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November/December 1994

The HUGgers Newsletter

Volume 13, Number 6

Monthly meeting location
 White house next to
 St. Ann's School
 2839 S. McClure
 Indianapolis, IN

Meeting starts at 2:00 pm
 November 20, 1994

HUG OFFICERS (Area code 317)

| | | |
|------------------|----------------------|-----------------|
| President | Ricky Bottoms | 392-2312 |
| Vice Pres | Bryant Pedigo | 255-7381 |
| Secretary | Greg Larson | 783-4575 |
| Tresurer | Greg Larson | 783-4575 |
| Librarian | Byrant Pedigo | 255-7381 |

ANNOUNCING THE MIDWEST TI CONVENTION!

12TH ANNUAL CHICAGO-MILWAUKEE INTERNATIONAL TI FAIRE

Co-sponsored by the Milwaukee Area Users Group and the Chicago Users Group

WHERE: Gurnee Holiday Inn - 6161 Grand Avenue, Gurnee, IL 60031
 Just west of I-94; Gurnee Mills is just across the street.

You may call the Lake County visitors office at 1-800-525-3669 for a FREE map and/or information about the area.

Reservations may be made at the Gurnee Holiday Inn @ 708-336-6300.
 Hotel Rooms (doubles) at the Holiday Inn are available at a discounted rate of \$55.00 per night. You MUST inform them you are attending the International TI Faire to obtain the discount.

Faire time: : Saturday November 12, 1994 from 9:00am - 5:00pm

Admission: \$1.00 with any valid computer membership
 \$2.00 for all others

- Door prizes will be given out to a few lucky individuals
- Raffle of vendor-donated hardware and software

FOR ADDITIONAL INFORMATION, you may contact DON WALDEN at Cecure Electronics

South 74 West 17000 Janesville Rd
 PO BOX 132
 Muskego, WI 53150-0132

Phone: 414-679-4343
 FAX : 414-679-3736
 BBS : 414-422-9669

TI-99/4A / Geneve 9640 quiz
by Mike Dodd

May be freely distributed provided the file is distributed in full and without modification. Credit must be given to Mike Dodd and Delphi's TI Net.

This quiz is designed to test your knowledge of the TI/9640 computer community. Some of the questions will be more difficult than others. Scoring information is at the end of this file.

- 1) Most TI users do not watch soap operas because:
 - a) The average TI user does not have time.
 - b) The average TI user is above watching soap operas.
 - c) The infighting in the TI community is far more fascinating than a soap opera.
- 2) Home Computing Journal was an attempt by Gary Kaplan to:
 - a) Produce a timely, informative magazine covering many computers.
 - b) Help human-kind by advancing computer literacy.
 - c) Make tons of money and skip town fast.
- 3) TI's departure from the computer community was most probably due to:
 - a) A failure to promote the advanced hardware of the TI-99/4A.
 - b) A failure to communicate between engineering and marketing.
 - c) A failure to comprehend just how bent on revenge Jack Tramiel (then-owner of Commodore) was.
- 4) Delphi has attracted many of the top programmers because of:
 - a) The ease of using Delphi.
 - b) The friendly people on Delphi.
 - c) Jeff Guide's willingness to give out free flags.
- 5) MYARC's most probable response to a user's complaint that his machine is not working is:
 - a) Check all of your connections and clean the contacts.
 - b) Send it in right away; we'll fix it.
 - c) It's a software problem -- wait for the next system release (two weeks).
- 6) HyperCopy was created because:
 - a) The author had an earnest desire to produce quality software.
 - b) Many users had requested such a program.
 - c) The author was broke and loathed the idea of working for MacDonalds.
- 7) CorComp's problems were due to:
 - a) Unintentional corporate mismanagement.
 - b) Evil spirits bent on destruction that invaded their products.
 - c) Simple dishonesty.
- 8) A certain TI company isn't going to be mentioned in here because:
 - a) It is a great company.
 - b) I'm a good friend of the vice-president.
 - c) I don't want to be sued.
- 9) Terrie Masters is one of the most respected members of the TI community, due to:
 - a) Her incisive commentaries on current events.
 - b) Being editor of one of the largest TI newsletters.
 - c) No sane person would dare cross her.
- 10) If MICROpendium reviews several programs, all of which get high marks, it is:
 - a) Due to the sterling quality of all TI programs.
 - b) Because the excellent documentation far makes up for any shortcomings in the program itself.
 - c) A typical issue.
- 11) Most programmers await Harry Brashear's articles and reviews with:
 - a) Great anticipation due to his skill as a writer.
 - b) Complete apathy.
 - c) A plane ticket to New York and automatic fire arms at the ready.
- 12) People await each new release of Telco with:
 - a) Eager anticipation, recalling the new features the last update offered.
 - b) Hopefulness that it will add script capability.
 - c) Dread, recalling how long it took to download that thing the last time.

