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**ITU Regional Workshop on SMS4DC for   
English Speaking countries in Africa,   
Abuja, Nigeria , 20-31-May 2013**

**Workshop Exercises Sheet**

**Exercise 1**

**Start-up with SMS4DC**

* Step 1: Set up SMS4DC system
* Step 2: Launch the SMS4DC software using username and password of SMS4DC.
* Step 3: Choose Country from list(ex NIG)
* Step 4:Using IDWM Status Bar draw Country/Region and Coastal Zones
* Step 4: Launch the DEM view using  toolbar push button.
* Step 6: Go to Tools ColorMap and select color.
* Step 7: Go to Vectors Draw country border.
* Step 8: Go to Database Users and then create new account.
* Step 9: Establish station “Test 1”using  and set frequency to 150MHz and antenna height above ground level (AGL)to 40m, and power to 30w.
* Step 10: View SMS4DC installed folders

C:\BDT\_Soft\SMS4DC

**Exercise 2**

**SMS4DC Antenna Editor**

* Step 1: Launch the SMS4DC software.
* Step 2: Launch the DEM view using  toolbar push button
* Step 3: Go to tools select antenna editor
* Step 4:load antenna from antenna libraries

C:\BDT\_Soft\SMS4DC\Antenna

* Step5: View E-plane, H-plane, and 3D
* Step6: Make a suitable modification to the antenna radiation pattern by editing (degrees/attenuation) or Graphically by mouse click on wanted points on the E-Plane or H-Plane display.
* Step7:Save the modified pattern in antenna libraries.

C:\BDT\_Soft\SMS4DC\Antenna

**Exercise 3**

**SMS4DC Technical parameters**

* Step 1: Launch the SMS4DC software.
* Step 2: Launch the DEM view using  toolbar push button
* Step 3: Establish FX station “Test 2”using  and set the frequency to 150 MHz and antenna height above ground level to 40m, and set power to 30w .
* Step 4: Choose antenna “the antenna which you define in the exercise 2” and check the antenna pattern.
* Step 5: Select Calculation from the top menu and choose “Effective height”, then select station “Test2”.
* Step 6: Right-click on the effective height figure and select “save effective height (Database)”, Then close the effective height window.
* Step 5: Select draw line  from tool bar and connect between “TEST 1” to “TEST 2”, then select calculation menu from toolbar and then calculate: Azimuth angle , Elevation angle , and distance.
* Step 6: Select draw line  from tool bar and connect between “TEST 2” to “TEST 1”, then select calculation menu from toolbar and then calculate: Azimuth angle , Elevation angle , and distance.
* Step 7: Go to Database Licensing Anonymon station and “TEST 1” and “TEST 2” then go to the level of “antenna” the press modify and then fill the Azimuth and elevation which you obtain from step 5 and 6.
* Step 8: Go to Database Licensing Anonymon station and “TEST 1” and “TEST 2” then go to the level of ”frequency” then press add receiver then select “point” , then add “TEST 1” and “TEST 2” as receiver to each other.
* Step 9: Go to Tools Google Earth Export/Display links and the select “TEST 1” and “TEST 2.

**Exercise 4**

**Frequency Allocation**

* Step 1: Launch the SMS4DC software.
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Open the menu “Frequency Allocation” and select “Draw Chart”.
* Step 4: Set the “Region” field to “Region 1”, and set the frequency from 800 to 2400 MHz .
* Step 5: left-click on a colored patch to show its characteristics
* Step 6: From “Edit” menu select “Plan”, then create a new allocation by clicking on the  push button then push save button.
* Step 7: From “Edit” menu select “Footnote” to Show the existing footnotes, and then click on the  push button to add a new footnote then push save button.

**Exercise 5**

**National Frequency Allocation Table**

* Step 1: Launch the SMS4DC software.
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Open the menu “Frequency Allocation” and select “Draw Chart”.
* Step 4: Set the “Region” field to “National”,
* Step 5: Go to edit and select plan service table and then press add new record
* Step 7: Define service code , primary service name , secondary service name, and color and then press save bottom and close this window
* Step 8: Go to edit and select plan and then press add record
* Step 9: Add several new records from UAE NAT , primary services, secondary services, service footnotes , and then close the window
* Step 4: Go to edit and select footnote and then define your Footnotes
* Step 4: Switch to the main window and then check the modifications

**Exercise 6**

**Frequency Arrangement FM**

* Step 1: Launch the SMS4DC software.
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Open the menu “Frequency Allocation” and select “Frequency Arrangement”.
* Step 4: Create a new Frequency Arrangement by using  push button.
* Step 5: Set Region to Region 1, Service priority to Primary, Service to Broadcasting.
* Step 6: Set Type of frequency to Uniform, Channel spacing 0.3MHz, Reference frequency Fo= 87.6MHz, First channel 0, last channel 67, then click on the  push button to save the new arrangement.
* Step 7: Click on the  push button to view the new arrangement report.

