



Classic 99

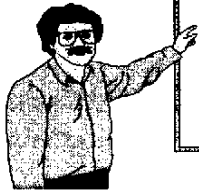
People
Helping
People

The Official Newsletter of the Hoosier Users Group

January 2000

The HUGger's Newsletter

Final Edition



Officer's Corner

By William M. Lucid

There is good news and there is not so good news. Not so good news first. This is the last newsletter of the Hoosier Users Group. There may be a special flyer from time to time; however, this too, is not set in stone. Like other user groups declining funds and lack of contributing writers, and no one that wants to assume the newsletter responsibilities are reasons for this decision. This decision was put to a vote of those present at the November meeting. The good news is we will continue meeting quarterly, with the next meeting scheduled for February 20th, 2000. [Editors Note: It looks like Mike Wright will be in town the weekend of the 19th and 20th. Currently we plan on a group trip up to Larry Conners! All are invited, so we may not have a meeting on Sunday. Let me know if you would like to go up to Larry's! We may have a visitor or two meeting us at Larry's from the Chicago TI group.] For the demo in February, I will be setting up a computer with Windows 2000. Also discussed at the November meeting was to begin supporting IBM clone computers. So, if you need help come to one of the quarterly meetings. Dan Eicher and myself support computers in a professional environment. Please keep the support questions to a meeting.

Dan asked me to do a history of the Hoosier Users Group. I have no notes, this is off the top of my head. The HUG was started back in the early days of Microcomputers, Inc and the first meeting was held in the backroom of Pat and Michael McQuaw's. The disk library was maintained at the McQuaw's store. Moving on and still growing, the

HUG met at Creative Computing, a business where Bill Jones of Indianapolis worked. From Creative Computing, the club moved to St. Ann's School on the Southside of Indianapolis. We met in the cafeteria of St. Ann's until the school closed, then we met in St. Ann's Community house. Our final meeting place has been at Dan H. Eicher's home.

Additional good news, the HUG BBS will continue as long as funds hold out. The BBS started out as a Caltex BBS with no download capability. Eventually it was upgraded to support DV163 merge type file transfers. Steve Sims was the BBS sysop and the BBS was in his house. Steve and his first wife Pam did just about everything for the group. Pam was the first newsletter editor and publisher, In those days there was no shortage of new material for the newsletter. The tough decisions were in selecting articles. There was also Bill Jones of Indianapolis that had a turn at producing the HUGGER. I forget the actual order of the people involved with publishing the newsletter. The most professional of course was Bob Stahlhut, who had worked in the printing industry.

Most recently, the task of publishing the HUGGER has been done by Dan H. Eicher and his wife Jamie. Both have done an excellent job with the newsletter. Jim Ellis was another

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important contributor of articles on modems. He helped all of us better understand modems. Without modems there would be no BBS or Internet connectivity. From Caltex BBS we updated to Texlink, a BBS program from the Ottawa, Canada user group. Texlink provided us with XMODEM upload and download capability. Then along came Tim Tesch's S&T Software BBS which is the current program we use for the HUG BBS. Sysop of the HUG BBS is John Powell. I maintain the hardware end of the BBS, plus I maintain the administrative end of the BBS remotely.

Dan's Spot

Administrative Stuff..

Let me know how much you would like back from any dues you have remaining and I'll refund them. For the past two years, I have been paying all the bills of the Hoosier Users Group out of pocket. Not unlike the Micropendium situation. From time to time I may put out a special flyer. I am also proud of the fact that we are putting out this newsletter! Many users group have disappeared without a trace!

This year's holiday dinner was a success, in addition to the usually suspects, former president Steve Sims and his daughter Danelle came also. It was good catching up with everybody after a busy year.

MORE good news and not so good news... First the not so good news, the once active SW99ers have voted to shutdown, see Tom's email later in this edition. The SW99ers were responsible for FestWest 98 in Lubbock, they also produced the SuperAMS card. The good news, Tony McGovern has decided to release the source code to his and Will's Funnelweb operating environment. Hopefully we will see some updates to take advantage of some of the new hardware that has been introduced!

In this issue you will find:

Some technical information by Michael Becker.

A copy of a TI warranty card I picked up in Europe (TI sold the 4A in more countries than I think any other manufacturer in the early to mid eighties).

Y2K has come and gone, leaving the TI mostly unscathed. A few problems did show up though. One of the problems

appeared in Clint Pulley's disk manager. Dates above and below 2000 would show up fine. Dates in the year 2000 would sometimes corrupt the display. I dropped a line to Clint, who within twenty-four hours had provided the community with a fix! I sent Clint a copy of all the updated MDOS software that had come out in the last couple of years. He wrote back and said he would be releasing the source code to his program to the community. What a great guy!

Here are the two emails I received from Clint:

Dan,

Surprisingly, my customized MDOS 2 system (built in 1994 when I was part of the first post-Myarc development team) appears to be reasonably Y2K compliant. On booting for the first time in months, the date was correct!

New files have a year of 00 when displayed with dir. The problem with dm was that the dates contained in file headers have a 4 digit year and my decoding was 1900 based, resulting in 2000 --> 100. The fix involved changing 2 lines of C code! I use GenASM et al and found that GenMAKE is not y2k compliant - sources changed in 2000 do not force recompiling of binaries built in 1994!! I also noticed that my Geneve compiles a bit slower than the Sun E3000 which I use at work!!!

As I mentioned, I'm very rusty on the Geneve and am not sure about file distribution over the internet. I used PC Transfer in TIFILES mode to move the individual files and an archive 3.03 file via diskette to my PC. I zipped the individual files so I'm attaching 2 files - dmy2k.ark and dmy2k.zip. Hopefully I got it right and the program files are intact.

The program files are dm, dn and d . d is a 2 column directory display which was also non-compliant. If they arrive intact please let me know and I'll put them on my ftp site.

Enjoying the nostalgia trip,
Clint

Dan,

Your package arrived Friday. I browsed through the newsletters and had a quick look at the disk contents. There is more interest in the Geneve than I realized so, as time permits, I'll package up the source code for things like DM, QDE, TICLIB etc. and release it as freeware through my ftp site and ftp.whitech.com. I'll email you when I release anything.

Clint

REMIND-ME:

Philip Vannordstrand of Seabrook, TX has sector edited John Johnson's REMIND-ME program to work properly on the Geneve for dates after 1999.

Just because the Huggers are officially closing down doesn't mean I plan on stopping using my TI's anytime soon! I'll be using my TI for at least another TWENTY years! I plan on continuing to support SNUG equipment on this side of the ocean, updating my web page with expanded support for other TI orphans. I have already send out my membership dues for the Southern California Computer Society, for which I plan on continuing to write articles for.

In closing, most people will never know all the midnight work that went into keeping the BBS going, making sure we had a meeting place, keeping the disk (and cassette) library up to date and organized, taking things to and from fairs to sale, working on demo's and producing a newsletter. I want to thank everyone who has contributed to help keep the Hoosiers Users Group going over these many years.

Dan

Report on the 1999 Chicago TI Faire

By Charles Good

This was the 17th year for the Chicago User Group's annual fair. This year the event was free. As in some past years, it was at the Evanston, Illinois public library. This an excellent easy to find location with indoor (not free) parking. The Chicago Faire is by far the longest running TI99/4A fair and perhaps the last remaining such annual event in the United States.

