

**T**

**OS**

**E**

**XTENSION**

**C**

**ARD**

**CodeHead**   
TECHNOLOGIES



# **T E C** OS Extension Card

## *Part One: Installation*

**WARNING:** The installation of the TOS Extension Card must be performed by someone who has experience in working with electronic devices. If you are not qualified, do not attempt to install it yourself. Codehead Technologies is not responsible for any damage caused by installation of the TEC.

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**Warranty:**

Artifex Computer and CodeHead Technologies warrant the TOS Extension Card to be free from defects in craft and workmanship for a period of 90 days after purchase. We cannot be held responsible for damage to the TEC or your computer caused by incorrect procedure during installation. The TEC Utilities Disk and this manual are provided "as is" without warranty of any kind. CodeHead Technologies hereby disclaims any real or implied warranty with respect to fitness for any particular purpose. We are not liable for any damage including but not limited to your equipment, reputation, profit-making ability, or mental or physical well-being caused by the use (or misuse) of the TEC, the software in ROM provided by Atari Corporation, the software on the TEC Utilities disk, or this manual.



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# 1. Foreword

When TOS 1.04 was released in 1988, it caused great excitement among Atari users. This operating system not only contained a host of corrections compared to TOS 1.00 and TOS 1.02, but it also offered numerous new features. More than three years have passed since then. Atari hasn't been idle during this time; as it turned out, TOS 1.04 contained a few bugs, which necessitated the use of patch programs in the AUTO folder. With the introduction of the 1040STe, Atari provided a new operating system: TOS 1.06. Finally, with the release of the TT with TOS 3.01, Atari gave the system a totally new look — the TT Desktop — which also was used later in TOS 2.05 in the MegaSTe. But these improvements had a cost; TOS had become so much larger that it would no longer fit in the 192K ROM chips of the older ST computers. So Atari gave up the maintenance of first generation TOS versions and concentrated on further development for the newer machines. As a result, ST owners were stranded; after 1988, no new operating system was forthcoming for their computers.

At the beginning of 1991, Artifex Computer began experimenting with Atari's newly released TOS 2.05. The goal was to get the new version running on the old computers. A small printed circuit board — necessary to complete the project — was designed, improved in many ways, and now lies before you as the TOS Extension Card.

However, in doing this we had mastered only a portion of the problems; the greatest stumbling block was Atari's TOS itself. TOS 2.05 assumes that it is running on a 1040STe or newer machine. Certain hardware features of these machines, which are absent in older ST models, are simply assumed to be present. The consequence is that TOS 2.05 will not run on an ordinary ST. Through hours of minute and detailed work, TOS was modified to differentiate between the older and newer systems.

Some weeks before the 1991 Duesseldorf Atari Fair, a slightly modified TOS 2.05 had proven itself absolutely reliable in extensive testing. The Fair revealed some new information: Atari was close to the release of a new TOS version for the MegaSTe with the designation 2.06.

During the Fair, Artifex succeeded in convincing Atari that a TOS 2.06 which, like the modified TOS 2.05, also functioned on "old" ST models with the help of the TOS Extension Card, is the optimal operating system for all STs and STes. The production of TOS 2.06 was halted, and in the following months TOS 2.06 came into being as it appears today on the TOS Extension Card.

Laurenz Prübner  
Artifex Computer

## 2. The Contents of Your TEC Package

The TOS Extension Card package contains the following items:

- ✓ The TOS Extension Card including TOS 2.06 (or later) ROMs/EPROMs.
- ✓ A piece of double-sided foam tape.
- ✓ A disk including the following files:
  - Atari's new control panel, XControl, and a collection of CPXs.
  - DESKICON.RSC, a file containing icons for the new desktop.
  - NoRoach, a utility by Atari Corporation which shortens the waiting time when booting the computer.
  - Icon Juggler, which allows you to compile your own set of icons from a number of other icon formats.
  - PinHead, a shareware program by Charles F. Johnson which speeds up the running of programs.
  - ButtonFix, a program by Charles F. Johnson which minimizes the double-scrolling window problem.
- ✓ A registration card, which you should fill out and return immediately in order to qualify for TEC product support.
- ✓ This manual describing the installation process for the TOS Extension Card and features of the new TOS operating system.

The documentation for XControl and the other included utilities can be found on the enclosed disk. There may also be other files included on this disk. If so, they will be described in the README file. Please be sure to read it.



## 3. Installing the TOS Extension Card

If you've had your dealer install the TOS Extension Card, then you can simply skip this chapter. If not, then please carefully read this chapter all the way through before you unpack the TOS Extension Card or try to use it. Be sure that you have sufficient skills and tools for the installation. In case of doubt, ask an experienced friend or your Atari dealer to help you out.

### 3.1. Liability and Limited Warranty

Unfortunately, any warranty which may be in effect for your Atari ST will be voided if you install the TOS Extension Card yourself. We guarantee the board to function only if it is properly handled and installed. In particular, we assume no liability for harm due to the installation or use of the TOS Extension Card. The software provided is an original operating system by Atari Corporation; the warranties of Atari Corporation are in force in this case. We expressly grant no guarantee of any kind for error-free operation of the software prepared by Atari, or for the function of any software running under the provided operating system. All installation work must be carried out only on disconnected and unpowered equipment and only by qualified personnel!

### 3.2. How the TOS Extension Card Works

The TOS Extension Card provides the address space needed by the newer TOS, which is not the same as the old operating system of TOS 1.0 to TOS 1.04 (only 192K in size). The ROMs with the old operating system are replaced by new ROMs (EPROMs) on the TOS Extension Card. The needed address and data lines, the ROM-select signal and the power supply are supplied by a ribbon cable with a DIP-header which plugs into the IC socket that formerly held the first high-byte ROM chip. The other address and data lines and the strobe signals are supplied by the other wires of the ribbon cable directly from the CPU (or, alternatively, from the system bus of the Mega ST). The GAL chip, located on the expansion board, decodes the access to the new address region — a job which had been performed previously by GLUE (one of the Atari custom chips).

The installation of the TEC ensures that you will be able to upgrade to any future version of TOS that Atari may release by simply replacing the ROM chips. This means that your older Atari ST will never become obsolete!

### 3.3. Tools Needed

In order to install the TOS Extension Card, you'll need the following:

- ✓ a Phillips-head screwdriver.
- ✓ a pair of needle-nose pliers.
- ✓ a fine-tipped, *low-powered* soldering iron (if you don't have one of the bridge versions of the TEC) and resin-core solder.
- ✓ an IC extractor or a flat screwdriver.
- ✓ a work space that is clean, well-lit, and large enough to put aside the housing parts, screws, etc.

**WARNING:** If you are at all unsure about working with electronic devices, do not attempt to install the TEC yourself. Enlist the services of a qualified technician to do the installation, especially if your version of the TEC requires the soldering of wires onto the CPU. The cost of installation is well worth it when compared to the price of the TEC and your computer, should they become damaged.

## 3.4. The Actual Installation

### 3.4.1. Preparation

1. Remove all cables — especially the power cord — from your computer. If there is a diskette in the disk drive, remove it.
2. Lay the computer upside down and remove all of the screws that hold the cover on. These are the screws that are recessed within square holes with rounded corners. You'll find 9 screws on a Mega ST and 7 screws on all others. On a Mega ST and 1040 ST, three screws hold the disk drive in place; you should not loosen these screws yet.
3. Turn the computer right side up and take the cover off. With the Mega ST or 1040 ST, be careful not to damage the opening for the disk drive. With the Mega ST, you must also disconnect the battery cable in the housing cover from the corresponding box in the shielding.
4. If you have a computer with a built-in keyboard (that is, any computer except a Mega ST), remove the keyboard by carefully pulling up on the connector to the motherboard and place it aside.
5. Loosen the screws which hold the metal shielding, and bend all flanges straight with the pliers.
6. If you have a Mega ST or a 1040 ST, loosen the disk drive; in the case of the 1040 ST — Model A, you must also remove the power supply by removing two screws and unplugging its connector. Avoid touching the inner parts of the power supply as they may still hold an electrical charge which can give you a jolt (but won't seriously harm you). Now carefully lift the shielding off and place it aside. With a Mega ST, you should free the battery connector from the metal shield by squeezing the plastic sides and pushing it down.
7. Now you have completely opened your computer and are looking at the motherboard. With the help of Figures 1 to 4, identify your computer type and locate the ROMs and the CPU. In the Mega ST and 1040 ST, there may be either 2 or 6 ROM chips; in other types, it should always be 6 chips.
8. It is now time to remove the ROM chips. If you are not familiar with the handling of ICs, please refer to chapter 4, "Handling IC Chips." Carefully pry the ROMs out of their sockets and put them in a protective holder — preferably made of anti-static foam (available in any electronics shop).