**Exercise 7**

**Frequency Arrangement 900MHz**

* Step 1: Launch the SMS4DC software.
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Open the menu “Frequency Allocation” and select “Frequency Arrangement”.
* Step 4: Create a new Frequency Arrangement by using  push button.
* Step 5: Set Region to Region 1, Service priority to Primary, Service to Land mobile.
* Step 6: Set Type of frequency to Homogeneous, Channel spacing 0.2MHz, Reference frequency Fo= 900MHz, foff=0,f’off=45, First channel 1, last channel 125, then click on the  push button to save the new arrangement.
* Step 7: Click on the  push button to view the new arrangement report.

**Exercise 8**

**Frequency Arrangement UMTS**

* Step 1: Launch the SMS4DC software.
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Open the menu “Frequency Allocation” and select “Frequency Arrangement”.
* Step 4: Create a new Frequency Arrangement by using  push button.
* Step 5: Set Region to Region 1, Service priority to Primary, Service to Land mobile.
* Step 6: Set Type of frequency to Homogeneous, Channel spacing 5MHz, Reference frequency Fo= 2000MHz, foff=-100 ,f’off=110 MHz, First channel 1, last channel 12, then click on the  push button to save the new arrangement.
* Step 7: Click on the  push button to view the new arrangement report.

**Exercise 9**

**Frequency Arrangement UMTS**

* Step 1: Launch the SMS4DC software.
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Open the menu “Frequency Allocation” and select “Frequency Arrangement”.
* Step 4: Create a new Frequency Arrangement by using  push button.
* Step 5: Set Region to Region 1, Service priority to Primary, Service to Land mobile.
* Step 6: Set Type of frequency to Homogeneous, Channel spacing 6MHz, Reference frequency Fo= 1900MHz, foff=0,f’off=30MHz , First channel 1, last channel 10, then click on the  push button to save the new arrangement.
* Step 7: Click on the  push button to view the new arrangement report.

**Exercise 10**

**Frequency Assignment**

* Step 1: Launch the SMS4DC software.
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Open the menu “Frequency Allocation” and select “Frequency Assignment” .
* Step 4: Set low freq=87 and high Freq=108
* Step 5: Select “Test 1” station.
* Step 6: Set Freq min= 87 and Freq max=108 and search radius to 200 Km and push OK.
* Step 7: Find a frequency channel without interference and double-click on it to assign to station Test1.

**Exercise 11**

**Creating licenses**

* Step 1: Launch the SMS4DC software.
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Establish BC station “BCTest1”using  and set the frequency to 100 MHz and antenna height above ground level to 50m.
* Step 4: Choose antenna “DEFAULT” and check the antenna pattern.
* Step 5: Select Calculation from the top menu and choose “Effective height”, then select station “BCTest1”.
* Step 6: Right-click on the effective height figure and select “save effective height (Database)”, Then close the effective height window.
* Step 7: Open the administrative part from “Database-> Licensing”.
* Step 8: Select “anonymous Station” and find station “BCTest1”.
* Step 9: Right-click on administrative data and select “New Owner”, then complete Owner information fields.
* Step 10: Go to “Active Licenses” and find the crated owner.
* Step 11: Right-click on the Owner’s name and select “New License”, then complete License information fields.
* Step12: Right-click on the License’s name and select “Move Anonymous Station”, then select station “BCTest1”.
* Step13: Select “Billing History” to show the billing information of the owner.
* Step 14: Right-click on the “Billing History” and add a new payment to the owner.

**Exercise 12**

**Effective Height**

* Step 1: open the administrative part from “Database-> licensing”.
* Step 2: Select “Active Licenses” and find station BCTest1, and select Provision= Article11 and Notice type=T01.
* Step 3: Open Equipment Information Table of Station BCTest1.
* Step 4: Push the “Modify” Button.
* Step 5: Change the field “FM Transmission code” to 2 and push ENTER then fill fields “Equipment Name” and “Power type”.
* Step 6: Push the “Save” Button.
* Step 7: Close Administrative dialog box.
* Step8: Open The “Database” Menu and select “Station in Desktop”.
* Step 9: Select the record of station (BCTest1).
* Step 10: Push OK button to display station on map.
* Step 11: Open the menu “Calculations” and select “Effective Height” item.
* Step 12: Select the record BCTEST1.
* Step 13: Open the menu “Tools” and select “Background” item.
* Step 14: Open the menu “Tools” and select “Save Effective Height (database)” item.

