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# **HP49G CATV Library**

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CATV Broadband and  
Fiber Optic Engineering Functions

Source Code

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## Source Code Listings

This section shows the code for the routines.

### EXIT

```
%%HP: T(1)A(D)F(.);  
"!NO CODE  
!RPL  
::  
  ROMPTR 4B0 8  
  xUPDIR  
  xHOME  
;  
@"
```

**ATTNd**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Shield O.D.\"
  BINT0
  THIRTEEN
  \"Frequency\"
  BINT6
  BINT27
  'DROPFALSE
  BINT46
  TWELVE
  THIRTYSEX
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Shield outer diameter in inches\"
  MINUSONE
  MINUSONE
  % .75
  % .75
  'DROPFALSE
  BINT46
  BINT26
  THIRTYSEX
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Frequency in MHz\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  cmp
  cmp
  'DROPFALSE
  \"Cable Attn VS Shield O.D.\"
  DoInputForm
  NOT?SEMI
  ::
    SWAP
    % .036
    SWAP
    %/
    SWAPDUP
    THREE
    ROLL
    SWAP
    %SQRT
    %*
    SWAP
    % .0002
    %*
    %+
  ;
;
@\"

```

**ATTNF**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Loss\"
  EXT
  hxs
  \"Freq1\"
  BINT10
  TWENTYFOUR
  \"Freq2\"
  BINT10
  BINT38
  'DROPFALSE
  BINT32
  BINT10
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter loss at known frequency\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  BINT32
  TWENTYTHREE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter known frequency in MHz\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  BINT32
  THIRTYSIX
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter desired frequency in MHz\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  THREE
  THREE
  'DROPFALSE
  \"Cable Attn VS Frequency\"
  DoInputForm
  NOT?SEMI
  ::
    SWAP
    %/
    %SQRT

```

⌘ \*  
;  
;  
@ "



<b>Cable</b>
--------------

```

%%HP: T(1)A(D)F(.);
«
  IFERR DUP
  THEN
    "ATTN VS FREQ
    Enter the frequency on the stack, then run  Cable .

```

C°

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Loss\"
  TWELVE
  BINT10
  \"Temp1\"
  BINT9
  TWENTYFOUR
  \"Temp2\"
  BINT9
  THIRTYNINE
  'DROPFALSE
  THIRTY
  BINT9
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter loss at known °C temp\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  THIRTY
  TWENTYTHREE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter known °C temp\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  THIRTY
  THIRTYSEVEN
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter desired °C temp\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  THREE
  THREE
  'DROPFALSE
  \"Attenuation VS Temp °C\"
  DoInputForm
  NOT?SEMI
  ::
    SWAP
    %-
    % 5.6

```

%/  
%100  
%/  
SWAP  
DUP  
THREE  
ROLL  
%\*  
DUP  
THREE  
ROLL  
%+  
;  
;  
@"

**L10+**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
0LASTOWDOB!
CK2NOLASTWD
CK&DISPATCH1
SEVENTEEN
::
%ABS
%CHS
SWAP
%ABS
%CHS
%10
%/
%ALOG
SWAP
%10
%/
%ALOG
%+
%LOG
%10*
;
;
@"

```

**L10-**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
0LASTOWDOB!
CK2NOLASTWD
CK&DISPATCH1
SEVENTEEN
::
%ABS
%CHS
SWAP
%ABS
%CHS
%10
%/
%ALOG
SWAP
%10
%/
%ALOG
%-
%LOG
%10*
;
;
@"

```

**L20+**

```
%%HP: T(1)A(D)F(.);  
"!NO CODE  
!RPL  
::  
  0LASTOWDOB!  
  CK2NOLASTWD  
  CK&DISPATCH1  
  SEVENTEEN  
  ::  
    %ABS  
    %CHS  
    SWAP  
    %ABS  
    %CHS  
    %20  
    %/  
    %ALOG  
    SWAP  
    %20  
    %/  
    %ALOG  
    %+  
    %LOG  
    %20  
    %*  
  ;  
;  
@"
```

**L20-**

```
%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
0LASTOWDOB!
CK2NOLASTWD
CK&DISPATCH1
SEVENTEEN
::
%ABS
%CHS
SWAP
%ABS
%CHS
%20
%/
%ALOG
SWAP
%20
%/
%ALOG
%-
%LOG
%20
%*
;
;
@"
```

**Lplus**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Spec1\"
  TWELVE
  hxs
  \"Spec2\"
  TWELVE
  BINT25
  \"LOGx\"
  SIXTEEN
  THIRTYNINE
  'DROPFALSE
  BINT35
  BINT9
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter Spec1 in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  BINT35
  TWENTYTHREE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter Spec2 in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  BINT35
  THIRTYSEVEN
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter the Log multiplier\"
  MINUSONE
  MINUSONE
  % 15.
  % 15.
  THREE
  THREE
  'DROPFALSE
  \"LOGx ADDITION\"
  DoInputForm
  NOT?SEMI
  ::
  {
    LAM spec1
    LAM spec2
  }

```



```

        LAM log
    }
    BIND
;
::
    LAM spec1
    %ABS
    %CHS
    LAM log
    %/
    %ALOG
    LAM spec2
    %ABS
    %CHS
    LAM log
    %/
    %ALOG
    %+
    %LOG
    LAM log
    %*
    ABND
;
;
@"
```

**Lsubt**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Spec1\"
  TWELVE
  hxs
  \"Spec2\"
  TWELVE
  BINT25
  \"LOGx\"
  SIXTEEN
  THIRTYNINE
  'DROPFALSE
  BINT35
  BINT9
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter total spec in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  BINT35
  TWENTYTHREE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter spec to subtract in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  BINT35
  THIRTYSEVEN
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter the Log multiplier\"
  MINUSONE
  MINUSONE
  % 15.
  % 15.
  THREE
  THREE
  'DROPFALSE
  \"LOGx SUBTRACTION\"
  DoInputForm
  NOT?SEMI
  ::
  {
    LAM spec1
    LAM spec2
  }

```

```

        LAM log
    }
    BIND
;
::
    LAM spec1
    %ABS
    %CHS
    LAM log
    %/
    %ALOG
    LAM spec2
    %ABS
    %CHS
    LAM log
    %/
    %ALOG
    %-
    %LOG
    LAM log
    %*
    ABND
;
;
@"
```

<b>CTB</b>
------------

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Spec\"
  BINT0
  BINT10
  \"Act\"
  BINT93
  BINT10
  \"Ref\"
  FORTYNINE
  BINT10
  \"Ref\"
  BINT4
  BINT25
  \"Act\"
  FORTYNINE
  BINT25
  \"Fac\"
  BINT93
  BINT25
  'DROPFALSE
  EIGHTEEN
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter the given CTB spec in dB\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  SIXTYTWO
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter reference level in dBmV\"
  MINUSONE
  MINUSONE
  % 44.
  % 44.
  'DROPFALSE
  BINT106
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter actual level in dBmV\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE

```

```

EIGHTEEN
TWENTYTHREE
BINT25
BINT9
real
{
  BINT0
}
BINT4
\"Enter reference slope in dB\"
MINUSONE
MINUSONE
%0
%0
'DROPFALSE
SIXTYTWO
TWENTYTHREE
BINT25
BINT9
real
{
  BINT0
}
BINT4
\"Enter actual slope in dB\"
MINUSONE
MINUSONE
% 14.7
% 14.7
'DROPFALSE
BINT106
TWENTYTHREE
BINT25
BINT9
real
{
  BINT0
}
BINT4
\"Enter CTB slope factor 1:x\"
MINUSONE
MINUSONE
%1
%1
BINT6
BINT6
'DROPFALSE
\"Amp Composite Triple Beat\"
DoInputForm
NOT?SEMI
::
{
  LAM spec
  LAM actlev
  LAM reflv
  LAM actslp
  LAM refslp
  LAM slpfac
}
BIND
::
  LAM actlev
  LAM reflv
  %-
  %2
  %*
  LAM actslp
  LAM refslp
  %-
  LAM slpfac
  %*

