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The views expressed in this magazine are those of the individual authors, and not necessarily those of the editor or the group.

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The Nottingham Tref

by

Francesco L. Lama

Dear Richard,

You had asked me to write something about the tref, and I have finally managed to put fingers to keyboard (pen to paper?!?). I hope this is the sort of thing you intended, and that I am not too late for the Autumn issue. See you on the 26th.

Francesco.

TI TREF 1998, NOTTINGHAM, ENGLAND. (by Francesco Lama)

At the beginning of the Summer I thought I would start writing a short piece about what a great opportunity for the TI community this Autumn's "tref" in Nottingham is going to be. Unfortunately, as often happens, procrastination had the better of me, and I am reduced to writing something up quickly to try and meet the deadline for the Autumn issue of TI*MES.

First of all why should we give it such an unusual name? For those who do not already know "tref" (or in its alternative Dutch spelling "tref") is simply German (Dutch) for "meeting". So why should we use a foreign word to describe something which is taking place in England? I have heard it said, especially by our User Group members who attended last October's event in Utrecht, that it seemed to be quite a catchy word which may draw a few more people to Nottingham this 9th-11th October week-end. I, however, believe there is a more significant reason behind this choice, which was clearly reflected in the Jim Peterson awards given earlier this year, and this is the fact that the centre for hardware development for our good old TI99 system has definitely shifted to continental Europe, mostly Germany. A lot of this good work has been originated by Michael Becker who lives in Mannheim, Germany (not far from

Frankfurt am Mein). This guy, together with a small team of associates, has produced such impeccable cards as the EVPC 80 column card (capable of Hi Fi image reproduction thanks to its over 2 million colour palette), the High Speed GPL card (containing up to 16 banks of flash programmable GROM-ROMs + 2 transient GRAM-RAM banks, and capable of emulating virtually every module ever made, and with excellent menu driven software to match), the Second Generation CPU card (replacing your old TI console with a card that fits in your Peripheral Expansion Box, can address up to 1 MB of RAM for assembly programmes with 16 bit bus access -- dramatically increasing the speed -- , has on-board Extended Basic which works with the 16 bit bus and is therefore faster, can be used with a PC style keyboard like the GENEVE or with the old faithful console keyboard, and is 100% compatible with TI99/4A software), a DSDD disk controller card inspired to the original TI design -- only a very small number of them was ever produced by TI -- and with the same specs or better, and a SCSI card which really works reliably and has appropriate software to enable one to take advantage of subdirectories, multiple file copying, PDMA access etc.. Many other projects are under way at the moment, but I am sure the developers will be able to give more precise and detailed information personally at the treff.

But there is another, perhaps more important, reason for turning up. The TI community is, by now, a widely scattered one, and getting to know people personally is becoming almost essential, if one intends to continue to use the computer. If anything goes wrong, there is no dealer we can contact to have our problems sorted out (not that most dealers do an awful lot of sorting out anyway, even for PCs), and, unless we maintain an efficient network of acquaintances, we would not know how to go about obtaining the relevant help.

I have often heard people comment that much of the modern hardware which has been produced for the TI99/4A is inordinately expensive, or perhaps not the sort of thing the average T1er would require. Here again the treff represents an ideal opportunity for these people to talk to the developers, and inform them of what it is they would require. There is no point in grumbling, if the problems are never addressed constructively.

Let me therefore close by inviting everyone who is still interested in continuing to make full use of the TI99/4A to Nottingham for this particular week-end in October. Come for the

full Friday night to Sunday evening event, or just on the Saturday or the Sunday, but PLEASE DO TURN UP.

Pocket Cannon, a little sound demo by Ted Stringfellow.

```
180 CALL CLEAR
190 DIM A(7)
200 DATA 0,0,262,196,220,165,175,131,175,196
210 READ B,C,A(0),A(1),A(2),A(3),A(4),A(5),A(6),A(7)
220 DEF D(E)=INT(E)-8*INT(E/8)
230 CALL SOUND(500,A(D(B/4)),3,1.5*A(D(B/
2)),30+29*(C>31),2*A(D(B)),30+30*(C>63))
240 B=B+1+32*(B>31)
250 C=C+1
```

More from Francesco L. Lama, and exponential functions in C99

Dear Richard,

This article is one of my contributions for the Autumn issue of TI*MES. Don't worry, I have not forgotten that you would like me to write something to encourage people to come to Nottingham next October. I will do that next.