**Exercise 13**

**Propagation Models**

* Step1: Launch the SMS4DC software.
* Step 2: Launch the DEM view using  toolbar push button.
* Step3: Open the “Database’’ menu and select ”Station in Desktop’’.
* Step4: Select the record of station(BCTEST1).
* Step5: Push OK button to display station on map.
* Step6: Draw a Box around BCTEST1 station by using  toolbar push button
* Step7: Open the menu “propagation Models” and select “P.1546” item and select Area.
* Step8: Select the record BCTEST1.
* Step9: Set parameters and push OK then save results .
* Step10: Open the menu “Tools” and select “contour value” item and then set threshold value and push OK then save results.
* Step11: Open the menu “Tools” again and select “remove contour from display”
* Step12: Open the menu “Tools” again and select “coverage Area”.
* Step13: Open the menu “window” and select “Main Desktop”.
* Step14: Open the menu” Propagation Models” and select “Overlay” then select Area calculation(P1546).
* Step 15: Go to step 7 and select other point to Area Propagation models and repeat steps 8 -14.
* Step 16: create another station near to the ‘BCTEST1’ station with freq=100 MHZ with the name of ‘BCTEST2’.
* Step 17: Draw a Box around ‘BCTEST1’ and ‘BCTEST2’ stations by using  toolbar push button.
* Step 18: Open the menu ” Propagation Models” and select “P.1546” item and then select Network processor and then Maximum field strength .
* Step 19: Select ‘BCTEST1’ and ‘BCTEST2’ stations from list of stations ,perform calculation and overlay the results on the DEM map.
* Step 20: Open the menu ” Propagation Models” and select “P.1546” item and then select Network processor and then Best server.
* Step 21: Select ‘BCTEST1’ and ‘BCTEST2’ stations from list of stations ,perform calculation and overlay the results on the DEM map.
* Step 22: Repeat steps 18-21 for other propagation models .

**Exercise 14**

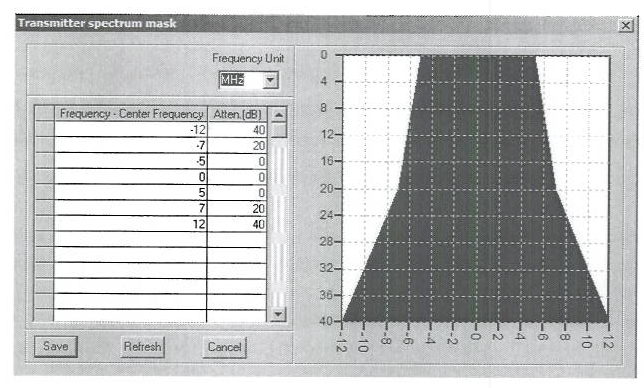
**Propagation Models LM**

* Step 1: launch the SMS4DC Software.
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: create a base station in land mobile service (FB TEST1) with Service = land mobile and class of station = FB and Freq=300 MHz and antenna height =10m.
* Step 4: Draw a box around FB TEST1 by usingtoolbar push button.
* Step 5: Open the menu “propagation Models” Select “P.1546” item and then select area.
* Step 6: Select the record FB TEST1.
* Step 7: Set parameters and push OK to start calculation.
* Step 8: Open the menu “Tools” and Select “Contour value” item and the set threshold value and push OK then save results.
* Step 9: Open the menu “Tools” and select “remove contour from display”.
* Step 10: Open the menu “Tools” and select “Coverage area” then set threshold value and push OK.
* Step 11: Open the menu “window” and select “Main Desktop”.
* Step 12: Open the menu “ propagation Models” and select “Overlay” then select area calculation (P1546).
* Step 13: Go to step 7 and select and select other point to area propagation models and repeat steps 8-13.
* Step 14: Create another base station in land mobile service near to the “FB TEST1” Station with Freq=300 MHz with the name of “FB TEST2”.
* Step 15: Draw a box around “FB TEST1” and “FB TEST2” Stations bytoolbar push button.
* Step 16: Open the menu “Propagation Models” and select “P.1546” item and then select Network processor and then Maximum field strength.
* Step 17: select “FB TEST1” and “FB TEST 2” Stations and from the list of stations, perform calculation and Overlay the results on DEM map.
* Step 18: Open the menu “Propagation Models” and select “P.1546” item and then select Network processor and then Best Server.
* Step 19: Select “FB TEST1” and “FB TEST2” stations and from the list of stations, perform calculation and Overlay the results on the DEM map.
* Step 20: Repeat steps 18-20 for the other propagation models.