- 13) People await each new release of Funnelweb with:
- Eager anticipation, recalling the new features the last update offered.
 - Hopefulness that it will add some of your requested new features.
 - Dread, thinking of what a pain it will be to update all your disks.
- 14) The biggest cause of delays in releasing programs by Paul Charlton is due to:
- His desire to eliminate all bugs before release.
 - His desire to add as many features as possible.
 - His dread at the thought of having to write documentation.
- 15) TI owners criticizing others for buying non-TI computers are most similar in amount of zeal to:
- Ronald Reagan criticizing Russia.
 - Michael Dukakis criticizing George Bush.
 - Ayatollah Khomeini criticizing Salman Rushdie.
- 16) Mike Dodd's typical reaction upon opening a letter and finding the word "PRBASE" in it is:
- "I sure hope I can help this person."
 - "<sigh> Another one."
 - "Aaaaaaaaaaaaaarrrrrrrrrrggggggggggggghhhhhhhhhhh!!!!!!!!!!!!!!!"
- 17) Paul Charlton's GIF and Picture Transfer programs have made the most money for:
- Paul Charlton.
 - Genial Computerware.
 - CompuServe, who suddenly had several hundred people downloading huge picture files (in number probably about twenty times as many people who actually paid for the fairware version).
- 18) When people ask how to access the low level disk I/O functions, it is usually because:
- They are on a constant quest for new knowledge.
 - They are interested in trying to gain more speed from their disk controller.
 - They want to break every copy protection left in existence.
- 19) MYARC probably increased the price on their HFDC card:
- Due to rising chip prices.
 - Because of the decision to add a tape backup circuit.
 - Just for the hell of it.
- 20) This entire quiz was written:
- Because the author wished to write a short humorous article.
 - It was an English assignment.
 - The author felt guilty about not uploading anything to Delphi in a while.

SCORING INFORMATION:

In case you haven't noticed, the correct answer is (c) on every question. Note: if you looked at this section first, then you obviously deserve more points than those who played by the rules (which is boring anyway). Give yourself something that is somewhat more than 20 points.

| <u>Correct</u> | <u>Diagnosis</u> |
|----------------|---|
| 0 | You obviously have absolutely NO sense of humor. Get one. |
| 1-5 | A start, but you're still probably a boring person. |
| 6-10 | Maybe watching something funny (e.g. The Holy Grail) would help. |
| 11-15 | Maybe you're mentioned in this quiz and weren't flattered... |
| 16-19 | Excellent! You have obviously kept up with the comings and goings in the TI/9640 community carefully. |
| 20 | You cheated. |
| 21- | Since you obviously REALLY cheated, go treat yourself to something really nice you need it bad. |

Hard drives

Different types and characteristics of drives described

By GARY COX

(Reprinted from the June 1994 newsletter of the Mid-South 99ers)

This article was originally written for an IBM compatible, but I have modified the article to make it generic enough to apply to any computer, I hope.

Where did the term "hard disk" come from? Obviously it came from the way the disk was constructed, as, unlike floppy disks that can bend, hard drive platters are solid and thus they cannot bend. Another name for a hard drive is "Fixed Disk" or "Winchester." The meaning of the term "Fixed Disk" is obvious as the disk is fixed in place and cannot be removed (although removable hard drives exist but they are actually fixed in a case that can be removed from the housing).