```

```
%-  
LAM spec  
%ABS  
%CHS  
%-  
%CHS  
ABND  
  
;  
;  
;  
@"
```

**CTB2**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Spec\"
  BINT0
  BINT10
  \"Act\"
  BINT93
  BINT10
  \"Ref\"
  FORTYNINE
  BINT10
  \"Ref\"
  BINT4
  BINT25
  \"Act\"
  FORTYNINE
  BINT25
  \"Fac\"
  BINT93
  BINT25
  \"LF\"
  lam
  THIRTYNINE
  \"HF\"
  FIFTYTHREE
  THIRTYNINE
  \"Alg\"
  BINT93
  THIRTYNINE
  'DROPFALSE
  EIGHTEEN
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter the given CTB spec in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  SIXTYTWO
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter reference level in dBmV\"
  MINUSONE
  MINUSONE
  % 44.
  % 44.
  'DROPFALSE
  BINT106
  BINT9
  BINT25
  BINT9
  real
  {

```

```

    BINT0
  }
  BINT4
  \"Enter actual level in dBmV\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  EIGHTEEN
  TWENTYTHREE
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter reference slope in dB\"
  MINUSONE
  MINUSONE
  %0
  %0
  'DROPFALSE
  SIXTYTWO
  TWENTYTHREE
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter actual slope in dB\"
  MINUSONE
  MINUSONE
  % 14.7
  % 14.7
  'DROPFALSE
  BINT106
  TWENTYTHREE
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter CTB slope factor 1:x\"
  MINUSONE
  MINUSONE
  %1
  %1
  'DROPFALSE
  EIGHTEEN
  THIRTYSEVEN
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter low frequency in MHz\"
  MINUSONE
  MINUSONE
  % 54.
  % 54.
  'DROPFALSE
  SIXTYTWO
  THIRTYSEVEN

```



```

BINT25
BINT9
real
{
    BINT0
}
BINT4
\"Enter high freq in MHz\"
MINUSONE
MINUSONE
% 870.
% 870.
'DROPFALSE
BINT106
THIRTYSEVEN
BINT25
BINT9
real
{
    BINT0
}
BINT4
\"Enter upper analog freq\"
MINUSONE
MINUSONE
% 550.
% 550.
BINT9
BINT9
'DROPFALSE
\"Hybrid Composite Triple Beat\"
DoInputForm
NOT?SEMI
::
{
    LAM spec
    LAM reflv
    LAM actlev
    LAM refslp
    LAM actslp
    LAM slpfac
    LAM lowfreq
    LAM hifreq
    LAM analog
}
BIND
::
    LAM actlev
    LAM reflv
    %-
    %2
    %*
    LAM actslp
    LAM refslp
    %-
    LAM hifreq
    LAM lowfreq
    %-
    %/
    LAM analog
    LAM lowfreq
    %-
    %*
    LAM slpfac
    %*
    %-
    LAM spec
    %ABS
    %CHS
    %+
    ABND

```

;  
;  
;  
@"

<b>CSO</b>
------------

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Spec\"
  BINT0
  BINT10
  \"Act\"
  BINT93
  BINT10
  \"Ref\"
  FORTYNINE
  BINT10
  \"Ref\"
  BINT4
  BINT25
  \"Act\"
  FORTYNINE
  BINT25
  \"Fac\"
  BINT93
  BINT25
  'DROPFALSE
  EIGHTEEN
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter the given CSO spec in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  SIXTYTWO
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter reference level in dBmV\"
  MINUSONE
  MINUSONE
  % 44.
  % 44.
  'DROPFALSE
  BINT106
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter actual level in dBmV\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE

```

```

EIGHTEEN
TWENTYTHREE
BINT25
BINT9
real
{
  BINT0
}
BINT4
\"Enter reference slope in dB\"
MINUSONE
MINUSONE
%0
%0
'DROPFALSE
SIXTYTWO
TWENTYTHREE
BINT25
BINT9
real
{
  BINT0
}
BINT4
\"Enter actual slope in dB\"
MINUSONE
MINUSONE
% 14.7
% 14.7
'DROPFALSE
BINT106
TWENTYTHREE
BINT25
BINT9
real
{
  BINT0
}
BINT4
\"Enter CSO slope factor 1:x\"
MINUSONE
MINUSONE
% .5
% .5
BINT6
BINT6
'DROPFALSE
\"Amp Composite Second Order\"
DoInputForm
NOT?SEMI
::
{
  LAM spec
  LAM actlev
  LAM reflv
  LAM actslp
  LAM refslp
  LAM slpfac
}
BIND
::
  LAM actlev
  LAM reflv
  %-
  LAM actslp
  LAM refslp
  %-
  LAM slpfac
  %*
  %-
  LAM spec

```

%ABS  
%CHS  
%-  
%CHS  
ABND  
;  
;  
;  
@"

**CS02**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Spec\"
  BINT0
  BINT10
  \"Act\"
  BINT93
  BINT10
  \"Ref\"
  FORTYNINE
  BINT10
  \"Ref\"
  BINT4
  BINT25
  \"Act\"
  FORTYNINE
  BINT25
  \"Fac\"
  BINT93
  BINT25
  \"LF\"
  lam
  THIRTYNINE
  \"HF\"
  FIFTYTHREE
  THIRTYNINE
  \"Alg\"
  BINT93
  THIRTYNINE
  'DROPFALSE
  EIGHTEEN
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter the given CSO spec in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  SIXTYTWO
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter reference level in dBmV\"
  MINUSONE
  MINUSONE
  % 44.
  % 44.
  'DROPFALSE
  BINT106
  BINT9
  BINT25
  BINT9
  real
  {

```

```

    BINT0
  }
  BINT4
  \"Enter actual level in dBmV\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  EIGHTEEN
  TWENTYTHREE
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter reference slope in dB\"
  MINUSONE
  MINUSONE
  %0
  %0
  'DROPFALSE
  SIXTYTWO
  TWENTYTHREE
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter actual slope in dB\"
  MINUSONE
  MINUSONE
  % 14.7
  % 14.7
  'DROPFALSE
  BINT106
  TWENTYTHREE
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter CSO slope factor 1:x\"
  MINUSONE
  MINUSONE
  % .5
  % .5
  'DROPFALSE
  EIGHTEEN
  THIRTYSEVEN
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter low frequency in MHz\"
  MINUSONE
  MINUSONE
  % 54.
  % 54.
  'DROPFALSE
  SIXTYTWO
  THIRTYSEVEN

```

```

BINT25
BINT9
real
{
  BINT0
}
BINT4
\"Enter high freq in MHz\"
MINUSONE
MINUSONE
% 870.
% 870.
'DROPFALSE
BINT106
THIRTYSEVEN
BINT25
BINT9
real
{
  BINT0
}
BINT4
\"Enter upper analog freq\"
MINUSONE
MINUSONE
% 550.
% 550.
BINT9
BINT9
'DROPFALSE
\"Hybrid Composite Second Order\"
DoInputForm
NOT?SEMI
::
{
  LAM spec
  LAM reflv
  LAM actlev
  LAM refslp
  LAM actslp
  LAM slpfac
  LAM lowfreq
  LAM hifreq
  LAM analog
}
BIND
::
  LAM actlev
  LAM reflv
  %-
  LAM actslp
  LAM refslp
  %-
  LAM hifreq
  LAM lowfreq
  %-
  %/
  LAM analog
  LAM lowfreq
  %-
  %*
  LAM slpfac
  %*
  %-
  LAM spec
  %ABS
  %CHS
  %+
  ABND
;
;

```



;  
@ "

**XMOD**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Spec\"
  BINT0
  BINT10
  \"Act\"
  BINT93
  BINT10
  \"Ref\"
  FORTYNINE
  BINT10
  \"Ref\"
  BINT4
  BINT25
  \"Act\"
  FORTYNINE
  BINT25
  \"Fac\"
  BINT93
  BINT25
  'DROPFALSE
  EIGHTEEN
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter the given XMOD spec in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  SIXTYTWO
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter reference level in dBmV\"
  MINUSONE
  MINUSONE
  % 44.
  % 44.
  'DROPFALSE
  BINT106
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter actual level in dBmV\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE

```

```

EIGHTEEN
TWENTYTHREE
BINT25
BINT9
real
{
  BINT0
}
BINT4
\"Enter reference slope in dB\"
MINUSONE
MINUSONE
%0
%0
'DROPFALSE
SIXTYTWO
TWENTYTHREE
BINT25
BINT9
real
{
  BINT0
}
BINT4
\"Enter actual slope in dB\"
MINUSONE
MINUSONE
% 14.7
% 14.7
'DROPFALSE
BINT106
TWENTYTHREE
BINT25
BINT9
real
{
  BINT0
}
BINT4
\"Enter XMOD slope factor 1:x\"
MINUSONE
MINUSONE
% .6
% .6
BINT6
BINT6
'DROPFALSE
\"Amp Cross Modulation\"
DoInputForm
NOT?SEMI
::
{
  LAM spec
  LAM reflev
  LAM actlev
  LAM refslop
  LAM actslop
  LAM slpfac
}
BIND
::
  LAM actlev
  LAM reflev
  %-
  %2
  %*
  LAM actslop
  LAM refslop
  %-
  LAM slpfac
  %*

```

```
%-  
LAM spec  
%ABS  
%CHS  
%+  
ABND  
;  
;  
;  
@"
```

**BEATS**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Carriers\"
  hxs
  THIRTEEN
  \"Channel\"
  rompointer
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter total number of carriers\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Channel number of interest\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"Number of Beats\"
  DoInputForm
  NOT?SEMI
  ::
    {
      LAM n
      LAM m
    }
    BIND
  ::
    LAM n
    %2
    %^
    %4
    %/
    LAM n
    LAM m
    %-
    LAM m
    %1
    %-
    %*
    % .5
    %*
    %+

```

ABND  
;  
;  
;  
@"

**DSO**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Act\"
  BINT22
  THIRTYSEVEN
  \"Ref\"
  TWENTYTHREE
  TWENTYFOUR
  \"Spec\"
  BINT19
  BINT10
  'DROPFALSE
  THIRTYSIX
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter the given DSO spec in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  THIRTYSIX
  BINT22
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter reference level in dBmV\"
  MINUSONE
  MINUSONE
  % 44.
  % 44.
  'DROPFALSE
  THIRTYSIX
  BINT35
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter actual level in dBmV\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  THREE
  THREE
  'DROPFALSE
  \"Amp Discrete Second Order\"
  DoInputForm
  NOT?SEMI
  ::
  {
    LAM spec
    LAM actlev

```

```
      LAM reflev
    }
  BIND
  ::
    LAM actlev
    LAM reflev
    %-
    LAM spec
    %ABS
    %CHS
    %-
    %CHS
    ABND
  ;
;
;
@"
```



**DTO**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Act\"
  BINT22
  THIRTYSEVEN
  \"Ref\"
  TWENTYTHREE
  TWENTYFOUR
  \"Spec\"
  BINT19
  BINT10
  'DROPFALSE
  THIRTYSIX
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter the given DSO spec in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  THIRTYSIX
  BINT22
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter reference level in dBmV\"
  MINUSONE
  MINUSONE
  % 44.
  % 44.
  'DROPFALSE
  THIRTYSIX
  BINT35
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter actual level in dBmV\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  THREE
  THREE
  'DROPFALSE
  \"Amp Discrete Second Order\"
  DoInputForm
  NOT?SEMI
  ::
  {
    LAM spec
    LAM actlev

```

```
      LAM reflev
    }
  BIND
  ::
    LAM actlev
    LAM reflev
    %-
    %2
    %*
    LAM spec
    %ABS
    %CHS
    %-
    %CHS
    ABND
  ;
;
;
@"
```

NF
----

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Gain\"
  BINT34
  THIRTYSEVEN
  \"Thermal\"
  TWENTYTHREE
  TWENTYFOUR
  \"NoiseO/P\"
  BINT19
  BINT10
  'DROPFALSE
  FIFTYTHREE
  BINT9
  BINT41
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter output noise power in dBmV\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  FIFTYTHREE
  BINT22
  BINT41
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter thermal noise in dBmV\"
  MINUSONE
  MINUSONE
  % -59.17
  % -59.17
  'DROPFALSE
  FIFTYTHREE
  BINT35
  BINT41
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter gain in dB\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  THREE
  THREE
  'DROPFALSE
  \"Amplifier Noise Figure\"
  DoInputForm
  NOT?SEMI
  ::
  {
    LAM noiseop
    LAM thermal

```

```
      LAM gain
    }
  BIND
  ::
    LAM thermal
    LAM gain
    %+
    LAM noiseop
    %-
    %CHS
    ABND
  ;
;
;
@"
```

**CNR**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Gain\"
  BINT34
  THIRTYONE
  \"Thermal\"
  TWENTYTHREE
  TWENTY
  \"Output\"
  BINT27
  BINT10
  \"NF\"
  FORTYTWO
  BINT41
  'DROPFALSE
  FIFTYTHREE
  EIGHT
  BINT41
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Enter output level in dBmV\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  FIFTYTHREE
  EIGHTEEN
  BINT41
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Enter thermal noise in dBmV\"
  MINUSONE
  MINUSONE
  % -59.17
  % -59.17
  'DROPFALSE
  FIFTYTHREE
  BINT28
  BINT41
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Enter gain in dB\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  FIFTYTHREE
  BINT38
  BINT41
  EIGHT
  real
  {

```

```

    BINT0
  }
  BINT4
  \ "Enter noise figure in dB\ "
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  BINT4
  BINT4
  'DROPFALSE
  \ "Amplifier HF Carrier-to-Noise\ "
  DoInputForm
  NOT?SEMI
  ::
  {
    LAM output
    LAM thermal
    LAM gain
    LAM nf
  }
  BIND
  ::
    LAM output
    LAM thermal
    LAM gain
    LAM nf
    %+
    %+
    %-
    ABND
  ;
;
;
@"

```

**CIN**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Act\"
  BINT22
  THIRTYSEVEN
  \"Ref\"
  TWENTYTHREE
  TWENTYFOUR
  \"Spec\"
  BINT19
  BINT10
  'DROPFALSE
  THIRTYSIX
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter the given CIN spec in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  THIRTYSIX
  BINT22
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter reference level in dBmV\"
  MINUSONE
  MINUSONE
  % 44.
  % 44.
  'DROPFALSE
  THIRTYSIX
  BINT35
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter actual level in dBmV\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  THREE
  THREE
  'DROPFALSE
  \"Composite Intermodulation Noise\"
  DoInputForm
  NOT?SEMI
  ::
  {
    LAM spec
    LAM actlev

```

```
      LAM reflev
    }
  BIND
  ::
    LAM actlev
    LAM reflev
    %-
    %2
    %*
    LAM spec
    %ABS
    %CHS
    %-
    %CHS
    ABND
  ;
;
;
@"
```



**CNdig**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"CNRf\"
  BINT10
  hxs
  \"CNRc\"
  BINT70
  hxs
  \"Level\"
  cmp
  TWENTYFOUR
  \"Bw\"
  BINT77
  TWENTYFOUR
  \"Margin\"
  cmp
  THIRTYNINE
  'DROPFALSE
  BINT28
  BINT9
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter fiber system CNR in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  BINT88
  BINT9
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter coax system CNR in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  BINT28
  TWENTYTHREE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Digital suppression level in dB\"
  MINUSONE
  MINUSONE
  % 10.
  % 10.
  'DROPFALSE
  BINT88
  TWENTYTHREE
  THIRTY

```

