

UPDATED

*Create a super-high-capacity television
programming and movie server*




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Expand your DVR Hard Drive for virtually endless recording possibilities

By, Steve Hartfelder and Ryan Koskela of Diamond Case Designs, Inc.

In a previous article, we wrote a story about using your existing cable box or satellite DVR to create a flexible and cost-effective high-definition movie server. We received a tremendous amount of feedback on that article and many of our readers indicated that method of viewing would work best for them, particularly as compared to paid third party solutions such as Apple TV or Vudu ([read previous article for full details](#)).

Hard Drive Expansion Is Available For These DVRs

	Direct TV HR20
	Direct TV HR21
	Scientific Atlanta Explorer 8300HD

If you are interested in expanding the capacity of your hard drive but do not own one of these boxes check to see if your box has a SATA connection on the back panel. If it does, call your cable or satellite company to see if it active so you can try this expansion.

boxes use internal hard drives to store things you record. The storage capacity (or in plain terms, how much space there is to record) of a given box is determined entirely by its manufacturer. Usually, the default (or “built-in”) storage capacity of satellite and cable boxes hovers in the 160 to 250 gigabyte range. This amount of space may seem large, but since high-definition broadcasts require a significant amount of storage, drives in this capacity range fill up quickly, especially if you use the box as a movie server or use it to record entire series of television programs. A few high-definition movies or full seasons of popular programs such as *American Idol*, *Survivor*, *CSI*, or *Lost* could surely put a big dent in your hard drive’s storage space!

When your drive is full, you have two options: don’t record or delete some of your recorded programs. In fact, most boxes will automatically start deleting your “oldest” content as the drive becomes full. You can imagine the frustration you or your family might feel if you lost the season finale of *Grays Anatomy*, *Desperate Housewives*, or your favorite edge-of-your-seat drama. Even worse, what if your favorite high-definition baseball game or play-off game was missing? Or what if you simply want some storage space for *your* programs because your spouse and kids have filled up 90% of your hard drive? At some point you will be faced with a compromise of what to keep and what to delete.

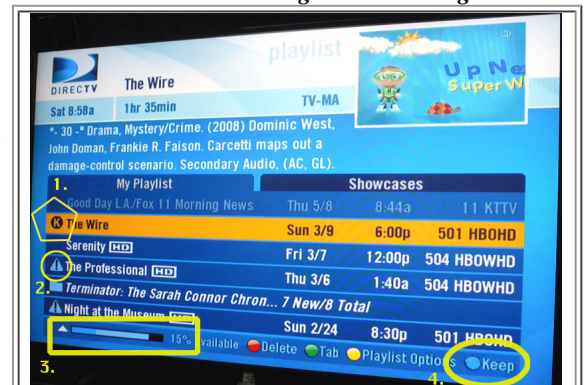
In this article, we’d like to expand on the concept and show you how to give your Direct TV satellite box (or any compatible satellite or cable box) a huge storage capacity boost by pairing it with a specialized external hard drive. By choosing just the right add-on storage solution you will be able to create a super high-capacity television and movie server that can triple or even quadruple the storage capacity of your original cable or satellite box.

Before we get started, let’s clarify a few technology issues. All cable and satellite

After about a week and a half of recording we had amassed a collection of over 65 high definition movies and shows totaling over 120 hours of HD footage.

The best way to resolve this storage issue is to give your cable or satellite box a major boost in storage capacity. By pairing your DVR with just the right high-

Direct TV Recording Screen Messages



This graphic explains some of the common Direct TV symbols to help you properly manage your recordings. [Click to enlarge.](#)

By pairing your DVR with just the right high-




performance external hard drive you'll enjoy a dramatically increased recording ability. The upgrade process documented here was completed on the Direct TV HR20 satellite receiver but is compatible with other models. It has also successfully been completed on the Direct TV HR21 as well as the Scientific Atlanta 8300 series cable box. The exact process of upgrading the drive may vary slightly from box to box, but the concept is universal.

The goal for our upgrade is to provide an easy plug and play solution. We started out by testing three large one terabyte hard drives (1terabyte is about 3-4 times larger than the standard hard drives) from Western Digital, Seagate, and Apricorn. These hard drives all connected to our Direct TV HR20 through the eSATA connection on the rear of the Direct TV box. Unfortunately, we did not have much luck with the Western Digital and Seagate drives; both of them were not successfully recognized by the Direct TV boxes. After determining two of the three drives were not compatible with our upgrade, we realized choosing the right drive was critical to the expansion. As the saying goes the third time is the charm, and our third hard drive attempt, the DVR Xpander from Apricorn, connected flawlessly and allowed our upgrade to go smoothly.