About the Summer issue: the size was certainly more manageable for Ross if a little on the thin side perhaps. I am surprised that, after what was said at the AGM, you did not receive more contributions!

Just a comment about how my own article turned out. I think you probably reformatted it to fit more characters into a page using condensed print. That worked fine for the text, but the indices and exponents in the formulae were all shifted to the wrong place, and a large number of programme lines have been wrapped around with comments making the programme very difficult to read unless one is very familiar with C. I don't know how you can stop a PC doing this but perhaps the only easy way is to avoid reformatting next time?

You are welcome to come and see us in Oxford any time after the middle of September, preferably at the week-end so I can be at home during the day. See you soon. I'll be in touch about my next contributions.

Good Luck with everything.

Francesco.

THE EXPONENTIAL FUNCTION IN C99

In the Summer 98 issue of TI*MES I have described how the Natural Logarithm function can be implemented in C99, and how such logarithms can be used to calculate logarithms of real powers of positive real numbers (e.g. $\text{LN}(1.25^{6.453})=6.453*\text{LN}(1.25)=6.453*0.2231435513=1.439945337$, where BASIC notation has been adopted). The result we are interested in is, however, the number itself, and not its logarithm. In order to obtain this number, the Exponential function must also be used. It is in fact true that:

$$1.25^{6.453} = \text{EXP}(\text{LN}(1.25^{6.453})) = \text{EXP}(1.439945337) = 4.220465$$

Just as in the case of the Natural Logarithm, the

Exponential, EXP(X), is split into two parts by setting the integer part of the argument, X, equal to XI, and the decimal part equal to XD. One can therefore write

EXP(X)=EXP(XI+XD)=EXP(XI)*EXP(XD), and evaluate EXP(XI) and EXP(XD) separately. This is useful, because XI is now an integer (positive, negative, or zero); therefore:

$$\begin{aligned} \text{EXP}(XI) &= \begin{cases} 1/(e * e * e * e * \dots * e) \text{ (XI times)} & \text{if } XI < 0 \\ \dots 1 \dots\dots\dots & \text{if } XI = 0 \\ e * e * e * e * \dots * e \text{ (XI times)} & \text{if } XI > 0 \end{cases} \end{aligned}$$

all of which can easily be calculated by invoking:

$$\begin{aligned} &\text{pow}(1/e, XI, \text{res}) \text{ if } XI < 0 \quad \text{and} \\ &\text{pow}(e, XI, \text{res}) \text{ if } XI \geq 0 \quad , \end{aligned}$$

where pow(base,m,res) is the integer power function described in the Summer 98 issue.

There remains to evaluate EXP(XD), where 0<XD<=1. As was done

for the Natural Logarithm function, a Taylor (polynomial) expansion can be used to approximate EXP(XD) in that limited range, by appropriately choosing a series of tabulated values of the function, and calculating the expansion from the nearest of these to the value of the argument. The table of values used is given below.

X0	EXP(X0)
0.0	1.0
0.2	1.221402758
0.4	1.491824698
0.6	1.822118800
0.8	2.225540928
1.0	2.718281828

Similarly to the case of the Logarithm, it was found that it is enough to evaluate the Taylor expansion to 6th order (seven terms) in order to have the value of the Exponential to the maximum precision available, provided the appropriate choice is made for X_0

(the starting point of the expansion) from the above table. $EXP(XD)$ can then be given by:

$$EXP(XD) \sim EXP(X_0) * \sum_{n=0}^6 [(XD-X_0) / n!] =$$

$$EXP(XD) * [1 + (XD-X_0) + (XD-X_0)^2 / 2! + \dots + (XD-X_0)^6 / 6!].$$

The program starts by defining two floating point variables, x and ex , which are used to pass values between the calling programme and the Exponential Function $exp(x,ex)$. Subsequently

four

integers are declared ($i, i1, f$, and j), two characters (the pointer c , and the 16 element array $s[16]$), and eight floating point variables ($xi, x0, r, e, r1, t, c0$, and $c5$). The next section of programme sets $c5$ equal to e (2.718281828.etc...) through the array s , by means of the floating point variable function $stof(s,c5)$, which is used to give the fp variable $c5$ the numerical value contained in the string s .