There are three different versions of the TEC — Standard, Bus Bridge, and CPU Bridge. The version you have purchased will determine which installation alternative is available to you.

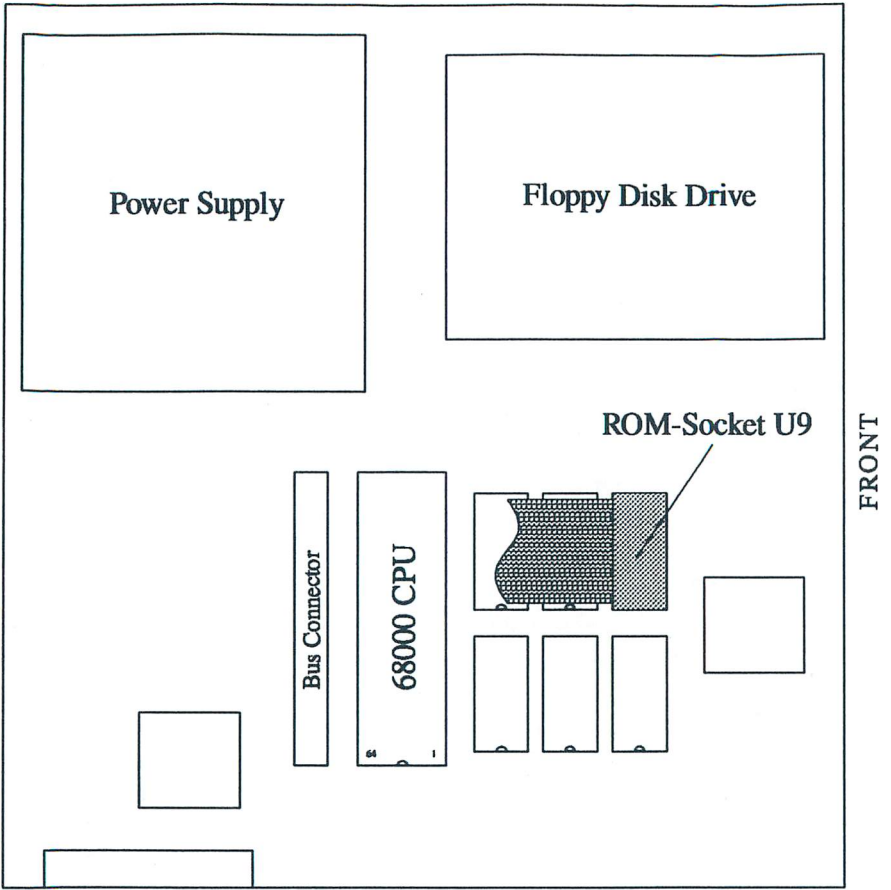


Figure 1: Installation diagram for MEGA ST computers



FRONT

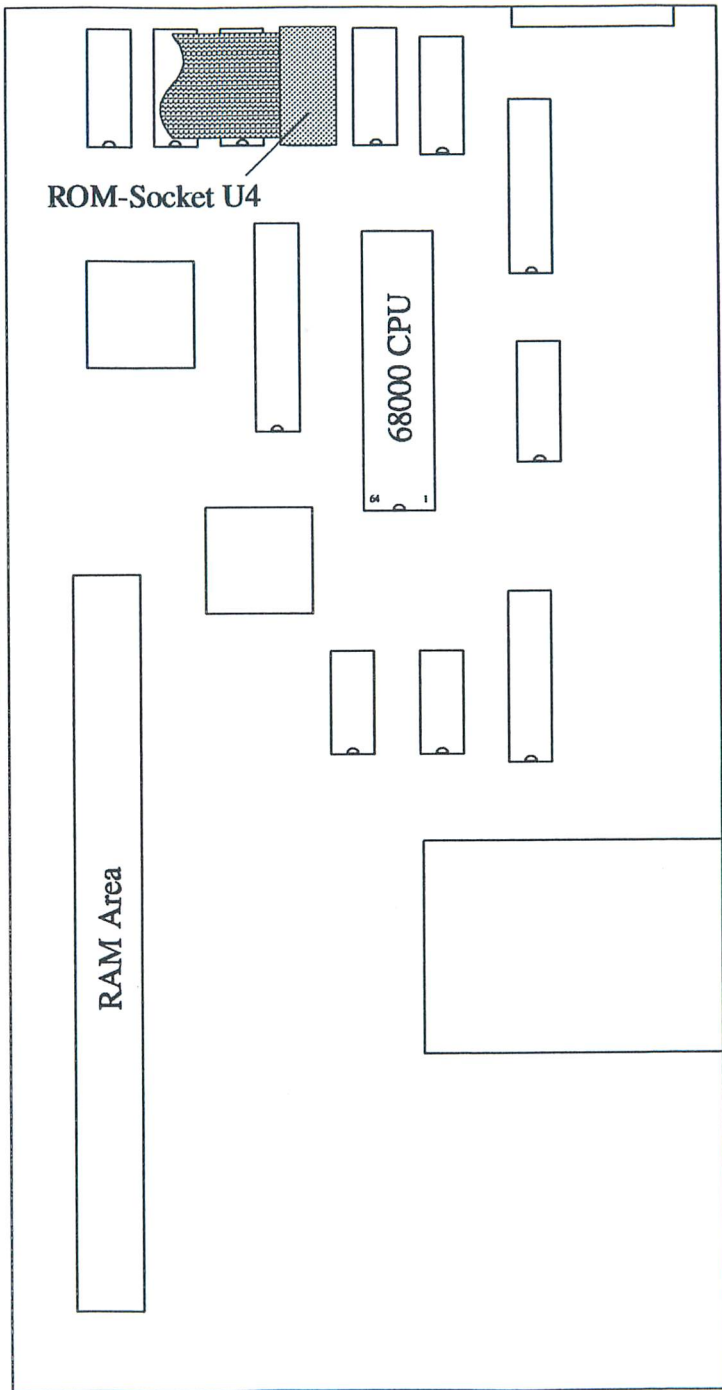


Figure 2: Installation diagram for 260ST and 520ST

FRONT

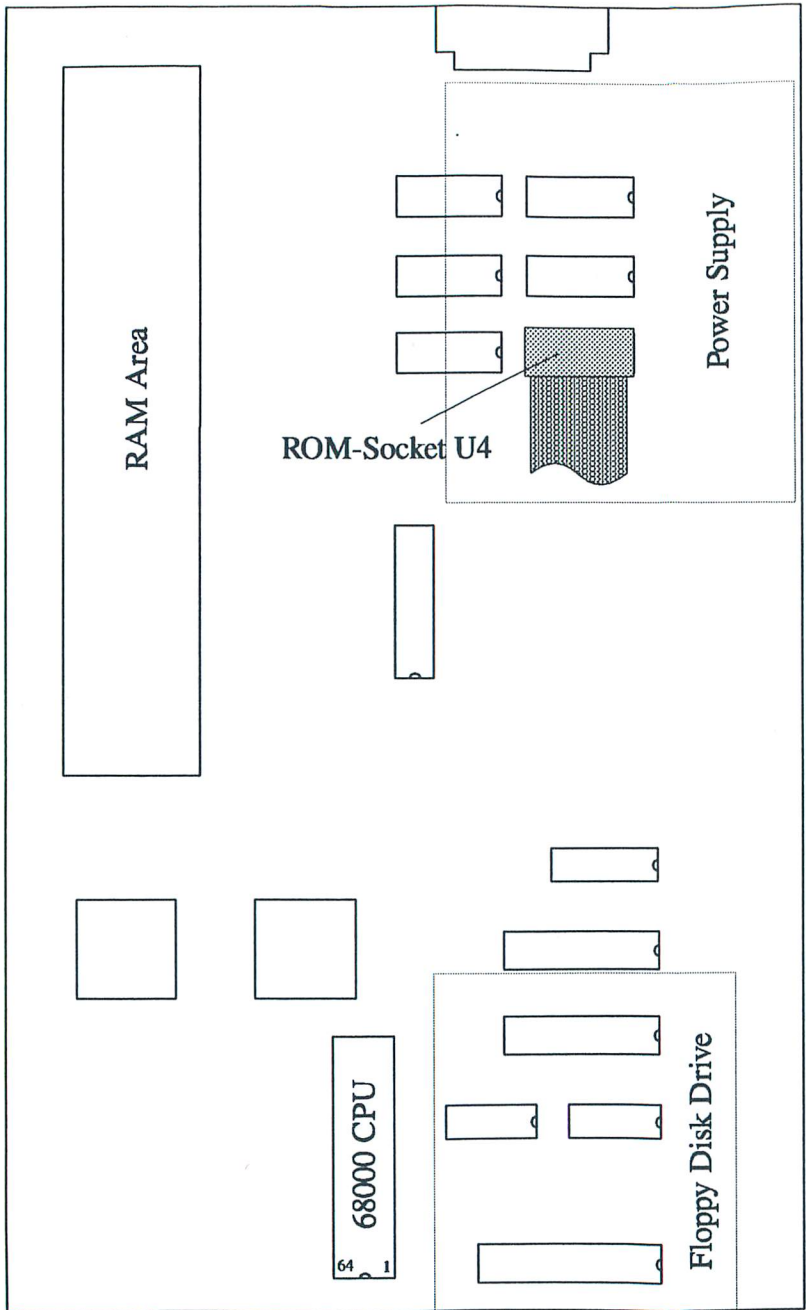


Figure 3: Installation diagram for 1040ST (Model A) computers

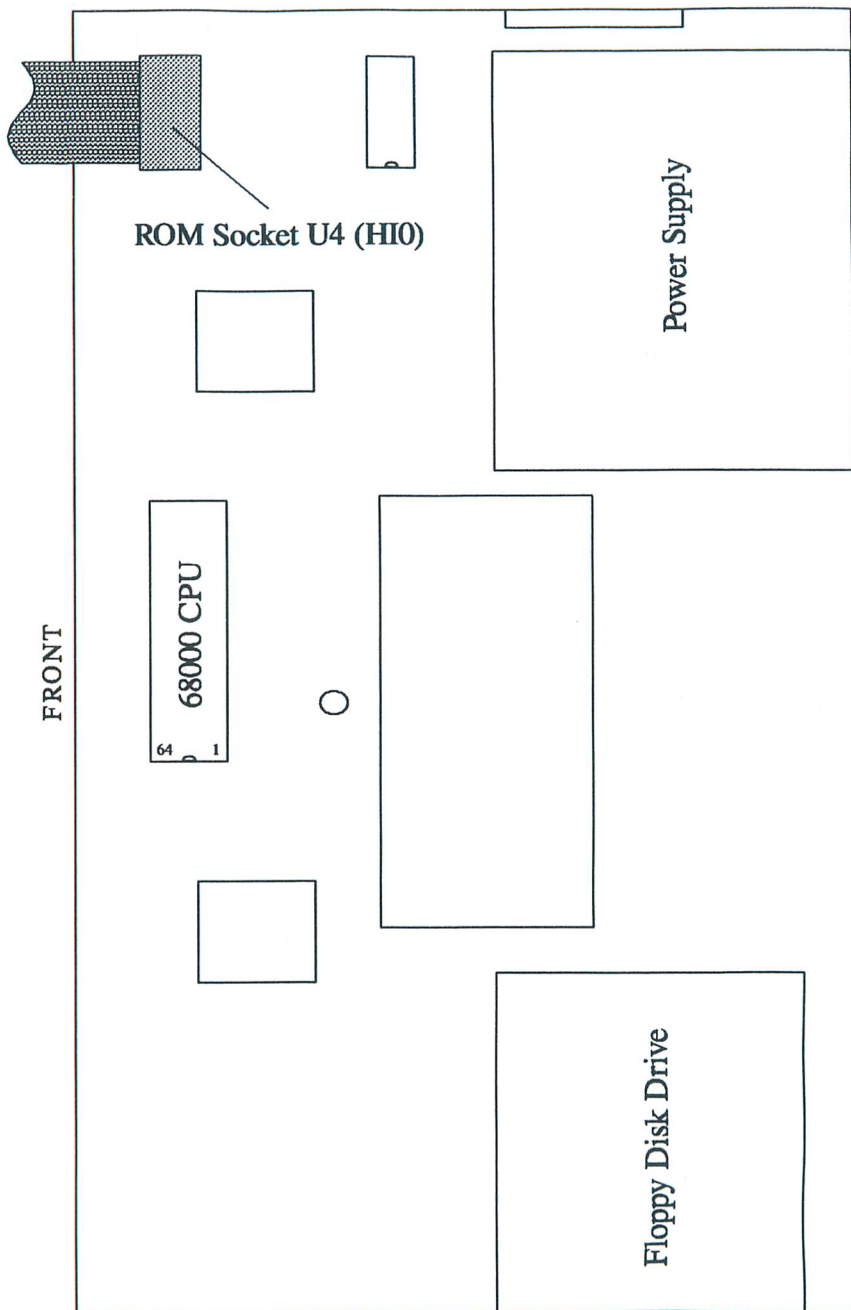


Figure 4: Installation diagram for 1040ST (Model B) computers

### 3.4.2. Installation Alternative 1: Soldering the Leads to the CPU

If you have the Standard version of the TEC, one of the ribbon cables will be terminated with 22 wires which have already been separated, stripped, and tinned. If you have a Mega ST, you may choose either Alternative 1 or 2. Alternative 1 consists of soldering these wires to the CPU.

First tin the CPU pins by carefully melting a small amount of solder on the appropriate pins. Make sure that you do not overheat the CPU or you may damage it. Table 1 shows the relationship