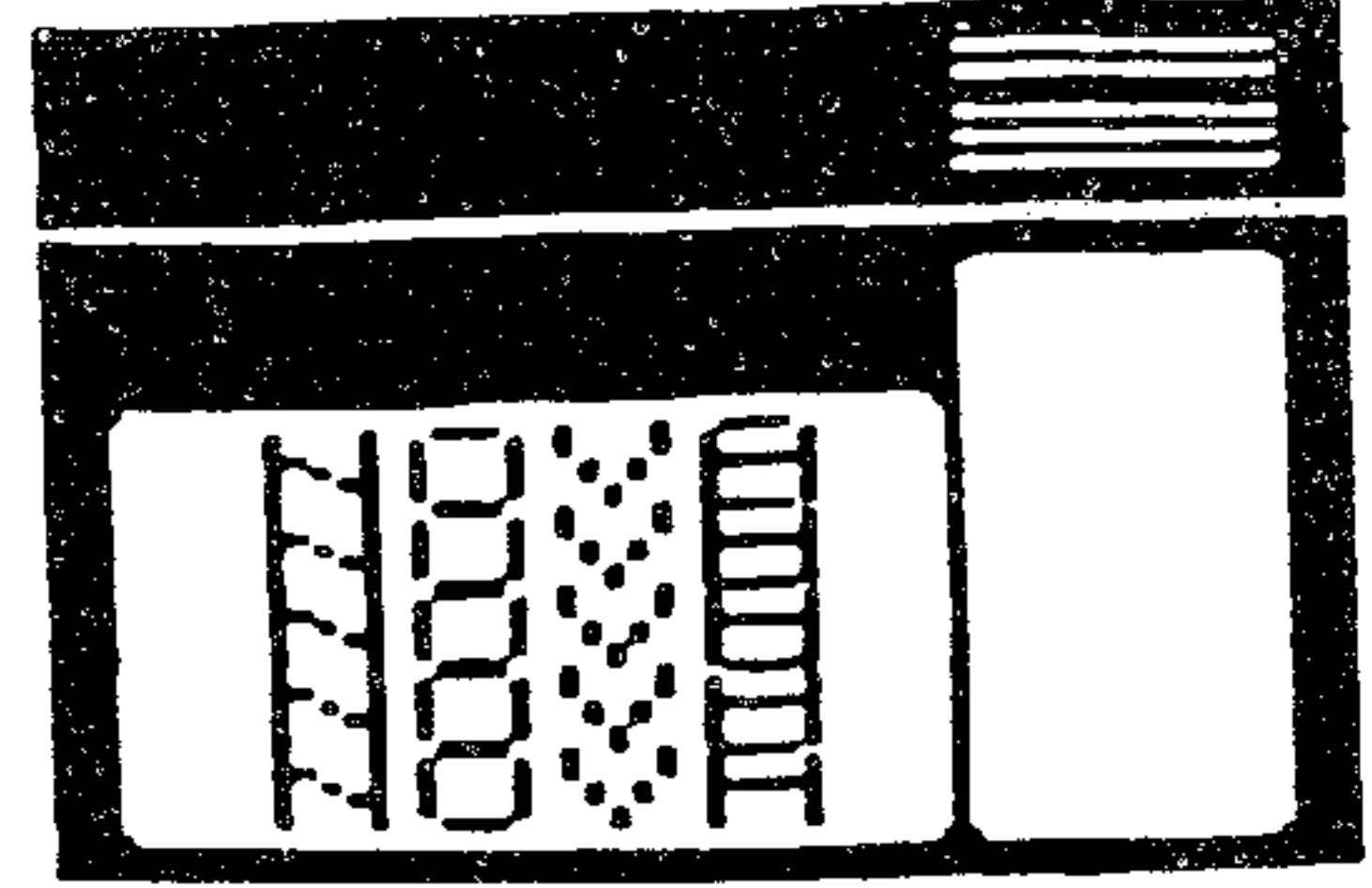


N.O.V.A.

(P.O. Box 508 - Vancouver, Wa. 98666)



NINETY-NINERS OF THE VANCOUVER AREA

VANEWS#80

MAR 1990

Next Meeting :

TUESDAY, MAR 27th

7:00PM Please be prompt we need to be out of this room by 9:00PM.
VANCOUVER MALL, Community Room. (near J.C. Penneys).



Next Workshop :

Sunday APR 8th 1990 11:AM to 4:PM
VANCOUVER MALL, Community Room. (near J.C. Penneys)
Bring your computer and any questions or problems.

N.O.V.A. BBS :

206-687-4497

24hrs, except when the Sysop needs the system.
Donations being accepted to upgrade our BBS with a Hard Drive.

***** Order your library programs for delivery to the meetings! *****
***** Also D.O.M.(disk of the month) is available by mail — *****
***** Contact Librarian if interested. *****

ASSEMBLY S.I.G. :

Beginning April 5th 7:00 pm
Contact Quinton Tormanen if interested 206-687-4972

The Officers of NOVA:

Area Code

Dan Lisson	President	206-693-7575	
Quinton Tormanen	Vice President	206-687-4972	
Lila Simmons	Treasurer	206-896-0113	
Beth Webber	Secretary	206-892-1386	
Committees:			
Gary Crawford	Sysop/Librarian	message	206-687-3516
Maria Adler	Editor		206-695-9932
Bob Chase	Editor Advisor		206-695-7002
Cal Oberg	Membership		503-357-8353
Dan Lisson	TI Fair		206-693-7575

The officers and committee members welcome your questions and will do their best to answer them or get someone who can help. Please feel free to call. Early evening is probably the best time as most of these people work during the day.

Schedule of upcoming meetings and workshops.
April 24th Meeting _____ May 6th Workshop
May 29th Meeting _____ June 3rd Workshop

619-218-8198

From the President's Desk

As I'm sure everyone in NOVA knows by now, we are planning joint sponsor ship (with PUNN) of a TI computer Fair for the fall of this year. This Fair is in support of the TI-99/4A and compatibles. The following is the status of the planned computer Fair as of 03/15/90.

The primary sponsoring groups, namely NOVA (Ninety-niners Of the Vancouver Area) and PUNN (Portland Users of Ninety-Nines), have separately agreed to jointly go ahead with plans to "stage" the first annual TI Fair to be held in the Vancouver and Portland area of the Pacific Northwest. An official name and theme will be finalized Tuesday the 20th at the combination PUNN board meeting and Fair committee meeting, to be held at Mike Calkins' house in Portland.

The Fair will be held the last weekend in October (10/27, 28) at the Red Lion Hotel/Jantzen Beach. The Fair committee agreed to this after applying much time and diligence in research and fact-gathering over the last two-plus weeks. There is everything good to say about this location. (The date goes with the location, as available dates are few and far between.) This gives us nearly seven and one-half months to finish putting it all together.

Both user groups and vendors will be invited to set up displays/tables. We will be planning on 25 to 30 such displays in total, but will be able to accommodate more.

There will be two "break-out" rooms for vendor and other lectures on Saturday, probably one on Sunday. The second

"break-out" room will become an "all comers" computer and electronics swap meet on Sunday. Speaking time priority will be given to vendors (or their representatives), with at least about an hour's time each. Remaining available time will be on a "1st-come" basis for non-commercial speakers with something to offer the TI community.

A dinner banquet is being planned for Saturday night as a forum from which to highlight special announcements and presentations. For those who may wish to follow this function with more socializing and dancing, the 1st-class live music lounge on the upper level of the hotel will most graciously accommodate any and all (adults).

It has also been suggested that the Fair would comprise a contest for the best new completed software offerings and the best new completed hardware offerings. For commercial products, these would have to be INTRODUCED to the TI marketplace AT OUR FAIR. This restriction may not be required of non-commercial or "fairware" offerings. "Prizes" won would be highly recognition-oriented, and well worth "competing" for.

There are more ideas that are being put forth, and they will be further discussed at Tuesday's (the 20th) PUNN board meeting, and at the NOVA business meeting the following Tuesday (the 27th).

Gary Crawford is working out the modeling of displays and the available space. A representative scale layout will be displayed at the NOVA meeting. Mike Calkins is nearly finished with the letter to the White House through which we expect to gain endorsement from a tie-in to the President's emphasis on better education for our children. This can also be one of possibly two themes for the Fair.

There is absolutely no reason why we cannot have the MOST successful TI Fair of all those previously held any time or anywhere! See you at this next meeting!

FROM THE VICE-PRES...

By Quinton Tormanen

My, my, but how quick these months pass; another article is already due! There is not a whole lot new going on this month. The TI-Fair is still in the works and open to your input. As Dan Lisson said at last month's meeting: every member will need to get involved in order to put on the "Greatest TI-Fair on Earth!"

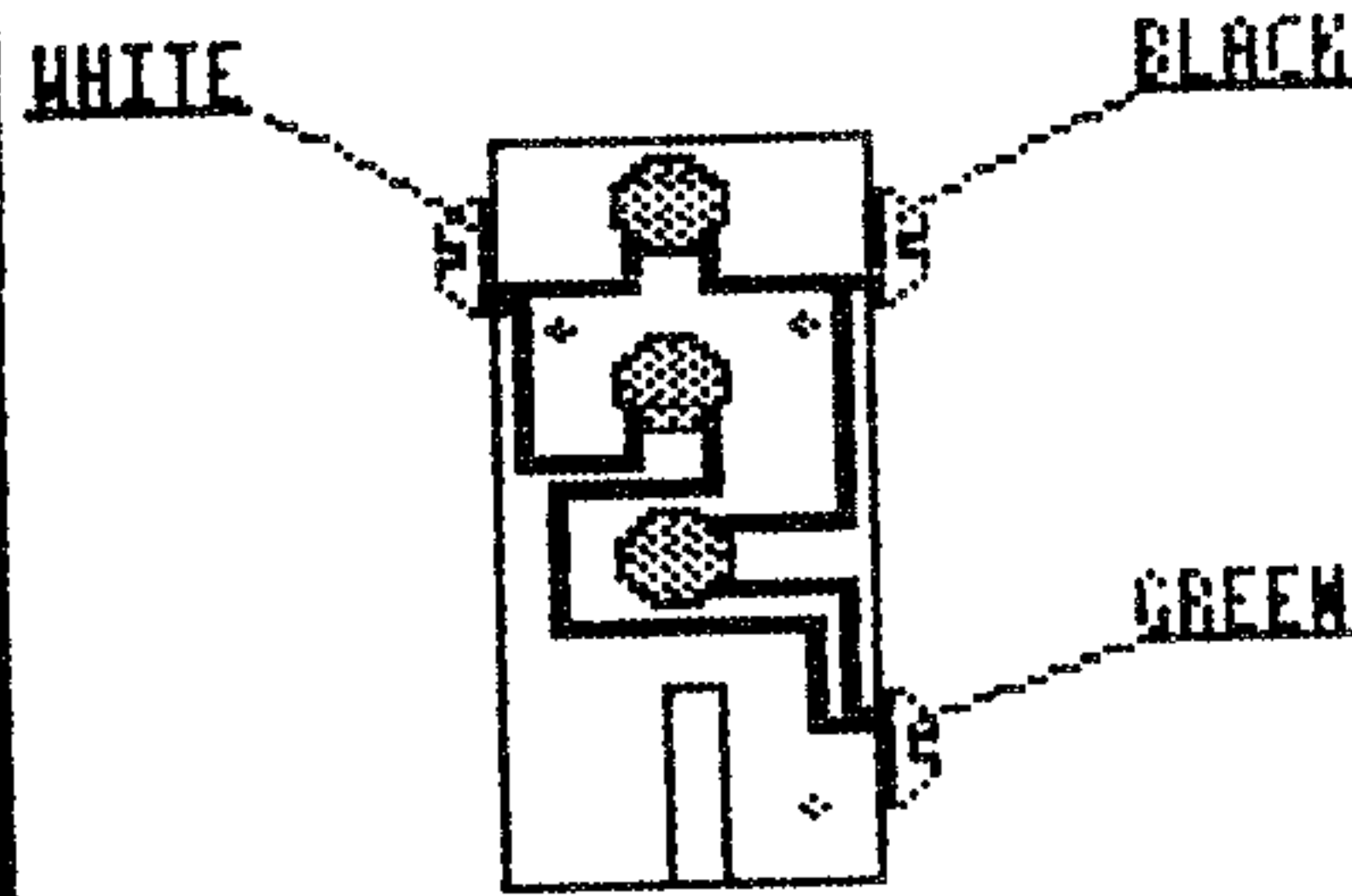
The workshops getting better and better each month. I believe I counted seven consoles! There were also several new faces. Well, not really new, but new to the workshops. I hope we've set a new standard as far as workshops go.

