

ISPF IS DEAD! LONG LIVE ISPF!

User-Driven Enhancements for ISPF: CBT Usermod Collection for ISPF (CUCI)

Session 27273

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Abstract

Have you heard that ISPF is dead? Do you still rely on ISPF to do your job? Do you want to continue to see enhancements to ISPF so it remains relevant to the work you do? If you answered "YES" to any of these questions, then this session is for you! To paraphrase Mark Twain, reports of ISPF's death were an exaggeration. A dedicated core of long-time ISPF users and developers are working to enhance ISPF wherever possible, in order to ensure that ISPF remains viable well into the future. Two significant works from this group have been released so far: PDSEGEN and the CBT Usermod Collection for ISPF (CUCI). Attend this session to learn about exploiting PDSE Member Generations, EDIT highlighting for unsupported languages such as Java, SQL, shell script (and many more!), and other useful ISPF usermods as well. We fully expect this effort to continue and grow into the future, so please, COME JOIN THE REVOLUTION!



Agenda

- ISPF is Dead...
- LONG LIVE ISPF!
- The ISPF Cabal
- CBT Usermod Collection for ISPF (CUCI)
- USRCCONF
- FLOWASM Edit Highlighting
- Finally...



ISPF is Dead...

- IBM's investment in ISPF has been steadily dwindling
- z/OS V2R1 had 5 pages of enhancements
- z/OS V2R2 had 3 pages of enhancements
- z/OS V2R3 had two line items
 - TSO 8-character support
 - Make enhanced statistics usable (really a bug fix for an unusable design)
- z/OS V2R4 offered these "enhancements"
 - ISPF Upper Case function for Japanese clients (available for V2R3)
 - Withdrawal of ISPF Workstation Agent (WSA) after V2R4



ISPF is Dead...

- ISPF is no longer strategic for IBM
- z/OSMF strategic platform going forward for sysprogs
 - Workflows now strategic for software installs, so get with the program
- IBM Developer for z Systems strategic platform for developers
 - Support to bring your own IDE (Eclipse, vscode)
- Future enhancements likely limited to infrastructure support, BUT...
 - PDSE Member Generations cannot be displayed on a member list
 - You can Edit/View/Browse member generations by guessing
 - But how do you know if they're even there? (Use PDSEGEN, in Backup Slides)
 - IBM wasn't supporting new z/OS features, BUT....
 - OA59267 was created to support defining an extended GDG in option 3.2



LONG LIVE ISPF!

- Enter The ISPF Cabal

- Tom Conley, Pinnacle Consulting Group, Inc.
- Dan Dalby, Compuware
- Dan Dirkse, Iuvo Technologies
- Lionel Dyck, 21st Century
- Sam Golob
- John Kalinich
- Bruce Koss, Wells Fargo
- Ray Mullins, Rocket Software
- Greg Price, HCL
- Bill Smith



The ISPF Cabal

- Dedicated team of ISPF users determined to keep ISPF relevant
- We feel z/OSMF adoption as new sysprog interface has been slow
- Many sites still use critical homegrown ISPF applications in-house
- ISPF still has a large, dedicated user base
- To support them, we will deliver function to enhance ISPF operation
- We feel ISPF's lifespan is easily another 15-20 years, or more
- We're dedicated to keeping ISPF relevant during that timeframe



CBT Usermod Collection for ISPF (CUCI)

- In August 2017, I began to work on user-driven ISPF enhancements
- CBT Usermod Collection for ISPF (CUCI) was born
- Download [File967](http://www.cbttape.org) at <http://www.cbttape.org>
- All enhancements via usermod, no manual hacks allowed



CUCI Release V1.0

- First release V1R0 delivered on 11/16/2017, small proof of concept
- Satisfied two RFE's
 - RFE 112749 - Update ISPCMDS table entries for Minimum TRUNC values (e.g. UDLIST should be 3)
 - RFE 112745 - Add DSL as a synonym for the DSLIST command
 - Created ISPCMDS table member with abbreviated commands



CUCI Release V1R1

- During 2018, attempted two other ISPF enhancements (and 1 z/OS)
 - RFE 128561 - ISPF OPT 3.4 block delete commands should delete VSAM cluster, and bypass DATA and INDEX components without stopping
 - RFE 120120 - ISPF 3.17 Should Reset UID on Exit Back to User UID from SU
 - RFE 102407 - ISPF UDLIST - for reset to users default UID on exit (same as above RFE 120120)
 - Modified ISHELL to reset user's default UID on exit (z/OS usermod)
- Experienced multiple coding difficulties
- Finally delivered on 12/24/2018 (My 2018 Christmas gift to you!)



CUCI Release V1R2

- Release V1R2 delivered on 01/28/2019
 - RFE 122097 - ISPF EDIT highlighting for FORTRAN
 - RFE 117386 - ISPF EDIT highlighting for SQL
 - RFE 79228 - ISPF EDIT highlighting for SQL
 - RFE 57717 - ISPF EDIT highlighting for SQL
 - RFE 37007 - ISPF EDIT highlighting for SQL
 - RFE 107568 - ISPF EDIT highlighting for CARLa
 - RFE 83017 - ISPF EDIT highlighting for shell script
 - RFE 83016 - ISPF EDIT highlighting for Java



CUCI Release V1R2

- Release V1R2 delivered on 01/28/2019 (continued)
 - RFE 112741 - Simplify UNIX file access in ISPF by prepending current Unix directory to filename for COMPARE, COPY, CREATE, and REPLACE commands (BROWSE, EDIT, and VIEW require member names and continue to issue "Invalid member name" error message)



CUCI Release V1R3



NEW!

- Release V1R3 delivered on 07/12/2020 (Total RFEs delivered - 23)
 - RFE 143505 - Add missing ISPF options to ISPCCONF
 - RFE 42655 - ISPCCONF - Add PFKey
 - RFE 144196 - ISPF EDIT Highlighting for FLOWASM
 - RFE 143504 - ISPF EDIT Highlighting for Google GO
 - RFE 143155 - Modify SISPSAMP member ISRPXASM to add missing COBOL and PL/I keywords for highlighting (73 COBOL and 140 PL/I keywords added)
 - RFE 136261 - PDSE V2 allocated under ISPF (panel edit, should've been APAR)
 - RFE 132595 - VSCR for z/OS move ISPF SCLM members from LPA to LOAD
 - RFE 40668 - Prime ISRUMVC 'other dataset' field with current dataset for Copy/Move



CUCI Coming Attractions - Not In Plan

- UDLIST (3.17) file coloring (ISHELL analog)
 - UDLIST table display, can't color rows, model attributes unchangeable
- SWAPBAR options
 - They're in ISPSPROF, not ISRPROF, so nothing we can do



Set ISPF Defaults for Options not in ISPCCONF

- New dialog USRCCONF modelled after ISPCCONF
- Create keyword file member with options not set in ISPCCONF
- ISR@PRIM invokes Rexx exec to open option member and read it
- If new user, or admin specifies FORCE, update profile with settings
 - PFKeys
 - Calendar options for colors, start day, and time format
 - MEMLIST, DSLIST, UDLIST SRCHFOR options
 - UDLIST Directory List and Mount Table Options
 - UDLIST Directory List Column Arrangement
 - UDLIST Mount Table by File System Column Arrangement
 - UDLIST Mount Table by Mount Point Column Arrangement

Set ISPF Defaults for Options not in ISPCCONF

- Install ISR@PRIM)INIT code (or other primary option menu)

```
/* **** */
/* **** BEGIN CUCI MODIFICATIONS **** */
/* **** */
/* This code was added to ensure that the keyword settings would */
/* only be checked on initial logon. USRKWDAT is the date the user */
/* last logged on, and USRKWTSU is the last five digits in the job */
/* number TSUxxxxx (held in the ZSEQ variable). The two fields */
/* together uniquely identify a TSO session. Any START or SPLIT */
/* NEW command invoking a new menu will not incur the overhead of */
/* setting defaults. This code also tests for a new user, since */
/* the profile variables will be blank. */
/* **** */
VGET (USRKWDAT USRKWTSU) PROFILE
IF (&USRKWDAT NE &ZDATESTD | &USRKWTSU NE &ZSEQ)
  IF (&USRKWDAT = &Z AND &USRKWTSU = &Z)
    &USRKWNEW = 'YES'
    &USRKWDAT = &ZDATESTD
    &USRKWTSU = &ZSEQ
  VPUT ( USRKWDAT USRKWTSU ) PROFILE
&USRKWUPD = 'NO'
```


Set ISPF Defaults for Options not in ISPCCONF

- Install ISR@PRIM)INIT code (or your primary option menu, cont'd)

```
/* **** */
/* Create the name list of variables to pass to the Rexx panel exit. */
/* **** */
&USRNMLST = 'USRKWNEW USRKWUPD +
              ZPF01 ZPF02 ZPF03 ZPF04 ZPF05 ZPF06 +
              ZPF07 ZPF08 ZPF09 ZPF10 ZPF11 ZPF12 +
              ZPF13 ZPF14 ZPF15 ZPF16 ZPF17 ZPF18 +
              ZPF19 ZPF20 ZPF21 ZPF22 ZPF23 ZPF24 +
              ZPFL01 ZPFL02 ZPFL03 ZPFL04 ZPFL05 ZPFL06 +
              ZPFL07 ZPFL08 ZPFL09 ZPFL10 ZPFL11 ZPFL12 +
              ZPFL13 ZPFL14 ZPFL15 ZPFL16 ZPFL17 ZPFL18 +
              ZPFL19 ZPFL20 ZPFL21 ZPFL22 ZPFL23 ZPFL24 +
              ZMSFMIXV ZMSFANYC ZMSFASCI ZMSFVIEW +
              ZMSFSAVE ZMSFFILT ZMSFEDTF ZMSFBROF +
              ZUDFMIXV ZUDFANYC ZUDFASCI ZUDFVIEW +
              ZUDFSAVE ZUDFLIST ZUDFEDTF ZUDFBROF +
              ZMSFLIST ZCALSTRT ZCALGCSB ZCALGCHD +
              ZCALGCHT ZCALGCWD ZCALGCWE ZCALGCTD +
              ZCALTIME ZUS4LIST ZUS4MIXV ZUS4MIGR +
              ZUS4XCLD ZUS4VIEW ZUS4ANYC ZUS4XNF +
```

Set ISPF Defaults for Options not in ISPCCONF

- Install ISR@PRIM)INIT code (or your primary option menu, cont'd)

```

      ZUS4ASCI ZUS4TOTS ZUS4STOP +
      ZUS4XCLD ZUS4VIEW ZUS4ANYC ZUS4XNF  +
      ZUS4ASCI ZUS4TOTS ZUS4STOP +
      ZULWFNMC ZULFSUBC ZULSHCTM +
      ZULFCONV ZULCMDOM ZULDCONV ZULBYEDV +
      ZULDPMOV ZULUXPCV ZULBYEDF ZULDPMOF +
      ZULUXPCF ZULDLDIR ZULDIREG ZULDLCBS +
      ZULDLFIF ZULDLSYM ZULARR   ZMTFARR  +
      ZMTMARR  ZMTWFSYC ZMTWMTPC'

/*****/
/* If any updates were made to the default settings, VPUT all the      */
/* variables to the PROFILE pool.  Save the date and job number in      */
/* the profile to prevent multiple executions of USR@KYWD.              */
/*****/
      PANEXIT ( (&USRNMLST) ,REXX,%USR@KYWD)
      &USRKWDAT = &ZDATESTD
      &USRKWTSU = &ZSEQ
      VPUT ( USRKWDAT USRKWTSU ) PROFILE
      IF ( &USRKWUPD = 'YES' )
          VPUT ( ZPF01 ZPF02 ZPF03 ZPF04 ZPF05 ZPF06 ) PROFILE
```



Set ISPF Defaults for Options not in ISPCCONF

- Install ISR@PRIM)INIT code (or your primary option menu, cont'd)

```
VPUT ( ZPF07 ZPF08 ZPF09 ZPF10 ZPF11 ZPF12 ) PROFILE
VPUT ( ZPF13 ZPF14 ZPF15 ZPF16 ZPF17 ZPF18 ) PROFILE
VPUT ( ZPF19 ZPF20 ZPF21 ZPF22 ZPF23 ZPF24 ) PROFILE
VPUT ( ZPFL01 ZPFL02 ZPFL03 ZPFL04 ZPFL05 ZPFL06 ) PROFILE
VPUT ( ZPFL07 ZPFL08 ZPFL09 ZPFL10 ZPFL11 ZPFL12 ) PROFILE
VPUT ( ZPFL13 ZPFL14 ZPFL15 ZPFL16 ZPFL17 ZPFL18 ) PROFILE
VPUT ( ZPFL19 ZPFL20 ZPFL21 ZPFL22 ZPFL23 ZPFL24 ) PROFILE
VPUT ( ZMSFMIXV ZMSFANYC ZMSFASCI ZMSFVIEW ) PROFILE
VPUT ( ZMSFSAVE ZMSFFILT ZMSFEDTF ZMSFBROF ) PROFILE
VPUT ( ZUDFMIXV ZUDFANYC ZUDFASCI ZUDFVIEW ) PROFILE
VPUT ( ZUDFSAVE ZUDFLIST ZUDFEDTF ZUDFBROF ) PROFILE
VPUT ( ZMSFLIST ZCALSTRT ZCALGCSB ZCALGCHD ) PROFILE
VPUT ( ZCALGCHT ZCALGCWD ZCALGCWE ZCALGCTD ) PROFILE
VPUT ( ZCALTIME ZULWFNMC ZULFSUBC ZULSHCTM ) PROFILE
VPUT ( ZULFCONV ZULCMDOM ZULDCONV ZULBYEDV ) PROFILE
VPUT ( ZULDPMOV ZULUXPCV ZULBYEDF ZULDPMOF ) PROFILE
VPUT ( ZULUXPCF ZULDLDIR ZULDLREG ZULDLCHS ) PROFILE
VPUT ( ZULDLFIF ZULDLSYM ZULARR   ZMTFARR ) PROFILE
VPUT ( ZMTMARR   ZMTWFSYC ZMTWMTPC           ) PROFILE
```



Set ISPF Defaults for Options not in ISPCCONF

- Install ISR@PRIM)INIT code (or your primary option menu, cont'd)

```
&ZCMD = 'SP'  
.RESP = 'ENTER'  
  
/*****/  
/***** END CUCI MODIFICATIONS *****/  
/*****/
```



Set ISPF Defaults for Options not in ISPCCONF

- Modify USR@KYWD for your USRCCONF keyword file and member:

```
/* rexx */
call isprepx('I')
address tso "ALLOC FI(USRKWFIL) SHR",
            "DA('yourhlq.ispf.keyword(member) ')" /*MODIFY FOR */
                                                    /*YOUR ISPF */
                                                    /*KEYWORD FILE */
                                                    /*AND MEMBER */
"EXECIO * DISKR USRKWFIL (OPEN STEM USRKWFIL. FINIS)"
```



Set ISPF Defaults for Options not in ISPCCONF

- Enter “TSO USRCCONF” on command line or “USRCCONF” in option 6
- Enter keyword file and member
 - Must match keyword file and member specified in USR@KYWD member
 - You can use your ISPF keyword file with a unique member
 - Keyword file must be FB 251 or VB 255