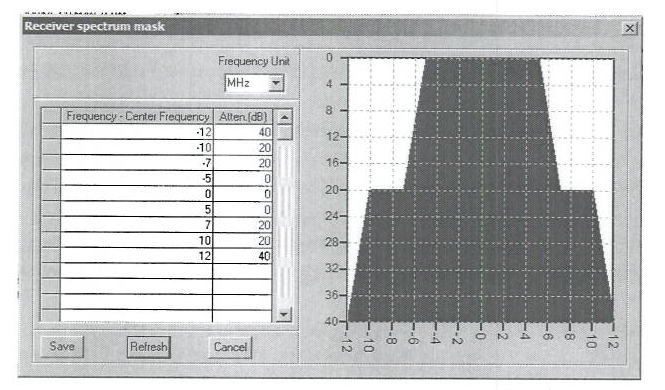
**Exercise 15**

**Propagation Models, Point to Point**

* Step 1: launch the SMS4DC Software.
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Establish Fixed station “ A” using  Set the frequency to 2000 MHz
* Step 4: Choose antenna “ant\_ALE8603\_806” and check the antenna pattern.
* Step 5: Establish an other Fixed station “ B” using  Set the frequency to 2000 MHz.
* Step 6: Choose antenna “ant\_ALE8603\_806” and check the antenna pattern.
* Step 7: Open the Administrative part from “Database-> Licensing”.
* Step 8: Select “Anonymous Station” and find Station B.
* Step 9: Open Antenna Information Table of station B and set Azimuth and Elevation angles toward station A.
* Step 10: Push the “Save” Button.
* Step 11: Open Antenna Information Table of station A and set Azimuth and Elevation angles toward station B.
* Step 12: Find the station A and go to the level of “Frequency”.
* Step 13: Push the “Add receiver” button top of the “frequency information” table of station A. The “Add receiver” dialog box will appear.
* Step 14: Select the “Point” Radio button. All the selectable receivers will be displayed in relevant spreadsheet.
* Step 15: Choose the station B from table under POINT section and push ok.
* Step 16: Close Administrative dialog.
* Step 17: Open the “data base” menu and select “Display Link”.
* Step 18: Select the record of new established hop.
* Step 19: push OK button to display stations of selected hop on map.
* Step 20: open the menu “propagation Model” and select Link item under the ITU-R P.370 propagation model.
* Step 21: Repeat step 20 for p.530 propagation model. See the different calculated results.
* Step 23: Use mouse drag to change antenna height and mange reflection points.
* Step 24: push “Reflection Points” button to see spreadsheet of reflection points.
* Step 25: push “Availability” button to see the availability calculation result.
* Step 26: For stations A and B go to Frequency level, and by using of right click select TX filter and shape it same as following figure.



* Step 27: For Stations A and B go to frequency level, and by using right click select RX Filter and shape it same as following figure.



* Step 28: Repeat step 20 for p.452 propagation model. See the different calculated.

**Exercise 16**

GE84 Agreement

* Step1: Establish BC station BCGE84 1 using ,set the frequency to 90 MHZ, power 1000w , and height of Antenna=100m
* Step2: Open database menu and licensing, Anonymous stations and then find BCGE84 1 station and change its provision to GE84 Notice type to T01 **.**
* Step3: Open Coordination menu and the GE84 BC2BC(coord dis) select the country of station and then BCGE84 1 push OK and see the results.
* Step4: Open Coordination menu and the GE84 BC2FX select BCGE84 1 push OK and see the results.
* Step5: Open Coordination menu and the GE84 BC2LM select BCGE84 1 push OK and see the results.
* Step6: Open Coordination menu and the GE84 and then select(Interference from country of station and then BCGE84 1 push OK and see the results.

**Exercise 17**

**Establishing Different digital plan entries based on GE06 Agreement**

* **Single digital Broadcasting station (plan entry code=1)**
  + Step 1: Create a BT station “ BTPEC1” with freq= 184.5 MHz , ANTHIGHT= 10, EIRP= 1000 W.
  + Step 2: Open database menu and licensing and find “BTPEC1” Station and change its provision to GENEVA 2006D and notice type to GT1, ADM REF ID= BTPEC1, SITE ID= BTPEC1, Plan Entry code=1 , ASSIGNMENT CODE= S then Push SAVE button.
  + Step 3: Go to equipment level and set EQUIPMENT NAME = BTPEC1, POWER TYPE= Mean power, Ref plan config= RPC1 the push SAVE button.
  + Step 4: Go to frequency level and set type of spectrum mask = N then push SAVE button.
  + Step 5: Come back to main desktop and select “ Display GE06 plan Entry” under DATABASE menu and then select BTPEC1 as wanted station to check PEC.

**Exercise 18**

* **Single- Frequency Network (PEC=2 i.e Stations linked with SFN with same SFN ID)**
  + Step 1: Create a BC station “ BCPEC21” with freq= 183.648 MHz , ANTHIGHT= 10, EIRP= 1000 W.
  + Step 2: Create another BC station “ BCPEC22” with freq= 183.648 MHz , ANTHIGHT= 10, EIRP= 1000 W.
  + Step 3: Open database menu and licensing and find “BCPEC21” Station and change its provision to GENEVA 2006D and notice type to GS1, ADM REF ID= BCPEC21, SITE ID= BCPEC21, Plan Entry code=2 , ASSIGNMENT CODE= L then Push SAVE button.
  + Step 4: Open database menu and licensing and find “BCPEC22” Station and change its provision to GENEVA 2006D and notice type to GS1, ADM REF ID= BCPEC22, SITE ID= BCPEC22, Plan Entry code=2 , ASSIGNMENT CODE= L, SFN ID = BCPEC22 then Push SAVE button.
  + Step 5: Go to equipment level of BCPEC21 and set EQUIPMENT NAME= BCPEC21, Power TYPE =Mean Power, Ref plan Config= RPC4 the push SAVE button.
  + Step 6: Go to frequency level of BCPEC21 and set type of spectrum mask =1 then push SAVE button.
  + Step 7: Go to equipment level of BCPEC22 and set EQUIPMENT NAME= BCPEC22, Power TYPE =Mean Power, Ref plan Config= RPC4 the push SAVE button.
  + Step 8: Go to frequency level of BCPEC22 and set type of spectrum mask =1 then push SAVE button.
  + Step 9: Select “Display GE06 plan Entry” under DATABASE menu and then select BCPEC21 as Wanted station to check PEC.