```

BINT9
real
{
  BINT0
}
BINT4
\"Rx noise susceptibility BW in MHz\"
MINUSONE
MINUSONE
%6
%6
'DROPFALSE
BINT28
THIRTYSEVEN
THIRTY
BINT9
real
{
  BINT0
}
BINT4
\"Variation from design in dB\"
MINUSONE
MINUSONE
%3
%3
FIVE
FIVE
'DROPFALSE
\"CNR for Non-Analog Signal\"
DoInputForm
NOT?SEMI
::
{
  LAM cnrf
  LAM cnrc
  LAM level
  LAM bw
  LAM margin
}
BIND
::
  LAM cnrf
  LAM cnrc
  %ABS
  %CHS
  SWAP
  %ABS
  %CHS
  %10
  %/
  %ALOG
  SWAP
  %10
  %/
  %ALOG
  %+
  %LOG
  %10*
  %CHS
  LAM level
  %-
  LAM bw
  %4
  %/
  %LOG
  %10*
  %-
  LAM margin
  %-
  ABND

```

;  
;  
;  
@ "

**PERF**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"CTB\"
  BINT0
  BINT9
  \"CSO\"
  BINT47
  BINT9
  \"XMD\"
  BINT93
  BINT9
  \"CIN\"
  BINT0
  SEVENTEEN
  \"IPSlp\"
  THIRTYNINE
  SEVENTEEN
  \"OPSlp\"
  FIVESIX
  SEVENTEEN
  \"NFL\"
  BINT0
  BINT25
  \"NPH\"
  BINT47
  BINT25
  \"O/P\"
  BINT0
  BINT33
  \"Gain\"
  BINT89
  BINT25
  \"Ctb F\"
  FOURTY
  BINT33
  \"Cso F\"
  FIVESIX
  BINT33
  \"LEV\"
  BINT0
  BINT41
  \"Slope\"
  THIRTYNINE
  BINT41
  \"Casc\"
  BINT89
  BINT41
  'DROPFALSE
  TWELVE
  lam
  BINT25
  lam
  real
  {
    BINT0
  }
  BINT4
  \"Enter the unit CTB spec\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  SIXTY
  lam
  BINT25

```

```

lam
real
{
  BINT0
}
BINT4
\"Enter the unit CSO spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
BINT106
lam
BINT25
lam
real
{
  BINT0
}
BINT4
\"Enter the unit XMOD spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
TWELVE
rompointer
BINT25
lam
real
{
  BINT0
}
BINT4
\"Enter unit CIN spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
SIXTY
rompointer
BINT25
lam
real
{
  BINT0
}
BINT4
\"Enter the ref input slope\"
MINUSONE
MINUSONE
%0
%0
'DROPFALSE
BINT106
rompointer
BINT25
lam
real
{
  BINT0
}
BINT4
\"Enter the ref output slope\"
MINUSONE
MINUSONE
% 14.7
% 14.7

```

```

'DROPFALSE
TWELVE
TWENTYTHREE
BINT25
lam
real
{
  BINT0
}
BINT4
\"Enter LF noise figure\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
SIXTY
TWENTYTHREE
BINT25
lam
real
{
  BINT0
}
BINT4
\"Enter HF noise figure\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
BINT106
TWENTYTHREE
BINT25
lam
real
{
  BINT0
}
BINT4
\"Enter reference gain\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
TWELVE
THIRTYONE
BINT25
lam
real
{
  BINT0
}
BINT4
\"Enter the ref output level\"
MINUSONE
MINUSONE
% 51.
% 51.
'DROPFALSE
SIXTY
THIRTYONE
BINT25
lam
real
{
  BINT0
}
BINT4
\"Enter CTB slope factor\"

```

```

MINUSONE
MINUSONE
%1
%1
'DROPFALSE
BINT106
THIRTYONE
BINT25
lam
real
{
    BINT0
}
BINT4
\"Enter CSO slope factor\"
MINUSONE
MINUSONE
% .5
% .5
'DROPFALSE
TWELVE
THIRTYNINE
BINT25
lam
real
{
    BINT0
}
BINT4
\"Enter actual output level\"
MINUSONE
MINUSONE
% 51.
% 51.
'DROPFALSE
SIXTY
THIRTYNINE
BINT25
lam
real
{
    BINT0
}
BINT4
\"Enter actual slope\"
MINUSONE
MINUSONE
% 14.7
% 14.7
'DROPFALSE
BINT106
THIRTYNINE
BINT25
lam
real
{
    BINT0
}
BINT4
\"Enter number amps in cascade\"
MINUSONE
MINUSONE
%1
%1
rompointer
rompointer
'DROPFALSE
\"Amplifier Performance Specs\"
DoInputForm
NOT?SEMI
::

```

```

{
  LAM CTB
  LAM CSO
  LAM XMD
  LAM CIN
  LAM IPSLP
  LAM OPSLP
  LAM NFL
  LAM NFH
  LAM GAIN
  LAM OP
  LAM CTBF
  LAM CSOF
  LAM LEV
  LAM SLP
  LAM CASC
}
BIND
::
  LAM CTB
  %ABS
  %CHS
  LAM OP
  LAM LEV
  %-
  %2
  %*
  %+
  LAM OPSLP
  LAM SLP
  %-
  LAM CTBF
  %*
  %-
  {
    \"CTB UNIT\"
  }
  TAGOBS
  LAM CASC
  % 1.
  %=
  NOT_IT
  ::
    DUP
    STRIPTAGS
    LAM CASC
    %LOG
    %20
    %*
    %+
    {
      \"CTB CASC\"
    }
    TAGOBS
  ;
  LAM CSO
  %ABS
  %CHS
  LAM OP
  LAM LEV
  %-
  %+
  LAM OPSLP
  LAM SLP
  %-
  LAM CSOF
  %*
  %-
  {
    \"CSO UNIT\"
  }

```



```

TAGOBS
LAM CASC
% 1.
%=
NOT_IT
::
    DUP
    STRIPTAGS
    LAM CASC
    %LOG
    %10
    %*
    %+
    {
        \ "CSO CASC\ "
    }
    TAGOBS
;
LAM XMD
%ABS
%CHS
LAM OP
LAM LEV
%-
%2
%*
%+
LAM OPSLP
LAM SLP
%-
LAM CSOF
%*
%-
{
    \ "XMOD UNIT\ "
}
TAGOBS
LAM CASC
% 1.
%=
NOT_IT
::
    DUP
    STRIPTAGS
    LAM CASC
    %LOG
    %20
    %*
    %+
    {
        \ "XMOD CASC\ "
    }
    TAGOBS
;
LAM CIN
%ABS
%CHS
LAM OP
LAM LEV
%-
%2
%*
%+
{
    \ "CIN UNIT\ "
}
TAGOBS
LAM CASC
% 1.
%=
NOT_IT

```

```

::
  DUP
  STRIPTAGS
  LAM CASC
  %LOG
  %20
  %*
  %+
  {
    \ "CIN CASC\ "
  }
  TAGOBS
;
LAM LEV
% -59.14
LAM GAIN
LAM NFH
%+
%+
%-
{
  \ "HF CNR UNIT\ "
}
TAGOBS
LAM CASC
% 1.
%=
NOT_IT
::
  DUP
  STRIPTAGS
  LAM CASC
  %LOG
  %20
  %*
  %-
  {
    \ "HF CNR CASC\ "
  }
  TAGOBS
;
LAM LEV
% -59.17
LAM GAIN
LAM NFL
LAM IPSLP
%+
%+
%+
%-
{
  \ "LF CNR UNIT\ "
}
TAGOBS
LAM CASC
% 1.
%=
NOT_IT
::
  DUP
  STRIPTAGS
  LAM CASC
  %LOG
  %20
  %*
  %-
  {
    \ "LF CNR CASC\ "
  }
  TAGOBS
;

```

```
LAM CASC
% 1.
%=
NOT_IT
::
  hxs
  ROLL
  BINT10
  ROLL
  BINT9
  ROLL
  EIGHTROLL
  7ROLL
  SIXROLL
;
ABND
;
;
;
@"
```