Set ISPF Defaults for Options not in ISPCCONF

```
File Edit Font Transfer Macro Options Window Help zPDT
```

```
          CUCI ISPF Configuration for Settings not in ISPCCONF
Option ==> 1
```

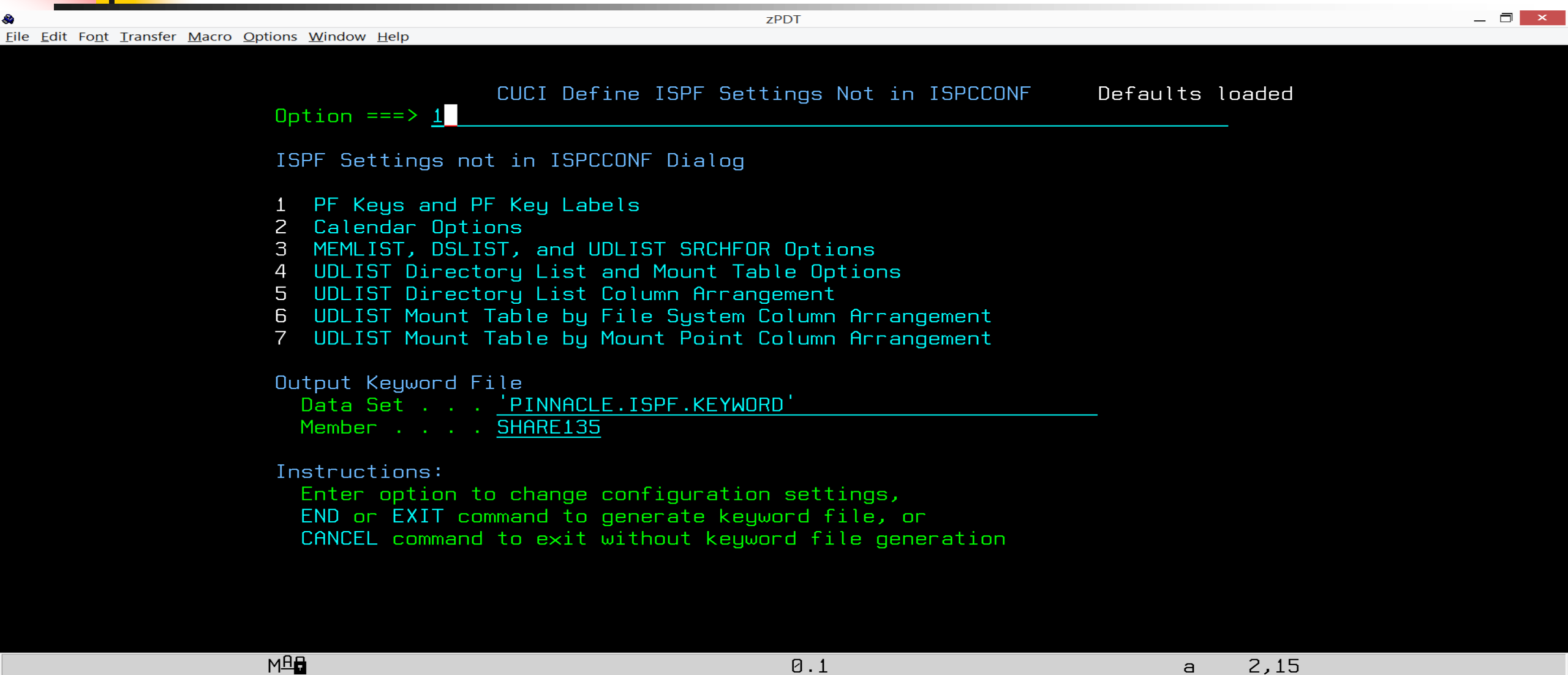
```
1 Define Settings Not in ISPCCONF and Generate Keyword File
2 View Keyword File
X Exit
```

```
Keyword File Data Set (should match dataset specified in ISR@PRIM)
Data Set . . . 'PINNACLE.ISPF.KEYWORD'
Member . . . . SHARE135
```

```
Output File Content for Keyword File
2 1. Include only non-default values
   2. Include defaults as comments
   3. Include all values
```

```
MA 0.0 a 2,15
```

Set ISPF Defaults for Options not in ISPCCONF



The image shows a screenshot of a zPDT window titled "zPDT". The window has a menu bar with "File", "Edit", "Font", "Transfer", "Macro", "Options", "Window", and "Help". The main content area displays the following text:

```
CUCI Define ISPF Settings Not in ISPCCONF      Defaults loaded

Option ==> 1

ISPF Settings not in ISPCCONF Dialog

1  PF Keys and PF Key Labels
2  Calendar Options
3  MEMLIST, DSLIST, and UDLIST SRCHFOR Options
4  UDLIST Directory List and Mount Table Options
5  UDLIST Directory List Column Arrangement
6  UDLIST Mount Table by File System Column Arrangement
7  UDLIST Mount Table by Mount Point Column Arrangement

Output Keyword File
Data Set . . . 'PINNACLE.ISPF.KEYWORD'
Member . . . . SHARE135

Instructions:
Enter option to change configuration settings,
END or EXIT command to generate keyword file, or
CANCEL command to exit without keyword file generation
```

The status bar at the bottom of the window displays "MBA", "0.1", "a", and "2,15".

Set ISPF Defaults for Options not in ISPCCONF

```
zPDT
File Edit Font Transfer Macro Options Window Help

PF Key Definitions and Labels - Primary Keys

Command ==>  More: -

PF13 :ts
PF14 SPLIT
PF15 END
PF16 :tf
PF17 RFIND
PF18 RCHANGE
PF19 UP
PF20 DOWN
PF21 SWAP
PF22 LEFT
PF23 RIGHT
PF24 RETRIEVE

Enter "/" to force settings

Force Force Force
PF13 label TEXTSPLT PF14 label PF15 label
PF16 label TEXTFLOW PF17 label PF18 label
PF19 label PF20 label PF21 label
PF22 label PF23 label PF24 label

Enter END command to exit.
```

MA 0.0 a 2,15

Set ISPF Defaults for Options not in ISPCCONF

zPDT

File Edit Font Transfer Macro Options Window Help

Calendar Colors and Options

Command ==>

Defaults

Change one or more of the Calendar colors and press enter to immediately see the effect. Clearing a field restores defaults.

More: +

Enter "/" to force settings

| Field and Color: | Force: | Valid Colors: | Sample: |
|-----------------------|--------|----------------|----------------------|
| Scroll Button . . . 1 | — | 1. White | < Calendar > |
| Heading Date . . . 6 | — | 2. Red | July 1995 |
| Heading Text . . . 3 | — | 3. Blue | Su Mo Tu We Th Fr Sa |
| Weekday 4 | — | 4. Green | 1 |
| Saturday/Sunday . 2 | — | 5. Pink | 2 3 4 5 6 7 8 |
| Current Day . . . 5 | — | 6. Yellow | 9 10 11 12 13 14 15 |
| | | 7. Turq | 16 17 18 19 20 21 22 |
| | | 8. CUA default | 23 24 25 26 27 28 29 |
| | | | 30 31 |
| | | | Time : 10:10 |
| | | | Day of year. : 202 |

Enter "/" to force settings

M 0.0 a 2,15

Set ISPF Defaults for Options not in ISPCCONF

```
File Edit Font Transfer Macro Options Window Help
zPDT

Calendar Colors and Options

Command ==>

Defaults

Change one or more of the Calendar colors and press enter to
immediately see the effect. Clearing a field restores defaults.

Saturday/Sunday . 2
Current Day . . . 5

5. Pink
6. Yellow
7. Turq
8. CUA default

More: -
2 3 4 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31
Time . . . . : 10:10
Day of year . : 202

Enter "/" to force settings
Start date . . . . . 1 1. Sunday
2. Monday
3. Saturday
_ FORCE Start date

Time format . . . . . 2 1. 12 hour format
2. 24 hour format
_ FORCE Time format

MBA 0.0 a 2,15
```

Set ISPF Defaults for Options not in ISPCCONF

```
File Edit Font Transfer Macro Options Window Help
zPDT

Modify MEMLIST, DSLIST, and UDLIST SRCHFOR Options

Command ==>

More: +

MEMLIST SRCHFOR Options

Enter "/" to select option      Enter "/" to force settings

Mixed Mode                      - FORCE Mixed Mode
/ Any case                      - FORCE Any case
ASCII                           - FORCE ASCII
/ Set EDIT FIND string          - FORCE Set EDIT FIND string
/ Set BROWSE FIND string        - FORCE Set BROWSE FIND string
- View output                   - FORCE View output
- Save output                   - FORCE Save output
/ Filter list                   - FORCE Filter list

DSLIST SRCHFOR Options

Enter "/" to select option      Enter "/" to force settings

- Mixed Mode                    - FORCE Mixed Mode
- Any case                      - FORCE Any case
- ASCII                         - FORCE ASCII
```

Set ISPF Defaults for Options not in ISPCCONF

```
zPDT
File Edit Font Transfer Macro Options Window Help

Modify MEMLIST, DSLIST, and UDLIST SRCHFOR Options

Command ==>

More: - +

DSLIST SRCHFOR Options

Enter "/" to select option

Z Mixed Mode
Z Any case
- ASCII
- Totals Only
- First found
Z View output
Z Exclude not found

Search Migrated
1 1. None
   2. First level
   3. All

Search Excluded
- 1. Excluded
  2. Non-excluded

Enter "/" to force settings

- FORCE Mixed Mode
- FORCE Any case
- FORCE ASCII
- FORCE Totals Only
- FORCE First found
- FORCE View output
- FORCE Exclude not found

- FORCE Search Migrated

- FORCE Search Excluded

MMA 0.0 a 2,15
```

Set ISPF Defaults for Options not in ISPCCONF

```
File Edit Font Transfer Macro Options Window Help      zPDT      _  _  x

Command ==>      Modify MEMLIST, DSLIST, and UDLIST SRCH      End of data

More:      -

1  1. None
   2. First level
   3. All

Search Excluded      _  FORCE Search Excluded
2  1. Excluded
   2. Non-excluded
   3. Both

UDLIST SRCHFOR Options

Enter "/" to select option      Enter "/" to force settings

Z  Mixed Mode      _  FORCE Mixed Mode
Z  Any case      _  FORCE Any case
Z  ASCII      _  FORCE ASCII
Z  Set EDIT FIND string      _  FORCE Set EDIT FIND string
Z  Set BROWSE FIND string      _  FORCE Set BROWSE FIND string
_  View output      _  FORCE View output
_  Save output      _  FORCE Save output

M  0.0      a  2,15
```

Set ISPF Defaults for Options not in ISPCCONF

```
File Edit Font Transfer Macro Options Window Help
zPDT

Modify UDLIST Directory List and Mount Table Options

Command ==>

More: +

Directory List Options

Enter "/" to force settings

Width of filename column . . . . . 30 _ FORCE File Width
Pathname substitution character . . . ! _ FORCE Path SubChar
z/OS UNIX command time limit . . . . _ _ FORCE Cmd Time Lim

Enter "/" to select option
/ Confirm File Delete _ FORCE Conf File Del
/ Confirm Non-empty Directory Delete _ FORCE Conf Dir Del
/ Bypass z/OS UNIX File Edit Options panel _ FORCE Byp EDIT Opt
/ Display permissions in octal format _ FORCE Octal Perm
/ Enter z/OS UNIX commands in Command field _ FORCE UNIX Cmds

Enter "/" to force settings
Output mode . . . . . 2 1..View _ FORCE Output Mode
2..Browse
```

Set ISPF Defaults for Options not in ISPCCONF

```
File Edit Font Transfer Macro Options Window Help zPDT
```

```
Modify UDLIST Directory List and Mount Table Options
```

```
Command ==> 
```

```
More: -
```

```
Enter "/" to force settings
```

```
Output mode . . . . . 2 1..View _ FORCE Output Mode
```

```
                2..Browse
```

```
Directory List Default Line Commands
```

```
Directory . . . . . L _ FORCE Directory
```

```
Regular file . . . . . B _ FORCE Regular file
```

```
Character special . I _ FORCE Char special
```

```
FIFO . . . . . I _ FORCE FIFO
```

```
Symbolic link . . . B _ FORCE Symlink
```

```
Mount Table List Options
```

```
Width of Mount Point column in Mount Point List . . 50 _ FORCE width
```

```
Width of File System column in File System List . . 50 _ FORCE width
```

```
MP 0.0 a 2,15
```


Set ISPF Defaults for Options not in ISPCCONF

```
zPDT
File Edit Font Transfer Macro Options Window Help

z/OS UNIX Directory List Column Arrangement Row 1 to 13 of 13
Command ==> _____ Scroll ==> CSR

Enter "/" to select option
_ Restore default column arrangements

Order  Column          Width  Maximum
01    Type             04      4
02    Permission       10     10
03    Audit            06      6
04    Ext              04      4
05    Fmat             04      4
06    Owner            08      8
07    Group            08      8
08    Links            06     14
09    Size             10     20
10    Modified         19     19
11    Changed          19     19
02    Accessed         19     19
13    Created          19     19
***** Bottom of data *****

MRA 0.0 a 19,6
```

Set ISPF Defaults for Options not in ISPCCONF

```
File Edit Font Transfer Macro Options Window Help
zPDT

z/OS UNIX Directory List Column Arrangement Row 1 to 13 of 13
Command ==> _____ Scroll ==> CSR

Enter "/" to select option
/ Restore default column arrangements

Order  Column          Width  Maximum
01   Type              04      4
02   Accessed          19     19
03   Permission        10     10
04   Audit             06      6
05   Ext               04      4
06   Fmat              04      4
07   Owner             08      8
08   Group             08      8
09   Links             06     14
10   Size              10     20
11   Modified          19     19
12   Changed           19     19
13   Created           19     19
***** Bottom of data *****

MBA 0.0 a 5,5
```

Set ISPF Defaults for Options not in ISPCCONF

```
zPDT
File Edit Font Transfer Macro Options Window Help

z/OS UNIX Directory List Column Arrangement Row 1 to 13 of 13
Command ==> CSR Scroll ==> CSR

Enter "/" to select option
_ Restore default column arrangements

Order  Column          Width  Maximum
01    Type              04      4
02    Permission        10     10
03    Audit             06      6
04    Ext               04      4
05    Fmat              04      4
06    Owner             08      8
07    Group             08      8
08    Links             06     14
09    Size              10     20
10    Modified          19     19
11    Changed           19     19
12    Accessed          19     19
13    Created           19     19
***** Bottom of data *****

MBA 0.0 a 2,15
```

Set ISPF Defaults for Options not in ISPCCONF

```
File Edit Font Transfer Macro Options Window Help
zPDT
Mount Table Column Arrangement Row 1 to 7 of 7
Command ==> Scroll ==> CSR
Enter "/" to select option
_ Restore default column arrangements

Order  Column      Width  Maximum
01    Mount Point   035    150
02    Type          004      8
03    Mode          004      8
04    Owner         008      8
05    A/M           003      3
06    Status        010     40
07    I/O Counts    010     16
***** Bottom of data *****

M 0.0 2,15
```

Set ISPF Defaults for Options not in ISPCCONF

```
zPDT
File Edit Font Transfer Macro Options Window Help

Mount Table Column Arrangement Row 1 to 7 of 7
Command ==> Scroll ==> CSR

Enter "/" to select option
_ Restore default column arrangements

Order  Column      Width  Maximum
 01  File System Name  035    70
 02  Type              004     8
 03  Mode              004     8
 04  Owner             008     8
 05  A/M              003     3
 06  Status           010    40
 07  I/O Counts       010    16
***** Bottom of data *****

M  0.0 a 2,15
```

