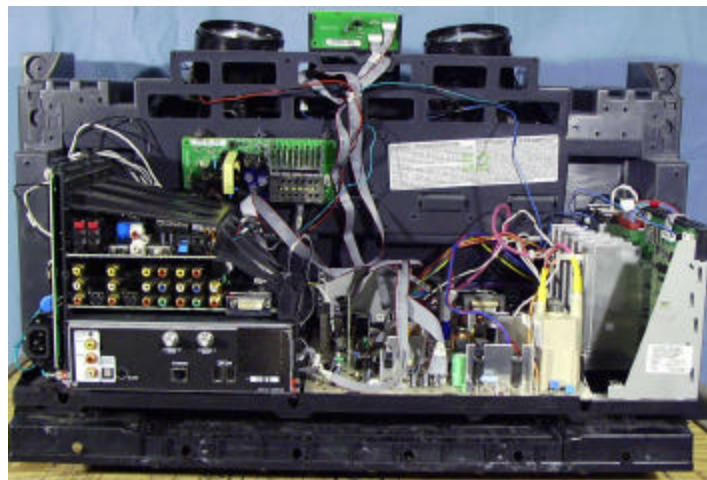
From a service standpoint the ATC311 is fully serviceable to component level and access to the CBA's is a snap. Although there are many screws to remove to gain access to the CBA's, once in the service position most CBA's are accessible with test points visible.

The service position also provides a "PTV Kit" like ability for transporting the ATC311 chassis.

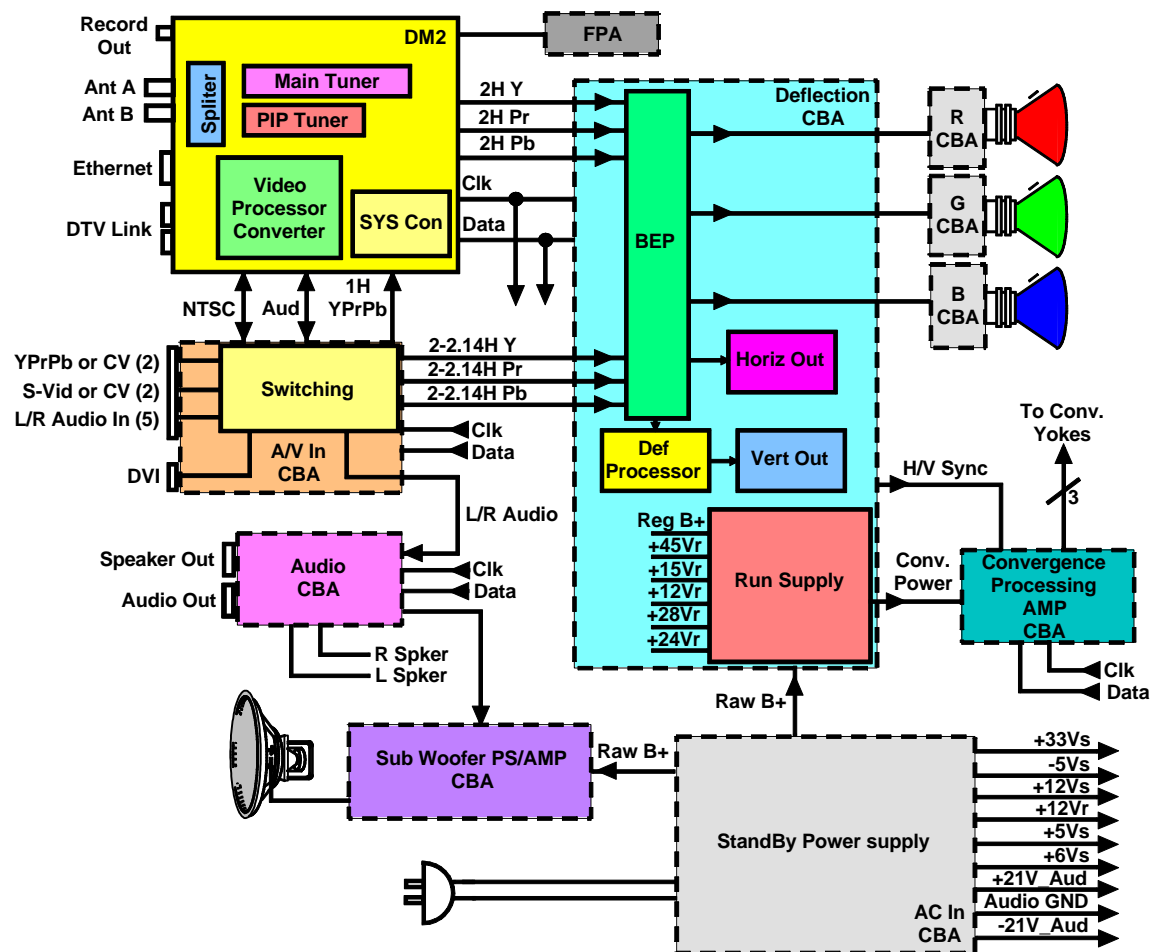
Once the top is removed, the chassis tray may be placed in the service position. Each CBA can be placed into a service position of it's own to gain access to both sides of the CBA. The only exception to this is the DM2 module. Only the cable connectors of the DM2 module can be accessed once in the service position. See service data for details on service position on each CBA.



Chassis Service Position



PTV "Kit"



System Block

Overview

The ATC311 chassis is modular with separate circuit board assemblies (CBA) for various circuits.

The major CBA's are:

- AC IN
- Deflection
- Audio
- A/V In
- Convergence
- DM2
- Back End Processor (BEP)
- CRT CBA's (Red, Green, and Blue)

The cabinet is also a modular design with the "Box" (screen, frame, and mirror) able to be separated from the lower cabinet assembly that houses the PTV kit. This allows easy access to the chassis for servicing. See service positions for more information.

AC In CBA

The AC in CBA provides the standby power supplies +33V, -5V, +12V, +5V, and audio +/- 21V. Raw B+ is also provided to the subwoofer amp and the main chassis from the AC in CBA.

Deflection CBA

The deflection CBA or main chassis contains the run supply, back end processor (BEP), horizontal and vertical circuits. The BEP and deflection CBA are aligned together and therefore are married and can only be replaced together. The BEP is a module like the DM2 but the deflection CBA is component level serviceable.

Audio CBA

The audio CBA contains audio processing, final amp and speaker output. The left and right audio signals from the AV CBA are processed and routed to the internal or external speakers by the Audio CBA. Power for the Audio CBA is + / - 21Vdc from the standby power supply CBA.

A/V In CBA

Audio and Video switching is done on the A/V In CBA. Further video processing (comb filtering and PIP) is also done on the A/V In CBA. The DVI input, switching, and processing is part of the A/V In CBA. Outputs are 2-2.14H YPrPb, 1H YPrPb, Composite video, and audio. All NTSC signals are processed and switched to the DM2 for up-conversion. The 2-2.14H YPrPb signals are switched and sent to the BEP for processing.

Convergence CBA

The convergence CBA houses convergence processing and the convergence amplifiers. Horizontal and vertical sync signals and power come from the deflection CBA. Alignment pattern and data are on the convergence CBA for auto-convergence and service adjustments.

DM2 Module

What goes on in the DM2 is digital processing of NTSC signals and AC3 audio processing. Main and PIP tuners, DTV links, and Ethernet processing is also contained in the DM2. The NTSC signals are digitally converted and up converted to 2H. Further processing takes the digital up-converted NTSC signal and passes it through a D/A converter to an YPrPb output at 2H. The YPrPb 2H signal is sent to the BEP for further processing. System control processing, user input, and Ethernet communication is also done by the DM2. Clock and data from the DM2 communicates with the deflection, A/V in, Audio, and convergence CBA's. This makes the DM2 the heart and brains of the ATC311.

CRT CBA

As with all projections there are three CRT drive CBA's, one for each color. Each CBA has a single Integrated Circuit that is used for the kine drivers. A current reference for AKB is DC coupled from each IC driver back to the back end processor. Grid Kick and Scan Loss provide protection from burns.

Digital Video Interface (DVI)

The ATC311 includes a Digital Visual Interface (DVI) input. The advantages of a DVI connection include a completely digital link between the source and display device, copy protection, and one cable connection to the television. The digital connection enhances picture performance by reducing the number of Digital to Analog conversion inside the television. DVI copy protection does not compress the digital signal, so it does not reduce picture performance while still providing formidable security for the software providers. Finally, the DVI connector accommodates all the necessary connections to pass digital signals to the television in a single cable. This simplifies the connections to the television.

DVI was developed by the computer industry to serve as a digital connection between the computer and the monitor. This is different than current connection schemes that convert digital signals to analog signals before sending them to the monitor. At the monitor, the signals are converted back to digital again for processing. Once processed, the signal is either converted back to analog for display on CRT monitors or remains digital to drive LCD or plasma displays. With DVI devices, the signals that are passed between source and monitor are digital and eliminates many of the conversions.

While DVI was developed for computer signals, it also includes provisions for Consumer Electronic devices (such as televisions, DVD's, and Digital Media Managers). It is capable of bandwidths as high as 160 MHz, so it can easily

transport all ATSC high definition signals. The DVI input of the ATC311 supports only the 480p and 1080i scan rates. The chassis will not display computer scan rates.

Copy protection is accomplished by a High-bandwidth Digital Content Protection system called HDCP. The HDCP system encrypts without compressing, so all picture information is sent to the monitor. This system uses both source and receiver keying to scramble and then unscramble the DVI signal. The keys are stored in the internal ROM's of the source and receive DVI interface IC's. This simplifies the DVI copy protection system, because no external memory is required for it to operate.

The DVI connector has provisions for both digital and analog signals. It includes 24 pins for digital signals and 5 pins for analog signals. The digital pins are placed in two rows of 12 on the left side of the connector. The analog pins form a cross pattern on the right side of the connector. The ATC311 uses four digital pins of the DVI connector: one for each Red, Green, and Blue signals and one for a clock signal.

The DVI connector is located on the Jack panel. It is labeled "DVI-HDTV". The connector is not used for audio, so a left and right audio jack is provided. On the ATC311 jack panel, these jacks are positioned next to the DVI connector. To display a DVI signal on the ATC311, the user must select Input 5.

Ethernet

The ATC311 uses an Ethernet connection to connect to a network computer or cable modem to access the Internet and uses the IEEE802.3 Ethernet standard. The Ethernet is the most popular and most widely deployed network technology in the world. Ethernet can be described as communication over a single cable shared by all devices on a network. Once a device is attached to this cable, it had the ability to communicate with any other attached device. This allows the network to expand to accommodate new devices without requiring any modification to those devices already on the network. All devices connected to the network have to have the same protocol in order to communicate.

In networking, the term protocol refers to a set of rules that govern communications. Protocols are to computers what language is to us. For two devices on a network to successfully communicate, they must both understand the same protocols.

CSMA/CD:

The acronym CSMA/CD signifies carrier-sense multiple access with collision detection and describes how the Ethernet protocol regulates communication among stations. Stations are devices connected to the Ethernet.

DHCP:

Dynamic Host Configuration Protocol (DHCP) allows a computer to join an IP-based network without the need for it to have a pre-configured IP address. DHCP is a protocol that assigns unique IP addresses to devices, and it releases and renews these addresses as devices leave and re-join the network. Many Internet Service Providers (ISPs) use DHCP to allow customers to join the Internet with minimum effort.

DHCP systems require a server set up with the appropriate configuration parameters for the given network. These parameters include the range of available IP addresses, the correct subnet masks, gateway and name server addresses. Devices running DHCP client software can then automatically retrieve these settings as needed. Using DHCP on a network means that system administrators do not need to configure these parameters individually for each device joining the network.

MAC Address:

Media Access Control address is a hardware address that uniquely identifies each station of a network. Each ATC311 has a different MAC address that interfaces directly with the network media.

Service Menu and Chipper Check

The ATC311 service menu has a new look and feel along with a new hookup for Chipper Check. To access the first section of the service menu one must press both Menu/OK and channel down at the same time. A three-section menu structure will be displayed with the correct key press. Two of the menu items are for information and the other is to access the service alignment menu. These menu items are labeled:

1. Information
2. Service Alignment
3. IP Configuration

Information

Menu item one (Information) provides the service technician with version information for various devices. This information can be used for checking various devices for possible upgrades.

Service Alignment

Menu item two (Service Alignment) allows the service technician to access the 26 service alignment modes. To gain access to the common P:00 V:00, the service technician must volume up to 76 and then press channel up to access the alignments. The first three parameters show "See Security Code 50 for Error Codes", that's because the error codes were placed under a different password (50). By channeling up through the three error code parameters, the first alignment parameter (P: 4) is accessed. The alignment parameters are from P: 4 to P: 26, with P: 25 reserved for future use.

IP Configuration

The last menu item is IP Configuration. This menu provides the service



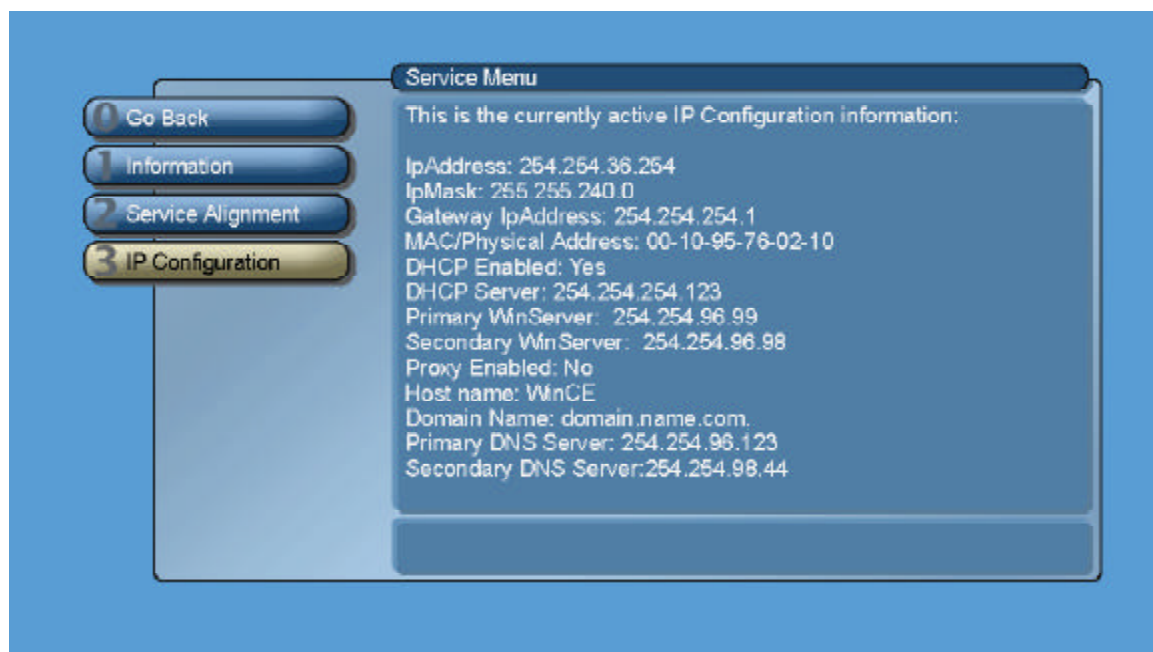
technician information about the Internet protocol configuration. This information is helpful when dealing with an ISP (Internet service provider) to determine the IP configuration of the set.

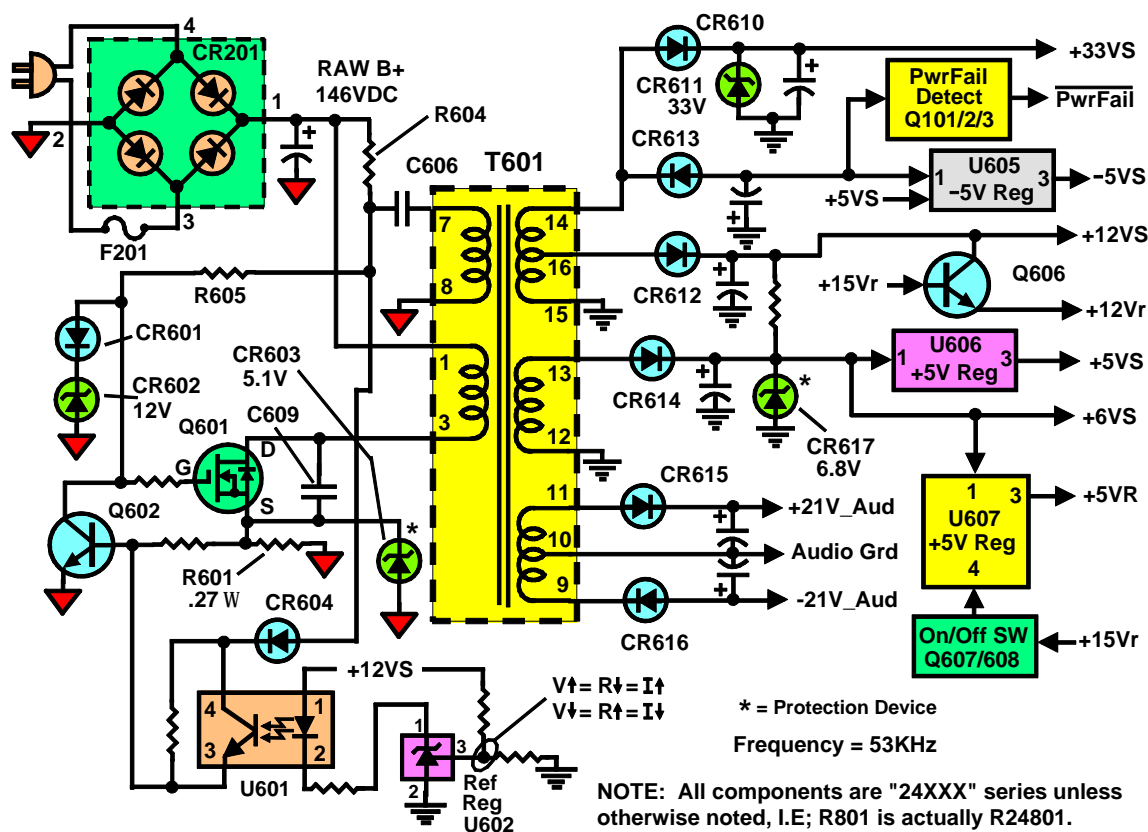
Chipper Check Connection

The ATC311 brings with it a whole new meaning to connecting Chipper Check to the set. First of all there is no internal connection or special adaptor to connect Chipper Check to the set. Connection is made through the Ethernet jack on the back of the set using a crossover cable and Ethernet adaptor card in the computer. This means that the set has an IP address. This IP address, **169.254.1.0**, needs to be added to the

computer network setup before Chipper Check can access the set. The IP address for Chipper Check communication is **169.254.1.0**. Refer to a qualified IT computer technician for changing IP addresses for different operating systems.

By using the Ethernet connection one eliminates the need for an adaptor, an interface box, and multiple cables. The Ethernet connection uses a single cross-wired network cable connected directly to the set and computer. This type of connection also reduces communication problems do to cable length. Once communication is established, Chipper Check functions as with previous chassis.