"I'm really glad that I connected Steve's DVR expander to my Scientific Atlanta 8300 from Cox. It increased my capacity from 20 hours of HDTV to around 120 hours of HD programming. Now that most sports events are in HD it is a must for sports fans who want to record the extensive tennis and golf coverage as well as a baseball game or two. Now I don't have to run through my saved shows and movies and clean them out before a big sports weekend. Friends will say "how can you watch that much TV?" I tell them it's not that I watch that much but that I watch what I want and forward through the rest."
-Cliff Breining, Customer

Here is the process we followed to upgrade the Direct TV HR20 (or HR21):

How to increase the recording capacity on the Direct TV HR20 or HR21

		
<p>1. Stop any recordings on the satellite box and turn it off. Unplug the power cord from the back of the box.</p>	<p>2. Place the external hard drive in a convenient location close to the satellite box and with adequate air flow. Plug the included eSATA cable into the back of the hard drive. Plug the hard drive into an available AC outlet.</p>	<p>3. Plug eSATA cable into the port marked SATA on back of satellite box. Press power button on hard drive. Wait about one minute, plug power cord back into satellite box and turn it on. The satellite box will recognize the new hard drive, format it, and then reset itself. Once the satellite is rebooted, you are fully upgraded!</p>

IMPORTANT NOTE: Once the external hard drive is properly connected all of the previously existing recordings and To Do List items are reset. You will need to re-establish all of your recordings. (It should be pointed out that if this process is followed in reverse and the external hard drive is removed from the setup the old recordings and old To Do List items will still be on the internal hard drive).

Now that we had a properly installed massive hard drive we wanted to see just how much real world recording we could do. We immediately went into the guide, filtered out the high-definition channels, and started recording. Since we are planning to illustrate what a great high movie server this box can be we focused on recording HD movies off of HBO, Showtime, Cinemax, etc. We also recorded several 'normal'



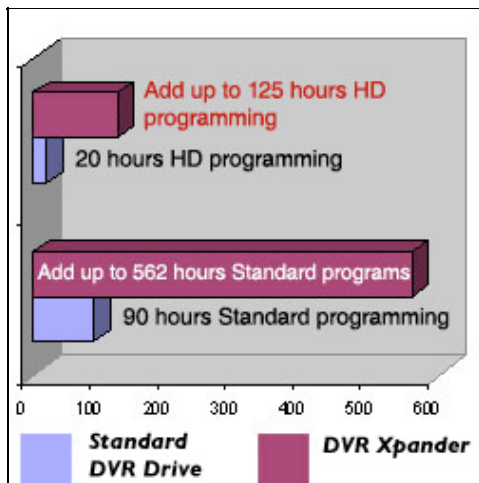
programs such as sporting events, cooking shows, and some popular TV series such as *Lost*.

TIP: To take full advantage of your high TV and DVR you should record as much high-definition programming as possible (as opposed to analog or standard definition programs). Direct TV provides an easy way for you to filter out and show only the high-definition programs in the guide. If you press the guide button once you will see your standard channel guide, if you press the guide button again you will see a menu called "Filter The Guide". The last selection in the Filter Guide is "HDTV Channels". Select this and your guide will now only display high-definition channels.



*TV Recording Tip: The new high-capacity hard drive is also perfect for recording weekly TV programming. In fact, you could set-up the DVR to record the **entire season** of either your favorite program or a new series. Once the entire season had been captured you could watch the individual episodes at your leisure. One of the major advantages of recording in this fashion is if you get really into a program you could watch multiple episodes in one sitting (or within few days) without having to wait an entire week for a new episode. And of course you will always be able to skip through the commercials.*

After about a week and a half of recording we had amassed a collection over 65 high-definition movies and shows totaling over 120 hours of HD footage – and the hard drive was only 68 percent full! Our new high-definition movie library included some major blockbuster titles such as *Shrek The Third*, *Night At The Museum*, *Evan Almighty*, *Pirates Of The Caribbean: Dead Man's Chest*, *Ratatouille*, *Spider Man 3*, and *Transformers*. We even had classic and all time favorite movies such as *Titanic*, *Hairspray*, *Truman Show*, *300*, *Austin Powers*, *Mission Impossible 3*, *Bridge To Terabithia*, *The Patriot*, *Gladiator*, and *The Mummy*. The downloadable PDF version of this article includes a complete list of the movies and programs we recorded.



