Here are some quick notes for common operator actions on CYBIS.

This version describes procedures for CYBIS running on NOS 2.8.7 on the DtCyber emulator.

1.   Local and remote control of DtCyber

DtCyber is controlled via two X-based applications, called "dd60" (the Cyber console emulation) and "dtoper" (the DtCyber operator control interface.

If you're using local access, i.e., you're at the X display of the machine where DtCyber runs, you would start DtCyber with the "dtcyber.sh" script. Among other things, that script will start dd60 and dtoper.

If you're using remote access (you're coming in via SSH) do **not** use dtcyber.sh but instead use "dtcyber-remote.sh". That script also does dtcyber startup handling but doesn't run the control applications.

For remote access, you'll need to specify SSH tunneling on the SSH command line, or in the tunneling settings if you're using a GUI-based SSH utility such as PuTTY. I use this command:

```
ssh -L 5104:localhost:5004  -L 5105:localhost:5005 \
 -L 5106:localhost:5006  -L 5107:localhost:5007 \
 -L 8105:localhost:8005 paul@cyberserv.org
```

The tunnel entries for 5004 and 8005 are for the classic and ASCII pterm respectively. 5005 is the port for the pterm at station 0-1; that is occasionally needed because 0-1 is a "special station". 5006 is the port for dtoper; 5007 is the port for dd60. I map all these to different port numbers locally so I don't get conflicts if I run dtcyber on my own machine while at the same time tunneling to Cyber1.

1.1.   Starting and stopping dtoper

You can start dtoper and stop at any time. It's ok to have more than one copy running. For local access, simply start it in the background:

```
./dtoper & <enter>
```

For remote access, specify the TCP port number to access. That will have to be a port number you gave to SSH for tunneling to the machine on which DtCyber is running. My convention is to use the standard port number plus 100; for dtoper that means 5106:

```
./dtoper 5106 & <enter>
```

To exit dtoper, enter the command:

```
end. <enter>
```

dtoper will exit. Note that this doesn't affect DtCyber.

1.2.   Starting and stopping dd60

You can start dd60 and stop at any time. It's ok to have more than one copy running. For local access, simply start it in the background:

```
./dd60 & <enter>
```

For remote access, specify the refresh interval, and the TCP port number to access.

The refresh rate controls how quickly dd60 updates. The default is every 60 milliseconds, which makes it nicely responsive for local use, but that isn't a good idea for WAN access. I usually pick 3-5 seconds for the refresh rate.

The TCP port number will have to be a port number you gave to SSH for tunneling to the machine on which DtCyber is running. My convention is to use the standard port number plus 100; for dd60 that means 5107:

```
./dd60 4 5107 & <enter>
```

To exit dd60, enter ALT-Z (Command-Z on the Mac). dd60 will exit. Note that this doesn't affect DtCyber.

2.   Startup.

Normally you will want to start DtCyber with a Level 0 Deadstart, and autostart everything.   There are two startup scripts: dtcyber.sh (if you're local, i.e., sitting at the X display of the machine where DtCyber runs) and dtcyber-remote.sh (if you're remote, i.e., connected via SSH). Either way, if you invoke the script without arguments, it will start DtCyber in autostart mode, which will start everything (including PLATO). Autostart mode also reinitializes ECS, which is necessary after certain failures and never hurts in a level 0 deadstart.

```
./dtcyber.sh
```

After a few seconds, two windows appear, one of these is the Cyber console. (If you're using dtcyber-remote.sh, the script just exits once dtcyber has started, and you then have to start dd60 and/or dtoper manually, at your local system.)

