The Man Behind TSReader: Rod Hewitt

- **Wrote one of the most successful stream reader programs**
- **Developed a technical solution to archive TV channels for 'Internet Archive'**
- **Working on IPTV application programs**
- **Planning on a program for OCR recognition of BBC's EPG data**

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Rod Hewitt enjoys reading TELE-satellite magazine. The picture of the Eiffel Tower in his living room highlights the fact the he can speak French fluently and loves the French way of life.

One of the most well-known analyzer programs for digital TV is TSReader. This program can be used to analyze the transport stream of a digital channel: the software identifies every single PID of a digital transponder as well as a world of additional information such as bit rate or the type of PIDs. Video PIDs are displayed as a live picture and audio PIDs can be listened to. An analyzer program like TSReader is an invaluable tool for technicians; it lets them monitor the data stream so that any errors can be quickly identified and dealt with.

TSReader was developed by Rod Hewitt who is originally from England. For the past several years he has called Annapolis, the capital of the state of Maryland on the east coast of the USA, his home. Rod Hewitt's life story is typical for many software engineers: he dropped out of school early and yet

despite of that (or perhaps because of that) he became successful. We met up with him at his home in Annapolis. Computers (he's a fan of Apple) and digital receivers are scattered all over his apartment. "I used to have more satellite dishes including a 4.5-meter antenna", explains Rod to us, "but today a cable connection and good Internet access is sufficient."

But first things first. Rod Hewitt comes from Ware, a small town about 40km north of London, about half way between Stevenage and Harlow. "Ware sits exactly on the Prime Meridian, that is, precisely at 0° longitude", says Rod. His father worked as the Managing Director at Ferguson, a well-known manufacturer of TVs back then. "My

Annapolis, Maryland, USA

■ Rod Hewitt lives and works in this modern apartment building in Annapolis, Maryland, USA. Just a small 40cm antenna identifies the location of his apartment.

