## We Support Cassette Users：Program Pages 6－9；Resources Rope 10880k 

THE DELAWARE WALLET USERS GROUP
P．O．BOX 6240 STANTON BRANCH，WILMINGTON DE 19804－9998 DEDICATED TO THE TI AND COMPATIBLE HOME COMPUTER FAMILY

## WELCOME NEW DUG G METER

Bill Cook（Kane，Pa．）
RECENT RENEWALS WITH DOUG：
Richard Jabkowski

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#### Abstract

Thoughts of the Political Season ．．．．．．．．．．．．．．．．．．．Page 1 DKl Doings ．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．Pages I－3 PROGRSM：（XB）Subroutine／Line Extraction ．．．．．．．．．．．Page 2 Wire It Yourself（Make Your On Cables）．．．．．．．．Pages 4－5 PROERAM：Basic，XB Tape \＆Disk Screen Dumps ．．．Pages 6－9 （Wit th Thanks to Jim Schwaller，Extended Software Company！） Some II Software，Other Resource Items ．．．．．．．．．．．．Page IB


## THOUGHTS OF THE POLITICAL SEASON

＇He［ Rev．Jesse Jackson ］＇s a poet；［ N．Y．Governor Mario ］Cuneo＇s a poet；［ Massachusetts Governor Michael］ Dukakis is a Word Processor．＇－Richard M．Nixon．

POLIIICIANS RIN，Fairware by Marsoft Inc．，P．0．Box 83 E．Glastonbury，CT 06026．Extended Basic game simulates a Presidential Campaign． 2 players vie for votes in various states．There are 4 variations of the game．

Available on 5SSO， 273 Sectors，from the LOS Angeles Computer Group．Write Librarian FRED MOORE， 7730 Emerson Ave．，Los Angeles，CA 90045．This and any other program in the LA ger Group Library is available for $\$ 3$ per program disk，or 4 disks for $\$ 10$ ．Add $\$ 1$ for shipping／handling of the first disk，$\$ .25$ for additional disks．

Catalogs from the LA 99er Library were distributed to DVUG chapters this Spring．Check with your Librarian，or consult the Newsletter Library copy of LA 99er TOPICS，for additional material not in DKl＇s Library．DUG Librarian Don Newton can be reached at（609）299－3720．

COMING MEETINGS OF DUG AFFILIATED GROUPS：
SClLLUILLE，NJ：Thursday，July 7，and August 11，7：30 pm．
DOVER，DE：Monday，July II－TOPIC：Using TI－writer
CHRISTIAH MALL，Delaware：Thursday，June 23，and July 28， at 6：30 pom．：Always the 4th－NOT last，Thursday monthly．

## THE OUERHELNG SOUNDS OF SUMER SILENCE：MEMBER NEED？

With little clear indication from members as to areas of needs or interests，it makes it hard for your Editor to know on what to focus each issue．Do you identify with the profile from Ali Ulgen＇s poll in the March newsletter？Do you use DSDD system disks so that Funnelweb or like loader： aids are meaningful to you？Those who consistently attend meetings are interested in ongoing development of the ir Tl systems，with spreadsheets，data bases，BBS terminal help， VCR or robotic interconnections，graphic or print aids．I have no idea what the＇silent majority＇want，even if you renew，and say＇nice job＇when we meet．

There are innumerable articles of discussion in other newsletters，and current developments are always important －but does that mean hardware，or fairware，or a tutorial refresher for new members with undeveloped systems？In a ten－page monthly，it＇s hard to choose．In July＇s DATA \＆⿴囗⿱一一心 you＇ll be asked to survey yourselves to provide direction， in terns of subject and format for your User Group－which you may have noted from the Ulgen poll remains one of the larger membership ones around，a great help for finding Tl users with like needs，interests and ability to help one another－if we know where you stand！

The contrast in technical competence（as least，from the Editor＇s perspective）shown in articles in this issue is another example．Do you solder？Do windows？Only use tape（cartridges）？Let＇s hear from you！

#  PAGE Z - DELAWARE UALLEY USERS GRGLP 

DUUG EXECUTIUE OFFICERS FOR 1988

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## NOAAAL MEETING SCHEDUEES AND PLACES:

| SCULLUILLE,NJ | Ist Thurs. | $7: 30-9: 00$ |
| :--- | :--- | :--- |
| DOIER,DE | 2nd Monday | $7: 00-9: 00$ |
| CHRISTIAN, DE | 4th Thurs. | $6: 30-9: 30$ |

JERSEY SHORE: Sculluille Firehouse \#1 County Rte. 559 (on left, between mile markers 4 and 3), in Atlantic County, N. Ignore Station 12 on right en route.

DELHARNA CHAPTER: Kent County Courthouse, Basement Conference Rm. \#25, The Green and State Street, Dover, Delaware. Use entrance on The Green side.

CHRISTIAK: Delaware's Christiana Mall on Rte. 7 at 1-95, Exit 4-S, Comannity Room. Enter inside Mall, between J.C. Penney and Liberty Travel.

## DUUG BULLETIN BOARD SYSTEAS (BBS)

No. Delamare: (302) 322-3999 24 Hrs . 300 \& 1200 Band
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adNertising rates in the data bus
$1 / 4$ Page $=\$ 5 /$ issue, or $\$ 45 / 12$ issues
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THE DATA BUS goes to DUUG member homes in 4 states and over 60 II User Groups.