This particular event was unusually organized and unusually well attended. When I say well organized I mean that everything worked smoothly as planned. In particular, all the equipment worked, and there was some rather fancy equipment. Hal Shanafield told me that he handed out 50 name tags at the event. This means that attendance was probably UP from 1998 and 1997 levels. I met Tiers I know who had not attended a fair in several years, including Don Jones who used to write a monthly column about the Geneve, and Andy Frueh (andyfrueh@hotmail.com). Andy had Windows CD's with the complete collection of Micropendium magazines as scanned images available for \$2. He sold at least 10 of these. Fair attendees saw new hardware and new software and heard some great stories.

One of the more interesting stories was told by Hal during a break in Bud Mills' presentation. Hal said that recently a friend of his telephoned him on a Friday evening. This friend had recently lost his job at Scott Forsman's headquarters in a Chicago suburb. The company had been acquired by another company and was downsizing. On the day his friend had to clean out his desk, the friend reported that a storage room was being emptied of old TI cartirdges and hardware. Scott Forsman had developed a bunch of TI software, some of which didn't sell well and some of which was never released. Some of these programs were ported over to other systems like Apple II. Everything went into dumpsters. Then next day, Saturday, Hal zoomed over to SF headquarters and found the place more or less deserted except for a watchman. This guy said, "Yup, they threw away several dumpsters full of little rectangular beige plastic things (cartridges) as well as larger beige plastic boxes and silver and black boxes (TI consoles and probably pboxes) as well as lots of square flat black things (floppy disks)." The dumpsters were empty! The trash hauling company told Hal that everything had first been crushed and then dumped in a landfill, lost forever. In its School Management Applications catalog of 1981 the company offers school districts complete 99/4A software AND HARDWARE systems to manage school systems. Apparently they just recently threw all this stuff out.

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Barry Harmsen from the TIGG group of the Netherlands talked about how Europeans use the 99/4A. Most there have Michael Becker SCSI cards in their systems with zip drives. John Johnson's Boot menu program works great with such a system. Art Green's TT Writer v5 and the Funnelweb editor both allow the use of path names. He have out copies of DM2K v1.5 which is the preferred 99/4A disk manager there.

This software works well in all platforms (ramdisk, Myarc floppy controller, HFDC, floppy, and SCSI). One still needs David Neeter's SCSI manager to initialize the SCSI drive, which you have to do with each separate zip disk. Barry reports that USA made SCSI cards by Western Horizon Technologies need an upgrade board and eprom 6.0 to work well on a 99/4A. This upgrade is available from WHT.

Although WHT SCSI boards that are not upgraded will work with a Geneve they will work better with a Geneve if they are upgraded, Barry said.

Gerd Weissmann then talked about the German pbox cards made by Michael Becker and demonstrated the speech card. Most cards were available for examination, but purchases need to be made either directly from the person who makes the cards, Michael Becker michael.becker@man.adtranz.de, or perhaps from Dan Eicher EICHER@delphi.com in Indianapolis. Prices in DM are stable but dollar prices may change as exchange rates vary. Available cards for the /4A include 80 column cards with either the 9938 or 9958 video chip. Both need an RGB monitor like that used with the Geneve. The 9938 supports a mouse and 256 colors. The 9958 has no mouse support but has thousands of colors. No price for the 80 column cards was available. The HSGPL card with 16 pages of GROM is \$165.

This completely replaces the /4A console and lets you use a modern keyboard. The GROM pages can be loaded with cartridge software. A 16 bit RAMDISK card with 3mb of memory costs \$160. A speech card cost \$160. This has a greatly expanded 400+ word XB vocabulary and gives you either a male or female voice as well as the

standard TI "computer" voice. It is 100% compatible with cartridges that include speech.

Mike Wright mjmw@ix.netcom.com told the audience about his recent trip to visit Tiers in Europe. Mike also demonstrated PC99. This was projected onto a large screen in front of the audience using the libraries computer projector and the library's portable Pentium PC with monitor. This projection system was spectacular. While in Europe Mike said that he saw a WORKING TI Video Controller card actually controlling a modern VCR from the TI's keyboard. This is probably the card that I gave to Gerd Weissmann several years ago. He gave it to Michael Becker, who figured out how to make the card send instructions to the infrared input of the VCR. The TI was functioning as an automatic remote control, alternately combining computer output and video tape images on a TV screen under the control of an XB program.

Another amazing story Mike and Barry Harmsen told means that we now have available a "new" official TI cartridge that nobody on this side of the Atlantic has ever seen. In 1983, Barry was in Paris and saw for sale TI CALC, spreadsheet software completely contained in a cartridge. This was two days before Black Friday. Barry knew that this was a new product and although it was expensive he purchased it. He went back to the Netherlands and showed the product to his local user group a couple of days later. If I understand Barry's story correctly, Black Friday came and then in Europe Black Tuesday occurred when TI mandated that all its products be pulled from store shelves. The next weekend other members

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of Barry's user group went to Paris and were unable to purchase TI CALC. It was gone from all store shelves. This is apparently a product that was only available in one country and only for one weekend before TI withdrew it from the market. Barry purchased the only known copy. Michael Becker had Barry's cartridge and official TI user guide. Now Mike has them. The user guide is now available from Mike as part of his CYC, \$25 on a cd with lots and lots of text and documents in *.pdf format as well as some software in PC99 format. The cartridge uses a unique bank switching system with 4 banks of rom. Mike arranged to have PC99 modified so that it will run TI CALC and showed the audience the title screen and played with the spread sheet a bit. The next version of PC99 will have this 4 rom bank emulation and may include for free TI CALC.

Mike also found in Michael Becker' magic basement the source code in GPL for a "13SN Basic Support Module" which was apparently only to be used internally at TI. It does vpoke and other neat stuff. Unfortunately this will not assemble on a 4A with available GPL assemblers. Mike shipped the code off to Rich Gilbertson who probably knows more about GPL than anyone else alive. We may soon also have this "new" official TI cartridge to play with.

And finally, Mike brought home from Michael Becker's magic basement the official commented TI source code for the console GROMs and ROMs. Instead of reverse engineering the console and guessing at what everything does, as was done in the book TI Intern, we will soon have available the official version, with no guessing and with official comments like "don't change the contents of this address because if you do XB will crash".

Lew King showed how he accesses the internet using the programs ZT4_80 and TERM 80. Both give you an 80 column display on an unmodified 99/4A using 3 pixel wide characters.

They looked really really good on the big projector screen feeding from a 99/4A console into some kind of a converter box to an SVGA monitor and to the PC SVGA projector. The box lets one use an SVGA monitor with a 99/4A. If you ask Lew he will give you the details about where he

purchased this magic box. Using ZT4_80 Lew was able to log on at 38400 using a TI_RS232 and a 36.6 modem. He downloaded email and downloaded files from an ftp server with this configuration. Then he switched to Term 80 and used the LYNX browser that was running on his ISP's server to view the text (no graphics) of web pages. Very impressive!

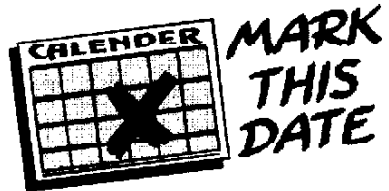
The final presentation of the day was by Mark and Dave (I missed their last names) on the Linux operating system. They also used the projector system to display what was on their laptops. They represent the Chicagoland Linux user group <http://clug.chicago.il.us>. Linux is a free open operating system for PCs with source code also freely available. Most web servers today run the free Apache server program under Linux. Netscape has a Linux version of its browser. The presenters said that currently Linux development is similar to the 99/4A, both of whose operating systems are today open and widely known and can be modified as needed. They also stated that Linux has a "dosemu" mode which emulates msdos. Soon Mike Wright will try to run PC99 under Linux using this mode.