Click on the dd60 window to see the console display so you can see what's going on. When it first appears, NOS is in the middle of the deadstart, which shows a display like this:

```
14.42.54. 07/04/20. NETWORK OPERATING SYSTEM. (CYBER1).
             MID=AA   NOS 2.8.7 871/871.
NOW LOADING THE NOS SOFTWARE SYSTEM.
COPYRIGHT CONTROL DATA SYSTEMS INC.  1997.


                        DEADSTART STATUS.


                     LOADING   PFLOAD1




AUTO.
```

When it is done, you'll see the A and B displays on the console, and lots of things will start to run. After all the activity stops, PLATO is running; the display will look roughly like this:


```
A.  SYSTEM DAYFILE.                                B,A.  SYSTEM STATUS.

   14.45.22. 07/04/20. NETWORK OPERATING SYSTEM. (CYBER1).
              MID=AA    NOS 2.8.7 871/871.

   14.44.59.  PLAIS.    UNIT 3    DEVELOP   MASTER   A      CP   JSN  SC   PR    FL   CPU        STATUS
   14.44.59.  PLAIS.    UNIT 4    PUBA      MASTER   A
   14.44.59.  PLAIS.    UNIT 5    PUBB      MASTER   A      1
   14.44.59.  PLAIS.    UNIT 6    PUBC      MASTER   A      2    NAM  X    77    335   X   NV/       14.45.00.APPLICATIO
   14.45.00.  PLAIS.    UNIT 7    PUBD      MASTER   A      3    MAS1 S    76     45   X   CYBIS
   14.45.00.  PLAIS.    UNIT 8    PUBE      MASTER   A      4
   14.45.00.  PLAIS.    UNIT 9    PUBF      MASTER   A      5    PLA1 S    73   1243   X       CHECK DATE/TIME
   14.45.00.  PLAIS.    UNIT 10   PUBG      MASTER   A      6    COA1 S    72     11   X
   14.45.00.  PLAIS.    UNIT 11   PUBH      MASTER   A      7    FOR1 S    74    172   X   FRAMAT
   14.45.00.  PLAIS.    UNIT 12   PUBI      MASTER   A      10   PNI1 S    74    462   X       0 TERMINALS ACTIVE.
   14.45.00.  PLAIS.    UNIT 13   PUBJ      MASTER   A      11
   14.45.00.  PLAIS.    UNIT 14   BINARIES  BINARY   D      12
   14.45.00.  NAM X.    NV/       14.45.00.APPLICATION NETTED 0  13
              N. - CYBIS                                    13
   14.45.00.  PLAIS.    UNIT 15                             14
   14.45.00.  PLAIS.     ERROR  2  INFO =                   15
   14.45.00.  PLAIS.    UNIT 16                             16
   14.45.00.  PLAIS.    UNIT 17                             17
   14.45.00.  PLAIS.    UNIT 18                             20
   14.45.00.  PLAIS.    UNIT 19                             21
   14.45.00.  PLAIS.    UNIT 20                             22
   14.45.00.  PNI1S.    NETON COMPLETE.                     23
   14.45.00.  PLAIS.    UNIT 21                             24
   14.45.01.  PLAIS.    UNIT 22                             25
   14.45.01.  PLAIS.    UNIT 23
   14.45.01.  PLAIS.    UNIT 24
   14.45.01.  PLAIS.    UNIT 25
   14.45.01.  PLAIS.    UNIT 26                             26   MAG  X    76     35   X   MAGNET.
   14.45.01.  PLAIS.    UNIT 27                             27   BIO  X    70      2       IDLE.
   14.45.01.  PLAIS.    UNIT 28                             30
   14.45.01.  PLAIS.    UNIT 29                             31   SYS  S   100      0       EQ006, CYBER, 06 RECOVERED.
   14.45.01.  PLAIS.
   14.45.05.  PLAIS.    INSTALLING LOCAL SYSLES MODS
   14.45.05.  PLAIS.    LOCAL SYSTEM LESSONS INSTALLED
   14.45.07.  PLAIS.    SYSTEM *PKMAC.LOCA* NOT IN NETWORK TABLE
   14.45.08.  PLAIS.    (SDINIT) COURSEWARE ACCESS LIMIT NOT FOU
              ND
   14.45.14.  PLAIS.       CHECK DATE/TIME
```