Standby Power Supply

Standby Power Supply Overview

The standby power supply is a switch mode power supply is a PWM regulated, constant frequency (53KHz) power supply. When the unit is plugged into 120AC, startup resistor R604 and R605 provides the initial gate bias voltage which turns on the power output device (Q601) the first time. A positive feedback voltage is developed by windings between pins 7 & 8 of T601. This positive voltage is capacitively coupled back to the gate of Q601. This causes Q601 to saturate and the voltage drop across the current sensing resistor R601 turns on Q602. With Q602 on, the gate of Q601 is grounded shutting off the output device. When Q601 is turned off, the energy stored in the primary windings (T601 pins 1 & 3) is transferred

to the secondary windings of T601. When current through Q601 stops flowing, Q602 is turned off. When all the energy has been completely drained from the primary the gate is again pulled high which turns on Q601 for the next cycle.

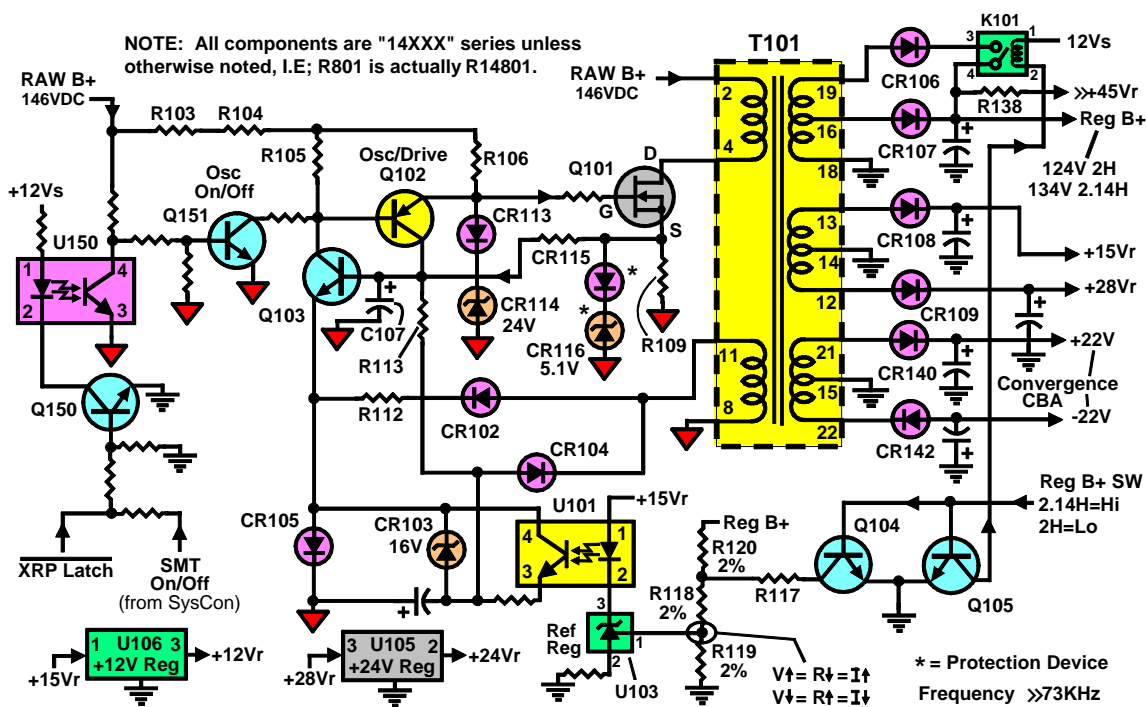
The standby supplies are generated by the rectifier diodes and filter capacitors on the secondary of T601. This includes +33VS, -5VS, +12VS, +5VS, +6VS and the +/- 21 volt audio supply. The unregulated -5VS supply follows raw B+ and a power fail (active lo) signal is developed by transistors Q101, Q102 and Q103. Transistors Q101 & Q102 are normally on while Q103 is normally

off. If Raw B+ (146VDC) starts to fall, Q101 & 102 turn off which turns on Q103 generating the active low power fail signal that is applied back to the system control. Two switched run supplies are also generated by the standby supply. Q606 is turned on by the +15VR generating a +12VR supply.

A +5VR is provided by U607. The +5VR run regulator is turned on by the On/Off switch transistors Q607 & 608. The transistors (Q607 & 608) are activated by the application of the +15VR run supply. Overvoltage protection in the secondary is provided by the 6.8V zener diode CR617. If the voltage rises above the 6.8V, the zener breaks over and clamps the output voltage.

Regulation of the supply is accomplished by Opto-Coupler U601 and Ref Reg U602. The bias supply for the photo transistor of U601 is developed by diode CR604 from pulses off pin 7 of T601. The +12VS is the supply that is monitored for regulation. The supply is regulated by varying the bias voltage on the base of Q602. A voltage divider network applies the reference voltage

to pin 3 of the reference regulator U602. If the voltage at pin 3 of U602 goes up (+12VS supply is increasing), the internal resistance of Ref Reg (U602) goes down. This increases the current through the photo diode of U601. When the current through the photo diode increases the current in the photo transistor and causes the base voltage of Q602 to go up. The increased base voltage on Q602 reduces the current sense (R601) trip voltage which reduces the amount of 'On' time for Q601. This reduced 'On' time reduces the output power that is transferred to the secondary which in turn reduces the output voltages of the secondary. The opposite occurs if the supply output voltage is decreasing. The base bias voltage of Q602 is reduced allowing Q601 to stay on longer and pumping more power into the secondary which increase the output voltages. CR601 and CR602 (zener) provides the gate bias voltage of Q601. The 5.1V zener diode CR603 serves as a protective device in the event that Q601 is shorted and the current sense resistor opens, the zener breaks over and shorts to ground to allow the line fuse F201 to open.



Main (Run) Power Supply

Main (Run) Power Supply Overview

The main (run) power supply is a constant frequency (approx. 73KHz) switch mode power supply that is regulated using pulse width modulation (PWM). The power supply is held off by Q151. Q151 is turned on during standby. With Q151 on, ground is applied to the base of Q102. With Q102 on, the gate of the power output (Q101) is held low preventing the supply from running.

The supply is turned on by the SMT On/Off signal from the system control and is applied to Q150. When Q150 turns on, ground is applied to pin 2 of U150. This causes the photo diode to conduct which in turn causes the photo transistor to saturate applying ground to pin 4 of U150. This turns off transistor Q151 and allows the oscillator driver (Q102/103) circuit to operate. In case of an XRP shutdown, the base of Q150 is

pulled lo, shutting it off. With Q150 off, Q151 is allowed to turn back on which grounds the base collector junction of the oscillator driver Q102 & Q103 turning the run supply off.

Raw B+ (146VDC) is applied to the drain of Q101 via pin 2 & 4 of T101. After the oscillator drivers have been released by turning off Q151 the diodes CR114, CR113 and resistor R106 turns on the output device (Q101) for the first time. With Q101 turned on, energy is stored in the primary winding of T101 (pins 2 & 4). As the current through R109 (current sense resistor) increases a positive voltage is coupled to the base of Q103. Once this voltage is high enough, Q103 & Q102 removes the drive from the gate of Q101. Once Q101 is turned off the, the energy stored in the primary windings (T101 pins 2 & 4) is transferred to the secondary

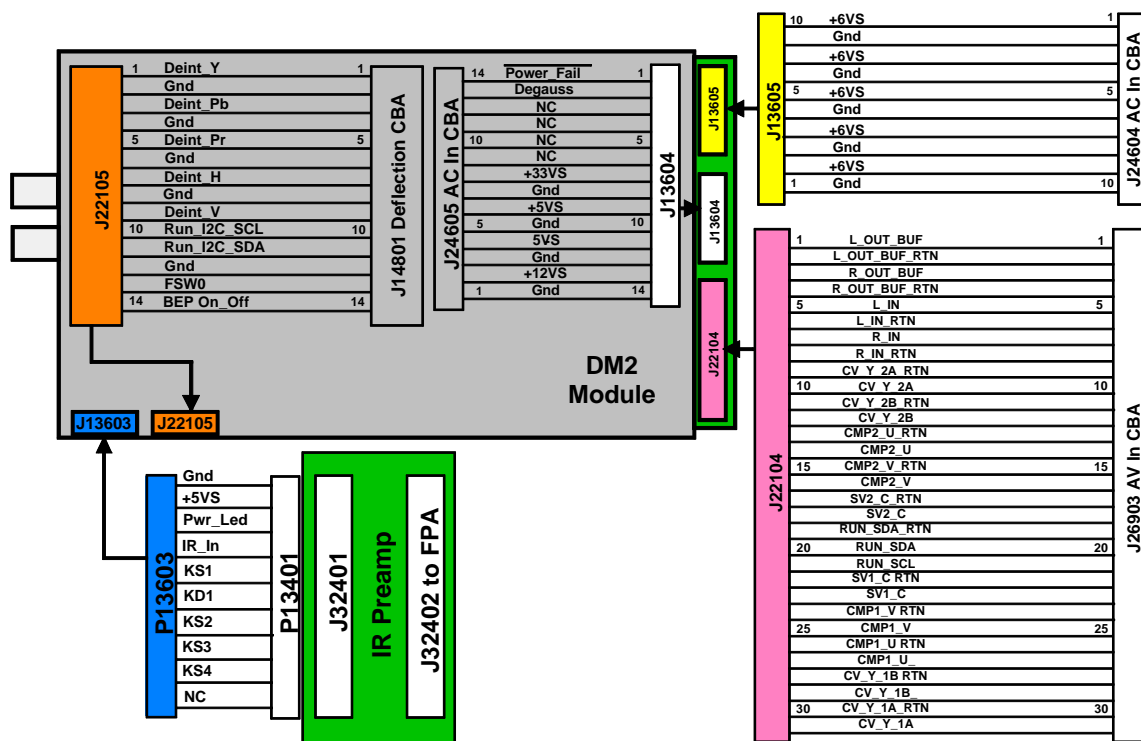
windings of T101. The diode CR105 provides the current path for Q103 during startup while CR114 and CR113 set the bias on the gate of Q101.

Diodes CR115 and CR116 serve as protection devices in the event that Q101 shorts and R109 opens. The diodes conduct applying ground to the source of Q101. This allows enough current to be drawn that the main fuse opens. Diode CR102 provides a positive re-supply voltage to the oscillator driver circuit. CR104 generates the negative supply for U101-3 and the base of Q103.

The rectifier diodes on the output of T101 generate the various run supplies needed by the chassis. Regulated B+ is generated by CR107. However, since the chassis operates at 2H (124V) and 2.14H (134V), a slightly different Reg B+ is needed. This is accomplished by the Reg B+ Switch signal from the system control that is applied to transistors Q104 and Q105. When Q104 is turned on the resistor divider network (R117/118/119 & R120) connected to pin 1 of the reference regulator (U103) is altered slightly to compensate for the slightly higher Reg B+. When Q105 is turned on the relay K101 is closed and switches in an additional source voltage rectifier (CR106) increasing Reg B+ slightly. With 2.14H operation requiring a slightly

higher Reg +, Reg B+ Switch signal is Hi for 2.14H and Lo for 2H.

Reg B+ is monitored for regulation of the supply. U101, U103 and the precision resistor network serve as the regulation feedback circuit. As Reg B+ goes up or down, the voltage at pin 1 of U103 will go up or down as well. This changes the current flow through the photo transistor of U101. This causes the voltage on the emitter of Q103 to change. The voltage at the emitter of Q103 determines how long the output device stays on which determines the output power of the supply. For example, if the voltage at U103-1 rises, the resistance through the diode of U103 goes down allowing more current through the photo diode of U101. This causes the photo transistor to turn on harder causing the voltage at Q103-E to go more negative. This allows the oscillator driver to turn off Q101 sooner thus reducing the amount of power in the secondary. In reverse, if the voltage at U103-1 goes down the current through the photo diode goes down causing less current through the phototransistor. This allows the voltage at Q103-E to move in a positive direction. This causes the oscillator driver to keep Q101 on longer which increases the amount of power in the secondary. More power in the secondary causes the voltages to rise. Finally, U105 and U106 generate a +24Vr and +12Vr supplies from the +28Vr and +15Vr supplies respectively.



System Control

System Control

The ATC311 system control is contained in the DM2 module. System control performs such functions as channel change, audio adjust, A/V switching, chassis on/off, Ethernet communication, browser function, service alignments and more. The system control receives commands from the user by keyboard or remote. These signals are found on J13603.

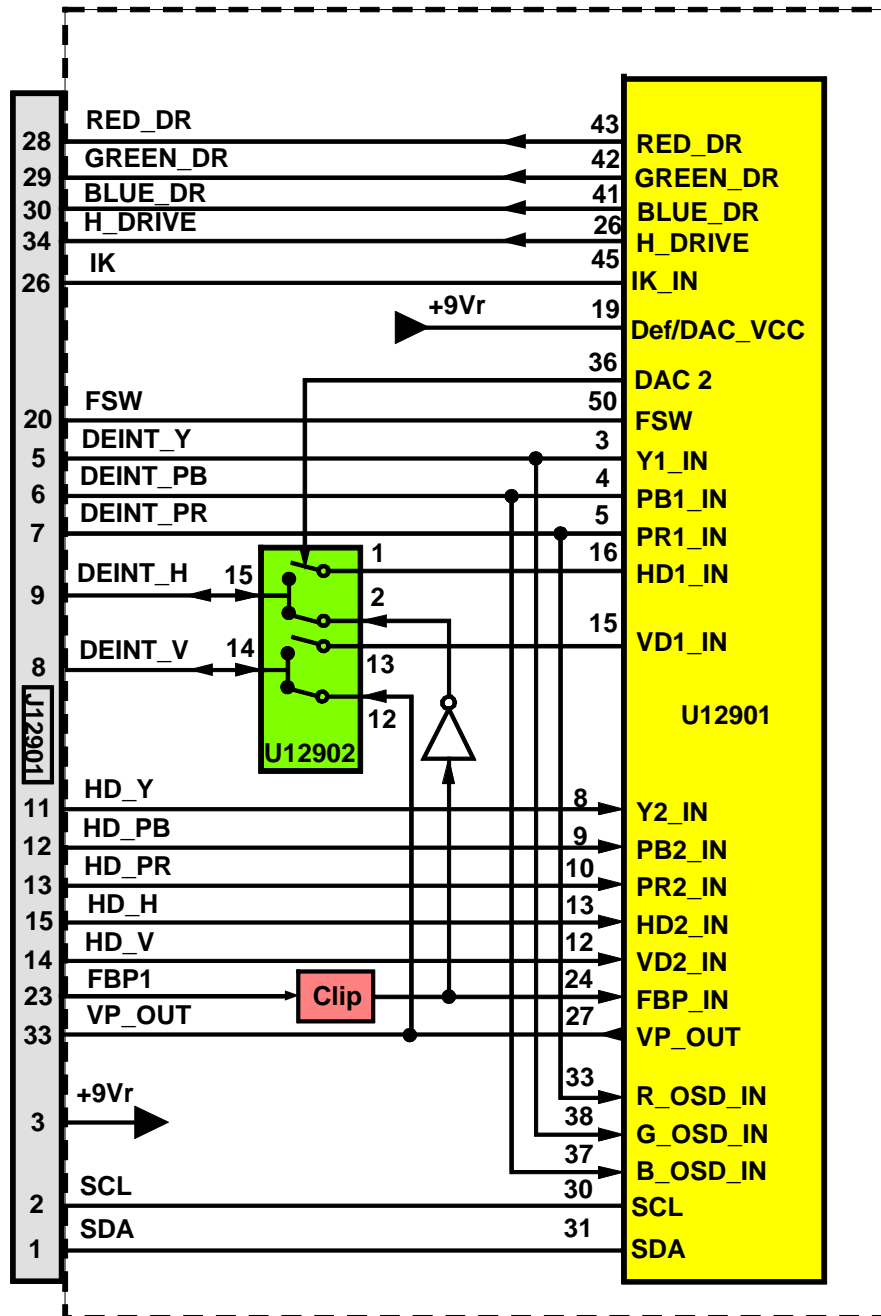
Communication between the DM2 and the rest of the set is via I2C communication. Both J22105 and J22104 have clock and data signals that the system control uses to communicate with. The interface is standard I2C communication.

Power for the system control comes from the AC in CBA. The two connectors that supply the power are J13605 and J13604. The power requirements for DM2 operation are:

- +33Vs
- +12Vs
- +6Vs
- +5Vs

Internal to the DM2 are regulators that further regulate the supply voltages for the various circuits and system control. The power fail signal on J13604-1 tells system control to “batten down the hatches” or store settings as power is failing. The power fail signal is active low when AC power is lost or interrupted.

The system control operates independent of the main chassis. This means that if power is applied to the DM2 it will process signals, tune channels, and perform as though it was in the set. This feature helps in troubleshooting the DM2 as a module and isolates problems to DM2 or other circuit areas.



Back End Processor

Back End Processor (BEP)

Except for the de-interlacing, the luminance processing is done in U12901 back end processor BEP. U12901 has two component video inputs. YPrPb from the DM2 is on J12901 pins 5, 6, and 7. External 2H or 2.14H YPrPb is on J12901 pins 11, 12, and 13. The YPrPb signal undergoes the following processing within the BEP:

- Black Stretch
- Black Level Correction
- Dynamic Gamma Processing
- Controlled DC Restoration
- Sharpness Control
- Edge Replacement
- High Frequency White Peak Limiting
- Sub Contrast
- UniColor (Ganged Contrast and Color Level)
- Clamping
- White Peak Limiting
- Output Gamma Processing
- Half Tone Processing

OSD RGB Processing

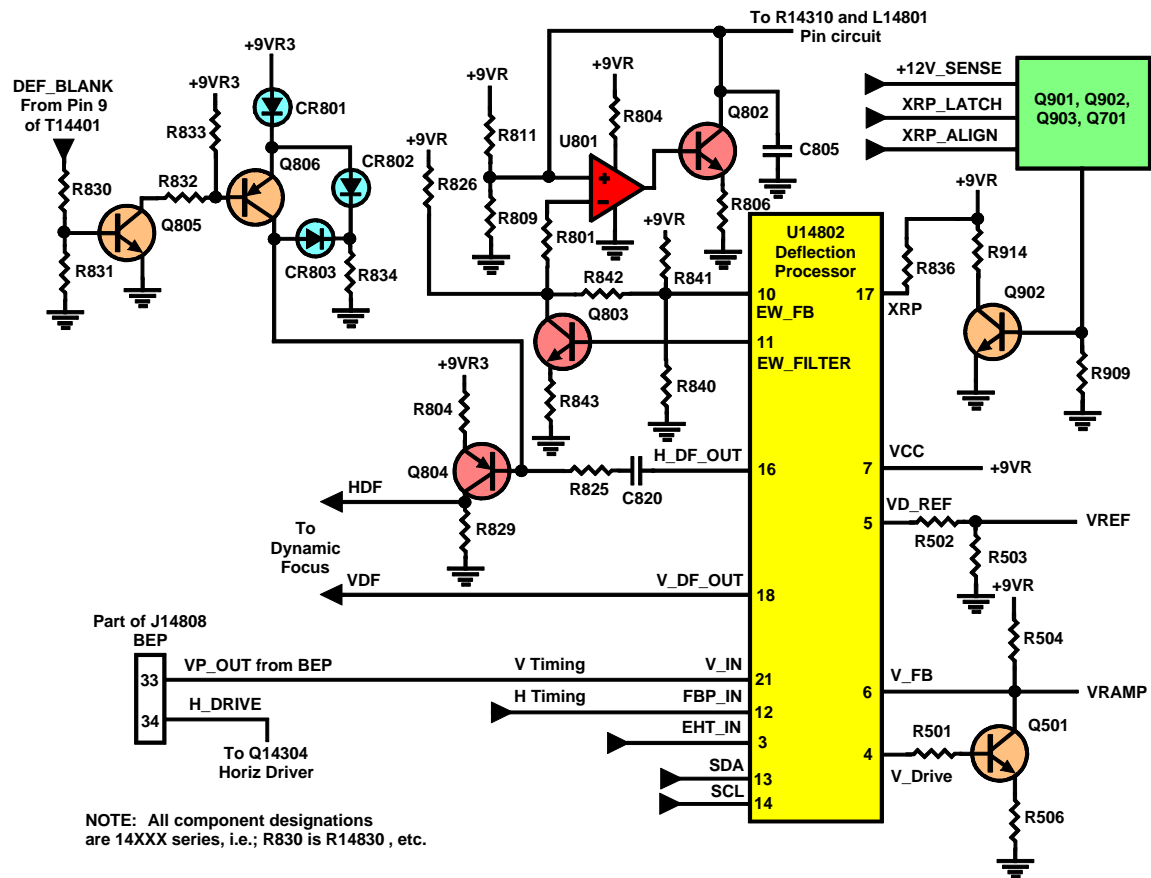
The OSD is processed and inserted by the DM2 for NTSC signals. Whenever an external 2H or 2.14H signal source (including DVI) is selected, the OSD is no longer part of the video. The OSD must be inserted to the external signal as an RGB signal from the DM2. The OSD RGB and fast switch signals are applied to U12901 from the DM2 via J12901 pins 5, 6, 7 and 8. The fast

switch line controls the correct timing of OSD to video. There are two fast switch inputs on the Backend Processor; however, since there is only one fast switch line from the DM2, the two FSW inputs are tied together on the BEP board. When the OSD inputs to the Backend Processor are above 0.7 volts, the SVM output signal is disabled. After beam limiting, the OSD signal is mixed with the video RGB.