<b>Anlys</b>
--------------

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"SPEC\"
  BINT0
  EIGHT
  \"AMP1\"
  BINT44
  EIGHT
  \"Fiber\"
  TWENTY
  EIGHT
  \"AMP2\"
  BINT67
  EIGHT
  \"AMP3\"
  BINT90
  EIGHT
  \"AMP4\"
  BINT114
  EIGHT
  \"CTB\"
  BINT0
  SEVENTEEN
  \"CSO\"
  BINT0
  BINT25
  \"CIN\"
  BINT0
  BINT33
  \"CNR\"
  BINT0
  BINT41
  'DROPPFALSE
  SEVENTEEN
  rompointer
  BINT22
  lam
  real
  {
    BINT0
  }
  BINT4
  \"Enter fiber CTB spec\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPPFALSE
  FOURTY
  rompointer
  BINT22
  lam
  real
  {
    BINT0
  }
  BINT4
  \"Enter amp 1 CTB spec\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPPFALSE
  BINT63
  rompointer
  BINT22

```

```

lam
real
{
  BINT0
}
BINT4
\"Enter amp 2 CTB spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
FIVESIX
rompointer
BINT22
lam
real
{
  BINT0
}
BINT4
\"Enter amp 3 CTB spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
BINT109
rompointer
BINT22
lam
real
{
  BINT0
}
BINT4
\"Enter amp 4 CTB spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
SEVENTEEN
TWENTYTHREE
BINT22
lam
real
{
  BINT0
}
BINT4
\"Enter fiber CSO spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
FOURTY
TWENTYTHREE
BINT22
lam
real
{
  BINT0
}
BINT4
\"Enter amp 1 CSO spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF

```

```

'DROPFALSE
BINT63
TWENTYTHREE
BINT22
lam
real
{
  BINT0
}
BINT4
\"Enter amp 2 CSO spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
FIVESIX
TWENTYTHREE
BINT22
lam
real
{
  BINT0
}
BINT4
\"Enter amp 3 CSO spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
BINT109
TWENTYTHREE
BINT22
lam
real
{
  BINT0
}
BINT4
\"Enter amp 4 CSO spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
FOURTY
THIRTYONE
BINT22
lam
real
{
  BINT0
}
BINT4
\"Enter amp 1 CIN spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
BINT63
THIRTYONE
BINT22
lam
real
{
  BINT0
}
BINT4
\"Enter amp 2 CIN spec\"

```

```

MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
FIVESIX
THIRTYONE
BINT22
lam
real
{
  BINT0
}
BINT4
\"Enter amp 3 CIN spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
BINT109
THIRTYONE
BINT22
lam
real
{
  BINT0
}
BINT4
\"Enter amp 4 CIN spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
SEVENTEEN
THIRTYNINE
BINT22
lam
real
{
  BINT0
}
BINT4
\"Enter fiber CNR spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
FOURTY
THIRTYNINE
BINT22
lam
real
{
  BINT0
}
BINT4
\"Enter amp 1 CNR spec\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
BINT63
THIRTYNINE
BINT22
lam
real
{

```

```

    BINT0
  }
  BINT4
  \ "Enter amp 2 CNR spec\ "
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  FIVESIX
  THIRTYNINE
  BINT22
  lam
  real
  {
    BINT0
  }
  BINT4
  \ "Enter amp 3 CNR spec\ "
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT109
  THIRTYNINE
  BINT22
  lam
  real
  {
    BINT0
  }
  BINT4
  \ "Enter amp 4 CNR spec\ "
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  BINT10
  BINT19
  'DROPFALSE
  \ "CASCADE ANALYSIS\ "
  DoInputForm
  NOT?SEMI
  ::
  {
    LAM CTBF
    LAM CTB1
    LAM CTB2
    LAM CTB3
    LAM CTB4
    LAM CSOF
    LAM CSO1
    LAM CSO2
    LAM CSO3
    LAM CSO4
    LAM CIN1
    LAM CIN2
    LAM CIN3
    LAM CIN4
    LAM CNRF
    LAM CNR1
    LAM CNR2
    LAM CNR3
    LAM CNR4
  }
  BIND
  ::
    LAM CTB4
    DUPTYPEBINT?
    ITE

```



```

::
  DROP
  %0
;
::
  %ABS
  %CHS
  %20
  %/
  %ALOG
;
LAM CTB3
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %20
  %/
  %ALOG
;
LAM CTB2
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %20
  %/
  %ALOG
;
LAM CTB1
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %20
  %/
  %ALOG
;
LAM CTBF
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %20
  %/
  %ALOG
;
%+
%+
%+
%+

```

```

%LOG
%20
%*
LAM CSO4
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %10
  %/
  %ALOG
;
LAM CSO3
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %10
  %/
  %ALOG
;
LAM CSO2
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %10
  %/
  %ALOG
;
LAM CSO1
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %10
  %/
  %ALOG
;
LAM CSOF
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %10
  %/

```

```

      %ALOG
    ;
    %+
    %+
    %+
    %+
    %LOG
    %10
    %*
    LAM CIN4
    DUPTYPEBINT?
    ITE
    ::
      DROP
      %0
    ;
    ::
      %ABS
      %CHS
      %20
      %/
      %ALOG
    ;
    LAM CIN3
    DUPTYPEBINT?
    ITE
    ::
      DROP
      %0
    ;
    ::
      %ABS
      %CHS
      %20
      %/
      %ALOG
    ;
    LAM CIN2
    DUPTYPEBINT?
    ITE
    ::
      DROP
      %0
    ;
    ::
      %ABS
      %CHS
      %20
      %/
      %ALOG
    ;
    LAM CIN1
    DUPTYPEBINT?
    ITE
    ::
      DROP
      %0
    ;
    ::
      %ABS
      %CHS
      %20
      %/
      %ALOG
    ;
    %+
    %+
    %+
    %LOG
    %20
    %*

```

```

LAM CNR4
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %10
  %/
  %ALOG
;
LAM CNR3
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %10
  %/
  %ALOG
;
LAM CNR2
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %10
  %/
  %ALOG
;
LAM CNR1
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %10
  %/
  %ALOG
;
LAM CNRF
DUPTYPEBINT?
ITE
::
  DROP
  %0
;
::
  %ABS
  %CHS
  %10
  %/
  %ALOG
;
%+

```

```

%+
%+
%+
%LOG
%10
%*
%CHS
DUP
%CHS
3PICK
%10
%/
%ALOG
SWAP
%10
%/
%ALOG
%+
%LOG
%10*
%CHS
{
  \ "CTB\ "
  \ "CSO\ "
  \ "CIN\ "
  \ "CNR\ "
  \ "CCNR\ "
}
TAGOBS
ABND
;
;
;
@ "

```

**LinLv**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Known LF level\"
  FORTYTWO
  hxs
  \"Freq\"
  TWENTY
  BINT38
  \"LF\"
  BINT0
  hxs
  \"Known HF level\"
  FORTYTWO
  TWENTYFOUR
  \"HF\"
  BINT0
  BINT25
  'DROPFALSE
  BINT10
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter low frequency in MHz\"
  MINUSONE
  MINUSONE
  % 54.
  % 54.
  'DROPFALSE
  BINT99
  BINT9
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter known level at low freq\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  BINT10
  BINT22
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter high frequency in MHz\"
  MINUSONE
  MINUSONE
  % 870.
  % 870.
  'DROPFALSE
  BINT99
  BINT22
  THIRTY

```

```

BINT9
real
{
  BINT0
}
BINT4
\"Enter known level at high freq\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
BINT38
BINT35
BINT27
BINT9
real
{
  BINT0
}
BINT4
\"Enter desired frequency in MHz\"
MINUSONE
MINUSONE
# FFFF
# FFFF
FIVE
FIVE
'DROPFALSE
\"Linear Level Interpolation\"
DoInputForm
NOT?SEMI
::
{
  LAM lf
  LAM lflev
  LAM hf
  LAM hflev
  LAM freq
}
BIND
::
  LAM hf
  LAM lf
  %-
  LAM hflev
  LAM lflev
  %-
  DUPROT
  %/
  LAM freq
  %*
  DUP
  LAM lflev
  %+
  {
    \"Overall Slope\"
    \"Slope at Freq\"
    \"Level at Freq\"
  }
  TAGOBS
  ABND
;
;
;
@\"

