THE PROBLEM WITH PRINTERS   by Jim Peterson

When a program is written on one TI-99/4A console, it's a pretty sure bet that it will run on any other TI-99/4A console — unless the programmer has used some of the special features of the CorComp Disk Controller, Super Extended Basic, or whatever. But when a programmer writes a program to output to his own printer, it is by no means certain that it will work with your printer. As far as printer compatibility is concerned, it's a jungle out there. Anarchy, chaos and total confusion!

To begin with, if the printer has a parallel port it must be opened with "PIO", otherwise with "RS232" followed by the baud rate — or something else again for AXIOM. And you may have to add .LF to suppress line feeds or .CR to suppress carriage returns. Next, its output and its response to control codes is partly controlled by those idiotic, microscopic, inaccessible, fragile-looking inventions of the devil called dip switches. And finally, the output is mostly controlled by the printer control codes in the program itself.

Somewhere among the thousands of publications on computers, someone must have written a comprehensive guide to writing and modifying software for printer compatibility. If anyone knows of such, please tell me! I have read literally thousands of user group newsletters over the past several years, and have seen many mentions of "fixes" to various problems, but never a detailed article. I have called printer manufacturers, and they have been most helpful in suggesting that I buy one of their expensive manuals for each of their models. I have talked to programmers with much more experience in writing printer programs than I have, and they tell me it is very difficult, even with the manual at hand, to modify a program for a particular printer without having access to that printer for testing.

I have no experience in programming for any printer other than my trusty old Gemini 10X, and my few attempts to modify programs for other printers have mostly ended in failure. However, I have borrowed several manuals and attempted to chart the differences. I had hoped to compile and publish a complete conversion chart, until I realized the complexity of the problem. Anyway, perhaps I can pass on a few tips to programmers, to help them make their programs as widely compatible as possible, and possibly I can give users a little bit of guidance to help in modifying programs to suit their printer.

In the following, in order to be brief, I have mentioned control code sequences by their ASCII numbers, such as 27 66 1. This would be programmed as CHR$(27);CHR$(66);CHR$(1) or, since ASCII 66 is within the printable range, it might be CHR$(27)"B"CHR$(1). 27 77 n means that for n you substitute an ASCII, within an allowable range, according to what you want to accomplish.

There seem to have been four systems of printer control codes used with the printers commonly found in the TI world — Epson, Micronics, Axiom, and Okidata The Micronics people tell me that they "used the Micronics emulation until the introduction of the current NX series, when they switched to the IBM emulation". The IBM emulation appears to be the same as the Epson mode except that it has a different set of special character symbols — in fact, many current Epson-compatibles have an optional IBM mode.

The Micronics mode and the Epson mode are quite similar, although with aggravating differences. Okidata and Axiom are way out in left field. Since Micronics, Epson and Panasonic (which is basically Epson-compatible) seem to be by far the most popular in the TI community, and most software is written for them, it might be wise to avoid the Okidata. I have also seen mention of problems with Diablo and Centronics, but I have no information on those.

Any of the ASCII from 0 to 127 can be used as a printer control code. If the ASCII is above 31, it must be preceded by ASCII 27, known as the escape code, which is universally used to alert the printer that the following ASCII codes are to be interpreted as controls rather than printed as characters. If the printer recognizes an ASCII below 31, or one or more ASCII immediately following ASCII 27, as a valid control code, it acts upon them but does not print them. This is why, if you insert "control U" codes in a line of text, the text will be shifted left. However, if the codes are not recognized as valid, the ASCII below 32 or above 126 are printed as a blank space, the others are printed as the character they represent. This is why that puzzling E, G, S or whatever shows up on the first line of a printout, if a program is not compatible with your printer.

Some printer commands require a sequence of three or more ASCII codes, of which the first is 27, the second could be anything above 31 and the remainder could be anything at all. If your printer does not recognize the second ASCII as valid, but then comes to an ASCII below 31 which it does recognize, it acts on that ASCII as if it was a single command — which is why your printer sometimes "goes crazy".

The ASCII below 27 are quite standardized, and many of them have names, such as BEL for 7 (activates buzzer) which are also commonly used in telecommunications. ASCII 10 (line feed), 12 (advance to next top of form) and 13 (carriage return) seem to be universally recognized. For some reason, Panasonic owners seem to have trouble with line feeds when running programs written for other printers.

ASCII below 27 are not preceded by the escape code 27. Some printers will optionally recognize 14 (double width for one line) and 15 (cancel 14) preceded by 27, but programmers should avoid this since other printers will treat the 27 as a blank space. The NX-10 recognizes 27 10 as a command to reverse the paper one line and 27 12 to reverse to top of page.

