



## TECHNICAL BULLETIN

Date: 11/08/01

Subject: Intellex External Storage Limitations

Technical Bulletin No.TB\_110801

DAT tapes are used in Intellex to provide an archived copy of recorded video information. With the ever-increasing size of internal storage, the need for DAT archiving is diminishing. Typical applications require that video is retained for a particular length of time. If the on board storage will accommodate this length of time, the video will always be available during the time requirement. If a longer period of storage is necessary, you could install extended storage modules (ESM320s). Otherwise the only option is to use DAT as an archive method.

DAT strengths are small size and large capacity (DDS3 provides 12gig and DDS4 provides 20gig in Intellex). Weaknesses include operation limitations and the need for frequent cleaning. Here is what we have learned about DATs from our Intellex experiences.

1. **DAT drives have improved:** Like most PC compatible devices, DAT drives have improved with later versions. DDS4 is an improvement over DDS3. Independent studies indicate that DDS4 is more reliable than DDS3. The MTBF (mean time between failure) for DDS3 at 50% duty cycle is 100,000 hours. The MTBF for DDS4 at 50% duty cycle is 225,000 hours. As the duty cycle increases beyond 50%, the MTBF drops dramatically.
2. **DAT tapes have improved:** DAT tapes have improved. Early DDS3 tapes were more likely to cause dirty heads than later DDS3 and DDS4 versions. Use only premium tapes (ex. 120P rather than 120M). The "M" designation indicates the tape length in meters. The "P" (for premium) is the same length with an improved formulation of the metal oxide coating, which is less likely to clog the heads. There are inferior tapes available. Always specify Sony premium tapes.
3. **You have to keep a DAT drive clean:** This is different than running the cleaning tape through after the message and LED indications call for cleaning. Once the heads are clogged, it is difficult to get them clean with the cleaning tape. Disassembly of the drive and cleaning with a cotton swab is not a pleasant task and is not an option in the field.
4. **Cleaning tapes aren't always what they seem to be:** The drive knows what kind of tape you insert (DDS2, DDS3, DDS4, cleaning tape,) by reading a series of holes on the bottom of the cassette. When a DAT drive calls for cleaning (appropriate LED flashing,) and you insert the cleaning tape, the drive sees the hole-pattern, knows it's a cleaning tape and resets the flashing LED. This does not necessarily mean that the heads have been sufficiently cleaned; only that a cleaning tape has been inserted. You may have to repeat the process several times to clean a very dirty unit. There is no positive feedback to assure you when the heads are really clean.
5. **DAT tapes don't last forever:** Yes, DAT tapes can get expensive, but don't skimp on the original tape, or the number of times you use it. Sony indicates that a DDS4 tape can be used between 100 and 200 times in a perfect environment. Using the tape in a drive with clogged heads can scratch the tape and make it unreadable immediately. Security installations are rarely in "clean rooms." You're pressing your luck after a dozen usages. If you're archiving the tape for 90 days, a dozen cycles will last for three years.
6. **Cleaning tapes don't last forever:** Different length tapes are available. Most are good for from 30 to 50 uses. Once they are spent, they will not clean the drive. In fact, the empty tape will still

Information furnished by Sensormatic Electronics is believed to be accurate and reliable. However, no responsibility is assumed by Sensormatic Electronics ICS for its use, nor any infringements of other rights of third parties which may result from its use. No license is granted by implications or otherwise under any patent rights of Sensormatic Electronics.

Technical Services Email- [vsdtechservices@tycoint.com](mailto:vsdtechservices@tycoint.com)

Tel (800) 507-6268 (International: 561-912-6259)-Option 2 • Fax (845) 624-7685

turn off the LED, "clean me," indication on the drive (it still sees the hole pattern). Be sure that you are using a good cleaning tape.

7. **Keep DAT tapes in a safe place:** This includes installing the Intellex in a clean environment. DAT operation does not tolerate a dirty, or dusty atmosphere. A particle of dust can cause damage. Dust increases the chance of dirty heads and dirty rollers damaging the tape surface and rendering the tape unreadable. Store the tapes in their original plastic storage container. Remove them only when you need to use them.
8. **Duty Cycle is important:** Duty cycle refers to the percentage of time that the unit is actually in use (writing to the tape). In the "Stop recording and archive now" mode, you insert a tape and it writes continuously (maximum duty cycle) until full. This takes nearly four hours for a DDS4 tape. It is best not to exceed 50% duty cycle, so, don't change the tape more than once a shift in a 24 hour application (three times a day).

Some high usage applications have encountered problems with DATs. These failures are typically related to dirty heads for one, or more of the following issues.