RGB Output Processing

The RGB signals from the OSD/Video RGB matrix are applied to variable gain stages, two of which are controlled by the bus. The ATC311 controls the gain of Red and Blue channels, leaving the Green channel at fixed gain. The gain of the amplifiers is adjusted to achieve the desired display color temperature. The gain of the Red and Blue are modified to change color temperature from Normal to Warm or Cool. To set the color temperature for Warm, the Red gain is increased and the Blue gain is reduced. To set the color temperature for Cool, the Red gain will be reduced and the Blue gain will be increased.

After the RGB signals are gain controlled, they are applied to a set of clamps. These clamps are used to set the output DC levels of the RGB signals. The video signals have horizontal and vertical blanking applied to them at the output buffers and is output on the RGB pins of the IC.



Deflection

Deflection

The ATC311 deflection consists of two levels, Low Level Deflection and the Output. Low level processing is done in part by the backend processor (U12901) and by U14802 deflection processor. The deflection processor U14802 generates the East West parabola, vertical ramp, and dynamic focus signals. The backend processor U12901 generates horizontal PLL, H/V countdown, and H / V drive signals. **H_DRIVE** from the Back End Processor is used to drive Q14304 and the Horizontal output stage.

East- West pincushion correction and width adjustment are provided by a diode modulator, driven by a linear pincushion driver (Q802). U14802 IC generates the parabola used to develop the correction waveform. This allows bus control of the horizontal width and pin amplitude as well as horizontal trap correction and corner correction. In addition, a voltage developed across the high voltage return resistor (R14310) is summed at the pin driver (U14801) to compensate for the decrease in width that occurs as the high voltage increases.

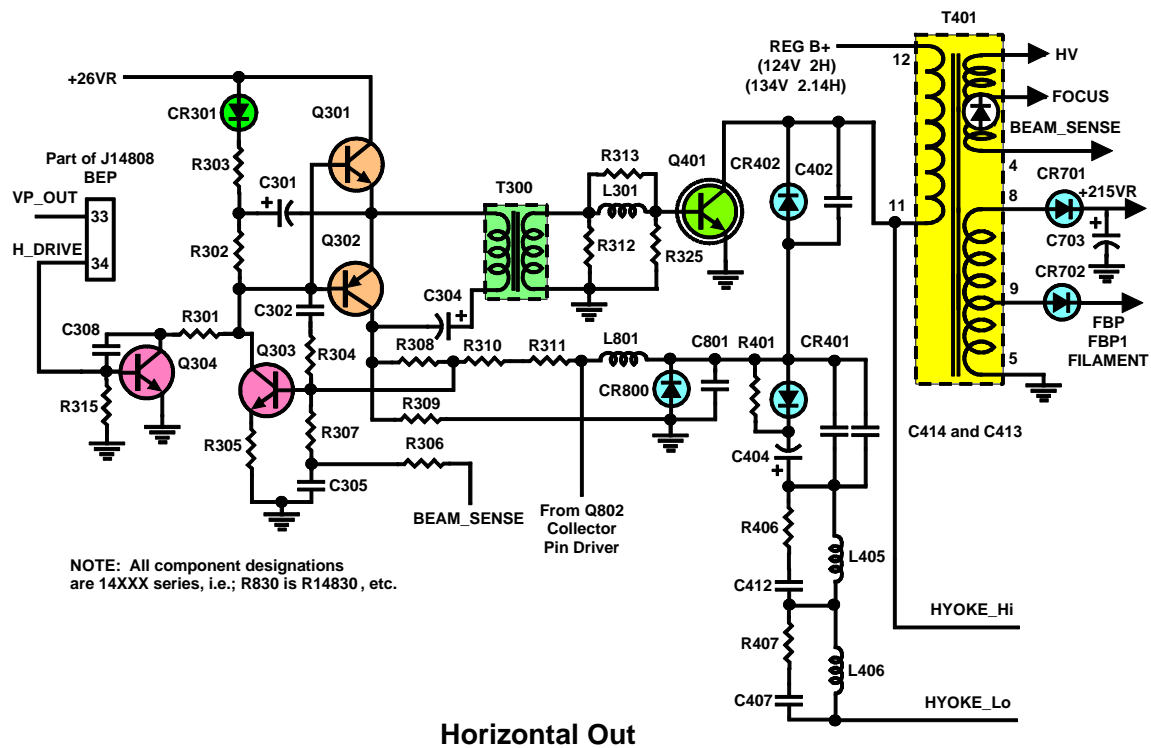
The XRP circuit in the ATC311 is similar to that of DTV307 and CTC211. A peak detector sets a self-biasing latch, which turns off the Main (Horizontal B+) power supply. The latch is reset by IIC communication only. The +12V detect is part of the XRP circuit called **+12V_SENSE**. A loss of the +12Vr turns on Q14701 tripping the XRP latch.

The low level vertical deflection processing is done in two parts. First the Back End Processor, that includes a sync separator and countdown circuit, provides the negative going vertical rate pulse, **VP_OUT**. This pulse is also used to synchronize the digital convergence.

Second, U14802 receives the **VP_OUT** pulse at pin 21 and develops the vertical deflection ramp at pin 6. The IC also provides a dc reference at pin 5, **VD_REF**, which tracks at twice the ramp center value. These two signals after a source resistor and resistive divider respectively become **V_RAMP** and **V_REF**, and are coupled differentially to the vertical output IC, which drives the yoke.

U14802 has an internal error amplifier with input at V_FB, pin 6 and output at V_DRIVE, pin 4, but local feedback is used to develop the reference ramp at pin 6.

Dynamic focus signals (HDF and VDF) come from U14802. Blanking signal from pin 9 of T14401 is buffered and added to the horizontal dynamic focus signal from pin 16 of U14802. The two signals are provided to the dynamic focus circuit via Q14804. Vertical dynamic focus signal comes from pin 18 of U14802.



Horizontal Out

The horizontal deflection system has two main functions in the ATC311 chassis. First, it supplies the current for the horizontal yoke. Second, it provides signals and power supplies needed for operation of the chassis and picture tube.

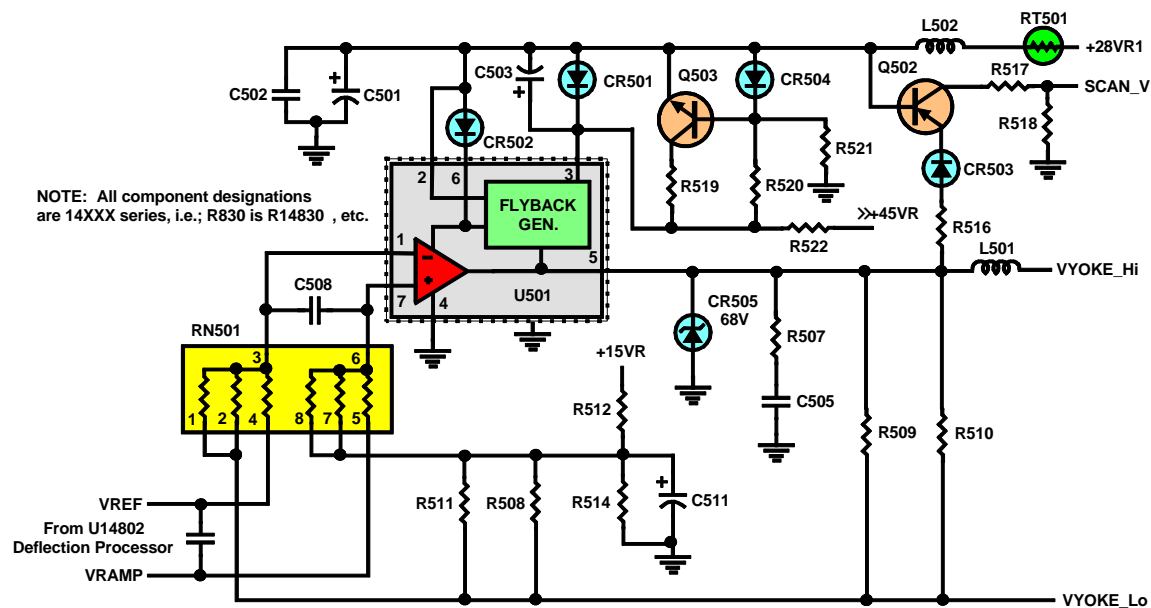
The horizontal yoke drive is provided by Q14401, CR14402, (HOT and damper diode combination), T14401 (IHVT), C14402 retrace capacitor, C14801 trace capacitor, and the horizontal yoke coils. Drive for Q14401 comes from the back end processor through J14808-34, Q14304, Q14301, and Q14302 to T14300 primary. The secondary of T14300 is inductively coupled by L14301 to Q14401-B. The frequency at which the horizontal operates is determined by the incoming signal and the BEP. The ATC311 is designed to operate at 2H and 2.14H only.

Beam sense comes from pin 4 of T14401 and is used as a control signal

for the horizontal driver and back end processor. Beam sense, at the base of Q14303, controls drive by reducing the drive signal at the collector of Q14304. As beam current increases, voltage is developed at pin 4 of T14401 and supplied to the base of Q14303. Q14303 conducts, reducing the drive signal to Q14301 and Q14302 reducing horizontal drive.

Voltages are derived from secondary windings on T14401. The video amplifier and the CRTs use these supplies. CR14701 and C14703 provide a +215V source for the CRT's and CR14702 provides the fly back pulse (FBP) for filament and timing signals. High Voltage and focus are also developed by T14401.

Pin correction signal from Q14802 is coupled to the low side of the horizontal yoke by L14801.



Vertical Out

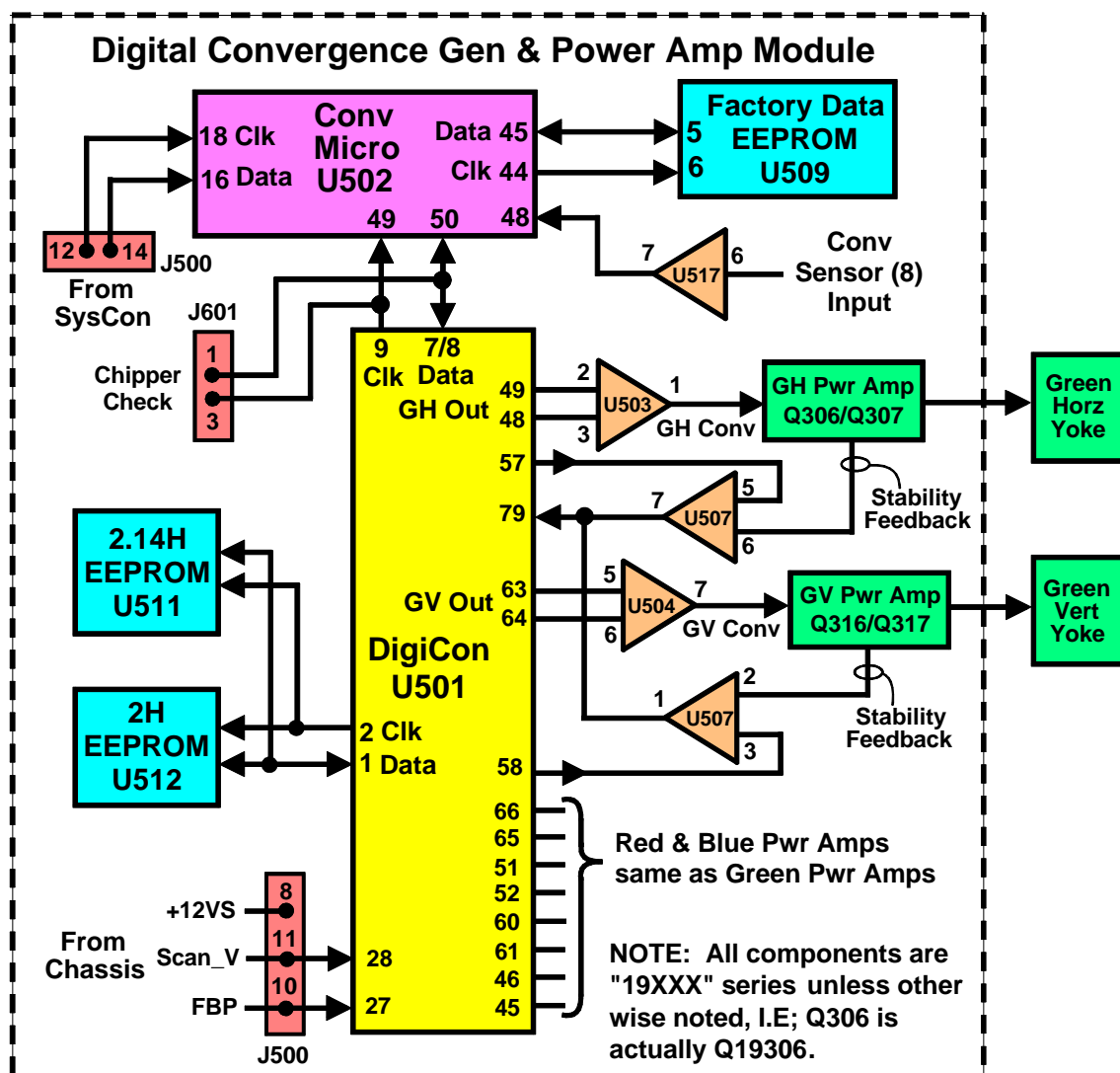
Vertical Out

The vertical output of the ATC311 is different from other vertical circuits in the past. The vertical circuit has no negative supply but uses three positive power supplies and a shunt regulator instead. The rest is similar with two signals from the deflection processor differentially coupled to U14501 via a resistor network (RN14501). These two signals are **V_RAMP** and **V_REF**. The vertical output IC (U14501) then drives the yokes. The frequency at which vertical operates is 60Hz.

Power for U14501 comes from +28Vr, +45Vr boost supply, and +15Vr half supply. The boost supply is derived from Reg B+ through dropping resistor

R1452 and shunt regulator Q14503. Shunt regulation, performed by Q14503 and the associated resistors, drops the Reg B+ voltage to +48 volts to power the output stage of U14501 during vertical retrace. The +15Vr is used as half supply with R14511 and R14508 providing current sense. C14511 provides filtering for the half supply.

A sample of the vertical output signal is used for **Scan_V**. Q14502 clamps and buffers the output signal. The signal is used for AKB and Scan Loss. If the **Scan_V** pulse is missing or distorted the video will be blanked by the Scan Loss circuit and AKB will reduce the drive. This prevents burning of the CRT's in the event vertical scan is lost.



Digital Convergence Block Diagram

Digital Convergence Overview

The effects of the Earth's magnetic field change with the placement of the TV and cause errors in convergence. These errors are automatically corrected using a microprocessor and data from optical sensors positioned inside around the outer edge of the screen. This process is referred to as digital convergence.

The digital convergence system generates six drive signals that correct

geometry of the image created by the three picture tubes. This is accomplished by a matrix of vertical and horizontal points that are assigned a digital value that is stored in non-volatile memory. Each of these data points can be individually changed. This stored digital information is converted into six analog signals that drive the convergence amplifiers. The amplified signals are used to drive the convergence yokes.

There are separate customer convergence adjustments along with much more detailed serviceman adjustments. The use of Chipper Check can speed up the alignment process in the event of major component failure.

There has been little change in the digital convergence when compared to the earlier projection sets with auto convergence. The ATC311 uses the same digital convergence processing and sensor arrangement as the CTC211. The ATC311 has only two scan modes, 2H and 2.14H.

The sensor position and access is the same as in the DTV307 and MMC102. The speed of sensor detection has increased but the process remains the same. These sensors can only be seen from the back side of the screen. A cross hatch test pattern is generated by the digital convergence micro to aid in converging the set.

Digital Convergence Generator & Power Amp Module

The ATC311 utilizes a new integrated Digital Convergence Generator & Power Amp Module for convergence correction and auto convergence. Located on the module are five EEPROMs, Convergence Micro and the Digicon IC, U501. Unlike earlier instruments, the power amplifiers are also located on the module. U502 is the convergence micro. The purpose of U502 is calculating convergence correction based on information from the optical sensors. The convergence micro controls the Digicon IC and the EEPROMs. U501 (Digicon) generates the convergence correction signals that are applied to the convergence amplifiers. U510, 511, 512, and U513 are mode EEPROMs and contain data that is used for alignment information for the different scan modes. The EEPROM U509 is the factory preset EEPROM. Two buffer ICs (U503 and 504) buffer the output from the Digicon IC to the output amplifiers. A stability feedback signal from the power amplifiers is applied to a comparator (U507) op amp along with a reference from the DigiCon IC. This is to prevent any drift of the convergence signal over a period of time due to component aging.