Paid-up DNG members may place a short notice of the ir used computer equipment for sale in THE DATA $84 S$ without charge.

TRANSYIT YOUR NEUSLETTER COPY TO EDITOR Jack Shattuck, (302)764-8619 or reach us at the DVG mailing address, as shown on Page One of this newsletter. NEWSLETTER COPY WILL NOT BE ACCEPTED FOR AN ISSUE AFTER THE ZND THURSDAY OF EACH MONTH.

An annual index appears in February each year. Single copies of THE DATA 睢S are auailable to inquirers who write to the Editor at DNUG's mailing adoress.

NOTICE TO OTHER USER GROUPS, ON MAILINGS TO THE DELAHARE VMLLEY USERS GROUP:

We ask that you use the P.O. Box on THE DATA BUS mast to reach us. In past years, mail sent to changing individuals in the organization provided undesirable delays in reaching others. Thank you. -
mini but mighty aid - extracting routine
XBasic Programing Utility, published in Word Play, The PUNN Newsletter, May 1988

How any times have you wished there was a way to extract a routine or part of a progran from an Extended Basic progran? Well, this little routine when merged into a program allows you to do just that. Originally published in MICROpendium DEC 1985 and provided by George Steffan LA/UG the features of this progran are often needed. ... After typing in this progran, save it to disk as a progran, and again in merge format: SAUE DSKX.ROUT/EXTR,MERGE. Now load the progran that you are going to extract the subroutine from.

Resequence your progran to start at line 18, as this six-liner is now MERGED - MERGE DSKX.ROUT/EXTR into the start of your program. Enter RLN and you will be prompted for the starting and ending lines you wish to extract. You will receive an error prompt but just simply enter LIST to see the routine lines you just extracted; the other lines are deleted. This routine can then be saved in Merge format, which can then be made runnable by NEWing and RIN DSKx. (Routine name). In nost cases it will run when saved as a progran.

1 CALL CLEAR :: CALL INIT :: INPIT 'LINE NMBEERS OF ROUT INE TO BE SANED: FIRST,LAST?
':L,M : : $G=256$ :: CALL PEEK ( $-31952, \mathrm{H}, \mathrm{I}, \mathrm{J}, \mathrm{K}$ )! ! W pend $12 / 5$ $2 \mathrm{C}=\mathrm{IN}(\mathrm{M} / \mathrm{G}):: \mathrm{D}=\mathrm{H}-\mathrm{C} \times \mathrm{G}: \mathrm{:} \mathrm{~F}=$ (J-G)*G*K :: FOR $E=(H-G) * G+1$ TO F STEP 4 :: CALL PEEKIE, $A, B):$ : IF $A=C$ AND $B=D$ THEN 4 3 NEXT E :: PRINT :'LINE'; $\theta$; "NOT FOND! ": STOP ! PP$4 \mathrm{H}=\mathrm{INT}(\mathrm{E} / \mathrm{G}):$ : $\mathrm{I}=\mathrm{E}-(\mathrm{G}+\mathrm{H}):$ : H $=H+G:: C=I N T(L / 6): D=L-C \neq G$ :: FOR E=E+4 TO F STEP 4 :: CALL PEEK(E, $A, B):$ : IF $A=C A$ ND $B=0$ TKEN $6!? P-$
5 NEXT E :: PRINT :'LINE';N: "NOT FOND!" :: STOP!PP$6 \mathrm{E}=\mathrm{E}+3:$ : $\mathrm{J}=\mathbb{N} T(\mathrm{E} / \mathrm{G}):$ : $\mathrm{K}=\mathrm{E}-$ (G.J):: J=J+G :: CALL LOADC$31952, \mathrm{H}, \mathrm{I}, \mathrm{J}, \mathrm{K}):$ : STOP ! $2 \mathrm{P}-$

DELAAARE VALLEY USERS GROPP HEETING, Christiana, May 23rd:

Meeting was officially called to order at $7: 25 \mathrm{p} . \mathrm{m} . ;$ Jim Davis agreed to take minutes in Secretary's absence. President Jack Shattuck noted with appreciation readiness of the ever reliable vice President to help in unexpected as well as scheduled club activities.

Norm Sellers gave an updated Traeasurer's Report.
Comittee reports followed.
Newsletter Editor requested assistance from members who had failiarity with special topics to review selected newsletters froa other User Groups, to determine relevant items in various categories, and write short articles for THE DATA BUS about them. Given breadth of TI interests, it is not possible for Editor to be on top of and write about every area, month after month.

Librarian Don Newsom will have updated Public Domain catalog of Sof tware Library available in June. Delays were necessitated by requests for some descriptions beyond just the titles in Library Catalog, which has many prograns.

TIPRS Comaittee suggested that more frequent calls to our main BBS would access latest software acquisitions, in a speedy manner. Calls are down in Summer despite student use, and much new has arrived. There appears an excellent opportunity for DWG to obtain several hard orives, which which boost speed and storage capacity such that the whole DUV sof tware library could be available through the TIBBS line. That would be subject to obtaining Hyarc's Hard and Floppy Disk Controller, finally available. The latter can handle up to 3 hard drives of 70 megabytes, plus 4 floppy drives. With 20 meg hard drives equating to 27 DSDD floppy storage capacity, that's a lot of programs. The President suggested deferral of a motion to purchase, pending notice to the broader membership.