Set ISPF Defaults for Options not in ISPCCONF

```
File Edit Font Transfer Macro Options Window Help zPDT
```

CUCI Define ISPF Settings Not in ISPCCONF

Option ==> end

ISPF Settings not in ISPCCONF Dialog

- 1 PF Keys and PF Key Labels
- 2 Calendar Options
- 3 MEMLIST, DSLIST, and UDLIST SRCHFOR Options
- 4 UDLIST Directory List and Mount Table Options
- 5 UDLIST Directory List Column Arrangement
- 6 UDLIST Mount Table by File System Column Arrangement
- 7 UDLIST Mount Table by Mount Point Column Arrangement

Output Keyword File

Data Set . . . 'PINNACLE.ISPF.KEYWORD'

Member . . . SHARE135

Instructions:

Enter option to change configuration settings,
END or EXIT command to generate keyword file, or
CANCEL command to exit without keyword file generation

MA 0.0 a 2,17

Set ISPF Defaults for Options not in ISPCCONF

```
File Edit Font Transfer Macro Options Window Help
zPDT

File Edit Edit_Settings Menu Utilities Compilers Test Help
VIEW PINNACLE.ISPF.KEYWORD(SHARE135) - 01.00 Columns 00001 00072
Command ==> Scroll ==> CSR
***** Top of Data *****
==MSG> -CAUTION- Data contains invalid (non-display) characters. Use command
==MSG> ==> FIND P'.' to position cursor to these
000001 /* ISPF CUCI Configuration for settings not in ISPCCONF */
000002 /* Generated by Rexx USRCMOD */
000003 /* Created 21:37:01 on 26 Jul 2020 */
000004 /* by user IBMUSER. */
000005 /* Defaults were included as comments. */
000006 /* */
000007 PF13 = :TS
000008 PF16 = :TF
000009 PF13_LABEL = TEXTSPLT
000010 PF16_LABEL = TEXTFLOW
000011 CALENDAR_SCROLL_BUTTON_COLOR =
000012 CALENDAR_HEADING_DATE_COLOR =
000013 CALENDAR_HEADING_TEXT_COLOR =
000014 CALENDAR_WEEKDAY_COLOR =
000015 CALENDAR_SATURDAY_SUNDAY_COLOR =
000016 CALENDAR_CURRENT_DAY_COLOR =
000017 CALENDAR_TIME_FORMAT = 2

M 0.0 a 4,15
```

Set ISPF Defaults for Options not in ISPCCONF

```
File Edit Font Transfer Macro Options Window Help
zPDT

File Edit Edit_Settings Menu Utilities Compilers Test Help
VIEW PINNACLE.ISPF.KEYWORD(SHARE135) - 01.00 Columns 00001 00072
Command ==> Scroll ==> CSR
000018 MEMLIST_SRCHFOR_ANY_CASE = /
000019 MEMLIST_SRCHFOR_SET_EDIT_FIND_STRING = /
000020 MEMLIST_SRCHFOR_SET_BROWSE_FIND_STRING = /
000021 MEMLIST_SRCHFOR_FILTER_LIST = /
000022 DSLIST_SRCHFOR_ANY_CASE = /
000023 DSLIST_SRCHFOR_EXCLUDE_NOT_FOUND = /
000024 UDLIST_SRCHFOR_ANY_CASE = /
000025 UDLIST_SRCHFOR_SET_EDIT_FIND_STRING = /
000026 UDLIST_SRCHFOR_SET_BROWSE_FIND_STRING = /
000027 UDLIST_WIDTH_OF_FILENAME_COLUMN = 30
000028 UDLIST_BYPASS_ZOS_UNIX_FILE_EDIT_OPTIONS_PANEL = /
000029 UDLIST_DISPLAY_PERMISSIONS_IN_OCTAL_FORMAT = /
000030 UDLIST_ENTER_ZOS_UNIX_COMMANDS_IN_COMMAND_FIELD = /
000031 UDLIST_SYMBOLIC_LINK_LINE_COMMAND = B
000032 UDLIST_WIDTH_OF_MOUNT_POINT_COLUMN_IN_MOUNT_POINT_LIST = 50
000033 UDLIST_WIDTH_OF_FILE_SYSTEM_COLUMN_IN_FILE_SYSTEM_LIST = 50
000034 /*-----*/
000035 /* The following values match the ISPF Defaults */
000036 /*-----*/
000037 /*-----*/

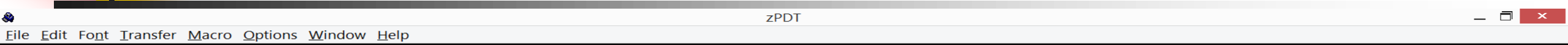
M 0.0 a 4,15
```


Set ISPF Defaults for Options not in ISPCCONF

```
zPDT
File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help
VIEW          PINNACLE.ISPF.KEYWORD(SHARE135) - 01.00          Columns 00001 00072
Command ==>  Scroll ==> CSR
000034 /*-----*/
000035 /*          The following values match the ISPF Defaults          */
000036 /*-----*/
000037 /*-----*/
000038 /*          PFKeys          */
000039 /*-----*/
000040 /*PF01                      = HELP          */
000041 /*PF02                      = SPLIT          */
000042 /*PF03                      = END          */
000043 /*PF04                      = RETURN          */
000044 /*PF05                      = RFIND          */
000045 /*PF06                      = RCHANGE          */
000046 /*PF07                      = UP          */
000047 /*PF08                      = DOWN          */
000048 /*PF09                      = SWAP          */
000049 /*PF10                      = LEFT          */
000050 /*PF11                      = RIGHT          */
000051 /*PF12                      = RETRIEVE          */
000052 /*PF14                      = SPLIT          */
000053 /*PF15                      = END          */

M 0.0 a 4,15
```



```

CUCI ISPF Configuration for Settings not i      Keyword file saved
Option ==>

```

- ```
1 Define Settings Not in ISPCCONF and Generate Keyword File
2 View Keyword File
X Exit
```

Keyword File Data Set (should match dataset specified in ISR@PRIM)

```
Data Set . . . 'PINNACLE.ISPF.KEYWORD'
Member SHARE135
```

### Output File Content for Keyword File

1. Include only non-default values
2. Include defaults as comments
3. Include all values

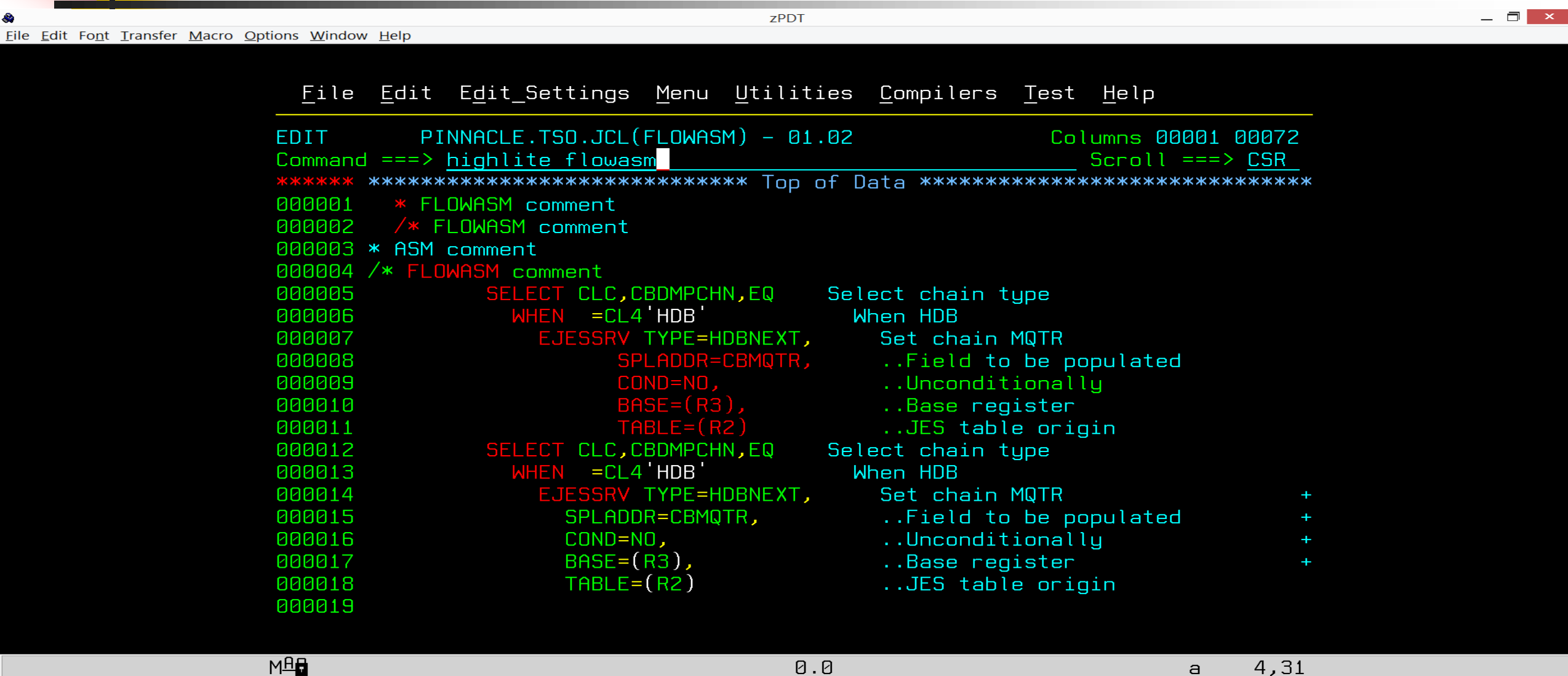


# Acknowledgements for USRCCONF

---

- Dan Dirkse – Iuvo Technologies
  - UDLIST and MOUNT TABLE columns stored in a cryptic way
  - Dan figured it out so I could deliver column ordering in USRCCONF
- Marv Knight – IBM
  - The calendar colors were not working
  - Marv gave me an idea, and calendar colors appeared on first invocation
- Bill Smith
  - Dialog options were being set on every invocation of ISR@PRIM
  - Bill gave me an idea, and dialog options ran once every ISPF session

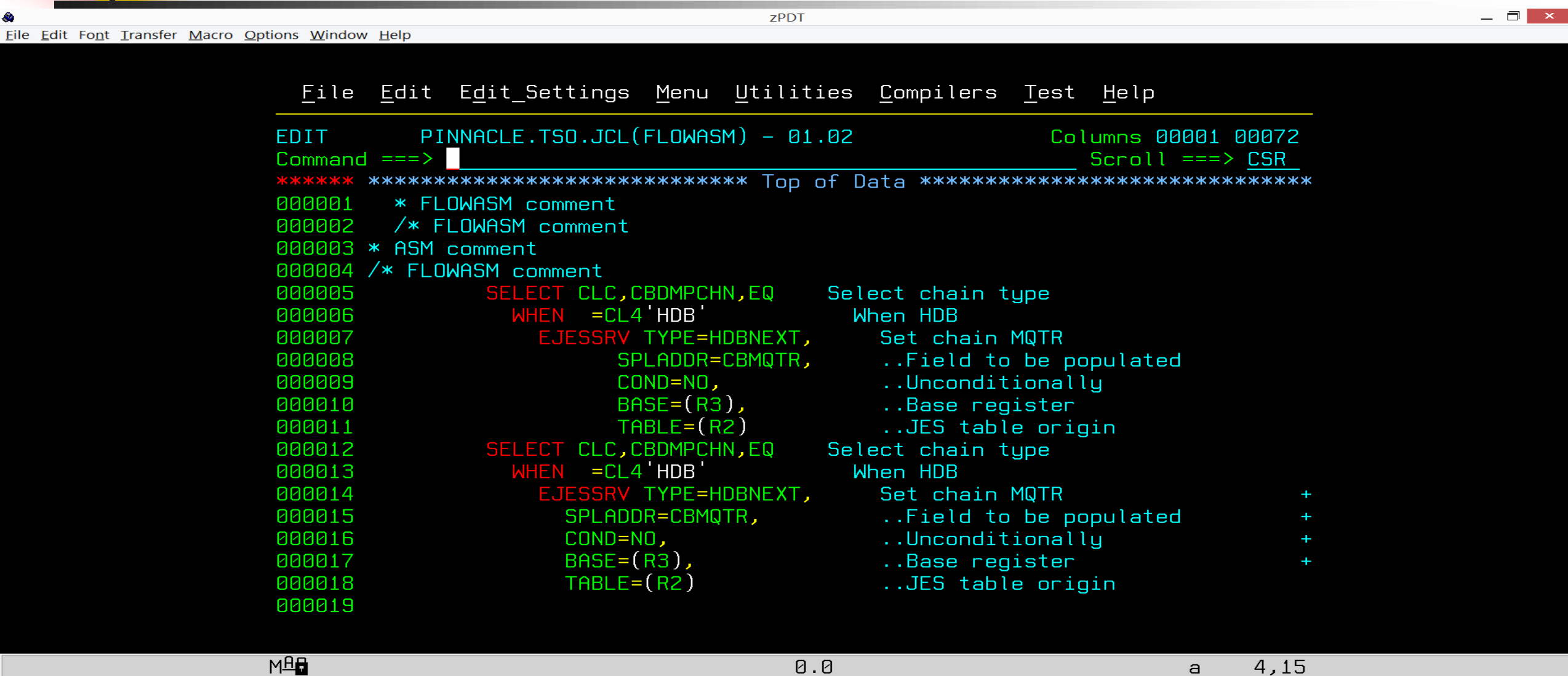
# FLOWASM Edit Highlighting



```
File Edit Font Transfer Macro Options Window Help
EDIT PINNACLE.TSO.JCL(FLOWASM) - 01.02 Columns 00001 00072
Command ==> highlite flowasm Scroll ==> CSR
***** Top of Data *****
000001 * FLOWASM comment
000002 /* FLOWASM comment
000003 * ASM comment
000004 /* FLOWASM comment
000005 SELECT CLC,CBDMPCN,EQ Select chain type
000006 WHEN =CL4'HDB' When HDB
000007 EJESSRV TYPE=HDBNEXT, Set chain MQTR
000008 SPLADDR=CBMQTR, ..Field to be populated
000009 COND=NO, ..Unconditionally
000010 BASE=(R3), ..Base register
000011 TABLE=(R2) ..JES table origin
000012 SELECT CLC,CBDMPCN,EQ Select chain type
000013 WHEN =CL4'HDB' When HDB
000014 EJESSRV TYPE=HDBNEXT, Set chain MQTR +
000015 SPLADDR=CBMQTR, ..Field to be populated +
000016 COND=NO, ..Unconditionally +
000017 BASE=(R3), ..Base register +
000018 TABLE=(R2) ..JES table origin
000019
```

