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tech tips

Servicing TV Video Problems With Your VA62A Universal Video Analyzer

Any of the television signal circuits from the antenna input to the CRT, plus control circuits associated with these circuits (AGC, AFC, blanking), can cause video problems. Because of this, it is often difficult to track down the cause of a poor or no video symptom. This Tech Tip explains an efficient procedure for servicing video problems in the least amount of time with the VA62A Universal Video Analyzer.

Keys To Efficient Troubleshooting

There are two keys to troubleshooting video problems efficiently. First, you want to use a troubleshooting method that allows you to easily tell whether stages are good or bad. Functional analyzing with the VA62A Universal Video Analyzer is such a method. It allows you to tell whether stages are good or bad by simply watching for a good picture on the CRT.

Second, you want to use this easy troubleshooting method in a logical order that minimizes the steps needed to find the defective circuit. The "Divide and Conquer" troubleshooting system gives you a logical order to use functional analyzing to quickly zero in on the defective circuit. The TV Functional Analyzing Troubleshooting Guide (a portion of which is shown in Figure 1) is based on the Divide and Conquer system.

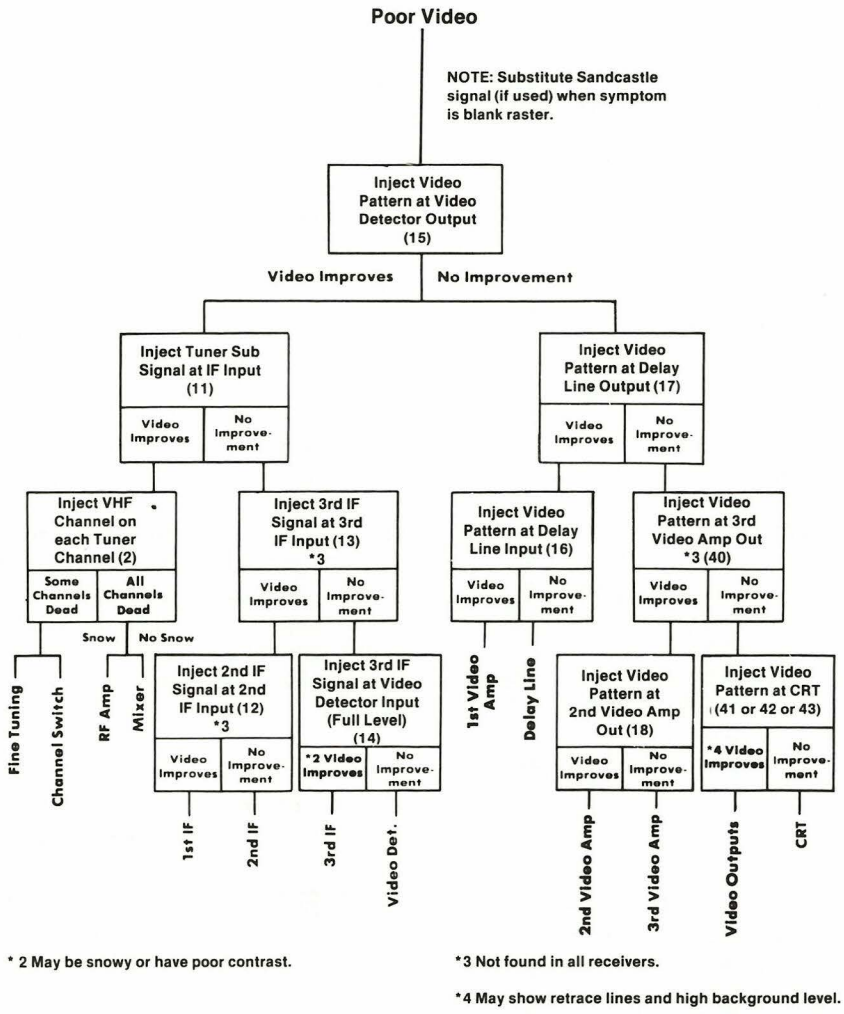

Fig. 1: Use the Troubleshooting Guide to help you quickly find the defective stage when functional analyzing with the VA62 Video Analyzer.

How To Recognize Video Circuit Symptoms

If the symptom is no video (blank raster, but you have HV) in a set using a sandcastle circuit, the set has one of three types of problems:

1. The video detector is not turning on because an RF or IF stage is stopping the signal.

2. One of the video amplifier stages is not allowing any signal to pass through.

3. The sandcastle circuit is not delivering the proper signal to the video IC to bring it out of blanking.

Your first step should be to substitute the VA62A horizontal keying pulse for the sandcastle signal at the video IC's sandcastle input. If video returns, the problem is in the sandcastle generator. If you still have no video, an RF, IF or video stage is at fault.

To continue troubleshooting the video circuits, divide the signal circuits in half. Substitute VA62A video drive signal at the video detector output (Figure 2). If the video improves, you know that the circuits beyond the video detector are working properly. You need to troulbeshoot the RF/IF stages. If the video doesn't improve, you need to troubleshoot the video amps and CRT.