3.   Shutdown.

First back out PLATO (1 3 from author mode). Then, at the console:

```
A.  SYSTEM DAYFILE.                              B,A.  SYSTEM STATUS.

  14.46.56. 07/04/20. NETWORK OPERATING SYSTEM. (CYBER1).
               MID=AA    NOS 2.8.7 871/871.


  14.44.59.  PLA1S.   UNIT 5    PUBB     MASTER    A     CP   JSN   SC    PR     FL   CPU        STATUS
  14.44.59.  PLA1S.   UNIT 6    PUBC     MASTER    A      1
  14.45.00.  PLA1S.   UNIT 7    PUBD     MASTER    A      2   NAM   X    77    335   X   NV/        14.45.00.APPLICATIO
  14.45.00.  PLA1S.   UNIT 8    PUBE     MASTER    A      3   MAS1  S    76     45   X   CYBIS
  14.45.00.  PLA1S.   UNIT 9    PUBF     MASTER    A      4
  14.45.00.  PLA1S.   UNIT 10   PUBG     MASTER    A      5   PLA1  S    73   1243   X   FULL SYSTEM BACKOUT COMPLETED.
  14.45.00.  PLA1S.   UNIT 11   PUBH     MASTER    A      6   COA1  S    72     11   X
  14.45.00.  PLA1S.   UNIT 12   PUBI     MASTER    A      7   FOR1  S    74    172   X   FRAMAT
  14.45.00.  PLA1S.   UNIT 13   PUBJ     MASTER    A     10   PNI1  S    74    462   X      0 TERMINALS ACTIVE.
  14.45.00.  PLA1S.   UNIT 14   BINARIES BINARY    D     11
  14.45.00.  NAM X.   NV/      14.45.00.APPLICATION NETTED 0  12
  14.45.00.            N - CYBIS                            13
  14.45.00.  PLA1S.   UNIT 15                              14
  14.45.00.   ERROR 2  INFO =                              15
  14.45.00.  PLA1S.   UNIT 16                              16
  14.45.00.  PLA1S.   UNIT 17                              17
  14.45.00.  PLA1S.   UNIT 18                              20
  14.45.00.  PLA1S.   UNIT 19                              21
  14.45.00.  PLA1S.   UNIT 20                              22
  14.45.00.  PNI1S.   NETON COMPLETE.                      23
  14.45.00.  PLA1S.   UNIT 21                              24
  14.45.01.  PLA1S.   UNIT 22                              25
  14.45.01.  PLA1S.   UNIT 23                              26   MAG   X    76     35   X   MAGNET.
  14.45.01.  PLA1S.   UNIT 24                              27   BIO   X    70      2       IDLE.
  14.45.01.  PLA1S.   UNIT 25                              30
  14.45.01.  PLA1S.   UNIT 26                              31   SYS   S   100      0       EQ006, CYBER, 06 RECOVERED.
  14.45.01.  PLA1S.   UNIT 27
  14.45.01.  PLA1S.   UNIT 28
  14.45.01.  PLA1S.   UNIT 29
  14.45.01.  PLA1S.
  14.45.05.  PLA1S.   INSTALLING LOCAL SYSLES MODS
  14.45.05.  PLA1S.   LOCAL SYSTEM LESSONS INSTALLED
  14.45.07.  PLA1S.   SYSTEM *PKMAC.LOCA* NOT IN NETWORK TABLE
  14.45.08.  PLA1S.   (SOINIT) COURSEWARE ACCESS LIMIT NOT FOU
                      ND
  14.45.14.  PLA1S.    CHECK DATE/TIME
  14.46.19.  PLA1S.   FULL SYSTEM BACKOUT COMPLETED.


K,MAS1.
```