**Exercise 19**

**Broadcasting allotment (PEC=3)**

* + Step 1: Open database menu and licensing and select New Allotment under SMS4DC menu.
  + Step 2 : Set allotment Name= BTPEC3 , Notice type to GT2, plan entry code=3 ADM REF ID = BTPEC3, SFN ID= BTPEC3 Freq= 191.5 MHz Country= Your country , PPLARIZATION= V , Ref Net = RN1, Spectrum Mask= N, RPC= RPC1 then push SAVE button.
  + Step 3: Go to DEM map view and draw a poly line as desired allotment area.
  + Step 4: Select “Define New allotment” under DATABASE. Menu and select BTPEC3 as wanted allotment and Push OK.
  + Step 5: Open database menu and licensing and select “BTPEC3” allotment and find attached contour . with right click on It and selection of contour points see test points of attached allotment area.
  + Step 6: select “ Display GE06 plan entry” under DATABASE menu and then select BTPEC3 as wanted allotment to check PEC.

**Exercise 20**

**An allotment with linked assignments and SFN identifier (PEC=4 i.e All linked assignments have Same SFN ID with allotment and in their Field of associated\_adm\_allot-id the Adm\_ref\_id of allotment is addressed).**

* + Step 1: Open database menu and licensing and select New Allotment under SMS4DC menu.
  + Step 2 : Set allotment Name= BTPEC4 , Notice type to GT2, plan entry code=4 ADM REF ID = BTPEC3, SFN ID= BTPEC4 Freq= 474 MHz Country= Your country , PPLARIZATION= V , Ref Net = RN1, Spectrum Mask= N, RPC= RPC1 then push SAVE button.
  + Step 3: Go to DEM map view and draw a poly line as desired allotment area.
  + Step 4: Select “Define New allotment” under DATABASE. Menu and select BTPEC4 as wanted allotment and Push OK.
  + Step 5: Open database menu and licensing and select “BTPEC4” allotment and find attached contour . with right click on It and selection of contour points see test points of attached allotment area.
  + Step 6: Create BT station “BTPEC41” with freq=474 MHz, ANTHIGHT=10, EIRP=1000W.
  + Step 7: Create another BT station “BTPEC42” with freq=474 MHz, ANTHIGHT=10, EIRP=1000W.
  + Step 8: Open database menu and licensing and select “BTPEC41”station and change its provision to GENEVA 2006D and Notice type to GT1, Plan entry code=4, ADM REF ID= BTPEC41, SITE ID = BTPEC41, ASSIGNMENT CODE=L , ASSOC ALLOT ID = BTPC4 , ASSOC ALLOT SFN ID= BTPEC4, SFN ID= BTPEC4 then push SAVE button.
  + Step 9: Open database menu and licensing and select “BTPEC42”station and change its provision to GENEVA 2006D and Notice type to GT1, Plan entry code=4, ADM REF ID= BTPEC42, SITE ID = BTPEC42, ASSIGNMENT CODE=L , ASSOC ALLOT ID = BTPC4 , ASSOC ALLOT SFN ID= BTPEC4, SFN ID= BTPEC4 then push SAVE button.
  + Step 10 : Go to equipment level of BTPEC 41 and set EQUIPMEN NAME=BTPEC41 , POWER TYPE = Mean power, Ref plan Config = RPC1 then push SAVE Button.
  + Step 11 Go to Frequency level of BTPEC41 and set type of spectrum Mask = N then push SAVE button.
  + Step 12 : Go to equipment level of BTPEC 42 and set EQUIPMEN NAME=BTPEC42 , POWER TYPE = Mean power, Ref plan Config = RPC1 then push SAVE Button.
  + Step 13 Go to Frequency level of BTPEC42 and set type of spectrum Mask = N then push SAVE button.
  + Step 14: select “ Display GE06 plan entry” under DATABASE menu and then select BTPEC42 as wanted allotment to check PEC.

**Exercise 21**

**An allotment with linked assignments and SFN identifier (PEC=5 i.e All linked assignments have Same SFN ID with allotment and in their Field of associated\_adm\_allot-id the Adm\_ref\_id of allotment is addressed).**

* + Step 1: Open database menu and licensing and select New Allotment under SMS4DC menu.
  + Step 2 : Set allotment Name= BTPEC4 , Notice type to GT2, plan entry code=5 ADM REF ID = BTPEC5, SFN ID= BTPEC4 Freq= 474 MHz Country= Your country , PPLARIZATION= V , Ref Net = RN1, Spectrum Mask= N, RPC= RPC1 then push SAVE button.
  + Step 3: Go to DEM map view and draw a poly line as desired allotment area.
  + Step 4: Select “Define New allotment” under DATABASE. Menu and select BTPEC5 as wanted allotment and Push OK.
  + Step 5: Open database menu and licensing and select “BTPEC5” allotment and find attached contour . with right click on It and selection of contour points see test points of attached allotment area.
  + Step 6: Create BT station “BTPEC51” with freq=474 MHz, ANTHIGHT=10, EIRP=1000W.
  + Step 7: Open database menu and licensing and select “BTPEC51”station and change its provision to GENEVA 2006D and Notice type to GT1, Plan entry code=5, ADM REF ID= BTPEC51, SITE ID = BTPEC51, ASSIGNMENT CODE=L , ASSOC ALLOT ID = BTPC5 , then push SAVE button.
  + Step 8 : Go to equipment level of BTPEC 51 and set EQUIPMEN NAME=BTPEC51 , POWER TYPE = Mean power, SYS VAR.= A1, RX MODE = FX then push SAVE Button.
  + Step 9: Go to Frequency level of BTPEC51 and set type of spectrum Mask = N then push SAVE button.
  + Step 10: select “ Display GE06 plan entry” under DATABASE menu and then select BTPEC51 as wanted allotment to check PEC.

