

Some Scilab Bugs from a Large Number of Targeted Floating Gates in a Design

1) Macrocab generation crash

In rasp30/sci2blif/macrocab_gen_fcn.sce

```
//////////  
// Read Block information file  
//////////  
mblif_xcos_r=[""];  
ele_index_r=[""];  
fd_r = mopen("/home/ubuntu/rasp30/sci2blif/block_info/bi_"+macrocab_name+".sci",'r');  
for i=1:7  
    str_temp=mgetl(fd_r, 1); str_temp=strsplit(str_temp,",",500);str_size=size(str_temp);  
    for j=1:str_size(1)  
        mblif_xcos_r(i,j)=str_temp(j)  
    end  
end  
for i=1:strtod(mblif_xcos_r(7,1))  
    str_temp=mgetl(fd_r, 1); str_temp=strsplit(str_temp,",",500);str_size=size(str_temp);  
    for j=1:str_size(1)  
        ele_index_r(i,j)=str_temp(j)  
    end  
end  
mclose(fd_r);
```

The number of elements in the split string was greater than the specified buffer amount, causing a crash further down the line when parsing said string. Was originally 100, increased to 500, may need to be increased further.

2) Compilation crashes

In rasp30/sci2blif

```
// write blif information  
file_list=listfiles("/home/ubuntu/rasp30/sci2blif/sci2blif_added_blocks/*.sce");  
size_file_list=size(file_list);  
if file_list ~= [] then  
    for bl=1:length(blk_objs)  
        for i=1:size_file_list(1)  
            // Set fix location  
            if use_text_pos then  
                if (scs_m.objs(bl).gui == block_name) then  
                    fix_loc_idx_1 = size(scs_m.objs(bl).model.rpar,"c")-2;  
                    scs_m.objs(bl).model.rpar(fix_loc_idx_1) = 1;  
                    scs_m.objs(bl).model.rpar(fix_loc_idx_1+1) = cab_col;  
                    scs_m.objs(bl).model.rpar(fix_loc_idx_1+2) = cab_row;  
                end  
            end  
            exec(file_list(i),-1);  
        end  
    end  
end
```

