

SCPI Command Reference, Volume 3

Agilent Technologies E4428C/38C ESG Signal Generators

This guide applies to the following signal generator models:

E4428C ESG Analog Signal Generator

E4438C ESG Vector Signal Generator

Due to our continuing efforts to improve our products through firmware and hardware revisions, signal generator design and operation may vary from descriptions in this guide. We recommend that you use the latest revision of this guide to ensure you have up-to-date product information. Compare the print date of this guide (see bottom of page) with the latest revision, which can be downloaded from the following website:

<http://www.agilent.com/find/esg>



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SCPI Command Reference, Volume 1

1. SCPI Basics	1
Command Reference Information	2
SCPI Command Listings	2
Key and Data Field Cross Reference	2
Supported Field	2
SCPI Basics	3
Common Terms	3
Command Syntax	4
Command Types	5
Command Tree	6
Command Parameters and Responses	7
Program Messages	12
File Name Variables	13
MSUS (Mass Storage Unit Specifier) Variable	15
Quote Usage with SCPI Commands	16
Binary, Decimal, Hexadecimal, and Octal Formats	16
2. Basic Function Commands	17
Correction Subsystem ([:SOURce]:CORRection)	18
:FLATness:LOAD	18
:FLATness:PAIR	18
:FLATness:POINts	18
:FLATness:PRESet	19
:FLATness:STORe	19
[:STATe]	19
Digital Modulation Subsystem—E4438C ([:SOURce])	20
:BURSt:SOURce	20
:BURSt:STATe	20
:DM:EXTernal:ALC:BANDwidth BWIDth	21
:DM:EXTernal:HCRest[:STATe]	21
:DM:EXTernal:FILTer	22
:DM:EXTernal:FILTer:AUTO	22
:DM:EXTernal:POLarity	23
:DM:EXTernal:SOURce	23
:DM:IQADjustment:EXTernal:COFFset	24

Contents

:DM:IQADjustment:EXTernal:DIOFFset	24
:DM:IQADjustment:EXTernal:DQOFFset	25
:DM:IQADjustment:EXTernal:GAIN	25
:DM:IQADjustment:EXTernal:IOFFset	26
:DM:IQADjustment:EXTernal:IQATten	26
:DM:IQADjustment:EXTernal:QOFFset	27
:DM:IQADjustment:GAIN	27
:DM:IQADjustment:IOFFset	28
:DM:IQADjustment:QOFFset	28
:DM:IQADjustment:QSKew	29
:DM:IQADjustment:SKEW	29
:DM:IQADjustment:SKEW:Path	30
:DM:IQADjustment[:STATe]	31
:DM:MODulation:FILTer	31
:DM:MODulation:FILTer:AUTO	32
:DM:MODulation:ATTen	32
:DM:MODulation:ATTen:AUTO	33
:DM:POLarity[:ALL]	33
:DM:SKEW:PATH	34
:DM:SKEW[:STATe]	34
:DM:SOURce	35
:DM:SRATio	35
:DM:STATe	36
Frequency Subsystem ([:SOURce])	37
:FREQuency:CHANnels:BAND	37
:FREQuency:CHANnels:NUMBer	39
:FREQuency:CHANnels[:STATe]	40
:FREQuency:FIXed	40
:FREQuency:MODE	41
:FREQuency:MULTiplier	41
:FREQuency:OFFSet	42
:FREQuency:OFFSet:STATe	42
:FREQuency:REFerence	43
:FREQuency:REFerence:STATe	43
:FREQuency:START	44
:FREQuency:STOP	44
:FREQuency:SYNTHeSis	45
:FREQuency[:CW]	46

:PHASe:REFerence	46
:PHASe[:ADJust]	47
:ROSCillator:SOURce	47
:ROSCillator:SOURce:AUTO	47
List/Sweep Subsystem ([:SOURce])	48
:LIST:DIRection	49
:LIST:DWELl	49
:LIST:DWELl:POINts	50
:LIST:DWELl:TYPE	50
:LIST:FREQuency	50
:LIST:FREQuency:POINts	51
:LIST:MANual	51
:LIST:MODE	52
:LIST:POWer	52
:LIST:POWer:POINts	52
:LIST:RETRace	53
:LIST:TRIGger:SOURce	53
:LIST:TYPE	54
:LIST:TYPE:LIST:INITialize:FSTep	54
:LIST:TYPE:LIST:INITialize:PRESet	55
:SWEep:DWELl	55
:SWEep:POINts	56
Power Subsystem ([:SOURce]:POWer)	57
:ALC:BANDwidth BWIDth	57
:ALC:BANDwidth	57
:ALC:LEVel	58
:ALC:SEARch	58
:ALC:SEARch:REFerence	59
:ALC:SEARch:SPAN:START	59
:ALC:SEARch:SPAN:STOP	59
:ALC:SEARch:SPAN:TYPE	60
:ALC:SEARch:SPAN[:STATe]	60
:ALC[:STATe]	60
:ALTerminate:AMPLitude	61
:ALTerminate:MANual	61
:ALTerminate:STATe	62
:ALTerminate:TRIGger[:SOURce]	62
:ATTenuation:AUTO	63

Contents

:ATTenuation.	64
:MODE	65
:REFerence	65
:REFerence:STATe	66
:START	66
:STOP	67
[:LEVel][:IMMediate]:OFFSet	67
[:LEVel][:IMMediate][:AMPLitude]	68
Pulse Subsystem ([:SOURce]:PULSe).	69
:FREQuency:STEP	69
3. System Commands.	71
Calibration Subsystem (:CALibration).	72
:DCFM	72
:IQ	72
:IQ:DC	72
:IQ:DEFault	73
:IQ:FULL	73
:IQ:START	74
:IQ:STOP	74
Communication Subsystem (:SYSTem:COMMunicate)	75
:GPIB:ADDRess	75
:GTLocal	75
:LAN:GATEway	75
:LAN:HOSTname	76
:LAN:IP	76
:LAN:SUBNet	76
:PMETer:ADDRess.	77
:PMETer:CHANnel	77
:PMETer:IDN	78
:PMETer:TIMEout	78
:SERial:BAUD	79
:SERial:ECHO	79
:SERial:RESet.	79
:SERial:TOUT	80
Diagnostic Subsystem (:DIAGnostic[:CPU]:INFORMATION)	81
:BOARDs.	81
:CCOunt:ATTenuator	81

:CCOut:PON	81
:CCOut:PROTection	81
:DISPlay:OTIME	82
:LICense:AUXiliary	82
:LICense:WAVeform	83
:OPTions	83
:OPTions:DETail	83
:OTIME	84
:REVision	84
:SDATe	84
:WLIcenc[e][:VALue]	84
Display Subsystem (:DISPlay)	85
:ANNotation:AMPLitude:UNIT	85
:ANNotation:CLOCK:DATE:FORMat	85
:ANNotation:CLOCK[:STATe]	85
:BRIGHtness	86
:CAPTure	86
:CONTrast	87
:INVerse	87
:REMote	88
[:WINDow][:STATe]	88
IEEE 488.2 Common Commands	89
*CLS	89
*ESE	89
*ESE?	89
*ESR?	90
*IDN?	90
*OPC	90
*OPC?	90
*PSC	91
*PSC?	91
*RCL	91
*RST	91
*SAV	92
*SRE	92
*SRE?	92
*STB?	93
*TRG	93

Contents

- *TST? 93
- *WAI 93
- Memory Subsystem (:MEMory) 94
 - :CATalog:BINary 94
 - :CATalog:BIT 94
 - :CATalog:CDMa 95
 - :CATalog:DMOD 95
 - :CATalog:DWCDma 96
 - :CATalog:FCDMa 96
 - :CATalog:FIR 97
 - :CATalog:FSK 97
 - :CATalog:IQ 98
 - :CATalog:LIST 98
 - :CATalog:MCDMa 99
 - :CATalog:MDMod 99
 - :CATalog:MDWCdma 100
 - :CATalog:MFCdma 100
 - :CATalog:MTONe 101
 - :CATalog:RCDMa 101
 - :CATalog:SEQ 102
 - :CATalog:SHAPE 102
 - :CATalog:STATe 103
 - :CATalog:UFLT 103
 - :CATalog:UWCDma 104
 - :CATalog[:ALL] 104
 - :COPY[:NAME] 105
 - :DATA 105
 - :DATA:APPend 106
 - :DATA:BIT 107
 - :DATA:FIR 108
 - :DATA:FSK 109
 - :DATA:IQ 110
 - :DATA:PRAM:FILE:BLOCK 111
 - :DATA:PRAM:FILE:LIST 112
 - :DATA:PRAM 113
 - :DATA:PRAM:BLOCK 113
 - :DATA:PRAM:LIST 113
 - :DATA:SHAPE 113

:DATA:UNPRotected	114
:DELeTe:ALL	115
:DELeTe:BINary	116
:DELeTe:BIT	116
:DELeTe:CDMa	116
:DELeTe:DMOD	116
:DELeTe:DWCDma	116
:DELeTe:FCDMa	117
:DELeTe:FIR	117
:DELeTe:FSK	117
:DELeTe:IQ	117
:DELeTe:LIST	117
:DELeTe:MCDMa	118
:DELeTe:MMod	118
:DELeTe:MDWCdma	118
:DELeTe:MFCdma	118
:DELeTe:MTONE	118
:DELeTe:RCDMa	119
:DELeTe:SEQ	119
:DELeTe:SHApe	119
:DELeTe:STATe	119
:DELeTe:UFLT	119
:DELeTe:UWCDma	120
:DELeTe[:NAME]	120
:FREE[:ALL]	120
:LOAD:LIST	120
:MOVE	121
:STATe:COMMeNt	121
:STORe:LIST	121
Mass Memory Subsystem (:MMEMory)	122
:CATalog	122
:COpy	124
:DATA	124
:DATA:UNPRotected	125
:DELeTe:NVWFm	126
:DELeTe:WFM	126
:DELeTe:WFM1	127
:DELeTe[:NAME]	127

