

Solving TV Audio Problems With The VA62A

Although television audio may seem fairly easy for some people, there are problems that cause many technicians to scratch their heads. These include the symptoms of; no audio, noisy audio, or no control of the volume.

This Tech Tip covers how to use your VA62A Universal Video Analyzer to find the cause of audio problems in televisions. We will start with a brief description of how the audio circuits function, then we will take a look at signal injection with the VA62A.

Test Audio Operation By Starting At The Antenna Terminals With The VA62A

Use the VA62A to inject a known good (standard) RF signal into the antenna terminals of the

TV. By first connecting to the TV's antenna terminals, you can tell for sure if there are any problems with the quality of the reproduced audio. The VA62A's RF Output signal contains an FM audio tone when you select any of the four tones with the VA62A's AUDIO control.

If a defect in the audio is noticed, you then use the VA62A to signal inject through the audio circuits. The audio circuits consist of four main sections; the RF, IF, sound processor IC, and the output.

To supply audio to the TV antenna terminals:

1. Connect the VA62A to the antenna terminals either by using the supplied RF cable or with the supplied 39G72 matching balun.
2. Match the VA62A's RF output channel to the

TV's tuner, and set the RF level and vernier controls to the HI and NORMAL positions.

3. Place the AUDIO control in one of the four tone positions. Turn up the TV's volume. You should hear good clean audio from the TV's speaker. If not, the audio circuits will need to be repaired.

Injecting Audio Into The IF Stages With The VA62A

Use the VA62A to inject a signal into the IF stages to help isolate the cause of the audio defect. The VA62A supplies the IF frequency of 45.75 MHz with both modulated video and audio information. This is important because many TVs use synchronous detectors and you need a video signal to properly detect and pass the IF audio signal.

To inject audio into the IF stages:

1. Connect the VA62A RF-IF OUT to the input of the IF stage.
2. Set the RF-IF SIGNAL switch to the 45.75 MHz position, and place the AUDIO control in one of the four tone positions.
3. Set the VA62A's RF-IF level adjustments in the LOW and NORMAL positions. You should hear good audio if the tuner was causing the defect. If not, the defect lies towards the speaker.

Use The VA62A To Inject At The Input Of The Audio Processor IC

After the video and audio are detected in the IF stages, the audio can be separated from the video. This is done with a bandpass or notch filter

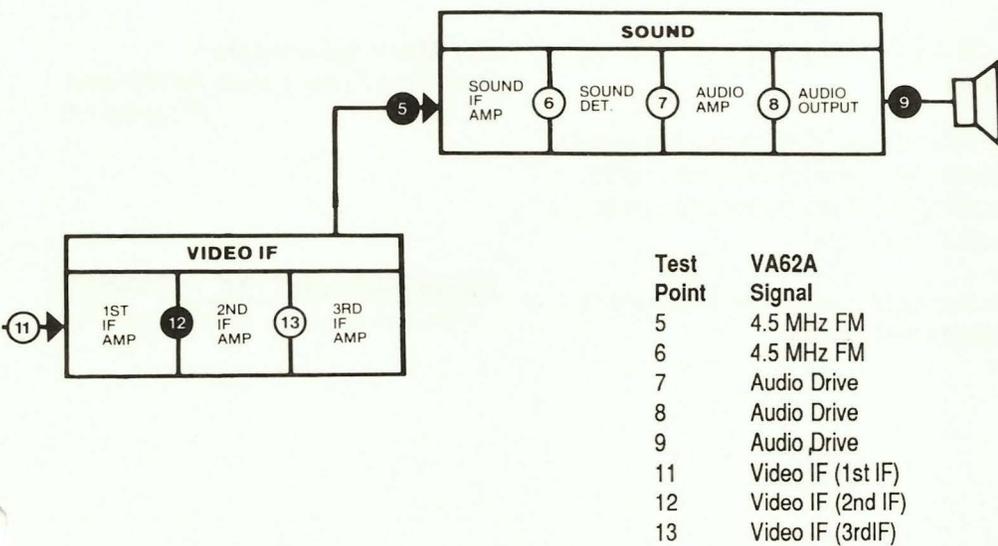


Fig. 1: The block diagram above shows the key injection point and the VA62A signals to be used.