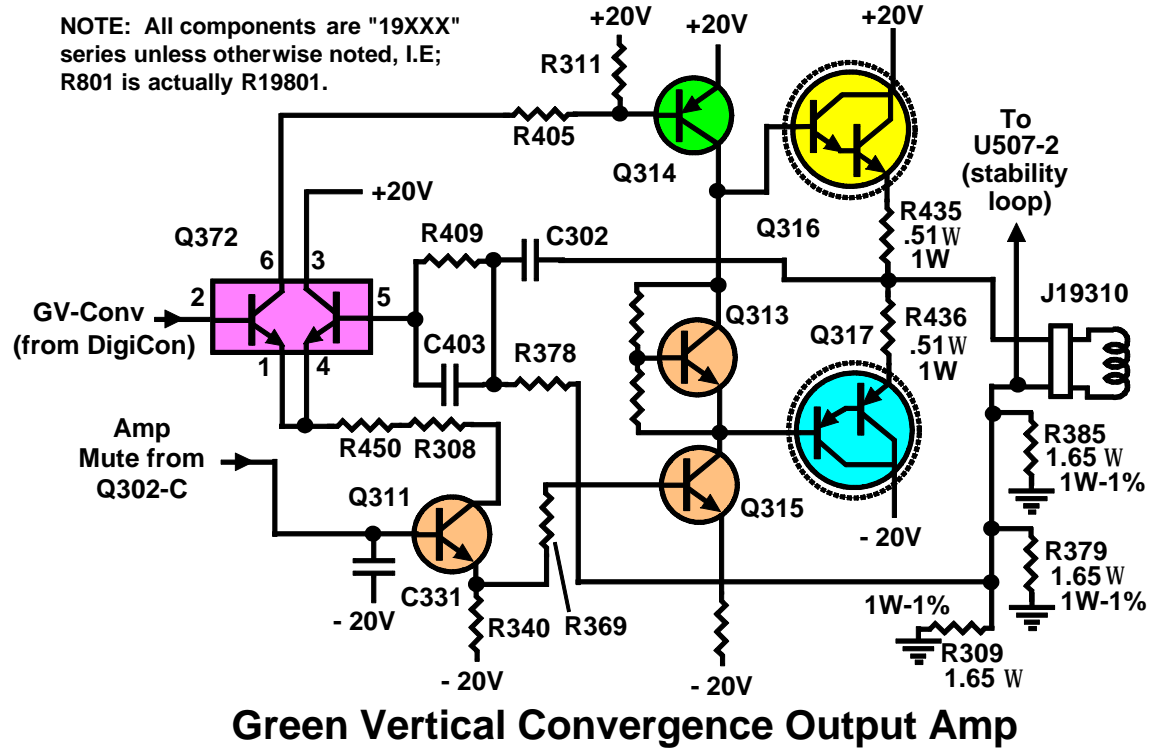
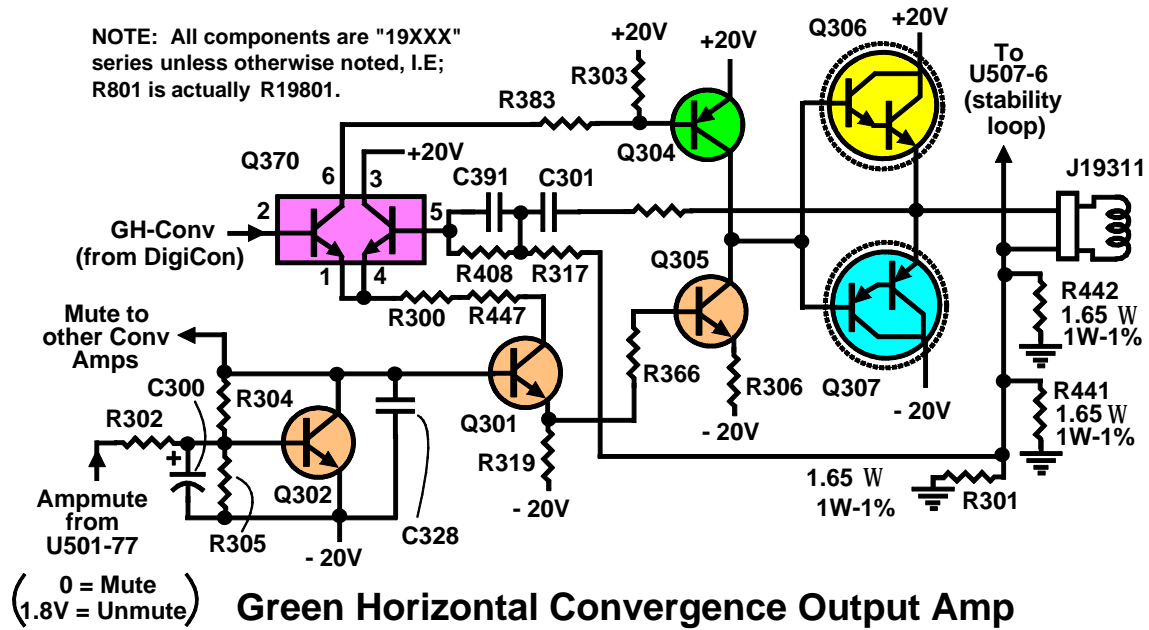
Horizontal and Vertical Convergence Power Amplifiers

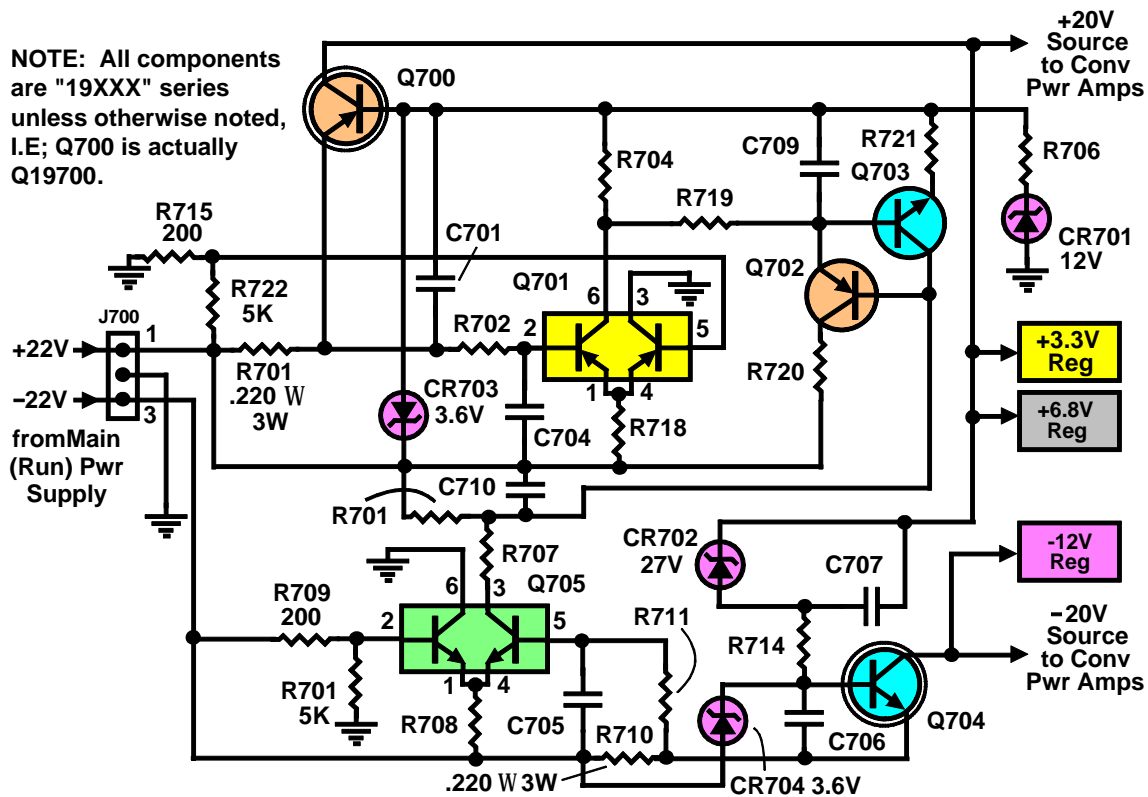
The convergence power amplifier (see Green Horz Output Amp) drives the convergence yokes via the drive waveform (GH-Conv) at pin 2 of Q370 from the DigiCon IC. The power amplifier operates between +/-20V supplies. The voltage across the yoke current sense resistors consisting of three 1.65 ohm resistors (R442, 441 & 301) is applied to the stability loop circuit of U507-6. This voltage also serves as a feedback voltage to pin 5 of Q370. Q370 is provided a fixed current (at pins 1 & 4) by a current source (Q301) that is biased on or off by a mute switching voltage (1.8V-On or 0-Off) that is output from the DigiCon IC U501, pin 77.

All the convergence power amplifiers are turned off during power up and convergence data loading from the EEPROM. The transistor Q301, a current source transistor is also an emitter follower that drives the negative pre-driver transistor (Q305). The positive rail pre-driver (Q304) is driven by the left side transistor (pins 1, 6) of

Q370. The pre-driver transistors Q304 and Q305 provides the drive for the NPN and PNP power Darlington transistors (Q306 & Q307). These power transistors operate in class B mode and drive the high side of the convergence yoke. Feedback from the high side of the yoke is coupled to pin 5 of Q370 and sets phase margin and damping. A sample of the voltage across the sense resistors is also sent to comparator (U507-6). These levels are compared with standardized outputs from the DigiCon IC U501. The DC balance and AC gain of each of the 6 channels is digitally adjusted to correct for any drift. The vertical amplifiers (see Green Vert Output Amp) are almost identical but have a transistor (Q313) connected as a base to emitter voltage multiplier located between the bases of the power Darlington. Also, feedback resistors R434 and R435 are included in series with the Darlington emitters. These two changes reduce the class B crossover transients and eliminates a horizontal streak from the raster.

NOTE: All components are "19XXX" series unless otherwise noted, I.E.; R801 is actually R19801.





Convergence Power Amp Shutdown

Convergence Power Amplifier Shutdown

The convergence power amplifier shutdown circuit is designed to prevent further damage to the power amplifiers by removing the +/-20V supplies in the event of a failure. Q700 and Q704 act as disconnect switches while Q702 and Q703 serve as a latch. The latch resets when the set is cycled off and back on. Q700 and Q704 disconnects the power supplies to the convergence amplifiers and latch them off via Q702 & Q703 if either supply delivers greater than 3A for more than 10 to 15mS. The delay is needed because of startup current spikes. It's important to realize that all the bias voltages in the circuit are provided by the +/-22V supply from the

main (run) power supply. Transistors Q700 and Q704 actually provide the +/-20V source supply to the convergence power amplifiers.

During normal operation Q700 is biased On by CR703, R706 and CR701. Also, during normal operation transistor Q701 pins 1-2-6 is biased Off. R701 serves as the current sense resistor. As current increases through R701 the voltage at pin 2 of Q701 begins to fall. The voltage at pin 5 of Q701 is a reference voltage provided by R715 and R722 and determines the voltage at which the transistor Q701 (pins 1, 2 & 6) turns on.

It's important to note that the R/C time constant of R702 and C704 provides the 10 to 15mS delay. C704 holds pin 2 of Q701 Hi for 15mS before letting the transistor turn on. When the voltage falls to .7V below the emitter (pin 1), the transistor turns on applying a Hi to the base of Q703 turning it on. When Q703 turns on Q702 turns on and they latch. With Q703 on, a Hi is placed on the base of Q700 by the emitter voltage of Q703 turning Q700 off and removing the +20V source from the power amplifiers. With the +20V source gone, the base of Q704 is allowed to go more negative than the emitter thus turning it off. With Q704 off, the -20V source is removed from the convergence power amplifiers.

The negative side of the circuit (Q704 and Q705) operates in the same manner as the positive side except that the voltages are below ground potential. When excess current is drawn from the

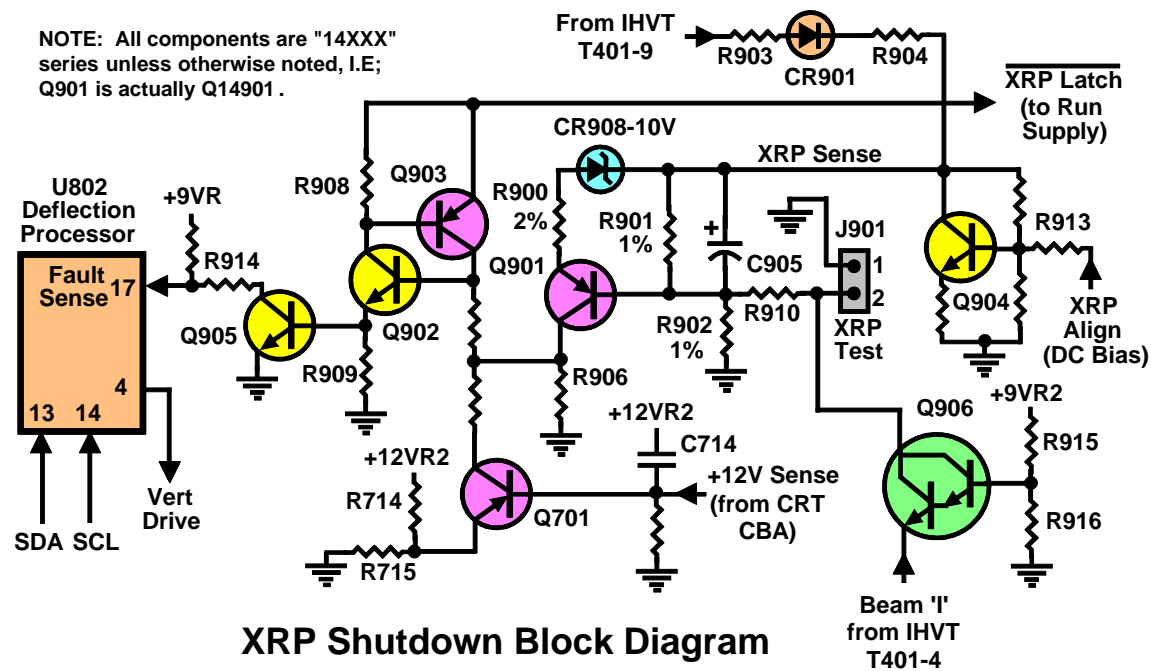
-22V supply through R710, the base voltage at pin 5 of Q705 goes Hi enough for the transistor to turn on. With Q705 on, the base of Q702 (latch circuit) is pulled Lo enough for it to turn on. With Q702 on, Q703 turns on and again places a Hi on the base of Q700 removing the positive source voltage. With the +20V at the cathode of CR702 missing, Q704 is biased off removing the -20V source. C705 and R711 provides the 10 to 15mS delay in the negative circuit.

The +20V source is also applied to a +3.3V regulator located on the convergence circuit board. This +3.3V supply is for the DigiCon IC and the convergence microcomputer. If the +20V source is lost, the +3.3V is also lost and the convergence microcomputer goes down. When the system control micro tries to communicate with the convergence micro it does not get a reply and system control micro shuts the instrument down.

R107 and R116 placing a low on the base of Q107 turning it on. With the loss of horizontal, the run supply is lost and the voltage stored in capacitors C104 and C114 provides the B+ for Q107. With Q107 turned on Q104 and Q105 are turned on. The grid kick voltage (approx. -180VDC) is generated by capacitors C102 and C110 charging through diode CR103 and CR114 to the +215V supply. When Q105 turns on, the positive side of the grid kick capacitors are grounded applying a negative 180VDC directly to the G1 grid. Reverse biasing the G1 grid with -180VDC ensures that the cathode current is zero. At the same time Q104 is turned on grounding the junction of R110 and R111 and turning off the +10V grid bias by removing B+ from the emitter of Q103. A high (video mute) is

also coupled to each CRT circuit board via R144.

Vertical is monitored for scan loss by Q110 and Q111. A vertical pulse is capacitively (C120) coupled to the base of Q110. CR120, CR121 and the +12Vr provides bias to the base of Q110 causing it to act as a vertical rate oscillator. With Q110 oscillating, the base voltage of Q111 is kept low enough to keep it off. When vertical is lost, capacitor C121 charges through R122 and turns on Q111. When Q111 turns on, the base of Q107 is pulled low turning it on. This applies a high to Q104, Q105 and also to the CRT CBA's (video mute). As with horizontal loss, Q105 applies the grid kick voltage (-180VDC) to grid G1 and Q104 shuts off the grid bias transistor Q103.



XRP Shutdown Overview

The primary function of the XRP circuit is to turn off the run power supply and shutdown the deflection processor IC, U802. The XRP shutdown circuit has three (3) inputs. These are the Over-Voltage, +12V Sense (CRT CBA) and the excessive beam current. Detecting over-voltage is performed by CR901 and CR908. A horizontal pulse from the IHVT T401 pin 9 is rectified by CR901. A precision reference voltage is generated by Q904 and the XRP Align bias voltage. This XRP Align voltage is stored digitally in the EEPROM and is converted (by a DAC) to an analog

voltage. When the voltage on the cathode of CR908 (Q904-C) rises above 10V, zener CR908 breaks over and transistor Q901 turns on. With Q901 turned on, the latch (Q902 & Q903) turns on and outputs a low (XRP Latch) that turns off the run power supply (see run power supply). When Q902 turns on, the base of Q905 is pulled high enough to turn it on. With Q905 on, a low is applied to pin 17 of U802, instructing it to turn off vertical and send a message to the system control (SDA) to shutdown the instrument.

The +12V Sense monitors for problems in the video drive circuit on the CRT CBA's to prevent damage to the CRT's. In the event the video drive IC shorts or the 215V cathode voltage is lost the XRP circuit is activated, shutting down the instrument. The CRT CBA +12V Sense is applied to the base of Q701. Q701 is held off as long as the +12V is present. If the +12V is lost on the CRT circuit board, the base of Q701 goes low enough to turn on Q701. When Q701 is on, the latch circuit (Q902/903) turns on again and applies the XRP

Latch signal to the run supply. Also, Q905 turns on shutting down U802.

Beam current is monitored by Q906. The emitter of Q906 is connected to pin 4 of the IHVT, T401. When excessive beam current occurs the emitter voltage of Q906 is pulled below its base voltage which turns it on. With Q906 on, a low is applied to the base of Q901 turning it on. With Q901 turned on the latch Q902/903 turns on generating the XRP Latch. Q905 also turns on shutting off IC U802.

Appendix A

Troubleshooting Section

Dead Set Troubleshooting

NOTE: If power LED comes on when power button is pressed and then the set powers down (LED off) go to step 6.

1. Use J24204-1 as the hot ground reference. Check Raw B+ at connector J24204-2 (AC IN CBA). If Raw B+ is OK, go to step 4. If not OK go to step 2.
2. Check AC fuse, F24201. If fuse is OK, suspect AC IN CBA. If fuse is open, unplug horizontal yoke plug J14401 (Deflection CBA) and check for short between pins 1 and 2 on the deflection circuit board. If shorted suspect Deflection CBA. If not shorted go to next step.
3. Unplug connector P24203 (AC IN CBA) and check for short across pins 1 & 2 (cable end). If shorted suspect Subwoofer Amp/PS CBA. If not shorted, suspect AC IN CBA.
4. Use the interconnect diagram as a reference and J24604-10 as the cold ground reference. Check all standby voltages at connectors J24604, J24605, J24601 and J24602 (AC IN CBA). If any standby voltages missing, suspect AC IN CBA. If standby voltages are OK go to next step.
5. Apply AC power and press power button.
6. If LED turns on and then off, disconnect J11501 (Audio CBA) and press power button again. If power LED comes on and stays on suspect Audio CBA. If LED still flashes or does not light go to step 7.
7. Disconnect J26903 (AV IN CBA) and press power button again. If power LED comes on and stays on suspect AV IN CBA. If LED still flashes or does not light go to next step.
8. Disconnect J19500 (Convergence CBA) and press power button again. If power LED comes on and stays on troubleshoot the Convergence CBA. If LED still flashes or does not light go to next step.