k,mas1. <enter>

```
  K.            MAS1                              B,A.  SYSTEM STATUS.

  14.47.08. 07/04/20. NETWORK OPERATING SYSTEM. (CYBER1).
               MID=AA    NOS 2.8.7 871/871.

                                                    CP   JSN   SC    PR     FL   CPU        STATUS
                                                     1
                                                     2   NAM   X    77    335   X   NV/        14.45.00.APPLICATIO
                                                     3   MAS1  S    76     45   X   CYBIS
  MASTOR K-DISPLAY                                   4
                                                     5   PLA1  S    73   1243   X   FULL SYSTEM BACKOUT COMPLETED.
                                                     6   COA1  S    72     11   X
  SUBMIT FILE =    CYBIS                             7   FOR1  S    74    172   X   FRAMAT
                                                    10   PNI1  S    74    462   X      0 TERMINALS ACTIVE.
  SECUR       =    OFF                              11
                                                    12
                                                    13
                                                    14
                                                    15
                                                    16
                                                    17
                                                    20
                                                    21
                                                    22
                                                    23
                                                    24
                                                    25
                                                    26   MAG   X    76     35   X   MAGNET.
                                                    27   BIO   X    70      2       IDLE.
                                                    30
                                                    31   SYS   S   100      0       EQ006, CYBER, 06 RECOVERED.




  K.STOP
```

k.stop   <enter>
[(to erase the "k.")

```
K.                    MAS1                      B,A.   SYSTEM STATUS.

  14.47.31. 07/04/20. NETWORK OPERATING SYSTEM. (CYBER1).
            MID=AA    NOS 2.8.7 871/871.

 JSN NOT FOUND                               CP   JSN  SC   PR    FL   CPU        STATUS
                                              1
                                              2   NAM  X    77    335  X   NV/       14.47.11.APPLICATIO
                                              3
                                              4
                                              5
                                              6
                                              7
                                             10
                                             11
                                             12
                                             13
                                             14
                                             15
                                             16
                                             17
                                             20
                                             21
                                             22
                                             23
                                             24
                                             25
                                             26  MAG  X    76    35   X   MAGNET.
                                             27  BIO  X    70    2        IDLE.
                                             30
                                             31  SYS  S   100    0        EQ006, CYBER, 06 RECOVERED.



 AB.
```

ab.<enter>

```
A.   SYSTEM DAYFILE.                         B,A.   SYSTEM STATUS.

  14.47.41. 07/04/20. NETWORK OPERATING SYSTEM. (CYBER1).
            MID=AA    NOS 2.8.7 871/871.

 14.45.00.  PNI1S.   NETON COMPLETE.         CP   JSN  SC   PR    FL   CPU        STATUS
 14.45.00.  PLA1S.   UNIT 21                   1
 14.45.01.  PLA1S.   UNIT 22                   2   NAM  X    77    335  X   NV/       14.47.11.APPLICATIO
 14.45.01.  PLA1S.   UNIT 23                   3
 14.45.01.  PLA1S.   UNIT 24                   4
 14.45.01.  PLA1S.   UNIT 25                   5
 14.45.01.  PLA1S.   UNIT 26                   6
 14.45.01.  PLA1S.   UNIT 27                   7
 14.45.01.  PLA1S.   UNIT 28                  10
 14.45.01.  PLA1S.   UNIT 29                  11
 14.45.01.  PLA1S.                            12
 14.45.05.  PLA1S.   INSTALLING LOCAL SYSLES MODS   13
 14.45.05.  PLA1S.   LOCAL SYSTEM LESSONS INSTALLED  14
 14.45.07.  PLA1S.   SYSTEM *PKMAC.LOCA* NOT IN NETWORK TABLE  15
 14.45.08.  PLA1S.   (SOINIT) COURSEWARE ACCESS LIMIT NOT FOU  16
                     ND                       17
 14.45.14.  PLA1S.     CHECK DATE/TIME        20
 14.46.19.  PLA1S.   FULL SYSTEM BACKOUT COMPLETED.  21
 14.47.10.  MAS1S.   DS, K.STOP               22
 14.47.10.  PLA1S.   (PIO)  PPU DROPPED       23
 14.47.10.  PLA1S.    OPERATOR KILL.          24
 14.47.10.  COA1S.    OPERATOR KILL.          25
 14.47.10.  FOR1S.    OPERATOR KILL.          26  MAG  X    76    35   X   MAGNET.
 14.47.11.  NAM X.   NV/ - CYBIS  14.47.11.APPLICATION NETTED 0  27  BIO  X    70    2        IDLE.
                     FF - CYBIS               30
 14.47.11.  PNI1S.   NETOFF COMPLETE.         31  SYS  S   100    0        EQ006, CYBER, 06 RECOVERED.
 14.47.11.  PNI1S.    OPERATOR KILL.
 14.47.12.  MAS1S.   MASTOR DROP
 14.47.13.  MAS1S.   ELSE(MASTOR)
 14.47.13.  MAS1S.   ENDIF(MASTOR)
 14.47.13.  MAS1S.   DAYFILE.
 14.47.13.  MAS1S.    USER DAYFILE PROCESSED.
 14.47.13.  MAS1S.   EXIT.
 14.47.13.  MAS1S.    OUT(*/OP=E)
 14.47.13.  MAS1S.    UNLOAD(*/OP=O)
 14.47.13.  MAS1S.    DAYFILE(OUTPUT,JT=D)
 14.47.13.  MAS1S.    USER DAYFILE PROCESSED.



 IDLE,NAM.
```