John kelley observed that Compuserve now advertises a Dover tie line, allowing those area residents to access it without need of a toll call.

## Program demonstrations followed:

Jack Shatttuck provided hard copy screen dump and the full listing for each member present, and for each Chapter of DUV, for an XBasic program he used for a Hospital Heek display at the Veterans Achinistration. Amongother items noted was ability to run it from XB Load in 50 sectors but not having to Call files. This was attributed to doing a RESequence to start at I and save memory. The progran was then shown to the group.

A group of approximately one-half dozen is studying use of Assembly Language under Nora Sellers' tutelage. Jin Davis provided a "chalkboard" comparison of TI's BASIC and
assembly language routines to accomplish both data storage and addition of simple sums. If the BASIC compiler in our computers can be said to operate in a blink of an eye from our human perspective then $A / L$ routines may be said to run at 1000 times the blink of an eye.

Congratulations to Bill Godshall, $50 / 50$ winner.

DUG DELHARNA CHAPTER HEETING, Dover, May 9th:
'Den' Dawson, Chapter Chairman, opened the meting at the Kent County Cour thouse at 7:30 p,m.

Treasurer's Report was read by Al Freischaidt, wich was approved as read.

Discussion centered on relocation of the BBS and upgrading to 1200 Baud. A problem identified with moving it was the necessity of toll calls from certain exchanges. the question arose, "do me really mant to retain the BBS?" Another discussion cited aspects of the phone line and the linitations of the features theeon, i.e., no touch-tone, a linited number of outgoing calls or any other restriction that will aid in keeping the nonthly bill to a minimm. All present agreed that the chapter siould retain the B8S for at least another year; that Jim Gentry be considered the reluctant and temporary SYSOP.

All present attempted to present ideas for inducing new embers into DVG and to entice participation of current members. It was mentioned that at the most recent OUV meeting, a visitor from the Baltimore Users Group stated that their group had gotten a listing from TI Lubbock, identifying omers of TI/99's in their area. He ask that our DNo attempt to do the same, sharing such information with this chapter. He could then intensify our membership efforts.

Chuck Bower and Dea Dawson gave a rundown on the Trenton Computer fair and displays/material available.

Chuck explained the experience he and Jim Gentry had, working computer-to-computer, using Jin's new modem which had the auto-answerng feature.

Jin England, with an awesome array of hardware and systems, demonstrated the TI/Home Entertainent interface, using Video taping, filaing and playback.

The menbers held a general discussion of "Things to Cone', the impact of digital processing on video, audio and combinations thereof.

The meeting was adjourned at 9:00 p.m.

## WIRE IT YOURSELF

## ALTERNATE ORIVE INTERFACES

Uownloaded From DELPHI TI NET. submitted by Tom Burke

If you are thinking of adding a second drive to your system, and it is not a T.l. drive, it may or may not work by connecting it to the external drive connector on the back of the Disk Controller Card.

If it does NOT work with the T.I. recommended installation proceedure, try this.....

You will need the following: An adequate length of 34 conductor ribbon cable. (2 to 3 feet)

1 - female 34 pin connector. This will connect to the controller card inside the P.E. box. Part \#41-908 6C
> 1...................|
> 1...................|
> --------------------

It should look something like this. 2 female 34 contact edgecard connectors. Part \#41-946

This makes a total of three connectors. The part \#'s are from RESCO Electronics. Use the crimp-on type connectors. Put part \#41-908 6C on one end of the cable. Plug this into the controller card inside the PE box. Place the first edge card connector approx. eight to twelue inches from the controller card. Crimp it on the cable. Now you should loosen the screw on the right, rear, top of the outside of the PE box enough so that you can slide the other end of the cable out through the gap. When this is done, plug the middle connector onto the internal drive, (don't forget to plug the power cable back on the drive), and put the drive back into the PE box, pulling the excess cable through the gap.
do NOT INSTALL THE DRIVE PERMANENTLY AT this time. Just leave it sit in the peb

Next, crimp the remaining connector on to the other end of the cable. Bare in mind that when you do put the connectors on the cable, that the same wires must be connected to the same numbered contacts on all three con- nectors. ( e.g. wire one goes to pin one on connectors 1, 2, 3) Plug the last connector onto the external drive. (contact one to contact one, etc) Now test the system. You may or may not have to remove the resistor from drive \#l. Info on where the resistor is found is in the Controller Manual.

## Make your own cassette cable

The following information will enable you to make your oun single cassette cable for your Tl. All parts are easily obtainable from Radio Shack, and for convenience the part numbers are given. All you need is a little skill and time to wire it up.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

J1,J2 1/8' plugs 274-287..... 2 for 1.29
J3 3/32" plugs 274-281............ . 99
J4 D-connector 276-1537.......... 2.49
-- Hood for J4 276-1539.......... 1.99

This is the diagram of the cassette port located on the rear of the TI, next to the power jack:

12345
\begin{tabular}{|c|c|}
\hline \multicolumn{2}{|l|}{TI/99才 . . . . . female} \\
\hline \multicolumn{2}{|l|}{Cass. \. . . /} \\
\hline Port & \\
\hline 678 & \\
\hline Cassette control & \\
\hline pophone jac & (usually \\
\hline =Earpiece jack & (U) \\
\hline
\end{tabular}
(Continued on Page 5)

\section*{ DELAWARE MALLEY LSERS GRQLF- PAGE S}

WIRE IT YOURSELF - Continued from Page 4

After getting all the parts together, wire the jacks one at a time with two conductor wire. Noting that J3 is a micro-mini phono jack, while the other two are regular mini phono jacks. The positive connection from J3 will connect to pin \#l on the \(D\) connector, and the ground goes to pin \#2.
The positive connection from J2 will connect to pin \#5 on the \(D\) connector, and the ground goes to pin \#3.
The positive connection from Jl will connect to pin \#8 on the \(D\) connector, and the ground goes to pin \#9. Connect the wire number to the appropriate part of the plug, following the above method.

