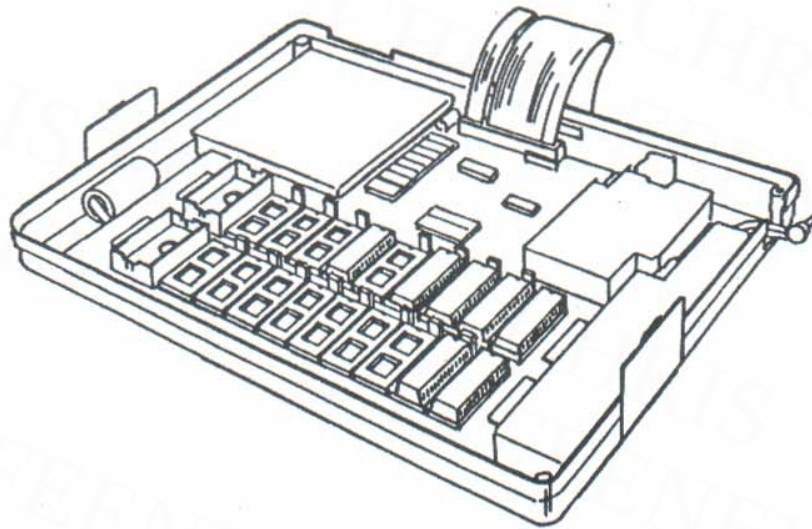# BOOSTER PAK™

RAM and ROM Expansion
for the
Tandy 100 and 102 Computers

TRAVELING
SOFTWARE
®

BOOSTER PAK™

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RAM and ROM Expansion
for the
Tandy 100 and 102 Computers

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PAK–H87

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TRADEMARKS

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Section 1

Getting Started

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Overview:
Read This First

Before you proceed, take a few minutes to orient yourself
to the world of the BOOSTER PAK. You may know your
Tandy computer thoroughly, but the BOOSTER PAK intro-
duces new considerations with which you must become
familiar. Understand these considerations, and you soon
will become as accustomed to using your computer *with*
the BOOSTER PAK as you now are to using your computer
by itself.

Two of these considerations—*directories* and *environments*
—are particularly important. They are involved in many
of the operations you will undertake with the BOOSTER
PAK. And the manner in which you set up your direc-
tories and environments will determine how efficiently the
BOOSTER PAK serves you.

The Workspace and the RAM Disk

With the addition of the BOOSTER PAK your Tandy 100
or 102—with its limited memory—is freed of the need to
store your programs and data files while they are not in
use. You will now store them in the BOOSTER PAK.
When you want to run a program and work on your files,
you will instruct the BOOSTER PAK to load them into your
computer. When you are through, they will be returned
to the BOOSTER PAK for storage.

In terms of the BOOSTER PAK, then, your computer has
become a *workspace*—the place where programs are run
and information is created and altered.

When they are not in use, your programs are stored in the
BOOSTER PAK—in either the ROM or RAM chips installed
in the PAK, depending on the program. Your data files
are all stored in the RAM chips.

The part of the BOOSTER PAK which stores your data files and any programs not on ROM chips is called the *RAM disk*.

Directories

Before initializing the BOOSTER PAK you will be advised to back up all important files in your computer and then cold start the computer. You will thus start with a clean slate. Once the BOOSTER PAK is installed, you will copy files into the RAM disk—the expanded RAM now available in the PAK. When you copy files into your RAM disk, you will place them into *directories*. And as you continue using the BOOSTER PAK, you will create and store files in directories.

The large amount of memory available in the RAM disk permits the storage of many more files than you are used to with your computer. In fact, you can quickly accumulate so many files that their number becomes unwieldy. Like disk-operating systems on desktop computers, then, the BOOSTER PAK allows you to create a hierarchy of directories and thus group your files in a way that makes sense to you.

When you initialize the BOOSTER PAK a *ROOT directory* is created automatically in the RAM disk. You can then create virtually as many directories as you need—up to 254 in all.

Unlike desktop computers, the BOOSTER PAK allows directories at only two levels: the ROOT directory and one level below the ROOT. Because they branch off the ROOT directory, the optional directories are sometimes call *sub-directories*.