Contents

:HEADer:CLEar	127
:HEADer:DESCription	128
:LOAD:LIST	128
:MOVE	128
:STORE:LIST	128
Output Subsystem (:OUTPut)	129
:BLANKing:AUTO	129
:BLANKing:STATe	129
:MODulation[:STATe]	129
[:STATe]	130
Route Subsystem (:ROUte:HARDware:DGENerator)	131
:INPut:BPOLarity	131
:INPut:CPOLarity	131
:INPut:DPOLarity	132
:INPut:SPOLarity	132
:IPOLarity:BGATe	132
:IPOLarity:CLOCK	133
:IPOLarity:DATA	133
:IPOLarity:SSYNc	133
:OPOLarity:CLOCK	134
:OPOLarity:DATA	134
:OPOLarity:SSYNc	135
:OUTPut:CPOLarity	135
:OUTPut:DCS[:STATe]	136
:OUTPut:DPOLarity	136
:OUTPut:SPOLarity	136
Status Subsystem (:STATus)	137
:OPERation:BASeband:CONDition	137
:OPERation:BASeband:ENABle	137
:OPERation:BASeband:NTRansition	138
:OPERation:BASeband:PTRansition	138
:OPERation:BASeband[:EVENT]	139
:OPERation:CONDition	139
:OPERation:ENABle	140
:OPERation:NTRansition	140
:OPERation:PTRansition	141
:OPERation[:EVENT]	141
:PRESet	141

:QUESTionable:BERT:CONDition	142
:QUESTionable:BERT:ENABle	142
:QUESTionable:BERT:NTRansition	143
:QUESTionable:BERT:PTRansition	143
:QUESTionable:BERT[:EVENT]	144
:QUESTionable:CALibration:CONDition	144
:QUESTionable:CALibration:ENABle	144
:QUESTionable:CALibration:NTRansition	145
:QUESTionable:CALibration:PTRansition	145
:QUESTionable:CALibration[:EVENT]	146
:QUESTionable:CONDition	146
:QUESTionable:ENABle	147
:QUESTionable:FREQuency:CONDition	147
:QUESTionable:FREQuency:ENABle	147
:QUESTionable:FREQuency:NTRansition	148
:QUESTionable:FREQuency:PTRansition	148
:QUESTionable:FREQuency[:EVENT]	148
:QUESTionable:MODulation:CONDition	149
:QUESTionable:MODulation:ENABle	149
:QUESTionable:MODulation:NTRansition	150
:QUESTionable:MODulation:PTRansition	150
:QUESTionable:MODulation[:EVENT]	150
:QUESTionable:NTRansition	151
:QUESTionable:POWer:CONDition	151
:QUESTionable:POWer:ENABle	152
:QUESTionable:POWer:NTRansition	152
:QUESTionable:POWer:PTRansition	152
:QUESTionable:POWer[:EVENT]	153
:QUESTionable:PTRansition	153
:QUESTionable[:EVENT]	154
System Subsystem (:SYSTem)	155
:CAPability	155
:DATE	155
:ERRor[:NEXT]	156
:ERRor:SCPI[:SYNTAX]	156
:FILEsystem:SAFEmode	156
:HELP:MODE	157
:IDN	157

Contents

:LANGUage	157
:PON:TYPE	158
:PRESet	159
:PRESet:ALL	159
:PRESet:LANGUage	159
:PRESet:PERSistent	160
:PRESet:PN9	160
:PRESet:TYPE	161
:PRESet[:USER]:SAVE	161
:SECurity:DISPlay	162
:SECurity:ERASeall	162
:SECurity:LEVel	163
:SECurity:LEVel:STATe	164
:SECurity:OVERwrite	164
:SECurity:SANitize	165
:SSAVer:DELay	165
:SSAVer:MODE	166
:SSAVer:STATe	166
:TIME	166
:VERSion	167
Trigger Subsystem	168
:ABORt	168
:INITiate:CONTInuous[:ALL]	168
:INITiate[:IMMediate][:ALL]	169
:TRIGger:OUTPut:POLarity	169
:TRIGger[:SEQuence]:SLOPe	170
:TRIGger[:SEQuence]:SOURce	170
:TRIGger[:SEQuence][:IMMediate]	171
Unit Subsystem (:UNIT)	172
:POWer	172
4. Analog Commands	173
Amplitude Modulation Subsystem ([:SOURce])	174
:AM[1] 2...	174
:AM:INTernal:FREQuency:STEP[:INCReMENT]	174
:AM:WIDeband:STATe	175
:AM[1] 2:EXTernal[1] 2:COUPling	175
:AM[1] 2:INTernal[1]:FREQuency	176

:AM[1]2:INTErnal[1]:FREQuency:ALTErnate	176
:AM[1]2:INTErnal[1]:FREQuency:ALTErnate:AMPLitude:PERCent	176
:AM[1]2:INTErnal[1]:FUNCTion:SHAPE	177
:AM[1]2:INTErnal[1]:SWEep:TIME	177
:AM[1]2:INTErnal[1]:SWEep:TRIGger	178
:AM[1]2:SOURce	178
:AM[1]2:STATe	179
:AM[1]2[:DEPT]h	179
:AM[1]2[:DEPT]h:TRACk	180
:AM[:DEPT]h:STEP[:INCR]ement	180
Frequency Modulation Subsystem ([:SOUR]ce)	181
:FM[1]2...	181
:FM:INTErnal:FREQuency:STEP[:INCR]ement	182
:FM[1]2:EXTErnal[1]2:COUPLing	182
:FM[1]2:INTErnal[1]:FREQuency	183
:FM[1]2:INTErnal[1]:FREQuency:ALTErnate	183
:FM[1]2:INTErnal[1]:FREQuency:ALTErnate:AMPLitude:PERCent	184
:FM[1]2:INTErnal[1]:FUNCTion:SHAPE	184
:FM[1]2:INTErnal[1]:SWEep:TIME	185
:FM[1]2:INTErnal[1]:SWEep:TRIGger	185
:FM[1]2:SOURce	186
:FM[1]2:STATe	186
:FM[1]2[:DEVI]ation	187
:FM[1]2[:DEVI]ation:TRACk	187
Low Frequency Output Subsystem ([:SOUR]ce[:LFO]utput)	188
:AMPLitude	188
:FUNCTion[1]:FREQuency	188
:FUNCTion[1]:FREQuency:ALTErnate	189
:FUNCTion[1]:FREQuency:ALTErnate:AMPLitude:PERCent	189
:FUNCTion[1]:PERiod	190
:FUNCTion[1]:PWIDth	190
:FUNCTion[1]:SHAPE	191
:FUNCTion[1]:SWEep:TIME	191
:FUNCTion[1]:SWEep:TRIGger	191
:SOURce	192
:STATe	192
Phase Modulation Subsystem ([:SOUR]ce)	193
:PM[1]2...	193

Contents

:PM:INTErnal:FREQUency:STEP[:INCRement]	194
:PM[1]2:BA NDwidth BWIDth	194
:PM[1]2:EXTErnal[1]:COUPling	195
:PM[1]2:INTErnal[1]:FREQUency	195
:PM[1]2:INTErnal[1]:FREQUency:ALTErnate	196
:PM[1]2:INTErnal[1]:FREQUency:ALTErnate:AMPLitude:PERCent	196
:PM[1]2:INTErnal[1]:FUNCTion:SHAPE	197
:PM[1]2:INTErnal[1]:SWEep:TIME	197
:PM[1]2:INTErnal[1]:SWEep:TRIGger	197
:PM[1]2:SOURce	198
:PM[1]2:STATe	198
:PM[1]2[:DEVIation]	199
:PM[1]2[:DEVIation]:TRACk	199
:PM[:DEVIation]:STEP[:INCRement]	200
Pulse Modulation Subsystem ([:SOURce]:PULM)	201
:INTErnal[1]:FREQUency	201
:INTErnal[1]:FREQUency:STEP	201
:INTErnal[1]:FUNCTion:SHAPE	202
:INTErnal[1]:PERiod	202
:INTErnal[1]:PERiod:STEP[:INCRement]	202
:INTErnal[1]:PWIDth	203
:INTErnal[1]:PWIDth:STEP	203
:SOURce	204
:STATe	204
5. Component Test Digital Commands	205
All Subsystem–Option 001/601 or 002/602 ([:SOURce])	206
:RADio:ALL:OFF	206
AWGN ARB Subsystem–Option 403 ([:SOURce]:RADio:AWGN:ARB)	207
:BWIDth	207
:IQ:EXTErnal:FILTEr	207
:IQ:EXTErnal:FILTEr:AUTO	208
:HEADer:CLEar	208
:HEADer:SAVE	208
:IQ:MODulation:ATTen	209
:IQ:MODulation:ATTen:AUTO	209
:IQ:MODulation:FILTEr	210
:IQ:MODulation:FILTEr:AUTO	210