of the wires to the CPU pin numbers; the pin arrangement of the CPU is shown in Figure 5. Note that there are only ten different colors of wires and that there is more than one wire in each color.

Make sure your work area is well lit. It's best to start with the connections to CPU pins 1-10, then 64-62, 53-50, and finally 48-44. This sequence works best for keeping the ribbon cable out of your way as you solder. Examine your soldering work very, very carefully! Be especially wary of solder connections which may have inadvertently bridged across neighboring CPU pins. When you've verified that the connections are properly made, continue with "Further Installation" (3.4.6).

Table 1

Wire No.	Color	CPU Pin	Function	Expansion Pin
1	Black	44	A16	a21
2	White	53	GND	a12
3	Gray	46	A18	a19
4	Violet	45	A17	a20
5	Blue	9	R/W	b9
6	Green	52	A23	a13
7	Yellow	7	UDS	b7
8	Orange	6	AS	b6
9	Red	51	A22	a14
10	Brown	8	LDS	b8
11	Black	48	A20	a17
12	White	50	A21	a15
13	Gray	10	DTACK	b10
14	Violet	47	A19	a18
15	Blue	1	D4	b1
16	Green	2	D3	b2
17	Yellow	63	D6	a2
18	Orange	64	D5	a1
19	Red	5	D0	b5
20	Brown	62	D7	a3
21	Black	3	D2	b3
22	White	4	D1	b4



