

Radio Shack®

MICROCOMPUTER NEWSLETTER

MAY, 1979

Radio Shack One Tandy Center Fort Worth, Texas 76102

Computer Services

HOTLINE

1-800-433-1679

This information may be the most valuable you'll find in this Newsletter. We suggest you read it carefully and file it for future reference.

Radio Shack is dedicated to the idea that our responsibility to you doesn't end when we sell you a computer. For that reason, we've established a Computer Services Group to help you with hardware and software questions.

Of course, one of the first things you can do to insure best performance from your equipment is to read your manuals carefully. Often, the solution to a problem can be found in the manuals. But if not, Radio Shack Computer Services has a toll-free HOTLINE you can call for assistance. It's shown in big type above and again on the next page.

The Computer Services Group has recently been reorganized and is now under the direction of John Snodgrass. On John's staff are a number of computer analysts you can call to get answers to your questions.

To get the most efficient service, think through your problem completely and develop as clear a statement as possible about your difficulty. (For vague aches and pains, we can only prescribe aspirin.) Please DO NOT call us for help in writing or debugging your applications programs . . . we are not set up for custom software work.

Radio Shack is a 59-year-old company. We value *your* business and *our* reputation. So here's how you can help us preserve both:

For **routine** questions, call our Computer Services Group and speak with one of our analysts. The toll-free number is:

1-800-433-1679 (or 1680)

If you believe the problem is **not** routine; if it appears to be chronic and has resisted repeated attempts at solution, call and ask specifically for Paul Ranco. Think of Paul as a "central communications point" at Radio Shack who knows where to get the answers you need.

In the case of a detailed problem, it may be easier and more convenient for you to write. But always include a telephone

Please turn to Hotline. next page



SALE!

\$200 OFF TRS-80™ SCREEN PRINTER

If you've been needing an economical way to get a printed copy of programs and data, your wait is over! Our fast Screen Printer is now on sale for \$399. (Regular price, \$599.)

This printer will produce a copy of whatever is on your video screen — including graphics — in only 2 seconds! It will operate on a Level-I or Level-II TRS-80, with or without the Expansion Interface. BUT—if you presently have an Expansion Interface with a buffered cable, you will have to order a *special* buffered cable, discussed below.

The Screen Printer uses special aluminum paper which can be ordered at your Radio Shack store from our National Parts Dept. Copies will not fade and are not affected by heat or light.

Don't miss this outstanding buy. Save \$200!

Screen Printer,
Cat. No. 26-1151 Sale \$399.00
Paper, Item No.
ACP-0001 Pkg. of 3 rolls, \$14.95

SCREEN PRINTER BUFFERED E/I CABLE

If you are operating an Expansion Interface that already has a Buffered Cable, you will need this **special** Buffered Cable for use with the Screen Printer.

Just ask your store to order part number AW-2340 from Radio Shack National Parts Dept. in Fort Worth.

When the new cable arrives, you can exchange your existing buffered cable for the new cable at no charge.

**Part No. AW-2340 No Charge
with Exchange.**

Ft. Worth Scene . . .

"Good grief, Virginia! It's a newsletter from Radio Shack! Now I know there's a Santa Claus!"

We know how you feel. We've received numerous inquiries about the "monthly" Microcomputer Newsletter. Please bear with us a little longer. We are in the process of "beefing up" our Newsletter staff so it will *indeed* be the monthly publication we've been promising. Meanwhile, we've tried to do some catching up by making this an extra long issue. Look it over carefully — there should be something of interest for almost everyone.

. . . .

To start with, many of you will be pleased to know that TRSDOS 2.2 is in the works. It will contain some corrections and enhancements. Again, bear with us . . . it'll be worth the wait! The exact release date for TRSDOS 2.2 is not certain, but when it's released, those of you who already have TRSDOS 2.1 can get the new version **at no charge**.

All you'll have to do is go to the Radio Shack store or Computer Center where you purchased your original system and pick up a diskette with the new system and revised manual pages.

TRS-80 User's Groups are forming all over the country. We have received reports from groups in Oregon and California, and West Virginia. If there are more of you out there, we would very much like to hear from you! Write to:

Microcomputer Newsletter
700 One Tandy Center
Fort Worth, Texas 76102

Let us know that you exist and what you're doing. If you have any programming tips or especially useful programs you'd like to share, send them in so we can publish them in future editions of the Newsletter.

Mailing List Info
— See last page —

Disk Owners
. . . See Page 5

KKKKeybounce . . .

Keybounce is the condition in which a key is struck **once**, but **two** or more characters are transmitted to the computer. We'd like to explain why this happens and what you can do about it.