:MDEStination:PULSe	211
:MDEStination:AAMPlitude	211
:MDEStination:ALCHold	211
:MPOLarity:MARKer1	212
:MPOLarity:MARKer2	212
:MPOLarity:MARKer3	212
:MPOLarity:MARKer4	212
:LENGth	213
:REFeRence:EXTeRnal:FREQUency	213
:REFeRence[:SOURce]	214
:SCLock:RATE	214
:SEED	215
[:STATE]	215
CDMA ARB Subsystem–Option 401 ([:SOURce]:RADio:CDMA:ARB)	216
:CLIPping:I	216
:CLIPping:POSition	216
:CLIPping:Q	217
:CLIPping:TYPE	217
:CLIPping[:IJQ]	218
:CRATe	218
:IQ:EXTeRnal:FILTer	219
:IQ:EXTeRnal:FILTer:AUTO	219
:FILTer	220
:FILTer:ALPHa	221
:FILTer:BBT	221
:FILTer:CHANnel	222
:HEADer:CLEar	222
:HEADer:SAVE	222
:IQMap	223
:IQ:MODulation:ATTen	223
:IQ:MODulation:ATTen:AUTO	223
:IQ:MODulation:FILTer	224
:IQ:MODulation:FILTer:AUTO	224
:MDEStination:PULSe	225
:MDEStination:AAMPlitude	225
:MDEStination:ALCHold	225
:MPOLarity:MARKer1	226
:MPOLarity:MARKer2	226

Contents

:MPOLarity:MARKer3.....	226
:MPOLarity:MARKer4.....	226
:OSAMple.....	227
:REFerence:EXTernal:FREQuency.....	227
:REFerence[:SOURce].....	228
:RETRigger.....	228
:SCLock:RATE.....	229
:SETup.....	229
:SETup:CHANnel.....	230
:SETup:MCARrier.....	231
:SETup:MCARrier:STORE.....	232
:SETup:MCARrier:TABLE.....	232
:SETup:STORE.....	233
:TRIGger:TYPE.....	234
:TRIGger:TYPE:CONTInuous[:TYPE].....	235
:TRIGger:TYPE:GATE:ACTive.....	236
:TRIGger[:SOURce].....	236
:TRIGger[:SOURce]:EXTernal:DELay.....	238
:TRIGger[:SOURce]:EXTernal:DELay:STATe.....	238
:TRIGger[:SOURce]:EXTernal:SLOPe.....	239
:TRIGger[:SOURce]:EXTernal[:SOURce].....	239
:WLENgth.....	240
[:STATe].....	241
CDMA2000 ARB Subsystem–Option 401 ([:SOURce]:RADio:CDMA2000:ARB).....	242
:CLIPping:I.....	242
:CLIPping:POSition.....	242
:CLIPping:Q.....	243
:CLIPping:TYPE.....	243
:CLIPping[:IJQ].....	244
:IQ:EXTernal:FILTer.....	244
:IQ:EXTernal:FILTer:AUTO.....	244
:FILTer.....	245
:FILTer:ALPHa.....	246
:FILTer:BBT.....	246
:FILTer:CHANnel.....	247
:HEADer:CLEar.....	247
:HEADer:SAVE.....	247
:IQ:MODulation:ATTen.....	248

:IQ:MODulation:ATTen:AUTO	248
:IQ:MODulation:FILTer	249
:IQ:MODulation:FILTer:AUTO	249
:IQMap	250
:LINK	250
:LINK:FORWard:SETup	250
:LINK:FORWard:SETup:MCARrier	251
:LINK:FORWard:SETup:MCARrier:STORE	252
:LINK:FORWard:SETup:MCARrier:TABLE	252
:LINK:FORWard:SETup:MCARrier:TABLE:NCARriers	253
:LINK:FORWard:SETup:STORE	254
:LINK:FORWard:SETup:TABLE:APPLY	254
:LINK:FORWard:SETup:TABLE:CHANnel	255
:LINK:FORWard:SETup:TABLE:NCHannels	256
:LINK:FORWard:SETup:TABLE:PADJust	256
:LINK:REVerse:RCONfig	256
:LINK:REVerse:SETup	257
:LINK:REVerse:SETup:STORE	258
:LINK:REVerse:SETup:TABLE:APPLY	258
:LINK:REVerse:SETup:TABLE:CHANnel	259
:LINK:REVerse:SETup:TABLE:NCHannels	260
:LINK:REVerse:SETup:TABLE:PADJust	260
:MDESTination:PULSe	260
:MDESTination:AAMPLitude	261
:MDESTination:ALCHold	261
:MPOLarity:MARKer1	261
:MPOLarity:MARKer2	262
:MPOLarity:MARKer3	262
:MPOLarity:MARKer4	262
:REFerence:EXTernal:FREQuency	263
:REFerence[:SOURce]	263
:RETRigger	264
:REVision	264
:SCLock:RATE	264
:SPReading:RATE	265
:SPReading:TYPE	265
:SPReading:TYPE:MCARrier:SPACing	266
:TRIGger:TYPE	266

Contents

:TRIGger:TYPE:CONTInuous[:TYPE]	268
:TRIGger:TYPE:GATE:ACTive	268
:TRIGger[:SOURce]	269
:TRIGger[:SOURce]:EXTernal:DELay	270
:TRIGger[:SOURce]:EXTernal:DELay:STATe	271
:TRIGger[:SOURce]:EXTernal:SLOPe	271
:TRIGger[:SOURce]:EXTernal[:SOURce]	272
[:STATe]	273
Dmodulation Subsystem—Option 001/601 or 002/602 ([:SOURce]:RADio:DMODulation:ARB)	274
:IQ:EXTernal:FILTer	274
:IQ:EXTernal:FILTer:AUTO	274
:FILTer	275
:FILTer:ALPHa	276
:FILTer:BBT	276
:FILTer:CHANnel	277
:HEADer:CLEar	277
:HEADer:SAVE	277
:IQ:MODulation:ATTen	278
:IQ:MODulation:ATTen:AUTO	278
:IQ:MODulation:FILTer	279
:IQ:MODulation:FILTer:AUTO	279
:MDEStination:PULSe	280
:MDEStination:AAMPLitude	280
:MDEStination:ALCHold	280
:MODulation:FSK[:DEViation]	280
:MODulation[:TYPE]	281
:MPOLarity:MARKer1	281
:MPOLarity:MARKer2	282
:MPOLarity:MARKer3	282
:MPOLarity:MARKer4	282
:REFerence:EXTernal:FREQUency	282
:REFerence[:SOURce]	283
:RETRigger	283
:SCLock:RATE	284
:SETup	284
:SETup:MCARrier	285
:SETup:MCARrier:PHASe	286
:SETup:MCARrier:STORE	286

:SETup:MCARrier:TABLE	286
:SETup:MCARrier:TABLE:NCARriers	287
:SETup:STORe	288
:SRATe	288
:TRIGger:TYPE	289
:TRIGger:TYPE:CONTinuous[:TYPE]	291
:TRIGger:TYPE:GATE:ACTive	291
:TRIGger[:SOURce]	292
:TRIGger[:SOURce]:EXTernal:DELay	293
:TRIGger[:SOURce]:EXTernal:DELay:STATe	294
:TRIGger[:SOURce]:EXTernal:SLOPe	294
:TRIGger[:SOURce]:EXTernal[:SOURce]. [:STATe]	295 296
Dual ARB Subsystem–Option 001/601 or 002/602 (:SOURce):RADio:ARB)	297
:CLIPping	297
:GENerate:SINE	297
:HEADer:CLear	298
:HEADer:RMS	298
:HEADer:SAVE	299
:HCRest[:STATe].	299
:IQ:EXTernal:FILTer	300
:IQ:EXTernal:FILTer:AUTO	300
:IQ:MODulation:ATTen	301
:IQ:MODulation:ATTen:AUTO	301
:IQ:MODulation:FILTer	302
:IQ:MODulation:FILTer:AUTO	302
:MARKer:CLear	303
:MARKer:CLear:ALL	303
:MARKer:ROtate	304
:MARKer:[SET]	304
:MDESTination:PULSe	305
:MDESTination:AAMPLitude	305
:MDESTination:ALCHold	306
:MPOLarity:MARKer1	306
:MPOLarity:MARKer2	306
:MPOLarity:MARKer3	307
:MPOLarity:MARKer4	307
:NOISe	307

Contents

:NOISe:BFACtor	308
:NOISe:CBWidth	308
:NOISe:CN	309
:REFerence:EXTernal:FREQuency	309
:REFerence[:SOURce]	310
:RETRigger	310
:RSCALing	311
:SCALing	311
:SCLock:RATE	311
:SEQuence	312
:TRIGger:TYPE	312
:TRIGger:TYPE:CONTinuous[:TYPE]	314
:TRIGger:TYPE:GATE:ACTive	314
:TRIGger:TYPE:SADVance[:TYPE]	315
:TRIGger[:SOURce]	315
:TRIGger[SOURce]:EXTernal:DELAy	316
:TRIGger[:SOURce]:EXTernal:DELAy:STATE	317
:TRIGger[:SOURce]:EXTernal:SLOPe	317
:TRIGger[:SOURce]:EXTernal[:SOURce]	318
:WAVEform	318
:Waveform:NHEAders	319
[:STATE]	320
Multitone Subsystem—Option 001/601 or 002/602 ([:SOURce]:RADio:MTONE:ARB)	321
Creating a Multitone Waveform	321
:HEADer:CLear	321
:HEADer:SAVE	321
:IQ:EXTernal:FILTer	322
:IQ:EXTernal:FILTer:AUTO	322
:IQ:MODulation:ATTen	323
:IQ:MODulation:ATTen:AUTO	323
:IQ:MODulation:FILTer	324
:IQ:MODulation:FILTer:AUTO	324
:MDESTination:PULSe	325
:MDESTination:AAMPLitude	325
:MDESTination:ALCHold	325
:MPOLarity:MARKer1	326
:MPOLarity:MARKer2	326
:MPOLarity:MARKer3	326