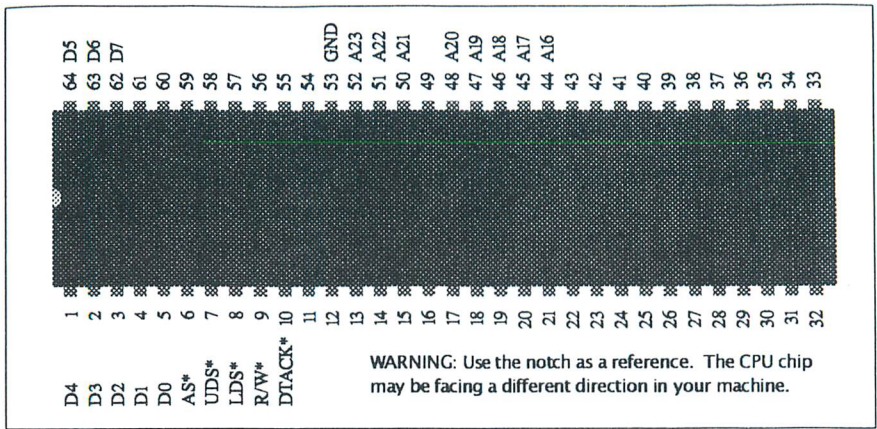


Figure 5: Pin Layout of the 68000 CPU

### 3.4.3. Installation Alternative 2: Soldering the Leads to a Mega ST System Bus Expansion Connector

If you have a MegaST and the system bus socket is unoccupied, you can solder the free leads to a 64-pin DIN expansion connector. This allows you to easily unplug the modification in the future. Refer to Table 1 for the relationship of the wires to the DIN connector numbers. Check your work very carefully! In particular, check for solder connections which may have inadvertently bridged between neighboring pins. When you've verified that the connections are correct, continue with "Further Installation" (3.4.6).

### 3.4.4. Installation Alternative 3: Using the CPU Bridge

If you have the CPU Bridge version of the TEC, you'll need a computer with a socketed CPU. The CPU Bridge is an adaptor which plugs into the CPU socket and contains a socket into which you can plug your CPU, accelerator board, or PC emulator. This eliminates the need for any soldering. The only further condition is that there must be 9/16th inches of room above the CPU within the housing.

To install the CPU Bridge in the computer, remove the CPU and anything atop the CPU. If you have an accelerator board, remove it from your motherboard, being careful not to damage any of the connecting wires or flex the board, which may use surface-mount technology. Place the CPU Bridge in the free socket, making sure that the notches line up. Now insert the CPU or any expansion removed from the socket into the free CPU socket of the bridge. Again, be sure

or any expansion removed from the socket into the free CPU socket of the bridge. Again, be sure that the notch aligns with the notch on the motherboard. Then continue with "Further Installation."

### 3.4.5. Installation Alternative 4: Using the Bus Bridge

The Bus Bridge version of the TEC requires that you have a Mega ST computer. This bridge connector plugs into the Mega bus expansion connector and allows a solderless installation of the TEC. Your bus connector must be unused, or if used, the device installed must have a "through" connector allowing you to insert the bus bridge.

To install the bus bridge, locate the bus connector on your motherboard by referring to Figure 1 and simply plug the bus bridge into it. It will only fit in one direction. Make sure that it's well-seated by pressing it firmly down. Then continue as described under "Further Installation."

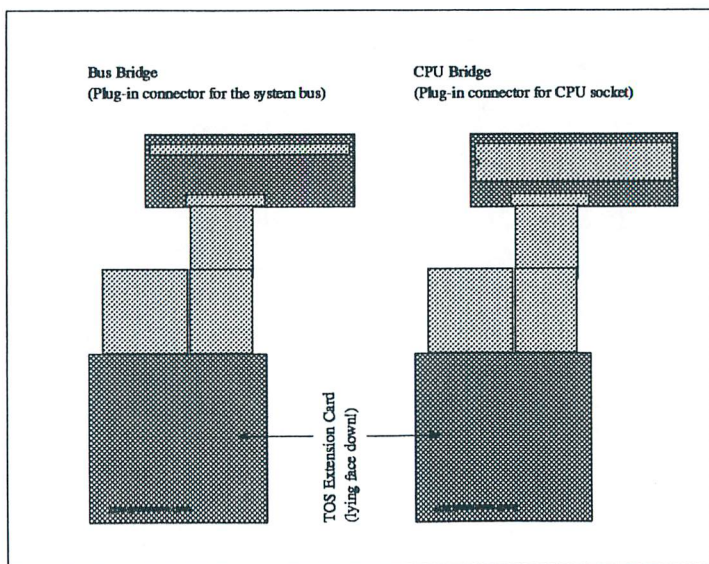


Figure 6: Connections between TOS Extension Card and Bus bridge (left) or CPU bridge (right)

### **3.4.6. Further Installation Notes**

Now that you have made the connection to the CPU or to the system BUS, place the other ribbon cable plug into the provided ROM socket, which is indicated in the illustration corresponding to your computer type. In all computer models, this is the socket for the first high-byte ROM (H0). On a Mega ST, this IC is labelled "U9," on all other computers it is "U4." Refer to the illustration corresponding to your computer type to determine the orientation of the ribbon cable. Make sure that you press down on the plug evenly and without too much pressure. None of the pins must bend when you do this! Ensure that the plug is in the correct position, especially if working with the I040ST Model A, where the plug lies beneath the power supply.

Now choose a place in your computer for the board. Any location which has enough space for the board will suffice. Use the supplied double-sided foam tape to affix the TEC to the motherboard. The ribbon cable should lie flat and, if folding proves necessary, should be bent at a 45 degree angle. When arranging the ribbon cable in a Mega ST, be aware that one of the cover supports ends up in the middle of the motherboard and should not rest on the ribbon cable. Be especially careful that there are no short circuits between the board and other components. Neither the housing nor the motherboard should press against the TOS Extension Card. After a further visual inspection, the installation is complete, and you can reassemble your computer in the opposite order. Again, in doing so, be careful of the proper position of the ribbon cable and above all that it isn't pinched in any way.

### **3.5. The Unveiling**

Replace the cables and power up the computer. If the keyboard light doesn't come on or if the disk drive doesn't respond within a few seconds, turn the computer off IMMEDIATELY! Open the computer again and check your work, especially the position of the ribbon cable plug and the solder connections. Otherwise, your new operating system is ready to use. We wish you much fun and success in working with your upgraded TOS!



### 3.6. Installation of a TOS Switching Option

Some software (especially game software) does not work correctly on all versions of TOS. If this concerns you and you'd like to be able to alternate between the TOS installed on the TEC and an earlier version (1.00-1.04), with a little extra work you can install a switch allowing you to do so. At the time of this writing, it's not possible to install this option if you have a Model A type machine where the ROMs are located beneath the power supply. We are examining alternative solutions involving the use of an extra socket and ribbon cable assembly to extend the ROM position from beneath the power supply.

To install the switch option, you'll need the following materials:

- ✓ 2 10K Ohm resistors
- ✓ 1 47K Ohm resistor
- ✓ 1 28-pin DIP socket
- ✓ 1 DPDT switch
- ✓ about 2 feet of small-gauge wire

Figure 7 shows the principal construction of the switch. Instead of removing all ROM chips, remove only two of them — the ROM chip in the high-byte socket (HQ, which is in U9 or U4), in which the DIP plug of the TOS Extension Card would be placed during normal installation, and the low-byte ROM chip next to it (LQ, which is in U10 or U7). Prepare a wire long enough to reach from the high-byte socket to the position in which you intend to install the switch. Solder one end of the wire to the high-byte ROM socket at pin 20 (CE\* in Figure 7) and connect the other end to one of the center poles of the switch. Now on each of the ROM chips you've just removed, bend pin 20 up until it is in a horizontal position. You may have to actually cut off the ends of the pins so that they do not short out against the neighboring ROM chips after being reinserted in their sockets. On the 28-pin DIP header, bend pin 20 up also. Piggy-back the DIP socket over the ROM chip and solder all of the socket's pins to the high-byte ROM chip except number 20. Make sure your soldering is done neatly or you may not be able to reinsert the ROM chip in its socket. The end result will be that after reinserting the ROM chip, it will be in the high-byte socket (U9 or U4) and on top of it will be a socket in which pin 20 is bent upwards.