9. Disconnect J14801 (Deflection CBA) and press power button again. If power LED comes on and stays on suspect Deflection CBA. If LED still flashes or does not light suspect DM2 module.
-

Standby Power Supply Troubleshooting

1. With AC power supplied, check for raw B+ at connector J24204-2. If raw B+ is ok, go to step 4. If not ok, check F24201, CR24201, C24208 and 209.
2. If fuse F24201 is open, remove AC power, unplug J14401 and check for short between pins 1 and 2 on the deflection CBA side. If shorted troubleshoot the run supply and deflection circuits. If not shorted, go to step 3.
3. Unplug connector P24203 and check for short across pins 1 and 2 on the subwoofer power supply / amp CBA side. If shorted troubleshoot subwoofer power supply / amp CBA. If not shorted, go to step 4.
4. Remove AC power and check Q24601 for gate to drain short and drain to source short. If shorted replace all active components on the primary side of T24601 and R24601. If not shorted, go to step 5.
5. Unsolder drain of Q24601, if fuse was open replace AC fuse and apply AC power.
6. Check for +12Vdc on the gate of Q24601. If missing, suspect R24604, 605, 602, CR24601, 602, Q24602, and 601. If +12Vdc present, go to step 7.
7. Remove AC power and check for proper resistance (see table on pg. 40) on each output diode CR24620, 623, 626, 630, 637, and 638. If not correct check associated circuit with each incorrect resistance. If resistances ok, go to step 8.
8. Solder drain of Q24601 back in, short pins 3 and 4 of U24601, and apply AC power. If supply starts to oscillate, check U24601, 602, and precision resistor network in feed back circuit. If not check components in the source circuit of Q24601.

Standby Power Supply Resistance Table

| | |
|---------|----------|
| CR24610 | Infinity |
| CR24613 | 5K |
| CR24612 | 85 ohms |
| CR24614 | 115 ohms |
| CR24615 | 2K |
| CR24616 | 2K |

Run Power Supply Troubleshooting

No Start, Relay clicks, and Power LED is on

NOTE: If relay clicks and power LED comes on then the standby power supply and system control are functioning.

1. Apply AC power and check Q14101-D for raw B+ (approx.150Vdc). If missing, check J14101 from the standby supply and T14101 for an open circuit. If raw B+ is correct go to step 2.
2. Remove AC power, unsolder the drain of Q14101 and short collector to emitter of on/off transistor Q14150. This will turn on bias to the oscillator circuit and gate of Q14101. Check for +24V on the Q14101-G. If missing check Q14102, 103, 151, R14103, 104, 105, 106, 107, CR14113, and CR14114. If +24V present, go to step 3.
3. Using the resistance table, check each output diode. If resistances are correct go to step 4. If not correct check associated circuit of improper resistance reading.
4. With Q14150 still shorted (C-E), solder the drain of Q14101 back in and short pins 3 and 4 of U14101 to bypass regulation control. This makes the supply operate at reduced voltage. Apply AC power, if supply starts to oscillate, check feedback circuit Q14104, U14103, U14101, and precision resistors. If no oscillation, go to step 5.

5. Remove AC power and check components off of pin 11 of T14101 and off of pins 3 and 4 of U14101. Check components in the source circuit of Q14101.

Resistance Table

| | |
|---------|----------|
| CR14109 | 55K |
| CR14108 | 9K |
| CR14107 | 28K |
| CR14106 | Infinity |
| CR14140 | 5K |
| CR14142 | 5K |

System Control Troubleshooting

Dead set, isolate down to chassis or DM2 module. Power LED blinks.

1. Apply AC power and check J13604 and J13605 for proper voltages all pins. Voltages not correct troubleshoot AC in CBA. Voltages correct go to step 2.
 2. Check J13604-1 for 5Vdc. If missing or low power supply is indicating power failure. Troubleshoot AC in CBA. If 5Vdc ok, go to step 3.
 3. Remove AC power and disconnect J14801 on the deflection CBA. Apply AC power and turn on set. If power led turns on, troubleshoot deflection CBA. If power LED still wont stay on suspect DM2 module.
-

Horizontal Out Troubleshooting

Setup:

- Unsolder Q14401-C
- Disconnect all three CRT sockets
- Force on Run supply by shorting C-E on Q14150
- Force on 9Vr for BEP by shorting C-E on Q14111 and apply AC power.

Horizontal Drive should be present at pin 34 of J14808 if not troubleshoot BEP.

1. Check for drive signal at Q14304-C. If missing check +26Vr, Q14304, and Q14303. If ok go to step 2.
2. Check for horizontal drive at Q301-E. If missing check base circuit of Q14302 and Q14301, 14302, and C14304. If ok go to step 3.
3. Check for signal at the base of Q14401. If missing suspect Q14401, T14300, and L14301. If present, remove AC power and reconnect Q14401-C.
4. Unplug J14401, horizontal yoke.
5. Apply AC power and check for signal (490V P-P) at the collector of Q14401. If incorrect, suspect T14401 or it's secondary circuits. If correct suspect yokes or yoke return circuit.

Vertical Out Troubleshooting

Troubleshooting Tips

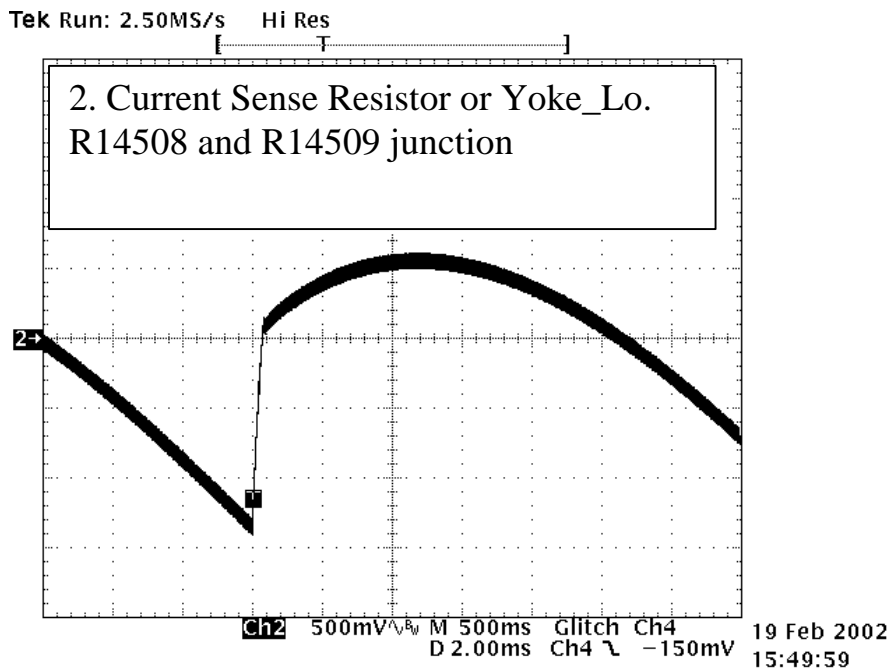
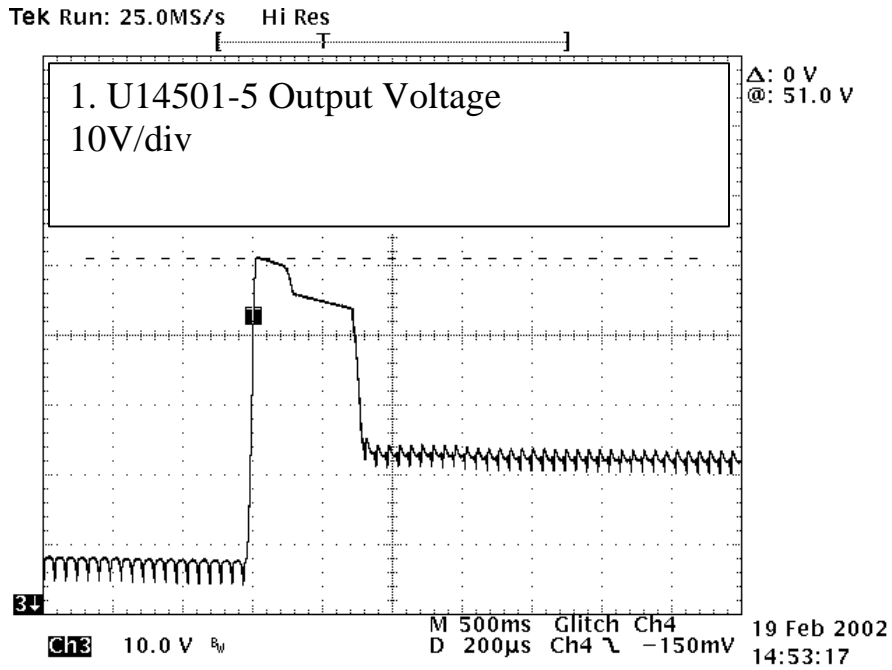
- If there is no vertical pulse from U12901-27, confirm fly-back pulse is present at U12901-24. It must be present for the vertical countdown to function.
- If the vertical power stage U14501 has failed, CR14501 has likely failed also, and should be replaced. Failure to replace it will result in the boost voltage being equal to the 28VR1 supply voltage. The retrace will be too slow, and SCAN_V will not be proper. AKB blanks the picture if this pulse is not proper.

1. Disconnect CRT sockets from all three CRT's.
2. Disconnect vertical yoke plug J14501.

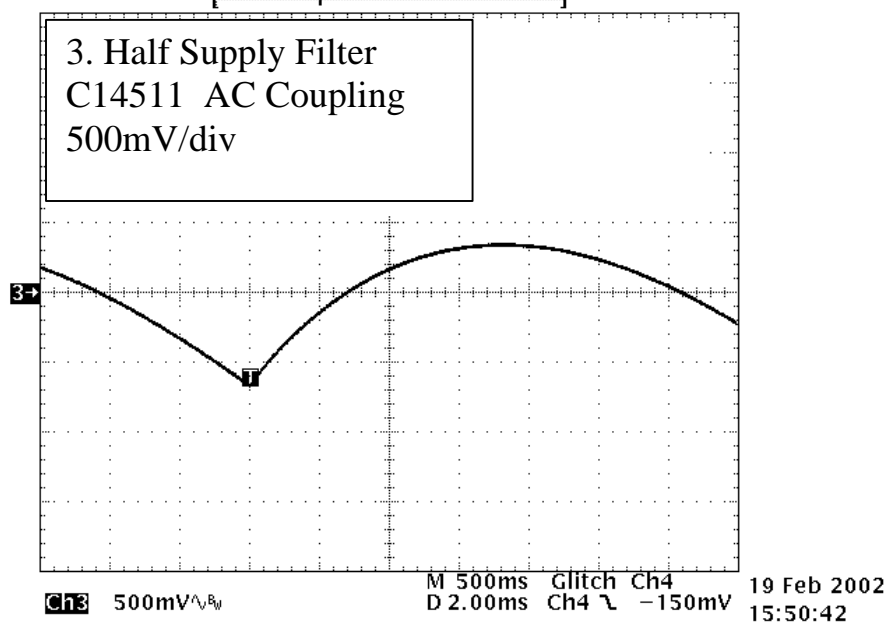
3. Apply AC power and turn on set.
4. Check Source voltages +28Vr, +15Vr, and +45Vr. If sources are missing troubleshoot source supplies. If ok, go to step 5
5. Check U14501 for proper voltages at pins 1, 2, 3, 5, 6, and 7. See chart below. If incorrect, suspect U14501, CR14501, RN14501, and C14503. If correct, go to step 6.
6. Check for waveform at pin 5 of U14501. If correct suspect open yoke. If not correct suspect R14509, 14510, and feed back components to RN14501.

| U14501 Pin # | Voltage With Yokes | Voltage W/O Yokes |
|--------------|--------------------|-------------------|
| 1 | 7.9Vdc | 7.9Vdc |
| 2 | 31.5Vdc | 31.5Vdc |
| 3 | 46.8Vdc | 47.3Vdc |
| 5 | 15.1Vdc | 15.8Vdc |
| 6 | 30.9Vdc | 31.0Vdc |
| 7 | 7.8Vdc | 7.8Vdc |

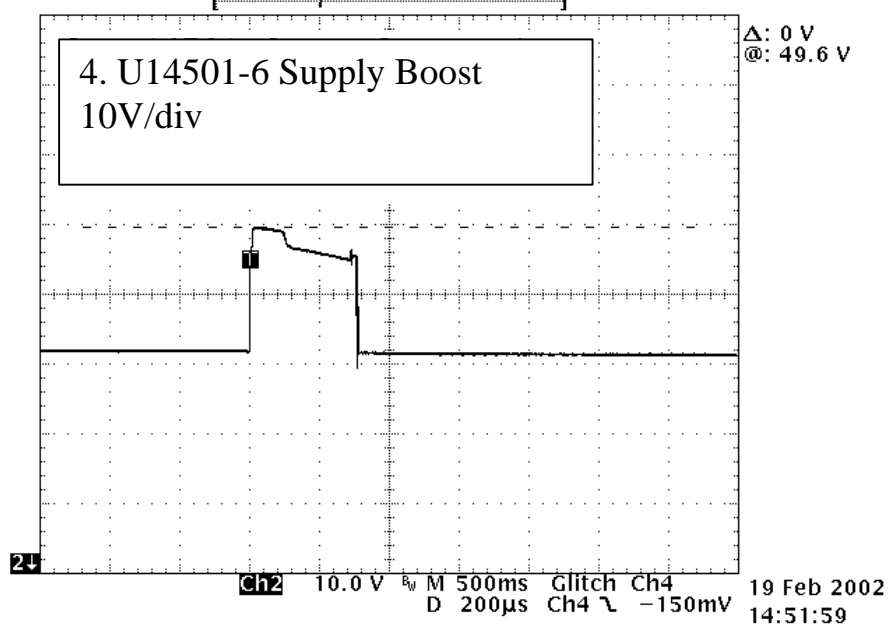
Vertical Key Waveforms

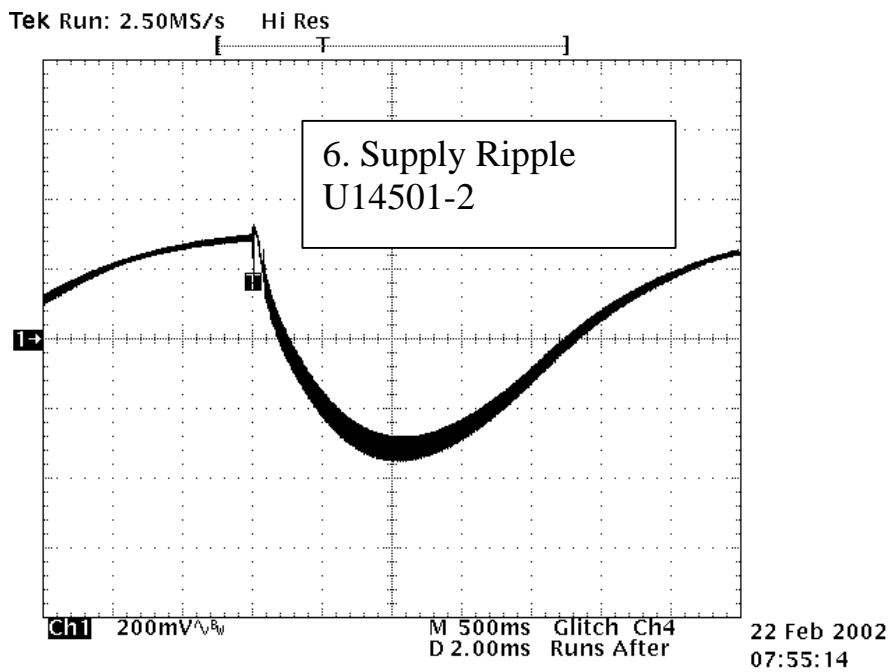
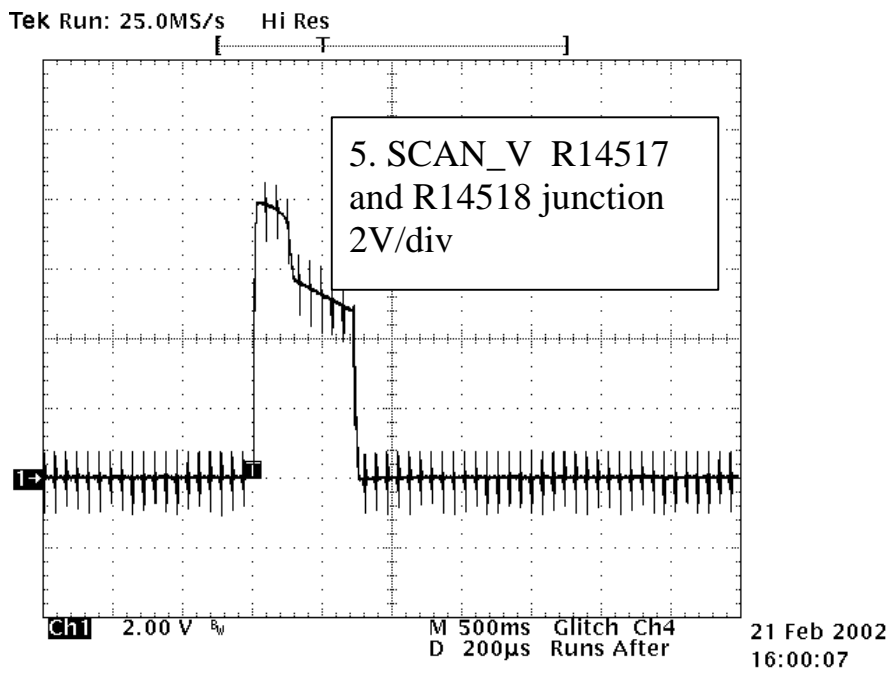


Tek Run: 2.50MS/s Hi Res

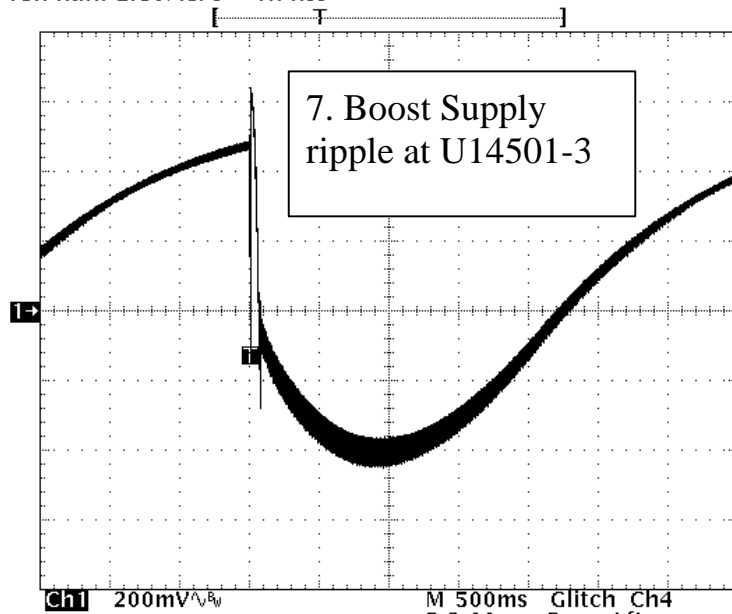


Tek Run: 25.0MS/s Hi Res





Tek Run: 2.50MS/s Hi Res



XRP Shutdown Troubleshooting

1. Remove CRT CBA's. Apply AC power and turn set on. If set starts suspect +12V Sense and/or excessive beam current shutdown.
 2. If set doesn't start with CRT sockets unplugged, remove R14914 (XRP bypass). Monitor high voltage and turn set on.
 3. If high voltage is excessive, troubleshoot horizontal and Reg B+ circuits.
 4. If high voltage is OK, suspect component failure in XRP circuit.
-

Back End Processor Troubleshooting Tips

If there is video at the input, but no RGB output, check that the FSW0 line, pin 20 of J12901 connector, FSW0 is low. If it is high, the video will be blanked.