In the next two lines first the fp variable xi is given the value of the integer part of x (remember $INT(-2.3)=-3$) by means of the fp library function $fint(x,xi)$, then xi is subtracted from x and the result is placed in x (xi and x are now equivalent to the XI and XD respectively used in the equations given above).

The next four lines simply set the fp variables ex, e , and $c0$ equal to 1 ($c0$ is set =1 because it may not be set by either of the if statements that follow i.e. if $xi=0$).

The four following lines set $r1=1/e$, the integer $f=xi$ (in value), and finally change the sign of f if $f<0$ (effectively making f equal to the absolute value of xi).

The calculation of the integer part of the power of $1/e$ or e is made quicker by the next two lines, which set j equal to the integer part of $f/3$ ($INT(ABS(xi)/3)$), and give f the new value $f-3*j$, thereby increasing the speed of powers computed by the `pow()` subroutine when $f>6$. Subsequently r and i are set equal to 0 and 3 respectively, and if $xi<0$ $c0$ and ex are set equal to $((1/e)^3)^j$ and $(1/e)^f$ respectively, if $xi>=1$ $c0$ and ex is set equal to $(e^3)^j$ and e^f respectively (if xi should be 0, $c0$ and ex would remain equal to 1). The final line in this section of the programme multiplies ex by $c0$ and stores the result in ex , thereby setting it equal to e^{xi} .

The next 9 lines of programme are used to calculate the argument of the switch statement, $i1 (=INT(5x+0.5))$. This ensures that $i1=0$ if $0<=x<0.1$, $i1=1$ if $0.1<=x<0.3$ etc..., thereby selecting the right subroutine to call by the switch statement. These subroutines simply load the correct constant from the table into the `fp` variable $c0$. The default is $c0=c5$ (i.e. $=e$).

The subsequent three lines calculate the point from which the Taylor Expansion is carried out as $x0=i1*0.2$, and the next four evaluate the first two terms of the expansion setting $e=1+(x-x0)$.

The remaining five terms are computed within the two nested while loops, the inner one of which is used to produce the value of $i!$ ($=i*(i-1)*(i-2)* \dots *2$), and the outer one to compute each additional term of the expansion $((x-x0)^i/i!)$, which can be verified by remembering that $r=x-x0$, $f=i!$, and $r1$ is the `fp` equivalent of the integer f . At the end of the loop the index, i , is incremented, and the process repeated as long as $i<7$.

The first of the next two lines multiplies the completed expansion, e , by $c0$, so obtaining $EXP(x)$, and the second multiplies this result by $ex (=EXP(xi))$ and stores the completed calculation in ex . ex is then returned to the calling programme by the return statement.

The next five subroutines, which, as we have already said, are called by the switch statement, only load the appropriate constants contained in the table into the variable c0 via the character array s and the fp function stof(s,c0), which we have already mentioned.

The pow(base,m,res) subroutine which concludes the listing was already explained in the Summer 98 issue of TI*MES.

A listing of exp(x,ex) follows.