MBA 0.0 a 4,31

# FLOWASM Edit Highlighting



```
File Edit Font Transfer Macro Options Window Help

EDIT PINNACLE.TSO.JCL(FLOWASM) - 01.02 Columns 00001 00072
Command ==> Scroll ==> CSR
***** Top of Data *****
000001 * FLOWASM comment
000002 /* FLOWASM comment
000003 * ASM comment
000004 /* FLOWASM comment
000005 SELECT CLC,CBDMPCHN,EQ Select chain type
000006 WHEN =CL4'HDB' When HDB
000007 EJESSRV TYPE=HDBNEXT, Set chain MQTR
000008 SPLADDR=CBMQTR, ..Field to be populated
000009 COND=NO, ..Unconditionally
000010 BASE=(R3), ..Base register
000011 TABLE=(R2) ..JES table origin
000012 SELECT CLC,CBDMPCHN,EQ Select chain type
000013 WHEN =CL4'HDB' When HDB
000014 EJESSRV TYPE=HDBNEXT, Set chain MQTR +
000015 SPLADDR=CBMQTR, ..Field to be populated +
000016 COND=NO, ..Unconditionally +
000017 BASE=(R3), ..Base register +
000018 TABLE=(R2) ..JES table origin
000019
```

M 0.0 a 4,15



# Finally...

---

- If you have any questions, please let me know
- If you have an idea for enhancing ISPF, please let me know
- If you want to try your hand at coding for CUCI, please let me know
- JOIN THE REVOLUTION!
- Drop me an Email [pincons@rochester.rr.com](mailto:pincons@rochester.rr.com)



# Backup Slides

---

- Following slides appeared in earlier versions of presentation:
  - PDSEGEN
  - REVEDIT
  - PDS86
  - CUCI Usermods
    - ISPCMDS
    - Block DELETES for VSAM in 3.4 Without Stopping
    - EDIT Highlighting for Java, SQL, etc!
    - USS path for COMPARE, COPY, CREATE, REPLACE



# PDSEGEN

---

- IBM introduced PDSE Member Generations in December 2013
- Unfortunately, it was rushed to GA
- Still today, no way to list PDSE Member Generations natively in z/OS
- ISPF Edit/View/Browse interface very limited and hard to use
- No support in IEBCOPY, JCL, DYNALLOC, et al.
- Lionel Dyck created PDSEGEN to address these shortcomings
- Other products that support PDSE Member Generations
  - CA-PDSMAN
  - Compuware FileAid
  - IBM Dataset Commander
  - MacKinney SimpList





# PDSEGEN

---

- In May of 2016, Lionel began working on PDSEGEN
- Used PDSE Developer Tom Reed's [presentation](#) from SHARE in Seattle
- Presentation provided Rexx samples to access member generations
- Lionel expanded Rexx code to start working with member generations
- John Kalinich discovered Xephon code to read PDSE object libraries
- Greg Price modified code to read PDSE data libraries
- Incorporated into PDSEGEN V2.0 in June 2016
- If you want to use PDSE Member Generations, you need PDSEGEN
- ISPF unlikely to ever duplicate function available in PDSEGEN
- PDSEGEN available [here](#) and at [Lionel Dyck's website](#)



# PDSEGEN and PDSE APARs

---

- PDSEGEN is great example of user-driven code for ISPF
- PDSEGEN development surfaced many PDSE Member Generation bugs
- DFSMS APAR OA42358, ISPF APARs OA42247, OA42248 added PDSE member generation support
- To safely use PDSE Member Generations, apply these APARs:
  - OA57897 - Oldest member gens inaccessible using ISPF Edit/Browse/View
  - OA56897 - AE OA56619 FIX COMPLETION Missing aliases after pending delete
  - OA56619 - Missing aliases after pending delete
  - OA55672 - PDSE member create failed with ABEND002 RC94
  - **OA54890 - IEBPDSE detects corruption after editing non-0 generation**
  - OA54281 - STOW RECOVERG bad RC for program object member gen



# PDSEGEN and PDSE APARs

---

- To safely use PDSE Member Generations, apply these APARs (cont'd):
  - OA53942 - ABEND 0C1 occurred while writing to a PDSE
  - OA53621 - Error updating member generation directory STOW TYPE=RG
  - OA52543 - Using DESERV FUNC=GET\_G and GET\_ALL\_G invalid length
  - OA51579 - IEC911I 315 ABEND when STOWing member at MAXGENS
  - OA51441 - Current/highest gen number not available to ISPF edit macros
  - OA51009 - Error msg for SAVE NEWGEN/NOGEN if gens not enabled

# PDSEGEN Line Commands

```
zPDT
File Edit Font Transfer Macro Options Window Help

------(PDSE V2 Member Generations 5.5.3)----- Row 1 to 9 of 9
Command ==> _____ Scroll ==> CSR

DSN=PINNACLE.PDSEV2.TEST - MaxGens=3
 Name Gen Abs Created Changed VV.MM Size Mod ID
- AMEM 0 0 2019/08/01 2019/08/01 20:40 01.00 1 0 IBMUSER
- AMEM -1 2 2019/08/01 2019/08/01 20:40 01.01 2 0 IBMUSER
/ BMEM 0 0 2019/08/01 2019/08/01 20:43 01.00 1 0 IBMUSER
| BMEM -1 49 2019/08/01 2019/08/01 20:43 01.00 1 0 IBMUSER
 BMEM -2 47 2019/08/01 2019/08/01 20:43 01.00 1 0 IBMUSER
- LINES10M 0 0 2019/08/01 2019/08/01 01:08 01.00 10M 0 IBMUSER
- LINES11M 0 0 2019/08/01 2019/08/01 01:10 01.00 11M 0 IBMUSER
- LINES13M 0 0 2019/08/01 2019/08/01 01:16 01.00 13M 0 IBMUSER
- LINES20M 0 0 2017/05/25 2017/05/25 14:43 01.00 20M 0 IBMUSER
***** Pages: 442,857 Percent Util: 90 *****

*PDSEGEN

MAB 0.3 a 9,2
```

# PDSEGEN Line Commands

```
File Edit Font Transfer Macro Options Window Help
zPDT
------(PDSE V2 Member Generations 5.5.3)----- Row 1 to 9 of 9
Command ==> Scroll ==> CSR

DSN=PINNACLE.PDSEV2.TEST - MaxGens=3

Na
AM
AM
/ BM
BM
BM
LI
LI
LI
LI

 A Atttrib E Edit Q RenSwap V View
 B Browse I Info R Rename X eXecute
 C Copy J Submit JCL T Tryit
 D Delete K Clone U User

------(PDSE V2 Generations Select 5.5.3)-----
Command ==> _____

Line selection processing for member: BMEM

Generation 0 (base) selection options.

Enter a valid member selection option: █

Mod ID
0 IBMUSER
0 IBMUSER
0 IBMUSER
0 IBMUSER
0 IBMUSER
0 IBMUSER
0 IBMUSER
0 IBMUSER
0 IBMUSER

*PDSEGEN

M 0.0 a 13,48
```

# PDSEGEN Line Commands

```
zPDT
File Edit Font Transfer Macro Options Window Help

------(PDSE V2 Member Generations 5.5.3)----- Row 1 to 9 of 9
Command ==> _____ Scroll ==> CSR

DSN=PINNACLE.PDSEV2.TEST - MaxGens=3
 Name Gen Abs Created Changed VV.MM Size Mod ID
- AMEM 0 0 2019/08/01 2019/08/01 20:40 01.00 1 0 IBMUSER
- AMEM -1 2 2019/08/01 2019/08/01 20:40 01.01 2 0 IBMUSER
- BMEM 0 0 2019/08/01 2019/08/01 20:43 01.00 1 0 IBMUSER
7 BMEM -1 49 2019/08/01 2019/08/01 20:43 01.00 1 0 IBMUSER
 BMEM -2 47 2019/08/01 2019/08/01 20:43 01.00 1 0 IBMUSER
- LINES10M 0 0 2019/08/01 2019/08/01 01:08 01.00 10M 0 IBMUSER
- LINES11M 0 0 2019/08/01 2019/08/01 01:10 01.00 11M 0 IBMUSER
- LINES13M 0 0 2019/08/01 2019/08/01 01:16 01.00 13M 0 IBMUSER
- LINES20M 0 0 2017/05/25 2017/05/25 14:43 01.00 20M 0 IBMUSER
***** Pages: 442,857 Percent Util: 90 *****

*PDSEGEN

MRA 0.0 a 110,2
```

# PDSEGEN Line Commands

```
File Edit Font Transfer Macro Options Window Help zPDT _ □ ×

------(PDSE V2 Member Generations 5.5.3)---- Row 1 to 9 of 9
Command ==> Scroll ==> CSR

DSN=PINNACLE.PDSEV2.TEST - MaxGens=3

Na
AM -----(PDSE V2 Generations Select 5.5.3)-----
AM Command ==> _____
BM
/ BM Line selection processing for member: BMEM
BM generation: -1
LI
LI Non-0 Generation selection options.
LI
LI Enter a valid member selection option: █

 B Browse I Info T Tryit X eXecute
 D Delete J Submit U User Z Compare
 G Recover P Promote V View

Mod ID
0 IBMUSER
0 IBMUSER
0 IBMUSER
0 IBMUSER
0 IBMUSER
0 IBMUSER
0 IBMUSER
0 IBMUSER

*PDSEGEN

MAB 0.0 a 14,48
```



# PDSEGEN Line Commands for Base Members

---

- For base members, PDESGEN provides the following options:
  - A (Attrib) - Display Version, Mod Level, and Userid for member
  - B (Browse) - Invoke ISPF Browse for member
  - C (Copy) - Copy base member and all its generations to another PDSE
  - D (Delete) - Deletes base and all gens or just base, promoting gens
  - E (Edit) - Invoke ISPF Edit for the member (base only)
  - I (Info) - Display ISPF stats, if available, for member
  - J (Submit JCL) - Submit member to internal reader
  - K (Clone) - Copy only base member (not the gens) to new name in same PDSE
  - Q (Rename Swap) - Swaps base member names and all generations
  - R (Rename) - Renames base member and all generations





# PDSEGEN Line Commands for Base Members

---

- For base members, PDESGEN provides the following options (cont'd):
  - T (Tryit) - Use Tryit to execute member (Rexx, CLIST, panel, skel, JCL, ASM)
  - U (User) - Invoke user command ("/" in command replaced with 'dsn(mem)')
  - V (View) - Invoke ISPF View for member
  - X (eXecute) - Executes member (CLIST/Rexx), gen executed from temp dataset
  - Z (Compare) - Compare base to a particular gen



# PDSEGEN Line Commands for Member Gens

---

- For generations, PDESGEN provides the following options:
  - B (Browse) - Invoke ISPF Browse for member generation
  - D (Delete) - Deletes member generation
  - \*\*NOTE NO EDIT FOR NON-ZERO GENS, CORRUPTS PDSE - OA54890 \*\*
  - G (Recover) - Copy member generation to new base member name
  - I (Info) - Display ISPF stats, if available, for member generation
  - J (Submit JCL) - Submit member generation to internal reader
  - P (Promote) - Promote member gen to base member, base becomes -1 gen (same as SAVE NEWGEN, but safer and will not corrupt PDSE)
  - T Tryit - Use Tryit to execute member gen (Rexx, CLIST, panel, skel, JCL, ASM)
  - U User - Invoke user command ("/" in command replaced with 'dsn(mem)')



# PDSEGEN Line Commands for Member Gens

---

- For generations, PDESGEN provides the following options(cont'd):
  - V (View) - Invoke ISPF View for member generation
  - X (eXecute) - Executes member gen (CLIST/Rexx) from temp dataset
  - Z (Compare) - Compare gen to base or other gens



# PDSEGEN Miscellaneous Primary/Batch Commands

---

- BACKUP primary command will backup PDSE and retain gen info
- PDSEGBAK Rexx exec will BACKUP/RESTORE PDSE in batch
- PDSEGENC Rexx exec will copy PDSE in batch, retaining gens in copy
- PRUNE command deletes obsolete member generations
- VALIDATE command invokes IEBPDSE to verify PDSE
  - Can also clean PDSE with PERFORMPENDINGDELETE operand of IEBPDSE



# REVEDIT

---

- REVEDIT is part of Greg Price's REVIEW package on CBT Mods Tape
- Grab Greg's FILE134 [here](#), and FILE135 [here](#)
- REVEDIT partially satisfies RFE 112742 for editing larger files
- Uses SCOPE-SINGLE extendable dataspace
  - Dataspace limited to 2GB or smaller by installation settings
  - Cut/Paste records held in subpool 38 in region, so can't cut 2GB of data
  - Cut/Paste does not communicate with ISPF Cut/Paste