If there is video at the input, but no RGB output, check that the BLK_OUT line, pin 25 of the J12901 connector is low. If it is high, video will be blanked.

Troubleshooting

No Video any mode

1. Check for clock and data at J12901-1 and 2. If missing troubleshoot deflection CBA and DM2 clock and data lines. If ok, go to next step.
 2. Select a known good channel and check for proper signals on J12901-5, 6, 7, 8, and 9. If missing, troubleshoot DM2 and A/V switching CBA. If correct, go to next step.
 3. Check for proper signals at J12901-28, 29, and 30. If correct, troubleshoot deflection CBA, CRT CBA for loss of signal flow. If missing, see troubleshooting tips above and suspect BEP.
-

Convergence Generator Troubleshooting

1. Check the operation of the Convergence Power Amps and the Convergence Power Amp Shutdown circuits using the appropriate troubleshooting procedure. If the circuits check OK go to next step.
 2. Check clock and data at J19500 pins 12 & 14. If OK go to next step. If not OK suspect loss of clock and data between system control and convergence CBA.
 3. Check for +12VS at J19500-8. If OK go to next step. If not OK, troubleshoot +12VS standby supply.
 4. Check J19500-10 & 11 for horizontal and vertical sync. If OK suspect convergence CBA. If not OK, troubleshoot horizontal and vertical sync circuits.
-

Convergence Power Amplifier Troubleshooting

1. Remove AC power and unplug convergence yokes. Apply AC power and turn instrument on. Check for the +/-20VDC supplies at collectors of output transistors, IE; Q19306 and Q19307.
2. Check emitter junction of power output devices for 0VDC. If other than 0VDC, suspect power amplifier circuit.

NOTE: Pre-drivers and output devices may be swapped with like components of other power amp circuits to verify defective devices.

Convergence Power Amplifier Shutdown Troubleshooting

1. Remove AC power and disconnect J19500. Apply AC power and start instrument. If chassis starts go to next step. If chassis doesn't start go to Dead Set Troubleshooting.
 2. Remove AC power and disconnect J19310 and J19311 (convergence yokes). Apply AC and turn instrument on.
 3. Check Q19704-C. If +20VDC present, check Q19704-C for -20VDC. If OK, troubleshoot convergence power amplifiers. If not OK, go to next step.
 4. Check for +/-22VDC at J19700-1/3. If missing troubleshoot the main (run) power supply. If OK, suspect a problem in the amplifier shutdown circuit (static check all components).
-

No Video Troubleshooting

1. Apply AC power and turn on unit.
2. Press menu, if OSD is present go to step 6.
3. No OSD / video, connect 2H or 2.14H Y Pr Pb signal to Aux. 4 input and using the remote slowly cycle through all inputs. This requires pressing the input button on the remote seven (7) times to cycle through all inputs.
4. Video present and no OSD go to step 8. No video present, go to next step.
5. Using scope check for signals on J14802-1, 2, 4, 6, and 8. Signals present, suspect deflection / back end processor. Signals not present suspect AV In CBA.
6. Using a known good NTSC RF source and splitter, connect source to both antenna inputs. Check for video on antenna A and B, if no video on both or

just one antenna input suspect DM2. If video is present with both antenna A and B go to next step.

7. Connect a NTSC 1H video signal to aux inputs. Cycle through each of the inputs. No video or video on some inputs, suspect AV In CBA.
 8. Using a video monitor connected to the video output, tune to an active station. Video displayed on monitor suspect A/V In CBA. No video displayed suspect DM2 module.
-

Chipper Check Connection Troubleshooting:

Can't establish a connection

Step 1: Check to ensure IP address is set correctly

Use ipconfig to verify IP address and Subnet mask are set correctly

Run Dos Prompt

Type ipconfig

Verify that network adapter IP address = 169.254.1.0

Verify that network adapter subnet mask = 255.255.0.0

Step 2: Make sure your PC isn't blocking Ethernet communications

Use Ping to communicate with TV.

Run Dos Prompt

Type ping 169.254.1.0

PC will respond with no error.

NOTE: If you don't get a response from your PC, try the following:

- 1) Disable any firewall/antivirus software
- 2) Restart PC.

Step 3: Try to manually establish a connection with Chipper Check

- 1) Start Chipper Check.
- 2) Select <Ethernet><Software Upgrade>
- 3) Open Dos prompt
- 4) type [ftp 169.254.1.0](ftp://169.254.1.0)

If you are set up correctly, Chipper Check will allow the connection and ask for a user name and password.

Appendix B

Networking Glossary

10Base-2 cable: More commonly known as *coaxial cable* or *thinnet cable*. This network cable looks like a thin version of the cable that your cable television company uses. Today, many companies are abandoning their 10Base-2 systems in favor of 10Base-T cable. See also *10Base-T cable*.

10Base-T cable: Also called *twisted-pair cable*, 10Base-T is the current standard in network cable. 10Base-T looks like telephone cable, but the main difference is that it's designed to transmit data rather than voice. Two types of 10Base-T are available: unshielded twisted pair (UTP) and shielded twisted pair (STP). In STP, metal encases the cable wires, lessening the possibility of interference from other electrical devices, radar, radio waves, and so on. Using 10Base-T requires the purchase of a concentrator. Each network computer's NIC is connected to a length of 10Base-T, which is then connected to a concentrator. The concentrator disseminates data to the computers' NICs. See also *concentrator*; *NIC*, *star topology*.

AC adapter: A device that transforms alternating current (AC) electricity into direct current (DC) that devices like laptops and notebooks can use.

active application: The software application you currently have open with the application's window appearing in the foreground of your screen. Other applications that may be open are in the background of your screen and are called inactive applications.

ADSL (Asymmetric Digital Subscriber Line) modem: This technology uses standard telephone lines to produce incredibly fast connections to the Internet. You need a special ADSL modem, telephone lines that support the technology (coming soon to most cities), and an Internet host server that supports ADSL technology.

arrow keys: Sometimes called direction or cursor keys. These keyboard keys have arrows pointing up, down, right, and left and are used to navigate around the screen.

ASCII (American Standard Code for Information Interchange): This standard assigns a number to each key on your keyboard. Internally, your computer uses the numbers to read and write keyboard characters.

ASCII text file: A file that contains untranslated ASCII characters without special formatting.

AutoPlay: A feature in Windows that automatically searches for and launches a CD's Auto Run file when you insert a disc into a CD-ROM drive.

backup: A copy of the files on *your* computer that you can use to restore data in the event of a computer crash.

banner: Also called a *separator page*. A form that accompanies each print job. The form displays the name of the user and prints ahead of the first page of each document so that multiple users of a printer can easily identify their documents. To print a banner, you must configure the printer for this feature.

barrel connector: A tube-shaped device that enables you to join two lengths of 10Base-2 cable in a network. See also *10Base-2 cable*.

baud rate: Also referred to as *bits per second* (bps). The speed at which information is transferred.

beta: A designation given to software that has not yet been released for distribution because it is still being tested. The beta version of software is usually in its second testing cycle (*alpha* versions are earlier releases) and is usually only available to particular users (called *beta testers*).

BIOS (Basic Input-Output System): Part of a PC that controls and manages the hardware in the computer.

bit: The smallest unit of digital information. A bit is either *on* or *off* (to the computer, on is 1 and off is 0).

bitmap: A graphic image stored as a pattern of dots (called *pixels*).

bits per second (bps): *The speed at which data is transferred.*

BNC connector: A round device shaped like a fat ring that locks male and female connectors together. A BNC connector looks like a smaller version of the connector at each end of your cable television cable. Installed at each end of a length of coaxial cable (also called 10Base-2 or thinnet), the BNC features a center pin (connected to the center conductor inside the cable) and a metal tube (connected to the outer

cable shielding). The rotating ring on the metal tube turns to lock the male connector to the female connector. See also *10Base-2 cable*.

boot: The process of starting the computer and loading the operating system. Some people think the term originates from the adage “pulling oneself up by one’s bootstraps.”

brownout: A drop in electrical voltage that can destroy a variety of computer components (hard drive, chips, and so on). You can prevent brownout damage by purchasing a voltage regulator. See also *voltage regulator*.

bus: A slot on your computer’s motherboard into which you insert cards, such as network interface cards. (technically), the name of the slot is *expansion slot* the bus is merely the data path along which information flows to the card. Nowadays, the common computer jargon is bus.) See also *NIC*.

byte: The amount of memory needed to specify a single ASCII character (which is 8 bits). Kilobytes and megabytes are usually used to describe the amount of memory a computer uses. See also *kilobyte*, *megabyte*.

cable modem: A modem that connects to your cable television company’s cable lines (but doesn’t interfere with TV transmissions). Cable modems are significantly faster than standard modems but aren’t yet widely available. Cable modem speeds are measured in millions of bytes per second rather than in the thousands of bytes per second common in standard modems. See also *standard modem*.

cache: Random access memory (RAM) that is set aside and used as a buffer between the CPU and either a hard disk or slower RAM. The items stored in a cache can be accessed quickly, speeding up the flow of data.

cascade: An arrangement of open program windows on the desktop so that they overlap each other, with the title bar of each window visible.

cascading menu: Also called a hierarchical menu or submenu. A menu that is opened from another menu item. In Windows, a menu item has an arrow that points to the right if the item opens a cascading menu.

CD-ROM (Compact Disc-Read Only Memory): Discs that contain programs or data. CD-ROMs can hold over 600 MB of data. You can only read data on a CD-ROM; you cannot write (save) data.

CDRW (Compact Disc-Recordable/reWritable): Compat discs that can be re-written to multiple times.

centronics interface: The connector on a printer cable (called a *parallel cable*) that attaches to the printer.

check box: A small square box in a dialog box that can be selected or cleared to turn an option on or off. When the check box is selected, an X or a check mark appears in the box.

client: A computer that uses hardware and services on another computer (called the *host* or *server*). Also called a *workstation*. See also *client/server network*, *host*.

client/server network: A network scheme in which a main computer (called the host or server) supplies files and peripherals shared by all the other computers (called clients or workstations). Each user who works at a client computer can use the files and peripherals that are on his individual computer (called the local computer) or on the server. See also *client*, *host*, *local computer*.

Clipboard: An area of memory devoted to holding data you cut or copy, usually used to transfer data between applications or between parts of a data file. Typically, you transfer data to the Clipboard by using an application's Copy or Cut command, and you insert data from the Clipboard by using the application's Paste command.

cluster: A unit of data storage for hard or floppy disks. coaxial cable: See *10Base-2 cable*.

COM port: Also called a serial port. A connector into which you can plug a serial device cable, usually a modem. Most PCs have two COM ports: *COM1* and *COM2*.

computer name: A unique name assigned to a computer on a network to differentiate that computer from other computers on the network.

concentrator: Also called a *hub*. The home base of a 10Base-T network to which all lengths of cable from the network computers are attached. (One end of each cable length attaches to the concentrator;

the other end of each length attaches to a computer's network interface card.) See also *10Base-T cable*, *Nic*, *star topology*.

CPU (central processing unit): The chip that runs the computer.

default button: In some dialog boxes, a command button that is selected automatically if you press Enter. In most dialog boxes, the default button has a bold border to make it discernable.

defragment (or defrag): To take fragments of files and put them together so that every file on a hard drive has all of its contents in one place. Defragging makes opening files a much faster process because the operating system doesn't have to look all over your hard drive for all the pieces of a file that you want to open.

device driver: Software that allows your operating system to communicate with hardware (such as network interface cards) or peripherals (such as printers). For example, a printer driver translates information from the computer into information the printer can understand and manage. (Also called *drivers*.)

Dial-Up Networking: A feature in Windows that enables your modem to dial out and connect to a server, either on the Internet through an Internet service provider, or to a server in a company network.

directory: Part of the structure for organizing your files on a disk. A directory can contain files and other directories called subdirectories). In Windows, directories are usually called *folders*.

document: A data file that you create in a software program.

document window: A window within a software program that contains an open document. Most software written for Windows can have more than one document window open at a time.

embedded network card: A network card built into a computer's motherboard.

Ethernet: The most widely used of the several technologies available for cabling local area networks. See also *LAN*

evaluation software: A specially programmed version of commercial software. The software may stop working after a certain amount of

time has elapsed or may be missing some features of the commercial version. See also *free ware*, *shareware*.

expansion slot: A slot on your computer's motherboard into which you insert cards, such as network interface cards. See also *bus*.

extension: The period (.) and characters at the end of a filename. An extension usually identifies the kind of information a file contains. For example, text files usually have the extension .txt, and Microsoft Word files usually have the extension .doc.

FAT (File Allocation Table): An entry in the operating system that acts like an index or a table of contents. The FAT keeps track of where all the fragments of a file are stored on a drive.

file sharing: The ability to allow more than one user to access the same file. Usually refers to software programs that are stored on a network fileserver.

firewall: Software that protects a computer on the Internet from unauthorized, outside intrusion. Companies that have one or more servers exposed to the Internet use firewalls to allow only authorized employees access to the servers.

fish: A tool designed for fishing cable. It's made out of flexible, thin, steel tape that has a hook at the end. The tape rolls out of a container (like a measuring tape). A fish is used by electricians and is sold in hardware stores, but you can fashion a homemade version by untwisting a coat hanger and using the hook at the end of the hanger to grab the cable as you run it through your house.

freeware: Software that's free, use it as much as you like without paying anyone a dime. See also *evaluation software*, *shareware*.

gigabyte (GB): 1,000 megabytes.

gigahertz: 1,000 megahertz

GPF (General Protection Fault): Also known as a *crash*. In Windows, this means the memory protection feature has detected an illegal instruction from a program, causing the program to crash, or stop functioning.

GUI (Graphical User Interface): Pronounced “goo-ey.” A way of interacting with a computer using graphics instead of text. GUIs use icons, pictures, and menus to display information and accept input through a mouse and a keyboard. For example, software windows that have icons, and dialog boxes that have selection boxes, are GUI interfaces.

Home Phone Line Networking Alliance: An association working to ensure adoption of a single, unified home telephone line networking standard and to bring home telephone line networking technology to the market.

host: The main computer on a client/server network that supplies the files and peripherals shared by all the other computers. Also called a *server*. See also *client/server network*.

HTML (Hyper Text Markup Language): The language used to create Web pages, it defines the location and characteristics of each element on the Web page.

HTTP (Hyper Text Transfer Protocol): The protocol used for transferring files to and from World Wide Web (WWW) sites.

Hub: See concentrator

IDE (Integrated Drive Electronics): A type of hard drive.

install: Not only to physically set up a device but also to set up the files (called drivers) that Windows needs to communicate with the device. See also *device driver*.

interrupt: A signal that a device sends to the computer when the device is ready to accept or send information. See also *IRQ*.

I/O (Input/Output): The process of transferring data to or from a computer. Some I/O devices only handle input (keyboards and mice), some handle only output (printers), and some handle both (disks).

IP (Internet Protocol): The method by which data is sent from one computer to another computer on the Internet or on a network using the TCP/IP protocol.

IP address: A number that identifies a computer's location on the Internet or on a network using the TCP/IP protocol.

IRQ (Interrupt Request): An assigned location in memory used by a computer device to send information about its operation. Because the location is unique, the computer knows which device is interrupting the ongoing process to send a message.

ISA (Industry Standard Architecture) bus: A standard bus that has been used for a number of years. It's a 16-bit slot, which means that it sends 16 bits of data at a time between the motherboard and the card (and any device attached to the card). See also *bus*, *motherboard*, *PCI bus*.

ISDN (Integrated Services Digital Network) modem: A modem that offers faster transmission speeds than a standard modem. The drawback is that an ISDN modem is generally more expensive than a standard modem and requires a special ISDN phone line (which is more expensive than a standard phone line).

ISP (Internet service provider): A company that provides Internet access to individuals and businesses.

Java: A programming language produced by Sun Microsystems. Java is used to provide services over the Web. A Web site can provide a Java application (called an *applet*), which you download and run on your own computer.

JPEG: A format for graphic image files. JPEG images are usually smaller, due to compression features. However, the compression features are rather bad, so it may be difficult to reproduce the image properly.

jumper: A small piece of plastic in a network interface card that "jumps" across pins. Whether or not pins are "jumped" determines IRQ and I/O settings for the NIC. See also *I/O*, *IRQ*, *NIC*.

keyboard buffer: An area in memory that keeps track of the keys you typed, even if the computer did not immediately respond when you typed them. If you hear a beep when you press a key, you've exceeded the size of the buffer.

kilobyte (K): 1,024 bytes. Used to describe the size of memory and hard drive storage.

LAN (local area network): Two or more computers connected to one another so that they can share information and peripherals.

laser printer: A printer that uses a laser beam to produce fast, high-quality output.

LCD (liquid crystal display): Technology used for laptop computer displays, as well as many other electronic devices.

local computer: The computer you sit in front of when you access a remote computer. See also *remote computer*.

local printer: A printer attached to the computer you're using.

LPT1: The name used to refer to the first parallel port on a computer. The second parallel port, if one exists, is called LPT2.

map: To assign a drive letter to a shared resource on another computer to more easily access that shared resource. You can map another computer's drive, folder, or subfolder. The drive letter that you use becomes part of the local computer's set of drive letters. The drives you create are called *network drives*. See also *local computer*; *network drive*.

megabyte (MB): 1,024 kilobytes (approximately 1 million bytes). Usually abbreviated MB.

megahertz (MHz): The speed at which a computer runs (set by the processor).

MIDI (Musical Instrument Digital Interface): The protocol for communication between electronic musical instruments and computers.

MIME (Multipurpose Internet Mail Extension): The standard for transferring binary information (files other than plain text files) via e-mail.

modem: A communications device that enables a computer to transmit information over a telephone line.

modular duplex jack: A device that plugs into a telephone wall jack to convert that single telephone jack into two jacks so that you can plug in two phones, a phone and a modem, or in the case of a telephone line network a telephone and a telephone line network cable. Also called a *splitter*.

monochrome printer: A printer that prints in black and shades of gray. Some people call this a black-and-white printer, despite the fact that no white ink is involved.

motherboard: For a PC, a plane surface that holds all the basic circuitry and the CPU.

multimedia PC: A PC that contains a CD-ROM drive, sound card, and speakers.

multiprocessor: A computer system that uses more than one CPU running simultaneously for faster performance.

NetBIOS (Network Basic Input/Output System): A software program that permits applications to communicate with other computers that are on the same cabled network.

network: Two or more computers connected to one another using network interface cards, cable, and networking software to communicate and exchange data. See also *client/server network*, *LAN*; *NIC*, *peer-to-peer network*.

network administrator: The person that is responsible for maintaining the network, adding users, giving access permissions, etc.

network drive: A drive that is located somewhere other than your local computer. See also *local computer*.

network printer: A printer attached to a remote computer on the network. (A printer attached to a local computer on the network is called a *local printer*.) See also *local printer*.

network resource: A device located in a computer other than the local computer. See also *local computer*.

network-ready computers: A new breed of computers that have telephone wiring adapters built into their motherboards for telephone line networking, eliminating the need to install telephone line networking NICs. See also *motherboard*, *NIC*.

NIC (network interface card): The primary hardware device for a network, a NIC attaches a computer to the network cable.

node: A connection point for distributing computer transmissions. Usually applied to computers that accept data from one computer and forward it to another computer.

