

CLONE 4.0 for TRS-80 Model I and Model III  
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CLONE was designed as a method of copying programs that are either difficult to load by reason of poor quality duplication or impossible to duplicate by virtue of their format. CLONE will copy virtually any program or data (except itself) without knowing anything about the data in question. All you need is a good load. On poorly duplicated material this alone can be difficult, but once it is accomplished you can make as many first quality copies as you choose. It should be mentioned that the purpose of this ability is to allow users to protect their investment in vulnerable data and that duplication of copyrighted material for resale, or even give-away, is illegal.

CLONE 4.0 is a machine language program. There are four copies of it on each tape. The first two are for cassette users and the second two are for disk users. The difference between the two types is that the disk version loads at a higher address so as not to conflict with the operating system. CLONE works in the following way: a program or data tape is fed into CLONE. The information on the tape is stored in a RAM buffer. When you want to make copies of this information the data in the RAM buffer is recorded back onto tape.

**TO LOAD CLONE INTO A CASSETTE SYSTEM:** Turn on the computer. If you have a Model III, answer the CASS? question with L, for low speed. In both Model I and Model III machines just hit ENTER when asked for a MEMORY SIZE. Put the CLONE tape in the cassette, type the word SYSTEM, and hit ENTER. The computer will respond with an asterisk and a question mark. Now type the word CLONE and hit ENTER. The cassette player will start and CLONE will load into the computer. The computer will then respond with another asterisk and question mark. At this time you should hit the slash key (/) and ENTER. You will then be running the CLONE program.

**TO LOAD CLONE INTO A DISK SYSTEM:** Listen to the CLONE tape in the cassette and play it long enough to pass both copies of the tape version. If you have a Model I you may use TAPEDISK in TRSDOS or LMOFFSET in NEWDOS to transfer CLONE to disk. If you have a Model III you may use the library command TAPE (keep in mind that CLONE comes recorded at 500 baud, which is the low tape speed). Instructions for these programs come with their respective operating systems. CLONE should be stored as a command file (CLONE/CMD) so that it may be executed directly from DOS READY by just typing CLONE. The starting address of disk CLONE is 6000H, the end address is 6400H, and the entry point is 6000H.

When running CLONE you will be shown a directory with a choice of operations. Basically there are three different functions, which will be described below. Model III owners will be given another function, however, which is to choose tape speed. This choice may be made anytime the directory is displayed by typing F for fast or S for slow. In this way 500 baud tapes may be read in and written back out at 1500 baud.

#### PART ONE

The first function will load a SYSTEM tape. SYSTEM tapes in this case are defined as discrete programs, normally loaded with the SYSTEM command, which have an execute address. That is, after the program has loaded you may hit " / ENTER" and the program will start. To CLONE such a program, type the number "1". The screen will clear and "OK" will be displayed in the upper left corner. Put the tape you want to duplicate in the cassette recorder and press PLAY. The program will now begin loading into CLONE. Nothing will happen as the leader loads. As soon as the leader has ended, however, the file name of the program will be displayed at the top of the screen. Also, the asterisks will flash in the upper right-hand corner to indicate proper checksums are loading. At the same time, the stream of data will be displayed in ASCII format



one byte after another across the video screen. If there is English text in the program it will be readable in the data. If the data is all machine code it will look like an assortment of alphanumeric and graphics characters. You can get some idea of proper loading level from this motion on the screen. It should be even and continuous for the duration of the program. If it is not, the level is probably too low, data is being lost, and a checksum error will be produced. If most of the data being loaded is graphics characters your level may be too high. If you try to load a program which is longer than there is room for in your machine, the data displayed will be solid white blocks (although these characters will also appear in some programs). If for some reason you wish to abort tape loading, hit the space bar and control will return to the command summary. These same rules apply to the loading of data in the second part of CLONE, where no checksums occur to positively indicate loading errors.

If the program has successfully loaded the starting and execute addresses of the program being copied will be displayed. At this point you should hit the space bar to return to the command summary and dump your program on a blank tape with the third part of CLONE. (See below)

#### PART TWO

The second part of CLONE is used for copying data lists and any other data that does not end with an execute address. You may also CLONE SYSTEM tapes with this part but it is not as convenient as part one. Basically, part two duplicates any data stream fed into it. To use it, when the command summary is displayed, type the number "2". The screen will go blank and "OK" will be displayed in the upper left hand corner. Turn on the cassette and play the tape you want to duplicate. Nothing will happen as the leader loads. When the leader has finished the data will be displayed one byte after another in ASCII format across the video screen. If the data has a file name it will be displayed at the beginning of this information. When the data has ended, the display will stop. To return to the directory, rewind the tape a little bit, hold down the space bar, and press PLAY on the recorder. As soon as the first byte of data has loaded, CLONE will return to the command summary.

#### PART THREE

To dump the program or data stored in CLONE you should type the number "3" when the command summary is displayed. CLONE will ask you how many times you want to dump the data. Get the recorder ready to record on a blank tape and answer this question with a number between 1 and 9. CLONE will proceed to save on tape the exact bit pattern that it received during loading, which will also be displayed on the video screen in ASCII format. If you want to abort this function, hit the space bar. If you have requested more than one copy, CLONE will leave a few seconds of empty space between each one and make more copies of the same data. When it has finished, control will be returned to the command summary.

In an effort to prevent unauthorized duplication of their software, some authors use a "custom loader" for their programs. This custom loader is a short program of standard format which is loaded and run before the main part of the program is loaded. To duplicate these programs, you will need to duplicate both parts separately. The first is a standard SYSTEM tape, the second is essentially a data tape, and you should use the appropriate functions in CLONE to copy each of these parts.