# GTIA

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Every ATARI computer owner probably has heard about the new GTIA chip that replaces the CTIA chip. This upgrade item for both the 400 and 800 computers began appearing in new machines in the beginning of 1982. Some of you who bought at about that time may wonder if you have the GTIA. You can find out by running the following BASIC program.

```
10 GRAPHICS 9
20 GOTO 20
```

If you get a black screen, you have the new chip. If you get a blue screen, you have the old chip.

GTIA means Graphics Television Interface Adapter, and CTIA means Color Television Interface Adapter. GTIA continues to do all the things CTIA did, but more.

GTIA widens the gap between the ATARI computers and other home systems. It adds three more "modes" of graphic display to the nine available with the CTIA. Those modes began with GRAPHICS 0 (Test Mode) and ended with GRAPHICS 8, a high-resolution (small pixel) mode with one color of your choice in two luminances. Modes 3,5 and 7 gave you up to four colors simultaneously, with different sized pixels in each mode.

With GTIA you gain the following:

- GR.9-sixteen luminances (shades) of one of the available colors
- GR.10-nine individuals colors, each a combination of one hue and one luminance
- GR.11-sixteen colors, all at the same luminance.

The pixel with these modes is long and flat, having a 4:1 ratio, with 80 across the screen by 192 down. For comparison, a hyphen in text mode has a 7:1 ratio. The pixel (picture element) is the smallest programmable unit in a given text or graphics mode.

Using the GTIA is as simple as using the CTIA. Just use GR.9, GR.10 or GR.11 in the same way the previous modes are used (see ATARI BASIC Reference Manual and Self-Teaching Guide).

The GTIA is fully supported by the Operating System, and all the commands and utilities that run with the CTIA can be used with the GTIA, except you now have more colors available to you. Sixteen color changes can take place on a line, completely independent of the main processor. This is better than the 12 changes you could get using display list interrupts, for example. Contouring and 3-D effects are greatly enhanced. (see Listings).

GTIA programs can be used on CTIA equipped machines, but will suffer color simplification and some shifting (e.g. blue for green).

If you have the GTIA chip, you may want to type in some of the following listings. The first demonstrates GR.9. Here, the background hue is set by the SETCOLOR command. Then, the COLOR command determines the luminances for drawing on the screen by using values from 0 to 15.

```
10 GRAPHICS 9
20 SETCOLOR 4,8,0
30 FOR I=1 TO 78
40 COLOR I
50 PLOT I,I+I
60 NEXT I
70 GOTO 10
```

We will skip mode 10 for a moment to compare the similarities of mode 9 to mode 11. Here the program can use 16 different hues (colors) all at the same luminance, i.e., just the reverse of mode 9. This time the SETCOLOR command is used to provide the luminance value only, as in the line "SETCOLOR 4,0,10". The 10 is the luminance value.

```
10 GRAPHICS 11
20 SETCOLOR 4,0,10
30 FOR I=1 TO 78
40 COLOR I
50 PLOT I,I+I
60 NEXT I
70 GOTO 10
```