The wires connecting the TOS Extension Card to the CPU will be attached in the manner described in section 3.4.2. But instead of connecting the number 8 orange wire to pin 6 of the CPU, it is now connected to one side of the switch and a wire must be connected from pin 6 of the CPU to the other center pole of the switch. If you have one of the bridge versions of the TEC, you'll need to separate the orange wire from the ribbon cable by carefully slicing the ribbon cable on each side of the orange wire. Once separated, it can be cut and you can attach



wires that connect it to the switch as shown in the diagram. Make sure you are using the correct orange wire, the eighth wire from the edge of the ribbon cable with the black wire. Refer to the switch plans (Figure 7) for further wiring instructions. You must run wires to the switch from pin 20 of each of the ROMs and pin 20 of the DIP socket. It's best to solder the resistors directly to the switch. Connect the other ends of the three resistors to a wire and run it to pin 28 of the ROM socket to obtain the +5V signal. All that remains is that you determine where you want to mount the switch. We leave this up to you.

**NOTE:** If you have a Mega ST and the CPU bridge version of the TEC, you should insulate the underside of the bridge with some electrical tape below the ribbon cable connection. Otherwise it's possible that these leads could short against the nearby ROM chips.

**WARNING:** Beginning with TOS 1.04, Atari computers allowed GEM hard drive partitions up to 32 megabytes in length; however, TOS 1.00 and 1.02 are limited to 16 megabyte partitions. If you begin using 32 meg partitions after installing the TEC, you should be very careful about switching back to TOS 1.00-1.02. If TOS 1.00 or 1.02 writes to a 32-meg partition, it can/will cause serious damage to the file structure of that partition. Even the simple act of booting your computer can cause problems if you are using a program which writes to your hard drive during the boot-up process.

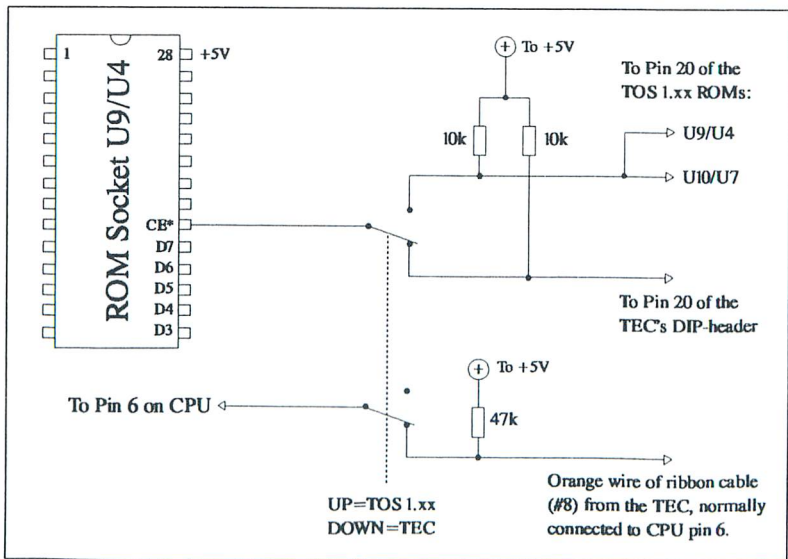


Figure 7: Installation of the TEC to TOS 1.xx switching option

## 4. Handling IC Chips

Integrated circuits (IC chips) are very sensitive devices. They can be easily damaged by mishandling, either physically due to the bending or breaking of the pins, or internally from a charge of static electricity. For this reason, certain precautions must be taken whenever handling ICs or electronic devices containing them (such as the TEC).

A static charge can build up in your body in many ways, such as shuffling your feet across the carpet or rubbing a balloon against a wool sweater. This is evidenced when you touch a metal object and receive a small electrical shock. Although the shock may be very small and seem insignificant, it is created by the presence of thousands of volts of positive electrons stored in your body. This kind of potential can instantly ruin an IC chip, whether you touch it directly or handle a printed circuit board containing ICs.

You can take precautions against this kind of damage by making sure you discharge any electrical build-up before touching sensitive electronics. Touching a piece of metal that is grounded is a good way to discharge a build-up. Before touching any ICs in your computer, it's a good idea to simply touch the metal shielding containing the electronics (after making sure that the computer is unplugged).

Besides electrical damage, physical damage can result from improper handling of IC chips. Whenever holding an IC, try to avoid touching the pins. It's best to keep all chips embedded in anti-static foam to protect them.

To remove a chip from a socket, you should use either an IC extractor or a small screwdriver. Using a screwdriver, carefully and slowly pry up on one end of the chip. Then with a rocking motion you can begin to free the other end while still using the screwdriver to pry the other end. Never use excessive force to remove a chip. Even with an IC extractor, you can damage a chip by pulling too hard and losing control as the chip frees itself from one end of the socket before the other end, bending or breaking the pins. Also, if you try to do this with your fingers, you can actually end up puncturing yourself with the pins after the chip suddenly breaks free from the socket.

The key is to use slow even leverage to remove a chip. Once you've removed a chip, you should insert it into some anti-static foam and if it is not clearly marked you should mark it in case you need to reinsert it at a later time.

# **T E C** OS xtension ard

*Part Two:  
The Features of TOS 2.06*



# 1. At a Glance: The Advantages of the New TOS

The functions of TOS 2.06 are considerably different from those of older TOS versions (TOS 1.0x). In this chapter, we'll discuss the changes during the boot phase as well as the essential new characteristics of the desktop.

## 1.1. Booting Up

Immediately after turning on the computer with TOS 2.06, you'll notice the first surprise — the Atari logo appears in the upper left corner of the monitor screen. After a short pause you'll notice another new feature, a routine which will test all of the memory installed in your computer. You can bypass this test at any time by pressing any key. The memory test is only carried out during a cold boot. If the memory test is not interrupted, an additional bar will appear, which begins to shrink from the right. The purpose of this bar is to wait until the hard disk comes up to speed before proceeding with the boot process. This integrated boot delay makes it possible to turn on the hard disk and the computer with the same power switch.

This boot-up pause causes some confusion. If uninterrupted, the pause is 90 seconds from the cold boot until the boot-up procedure continues. Most hard drives take 10-20 seconds to spin up, but since there's no message on the screen telling you what you're waiting for, some people just sit and wait until it proceeds on its own. You can hit any key at any time to proceed with the boot-up because your computer is doing absolutely nothing but waiting for you to press a key. The TEC Utilities Disk contains a program from Atari called NoRoach which will install an automatic bypass on a floppy disk. You can create a boot disk with NoRoach and keep it in your floppy drive when you boot up. Read the documentation on disk for more information.

If you hold down the <Control> key during the boot process, the AUTO folder will not be accessed, no accessories will be installed, and the NEWDESK.INF file will not be loaded. This procedure is particularly useful when you want to deactivate defective AUTO folder programs or accessories. It does, however, make the timing very tricky if you are trying to bypass your hard disk (by pressing Control/LeftShift/Alternate) but still boot the AUTO programs on a floppy disk.

**NOTE:** TOS executes a checksum of the ROMs during a cold boot. Immediately after the Atari logo appears, if you see a message announcing a CRC error in ROM E or O, it means your ROMs are defective and you should contact CodeHead Technologies for a replacement.

## 1.2. The Desktop

One very substantial change in this new TOS version is an increase in the number of windows which can be open at the same time: the desktop now allows 7 open windows (formerly, it only allowed four).

The ability to scroll windows with files already selected also will prove to be very practical. For example, if you are using a directory with 100 files, you can select the first file and scroll down to the end without losing your selection. The scrolling itself goes much more quickly than with previous TOS versions because of a considerably more intelligent routine.

Now you can copy all of the files in any drive to another drive by dragging its icon to another. Previously this was only allowed with floppy drives.

With the new TOS, all selected files may be moved not only to another drive, to the trash can, or to another window; you can also now place them directly on the desktop. Every object on the desktop – it doesn't matter whether it's a drive, printer, or trash can – can be assigned its own icon, just like every individual file or folder.

If the icons contained in TOS 2.06 aren't adequate for your purposes, you can add to them by modifying your DESKICON.RSC file. The new TOS loads this file automatically upon boot-up and makes available any icons it contains.