The escape code 27 can be input from the TI-99/4A keyboard by depressing the CTRL key and the period key together — the actual ASCII is 155 but printers, other than the Axiom, will accept it as 27. This is handy when opening the printer in immediate mode or writing a routine for your own use, but should be avoided in programs being distributed because the character prints out as a blank space which will probably confuse anyone trying to modify the program.

I have studied the manuals, and attempted to chart some of the codes, for the Gemini 10X, SG-10 and Star NX-10; Epson FX-80, FX-85/185 and its IBM mode; Panasonic KX-P1080; MX Graftrax Plus; Brother M-1009; Seikosha 550A or 550TI by Axiom; and Okidata (model unknown). Due to differences in terminology, it is not easy to relate them to each other.

The IBM mode of the Epson FX-85 seems to be entirely compatible with its Epson mode except that it lacks some features. The FX-80 seems to be entirely compatible with the FX-85 except lacking NLQ and a few specialized codes (and

did not get into comparing graphics capabilities of any of these printers). The Brother M-1009 is also apparently highly compatible. The MX Graftrax Plus, another Epson model, is entirely compatible but lacks some features (no graphics capability?). The Panasonic KX-P1080 is very compatible but also has several unique codes of its own for setting tabs and spacing, etc. The Star NX-10 also seems to be in complete agreement with the FX-85, but with some additional codes for unique features such as reversed paper feed. I would guess that in actual practice these may not be as compatible as they seem. And of course, any maker's newer or more expensive models have additional codes for features not found on older or cheaper models.

The Seikosha 550A or 550TI, made by Axiom, recognizes a few of the common codes between ASCII 7 and 14, but from there on it has entirely its own system of codes; many of these same codes are used by Epson/Micronics for entirely different purposes, so running a program written for either on the opposite printer can be guaranteed to produce pure garbage. Okidata likewise recognize a few of the low codes and then goes into its own system, frequently in direct conflict with the Epson standard; due to the terminology used in its manual, I am not sure what some of them do.

The Gemini 10X, made by Star Micronics, has long been superseded by newer models, but stocks are still being sold by discounters. It has been a sturdy workhorse, long popular with TI owners, and a great many programs have been written using its printer control codes. These are 90% compatible with Epson - but that other 10% causes a great deal of trouble. The differences are described below. The Star SG-10/15 was a transitional hybrid, switchable by di switch 2-2 between the Micronics mode and the IBM mode. The Micronics mode is completely compatible with the Gemini 10X (except for download characters) and with some additional features - NLQ and proportional printing, and a slashed zero option. The IBM mode seems to be very compatible with the Epson standard. This printer was superseded by the Star NX-10, which is again Epson compatible

A major incompatibility between programs written for the Gemini 10X or SG-10 and Epson-compatible printers, is that Micronics recognizes 27 66 1 to select pica, 27 66 2 to select elite and 27 66 3 for compressed, and on the SG-10 als 27 66 4 to select NLQ and 27 66 5 to cancel it. On Epson/IBM printers, 27 66 i the beginning of a series of codes used to set vertical tabs. Actually, since pica is the default, there is no need to program for it except to cancel condensed print, for which purpose 18 is recognized by both Micronics and Epson. (Avoid using 27 80 to return to pica because Micronics does not understand it and might misinterpret it to change default tabs.) Similarly, 15 will select condensed print on both the Micronics and Epson .Unfortunately, there is no compatible code for elite; Epsons use 27 77 to select elite, but 2 77 n is used by the 10X, SG-10 to set the left margin n spaces, so that misinterpreting these codes can be catastrophic! The Epsons use 27 108 n to se the left margin, but this is not recognized by Micronics.

The other major difference is 27 51 n which sets the line feed to n/144" on th 10X and on the SG-10 in Star mode, but to n/216" on Epson compatibles and on the SG-10 in IBM mode. The "fix" here is to multiply the value of n by 1.5 whe running a Micronics program on an Epson printer. The same applies to 27 74 n which sets a one-time line feed of n/144" or n/216".

Micronics uses 27 82 n to set the margin at the top of the page, but Epson recognizes this as a command to switch to one of the international character

sets, which can produce some interesting results. The Epsons use 27 114 n to set the top margin, but Micronics doesn't know this one. Micronics uses 27 55 n to select an international character set, but the Epson will read 27 55 as a comand to cancel 27 54 which selected a special character set. I'm not sure what that means, but the results will surely be undesirable.

There may also be a conflict between the Micronics 27 98 n, which performs a one-time tab of n columns, and the Epson 27 998 n n 0, which "sets vertical tabs in channel", whatever that means.

Several codes, common to both Epson and Micronics, use 1 as the 3rd ASCII to turn on a feature and 0 to cancel it. For instance, 27 87 1 turns on double width (expanded) print and 27 87 0 cancels it. Also, subscript is selected by 27 83 1 and superscript by 27 83 0. Some of the Epson/IBM compatibles will accept either an ASCII or numeric 0 or 1 (i.e., "1" or CHR$(1)) for that third code, for which reason you will often see program coding such as CHR$(27);"W1". These should be avoided when programming for general distribution, because the older Micronics recognize only the ASCII. If I understand my notes from the manual correctly, the Panasonic KX-P1080 also accept ASCII 129 or 177 in lieu of ASCII 49 or "1" and ASCII 128 or 176 in lieu of 48 for "0" !