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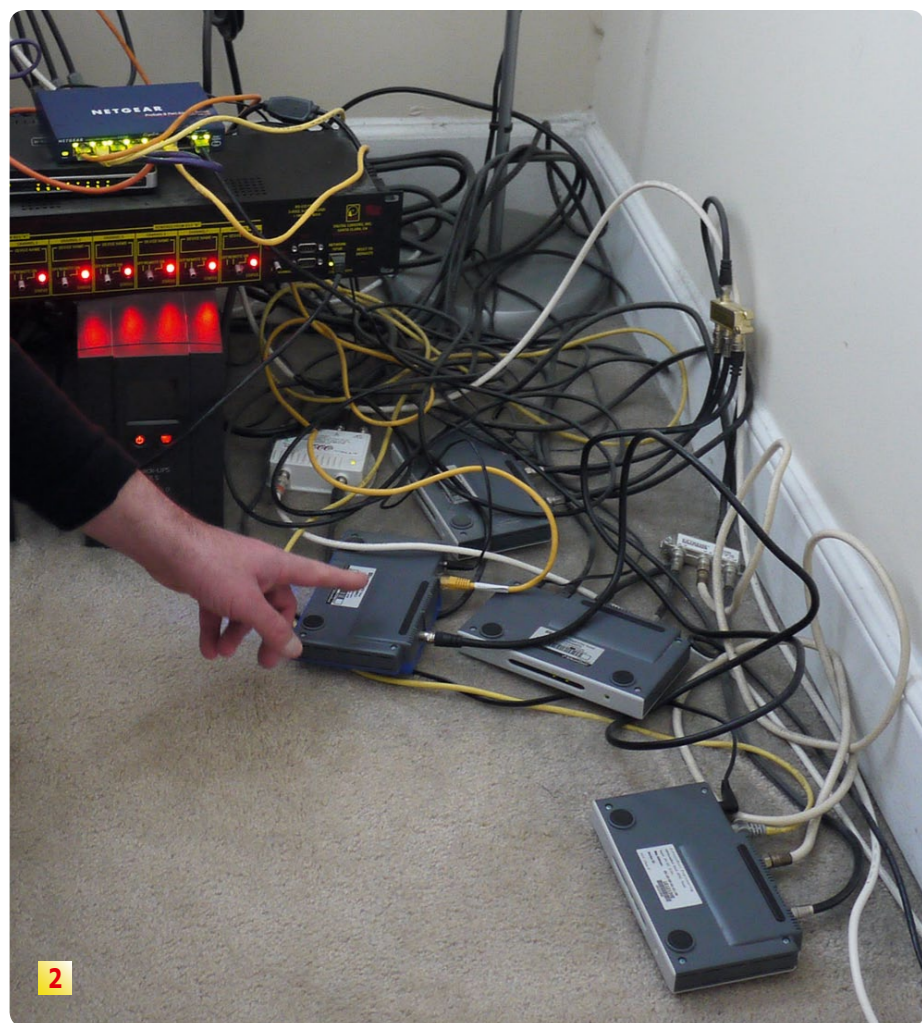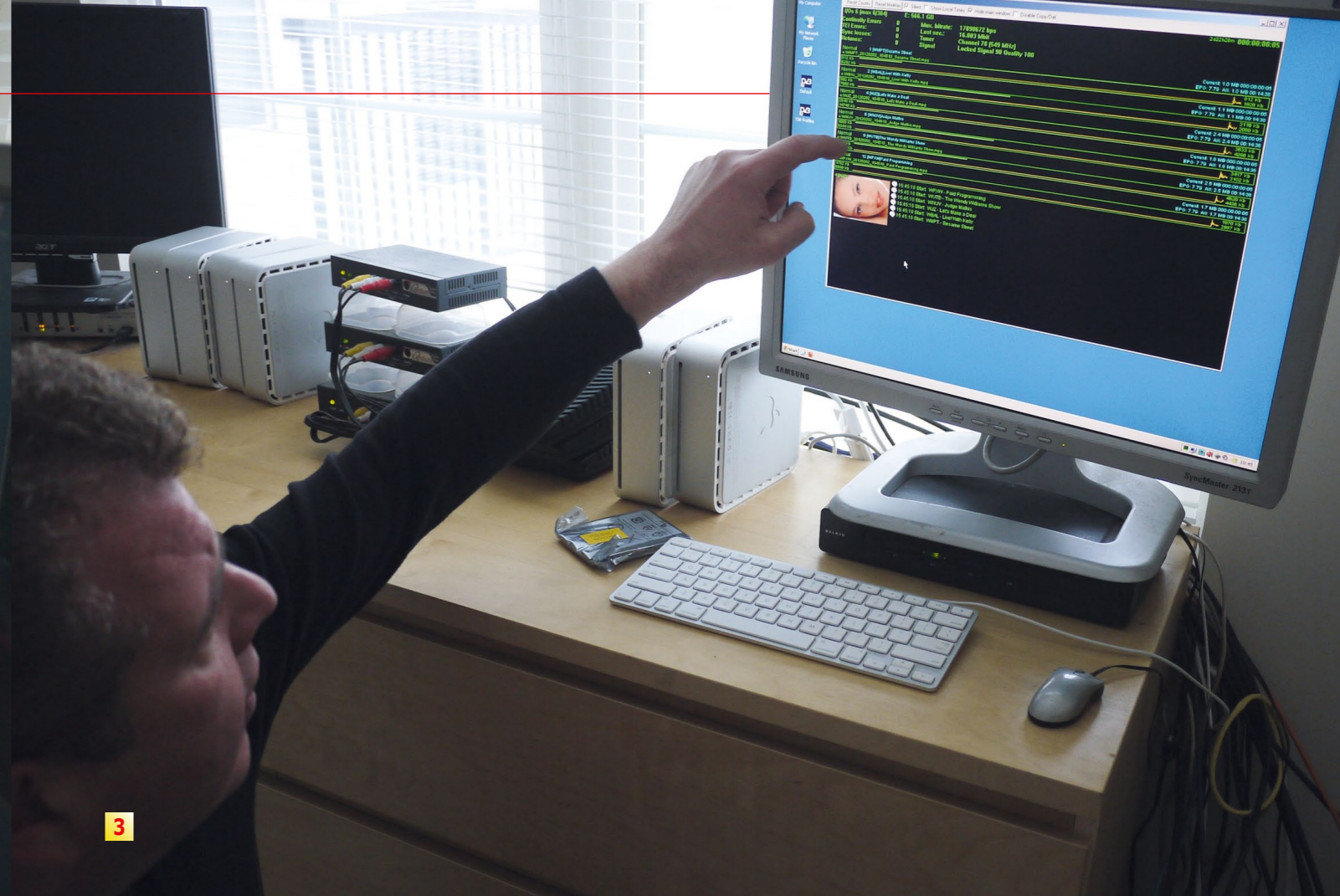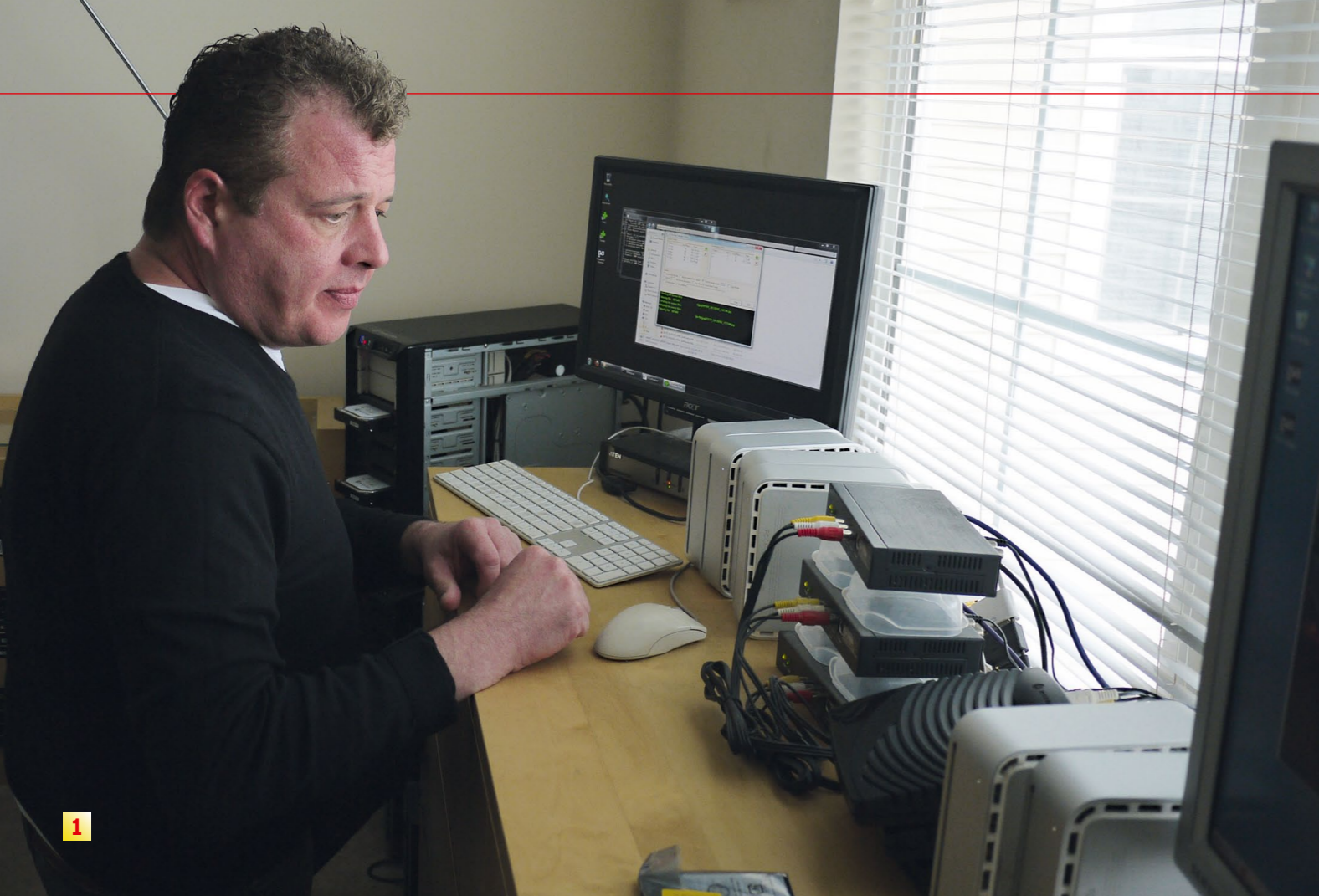
father occasionally took me with him to work and I managed to pick up a few things about TV reception." It got more interesting in 1980: "I was 14 years old then and had access to the university's computer through my school."

