

Appeals Court Reverses Disassembly Decision

Reversal of Sega v. Accolade Ruling Critical for Reverse Engineering

By Rich Belgard

On April 3, 1992 Federal Court Judge Barbara A. Caulfield handed down a decision in *Sega v. Accolade* which effectively outlawed the disassembly of computer programs (see [060704.PDF](#)). On August 28, 1992 the Court of Appeals for the Ninth Circuit reversed in part this key legal decision. The opinion of the Court, which explains the decision, was released on October 20.

Accolade makes game cartridges for the Sega "Genesis" video game system. In order to make game cartridges that operate in the Genesis console, Accolade reverse-engineered three of Sega's game cartridges to discover the requirements for compatibility with the Genesis console. In order to do so, Accolade disassembled Sega's object code. Sega sued Accolade for, among other things, violating Sega's copyrights through intermediate copying of its game programs.

Accolade claimed that in order to understand the functional requirements of the Genesis console, it had to disassemble the object code of Sega's game cartridges. In the original decision, Judge Caulfield interpreted the disassembled code as a "derivative work" and so concluded that in disassembling Sega's object code, Accolade violated Sega's copyright. As the principal basis for her decision, she stated that, "Accolade could have peeled the microchips...or programmed in a 'clean room,' but instead chose to disassemble, reproduce and enhance [Sega's] software."

According to the Copyright Act, only the creative expression of an idea is protected, not the idea itself or its functional aspects. In the software domain this means that the sequence of instructions and the structure of a program (i.e., the expression of an idea) may be protected, but the underlying algorithms (i.e., the idea itself) are not. In addition, the expression may not be protected if it is the only way to achieve the desired function within the constraints of system architecture.

In order to understand the functional, hardware and other requirements of the Genesis console, Accolade had to disassemble object code of a Sega game program. Sega argued in court that Accolade could have "peeled" the microchips (ROMs) in order to understand the requirements of the game program. They would still have had to disassemble it to understand it. The Court apparently believed that by "peeling" the Sega microchips, but without disassembly, Accolade could understand the interface to the Genesis console. This was a major misunderstanding of the reverse-engineering process. This misunder-

standing can only be attributed to the lawyers involved in the case, since it is clearly their responsibility to have presented the technical details in a cogent manner to the Court.

From portions of the disassembled code, Accolade wrote a development manual that contained no traces of the Sega object code, but rather functional descriptions of the interface requirements to the Genesis console. This development manual was the functional specification for the Accolade game program. From this development manual, Accolade programmers, who had not seen and did not use the disassembled Sega code, independently ported the Accolade game programs to be compatible with the Genesis console.

This process is similar to the steps taken in a "clean room" development, which the Court also suggested as a legitimate alternative to disassembly. Here again, disassembly is still required. Only from the disassembled code could Accolade understand the functional aspects of the Genesis interface. In a clean room development, a specification is developed which contains only functional descriptions of what a program must do. Starting from the functional specification, an independent development group designs and implements the program.

The Court of Appeals Decision

According to the decision of the Appeals Court, the facts in this case are different from other copyright cases to date. Sega did not claim that the final Accolade programs infringed Sega's copyrights. (The decision indicates that Sega is still open to do so.) Rather, Sega claimed that in dumping, disassembling, and annotating its object code, Accolade had made "intermediate" copies of its copyrighted material, in violation of the Copyright Act.

In the decision, the Court of Appeals said, in general, that, "Intermediate copying of computer object code may infringe the exclusive rights granted to the copyright owner... regardless of whether the end product of the copying also infringes those rights." It continues, "If intermediate copying is permissible... authority for such copying must be found [elsewhere in the Copyright Act]."

The Copyright Act contains an explicit exclusion from copyright violation if the copying is a "fair use" of the program. The four factors to be considered in evaluating whether copying is permissible include: the purpose of the copying, including whether the copying is for educational purposes; the nature of the copyrighted work; the amount of copying involved; and the effect of the copying on the potential market for the copyrighted work. Accolade

claimed that its copying was a “fair use” according to the Act since it only used the intermediate copies to understand the constraints and interfaces to the Genesis console.

In attempting to determine whether or not “fair use” was involved, the Appeals Court considered whether the Sega code had to be disassembled. They categorically concluded that many types of computer programs would not have to be disassembled because, they claimed, the constraints and functions could be determined by using the programs. “The ideas and functional concepts underlying many types of computer programs, including word processing programs, spreadsheets, and video game displays, are readily discernible without the need for disassembly, because the operation of such programs is visible on the computer screen. The need to disassemble object code arises, if at all, only in connection with operating systems, system interface procedures, and other programs that are not visible to the user when operating—and then only when no alternate means of gaining an understanding of those ideas and functional concepts exists.”

It is certainly the case that even the types of programs which the Court claims have “readily discernible” function may require disassembly of at least portions of their code. Word processing programs, for example, contain non-visible interfaces to operating systems and other system procedures. The blanket conclusion might better have been left open to a case-by-case examination.

The Court did correctly conclude that in this case, Accolade could not practically discern the function and constraints in any other way but to disassemble the Sega

code: “Given the nature and characteristics of Accolade’s direct use of the copied works, the ultimate use to which Accolade put the functional information it obtained, ... we conclude that ... both factors support Accolade’s ‘fair use’ defense, as does [the nature of the copyrighted work].”

So, given that the “idea” of producing a Genesis-compatible game program is a valid idea, and the facts in the case, the Court concluded, “... that where disassembly is the only way to gain access to the ideas and functional elements embodied in a copyrighted computer program and where there is a legitimate reason for seeking such access, disassembly is a fair use of the copyrighted work, as a matter of law.”

For the industry, many can breathe a deep sigh of relief. No longer are we unwitting copyright violators because we need to understand the parameters to an undocumented “Int 21” call. We cannot fault Judge Caulfield for her original decision, since, as trier of fact, she could only base her decision on the evidence presented. The clear misunderstanding of the “peeling” of the Sega chip and “clean room” as alternatives to disassembly is a fault of the presenters in the case—the lawyers. Ironically, in a case so complex in computer technology, there were no computer experts retained by either side, nor did the Court retain its own expert. It was only after the Caulfield decision that experts were retained. Perhaps this is why only the Appeals Court rendered an informed decision in the case.

Of course, the last shots have not yet been fired—another appeal is expected.♦