According to the manuals, ASCII 141 can be substituted for ASCII 13 on the Brother M-1009, and ASCII codes 128 to 255 can be substituted for 0 to 127, respectively, on the Epson - but there seems to be no good reason to confuse the other printers by using those!

Different printers also have different sets of symbols in ASCII 160-254. The Gemini 10X and SG-10 in Star mode has one set, the SG-10 in IBM mode has an entirely different set which I presume is also on the Epson in IBM mode, and I think that the Epson has still a different set. This causes problems when running some banner or graphing programs which access these characters. Different printers also vary in the number of international character sets available and the sequence of their access codes.

I have never gotten involved in graphics printing, and I failed to chart all the graphics codes when I had borrowed manuals available, so I cannot comment on compatibility here. I have not heard of any problems except that some Axiom models are apparently incapable of graphics, and there is also sometimes a problem with thin white horizontal lines through the picture - possibly because of the n/144" and n/216" difference in line spacing between Micronics and Epson?

With downloadable characters, we find another jungle which I'm not too anxious to explore. The Gemini 10X has a quite simple and efficient method, and I once published in Micropendium a DOWNCHAR program to design these characters on screen, dump them to the printer for editing, and save them to disk. I have also written a routine which will convert a sequence of any length of standard or reidentified screen characters into a D/V 80 file of download character printer codes.

But, here the SG-10 Star mode departs from compatibility with the 10X. Its system offers much greater capabilities but is also quite complex and entirely different. I tried, and failed, to convert my routine for use on the Epson FX-85; its system is somewhat similar to that of the SG-10 but again different. I am told that the Epson RX-80 does not support downloadable characters, the

LX-80 only allows 6 and some Panasonics only allow 40 of them. I have seen an article describing a method of creating downloadable NLQ characters but unfortunately the name of the printer being used was not mentioned.

This article is obviously incomplete and probably inaccurate. Perhaps it will inspire someone to write something better. In the meantime, programmers could help out a great deal by putting REMs in their programs giving the name of the printer they are writing for, and REMs after every printer control command indicating its purpose. I regret that I have not been in the habit of doing that!

The following are the M.U.N.C.H. financial statements for the year ending September 30, 1989.

ASSETS		LIABILITIES	
Cash in bank	841.08	NONE	
Computer System	350.00		
High Speed Copier	100.00		
Disk and tape library	250.00		
Miscellaneous	100.00		
TOTAL ASSETS	$1,641.08	TOTAL MEMBERS' EQUITY	$1,641.08

Income and expense for the year fiscal year ended September 30, 1989.

INCOME		EXPENSES	
Adventure sales	501.30	Postage	333.72
Dues	490.00	Newsletter supplies	315.92
Raffles	171.00	Hall rental	275.00
Disk sales	82.00	Disks purchased	182.80
Newsletter subscriptions	50.00	Cases for Adv. disks	141.75
Fayah proceeds	40.00	Fayah expense	30.00
P.O. Box rental	28.00		
Bank service charges	15.00		
TOTAL INCOME	$1,294.30	TOTAL EXPENSES	$1,322.19

Respectfully submitted James W. Cox, Treasurer.

TIPS FROM THE TIGERCUB

$50

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TIGERCUB SOFTWARE
156 Collingwood Ave.
Columbus, OH 43213

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```
###################################
#       NOW READY             #
# TIPS FROM TIGERCUB VOL.5 #
# Another 49 programs and #
# files from issues No. 42 #
# through 50. Also $10 ppd #
###################################
```

TIGERCUB CARE DISKS #1,#2,#3 and #4. Full disks of text files (printer required). No. 1 contains the Tips newsletters #42 thru #45, etc. Nos. 2 and 3 have articles mostly on Extended Basic

programming. No. 4 contains Tips newsletters Nos. 46-52. These were prepared for user group newsletter editors but are available to anyone else for $5 each postpaid.

This educational program is a much expanded version of a routine I published before.