This diagram illustrates a RAM disk for which the user has set up three directories (or subdirectories):

```
                        ROOT
                         |
         ┌───────────────┼───────────────┐
    Directory A     Directory B      Directory C
```
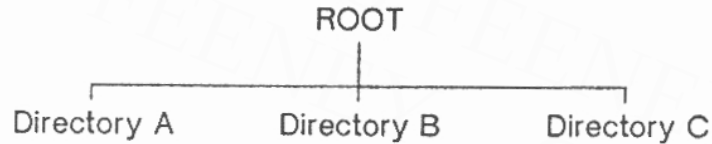
The names of all the directories you create will appear in the menu of the ROOT directory. You can find any file stored in the RAM disk by traveling from the ROOT directory to the directory in which the file is stored: simply place the bar cursor over the name of the directory and press [ENTER]. There is also a function key that allows you to move directly from any directory—either the ROOT or one of the subdirectories—to another directory.

The process of moving from one directory to another is called *logging*. And the directory you are in at the moment is called the *logged, or current, directory*.

Setting Up Your Own Directories. When setting up your own directories consider how you use your Tandy computer. Which files do you want grouped together, separately from the others? When you use a particular file, which other files do you also want to have quick access to?

Let's consider that you use your computer for these purposes: writing articles for magazines; corresponding with publishers and with family and friends; keeping your business and personal accounts; and doing miscellaneous other tasks. Under these circumstances you might decide to create six directories: one each for magazine articles, business correspondence, personal correspondence, business accounts, personal accounts, and miscellaneous work. Allowing up to six characters for each name, you could designate these directories as MAG, CORR1, CORR2, ACCTS1, ACCTS2, and MISC.

This diagram illustrates the directory structure just proposed:

```
                        ROOT
                         |
  ┌────────┬────────┬────────┬────────┬────────┐
 MAG     CORR1    CORR2    ACCTS1   ACCTS2    MISC
```

Environments

In addition to directories you will create environments. Whereas directories have to do with the storage of files in the RAM disk of your BOOSTER PAK, environments have to do with the operation of the workspace in your Tandy computer. Each time you load an environment, you in effect create a new workspace in your computer.

Environments serve two main purposes:

- to load programs and data files from the RAM disk into the workspace—and back into the RAM disk

- to prepare the workspace to run ROM-based programs and other programs

Preparing the Workspace. If you have ever switched from one machine-language program to another or from one ROM-based program to another or have tried to run one program while another is in high memory, you already know the problems and dangers that can arise out of conflicts between programs. At worst you may inadvertently cold start your computer and lose valuable files.

The BOOSTER PAK makes use of environments to avoid these conflicts and make it easy to switch from one program to another.

When you initialize the BOOSTER PAK a *NULL environment* is created automatically. This environment duplicates in many respects the state of your computer after a cold start: the RAM in the workspace is cleared of all files, both program and data; high memory is cleared as are the buffers that temporarily store data for processing. The NULL

environment, in short, is a clean slate, waiting for programs and data files and the information necessary to operate the programs.

The NULL environment is all you will need to operate some programs. You can move from one program to another within the NULL environment—as long as those programs do not conflict with each other.

When you are using programs based on ROM chips in the BOOSTER PAK, however, you will have to create special environments. Each environment will prepare the workspace to operate a particular ROM-based program.

Loading Files into and out of the Workspace. As part of the process of creating an environment for a particular program, you will take the steps necessary to include in the environment the file for that program. Each time thereafter that you load that environment the program automatically will be loaded into the workspace along with the environment. Remember that programs must be loaded from the RAM disk into the workspace before they can be used.

Environments are useful also for loading data files. (Like program files, data files must be loaded into the workspace before they can be used.) Assume now that you make regular use of certain data files in connection with a particular program. By including those files in the environment, you can load everything—program *and* data files—in the few keystrokes it takes to load the environment.

The files associated with an environment are not fixed. You can add or delete them as the situation demands. Each time you exchange environments (that is, replace one environment with another), you are asked if you want to update the environment as it now exists (the current environment). If you reply that you do, all files currently in the workspace—even those you have added since loading the environment—now become part of that environment.

And the next time you load that environment, those same files will be loaded into the workspace. If you reply that you do *not* want to update the environment, you will leave the environment as it was the last time it was updated. And only those files loaded into the workspace the last time you loaded that environment will be loaded into the workspace the next time you load the same environment.