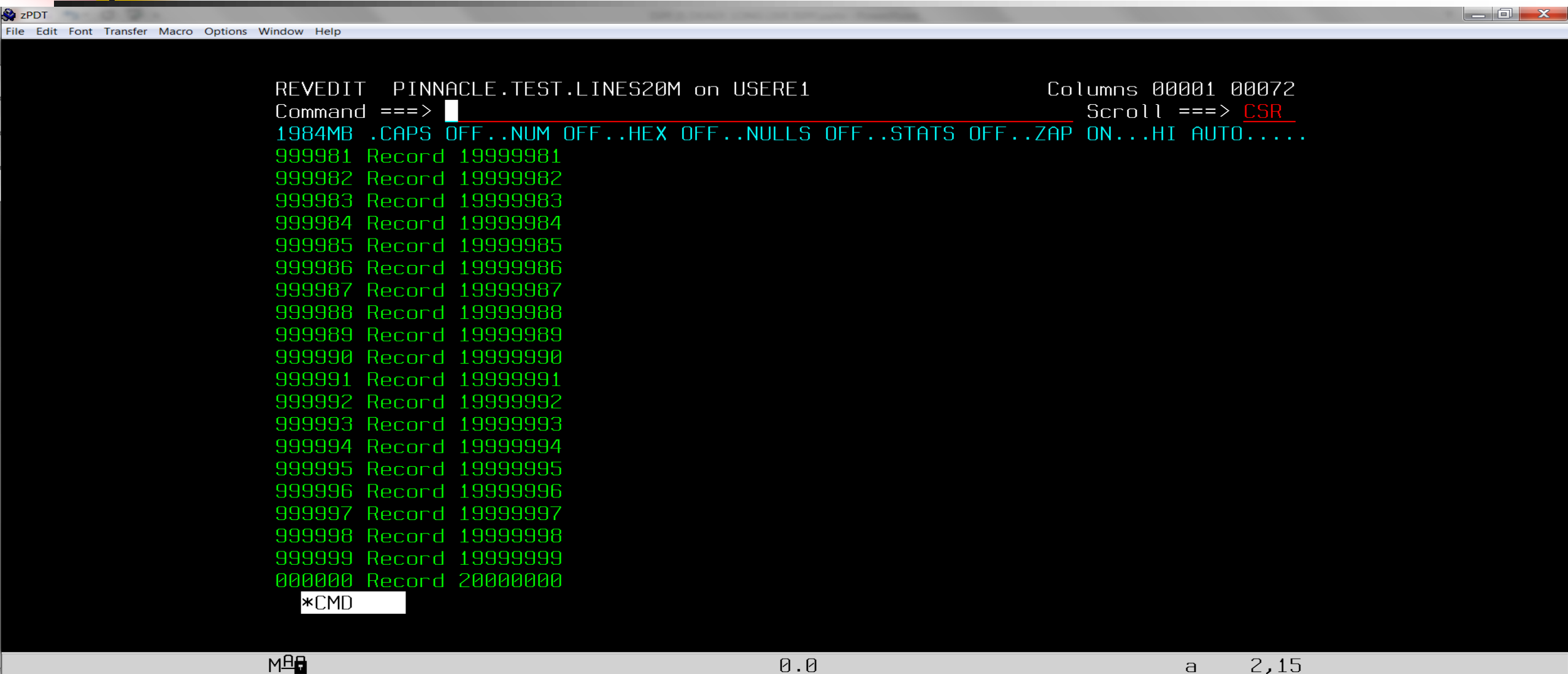


# REVEDIT

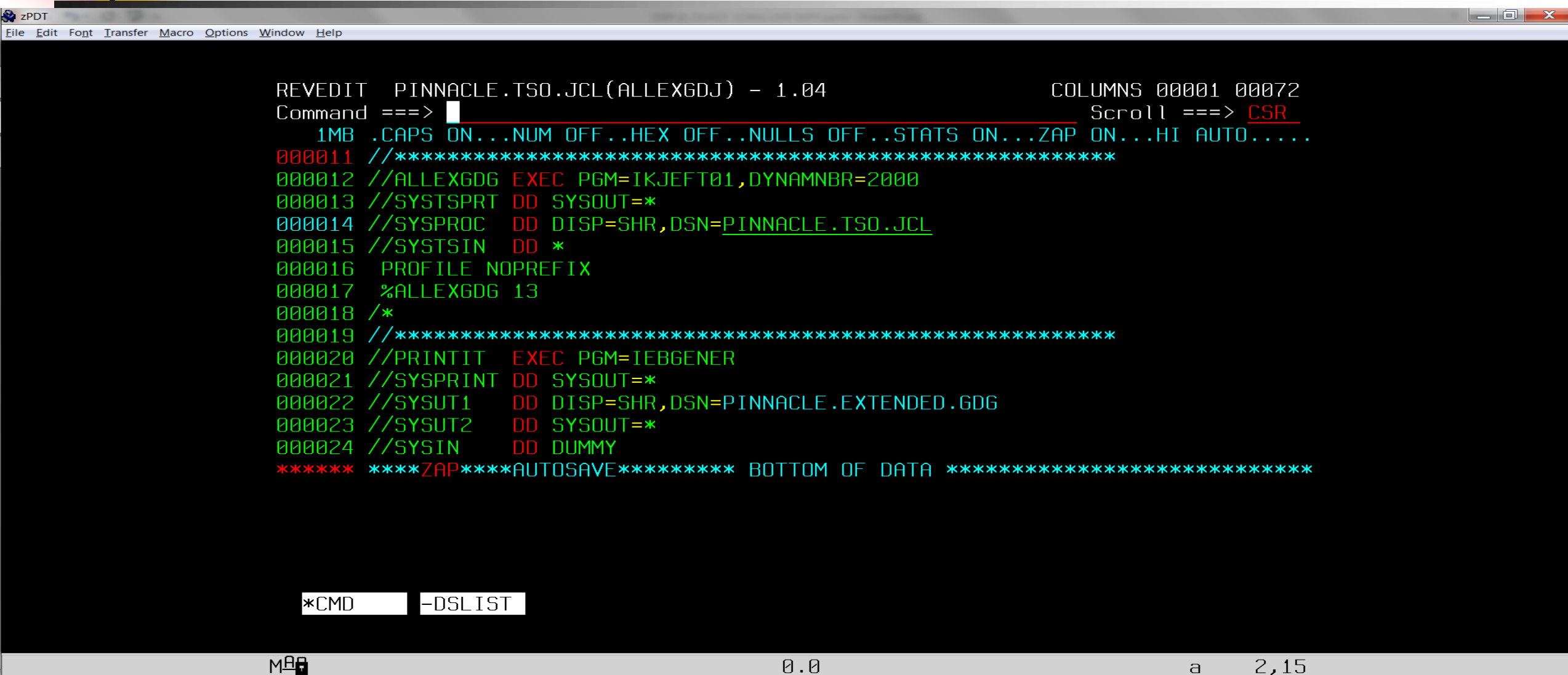
---

- Ran some tests with FB80 file
- ISPF can edit 13M lines (~991MB), goes to browse with 14M lines
- REVEDIT can edit 20M lines (~1.5GB), goes to browse with 21M lines
  - ~50% more than ISPF can handle
- REVEDIT supports most ISPF Edit commands and adds function
- UNDO/REDO/RECOVER unavailable if LRECL > 4084 or recs > 65535
- Records updated this edit session have line numbers shown in TURQ
- Updated lines can be located via L UPD (NEXT/PREV/FIRST/LAST)
- DSNCHECK ON will highlight (un)cataloged data sets in JCL

# REVEDIT

A screenshot of a zPDT window titled 'zPDT'. The window has a menu bar with 'File', 'Edit', 'Font', 'Transfer', 'Macro', 'Options', 'Window', and 'Help'. The main area is black with white and green text. At the top left, it says 'REVEDIT PINNACLE.TEST.LINES20M on USER1'. To the right, it says 'Columns 00001 00072'. Below that, 'Command ==>' is followed by a cursor. To the right of that, 'Scroll ==>' is followed by 'CSR' in red. The main display shows a list of records in green text: '1984MB .CAPS OFF..NUM OFF..HEX OFF..NULLS OFF..STATS OFF..ZAP ON...HI AUTO.....', followed by records 999981 through 999999, and finally '000000 Record 20000000'. At the bottom left, there is a white box containing '\*CMD'. The status bar at the bottom is grey and contains 'MBA', '0.0', 'a', and '2,15'.

# REVEDIT



The image shows a screenshot of a zPDT window titled "zPDT". The window has a menu bar with "File", "Edit", "Font", "Transfer", "Macro", "Options", "Window", and "Help". The main area displays the REVEDIT command and a JCL program. The command is "REVEDIT PINNACLE.TSO.JCL(ALLEXGDJ) - 1.04" and "Columns 00001 00072". The JCL code is as follows:

```
Command ==> Scroll ==> CSR
1MB .CAPS ON...NUM OFF..HEX OFF..NULLS OFF..STATS ON...ZAP ON...HI AUTO.....
000011 //*****
000012 //ALLEXGDG EXEC PGM=IKJEFT01,DYNAMNBR=2000
000013 //SYSTSPRT DD SYSOUT=*
000014 //SYSPROC DD DISP=SHR,DSN=PINNACLE.TSO.JCL
000015 //SYSTSIN DD *
000016 PROFILE NOPREFIX
000017 %ALLEXGDG 13
000018 /*
000019 //*****
000020 //PRINTIT EXEC PGM=IEBGENER
000021 //SYSPRINT DD SYSOUT=*
000022 //SYSUT1 DD DISP=SHR,DSN=PINNACLE.EXTENDED.GDG
000023 //SYSUT2 DD SYSOUT=*
000024 //SYSIN DD DUMMY
***** ****ZAP****AUTOSAVE***** BOTTOM OF DATA *****
*CMD -DSL IST
```

At the bottom of the window, there is a status bar with "MBA" on the left, "0.0" in the center, and "a 2,15" on the right.





# PDS86

---

- PDS86 is still the best piece of z/OS freeware out there
- [File 182](#) at [www.cbttape.org](http://www.cbttape.org)
- Grab my presentation [PDS - The Swiss Army Knife of Utilities](#)
- Powerful utility to operate on groups of members by many criteria
  - Userid, Last Modified Date, Created, Size, etc.
  - Just about any field associated with the member can be selection criteria
- Maintained by John Kalinich, with assistance from ISPF Cabal members
- Following are slides showing new function added in the last 12 months



# PDS86 - New Features

---

- PGLITE subset of PDSEGEN, provides Edit/View/Browse, some others
- MAP: Binder API now used for program objects and load modules
  - Enhanced reporting
  - Thank you Greg Price
- RSECT reporting (R-O)
- RMODE64 section reporting
- Private code section reporting (\$PRVnnnn)
- Binder class reporting (deferred load is labeled)
- ATTRIB/DIRENTRY/VERIFY: RMODE64 reporting



## PDS86 - New Features (cont'd)

---

- The following messages were added:
  - PDS879E RESIDENCE MODE 64 AND ADDRESSING MODE xxx ARE INCOMPATIBLE
  - PDS198I COPY, RENAME, AND REPRO DO NOT PRESERVE PDSE V2 MEMBER GENERATIONS
  - PDS983E MAXGENS VALUE IS > 2,000,000,000
  - PDS984E MAXGENS VALUE EXCEEDS THE SMS LIMIT
  - PDS199I LARGEST FREE AREA ON VOLUME volser IS nnnnnnn CYLINDERS
- COPY: MAXGENS parameter added for NEW DSNTYPE(LIBRARY) output dataset allocations.



## PDS86 - New Features (cont'd)

---

- PDSVERS: Save PDS version display setting in ISPF Profile
- O.UT: Added new options to P86OPUX (primary cmd utility)
  - FLIP Switch between current and previous data sets
  - CHEAT PDS cheat sheet for long subcommands
  - VERS Display PDS version number in Starboard area
  - YALE Compare two PDS files with Yale COMPARE command
  - PGLITE A simpler version, or subset, of PDSEGEN
- PTSEXP: Member name of ALL will expand all members of the input PDS to an output PDS
- HISTORY: Display Enterprise COBOL compiler options when they are program objects in a PDSE



## PDS86 - New Features (cont'd)

---

- PDS200I: Display number of extents for PDSE libraries
- SHAXMIT: SHA1SUM, SHA2SUM, SHA224S, SHA3SUM, and SHA5SUM in TSO XMIT format (load modules)
- O.UT: Added new options to P86LOUX (line cmd utility)
  - RVIV RESTORE deleted versions of member
  - RNS RENAME SWAP for PDSE members
- SMPJOBS: SMP jobs to install the PDS command package. JCL, IDCAMS, and the UCLIN you need for a SMP install.
- IF: PACKED/NOPACKED parameters were added
- OFFLOAD/LOAD/PTSEXP: NEW, TRK/CYL, SPACE, and VOLUME parameters for output file allocation were added



## PDS86 - New Features (cont'd)

---

- FIND/IF: NEWML added to THEN/ELSE actions to reset MEMLIST
- CONTROL: TOGGLES displays the state of switches set by CONTROL
- CONTROL: MEMLIST toggles whether RESET should be added to all MEMLIST subcommands
- ATTRIB: PDS856E STOW ERROR, R15=28, R0=00000000 when STOW replace attempted for a PDSE load library with the LKEDDATE parameter specified, fixed by Greg Price
- PDSQINST: Quick install exec
- \$TSO8\*: 8-character TSO userid/prefix support for z/OS 2.3
- PDSHELP: Add doc for functions CAX, LISTA, LISTC, LISTV, SET, TCT



## PDS86 - New Features (cont'd)

---

- PDS859E COMMAND IKJEFTSR WAS NOT FOUND
  - LPD search in PDSMAIN failed for LPA modules because of LPD entry size increase (40 to 48) in z/OS 2.3, LPD search replaced with LOAD macro
- O.UT: Added new option to P86LLUX (line cmd utility for load)
  - CS Display CSECTs for load module
- O.UT: Added new options to P86OPUX (primary cmd utility)
  - FP FInd ISPF packed members
  - MODEL Allocate a new data set based on the active data set
  - COPMSG Extract XMIT/IEBCOPY summary messages from SYSOUT
  - CHGM CHANGE dataset menu
  - IRL Last 30 Referenced DSNAMES



## ISPF 3.17 Reset UID to Default on Exit

```
/* **** */
/* The following code is added to ensure that the UID is reset to the */
/* user's default UID upon exit from 3.17. This is necessary if the */
/* user entered SUPERUSER mode while in 3.17. */
/* **** */
IF (.RESP = 'END')
 *REXX(ZINIUID ZEUID)
 call syscalls('ON')
 address syscall 'seteuid' ziniuid
 address syscall 'getuid'
 zusruuid = retval
 address syscall 'geteuid'
 zeuid = retval
 *ENDREXX
```



# Default ISPCMDS

```
zPDT
File Edit Font Transfer Macro Options Window Help

Menu Utilities Help

Display ISPCMDS Row 10 to 24 of 92
Command ==> Scroll ==> CSR

The command table is currently open, it cannot be modified. Use the view(V)
row command to see an entire entry.

Verb T Action

CRETRIEV 0 CRETRIEV
CUAATTR 0 SELECT PGM(ISPOPT) PARM(ISPOPT11) SCRNAME(SETTINGS)
CURSOR 0 CURSOR
DDLST 0 SELECT PGM(ISRDDN) NEWAPPL(ISR) SUSPEND SCRNAME(DDLST) PARM
DOWN 0 SETVERB
DSLST 0 SELECT PGM(ISRDSLST) PARM(DSL &ZPARM) SUSPEND SCRNAME(DSLST)
DTEST 0 SELECT PGM(ISPYDTST) PARM(&ZPARM) NOFUNC SCRNAME(DTEST)
END 0 SETVERB
ENVIRON 0 SELECT PGM(ISPENV) PARM(&ZPARM) SCRNAME(SETTINGS)
EPDF 0 SELECT CMD(%ISREPDF &ZPARM) NEWAPPL(ISR) SUSPEND
EXHELP 0 SELECT PGM(ISPTUTOR) PARM(&ZPARM) NOFUNC SCRNAME(HELP)
EXIT 0 EXIT
EXPAND 0 SETVERB
FKA 0 SELECT PGM(ISPOPF) PARM(FKA,&ZPARM) NOFUNC SUSPEND
HELP 0 SELECT PGM(ISPTUTOR) PARM(&ZPARM) NOFUNC SCRNAME(HELP)
```

MA 0.0 a 4,15

# Updated ISPCMDS

```
zPDT
File Edit Font Transfer Macro Options Window Help

Menu Utilities Help

Display ISPCMDS Row 10 to 24 of 92
Command ==> Scroll ==> CSR

The command table is currently open, it cannot be modified. Use the view(V)
row command to see an entire entry.

Verb T Action

CRETRIEV 4 CRETRIEV
CUAATTR 0 SELECT PGM(ISPOPT) PARM(ISPOPT11) SCRNAME(SETTINGS)
CURSOR 0 CURSOR
DDLIST 3 SELECT PGM(ISRDDN) NEWAPPL(ISR) SUSPEND SCRNAME(DDLIST) PARM
DOWN 0 SETVERB
DSLST 3 SELECT PGM(ISRDSLST) PARM(DSL &ZPARM) SUSPEND SCRNAME(DSLIST
DTEST 0 SELECT PGM(ISPYDTST) PARM(&ZPARM) NOFUNC SCRNAME(DTEST)
END 0 SETVERB
ENVIRON 3 SELECT PGM(ISPENV) PARM(&ZPARM) SCRNAME(SETTINGS)
EPDF 0 SELECT CMD(%ISREPDF &ZPARM) NEWAPPL(ISR) SUSPEND
EXHELP 0 SELECT PGM(ISPTUTOR) PARM(&ZPARM) NOFUNC SCRNAME(HELP)
EXIT 0 EXIT
EXPAND 3 SETVERB
FKA 0 SELECT PGM(ISPOPF) PARM(FKA,&ZPARM) NOFUNC SUSPEND
HELP 0 SELECT PGM(ISPTUTOR) PARM(&ZPARM) NOFUNC SCRNAME(HELP)

MAB 0.0 a 4,15
```