Universal TV Block Diagram (Video signal portion only)

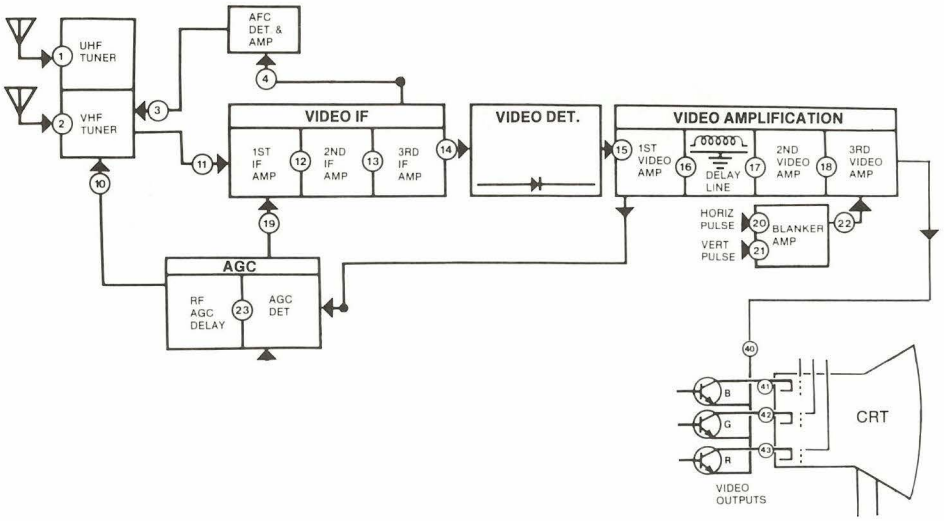

Fig. 2: Use the Universal Block Diagram to help simplify sets to the block diagram level when troubleshooting.

The RF/IF Stages Can Cause Similar Symptoms

Substitute the VA62A Video IF signal at the IF input to determine whether the video IF and detector are working properly. Unplug the tuner/IF link cable at either end and use the supplied VA62A adaptor to feed signal to the IF. If the cable is soldered on at both ends, use the VA62A troubleshooting balun to make the connection. **The VA62A swamps out any signal coming from the tuner.**

NOTE: Set the VA62A to the normal IF input level by selecting the LO (1ST IF) position of the RF-IF LEVEL knob and set the RF-IF LEVEL VERNIER to the NORM (1) position. The exception to this is in late model chassis when the IF preamp is in the tuner rather than with the rest of the IF stages. In this case select the MED (2ND IF) position.

If there is no improvement, you know that one of the IF/detector stages is at fault. Substitute into the individual IF/detector stages to localize the defective stage (normal input to the SAW filter is MED/1 and normal input to the IF Processor IC is LO/1).

When you localize the problem to an amplifier stage controlled by AGC, use the VA62A DC Power Supply to substitute the proper DC control voltage to the stage. If proper output is restored, troubleshoot the AGC circuit; otherwise, troubleshoot the amplifier.

If proper operation was restored when you substituted at the IF input, you know the problem is before the IF input. Check the tuner supply, AGC, AFT, and tuner control voltages. If you find an incorrect voltage, use the VA62A DC Power Supply to substitute the proper voltage to confirm that the tuner is good. If all the voltages to the tuner are good, replace the tuner.

Troubleshooting The Video Amps And CRT

If the video didn't improve when you substituted at the output of the video detector, you know that the problem is in one of the video amps or the CRT. To identify the defective stage, continue the Divide and Conquer process that you started at the video detector (outlined in the Troubleshooting Guide in Figure 1). If you make it to the point of substituting at the CRT and you get no improvement, test the CRT to confirm that it is the problem.

NOTE: Many technicians test the CRT before beginning any troubleshooting. This prevents the possibility of spending time troubleshooting and replacing parts, only to find that the CRT is also bad or weak. This also helps you give an accurate repair estimate.

Injecting Signals Into The IF Processor IC

You need a slightly different procedure to inject your IF signals in place of the SAW filter output (IF processor IC input) because neither of the SAW filter output pins is grounded. The two IF processor IC input pins feed the IC a differential signal. The VA62A lets you feed the IC a differential signal as long as you follow two simple procedures.

First, connect the two output leads of the VA62A troubleshooting balun (a normal matching transformer shorts DC voltages) to the two IC input pins instead of using the normal procedure of connecting one lead to the circuit and the second one to ground.

Second, run a ground lead from the VA62A to the receiver chassis to prevent induced AC picked up by the VA62A shield from injecting hum and noise into the picture. (Remember that you must have the receiver plugged into an isolation transformer or you will blow up the receiver's power supply when you make this or any other ground connection!)

The easiest way to ground the chassis is to connect a test lead to any of the VA62A output jacks marked as having an earth ground (such as the VCR Standard jack). Connect the black alligator clip of this test lead to the TV chassis. Connect the red clip to the insulation of the black clip so it doesn't contact the metal chassis.

NOTE: You only need to connect this ground lead when working with ICs having differential inputs, but you can leave the ground lead connected for all other tests without causing other problems.

Form 4420 Printed in U.S.A.