

TANDY®

**Technician Series
Diagnostics Software**

CLKSPD

**Programmable CPU Speed Diagnostic
for
MS-DOS™ Computers**

01-0220 Computer Technical Services

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CLKSPD DIAGNOSTIC

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GENERAL DESCRIPTION

The CLKSPD program is used to test the ability of the CPU clock to change between a slow and a fast speed.

FEATURES

- * Easy to operate test
- * On-screen error reporting

EQUIPMENT REQUIRED

MS-DOS™-based Compatible Computer with programmable CPU clock speed
Monitor
Display Adapter
Keyboard

LOADING CLKSPD

There are two methods for loading the CLKSPD diagnostic. The first is to select the clock speed test function that appears on the main menu of our diagnostic software suite for your machine. Because CLKSPD is a DOS executable program, you can also run it directly from DOS by typing:

CLKSPD<ENTER>

You will then see the main display screen of the diagnostic.

OPERATING CLKSPD

CLKSPD is a single test screen program. Once the test has been performed, you may re-execute it by pressing any key except <ESC>. To exit the test, press <ESC>.

DISPLAY DESCRIPTIONS

<p>CPU CLOCK SPEED TOGGLE</p> <p>xxxxxxxxxx xx, 19xx Version x.xx</p> <p>(C) Copyright Tandy Corp. All rights Reserved.</p> <hr/> <p>Clock Speed Toggles Correctly.</p> <p>SLOW SPEED: x MHz</p> <p>FAST SPEED: xx MHz</p>

Press <ESC> To Exit, Or Any Other Key To Repeat.

TEST SCREEN:

The figure above is the screen for the clock speed test. Before "Clock Speed Toggles Correctly" appears, first the message "Checking Slow Speed" is displayed. Once the slow clock speed has been set, the message "Checking Fast Speed" is shown. Because these tests take very little time, you may not see either of the above messages and so the first message you should see is "Clock Speed Toggles Correctly".

If the slow speed is slower than the fast speed, then "Clock Speed Toggles Correctly" is displayed.

<p>MACHINE TYPE ERROR</p> <p>This machine uses emulated speed switching; it does NOT switch speed via hardware.</p> <p>Therefore, this diagnostic is not supported on this machine. Please see the manual for additional information.</p> <p>PRESS ANY KEY TO EXIT _</p>
--

EMULATED SWITCHING ERROR SCREEN:

This screen will appear on those machines that do switch speeds, but use an emulated switching technique by inserting CPU hold cycles. Since CPU hold cycles do not involve using a different CPU clock speed, this test will not test it.

MACHINE TYPE ERROR

This machine does not do speed switching.

Therefore, this diagnostic is not supported
on this machine. Please see the manual for
additional information.

PRESS ANY KEY TO EXIT _

NO SWITCHING ERROR SCREEN:

When the diagnostic can detect a machine that will not switch speeds, the screen shown above will appear. This indicates that this machine does not support speed switching.

TEST DESCRIPTION

CLKSPD tests the programmable CPU clock speed. It first puts the computer in what should be the slow speed mode, performs a timing loop, and, based on the result, displays the determined CPU clock speed. It then puts the computer in what should be the fast speed mode, performs a timing loop and displays the determined CPU clock speed. If the fast speed loop executed faster than the slow speed loop, the message "Clock Speed Toggled Correctly" is displayed. If the speed did not change or did not change correctly, the message "Clock Speed Will Not, Or Can Not, Toggle" is displayed.

Not all MS-DOS computers support dual clock speeds. Please see the Appendix for a list of systems that support programmable CPU speeds.

The test can be repeated by pressing any key. Press <ESC> to exit.

NOTES:

1. When testing a Tandy 1000 EX or 1000 HX without expansion memory, please note that the speed will appear not to toggle. This is because the speed difference is very small from SLOW to FAST mode when there is no DMA present, and this program cannot detect it.

2. This diagnostic was designed to be executed in a system booted with no MS-DOS drivers loaded. If you experience trouble, please make sure that there are no drivers, such as network drivers, loaded in the CONFIG.SYS or AUTOEXEC.BAT files.

APPENDIX

CPU SPEED LIST

The following chart lists each computer along with the correct slow and fast speed values in megahertz (MHz):

Computer	Slow	Fast	Comments
Tandy 1000	4.77	4.77	Does not support dual speed.
Tandy 1000 EX	4.77	7.16	See Note 1 on page 8.
Tandy 1000 HX	4.77	7.16	See Note 1 on page 8.
Tandy 1000 SX	4.77	7.16	
Tandy 1000 TX	4	8	
Tandy 1000 SL	4	8	
Tandy 1000 TL	4	8	
Tandy 1000 SL/2	4	8	
Tandy 1000 TL/2	4	8	
Tandy 1000 RL	4.77	9.54	
Tandy 1100 FD	8	8	Does not support dual speed.
Tandy 1200	4.77	4.77	Does not support dual speed.
Tandy 1400 LT	4.77	7.16	
Tandy 1400 FD/HD	4.77	8	
Tandy 1500	10	10	Does not support dual speed.
Tandy 2500 XL	5	10	
Tandy 2800 HD	6	12	
Tandy 3000	8	8	Does not support dual speed.
Tandy 3000 HL	4	8	
Tandy 3000 NL	8	10	
Tandy 3000/12	6	12	
Tandy 4000	6	16	
Tandy 4000 SX	8	16	
Tandy 4000 LX	8	20	
Tandy 4016 DX	8	16	Uses emulated speed change.
Tandy 4016 SX	8	16	Uses emulated speed change.
Tandy 4020 SX	8	20	Uses emulated speed change.
Tandy 4020 LX	8	20	Uses emulated speed change.
Tandy 4025 LX	8	25	Uses emulated speed change.
Tandy 4033 LX	8	33	Uses emulated speed change.
Tandy 5000 MC	20	20	Does not support dual speed.

CPU SPEED LIST (CONTINUED)

Computer	Slow	Fast	Comments
GRiD 140XT	4.77	8	
GRiD 286mfp	5	10	
GRiD 286mfpsvga	5	10	
GRiD 286is	8	12	
GRiD 386isx	8	16	
GRiD 386sxmfp	8	16	Uses emulated speed change.
GRiD 386sxmfpsvga	8	16	Uses emulated speed change.
GRiD 386is-16	8	16	Uses emulated speed change.
GRiD 386is	8	20	
GRiD 386is-20	8	20	Uses emulated speed change.
GRiD 386is-25	8	25	Uses emulated speed change.
GRiD 386is-33	8	33	Uses emulated speed change.
GRiD 386mc	20	20	Does not support dual speed.

ERROR MESSAGE:

Clock Speed Will Not, Or Can Not, Toggle

This error message is displayed when the fast loop has performed at the same rate or slower than the slow loop. This may indicate that the machine you are using does not support a programmable CPU speed, an incompatibility between the machine and the program, or that the programmable clock speed chip (or associated circuitry) is malfunctioning.

First verify that the machine you are using does support programmable CPU speeds. If it does, try the software on a different machine of the same model. If the speed toggles correctly on the second machine, there is one more step before assuming the clock speed chip is defective. Since this program uses the timer chip to determine how long each timing loop takes, run the diagnostic software for the Programmable Interval Timer (PIT). If that passes, then the machine probably has a defective programmable clock speed chip.

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