idle,nam.<enter>

```
A.  SYSTEM DAYFILE.                                    B,A.  SYSTEM STATUS.
  14.48.19. 07/04/20. NETWORK OPERATING SYSTEM. (CYBER1).
                 MID=AA    NOS 2.8.7 871/871.

  14.47.52.  AAAFN.  DAYFILE(DFL)                       CP  JSN  SC   PR   FL  CPU        STATUS
  14.47.52.  AAAEN.  SKIPEI(NSLST)
  14.47.52.  AAAEN.  NOTE(DFL,NR)/NSDA163               1
  14.47.52.  AAAEN.   USER DAYFILE PROCESSED.           2
  14.47.52.  AAAEN.  DAYFILE(DFL)                       3
  14.47.52.  AAAFN.  PACK(DFL)                          4
  14.47.52.  AAADN.  ENDIF(NOTRACE)                     5
  14.47.52.  AAADN.  ATTACH(NVFLST=NVLO163/NA,M=W)      6
  14.47.52.  AAAEN.   USER DAYFILE PROCESSED.           7
  14.47.52.  AAAEN.  PACK(DFL)                          10
  14.47.52.  AAAFN.   PACK COMPLETE.                    11
  14.47.52.  AAAFN.  COPYEI(DFL,CSLST)                  12
  14.47.52.  AAAEN.   PACK COMPLETE.                    13
  14.47.52.  AAAFN.   EOI ENCOUNTERED.                  14
  14.47.52.  AAAFN.   EOI. O FILES  1 RECORD  400 WORDS. 15
  14.47.52.  AAAEN.  COPYEI(DFL,NSLST)
  14.47.52.  AAADN.  IF(.NOT.FILE(NVFLST,AS))DEFINE(NVFLST=NV  16
                     LO163)                             17
  14.47.52.  AAAFN.  SETJOB(DC=NO)                      20
  14.47.52.  AAADN.  DEFINE(NVFLST=NVLO163)             21
  14.47.52.  AAAEN.   EOI ENCOUNTERED.                  22
  14.47.52.  AAAEN.   EOI. O FILES  1 RECORD  389 WORDS. 23
  14.47.52.  AAAFN.  EXIT.  CS                          24
  14.47.52.  AAAEN.  SETJOB(DC=NO)                      25
  14.47.52.  AAAEN.  EXIT.  NS                          26  MAG  X   76   35  X  MAGNET.
  14.47.52.  AAADN.  SKIPEI(NVFLST)                     27  BIO  X   70   2     IDLE.
  14.47.52.  AAADN.  NOTE(DFL,NR)/NVDA163               30
  14.47.52.  AAADN.  DAYFILE(DFL)                       31  SYS  S  100   0     EQ006, CYBER, 06 RECOVERED.
  14.47.52.  AAADN.   USER DAYFILE PROCESSED.
  14.47.52.  AAADN.  PACK(DFL)
  14.47.52.  AAADN.   PACK COMPLETE.
  14.47.52.  AAADN.  COPYEI(DFL,NVFLST)
  14.47.52.  AAADN.   EOI ENCOUNTERED.
  14.47.52.  AAADN.   EOI. O FILES  1 RECORD  435 WORDS.
  14.47.52.  AAADN.  SETJOB(DC=NO)
  14.47.52.  AAADN.  EXIT.  NVF
  14.48.04.  SYS S.  DS, UNLOCK.
  14.48.11.  SYS S.  DS, LOCK.

UNLOCK.
```