As many other software pioneers did back then, the young Rod Hewitt learned the secrets to computer programming. "I learned everything on my own." And just like other life stories from this day and age, Rod also couldn't take it much longer going to school: "I dropped out of school at 16 and started working for a computer distributing company."

In 1983 this company added a new computer model to their product line and wouldn't you know it: "It was the successor model to the same type of computer on which I learned to program by myself." In other words, Rod was instantly up to speed with all the secrets of this new computer model and took over the support of this manufacturer's computer models.

A few years later, in 1988, he was invited by this company to travel to the USA to handle a project." I spent three weeks in Santa Anna, California in Orange County and the Manager of the company was so impressed with my

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work that they invited me to stay." Rod didn't take long to decide; giving up the rainy weather in northern London for consistently sunny days in California? It was a no-brainer. Since he had already worked for many years for the company in England, it wasn't difficult to get a work permit.

1. In this digital day and age large offices are no longer necessary. Rod Hewitt works from home and simply installed the technology for the 24/7/365 recording of TV channels in his bedroom. In the background is the PC with the slots for multiple hard drives.

2. Rod explains the setup: "These four cable receivers each of which have two tuners are connected to the cable connection in my apartment via an eight-way splitter and an active amplifier." Using two large PCs, with one as a backup, Rod records the data stream from 22 channels. The filled hard drives are sent to 'Internet Archive' in San Francisco to be archived.

3. Rod uses a monitor to keep an eye on all the MPEG data from the recorded TV channels. He uses mini MACs for his work. Replacement hard drives are ready to go as soon as one is full. "They're automated to the extent that I can record all 22 TV channels uninterrupted with my two PCs and all the empty hard drives for about one month."

4. The old recording system based on DLT (Digital Live Tape). Rod is now busy transferring the recorded data on the tapes over to hard drives.

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Those were the best of times for the computer business. "This company had as many as 400 employees", remembers Rod, "and one of their many customers was a company in Maryland on the east coast of the USA."

As business started to slowly fall off for the California company, a job offer came from the company in Maryland. Should Rod move to the east coast of the USA? "There was one important factor in making this decision: back then the BBC World Service could be found at 58W and in Maryland it was easy to receive this signal."

Rod moved to Annapolis and erected his first satellite dish: "It was a two-meter antenna. BBC transmitted the signal in the clear so that it could be accessed by Canadian PayTV providers." BBC didn't count on private satellite enthusiasts receiving their channel, so not long after that, BBC encrypted the signal.

But by the time that happened, Rod had already become more involved with satellite reception. He acquired the Nokia D-Box and installed the DVB98 software and later on the DVB2000 software: "It allowed you to do blind scans." Rod became a regular feed hunter.

At the same time he developed his first software application for his employer; it was a terminal program for Windows that he offered on his new website www.coolstf.com.

"In 1997 I got a little nosy and opened up my D-Box." To his surprise he recognized all of the installed chips and knew exactly how each of them functioned. He got in touch with the developer of DVB98 and DVB2000 and proposed an improvement. Rod then wrote the program DVBEdit himself.

In the meantime Rod worked himself so deep into digital TV that he wrote a paper on the operation of MPEG2 (still worth reading today at www.tsreader.com/legacy). In 1999 coincidence once again stepped into Rod's life: an employee at the non-profit organization

'Internet Archive' in Los Angeles contacted Rod. The goal of this organization, founded in 1996, is to build a complete Internet archive which would also include the archiving of TV channels. They stumbled onto Rod through is MPEG2 paper: anyone who was so familiar with modern TV technology would undoubtedly know how to record TV channels.

As it turned out, they found the right person: "I worked up a strategy on how you would record and archive channels and made a proposal to 'Internet Archive'." It involved the sum of a quarter million US dollars recalls Rod. "It included the complete infrastructure and technological design."

Rod won the contract! He constructed a reception station for 20 TV channels as well as the technology for recording these channels. "We record the channels in their entirety, 24 hours a day, seven days a week, 365 days a year."

That was not as easy to do in 2000 as it is today. "The cost effective method

■Isn't one iPhone enough for Rod? Why does he have two? A closer look at the display shows that one iPhone is used with US provider AT&T while the other is used with the British provider Vodafone UK. Wait a second… how does that work? "Very simple: I have a VPN connection (Virtual Private Network) to my family in London and from there I have access to the British mobile telephone network." This lets Rod call anyone in Great Britain at local British rates - and all this from the other side of the Atlantic!

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Rod would gladly record more TV channels: "The goal is to record at a minimum of one TV channel from every country."

But there are limits to what the 'Internet Archive' organization can do: "The amount of data involved is absolutely gigantic and every additional channel that we continuously record each time means a high investment." Even if the foundation that supports 'Internet Archive' has a lot of money behind it, the resources are still limited. "Any expansion is done with great care."

It's interesting to note that Rod Hewitt also records the EPG data for 'Internet Archive'. "Here by the window I have a small antenna pointed to DishNetwork at 72W. Once a day I automatically record all the EPG data. It takes about 20 minutes before all the data has been received and it amounts to about 300MB." The EPG data contains programming information for the next nine days. Rod records the data daily on a rolling basis and sends the data on a hard drive to the 'Internet Archive' headquarters in San Francisco.