Sci2blif iterates through all blif generation templates for each macrocab generated, looking for the correct one. The “exec” function works by reading in the scilab code specified, line by line. A design with many FGs has an enormous string that breaks some internal buffer in scilab and throws an error. This can be fixed by going to rasp30/sci2blif/sci2blif_added_blocks/your_design.sce and breaking that string into multiple lines that get added together at the end instead of one mega-line.

```

TenIn2NH.sce
//***** TenIn2NH *****
if (blk_name.entries(bl) == "TenIn2NH") then
    for ss=1:scs_m.objs(bl).model.lpar(1)
        mputl("# TenIn2NH "+string(bl)+" "+string(ss),fd_w);

        scizblif_io = ".subckt TenIn2NH"+ ln[0]=net+string(blk(blk_obj(b),2))+ " "+string(ss)+" ln[1]=net+string(blk(blk_obj(b),3))+ " "+string(ss)+" ln
[2]=net+string(blk(blk_obj(b),4))+ " "+string(ss)+" ln[3]=net+string(blk(blk_obj(b),5))+ " "+string(ss)+" ln[4]=net+string(blk(blk_obj(b),6))+ " "+string(ss)+" ln
[5]=net+string(blk(blk_obj(b),7))+ " "+string(ss)+" ln[6]=net+string(blk(blk_obj(b),8))+ " "+string(ss)+" ln[7]=net+string(blk(blk_obj(b),9))+ " "+string(ss)+" ln
[8]=net+string(blk(blk_obj(b),10))+ " "+string(ss)+" ln[9]=net+string(blk(blk_obj(b),11))+ " "+string(ss)+" ln[10]=net+string(blk(blk_obj(b),12))+ " "+string(ss)+"
out[0]=net+string(blk(blk_obj(b),2+numoflp))+ " "+string(ss)+" out[1]=net+string(blk(blk_obj(b),3+numoflp))+ " "+string(ss);

        scizblif_str1 = " TenIn2NH_W2ip =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(1-1)+ss)))+&TenIn2NH_Gbip =" +string(sprintf('%
e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(2-1)+ss)))+&TenIn2NH_Vbip =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(3-1
+ss)))+&TenIn2NH_W2in =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(4-1)+ss)))+&TenIn2NH_Gbin =" +string(sprintf('%e',scs_m.objs
(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(5-1)+ss)))+&TenIn2NH_Vbin =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(6-1)+ss))
)+&TenIn2NH_W2ip =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(7-1)+ss)))+&TenIn2NH_Gb2p =" +string(sprintf('%e',scs_m.objs
(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(8-1)+ss)))+&TenIn2NH_Vb2p =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(9-1)+ss))
)+&TenIn2NH_W12n =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(10-1)+ss)))+&TenIn2NH_Gb2n =" +string(sprintf('%e',scs_m.objs
(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(11-1)+ss)))+&TenIn2NH_Vb2n =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(12-1)+ss))
)+&TenIn2NH_In1p1 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(13-1)+ss)))+&TenIn2NH_In1n1 =" +string(sprintf('%e',scs_m.objs
(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(14-1)+ss));

        scizblif_str2 = &TenIn2NH_In2n1 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(15-1)+ss)))+&TenIn2NH_In3n1 =" +string(sprintf('%
e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(16-1)+ss)))+&TenIn2NH_In4n1 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(
17-1)+ss)))+&TenIn2NH_In5n1 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(18-1)+ss)))+&TenIn2NH_In6n1 =" +string(sprintf('%
e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(19-1)+ss)))+&TenIn2NH_In7n1 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(
20-1)+ss)))+&TenIn2NH_In8n1 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(21-1)+ss)))+&TenIn2NH_In9n1 =" +string(sprintf('%
e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(22-1)+ss)))+&TenIn2NH_In10n1 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(
23-1)+ss)))+&TenIn2NH_In11n1 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(24-1)+ss)))+&TenIn2NH_In1p2 =" +string(sprintf('%
e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(25-1)+ss)))+&TenIn2NH_In2p2 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(
26-1)+ss)))+&TenIn2NH_In3p2 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(27-1)+ss)))+&TenIn2NH_In4p2 =" +string(sprintf('%
e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(28-1)+ss)))+&TenIn2NH_In5p2 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(
29-1)+ss)))+&TenIn2NH_In6p2 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(30-1)+ss)))+&TenIn2NH_In7p2 =" +string(sprintf('%
e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(31-1)+ss));

        scizblif_str3 = &TenIn2NH_In8p2 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(32-1)+ss)))+&TenIn2NH_In9p2 =" +string(sprintf('%
e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(33-1)+ss)))+&TenIn2NH_In10p2 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(
34-1)+ss)))+&TenIn2NH_In11p2 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(35-1)+ss)))+&TenIn2NH_In1n2 =" +string(sprintf('%
e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(36-1)+ss)))+&TenIn2NH_In2n2 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(
37-1)+ss)))+&TenIn2NH_In3n2 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(38-1)+ss)))+&TenIn2NH_In4n2 =" +string(sprintf('%
e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(39-1)+ss)))+&TenIn2NH_In5n2 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(
40-1)+ss)))+&TenIn2NH_In6n2 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(41-1)+ss)))+&TenIn2NH_In7n2 =" +string(sprintf('%
e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(42-1)+ss)))+&TenIn2NH_In8n2 =" +string(sprintf('%e',scs_m.objs(bl).model.rpar(scs_m.objs(bl).model.lpar(1)*(
43-1)+ss));

```

Scilab • Tab Width: 8 • Ln 12, Col 256 • INS

3) Can't modify palette browser block by double clicking in Xcos

If you have a large number of floating gate elements, you will initially not be able to modify the programmed value through the GUI. To fix this, go to rasp30/xcos_blocks/your_design.sci. Here you can manually vectorize your FG targeted values to fit into the gui window of Scilab.