:MPOLarity:MARKer4	326
:REFeRence:EXTeRnal:FREQUency	327
:REFeRence[:SOURce]	327
:ROW	328
:SCLock:RATE	329
:SETup	329
:SETup:STORe	329
:SETup:TABLE	330
:SETup:TABLE:FSPacing	330
:SETup:TABLE:NTONes	331
:SETup:TABLE:PHASe:INITialize	331
:SETup:TABLE:PHASe:INITialize:SEED	332
[:STATe]	332
Wideband CDMA ARB Subsystem–Option 400 ([:SOURce]:RADio:WCDMa:TGPP:ARB)	333
:CLIPping:I	333
:CLIPping:POSition	333
:CLIPping:Q	334
:CLIPping:TYPE	334
:CLIPping[:IJQ]	335
:CRATe	335
:FILTer	336
:FILTer:ALPHa	336
:FILTer:BBT	337
:FILTer:CHANnel	337
:HEADer:CLEar	338
:HEADer:SAVE	338
:IQ:EXTeRnal:FILTer	338
:IQ:EXTeRnal:FILTer:AUTO	338
:IQMap	339
:IQ:MODulation:ATTen	339
:IQ:MODulation:ATTen:AUTO	340
:IQ:MODulation:FILTer	340
:IQ:MODulation:FILTer:AUTO	341
:LINK	341
:LINK:DOWN:OACP	342
:LINK:DOWN:SETup	342
:LINK:DOWN:SETup:MCARrier	343
:LINK:DOWN:SETup:MCARrier:CLIPping:I	345

Contents

:LINK:DOWN:SETup:MCARrier:CLIPping:Q	345
:LINK:DOWN:SETup:MCARrier:CLIPping:TYPE	346
:LINK:DOWN:SETup:MCARrier:CLIPping[:IJQ]	346
:LINK:DOWN:SETup:MCARrier:SCODE:AINCrement	346
:LINK:DOWN:SETup:MCARrier:STORE	347
:LINK:DOWN:SETup:MCARrier:TABLE	347
:LINK:DOWN:SETup:MCARrier:TABLE:NCARriers	349
:LINK:DOWN:SETup:MCARrier:TOFFset:AINCrement	349
:LINK:DOWN:SETup:STORE	350
:LINK:DOWN:SETup:TABLE:APPLY	350
:LINK:DOWN:SETup:TABLE:CHANnel	351
:LINK:DOWN:SETup:TABLE:NCHannels?	355
:LINK:DOWN:SETup:TABLE:PADJust	356
:LINK:DOWN:TFCI	356
:LINK:UP:OACP	356
:LINK:UP:SCRAMBLE	357
:LINK:UP:SDPDch	357
:LINK:UP:SETup	357
:LINK:UP:SETup:STORE	358
:LINK:UP:SETup:TABLE:APPLY	359
:LINK:UP:SETup:TABLE:CHANnel	359
:LINK:UP:SETup:TABLE:GUNit	360
:LINK:UP:SETup:TABLE:NCHannel	361
:LINK:UP:TFCI	361
:MDEStination:PULSe	361
:MDEStination:AAMPLitude	362
:MDEStination:ALCHold	362
:MPOLarity:MARKer1	362
:MPOLarity:MARKer2	363
:MPOLarity:MARKer3	363
:MPOLarity:MARKer4	363
:REFerence:EXTernal:FREQuency	364
:REFerence[:SOURce]	364
:RETRigger	365
:REVision	365
:SCLock:RATE	366
:TRIGger:TYPE	366
:TRIGger:TYPE:CONTInuous[:TYPE]	368

:TRIGger:TYPE:GATE:ACTive	369
:TRIGger[:SOURce]	369
:TRIGger[:SOURce]:EXTernal:DELay	370
:TRIGger[:SOURce]:EXTernal:DELay:STATe	371
:TRIGger[:SOURce]:EXTernal:SLOPe	372
:TRIGger[:SOURce]:EXTernal[:SOURce].	372
[:STATe]	373

SCPI Command Reference, Volume 2

6. Digital Signal Interface Module Commands	375
Digital Subsystem—Option 003 and 004 ([:SOURCE])	376
:DIGital:CLOCK:CPS 1 2 4	376
:DIGital:CLOCK:PHASe	376
:DIGital:CLOCK:POLarity	377
:DIGital:CLOCK:RATE	378
:DIGital:CLOCK:REFerence:FREQuency	378
:DIGital:CLOCK:SKEW	379
:DIGital:CLOCK:SOURCe	379
:DIGital:DATA:ALIGNment	380
:DIGital:DATA:BORDER	380
:DIGital:DATA:DIRection	381
:DIGital:DATA:IGain	381
:DIGital:DATA:INEGate	382
:DIGital:DATA:IOFFset	382
:DIGital:DATA:IQSWap	383
:DIGital:DATA:NFORmat	383
:DIGital:DATA:POLarity:FRAMe	383
:DIGital:DATA:POLarity:IQ	384
:DIGital:DATA:QGain	384
:DIGital:DATA:QNEGate	385
:DIGital:DATA:QOFFset	386
:DIGital:DATA:ROTation	386
:DIGital:DATA:SCALing	387
:DIGital:DATA:SIZE	387
:DIGital:DATA:STYPe	388
:DIGital:DATA:TYPE	388
:DIGital:DIAGnostic:LOOPback	389
:DIGital:LOGic[:TYPE]	389
:DIGital:PCONfig	390
:DIGital:PRESet:PTHROUGH	391
:DIGital[:STATe]	391
7. Bit Error Rate Test (BERT) Commands	393
Calculate Subsystem—Option UN7 and 300 (:CALCulate:BERT)	394

:BTS:LOOPback:EDGE:ETCH:F43:COMParator:CRITeria:ERATe	394
:BTS:LOOPback:EDGE:ETCH:F43:COMParator:CRITeria[:SElect]	394
:BTS:LOOPback:EDGE:MCS5:COMParator:CRITeria:ERATe	395
:BTS:LOOPback:EDGE:MCS5:COMParator:CRITeria[:SElect]	395
:BTS:LOOPback:EDGE:MCS9:COMParator:CRITeria:ERATe	395
:BTS:LOOPback:EDGE:MCS9:COMParator:CRITeria[:SElect]	396
:BTS:LOOPback:EDGE:UNCoded:COMParator:CRITeria:ERATe	396
:BTS:LOOPback:EDGE:UNCoded:COMParator:CRITeria[:SElect]	397
:BTS:LOOPback:GSM:CS1:COMParator:CRITeria:ERATe	397
:BTS:LOOPback:GSM:CS1:COMParator:CRITeria[:SElect]	398
:BTS:LOOPback:GSM:CS4:COMParator:CRITeria:ERATe	398
:BTS:LOOPback:GSM:CS4:COMParator:CRITeria[:SElect]	398
:BTS:LOOPback:GSM:MCS1:COMParator:CRITeria:ERATe	399
:BTS:LOOPback:GSM:MCS1:COMParator:CRITeria[:SElect]	399
:BTS:LOOPback:GSM:COMParator:CRITeria:CIB	400
:BTS:LOOPback:GSM:COMParator:CRITeria:CII	400
:BTS:LOOPback:GSM:COMParator:CRITeria:FERasure	400
:BTS:LOOPback:GSM:COMParator:CRITeria[:SElect]	401
[:BAsEband]:COMParator:MODE	401
[:BAsEband]:COMParator:THReshold	402
[:BAsEband]:COMParator[:STATe]	402
[:BAsEband]:DISPlay:MODE:	403
[:BAsEband]:DISPlay:UPDate:	403
Data Subsystem–Option UN7 and 300 (:DATA)	404
:BERT:BTS:LOOPback:EDGE:ETCH:F43[:DATA]	404
:BERT:BTS:LOOPback:EDGE:MCS5[:DATA]	405
:BERT:BTS:LOOPback:EDGE:MCS9[:DATA]	406
:BERT:BTS:LOOPback:EDGE:UNCoded[:DATA]	406
:BERT:BTS:LOOPback:GSM[:DATA]	406
:BERT:BTS:LOOPback:GSM:CS1[:DATA]	408
:BERT:BTS:LOOPback:GSM:CS4[:DATA]	409
:BERT:BTS:LOOPback:GSM:MCS1[:DATA]	409
:BERT:AUXout	409
[:DATA]	411
Input Subsystem–Option UN7 (:INPut:BERT[: BAsEband])	412
:CGATe:DELay:CLOCK	412
:CGATe:DELay:MODE	412
:CGATe:DELay:TIME	413

Contents

:CGATe:DELAy[:STATe]	413
:CGATe:POLarity	414
:CGATe[:STATe]	414
:CLOCK:DELAy:RESolution	414
:CLOCK:DELAy:TIME	415
:CLOCK:DELAy[:STATe]	415
:CLOCK:POLarity	416
:DATA:POLarity	416
:IMPedance	416
:THReshold	417
Measure Subsystem–Option 300 (:MEASure[:SCALar]:BERT:BTS:LOOPback)	418
:EDGE:MCS5[:SENSitivity]	418
:EDGE:MCS9[:SENSitivity]	418
:EDGE:UNCoded[:SENSitivity]	419
:GSM[:SENSitivity]	420
Sense Subsystem–Options UN7 and 300 ([:SOURce]:SENSe:BERT)	421
:BTS:LOOPback:EDGE:ETCH:F43:BLOCK:COUNt	421
:BTS:LOOPback:EDGE:ETCH:F43:CONTAin	421
:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria:EBLock	422
:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria[:SElect]	422
:BTS:LOOPback:EDGE:FTRigger:EXTernal:DELAy	423
:BTS:LOOPback:EDGE:FTRigger:EXTernal:POLarity	423
:BTS:LOOPback:EDGE:FTRigger[SElect]	424
:BTS:LOOPback:EDGE:MCS5:BLOCK:COUNt	424
:BTS:LOOPback:EDGE:MCS5:CONTAin	425
:BTS:LOOPback:EDGE:MCS5:ESENSitivity	425
:BTS:LOOPback:EDGE:MCS5:HAMPLitude	425
:BTS:LOOPback:EDGE:MCS5:LAMPLitude	426
:BTS:LOOPback:EDGE:MCS5:PAMPLitude	426
:BTS:LOOPback:EDGE:MCS5:SBLock:COUNt	426
:BTS:LOOPback:EDGE:MCS5:SBLock:INITial	427
:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria:EBLock	427
:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria[:SElect]	427
:BTS:LOOPback:EDGE:MCS9:BLOCK:COUNt	428
:BTS:LOOPback:EDGE:MCS9:CONTAin	428
:BTS:LOOPback:EDGE:MCS9:ESENSitivity	428
:BTS:LOOPback:EDGE:MCS9:HAMPLitude	429
:BTS:LOOPback:EDGE:MCS9:LAMPLitude	429