```

<b>Slope</b>
--------------

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Known level\"
  BINT0
  hxs
  \"Freq\"
  BINT0
  TWENTYFOUR
  \"LF\"
  BINT48
  TWENTYFOUR
  \"HF\"
  BINT93
  TWENTYFOUR
  \"Slope\"
  BINT0
  BINT38
  'DROPFALSE
  BINT45
  BINT9
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter known level at high freq\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  SEVENTEEN
  BINT22
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter desired frequency in MHz\"
  MINUSONE
  MINUSONE
  % 750.
  % 750.
  'DROPFALSE
  FIFTYNINE
  BINT22
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter low frequency in MHz\"
  MINUSONE
  MINUSONE
  % 54.
  % 54.
  'DROPFALSE
  BINT103
  BINT22
  BINT25

```



```

BINT9
real
{
  BINT0
}
BINT4
\"Enter high frequency in MHz\"
MINUSONE
MINUSONE
% 870.
% 870.
'DROPFALSE
BINT22
THIRTYSIX
BINT25
BINT9
real
{
  BINT0
}
BINT4
\"Enter slope between LF & HF (dB)\"
MINUSONE
MINUSONE
% 14.7
% 14.7
FIVE
FIVE
'DROPFALSE
\"Slope & Level\"
DoInputForm
NOT?SEMI
::
{
  LAM Level
  LAM Freq
  LAM Flo
  LAM Fhi
  LAM Slope
}
BIND
::
  LAM Freq
  LAM Flo
  %-
  LAM Slope
  LAM Fhi
  LAM Flo
  %-
  %/
  %*
  DUP
  LAM Slope
  %-
  DUP
  LAM Level
  SWAP
  %+
  {
    \"Slope\"
    \"Delta\"
    \"Level\"
  }
  TAGOBS
;
ABND
;
;
@\"

```

**EQLoss**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"EQ Value\"
  BINT6
  hxs
  \"Lo Freq\"
  BINT10
  TWENTYFOUR
  \"Hi Freq\"
  BINT10
  BINT38
  'DROPFALSE
  FOURTY
  BINT10
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter EQ value in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  FOURTY
  TWENTYTHREE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter low frequency in MHz\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  FOURTY
  THIRTYSIX
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter high frequency in MHz\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  THREE
  THREE
  'DROPFALSE
  \"EQ Loss VS Cable Attn\"
  DoInputForm
  NOT?SEMI
  ::
    %/
    SWAPDUP
    THREE

```

```
ROLL
%SQRT
%*
%1
%-
%-
;
;
@"
```

Tilt

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Tilt\"
  BINT22
  hxs
  \"Lo Freq\"
  BINT10
  TWENTYFOUR
  \"Hi Freq\"
  BINT10
  BINT38
  'DROPFALSE
  FOURTY
  BINT10
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter tilt (slope) in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  FOURTY
  TWENTYTHREE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter low frequency in MHz\"
  MINUSONE
  MINUSONE
  % 54.
  % 54.
  'DROPFALSE
  FOURTY
  THIRTYSIX
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter high frequency in MHz\"
  MINUSONE
  MINUSONE
  % 870.
  % 870.
  THREE
  THREE
  'DROPFALSE
  \"Tilt VS Cable Attn\"
  DoInputForm
  NOT?SEMI
  ::
    %/
    %SQRT
    %1

```

```
      SWAP
      %-
      %/
    ;
  ;
@ "
```

**BCPF**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"BW fwd\"
  TWENTYFOUR
  BINT10
  \"Penetration\"
  THREE
  TWENTY
  \"Nodes\"
  BINT27
  THIRTY
  \"Homes\"
  BINT27
  BINT41
  'DROPFALSE
  FIFTY
  EIGHT
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Service total downstream BW (MHz)\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  FIFTY
  EIGHTEEN
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Homes passed service penetration\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  FIFTY
  BINT28
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Nodes served by 1 foward Tx\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  FIFTY
  BINT38
  THIRTY
  EIGHT
  real
  {

```

```

    BINT0
  }
  BINT4
  \"Homes passed from each node\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  BINT4
  BINT4
  'DROPFALSE
  \"Forward Bandwidth/Customer\"
  DoInputForm
  NOT?SEMI
  ::
  {
    LAM bw
    LAM pen
    LAM nodes
    LAM homes
  }
  BIND
  ::
    LAM bw
    LAM pen
    LAM nodes
    LAM homes
    %*
    %100
    %/
    %*
    %/
    % 1000.
    %*
    ABND
    \"KHz\"
    >TAG
  ;
;
;
@\"

```

**BPCR**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"BW rtn\"
  TWENTYFOUR
  BINT10
  \"Penetration\"
  THREE
  TWENTY
  \"Nodes\"
  THREE
  THIRTY
  \"Homes\"
  FIVETHREE
  THIRTY
  \"Comb block converter lines\"
  BINT0
  BINT41
  'DROPPFALSE
  FIFTY
  EIGHT
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Service total upstream BW (MHz)\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPPFALSE
  FIFTY
  EIGHTEEN
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Homes passed service penetration\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPPFALSE
  TWENTYFOUR
  BINT28
  BINT25
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Nodes combined to each Rx\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPPFALSE
  BINT105
  BINT28
  BINT25

```



```

EIGHT
real
{
  BINT0
}
BINT4
\"Homes passed from each node\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
BINT105
BINT38
BINT25
EIGHT
real
{
  BINT0
}
BINT4
\"Independent, = sized node lines\"
MINUSONE
MINUSONE
# FFFF
# FFFF
FIVE
FIVE
'DROPFALSE
\"Upstream Bandwidth/Customer\"
DoInputForm
NOT?SEMI
::
{
  LAM bw
  LAM pen
  LAM nodes
  LAM homes
  LAM lines
}
BIND
::
  LAM lines
  LAM bw
  %*
  LAM pen
  LAM nodes
  LAM homes
  %*
  %100
  %/
  %*
  %/
  % 1000.
  %*
  ABND
  \"KHz\"
  >TAG
;
;
;
@\"

```

**Nsim**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \ "Modulation\ "
  lam
  BINT10
  \ "Bps/User\ "
  rompointer
  THIRTY
  \ "BW\ "
  THIRTYNINE
  FOURTY
  \ "BW Eff\ "
  TWENTYTHREE
  TWENTY
  'DROPFALSE
  FIFTY
  EIGHT
  BINT76
  EIGHT
  TWELVE
  MINUSONE
  SEVENTEEN
  \ "Choose modulation scheme\ "
  {
    {
      \ "PSK,FSK,ASK\ "
      %1
    }
    {
      \ "QPSK\ "
      %2
    }
    {
      \ "16-QAM\ "
      %4
    }
    {
      \ "64-QAM\ "
      %6
    }
    {
      \ "256-QAM\ "
      %8
    }
  }
  SEVENTEEN
  {
    \ "PSK,FSK,ASK\ "
    %1
  }
  {
    \ "PSK,FSK,ASK\ "
    %1
  }
  'DROPFALSE
  FIFTY
  EIGHTEEN
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \ "Enter efficiency (Typ 80 to 90%)\ "
  MINUSONE

```

```

MINUSONE
% 90.
% 90.
'DROPFALSE
FIFTY
BINT28
THIRTY
EIGHT
real
{
    BINT0
}
BINT4
\"Bits-per-second per user\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
FIFTY
BINT38
THIRTY
EIGHT
real
{
    BINT0
}
BINT4
\"Service bandwidth (MHz)\"
MINUSONE
MINUSONE
# FFFF
# FFFF
BINT4
BINT4
'DROPFALSE
\"Num Simultaneous Service Comms\"
DoInputForm
NOT?SEMI
::
{
    LAM mod
    LAM eff
    LAM bps
    LAM bw
}
BIND
::
    LAM mod
    INNERCOMP
    XYZ>Y
    LAM eff
    %100
    %/
    LAM bw
    %*
    %*
    LAM bps
    %/
    % 1000.
    %*
;
ABND
;
;
@"