AWARDS

After the show we all went to eat at a neighborhood restaurant. Then we went around the corner to a cyber cafe. The Chicago group paid for our computer time and award announcements were made by fair organizer Hal Shanafield.

The John Birdwell award for outstanding service to the TI community is awarded annually by the trustees of the Birdwell Fund, into which fairware donations for Birdwell's DSKU (Disk Utilities) are placed. The fund pays for a plaque to the award recipient. This year's award goes to Tony and Will McGovern, authors of Funnelweb. The Chicago group's annual Grant Schnaglemeier (I hope I spelled this properly) memorial award goes to Ernest Pergrem who, after leaving the TI community years ago has come back into the flock and now runs the Chicago group's BBS and software library. Ernie has also helped me out significantly in my project to get all the

Micropendium magazines and disks available for free to the TI community.



Fair addendum by Mike Wright.

Dear Charles,

Please make a couple of amendments to the story on the Chicago Faire you posted. I've been given a rough time over some of the stuff.

1. The VCR demo was done by Wolfgang Bertsch. He was the owner of the Video Controller and the VCR. The VCR was a vintage machine with a wired remote control. It was made by Panasonic, but it had a Blaupunkt label.

Wolfgang told me he was a TV technician, and that he thought it might be possible to make an infrared interface so that the Video Controller could drive a modern VCR.

2. The BSM code was brought from Michael Becker's basement. The TI source code for the console ROMs and GROMs came from another source. It is very similar to the ROM source code that is already on the CaDD CD. I am only working on the ROM portion, since I don't think I know enough to be able to get the GROMs to assemble.

Sorry if the above wasn't too clear during the presentation.
Mike

The Demise of the South West 99ers

Date: Tue, 18 Jan 2000 21:10:47 _0700
From: Tom Wills <Tom@Wills.net>
Subject: [ti_99/4a] Re: User Groups

Ernie,
The membership of the SW99UG voted at the last membership meeting to disband. The officers from 1999 are shutting down the UG in an orderly manner. It probably won't be totally shut down until about April.

As far as I know, VAST went under some time ago.
Tom

Tentative HOOSIER USERS GROUP Meeting

Schedule

February 20th

May 21st

August 20th

November 19th

Mark your calendars!!

Hoosier User Group meeting place TO BE ANNOUNCED prior to meeting. Meetings start at 2:00pm.

HUG supports the following computers:

TI 99/4A and Myarc 9640 Geneve, TI CC-40 and TI-74 BasicCalc and IBM PC.



HUGGER S&T BBS

Hoosier Users Group, Indianapolis, IN
300/1200/2400/4800/9600 8N1
317-782-9942

Sysop: William M. Lucid
email: lucid@indy.net

David,

Has SW99ers formally disbanded? BTW, what ever happened to VAST, did they also throw in the towel?

Ernie

Surviving Local TI Clubs with a newsletter

The Southern California Computer Group in San Diego, Ca. still meets eleven times a year on the second Thursday of each month except December. We publish a newsletter and Ken Hastings has opened a Web site restricted to our group on egroups.com. Our library and equipment is free to ANYONE that is willing to pay shipping charges. We still have P.E. Boxes and consoles available plus a few other items such as disk drives, etc. We still have a P.O. Box but plan to give it up at the end of April since we do not get very much mail anymore from other groups. As the treasurer of the group, it is OK to send communications to me. I ask that any checks sent to me for the group be in my name since the SCCG dropped Bank of America because check charges were draining our account. Membership in the group is still \$15 a year and we plan to pro-rate and refund any unused fees if we have to disband.

If you need further info, address me an email please at

sccgwoody@aol.com

Woodrow A. Wilson

5311 Kalmia St.

San Diego CA 92105_4910

Date: Tue, 18 Jan 2000 22:08:34 _0600

From: Ernest Pergrem <epergrem@core.com>

Subject: [ti_99/4a] Re: Surviving User Groups

Dan,

Chicago plans to resume a printed newsletter starting with the March -April issue. It won't be nearly the size it once was, and distribution will be bi-monthly, but I really believe it's absence, linked with our BBS having been shut down for 2 years, really had an effect on our membership. Would more than welcome your contributions. Ernie "so kick me for taking on such an under appreciated task" Pergrem

From: GBBasics@aol.com

Subject: [ti_99/4a] Re: Surviving User Groups

The TI-Chips is the only remaining TI-99/4A-Geneve 9640 user group in the Cleveland, Ohio area. (See the Calendar section of the [ti99/4a e_group](http://ti99/4a_e_group) for our meeting dates, time and place.) The Northcoast 99ers disbanded in September of last year. The Cleveland Area TI-99/4A User Groups was a coalition of the TI-Chips and the Northcoast 99ers.

Historic Note: Way back in 1983, the Cleveland Area TI-99/4A User Groups consisted of the Solon, Ohio UG, Golden Crescent UG, Northcoast 99ers UG and the Westside (TI-Chips) UG. Both Solon and Golden Crescent user groups dropped out in 1987. (There was no "Cleveland User Group" as such.) The confusion came from those who advertised us as such and the masthead on our newsletter (Which has recently been changed to read, "TI-CHIPS of Greater Cleveland, Ohio.")

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Disclaimer

This newsletter is brought to you through the efforts of officers and members of the Hoosier Users Group. Every member is encouraged to submit articles.

If you have an article you would like to share; or a request for an article, mail it to:

Dan Eicher

4509 Northeastern Ave.

Indianapolis, IN 46239

Opinions expressed are those of the author and not necessarily those of the Hoosier Users Group.

The TI-Chips is still alive and well mainly because we expanded our meeting agenda to include discussing, sharing information and demoing the TI-99/4A, Geneve 9640 and non-TI computer systems. The only thing that remains the same is that membership in the TI-Chips is restricted to those who either own or know how to use a TI-99/4A or Geneve 9640. The TI-Chips still publish our bimonthly newsletter. Membership is \$10/yr.

Glenn Bernasek
Secretary, TI_Chips
GBBasics@aol.com

Michael Becker's Technical Corner

[Editors Note: I have heavily modified this section to make everything "fit" nicely into a question and answer format.]

Question: I have a card, I believe to be a Mechatronic's RAMDISK but it doesn't fit into the P-BOX. What card did Mechatronics manufacture?

Answer: I only know the following projects/products from MECHATRONIK:

QUICK-DISK for the TI CC-40
80-column-card (sidecar for TI99)
CENTRONICS-sidecar for TI99 with or without
32K-memory
128K-GRAM-card for P-Box
512K-GRAM (same as 128K, but with miniboard on the top)
64K-EPROM-module for TI CC-40
EPROMMER for TI99-Module-Port.

Are you sure you do not have a ATRONIC-product instead of MECHATRONIK? There were two German manufacturers/vendors in the past.

Question: I have a Mechatronic 128K GRAM card. In the manual it states that I should contact my dealer to upgrade to a 512K GRAM card. Since there is no known dealer anymore, can the 128K card be upgraded by replacing or adding memory?

My card uses four HM50464 (64Kx4 bit) DRAM chips. To upgrade, I would think 256Kx4bit DRAM, but these are 20-pin DIP and not 18-pin DIP. Was the 512K card a different board layout? A daughter-board attachment?

Also, I have DSR v1.1 on the card. Is there a later version?

