

# DISH AND DAT, FROM THERE TO HERE

by Gordon S. Carter - Pro Audio Services - (708) 482-4142

Over the past several months we have looked at maintenance for most major portions of the audio chain. This month we will tie up some loose ends and deal with a number of smaller items.

## Satellite Equipment

The first item on our list is the station's satellite dish and associated equipment. Entire articles have been written on maintenance of the satellite dish in other publications, so we will only touch on a few key points here.

From my experience and conversations with a number of radio station personnel, it appears that many people think that once the dish is installed and adjusted, you just let it go and it works forever. Of course, those of us in the engineering area know that nothing works forever without attention. But, just what do you have to do to that upside-down umbrella to keep it working well?

The most common problem encountered with satellite dishes is that they are no longer aimed directly at the

satellite. I suggest checking your dish each spring, just after the spring winds (if you have any in your area) have settled down. The strong gusty winds encountered in many northern areas of the United States put a severe strain on the mounts for satellite dishes, especially the larger ones. The winds and gusts can cause your dish to move a fraction of a degree in any direction. Since the satellite spacing is only two or three degrees (depending on the specific satellite you are looking at) this could be a serious problem. It is usually evidenced by lower than normal signal strength and, in more severe cases, by interference from an adjacent satellite. Properly adjusting your dish requires patience and a few extra hands, and may be a bit tricky the first few times you do it. I suggest that you work with someone experienced in the procedures until you get the hang of it.

Another problem, especially for dishes receiving SCPC signals, is crosspole adjustment. This is the alignment of the antenna relative to the polarization of the signal from the satellite. Since most satellites make effective use of the frequency spectrum by using the same frequencies on alternating polarizations, a small error in this adjustment may leave you open for interference from signals on an adjacent transponder. Again, patience and experience are helpful when making these adjustments.

While you are looking after your dish, be sure to check that it is free of debris such as fallen leaves, tree limbs, baseballs, or pop cans and bottles. In the fall, make sure you check your de-icers (if you have them) before the snow falls. If you do not have de-icers, make sure you know how to sweep the snow from your dish without disturbing the antenna. Also, while you are snooping around your dish, check all the waveguide and RF connections. Make sure they are good and tight and free from corrosion. Remember that the frequencies encountered here are much higher than your

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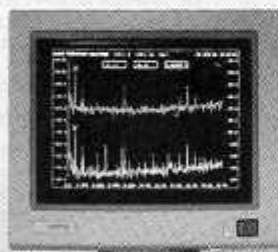
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transmitter, so even what may appear to be a small problem can cause big trouble.

Most of the electronics used with your satellite dish require little attention. Check with the owners' manuals for suggested maintenance and adjustments. Once you have checked over your dish, waveguide, and co-ax, a complete performance check on your system is a good idea. A check of the audio performance of your equipment may lead you to a problem in the RF portion of your system. You will probably have to coordinate this with the operator of your satellite service unless he has a regularly scheduled test period.

### DAT Machines

DAT (Digital Audio Tape) machines are becoming more and more popular with broadcasters. They provide a small, high-quality, low-cost recording medium with many neat features, such as indexing and long recording time on each tape. If you do not have DAT yet, you may have it soon. If you do have it, sooner or later you will be asked to fix one that doesn't work.

The first problem you will encounter with most DAT machines is the lack of any worthwhile service information. Most of these machines are sold with a consumer-style operations manual, but you must buy the service manual separately. The service manuals seem to assume that you understand the theory and principles of operation of the DAT medium, so you will have to do some digging to educate yourself in this area. The next thing you will notice is that the manuals give very little trouble-shooting information. They tell you in excruciating detail how to take the thing apart and how to make every little adjustment, but give you no clue as to what to do when the framistan refuses to mesh with the gezortenclap.

The second problem you will encounter with most DAT machines is the need for special DAT alignment tapes, which seem to be scarce as hen's teeth. Of course, you only need three or four different tapes, plus tension measuring cassettes, to check out your machine, and these things aren't cheap.

All of this brings me to some simple conclusions. If you are going to be servicing a number of DAT machines on a regular basis, go ahead and learn all you can about them and invest in the necessary test equipment. If you only have one or two machines your best bet may be to send them out to a service center for any necessary repairs. You'll have to weigh your situation and make your own decision.

One final word on DAT machines. The heads on these machines only seem to be good for a few hundred hours of playing time or about a year or two depending on your use. With the technology advancing as quickly as it is, you may be better off to simply replace the machines when they don't work if they are more than a few years old. Many of the machines have a built in test program that you can activate by pressing a special combination or sequence of buttons. Check with your service manual or the technician you send the machines to for repair for the details on this. You can often tell the general nature of your problem, and possibly get an idea of the magnitude of the repair bill, by running this program and reading the results.

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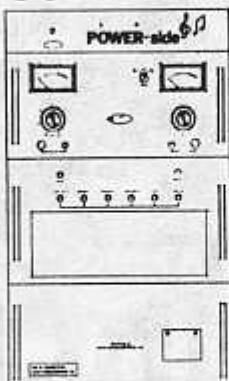
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## VCR's

Some radio stations have been using VCR's for a few years as an audio recording medium. Some have used their VCR's with a PCM (pulse code modulation) converter to record stereo audio which has been converted to digital and then formatted to the video frame. This technique yields audio performance comparable to DAT but has been available for quite some time. Others have used the "hi-fi" tracks on the VCR to record audio, while others have used the digital recording capabilities of 8 mm video cassettes for extended play audio.