```
100 DIM M$(100)
110 GOTO 150
120 S,K,A$(),J,M$(),Y$,Z$,Z,
X,ING$,A,AN$
130 CALL CLEAR :: CALL COLOR
 :: CALL SCREEN :: CALL CHAR
 :: CALL KEY :: CALL ING ::
CALL HCHAR
140 !@P-
150 CALL CLEAR :: FOR S=0 TO
 12 :: CALL COLOR(8,2,8):: N
EXT S :: CALL SCREEN(5):: DI
SPLAY AT(3,1):"LEARNING TO "
"ING" IT V.1.1"
160 CALL CHAR(64,"3C4299A1A1
99423C"):: DISPLAY AT(15,1):"
@ Tigercub Software 1987 for
free distribution - no price
or copying fee to be charged
"
170 CALL KEY(3,K,S)
180 A$(1)="No, if the word d
oes not end in B, D, G, M, N
, P, R or T you always just
add ING"
190 A$(2)="No,if the last le
tter is not E and the next-t
o-last    letter is not a v
owel, just add ING"
200 A$(3)="No, if the word h
as two    vowels just befor
e the last letter, just add
ING"
210 A$(4)="No, if a word end
s in B, D, G, M, N, P, R or
T with one vowel (but not tw
o vowels!) just before it, y
ou must    double the last
letter and add ING"
220 A$(5)="No, if the word e
nds in IE, change the IE to
Y and add  ING"
230 A$(6)="No, BE is an exce
ption to   the rules,"
240 A$(7)="Some dictionaries
 give EYING but EYEING is be
tter"
250 A$(8)="No, if a word end
s in E (ex-cept BE and words
```

ending in IE,DE,UE AND YE) you must drop the E and add ING"

```
260 A$(9)="No, if the word e
nds in EE, or DE or UE, just
 add ING"
270 A$(10)="No, QUIP, QUIT a
nd QUIZ are exceptions to th
e rule.    Double the last
letter and  add ING."
280 FOR J=1 TO 100 :: READ M
$(J):: NEXT J
290 FOR J=1 TO 100 :: Y$=Y$&
CHR$(J):: NEXT J :: Z$=Y$
300 DISPLAY AT(3,1):"":"":"
:" Type the word with the
correct ING suffix"
310 RANDOMIZE :: Z=INT(RND*L
EN(Z$)+1):: X=ASC(SEG$(Z$,Z,
1)):: Z$=SEG$(Z$,1,Z-1)&SEG$
(Z$,Z+1,255):: IF LEN(Z$)=0
THEN Z$=Y$
320 CALL ING(M$(X),ING$,A)
330 DISPLAY AT(12,1):M$(X)::
 ACCEPT AT(12,15):AN$
340 CALL HCHAR(15,1,32,280):
: DISPLAY AT(10,1):"" :: IF
AN$=ING$ THEN DISPLAY AT(10,
10):"CORRECT!" :: GOTO 310
350 DISPLAY AT(15,1):A$(A):"
":"The word is ";ING$ :: GOT
O 310
360 !@P+
370 DATA LODGE,BUY,HOPE,QUIP
,TITHE,WISH,CUT,DRIVE,SEE,EY
E,GO,CRY,TRY,AGREE,QUIT
380 !@P-
390 DATA BOIL,COOL,HURT,BUTT
,CAGE,BE,ROVE,PITY,SAVE,COOL
,RULE,MEASURE,TUNE,RAVE
400 DATA RUN,BEG,STOP,THINK,
ERR,BORE,TEAR,BAR,CARE,BARE,
BEAR,LET,QUIZ,HOOT,HEAT,COME
410 DATA DREAM,TAKE,FRY,CADD
Y,FLEE,HOE,SEW,TRIP,HOPE,RIG
,DRAG,SUE,KNEE,BOO,BABY,NURS
E,CRUISE
420 DATA LIE,TIE,DIE,BELIE,V
IE,DODGE,LIVE,DRIVE,LOVE,LEA
VE,HUM,HOP,BEG,BEGIN,BOMB,BO
B
430 DATA ADD,AID,BAT,BOAT,PR
AY,LAY,QUOTE,SNORE,STARE,HIR
E,FIRE,LINE,CRY,SAY
440 DATA BOOGIE,RAGE,RATTLE,
GRATE,LEAVE,STRIVE,DRAW,WRIT
E
450 !@P+
460 SUB ING(M$,ING$,A):: E$=
SEG$(M$,LEN(M$),1):: F$=SEG$
```

```
(M$,LEN(M$)-1,1):: A$="ING"
 :: C$="BDEGHMPRT" :: V$="AEI
OU"
470 GOTO 500
480 C$,E$,ING$,M$,A$,A,V$,F$
490 !@P-
500 IF LEN(M$)=4 AND SEG$(M$
,1,3)="QUI" THEN ING$=M$&E$&
A$ :: A=10 :: SUBEXIT
510 IF POS(C$,E$,1)=0 THEN I
NG$=M$&A$ :: A=1 :: SUBEXIT
520 IF E$="E" THEN 550
530 IF POS(V$,F$,1)=0 THEN I
NG$=M$&A$ :: A=2 :: SUBEXIT
540 IF POS(V$,SEG$(M$,LEN(M$
)-2,1),1)<>0 THEN ING$=M$&A$
 :: A=3 :: SUBEXIT ELSE ING$
=M$&E$&A$ :: A=4 :: SUBEXIT
550 IF F$="I" THEN ING$=SEG$
(M$,1,LEN(M$)-2)&"YING" :: A
=5 :: SUBEXIT ELSE IF F$="E"
 OR F$="O" OR F$="U" THEN IN
G$=M$&A$ :: A=9 :: SUBEXIT
560 IF M$="BE" THEN ING$="BE
ING" :: A=6 :: SUBEXIT
570 IF M$="EYE" THEN ING$="E
YEING" :: A=7 :: SUBEXIT
580 ING$=SEG$(M$,1,LEN(M$)-1
)&A$ :: A=8
590 !@P+
600 SUBEND
```

I still have a sort of an old-fashioned idea that the computer can be a useful educational tool -