TIP: Families with children know how often kids get a movie stuck in their head and they will watch it over and over again, day after day. This high-capacity movie server is a perfect solution as you will have plenty of space to record your kids favorite programs.

In addition to our enormous recording capacity, we noticed that the hard drive worked exactly like the standard internal hard drive. We experienced no speed or latency issues.

In conclusion, we found that expanding our DVR's recording capacity to create a massive movie and TV server is an easy process. However, to do so, it is absolutely critical the right hard drive is chosen for the job. We found out firsthand that the expansion is not as easy as just picking a random external hard drive. As with most things in life choosing the right tool is critical for the job.

What hard drives work for this expansion? What are their specifications?

As mentioned in the article we did not have success in our testing with either the Western Digital or Seagate hard drives. We successfully used (and fell in love with) the Apricorn 1TB external eSata hard drive. Given the ease of use and low cost of the Apricorn hard drive it was the best (and only) solution.

Full drive specifications can be found in the PDF version of this article (you can download by [clicking here](#)).

I'm sold, how do I purchase one?

You can order the hard drive expansion through our on-line store or by calling us toll-free at 800-616-5354.

The kit comes complete with a 1TB external (Apricorn) hard drive, an approximate three foot eSata cable, power supply, power cord, and a vertically configured drive stand. Everything you need to get started is included. The drive comes with a one year manufacturers warranty. The kits are normally in stock and ready for prompt shipment.

**Update Your Recording Capacity Up To
400% - Only \$269.**

The upgrade kit is valued at \$399. We are currently offering the entire kit for \$269. This is an extremely cost effective way to really boost up your HDTV experience!

[ORDER ON-LINE NOW](#)

If you have questions please call Steve or Dave at 800-616-5354.
In addition, you can reach Steve by e-mail at sales@diamondcase.com.

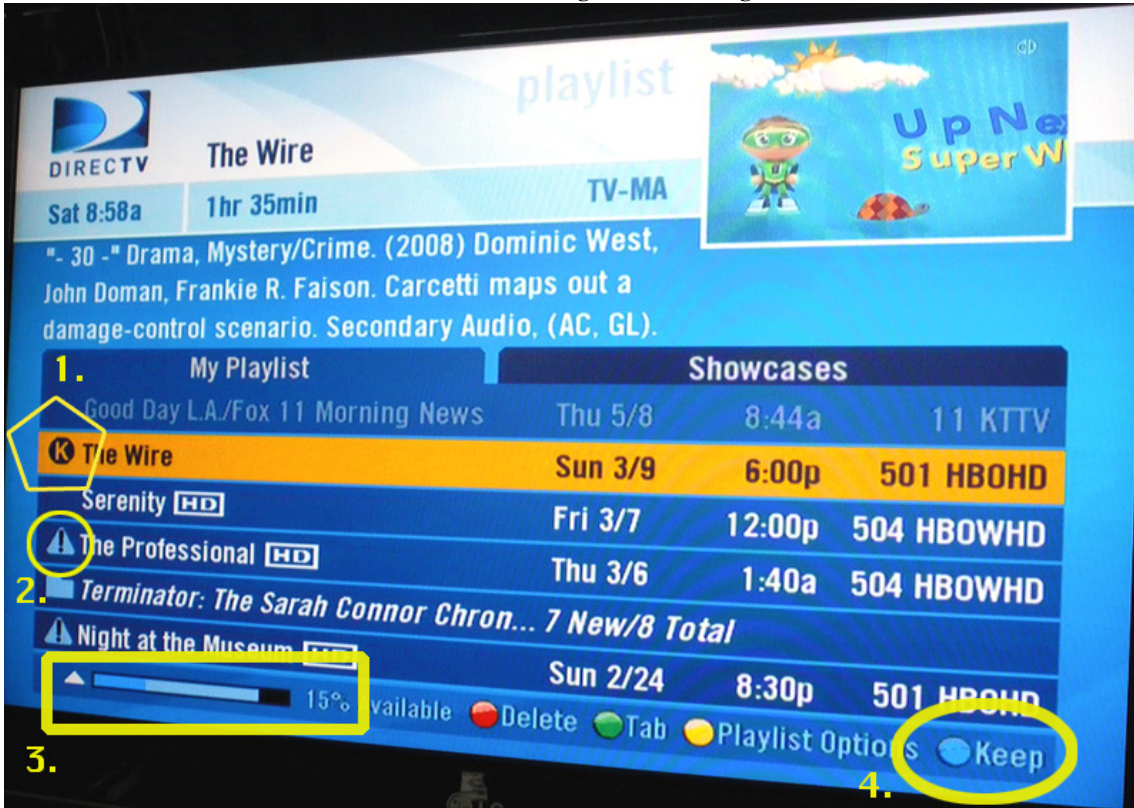
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Direct TV Recording Screen Messages