\section*{INTERFACE YOUR PRINTER TO YOUR MODEM}

Many people have asked how to have the data that is coming from the modem, print to their printer at the same time it prints to their monitor. This is not hard, if you have a serial interfaced printer and it does work, with the following printers :
TI 99/4 IMPACT PRINTER
TI 810
EPSON PRINTER
GEMINI I日X


Some modems also connect pin 5 to pin 5. Fin 11 on the T.I. 818 printer is called "REUERSE CHANNEL". It is simular to the pin 6 of the RS232/C. Be sure to set the printer's baud rate to match that of your modem, (300-1208). The off/on switch permits you to pause the printer. Using the on line/off line switch on the printer will also pause the modem.

The following are the pin connections for for a parallel interface ( PIO ) from your RS232/C to your parallel port on your printer.

You will need the following:
- An adequate length of 16 conductor ribbon cable.
- One 36 connection male Centronics connector.
- One 16 connection female PIO port connector.

Wire the connectors together as follows:


TAKE NOTE: For an Epson RX/88 printer, you must wire pin 13 to PIN 13

ADDENDUM by Art Byers of the CW 99'ers
If your PIO cable made as above does not work properly, try the pin connections listed below. they are taken from a cable supplied by Texcomp as being specifically for \(\mathrm{TI} 99 / 4 \mathrm{~A}\) and Plo printers and does work very well with the TI Impact Printer (which is an Epson MX 80).

Printer PIO CARD
1 thru 9 to 1 thru 9
11---~------------18
19-----------------11
not used 12
13--------------- 13
not used 14
not used 15
16---------------- 16



\section*{SCREEN DUPS FOR STARTERS}

Your first II expansion iten way be storage capability to retain programing activity. If so, the next supplemental equipment to advance program development surely has to be a printer, to allow an easy recall of what's captured in a file or listing. Next are additional printout features to observe: capturing one's creations for posterity is an endless pursuit of mankind.

Following are some introductory screen dump routines. First in EASIC from the keyboard, let the user enter any 28-character (one line) string, dump it to a printer (your serial option may be 'RS232. \(\mathrm{BA}=4800^{\prime \prime}\) instead of "PI0') and wait for the next one-line input ... 24 times; one screen.
```
100 REM *24-LINE BASIC DUPP; 140 PRINT II:A$
110 OPEN #1:'PIO" 150 NEXT R
120 FOR R=1 T0 24
    160 CLOSE II
130 INPUT ":A$
```

Should yox want to print more than 28 characters on a line on the printer at a time - as opposed to 2428 -char. lines - you'll need to escape from the 24-line loop with a slight diversion by adding:

135 IF LEN(AS) \() 24\) THEN \(170 \quad 170\) PRINT II:AS 180 GOTO 130

Now, however, you'll get more than a single screen of text dumped since you have the 24 -line lieit PLUS a longer (screen) line you allawed yourself. The For-text loop from lines 120 and 150 was a convenience, for a single screen at a time, a line at a time.

Use another option: set yourself to DIMension your output to an entire screen at a time. It's then irrelevant as to where your screen line ends, as a 24-line, 28-column screen can get dumped to the printer as a unit. Following is an Extended BASIC (XB) rootine to do so:
```
90 REY Quick and Dirty Hor
d Processor by Del Gittinge
r, Marion,Ohio: Marion Area
    99ers
95 REY *PROOUCES 28 COR. LIN
ES THAT DLFP AFTER 24 LINES
    (ONE SCREEN); 6000 FOR A
    PROCRHY LISTING IN XBASIC
100 CALL CLEAR
110 DIM TEXT\$(24)
120 CALL SCREEN(12): CALL V
```

90 REY Quick and Dirty Hor d Processor by Del Gittinge \(r\), Marion,Ohio: Marion Area

99ers
95 REY *PROOUCES 28 COL. LIN
ES THAT DUFP AFTER 24 LINES
(ONE SCREEN); GOOO FOR A PROORHY LISTING IN XBASIC

110 DIM TEXT\$(24)

120 CALL SCPREN(12):: CALLV CHAR \((1,2,30,24):\) : CALL VCHAR \((1,31,30,24)\)
130 FOR \(X=1\) TO 24: : ACCEPT A
\(T(X, 1)\) BEEP SIZE(28) :TEXT \(\$(X)\)
: : NEXT X
140 OPEN 11:"P10"
150 PRINT 11:CHR\$(15): : FOR
\(X=1\) TO 24: : PRINT II:TEXT\$ \((X\) ): : NEXT \(X\) 160 CLOSE 11: 60010100

Why dum the screen? To capture some instructions or perhaps the way text is displayed. Hore popular is the desire to capture a graphic display fro the screen, often with specially formed characters.