I announced last meeting, near the end, that I was hoping to start an Assembly Language Special Interest Group. It would basically be a class for those who want to learn Assembly Language. I recommend that those interested pick up a TI-Artist map from the NOVA BBS on how to get to my house (which is where it will be held). The group will meet every other Thursday beginning April the 5th from 7 to 9 PM. To avoid redundancy, I would like those who want to be in this S.I.G. to read the first four installments of "An Assembly Language Tutor." This month's is the fourth. If you do not have all four, I will be having a Disk of the Month with all four articles in Page Pro 99 and TI-Writer formats. If you have any questions on this, feel free to either leave me a message on the BBS (I am #26) or give me a voice call at (206)687-4972.

We are planning a raffle at the next few "Business" meetings. The prizes will include commercial programs. An example is one of my games, "War Zone" or "Living Tomb." By the way, both games are still available for \$10 and \$15 respectively.

The next workshop will be held on the 8th or April, not the 1st, which will be the second Sunday. I hope to see you there and at the next business meeting.

MOV METAL OXIDE VARISTORS INEXPENSIVE OUTLET SURGE PROTECTION



PARTS LIST

METAL OXIDE VARISTOR
PART # 276-568
PRICE: 1.99/PACKAGE

HEAT SHRINK TUBING
PART # 278-1627
PRICE: 1.79/PACKAGE

CONNECTIONS

MOV 1 BLACK-WHITE
MOV 2 BLACK-GREEN
MOV 3 WHITE-GREEN

By: KEVAN J. COLEMAN
M.O.V.A. USER GROUP
Box 508 VANCOUVER WA. 98666

If you want extra protection for your complete TI setup, but don't want to spend a fortune, this project is for you. The total cost for supplies will run you \$3.98 at Radio Shack, before sales tax.

In most homes, the electrical outlet in the wall is constructed in a duplex or parallel arrangement, so it figures that if you install these three MOV's on the receptacle, you will provide protection to both outlet connections. The response time is less than 35 ns (nanoseconds), more than enough time to handle any potential damage.

The shrink wrap tubing is to insulate the leads on the varistors, thereby preventing a short.

Remember, the TI community needs ALL of you, so don't forget to turn off power at the breaker box BEFORE you begin the project.

On the Subject of
Fund-Raising.....

The NOVA group is now the proud owner of a permit to dispense refreshments at e Park. What? Say what? Well, for any of you who may not be aware of why we would subject ourselves to such duty, it is a FUND-raising thing to do. It is considered by many to be the opportunity of a weekend! It is so popular among other groups like ours that we just snatched the only dates available for this unique opportunity for all of 1990 - what a coup!

The thanks for our involvement goes to Darris Sinden, who called this opportunity to our attention at the last meeting. She went down to the D.O.T. Thursday to see what was available, and there was this one CANCELLATION that had just come up. Are we lucky, or what?

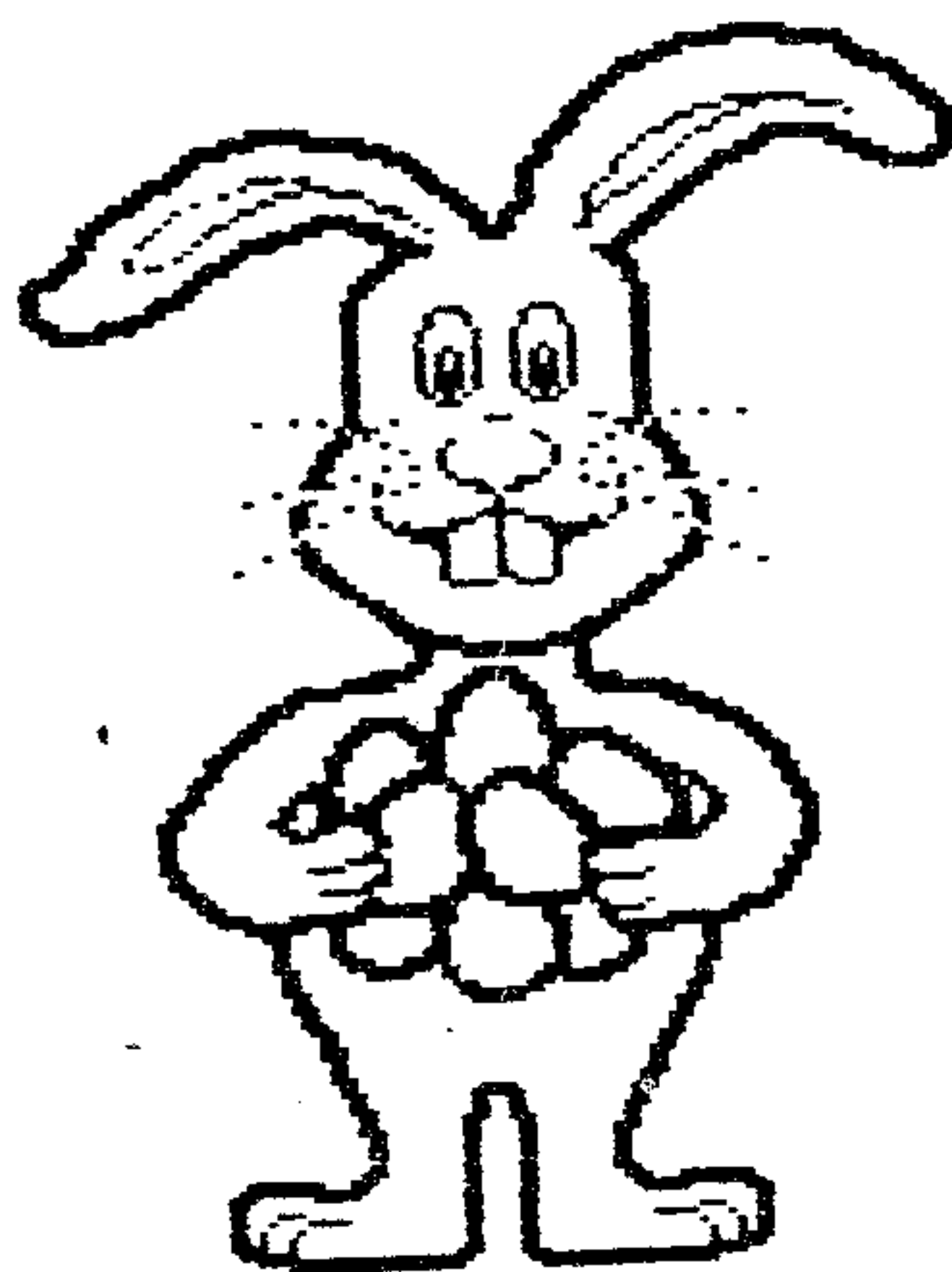
So here's the gist of it: Gee Park is the first Rest Area north of Vancouver on I-5 (not far from Ridgefield). We will be serving refreshments at northbound Rest Area. We are responsible for the time from 2:00 A.M. June 9, 1990 to 2:00 A.M. June 11, 1990. Weekend responsibility requires CONTINUOUS coverage (yes, folks, that's 24 hours per day!), and we are registered for that 48-hour block of time. Sounds like fun already? But wait, there's more!

I have in my possession all of the rules and regulations, which we will go over at this next business meeting. There are a number of "can'ts" and "don't dos", but they are

pretty much restricted to the usual normal common sense things with which we should have no problem - well, most of us, anyway. BUT, what we CAN do is make some money for the group and its expenses (you know - those things we'll be having a lot more of between now and the Fair in October?!)

There, yes, you knew there had to be SOMETHING good about volunteering to go out at 2:00 in the dark rainy (possibly) morning, serving coffee to tired drivers, and looking forward (?) to doing it for 4 hours, right? And sure enough, that's it. Money. Accepting contributions for your favorite non-profit group. Not yourself. And all because you love this little wonder we affectionately call the "99/4A", and are devoted to its continued existence - well, LIFE, I guess we might even say.

But of course, no matter how dreary a picture I paint of the scenario, I have to tell you in all honesty that it will really be lots of fun. We'll talk more about how and why, and some ideas that have already crept into a couple of our devious minds at the upcoming meeting. Believe me, you'll be glad you'll be there! Yeah, really! Trust me on this! This is your non-political didn't-run-for-the-office president speaking. See you at the meeting!



POWERMASTER

Activate all equipment by the flick of the P-Box switch.

By: Kevan J. Coleman

RADIO SHACK PARTS LIST

1 Package/heat shrink tubing	278-1627	\$1.79	Additional Parts From Any Local Hardware Store
1 Relay	275-217	\$5.99	
1 Socket for relay	275-220	\$1.79	
1 Project box	270-627	\$2.59	1 2-conductor extension cord
1 Three-conductor extension cord	61-2765	\$6.49	1 Electrical wall outlet
1 Roll electrical tape	64-2349	\$0.89	1 Outlet cover

This project is for all those people who are tired of flipping switches. You know what I mean: the P-Box switch, the console switch, the monitor switch, the printer switch, the modem switch, the external drives switch, the light switch.....