unlock. <enter>

The word "UNLOCK" appears in bold on the top line of the display.

```
A.  SYSTEM DAYFILE.                                    B,A.  SYSTEM STATUS.
                       UNLOCK
  14.48.29. 07/04/20. NETWORK OPERATING SYSTEM. (CYBER1).
                 MID=AA    NOS 2.8.7 871/871.

  ...

  14.48.11.  SYS S.  DS, LOCK.
  14.48.30.  SYS S.  DS, UNLOCK.

CHECK POINT SYSTEM.
```

check point system. <enter>

Important! Wait for "check point complete" message (at the B display line for "system").

```
step. <enter>
```

The word "STEP" appears in bold on the top line of the display.

Now go to the DtCyber operator window. At that window, enter:


```
unlock. <enter>
```

The word "UNLOCKED" appears in the top line, on the right hand side.

```
        Desktop CYBER 2.2 ALPHA 3 (GPK) on pkmac.local          UNLOCKED
          OPERATOR INTERFACE
                                                                    (more)
   LOAD,CH,EQ,FILE   Load file for ch/eq, read-only.       DD844   25 00 pack/pube
   LOAD,CH,EQ,FILE,W. Load file for ch/eq, read/write.     DD844   25 01 pack/pubf
   LOCK.             Disable SHUTDOWN.                      DD844   25 02 pack/pubg
   UNLOCK.           Enable SHUTDOWN.                       DD844   25 03 pack/pubh
   UNLOAD,CH,EQ.     Unload ch/eq.                          DD844   25 04 pack/pubi
   DUMP,CPU.         Dump state of CPUs.                    DD844   25 05 pack/pubj
   DUMP,CM,X,Y.      Dump CM from X to Y.                   DD844   25 06 pack/binary
   DUMP,ECS,X,Y.     Dump ECS from X to Y.                  DD844   25 07 pack/castor
   DUMP,PPUNN.       Dump specified PPU state.              DD844   26 00
   DISASSEMBLE,PPUNN. Disassemble specified PPU.            DD844   26 01
   SET,KEYBOARD=TRUE. Emulate console keyboard accurately.  DD844   26 02
   SET,KEYBOARD=EASY. Make console keyboard easy (rollover). DD844  26 03
   DEBUG,DISPLAY=[ON,OFF]. Turn CP/PP debug display on/off. DD6612  10 00 1 connection
   DEBUG,[ON,OFF].   Enabled/disable debug commands.        CR3447  12 04
   TRACE,CPUN.       Trace specified CPU activity.          MT669   13 00 sys/871/cy871ar.tap
   TRACE,CPNN.       Trace CPU activity for CP NN.          MT669   13 01
   TRACE,XJ.         Trace exchange jumps.                  MT669   13 02
   TRACE,PPUNN.      Trace specified PPU activity.          MT669   13 03
   TRACE,CHANNELNN.  Trace specified channel activity.      NIU     05 00
   TRACE,ECS.        Trace ECS accesses.                    NPU     06 00
   UNTRACE,XXX       Stop trace of XXX.
   UNTRACE,.         Stop all tracing.
   UNTRACE,RESET.    Stop tracing, discard trace data.

   END.              Exit operator mode.
   SHUTDOWN.         Close DtCyber.


   SHUTDOWN.
```