Jeff White
jhwhite@delphi.com

Answer: The 512K-version used a daughterboard instead of the D-RAMS in the 4 sockets. I've seen it only once. There are two versions in the field, but one is very rare! One was made from Mechatronic, using 4 DRAMS of 256K*4 and a lot of 74LS257 Muxes. The other one is from an unknown vendor and made in a different way, but using the same 256K*4 DRAM's. The board layout was still the same, but the second 7805-regulator was installed (have a look at your board!).

DSR1.1 is fine, ASFAIK the last revision. Please do not try to upgrade your card!

When MECHATRONIC discontinued the production, a vendor in the near of Hamburg bought all the material. I made all the fixing and soldering of the last boards (the light-green-layout). So I know all about the sensitivity of the layout. i.e. the DRAMS for the GROM-emulation have to be from NMOS-type, CMOS will not work. Installing the series resistors (design is prepared for it, have a look!) in the DRAM-traces will not fix it. DRAMS for RAM (the other pair) maybe CMOS or NMOS..... bad design!

BTW: this card is a copy of TI's GRAM-card, only the DSR_ROM is added! (You can see it because the EPROM is located OUTSIDE the Data-buffer 74LS245 and has to drive the Databus directly!!!), made by Heiner Martin, same as the "real GROM-module-emulation" which was a copy of TI's engineering samples too!!! (This guy had very good connection to the Dutch TI_factory.)

Questions: After reading the manual (which I have, though Thierry Nospikel's website also has it), I notice that the GROM addresses do not roll over properly. Next access

fter G>77FF goes to G>7800, rather than back to G>6000. After G>7FFF, goes to G>8000, and after G>FFFF goes to G>0000. Does this improper rollover affect the operation of any cartridges?

[Nouspikel's site:

<http://www.stanford.edu/~thierry1/ti99/titechpages.htm>]

I think the Geneve and HSGPL handle the rollovers to the real GROM convention. I'm not sure about the GramKracker, Gramulator or PC99 and other emulators.

Jeff White

Answer: All GROM addresses do NOT rollover to its base! This will not affect operation of any cartridge. We have used this feature in our HSGPL to find out if the GROM0 is a real GROM or our own GROM from our card. ALL real GROM's have a 13bit Address-counter only, the 3 higher level bits are decoded at the moment when the address is written too 9C02. The output of the chip select is then latched until an overflow of the 13-bit counter occurs. So on every 8K-border the actual chip-select is lost and not taken to the next GROM (How should this work?). The "slack" on the upper 2K is normal and not because of the address-counter. On every GROM-Emulation is an central 16-bit counter, and the chip select is made from the upper 3 addresses every time, so it is every time true. That is the reason that after the last address of GROM-3 (G>7FFF) the GROM_4 is addressed. Our test in the HSGPL works like this: Preload the GROM-address to the end G>FFFF, read one time (dummy to increase the counter) and look for the >AA in GROM-0. If available, it is our own GROM (from our emulation), if not, it is a real GROM, which has not seen the rollover. Tricky!

Michael Becker

Question: I have a RAVE-SPA01 which I use with a Geneve. Sometimes I hear "popping" sounds when I load a large program.

Answer: This might be caused by some early boards that did not fully decoded the AMA, AMB and AMC lines which are used on the Geneve to access additional memory, not used in the 4A. I have decoded the PAL that

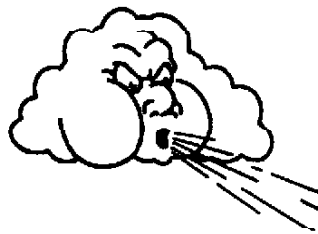
came with the RAVE-SPA01. The version I have does fully decode these lines. If anyone needs one I will ship some over to Dan Eicher.

In addition, I've found a small bug in the board:

The READY-line, which is output from Speech-chip is buffered and gated by the PAL. But they forgot to include the pull-up-resistor on the PAL-input, because the output of the PHP1500-board is an open-collector from an real transistor. It works with the bipolar PAL-device only, because this will supply current output through its multiemitter_transistor.....(typically.) You better should mount a 4K7-resistor from PAL-pin-14 to +5V on the SPA01. This makes the whole thing safer and allows you to replace the PAL20L8 with any compatible CMOS-GAL.

BTW: When the PHP1500 is connected directly to the console, the pull-up (4K7) is inside the console, but RAVE forgot to include it in their design.

P.S. The value "4K7" is a safe way to describe 4700 Ohms (4,7K), because the comma is so small, professionals always use the letter for the value as the comma. Ie. 4K7 = 4,7K 2u2 = 2,2 microfarad (because the Greek micro is not in 7bit_ASCII, you may use "u" instead of)



Good bye for now...
the Hoosier Users
Group



English

Limited warranty - U.K.

This Texas Instruments (TI) warranty extends only to the original consumer purchaser.

- The electronic and mechanical components of the product are warranted for a period of twelve (12) months from the date of original purchase under normal use and service against defective materials or workmanship. This warranty is void if the product has been damaged by accident, unreasonable use, neglect, improper service or other causes arising out of defects in materials or workmanship.
- Any implied warranties arising out of the sale are limited in duration to the above twelve (12) month period.
- During the above twelve (12) month period, the product will be repaired or replaced with a new or reconditioned one of equivalent quality at Texas Instruments option, without charge to the purchaser when the product is returned, with proof of purchase date to a Texas Instruments retailer. The repaired or replacement product will continue to be warranted until the end of the original twelve month period or ninety (90) days from the date of repair or replacement, whichever comes later.
- Important notice of disclaimer regarding the software programs and book materials - read this carefully before purchasing the console and/or programs.
T.I. does not warrant that the software programs and book materials will be free from error or will meet your specific requirements. Each user is notified that the programs may contain errors and assumes sole responsibility for any decision made or actions taken based on information obtained from using the programs. No information given concerning the utility of the programs is to be construed as an express or implied warranty.
- In no event shall T.I. be liable to anyone for special, incidental, or consequential damages in connection with or arising out of the purchase or use of the console. Hardware and/or programs and the sole and exclusive liability of T.I. shall not exceed the purchase price of the console, hardware and/or programs. T.I. shall not be liable for any claim of any kind whatever against the user of the programs by any other party.

** Paragraphs 4 and 5 shall not affect the statutory rights of the consumer as defined in the consumer transactions (restrictions of statements) order 1978, as amended.

Deutsch

Garantie

Texas Instruments gewährleistet nur dem Endverbraucher (Erstkäufer), daß dieses Produkt von Texas Instruments bei sachgemäßer Wartung und sachgemäßem Gebrauch frei von Herstellungs- und Materialfehlern ist.