The “while %t do” loop is what displays the GUI when you double click a block. It can only display 14 instances, which is what causes the initial error. Change this to less than 14 fields.

```

function [x,y,typ]=TenIn2NH(job,arg1,arg2)
    x=[];y=[];typ=[];
    select job
    case 'plot' then standard_draw(arg1)
    case 'getInputs' then [x,y,typ]=standard_inputs(arg1)
    case 'getOutputs' then [x,y,typ]=standard_outputs(arg1)
    case 'getorigln' then [x,y]=standard_origln(arg1)
    case 'set' then
        x=arg1;graphics=arg1.graphics;model=arg1.model;exprs=graphics.exprs;
        while %t do
            //
            [ok,num_of_blk,nbLif_num,TenIn2NH_W2ip,TenIn2NH_Gbip,TenIn2NH_Vbip,TenIn2NH_W2in,TenIn2NH_Gbin,TenIn2NH_Vbin,TenIn2NH_W12p,TenIn2NH_Gb2p,TenIn2NH_Vb2p,TenIn2NH_W12n,Ten
('New Block Parameter',
            ['num_of_blk';nbLif_num';TenIn2NH_W2ip';TenIn2NH_Gbip';TenIn2NH_Vbip';TenIn2NH_W2in';TenIn2NH_Gbin';TenIn2NH_Vbin';TenIn2NH_W12p';TenIn2NH_Gb2p';TenIn2NH_Vb2p
('vec','-1','vec','-1','vec','-1','vec','-1','vec','-1','vec','-1','vec','-1','vec','-1','vec','-1','vec','-1','vec','-1','vec','-1','vec','-1','vec','-1','vec','-1','vec'
            [ok,num_of_blk,nbLif_num,Row1,Row2,Row3,Row4,fix_loc,exprs] = scicos_getvalue('New Block Parameter',
            ['num_of_blk';nbLif_num';Row1';Row2';Row3';Row4';fix_loc'],list('vec',-1,'vec',-1,'row',-1,'row',-1,'row',-1,'row',-1,'row',-1,'vec',-1),exprs);

```

Then manually assign each FG variable from the vectors you instantiated in the GUI

```

if ~ok then break,end
if ok then
    TenIn2NH_Gbip = Row1(1);
    TenIn2NH_Vbip = Row1(2);
    TenIn2NH_In1p1 = Row1(3);
    TenIn2NH_In2p1 = Row1(4);
    TenIn2NH_In3p1 = Row1(5);
    TenIn2NH_In4p1 = Row1(6);
    TenIn2NH_In5p1 = Row1(7);
    TenIn2NH_In6p1 = Row1(8);
    TenIn2NH_In7p1 = Row1(9);
    TenIn2NH_In8p1 = Row1(10);
    TenIn2NH_In9p1 = Row1(11);
    TenIn2NH_In10p1 = Row1(12);
    TenIn2NH_In11p1 = Row1(13);
    TenIn2NH_W2ip = Row1(14);

    TenIn2NH_Gbin = Row2(1);
    TenIn2NH_Vbin = Row2(2);
    TenIn2NH_In1n1 = Row2(3);
    TenIn2NH_In2n1 = Row2(4);
    TenIn2NH_In3n1 = Row2(5);
    TenIn2NH_In4n1 = Row2(6);
    TenIn2NH_In5n1 = Row2(7);
    TenIn2NH_In6n1 = Row2(8);
    TenIn2NH_In7n1 = Row2(9);
    TenIn2NH_In8n1 = Row2(10);
    TenIn2NH_In9n1 = Row2(11);
    TenIn2NH_In10n1 = Row2(12);
    TenIn2NH_In11n1 = Row2(13);
    TenIn2NH_W2in = Row2(14);

    TenIn2NH_Gb2p = Row3(1);
    TenIn2NH_Vb2p = Row3(2);
    TenIn2NH_In1p2 = Row3(3);
    TenIn2NH_In2p2 = Row3(4);
    TenIn2NH_In3p2 = Row3(5);
    TenIn2NH_In4p2 = Row3(6);
    TenIn2NH_In5p2 = Row3(7);
    TenIn2NH_In6p2 = Row3(8);