Undoubtedly, the first piece of non-cartridge based software I bought was a \(\$ 12\) ScreenDump tirst advertised in the pages of 99'er Magazine in January, 1983. Available in both the cassette and a disk format, the introcuction of Extended Software's version (requiring Extended Basic then selling as a \(\$ 75\) cartridge) was notable above all for its User Friendly explanation of the always mysterious world of printer codes.

Back in those days, having thorough documentation was deemed even more essential than ever, if you didn't have a II Impact (i.e., Epson NX 80) Printer. The popular second choice of those dot matrices available at the time was the C.Itoh Prariter (codes identical to the NEC 8023A-C), and these codes were provided, as well. Considering prices of \(\$ 880\) for the TI printer, that alternative was important.

That Screen Duap progran has been used for a variety of printers over the years due to clarity of documentation by author Jim sashaller from Cincinnati. It last appeared for sale in the Holiday (December) 1986 Tenex catalog.

That program, superseded by speedier or specialized versions since then, never the less orms vers of both the newer as well as older printers to it, as a starting point for graphic code comands. Writers to MICROpendium of ten provide changes in internal code lines, while not citing the complete original progran, due to copyright limits. THE DATA BUS Editor has obtained the author's consent to print the original program -- no longer with a meaningful comercial base - to illustrate the purpose and method of screen dump for newer users.

How do they work? slowly. Character patterns at each location, 24 rows of 32 - not 28 -column locations, 768 tines 8 blocks, are found on the screen. That totals 6, 144 blocks of 8 picture elements (pixels), or 49,152 pixels that require duming. That means converting hexadecimal character patterns (Charpats) into a binary code, and then changing it into a decimal code, for a printer to use.

How slowly it occurs depends on whether characters to be dumped, i.e., on the screen, occur more than once. If each ASCII character from 32-143 (available in XBasic) is used, the process for one screen could take as much as 15 minutes ... otherwise, 6-9 inutes, suggests the author. (Note that Sprites will not be captured by the printouts.) Yes, there are faster routines, with assenbly language, or interrupt switches, special chips; but it's the principles we're learning here.
( Continued on next page ....)

\section*{SCREEN DUPPS (Continued from Page 6)}

In a moment, you'll get to the the progran itself, on pages 8 (for cassette) and 9 (for disk).

To capture your fayorite screen, first you'll need to run your favorite program with the display you want. DEMOI is a random sample graphics progran, on page 8 of THE DATA Bul, which can be used with cassette.

Let's analyze the program you want to dump. Basically you run it, until you get to where you want to dump. You don't have to turn the page yet; just get an understanding as to where we're going.

Line 110 places various characters on screen. Line 120 reshapes them in accord with patterns found in Lines 140-370. Then Line 130 calls up the subroutine which activates the Screen Dump. In this case, it's Line 138, but it can be inserted at any particular line you wish into any program of choice. There are two parts which need to be included (for tape users). First, when you reach a point when you want to stop and print, use (FCTN 4) to interrupt the display. When the screen shows:

BREAKPOINT IN XXX
with XXX being the line number of the breakpoint, type in:
XXX CALL DNP : : END
and press \{
Now add lines 32000-32060 (also on page 8), which will be invoked by the CALL DUP comand. Type RLN (ENTER) and the sample DEM1, or whatever progran you use, will be loaded, ready to print out. At that point, for tape users, load, then RUN, the main Screen Dump program (on page 8) itself, to activate the printer.

Disk users should save "SCREEVD", program found on Page 9 of this newsletter, Load DEMOI but for Line I30 use RIN "DSKI.SCREAVD" instead, Ouit Lines \(32000-\). When the progran reaches line 130 , it will kick directly into your Screen Dump progran (looking for it as DSKI. SCREEND).

Extended Sof tware's screen dump shows you progress by moving an asterisk across the screen as it converts, then dumps the screen line by line and eventually sounds a loud tone to alert you to completion (you can get a coffee in the next room, meanmile). You should realize that usually one runs a progran once, to dump a particular screen. If there are several screens to dunp, you'll have to rerun it and (BREAK), save, and rerun for each duap. Use a second tape, not the same cassette, for safety and convenience.

There may be occasions in which you'll return to that same graphic to redo the same dunp to a printed page, time after time. THE DATA Bats logo, page 1 of this newsletter, is dumped month after month; it's permanently saved with the CALL DUPP (or RUN for disk) line inserted as needed. of course the companion Screen Dunp progran is kept on the same disk.

\section*{MODIFYING THE SCREEN OLMP FOR YOUR PRINTER:}

We come finally to the real strength of the Schwaller program (aside from prowiding tape users a needed tool). The initial lines of the Screen Dump program, up until 160 or so, are geared to differences between tape and disk use since the data is scanned differently. You'll see a minor change or two in lines that follow, e,.g., PRINT 11 versus PRINT 2 , and in the CLOSE statement, else they're alike.