The term "Winchester" is also used to describe a hard drive. The term "Winchester" goes back to the 1960s where IBM developed a high-speed hard disk that had 30 megabytes of fixed platter storage and 30 megabytes of removable platter storage, thus calling the disk a 30-30 drive. However, instead of the disk being called a 30-30 drive, it gained the nickname "Winchester" referencing the "Winchester 30-30 caliber rifle." Nowadays the term "hard drive" is usually the only term that is used, but you may see references to older hard drives and controllers as "Winchester" drives or "Winchester" controllers.

BASIC COMPONENTS

The basic components of all hard drives are the same; each hard drive contains at least one disk platter, rewrite heads, a head actuator or arm, a platter motor or spindle actor, a circuit board, connectors and a case. The platters are stored one on top of another with spacing in between for the read/writer heads to magnetically store data on the media. All the inner workings are sealed inside a metal housing that protects the platter and heads from dirt and dust. In fact, the tolerance between the platter and head is so close that even one particle of dust can cause a scratch on the platter surface, thus damaging the drive as one particle of dust is larger than the gap between the head and the platter. There-

fore, a hard drive should *never* be opened! Hard drives are manufactured in dust-free "Class 100 clean rooms" which are cleaner than operating rooms! CMI (Computer Memories Incorporated) had trouble with a contaminated clean room that caused some of the early hard drives manufactured by them to be contaminated, thus causing a variety of problems, including a total disk crash.

Each hard drive usually contains more than one platter with a head attached to an arm on each of the platters creating a surface for data (kinda like a record player).

A variety of types of hard drives exists, with each type using a different method of

timing signals and thus was replaced with MFM coding.

Another type of drive coding is RLL, which stands for Run Length Limited. RLL is more complicated than MFM, but allows for the placement of more data on the disk for the given amount of space. RLL may often be referred to in technical publications as RLL 2,7, referencing that the run length is limited to 7.

Also used is RLL 3,9 (also called ARLL) which increases disk space even more. Drives for use as MFM and RLL come new from the factory completely blank, as the encoding for MFM and RLL drives is created during the low-level format. This low-level format is done by the user by invoking a built-in program in the ROM on the controller or by using a program to low-level format it. The low-level format creates the tracks that the drive uses to store data. As well, the low-level format locates any bad areas and locks them off. Thus, the encoding method is determined by the controller that you use, but with an MFM drive you should use *only* an MFM controller and with an RLL drive use *only* an RLL controller, as doing otherwise can cause intermittent problems and/or loss of data!

Another type of encoding used on hard drives is ESDI, which stands for Enhanced Small Device Interface, which was created to allow for larger data capacity and speed in hard drives, as MFM and RLL drives are limited to under 140 megabytes due to their design. ESDI is really more of a standard of control rather than an encoding method, as ESDI was designed as an "intelligent" controller that could potentially handle not only hard drives, but floppy drives, tape backups, etc. However, I have never seen ESDI used for anything other than hard drives.

Another type of encoding used on hard drives is SCSI, which stands for Small Computer Systems Interface. SCSI is also really more of a standard of control rather

The tolerance between the platter and head is so close that even one particle of dust can cause a scratch on the platter surface, thus damaging the drive as one particle of dust is larger than the gap between the head and the platter.

coding the information on the disk. The different coding methods provide for the different sizes, reliability and speed of the hard drive. The different coding methods are more or less a reflection of the changes in technology over the years. The physical size of the hard drive is no indication of the amount of storage space, as a very large (full height) drive might be only 10 megabytes where a hard drive smaller than the size of your hand might be able to store 300 megabytes! The encoding method as well as the way the drive is build determines the drive's size in megabytes.