Rod is also planning to record the EPG data from BBC. "But they're not making it easy for me: the BBC sends the EPG data as a bitmap and not in text format. I would first need to write a program that could read the bitmaps in OCR." Rod is always getting new challenges placed in front of him. And what does he have planned for TSReader?

"Last year I made TSReader compatible with ISDB-T and also adapted it to AIT. Aside from that, TSReader is now also compatible with many different typesets so that, for example, Greek and Cyrillic can be properly displayed." But it doesn't stop there: "I just received an e-mail that says there are still problems with the display of Slovakian characters." It's actually not really a problem; Rod just needs a corresponding data stream so that he can adapt TSReader with it.

Rod is currently working on a project for IPTV: "I'm in the process of writing software that would let you display various IPTV channels in mosaic form." This is an especially interesting piece of software for IPTV operators to control their programming. Rod

has even more ideas: "You could build a small adapter and connect it to an LNB and transmit reception data to an iPhone or iPad via Bluetooth. In this way you wouldn't need your own signal analyzer; you could use the display and processor power in the iPhone or iPad for the measurements." Wow, what a fantastic idea! "Or you could use WiFi instead of Bluetooth", continues Rod regarding his ideas on the possibilities with today's technology. "I'm not sure yet if I'll get involved with that", grins Rod.

Rod clearly isn't short on ideas. His examples only prove that there's still more to be discovered and developed. Innovations today are much more than just possible, you just have to come up with the right ideas.

1. Rod's current project: the mosaic display of live video from IPTV channels.

2. Many satellite enthusiasts as well as digital TV professionals use Rod Hewitt's TSReader software. It displays all of the available PIDs in a data stream plus additional details such as bit rate. FTA channels are displayed in a window. The Lite version can be downloaded free of charge from Rod Hewitt's web site at www.coolstf.com or www.tsreader.com .

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to record such large amounts of data was through 'Digital Live Tape DLT'. But since at that time is was not yet possible to record the stream directly, we used MPEG encoders to take the digitally received signals that were outputed in analog by the receiver and reconvert them back into an MPEG stream." In just one year this method filled up 9000 DLT tapes. In 2002 the prices for hard drives fell so far that it became more cost effective to start using them and stop using DLT technology. Since then, Rod has been busy copying the 9000 DLT tapes onto hard drives. "This job will keep me busy for quite some time yet", sighs Rod.

During the course of recording the TV channels, it became evident that there were blackouts in the recordings. What was causing this? Rod was getting more and more nervous; sometimes he had to search for a long time. "I never knew if my reception system was the cause or if there was an issue with the uplink or downlink or if it was the channel itself." He had to find a solution - he had to be able to read the stream directly to find out what was causing the blackouts. "There were professional solutions but they were just too expensive."

Rod sat down and began programming the first version of his TSReader. "I used a commercial satellite receiver with ASI output and a professional PC card with ASI input; this let me start reading and analyzing the stream." He soon adapted his software to another PC card that also happened to be popular with private users and thus TSReader 1.0 was born. He made the software available as a free download. As a result, many DXers could now easily analyze the PIDs directly. He realized that professional users were also using his software and one day it was suggested by one of these professional users to expand his software to, for example, include the playback of video. "Since then TSReader is available in three versions: a Lite version for everyone, a standard version and a professional version with all the bells and whistles."

In 2004 Rod took it all online. "In my first year sales were a little slow at around 300 licenses." In 2011 TSReader was accepted: "In this year 6000 software licenses were purchased." Since some of these licenses were valid for more than one PC, the total users added up to over 10,000." It was quite a success for Rod consider-

ing that TSReader was originally written as a way for Rod to better handle the TV channel stream recordings he was undertaking for 'Internet Archive'. But there was another side effect to TSReader: "Since I was always getting better at working with the streams, the opportunity arose to also use TSReader to record the TV channels and this time using the original stream for these recordings."

Rod took some time to test and perfect his software. Finally, in 2008 it was time: 'Internet Archive' completely converted to recording using TSReader. "Since then we've been using my software to record the TV channels directly to hard drives." Rod continues, "At 'Internet Archive's' headquarters in San Francisco is a reception and recording station for currently 70 channels. Some of these channels come from the local cable network there and some via satellite. I record 22 TV channels here in Maryland including PBS Annapolis as well as WBAL, WJZ, WNUV, WUTB and WPBX." Rod simply uses his cable TV connection in his apartment. "Not only that, we have another reception station in London from which we record another 15 channels from Europe.