All these video machines have the same sort of problems as the DAT machines. In fact, one of the most noticeable differences between a VCR transport and a DAT transport is the size. Many of the principles are the same. Again, due to the complexity of the equipment and the specialized test equipment needed, you may find it more expedient to send this equipment out or replace it than to try to fix it yourself.

A quick word on the PCM units. These units appear to be quite reliable and stable of a long period of time. However, most of them are consumer units are not necessarily designed to operate 24 hours a day, 7 days a week. If they are left on for extended periods of time, you may develop some heat-related problems, especially in the areas of the power supply and voltage regulators (the heat-producing components). With the help of a service manual you can probably track down these problems yourself.

## Microphones and Cables

Generally, microphones work. However, once in a while you come across one that does not work as well as it should. The most common problems are low output or poor frequency response. If you have a mic that you think is not working properly, check it with another console or another input on the same console to eliminate any possible pre-amp problems. Also try it with a different cable to eliminate the possibility of a bad cable. If you get no output or very low output and your microphone requires phantom power, check to make sure your console is providing the phantom on both sides of the line. Check any switches that may be on the microphone for proper settings. These are often recessed and may be hard to see if the mic is old and dirty. Also, these switches can get dirty or go bad, so you may want to try exercising the switches as well. Some newer microphones work with a special "box" between the microphone and the line to the console. If you have a mic like this and have a working spare, try to determine if the problem is the microphone head or the box.

Once you have determined that the problem is definitely with the mic, your best bet is to package it up and send it back to the manufacturer for repairs. When you send in the mic, be sure to include a detailed explanation of the symptoms to assist the repair technicians in finding the problem. If your mic has a separate box, send all the parts, but be sure to let them know which part is defective if you can.

Microphone cables take a lot of abuse at a typical radio station. While they are the glue that keeps everything together, like Rodney Dangerfield they get no respect. MI-

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crophone cables get walked on, run over by any number of wheeled contraptions, pinched in doors, and have things dropped on them.

When checking out a mic cable, a simple ohmmeter or continuity tester is a big help. Check end-to-end continuity for each conductor, including the shield and check for shorts between any conductors. The most common problem is a wire that has been pulled apart within the connector. You can usually spot this with a quick visual inspection and fix it. Sometimes you can spot a damaged area in the cable where the wires are broken or the insulation is damaged enough to cause a short. You can either shorten the cable to this point or try to cut out the bad section. Personally, I prefer not to try to splice out bad sections in cables unless it is necessary for an emergency repair. Splices just don't hold up well as a long-term fix.

While you are checking out the cable, check the condition of the connectors. Make sure the shell is not bent so that it binds when mating to another connector. Check the strain relief on the end of the connector to make sure it is doing its job. Look for corrosion on the connector pins, especially on older connectors. Make sure the pins or sockets line up properly and mate well with other connectors. If any of these is not right, replace the connector or you will have trouble when you go to use the cable again.

When you are finished with the mic cable, check for continuity and shorts once again. Shake the cable and wiggle it to make sure you don't have an intermittent problem. Then plug a microphone into the cable and plug it into a console. Listen to someone talk as you shake the cable and wiggle the connections. If you hear any problems, you missed something. In some cases it will be more economical to simply throw out the cable than to try to fix it. This is especially true if you have a cable with intermittent problems and no visible signs of damage.

### Remote Equipment

Remote equipment is usually no different than studio equipment except that it is usually smaller, lighter, portable, and takes a lot more abuse. This is especially true of the already

abused microphone cable. It is always a good idea to set up all your remote audio equipment in your shop before you go out on a remote and make sure it all works reliably. If you find a problem, you can fix it while you still have the time and your tools and test equipment are available. Once you get out on the remote, you will probably not have time or tools to work with.

Some of the best remote people I know can work their way around almost any problem they may encounter on the remote. They take a little extra equipment (just to be safe) and use their ears extensively. However, when they find a problem while on a remote, they never tell anyone about it, especially the person who has to fix it. Try to get whoever does your remotes to flag any piece of equipment that doesn't work, even a mic cable, so it can be fixed as soon as it comes back. That way it will be ready to go next time.

If you are doing your remotes by phone line, be sure to check out the lines before your remote. Depending on your local phone company, you may or may not be able to get quick reliable service on your lines, so be sure to allow enough time. Your experience will let you know what is enough. When you are checking the lines, be sure to feed them from the proper source impedance and terminate them with the proper load. If you don't the frequency response may be quite screwy.

Once you have checked out your lines, put tone on them and leave it there. Some phone company employees have an annoying habit of using any pair of wires in the cable that is not in use for the next customer. They check by listening to the wire and if they hear nothing, they use it. The tone will give them something to listen to and may keep your lines available for your use.

If you use RPU gear, be sure to check all your RF cables and connections before you take it out. If possible, set up the complete rig and run a test to make sure it is solid. Cables and connectors that are not used often can oxidize and make poor contact, especially when you want to use it NOW.

Finally, when preparing for a remote, make sure your board operator knows how to get it on the air. **RG**