MFM DRIVES

MFM-type drives are among the oldest and most common found in older computers. MFM stands for Modified Frequency Modulation and originated out of FM Encoding or Frequency Modulation Encoding. FM Encoding is an outdated coding scheme that used half the disk up just for

HARD DRIVES—

than an encoding method, as SCSI is an "intelligent" control method used not only to control hard drives but other devices such as tape drives, floppy drives, CD-ROMs, printers, etc. Up to seven devices can be attached to a SCSI controller as long as each device has an individual ID number. SCSI drives usually come in large capacities and are often low-level formatted at the factory or come with low-level formatting software.

Nowadays the most common type hard drive is IDE, which stands for Imbedded Drive Electronics. On IDE drives the controller is actually built onto the drive itself; thus, only a sort of simple interface card is used to interface the drive into the computer databus. IDE drives are low-level formatted at the factory and should *never* be formatted by the user. Attempting to low-level format an IDE drive will probably destroy it! IDE drives only need to be partitioned and high-level formatted.

Some of the terms that you might run across with hard drives are as follows:

INTERLEAVE — Since the drive continuously spins at 3600 RPM and the drive head reads the data off a platter at that speed it is possible that your computer or controller card cannot accept data from the hard drive as fast as the hard disk is reading it. Since the platter cannot be slowed down, the sectors on the hard disk are spread out differently, so that the head will physically pass over a specified number of sectors before it reads more data where that sector is what the drive per-

ceives as actually being the next sector, but in actuality it could be physically several sectors down the platter. In skipping several sectors, this method gives the computer time to catch up before more data is thrown into it. So a 1 or 3 interleave would be sequential sectors set up every 3 physical sectors. A 1-to-1 interleave would be the best case, where each sector is actually set up the same as what is physically there.

Only on those hard drives that can be low-level formatted can an interleave be set up, thus IDE drives cannot have an interleave set as they are factory set at 1 to 1. If an interleave is set wrong, it will only slow down your drive as, if the next sector comes around too soon and the computer is not ready for it, it will skip that sector and wait until that sector comes around again, which takes time.

TRACK — A track is concentric circles that hold data on a hard disk platter with a track being composed of, not physical tracks, but magnetically allocated areas on the hard disk.

SECTOR — A section of one track is called a sector; usually 512K bytes of data are contained per sector.

ZONE BIT RECORDING — Since the tracks toward the outside of the disk are longer than those toward the center of the disk, due to the disk circular design, a lot of space toward the outside is wasted. Thus, a recording method called Zone Bit Recording (ZBR) was created to which tracks toward the outside of the platter have more sectors per track than the inside

of the platter, but each sector still contains only 512K bytes of data.

CYLINDER — A cylinder is basically the combination of identical track numbers on each platter of the disk of which each platter of a disk is stacked on top of each other; thus, just imagine a cylinder as being a rod vertically through each track on the platters. The usefulness of a cylinder is that it is one of the components used to find an address on the hard disk, with the other components being the head number and sector number.

CLUSTER — A cluster is basically the number of sectors that the operating system uses each time space on the hard disk is needed.

TRACK 0 — Track 0 on a hard drive is very important, as when the drive is first powered up it goes to track 0 to recalibrate the position of the heads, as that is the only position where the drive can physically tell where the head is located. Also at track 0 the file allocation table (FAT) resides. The FAT contains information about the location of files and bad tracks.

In closing, the encoding on the hard drive determines the drive's size in megabytes as well as its speed and efficiency. The cylinders, heads and sectors make up the scheme in locating addresses for data on that drive. A combination of all of the above and more is what is actually involved in the workings of a hard drive.

I hope that this gives you some insight into the interworkings of a hard drive.

ATTENTION ATTENTION ATTENTION ATTENTION ATTENTION ATTENTION ATTENTION
 T THIS IS IT, A FOLLOW UP REMENDER!! THE MONTH OF NOV. IS T
 E HERE. PLEASE RENEW BY SENDING YOUR CHECK FOR \$22.00 TO E
 N HOOSIER USER GROUP GREG LARSON, SECRETARY, TREASURER N
 T 1604 HERITAGE LANE #3A T
 I INDIANAPOLIS, INDIANA 46227 I
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! # \$ % * OUCH, that hurt
by Dennis Hathaway

Fall is here, winter is just around the corner.