Normally, when you depress a key, two prongs located under it make electrical contact. This completes a circuit and a character is transmitted. If, for any reason, the prongs separate and then make contact again (before you remove your finger from the key) a second character may be transmitted.

Striking the key hard, or at an unusual angle, can cause the prongs to vibrate and transmit the extra character. Also, dust and the need for lubrication and cleaning can keep the prongs from moving freely and smoothly.

You can cure the keybounce problem two ways. A program called KBFIX can be ordered through your Radio Shack store. Ask them to order the cassette from the National Parts Dept. in Fort Worth — stock item ACT-0300.

As an alternative to the KBFIX program, here are some routine maintenance tips that can help prevent the keybounce problem or remove it if it exists.

First, when not using the keyboard for an extended period of time, (like overnight), place a dust cover over it. When working around the keyboard, take care that eraser shavings, cigarette ashes, chalk, dust, etc. do not get under the keys.

If keybounce does occur, the back-arrow key (↵) can be used — as usual — to erase the extra characters. If you desire to correct the problem yourself, the following steps should help. (If you don't trust your mechanical aptitude, take the keyboard to your Radio Shack store for servicing.)

The picture below shows how a key cap can be "popped off" using a heavy paper clip. The key caps are held in place by a pressure fit.

Bend a paper clip to form a "J," then place the "hook" of the paper clip under the front center of the key cap. Apply steady, firm pressure in the upward direction until the key pops off.



The next picture shows the two prongs that make contact when the key is depressed



Clean the prongs as follows.

1. Obtain a good spray lubricant, like Radio Shack's Color-TV Tuner Cleaner, Cat. No. 64-2320. A good cleaner from another manufacturer is LSP #1. However, if any other cleaner is used, first spray it on the bottom of a key to make sure it doesn't damage the plastic.
2. Spray the cleaner/lubricant on a cotton swab. Then, wipe the prongs with the swab, **very gently** to remove any dirt or other debris.
3. **Some** flexibility is present in the prongs but **do not** forcefully bend them.
4. Replace key cap by centering it over the prongs and pressing straight down.
5. Now, test the key. In most cases the keybounce will be gone. If it still occurs, try the process again or get service through your local Radio Shack store.

NEW PRINTER INTERFACE CABLE

This new Printer Interface Cable allows you to operate **any** of our current Line Printers off the Level-II Keyboard Unit directly, **without** having to use an Expansion Interface!

If you are operating on a budget, and don't need any of the other E/I features, this may be your easy route to paper copy!

Printer Interface Cable,
Cat. No. 26-1411 \$79.00



Quick Printer Manual Update

On page 8 of the Quick Printer Manual, step 3 under "Using the Printer" mentions an "Interface Cable."

This cable is the one described above. (Cat. No. 26-1411). It's now (and finally!) available.

HOTLINE

Continued from first page

number where you can be reached during business hours, because we will reply by phone. Address all inquiries to:

Radio Shack Computer Services
205 NW 7th Street
Fort Worth, Texas 76102

Radio Shack depends heavily on the Computer Services Group to keep us informed of problems and relay customer suggestions for product improvement. They are the folks to turn to for help and they're here to do everything possible to help **you** — our valued computer-products customer.

TAPE MAILING LIST IMPROVEMENTS

Several improvements to the Tape Mailing List have been suggested by customers. One is an option to sort by zip code; the other is an option to sort only on command. Since a sort of 400 names could take seven hours or more, it is often desirable to postpone the sort until the end of the day, then run the sort at night.

1. These changes make sort a menu option. Add these lines:

```
62 PRINT "(X) SORT THE LIST"
95 IF A$="X" THEN GOSUB
9000:GOTO30
```

Change line 322 to read:

```
322 N=N-1:GOTO30
```

2. These changes allow sorting by either name or zip code. Add this line:

```
9002 CLS:Z=0:P=555:PRINT
@522, "NAME OR ZIP
CODE SEQUENCE
(N/Z)";GOSUB3000:
IF A$="Z" THEN Z=5:ELSE
IF A$(">"N" THEN 9000
```

Change line 9030 to read:

```
9030 IF B$(I+Z)=F$(K,
I+Z) THEN 9060
```

— EXPLANATION —

Change #1. Add a new line to the main menu. It reads:

```
(X) SORT THE LIST
```

When the letter "X" is typed, the mailing list will be sorted. No sort will take place after adding names to the mailing list.

Change #2 will print the following message when a sort is requested:

NAME OR ZIP CODE SEQUENCE (N/Z)

Type N to alphabetize the list or Z to arrange the names in zip code sequence.