Environments are not the only means of loading files into and out of the workspace. You may, for example, use the Copy or Kill function keys to move them one at a time or several at once. The BOOSTER PAK also lets you set up macros, by which you can reduce to 2 the number of keystrokes necessary to move files into the workspace. You might, for example, set up a macro to load a data file into the workspace, activate the program associated with that environment, then open the file.

The Link between Environments and Directories

Though distinct in purpose, environments and directories are inextricably linked by certain rules. These rules are in force whenever you exchange one environment for another.

Updating an Environment. As part of the process of exchanging environments you have the choice of updating or not updating the current environment.

If you opt to update the environment, all files currently in the workspace will be saved to the directory of the RAM disk you were in when you loaded that environment. They will be saved to that directory even if you have logged onto a different directory in the meantime. Any changes you made in the files while they were in the workspace will then be saved to the RAM disk. (If you opt *not* to update the current environment, none of the changes you made to the files will be saved to the RAM disk.)

Loading an Environment. When you load an environment you replace the files of the current environment with those of the new environment. In loading the new environment, the BOOSTER PAK software looks for files only in the *current* directory—that is, the directory you are in when you load the environment. If you wish, you can then copy files from other directories into the workspace; these files become part of that environment and will remain so until you delete them.

Setting Up Environments. The crucial link between environments and directories, then, is the directory you are in when you load an environment. From this it follows that you should set up each environment *within* the directory containing the program and data files you want to use when you load that environment.

When you create an environment, you create a file. That file is stored in the directory in which you created the environment. To load that environment move to the directory in which the file for that environment is stored. Then activate the file by placing the bar cursor over its name and pressing ENTER.

If you wish, you can set up more than one environment in a directory. You may, for example, have more than one ROM-based program you want to use with the files in that directory; by setting up an environment for each program you can move easily from one program to another. You can even set up more than one environment for a single program. If you find, for example, that you are using a program with certain data files at times and certain other data files at other times, you may find it economical to create an environment for each set of files. Moving from one set of files to the other then becomes a matter of a few keystrokes.

The BOOSTER PAK as an Open–ended System

> **open-end·ed**, *adj*. not rigorously fixed, adaptable to the developing needs of a situation.

As you have discovered, the BOOSTER PAK imposes certain rules. But those rules are general enough to make the BOOSTER PAK a truly open-ended system. Operating within those rules leaves you considerable latitude in how you use your BOOSTER PAK, particularly in the creation and use of directories and environments.

Because it describes an open-ended system, this manual sometimes explains different ways of accomplishing the same end. It will be up to you to choose among the possibilities in light of your own requirements and habits. You will find that one approach works well for you in certain situations while another approach works better in others. Only by knowing the possibilities can you make the best choice.
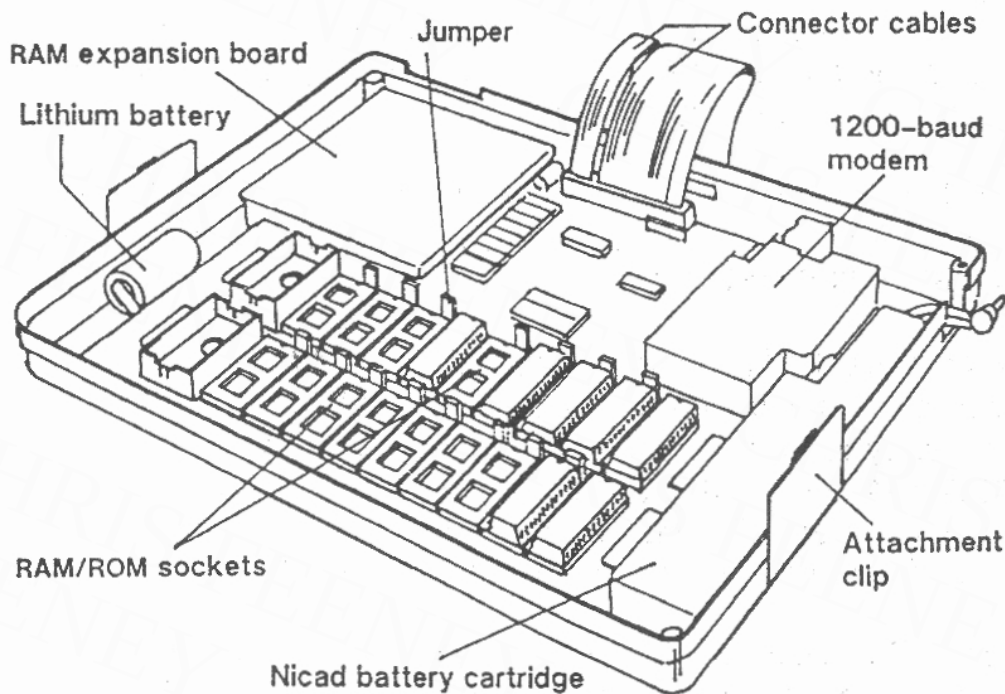
What You Need to Use the BOOSTER PAK

The BOOSTER PAK can be used only with a Tandy 100 or 102 computer with 32K of memory.