With winter comes low temperatures and extremely low Relative Humidity (RH). Low RH presents us with the problem of dealing with very high levels of static electricity. So it is timely for a discussion on static. What is static, what can it do to our hardware, and what precautions can we take to reduce problems.

First, what is it? Every person, animal, plane, truck, auto, etc. carries with them an electrostatic charge (Q), except when they (or it) are in direct contact with a conductive path to ground. We accumulate this charge as we move around, for example walking on a carpet, touching things (or beings) that carry a charge greater than ours, the rubbing together of our items of clothing (especially clothing of man-made materials), even the friction of air flowing past us. Depending on the materials involved we can become charged either positive or negative with respect to ground. When we touch something with a different level of charge we often feel a sharp tingle, or minute burn (oddy enough, we don't usually feel anything if the potential is less than 2300 volts, because then the total static power involved is small). This sensation is caused by the discharge of the static we were carrying, or to give it its full name ElectroStatic Discharge (ESD). More on ESD later.

The charge we carry (Q) is given by $Q = CV$, where Q is in coulombs, C is in microfarads, and V is in volts. For a human being C is usually around 100 to 250 picofarads, depending mainly on overall bulk, size of feet, and type of footwear. Because womens shoes usually have thin soles, their capacity (C) is often higher than that of a man. Typically Q ranges up to 5 microcoulombs.

A calculation will show that a person whose $Q = 3$ microcoulombs and whose $C = 200$ picofarads will be at 15KV with respect to ground (where 1 KV = 1000 volts).

This voltage can in extreme cases be as high as 40 KV. Beyond this point the charge will bleed off through the air, and may sometimes even form a carona. The drier the air, the less is the bleed off effect and this is why we should be concerned when the RH is low. In upper Wisconsin during the fall of a few years ago, using a grounded electrostatic meter, I measured 23 KV on a man walking towards me over a vinyl tiled floor, while he was wearing crepe soled shoes. At the same location, the plastic cover on a notice board was at 45 KV. Even allowing for meter inaccuracies this still gives an indication of the level of voltages out there at this time of year. We must not let this cause us to think that we generate static only when the RH is low. This is not the case. We generate static ALL YEAR LONG, but when the RH is higher the charge bleeds away more readily.

I am sure that all of us have at some time touched the screen of our monitor/TV while working at the keyboard, and have heard the air crackling as we became charged to some 12 to 15 KV. When we next touched the keyboard we partially discharged into the console. TI was fully aware of this problem when they designed the 99/4A, and have almost certainly taken suitable precautions to prevent damage to the console when we zapped it in this way.

Now what can happen to our equipment if we pass our charge to it in a manner TI did not anticipate?

Actually we share our charge with the equipment, until both we and it are at an equal potential, then current flow ceases. In practice a typical discharge is found to be somewhere in the order of 20 millijoules (where a joule is 1 watt/second). Now when we discharge into our equipment it takes place very rapidly, depending on our capacitance C, and our skin resistance (usually around 1000 ohms). The effect is such that we can be feeding some 20 amps into the equipment for a period of some 100 nanoseconds. If we do this to the connector contacts on a module, or on one of our PEB cards we will cause damage to them. In some cases it will be obvious when a device is destroyed because the system quits. Usually however we end up with a device that is only partially damaged. The device is then known as being among the "walking

wounded". It carries on working, but is likely to die on us at any time, maybe weeks later when we have completely forgotten that we previously zapped it with 20 millijoules.

It is general knowledge that MOS devices used in many TI assemblies are susceptible to this kind of harsh treatment, but it must be realized that bipolar transistors, diodes, and other devices are also affected similarly, but to a somewhat lesser degree. Incidentally, those of us who attended the TI Faire probably witnessed some PC boards being "wounded" both by vendors and buyers. Good luck guys!