CORRECTION TO MANUAL

The number of names which may be held by the system is incorrect. They should read:

RAM	CAPACITY
16K	80
32K	250
48K	400

Radio Shack's Unique "Live Keyboard" Input Routine

Dress up your programs with this unusual coding

The program reproduced on this page will give you a considerable amount of power and control over the process of input to your programs.

This program, called INKEY, can recognize the difference between numeric and alphanumeric input. (By the way, don't confuse subroutine INKEY with the BASIC command INKEY\$, which it uses.)

For numeric input, the program will not allow you to type a "bad" number. For example, it keeps you from putting a letter into numeric field, or two decimal points, etc.

This kind of control can be used to great advantage in computer-assisted instruction programs and others when the person doing the input tends to make errors — i.e., people like you and me!

For quickest execution, this subroutine should be near the beginning of your program. Here's how to use it.

First, place the cursor at the beginning of the input field on the screen. Next, give a value to the flag variable FL. Finally, execute a GOSUB 100 which sets INKEY into operation.

You assign a value to the variable FL according to the following rules.

The numeric (or absolute) value of FL is the maximum number of characters INKEY will accept for input. INKEY will take fewer than FL characters, but not more.

If FL is positive, INKEY will expect alphanumeric input. These characters include everything from the "space" (20 hexadecimal) through the letter "Z" (5A hexadecimal).

If, however, you make FL negative, INKEY will expect numeric input. The acceptable numeric characters are **0 through 9, +, -, . and comma**. INKEY will only accept one +, - and . (decimal point). Any number of commas may be typed, but they are ignored by INKEY. The keyboard will not respond to any other characters during numeric input.

Finally, if you make the numeric (absolute) value of FL equal to 1, it will not be necessary to press the ENTER key after typing the acceptable character. INKEY will just go ahead and resume execution.

The information you type will return to the calling program in the string variable IN\$. (By the way, if the input was numeric, the contents of IN\$ may be converted to the internal computational form by using the function VAL... e.g., Y=VAL (IN\$).)

```

100 IN$="" : W$=INKEY$ : W=14 : WD=0 : WS=WD : WLX=WD : IFFL=WD THEN FL=1
105 PRINTSTRING$(ABS(FL), 136) : STRING$(ABS(FL), 24)
110 PRINTCHR$(W) : FOR W=1 TO 25 : W$=INKEY$ : IF W$<>" " THEN 115
    ELSE NEXT PRINTCHR$(15) : FOR W=1 TO 25 : W$=INKEY$ : IF W$<>" "
    THEN 115 ELSE NEXT : GOTO 110
115 PRINTCHR$(W) : IF ABS(FL)=WLX THEN 125 ELSE IFFL>0 AND W$<>" "
    AND W$<="Z" THEN 170 ELSE IFFL<0 AND W$<>"/" AND W$<" " THEN 170
117 IF W$="." THEN PRINT W$ : WLX=WLX+1 : GOTO 175
120 IF W$="." AND WD=0 THEN WD=1 : GOTO 170
123 IF (W$="-" OR W$="+") AND WS=0 AND WLX=0 THEN WS=1 : GOTO 170
125 IF W$<>CHR$(8) THEN 150 ELSE IF WLX=0 THEN 110 ELSE PRINTCHR$(24) :
    IFFL>0 THEN 135 ELSE IFFPEEK(16418)=44 THEN 140
130 IFFPEEK(16418)=46 THEN WD=0 : GOTO 135 ELSE IFFPEEK(16418)=43
    OR PEEK(16418)=45 THEN WS=0
135 IN$=LEFT$(IN$, LEN(IN$)-1)
140 WLX=WLX-1 : POKE 16418, 136 : GOTO 110
150 IF W$=CHR$(24) THEN PRINTSTRING$(WLX, CHR$(24)) : GOTO 100
155 IF W$<>CHR$(13) THEN 110 ELSE PRINTSTRING$(ABS(FL)-WLX, 32)
160 PRINTCHR$(15) : W=25 : NEXT : RETURN
170 PRINT W$ : IN$=IN$+W$ : WLX=WLX+1
175 IF ABS(FL)=1 THEN 160 ELSE 110

```

Another nice feature of INKEY is that it "formats" the line for input. It prints as many graphics block characters as the maximum number of characters it will accept, and then places the cursor at the beginning of the field.

This way, you get visual "feedback" on how close you are to maximum input as you type. You don't have to count characters.

Of course our old friends backspace (␣) — to erase the last character — and shift/backspace — to erase the entire line — still work as usual.

One last thing — INKEY is a copyrighted program of Radio Shack and is included here for the benefit of our customers. This program should not be reproduced or sold under any circumstances. Good luck and happy computing!