In order to use the disk operations described in Section 2 you must also have a 3½-inch portable disk drive or an IBM PC, XT, AT, or compatible desktop computer and the DESK-LINK program, available separately from Traveling Software.

What's What
⸰ in the BOOSTER PAK

Now that you have acquainted yourself with directories, environments, and other matters essential to the operation of the BOOSTER PAK, let's look at the BOOSTER PAK itself.

RAM expansion board   Jumper   Connector cables

Lithium battery

1200–baud
modem

RAM/ROM sockets

Attachment
clip

Nicad battery cartridge

RAM/ROM Sockets: The basic BOOSTER PAK has a total of 20 sockets for RAM and ROM chips; 18 of those sockets may be in use at one time. Already installed in 7 of these sockets are 3 chips (both RAM and ROM) for the BOOSTER PAK software and operating memory, 1 ROM chip containing the software for the telecommunications program and the Asteroids game, and 3 other RAM chips of 32K each. If you ordered just the basic BOOSTER PAK, you then have 11 open sockets in which you can install your own chips—12 sockets if you remove the telecommunications/Asteroids chip. (See page 1-14.) If you ordered additional RAM or ROM chips, those chips have already been installed.

Jumpers: There are 15 jumpers, one at each of the sockets designed to hold either a RAM or a ROM chip. The jumper at each of these sockets must be positioned in such a way that it designates the chip in that socket as either a RAM or a ROM chip. The jumpers for all of the factory-installed chips are in the correct position.

Connector Cables: The two connector cables link the BOOSTER PAK to the computer. The narrower cable attaches to the option ROM socket inside the ROM module expansion compartment of your computer, the wider cable to the system bus. (See page 1-16.)

Lithium Battery: The lithium battery, rated to last 7–10 years, retains any information you place in the memory of the BOOSTER PAK RAM chips.

Attachment Clips: These handy clips hold the computer securely in place, on top of the BOOSTER PAK. Once you are ready to do so, simply lower the computer into the BOOSTER PAK and the clips will snap into a secure lock on the computer. To remove the computer, spread both clips and lift the computer way from the BOOSTER PAK.

Note: The remaining items in the illustration above are *optional* and will be included in your BOOSTER PAK only if you have ordered them:

Nicad Battery Cartridge: This rechargeable battery cartridge plugs into the external power adapter connector on the side of the Tandy computer. When the cartridge becomes exhausted, the low battery indicator on the computer will light up. Unplug the battery cartridge and operate the computer off the alkaline batteries inside the computer. Or plug your Tandy AC adapter into the cartridge and continue working as the cartridge is being recharged. (A separate pamphlet describes the battery cartridge.)