DESKICON.RSC is normally created with a resource construction set, but we've provided a special program on the Utilities Disk called Icon Juggler, which allows you to create your own set of icons from any of the hundreds of icons available in the public domain. If you do not already have a DESKICON.RSC file on your boot disk, you should copy the one contained on the TEC Utilities Disk.

One of the desktop's most useful new features allows you to assign keystrokes to commonly used options.

*The Desktop Configuration Box allows you to define single keystrokes to select menu options.*

DESKTOP CONFIGURATION	
Set default directory as:	<input type="text" value="Application"/> <input type="text" value="Top Window"/>
Set input parameter:	<input type="text" value="Full Path"/> <input type="text" value="File Name Only"/>
Function-key Assignments:	
F10	<input type="text" value="HOTWIRE!"/>
	<input type="button" value="Up"/> <input type="button" value="Down"/>
Define Single Keystroke:	
Menu Item:	<input type="text" value="Close Top Window"/> <input type="text" value="[C]"/>
Key:	<input type="text" value="C"/> <input type="button" value="Clear All"/>
System Free Memory:	1986888 bytes
	<input type="button" value="OK"/> <input type="button" value="Cancel"/>

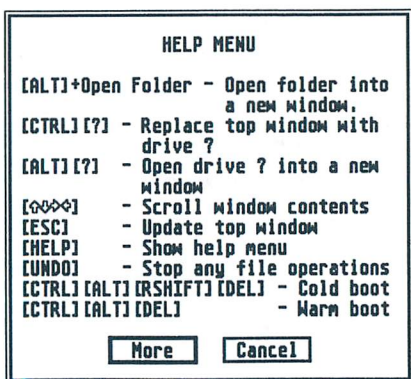


Not all macros for the desktop can be freely chosen. Atari has previously defined certain key combinations, for example those concerning changing the screen resolution and for opening a window of a disk drive's contents.

An overview of the predetermined keyboard commands can be called up at any time by pressing the <Help> key. As you will see, Atari has thought of plenty of helpful supplementary functions, for example the printing of the directory as ASCII text or the global deselection of previously selected icons.

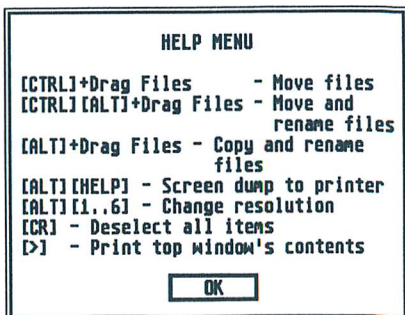
In addition, the new desktop offers many advantages, such as displaying files in unsorted order or starting programs with a function key.

With the help of the new TOS, it is also possible to produce special characters which previously could not be entered directly from the keyboard. To do this, you need only know the ASCII code of the desired character. These characters are entered when you press the <Alternate> key while typing the number keys on the numeric keypad. For example, if you press and hold the <Alternate> key, and type the number "249" on the keypad, the result is this dot • .



*Pressing the Help key provides two dialog boxes full of keyboard shortcuts that can be used at the desktop.*

*Many common operations now have keyboard equivalents, including the opening of windows and resolution changes.*



## 2. The Menu Bar

After booting, you'll find yourself at the GEM desktop. From here you can start programs, format disks, copy files, create folders, and much more. Most functions are controlled through the desktop's menu bar, in which you'll find these four entries: "Desk," "File," "View," and "Options."

### 2.1. Desk

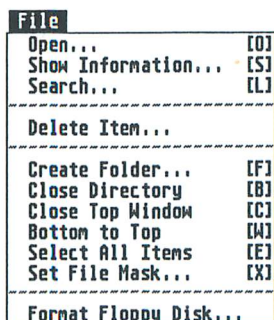
The Desk menu contains the entry "Desktop Info...," in which the official TOS copyright statement is located. If any desk accessories have been loaded upon boot-up, they will also be located in this menu.

Normally, a maximum of six accessories can be loaded; the accessories can only be removed from memory by restarting the computer. If you would like to load more than six accessories and change them at any time, **MultiDesk Deluxe** provides a remedy for this limitation; it lets you load as many accessories as you wish, and also remove them from memory without rebooting your computer. For more information on **MultiDesk Deluxe**, contact CodeHead Technologies.

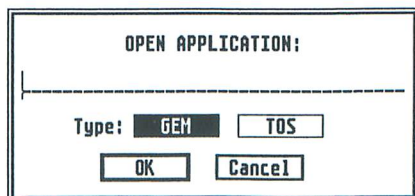
### 2.2. File

The first item in the File menu serves to open drives, folders, and files. First the desired object is selected and then the menu item "Open..." is chosen. Of course, just as before, you may also double-click on the drive, folder, or file icon.

If you have selected the "Open..." function without selecting an openable object, a dialog box will appear for starting a program, much like a command line interpreter (CLI). You'll need to type the full path name of the program here (for example, C:\MEGPAINT\MEGA.PRG). Parameters can also be provided here; program names and parameters must be separated from each other with a space.



*The File Menu*



*This box allows you to start a program the "old-fashioned" way.*

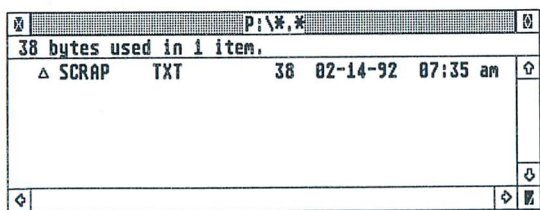
## Opening Files

If you have opened (by selecting and opening or simply by double-clicking) an ASCII text file that can be read from the desktop, a dialog box will appear informing you that this file can only be shown or printed.

If you choose to display this file, the first screenful will be shown and the computer will wait for further input. To see another screenful, press the space bar or the left mouse button. To see only the next line, press the **<Return>** key, and for the display of half of a screen, press the **<D>** key. You can quit this operation by pressing the **<Q>** key, by clicking the right mouse button, or by pressing **Control-**<C>****.

## Showing Information about a File, Folder, or Drive

The "Show Information..." function can only be chosen if you've previously selected one or more drives, files, or folders. In the case of drives, the used and free drive space will be shown; in the case of files and folders the length of the file, date, and the read/write status will be shown. This last function allows you to protect a file from accidental erasure. If a file is tagged with the attribute "read only," then its status is indicated with a small triangle in front of the file name on the desktop when the files are shown as text. Changing file or folder names also is possible with this function.



*When showing files as text, a "read-only" file is preceded by a triangle character.*

Newly-added is the possibility of selecting several files and working on one after the other. By choosing the "Skip" Button, you'll be presented with the next file. This is practical, for example, when changing the names of several files, as when deactivating accessories. This "batch" ability carries over into many of the desktop's functions.

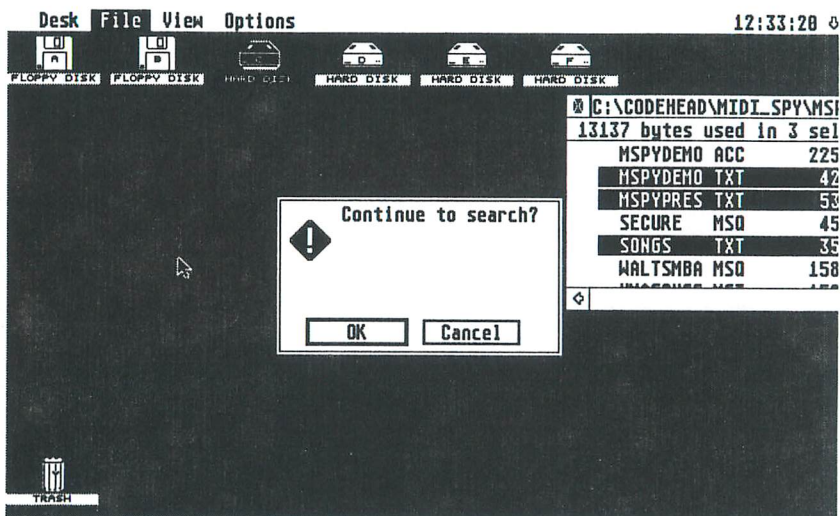
The two arrows before and after the pathname in the uppermost line of the dialog box allow you to scroll through the path, in case it doesn't fit in the provided area.