# ISPCMDS Usermod (No Hacks Allowed!)

```
//IBMUSERU JOB 'IBMUSER',CLASS=A,NOTIFY=&SYSUID,
// MSGCLASS=X,REGION=0M,TIME=NOLIMIT,MSGLEVEL=(1,1)
//*****
//APPLYUM EXEC PGM=GIMSMP
//SYSPRINT DD SYSOUT=*
//SMPCSI DD DISP=SHR,DSN=yourhlq.GLOBAL.CSI <=== YOUR ISPF CSI
//CBTFILE DD DISP=SHR,DSN=yourhlq.CBT.FILE967 <=== CBT FILE
//SMPCNTL DD *
 SET BDY(GLOBAL) .
 RECEIVE S(UMISPCM) SYSMODS.
 SET BDY(target) . /* <=== YOUR TARGET ZONE */
 APPLY S(UMISPCM) CHECK.
 APPLY S(UMISPCM) .
/*
//SMPPTFIN DD DATA,DLM=@@
++USERMOD(UMISPCM) REWORK(20173190) . /*<=== RESET REWORK IF NEEDED */
++VER (Z038) FMID(HIF7R02) . /*<=== YOUR ISPF FMID (ADD PRE IF NEEDED) */
++TBLENU(ISPCMDS) DISTLIB(AISPTENU) TXLIB(CBTFILE) .
@@
```

# Block DELETES for VSAM in 3.4 Without Stopping

```
zPDT
File Edit Font Transfer Macro Options Window Help

Menu Options View Utilities Compilers Help

DSLIST - Data Sets Matching PINNACLE.ISPF.DSN* Row 1 of 198
Command ==> Scroll ==> CSR

Command - Enter "/" to select action Message Volume

//d PINNACLE.ISPF.DSN00001 *VSAM*
 PINNACLE.ISPF.DSN00001.DATA USER00
 PINNACLE.ISPF.DSN00001.INDEX USER00
 PINNACLE.ISPF.DSN00002 *VSAM*
 PINNACLE.ISPF.DSN00002.DATA USER00
 PINNACLE.ISPF.DSN00002.INDEX USER00
 PINNACLE.ISPF.DSN00003 *VSAM*
 PINNACLE.ISPF.DSN00003.DATA USER00
 PINNACLE.ISPF.DSN00003.INDEX USER00
 PINNACLE.ISPF.DSN00004 *VSAM*
 PINNACLE.ISPF.DSN00004.DATA USER00
 PINNACLE.ISPF.DSN00004.INDEX USER00
 PINNACLE.ISPF.DSN00005 *VSAM*
 PINNACLE.ISPF.DSN00005.DATA USER00
 PINNACLE.ISPF.DSN00005.INDEX USER00
 PINNACLE.ISPF.DSN00006 *VSAM*
 PINNACLE.ISPF.DSN00006.DATA USER00
 PINNACLE.ISPF.DSN00006.INDEX USER00
 PINNACLE.ISPF.DSN00007 USER11
 PINNACLE.ISPF.DSN00008 USER07
 PINNACLE.ISPF.DSN00009 USER02
 PINNACLE.ISPF.DSN00010 *VSAM*
 PINNACLE.ISPF.DSN00010.DATA USER00
 PINNACLE.ISPF.DSN00010.INDEX USER00
// PINNACLE.ISPF.DSN00011 *VSAM*
```

MA 0.0 a 4, 15

# Block DELETES for VSAM in 3.4 Without Stopping

```
zPDT
File Edit Font Transfer Macro Options Window Help

Confirm TSO Delete

Command ==> _____

Data Set Name . : PINNACLE.ISPF.DSN00001
Volume : *VSAM*
Creation date . :

CAUTION:
If TSO delete command was issued against an uncataloged data set, a
cataloged version on a volume other than the one listed here may be
deleted.

Command . . . : USRDEL34 'PINNACLE.ISPF.DSN00001'

Enter "/" to select option
/ ☒ Set data set delete confirmation off

Instructions:
 Press ENTER to confirm delete.
 (The data set will be deleted.)

 Press CANCEL or EXIT to cancel delete.
```

# Block DELETES for VSAM in 3.4 Without Stopping

```
zPDT
File Edit Font Transfer Macro Options Window Help

Menu Options View Utilities Compilers Help

DSLIST - Data Sets Matching PINNACLE.ISPF.DSN* Row 1 of 198
Command ==> _____ Scroll ==> CSR

Command - Enter "/" to select action Message Volume

PINNACLE.ISPF.DSN00001 USRDEL34 RC=0 *VSAM*
PINNACLE.ISPF.DSN00001.DATA USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00001.INDEX USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00002 USRDEL34 RC=0 *VSAM*
PINNACLE.ISPF.DSN00002.DATA USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00002.INDEX USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00003 USRDEL34 RC=0 *VSAM*
PINNACLE.ISPF.DSN00003.DATA USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00003.INDEX USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00004 USRDEL34 RC=0 *VSAM*
PINNACLE.ISPF.DSN00004.DATA USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00004.INDEX USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00005 USRDEL34 RC=0 *VSAM*
PINNACLE.ISPF.DSN00005.DATA USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00005.INDEX USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00006 USRDEL34 RC=0 *VSAM*
PINNACLE.ISPF.DSN00006.DATA USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00006.INDEX USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00007 USRDEL34 RC=0 USER11
PINNACLE.ISPF.DSN00008 USRDEL34 RC=0 USER07
PINNACLE.ISPF.DSN00009 USRDEL34 RC=0 USERE2
PINNACLE.ISPF.DSN00010 USRDEL34 RC=0 *VSAM*
PINNACLE.ISPF.DSN00010.DATA USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00010.INDEX USRDEL34 RC=4 USER00
PINNACLE.ISPF.DSN00011 USRDEL34 RC=0 *VSAM*
```



# Block DELETES for VSAM in 3.4 Without Stopping

---

- Rexx exec USRDEL34 invokes IDCAMS and suppresses messages
- Any errors from IDCAMS set RC=4 to bypass ISPF error handling
- Note RC=4 for DATA and INDEX components
- Panel ISRUDSL0 ignores errors, bypasses dataset, and continues
- RACF and I/O errors will also be bypassed
- Because any errors are bypassed, you may have some cleanup
- After block delete, issue REFRESH command to see updated list

# Block DELETEs for VSAM in 3.4 Without Stopping

- Panel Rexx in ISRUDSL0 )PROC injecting USRDEL34 command

```
do i = 1 to #lines
 endpos = i * 80
 startpos = endpos - 79
 parse var zdata begzdata =(startpos) scrnline =(endpos) rstzdata
 parse upper var scrnline 1 attr 2 command 6 13 rstline
 if command = '//D ' then
 zdata = begzdata ||,
 attr = ||,
 '//USRDEL34 ' ||,
 rstline = ||,
 rstzdata
end
```



# Block DELETEs for VSAM in 3.4 Without Stopping

## ■ USR34DEL exec:

```
/* **** */
/* Parse the arguments for the dataset name to be deleted. */
/* **** */
parse arg dsn
/* **** */
/* VGET the delete confirmation variable ZDSLCONF. It the value is */
/* not equal to 'OFF', then display the delete confirmation panel, */
/* otherwise set the delrc variable to 0 and proceed with DELETE. */
/* **** */
address ispexec "VGET (ZDSLCONF) "
```



# Block DELETES for VSAM in 3.4 Without Stopping

---

```
if zdslconf <> 'OFF' then
 do
 address ispexec "DISPLAY PANEL(ISRUADC4) "
 /*****
 /* Save the return code from the delete confirmation panel display. */
 /* If the user hit 'ENTER' on the panel, rc will be 0, any other key */
 /* will be a non-zero rc. */
 *****/
 delrc = rc
 end
else
 delrc = 0
```

# Block DELETES for VSAM in 3.4 Without Stopping

```
/* **** */
/* If the user hit 'ENTER' to confirm the delete, or if delete */
/* confirmations were off, allocate files and invoke IDCAMS to */
/* process the DELETE. */
/* **** */
if delrc = 0 then
 do
/* **** */
/* Dummy out SYSPRINT to suppress any IDCAMS messages coming back to */
/* the terminal. Allocate SYSIN, write the DELETE command to it, */
/* set the lastrc to 0, call IDCAMS to complete the DELETE, and FREE */
/* SYSPRINT AND SYSIN. */
/* **** */
```



# Block DELETES for VSAM in 3.4 Without Stopping

---

```
address tso "ALLOC FI(SYSPRINT) DUMMY REUSE"
address tso "ALLOC FI(SYSIN) UNIT(SYSALLDA) SPACE(1) TRACK",
 "RECFM(F B) LRECL(80)"
sysin.1 = " DELETE "dsn
"EXECIO * DISKW SYSIN (OPEN STEM SYSIN. FINIS)"
lastrc = 0
address tso "CALL *(IDCAMS)"
```

# Block DELETES for VSAM in 3.4 Without Stopping

```
/* **** */
/* Set all non-zero return codes to 4, to echo back a small error to */
/* the user. The return code 8 that IDCAMS receives when trying to */
/* delete any DATA or INDEX components causes a misleading "Command */
/* failed" message to appear on the re-display of ISRUDSL0. Setting */
/* the return code to 4 prevents this, while still showing the user */
/* "USRDEL34 RC=4" in the message area. */
/* **** */

 if rc <> 0 then
 lastrc = 4
 address tso "FREE FI (SYSPRINT) "
 address tso "FREE FI (SYSIN) "
 end
```

# Block DELETES for VSAM in 3.4 Without Stopping

```
/* **** */
/* If the user hit 'CANCEL' or 'END' on the delete confirmation */
/* panel to cancel the delete, set lastrc = 4. */
/* **** */
else
 lastrc = 4
/* **** */
/* Send back the return code to prevent the misleading "Command */
/* failed" error message, and keep the re-display of ISRUDSL0 clean. */
/* **** */
exit(lastrc)
```

# Block DELETES for VSAM in 3.4 Without Stopping

- Panel Rexx in ISRUDSL0 )INIT to bypass errors on DELETE

```
do i = 1 to #lines
 <snip>
 parse var zdata begzdata =(startpos) scrnline =(endpos) rstzdata
 parse upper var scrnline 1 attr 2 command 11 rstline
 if command = 'USRDEL34 ' then
 do
 zdata = begzdata ||,
 attr ||,
 ' ' ||,
 rstline ||,
 rstzdata
 usrdlbyp = 'BYPASS'
 leave i
 end
end
end
```



# Block DELETEs for VSAM in 3.4 Without Stopping

---

- If "bypass" flag is set, simulate enter to continue processing

```
IF (&USRDLBYP = 'BYPASS')
 .MSG = ''
 .RESP=ENTER
```





# EDIT Highlighting for Java, SQL, etc!

---

- At SHARE in San Jose, my life changed
- Pedro Vera presented Customizing the ISPF HILITE Command
- Pedro showed how to manipulate EDIT data for highlighting
- Block DELETE code showed how to manipulate panel dynamic area
- Armed with Pedro's ground-breaking work and block DELETE code, language highlighting was doable



# EDIT Highlighting for Java, SQL, etc!

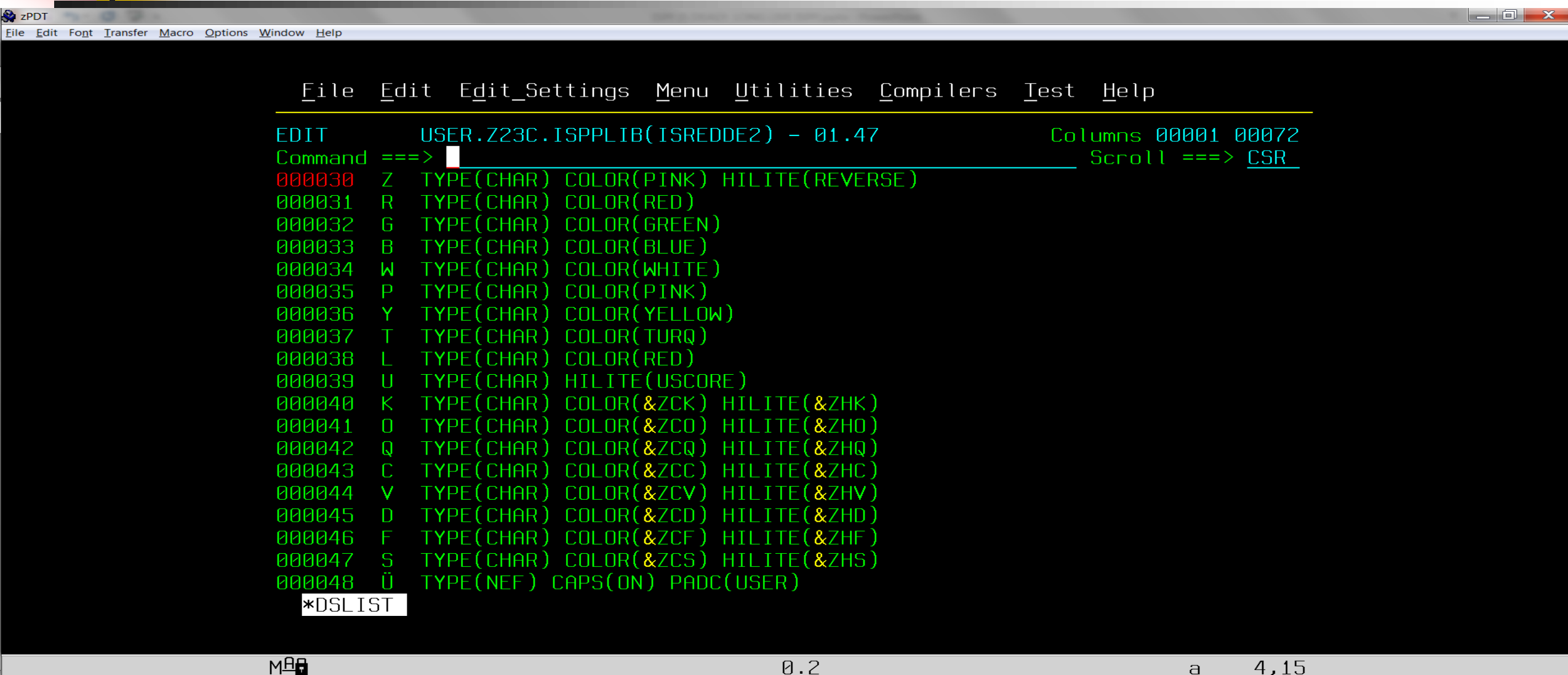
---

- Highlighting starts with dynamic area of ISPF Edit panel ISREDDE2

```
26 AREA(DYNAMIC) EXTEND(ON) SCROLL(ON) USERMOD('20')
)BODY EXPAND(//) WIDTH(&ZWIDTH) CMD(ZCMD)
<snip>
.ZDATA,ZSHADOW/ /
2ECCEC6EECCCDE646
694131B9281466101
```

- Dynamic areas defined with data and shadow
- Shadow same length as data, assigns attribute to each byte of data
- Enables coloring at the character level

# EDIT Highlighting for Java, SQL, etc!



The image shows a terminal window titled 'zPDT' with a menu bar (File, Edit, Font, Transfer, Macro, Options, Window, Help). The main window displays the output of the 'EDIT' command, which is a list of commands and their parameters. The output is color-coded: 'EDIT' is red, 'USER.Z23C.ISPPLIB(ISREDDE2) - 01.47' is cyan, 'Columns 00001 00072' is green, 'Command ==>' is green, and 'Scroll ==> CSR' is green. The list of commands is as follows:

```
EDIT USER.Z23C.ISPPLIB(ISREDDE2) - 01.47 Columns 00001 00072
Command ==> Scroll ==> CSR
000030 Z TYPE(CHAR) COLOR(PINK) HILITE(REVERSE)
000031 R TYPE(CHAR) COLOR(RED)
000032 G TYPE(CHAR) COLOR(GREEN)
000033 B TYPE(CHAR) COLOR(BLUE)
000034 W TYPE(CHAR) COLOR(WHITE)
000035 P TYPE(CHAR) COLOR(PINK)
000036 Y TYPE(CHAR) COLOR(YELLOW)
000037 T TYPE(CHAR) COLOR(TURQ)
000038 L TYPE(CHAR) COLOR(RED)
000039 U TYPE(CHAR) HILITE(USCORE)
000040 K TYPE(CHAR) COLOR(&ZCK) HILITE(&ZHK)
000041 O TYPE(CHAR) COLOR(&ZCO) HILITE(&ZHO)
000042 Q TYPE(CHAR) COLOR(&ZCQ) HILITE(&ZHQ)
000043 C TYPE(CHAR) COLOR(&ZCC) HILITE(&ZHC)
000044 V TYPE(CHAR) COLOR(&ZCV) HILITE(&ZHV)
000045 D TYPE(CHAR) COLOR(&ZCD) HILITE(&ZHD)
000046 F TYPE(CHAR) COLOR(&ZCF) HILITE(&ZHF)
000047 S TYPE(CHAR) COLOR(&ZCS) HILITE(&ZHS)
000048 Ü TYPE(NEF) CAPS(ON) PADC(USER)
*DSL IST
```

The terminal window also has a status bar at the bottom with the text 'MBA 0.2 a 4,15'.