shutdown. <enter>

The message "DtCyber shut down." appears at the bottom, indicating that DtCyber has exited.


```
        Desktop CYBER 2.2 ALPHA 3 (GPK) on pkmac.local          UNLOCKED
          OPERATOR INTERFACE
                                                                    (more)
   LOAD,CH,EQ,FILE   Load file for ch/eq, read-only.       DD844   25 00 pack/pube
   LOAD,CH,EQ,FILE,W. Load file for ch/eq, read/write.     DD844   25 01 pack/pubf
   LOCK.             Disable SHUTDOWN.                      DD844   25 02 pack/pubg
   UNLOCK.           Enable SHUTDOWN.                       DD844   25 03 pack/pubh
   UNLOAD,CH,EQ.     Unload ch/eq.                          DD844   25 04 pack/pubi
   DUMP,CPU.         Dump state of CPUs.                    DD844   25 05 pack/pubj
   DUMP,CM,X,Y.      Dump CM from X to Y.                   DD844   25 06 pack/binary
   DUMP,ECS,X,Y.     Dump ECS from X to Y.                  DD844   25 07 pack/castor
   DUMP,PPUNN.       Dump specified PPU state.              DD844   26 00
   DISASSEMBLE,PPUNN. Disassemble specified PPU.            DD844   26 01
   SET,KEYBOARD=TRUE. Emulate console keyboard accurately.  DD844   26 02
   SET,KEYBOARD=EASY. Make console keyboard easy (rollover). DD844  26 03
   DEBUG,DISPLAY=[ON,OFF]. Turn CP/PP debug display on/off. DD6612  10 00 1 connection
   DEBUG,[ON,OFF].   Enabled/disable debug commands.        CR3447  12 04
   TRACE,CPUN.       Trace specified CPU activity.          MT669   13 00 sys/871/cy871ar.tap
   TRACE,CPNN.       Trace CPU activity for CP NN.          MT669   13 01
   TRACE,XJ.         Trace exchange jumps.                  MT669   13 02
   TRACE,PPUNN.      Trace specified PPU activity.          MT669   13 03
   TRACE,CHANNELNN.  Trace specified channel activity.      NIU     05 00
   TRACE,ECS.        Trace ECS accesses.                    NPU     06 00
   UNTRACE,XXX       Stop trace of XXX.
   UNTRACE,.         Stop all tracing.
   UNTRACE,RESET.    Stop tracing, discard trace data.

   END.              Exit operator mode.
   SHUTDOWN.         Close DtCyber.


   END.
```

end. <enter>

This will close the operator window.

3.1.   Shutdown failures

Sometimes, if a PPU program is misbehaving, the "check point system" step does not complete normally. (Give it 30 seconds or so, but it should complete fairly quickly.) If

that happens, do the following. **Important: d**o this right away, you get only **one** chance to do this and you wouldn't want to wait till later and forget...
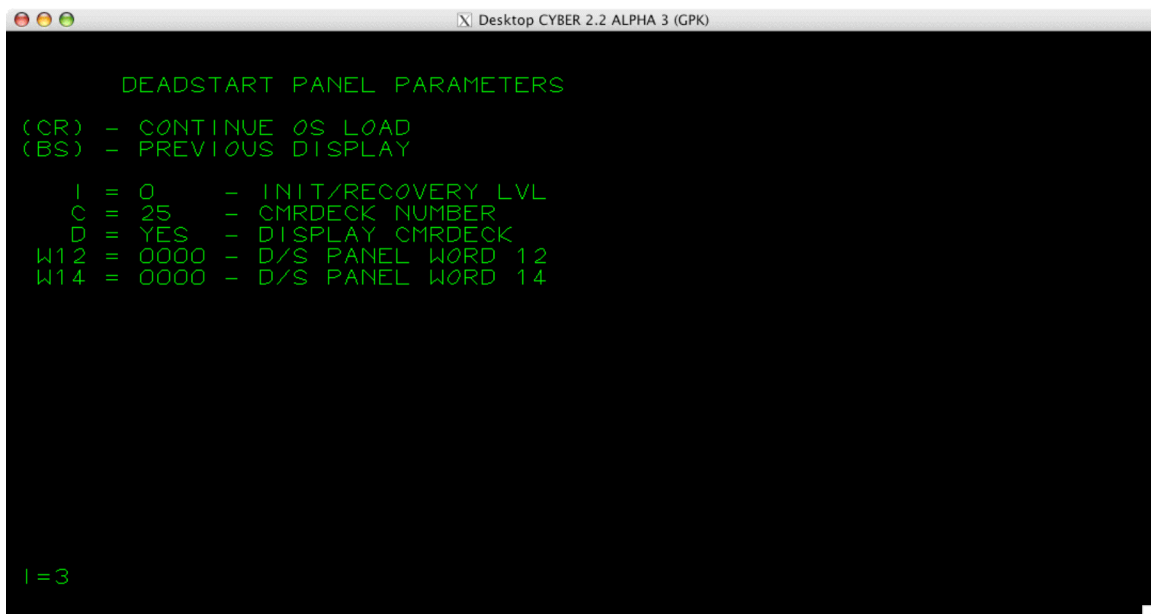
Go to the DtCyber operator window. At that window, enter:

```
unlock. <enter>
shutdown. <enter>
end. <enter>
```