**Exercise 22**

**Analogue Broadcasting station**

* + Step 1: Create BT Station” BTPEC00” with Freq= 482 MHz, ANTHIGHT= 10 EIRP=1000w.
  + Step 2: Open database menu and licensing and select “BTPEC00”station and change its provision to GENEVA 2006A and Notice type to G02, ADM REF ID= BTPEC00, SITE ID = BTPEC00, then push SAVE.
  + Step 3: Go to equipment level of BTPEC00 and set EQUIPMENT NAME=BTPEC00 , POWER TYPE = Mean power, TV SYS.= G, TV color= PAL, Power radio=10, Frequency Stability= Normal then push SAVE button.
  + Step 4: Go to Frequency level and set Vision Carrier frequency =479.25 MHz, Sound carrier Frequency =484.75 and then push SAVE button.

**Exercise 23**

**GE06 BCNT2BCBT AFFECTED ADMINISTRATIONS**

* Step I: Open "Coordination" menu and GE06 and BCBT2BCBT (affected ADM) select BTPEC1 station and push OK
* Step 2: Set Azimuth step=l, Search radius=1000 km and push OK and analyze the results
* Step 3: Open "Coordination" menu and GE06 and BCBT2BCBT (affected ADM) select BTPEC 4 station and push ok
* Step 4: Set Azimuth step=l, Search radius=1000 km and push OK and analyze the results.

**Exercise 24**

**GE06 BCNT2FXM AFFECTED ADMINISTRATIONS**

* Step I: Create BT station “ BTFXM1” with freq = 818 MHz , ANTHIGHT = 10, EIRP = 1000 W.
* Step 2: Open database menu and licensing and find “ BTFXM1” station and change its provision to GENEVA 2006D and Notice type to GT1, ADM REF ID = BTFXM1, SITE ID= BTFXM1, plan entry code=1 ASSIGNMENT CODE= S then push SAVE button.
* Step 3: Go to frequency level and set EQUIPMENT NAME= BTFXM1, POWER TYPE= Mean power , REF plan config = RPC1 then push SAVE button.
* Step 4: go to frequency level and set type of spectrum mask = N then push SAVE button.
* Step 5: Come back to main desktop and select “Display GE06 plan entry” Under database menu and then select BTFXM1 as wanted station to check PEC.
* Step 6: Create a fixed station in your neighboring country in fixed service (FX GE06-1) with service = Fixed and class of station = FX and freq=818 MHz and Antenna Height =10m , Power = 10 W.
* Step 7: Open database menu and licensing and find “ FX GE06-1” station and change its provision to GENEVA 2006L and Notice type to G11 Site ID= FX GE06-1 and then push SAVE Button.
* Step 8: Go to equipment level and set EQUIPMENT NAME = FX GE06-1, POWER TYPE= Mean Power , System type1= FF then Push SAVE Button.
* Step 9: Go to frequency level and set response frequency =818 MHz then push SAVE Button.
* Step 10: Open “ Coordination “ Menu and GE06 and BCBT2FXM (affected ADM) select BTFXM1 Assignment and push OK.
* Step 11: Set Azimuth Step=1, Search radius = 1000 Km and push OK.
* Step 12: Select the found trigger FS then push OK to see the results.

**Exercise 25**

**GE06 FXM2 BCBT AFFECTED ADMINISTRATIONS**

* Step 1: Open “coordination” Menu and GE06 and FXM2BCBT (affected ADM) and TX station and then select FXGE06-1 station and push OK.
* Step 2: Set Azimuth step=1, Search radius = 1000 km and push OK and analyze the results.
* Step 3: Open “ Coordination” Menu and GE06 and FXM2BCBT (affected ADM) and RX station and then select FXGE06-1 station and push OK.
* Step 4: Set azimuth step=1 , Search radius =1000 km, DVB 8 MHz and push OK and analyze the results.

**Exercise 26**

**GE06 Coverage Area and service Area**

* Step 1: Open “Coordination” menu an GE06 and coverage Area then select BTPEC1 assignment and push OK
* Step 2: Set parameters and push OK
* Step 3: Select line width and color of noise - limited coverage area contour and push OK to continue.
* Step 4: Select all found interferer assignments/allotment and push OK
* Step 5: Select line width and color of interference - limited coverage area contour and push OK
* Step 6: Compare noise -limited and interference coverage area
* Step 7: Open “Coordination” menu and GE06 and service Area then select New Assignments, Number of test points =12 and push OK
* Step 8: Select BTPEC1 assignment and push OK
* Step 9: Set parameters and push OK
* Step 10: Select line width and color of service area contour push OK
* To continue after calculation save results.
* Step 11 : Repeat steps 7 to 10 for other assignments which have been created in previous exercises.