LEVEL-II CASSETTE Modification Available

Those of you who are doing cassette input and output on a Level-II system know about the sensitivity of the volume control on the cassette recorder. This is mentioned on page iv in your Level-II BASIC manual.

Well... now we've got a modification (a PC board for your cassette recorder) that will considerably improve that sensitivity. And best of all, it's FREE!

Most repair centers should have the kit by now, but just to save yourself a trip, we recommend you phone ahead before bringing your unit to your local store. If you are operating on cassette with Expansion Interface, bring in both your Cassette Recorder and Keyboard Unit. If your configuration has one or two cassette machines plugged into an Expansion Interface, bring in your cassette recorder(s), Expansion Interface and Keyboard Unit.

TELE-COMMUNICATIONS

Hardware and Software

Telephone Interface-II Originate/Answer

For those of you who would like to use your TRS-80 to talk to other computers, Radio Shack will shortly be offering a complete line of hardware and software to help you.

With this capability, you may use your TRS-80 and an ordinary telephone line to "talk" to another TRS-80. Or, if you know the necessary timing, parity and baud rate information, you can talk to many other computers.

The essential hardware is the new Telephone Interface-II Acoustic Coupler, (Cat. No. 26-1171), and the RS-232 Board, (Cat. No. 26-1145). You will, of course, need a Level-II, 16K TRS-80 with Expansion Interface.

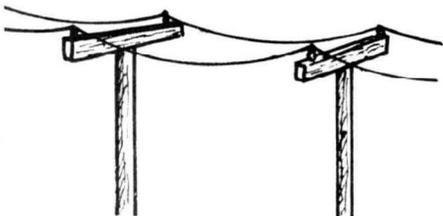
New Communications Software Package

The essential software is the new Communications Software Package (COMPAC), (Cat. No. 26-1146). COMPAC is not available at your Radio Shack store yet, but it should be in four to six weeks. COMPAC will permit your TRS-80 to act as a remote terminal. In this mode, you may operate someone else's TRS-80, (referred to as the "host" computer), in the same manner that you would if you were sitting at its keyboard. This is accomplished by running the program "TERM" in your computer.

If you want your computer to be the "host," then you would use the program "HOST" in COMPAC, and the other computer would use the "TERM" (terminal) program.

Also included in COMPAC is the software that permits you to transmit information between computers. For example, if a friend or business associate desired a copy of a program or data file that you have, you could transmit it to him by means of a third program in COMPAC.

Look for further announcements concerning availability of this software in our next Newsletter. It won't be long now!



Telephone Interface-I Has Been Discontinued

Telephone Interface-I was an "originate-only" coupler and could not establish a communication link to another Interface-I because it did not operate in "answer" mode.

Interface-I lacked the ability to generate the required carrier tone. For that reason, it has been discontinued.

The new Telephone Interface-II operates in both "originate" and "answer" modes.

CONVERT YOUR IN-MEMORY INFORMATION DATA TAPES

If you've been using the In-Memory Information Management System on a Level-I system and are going to upgrade to Level-II, you will need to convert your data tapes in order to make them compatible with Level-II cassette operations.

(The conversion programs CONV and DCONV you get in the upgrading kit will not do the job.)

The program that will make the conversion must be specially ordered through your Radio Shack store. Ask them to order item ACT-0073 from Radio Shack National Parts Dept. in Fort Worth.

Item No. ACT-0073 \$1.60

DELIVERY DELAYS

Are you impatient to get a particular hardware or software item? We know how you feel and we're really pushing to get the items you need to our stores and warehouses as fast as we can.

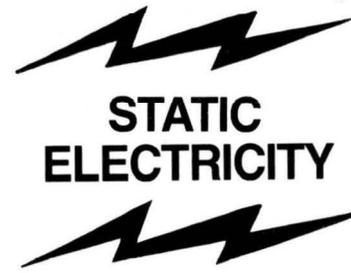
Disk Drives are a really hot item. We simply can't get enough of them. The manufacturer of the mechanism is delivering all he can to us, but at the current rate, you can expect at least a 4 to 5-month delivery delay.

So, if you can foresee the need for a Disk Drive, you might consider ordering in advance of the actual time you will need it.

We're working to improve deliveries, but, in some cases, delays will continue for the time being.

One hassle we're facing in producing software is that cassette duplication is a very sensitive process. Our Quality Control Department has rejected literally thousands of cassettes because they failed to meet our standards. While this assures you of the highest quality when you get the item, it also, unfortunately, means delays of the kind we're currently experiencing.