# EDIT Highlighting for Java, SQL, etc!

---

- Begin with ISPF command HILITE OTHER
- HILITE OTHER will handle some comments, keywords, and operators
- To highlight other languages, start by highlighting comments
  - Fortran - c, C, d, D, \*, ! in col. 1 or ! in any column not part of quoted string
  - Java - any '//' characters not already in comment or quoted string
  - Python, Ruby, Shell - any '#' character not already in comment or quoted string
  - SQL - any '--' characters not already in comment or quoted string
  - Ruby - Block comments delineated by =BEGIN and =END in column 1



# EDIT Highlighting for Java, SQL, etc!

- Highlighting requires blank delimiters to clearly delineate keywords
- All special characters converted to blanks (attributes, parens, etc.)

```
tempdata = zdata
tempdata = translate(tempdata, ,
 ' , ,
 '152A2B2F141B1C260102030405060708090A0B0C0D1316171D20'x)
tempdata = translate(tempdata, ' , ,
 ' { } [] () # + - * / = < > & ^ | : % , ')
```

- Keywords uppercased to highlight If, Then, Do, End, etc.

```
parse upper var tempdata tempdata
```



# EDIT Highlighting for Java, SQL, etc!

- Modified ISREDDE2 edit panel to support new HIGHLIGHT command

To use extended language highlighting, issue HILITE OTHER command  
then issue the HIGHLIGHT command with the following syntax:

```
HIGHLIGHT language | OFF
```

```
language = CARLA | FORTRAN | JAVA | PYTHON | RUBY | SHELL | SQL
```

OFF turns off extended language highlighting.

HIGHLIGHT BRACE toggles brace highlighting on and off.

HIGHLIGHT BRACKET toggles bracket highlighting on and off.

HIGHLIGHT DISPLAY | DISP shows current state of HIGHLIGHT options.

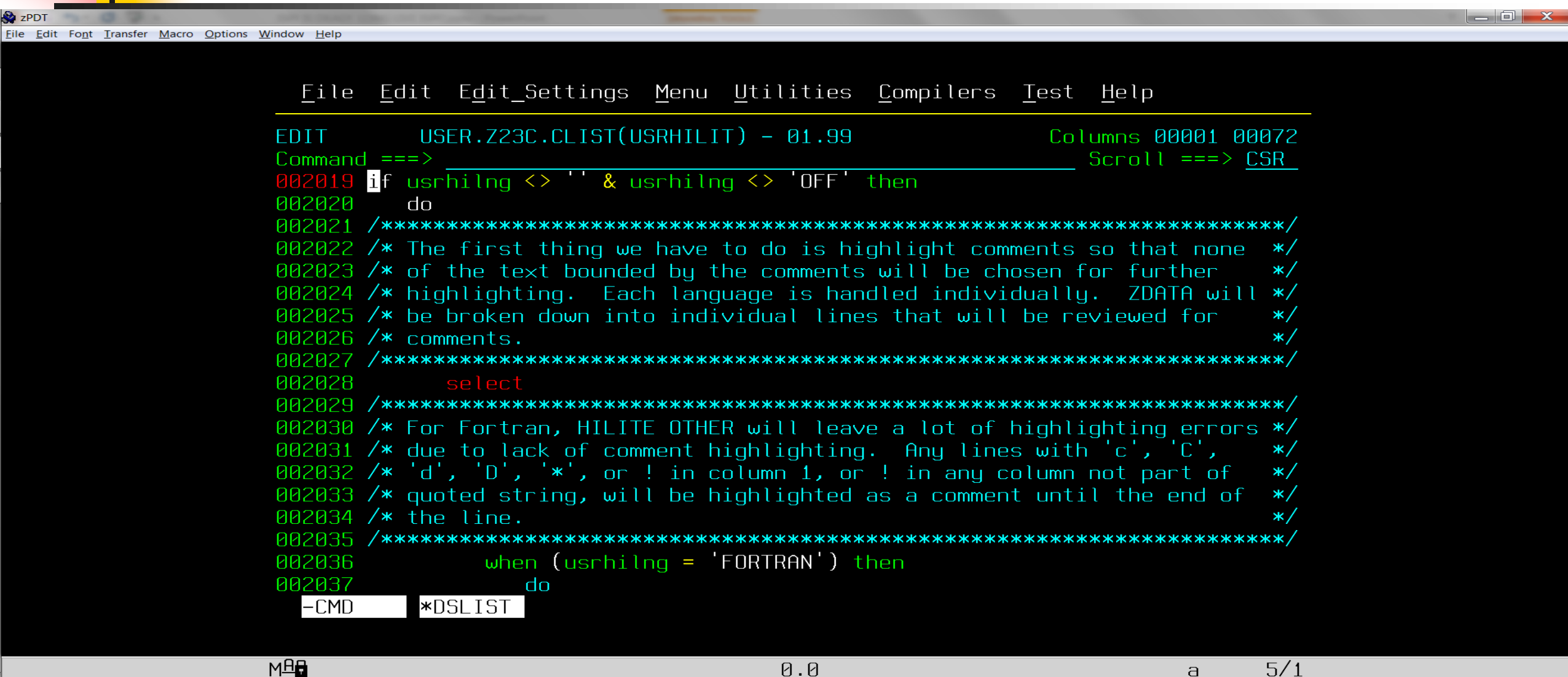
HIGHLIGHT HELP | ? displays this HELP text.

Note: NULLS ON ALL causes some keywords to remain unhighlighted.

NULLS ON STD allows all keywords to be highlighted.

Issue NULLS ON STD if not seeing all keywords highlighted.

# Processing Comments



The image shows a screenshot of the zPDT software interface. The window title is 'zPDT'. The menu bar includes 'File', 'Edit', 'Font', 'Transfer', 'Macro', 'Options', 'Window', and 'Help'. Below the menu bar, there is a secondary menu with 'File', 'Edit', 'Edit\_Settings', 'Menu', 'Utilities', 'Compilers', 'Test', and 'Help'. The main editing area displays Fortran code with line numbers 002019 through 002037. The code includes a conditional statement for 'usrhilng' and a large block of comments explaining the first thing to do is highlight comments. At the bottom of the code block, there are two input fields: '-CMD' and '\*DSLIST'. The status bar at the bottom shows 'MMA', '0.0', 'a', and '5/1'.

```
EDIT USER.Z23C.CLIST(USRHILIT) - 01.99 Columns 00001 00072
Command ==> Scroll ==> CSR
002019 if usrhilng <> ' ' & usrhilng <> 'OFF' then
002020 do
002021 /******
002022 /* The first thing we have to do is highlight comments so that none */
002023 /* of the text bounded by the comments will be chosen for further */
002024 /* highlighting. Each language is handled individually. ZDATA will */
002025 /* be broken down into individual lines that will be reviewed for */
002026 /* comments. */
002027 /******
002028 select
002029 /******
002030 /* For Fortran, HILITE OTHER will leave a lot of highlighting errors */
002031 /* due to lack of comment highlighting. Any lines with 'c', 'C', */
002032 /* 'd', 'D', '*', or ! in column 1, or ! in any column not part of */
002033 /* quoted string, will be highlighted as a comment until the end of */
002034 /* the line. */
002035 /******
002036 when (usrhilng = 'FORTRAN') then
002037 do
-CMD *DSLIST
```

MMA 0.0 a 5/1

# Converting Special Chars to Blanks, Uppercase

```
zPDT
File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

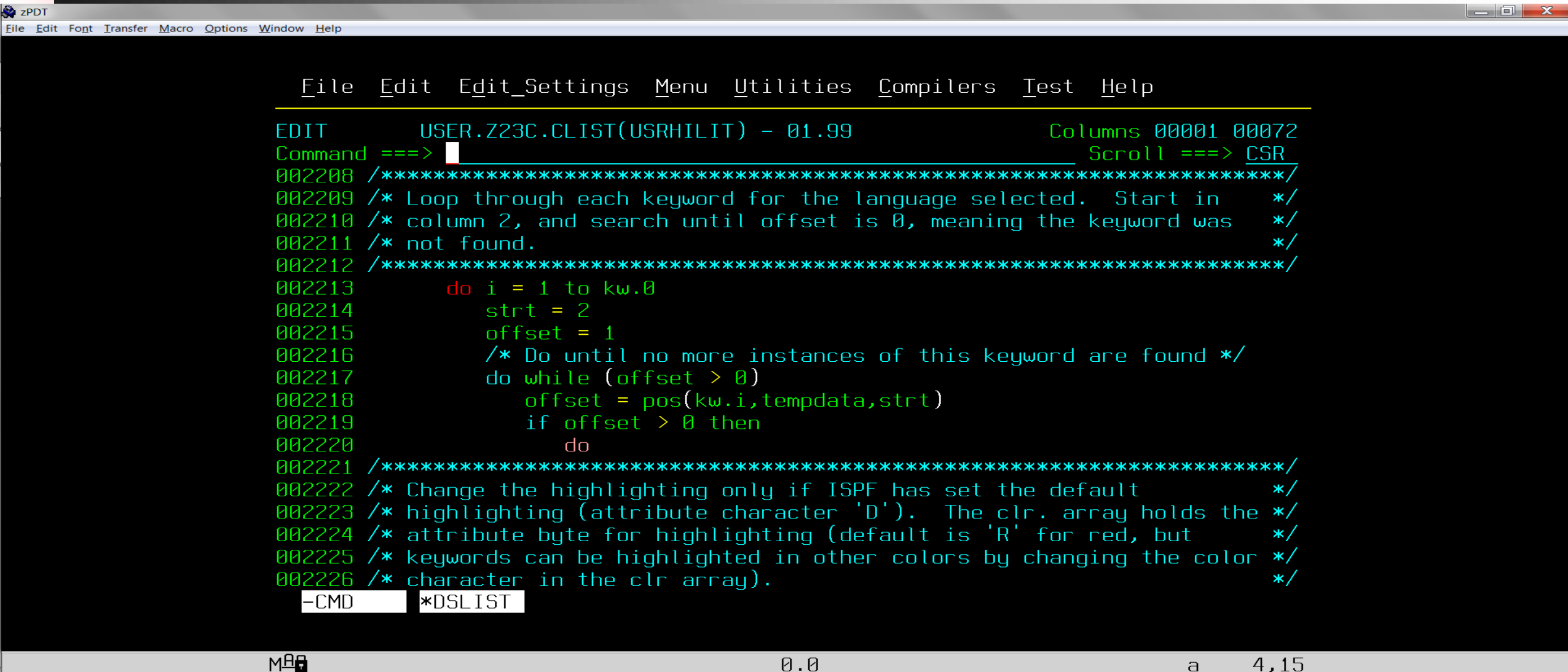
EDIT USER.Z23C.CLIST(USRHILIT) - 01.99 Columns 00001 00072
Command ==> Scroll ==> CSR

002196 tempdata = zdata
002197 /******
002198 /* The double commas are necessary to make the translate command */
002199 /* work properly. The first comma is the comma for the function, */
002200 /* the second comma will continue the line. */
002201 /******
002202 tempdata = translate(tempdata,,
002203 '152A2B2F141B1C260102030405060708090A0B0C0D1316171D20'x)
002204 tempdata = translate(tempdata,
002205 '{ } [] () # + - * / = < > & ^ | : % , ')
002206 parse upper var tempdata tempdata
002207 /******
002208 /* Loop through each keyword for the language selected. Start in */
002209 /* column 2, and search until offset is 0, meaning the keyword was */
002210 /* not found. */
002211 /******
002212 do i = 1 to kw.0
002213 strt = 2
002214 -CMD *DSL IST

MBA 0.0 a 4,15
```



# Highlighting Keywords



The image shows a screenshot of the zPDT software interface. The title bar reads 'zPDT'. The menu bar includes 'File', 'Edit', 'Font', 'Transfer', 'Macro', 'Options', 'Window', and 'Help'. Below the menu bar is a secondary menu bar with 'File', 'Edit', 'Edit\_Settings', 'Menu', 'Utilities', 'Compilers', 'Test', and 'Help'. The main editor area displays a code file named 'USER.Z23C.CLIST(USRHILIT) - 01.99'. The status bar at the bottom shows 'Columns 00001 00072', 'Command ==>', and 'Scroll ==> CSR'. The code in the editor is as follows:

```
EDIT USER.Z23C.CLIST(USRHILIT) - 01.99 Columns 00001 00072
Command ==> Scroll ==> CSR
002208 /*****
002209 /* Loop through each keyword for the language selected. Start in */
002210 /* column 2, and search until offset is 0, meaning the keyword was */
002211 /* not found. */
002212 /*****
002213 do i = 1 to kw.0
002214 strt = 2
002215 offset = 1
002216 /* Do until no more instances of this keyword are found */
002217 do while (offset > 0)
002218 offset = pos(kw.i,tempdata,strt)
002219 if offset > 0 then
002220 do
002221 /*****
002222 /* Change the highlighting only if ISPF has set the default */
002223 /* highlighting (attribute character 'D'). The clr. array holds the */
002224 /* attribute byte for highlighting (default is 'R' for red, but */
002225 /* keywords can be highlighted in other colors by changing the color */
002226 /* character in the clr array). */
-CMD *DSLIST
```