```
100 CALL CLEAR :: FOR SET=0
TO 12 :: CALL COLOR(SET,2,8)
 :: NEXT SET :: CALL SCREEN(5
):: DISPLAY AT(3,6):"NOUN TO
 ADJECTIVE" :: CALL KEY(3,K,
8)
110 CALL CHAR(64,"3C4299A1A1
99423C"):: DISPLAY AT(5,5):"
@ Tigercub Software":"":" Fo
r free distribution - no pr
ice or copying fee to be ch
arged."
120 DISPLAY AT(12,1):" One m
oment...loading memory"
130 DATA ROGUE,ROGUISH,HOG,H
OGGISH,PIG,PIGGISH,SWINE,SWI
NISH,THIEF,THIEVISH,KNAVE,KN
AVISH,BRUTE,BRUTISH or BRUTA
L
140 !@P-
150 DATA FAME,FAMOUS,TUMULT,
TUMULTUOUS,RIOT,RIOTOUS,SCAN
DAL,SCANDALOUS,MOUNTAIN,MOUN
```

```
TAINOUS,ODOR,ODOROUS or ODOR
IFEROUS
160 DATA CAVERN,CAVERNOUS,VI
LLAIN,VILLAINOUS,DANGER,DANG
EROUS,PERIL,PERILOUS,ADVANTA
GE,ADVANTAGEOUS
170 DATA BARB,BARBED,FORK,FO
RKED,BORDER,BORDERED,WHEEL,W
HEELED,HUNGER,HUNGRY,ANGER,A
NGRY
180 DATA PARLIAMENT,PARLIAME
NTARY,PLANET,PLANETARY,LEGIS
LATURE,LEGISLATIVE,PARISH,PA
ROCHIAL
190 DATA CONGRESS,CONGRESSIO
NAL,ELEPHANT,ELEPHANTINE,FAN
TASY,FANTASTIC,BULL,BULLISH
200 DATA GIRL,GIRLISH,BOY,BO
YISH,BABY,BABYISH,AMATEUR,AM
ATEURISH,FEVER,FEVERISH,DEVI
L,DEVILISH,FOOL,FOOLISH
210 DATA OAF,OAFISH,SHEEP,SH
EEPISH,CHILD,CHILDISH or CHI
LDLIKE,VIRTUE,VIRTUOUS,PRIDE
,PROUD or PRIDEFUL
220 DATA HATE,HATEFUL,DOUBT,
DOUBTFUL,THOUGHT,THOUGHTFUL,
SHAME,SHAMEFUL,FEAR,FEARFUL,
SORROW,SORROWFUL
230 DATA WISH,WISHFUL,PEACE,
PEACEFUL,EVENT,EVENTFUL,TRUT
H,TRUTHFUL,SKILL,SKILLFUL,MA
N,MANLY
240 DATA WOMAN,WOMANLY,FATHE
R,FATHERLY,MOTHER,MOTHERLY,B
ROTHER,BROTHERLY,SISTER,SIST
ERLY
250 DATA NIGHT,NIGHTLY,HOUR,
HOURLY,MONTH,MONTHLY,ORDER,O
RDERLY,SERIES,SERIAL
260 DATA TIME,TIMELY,GRAVEL,
GRAVELLY,FRIEND,FRIENDLY,WOO
L,WOOLLY,YEAR,YEARLY,SOUTH,S
OUTHERN or SOUTHERLY
270 DATA NORTH,NORTHERN or N
ORTHERLY,WEST,WESTERN or WES
TERLY,EAST,EASTERN or EASTER
LY
280 DATA CHARITY,CHARITABLE,
TERROR,TERRIFIED or TERRIBLE
,HORROR,HORRIFIED or HORRIBL
E or HORRIFIC
290 DATA RAG,RAGGED,MILITARY
,MILITARISTIC,ART,ARTISTIC,C
AT,CATTY,DOG,DOGGY,FOG,FOGGY
,SUN,SUNNY
300 DATA BAG,BAGGY,LEG,LEGGY
,BOG,BOGGY,STUB,STUBBY,FUN,F
UNNY,FUR,FURRY,GUM,GUMMY,AVA
RICE,AVARICIOUS
```