Again, as we've said before, please **bear with us!** We are aiming to bring you the highest quality and quantity of products and services that this industry can offer!



STATIC ELECTRICITY

It's a cold winter day. You don't really want to go out, but your wife insists because she's out of milk. Grumbling under your breath, you shuffle your way across the carpeted floor toward the front door. You reach for the knob and

ZAP!

static electricity shocks you out of your stew!

If you're a computer user, static electricity means trouble. Since the bits in memory, disks and cassettes are stored magnetically, it shouldn't be too surprising that static electricity will "rattle a few bits loose" if a big enough charge hits them. And sometimes it doesn't take a charge big enough for you to feel to do that.

If this happens (in the worst case) you could wipe out the contents of memory or leave information on your disks or cassettes unreadable.

Every computer system can be affected by static electricity. The best way to handle this problem is with a good preventive program.

Be alert to the presence of static electricity. It most commonly occurs during the winter months when the air indoors is very dry. But it can happen other times as well.

If you run a humidifier and keep the relative humidity above 50%, static electrical effects should disappear. (The extra humidity is healthier, too!)

Another thing you can do is place your complete system in a room with no carpeting. If you have carpeting, an anti-static floor pad could be used, although this can be expensive. There are commercially available anti-static compounds like Static-Guard which may be sprayed on carpeting.

Finally, if you need a stop-gap solution, before you touch the computer or any cassette or diskette, tap a metallic object like a filing cabinet with the largest knuckle on the top of your hand. Doing this will "discharge" you painlessly and you can safely touch any part of your computer system.

Now we know you're just **ec-static** to get this news. But even if it's not that terribly exciting, following the "self-discharge" tip could save you from some rather "shocking" damage to your TRS-80 data!

DISK OWNERS

Are you having trouble with frequent disk errors? The reason may be that your Disk Drives are located on the left of the video monitor (looking from the front).

Hocus Pocus? Nope! The answer is that there is a flyback transformer on the left side in the video monitor. This transformer generates a rather strong electromagnetic field that can interfere with disk input/output operations.

Our tests have shown that on **some** systems when the Disk Drives are moved at least six inches from the left side of the monitor (or moved to the right side of the monitor) the disk errors "mysteriously" disappear! Be sure to try this solution before seeking repairs.

CAUTION For Disk Owners

We recommend highly that no diskette be in the Disk Drive when the power is turned off. If power is turned off with the diskette in the drive, it is possible for data to be destroyed and not be recoverable.

NOTICE TO EXPANSION INTERFACE OWNERS

Extensive testing has shown that some of our RAM chips are more sensitive than others. When unusually sensitive chips are encountered, the result can be unpredictable dropouts in E/I memory. Signs of this would include random rebooting of DOS, unexplainable syntax errors or changes in contents of memory.

If you are encountering these symptoms you should call your local Radio Shack and arrange for returning both the E/I and Keyboard/CPU for a *free* engineering change. This includes anyone using a buffered E/I cable who still seems to be experiencing these occurrences!

Testing of units in which we have installed this engineering change has displayed a 100 percent correction rate.

To minimize downtime, *call your store first*, to be sure the Repair Center has a sufficient supply of kits. Thank you!

TRSDOS 2.1 PATCH

Those of you doing I/O with cassettes already know of the necessity for turning off the 25 msec. clock interrupt when transferring data to and from cassette.

We have found that in about one disk I/O operation in 500, the clock interrupt may cause a disk error when in BASIC or lost data during a read operation.

Below is a software patch that will eliminate the need for turning off the clock interrupt for disk I/O. This patch will have to be applied every time you boot TRSDOS 2.1. The patch will already be present in TRSDOS 2.2.

Right now, when you boot 2.1, RAM locations X'46B8' to X'46BF' contain

```
FE 20 28 15 CB 57 20 0F
```

You can confirm this fact by using the DEBUG program. These locations should contain

```
CB 57 20 13 FE 20 28 11
```

To obtain this change, execute the following BASIC program

```
5 POKE 16553,255: DEFINT J,I
10 FOR I = 0 TO 7: READ J: POKE
    18104 + I,J: NEXT I
20 DATA 203, 87, 32, 19, 254, 32,
    40, 17
```

This fix will work if other hardware problems are not the cause of your disk errors.

Final TRSDOS Manual Is Now Available

Some of you who purchased our TRS-80 Disk Operating System a few months ago were given a preliminary manual that was produced on mimeograph paper.

Well, now the final version of the manual is available in loose leaf bound form. If you haven't received your free final copy, contact the Radio Shack store where you purchased your disk system. The manager should have your manual, or can get one for you.

If you want to purchase a DOS manual only, a bound version is now available for sale.