- Diese Garantie deckt die elektronischen und materiellen Bestandteile dieses Produkts für einen Zeitraum von sechs (6) Monaten ab dem Tag des Verkaufs an den Einkäufer. Die Garantie ist hinfällig, wenn das Produkt durch Unfall, unsachgemäße Behandlung, Nachlässigkeit, unsachgemäße Wartung oder andere Ursachen, die nicht auf Material- oder Herstellungsfehler zurückzuführen sind, beschädigt wurde.
- Jegliche eingeschlossene Gewährleistung, welche durch den Verkauf entsteht, ist in der Dauer begrenzt auf den oben sechsmonatigen Zeitraum.
- Während des obigen sechsmonatigen Zeitraums wird das Produkt nach Wahl von Texas Instruments kostenlos repariert oder durch ein neues oder einwandfrei nachgebessertes Austauschprodukt entsprechender Qualität und Güte ersetzt, wenn das Produkt mit Nachweis des Kaufdatums an einen autorisierten Texas Instruments-Händler eingesandt wird.
Das reparierte oder ersetzte Produkt unterliegt weiterhin den Garantiebedingungen bis zum Ablauf des ursprünglichen sechsmonatigen Zeitraums, mindestens jedoch für neunzig Tage ab Datum der Reparatur oder des Austausches.
- Wichtiger Hinweis für die Grenzen der Gewährleistung von Software-Programmen und Druckwerken:
Bitte beachten Sie die folgenden Hinweise sorgfältig, bevor Sie die Programme einsetzen.
Texas Instruments gewährleistet nicht, daß Software-Programme und Druckwerke völlig frei von Fehlern sind oder ihren speziellen Anforderungen genügen, daß er allein und ausschließlich für die Entscheidungen und Maßnahmen verantwortlich ist, die auf Informationen beruhen, welche auf der Benutzung des Programms beruhen. Alle Angaben zur möglichen Verwendung der Programme sind Anregungen und verstehen sich nicht als Zusicherung der Brauchbarkeit für einen bestimmten Zweck. Sie erfolgen stets unter dem Vorbehalt, daß die Fehlerfreiheit der Programme nicht garantiert wird.
- Texas Instruments haftet nicht für entgangene Nutzung und sonstige Schäden, welche nicht am Produkt selbst entstanden sind.
Die Haftung von Texas Instruments beschränkt sich auf jeden Fall auf den Kaufpreis für das Produkt.
Texas Instruments haftet nicht für Forderungen jeglicher Art, welche durch Dritte gegen Anwender von Programmen gestellt werden.

Français

Garantie contractuelle du matériel constituant l'ordinateur familial de Texas Instruments

- La présente garantie ne s'applique qu'entre Texas Instruments France (TIF) et le premier acquéreur d'un Ordinateur Familial (console, accessoires, unités périphériques ou modules d'application) achetant pour son usage personnel en tant qu'utilisateur.
Elle est strictement personnelle et n'est en aucun cas cessible. Toutefois en cas de décès, le titre de garantie bénéficiera au conjoint et aux enfants habitant sous le même toit.
- La présente garantie s'applique à l'Ordinateur Familial Texas Instruments ainsi qu'à ses composants mécaniques et électroniques à l'exclusion, toutefois, des programmes contenus dans les différents supports (modules d'application, disquettes, cassettes). En outre, TIF ne sera pas responsable des erreurs contenues dans les brochures ou manuels d'utilisation de ces programmes.
- Durée de la garantie: La présente garantie prend effet à compter de la date d'acquisition de l'Ordinateur Familial pour une durée de 6 mois. TIF assure gratuitement la réparation ou le remplacement des composants ou des pièces détachées et la main d'œuvre correspondante pendant cette durée au présentateur ou justiciable d'achat seul en cas de non respect des prescriptions d'utilisation ou lorsqu'une cause étrangère à l'appareil est responsable de la défaillance. Les pièces réparées ou remplacées bénéficieront de la garantie applicable aux matériels d'origine à concurrence de la durée restant à courir pour celui-ci et à laquelle viendra s'ajouter un minimum de 90 jours à compter de la date de réparation ou de remplacement. Tout matériel retourné sans justificatif de la date d'achat sera réparé au coût de la réparation en vigueur au moment du retour.
- Exclusions: sont formellement exclus de la garantie les dommages occasionnés directement ou indirectement par:
 - Toute utilisation non conforme à l'usage pour lequel l'appareil a été vendu, toute absence de respect des instructions du fabricant, tout choc, chute, erreur de manipulation, tout transport ou démontage, toute élimination ou modification du numéro de série, et, d'une manière générale, tout événement extérieur, imprévisible et insurmontable.
 - Les préjudices immatériels (privation de jouissance) résultant du non fonctionnement de l'appareil couvert par la garantie.
- Les dispositions stipulées ci-dessus ne sont pas exclusives du bénéfice au profit de l'acquéreur de la garantie légale pour défaut de vices cachés qui s'appliquent, en tout état de cause, dans les conditions prévues par les articles 1641 et suivants du Code Civil.
Note: Vous devez vous adresser directement à votre revendeur pour la mise en oeuvre de cette garantie.

Norsk

Home Computer 24 måneders begrenset garanti

Denne TEXAS INSTRUMENTS (TI) garanti gjelder kun for opprinnelig kjøper.

- De elektroniske og mekaniske komponentene i produktet garanteres for en periode av 24 måneder regnet fra opprinnelig kjøpsdato, forutsatt normal bruk og service, mot feil i materialer og arbeid. Denne garanti bortfaller hvis produktet er blitt ødelagt som følge av uheld, uforutsigelig bruk, eller uforutsigelig service.
- I løpet av ovennevnte 24 måneders periode vil produktet bli reparert eller erstattet med et nytt eller overhølt produkt av samme kvalitet, etter TI's valg, uten belastning for kjøper, forutsatt at produktet returneres til en TI forhandler sammen med bevis for opprinnelig kjøpsdato. Det reparerte eller erstattede produktet er fortsatt dekket av garantien til utløpet av den opprinnelige 24 måneders perioden, eller i 90 dager etter reparasjon eller erstatning, avhengig av hvilken dato som kommer sist. Etter garantitidens utløp vil produktet bli reparert mot belastning av reparasjonens kostende, d. v. s. medgått arbeidstid og materialer.
- Viktig
Vedrørende reklamasjoner på software programmer og litteraturmaterieil: Les dette nøyte før kjøp av konsoll og/eller programmer.
TI garanterer ikke at software programmer og litteraturmaterieil vil være fri for feil eller vil dekke Deres spesifikke behov. Enhver bruker gjøres oppmerksom på at programmene kan inneholde feil, og er selv eneansvarlig for resultat av beslutninger og handlinger basert på informasjon som er resultat av bruk av programmer. Ingen informasjon som er gitt vedrørende anvendelighet av programmer er å anse som garanti av noe slag.
- TI er under ingen omstendigheter som direkte eller indirekte refererer seg til kjøp eller bruk av konsoll, tilleggsutstyr og/eller programmer ansvarlig for tap og følgeskader av noen slag. TI's ansvar vil under ingen omstendigheter overskride verdien av konsoll, tilleggsutstyr og/eller programmer. TI er under ingen omstendigheter ansvarlig for krav av noen slag fra noen annen part mot bruker av programmer.

Portuguese

Garantia limitada

Esta garantia TEXAS INSTRUMENTS (T.I.) aplica - se somente ao primeiro comprador.

- Os componentes eletrônicos e mecânicos estão garantidos por um período de seis (6) meses a partir da data da compra original, sob utilização e serviço normais, contra defeitos de fabrico. Esta garantia fica anulada se o equipamento for danificado por acidente, utilização inadequada, negligência, serviço impróprio ou outras causas que não se baseiam em defeitos de fabrico.
- Qualquer outras garantias decorrentes do acto de venda implícitas estão também limitadas em duração a seis (6) meses, a partir da data da compra original.
- Durante os seis (6) meses de garantia, o equipamento será reparado ou substituído por outro novo ou reconhecido de qualidade equivalente, segundo opção da TEXAS INSTRUMENTS, sem encargos para o comprador, quando o equipamento for devolvido a um agente da TEXAS INSTRUMENTS, acompanhado de prova da data de compra, o equipamento reparado ou substituído fica garantido até terminos da cessar a garantia original de seis meses ou por noventa dias, valendo o maior período de tempo.
- No que diz respeito a programas de software e literatura complementar deverá o comprador antes de adquirir a consola e/ou os programas levar em linha de conta o seguinte: A T.I. não garante que os programas de "software" e a literatura complementar estejam isentos de erros ou satisfaçam as necessidades específicas de cada utilizador. Cada utilizador é avisado de que os programas podem conter erros e assume total responsabilidade por qualquer decisão ou acção tomadas com base na informação recolhida da utilização dos programas. Nenhuma informação fornecida referente a utilidade dos programas poderá ser tomada como garantia expressa ou implícita.
- Em caso algum poderá a T.I. ser responsabilizada por danos especiais, incidentais ou consequentes ligados com ou originados pela compra ou utilização da consola, "hardware" ou programas e a única e exclusiva responsabilidade da T.I. não poderá exceder o preço de compra da consola, hardware e/ou programas. A T.I. não será responsável por qualquer reclamação, ainda que contra o utilizador dos programas, por qualquer outra parte.