```
310 DATA CLOUD,CLOUDY,RAIN,R
AINY,FLOWER,FLOWERY or FLORA
L,GREED,GREEDY,THIRST,THIRST
Y,AIR,AIRY,BUSH,BUSHY,FISH,F
ISHY
320 DATA SOUP,SOUPY,BLOOD,BL
OODY,FOAM,FOAMY,BEAD,BEADY,S
WAMP,SWAMPY,SILVER,SILVERY,C
OPPER,COPPERY,DUST,DUSTY
330 DATA DIRT,DIRTY,GUILT,GU
ILTY,SALT,SALTY,GRAIN,GRAINY
,OIL,OILY,TRICK,TRICKY,HILL,
HILLY,ROCK,ROCKY
340 DATA SAND,SANDY,SOAP,SOA
PY,SUDS,SUDSY,SILK,SILKY,WOO
D,WOODY,MODESTY,MODEST,PIETY
,PIOUS,DAY,DAILY
350 DATA TREE,TREELIKE,TOY,T
OYLIKE,FINGER,FINGERLIKE,SWA
N,SWANLIKE,WAR,WARLIKE,DISH,
DISHLIKE,PLATE,PLATELIKE
360 DATA SPOON,SPOONLIKE,BIR
D,BIRDLIKE,SNAKE,SNAKY,WIRE,
WIRY,BONE,BONY,SMOKE,SMOKY,F
LAKE,FLAKY
370 DATA NOISE,NOISY,BRINE,B
RINY,TASTE,TASTY,STONE,STONY
,WAVE,WAVY,GORE,GORY,PASTE,P
ASTY,BUBBLE,BUBBLY
380 DATA LABOR,LABORIOUS,ORN
AMENT,ORNAMENTAL,GOVERNMENT,
GOVERNMENTAL,CONTINENT,CONTI
NENTAL,MUSIC,MUSICAL
390 DATA MAGIC,MAGICAL,TOPIC
,TOPICAL,SENSATION,SENSATION
AL,LOGIC,LOGICAL,ALARM,ALARM
ING,ARTERY,ARTERIAL
400 DATA GOLD,GOLDEN,EARTH,E
ARTHEN,GLAMOUR,GLAMOURIZED,D
EPUTY,DEPUTIZED,ENERGY,ENERG
IZED,PART,PARTIAL,FIRE,FIERY
410 DATA ANGEL,ANGELIC,CHERU
B,CHERUBIC,BURDEN,BURDENSOME
,TROUBLE,TROUBLESOME,BEAST,B
ESTIAL
420 DATA HISTORY,HISTORICAL,
GEOGRAPHY,GEOGRAPHICAL,BOTAN
Y,BOTANICAL,BIOLOGY,BIOLOGIC
AL,LITURGY,LITURGICAL
430 !@P+
440 DIM A$(175),B$(175):: FO
R J=1 TO 174 :: READ A$(J),B
$(J):: Z$=Z$&CHR$(J):: NEXT
J :: Y$=Z$ :: RANDOMIZE
450 DISPLAY AT(7,1):"":"Type
 the adjective form of -":""
460 X=INT(RND*LEN(Y$)+1):: Y
=ASC(SEG$(Y$,X,1)):: Y$=SEG$
(Y$,1,X-1)&SEG$(Y$,X+1,255):
: IF LEN(Y$)=0 THEN Y$=Z$
```

```
470 DISPLAY AT(12,1):A$(Y)::
 ACCEPT AT(12,14):B$ :: IF P
OS(B$(Y),B$,1)=0 THEN 490
480 DISPLAY AT(18,1):"":"" :
: FOR D=1 TO 100 :: NEXT D :
: DISPLAY AT(18,1):" That is
 the word in my   memory b
anks.":"" :: GOTO 460
490 DISPLAY AT(18,1):" The a
djective in my memory banks
is ";B$(Y):: GOTO 460
```

When one program is run from from another by RUN DSK.., the screen is not cleared, sprites are not deleted, and screen color, character def- initions and sprite magnifi- cation are not returned to the default values. This can cause some strange results, which can be prevented by CALLing CLEARALL just before the RUN.

