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# NEWS

## Technology

### Why Every System Needs A Simple Test Set-Up For Testing Modules

By Steven K Richey and Andrew Staniak

In the early days of cable TV almost every system had a test set up in the back room. It usually consisted of a Jerrold 601 Sweep Generator, an RCA

technician did was brought the amplifier or module in and swept it. Many times faulty transistors were replaced on the spot and the amp was back in service by that afternoon.

Today we seem to have gotten away from that, and due to the expense and complexity of today's network analyzers, it is somewhat understandable. Today's solution seems to be to bring all your problems and suspected problems into the shop and promptly dispatch them to the next repair shop, who's truck

In fact I have seen as many as 70 percent of modules sent in for repair to be functioning properly. Some repair shops will return these units as "no problem found" while charging a bench fee. However most of the time they are able to find a reason to charge for a full repair. These reasons are varied, but most of the time the alignment is out of spec, because the amplifier has been tweaked in the field, and you get a full repair charge.

Every system operation should have the housings that they use in the field set up with a power inserter, either at their office or at the headend so that all modules can be checked prior to sending them out for repair.

There are couple of simple rules that need to be followed in order to get a fairly good idea of the health of your modules. The most serious — and the one error that we see most often — is the improper installation of the power inserter. What we see most times is the power inserter and the amplifier housing connected together with a length of RG-6 usually 5-20 feet long.

This can and will cause standing waves that can cause certain channels to



or Heathkit Scope, a WR99A RCA Marker generator and a 704 FSM with a Jerrold or Ameco Pad box and a detector.

In almost every case, when a field problem occurred the first thing the

shows up or who's representative calls on the phone.

One of the best kept secrets of the CATV repair business is that a very high percentage of these amplifiers work and do not really need any repair.

drop as much as 6 dB— which will lead you to the erroneous conclusion that you have a bad module, when in fact you have a bad set up.

To do this properly, you need to connect the power inserter to the housing with a housing to housing adapter and if you do this you will have a minimal effect on your test. (See photo). Another thing that is most helpful is to put a 20 dB pad in series with the amplifier output and your FSM or Spectrum analyzer. Many FSM's and analyzers do not have a good match across the entire band and the length of cable from the device under test and the FSM or analyzer can effect the reading. But the pad forces a match and minimizes this potential problem.

Dependant on the type of device you are using to monitor our output signal, you need to be mindful of any AC that may be fed to the output, and protect your equipment accordingly.

As you are testing, you should also compare the actual output to the test point and make sure that they agree. There are some amplifier modules that have a trimmer to adjust the accuracy of the test point and we have found these to be misadjusted in as much as 90 percent of the modules we looked at.

If you are testing a multi-output unit you can inject power without using a power inserter on one of the outputs. You may need to be able to change the AC input if you suspect that you may have a single bad output.

Once you have your test station set up the procedure is simple — just plug in your module and check it just as you would an amplifier in the field. You should adjust your inputs to be close to your actual field inputs and then check the outputs in the same manner that you would an amplifier in the field.

If you are using a sweep system such as a CaLun or a Acturna, then sweep the amplifier accordingly. One of the potential errors that you may encounter and should be aware of is if you are coming straight out of your headend signal with a flat signal, and you are looking at an amplifier that has built in slope, then you will see a humping at about 200 MHz that is a result of not going through cable.

It is a very good idea when you get your test set up operational that you

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start with amplifiers that you know are good, and establish a baseline from which to gauge future modules.

I know that this all may seem simple and redundant to many of you, but we are talking to more and more people in the field that do not even know what we are talking about when we ask if they have a test set up.

If you have a test set up already, great, use it. If you do not, then build one and I promise you that you will be dollars ahead. You will be surprised at the amount of good management information that you will get. For instance I

will be surprised if you don't find out that most of your, "no problem found" modules, come from the same people. They are the ones who, when faced with a problem, change the amplifier first and then drop the module in the back of their truck or in their bin. Then a few days later when they are cleaning up, they can only remember it was a bad module, forgetting the real problem was a wet connector. □

*Next time we will look at the do's and don'ts of reverse operation and the reasons why and why not.*



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