TEXAS INSTRUMENTS

Country: _____
 State: _____
 City: _____
 Zip: _____

Name: _____
 Address: _____
 Telephone: _____

Signature: _____
 Date: _____

U.S. Cash
 Personal
 Credit
 Charge
 Order
 Payment
 Enclosed
 In Cash

DATE ORDERED: _____
 DATE SHIPPED: _____

SEE IMPORTANT WARRANTY INFORMATION AT THE OTHER SIDE OF CARD.

Dansk

Etårig Afhjælpningsret for home computer

Texas Instruments (TI) påtager sig overfor forbrugeren at afhjælpe fabrikationsfejls som følger:

1. TI vil i et tidsrum af 1 år fra købsdatoen for det første de talte af afhjælpning af materialer og udførelse, forudsat normal anvendelse og service.
Afhjælpningsretten kan ikke påberåbes, hvis produktet er blevet beskadiget hænderligt eller som følge af forsømmelighed eller uønsket hård behandling, dårlig vedligeholdelse, eller andre årsager, der ikke skyldes fejl i materialer eller udført arbejde.
2. I afhjælpningsperioden vil varen blive repareret, istandsat eller ombygget med en ny eller istandsat model for TI's regning, hvis varen returneres til en TI forhandler med bevis for købsdato indenfor afhjælpningsperioden.
Den reparerede eller ombyggede vare vil fortsat være dækket af TI's afhjælpningsforpligtelse indtil 1-års periodens udløb, dog mindst 90 dage fra reparations- eller ombygningsdagen.
3. Vigtig meddelelse angående ansvarsbegrænsning for Software-Programmer og Brochurermateriale
Læs venligst grundigt for køb af konsoler og/eller programmer.
TI kan ikke indestå for, at softwareprogrammer og instruktionsmateriale vil være fejlfri, eller at disse opfylder Deras specielle krav. Hver enkelt køber er informeret om, at programmer kan indeholde fejl og tager selv det fulde ansvar for beslutninger truffet på grundlag af informationer opnået gennem brug af programmerne. Givne oplysninger vedrørende anvendelsen af programmerne må ikke betragtes som indeholdende nogen garanti eller indstælelse fra TI's side.
4. Købers ret til afhjælpning i medfør af ovennævnte er TI's eneste hermed pålæggende forpligtelse overfor forbrugeren. TI kan ikke i kraft af denne afhjælpningsret gøres ansvarlig for indirekte skader eller følgeskader af nogen art i forbindelse med salget eller ved brug af konsollen, hardware og/eller programmer. TI's erstatningsansvar kan under ingen omstændigheder direkte eller indirekte overstige varens selvkøbpris. TI er ikke ansvarlig for noget som helst krav, som måtte blive fremsat fra anden side mod brugeren af vore programmer.
5. Med forbehold af de forbruger/købers i henhold til lovgivningen tilkommende ufravigelige rettigheder, er den herved givne afhjælpningsret for hardware købers eneste retsmiddel i tilfælde af fejl og mangler.

Italiano- Questa garanzia della Texas Instruments (TI) si applica solo all'acquirente originale del prodotto

1. In caso di guasto vi preghiamo di consultare il vostro rivenditore.
2. Le parti elettroniche e meccaniche del prodotto sono garantite per un periodo di sei (6) mesi dalla data di acquisto originale per i difetti di materiale o di mano d'opera, "purché" utilizzata e mantenuta in normali condizioni".
Questa garanzia è invalidata se il prodotto è stato danneggiato in seguito ad incidenti, uso negligente, servizio di assistenza inappropriato o altre cause estranee a difetti di materiali o di mano d'opera.
3. Qualsiasi garanzia implicita conseguente alla vendita è limitata nel tempo al periodo sopra citato di sei (6) mesi.
La Texas Instruments non risponde dell'ossessibilità di uso del prodotto e di altri costi industriali o consequenziali e di altre spese e/o danni subiti dall'acquirente.
4. Durante il periodo citato di sei (6) mesi, il prodotto sarà riparato o sostituito con uno nuovo o ricondizionato di pari qualità a scelta della Texas Instruments, senza addebiti all'acquirente sempreché il prodotto venga da questi reso, con documento comprovante la data di acquisto, ad un rivenditore della Texas Instruments.
Il prodotto riparato o quello sostituito continuerà ad essere garantito fino alla fine del periodo originale di sei (6) mesi ovvero per novanta (90) giorni dalla data di riparazione o sostituzione, quale dei due termini scada in data posteriore. I prodotti per cui si richiede assistenza, privi della prova della data di acquisto, saranno riparati previo pagamento della tariffa in vigore al momento della ricezione.
5. Avvertenza importante di rinuncia riguardante i programmi di software e/o i manuali.
Leggere attentamente prima dell'acquisto della console e/o dei programmi.
La Texas Instruments non garantisce che i programmi di software ed i manuali siano privi di errori o soddisfino le necessità specifiche dell'utente.
Ogni utente si assume la completa responsabilità per qualsiasi decisione o azione intrapresa basandosi su informazioni ricavate dall'utilizzo di questi programmi.
Nessuna delle informazioni fornite relative all'utilizzo dei programmi potrà essere interpretata come una forma di garanzia espressa o implicita.
6. In nessun caso la Texas Instruments sarà responsabile nei confronti di terzi per danni accidentali, speciali o consequenziali collegati a/o derivanti dall'acquisto o dall'uso della console, dell'hardware e/o dei programmi e l'unica esclusiva responsabilità della Texas Instruments non supererà il valore del prezzo di acquisto della console, dell'hardware e/o dei programmi.
La Texas Instruments non sarà responsabile per alcun reclamo di qualsiasi genere nei confronti dell'utilizzatore dei programmi da parte di qualsiasi terzo.

Suomeksi

Kotitietokoneen kuuden kuukauden takuu

Tämä Texas Instrumentsin (TI) takuu on voimassa ainostaan ensimmäisen ostajan suhteen.