OLE (Object Linking and Embedding): A software system that allows programs to transfer and share information. When a change is made to a shared object in the first program, any document in any program that contains that object is automatically updated.

packet: A chunk of information, or *data*, sent over a network.

parallel port: A connection on a PC, usually named LPT1 or LPT2, where you plug in a cable for a parallel device (usually a printer).

parent-child relationship: A hierarchy of shared resources with the following rules: If a hard drive is shared, all the folders on that drive are also shared. Folders are children of parent drives, and subfolders are children of parent folders. The most important thing to remember about this parent-child scheme is that when you configure folders as shares, you also configure the files contained in those folders as shares, and all files are children (the folders that contain them are their parents). You can interrupt this inheritance factor by changing the configuration of a child to be either more restrictive or less restrictive than its parent.

pathname: In DOS, a statement that indicates a filename on a local computer. When you use a pathname, you tell your computer that the target folder is on the local computer. Anyone working at another computer on the network must use a UNC statement to access that folder. See also *local compute1*; *UNC*.

PCI (peripheral Component Interconnect) bus: The PO bus is built for speed and is found in most new computers. It comes in two configurations: 32-bit and 64-bit (32-bit means that the bus sends 32 bits of data at a time between the motherboard and the card; 64-bit means that the bus sends 64 bits of data at a time). Its technology is far more advanced and complicated than that of the ISA bus. See also *bus*, *ISA bus*.

PCMCIA (Personal Computer Memory Card Interface Adapter): A device for a laptop computer, such as a NIC or a modem, that works like an expansion slot (bus) in a desktop computer. A PCMCIA card is about the size of a credit card.

peer-to-peer network: A network in which all the computers communicate with each other communication isn't limited to a client and a server. See also *client*, *client/server network*, *host*, *network*.

peripheral: Any device connected to a computer: monitor, keyboard, removable drive, CD-ROM drive, scanner, speakers, and so on.

permission level: A setting that controls users' access to shared resources on a network. The person who creates a shared resource decides which type of permission level to grant, such as Read-Only, Full, or Depends on Password.

persistent connections: Mapped drives linked to a user (a logon name) rather than a computer. If multiple users share a computer, the mapped drives that appear are those created by the user who is currently logged on. See also *map*.

Plug and Play: A software feature that reviews all the hardware in your computer during startup. When a new Plug and Play hardware component is detected, the software installation procedure begins automatically.

POP (Post Office Protocol): A protocol that permits a user to download e-mail from an e-mail server.

port: A connector located on the back of your computer into which you can plug a peripheral, such as a keyboard, mouse, printer, and so on.

POST (Power-On Self-Test): The test of internal circuitry, memory, and installed hardware that a computer performs on itself when you turn it on.

print queue: The lineup of documents waiting to be printed.

print server: On a network, a computer to which a printer is attached.

print spooler: The place on your hard drive where printer jobs are lined up, waiting to be sent to the printer. See also *print queue*.

protocol: Standardized rules for transmitting information among computers.

proxy server: A server that acts in place of a client computer. For example, a proxy server performs all the functions of a Web browser for all the individual computers accessing the Internet. See also *client*.

queue: The lineup of documents waiting to be processed -for example, the print queue is the lineup of documents waiting to go to the printer.

RAM (random access memory): The memory used by the operating system and software to perform tasks. The phrase *random access* refers to the ability of the processor to access any part of the memory.

Registry: A database that keeps track of the configuration options for software, hardware, and other important elements of your Windows operating system.

remote computer: On a network, a computer other than the one you're work ing on.

remote user: A user who's accessing one computer but sitting in front of another computer.

resolution: The number of dots (pixels) that make up an image on a screen or printed document. The higher the resolution, the finer and smoother the images appear.

KG-58 cable: The specific type of coaxial (10Base-2) cable used in networks. See also *10Base-2 cable*.

RJ-II connector: The connector at each end of a length of telephone cable for telephones and telephone line networking schemes.

RJ-45 connector: The connector at the end of 10Base-T cable that looks like (but isn't) the connector at the end of a telephone cable. See also *10Base-T cable*, *RI-II connector*.

root directory: A section of a hard drive that is not part of a directory (folder). The root directory holds files needed for booting.

screen saver: A moving picture or pattern that appears on your screen when you haven't used the mouse or keyboard for a specified period of time.

scroll: To move through data on the screen (up, down, left, or right) to see parts of the data that cannot fit on the screen. You can use a

variety of scrolling tools to move through the screen, such as the scroll arrow, scroll bar, and scroll box.

separator page: See *banner*: *server*: See *host*.

shared resources: Drives, files, folders, printers, and other peripherals attached to one computer on a network that have been configured for access by remote users on other computers on the network. See also *remote user*.

shareware: Software that you use under an honor system -if you try it and like it, you should pay for it. See also *evaluation software*, *free ware*.

shielded twisted-pair cable: A type of 10Base-T cable. Metal encases the cable's wires, lessening the possibility of interference from other electrical devices, radar, radio waves, and so on. See also *10Base-T cable*.

slot: See *expansion slot*.

SMTP (Simple Mail Transfer Protocol): The protocol used to transfer e-mail between computers on the Internet. It is a server-to-server protocol, so other protocols (like POP) are needed to transfer e-mail to a user's computer.

sneakernet: The inconvenience you have when you don't bother setting up a network. With a sneakernet, information is exchanged between computers by copying files to a disk from one computer, walking to another computer and then loading the files from the disk to the second computer.

splitter: See *modular duplex jack*.

standard modem: A modem whose speed is measured in thousands of bytes per second (Kbps), which is also referred to as the *baud rate*. 33.6 and 56 Kbps are common. See also *ADSL modem*, *cable modem*, *ISDN modem*.

star topology: A 10Base-T network with multiple runs from the concentrator to each computer on the network, forming an arrangement that can resemble a star when several computers are used.

surge: A sudden spate of very high voltage that travels from the electrical lines to your house and ultimately to your computer. A surge protector can help protect your computer equipment. See also *surge protector*.

surge protector: Also called a *surge suppressor*. A device that protects computers and other devices by absorbing the electricity of power surges.

system files: The files that Windows installs to make the operating system run.

T connector: A T-shaped connector used to connect 10Base-2 to a NIC on a network without interrupting the cable run. See also *10Base-2 cable*, *NIC*.

TCP/IP (Transmission Control Protocol/Internet Protocol): A set of standardized rules for transmitting information. TCP/IP enables Macintosh, IBM-compatible, UNIX, and other dissimilar computers to jump on the Internet and communicate with one another, as long as each computer uses TCP/IP.

terminator: A device with BNC connectors that lets you “cap off” the empty crossbars of T-connectors at the beginning and end of a 10Base-2 cable run. See also *10Base-2 cable*, *BNC connector*; *T-connector*.

thinnet: See *10Base-2 cable*.

topology: The way a network is laid out. See also *star topology*. *twisted-pair cable:* See *10Base-T cable*.

UNC (Universal Naming Convention): A formatted style used to identify a particular shared resource on a particular remote computer. The format is \\computername\\resourcename. See also *pathname*.

unshielded twisted-pair cable: See *10Base-T cable*.

UPS (uninterruptible power supply): A mega-battery that plugs into the wall outlet. You plug your computer and monitor into the UPS outlets. If power fails, your computer draws power from the battery to give you enough time to properly shut down your computer.

URL (Uniform Resource Locator): An address system used on the World Wide Web (WWW) to identify the location of a resource on the Internet. For example, www.hungryminds.com.

user profile: The computer environment that belongs to a particular user. A profile lets you personalize your Windows desktop without risking ruin of your decorative efforts when the next person logs on to the computer.

virtual drive: A drive that doesn't really exist -you add a new drive letter, but you don't add any new physical drives to a computer. See also *map*.

voltage regulator: A device that constantly measures the voltage coming out of the wall and brings it to an acceptable minimum to protect against brownouts. See also *brownout*.

Web interface (also known as a web browser): In Windows 98, Windows Me, Windows 2000, or Windows 95 with Internet Explorer 4.0 installed, a graphical appearance that resembles the look of pages on the World Wide Web.

wizard: An interactive program that walks you through a software installation process.

workgroup: The group to which the computers on a network belong.

workstation: See *client*.

WYSIWYG (What You See Is What You Get): The ability to display on your monitor the same image that will appear on printed output. Pronounced "wizzy-wig."

Y-Connector: An adapter shaped like the letter Y that connects two devices to one input device.

Appendix C

Internet Browser Q & A

This TV contains a built-in internet browser and do I need a PC in order to use the TV browser?

No.

What equipment do I need to use the TV's built-in Internet browser?

You will need a cable modem or DSL unit from your cable or phone company and possibly a router. Also, an optional full-size keyboard is available to control the browser.

What are the features of the keyboard?

- Wireless keyboard using infrared transmitting technology
- Integrated pointing device with two mouse buttons
- Built-in TV control (including 12 hot keys)
- Operating range up to 23 feet
- Lightweight and durable construction
- Design complements style of TV and Remote
- Powered by two AA size batteries
- Improved Web browsing over TV remote includes:
 - Text entry
 - Text size control
 - Window control hot keys
 - Text searching function for web pages
 - Instant access to favorite websites (several FAV hot keys)

Can I use a phone line to connect the browser to the Internet?

No. To connect to the Internet, the browser uses a broadband Ethernet connection and not a modem dial-up. **WARNING:** To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug a telephone cable into the Ethernet RJ-45 jack.

What do the lights on the Ethernet connector mean?

A green light on the jack means that an active network has been detected. An orange light means the data either is being sent or received.

Can my Internet browser for TV replace my home-computer's browser?

No, it's not intended to. The browser in the TV is a basic browser for enhancing your TV viewing experience, not for replacing the browser on your home computer. For example, you can web surf during commercials. Or watch your favorite program and surf the program's website at the same time. Imagine watching football and visiting your favorite sports website to view your team's stats!

Can my TV browser do everything that my home computer's browser can do?

No. This is an Internet browser for TV and not a computer browser. The browser in the TV is a basic browser for enhancing your TV viewing experience, not for replacing the browser on your home computer. For example, some internet browser features require PC software to be downloaded into your computer: this is not allowed in your TV browser.

Can I send and receive email with the Internet browser for TV?

Yes, but the browser itself does not have a built-in email program. However, you can email using web-based email websites. Examples of web-based email sites are www.aol.com, www.hotmail.com, www.msn.com, www.yahoo.com, etc.

Does the browser cost anything to use?

No. The browser itself is a feature of the TV. Except for the costs you already incur from a subscription with your Internet Service Provider (ISP), the browser costs nothing to use.

What sort of capabilities does the browser not support?

The TV browser can't view Macromedia Flash animations, stream audio or video, Javascript, plug-ins, download files, or view documents (for example, an Adobe Acrobat PDF file). However, the TV browser lets you surf the web while you watch television.

Does the TV support PPPoE client for Internet connectivity?

The TV does not allow any clients to run on it. If your ISP requires a PPPoE client, then another PC on your local network will have to run this client. Your existing PC connected to your DSL modem should handle the PPPoE client. Your TV will have to be connected to a router, with another PC on the same router.

What are some of the features of the browser?

You can watch TV and surf the web at the same time. You can save several favorite websites to be instantly accessed at a later time. You can change the size of the text in the browser (most but not all websites allow this). You can put the video window on the left or the right or hide it entirely to have a maximized browser window. You can activate the commands of the browser without having to navigate the cursor to a toolbar; for example, you can close windows with the touch of a button, or move back and forward between pages with the touch of a button. You can search for a keyword on a webpage.

Can the size of the video window in the browser be changed?

No. However, by using the FORMAT button it can be moved to the left or right side of the screen, or hidden entirely so that the browser window fills up the entire TV screen.

Can closed captions be viewed while in the browser with the video window displayed?

No.

Can I prevent my children from using the TV's web browser and the Internet?

Yes! First, if you don't have the TV connected to a cable modem or DSL unit, you cannot access the Internet so you have nothing to worry about. If you do have the TV connected to a cable modem or DSL unit, you can block access to the web browser by following these steps: Go to the Parental Controls menu and select Web Browser Block. Then set it to "Block Web Browser". Now go to "Lock TV", enter a password, re-enter password to verify. Now the TV is locked and the web browser requires the password to be accessed, just like any blocked channel in the Locked List or V-Chip blocked rating.

Can I prevent my children from viewing specific websites?

No. The TV browser is a basic browser which does not include website filtering software. However, you can block access to the entire TV browser by using Web Browser Block in the Parental Controls menu and locking the TV with a password.

Can the web browser be upgraded?

No.

Does RCA collect any information about me while I'm using the web browser?

No.

I can get to the web, but I can't type in an address. Why not?

You need the optional accessory keyboard in order to type in web addresses (URL's).

Why can't I view some websites on my browser?

It may be a limitation of the browser, but most likely it's a problem with the website itself.

How do I navigate in the web browser?

The remote will allow some limited navigation and selection in the browser by using the arrow buttons and the OK key. However, there is an optional keyboard available for purchase which will allow access to the complete functionality of the browser, such as entering web addresses. The keyboard also has a pointer to allow you to move the cursor in any direction on the screen. A regular home-computer keyboard or any other wireless keyboard will not function with your TV's browser.

Where can I buy the TV browser keyboard?

To purchase the keyboard, go to www.rca.com/keyboard from your personal computer. You can also purchase the keyboard by calling 1.800.798.5875. To purchase the keyboard in Canada, please send an email to keyboard-canada@tce.com.

I just plugged in the Ethernet cable, and my browser doesn't work?

Are you sure you have setup everything correctly in the Ethernet Setup menu? If yes, then try waiting one minute and try launching the browser again. The TV automatically re-attempts to make a network connection every minute.

Why can't hear any sound on a website?

The TV does not play any audio from Internet sources.

How do I set my home page?

Press and hold the "Fav Home" key for about three seconds. Any of the Fav keys can be programmed in the same way.

I tried to play a game at a website, and nothing happened?

Many games on the Internet require downloadable software such as "Shockwave", "Flash", or "RealPlayer". The TV does not allow software to be downloaded.

Why does a big gray box keep popping up in front of the main browser window?

When you see this, you may want to press the "Close Window" key on the keyboard. Many websites launch additional pop-up browser windows, such as advertisements.

How do I make a small window, into a big window?

Use the pointer on the keyboard to navigate to the lower right-hand corner of the window. Then click and hold the corner, while “dragging” the cursor towards the right, and lower. This way you can resize the window to any size. Only pop-up windows can be resized. The main window cannot be resized.

How can I change the size of the big browser window?

By pressing the FORMAT button, the browser can be displayed full size with no browser window or at a reduced size with a video window. However, the browser window cannot be continuously sized.

Is there an on-screen toolbar for controlling the browser?

No, there doesn't have to be. The keyboard controls all of the functionality of the browser so that you don't have to move the cursor back and forth between a toolbar and the link you want on the page.

Sometimes when I change channels in the video to the right or left of the browser, the channel disappears. Why?

You've probably tuned to a channel which has a weak signal. Keep changing channels until you see the video window reappear. Or close the browser, tune to a valid channel, then go back into the browser.

Can the browser text be made clearer?

Try increasing the size of the text with the TEXT SIZE button on the keyboard. Or try turning off SVM in the Picture Quality menu before you enter the browser.

How do the buttons on the remote control operate the browser?

Arrow buttons move the cursor. OK button selects a link. PLAY button refreshes the page. FORWARD goes to the next page if available. REVERSE goes to the previous page (BACK). STOP button stops loading the page. CLEAR quits the browser. SWAP goes to the previous window. CH CTRL goes to the next window. FORMAT moves or hides the video window.

What functions does the keyboard have that the remote control doesn't?

Change text size, Find Text on page, Close Window, webpage address entry, the ability to store numerous favorite websites, the ability to enter text into a webpage, direct access button to browser.

Can the keyboard work like a remote even when the browser is closed?

Yes, if you lose your remote or if you are switching between TV watching and web surfing, the keyboard can also perform most of the remote's functions (e.g., access and navigate menu, channel entry, change channels and inputs, turn TV on/off, volume control, etc.).

Can a web page be recorded?

No. The TV's VIDEO OUTPUT jack sends only video information and not on-screen displays or graphics such as menus or the browser.

Tips and Tricks

Does the TV respond to any discrete infrared codes? How do I access the TV's discrete infrared codes in order to "teach" them to my other learning remote that I bought?

They are built right into the remote. To access them press the TV button to put remote into TV mode, then press and hold the ON-OFF button while using the number buttons to enter the code 090. In this special remote mode, the following buttons will send discrete IR codes as follows:

TV: power ON only (This is normal operation for this key)

ON-OFF: power OFF only

ANTENNA: Antenna A selection

FORWARD: Antenna B selection

INPUT: Press INPUT then a number key within 2 seconds to send a discrete IR code for that input.

1: Used after INPUT to select Input 1; otherwise sends the normal code.

2: Used after INPUT to select Input 2; otherwise sends the normal code.

3: Used after INPUT to select Input 3; otherwise sends the normal code.

4: Used after INPUT to select Input 4; otherwise sends the normal code.

5: Used after INPUT to select Input 5; otherwise sends the normal code.

6: Used after INPUT to select Input 6; otherwise sends the normal code.

7: Used after INPUT to select Input 7; otherwise sends the normal code.

8: Used after INPUT to select Input 8; otherwise sends the normal code.

RECORD: Normal Screen Format

STOP: Stretch Screen Format

PAUSE: Zoom Screen Format

All other buttons: Send the same code as normal-remote mode.

To return the remote to normal-remote mode, press the TV button to put remote

into TV mode, then press and hold the ON-OFF button and use the number buttons to enter the code 010.

How do I program my remote?

To directly program the remote with programming codes, look up your brand name of your device in the remote control code list in the TV owner's manual. The TV owner's manual also has instructions for having the remote automatically search for the right code to use.

Assuming I have cable connected to Antenna A and an over-the-air antenna connected to Antenna B, how do I switch between my over-the-air channels and cable channels?

Press the ANTENNA button to switch between Antenna A and Antenna B. If the TV is tuned to an input (e.g., Input 1), how do I get back to Antenna A or Antenna B?

You can either press the number buttons on the remote to tune to a channel or you can press the ANTENNA button to jump back to the channel you were on before going to the inputs.

How can I move forward quickly through the menu system?

Press the number on the remote that corresponds to the menu item. For example, to get to Proxy Server menu in Ethernet Setup, press 6 for Connections, press 9 for Ethernet Setup, then press 3 for Proxy Server. This style of navigation is faster since it doesn't require you to use the arrow buttons on the remote.

How can I move backward quickly through the menu system?

Press the GO BACK button on the remote instead of navigating to the Go Back menu button in the menu. Or press 0 to go to the previous menu.

How can I jump to the menu bar from the Listings in the Guide?

Press the MENU button on the remote. This way you can avoid pressing the arrow buttons to have to navigate to the menu bar.

How can I scroll the Guide Plus+ listings up and down quickly?

Press CH+ and CH- on the remote.

Miscellaneous

Will my TV software be upgraded?

While it is possible to receive a free TV software upgrade if you have a working connection to the Internet via the Ethernet jack, it's unlikely that this will occur. If a TV software upgrade does become available, you will be notified with an on-screen message and given the opportunity to accept or decline it. You can also check the Software Upgrade screen in the Connections menu to see if a software upgrade has become available.

Most TV's have only video input jacks. This TV has video input jacks and a video output jack. What is the video output jack ("RECORD OUTPUT") used for?

The RECORD OUTPUT jack on the TV is for recording programs. Without it, you probably could not record digital TV programs because most of today's VCR's don't have a digital TV tuner in them. The RECORD OUTPUT jack is another example of how this TV's connections are future-proofed.

How can I tell if a program is copy protected and not allowed to be recorded?