:BTS:LOOPback:EDGE:MCS9:PAMPlitude	430
:BTS:LOOPback:EDGE:MCS9:SBLock:COUNT	430
:BTS:LOOPback:EDGE:MCS9:SBLock:INITial	430
:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria:EBLock	431
:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria[:SElect]	431
:BTS:LOOPback:EDGE:MEASurement:STOP	432
:BTS:LOOPback:EDGE:MEASurement:TSLot	432
:BTS:LOOPback:EDGE:MEASurement[:MODE]	432
:BTS:LOOPback:EDGE:SINVert	433
:BTS:LOOPback:EDGE:SYNC:AGain	433
:BTS:LOOPback:EDGE:SYNC:RF	433
:BTS:LOOPback:EDGE:SYNC[:SOURce]	434
:BTS:LOOPback:EDGE:TRIGger[:SOURce]	434
:BTS:LOOPback:EDGE:ULINK:OFFSet	435
:BTS:LOOPback:EDGE:UNCoded:BIT:COUNT	435
:BTS:LOOPback:EDGE:UNCoded:ESENSitivity	435
:BTS:LOOPback:EDGE:UNCoded:HAMPLitude	436
:BTS:LOOPback:EDGE:UNCoded:LAMPLitude	436
:BTS:LOOPback:EDGE:UNCoded:PAMPLitude	437
:BTS:LOOPback:EDGE:UNCoded:SBIT:COUNT	437
:BTS:LOOPback:EDGE:UNCoded:SBIT:INITial	437
:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria:EBIT	438
:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria[:SElect]	438
:BTS:LOOPback:EDGE[:STATe]	438
:BTS:LOOPback:GSM:CS1:BLock:COUNT	439
:BTS:LOOPback:GSM:CS1:CONtain	439
:BTS:LOOPback:GSM:CS1:STOP:CRITeria:EBLock	440
:BTS:LOOPback:GSM:CS1:STOP:CRITeria[:SElect]	440
:BTS:LOOPback:GSM:CS4:BLock:COUNT	440
:BTS:LOOPback:GSM:CS4:CONtain	441
:BTS:LOOPback:GSM:CS4:STOP:CRITeria:EBLock	441
:BTS:LOOPback:GSM:CS4:STOP:CRITeria[:SElect]	442
:BTS:LOOPback:GSM:ESENSitivity	442
:BTS:LOOPback:GSM:FRAME:CIB	442
:BTS:LOOPback:GSM:FRAME:CII	442
:BTS:LOOPback:GSM:FRAME:COUNT	443
:BTS:LOOPback:GSM:HAMPLitude	443
:BTS:LOOPback:GSM:LAMPLitude	443

Contents

:BTS:LOOPback:GSM:MCS1:BLOCK:COUNT	444
:BTS:LOOPback:GSM:MCS1:CONTain	444
:BTS:LOOPback:GSM:MCS1:STOP:CRITeria:EBLock	444
:BTS:LOOPback:GSM:MCS1:STOP:CRITeria[:SElect]	445
:BTS:LOOPback:GSM:MEASurement:STOP	445
:BTS:LOOPback:GSM:MEASurement:TSLot	446
:BTS:LOOPback:GSM:MEASurement[:MODE]	446
:BTS:LOOPback:GSM:PAMplitude	447
:BTS:LOOPback:GSM:SFRame:COUNT	447
:BTS:LOOPback:GSM:SFRame:INITial	447
:BTS:LOOPback:GSM:SINVert	448
:BTS:LOOPback:GSM:STOP:CRITeria:CIB	448
:BTS:LOOPback:GSM:STOP:CRITeria:CII	449
:BTS:LOOPback:GSM:STOP:CRITeria:FERasure	449
:BTS:LOOPback:GSM:STOP:CRITeria[:SElect]	449
:BTS:LOOPback:GSM:SYNC:RF	450
:BTS:LOOPback:GSM:SYNC[:SOURce]	451
:BTS:LOOPback:GSM:TRIGger[:SOURce]	451
:BTS:LOOPback:GSM:ULINK:OFFSet	452
:BTS:LOOPback:GSM[:STATe]	452
[:BAsband]:PRBS:FUNcTION:SPIGnore:DATA	452
[:BAsband]:PRBS:FUNcTION:SPIGnore[:STATe]	453
[:BAsband]:PRBS[:DATA]	453
[:BAsband]:RSYNc:THReshold	454
[:BAsband]:RSYNc[:STATe]	454
[:BAsband]:STATe	454
[:BAsband]:STOP:CRITeria:EBIT	455
[:BAsband]:STOP:CRITeria[:SElect]	455
[:BAsband]:TBITs	456
[:BAsband]:TRIGger:BDELay	456
[:BAsband]:TRIGger:BDELay:STATe	456
[:BAsband]:TRIGger:COUNT	457
[:BAsband]:TRIGger:POLarity	457
[:BAsband]:TRIGger[:SOURce]	457
8. Receiver Test Digital Commands	459
All Subsystem–Option 001/601or 002/602 ([:SOURce])	460
:RADio:ALL:OFF	460

AWGN Real-Time Subsystem–Option 403 ([:SOURCE]:RADio:AWGN:RT)	461
:BWIDth	461
[:STATe]	461
Bluetooth Subsystem–Option 406 ([:SOURCE]:RADio:BLUEtooth:ARB)	462
:AMADdr	462
:BDADdr	462
:BURSt[:STATe]	462
:CGDelay	463
:DATA	463
:IQ:EXTernal:FILTer	464
:IQ:EXTernal:FILTer:AUTO	464
:HEADer:CLEar	465
:HEADer:SAVE	465
:IMPairments	465
:IMPairments:AWGN	466
:IMPairments:AWGN:CNr	466
:IMPairments:AWGN:NSEed	467
:IMPairments:DDEViation	467
:IMPairments:FDType	468
:IMPairments:FOFFset	469
:IMPairments:MINdex	469
:IMPairments:STERror	470
:IQ:MODulation:ATTen	470
:IQ:MODulation:ATTen:AUTO	471
:IQ:MODulation:FILTer	471
:IQ:MODulation:FILTer:AUTO	472
:MDESTination:PULSe	472
:MDESTination:AAMPLitude	472
:MDESTination:ALCHold	473
:MPOLarity:MARKer1	473
:MPOLarity:MARKer2	473
:MPOLarity:MARKer3	474
:MPOLarity:MARKer4	474
:PACKet	474
:REFerence:EXTernal:FREQuency	475
:REFerence[:SOURCE]	475
:RSYMBOLs	476
:SCLock:RATE	476

Contents

[:STATe]	476
CDMA2000 BBG Subsystem–Option 401 ([:SOURce]:RADio:CDMA2000[:BBG])	477
:LMODE	477
[:FORWard]:BBClock	478
[:FORWard]:CHIPrate	478
[:FORWard]:ESDelay	479
[:FORWard]:FILTer	479
[:FORWard]:FILTer:ALPHa	480
[:FORWard]:FILTer:BBT	481
[:FORWard]:FILTer:CHANnel	481
[:FORWard]:LCState	482
[:FORWard]:FFCH:DATA	482
[:FORWard]:FFCH:DATA:FIX4	482
[:FORWard]:FFCH:EBNO	483
[:FORWard]:FFCH:FOFFset	484
[:FORWard]:FFCH:LCMask	484
[:FORWard]:FFCH:LCMask:ESN	484
[:FORWard]:FFCH:LCMask:HEADer	485
[:FORWard]:FFCH:POWER	485
[:FORWard]:FFCH:PRAMp	485
[:FORWard]:FFCH:PRTIME	486
[:FORWard]:FFCH:QOF	486
[:FORWard]:FFCH:RATE	487
[:FORWard]:FFCH:RCONfig	487
[:FORWard]:FFCH:WALSh	487
[:FORWard]:FFCH[:STATe]	488
[:FORWard]:FPCH:DATA	488
[:FORWard]:FPCH:EBNO	488
[:FORWard]:FPCH:LCMask	489
[:FORWard]:FPCH:LCMask:F1	489
[:FORWard]:FPCH:LCMask:F2	489
[:FORWard]:FPCH:LCMask:F3	490
[:FORWard]:FPCH:MESSAge	490
[:FORWard]:FPCH:POWER	490
[:FORWard]:FPCH:RATE	491
[:FORWard]:FPCH:WALSh	491
[:FORWard]:FPCH[:STATe]	491
[:FORWard]:FPICH:ECNO	492