1. Tuotteen elohkirjoitusten ja mekaanisten komponenttien osalta on voimassa kuuden kuukauden takuu ostopäivästä lukien edellyttäen, että tuotetta käytetään ja huolletaan normaalisti. Tämä takuu koskee materiaali- ja valmistusvirheitä. Takuu ei koske vaurioita, jotka johtuvat vahingoista, virheellisestä käytöstä, huolimattomuudesta, virheellisestä huollosta tai muista sivistä, jotka eivät johdu materiaali- tai valmistusvirheistä.
2. Edellä mainittuna kuuden kuukauden takuaikana, tuote korjataan maksutta tai vaihdetaan uuteen vastaavanlaiseseen tuotteeseen edellyttäen, että tuote palautetaan jollekin TI:n vähittäismyyjälle varustettuna ostopäivätoistuksella. Korjatus tai vaihdettu tuoteen huoltotakuu on voimassa edellä mainitun kuuden kuukauden takuaajan loppuun, kuitenkin vähintään yhdeksänkymmentä (90) päivää siitä lukien, kun laite on korjattu tai vaihdettu.
3. Tärkeä vastuuvapauslauseke koskien ohjelmistoa ja kirjastomateriaalia - Lukekaa tämä huolellisesti ennen kuin ostatte näppäimistöä ja/ tai ohjelmitietoa.
TI ei takaa, että ohjelmistot ja kirjastomateriaali ovat virheettömät ja vastaavat vaatimuksianne. Jokaiselle käyttäjälle ilmoitetaan, että ohjelmistossa saattaa olla virheitä ja käyttäjä on itse vastuussa kaikista päätöksistään ja toiminnoista, joihin hän on ryhtynyt ohjelmista saatujen tietojen perusteella. Mitään tuotteen hyödyllisyyttä koskevia tietoja ei ole pidettävä annettuina tai edellytettynä takuuseurauksina.
4. TI ei missään tapauksessa vastaa kenellekään erityisistä satunnaisista tai väliaikaisista vahingoista, jotka liittyvät näppäimistöön, laitteistoon ja / tai ohjelmistoon ostoon tai johtuvat näiden käytämisestä. TI:n vastuu ei missään tapauksessa ylitä näppäimistön, laitteiston ja/ tai ohjelmiston myyntihintaa. TI ei vastaa mistään kolmannen osapuolen ohjelmien käyttäjään kohdistamista vaurioista.

IMPORTANT NOTICE

In the event of any conflict between this card and other warranty conditions printed inside manual, this card shall govern.

Nederlands

Garantie op TI 99/4A Produkten

Deze TEXAS INSTRUMENTS (TI) garantie geldt uitsluitend voor de oorspronkelijke koper.

1. De elektronische en mechanische onderdelen van het product zijn gegarandeerd voor een periode van zes maanden vanaf de oorspronkelijke aankoopdatum, echter alleen bij normaal gebruik, voor onderhoud van defecte materialen of fabricage.
Deze garantie is ongeknd indien het product beschadigd is door een ongeval, onregelmatig gebruik, ondeskundig onderhoud of andere oorzaken die voortkomen uit fouten in de materialen of fabricage.
2. Elke stilzittende garantie, voortkomende uit de aankoop, is in duur beperkt tot de bovengenoemde periode van zes maanden.
3. Gedurende de bovengenoemde periode van zes maanden zal het product gerepareerd worden of worden gereplacéerd door een nieuw of in zeer goede staat verkerend product van gelijkwaardige kwaliteit naar het oordeel van TEXAS INSTRUMENTS, zonder kosten voor de koper wanneer het product wordt gerepareerd met een bewijs van aankoop naar een TEXAS INSTRUMENTS dealer.
Het gerepareerde of gereplacéerde product zal gegarandeerd blijven tot het eind van de oorspronkelijke periode van 6 maanden of negentig dagen vanaf de datum van reparatie of replacering.
4. Belangrijke mededeling betreffende het afwijzen van verantwoordelijkheid met betrekking tot de software-programma's en boekenmateriaal. Lees dit zorgvuldig voor het kopen van de console en/of software.
T.I. garandeert niet dat de software programma's en boekmateriaal vrij zijn van fouten of zullen beantwoorden aan uw specifieke eisen. Elke gebruiker wordt erop gewezen dat de programma's fouten kunnen bevatten en dat hij alleen de verantwoordelijkheid aanvaard voor elke geronnen beslissing of actie, genomen op basis van informatie verkregen uit het gebruik van de programma's. Geen enkele gegeven informatie expliciete of impliciete garantie.
5. In geen enkel geval zal T.I. tegenover iemand aansprakelijk zijn voor bijzondere, toevallige of voortvloeiende schade als gevolg van of voortvloeiende uit de aankoop of gebruik van de console, hardware en/of programma's met over-schreden. Texas Instruments is niet aansprakelijk voor enige claim van welke aard, tegen de gebruiker van de programma's, door enige andere partij.

Espanol

Garantía limitada de 6 meses

Esta garantía de Texas Instruments (TI) es válida solamente para el comprador original.

1. Los componentes mecánicos y electrónicos de este producto están garantizados por un periodo de seis meses a partir de la fecha de compra original contra defectos de material o mano de obra siempre y cuando hayan estado sometidos a su uso normal. Esta garantía queda anulada si el producto ha sido dañado por accidente, uso indebido, negligencia, servicio inadecuado u otras causas no relacionadas a defectos de material o mano de obra.
2. Las obligaciones o garantías derivadas del acto de la venta quedan limitadas al periodo de seis meses antes mencionado.
3. Durante el periodo de seis meses antes mencionado, el producto objeto de esta garantía será reparado o reemplazado por otro de la misma calidad (a discreción de Texas Instruments) sin costo alguno para el comprador, siempre y cuando el producto sea devuelto a un distribuidor de Texas Instruments acompañado del comprobante de compra. El producto reparado o reemplazado continuará en garantía hasta la extinción del periodo original de seis meses, o noventa (90) días a partir de la reparación o el reemplazo, en el caso de que estos 90 días excedan el tiempo remanente del periodo de garantía original.
4. Noticia importante de descargo en relación con los programas, materias de los libros, ó el "software". Lea esto cuidadosamente antes de comprar la consola o los programas. Texas Instruments, bajo ningún concepto, garantiza que los programas, o el contenido de los libros o manuales de los mismos se encuentren exentos de errores o que satisfagan las necesidades específicas del comprador. Los usuarios quedan advertidos de que los programas puedan contener errores y de que deben asumir cualquier responsabilidad por cualquier decisión tomada o cualquier decisión emprendida basados en información obtenida del uso de dichos programas. Ninguna información suministrada relacionada con el uso de los programas se deben considerar como una garantía implícita.
5. En ningún caso Texas Instruments será tenida como responsable ante nadie por daños especiales, incidentales, o derivados del uso o como consecuencia de la compra de la consola, o los programas. La responsabilidad de Texas Instruments queda limitada al precio de compra de la consola o los programas. Texas Instruments no es responsable de ninguna reclamación contra el usuario por tercera persona.

Svenska

Hem dator - 1 års garanti

Denna garanti från Texas Instruments gäller endast i förhållande till den ursprungliga köparen av hem dator för enskilt bruk.

1. Garantin omfattar material- och tillverkningsfel beträffande de elektroniska och mekaniska komponenterna i denna produkt och gäller under en tid av ett år från inköpsdagen. Garantin gäller under förutsättning av normalt användning och service. Garantin gäller ej, om skada på produkten uppkommit genom olyckshändelse, oriktig användning, vårdslöshet, olämpligt service eller av andra orsaker, som icke beror på material- eller tillverkningsfel.
2. Alla till köpet hänförliga garantiåtgärdanden är begränsade till ovannämnda estersperiod.
3. Under ovannämnda ettårsperiod åtgärdas material- eller tillverkningsfel genom reparation, justering eller utbyte av produkten eller felaktiga delar mot nya eller renoverade delar/produkter av motsvarande kvalitet, eller Texas Instruments' val, utan kostnad för köparen i vad avser avhjälpande av felet, om produkten med bevis om inköpsdag inlämnas till en av Texas Instruments' hem dator återförsäljare. För den reparerade eller utbytta produkten kommer garantin att fortsätta att gälla under den ursprungliga produktens återstående garantiålder eller under en tid av 90 dagar från reparations- eller utbytesdagen, om detta innebär en längre garantiålder.
4. Viktigt meddelande angående undantag för programvara och tryckta anvisningar
Läs detta omsorgsfullt före köp av produkt och/eller program.
Texas Instruments garanterar inte att programvaran eller de tryckta anvisningarna är fejtfria eller att programvaran motsvarar köparens speciella önskemål. Varje köpare uppmärksammas på att programmen kan innehålla fel och att köparen ensam är ansvarig för varje beslut eller åtgärd som vidtages på grundval av uppgifter som erhålles vid användning av programmen. Ingen uppgift, som lämnas beträffande användbarheten av programmen, får uppfattas såsom en uttrycklig eller underförstådd garanti.
5. Texas Instruments är under inga förhållanden ansvarigt gentemot någon för speciella, avslidiga eller oavsiktliga skador eller följdskada, som kan uppkomma på grund av köpet eller användningen av produkten, maskinvaran och/eller programmen. Texas Instruments maximala erstatningsansvar kan aldrig överstiga inköpspriset för produkten, maskinvaran och/eller programmen. Texas Instruments' friskriver sig från allt ansvar av vad slag det vara må i fråga om krav, som kan komma att framställas av annan part gentemot köparen på grund av användningen av programmen.