What lines take into account changes in printers?:
Comands to printers begin with an ESCape, or notice that following data is INTERPRETED rather than printed as follow in the progran. The ESCape comand is [ PRINT \(\| X:]\) CHRs(27); and then the information. NOW you can look at listings on pages 8 and 9 and note these lines (the first reference is to the tape listing, then the Disk version):

Line 228 (Tape - Page 8) or Line 180 (Disk - Page 9):
Control or Escape codes to set the printer in graphic mode to produce lines closely spaced are found here. With a Gemini/Star/Epson compatible, the line shown works fine. The expression is CHR \(\$(27)\); "A" (ASCII 55 ); and a number. It tells us to use the decimal value of 8 to print lines that are 8 ?7nde of a det pesition anast. That could alse be expressed as \(16 / 144\) ths, and way not use an easily-read decimal expression, but could appear as ASCII equivalent. Printers (like the C.Itoh 8510 NEC 8023 个-C.) would compare like this:

Decimal: PRINT 1 : CHR\$(27);CHR (65);CHR\$(8);
ASCII: PRINT II: CHR\$ (27);CHR\$(84);CHR (39);CHR\$(54);
Not only does it use the form CHR (27); "T"; and a number instead of CHR (27); " \(A\) "; but additionally, the number is in 144ths of an inch, and is expressed in ASCII instead of decimal. (ASCII \(84={ }^{-1} \mathrm{~T}^{\prime}\) ) So it really says:

PRINT II: (ESCape command>; "T"; and then 16. (49 and 54 are ACII equivalents of 1 and 16 , or \(16 / 144\) ths of an inch)

Once you understand which langugge your own printer uses, you can make the appropriate substitutions. There will be four or five other lines in which changes can occur:

Lines 230 / 190: Continue to print, despite normal Gemini /Star/Epsorn skipping of several lines on tractor feed paper, to avoid perforation
Lines 250 / 210 : Provide a Character Return and Line Feed to go to column 1 and start next line
Lines \(310 / 270\); Inverts character printout (C.Itoh/NEC) Lines \(350 / 310\) : Conclurits and closes printer file

Necessary information to make changes is found on page 9.



CASSETTE VERSION:

188 ! SCREEN DUAP, COPYRIGHT 1982 EXTEIDED SOFTHARE CO., INSPIRED BY ED YORK
118 OPEN \(11:\) CSI I INTERAL, FIXED 192, IHPUT

 8
148 MEXT C : : MEXT R

: A\(\}_{1}\)
\(16^{\prime}\) CaLL CHAR(C, A \():\) : NEXT C
\(1780114 \mathrm{~K}(112,8)\)

16): : \(\left[5=\operatorname{RPT}\left({ }^{\circ} \mathrm{F}^{\prime}, 16\right.\right.\) )

I 98 FOR \(A=1\) TO \(8:!K(\theta, A)=255:\) MEXT A




248 FUR \(R=1\) TO 24
258 PRINT \#2; CHRs(13);CHRS(10);RPT3(' ' 24 );CHRS(27);CHRs(75);CHRs(0);CHRs(1);
268 FOR C=1 1032
 48
289 IF \(K(X, 1)()-1\) THEN 348 ELSE CALL CHARPAT \((x+31, A 3)\)
298 IF \(A=0\) THEN \(X=1:: 6010348\)

 \$ SECs (AS \(A+1, d), 1): \leq G=G+1: \operatorname{MEX} A\)
 on \(\mathrm{H}=\mathrm{H}+\mathrm{L}^{2} \mathrm{~F}\)
338 NEXT \(F: Y=Y+1:: K(X, Y)=H:: 1 K O:\) NEXT \(E: 1\) HEXT \(0: 1: Y=8\)


 LSOLIO (1888, 523,8): : PRINI 'FINISHEO'

LIMNES TO SAUE GRAPHICS

Sample DEMOI
Graphic Program:
181 CALL CLEAR
118 FOR \(A=11024\) :: CALL H
CHAR(A,1,95+A, 32):: NEXT A
128 FOR \(A=1\) TO \(24::\) READ A
: : : CALL CHAR(95+A,As): : N
EXT A
138 call dLap :: END
148 DATA ' \({ }^{\prime \prime} 987654321123456{ }^{\prime}\)
150 DATA 'A5ASA5A5A5A5A5'5'
160 DATA "FIF2F3F4F5F6F7F8'
170 DATA \({ }^{\circ} 3838394949585032^{\circ}\)
189 DATA 'D7FBA9FBDFD日FAAA'
\(190^{\text {DATA }}\) '2929292929292929'
218 DATA "4F5F 6 F7F 日F9F9F77F"
211 DATA "APCDEF5432109875'
220 DATA '35'4685678796561'
238 DATA "REGCCDE:F5456787"

258 DATA '5745342321GCEFBE'
261 DATA '2487347587842238',
270 DATA "ABABAB48:4:A7bA6"
288 DAIA "4504543;989;8532"
29 DATA \(^{\circ}\)-5676798064435324"
381 DATA "887878788897877A"
310 DATA • \(352463457678799 F^{\prime}\)
328 DATA "456768767965743A"
330 DATA 5746876785642 ?CE'
340 DATA 'ETCECDECDECDECDE'

368 DATA 'ACEACEILEACEACEA'
370 DATA 'FACEFACEFACEFACE'
Insert lines
32000-32060
(Sub Dump) here

Type these lines into your graphics program. They will be used by the line you addes in the operating portion of the program (CALL DUMP) to save the screen and characters onto cassette tape.