/* This program calculates EXP(X) to the maximum precision available

```
exp(x,ex)      /* x is the argument of the exponential function */
float x[8],ex[8]; /* ex returns the value of exp to the calling funct. */
{
  int i,i1,f,j;
  char *c,s[16];
  float xi[8],x0[8],r[8],e[8],r1[8],t[8];
  float c0[8],c5[8];

  s[0]='+';
  s[1]='2';
  s[2]='.';
  s[3]='7';
  s[4]='1';
  s[5]='8';
  s[6]='2';
  s[7]='8';
  s[8]='1';
  s[9]='8';
  s[10]='2';
  s[11]='8';
  s[12]="";
  s[13]="";
  s[14]="";
```

```

s[15]="";
c=stof(s,c5);

c=fint(x,xi);
c=fexp(x,"-",xi,x); /* xi is subtracted from x the result put in x */

i=1;
c=itof(i,ex); /* ex is set equal to 1 */
c=itof(i,e); /* e is set = 1 */
c=itof(i,c0); /* set c0=1 in case it is not set by either if statement */

c=fexp(e,"/",c5,r1); /* r1 = (1 divided by c5) */
f=ftoi(xi); /* f=int(xi) */
if(f<0)
  f=-f; /* positive exponent for pow() is ensured */

j=f/3; /* this speeds up the calculation for the */
f=f-3*j; /* larger values of xi (xi>6) */

i=0;
c=itof(i,r); /* r is set equal to 0 */
i=3; /* to define first call to pow() in both ifs */
if(fcom(xi,"<",r))
{
  pow(r1,i,t); /* calculate 1overc5 cubed and store it in t */
  pow(t,j,c0); /* c0 = t^j */
  pow(r1,f,ex); /* ex = r1^f where f is the residual exponent */
}
if(fcom(xi,">=",e)) /* e is equal to 1 already */
{
  /* if xi>=1 call pow(c5,f,ex) */
  pow(c5,i,t); /* identical to previous if but with c5 in */
  pow(t,j,c0); /* place of 1overc5 */
  pow(c5,f,ex);
}
c=fexp(ex,"*",c0,ex); /* final result for integer part of exponent */

```

```

i=5;
c=itof(i,r);
c=fexp(x,"*",r,r1); /* calculate 5x and put the result in r1 */
il=10;
c=itof(il,e);
c=fexp(r,"/",e,x0); /* calculate 5over10 and put result in x0 */
c=fexp(r1,"+",x0,r); /* calculate 5x+.5 and put result in r */
c=fint(r,r);
il=ftoi(r); /* set il=int(r) */
switch(il) {
case 0: /* this makes sure that we only load into */
che0(c0);
break;
case 1: /* a fp number c0 the value on which we are */
che1(c0);
break;
case 2: /* going to base the Taylor expansion */
che2(c0);
break;
case 3:
che3(c0);
break;
case 4:
che4(c0);
break;
default:
c=fcpy(c5,c0);
break;
}

i=2*i1;
c=itof(i,r1);
c=fexp(r1,"/",e,x0); /* x0 = (il times 2 divided by 10) */

```

```

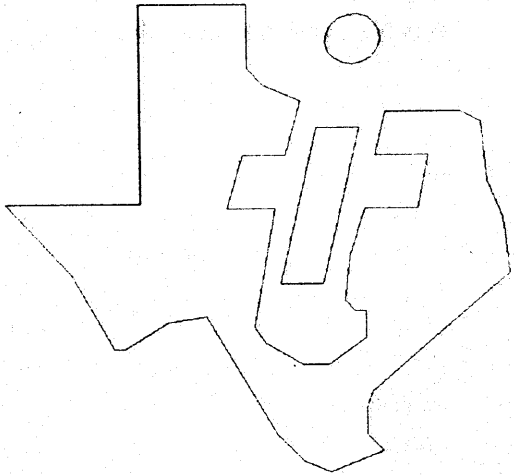
i=1;
c=itof(i,r1);
c=fexp(x,"-",x0,r);
c=fexp(r1,"+",r,e);    /* e = 1 + x - x0 */

```

```

i=2;
while(i<7)
{
f=1;
il=2;
while(il<=i)
{
f=f*il;
il++;
}
c=itof(f,r1);
pow(r,i,t);
c=fexp(t,"/",r1,r);
c=fexp(e,"+",r,e);
i++;
}

```



```

c=fexp(e,"*",c0,r);
c=fexp(ex,"*",r,ex);

```

```

return ex;
}

```

/* END OF COMPUTATION */

```

che0(c0)    /* The following 5 subroutines contain the data */
            /* which are used in the Taylor expansion */
float c0[8]; /* Since only one of them is used for each */
{           /* evaluation of EXP(X) 0<X<1, only one of these */
char *c,s[16]; /* will be called each time. */