How do we prevent static damage to our 99/4A? As we are about to sit down at our terminal we should bear in mind that every item around us has some capacity to ground, so by touching them briefly we share our charge with them. Do this to a couple of items (preferably large metallic ones) like a chair, or filing cabinet, etc. Personally I use an exposed screw head on my grounded power distribution expansion strip which sits on top of my PE box. If we are working on a printed circuit (PC) board outside of our PEB, or of our printer than a more elaborate method is needed. Consider, while sitting at the bench/table we may raise our potential by as much as 1000 volts each time we reach out to pick up a tool or device. An aid known as a wrist strap will help here. A conductive band goes on the wrist, and is connected via a 1.5 Megohm resistor to ground. This continuously bleeds away any static as fast as we generate it. The resistor limits current if we accidentally touch something with mains potential on it. These wrist straps are available from most electronic parts vendors for only a few dollars.

While the above discussion is directed to work on the 99/4A, it applies equally to other electronic items - radio, TV, VCR, etc. Static can ruin most electronic equipment.

It would be well to ensure that ones spouse and children are made aware of this static problem, so they will not nullify our efforts to prevent damage to our equipment.

Area: TI-ECHO Msg: 16785
Date: 10-28-94 14:38 Public
From: HAROLD HOYT
To: ALL
Subject: LIMA MULTI UG CONFERENCE

11-02-94 1:27p
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First Announcement of the next Lima Multi user Group Conference: April 28 and 29, 1995

The Lima Ohio User Group is VERY pleased to announce that we have scheduled another TI Multi User Group Conference for Friday and Saturday April 28/29 1995. Most scheduled activities will be Saturday. As in past years the event will be in Reed Hall of the Ohio State University Lima Campus. This all 99/4A-Geneve-CC40 event is totally free, with no admission or display table charges. For more information either write the group at P.O. Box 647 Venedocia OH 45894, or send internet email enquiries to cgood@lima.ohio-state.edu. or voice phone Charles Good evenings at 419-667-3131. (Reprint from Bits, Bytes & Pixels Nov 1994)

-- ConfMail V4.00

* Origin: MDC/RCC Fido's 'PUP' (314-830-2272) (1:100/210)

RDB Enterprises
643 Fair Ave.
Shelbyville, IN. 46176
(800)464-8851

Monthly meeting location
White house next to
St. Ann's School
2839 S. McClure
Indianapolis, IN

Meeting starts at 2:00 pm
November 20, 1994

Hard Floppy Controller for the TI/994a and the 9640 Geneve with the 32K expanded memory and the 9216b high speed data separator for use with high density drives on the Geneve with the latest version of MDOS \$200.00 or will trade for a non working and non butchered HFDC and \$150.00.

Personality Card and Controller with software to use 15meg drives \$125.00. This was the hard drive setup before the HFDC was produced.

Corcomp 512K memory card, use as a non battery backed Randisk also has a built in epron disk manager \$175.00.

Peripheral expansion boxes with working power supply \$25.00ea empty with an interface card and TI disk controller card \$65.

Foundation 128K card modified to be used as a Myarc 512k card \$175.00.

New Ti joysticks \$4.00 a set.

Replacement Ti keyboards only \$5.00 each.

Disk drives....I have some 5.25 DSDD 1/2 hgt drives \$20.00ea 5.25 DSDD full hgt drives \$15.00ea, I have both 1/2 and full hgt SSDD drives only \$5.00 each. I can also supply some 3.5 drives, but would have to talk to you about your needs.

Consoles \$10.00 each working, non working for parts 2.00.