This is a very basic and inexpensive project that connects between your powerstrip, wall outlet, and switched outlet. It is rated at 10 AMPS, more than enough to handle the load, even during the start-up surge.

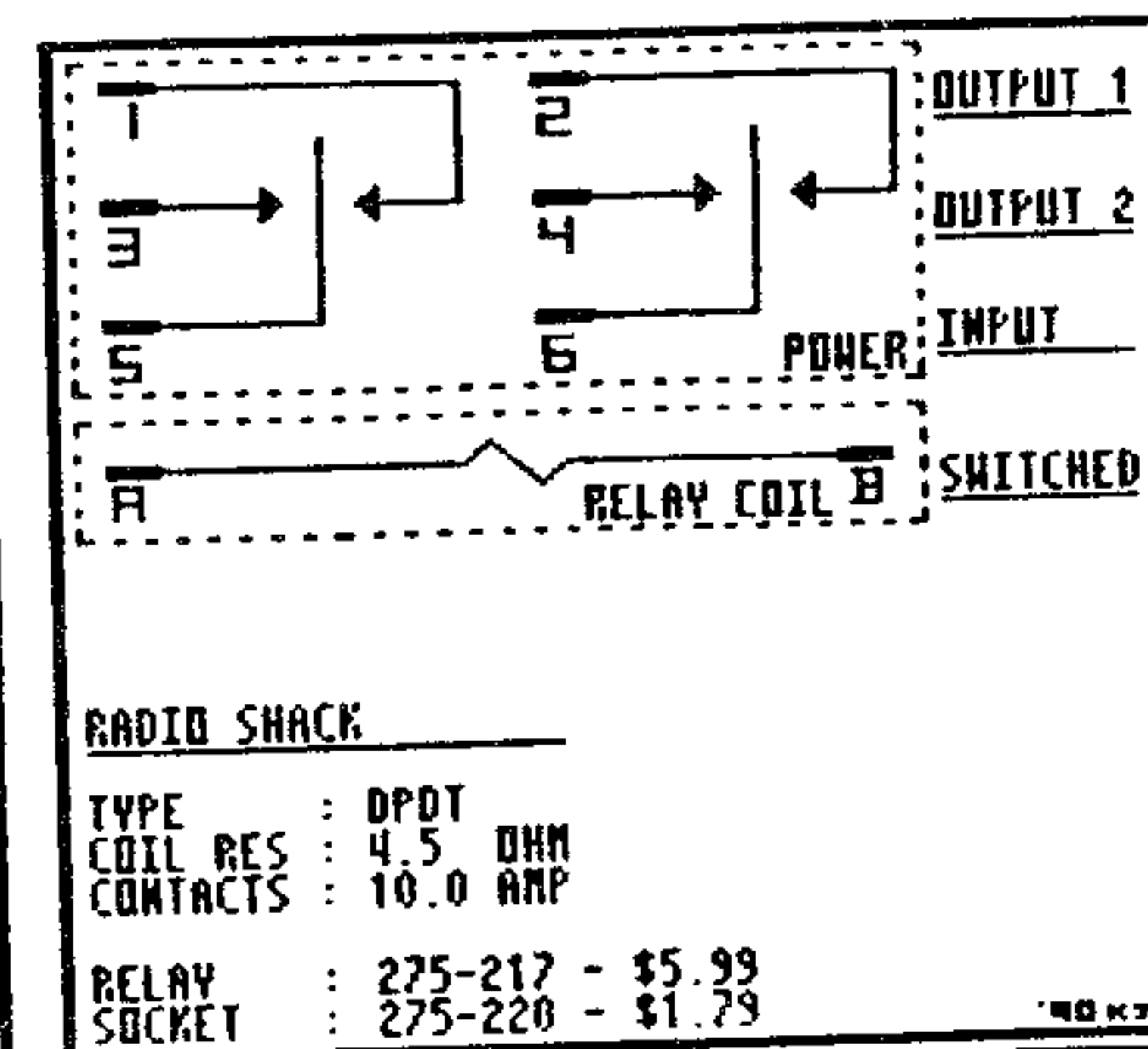
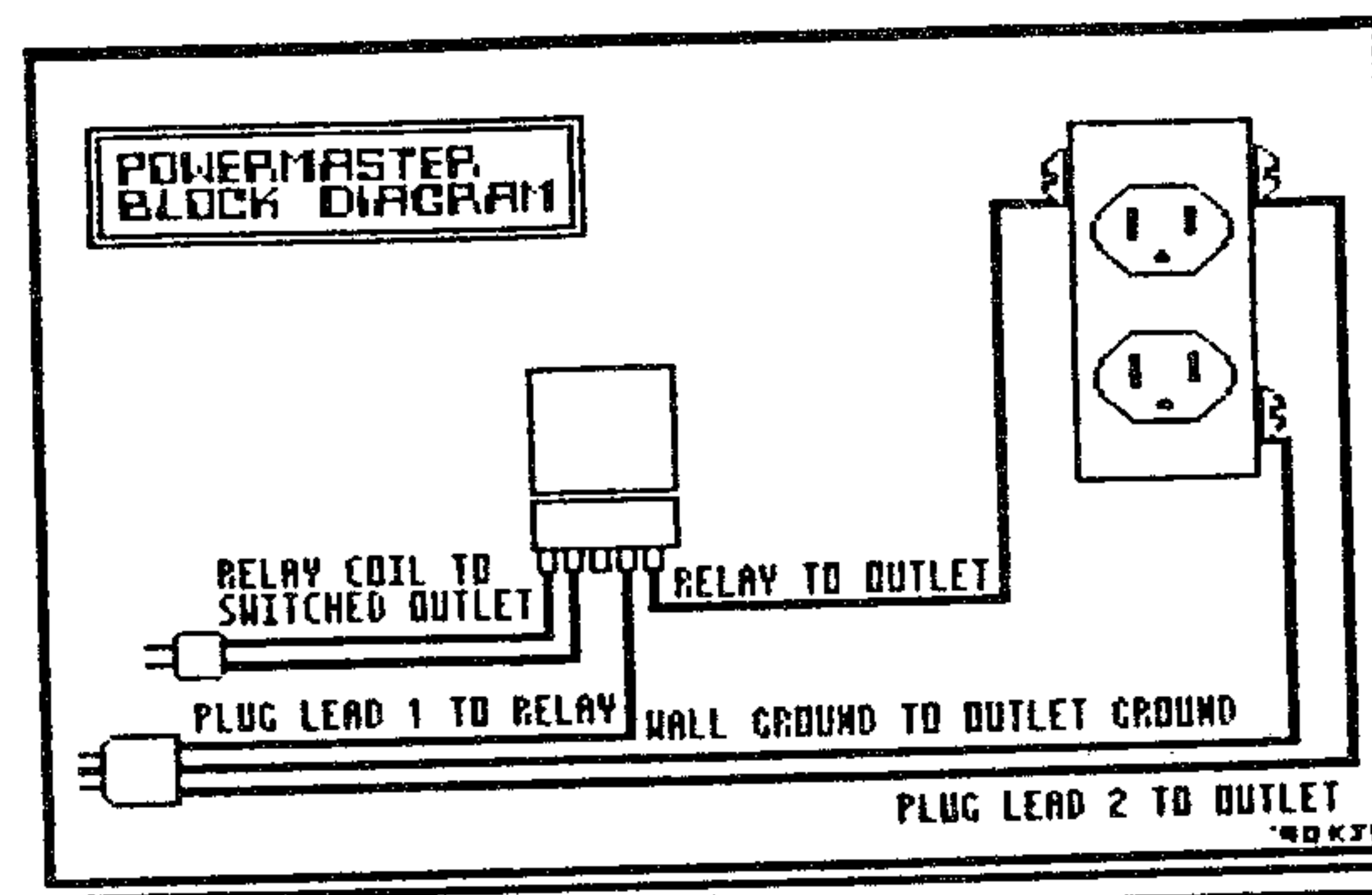
A relay is basically a switch that in this case requires 110 VAC to energize a coil that turns it on. If you installed the Y-ADAPTER on the fan circuit (N.O.V.A. Newsletter - December, 1989), you have that 110 VAC power source. When you turn on the box with this project installed, EVERYTHING will come on at once.

ASSEMBLY INSTRUCTIONS

- 1) This is easy. Hack off the female end of the '99 cent special' extension cord, install the heat shrink tubing after removing 1/4 inch of insulation from the leads. Now solder the leads to A and B of the relay socket. Move the heat shrink into place and use a match to shrink it. Don't get too close, or you will melt it.
- 2) Hack the female end off of the grounded extension cord. Strip off 12 inches of the outer insulation. Expose 1/2 inch of insulation of ONE of the power leads and the ground lead. Strip these leads to the outlet as per diagram.
- 3) Cut a six inch length of wire off the remaining lead. Then expose 1/4 inch of insulation on the cord end. Install the heat shrink and solder it to terminal (5) just like in step number 1.
- 4) On the six inch piece of wire cut 1/4 of insulation off one end and 1/2 on the other. Solder the 1/4 inch end to terminal (3) on the relay socket. Don't forget the heat shrink.
- 5) Connect the other end of the six inch lead to the electrical outlet.
- 6) Wrap electrical tape around the outlet to prevent any contact of metal.
- 7) Double check everything; test. If it works, install it in the box.
- 8) That's it, you're done.

For your convenience, I've used Radio Shack part numbers, as these are readily available nationwide.

Radio Shack does have a Remote Power-On Controller built into a power strip, but they want \$49.95 and it only controls four devices, where most regular power strips have 6 or 7 outlets. Not only does my project save money, but it gives more flexibility.



Minutes of Business Meeting
February 27, 1990

We had one visitor this month. Our treasury has a balance of \$329.11. Our BBS is 2 1/2 years old and has had 4,000 calls. Discussion on funding for the Hard Disk we need to get for the BBS. Thank you to Greg and Lila for donations this month.

Most of the meeting was used to discuss the TI FAIRE we are planning for this fall in conjunction with PUNN. We want to emphasize that in order to put on a good faire we will need to have every member of NOVA/PUNN involved. Let the committees know if you want to do a specific job before you are asked to do something you would rather not do. We will be having a lot of money raising projects within the next few months in order to pay the expenses involved in the faire, so try to help us out, please. MOTION-We have a Bingo game at the April and July Workshops. MOTION-We have a raffle each business meeting until the faire.

Quinton stated he is willing to teach a SIG group on assembly language if anyone is interested. Dan is willing to teach a class thru Clark College on TI Writer, TI Multiplan, etc. if there is interest.

