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tips

How To Drive Audio Inputs With The VA62 Universal Video Analyzer™

One area of TV/VCR servicing that is often overlooked is the audio circuits. Audio quality and complexity has changed over the past few years. For example, the development of TV Stereo and Hi-Fi offer new opportunities and troubleshooting challenges. As servicers, we quickly discover that audio performance testing is as important as a quality check for video. This tech tip explains how you can use your VA62 Universal Video Analyzer to provide audio tones to the audio inputs of TVs and VCRs.

When looking at the specifications of various TVs and VCRs, notice how the manufacturers list different levels for the audio inputs in their products. They even go as far as using different forms of measurement to specify the levels. Figure 1 shows a list of several different audio input specifications from some common manufacturers.

JVC VCR Model HR-D555U
Audio Input -8dBs, 50k

Goldstar VCR Model GHV-51FM
Audio Input -20dBm, 50k

NEC VCR Model N916U
Audio Input -8dBs, 47k

NAP CamCorder Model PV-210D
Audio Input -10dB, 50k

Sony TV Model KV-27TS21
Audio Input 500 mVrms, 47k

Zenith VCR Model UR4000
Audio Input -8dB, more than 50k

Fig. 1: Manufacturers use different levels and forms to specify the audio levels used. Here are a few examples.

Failure to provide the correct input level can give misleading symptoms ranging from clipping to no audio output, and can give incorrect levels for signal tracing the audio circuits. Your VA62 can be used to supply the input audio at the frequencies specified in the VCR alignment instructions (333 Hz, 1 kHz, 3 kHz, and 7 kHz) with the AUDIO control. However, because the VA62's drive signals are designed for use in circuits that have signals ranging from zero to 300 VPP, you may have to use a voltage divider (discussed later) to more accurately adjust the VA62's output signal level to the millivolt levels required by some manufacturers.

How To Convert The Audio Levels From VPP To RMS Or dBs. To match the input levels shown on some schematics, you will have to convert from peak-to-peak volts to rms, dBm, or dBs. * There are two methods you can use for setting the VA62's audio drive signal level to the specific level needed. One method is to measure the level at the output of the voltage divider (Figure 2). This only works if you have a voltmeter that allows you to make peak-to-peak, rms, and decibel measurements. The other method is to use the table (Figure 3), to find the DRIVE SIGNAL output level (monitored by the built-in DIGITAL METER) that matches the audio needed.

How To Hook The VA62 To The Audio Inputs

Figure 3 shows the proper method of connecting the VA62 to the audio inputs. You must assemble a voltage dividing network of a 150 k Ω and a 47 k Ω 5% or better resistors. Connect the resistors in series. Then connect the test leads from

the DRIVE OUTPUT of the VA62 to the outside ends of the series resistors. The positive lead should be connected to the 150 k Ω resistor and the negative to the 47 k Ω resistor.

The test lead connected to the audio input should connect with the positive clip at the junction of the two resistors and the negative clip to the negative terminal of the DRIVE OUTPUT of the VA62.

To drive audio inputs with the VA62's DRIVE OUTPUT:

1. Connect the VA62 to the voltage divider network and to the TV/VCR. (Figure 3)
2. Turn the VA62's AUDIO control to the desired frequency.
3. Set the DRIVE SIGNAL control to AUDIO and adjust the DRIVE LEVEL to provide the correct input level as shown in Figure 3.

* This measurement must be made by a meter with dB measurements referenced to an input impedance of 600 ohms, 0 dBs = 0.775 Vrms into 600 ohms.

for more information

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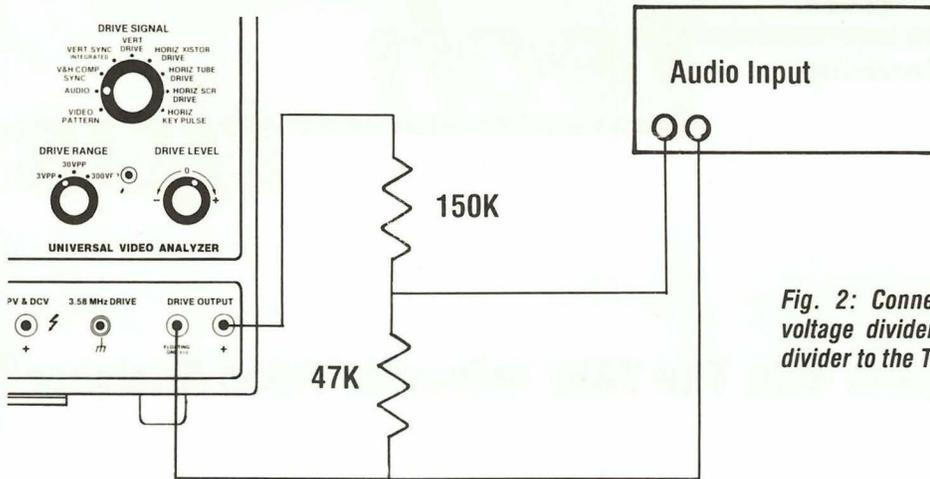


Fig. 2: Connect the VA62's DRIVE OUTPUT leads to the voltage divider network; connect the output of the voltage divider to the TV/VCR audio input as shown.

Voltage Needed At Divider Output (mVrms)	dBs (1mw into 600Ω)	Set Your VA62 Drive Output (PPV) To:
50	-23.8	.9
100	-17.7	1.8
150	-14.2	2.7
200	-11.7	3.6
250	-9.8	4.5
300	-8.2	5.4
350	-6.9	6.3
400	-5.7	7.2
450	-4.7	8.1
500	-3.8	9.0
550	-2.9	9.9
600	-2.2	10.8
650	-1.5	11.7
700	-0.8	12.6
750	-0.2	13.5
800	0.2	14.5

Note: Drive output Vrms × voltage divider ratio = dBs = 10 Log $\frac{\text{mVrms}^2/600}{1\text{mw}}$

1. (Drive output VPP/2) × .707 = Drive output in rms

2. Voltage divider ratio = $\frac{\text{parallel combination of 47k and component input R}}{150\text{K}}$ = divider ratio.

Fig. 3: This table gives the approximate audio output in both RMS and dBs, with different VA62 Drive Output Settings.