```
1000 SUB CLEARALL :: CALL CL
EAR :: CALL DELSPRITE(ALL)::
 CALL SCREEN(8):: CALL CHARS
ET :: CALL MAGNIFY(1)
1001 FOR CH=65 TO 90 :: CALL
 CHARPAT(CH,CH$):: CALL CHAR
(CH+32,"00"&SEG$(CH$,1,12)&S
EG$(CH$,15,2)):: NEXT CH
1002 CALL CHAR(96,"000201008
",123,"0018202040202018",124
,"0010101000101010003008080
0808300000205408")
1003 FOR CH=127 TO 143 :: CA
LL CHAR(CH,"0"):: NEXT CH ::
 SUBEND
```

The routine in line 1001 can be used, by deleting the +32 if necessary, to modify some of the character sets on my Nuts & Bolts disks.

From an idea in a program by Ed Machonis, here is an improvement to my 28-Column Converter published in Tips #18. After line 160, insert 165 DISPLAY AT(20,1):"Tab se tting? !" :: ACCEPT AT(20,14)SIZE(-2)BEEP:T
And change line 290 to -
290 PRINT #2:TAB(T);L$ :: S= S+28 :: GOTO 410

MEMORY FULL! - Jim P.

Those of you who have ever looked at the P-BOX buss realize that there are actually nineteen address bits available. This was implemented for a future product which was not officially released; namely the 99/8 which had a built in memory mapper for the 512K of address space. When used with a 99/4 or 99/4A, the address space is only 64K bytes or sixteen bits of address. The remaining three bits are pulled high on the P-BOX interface board.

Any P-Box board that meets Texas Instruments' specifications will use the three address bits labeled AMA, AMB, and AMC in it's address decode. At this point, it becomes obvious that if these bits were mapped to a CRU port, all T.I. boards would be turned off by changing any or all of these bits. This would give eight times the available address space.

There are some exceptions to this, as the console itself does not use these bits in it': internal decode. Therefore, certain blocks of address space will map into all eight banks of address space.

ADDRESS MAP OF THE 99/4A

0000 Internal and maps in all eight spaces.
2000
4000 Any non-standard boards, such as the Horizon Ramdisk, maps in all eight spaces. Includes the one Meg. Board.
6000 Internal and maps in all eight spaces if a module is present that has RAM or ROM in it, not just GROM.
8000 Internal and maps in all eight spaces.
A000
C000
E000

This leaves the normal 32K expansion space that can be used by the mapper at all times. This will give 262,144 bytes of memory space available to the progr- ramer with a module or nonstand- ard board present. However, if neither of these conditions is true, the space increases to 385,024 bytes. This could be built into a special RAM card or into multiple RAM cards.

Initially, I will start with the interface board modification. There are only three integrated circuits necessary to add our three address lines. They are a 74LS688, 74LS259, and a 74LS240. The '688 is an eight bit address comparator which decodes the eight MSBs of the address buss and CRUCLK* to select the CRU address that your mapper will respond to. The '259 is an ad- dressable latch to store one byte of the data from CRU. This will be AMA, AMB, AMC and five spare bits for future use. The '240 is an inverting bus driver to invert the input and outputs of the '259 insuring that on reset the three address lines are set to all ones as required by all T.I. boards in the P-Box.