Now is the time for all good members to come to the aid of our User Group. Come to the meetings. Get involved. There is a lot happening and we want you to get in on all the fun. Hope to see you all at the next meeting.

BETH WEBBER, SECRETARY

KEVAN J. COLEMAN
109 CONAN COURT
LONGVIEW, WASHINGTON 98632
PHONE 1-206-423-9130

MAKING THE CONNECTION

Hooking up your new modem is a lot easier than you probably imagined. Find which way is the best for you.

There are multiple approaches you can take to interface a modem with the TI. Whatever your choice, the wires still need to go to the right places. There are only six wires involved, and no matter which approach you take, they hook up the same way. The Radio Shack part numbers are given for your convenience. You may want to check other sources for price comparisons.

TI SERIAL PRINTER CABLE (DBIN-25 MALE-MALE)
You are not really changing genders, but just making an extension that will allow you to change 2 and 3 as well as 6 and 20. Since the old serial printer cable is the ribbon type, it would be impractical to mess with the cable. Just plug this gadget on and you're ready to go.
Radio Shack Null Modem Adapter Stock Number 26-1496 Price \$ 7.95
Total Cost \$ 7.95

PC-COMPATIBLE MODEM CABLE (DBIN-25 MALE-FEMALE)
You will need a gender changer because the PC compatibles use a MALE output on their RS-232's (the modem cable has 1 male end and 1 female end). The gender changer will need to have two (2) male ends. All you need to do is switch 2 and 3 as well as 6 and 20 in the box. Because of price, I do NOT recommend going this route unless you already have the PC cable.
RS-232-C Cable Stock Number 26-249 Price \$17.95
Gender Changer Stock Number 26-243 Price \$ 7.95
Total Cost \$ 25.90!

MAKING A CABLE FROM SCRATCH
This is the best route if you do not have an old TI SERIAL printer cable on hand. It is inexpensive and easy to build. The pins on the connectors are numbered, so it almost impossible to botch it up. One word of advice; make the individual leads at least 3 inches long so that you will have enough room to manipulate the wires.
2 25-Pin DBIN Male-connectors Stock Number 276-1547 Price \$ 1.49 Each
2 D-Sub hood (covers for connectors) Stock Number 276-1520 Price \$ 1.79 Each
1 Multiconductor cable (8ft 8 ft) Stock Number 278-775 Price \$.57 Foot
1 Roll electrical tape Stock Number 064-2349 Price \$.89 Roll
Total Cost \$12.17
1) Make a list of which color you want to go to each number. Be sure to switch the colors on 2 and 3 as well as 6 and 20 on the other end.
2) Wrap a good quantity of electrical tape on the cable where it exits from the hoods. This will prevent the cable from pulling out of the connections.

I have been re-writing the software library catalog off and on as time allows. I hope that I am not premature in saying that it will be available in DV80 format by the next business meeting. A lot of duplications have been eliminated and new programs added. One of the newest additions is the majority of the PLATO courseware and the PLATO interpreter. The Plato cartridge is available for rent for \$2.00 a month as are the lesson disks.

Our Disk of the Month, which is \$2.00 at the meetings, is now available by mail for \$3.00. We do sell blank DS/DD certified disks at 50 cents each or a dozen for \$5.00.

We also have the capability to re-ink printer ribbons. Why buy a new one when we can re-ink it for \$1.50.
****OTHER THINGS****

I have seen articles in other newsletters about "rare, hard-to-find" hardware for the TI or items that were planned but not produced.

But word has come our way about other prototype equipment that was scrapped.

One such item was the predecessor to the Nintendo Power Glove. Yes, someone else came up with the idea first for the TI. The concept was great but it had a major drawback. It was wired to the joystick port on the console. It seems that when the testers swung their arms to activate the mercury switches, the console was jerked about viciously. Usually sending it crashing to the floor. Sometimes causing the user to bash their knuckles on the monitor screen.

The Fisher-Price company tried to break into the

computer market by developing a side-car modem for the TI which had the telecommunication-ications program built in with ROM chips. What doomed this item was that it was too user friendly. It had wonderful pull-down menus where Big Bird would walk onto the screen and pull the menu down for you after an appropriate key press. The research and development department thought it was great but the consumer wouldn't buy it.

One of the slickest devices was an ultra-sonic transmitter for the console. A company (which will remain unnamed here) realized immediately how much of a nuisance that the peripheral cable would be so they came up with the idea of a remote console using an ultra-sonic transmitter to interface with the P-Box, thereby eliminating the cable. Yes, you are right, there were some serious design flaws in this approach. In that individual frequencies were needed for each key press. This resulted in low frequency ultra-sonic waves that caused automatic garage door openers within two blocks to cycle up and down, not to mention that the high frequencies ranged into the micro wave region. They originally thought that it might be a selling point by being able to heat your lunch or a pot of coffee when placed in front of the P-Box while using the keyboard. The president of the corporation canned this idea when testing it at home and his wife sat down in front of the P-Box. Need I say more. Another ill fated piece of hardware was the first hard drive specifically designed for use by the TI-99/4A. It was to be a joint venture

between TI and Cuisinart. Although it wasn't very good for storing or retrieving data, it was exceptional at slicing and dicing in micro-seconds.

Kids corner

GAMES

Z M U N C H M A N N M S F G N C V P Z
K A E G M A N C A L A E L T S U H R C
A A W M S P O X M K D M M H S Q P D F
F R E D D Y F A P A G O U H O A J U I
V P I R I V E R R E S C U E W P R J A
S E C G O R G F E Z A M V W Y P D Y
D I G J G A M A Z E I N G G M S D E X
S E N A J G B V S X M W H M U Y U I R
R P N N R E T L H G B X U G Y P M U J
G G T L E R F L A P B M R S V E P P V
M S Z O S T A V O C H N W D B L A E D
V N K V X E T B T O K F N R V A R R N
V R T X L J C P S P F J B N Y C S F U
W O N H Z G M F A I Y G A S Z K E E O
A O S O D Q J H L J O E Y C J H C C R
K G X E N O E G B O Z Q C V K O J T R
O U B Z X P A D A B B U R G A L D P U
I E X G J S B O D N B W F K S E M U S
R E G G O R F Z N M J M I D M O J S I
N Z P X O B T Y S R T S A K U D O H H

Objectives: To find the words listed below in the puzzle above. The words are hidden horizontally, vertically, and diagonally forward or backward. When you find a word, circle it in the puzzle and cross it out in the list.

- | | | | |
|-------------|-------------|------------|-----------|
| AMAZEING | BARRAGE | BATTLESHIP | BLACKHOLE |
| BLACKJACK | BLASTO | FREDDY | FROGGER |
| HOPPER | HUSTLE | JUMPY | MANCALA |
| MAZEDFGROG | MUNCHMAN | OHMUMMY | PARSEC |
| PERFECTPUSH | RIVERRESCUE | SURROUND | TENNIS |

by Sharon Crawford

NOTEPAD CREATION USING PAGE PRO-PART I

By now, some of you have had a chance to purchase, view, and/or use the superb program by ED JOHNSON - PAGE PRO 99. I won't attempt here to extoll all the virtues or weaknesses of this program; my aim is to show you how to make some great custom notepads, like the kind you buy at a stationery store.

Obviously, you will need to have the program PAGE PRO 99 (Asgard Software), and highly recommended, TI-ARTIST.

Basically, notepad creation can be done 1 of 2 ways, 1). using PAGE PRO entirely, and/or 2). using TI-ARTIST and PAGE PRO together. To use the former, will be a little easier and less time; but you are limited to the Page Pro fonts available and the line graphics (for drawing borders) inherent to the program. If you are really not too interested in something fancy and unique, then using PAGE PRO by itself will suffice. You can create, save, and output your notepad template solely using PAGE PRO 99. See sample at far right of this page. If you want to be more creative and artistic, I recommend creating and saving your notepad(s) as ARTIST picture files, then converting them to PAGE PRO format. That will be the focus of Part II, next time.

****USING PAGE PRO TO
^^^CREATE NOTE-PADS****

1. First decide what size your notepad is to become (3 1/2" X 5 1/4" is about right. That translates to about 27 columns by 31 lines on the PAGE PRO screen. 2.

Decide what graphic (if any) you wish to use. Remember, it must be in PAGE PRO format; if you have a special graphic in another format(not TI-ARTIST) use PIX PRO (Asgard Software) to convert it. Also, if the graphic is too large for the inside of the notepad, use ARTIST ENLARGER (Asgard Software), GRAPHIC EXPANDER (Genial Computerware), or TI-ARTIST PLUS to reduce it. Don't forget to convert to PAGE PRO format when done! 3. Decide what font style you want for your message. Once loaded, you don't have to keep the font disk in the drive. 4. Now we are ready to create a notepad template. Assuming your notepad size will be 3 1/2" X 5 1/4", place your left corner border style (CNTRL 8, line graphic) on Line 1, Column 1; for the top of the notepad, type (draw) to column 27. For the sides of the notepad, type (draw) to line 31. Complete it by typing the bottom line graphic just like the top (column 27). Now, you should have a rectangular "shell." Go back up to Line 1 and space over about 4 spaces from the right side of the first border, and repeat the whole process. You should have 2 "shells" when done 5. Return to Line 31 and space down about 3 spaces. Make this "shell" like the very first one. 6. You guessed it, make another "shell" to the right of the third. 7. You're almost done with your whole template. What remains is the addition of message and/or graphic. After