1200–baud Modem: With this modem you can load files

directly into and out of the RAM disk of your BOOSTER PAK or the workspace of your computer at the rate of 1200 baud. It operates off the X-TEL software included in the basic BOOSTER PAK as well as the TELCOM software built into your computer. Powered by its own 9-volt battery, the modem has a cable, which connects to the computer's RS232C serial port, and an RJ11 telephone jack; plug one end of the telephone cable included with the modem into the jack, the other end into a telephone wall outlet. (There is separate documentation for the modem and for the X-TEL software.)
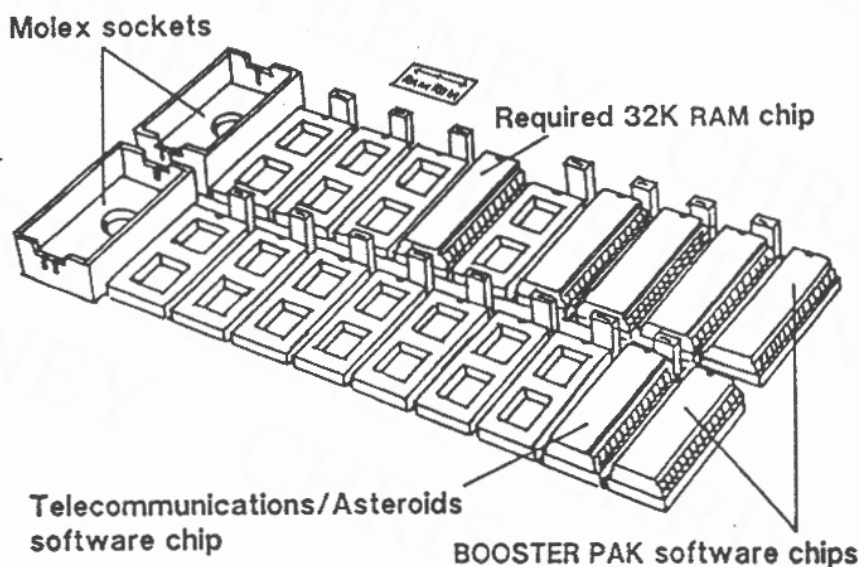
RAM Expansion Board: There are 6 sockets in the RAM expansion board, each designed for a 256K RAM module. Like the 32K RAM chips in the basic BOOSTER PAK, these modules provide *unsegmented* memory for the storage of files: there is no need to change banks, and the only limit on the size of a particular file is that imposed by the total amount of memory in the RAM disk. If you ordered 256K modules with the BOOSTER PAK, those modules have been installed for you.

Installing Your Own Chips

Any chips—whether RAM or ROM—you ordered with the BOOSTER PAK are already installed. If you have no chips of your own to be installed, you are ready to install the BOOSTER PAK. Turn to page 1-16.

If you have chips to install there are a few requirements you need to know about.

Requirements of the RAM/ROM Sockets

Molex sockets

Required 32K RAM chip

Telecommunications/Asteroids software chip

BOOSTER PAK software chips

Of the 20 RAM/ROM sockets all but five are designed to hold either RAM or ROM chips. These are the five exceptions:

- **BOOSTER PAK System Chips:** The 2 sockets at the right end of both rows of sockets contain the software and part of the operating memory for the BOOSTER PAK; no other chips should be put in their place.

- **Required 32K RAM Chip:** A 32K RAM chip now occupies a socket near the middle of the upper row of

sockets; this socket, which provides additional memory for the operation of the system, *must* contain a 32K RAM chip.

• **Molex Sockets:** The Molex socket at the left end of both rows of sockets can be occupied only by the kind of *ROM* chip that fits into a Molex socket.

About the Molex Sockets. If you have any software on ROM chips that you have been plugging into the ROM module expansion compartment of your computer, you should now install those chips in either of the Molex sockets. Only these two sockets are equipped to hold Molex chips. Any ROM chips you place elsewhere in the BOOSTER PAK must be straight-pinned chips.

Molex ROM chip

Straight-pinned chip
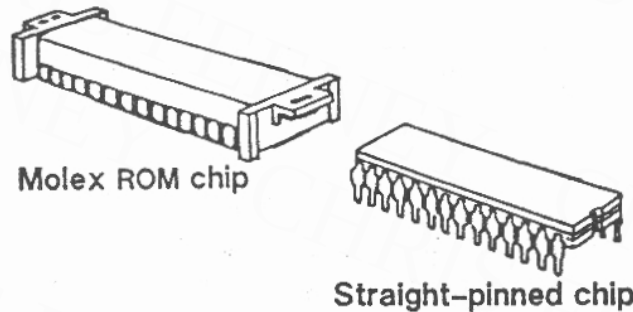
If you have more than two Molex ROM chips and would like to continue to use all of them, contact Traveling Software. We can convert Molex chips to straight-pinned chips.

The socket just to the right of each Molex socket is specially defined. These sockets can accommodate either a ROM or a RAM chip, but their use is mutually exclusive with that of the Molex sockets: if you install a chip in either Molex socket, you cannot install a chip in the socket immediately to the right. Conversely, if you install a chip in the socket immediately to the right of either Molex socket, you cannot install a chip in the adjoining Molex socket. This is why only 18 of the total 20 sockets can be filled at one time.

32K RAM Chips. Use only RAM chips with 32K of memory. The BOOSTER PAK will not work properly with other RAM chips.