[:FORWARD]:FPICH:POWER	492
[:FORWARD]:FPICH[:STATE]	493
[:FORWARD]:FSCH[1]2:DATA	493
[:FORWARD]:FSCH[1]2:DATA:FIX4	493
[:FORWARD]:FSCH[1]2:EBNO	494
[:FORWARD]:FSCH[1]2:FOFFset	494
[:FORWARD]:FSCH[1]2:LCMask	495
[:FORWARD]:FSCH[1]2:LCMask:ESN	495
[:FORWARD]:FSCH[1]2:LCMask:HEADer	495
[:FORWARD]:FSCH[1]2:POWER	496
[:FORWARD]:FSCH[1]2:QOF	496
[:FORWARD]:FSCH[1]2:RATE	496
[:FORWARD]:FSCH[1]2:RCONfig	497
[:FORWARD]:FSCH[1]2:TCODE	497
[:FORWARD]:FSCH[1]2:WALSh	497
[:FORWARD]:FSCH[1]2[:STATE]	498
[:FORWARD]:FSYNc:CFRequency	498
[:FORWARD]:FSYNc:DAYLt	498
[:FORWARD]:FSYNc:EBNO	499
[:FORWARD]:FSYNc:ECFRequency	499
[:FORWARD]:FSYNc:LPSec	500
[:FORWARD]:FSYNc:LTMoff	500
[:FORWARD]:FSYNc:MPREv	500
[:FORWARD]:FSYNc:MSGType	501
[:FORWARD]:FSYNc:NID	501
[:FORWARD]:FSYNc:POWER	501
[:FORWARD]:FSYNc:PRATe	502
[:FORWARD]:FSYNc:PREV	502
[:FORWARD]:FSYNc:RESERved	502
[:FORWARD]:FSYNc:SID	503
[:FORWARD]:FSYNc:STYPe	503
[:FORWARD]:FSYNc:SYSTime	503
[:FORWARD]:FSYNc:WALSh	504
[:FORWARD]:FSYNc[:STATE]	504
[:FORWARD]:NOISe:CN	504
[:FORWARD]:NOISe[:STATE]	505
[:FORWARD]:OCNS:EBNO	505
[:FORWARD]:OCNS:POWER	506

Contents

[:FORWard]:OCNS:WALSh	507
[:FORWard]:OCNS[:STATe]	507
[:FORWard]:PADJust	507
[:FORWard]:POLarity	508
[:FORWard]:QPCH:CCI	508
[:FORWard]:QPCH:EBNO	508
[:FORWard]:QPCH:PI	509
[:FORWard]:QPCH:POWer	509
[:FORWard]:QPCH:RATE	510
[:FORWard]:QPCH:WALSh	510
[:FORWard]:QPCH[:STATe]	510
[:FORWard]:SRATe	510
:PNOFFset	511
:REVerse:BBCLock	511
:REVerse:CHIPrate	512
:REVerse:ESDelay	512
:REVerse:FILTer	513
:REVerse:FILTer:ALPHa	514
:REVerse:FILTer:BBT	514
:REVerse:FILTer:CHANnel	515
:REVerse:LCMask	515
:REVerse:LCSTate	515
:REVerse:PADJust	516
:REVerse:POLarity[:ALL]	516
:REVerse:NOISe:CN	516
:REVerse:NOISe[:STATe]	517
:REVerse:RC12:ACCess:RACH:DATA	517
:REVerse:RC12:ACCess:RACH:DATA:FIX4	518
:REVerse:RC12:ACCess:RACH:EBNO	518
:REVerse:RC12:ACCess:RACH:FLENgth	519
:REVerse:RC12:ACCess:RACH:FOFFset	519
:REVerse:RC12:ACCess:RACH:POWer	519
:REVerse:RC12:ACCess:RACH:RCONfig	520
:REVerse:RC12:ACCess:RACH:RATE	520
:REVerse:RC12:ACCess:RACH[:STATe]	520
:REVerse:RC12:TRAFfic:RSCH:DATA	521
:REVerse:RC12:TRAFfic:RSCH:DATA:FIX4	521
:REVerse:RC12:TRAFfic:RSCH:FLENgth	521

:REVerse:RC12:TRAFfic:RSCH:FOFFset	522
:REVerse:RC12:TRAFfic:RSCH:POWer	522
:REVerse:RC12:TRAFfic:RSCH:RATE	522
:REVerse:RC12:TRAFfic:RSCH:RCONfig	523
:REVerse:RC12:TRAFfic:RSCH[:STATe]	523
:REVerse:RC34:CCONtrol:RCCCh:DATA	523
:REVerse:RC34:CCONtrol:RCCCh:DATA:FIX4	524
:REVerse:RC34:CCONtrol:RCCCh:EBNO	524
:REVerse:RC34:CCONtrol:RCCCh:FLENgth	525
:REVerse:RC34:CCONtrol:RCCCh:FOFFset	525
:REVerse:RC34:CCONtrol:RCCCh:POWer	525
:REVerse:RC34:CCONtrol:RCCCh:RCONfig	526
:REVerse:RC34:CCONtrol:RCCCh:RATE	526
:REVerse:RC34:CCONtrol:RCCCh:WALSh	526
:REVerse:RC34:CCONtrol:RCCCh[:STATe]	527
:REVerse:RC34:CCONtrol:RPICH:ECNO	527
:REVerse:RC34:CCONtrol:RPICH:GRATe	528
:REVerse:RC34:CCONtrol:RPICH:POWer	528
:REVerse:RC34:CCONtrol:RPICH:WALSh	528
:REVerse:RC34:CCONtrol:RPICH[:STATe]	529
:REVerse:RC34:EACCess:REACH:DATA	529
:REVerse:RC34:EACCess:REACH:DATA:FIX4	529
:REVerse:RC34:EACCess:REACH:EBNO	530
:REVerse:RC34:EACCess:REACH:FOFFset	530
:REVerse:RC34:EACCess:REACH:POWer	531
:REVerse:RC34:EACCess:REACH:RCONfig	531
:REVerse:RC34:EACCess:REACH:RATE	531
:REVerse:RC34:EACCess:REACH:WALSh	532
:REVerse:RC34:EACCess:REACH[:STATe]	532
:REVerse:RC34:EACCess:RPICH:ECNO	532
:REVerse:RC34:EACCess:RPICH:GRATe	533
:REVerse:RC34:EACCess:RPICH:POWer	533
:REVerse:RC34:EACCess:RPICH:WALSh	533
:REVerse:RC34:EACCess:RPICH[:STATe]	534
:REVerse:RC34:TRAFfic:RDCCh:DATA	534
:REVerse:RC34:TRAFfic:RDCCh:DATA:FIX4	534
:REVerse:RC34:TRAFfic:RDCCh:EBNO	534
:REVerse:RC34:TRAFfic:RDCCh:FLENgth	535

Contents

:REVerse:RC34:TRAFfic:RDCCh:FOFFset	536
:REVerse:RC34:TRAFfic:RDCCh:POWer	536
:REVerse:RC34:TRAFfic:RDCCh:RATE	536
:REVerse:RC34:TRAFfic:RDDCh:RCONfig	537
:REVerse:RC34:TRAFfic:RDCCh:WALSh	537
:REVerse:RC34:TRAFfic:RDCCh[:STATe]	537
:REVerse:RC34:TRAFfic:RFCH:DATA	538
:REVerse:RC34:TRAFfic:RFCH:DATA:FIX4	538
:REVerse:RC34:TRAFfic:RFCH:EBNO	538
:REVerse:RC34:TRAFfic:RFCH:FLENgth	539
:REVerse:RC34:TRAFfic:RFCH:FOFFset	539
:REVerse:RC34:TRAFfic:RFCH:POWer	540
:REVerse:RC34:TRAFfic:RFCH:RCONfig	540
:REVerse:RC34:TRAFfic:RFCH:RATE	540
:REVerse:RC34:TRAFfic:RFCH:WALSh	541
:REVerse:RC34:TRAFfic:RFCH[:STATe]	541
:REVerse:RC34:TRAFfic:RSCH[1]2:DATA	541
:REVerse:RC34:TRAFfic:RSCH[1]2:DATA:FIX4	542
:REVerse:RC34:TRAFfic:RSCH[1]2:DATA:EBNO	542
:REVerse:RC34:TRAFfic:RSCH[1]2:FLENgth	543
:REVerse:RC34:TRAFfic:RSCH[1]2:FOFFset	543
:REVerse:RC34:TRAFfic:RSCH[1]2:POWer	543
:REVerse:RC34:TRAFfic:RSCH[1]2:RCONfig	544
:REVerse:RC34:TRAFfic:RSCH[1]2:RATE	544
:REVerse:RC34:TRAFfic:RSCH[1]2:TCODE	544
:REVerse:RC34:TRAFfic:RSCH[1]2:WALSh	545
:REVerse:RC34:TRAFfic:RSCH[1]2[:STATe]	545
:REVerse:REFeRence:EXTeRnal:FREQuency	545
:REVerse:REFeRence[:SOURce]	546
:REVerse:TADVance	546
:REVerse:TEDGE	546
:REVerse:SRATE	547
[:STATe]	547
Custom Subsystem–Option 001/601or 002/602 ([:SOURce]:RADio:CUSTom)	548
:ALPha	548
:BBCLock	548
:BBT	549
:BRATE	549

:BURSt:SHAPE:FALL:DElay	.551
:BURSt:SHAPE:FALL:TIME	.551
:BURSt:SHAPE:FDElay	.552
:BURSt:SHAPE:FTIME	.552
:BURSt:SHAPE:RDElay	.553
:BURSt:SHAPE:RISE:DElay	.554
:BURSt:SHAPE:RISE:TIME	.554
:BURSt:SHAPE:RTIME	.555
:BURSt:SHAPE[:TYPE]	.555
:CHANnel	.556
:DATA	.556
:DATA:FIX4	.557
:DATA:PRAM	.557
:DENCode	.558
:EDATa:DElay	.558
:EDCLock	.558
:EREference	.559
:EREference:VALue	.559
:FILTer	.560
:IQ:SCALE	.561
:MODulation:FSK[:DEVIation]	.561
:MODulation:MSK[:PHASe]	.562
:MODulation:UFSK	.562
:MODulation:UIQ	.562
:MODulation[:TYPE]	.563
:POLarity[:ALL]	.563
:SRATe	.564
:STANdard:SELect	.565
:TRIGger:TYPE	.566
:TRIGger:TYPE:CONTinuous[:TYPE]	.566
:TRIGger:TYPE:GATE:ACTive	.567
:TRIGger[:SOURce]	.567
:TRIGger[:SOURce]:EXTernal:DElay	.568
:TRIGger[:SOURce]:EXTernal:DElay:STATe	.569
:TRIGger[:SOURce]:EXTernal:SLOPe	.569
:TRIGger[:SOURce]:EXTernal[:SOURce]	.570
[:STATe]	.570
DECT Subsystem–Option 402 ([:SOURce]:RADio:DECT)	.571