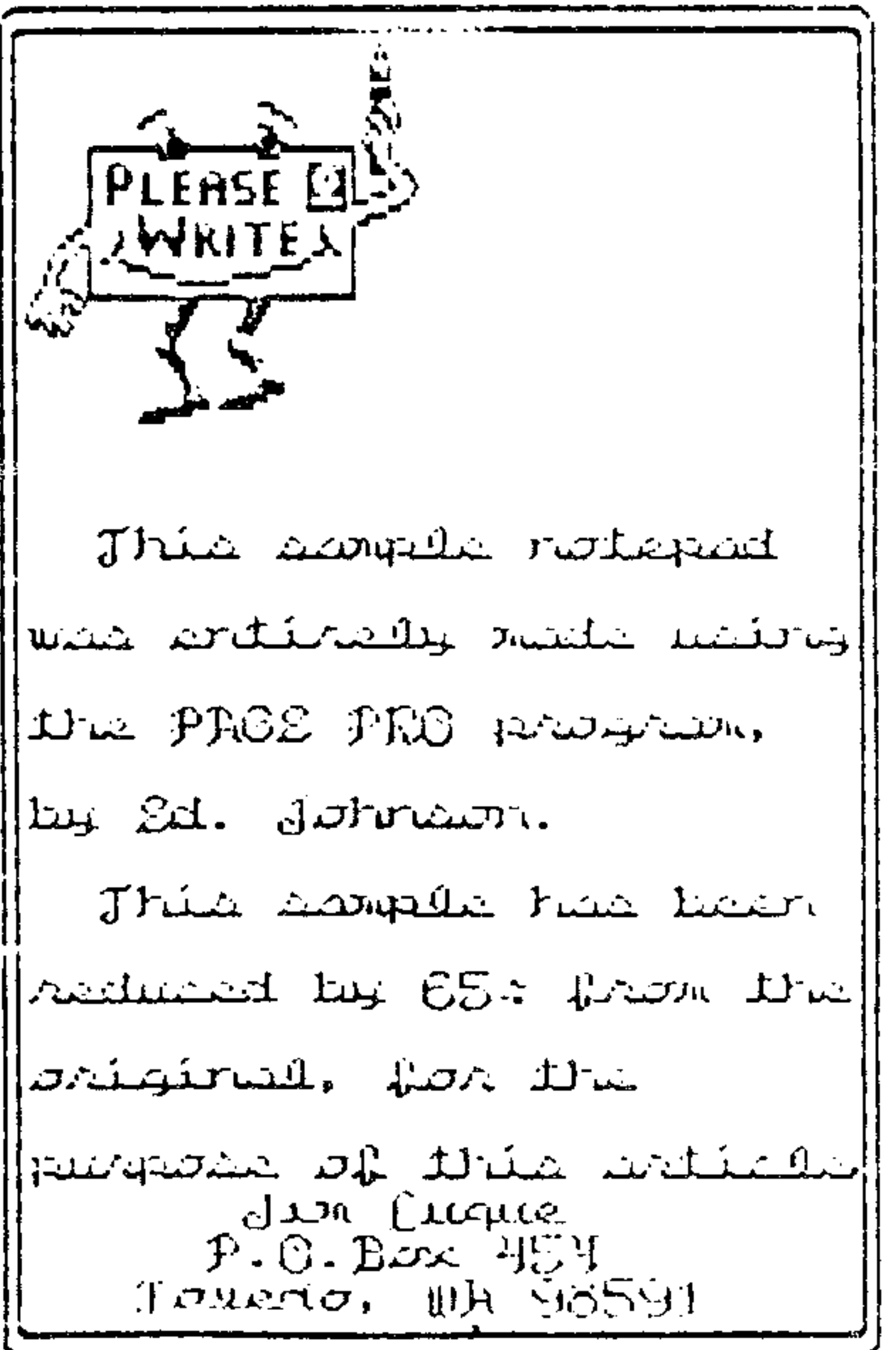
deciding what font style and graphic you want, place the cursor where you wish the graphic to be (NOTE: TURN THE PICTURE MODE OFF FIRST BY PRESSING CNTRL 0 -not 0). Do a CNTRL L to load your graphic. If you want to see how the picture is actually displayed, do a CNTRL 0 to turn the picture mode back on. If you like the placement, repeat the process for the other 3 "shells." Remember, turn off picture mode for faster loading of graphics. 8. Ok, it's time for your message. Upon loading (CNTRL A) your desired font, place the cursor where you wish to type your message. You will probably use the small fonts, over the large. Experiment by placing your message (i.e. "From the desk of...") horizontally or vertically. When you finally decide what (and where) you want, repeat the process for the other 3 "shells." 9. Save your complete page (CNTRL F). 10. When complete page is saved, do a CNTRL P and output the 4 notepad template to your printer. If everything is the way you want, take your hardcopy and photocopy it as many times as you want notepads. Carefully cut each sheet (paper cutter works best) into fourths.

