

VECTRACOM TECHNICAL NOTE

FOCUS ON EIAJ FORMAT.

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EIAJ is a video recording format that we used in the 70s. There are still many of these EIAJ tapes in public and private archives. They are more or less well preserved but are usually very interesting documents of a bygone era. As we move to digital, media stocks are currently inventoried. Many EIAJ reels are found and quite often, they are confused with audio tapes, as this old format has been forgotten. Nevertheless, it's still possible to save programs recorded on EIAJ tapes. We met Mr Denis Mahe who is technical director for Vectracom. Goal was to know more about the format and learn from a specialist what to do to save programs recorded on EIAJ tapes.

Good morning Mr Mahe and thank you for answering today to our questions about the EIAJ tapes.

You're welcome. It's a pleasure for me to share with you information about EIAJ.

Tell us please what EIAJ tapes are.

Well, they are 1/2 inch magnetic tapes residing on plastic reels of 5 or 7 inches in diameter. And on these tapes, there are video recordings made with EIAJ VCRs.

EIAJ is an industrial format. It's a non-broadcast format as EIAJ didn't allow recording the number of video lines requested by broadcasters.

EIAJ (Electronic Industries Association of Japan) is a real standard. Before EIAJ, there were the pre-EIAJ formats. They weren't standards. Each manufacturer had his own format with his own tape running on his own machines. At that time, we were quite obliged to play records on the machine that was used to create them.

The EIAJ format has been adopted in 1970 wherever you needed to record video at an acceptable cost. Journalists also used a lot this format as EIAJ machines were portable and robust enough. The EIAJ and 16mm were at that time the only portable and affordable recording formats.

And what kind of tape is it?

It's a first generation tape, quite simple with less magnetic performance than VHS for example. Tapes were thicker than VHS or Betacam as the tape tension automatism were very "mechanical", rather rough. Tapes had to be robust.

Nevertheless, these tapes had a carbon dorsal layer (heavily loaded with carbon and non-magnetic paint) facilitating the tape flow.

The very simple formulation of EIAJ tapes explains why these tapes degrade over time faster than the broadcast tapes (for instance 2-inch and 1 inch tapes that are older but higher quality tapes).

And it was used during the seventies isn't it?

Yes, it has only been used for a decade until the early 1980s when it was completely and quickly replaced by U-Matic tapes that had many advantages including the colour from the beginning.

How can we read these tapes today?

There is no secret. To read an EIAJ tape, you must have an EIAJ player with the right standard. There are machines built for 25 frames per second and machines for 30 frames per second. Some VTRs deal with colour signals (NTSC / PAL / SECAM), but the vast majority are only for black and white recordings. It is true that at that time there was no portable colour camera that was affordable.

And be careful because EIAJ machines are enslaved on the power. You must have the right power to read a tape. The power cycles must be similar to the image rate of the format. Some VTRs still exist, but all are old as they date from the 70s.

But the good thing is that you can normally read any EIAJ tape on any EIAJ VTRs of the same standard.

And when we don't have this type of machine?

Well, when you do not have EIAJ player, you need to look for someone who has one. It is increasingly uncommon. And you need to have a machine working properly. At Vectracom, we have several that we maintain in working order. They are now used exclusively on special EIAJ ingest lines.

Is there any special treatment to apply to EIAJ tape to facilitate their use?

Oh yes, several treatments. EIAJ tapes are not hydrophobic, more or less depending of their brand. This characteristic leads to a rather rapid degradation of binders. And it implies particles cutaway, heads clogging, difficulties and sometimes impossibility to read the tapes. My advice is to clean tapes and quite often, to bake them.

Sometimes it requires a lubricant to be put on the back side or even on the magnetic side. It's very special. You must have the right lubricant and everything relies on formulations that were used to create the tapes. A lubricant may well facilitate the use of a tape from a particular manufacturer and damage a tape from another.

At the end, the band may not slide well and then, you must find other tricks to be able to roll the tape in his path on the video tape machine.

And with these treatments is it easy to read old tapes?

No, it is not easy because EIAJ are very unstable. The signal can be viewed on an old tube monitor that's very tolerant, but modern monitoring devices and ingest lines don't accept this kind of unstable signal. So, it is necessary to process the signal with equipment capable of accepting huge instabilities on signals generated by EIAJ VTRs and generating signals compatible with today's equipment.

Do you have any secret for a first class transfer?

It takes a lot of patience and requires skills to analyse signals and listen to the machines. I call that "experience".

In which modern format do you recommend to transfer EIAJ tapes?

It really depends on your use. Any modern format is at least three times more efficient than EIAJ. The EIAJ format was theoretically close to 300 dots per line, but practically it was more around 200. So any modern format is good enough and it's really your usual format that must be privileged. In any case, excessive bandwidth is useless.

Does a digital restoration treatment improve the quality of images and sound?

Of course, but it all depends on the quality of the signals you capture. The critical point is about getting the best possible playback quality. For this, we do need the best signal. It works quite well, using a few tricks. And sometimes it's better than what we were able to do at the time of EIAJ recordings. Of course, the tapes have aged and we cannot compensate everything.

In fact, you shouldn't wait to digitise your EIAJ tapes. We will not have EIAJ VTRs for ever. We must take the opportunity to make the transfers as this is still possible.

In terms of restoration, it's important to understand that the quality of recordings is limited by those of the technology that we had in the 70s. At that time, cameras were also less efficient than the smallest modern cameras and tubes had poor bandwidth, a lot of persistence, little sharpness or contrast and very low sensitivity.

For conclusion, do you have other things to tell us?

You know, we manufacture wear parts for our EIAJ VTRs as it's no longer possible to purchase them. We also buy all the machines we find to have spare parts.

Today, we still have the skills to understand and maintain EIAJ machines. But one day this knowledge will disappear as nobody learns any more how these mechanical machines work and our staff who knows how to manage the technology will eventually retire. At that time, using EIAJ tapes will become impossible or very expensive.

So, on one side, skills disappear and on the other side, EIAJ tapes that are now between 30 and 40 years old (from the 70s) continue to age rapidly and turn into dust.

It is therefore urgent to have plans to preserve cultural heritage recorded on EIAJ tapes with a minimum quality at a cost that is still acceptable.

Thank you Mr Mahe for this very interesting information

Interview by Jean-Michel Seigneur