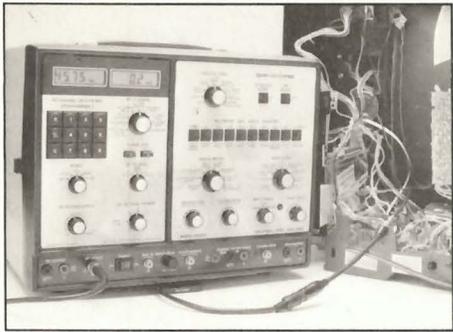


Fig. 2: Inject into the IFs to find faults in the tuner.

tuned to 4.5 MHz. The information (FM audio) is then fed into the audio processor IC where it is detected and sent to the speaker.

To inject at the input of the audio processor IC:

1. Connect the 39G72 matching balun to the RF output cable and connect it to the input pin(s) of the audio processor IC.
2. Place the RF-IF SIGNAL control in the 4.5 MHz position, and set the output level to the MED or HI and NORMAL positions.
3. Place the AUDIO control in one of the four tone positions. You should hear a good audio tone if everything from the input to the speaker are working.

The VA62A Drives Amplifiers And Volume Controls

Use the VA62A to supply a DC voltage and audio drive signal to test the final audio stages. Many TVs use a single DC voltage for volume control. This voltage is fed into the IC to a preamp or amplifier to control its gain. A higher voltage produces more output audio, and a lower voltage decreases the output audio. This stage can be troubleshot by using the VA62A's built-in digital meter or the DC drive output.

The signal at the input of the amplifier stage is audio (50 Hz to 15 kHz). The amplifier simply

changes the signal to a current with sufficient level to drive the speaker. Use the VA62A to supply an audio drive signal at the input of the final amp to isolate it as the failure.

To drive the TV audio amplifiers:

1. Connect the VA62A's RF test lead to the antenna terminals and set the TV's tuner to the same channel as the VA62A's RF output.

5. If not, connect the DRIVE OUTPUT to the input of the final amp. Set the level to match the normal level seen at the injection point.

6. Note if the speaker produces the proper audio tone. If not, troubleshoot the speaker or final output components.

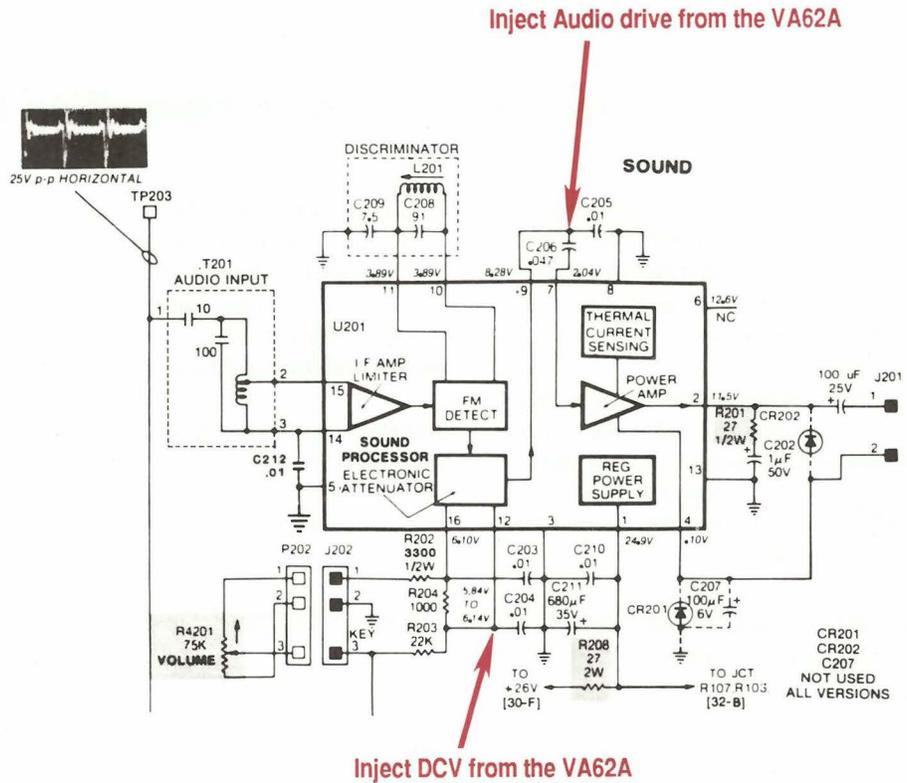


Fig. 3: Check the volume control DC voltage, or drive the final amp with the VA62A.

2. Set the AUDIO control to one of the four audio tones.
3. Either use the EXT DCV input of the VA62A to monitor the action of the volume control, or connect the DC output to the audio processor IC volume control input.
4. Vary the DC level from the VA62A and note if the speaker responds.

For More Information
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