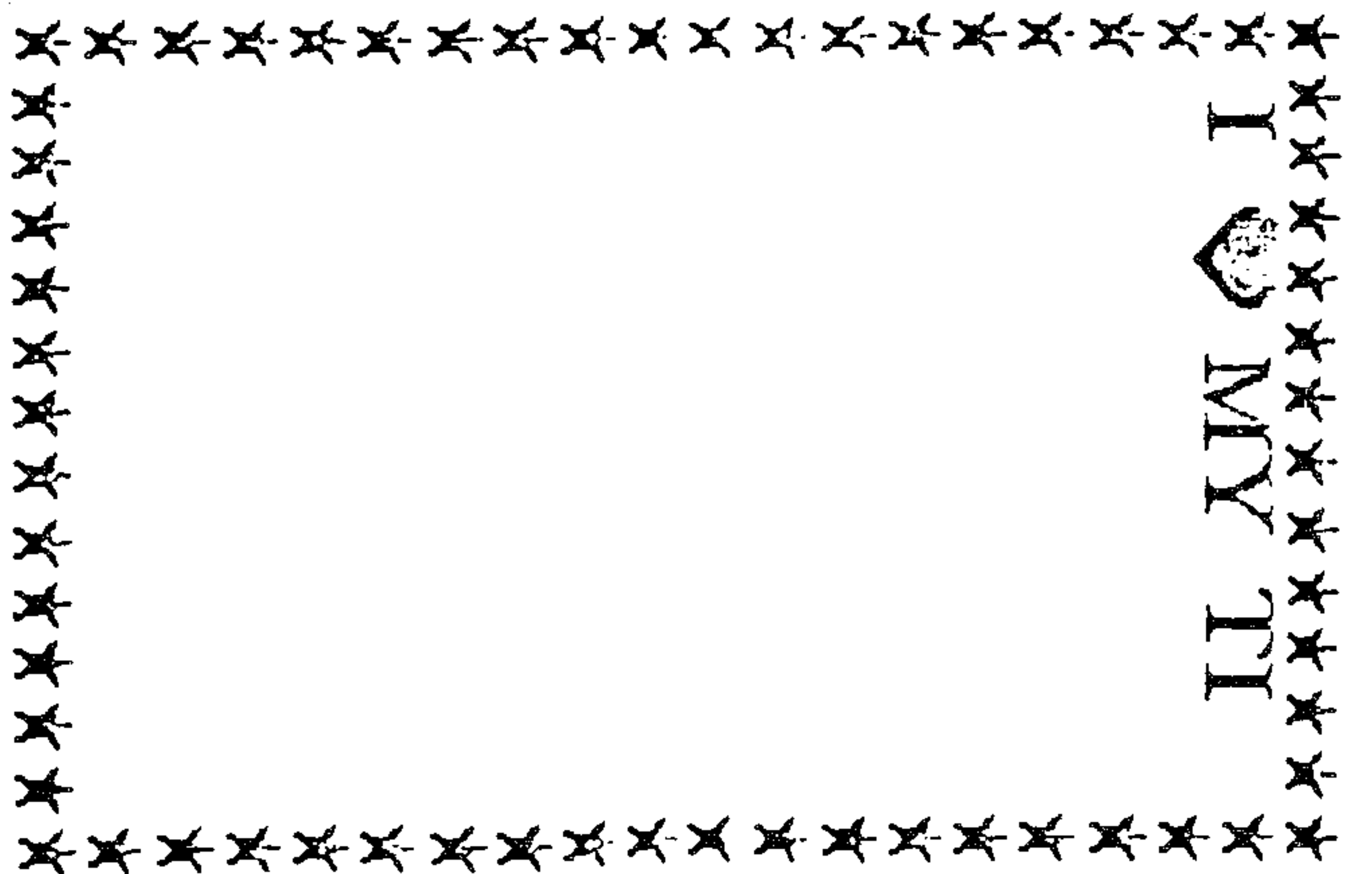
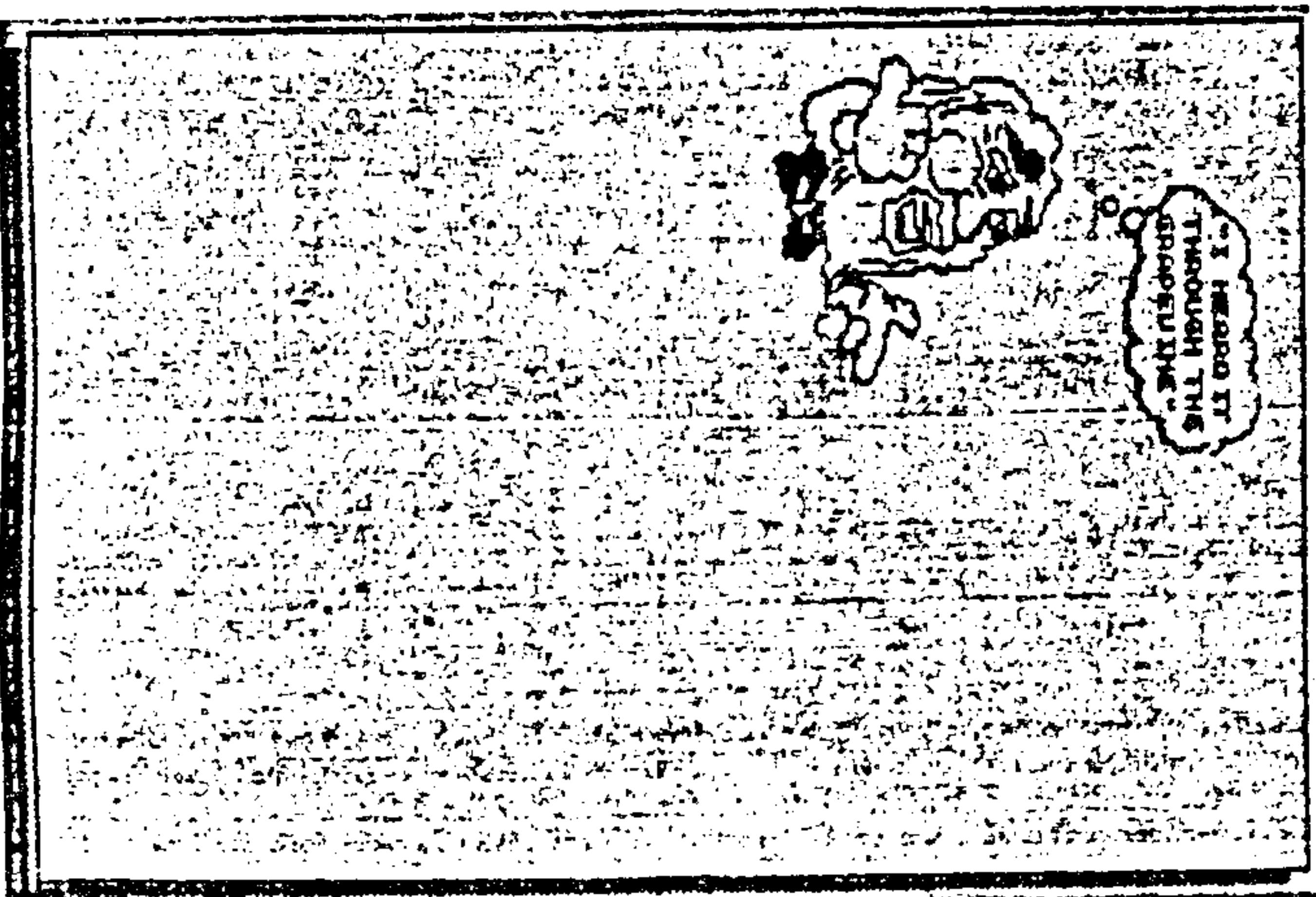
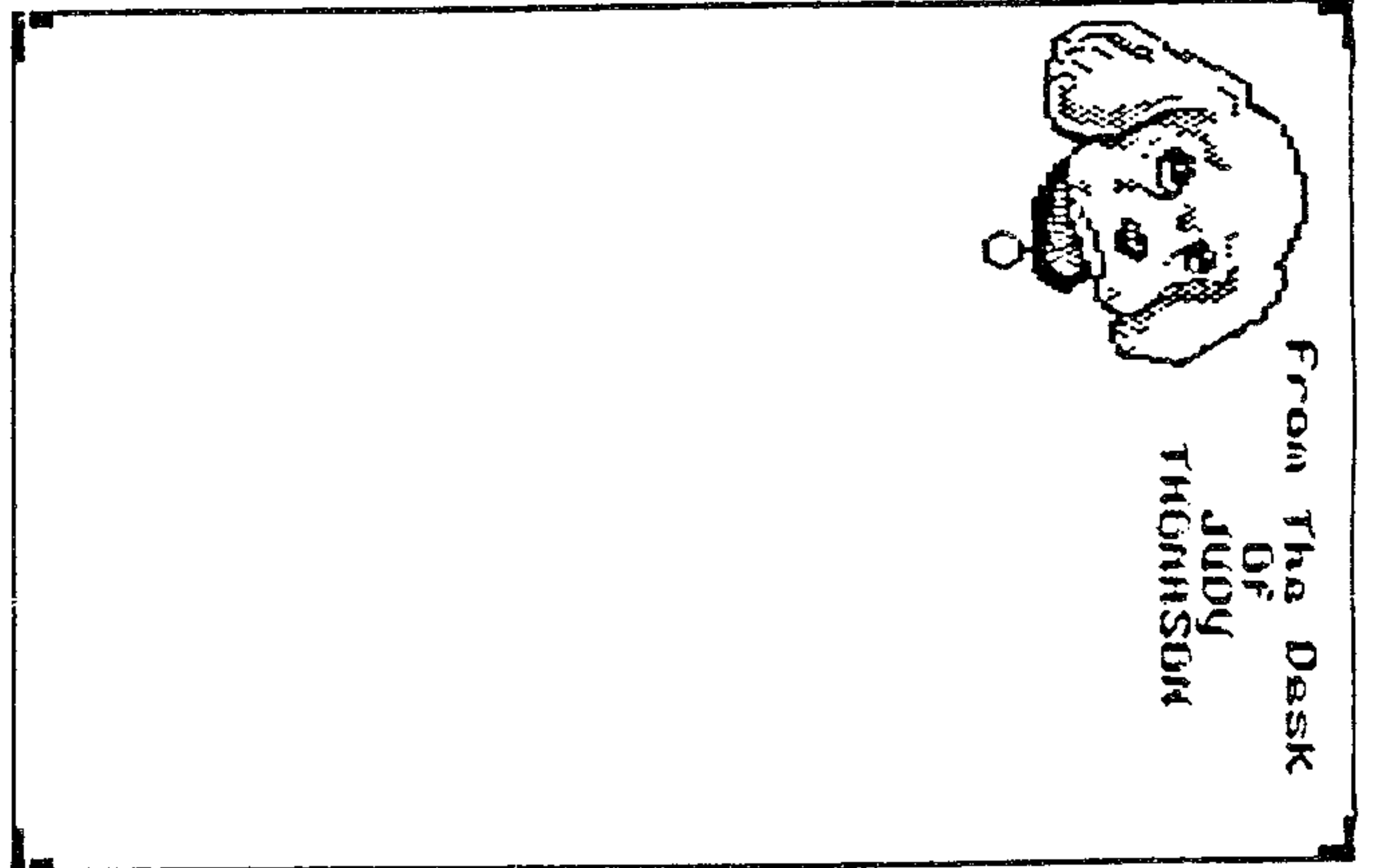
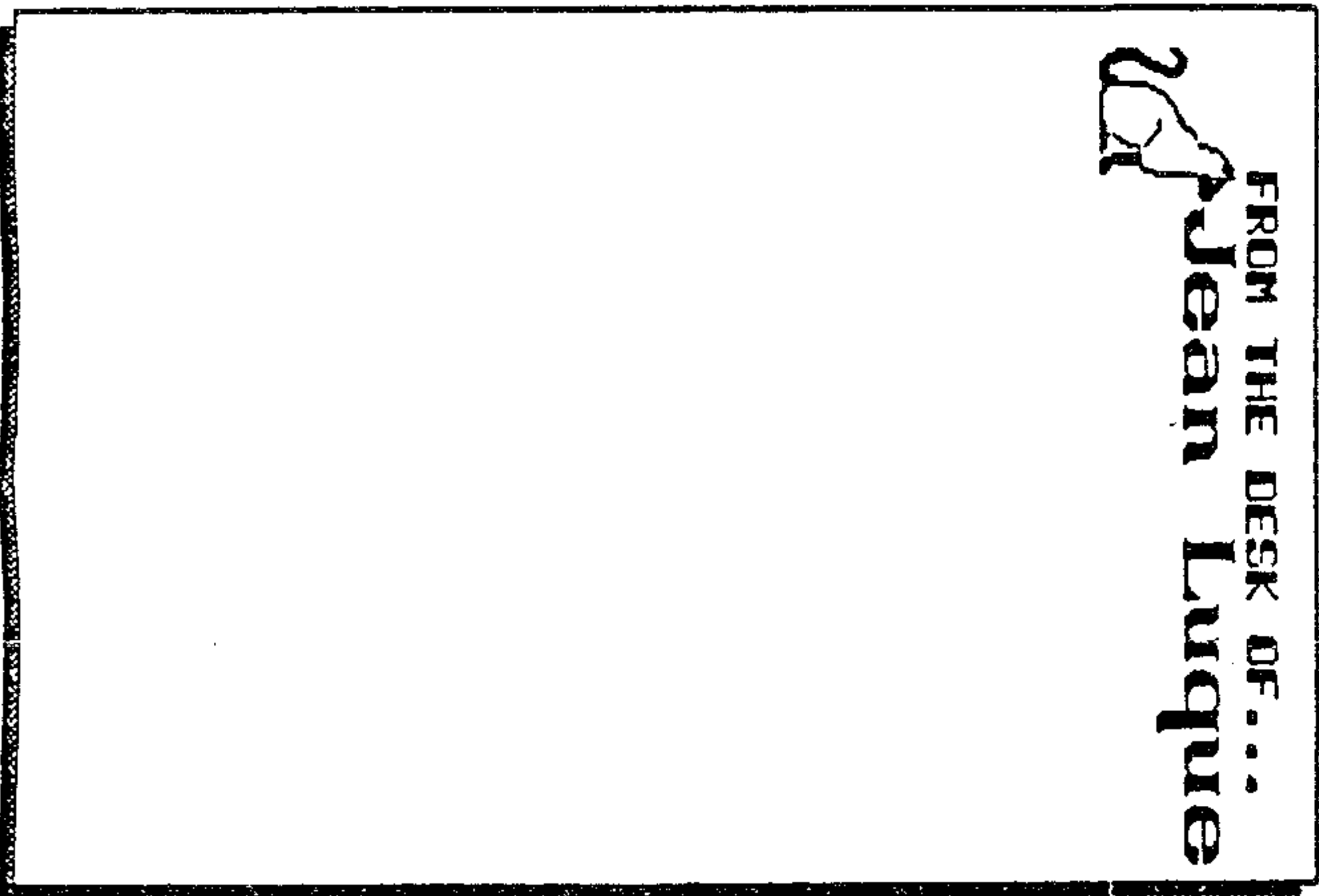
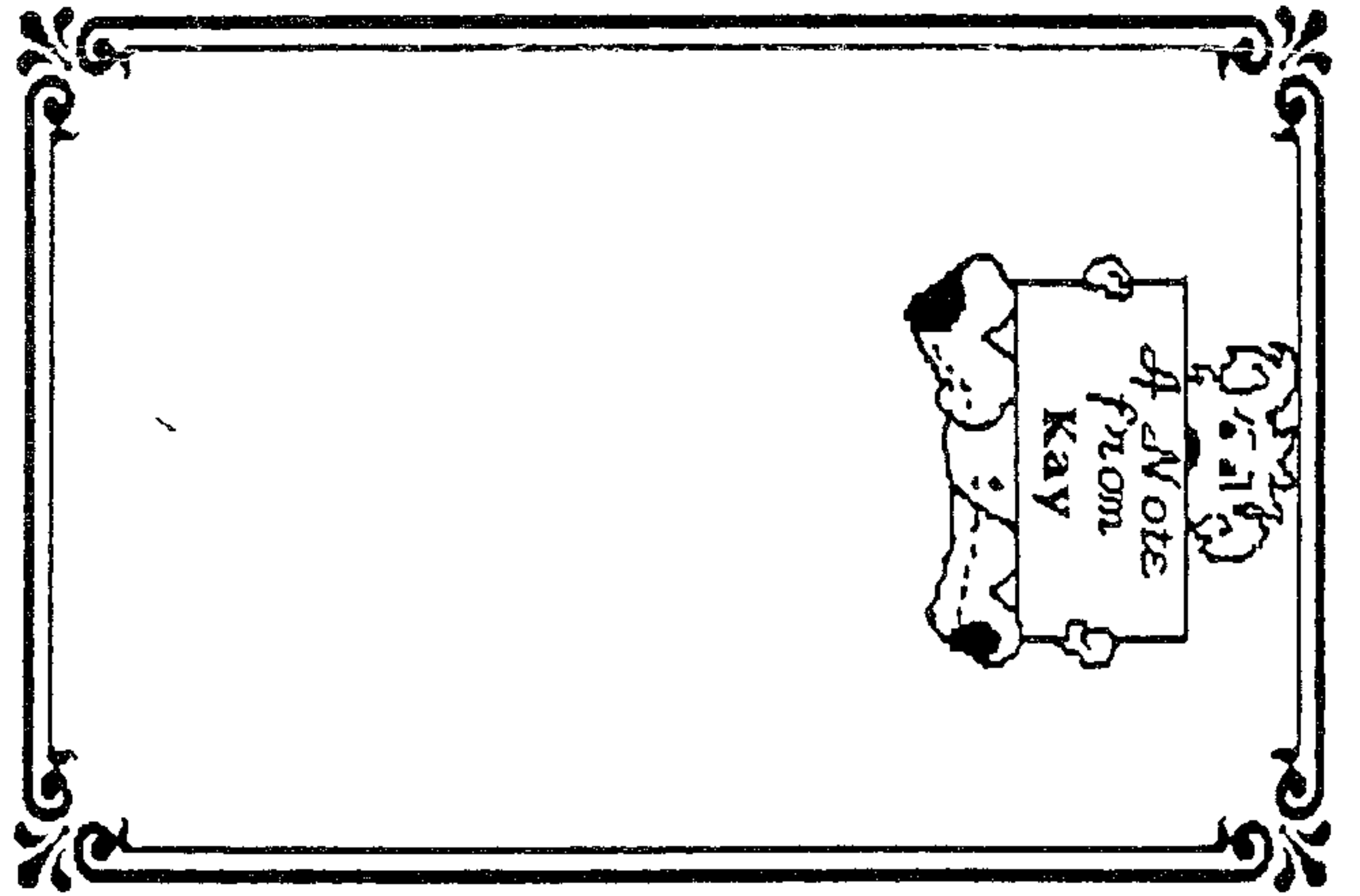
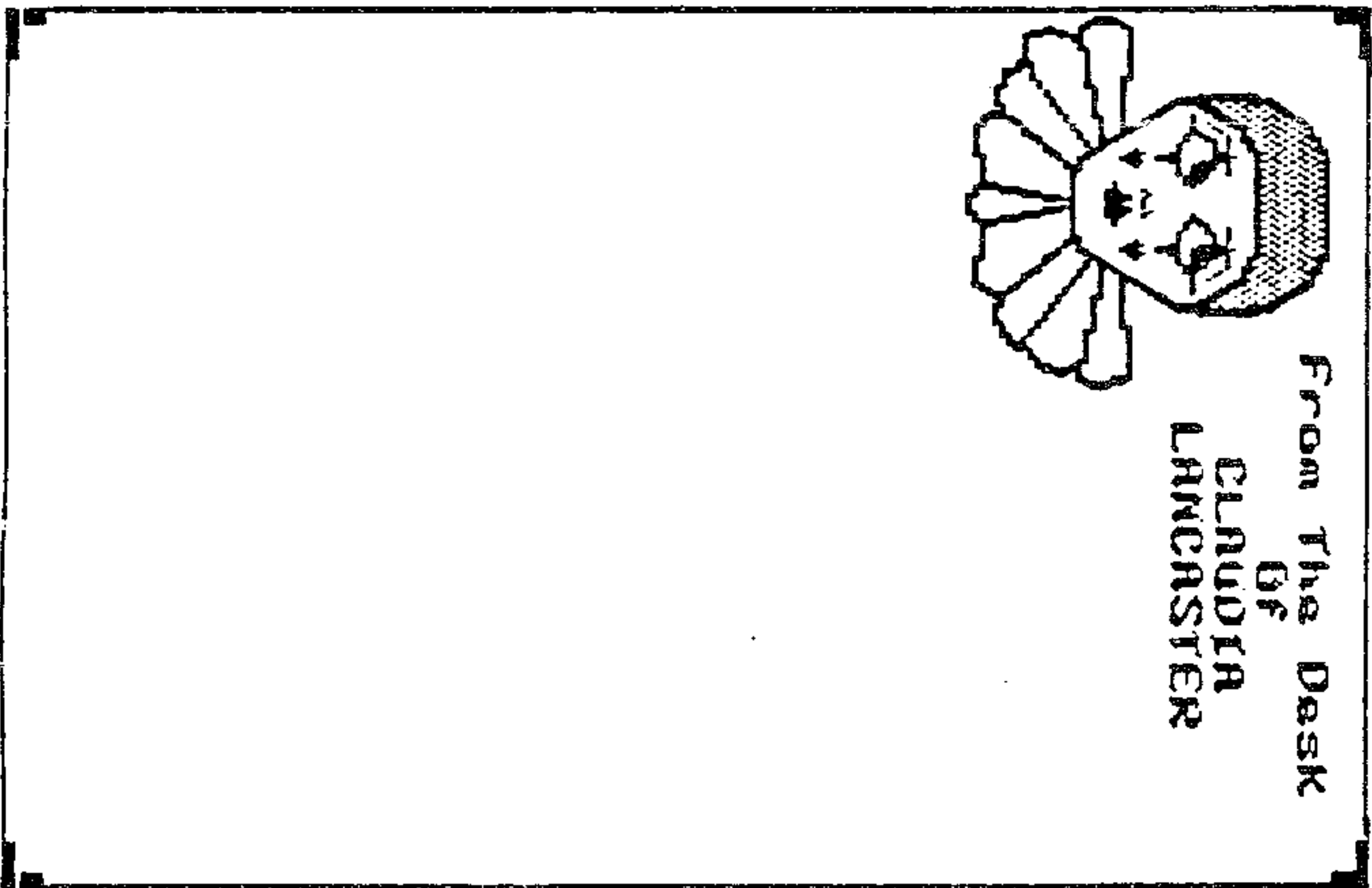
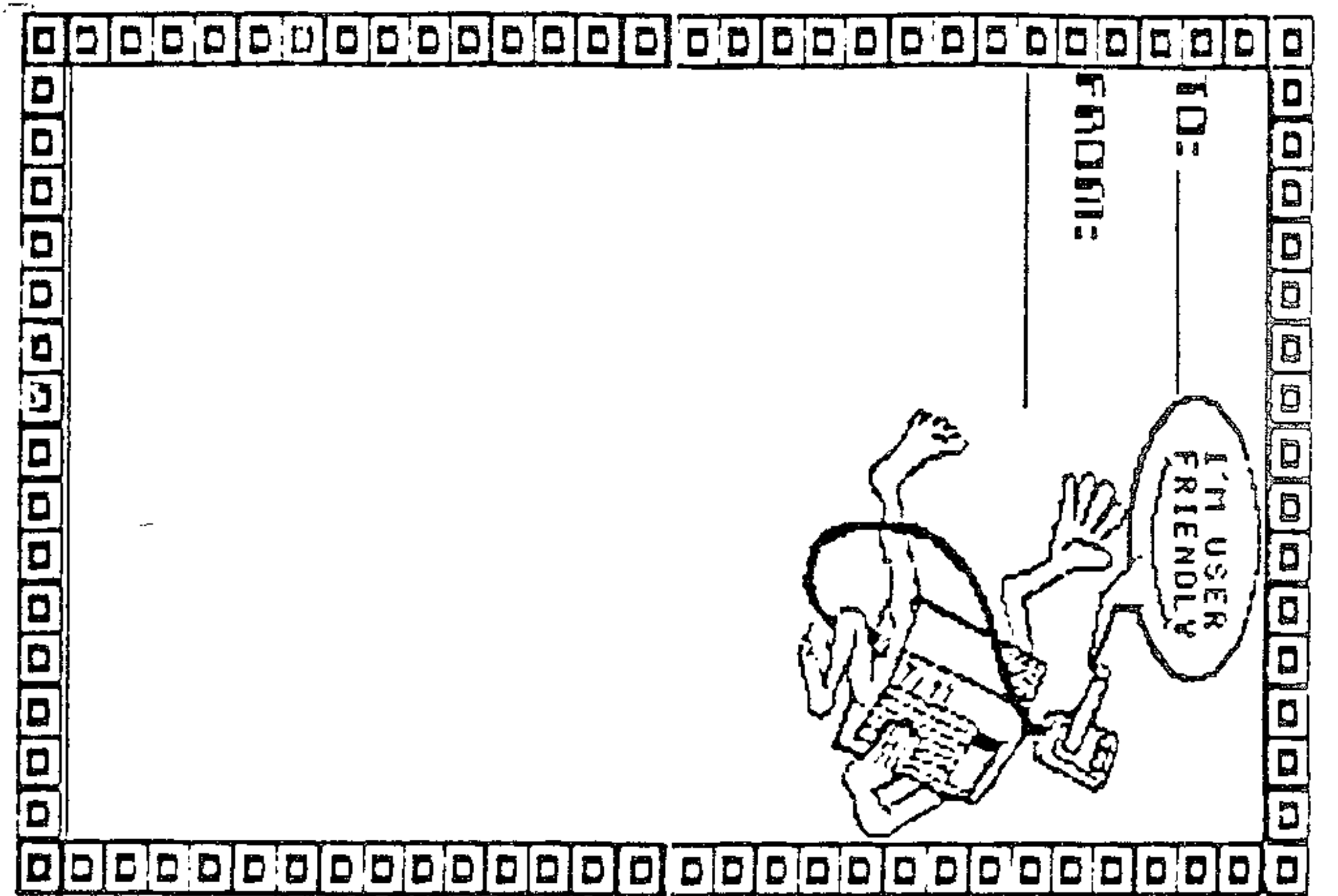