## Searching for Files

The new desktop has a built-in search function that will prove to be very useful. With it, you can search through selected folders, entire drives, or even a combination of drives for particular files; all subdirectories are automatically searched during this process. Before choosing "Search...", you need to select at least one drive, folder icon, or have a window open. If a window is open, the open directory will be searched.

You can enter any filename or use wildcards for your search specification. This allows you to search for either a single file or all files of a particular extension. Each time a file or files are found in a particular directory, they are displayed in a window and you can continue the search or cancel it.



*Here's an example of some files that were found when searching for "\*TXT".*

*When there are no more files to be found, you'll be informed with this message:*



## Deleting Files and Removing Icons

In order to delete one or several files, you can either drag them to the trash can or – after the files have been selected – choose the Delete function. The files will be destroyed and the information contained in them cannot be rescued without using magic!

New in TOS 2.06: you can also remove icons you don't need anymore from the desktop with this function. A dialog box asks you to decide what is meant by tossing the item into the trash can:



*When a desktop icon is selected for deletion, you may choose to remove the icon or delete the file or folder.*

## Creating New Folders

Before you can create a new folder, a drive must be selected or a window must be opened. Then you simply type in the desired folder name in the dialog box which appears when you click on the item "New Folder."

## Closing Windows and Folders

The function "Close" serves to close a directory. It has the same effect as clicking on the "Close" box of a window. If you are already in the top directory level of the drive (the root directory), then the window will be automatically closed. A window can also be closed immediately, regardless of the directory level by using the function "Close Window."

## Bottom to Top

A new function for owners of older TOS versions is the ability to shuffle windows on the desktop, even if they are totally obscured. The corresponding menu entry is called "Bottom to Top." It brings the bottom window to the top of the stack. All other windows remain in their same relative positions. This feature lets you quickly cycle through the available windows, especially if you use the keyboard command.



## Selecting All the Files in a Window

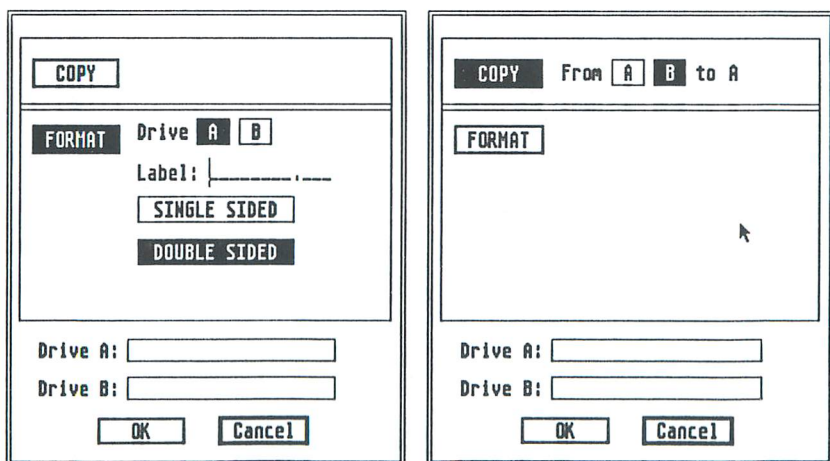
The function of selecting all the files present in the currently active window represents a great time-saver. By clicking on the menu item "Select All Items," all of the files and folders lying deeper in the directory hierarchy are selected independent of whether they are currently visible in the window or not.

## Establishing a Filemask

With this function, you can define which files will be displayed in the current window. The function "Set File Mask..." allows the use of wildcards much like what is often used in the file selector. That is, inputting "\*.PRG" causes the display of all program files. Folders are not influenced by filemasks, and therefore always displayed.

## Formatting Disks

Formatting and also copying of entire disks is possible with the menu item "Format Floppy Disk..." If you have a high-density drive and the manufacturer has provided the corresponding driver software, you will also be able to format high density diskettes with the desktop's format function. You'll know whether your HD setup is capable of this from the presence (or absence) of "High Density" in the Format dialog shown below.



*The Format dialog box allows you to format or copy a floppy disk. TOS 2.06 has built-in support for high-density floppy drives.*

## 2.3.View

### Representing Files as Icons

To show the files in pictorial form, choose the "Show As Icons" function. Now a corresponding symbol (also called an icon) will be shown for every file.

### Representing Files as Text with File Length and Date

You can also have the files displayed as text. In this mode, the length of the file and the date it was last modified is shown next to the filename on the same line. With this kind of display, a small triangle in front of the filename will indicate if a file has been set to read-only status.

### Sorting Criteria in the Display of Files

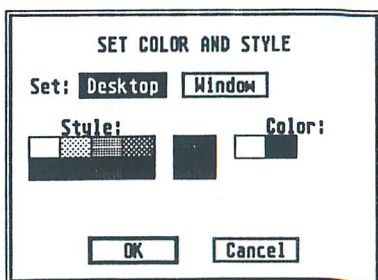
The order of the files displayed in a window can be sorted by name, date, size, and type (extension). The ability to display files in an unsorted order has been newly added; this can be an enormous help when determining the correct order of files in the AUTO folder since the order of execution is the same as the unsorted order.

### Sizing to Fit

With the "Size to Fit" function, the representation of the icons is limited to the width of the active window, so that scrolling the window contents to the left or the right isn't necessary. This applies also to files shown as text, but is only evident in this mode on larger monitor displays. On these displays the selection of "Size to Fit" is almost imperative because otherwise you'll only see a portion of the files if the window is sized to one column.

### Changing the Colors and Background Pattern of the Desktop and Windows

You're no longer stuck with the same old green background color (in color mode) or the gray half-tone pattern (in monochrome mode). With "Set Color & Style..." you can change the background of the desktop as well as the white background of the windows.



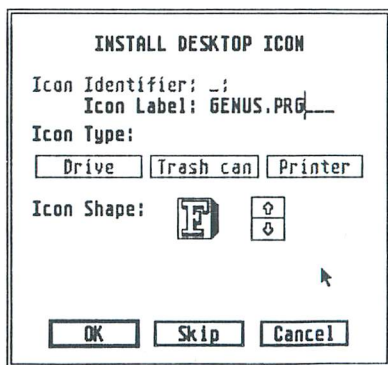
## 2.4.Options

### The Installation of New Icons on the Desktop

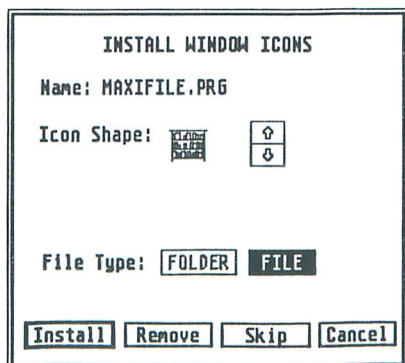
A unique icon can be chosen for each drive, the trash can, the printer, and every file or folder. This is done by selecting one or more of these items and choosing “Install Icon...”

With files and folders, icons can be assigned for each file or for an entire group of files. In order to assign an icon to a group of files, you can use “wildcards.” For example, if you type “\*PI3” as a filename and then choose an appropriate icon, all the files that have the extension “.PI3” will be represented with that new icon. To assign a special icon to a single file such as a program, select only one file and choose the desired icon. You can also work on a group of icons in one operation by first selecting the icons (through rubberbanding or shift-clicking) and then selecting “Install Icon...” The Install Icon box will take you through each of the selected items and you may “Skip” any that you don’t want to alter, much like the “Show Information...” option.

Don’t forget to save your work with the Save Desktop function.



*Depending on the type of item selected, one of these dialog boxes will appear, allowing you to choose an icon.*



The desktop normally provides a number of icons, which you can leaf through with the help of the arrow buttons. If you would like to define your own icons, then you must add them to the file DESKICON.RSC in the root directory of your boot disk. (See Icon Juggler on the TEC Utilities Disk.)