	1. The K symbol means this program has been marked as "Keep" and is protected from automatic deletion.
	2. The exclamation point symbol means your hard drive is close to capacity and older programs will automatically be deleted if you continue to record. Programs with this symbol are in danger of automatic deletion.
	3. The bar at the bottom of the screen shows the capacities of your hard drive. The dark blue portion shows the percent of the hard drive taken up by protect programs (programs marked as 'keep'). The light blue portion shows the percent of the hard drive taken up by normal, non-protected recordings. The black portion of the bar shows how much hard drive space is left available for additional recordings.
	4. The Keep function protects a program from being deleted automatically. You can protect the program by pressing the blue button on your Direct TV remote.

Complete List Of Movies and Programs Recorded During Test	
Movie Name	Time Duration
<i>300</i>	2 hrs
<i>American Pie</i>	1 hr. 45 mins.
<i>Austin Powers: The Spy Who Shagged Me</i>	1 hr. 40 mins.
<i>Babe</i>	1 hr. 35 mins.
<i>Blood Diamond</i>	2 hours
<i>Bridge to Terabithia</i>	1 hr. 31 mins
<i>Cars</i>	2 hrs.
<i>Casino Royale</i>	2 hrs. 30 mins.
<i>Catch and Release</i>	2 hrs.
<i>Click</i>	1 hr. 50 mins.
<i>Crouching Tiger, Hidden Dragon</i>	2 hrs. 5 mins.
<i>Curious George</i>	1 hr. 30 mins
<i>D2: The Mighty Ducks</i>	1 hr. 36 mins.
<i>Deck the Halls</i>	1 hr. 45 mins.
<i>Dick</i>	1 hr. 45 mins.
<i>Evan Almighty</i>	1 hr. 45 mins.
<i>Failure to Launch</i>	1 hr. 45 mins.
<i>Fantastic Festivals of the World (Documentary)</i>	1 hr.
<i>Fantastic Four: Rise of the Silver Surfer</i>	1 hr. 30 mins.
<i>Gladiator</i>	2 hrs. 40 mins.
<i>Grey's Anatomy</i>	2 hrs.
<i>Gridiron Gang</i>	2 hrs. 10 mins.
<i>Hairspray</i>	2 hrs.
<i>Heat</i>	3 hrs.
<i>Honey, I Blew Up the Kid</i>	1 hr. 35 mins.
<i>How to Eat Fried Worms</i>	1 hr. 30 mins.
<i>James and the Giant Peach</i>	1 hr. 25 mins.
<i>Knocked Up</i>	2 hrs. 15 mins.
<i>Lethal Weapon 4</i>	2 hrs. 5 mins.
<i>Material Girls</i>	1 hr. 45 mins
<i>Meet the Robinsons</i>	1 hr. 40 mins.
<i>Mighty Ducks</i>	1 hr. 45 mins.
<i>Miss Potter</i>	1 hr. 35 mins.
<i>Mission to Mars</i>	2 hrs.
<i>Mission: Impossible 3</i>	2 hrs. 5 mins
<i>Nacho Libre</i>	1 hr. 45 mins.
<i>Naked Earth</i>	1 hr.
<i>Night at the Museum</i>	2 hrs.
<i>Night Listener</i>	1 hr. 25 mins.
<i>Open Season</i>	1 hr. 30 mins.
<i>Pirates of the Caribbean: At World's End</i>	2. Hrs. 5 mins.
<i>Pirates of the Caribbean: Dead Man's Chest</i>	2 hrs. 35 mins.
<i>Poseidon</i>	1 hr. 40 mins.
<i>Pulp Fiction</i>	2 hrs. 35 mins.
<i>Ratatouille</i>	1 hr. 45 mins.
<i>Recount</i>	2 hrs.
<i>Red Planet</i>	2 hrs.
<i>RENO 911! Miami</i>	1 hr. 20 mins.
<i>Rocky Balboa</i>	1 hr. 45 mins.
<i>School for Scoundrels</i>	1 hr. 45 mins.
<i>Shreck the Third</i>	1 hr. 45 mins.
<i>Spider Man 3</i>	2 hrs. 25 mins.
<i>Star Trek: Insurrection</i>	1 hr. 45 mins.
<i>Surfs Up</i>	1 hr. 30 mins.
<i>The Holiday</i>	2 hrs. 20 mins.
<i>The Lake House</i>	1 hr. 45 mins.
<i>The Marine</i>	1 hr. 35 mins.
<i>The Mummy</i>	2 hr. 10 mins.
<i>The Patriot</i>	2 hrs. 45 mins
<i>The Wedding Planner</i>	2 hr. 10 mins.
<i>Titanic</i>	4 hrs. 15 mins.
<i>Transformers</i>	2 hrs. 30 mins.
<i>Truman Show</i>	1 hr. 45 mins.
<i>Tudors</i>	1 hr.
<i>Underdog</i>	1 hr. 25 mins.
<i>Wild Hogs</i>	1 hr. 40 mins.