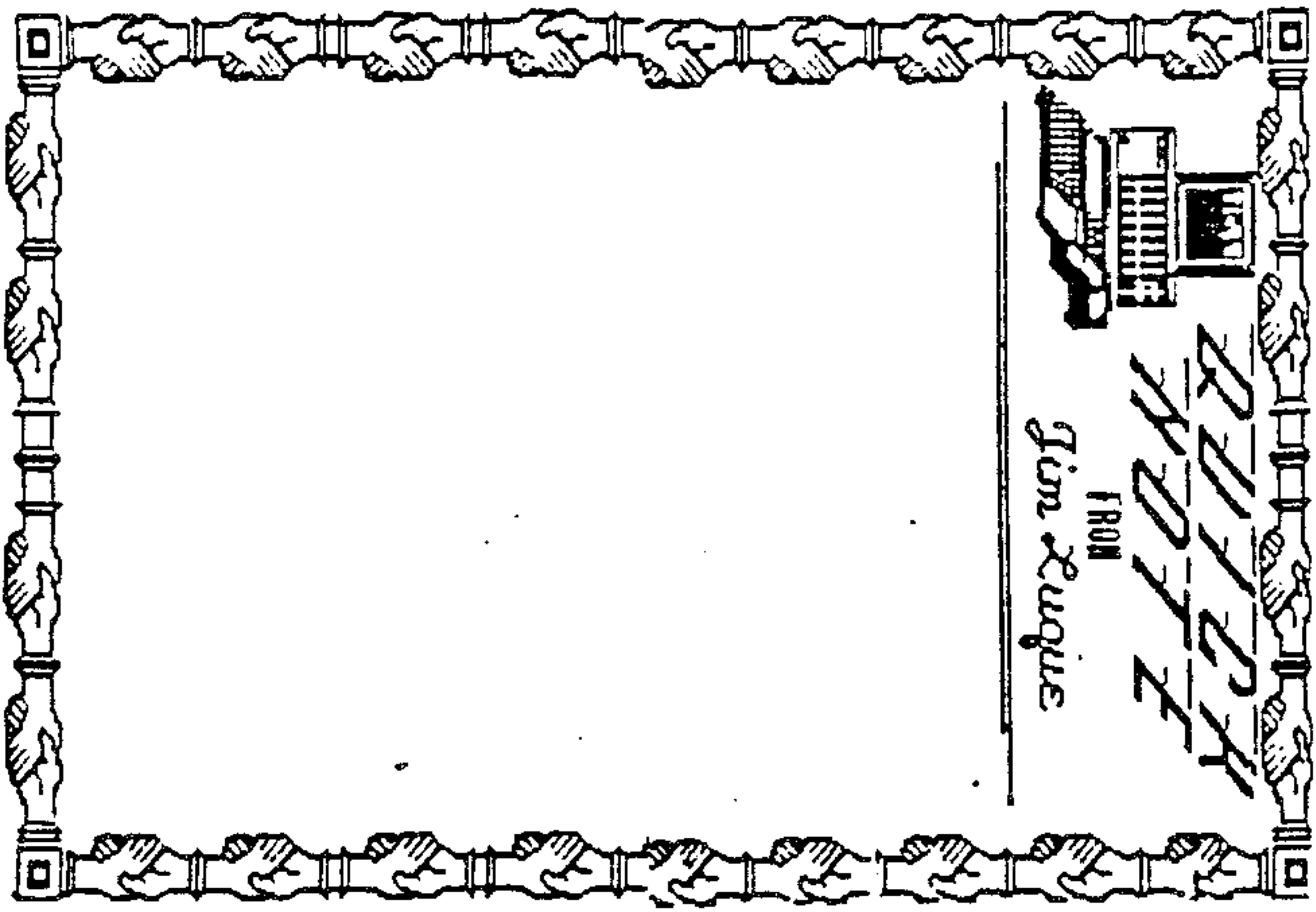
There you basically have it! If you wish to make some changes to your original saved copy, don't forget to save the new page again. YOU DON'T WANT TO RE-INVENT THE WHEEL! If you want to do an extra nice job, use colored paper to photocopy your notepads; and go to a