Now restart dtcyber **without** autostart:

```
./dtcyber.sh cybis871>
```

Then go to the console window and use the Deadstart Options display to do a level 3 deadstart:


```
O P I=3 <enter>
```

The Level 3 deadstart options display will appear. Enter:

```
abort. <enter>
go. <enter>
```

You should get a display like this. Don't be mislead by the "recovery aborted" message, the right thing has happened at this point.

Now go to the DtCyber operator window. At that window, enter:

```
unlock. <enter>
shutdown. <enter>
end. <enter>
```

Finally, restart DtCyber using the autostart (which is a level 0 deadstart with ECS initialization).

4. Crashes.

If PLATO (CYBIS) dies, you will get the dreaded "plato off" display on all the terminals. A memory dump will be generated and sent to the "printer". Mastor will automatically restart things.

If Conden dies, you may be able to restart it from the menu from 1 at author mode.

If Framat dies, go to the console window and enter:

```
drop,pla1. <enter>
```

(which will produce "plato off") and things should restart.

If Mastor dies, shut down the system and restart, as follows:

On the console, enter:

```
idle,nam. <enter>
unlock. <enter>
check point system. <enter>
```

Important! Wait for "check point complete" message (at the B display line for "system").

```
step. <enter>
```

Now go to the DtCyber operator window. At that window, enter:

```
unlock. <enter>
shutdown. <enter>
end. <enter>
```

Then restart DtCyber using the autostart (level 0 deadstart with ECS initialization).

4.1. Dump file preservation

In any of the above crash cases, wait for any line printer output to stop (BIO status on the B display is IDLE). Then enter this command into the DtCyber operator window:

```
unload,12,5. <enter>
```

You'll get a message saying that LP was unloaded to some long file name. That's the line printer output up to this point; save it for analysis.

If DtCyber dies, hopefully we'll have a corefile; save that for analysis. In all cases, if you do a restart, make it a level zero deadstart, with ECS initialized.

5. The "black box"

Some PLATO systems had a black box (earlier, an 8-track tape, if I remember right) that would transmit a fixed message periodically to all terminals. This is useful if the system

is down for some reason; that might be backups, or some planned (or unplanned) downtime of another kind.

The DtCyber equivalent is the utility program "blackbox". You can run this when DtCyber is **not** running. It takes one argument, which is the message to be displayed. It accepts connections from pterms, just as DtCyber does. It will ignore any input, and send the supplied message to every connected terminal every 5 seconds.

For example:

./blackbox "Backups in progress, expect PLATO back at 9:00 PST"

If no argument is given, the default is: "PLATO is down for the moment".

Blackbox will reply "Current message is: *message*" and "Enter a new message at any time, or Ctrl/D to stop blackbox". This allows you to change the message if you need to; just type the new message and Enter. You can change it as often as needed.

The black box runs until terminated (by control/D). It takes very little CPU time, so it can easily be used while the system is busy doing backups or the like.

If you use "blackbox" be sure to stop it before restarting DtCyber.

If you forget, you should see some messages saying "can't bind to socket" from DtCyber. If that happens, let startup complete normally, shut down DtCyber, kill blackbox, and restart. Since the NIU (PLATO terminal interface) couldn't start up in this situation, you'll need the console PLATO terminal (x.console.) to shut down PLATO if you had done an autostart.