```

<b>HPN</b>
------------

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Subs per homes passed\"
  BINT0
  TWENTY
  \"Service take-rate\"
  SEVENTEEN
  THIRTY
  \"Utilization factor\"
  THIRTEEN
  FOURTY
  \"Simultaneous users\"
  TWELVE
  BINT10
  'DROPFALSE
  FIVESIX
  EIGHT
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Enter # simultaneous users\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  FIVESIX
  EIGHTEEN
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Cable penetration %\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  FIVESIX
  BINT28
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"% Subs with cable modems\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  FIVESIX
  BINT38
  THIRTY
  EIGHT
  real
  {

```

```

    BINT0
  }
  BINT4
  \ "Est % number simult connected\ "
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  BINT4
  BINT4
  'DROPFALSE
  \ "Homes per Node\ "
  DoInputForm
  NOT?SEMI
  ::
  {
    LAM users
    LAM subs
    LAM take
    LAM util
  }
  BIND
  ::
    LAM users
    LAM subs
    %100
    %/
    LAM take
    %100
    %/
    LAM util
    %100
    %/
    %*
    %*
    %/
    ABND
  ;
;
;
@"

```

NA
----

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Core\"
  THIRTY
  THIRTEEN
  \"Clad\"
  THIRTY
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Refractive index of core\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Refractive index of cladding\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"Numerical Aperture\"
  DoInputForm
  NOT?SEMI
  ::
    {
      LAM core
      LAM clad
    }
    BIND
    ::
      LAM core
      DUP
      %*
      LAM clad
      DUP
      %*
      %-
      %SQRT
    ;
    ABND
  ;
;
@\"

```

<b>ACC</b>
------------

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Core\"
  THIRTY
  THIRTEEN
  \"Conf\"
  THIRTY
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Refractive index of core\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter confinement angle\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"Angle of Acceptance\"
  DoInputForm
  NOT?SEMI
  ::
    {
      LAM core
      LAM conf
    }
    BIND
    ::
      LAM conf
      %SIN
      LAM core
      %*
      %ASIN
      ABND
  ;
;
;
@\"

```

<b>Conf</b>
-------------

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Core\"
  THIRTY
  THIRTEEN
  \"Clad\"
  THIRTY
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Refractive index of core\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Refractive index of cladding\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"Confinement Angle\"
  DoInputForm
  NOT?SEMI
  ::
    {
      LAM core
      LAM clad
    }
    BIND
    ::
      LAM clad
      LAM core
      %/
      %ACOS
      ABND
  ;
;
@\"

```



<b>Crit</b>
-------------

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Core\"
  THIRTY
  THIRTEEN
  \"Clad\"
  THIRTY
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Refractive index of core\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Refractive index of cladding\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"Critical Angle\"
  DoInputForm
  NOT?SEMI
  ::
    {
      LAM core
      LAM clad
    }
    BIND
    ::
      LAM clad
      LAM core
      %/
      %ASIN
      ABND
  ;
;
@\"

```

**CNRIN**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \ "Mod\ "
  TWENTYTHREE
  THIRTYSEVEN
  \ "BW\ "
  BINT27
  TWENTYFOUR
  \ "RIN\ "
  TWENTYTHREE
  BINT10
  'DROPFALSE
  THIRTYSIX
  BINT9
  FOURTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \ "Relative Intensity Noise (dB/Hz)\ "
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  THIRTYSIX
  BINT22
  FOURTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \ "Receiver noise bandwidth (Hz)\ "
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  THIRTYSIX
  BINT35
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \ "Enter peak modulation in %\ "
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  THREE
  THREE
  'DROPFALSE
  \ "CNR/RIN\ "
  DoInputForm
  NOT?SEMI
  ::
  {
    LAM rin
    LAM bw

```

```

        LAM mod
    }
    BIND
    ::
        LAM rin
        %ABS
        LAM bw
        %LOG
        %10*
        %-
        LAM mod
        %100
        %/
        %2
        %SQRT
        %/
        %LOG
        %20
        %*
        %+
        ABND
    ;
;
;
@ "

```

**CNEdfa**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"NF\"
  BINT27
  THIRTYSEVEN
  \"OMI\"
  TWENTYTHREE
  TWENTYFOUR
  \"Input\"
  rompointer
  BINT10
  'DROPFALSE
  THIRTSIX
  BINT9
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Optical input power in dBm\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  THIRTSIX
  BINT22
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Optical Mod Index % per carrier\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  THIRTSIX
  BINT35
  BINT25
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"EDFA noise figure in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  THREE
  THREE
  'DROPFALSE
  \"CNR of an EDFA\"
  DoInputForm
  NOT?SEMI
  ::
  {
    LAM input
    LAM omi

```

```
      LAM nf
    }
  BIND
  ::
    % 86.2
    LAM input
    %+
    LAM omi
    %LOG
    %20
    %*
    %+
    LAM nf
    %-
    ABND
  ;
;
;
@"
```

**SHOT**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Rx Lev\"
  BINT38
  BINT10
  \"Peak Mod\"
  THIRTY
  TWENTY
  \"Responsivity\"
  EXT
  THIRTY
  \"Bandwidth\"
  BINT26
  FOURTY
  \"Hz\"
  IDREAL
  FOURTY
  \"mA/mW\"
  IDREAL
  THIRTY
  'DROPFALSE
  ARRYREAL
  EIGHT
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Received optical level in dB\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  ARRYREAL
  EIGHTEEN
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Peak modulation in %\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  ARRYREAL
  BINT28
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Receiving diode responsivity\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE

```

```

ARRAYREAL
BINT38
THIRTY
EIGHT
real
{
  BINT0
}
BINT4
\"Channel Noise susceptibility BW\"
MINUSONE
MINUSONE
# FFFFF
# FFFFF
BINT6
BINT4
'DROPFALSE
\"Shot Noise Carrier-to-Noise\"
DoInputForm
NOT?SEMI
::
{
  LAM level
  LAM mod
  LAM resp
  LAM bw
}
BIND
::
  LAM level
  LAM mod
  %100
  %/
  %2
  %SQRT
  %/
  %LOG
  %20
  %*
  %+
  LAM resp
  %LOG
  %10*
  %+
  LAM bw
  %LOG
  %10*
  %-
  % 154.94
  %+
  ABND
;
;
@\"

```

<b>CNPost</b>
---------------

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Rx Lev\"
  EIGHT
  BINT10
  \"Peak Mod\"
  FORTWO
  BINT10
  \"Responsivity\"
  EXT
  TWENTY
  \"Bandwidth\"
  BINT26
  THIRTY
  \"Hz\"
  IDREAL
  BINT29
  \"mA/mW\"
  IDREAL
  TWENTY
  \"Transimp\"
  BINT0
  FORTY
  \"NF\"
  BINT89
  FORTY
  'DROPFALSE
  BINT33
  EIGHT
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Received optical level in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  BINT99
  EIGHT
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Peak modulation in %\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  ARRYREAL
  EIGHTEEN
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4

```



```

\"Receiving diode responsivity\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
ARRYREAL
BINT28
THIRTY
EIGHT
real
{
    BINT0
}
BINT4
\"Channel Noise susceptibility BW\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
BINT33
THIRTYSEVEN
THIRTY
BINT9
real
{
    BINT0
}
BINT4
\"Transimpedance in ohms\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
BINT99
THIRTYSEVEN
THIRTY
BINT9
real
{
    BINT0
}
BINT4
\"Postamp noise figure\"
MINUSONE
MINUSONE
# FFFF
# FFFF
EIGHT
BINT6
'DROPFALSE
\"Postdetector CNR\"
DoInputForm
NOT?SEMI
::
{
    LAM lev
    LAM mod
    LAM resp
    LAM bw
    LAM ximp
    LAM nf
}
BIND
::
    LAM lev
    %2
    %*
    LAM mod

```