printing outfit, library, or book binding store and ask for a small amount (less than a pint) of bonding glue for notepads. RUBBER CEMENT DOES NOT WORK TOO WELL!

Place your notepad sheets on top of one another. To separate one set of pads from another, place a cut-out (same size as notepads) piece of card board in between. The thickness is up to you. Place something heavy on top of the pads (heavy books and liberally brush on the bonding glue to the top ends. Let dry for about an hour. Use a thin knife blade to separate the note pad sets. And there you have it! Once you've made a few, you'll want to make some for your friends!

Next month, Making fancier notepads using TI-ARTIST and PAGE PRO together. Just like the ones on the backside. Until next time, HAPPY TI-ING! JIM





Many of you may have become quite confused with last month's article. I hope it wasn't the content that did it, but in my copy of the newsletter, pages 3 and 4 were swapped. So if you didn't figure that out, go back and read pages 1,2,4, and 3 in that order. It should make more sense.

Last month, at the end of the article, I briefly told you how to "Assemble" a program listing. I didn't however explain why you were to do what I said to do. I did that because I was running out of room and wanted to let you actually run a program that month. Here is how to assemble any program.

Start by typing in the program with an editor, either E/A's Editor or Funnelweb's Program Editor. TI-Writer will not work because it adds Carriage Returns after each line. Once your program is complete, or is at a testing point, it is ready to be assembled. This process will turn your program into a runnable Display/Fixed 80 format file.

After your program is typed in, make sure it ends with the END command, and begins with a DEF command. Once these conditions are satisfied, save the program listing to disk. What has been saved is called the Source Code. Now load the assembler. From the E/A cartridge, go to the main menu and select option 2 (Load Assembler). Insert the E/A disk A into drive 1, and answer Y to the Y/N prompt.

Now the assembler is loaded and asking for a "Source filename." You can probably guess that it wants the name you saved the Source code under. Include DSKn. in the filename. Press ENTER. Now it wants an "Object filename." This will be the D/F 80 file to be created that will be runnable. The only rule on this filename is that it cannot be a pre-existing filename in the D/V 80 format. This is to avoid overwriting a program listing file. So, ENTER the desired filename for the Object Code.

Next comes a Listing filename. This is not required and may be left blank if wanted. You may, however, enter either a disk filename, RS232 or PIO at this prompt. This will be a detailed listing of the program. If a disk is specified, then it will be a D/V 80 file. PIO will only work on a few E/A Assemblers that have been fixed and the Funnelweb Assembler. Both RS232 and PIO will print out the same listing. One nice feature of the listing is that it tells you exactly where the occurring errors are at.

Now it wants options. The available options are: (R)egisters, (C)ompress, (L)isting, and (S)ymbol table. Enter the letters in parenthesis to enable that option. Last month I said to enter "RC." That caused the Registers to be defined, and the Object code to be compressed. The Registers option is pretty much required, as it allows R0-R15 to be used. Compress will cause the Object code to be compressed, but as a result, the program can not be loaded from Extended BASIC. That usually is not a problem. "Listing" will cause a list to be printed out to the "List filename." The Symbol option will cause a symbol table to be added to the Listing. Try these out to see the results. Use last month's example.

There are times, many of them, when a Source code will not fit into memory. When this happens, it is necessary to chain many files together. This is done by specifying a "Master" file. In this file are the COPY directives. To use COPY, enter it in the command field, and enter the filename to be chained in quotes in the operand field. Here is an example:

```
DEF  START
COPY "DSK2.DATA/S"
COPY "DSK2.TITLE/S"
COPY "DSK2.MAIN/S"
COPY "DSK2.SOUND/S"
END
```

This is a master file that chains the DATA/S, TITLE/S, MAIN/S, and SOUND/S files together. So, if this listing was saved as DSK2.MASTER/S, then when the assembler asks for the Source filename, you would enter DSK2.MASTER/S. Notice that START is DEFINED as the starting point, but START does not appear in this program. It does not need to, but it DOES have to be in one of the other four files chained together. The master file above is unique in that it does not have a single command in it. DEF, COPY, and END are all directives and do not effect the program itself, but effects the way the assembler works.

One more hitch, COPY must appear in the master file, not any of the COPIED files. So neither DATA/S, TITLE/S, MAIN/S, or SOUND/S can COPY any more files into the Source Code. Also, commands can be included in the master file anywhere you want. So the following master file will work.

```
DEF  START
START  LWPI >8300  % Assign workspace to >8300
      JMP  GO      % Jump to some place in "THE-REST/S"
      COPY "DSK2.THE-REST/S" % Insert "THE-REST/S" here
STOP   LIM1 2     % Allow FCTN =
      JMP  $      % Loop forever
      END
```

The comments pretty much cover that short program. Last month, one of the new commands was DECREMENT. It is one of four of its type of commands. The others are DECREMENT by Two, INCREMENT, and INCREMENT by Two. Add DECT, INC, and INCT to your list. DECT subtracts two to the operand, INC adds one, and INCT adds two. These four are extremely useful. The same result of DEC R0 could be accomplished by:

```
DECR  LI  R1,1    % Set R1 to equal 1
      S  R1,R0    % Subtract R1 from R0
```

DEC R0 uses two bytes, but the above program uses six bytes. Last month we started into using the screen by the use of VOPRO, VOPWD, and VOPWA. A runnable example was also included. It used quite a few statements for displaying HELLO in the upper left-hand corner. Let's make a common routine to do the same thing. First, lets introduce a command to make this easier. BLWP, or Branch and Link with Workspace Pointer, is like a gosub that doesn't effect the registers of the main program. Let me show you a short example.


```

DEF START
VDPWS BSS >200 * Reserve space for routine workspc
VMBW DATA VDPWS,VMBW1 * Used by the BLWP. The first word
* (VDPWS) is where to put new set of registers. The second
* one is the starting spot for the routine. This is the re-
* required format for a BLWP @VMBW
VMBW1 MOV *R13,R0 * The *Rn format means to get the
* value of the address pointed to by Rn. It is the same as
* the *Rnt format described last month, but it does not
* auto-increment. R13 holds the pointer to the previous
* workspace, so this gets the main program R0.
AI R0,>4000 * Add >4000 to R0 so it will write.
SWPB R0 * Get LSB of address ready to move.
MOVB R0,@VDPWA * Write MSB (LSB of address)
SWPB R0 * Get MSB of address ready to move.
MOVB R0,@VDPWA * Write MSB (MSB of address)
MOV @2(R13),R1 * Get second word of address pointed
* to by R13 (The workspace) The @x(Rn) format means the
* value of the address pointed to by Rn + x. So, let's say
* R13=>A000, then @2(R13) will get the value at >A002. The
* overall effect is that the old R1 is placed into the new
* R1.
VMBW2 MOV @4(R13),R2 * Do the same to the R2's
MOVB *R1+,@VDPWD * This is the same loop as
DEC R2 *
JNE VMBW2 * last months loop.
RTWP * Return to main program.
VDPWD EQU >8C00 * VDPWD=>8C00
VDPWA EQU >8C02 * VDPWA=>8C02
MSG1 TEXT 'HELLO' * The message
TART LWPI >8300 * Workspace at >8300
LI R0,0 * The desired address = 0 (>0000)
LI R1,MSG1 * The text is at MSG1
LI R2,5 * The length of message is 5 bytes
BLWP @VMBW * Go to our routine.
LIMI 2 * Allow FCTN =
JMP $ * Loop
END

```

This will do the same thing as last month's example, but it uses a subroutine, and takes more lines. There is a benefit, however, just as there is one in using the GOSUB in XB. It can be used over and over again. The BLWP is rather complex and needs some explanation. When it is executed, the address pointed to by the operand (VMBW in this case) is taken, and the first word at that address is the new workspace. This means that in our example, an equivalent to LWPI VDPWS is executed. The second word at that address is where to jump to. So, a JMP VMBW1 is also executed. At the same time, the old data must be saved. There are three words to be saved. First, the old workspace is saved at R13. The return address is saved at R14. The status bits talked about last month are saved in R15. These three registers can not be changed in the routine or the return will mess up.

When the MOV *R13,R0 is executed, the first word of the old workspace, R0, is placed into the new R0. And when the MOV @2(R13),R1 is executed, the second word, R1 is moved into the new R1. Remember that two different workspaces are used here. The RTWP, Return with Workspace Pointer, will restore the workspace, address, and status from R13-R15, thus returning. That'll be all for this month.