TRSDOS Manual,
Cat. No. 26-2104 \$5.95

Service Contract Information

If you have any questions about an existing Service Contract or if you wish to obtain a Service Contract, call our Service Contract Administrator, Mr. J. D. Hartman, at the toll free number: 1-800-433-5502.

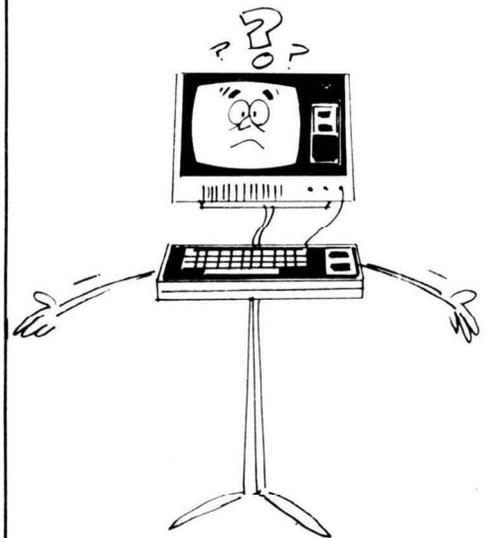
ATTENTION USERS OF 48K TRSDOS SYSTEMS

If you are operating a 48K system using Disk BASIC we want you to know that occasionally, and at random, it is possible for the top 6 bytes of memory to be overwritten.

When this happens, any string data that you have stored there will be clobbered. There are two ways of "correcting" this. Both amount to not using those bytes of memory.

When entering BASIC, answer the "MEMORY SIZE?" query with 65529. Or in your programs, put the BASIC Statement:

```
A$ = STRING$(6, 32):X = FRE(A$)
```

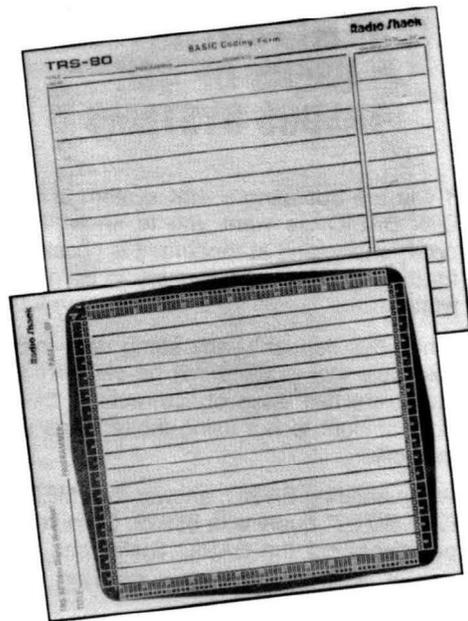


For Your Convenience

You'll notice that this Newsletter has been three-hole punched to make it easier for you to file for future reference.

Several readers suggested this and we recommend that you save your Newsletters since it's our primary way of communicating with you "after the sale."

Each issue will contain a host of useful information, manual updates and corrections, software patches, responses to widely-asked user questions, Company policy statements and so on. We would even recommend that you make a personalized index to the articles that you consider most important.



Video/Programming Worksheets Available

These worksheets are printed on both sides so you'll get flexibility and value.

Side one is formatted as a coding sheet for your programs. A special section to the right provides space for you to keep track of variable names used or to make comments on each line.

Side two is designed to help you take advantage of the fantastically flexible video screen formatting and graphics capability of Radio Shack BASIC, Level-I or II. Side two is "calibrated" to make it easy to locate any of the 1024 character positions on your screen . . . and it's in proportion to actual screen locations.

In addition, subsquares are printed which let you locate any of the 6144 graphics points on your screen.

These video display worksheets will really help you take full advantage of TRS-80's graphics features. Each package contains 2 pads. Total: 100 sheets.

Video/Programming Worksheets,
Cat. No. 26-2105 \$2.95

LEVEL-I TO LEVEL-II PROGRAM CONVERSION

LEVEL I/LEVEL II COMPATIBILITY

Please remember that Level I and Level II BASIC are not exactly the same in every respect. If you have converted Level I programs to Level II and they no longer work correctly, you probably overlooked a necessary change. "PRINT AT" in Level I would be "PRINT@" in Level II. Also, whereas you can use arrays in Level I freely, in Level II any array having a dimension exceeding 10 must appear in a "DIM" statement.

Some very minor "editing" of your programs may be required after you convert them to Level-II, but the "mini-manual" that comes with your Conversion Program explains what to look for and how to fix it.

Payroll Program Conversion

For those of you who are using our PAYROLL program on Level-II, there is one other thing you need to know. There are a couple of changes that the Conversions Program doesn't make that must be done.