**Exercise 27**

**GE06 Interference To and Interference From**

* Step 1: Open “Coordination” menu an GE06 and coverage Area and interference to and BCBT2DBCBT then select BTPEC1 assignment (as Interferer) and push OK.
* Step 2: Set parameters and Push OK
* Step 3: Select all found victim assignment/allotments and push OK to see the results.
* Step 4: Open “coordination” menu and GE06 and Interference From and BCBT2DBVBT then select BTPEC1 assignment (as victim) and push OK.
* Step 5: Set parameters and push OK.
* Step 6: Select all found interferer assignments/allotments and push OK to see results.

**Exercise 28**

**AGREEMENTS**

**Model 1 TYPE A**

* Step 1: Launch the SMS4DC software
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Open the menu “COORDINATION” and select AGREEMENTS item
* Step 4: By choosing  icon create a new agreement YEMOM
* Step 5: Choose Fixed and land Mobile as services by pushing icon
* Step 6: Set Model to 1 and type to 1
* Step 7: Open list of countries and select YEM and OM then push OK
* Step 8: Open list of propagation Models and select FREE SPACE
* Step 9: Insert LoFreq=100,HiFreq= 170,PIFS=12,CBR=80,ERP=12,Emergency=0
* Step 10: Push the “save” button,
* Step 11: Establish a FB station (with the name YEM FBAGR1) in YEM with the Freq=160 MHZ
* Step 12: OPEN the menu “COORDINATION” and select ‘Border’ item
* Step 13: Select the station YEMFBAGR1
* Step 14: Select the existing agreement that was found by software
* Step 15: Set search radius and push OK
* Step 16: After calculation compare Max Eb ,Max Ec and PIFS
* Step 17: Move YEMFBAGR1 station by using of  icon and repeat Item 13-16

**Exercise 29**

**AGREEMENTS**

**Model 1 TYPE B**

* Step 1: Launch the SMS4DC software
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Open the menu “COORDINATION” and select AGREEMENTS item
* Step 4: By choosing icon create a new agreement YEMOM1
* Step 5: Choose Fixed and land Mobile as services by pushing  icon
* Step 6: Set Model to 1 and type to 1
* Step 7: Open list of countries and select YEM and OM then push OK
* Step 8: Insert Lo Freq=3000,HiFreq= 6000,Coord dist1=100Km,Coord dist2=100Km ,Emergency=0.
* Step 9: Push the “save” button,
* Step 10: Establish a Fx station (with the name YEM FxAGR1) in JOR with the Freq=4000 MHZ
* Step 11: OPEN the menu “COORDINATION” and select ‘Border’ item
* Step 12: Select the station YEMFBAGR1.
* Step 13: Select the existing agreement that was found by software
* Step 14: After calculation compare MIN Distance and COORD DIST
* Step 15: Move YEMFXAGR1 station by using of  icon and repeat Item 11-14

**Exercise 30**

**AGREEMENTS**

**Model 2**

* Step 1: Launch the SMS4DC software.
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Open the menu “COORDINATION” and select AGREEMENTS item
* Step 4: By choosing icon create a new agreement YEMOM3
* Step 5: Choose Fixed and LM as services by pushing  icon
* Step 6: Set Model to 2 and propagation model to “FREE SPACE” type to 1
* Step 7: Open list of countries and select SOM and DJ then push OK
* Step 8: Insert Lo Freq=200,HiFreq= 300,Pref country=SYR , PIFS=12,XKM=80,ERP=12 Emergency=0
* Step 9: Insert Lo Freq=300,HiFreq= 300,Pref country=SYR , PIFS=12,XKM=80,ERP=12 Emergency=0
* Step 10: Push the “save” button.
* Step 11: Establish a FX station (with the name YEM FxAGR1) in YEM with the Freq=250 MHz
* Step 12: OPEN the menu “COORDINATION” and select ‘Border’ item.
* Step 13: Select the station YEMFBAGR3.
* Step 14: Select the YEMOM agreement that was found by software
* Step 15: Establish another FX station with the name YEM FxAGR4) in YEM with the Freq=350 MHz.
* Step 16: repeat Item 12-16.
* Step 15: Move YEMFXAGR1 station by using of  icon and repeat Item 11-14

**Exercise 31**

**BC to BC Interference**

* Step 1: create YEMBC1 station with freq=107MHZ,power=10W,and antenna height=10m.
* Step 2: create YEMBC2 station near to YEMBC1 station with freq=107MHZ, power=10W,and antenna height=10m.
* Step 3: open (database) menu and select licensing.
* Step 4 :set provision of YEMBC1and YEMBC2 station to article 11 and notice type to T01.
* Step 5: open the menu (interference) and select(BC 2 BC)item.
* Step 6: select YEMBC1 station and push OK.
* Step 7: set search radius ,and Min. FS and push OK.
* Step 8: select YEMBC2 station as interferer station and state calculation .
* Step 9: compare coverage area with and without interference .
* Step 10: change to main window and from propagation model select overlay item and choose the interference BC 2 BC results.