United States Patent [19]

Wetterau, Jr.

[11] Patent Number: 4,654,818

[45] Date of Patent: Mar. 31, 1987

[54] DATA PROCESSING DEVICE HAVING MEMORY SELECTIVELY INTERFACING WITH COMPUTER

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[73] Assignee: Texas Instruments Incorporated, Dallas, Tex.

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[22] Filed: Dec. 14, 1983

[51] Int. Cl.⁴ G06F 13/00; G06F 15/16; G06F 15/20

[52] U.S. Cl. 364/900; 364/419; 364/704

[58] Field of Search ... 364/200 MS File, 900 MS File, 364/401, 464, 709, 419, 704, 707; 365/228

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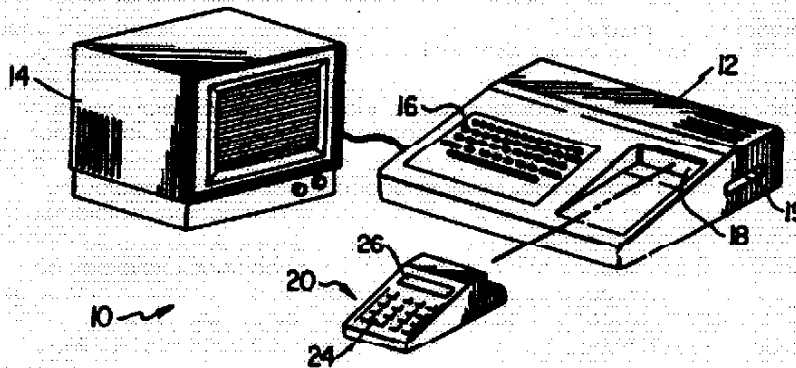
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[57] ABSTRACT

A portable educational device that is adapted to be used in conjunction with a counter (12) having a display (14) and a keyboard (16) for input of data. A memory slot (18) or an alternate port (19) is provided on the computer (12) to receive the educational device (20). Educational device (20) contains a keypad (24) and a display (26) and operates independent of the computer (12). The educational device (20) includes a central processing unit (48), a Read Only Memory (42) and a Random Access Memory (44). A primary power source (54) supplies power to the educational device (20) during the operation thereof. A back-up power source (56) provides power to the Random Access Memory (44) to form a non-volatile memory for retention of data during periods of non-use. A connector (34) interfaces with the computer (12) to allow the computer (12) to address the Random Access Memory (44) to retrieve data stored therein and to store data at selected locations therein for use by the Central Processing Unit.

15 Claims, 6 Drawing Figures



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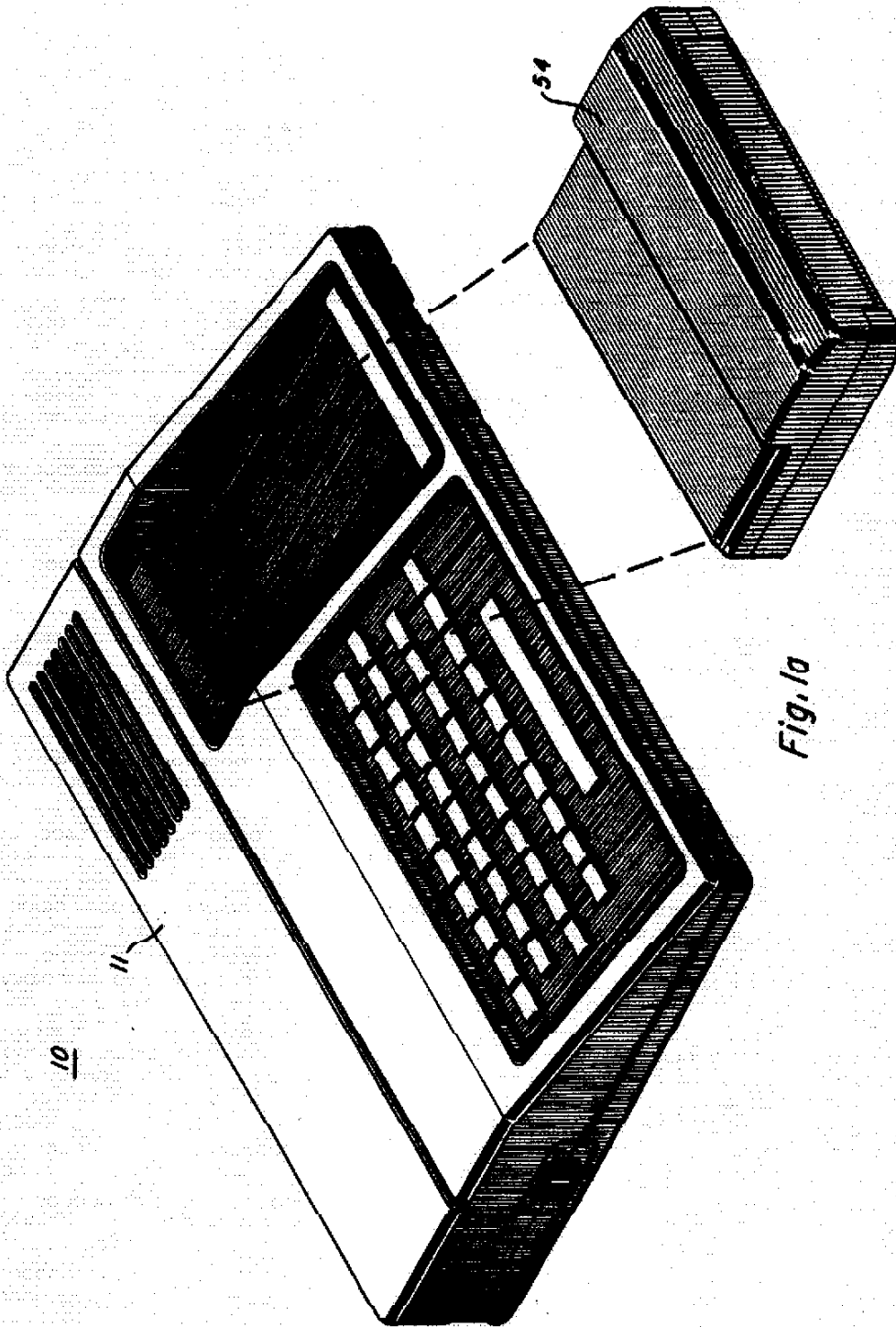


Fig. 1a



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