32008 SUB DUMP : : FOR \(R=1\) TO 17 : \(:\) FOR \(C=1\) TO 32 : \(X=X+1\) i: CALL GCHAR(R, \(C, Y):\) : CALL HCHAR(R,C,42): : 1F \(X=224\) THEN GOSUB 32050

32836 FOR R=32 TO \(143: 1\) CALL CHARPAT(R,A ): \(1 \mathrm{IF}(R-31) / 11=1 \mathrm{NT}((R-31) / 11)\) THEN
PRINT NI:A ELSE PRINT HI:A
32040 NEXT \(R:\) : CLOSE \(H 1\) : : SUBEXIT
32850 IF S=0 THEN S=1 : OPEN 1 : "CS1", INTERNAL,FIXED 192,OUTPUT : : R=0

SUBEND
SUB DUMP will remove the characters from the screen until it has the first seven rows. It will then open the cassette. The screen will scroll upward as the instructions built into the \(99 / 4(A)\) appear. Save the data that is output on a tape for loading into the STREENDUMP program conce saved, you can use the data as many times as you want without going throught this output section). The first 5 outp.uts will save the screen and the next ll outputs save the character patterns (i7 outputs in all). After the outputs, READY will appear at the bottom of the screen and rou, can run SCREENDUMP.

LSING THE GRAPHILS DATA
Load and run the SCREENDDUMP program. lt will immediately open the cassette to input the data saved from your graphics program. Position the data tape for this input (ten seconds of blank tape must be read first, just as it was output). As the data comes in, it will reconstruct the screen and then change the character patterns.

\section*{DELAWARE NALLEY USERS GROUPG— PAGE}

DISK VERSION：
```
100 !SCREEN/DUMP - COPYRIGHT 1983 EXTENDED SOFTWARE COMPANVY; INSPIRED BY ED YORK
110 DIM K(112,8)
120 FOR A=1 TO B :: K(0,A)=255 :: NEXT A
130 FOR A=2 TO 112: : K(A, 1)=-1 : : NEXT A
140 H末="123456787ABCDEF" :: B==RPT事("0",16):: Cक=RPTक("F",16)
150 CALL DELSPRITE(ALL) I: FOR R=1 TO 14: CALL COLOR(R,2,8):: NEXT R
160 DPEN #1:"RS232.BA=4800.DA=8.CR",OUTPUT
170 FOR R=1 T0 256 :: PRINT #1:CHR$(0);: NEXT R :: PRINT H1:CHR$(13);CHR$(10)
180 PRINT # 1:CHR#(27);CHR$(65);CHR#(8);!SET DISTANCE BETWEEN LINES
190 PRINT #1:CHR$(27);CHR$(79);!TURN OFF SKIP PERFORATION
200 FOR R=1 TO 24
210 PRINT # 1:CHR$(13);CHR末(10);RPT$(" ",24);CHR$(27);CHR$(75);CHR$(0);CHR$(1);
220 FOR C=1 TO 32
230 CALL GCHAR(R,C,X) : : CALL HCHAR(R,C,42): : X=X-31 : : IF X(1 THEN X=1 :: GOTO 3
0
240 IF K(X,1)<>-1 THEN 300 ELSE CALL CHARPAT(X+31,A # )
250 IF A }\ddagger=B=\mathrm{ THEN X=1 :: GOTO 300
260 IF A$=C末 THEN X=0 :: GOTO 300
270 G=0 :: FOR A=15 TO 1 STEP -2 :: B(0,G)=POS(H#,SEG$(A A,A,1),1):: B( 1,G)=POS(H
$,SEG$(A$,A+1,1),1):: G=G+1 :: NEXT A
280 FOR D=0 TO 1 :: FOR E=3 TO 0 STEP - 1 : FOR F=0 TO 7 :: IF (B(D,F)AND 2^E)TH
EN H=H+2^F
290 NEXT F :1 Y=Y+1 :: K(X,Y)=H 1: H=0 :: NEXT E :: NEXT D :: Y=0
300 PRINT # 1:CHR$(K(X,1));CHR$(K(X,2));CHR$(K(X,3));CHR$(K(X,4));CHR&(K(X,5); CH
R末(K(X,6));CHR末(K(X,7));CHR末(K(X, 8));
310 NEXT C :: NEXT R :: PRINT #1:CHR$(10);CHR$(13):: CALL SOUND(1000,523,8):: CL
OSE #1
```

Lines 230 Tape／ 190 Disk：Turn off Skip Perforation
If you＇ve got a SKip Perforation comand，the printer skips one inch（ 6 lines）at the top of the page，then will print 54 lines，skip 12 more lines（ 6 at the bottom，and 6 at the top of the next page，etc．）leaving one－inch margin space at top and bottom of all pages．Using continuous or non－tractor feed paper，or for cases where print cannot be interrupted（like a screen dump，needing tightly connected text，as opposed to a listing，for instance），Genini／Epson and compatible printers use these lines，to shut off any automatically－set Skip Perforation comand．Another way of saying it could be［ PRINT IX：］CHRS（27）；＇ \(0^{\prime \prime}\) ；

Some other printers don＇t perform a Skip Perforation； in which case you could ！REH or ignore this line．You may want to experiment．SAVE the version that works for you．

P．S．Not shown here：Gemini／Epson SETS the Skip Over Perforation command by using CHRS（27）；CHRS（78）；CHR\＄（12）；

Lines 250 Tape／ 210 Disk：Finish one Line，Start Next
Normally the printer finishes one line，starts a next （Did you recognize CHR（13）as the（ENER）Call Key？），and then drops one line before printing．That＇s a Line Feed －CHRT（10）and Carriage Return－CHR\＄（13）．You won＇t need to fool with this unless you overprint or get blank lines．

