C2N AQUARIUS MOD

OVERVIEW

The C2N Aquarius mod is an improved version of the original Datassette for the C64 computer. This modification allows an external audio signal to be loaded into the C64 or recorded onto tape. The mod also features four LEDs that indicate the data signal level, making azimuth adjustment much easier.

OPERATING INSTRUCTIONS

Basic LOAD/SAVE Operations

The mod can be used normally, just like an unmodified Datassette. However, these operations are NOT available when there's a plug inserted into the 3.5 mm audio connector. When plugged in, the signal (or flat line) from the external connector is always used instead of any signals coming from tape or the C64.

When loading from tape, the LEDs show signal strength. Aim for three to four LEDs lit and adjust the azimuth angle if necessary.

NOTE: When saving to tape from the C64, all four LEDs should be lit indicating the maximum signal strength possible.

Loading from an External Source

An external audio source can be used to load data into the C64. Connect the external source using the 3.5 mm audio jack and start loading as usual on the C64. Then, initiate the external signal feed; this signal will be loaded just like it would from a real tape.

Use non-inverted WAV files. The LEDs will indicate the strength of the external signal. One LED lit should be sufficient, but aim for three to four LEDs to be sure. A tape is not required for this feature.

NOTE: When loading programs, press the spacebar immediately after the program is found, as the C64 only pauses the Datassette motor—not your external source!

Saving from an External Source

The RECORD&PLAY function uses an external signal whenever a connector is plugged in. Just press RECORD&PLAY to start saving, then feed the desired signal through the audio connector. It will be recorded on tape just like when saving from the C64.

Use non-inverted WAV files. The LEDs will indicate the strength of the external signal; aim for three to four LEDs for a strong recording. A tape is required for this feature. ;)

THE MAKING OF...

by Sami Karjalainen

The idea for the mod first emerged during beta testing of the Aquarius game by Aleksi Eeben. The game loads from and is played on a real Datassette but was developed using an emulator. This posed the challenge of creating a tape in order to test the loader routines on real hardware.

Creating TAP/WAV files is easy these days, but recording to a real tape is more complicated. Normal Hi-Fi stereo decks won't work because the C2N has a mono head, and it seems to utilize the tape width in a somewhat unique way. It has been rumored that even professional businesses have found chained C2Ns to be the best method for duplicating C64 cassettes!

My father, a retired electrical engineer, accepted the challenge and offered to help with the project. First, a simple homemade circuit board with just a few components was created to feed an external audio signal into the recording circuitry of a C2N. This then evolved into the idea of using the same setup for loading from an external source. The next step was to explore whether all this could be solidly fitted inside the case of a C2N.
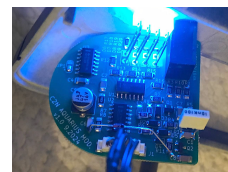
My father designed the schematics for a PCB that would do the job and could be installed inside the case. Surface-mounted components were chosen to make the final product as compact as possible. PCBs were ordered from PCB Way—not a sponsor of this project by any means.

I had acquired approximately 20 C2N units, in varying conditions, for this project. It is not uncommon for the azimuth angles of old Datassettes to be grossly mis-aligned. In our 'lab,' we were fortunate to use an oscilloscope for the adjustment procedure, but this is not feasible for most users or when the case is closed. This inspired the inclusion of LED-based metering of the signal strength.

We also thoroughly cleaned and refurbished every unit. Both belts (main motor and counter) were replaced, the heads were cleaned, and the azimuth angles were readjusted using an original Green Beret as a reference tape.

Moreover, the old cases were more or less dirty and slightly damaged. They were cleaned and repainted. We decided to use colors that reflect the underwater theme of the game Aquarius.

Thanks to Aleksi Eeben for the wonderful game and to Tero Suutari, who designed the label sticker in line with the game cover. Special thanks to my father, Pertti Karjalainen, without whom this project would not have been possible at all.

The project will be entered into the Party Feature competition at the ZOO '24 Party. There will also be some units available for sale at the venue. We hope that this project has given new life to some of these old Datassettes.

Happy Datassetting!