**Exercise 32**

**BT to BT Interference**

* Step 1: create YEMBT1 station with :
  + assign freq=714MHz.
  + power=1000W
  + antenna height=10m
  + provision=article 11
  + notice type=T02
  + vision freq=711.25MHz
  + sound freq=716.75.
  + color=pal.
  + power ratio=10
  + TVsys =G
  + class of EMISSION=C3E
  + bandwidth=8000KHz.
* Step 2: create YEMBT2station with:
  + assign freq=714MHz
  + power=1000w
  + antenna height=10m
  + provision=article 11
  + notice type=T02
  + vision freq=711.25MHz
  + sound freq=716.75
  + color=pal
  + power ratio=10
  + TV sys =G
  + class of EMISSION=C3E
  + bandwidth=8000KHz.
* Step 3: open the menu (interference)and select(BT 2 BT)item.
* Step 4 : select YEMBT1 station and push OK.
* Step 5: set search radius, and Min. FS and push OK.
* Step 6: select YEMBT2 station as interferer station and state calculation .
* Step 7: compare coverage area with and without interference.
* Step 8: change to main window and from propagation model select overlay item and choose the interference BT 2 BT results.

**Exercise 33**

**Interference FX**

* Step 1: Launch the SMS4DC software
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Establish Fixed station UAEFX11 using  , set the frequency to 6000MHZ , power=50W and height of antenna=10m
* Step 4: Establish Fixed station UAEFX22 using  ,set the frequency to hig6000MHZ,power=50W,and height of antenna=10m
* Step 5: open the administrative part from “data base->Licensing”
* Step 6: Find the station UAEFX11 and go to the level of “Frequency”
* Step 7: push the “Add Receiver “button top of the “Frequency Information “table of station UAEFX11.The “Add Receiver” dialog box will appear.
* Step 8: Select the “Point” Radio button .All the selectable receivers will be displayed in relevant spreadsheet
* Step 9: Choose the station UAEFX22 from table under POINT section and push ok
* Step 10: Close Administrative dialog box
* Step 11: Establish Fixed station UAEFX33 using,set the frequency to hig6000MHZ, power=50W,and height of antenna=10m
* Step 12: Establish Fixed station UAEFX44 using,set the frequency to hig 6000MHZ,power=50W,and height of antenna=10m
* Step 13: open the administrative part from “data base->Licensing”
* Step 14: Find the station UAEFX33 and go to the level of “Frequency”
* Step 15: push the “Add Receiver “button top of the “Frequency Information “table of station UAEFX33.The “Add Receiver” dialog box will appear.
* Step 16: Select the “Point” Radio button .All the selectable receivers will be displayed in relevant spreadsheet
* Step 17: Choose the station UAEFX44 from table under POINT section and push ok
* Step 18: Close Administrative dialog box
* Step 19: open the “Database “menu and select “Display Link “
* Step 20: Select the record of new established hops
* Step 21: Push ok button to display station of selected hops on map
* Step 22: Open the menu “Interference” and select FX2FX(LINK) and “Interference to”
* Step 23: select one of the hops was created by previous steps
* Step 24: Set parameters and push OK then select all found hops and push OK
* Step 25: open the menu “Interference” and select FX2FX (station) and “Interference to”
* Step 26: select one of the stations was created by previous steps
* Step 27: Set parameters and push OK then select all found hops and push
* Step 28: Compare the result with the result of step 24

**Exercise 34**

**Interference FXM**

* Step1: Launch the SMS4DC software
* Step 2: Launch the DEM view using  toolbar push button.
* Step3: Establish LM station UAEB1 using ,set the frequency to 150MHZ,and height of Antenna=10m
* Step4: Establish LM station UAEB2 using ,set the frequency to 150MHZ,and height of Antenna=10
* Step5: Open the menu “Interference” and select” FXM” and Interference to (FREE SPACE)
* Step6: select station UAEFB1 and push OK
* Step7: set parameters and push OK then select UAEFB2 station and push OK
* Step8: Open the menu “Interference” and select” FXM” and Interference to (P.1546)
* Step9: select station UAEFB1 and push OK
* Step10: set parameters and push OK then select UAEFB2 station and push OK
* Step11: compare the results with the result of step7

**Exercise 35**

**Interference: ES to/from FX**

* Step 1: Launch the SMS4DC software
* Step 2: Launch the DEM view using  toolbar push button.
* Step 3: Open the menu “DATABASE” and select “Earth Stations in Desktop” item.
* Step 4: Sort stations by NIG as Country.
* Step 5: Select earth station in NIG and push OK.
* Step 6: Find your Earth station on map.
* Step 7: Create FX station with name NIGFXES1 near to EARTH station with Tx Freq=400MHz and power =50 w and height of Antenna=10m.
* Step 8: Open the menu “DATABASE” and select “LICESING” and find FX and go to frequency level and change the response frequency to 6000MHZ.
* Step 9: Open the menu “DATABASE” and select “LICESING” and find ES and fill nominal longitude of space station .
* Step 10: open the menu “Interference” and select “ES2FX”.
* Step 11: Choose NIG.
* Step 12: Choose station YEMTEST and push OK.
* Step 13: Set parameters and push OK
* Step 14: Open the menu “Interference” and select “FX2ES”.
* Step 15: Repeat step 11 to 13.