The RPTs in the middle of the line is interesting．
Using this line as written produces a centered screen dump，in the middle of the page（ 24 blank characters，then

32 columns of screen，then another 24 blank \(=80\) printer columns．See the next two lines．）To start a screen dump at the extreme left of a page，OMIT the RPT\＄string pant．

Wny not do a Wide Dump，in which you can expanci your screen dump across the entire 80－column printes nese？！Do so by deleting the RPT\＄string and add 1 ：ae 205 （Tape），or 165 （Disk）to read：PRIN II：CHRS（14）；（tor the Gemini）， －Note！No CHRs（27）－or PRINT \＃1：CHRs（31）；（OKidata 92）， or PRINT \＃1：CHRS（27）；CHR（81）；CHR（1）；（for the Panasonic KX－P1091），etc．This is called Enlarged or Expanded type， if you＇re trying to find your manual reference．

The rest of the line tells the printer to send \(8 \times 32\) or 256 graphic characters．Unfortunately，other printers could get as exotic as CHR（ 83 ）；CHR（ 48 ）；CHR\＄（53）；（CHRs （54）；after the CHRS（27）；Escape cormand．ASCII values of 256 are，of course，50，53，and 54．If you get the idea， check your printer manual for the Decimal／Ascll command．

Jim Schwaller＇s 8 －page documentation for TAPE or DISK version helps！Virite to DUUG，PO Box 6240 Stanton Branch， Wilmington，DE 19804－9998，specify version，be polite！

Lines 310 Tape， 270 Disk：Invert Print Characters
C．ItohNEC ONEY：Use \(G=7\) and \(G=6-1\) instead of \(G=0\) and \(G=G+1\) as \(G\) values at the start and end of this line． Inverted C．Itoh／NEC characters are the reason they are not included as available printers for the more recent graphic software．This change resolves the screen dump inversion．
PAGE \(1 G\) - DELAWARE VALLEY USERS GROUP

There are several sources to which TI owners can turn for Tl software, aside from the presentation at their own User Group meetings, their software library, and downloads from the club BBS system, Here are some:

\section*{NEUSLETTERS (Thickest and most varied):}

Chicago TI-99/4A Users' Group, Inc., Membership Chr., P.0. Box 578341, Chicago, IL 68657-\$21/Yr, for 18 monthly issues, including huge Super Summer Issue, Lifetime access to BBS; Software Library privileges.

LA 99er Computer Group TOPICS, P.0. Box 67A79, Los Angeles, Ca 99067-1079 - \$20/Yr, for 12 issues and other member privileges. (See LA Library item on page 1 of this issue of THE DATA BUS.)

MICROpendium, P.0.Box 1343, Round Rock, TX 78680-\$28 for \(1 \hat{1}\) issues Second Class Mail. Best with current info! Letters: programs, articles, latest advertisements, etc.

\section*{COLLSTIG\&S WORTH KNOWING ABOUT:}

ANION HOTLINE, Dr. Guy-Stefan Romano, 116 Carl St.,
 through \(\mathrm{Sal}_{\mathrm{s} \text {. }}\) USCIFIC IIME or send a Self-Addressed Stamped Envelope for answers to just about anything related to the TI-99/4A. Wugtolibrary of public domain software available at nominal costs helping TI users since 1981.
 copy of any c: her many programs if you send \(\$ 3\), plus tape or disk, SASE and a mailer, specifying your preference. A preliminary SASE and \(\$ 1\) gets a printed catalog; add \(\$ 1.50\) for shipping/handling per order.
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    Check calendar for summer dates!

TIGERCIB Software, 156 Collingwood Ave., Columbus, OH 43213. Jim Peterson has marvelous educational and utility software programs. Send \(\$ 1\) for catalog; deductible from a subsequent order.

GENIAL TRAVelER's Diskazine, issued by Barry Traver, 835 Green Valley Drive, Philadelphia, PA 19128, irregularly but sold as a six-set disk subscription annually. Filled with programs, articles and enhanced utility routines. \$36

COMPUTE! 825 7th Ave., New York, NY 10819, (889) 3466767 or (212) 887-8525 has 18 books of software for the TI including one sold with disk programs. Most around \(\$ 14.95\) price; best reference - Regena's GUIDE TO THE TI/99-4A.

SAYS, 4398 W .62 nd St., Indianapolis, IN 46268 carries TI software book listings with tape backup, plus a series of more technical \(11-99 / 4 \mathrm{~A}\), printer, etc. reference works. Call (898) 428-SAMS.

\section*{FOR ECLECTIC READERS:}

COMPUTER SHOPPER, P.0. Box 1419, Titusville, FL 327819998 , (808) 327-9926, \(\$ 2.97\) on newsstands but cheaper with subscription, carries over 588 pages monthly including TI column of tooth general nous and Tl Forth, plus lIker Grown. and BES listings, every type of hardware and accessory ad imaginable (not just for the TI).

TENEX Computer Express (The Everything Book), P.0.Box 6578, South Bend, IN 46668 has toll-free Order line, plus Product Information, Technical Line, and Order Status Line to assist with other needs. Catalog includes software and virtually all peripheral needs - hardware, monitors, books and cables, printers, electrical switches, etc. As opposed to TRITON which carries predominantly (but not only) older
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