## Parameters for Installing Applications

The new TOS provides a very handy feature allowing you to start up programs with the function keys: A tap on F1 and your favorite program starts up, whether it be a word processor, programming language, or a game.

The menu item "Install Application..." is only selectable when an executable file has been previously selected, and contains the options necessary for this and further program-specific parameters. Altogether, 20 programs can be assigned to the function keys; the numbers 11 to 20 are called up by the combination of a <Shift> key and a function key.

If you'd like to have even more than 20 programs available to start at the press of a key, you should take a look at the program **HotWire**. You can get further information about **HotWire** by contacting CodeHead Technologies.

In the Install Application dialog box, you indicate the parameters with which the program is to be started, whether the current directory should be set to that of the application or the top window, and whether TOS should use the full path or the environment variables when searching for data files. If you choose "Application" and "Full Path" here, even untidy programs should find their needed files.

INSTALL APPLICATION

Application name: LOOKIT .PRG

Arguments: \_\_\_\_\_

Document type: TXT

Install as: F\_

Boot Status:  Auto  Normal

Application type:

TOS  TOS-takes parameters

GEM  GEM-takes parameters

Default dir:  Application  Top Window

Parameter:  Full Path  File Name

Install  Remove  Skip  Cancel

*The Install Application box allows you to configure an application in many ways, including selecting it as your auto-run application.*



“Document Type” operates as in previous versions of TOS, where you may install the application for a particular file extension. This allows double-clicking on data files of that type, thereby starting up the application and having the file automatically loaded into the application (if the application has been programmed for this feature).

There’s a new capability of predefining command lines, “Arguments.” For instance, a file compression utility like ZOO can automatically extract from files with the extension “.ZOO” to a particular partition or a corresponding folder. In addition, several files can be dragged to it, whereupon it would automatically extract the files — as long as you’ve predefined a suitable command line.

Atari has added the file type “GEM Takes Parameters” (.GTP) allowing parameters to be passed to any desired GEM program in the same way as a TTP program.

And finally, in this dialog box, you can designate an auto-booting program, that will be automatically run after booting the computer. There can only be one auto-run program. When you select “Auto,” any previous auto-run program will be canceled.

You’ll need to “Save Desktop” after installing applications in order to save your changes permanently.

### **Automatic Installation of Available Drives**

In earlier TOS versions, one had to individually install each drive for the desktop. In TOS 2.06, you can select “Install Devices” and icons are automatically placed on the desktop for all available disk drives.

### **Removal of Icons**

In order to remove an icon from the desktop, you can either drag it directly to the trash can or — after the icon has been selected — remove it by selecting “Remove Desktop Icon.”

### **Setting Preferences**

The Set Preferences dialog box allows you to configure which warnings will appear during file copying and deleting. “File Deletes” controls warnings for deletions, “File Copies” controls warnings for copying, and “File Overwrites” determines if you’ll get a warning before overwriting a file that already exists.

You can also choose from among the various screen resolutions here; this is only relevant if you are using a color monitor.



## Reading a New Desktop Configuration

A substantial improvement in TOS 2.06 is the ability to load a new desktop configuration. Previously, the file information for configuration of the desktop was only loaded during boot-up, and it wasn't possible to read a new one without rebooting the computer. With "Read .INF File...", a new configuration can be loaded by selecting it with the file selector. Although the default name of the configuration file is now "NEWDESK.INF", you may load a configuration file with any name (including the older DESKTOP.INF files). This allows you to set up different desktop configurations, save your desktop, copy "NEWDESK.INF" to a different location, and rename it, thereby creating a library of configuration files.

## Keyboard Control of Desktop Functions

The "Desktop Configuration" menu entry opens up a dialog box allowing you to assign keyboard equivalents to most menu items. In addition, you can view the function key assignments for starting program, but you cannot edit them. At the top of the Desktop Configuration box are selections for default directory and input parameter. These operate in the same manner as in the Install Application box, but affect all programs not otherwise configured. At the bottom of this box is a display of System Free Memory. This value shows the size of the largest memory block currently available in your computer.

## Saving the Desktop Configuration

The function "Save Desktop" saves a number of settings, including the placement and arrangement of desk icons, desktop windows and sizes, Option and View menu selections, installed applications, icon assignments, default resolution, colors and styles, the state of the Blitter, and the auto-run program.

In previous versions of TOS, this file was called DESKTOP.INF, but, from TOS 2.0x on, the file is called NEWDESK.INF. If NEWDESK.INF is not found when your computer boots, TOS will load an existing DESKTOP.INF file, but it's best to save your desktop configuration anew so that you have a NEWDESK.INF file.

## Print Screen

Selecting the Print Screen function will produce a hardcopy of the screen on your printer. This can also be accomplished by pressing the key combination <Alternate>-<Help>. The built-in routine is configured for 9-pin printers. If you are using a laser or a 24-pin printer, you'll need a copy of the corresponding printer driver, which is available in the Public Domain.

### **Turning the Blitter On and Off**

The Blitter is a chip which accelerates graphics operations in your computer. The “Blitter” menu option allows you to turn the Blitter on and off. If your computer doesn't have a built-in Blitter, this menu item will not appear.

## **3. Invisible Changes**

Behind the scenes in the desktop, many changes have been made to the internal workings of TOS. These changes may be of interest to programmers and further information can be obtained by contacting Atari Corporation for documentation.

To the user, it is only important to know that a number of bugs have been removed and optimization has been performed, providing greater efficiency, enhancing the usefulness of your computer and increasing the speed of its operation.

## **4. Special Problems Accompanying the TOS Upgrade**

In most cases, the transition from TOS 1.0x to TOS 2.06 will be very smooth and proceed without any trouble. But there are a few problems which might occur and should be mentioned here.

Although nearly all programs support 2.06, there are certainly some which will not function with this new TOS version. This is particularly troublesome with AUTO folder programs and accessories. In this case, the computer may crash during the boot process, prohibiting you from reaching the desktop. Thanks to TOS 2.06, however, one can solve this easily by holding the ⌘Control key down during boot-up so that the accessories and AUTO folder programs are bypassed. Upon reaching the desktop, you can simply rename the problem program or accessory.

If your hard drive has partitions larger than 16 megabytes and you've installed the switchable TOS option, or even if you hook up your drive to a machine with older TOS in it, there is a potential for serious damage to your files. See the warning on page 15.

## 5. Creating Your Own Icons for the New Desktop

An icon file named DESKICON.RSC must be placed in the root directory of the boot partition in order to install new icons for the the new desktop. The resource file DESKICON.RSC contains a single tree of the DIALOG type. In the dialog box are many objects of the ICON type. Each individual icon can be edited with an icon editor.

For the creation or modification of this file, one normally needs a resource construction set. On the TEC Utilities Disk, we've provided a program called Icon Juggler that will make it easy to create your own set of icons from existing icons in all formats. There's also a DESKICON.RSC file to get you started.

## 6. Keyboard Equivalents

Earlier TOS versions had almost no keyboard equivalents available. Besides the commands assignable from the Desktop Configuration box, the desktop in TOS 2.06 offers many other useful functions at the press of a key:

Alternate-1	Switch to low resolution.
Alternate-2	Switch to medium resolution.
Alternate-3	Switch to high resolution.
Control [A-P]	Display the directory of drive [A-P] in the current window.
Alternate [A-P]	Display the directory of drive [A-P] in a new window.
Arrow Keys	Scroll in the current window. Hold Shift for paging.
Help	Display an overview of the keyboard macros.
Undo	Abort the current file operation.
Return	Deselect selected objects.
>	Print the contents of the current window as ASCII text.

You can modify the operation of certain mouse actions by holding down particular keys:

Holding down the Alternate key while double-clicking on a folder causes the contents of the folder to appear in a new window.

Holding down the Control key while dragging items will move them instead of copying them. The original items are deleted.

Holding the Alternate key allows the renaming of files during the copying process.

Control and Alternate together allows both the moving and renaming of files.





The basic TEC requires soldering; TECbridge versions simply plug in.

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**T**OS  
**E**xtension  
**C**ard

Utilities Disk

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