For example, in Level-I BASIC, there is no DIM statement to create an array. And Level-II requires one for longer arrays.

The Conversion Program does not insert these DIM statements for you. (If you have converted your PAYROLL program from Level-I to Level-II and it doesn't work, try inserting

15 DIM A(MEM/8-300)

in your program.) In addition, the format of the Tax Tables has changed. To get the details concerning these additional changes, call Computer Services at the toll-free number — 1-800-433-1679 and request the addendum and new Tax Table format for the PAYROLL Program conversion.

NEW SOFTWARE

Double-Precision Subroutines

These new double precision programs let you obtain 15 decimal-digit accuracy in sine, cosine, arctangent, natural logarithm, experimental and square root functions. (Those located in the BASIC ROM are single-precision.)

Scientists, engineers and others requiring this extra precision will find that these programs fit compactly in RAM memory.

Even in a 4K machine, you should have enough room for your applications programs!

Level-II Double-Precision Sub-routines,
Cat. No. 26-1704 \$9.95

Micro-Music (Level-I or II)

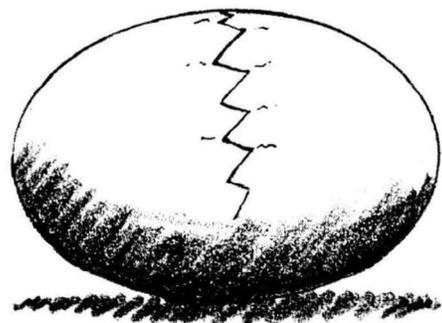
Here is a program that will give you an opportunity to creatively express yourself in music, regardless of whether or not you presently play an instrument!

With Micro-Music, you have a five-octave range, including sharps and flats. You can program whole notes, half notes, quarter notes and eighth notes — even dotted notes and triplets. Using these basic musical "building blocks" you can type in the symbols corresponding to the desired notes and thereby "play" your favorite music or create new compositions!

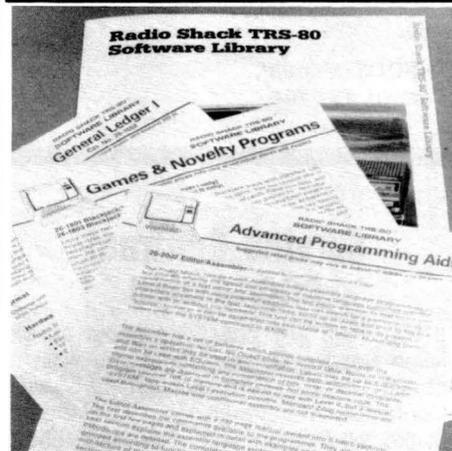
To play the music, simply connect your cassette recorder output jack to a speaker/amplifier or a hi-fi system. Or, you can record the output directly on a cassette tape and play it back.

If it doesn't sound just right the first time, just edit the program symbols until it does. You can make everything from delightful melodies to random music — it's up to you and your imagination!

Micro-Music, Cat. No. 26-1902 . . . \$9.95



**"TRSDOS 2.2 . . .
. . . coming soon!"**



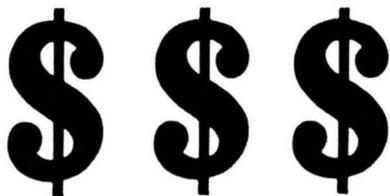
NEW SOFTWARE INFO SHEETS

If you're looking for detailed information about software, your Radio Shack store will have Fact Sheets which you can pick up free of charge.

Each contains sufficient detail on the capabilities and limitations of the programs to permit you to determine whether they fill your needs.

The picture at left shows some of the new Software data that should have reached your store in the last week or so. Look for exciting and practical new software to be announced in the coming months.

DISCOUNTS



NOW AVAILABLE

On Quantity Purchases of Diskettes and Cassettes

If you didn't know, quantity discounts are available on the purchase of blank diskettes and single C-20 Certified Digital Cassettes. The discounted rates are as follows:

3-PACK DISKETTES (26-405)

Quantity	Unit Price
1 to 4	16.95
5 to 9	15.95
10 to 19	13.95
20-up	11.95

C-20 CASSETTES (26-301)

Quantity	Unit Price
1 to 11	3.49
12 to 23	3.09
24 to 47	2.69
48-up	2.29

Other Vendor's Hardware/Software and TRS-80 Compatability

Radio Shack is aware that lots of fine hardware and software products are being sold by others for use with TRS-80.