Contents

:ALPha	571
:BBCLock	571
:BBT	572
:BRATe	572
:BURSt:PN9	574
:BURSt:SHAPE:FALL:DELay	574
:BURSt:SHAPE:FALL:TIME	575
:BURSt:SHAPE:FDELay	575
:BURSt:SHAPE:FTIME	576
:BURSt:SHAPE:RDELay	576
:BURSt:SHAPE:RISE:DELay	577
:BURSt:SHAPE:RISE:TIME	578
:BURSt:SHAPE:RTIME	578
:BURSt:SHAPE[:TYPE]	579
:BURSt[:STATe]	579
:CHANnel	580
:DATA	580
:DATA:FIX4	581
:DATA:PRAM	581
:DEFault	582
:EDATa:DELay	582
:EDCLock	582
:EREFerence	583
:EREFerence:VALue	583
:FILTer	584
:IQ:SCALe	585
:MODulation:FSK[:DEViation]	585
:MODulation:MSK[:PHASe]	586
:MODulation:UFSK	586
:MODulation:UIQ	586
:MODulation[:TYPE]	587
:POLarity[:ALL]	587
:PPart:SLOT0 [1] 2 3 4 5 6 7 8 9 10 11[:TYPE]	588
:PPart:SLOT0 [1] 2 3 4 5 6 7 8 9 10 11:CUSTom	588
:PPart:SLOT0 [1] 2 3 4 5 6 7 8 9 10 11:CUSTom:FIX4	589
:PPart:SLOT0 [1] 2 3 4 5 6 7 8 9 10 11:LCAPacity:A	589
:PPart:SLOT0 [1] 2 3 4 5 6 7 8 9 10 11:LCAPacity:P	590
:PPart:SLOT0 [1] 2 3 4 5 6 7 8 9 10 11:LCAPacity:S	590

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity[:B]591

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity[:B]:FIX4591

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:POWer592

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:STATe592

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:A592

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:P593

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:S593

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]594

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]:FIX4594

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:A595

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:P595

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:A596

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity[:B]596

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity[:B]:FIX4597

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:A597

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:P598

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:S598

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic[:B]599

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic[:B]:FIX4599

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11[:TYPE]600

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom600

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom:FIX4601

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM2:A601

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM2:P602

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM2:S602

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM[1]:A602

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM[1]:P603

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM[1]:S603

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:A603

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:P604

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:S604

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity[:B]604

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity[:B]:FIX4605

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:POWer605

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:STATe606

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:A606

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:P606

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:S607

Contents

- :RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B] 607
- :RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]:FIX4 608
- :RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:A 608
- :RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:P 609
- :RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:S 609
- :RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity[:B] 610
- :RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity[:B]:FIX4 610
- :RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:A 611
- :RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:P 611
- :RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:S 611
- :RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic[:B] 612
- :RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic[:B]:FIX4 612
- :SECondary:RECall 613
- :SECondary:SAVE 613
- :SECondary:TRIGger[:SOURce] 613
- :SECondary[:STATe] 614
- :SOUT 614
- :SOUT:OFFSet 615
- :SOUT:SLOT 615
- :SRATe 616
- :TRIGger:TYPE 617
- :TRIGger:TYPE:CONTInuous[:TYPE] 618
- :TRIGger:TYPE:GATE:ACTive 618
- :TRIGger[:SOURce] 619
- :TRIGger[:SOURce]:EXTernal:DELay 620
- :TRIGger[:SOURce]:EXTernal:SLOPe 620
- :TRIGger[:SOURce]:EXTernal[:SOURce] 621
- :TRIGger[:SOURce]:EXTernal:DELay:STATe 622
- [:STATe] 622
- EDGE Subsystem–Option 402 ([:SOURce]:RADio:EDGE) 623
- :ALPHa 623
- :BBCLock 623
- :BBT 624
- :BURSt:SHAPe:FALL:DELay 624
- :BURSt:SHAPe:FDELay 625
- :BURSt:SHAPe:FALL:TIME 626
- :BURSt:SHAPe:FTIME 626
- :BURSt:SHAPe:RDELay 627

:BURSt:SHAPE:RISE:DELAY	628
:BURSt:SHAPE:RISE:TIME	628
:BURSt:SHAPE:RTIME	629
:BURSt:SHAPE[:TYPE]	630
:BURSt[:STATe]	630
:CHANnel	631
:DATA	631
:DATA:PRAM	632
:DATA:FIX4	632
:DEFault	633
:EDATa:DELay	633
:EDCLock	633
:EREFerence	634
:EREFerence:VALue	634
:FILTer	635
:IQ:SCALE	636
:MODulation:FSK[:DEViation]	636
:MODulation:MSK[:PHASe]	637
:MODulation:UFSK	637
:MODulation:UIQ	637
:MODulation[:TYPE]	638
:POLarity[:ALL]	638
:SECondary:RECall	638
:SECondary:SAVE	639
:SECondary:TRIGger[:SOURce]	639
:SECondary[:STATe]	640
:SLOT0[1]2 3 4 5 6 7:CUSTom	640
:SLOT0[1]2 3 4 5 6 7:CUSTom:FIX4	641
:SLOT0[1]2 3 4 5 6 7:CUSTom:GUARd	641
:SLOT0[1]2 3 4 5 6 7:GMSK:ENCryption	642
:SLOT0[1]2 3 4 5 6 7:GMSK:ENCryption:CS1:DATA	643
:SLOT0[1]2 3 4 5 6 7:GMSK:ENCryption:CS4:DATA	644
:SLOT0[1]2 3 4 5 6 7:GMSK:ENCryption:DLINK:MCS1:DATA	644
:SLOT0[1]2 3 4 5 6 7:GMSK:ENCryption:FIX4	644
:SLOT0[1]2 3 4 5 6 7:GMSK:ENCryption:TCH:FS:DATA	645
:SLOT0[1]2 3 4 5 6 7:GMSK:ENCryption:ULINK:MCS1:DATA	645
:SLOT0[1]2 3 4 5 6 7:GMSK:STEal	646
:SLOT0[1]2 3 4 5 6 7:GMSK:TSEQuence	646

Contents

:SLOT0[1]2 3 4 5 6 7:MULTIslot	647
:SLOT0[1]2 3 4 5 6 7:NORMAl:ENCryption	648
:SLOT0:NORMAl:ENCryption:BCH:BCC	650
:SLOT0:NORMAl:ENCryption:BCH:CELLId	650
:SLOT0:NORMAl:ENCryption:BCH:LAC	651
:SLOT0:NORMAl:ENCryption:BCH:MCC	651
:SLOT0:NORMAl:ENCryption:BCH:MNC	651
:SLOT0:NORMAl:ENCryption:BCH:PLMN	652
:SLOT0[1]2 3 4 5 6 7:NORMAl:ENCryption:DLINK:MCS5:DATA	652
:SLOT0[1]2 3 4 5 6 7:NORMAl:ENCryption:DLINK:MCS9:DATA	653
:SLOT0[1]2 3 4 5 6 7:NORMAl:ENCryption:ETCH:F43:DATA	653
:SLOT0[1]2 3 4 5 6 7:NORMAl:ENCryption:FIX4	654
:SLOT0[1]2 3 4 5 6 7:NORMAl:ENCryption:ULINK:MCS5:DATA	654
:SLOT0[1]2 3 4 5 6 7:NORMAl:ENCryption:ULINK:MCS9:DATA	655
:SLOT0[1]2 3 4 5 6 7:NORMAl:ENCryption:UNCodeD	655
:SLOT0[1]2 3 4 5 6 7:NORMAl:GUARd	656
:SLOT0[1]2 3 4 5 6 7:NORMAl:T1	656
:SLOT0[1]2 3 4 5 6 7:NORMAl:T2	657
:SLOT0[1]2 3 4 5 6 7:NORMAl:TSEquence	657
:SLOT0[1]2 3 4 5 6 7:LCAPacity:POWer	657
:SLOT0[1]2 3 4 5 6 7:STATe	658
:SLOT0[1]2 3 4 5 6 7[:TYPE]	658
:SOUT:	658
:SOUT:OFFSet	659
:SOUT:SLOT	660
:SRATe	660
:TRIGger:TYPE	662
:TRIGger:TYPE:CONTInuous[:TYPE]	662
:TRIGger:TYPE:GATE:ACTive	663
:TRIGger[:SOURce]	663
:TRIGger[:SOURce]:EXTernal:DELay	664
:TRIGger[:SOURce]:EXTernal:DELay:FINE	665
:TRIGger[:SOURce]:EXTernal:DELay:STATe	666
:TRIGger[:SOURce]:EXTernal:SLOPe	666
:TRIGger[:SOURce]:EXTernal[:SOURce]	666
[:STATe]	667