There is a "REC" icon in the channel banner. If it is lit up (bright), then the current program is not copy protected and can be recorded. If the REC icon is grayed out (dim), then the current program is copy protected and cannot be recorded. The content provider — not RCA — decides which programs are copy protected and which are not. Also, the video output will either display "color bars" or a gray screen depending on which output you're tuned to.

Are the on-screen displays (the menu) recorded when recording from the RECORD OUTPUT?

No. To allow the cleanest and least obscured recording, on-screen displays are not visible on the video output.

Why do I get color bars on the VIDEO OUTPUT when I am watching a DVD movie?

The DVD is copy protected. To prevent copying, the disc is copy protected by the manufacturer. RCA does not decide which discs, tapes, or programs are copy protected.

Are there any subscription fees associated with the GUIDE Plus+ System?

No.

Does the GUIDE Plus+ System list digital TV programs too?

Yes. However, if you have cable you might need to use the channel editor feature to show the digital channels in the Guide. To do this, go to Setup in the GUIDE Plus+ menu bar, then select “Change channel display” in order to access the Channel Editor.)

The channel numbers in the Guide don’t match the channel numbers outside the Guide (e.g., in the banner). How do I correct this?

Go to Setup in the GUIDE Plus+ menu bar, then select “Change channel display” in order to access the Channel Editor. You can then change channel numbers used in the Guide to match up with channel numbers used outside the guide.

Does RCA collect any information about me while I’m using GUIDE Plus+?

No. The information you provide in order to setup GUIDE Plus+ is stored inside the TV but never sent to anyone.

How are the green and blue buttons on the remote control used?

They’re used in GUIDE Plus+ to enable commands. In the GUIDE, the functions of the blue and green action buttons will change depending on what part of the guide is highlighted. Just look at the top of the GUIDE to see what the action buttons will do when you press them.

I’ve entered all my information into Guide but my channel lineup is wrong. How do I correct it?

Press GUIDE, go to Setup in the menu bar, select “Change system settings”, then select “Yes, but my channel lineup is incorrect”. From the list of channel lineups, select the channel lineup that matches yours.

Can I read news stories on the TV?

Yes, the GUIDE Plus+ System has a News feature where you can read news stories. You do not even need a connection to the Internet to read the news stories.

GUIDE Plus+ is not working properly. What can I do?

There are three things you can try:

- Enter 99999 for the zip code to reset the zip code setting and then re-enter your zip code. This will keep intact the settings for cable, cable box, VCR, etc.
- Enter 00000 as zip code. This resets the entire Guide (but keeps the channel lineup) but does not reset the Guide back to factory defaults.
- Resetting the Guide back to the factory default state should only be used as a last resort since you will have to setup the Guide all over again and wait for a new download of guide information. If you want to reset the Guide back to the factory default state, press this sequence of buttons on the remote while the remote is in TV mode: MENU-1-2-GOBACK-INPUT.

What's DVI-HDTV and what can I connect to the DVI-HDTV connector?

The DVI-HDTV (Digital Visual Interface) connector allows transmission of uncompressed video signals from a set-top box such as digital cable boxes, digital satellite receiver or possible future digital sources.

Why can't I get audio from my speakers?

Be sure to check the SPEAKER SELECT and INTERNAL SPEAKER SOURCE switch settings on the back of the TV as well as the menu setting of the Fixed/Variable Output menu.

How far should my seat be from the television for optimum viewing?

Approximately 3 to 4 times the height of the screen.

What is screen burn, and how do I slow down its effects?

Screen burn is the uneven aging of the color phosphors used by the CRTs of the TV. It's caused by displaying areas on the TV which are significantly brighter or darker than surrounding areas for prolonged periods of time. It can be slowed down by limiting the amount of 4:3 material that you watch in Normal mode or by always applying Stretch and Zoom to 4:3 material by using the FORMAT key. Also, avoid displaying or watching fixed images on the screen for extended periods of time (e.g., paused video games, paused videos, some network logos, phone numbers, etc.). Limit the time of your browser sessions and use the FORMAT key to vary the positions of the browser and video window. Reducing the contrast to the minimal viewing level will also help slow down the effects of screen aging.

The Channel Banner indicates that SAP (a secondary audio program) is available and I have the SAP setting set to "on", but I don't hear it. Why not?

Sometimes the broadcaster will send the TV an indication that SAP is available when it is really not available.

The Channel Banner indicates that closed captioning is available, but I don't see any. Why not?

Sometimes the broadcaster will send the TV an indication that closed captioning is available when it really is not available.

What do the numbers in the Channel Banner mean (480i, 480p, 720p, 1080i)?

That number represents is the resolution of the picture that is being received from the broadcaster. The higher the number, the better the resolution and the better the picture.

What does HD and SD mean in the banner?

High Definition TV and Standard Definition TV.

Why do I sometimes see horizontal lines displayed momentarily when I switch from my VCR to my progressive scan DVD player?

The TV is switching display modes. This is normal behavior.

When I watch a program that has a 4:3 aspect ratio, there are gray panels on the right and left sides. Why? What is Stretch mode? Zoom mode? Normal mode?

The TV has a wide 16:9 aspect ratio. However, some programs (like analog programs) have a 4:3 aspect ratio. The gray panels fill in the gap and the gray color helps to slow down the uneven aging of the screen. To fill up the screen with the 4:3 program, press the FORMAT button on the remote to either Zoom (expand the 4:3 picture horizontally and vertically) or Stretch (expand the 4:3 picture horizontally) the program.

Why can't I change the screen format on high-definition programs?

Zoom and Stretch are not available when a program's aspect ratio is 16:9. High definition programs typically have a 16:9 aspect ratio so they already fill up the entire screen.

How can I see what the current Screen Format is?

When you press FORMAT on the remote it changes the Screen Format for 4:3 sources, however, the banner is not displayed because it would obscure the video you're changing. But you can display the banner to see the current Screen Format by pressing INFO on the remote.

When do I need to set the Convergence?

Over time, the three tubes that create the picture on your TV may slightly drift out of alignment and made the picture appear as if it has a "halo" or multiple images. Or moving the TV will disturb the alignment of the tubes. This is a natural occurrence. Running the AutoConverge process in the Picture Quality menu will automatically re-align the three tubes to create a clear and aligned picture. Be sure to let the TV warm up for at least 30 minutes before running AutoConverge.

Is Convergence different for digital and analog channels?

Yes. The TV stores different Convergence settings for digital and analog channels as well as inputs.

What is DTVLink?

These jacks enable connection of high-speed digital technology to other devices with a DTVLink logo on them. With the two DTVLink connectors, you can network your digital devices by linking them together. A product that has a DTVLink label is capable of interfacing with other products that use a 1394 serial connection, conform to the different technology standards, and use the Digital Transmission Content Protection (DTCP or 5C) system. DTCP is an encryption and authentication technology that can be used to protect content as it is being transferred over a digital connection in a home network.

What can I connect to the DTVLink connectors?

Other devices with a DTVLink logo on them. Examples might be a digital VCR or a digital cable box.

Why are there two DTVLink jacks at the back of the TV?

So you can connect several devices. There is no preference as to which plug a device should be connected to. Just remember, if you link DTVLink devices together, do so in a chain and never in a circular loop.

Can I play a digital camcorder on the TV?

Perhaps, however, it is likely that only devices that have the DTVLink logo on them should work with the HDTV.

Do I HAVE to connect my digital cable set-top box to the 1394 input of the TV?

It depends on the set-top box manufacturer; if there's no MPEG decoder in the set-top box then the only way you'll be able to view the digital programming is if you use the DTVLink connection. Refer to the set-top box's documentation.

The DTVLink connector on the TV has 6 pins on it. Does it provide power to DTVLink devices?

No.

What is the center channel audio input for?

You can use the TV's front speakers for the center audio channel from your audio receiver. That way, you don't need to balance a center audio speaker on top of the TV and the TV looks less cluttered (and you don't need a center audio channel speaker).

Why do I get the message “PIP not viewable”?

The PIP cannot be displayed when a digital picture (digital TV, DVI ,etc) is displayed in the main window. In addition, PIP cannot display a digital picture.

Why is PIP not visible for Input 3 or Input 4?

The PIP can only display composite or S- Video signals. It cannot display component video signals. If you have a component source connected to Input 3 or Input 4, you should also connect a composite version of the same source, if available, to allow it to be displayed in the PIP.

What features does the TV have for skipping commercials?

When a commercial comes on, press the SKIP button. This starts a timer. Change the channel. At the need of the timer, the TV tunes back to the channel you were on when you started the timer. Or, if you have the web browser connected, press WEB on the keyboard to view the browser and start surfing the web. Use the FORMAT button to view the video display window in the browser mode. When your program comes back on, close the browser

Can the each input have different picture (video) settings (i.e., Picture Quality menu settings)?

Yes. A different set of picture (video) preferences (Color, Tint, Auto Color, etc.) is saved for each input. So, for example, the video settings for Input 1 where your DVD player is connected can be different than the video settings for Input 2 where your VCR is connected. Remember, using the Reset Controls option in the Picture Quality menu will only set the current input's video settings back to the factory settings.

What's AutoTuning?

The AutoTuning feature allows you to set up the TV to tune to a specific channel when you press a certain component (VCR, DVD, SAT-CABLE, VCR1, VCR2) button on the remote.

The TV is not behaving normally. What can I do?

Try changing channels. Or try turning off the TV then turning it back on - that will usually clear up the issue. If that's not effective, try simultaneously pressing the POWER and CHANNEL DOWN buttons on the front of the TV for three seconds to perform a “soft reset” on the TV. You can also unplug the TV and waiting for one minute, then plug the TV back in.

Glossary of Terms

4:3 (also written 4 x 3): This is just an easier way of writing the aspect ratio so it appears in whole numbers instead of saying 1 x 1.33 (4 divided by 3 =1.33). To continue, 4 x 3 is the aspect ratio (width to the height) of standard definition televisions and NTSC pictures. 4:3 is the ratio of the width of the picture screen to the height - a 4:3 television with a width of 20 inches will have height of 15 inches.

16:9 (also written 16 x 9): This is just an easier way of writing the aspect ratio of High Definition Televisions so it appears in whole numbers instead of writing 1 x 1.77 (16 divided by 9 =1.77)- the aspect ratio for HDTV. The aspect ratio is the ratio of the width to the height - a 16:9 television with a width of 48 inches will have a height of 27 inches.

AC-3 (also called Dolby Digital): Digital surround sound technology that delivers five full channels of audio, with a sixth subwoofer channel (that 's the .1). HDTV signals include Dolby Digital audio information.

Amplifier: A component used to increase the voltage of any power signal fed to it.

Analog: Technically, a signal that has many varying levels instead of being discrete or digital.

Aspect ratio: Ratio of the width of a picture screen to its height. See 4:3 and 16:9.

ATSC (Advanced Television Standards Committee): Industry group formed to define digital television (DTV) standards, such as HDTV and SDTV. See also ATSC Formats.

ATSC formats: A series of 18 digital television formats, approved by the FCC (Federal Communications Commission) for use by the television broadcast industry. The 18 DTV formats defined by the ATSC include both HDTV and SDTV formats to be used by off-air broadcasters. Other formats have been defined by manufacturers and by satellite and cable broadcasters. RCA digital television products are designed to accept and display a picture of appropriate quality from any of the 18 FCC-approved formats.

A/V cable (audio/video cable): These cables are sometimes called RCA cables. Usually, they are color-coded (yellow is video, white is left/mono audio, and red is right audio). See composite video.

A/V receiver (audio/video receiver): The hub of an audio/video system. A component including surround sound processing, 5-channel amplification, audio/video switching and input/output jacks, AM/FM tuner, and remote control. An A/V receiver is different from a stereo receiver, which omits all or most of the video-related features.

Coaxial cable: A cable that carries both video and audio signals. Used by cable companies and satellite companies.

Component video: Three individual signals used to create a color video image. Component video produces an improved color picture image compared to standard composite technology because component video separates the three channels of a color video signal (two chrominance and one luminance which minimizes interference between these signals). Sometimes called YPrPb.

Composite video: Video signal where the luminance (black and white) and chrominance (color) are combined. NTSC signals (analog) are composite signals.

CRT (cathode ray tube): Color picture tubes used in standard TV sets. Electron gun generates beams that are guided to the screen, illuminating small red, green and blue phosphor targets on the front surface. This produces colors and images on the screen.

Digital: Signal technology that is based on streams of 1s and 0s instead of analog waves. HDTV signals are digital.

Discrete Codes: Versions of toggle codes that only perform one function. For instance, an “ON-OFF “ button on a remote would be a toggle, in that when it is used the current power state is reversed. If your device is on, it turns off. If it ‘s off, it turns on. An example of a “discrete” code would be a signal that ONLY turns the device on. If it is already on it remains so. These are most often used to ensure your home theatre components stay completely in sync for powering on and off and changing inputs. Such specialized codes may also be available for direct access to other “toggled” or “rotating” functions such as television inputs, receiver sound-field settings and on- screen display modes.

Dolby Digital: Digital surround sound technology that can deliver up to five full channels of audio, and a sixth subwoofer channel. HDTV signals include Dolby Digital sound. Formerly called AC-3.

DTV (Digital Television): A broadcast system in which the picture, sound and any auxiliary signals are all in digital form and the transmission techniques have been optimized for digital data. Specifically, DTV refers to the 1996 standards that describe the digital HDTV and SDTV systems.

DTVLink: These jacks enable connection of high-speed digital technology to other devices with a DTVLink logo on them. With the two DTVLink connectors, you can network your digital devices by linking them together. A product that has a DTVLink label is capable of interfacing with other products that use a 1394 serial connection, conform to the different technology standards, and use the Digital Transmission Content Protection (DTCP or 5C) system. DTCP is an encryption and authentication technology that can be used to protect content as it is being transferred over a digital connection in a home network.

DVD (Digital Versatile Disc or Digital Video Disc): Officially, DVD is not an abbreviation for anything because of trademark disputes. This high-capacity disc is primarily used for video playback. A single-sided, single-layer DVD can hold up to 4.7GB (gigabytes). The double-sided, double-layered DVDs hold more than 17GB of information.

DVI-HDTV: DVI-HDTV (Digital Visual Interface) allows transmission of uncompressed digital video signals from a set-top box to a digital TV. DVI delivers the purest digital transmission available today.

HDTV (High Definition Television): A complete product/system that receives and decodes all ATSC Table 3 video formats; has active vertical scanning lines of 720p, 1080i, or higher; is capable of displaying a 16:9 image; and receives and reproduces, and/or outputs Dolby Digital audio.

IR (Infrared): The technology used for most remote controls that consists of information being sent using infrared radiation to a component that has an infrared sensor to receive the information.

LED (Light Emitting Diode): Technically, a two electrode semiconductor device capable of producing illumination. The power light on the front of your TV is an L.E.D. Also called an indicator.

Letterbox: Video image displayed with black bars above and below it on the video screen. Letterboxing is used most often to show wide-screen (16:9) programming on standard 4:3 television screens.

Locked List: The TV has two lists: the Locked List and the Unlocked List. When the TV is locked, the Locked List is enforced and only those channels that are marked as “Viewable” are freely accessible without a password.

MPEG (Motion Pictures Experts Group): Refers to the standards widely used for compression of digital video.

NTSC (National Television Standards Committee): Industry group that established the television standards used with analog television transmission. Also used to refer to the American television transmission standard for analog broadcast (i.e., an NTSC channel refers to a broadcast displayed on a television that meets the NTSC guidelines for analog transmission).

Off-air (also called terrestrial and Over-The-Air): Broadcasts transmitted over the airwaves using powerful transmitters, and received via antennas.

OTA (Over-The-Air): Broadcasts transmitted over the airwaves using powerful transmitters, and received via antennas. OTA broadcasting is regulated in the U.S. by the Federal Communications Commission (FCC).

Progressive scan: The system of scanning an entire video picture with each scan as opposed to interlaced which scans every other line.

Resolution: Resolution is measured in terms of the density of the picture elements (pixels) and is the total number of pixels (horizontal x vertical) used to display images on the screen. High-resolution images are composed of more dots per inch and appear smoother than low-resolution images. The higher the resolution, the better the display of details.

RF jacks: On this TV, ANTENNA A IN or ANTENNA B IN jacks. Coaxial cables are connected to RF jacks.

SAP (Second Audio Program): Used to broadcast bilingual broadcasting, or descriptive video services for the visually impaired. In order to hear the SAP broadcast, the TV must have an SAP decoder, the program must be broadcast in SAP, and the SAP feature turned “on”.

SDTV (Standard Definition Television): A subset of the ATSC ‘s standard for Digital Television. SDTV refers to digital video signals that usually provide a picture quality similar to NTSC signals. The advantage of broadcasting SDTV instead of HDTV is the ability to broadcast several SDTV programs in the spectrum space that is taken up by a single HDTV program.

SPDIF: A technical abbreviation for the optical cable you use to connect the DIGITAL AUDIO OUTPUT jack on the TV to a Dolby Digital receiver that supports optical output.

S-video (separate or super video): When you connect an S- Video cable to the S-VIDEO jack on the TV and another component, the color (chrominance) part of the signal is separated from the black and white (luminance) portion of the signal creating improved resolution. This is also called Y/C.

SVM: Scan Velocity Modulation. When turned on, SVM improves the edges between dark and bright areas of video.

Terrestrial: Broadcasts transmitted over the airwaves using powerful transmitters, and received via antennas. Also called off-air and Over-The-Air (OTA).

Unlocked List: The TV has two lists: the Locked List and the Unlocked List. When the TV is unlocked, the Unlocked List is available and only those channels that have a checkmark (as setup in the Parental Controls menu) are viewed when surfing channels (i.e., pressing CH+ or CH-). All channels are freely available without a password. Channels that aren’t in the Unlocked List are still accessible with direct entry (press numbers on the remote).

V-Chip: The software used to translate ratings attached to broadcasts. A V-Chip system, called Parental Controls in most RCA products, enables owners to block programs based on certain criteria. In order for parental controls to work, the broadcaster must attach the rating when the signal is sent to your TV and the consumer must set and lock the ratings limits in the TV 's menu system.

Video Input Channel: Technically, this isn't a channel, but the term is used when explaining that you need to tune your TV to a specific channel in order to watch content (a videotape, DVD, etc.) that is being played by a component that is connected to the TV. For example, if your DVD Player is connected to the TV 's Input 1 jacks (VIDEO, AUDIO left and right), you won't be able to watch the movie on the disc that 's playing in the DVD Player unless you tune the TV to the channel assigned to Input 1. The AutoTuning feature eliminates the need to tune manually to the correct channel. The INPUT button on the remote control tunes the TV to the input channels (keep pressing INPUT to scroll through all of the video input channels).

Widescreen (also called 16:9): Widescreen refers to the ability of a TV to reproduce the video in the exact format it was created. This is just an easier way of writing the aspect ratio of High Definition Televisions so it appears in whole numbers instead of writing 1×1.77 (16 divided by 9 = 1.77). The aspect ratio is the ratio of the width to the height - a 16:9 television with a width of 48 inches will have height of 27 inches.

Y Pb Pr (also called Component Input): Three separate connectors connect to these jacks and separate the video into three parts. Y is the technical abbreviation for luminance (also called luma), and P stands for chrominance (also called chroma). Luminance is the black and white part of the video signal. Chrominance is the color part of the video signal. P is the technical abbreviation for chrominance. Pb and Pr are formulas that explain how the color part of the signal is separated into two parts.



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