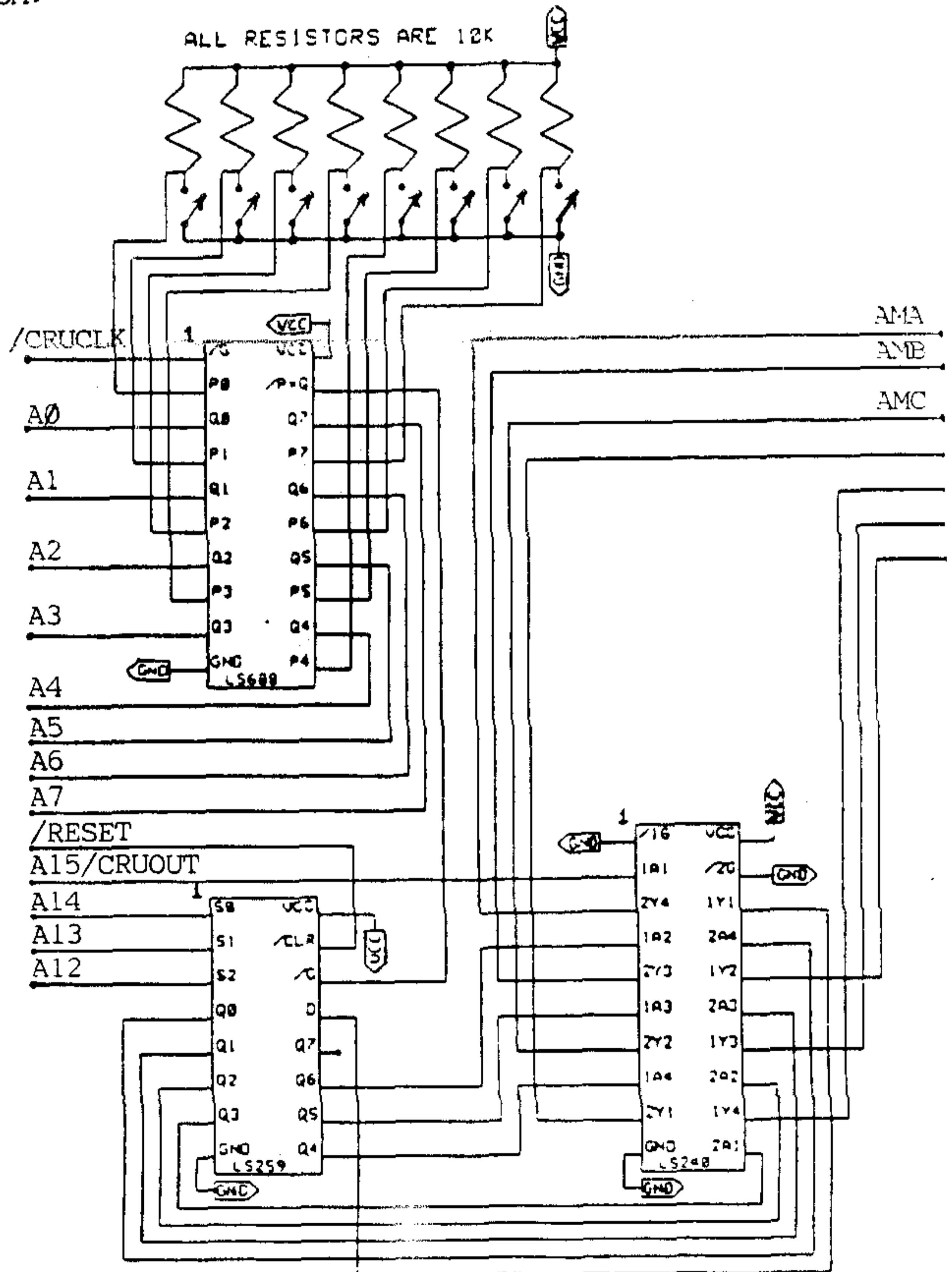
MORE NEXT MONTH.................

OCTOBER   10, 1989 HAPPY HALLOWEEN !!!

MUNCH OFFICERS AND NUMBERS (all in 508 area unless noted)

President	W.C. Wyman	839-4134
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Disk Librarian	Lou Holmes	617 965/3584
Tape Librarian	Walter Nowak	413 436/7675
+++++++	Jack Sughrue	476/7630

SEPTEMBER MEETING. President Corson Wyman called the meeting to order with 14
members present. Corson announced that the club has been given aa Super Sketch
and this is now available in the library. Aafter the usual announcements Corson
demonstrated how to formaat aa hard disk. Brian O'Brian demonstrated an Aauto
Spell Check Program aand Corson ended,the meeting with a quick Super Sketch
demo.

OCTOBER MEETING. Jack expects to be back this month and he plans to demo the
MUG loader load program. Corson and Lou will also have something to interest.
If possible, Lou will bring the disk library to the meeting.

RAFFLE. Each month we have a raffle and the dollar donation per ticket helps to
cover the monthly fee to rent the hall. This month's raffle will have a box of
ten disks and a game. The number of prizes depends on the
number of tickets sold.

MONTHLY SALES. At each meeting you have the opportunity to buy and/or sell new
or used hardware, software, books and original programs. Please have prices
marked on any items you have to sell.

LIBRARY NOTICE. Please return any items borrowed from our library. If you can
not come to a meeting or give these items to someone who will be at the meting,
please mail any library items to the group address which is listed on the cover
of this newsletter. There are no late fees, we don't care how long they have
been out, please return these items.

REPRINTS. Reprints of any items in this newsletter is permitted as long as
credit is given to M.U.N.C.H.

ARTICLES. I am always looking for articles for this newsletter, anything which
interests you will probably interest other members of the TI community, so
please share your ideas and opinions with all of us.

NEWSLETTER EXCHANGE EDITORS. Please note our corrected address on the front
cove of this issue.

THANK YOU. We wish to thank Alan Cox of Tarrent, Ala. for the donation of the
Super Sketch which is now a part of our library.

MUNCH OCT. '89

Mass Users of the Ninety-nine and Computer Hobbyists

OCTOBER 1989 Monthly Newsletter Version 8.10

JOIN THE CROWD AT OUR OCTOBER 10 MEETING

M.U.N.C.H.
560 LINCOLN ST.
P.O. BOX 7193
WORCESTER, MA. 01605-7193

!CORRETED ADDRESS!

Next Meeting OCTOBER   10th.

- U MASS MED. CTR. (OLD PLACE)
- MR. TUX
- ←WEST   RT. 9   EAST→
- SUNDERLAND RD. COMMUNITY HOUSE
- LIQUOR STORE
- RT. 122
- G R A F
- SUNDERLAND RD.
- RT. 20 EAST
- POLLY'S RESTAURANT LOUNGE
- LAKE AVE
- LIQUOR STORE
- THIS IS IT
- P=PARKING
- Ⓟ=NO PARKING