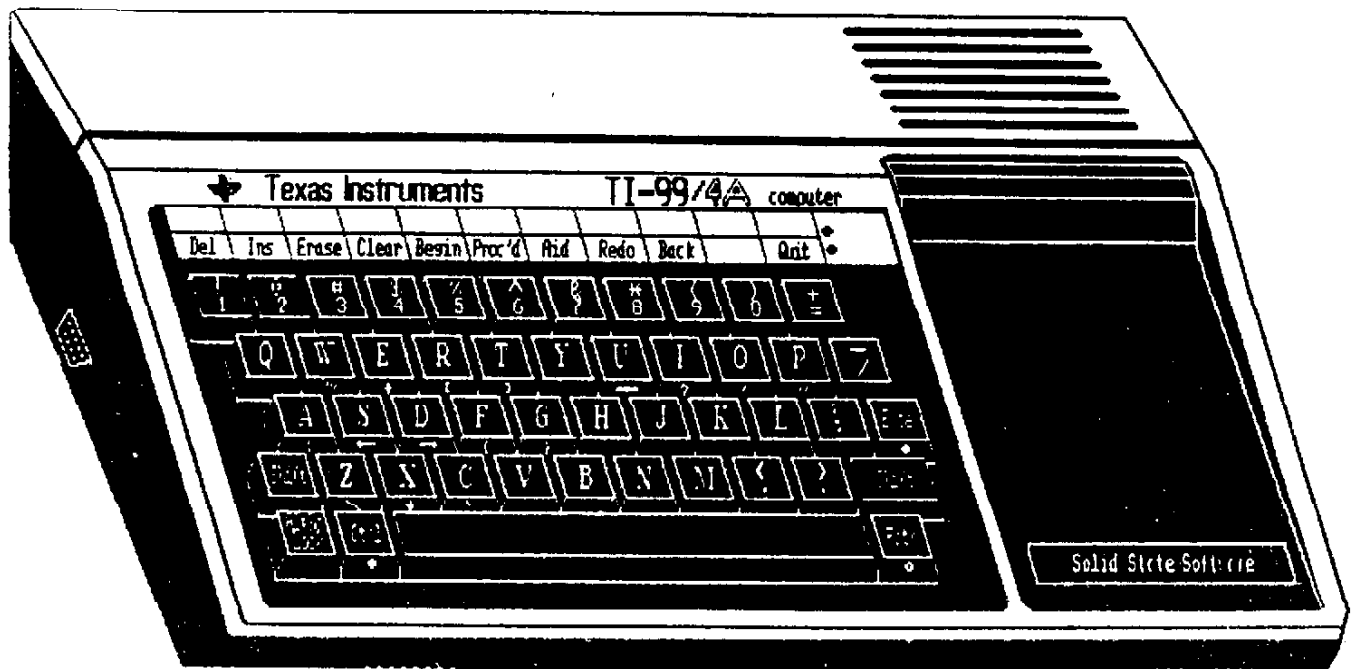
I have some linear power supplies that can be used with the TI PEB or with other projects \$10.00 each. Similar supplies from a parts house would cost much more.

Speech synthesizers \$15.00each.

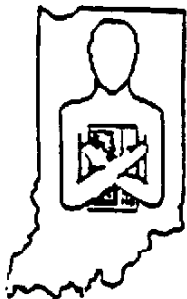
I can order whatever you need in the way of IC chips, cables, sockets or whatever your need may be. The 800 number at the top of the ad is for orders only. I work a full time day job so I will get in touch ASAP.

Thanks,
Ricky D. Bottoms I
RDB Enterprises

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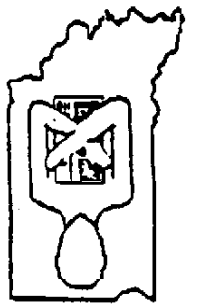
Dan H. Eicher
2720 Palo Verde Ct.
Indianapolis, IN 46227

May 1994
PLEASE RENEW

TIME DATED
November 20, 1994
MATERIAL

Forwarding and Address
Correction Requested

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APPLICATION FOR MEMBERSHIP

Below you will find an application for membership to the Hoosier Users Group. Active membership entitles you to the Newsletter, up and download on the HUGbbs, attendance and voting rights at regular club meetings, access to the HUGger Library of Programs, special club activities and special guest speakers for one year.

Make check or money order payable to Hoosier Users Group. Send completed application to:

HOOSIER USERS GROUP
P.O. Box 2222
Indianapolis, IN 46206-2222

please print

cut on line

Date: _____

Name _____

New membership:

Address _____

Renewals:

City/State _____

\$22.00

Phone number _____