- (a.) Not cleaning the drive often enough (remember, you have to keep it clean, rather than clean it when it's dirty).
- (b.) Reusing a tape too many times (they do wear out).
- (c.) Exceeding the duty cycle in normal operation. You may get lucky for a while, but long-term use in this area will cause problems.
- (d.) Tape is susceptible to both folding and fraying. Using damaged tape can damage the DAT drive which in turn can damage additional tapes.
- (e.) Other problems include a real drive failure and jamming a tape in the drive by inserting it backwards.

### What should you do?

1. Clean the drive every 24 hours of operation. Increase this to at each tape change in high use applications.
2. Replace tapes often. They do wear out. After ten cycles, you're pushing it.
3. Don't exceed 50% duty cycle.
4. Problematic media errors indicate a damaged DAT drive. The DAT drive and **all** recording and cleaning tapes need replacement. Otherwise damaged tapes will damage the replacement drive.
5. Be careful to insert the tape properly. It is possible (even easy) to insert the tape upside down, or backwards. This jams the tape in the drive and puts you out of business.
6. Consider replacing DAT drives on Intellex 2.X Systems with ESM320s. Extended Storage Modules are a much more reliable alternative storage solution.

**How should you archive?** The application may decide how archive is accomplished, however, you need to be aware of what happens in the two archive methods; "stop recording and archive now," and "archive while recording."

Which method has the highest duty cycle? It's not as obvious as it seems.

**Stop recording and archive now.** In this mode there is greater control over the tape recording. You select stop recording and insert a tape that continues to operate until it is full, writing at the maximum duty cycle. Since the data drives are considerably larger than the tape, you could run through one tape after another for a very long time. A DDS4, 20-gig tape would take about four hours to fill. While this is happening, you are not recording. The larger the database to be archived, the less likely that this procedure will be acceptable.

Information furnished by Sensormatic Electronics is believed to be accurate and reliable. However, no responsibility is assumed by Sensormatic Electronics ICS for its use, nor any infringements of other rights of third parties which may result from its use. No license is granted by implications or otherwise under any patent rights of Sensormatic Electronics.

Technical Services Email- [vsdtechservices@tycoint.com](mailto:vsdtechservices@tycoint.com)

Tel (800) 507-6268 (International: 561-912-6259)-Option 2 • Fax (845) 624-7685

**Archive while recording.** In this mode the archive function is progressing in the background while the Intellex is performing its normal live view and record operations. This does not mean that the DAT is proceeding at maximum duty cycle. If you manage the operation, you can stay well under 50% duty cycle.

The good news: DDS4 will write faster than Intellex records to the hard drive. If you have just reset the database, or, are current with the archive operation, the DAT will wait until the Intellex has twenty 20 Meg segments available for archive. The DAT then archives this information and waits for the next available data. In this mode, the write time is less than the idle time providing a favorable duty cycle. Once the tape is full, it automatically ejects.

The bad news: After the tape ejects, the recorded data continues to accumulate on the data drives. When another tape is inserted, the DAT will continue to write until it catches up with the current video. If considerable time has expired before another tape was inserted, the DAT will write at maximum duty cycle in an effort to catch up to the current video. This could be the entire tape, or several tapes. If the process has been ignored for a time, you could be inserting tape after tape in an effort to catch up with current recording. This puts you back into the dangerous duty cycle range.

DAT tape operation requires a routine plan for successful operation.

The Win/Win situation: The best method is to assure that the DAT is always in the “catch up and wait mode,” keeping the duty cycle under 50%. Always archive while recording and change the DAT tape before it fills (and ejects). Experience with a particular system will tell you how long this period of time will be. Just be sure to change the tape before that time and “reload it” with another tape for continuous use. Err on the conservative side. You change the DAT tape in much the same way that a VCR tape is changed, either every day, or every few days, depending on the record rate.

Q. Should I replace my DDS3 drive with a DDS4 drive?

A. If you have a failed DDS3, it makes sense to invest in a DDS4 replacement. Eventually, you won't have a choice, refurbished DDS3s are still available, but, not for long. Please note that when replacing a DDS3 with a DDS4 DAT drive you will also need to order a SCSI-3 cable, SCSI-3 terminator and a SCSI 68 to 50-pin adapter. Please refer to **Technical Bulletin TB\_110701** for further instructions.

Q. Is there anything I should avoid doing?

A. Yes. Always exit tape use using the menu. Don't press the eject button. Avoid power outages, as the interruption is not good for the tape operation. We do recover from power interruptions (most of the time); however, it's better to install the Intellex with a UPS (uninterruptible power supply).