```

Define your new GUI variables to initial FG values.

```
case 'define' then
    Row1 = [10e-6, 2e-9, 1e-12*ones(1,12)];
    Row2 = [10e-6, 1e-9, 1e-12*ones(1,12)];
    Row3 = [10e-6, 2e-9, 1e-12*ones(1,12)];
    Row4 = [10e-6, 1e-9, 1e-12*ones(1,12)];
    num_of_blk=1;
    mblif_num=0;
    TenIn2NH_W21p=1e-12;
    TenIn2NH_Gb1p=10e-6;
    TenIn2NH_Vb1p=2e-9;
    TenIn2NH_W21n=1e-12;
    TenIn2NH_Gb1n=10e-6;
```

Modify the “exprs” to reflect your new GUI variables

```
model.blocktype='d';
model.dep_ut=[%f %t]; //[block input has direct feedthrough to output w/o ODE block always active]
exprs = [scl2exp(num_of_blk);scl2exp(mblif_num);scl2exp(Row1);scl2exp(Row2);scl2exp(Row3);scl2exp(Row4);scl2exp(fix_loc)];
//exprs=[scl2exp(num_of_blk);scl2exp(mblif_num);scl2exp(TenIn2NH_W21p);scl2exp(TenIn2NH_Gb1p);scl2exp(TenIn2NH_Vb1p);scl2exp(TenIn2NH_W21n);scl2exp
(TenIn2NH_Gb1n);scl2exp(TenIn2NH_Vb1n);scl2exp(TenIn2NH_W12p);scl2exp(TenIn2NH_Gb2p);scl2exp(TenIn2NH_Vb2p);scl2exp(TenIn2NH_W12n);scl2exp(TenIn2NH_Gb2n);scl2exp
(TenIn2NH_Vb2n);scl2exp(TenIn2NH_In1p1);scl2exp(TenIn2NH_In1n1);scl2exp(TenIn2NH_In2n1);scl2exp(TenIn2NH_In3n1);scl2exp(TenIn2NH_In4n1);scl2exp(TenIn2NH_In5n1);scl2exp
(TenIn2NH_In6n1);scl2exp(TenIn2NH_In7n1);scl2exp(TenIn2NH_In8n1);scl2exp(TenIn2NH_In9n1);scl2exp(TenIn2NH_In10n1);scl2exp(TenIn2NH_In11n1);scl2exp
(TenIn2NH_In1p2);scl2exp(TenIn2NH_In2p2);scl2exp(TenIn2NH_In3p2);scl2exp(TenIn2NH_In4p2);scl2exp(TenIn2NH_In5p2);scl2exp(TenIn2NH_In6p2);scl2exp(TenIn2NH_In7p2);scl2exp
(TenIn2NH_In8p2);scl2exp(TenIn2NH_In9p2);scl2exp(TenIn2NH_In10p2);scl2exp(TenIn2NH_In11p2);scl2exp(TenIn2NH_In1n2);scl2exp(TenIn2NH_In2n2);scl2exp
(TenIn2NH_In3n2);scl2exp(TenIn2NH_In4n2);scl2exp(TenIn2NH_In5n2);scl2exp(TenIn2NH_In6n2);scl2exp(TenIn2NH_In7n2);scl2exp(TenIn2NH_In8n2);scl2exp(TenIn2NH_In9n2);scl2exp
(TenIn2NH_In10n2);scl2exp(TenIn2NH_In11n2);scl2exp(TenIn2NH_In2p1);scl2exp(TenIn2NH_In3p1);scl2exp(TenIn2NH_In4p1);scl2exp(TenIn2NH_In5p1);scl2exp
(TenIn2NH_In6p1);scl2exp(TenIn2NH_In7p1);scl2exp(TenIn2NH_In8p1);scl2exp(TenIn2NH_In9p1);scl2exp(TenIn2NH_In10p1);scl2exp(TenIn2NH_In11p1);scl2exp(fix_loc)];
gr_i=['text='TenIn2NH'';';xstringb(orig(1),orig(2),txt,sz(1),sz(2),'fill')'];
x=standard_define([5 3],model, exprs,gr_i) //Numbers define the width and height of block
end
endfunction
```