The status bar at the bottom of the window displays 'MAB', '0.0', 'a', and '4,15'.

```

File Edit Edit_Settings Menu Utilities Compilers Test Help

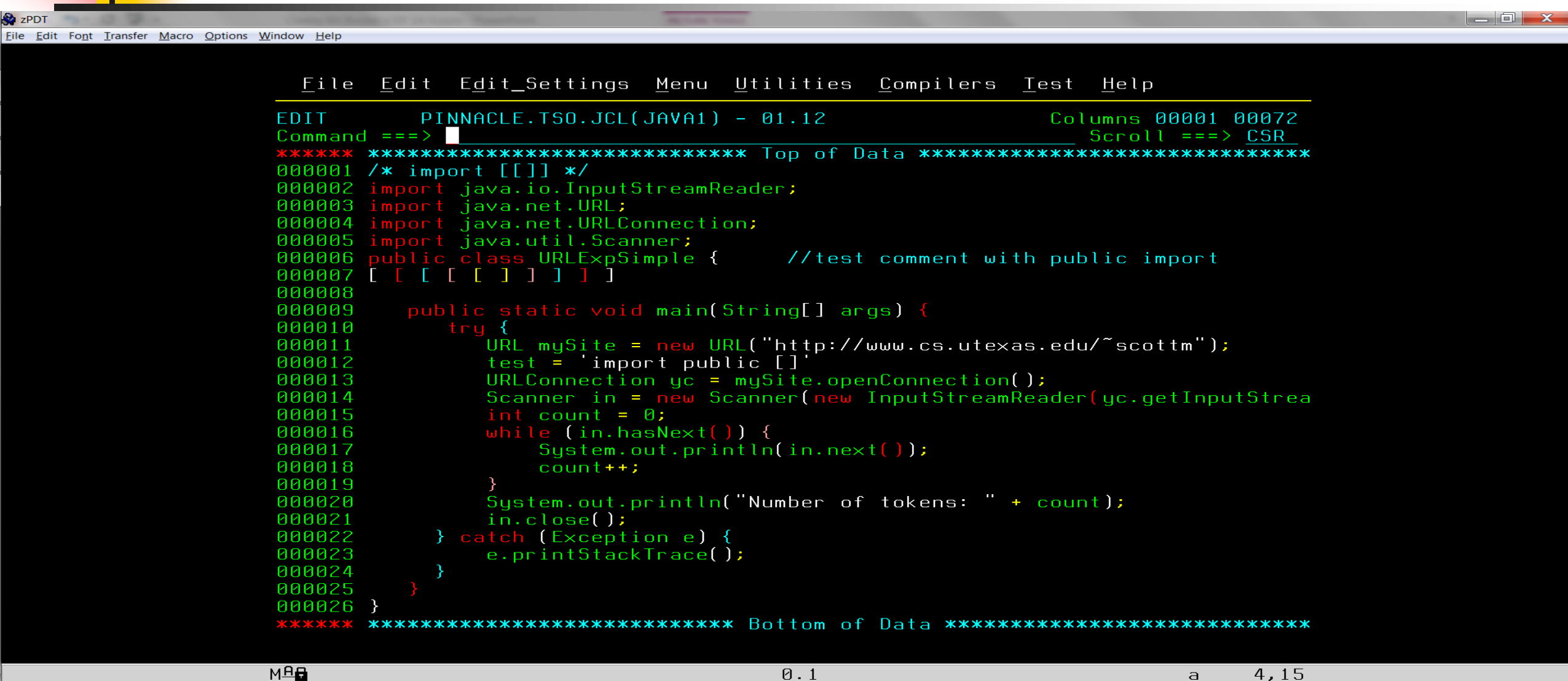
EDIT USER.Z23C.CLIST(USRHILIT) - 01.99 Columns 00001 00072
Command ==> Scroll ==> CSR

002227 /*****
002228 if substr(zshadow,offset+1,length(atr.i)) = atr.i then
002229 zshadow = overlay(clr.i,zshadow,offset+1,length(clr.i))
002230 /*****/
002231 /* Increment strt to begin the next search after the current found */
002232 /* keyword. */
002233 /*****/
002234 strt = offset + length(kw.i)
002235 end
002236 end
002237 end
002238 end
002239 /*****/
002240 /* This code will highlight braces and brackets. The algorithms on */
002241 /* the Web recommended a stack data structure to push and pop */
002242 /* open/close pairs for parens, braces, and brackets. Intialize the */
002243 /* "stacks" obracpos for braces, and obrakpos for brackets, and the */
002244 /* variables representing the stack levels obrac#, and obrak#. */
002245 /*****/
 -CMD *DSLIST

M8 0.1 a 4,15

```

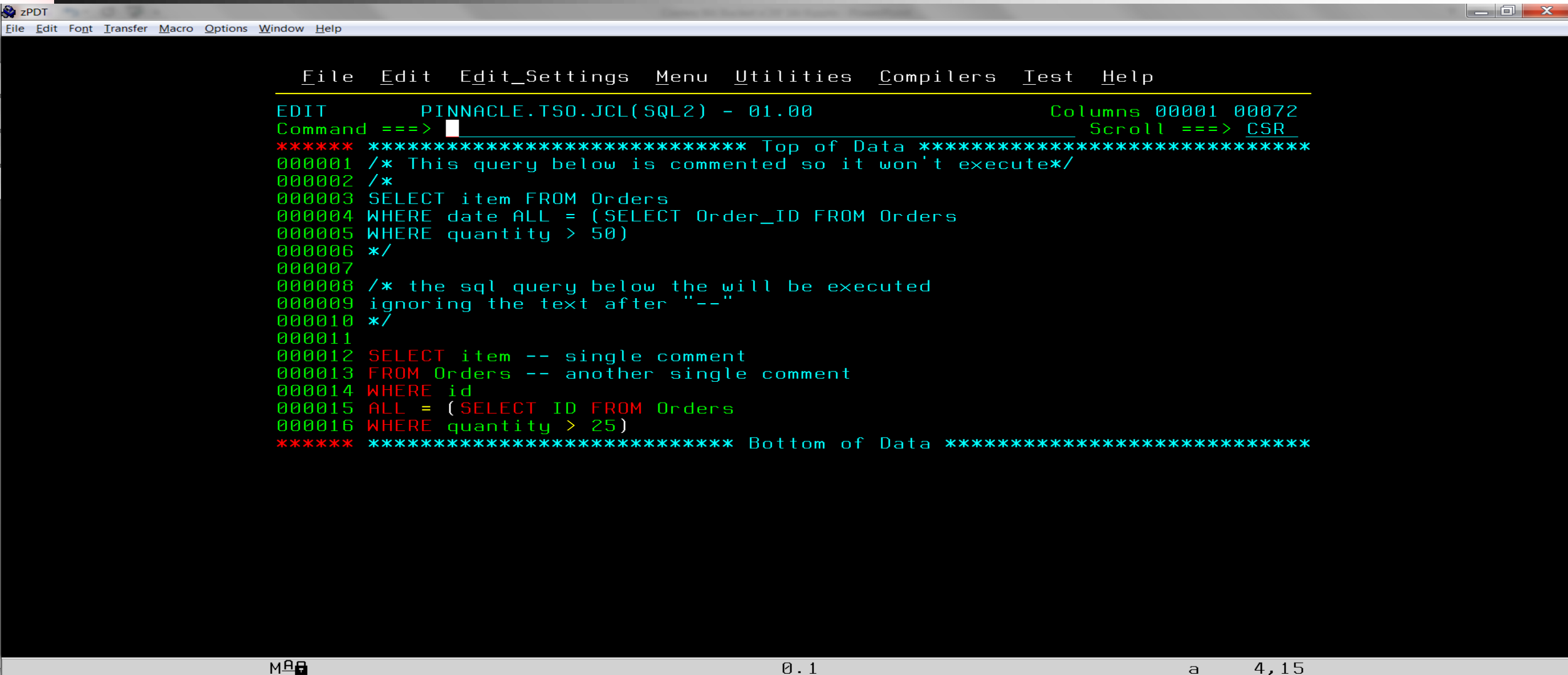
# HIGHLIGHT JAVA, BRACKET, and BRACE



The image shows a screenshot of the zPDT (z/OS Platform Development Tool) editor window. The window title is "zPDT" and the menu bar includes "File", "Edit", "Font", "Transfer", "Macro", "Options", "Window", and "Help". The editor displays a Java file named "PINNACLE.TSO.JCL(JAVA1) - 01.12". The status bar at the bottom shows "0.1" and "a 4,15". The code is highlighted with colors: red for keywords, green for identifiers and literals, and blue for comments. Brackets and braces are highlighted with a light blue background. The code is as follows:

```
EDIT PINNACLE.TSO.JCL(JAVA1) - 01.12 Columns 00001 00072
Command ==> Scroll ==> CSR
***** Top of Data *****
000001 /* import [[]] */
000002 import java.io.InputStreamReader;
000003 import java.net.URL;
000004 import java.net.URLConnection;
000005 import java.util.Scanner;
000006 public class URLExpSimple { //test comment with public import
000007 [[[[[]]]]]
000008
000009 public static void main(String[] args) {
000010 try {
000011 URL mySite = new URL("http://www.cs.utexas.edu/~scottm");
000012 test = 'import public []';
000013 URLConnection yc = mySite.openConnection();
000014 Scanner in = new Scanner(new InputStreamReader(yc.getInputStream()));
000015 int count = 0;
000016 while (in.hasNext()) {
000017 System.out.println(in.next());
000018 count++;
000019 }
000020 System.out.println("Number of tokens: " + count);
000021 in.close();
000022 } catch (Exception e) {
000023 e.printStackTrace();
000024 }
000025 }
000026 }
***** Bottom of Data *****
```

# HIGHLITE SQL



The image shows a screenshot of a terminal window titled 'zPDT'. The window has a menu bar with 'File', 'Edit', 'Font', 'Transfer', 'Macro', 'Options', 'Window', and 'Help'. Below the menu bar is a toolbar with icons for file operations. The main area of the window displays SQL code with syntax highlighting. The code is as follows:

```
EDIT PINNACLE.TSO.JCL(SQL2) - 01.00 Columns 00001 00072
Command ==> Scroll ==> CSR
***** Top of Data *****
000001 /* This query below is commented so it won't execute*/
000002 /*
000003 SELECT item FROM Orders
000004 WHERE date ALL = (SELECT Order_ID FROM Orders
000005 WHERE quantity > 50)
000006 */
000007
000008 /* the sql query below the will be executed
000009 ignoring the text after "--"
000010 */
000011
000012 SELECT item -- single comment
000013 FROM Orders -- another single comment
000014 WHERE id
000015 ALL = (SELECT ID FROM Orders
000016 WHERE quantity > 25)
***** Bottom of Data *****
```

The status bar at the bottom of the window displays 'M8', '0.1', 'a', and '4,15'.



# EDIT Highlighting for Other Languages

---

- EDIT highlighting for other languages is now easily possible
- USRHILIT exec is easy to modify to add languages
- In addition to RFE languages, Ruby and Python also added to V1R2

# Extending EDIT Highlighting - Modify USRHILIT

- USRHILIT modifications to add languages

- Modify kw.0 variable for number of keywords

```
when (usrhilng = 'CARLA') then
do
 kw.0 = 46
```

- Add array of blank-delimited keywords

```
kw.1 = ' ALLOCATE '
kw.2 = ' BDAMQSAM '
```

- Add array for default attribute string (what HILITE OTHER gives you)

```
atr.1 = 'DDDDDDDD'
atr.2 = 'DDDDDDDD'
```

- Add array for color attribute string (color for corresponding keyword)

```
clr.1 = 'RRRRRRRR'
clr.2 = 'RRRRRRRR'
```



# Extending EDIT Highlighting - Modify USRHILIT

- USRHILIT modifications to add languages (cont'd)
  - Add code to process any language-specific comments
  - This code processes '/' comments for Java

```
compos = pos('/',linedata)
if compos > 0 then
 do
 compend = compos + 2
 parse var shaddata =(compos) comshad =(compend)
 if comshad <> 'QQ' & comshad <> 'CC' then
 zshadow = overlay(,
 copies('C',zwidth - compos),,
 zshadow,,
 totchar+compos,zwidth - compos)
 end
```



# USS path for COMPARE, COPY, CREATE, REPLACE

---

- Modified ISREDDE2 edit panel to prepend path
- Unnecessary to type full USS pathname for above commands

```
parse upper var zcmd zcmd1u zcmd2u
parse var zcmd zcmd1 zcmd2
if ((zcmd1u = 'COPY' |,
 zcmd1u = 'COMPARE' |,
 zcmd1u = 'COMP' |,
 zcmd1u = 'CREATE' |,
 zcmd1u = 'CRE' |,
 zcmd1u = 'REPLACE' |,
 zcmd1u = 'REPL') &,
 (zpthnm <> ' ' &,
 substr(zcmd2,1,1) <> '/')) then
zcmd = zcmd1 zpthnm || '/' || zcmd2
```



# USS path for COMPARE, COPY, CREATE, REPLACE

```
zPDT
File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT /S0W1/etc/inetd.conf Columns 00001 00072
Command ==> create inetd1.conf Scroll ==> CSR
***** Top of Data *****
c99999 ###
000002 # Internet server configuration database
000003 #
000004 # (C) COPYRIGHT International Business Machines Corp. 1985, 2001
000005 # All Rights Reserved
000006 # Licensed Materials - Property of IBM
000007 #
000008 # US Government Users Restricted Rights - Use, duplication or
000009 # disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
000010 #
000011 # /etc/inetd.conf
000012 #
000013 # Internet server configuration database
000014 #
000015 # $01=PYQ0049, HOT7705, 010130, PDJP: Correct paths and remove
000016 # unsupported services (FIN APAR 0W45915
000017 #
000018 # Services can be added and deleted by deleting or inserting a
-MOUNTTA DTEST *UDLIST

MAB 0.2 a 6/1
```

# USS path for COMPARE, COPY, CREATE, REPLACE

```
zPDT
File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT /S0W1/etc/inetd.conf File created
Command ==> _____ Scroll ==> CSR
***** ***** Top of Data *****
000001 ###
000002 ## Internet server configuration database
000003 #
000004 # (C) COPYRIGHT International Business Machines Corp. 1985, 2001
000005 # All Rights Reserved
000006 # Licensed Materials - Property of IBM
000007 #
000008 # US Government Users Restricted Rights - Use, duplication or
000009 # disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
000010 #
000011 # /etc/inetd.conf
000012 #
000013 # Internet server configuration database
000014 #
000015 # $01=PYQ0049, HOT7705, 010130, PDJP: Correct paths and remove
000016 # unsupported services (FIN APAR 0W45915
000017 #
000018 # Services can be added and deleted by deleting or inserting a
-MOUNTTA DTEST *UDLIST

MBA 0.1 a 7,9
```

# USS path for COMPARE, COPY, CREATE, REPLACE

```
zPDT
File Edit Font Transfer Macro Options Window Help

Menu Utilities View Options Help

z/OS UNIX Directory List Row 1 to 14 of 45
Command ==> Scroll ==> CSR

Pathname . : /S0W1/etc
EUID . . . : 0
Command Filename Message Type Perm Owner

. Dir 755 OMVSKERN
.. Dir 755 OMVSKERN
csh.cshrc File 644 OMVSKERN
csh.login File 644 OMVSKERN
dbb Dir 755 OMVSKERN
dfs Dir 755 OMVSKERN
hosts File 755 OMVSKERN
httpd.conf File 700 OMVSKERN
httpd.envvars File 600 OMVSKERN
ics_pics.conf File 600 OMVSKERN
inetd.conf File 000 OMVSKERN
inetd1.conf File 000 OMVSKERN
init.options File 000 OMVSKERN
ioepdcf Syml 777 OMVSKERN
-MOUNTTA DTEST *UDLIST
```