```

%100
%/
%2
%SQRT
%/
%LOG
%20
%*
%+
LAM resp
%LOG
%20
%*
%+
LAM bw
%LOG
%10*
%-
LAM ximp
%LOG
%10
%*
%+
LAM nf
%-
% 137.91
%+
ABND
;
;
;
@"

```

**CNThPost**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Rx Lev\"
  EIGHT
  BINT10
  \"Peak Mod\"
  FORTWO
  BINT10
  \"Responsivity\"
  EXT
  BINT19
  \"Bandwidth\"
  BINT26
  BINT29
  \"Hz\"
  IDREAL
  BINT29
  \"mA/mW\"
  IDREAL
  BINT19
  \"I/P noise current\"
  BINT0
  FORTY
  \"pA/fHz\"
  BINT101
  FORTY
  'DROPFALSE
  BINT33
  EIGHT
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Received optical level in dB\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  BINT99
  EIGHT
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4
  \"Peak modulation in %\"
  MINUSONE
  MINUSONE
  # FFFF
  # FFFF
  'DROPFALSE
  ARRYREAL
  SEVENTEEN
  THIRTY
  EIGHT
  real
  {
    BINT0
  }
  BINT4

```

```

\"Receiving diode responsivity\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
ARRYREAL
BINT27
THIRTY
EIGHT
real
{
    BINT0
}
BINT4
\"Channel Noise susceptibility BW\"
MINUSONE
MINUSONE
# FFFF
# FFFF
'DROPFALSE
BINT69
THIRTYSEVEN
THIRTY
BINT9
real
{
    BINT0
}
BINT4
\"I/P noise current density\"
MINUSONE
MINUSONE
# FFFF
# FFFF
EIGHT
FIVE
'DROPFALSE
\"Postdetector Thermal CNR\"
DoInputForm
NOT?SEMI
::
{
    LAM lev
    LAM mod
    LAM resp
    LAM bw
    LAM ncur
}
BIND
::
    LAM lev
    %2
    %*
    LAM mod
    %100
    %/
    %2
    %SQRT
    %/
    %LOG
    %20
    %*
    %+
    LAM resp
    %LOG
    %20
    %*
    %+
    LAM bw
    %LOG

```

```
%10*
%-
LAM ncur
%LOG
%20
%*
%-
%180
%+
ABND
;
;
;
@"
```

**MwdBm**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"mW\"
  BINT35
  THIRTEEN
  \"dBm\"
  THIRTYONE
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter power level in mW\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter power level in dBm\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"mW Ž□ dBm\"
  DoInputForm
  NOT?SEMI
  ::
    DUPTYPEBINT?
    ITE
    ::
      DROP
      %LOG
      %10*
    ;
    ::
      XY>Y
      %10
      %/
      %ALOG
    ;
  ;
;
@\"

```

**mVdBV**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"mV\"
  BINT35
  THIRTEEN
  \"dBmV\"
  THIRTYONE
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter power level in mV\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter power level in dBmV\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"mV Ž□ dBmV\"
  DoInputForm
  NOT?SEMI
  ::
    DUPTYPEBINT?
    ITE
    ::
      DROP
      %LOG
      %20
      %*
    ;
  ::
    XY>Y
    %20
    %/
    %ALOG
  ;
;
;
@\"

```

**mVdBm**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"mV\"
  BINT35
  THIRTEEN
  \"dBm\"
  THIRTYONE
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter power level in mV\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter power level in dBm\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"mV Ž□ dBm\"
  DoInputForm
  NOT?SEMI
  ::
    DUPTYPEBINT?
    ITE
    ::
      DROP
      %LOG
      %20
      %*
    ;
  ::
    XY>Y
    %20
    %/
    %ALOG
  ;
;
;
@\"

```



**dBm/V**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"dBmV\"
  BINT28
  THIRTEEN
  \"dBm\"
  THIRTYONE
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter power level in dBmV\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter power level in dBm\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"dBm Ž□ dBmV\"
  DoInputForm
  NOT?SEMI
  ::
    DUPTYPEBINT?
    ITE
    ::
      DROP
      % 48.75
      %-
    ;
    ::
      XY>Y
      % 48.75
      %+
    ;
  ;
;
@\"

```

dB $\mu$ /V

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"dBmV\"
  BINT28
  THIRTEEN
  \"dB $\mu$ V\"
  THIRTYONE
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter power level in dBmV\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter power level in dB $\mu$ V\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"dB $\mu$ V Ž□ dBmV\"
  DoInputForm
  NOT?SEMI
  ::
    DUPTYPEBINT?
    ITE
    ::
      DROP
      % 60.
      %+
    ;
    ::
      XY>Y
      % 60.
      %-
    ;
  ;
;
@\"

```

**GAINV**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Vout\"
  BINT28
  THIRTEEN
  \"Vin\"
  THIRTYONE
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter output power level in mV\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter input power level in mV\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"GainV\"
  DoInputForm
  NOT?SEMI
  ::
    %/
    %LOG
    %20
    %*
  ;
;
@\"

```

**GAINP**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Pout\"
  BINT28
  THIRTEEN
  \"Pin\"
  THIRTYONE
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter output power level in mW\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter input power level in mW\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"GainP\"
  DoInputForm
  NOT?SEMI
  ::
    %/
    %LOG
    %10
    %*
  ;
;
@\"

```

**LOSSV**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Vout\"
  BINT28
  THIRTEEN
  \"Vin\"
  THIRTYONE
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter output power level in mV\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter input power level in mV\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"LossV\"
  DoInputForm
  NOT?SEMI
  ::
    SWAP
    %/
    %LOG
    %20
    %*
  ;
;
@\"

```

**LOSSP**

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Pout\"
  BINT28
  THIRTEEN
  \"Pin\"
  THIRTYONE
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter output power level in mW\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter input power level in mW\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"LossP\"
  DoInputForm
  NOT?SEMI
  ::
    SWAP
    %/
    %LOG
    %10
    %*
  ;
;
@\"

```

<b>Pout</b>
-------------

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Pin\"
  BINT28
  THIRTEEN
  \"Loss\"
  THIRTYONE
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter input power level in mW\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter loss level in dB\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"Pout\"
  DoInputForm
  NOT?SEMI
  ::
    %10
    %/
    %ALOG
    %/
  ;
;
@\"

```

<b>Pin</b>
------------

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Pout\"
  BINT28
  THIRTEEN
  \"Loss\"
  THIRTYONE
  BINT28
  'DROPFALSE
  BINT47
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter input power level in mW\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  BINT47
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter loss level in dB\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"Pin\"
  DoInputForm
  NOT?SEMI
  ::
    %10
    %/
    %ALOG
    %*
  ;
;
@\"

```



XI
----

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Frequency\"
  TWENTYONE
  THIRTEEN
  \"Inductance\"
  SEVENTEEN
  BINT28
  'DROPFALSE
  FIFTYNINE
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter frequency in MHz\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  FIFTYNINE
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter inductance in  $\mu$ H\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"Inductive Reactance\"
  DoInputForm
  NOT?SEMI
  ::
    {
      LAM f
      LAM l
    }
    BIND
    ::
      %2
      %PI
      %*
      LAM f
      %*
      LAM l
      %*
      ABND
    ;
  ;
;
@\"

```

<b>Xc</b>
-----------

```

%%HP: T(1)A(D)F(.);
"!NO CODE
!RPL
::
  \"Frequency\"
  TWENTYONE
  THIRTEEN
  \"Capacitance\"
  THIRTEEN
  BINT28
  'DROPFALSE
  FIFTYNINE
  TWELVE
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter frequency in MHz\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  'DROPFALSE
  FIFTYNINE
  BINT26
  THIRTY
  BINT9
  real
  {
    BINT0
  }
  BINT4
  \"Enter capacitance in pf\"
  MINUSONE
  MINUSONE
  # FFFFF
  # FFFFF
  cmp
  cmp
  'DROPFALSE
  \"Capacitive Reactance\"
  DoInputForm
  NOT?SEMI
  ::
    {
      LAM f
      LAM c
    }
    BIND
    ::
      %1
      %2
      %PI
      %*
      LAM f
      %*
      LAM c
      % .000001
      %*
      %*
      %/
      ABND
    ;
  ;
;

```

@ "

**Revision History**

Version	Notes
1.0	Initial public release