```

```
s[0]='+';
s[1]='1';
s[2]='.';
s[3]='0';
s[4]="";
s[5]="";
s[6]="";
s[7]="";
s[8]="";
s[9]="";
s[10]="";
s[11]="";
s[12]="";
s[13]="";
s[14]="";
s[15]="";
c=stof(s,c0);
```

```
return c0;
}
```

```
che1(c0)
```

```
float c0[8];
{
char *c,s[16];
```

```
s[0]='+';
s[1]='1';
s[2]='.';
s[3]='2';
s[4]='2';
s[5]='1';
s[6]='4';
```

```
s[7]='0';  
s[8]='2';  
s[9]='7';  
s[10]='5';  
s[11]='8';  
s[12]="";  
s[13]="";  
s[14]="";  
s[15]="";  
c=stof(s,c0);
```

```
return c0;  
}
```

```
che2(c0)
```

```
float c0[8];  
{  
char *c,s[16];
```

```
s[0]='+';  
s[1]='1';  
s[2]='.';  
s[3]='4';  
s[4]='9';  
s[5]='1';  
s[6]='8';  
s[7]='2';  
s[8]='4';  
s[9]='6';  
s[10]='9';  
s[11]='8';  
s[12]="";  
s[13]="";  
s[14]="";
```



```
s[15]="";  
c=stof(s,c0);
```

```
return c0;  
}
```

```
che3(c0)
```

```
float c0[8];  
{  
char *c,s[16];
```

```
s[0]='+';  
s[1]='1';  
s[2]='.';  
s[3]='8';  
s[4]='2';  
s[5]='2';  
s[6]='1';  
s[7]='1';  
s[8]='8';  
s[9]='8';  
s[10]="";  
s[11]="";  
s[12]="";  
s[13]="";  
s[14]="";  
s[15]="";  
c=stof(s,c0);
```

```
return c0;  
}
```

```
che4(c0)
```

```

float c0[8];
{
char *c,s[16];

s[0]='+';
s[1]='2';
s[2]='.';
s[3]='2';
s[4]='2';
s[5]='5';
s[6]='5';
s[7]='4';
s[8]='0';
s[9]='9';
s[10]='2';
s[11]='8';
s[12]="";
s[13]="";
s[14]="";
s[15]="";
c=stof(s,c0);

return c0;
}

```

The same recommendations apply about include statements at the beginning of a calling programme and object files to be loaded in order to run this function as did with the Natural Logarithm function given in the Summer issue.

Please let me know if you have any suggestions on how to improve my programmes, or about any queries you might have in connection with my articles. I look forward to hearing from you (my address, telephone number, and E-mail are all given in this issue).

Group Website:

News from Richard Speed is that the group now has an official web site which costs the group nothing!

The internet address of the page is...

<http://members.tripod.com/~TI99/Menu.htm>

You will hear more about this in the interim issue of TI*MES.

2023 note: The website contained the TREFF information in this issue and the following. The website was not then modified at any time.

The United Kingdom TI99 Users Group caters for users of all TI99 and compatible computers (including the Geneve and all emulators.) It publishes a regular 60 page magazine as well as an interim newsletter and has an extensive disk library and BBS for the use of members. In addition it has repair facilities for most TI hardware and has regular workshops as well as an annual AGM. For more information, please contact Richard Speed

Richard Twyning writes....

Well, I have contacted Ross, and as I feared, unfortunately he's heard nothing from the Dutch or Germans. I've e-mailed Michael Becker to see if he can contact anyone over there to find the information we need.

I went to Trevor's a few weeks ago for a meeting to discuss the Tref, and to produce a timetable of events for both days.

News on the Tref is that I've heard from Mike Wright that he is

definitely coming and will be bringing a demonstration of PC99 and he says he will be showing something that they've not even seen in the States yet. I hope it's 80 column support!

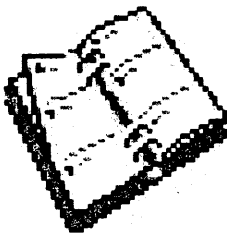
Also, I've heard from Sven Dyroff in Germany who will be visiting with two friends and he'll be bringing his entire TI system with him! Also Oliver Arnold from Germany will be coming to demonstrate his Multi-Disk Commander for the SCSI card, and will hopefully be doing a bit of a C99 workshop for those interested.