TOTAL TIME

Approx. 124 Hours

DVR Xpander

DVR EXTERNAL STORAGE SYSTEM

Instantly add up to 562 hours of your favorite programs

The perfect companion for the Scientific Atlanta 8300 series DVR

Compatible with any DVR that has an active eSATA port

Ultra-cool fan keeps DVR Xpander at the optimal temperature extending the life of your hard drive

Whisper quiet SATA hard drive

Designed to provide enhanced reliability in high duty cycle environments

Supports multiple stream high definition video recording

Use Horizontal or Vertical

Simple and easy to use,

1. Plug it in to the DVR
2. Format the drive
3. Start Recording

Dimensions:
4.80"x1.80"x8"

1 year warranty



DVR Xpander DVR/PVR Upgrade Kit

The DVR Xpander does exactly what its name implies, it instantly expands the number of television shows, movies and sporting events you can store on your DVR. The Digital Video Recorder (DVR) has changed the way you watch TV, putting you in complete control of when and how you watch the programs you love. Unfortunately there is never enough space on the DVR hard drive to record everything you want to watch, especially if you are recording it in high definition. When the hard drive is full you must delete shows to free up space for the new programs you want to watch.

The DVR Xpander solves the storage space problem by allowing you to instantly add up to 562 hours of standard TV or 125 hours of high definition programming with the DVR Xpander 1 Terabyte. DVR Xpander is the perfect companion for the Scientific Atlanta 8300 series DVR or any DVR equipped with an active eSATA port. Many cable companies offer Scientific Atlanta 8300 series DVR's with an activate eSATA port. If you are uncertain whether your DVR supports external storage, you can check Apricorn's website, search the internet by DVR model number, or contact the DVR manufacturer.

DVR Xpander has an ultra-cool fan that keeps the enclosure at optimal temperature which will extend the life of your hard drive. The sleek aluminum enclosure operates in horizontal and vertical configurations. The package includes a 500GB, 750GB or 1 Terabyte DVR Xpander and stand, eSATA cable, AC power adapter and Quick Start Guide.

DVR Xpander

DVR EXTERNAL STORAGE SYSTEM



Features	Benefits
Instant DVR Upgrade	Instantly add up to 562 hours of standard TV or 125 hours of your favorite high definition television shows, movies and sporting events.
Compatible with Scientific Atlana 8300 Series DVR's	Compatible with any Scientific Atlana 8300 series DVR or any DVR that has an active eSATA port.
Ultra-Cool Fan	Ultra-cool fan keeps DVR Xpander at the optimal temperature extending the life of your hard drive.
Quiet, Fast and Reliable SATA Hard Drive	The whisper quiet SATA hard drive features a large cache for lightning-fast performance and designed to provide enhanced reliability in high duty cycle environments.
Supports Dual Tuner DVR Functions	DVR Xpander will support all the functions your dual tuner DVR offers, including simultaneously recording two high definition channels while playing one back.
Simple and Easy to Use	1. Plug it in to the DVR 2. Format the drive 3. Start Recording
Versatile	Use Horizontal or Vertical.
Specifications	
Data Transfer Rates	Up to 300 MBps SATA
Power Supply	DC Output: +5V, +12V
Interface	eSATA External Port
Dimensions	4.80" x 1.80" x 8"
Warranty	1 year limited
Approvals	FCC, UL & CE
System Requirements	Any DVR with an active eSATA port
Comments	One gigabyte (GB) = one billion bytes; accessible capacity will be less and actual capacity depends on the operating environment and formatting.
Ordering Information	Apricorn Part Number: ADVRX - xxxx (xxxx = GBs)

For more information on **DVR Xpander** and other innovative Apricorn products visit our website

at www.apricorn.com or call 1-800-458-5448

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