We've been contacted by a few TRS-80 owners who were having problems with an "outside" product. Unfortunately, no manufacturer, including Radio Shack, can afford the manpower to fully evaluate all the accessories made by other firms.

In these cases, we don't have complete data on "outside" products so we ask our people not to express an opinion on them, pro or con.

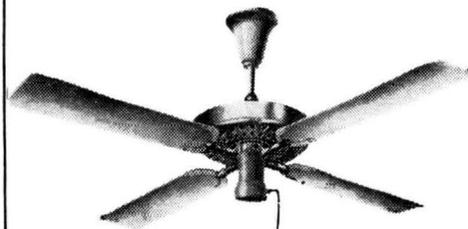
Some non-Radio Shack software works just fine. But some, we're told, doesn't work at all.

As for attaching non-Radio Shack hardware to TRS-80, we can't tell you for certain if it can be done or how difficult it will be. Again, we are simply not able to give you technical advice on how to do it.

Our best answer is that most reasonable peripherals probably can be used with TRS-80 if you know how to interface them.

However, you could find yourself in a situation where your TRS-80 is working properly and the outside manufacturer says his gear is O.K., but they won't work together.

Obviously, we can't guarantee a product we don't make or sell. This is one reason why Radio Shack cannot write Service Policies on TRS-80 systems that contain non-Radio Shack hardware. We appreciate your business and understanding!



FAN KIT AVAILABLE FOR SYSTEM DESK OWNERS

If you're operating a TRS-80 with three or four Disks and you have your equipment mounted in our System Desk, we now have a Fan Kit available that will help cool the Disk Drives.

You may have noticed that the rear of the Disks can get rather warm—this is normal, but it is desirable that air move freely over the Disks to hold temperatures at a satisfactory level.

The Fan Kit is easy to install in the System Desk because the mounting holes are already present.

Fan Kit, Cat. No. 26-1303 \$29.00

NEW!

VOICE SYNTHESIZER

Your TRS-80 Speaks!

The new TRS-80 Voice Synthesizer gives your Level-I or II TRS-80 the capability of **simulating human speech** under program control.

There are 60 phonemes (elementary sounds) which, under your program's control, are joined together by the computer to produce words. The words, in turn, may be joined together to form sentences. If you are writing an interactive program like the ones used in computer-assisted instruction, the Voice Synthesizer will allow you to verbally comment, clarify and direct the program user.

This may seem far-fetched, but you'll be **convinced** when you hear the demonstration cassette that comes with the Synthesizer! An instruction manual is also included.



With the new Voice Synthesizer, in many interactive programs, you can substitute **voice output** for information you would otherwise have printed on the video screen.

And, if you're really creative, you can try to develop a conversational program that will converse "intelligently" when it doesn't know what you are going to say! We warn you, it's not easy!

After you hear it, we're sure you'll agree that this is a peripheral right out of the next century! Get your TRS-80 Voice Synthesizer today.

Voice Synthesizer, Cat. No. 26-1180

\$299.00

IF UNDELIVERABLE DO NOT RETURN

Peripheral Orders

It's a common occurrence that soon after a customer buys a Level I or Level II TRS-80 he decides to add a peripheral device such as a printer or disk drive.

We want you to know that most Radio Shack stores do not keep larger peripherals in stock.

Generally speaking, most peripherals are available for ordering, with about two weeks shipping and handling time. Disk Drives are a major exception, with a minimum of four months waiting time at present.

So, don't expect to find *major* peripherals in our stores . . . they are normally available, quickly, only on Special Order. On the other hand, store managers are able to stock any and all software packages (programs), as they wish.

You can find out about new software that's on the way to your Radio Shack store through this Newsletter!

KBFIX and Screen Printer Can't be Used Together

If you have a Screen Printer and are also using KBFIX (a software fix for the keybounce problem), the Screen Printer will not operate properly.

The reason is that each must scan RAM memory to do its job. This competition for RAM memory leads to the printing of meaningless characters.

As a solution, we suggest you discontinue use of KBFIX and apply the keyboard bounce corrective actions described on page 2 of this Newsletter.



CAUTION

For Program "Customizers"

Radio Shack subjects its software to extensive testing and debugging before releasing it for sale! If you decide to modify one of our software products, you do so **at your own risk!**

We will not be able to certify the correctness of the "customized" version!

Mail to:
MICROCOMPUTER NEWSLETTER
700 ONE TANDY CENTER
FORT WORTH, TEXAS 76102

Please correct my address

I own a TRS-80; add my name to the mailing list

NAME _____

COMPANY _____

STREET _____

CITY _____

ZIP _____

TRS-80 Equipment	Serial No.
_____	_____
_____	_____
_____	_____
_____	_____