



INTER-OFFICE MEMO

TO: Steve Calfee

FROM: Ed Logg

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SUBJECT: PROTECTION FOR COIN-OPERATED GAMES

FILE: PROGRAMMING STANDARDS

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With the large number of copiers around the world copying our games, it is apparent that we should make some effort to prevent this. To stop the copiers from copying PCB and ROM's we recommend that the following be done.

- 1) Use POKEY or some other ATARI custom chip.
- 2) Use ATARI part numbers on standard chips such as the 2901's.

For those copiers who change the ROM's to delete the copyright message or the game name there are many ways of dealing with them in software. It is important that the copyright message "© 1980 ATARI" be put on the screen during attract and preferably during the entire game. If you can put the name of the game on the screen that is also helpful.

Encoding the game name and the copyright message is a good way of slowing them down. In the vector generator the alphanumeric are already coded in non-ASCII code. In BATTLEZONE the game name is encoded as a list of points.

A second tactic is to check to make sure that the copyright message is being displayed. To detect that they are being displayed, checksum the vector RAM/ROM or the video RAM. You should checksum it in several places and in different ways (ADC, EOR, etc.). You can now checksum the checksum code to make the checks another level deeper. Remember the more the merrier. It is also recommended that you use the video or vector RAM locations for constants.

Once you have detected that someone has changed the program then there are many things that can be done. The general rule which governs the responses is to postpone any action until later in game play. One good response is to give credits intermittently. For vector generator games using double buffering, change the first location (LSB of JMPL) in vector RAM causing the picture to do bizarre things. Another good response is to have the game hang up occasionally or like BATTLEZONE at a high score. Setting the processor in decimal mode in IRQ/NMI is another method of doing bizarre things to the game.