Also, Michael Becker replied to me to say that he's coming, and Wolfgang Bertsch from Bietigheim (near Stuttgart), and Martin Zeddies from Wolfsburg.

To add to this good news, NEC have had a new server installed which means Gary Smith can now receive my incoming e-mails, and he's replied to me. He says he's hopefully coming up for a day. It is going to definitely be the biggest show of its kind in the U.K. and for the foreseeable future. It's going to be a very good reunion to get us all back under the same roof again messing with TI's.

We have produced an agenda for the event which has already been published on the TI-List server...

AGENDA for the 13th International TI Tref.



Friday 9th of October.

Arrival and set up of the conference room and general get together for drinks and conversation etc.etc.

Saturday 10th of October.

The morning...

The room opens at 9am.

Welcoming message from Mr. Chairman followed by free period to allow people to circulate and chat.

10am: For those interested, regular demonstrations will be started.

Demonstration of V9T9

Demonstration of GIF Mania and conversion to TI-Artist, by Trevor Stevens

Demonstration of Page Pro

Requests for any demonstration that is not scheduled.

Dinner 12:30pm - 1:30pm

The afternoon.

Straight after dinner, Demonstration of PC99 by Mike Wright.

Demonstration of Sound FX by Trevor Stevens

Demonstration of TI to PC communications

Demonstration of the TIUG UK BBS by Trevor Stevens,

The BBS will be available for people to look around the BBS by themselves.

Music Demos by Trevor Stevens (Axel-F, Flea Waltzer etc.)

5:30pm Close for tea and to get ready for the evening meal.

In the evening it will be nice for all those interested to get together in the hotel dining room for an evening meal together. Smart dress for the evening meal would be nice, but not compulsory.

Those wishing to take part should meet in the dining room at 7:30pm.

Sunday 11th of October

The morning...

Again, the room opens at 9am.

10am Welcoming message from Trevor Stevens for those people who have arrived just for the Sunday's proceedings.
Demonstration of STAR BASIC routines by Trevor Stevens
Demonstration of TI-Artist by Richard Twynning
Demonstration of Germal HPGPL card, SCSI card, 80 column card etc. by Francesco L. Lama and Michael Becker
Demonstration of 80 Column Telco, TI-Writer, Multiplan, Yapp, etc.

Dinner 12:30pm - 1:30pm

The Afternoon...

Demonstrations by Oliver Arnold

MultiDiscCommander for SCSI drives.

Workshop for programing in C99 using the C-Compiler V5 from Winfried Winkler and the new C-ROM. The C-ROM is a set of most basic C-Routines in CPU RAM >6000 so you don` t have to load these routines everytime.

More requests for any other demonstrations.

Time for questions and answers.

General programming and discussions.

4:30pm: A meeting will be organized to close the Tref for a last minute discussion etc.

5:30pm: A thank you to all attending and the event will close.

Throughout both days, there will be stalls for the disk library, CD cutting, T-Shirts, PC Bits.

Both afternoons will have the TI Jumble sale of second hand bits and bobs.

Closing comment from Richard Twynning

Well, I don't know really what's occurring at the moment. If it wasn't for Francesco's input there would be nothing much else to publish, and we don't want a magazine that's 100% composed of extracts from the TI List Server, even though I will probably be relying on it to fill out next issue.

BUT WE NEED MORE ARTICLES FROM YOU TO INCLUDE IN THE MAGAZINE!!! SURELY THERE IS SOMEONE OUT THERE WHO'S READING THIS AND CAN WRITE SOMETHING!?!?!?

We don't care what it is, and you don't have to debate whether it's going to be of interest to the rest of the members in the group, because there is always someone out there that will be interested in reading what you write. We just need more input for the magazine.

We don't really know if the magazine is OK or not if no one ever gives us any feedback on it.

Well, I think that about covers it for another issue. One way or another I promise you a larger Winter issue with hopefully some programs to type in, but until then I'll look forward to seeing you at the Tref.

Live long and prosper!!!! Richard T. over and out!