SCPI Command Reference, Volume 3

9. Receiver Test Digital Commands (continued)	669
GPS Subsystem–Option 409	
([:SOURCE]:RADio[1] 2 3 4:GPS)	670
:DATA	670
:DMODE	670
:DSHift	671
:FILTer	671
:FILTer:ALPHa	672
:FILTer:BBT	673
:FILTer:CHANnel	673
:IQPHase	674
:PCODE	674
:RCODE	674
:REFClk	675
:REFFreq	675
:SATid	676
[:STATE]	676
GSM Subsystem–Option 402 ([:SOURCE]:RADio:GSM)	677
:ALPha	677
:BBCLock	677
:BBT	678
:BRATe	678
:BURSt:PN9	680
:BURSt:SHAPe:FALL:DELay	680
:BURSt:SHAPe:FALL:TIME	681
:BURSt:SHAPe:FDELay	681
:BURSt:SHAPe:FTIME	682
:BURSt:SHAPe:RDELay	683
:BURSt:SHAPe:RISE:DELay	683
:BURSt:SHAPe:RISE:TIME	684
:BURSt:SHAPe:RTIME	685
:BURSt:SHAPe[:TYPE]	685
:BURSt[:STATE]	686
:CHANnel	686
:DATA	687
:DATA:PRAM	687

Contents

:DATA:FIX4	688
:DEFault	688
:DENCode	688
:EDATa:DELay	689
:EDCLock	689
:EREference	690
:EREference:VALue	690
:FILTer	691
:IQ:SCALE	692
:MODulation:FSK[:DEViation]	692
:MODulation:MSK[:PHASe]	693
:MODulation:UFSK	693
:MODulation:UIQ	693
:MODulation[:TYPE]	694
:POLarity[:ALL]	694
:SECondary:RECall	695
:SECondary:SAVE	695
:SECondary:TRIGger[:SOURce]	695
:SECondary[:STATE]	696
:SLOT0[1]2 3 4 5 6 7:ACCess:ENCRyption	696
:SLOT0[1]2 3 4 5 6 7:ACCess:ENCRyption:FIX4	696
:SLOT0[1]2 3 4 5 6 7:ACCess:ETAil	697
:SLOT0[1]2 3 4 5 6 7:ACCess:SSEquence	697
:SLOT0[1]2 3 4 5 6 7:ACCess:CUSTom	697
:SLOT0[1]2 3 4 5 6 7:CUSTom:FIX4	698
:SLOT0[1]2 3 4 5 6 7:DUMMy:TSEquence	698
:SLOT0[1]2 3 4 5 6 7:MULTIslot	699
:SLOT0[1]2 3 4 5 6 7:NORMal:ENCRyption	699
:SLOT0:NORMal:ENCRyption:BCH:BCC	701
:SLOT0:NORMal:ENCRyption:BCH:CELLid	701
:SLOT0:NORMal:ENCRyption:BCH:LAC	701
:SLOT0:NORMal:ENCRyption:BCH:MCC	702
:SLOT0:NORMal:ENCRyption:BCH:MNC	702
:SLOT0:NORMal:ENCRyption:BCH:PLMN	702
:SLOT0[1]2 3 4 5 6 7:NORMal:ENCRyption:CS1:DATA	703
:SLOT0[1]2 3 4 5 6 7:NORMal:ENCRyption:CS4:DATA	703
:SLOT0[1]2 3 4 5 6 7:NORMal:ENCRyption:DLINK:MCS1:DATA	703
:SLOT0[1]2 3 4 5 6 7:NORMal:ENCRyption:FIX4	704

:SLOT0[1]2 3 4 5 6 7:NORMAl:ENCRYption:TCH:FS:DATA	704
:SLOT0[1]2 3 4 5 6 7:NORMAl:ENCRYption:ULINK:MCS1:DATA	704
:SLOT0[1]2 3 4 5 6 7:NORMAl:STeal	705
:SLOT0[1]2 3 4 5 6 7:NORMAl:TSEquence	705
:SLOT0[1]2 3 4 5 6 7:POWer	706
:SLOT0[1]2 3 4 5 6 7:STATe	706
:SLOT0[1]2 3 4 5 6 7:SYNC:ENCRYption	706
:SLOT0[1]2 3 4 5 6 7:SYNC:ENCRYption:FIX4	707
:SLOT0[1]2 3 4 5 6 7:SYNC:TSEquence	707
:SLOT0[1]2 3 4 5 6 7[:TYPE]	707
:SOUT	708
:SOUT:OFFSet	708
:SOUT:SLOT	709
:SRATe	709
:TRIGger:EXTeRnal:DELay	710
:TRIGger:TYPE	711
:TRIGger:TYPE:CONTInuous[:TYPE]	711
:TRIGger:TYPE:GATE:ACTive	712
:TRIGger[:SOURce]	712
:TRIGger[:SOURce]:EXTeRnal:DELay	713
:TRIGger[:SOURce]:EXTeRnal:DELay:FINe	714
:TRIGger[:SOURce]:EXTeRnal:DELay:STATe	714
:TRIGger[:SOURce]:EXTeRnal:SLOPe	714
:TRIGger[:SOURce]:EXTeRnal[:SOURce]	715
[:STATe]	716
HSDPA over W-CDMA Subsystem–Option 418 ([:SOURce]:RADio:WCDMa:HSDPa[:BBG])	717
File Overview	717
Managing ESG Setting Conflicts and Error Messages	719
:DLINK:APPLy	719
Nk:AWGN:CN	720
:DLINK:AWGN[:STATe]	720
:DLINK:BBCLock[:SOURce]	720
:DLINK:CPICH:CCODE	721
:DLINK:CPICH:POWer	721
:DLINK:CPICH[:STATe]	721
:DLINK:DPCH:CCODE	721
:DLINK:DPCH:DATA	722
:DLINK:DPCH:DATA:FIX4	722

Contents

:DLINK:DPCH:DCH[1] 2 3 4 5 6:BSIZE	723
:DLINK:DPCH:DCH[1] 2 3 4 5 6:CTYPe	723
:DLINK:DPCH:DCH[1] 2 3 4 5 6:CRC	724
:DLINK:DPCH:DCH[1] 2 3 4 5 6:DATA	724
:DLINK:DPCH:DCH[1] 2 3 4 5 6:DATA:FIX4	724
:DLINK:DPCH:DCH[1] 2 3 4 5 6:NBLocks	725
:DLINK:DPCH:DCH[1] 2 3 4 5 6:RMATtribute	725
:DLINK:DPCH:DCH[1] 2 3 4 5 6:TTI	726
:DLINK:DPCH:DCH2 3 4 5 6[:STATe]	726
:DLINK:DPCH:POWer	726
:DLINK:DPCH:SFORmat	727
:DLINK:DPCH:SSCOffset	727
:DLINK:DPCH:TFCI	728
:DLINK:DPCH:TOFFset	728
:DLINK:DPCH:TPC:NSTeps	729
:DLINK:DPCH:TPC:PATtern	729
:DLINK:DPCH:TRPosition	730
:DLINK:DPCH[:STATe]	730
:DLINK:FILTer	730
:DLINK:FILTer:ALPHa	731
:DLINK:FILTer:BBT	731
:DLINK:FILTer:CHANnel	732
:DLINK:HSBurst	732
:DLINK:HSDPa:AMC:CQIMapping:UECategory	733
:DLINK:HSDPa:AMC:CPATtern	733
:DLINK:HSDPa:FCONtrol	734
:DLINK:HSDPa:HARQ:APATtern	734
:DLINK:HSDPa:HARQ:MNHTrans	735
:DLINK:HSDPa:HARQ:RVSequence[1] 2 3 4 5 6 7 8	736
:DLINK:HSDPa[1] 2 3 4:BSINfo	737
:DLINK:HSDPa[1] 2 3 4:HSPDSch:COFFset	737
:DLINK:HSDPa[1] 2 3 4:HSPDSch:DATA	737
:DLINK:HSDPa[1] 2 3 4:HSPDSch:DATA:FIX4	738
:DLINK:HSDPa:HSPDSch:DSCH:DATA	738
:DLINK:HSDPa:HSPDSch:DSCH:DATA:FIX4	739
:DLINK:HSDPa:HSPDSch:DSCH:IRBSize	739
:DLINK:HSDPa:HSPDSch:NCODe	740
:DLINK:HSDPa[1] 2 3 4:HSPDSch:POWer	740

:DLINK:HSDPa[1] 2 3 4:HSPDsch:SFORmat	741
:DLINK:HSDPa[1] 2 3 4:HSPDsch[:STATe].	741
:DLINK:HSDPa[1] 2 3 4:HSSCch:CCODE	742
:DLINK:HSDPa[1] 2 3 4:HSSCch:DATA	742
:DLINK:HSDPa[1] 2 3 4:HSSCch:DATA:FIX4	743
:DLINK:HSDPa[1] 2 3 4:HSSCch:POWer	743
:DLINK:HSDPa[1] 2 3 4:ITTI	744
:DLINK:HSDPa[1] 2 3 4:ITTI:PATtern	744
:DLINK:HSDPa:NHPRocess.	745
:DLINK:HSDPa[1] 2 3 4:RVParameter	745
:DLINK:HSDPa[1] 2 3 4:UEID	746
:DLINK:HSDPa[1] 2 3 4[:STATe].	746
:DLINK:OCNS[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:CCODE	747
:DLINK:OCNS[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:DATA	747
:DLINK:OCNS[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:POWer	748
:DLINK:OCNS[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:SSCOffset	748
:DLINK:OCNS[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:TOFFset.	749
:DLINK:OCNS[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16[:STATe].	749
:DLINK:PCCPch:BCH:DATA.	749
:DLINK:PCCPch:BCH:DATA:FIX4	750
:DLINK:PCCPch:CCODE	750
:DLINK:PCCPch:POWer.	751
:DLINK:PCCPch[:STATe].	751
:DLINK:PICH:CCODE	751
:DLINK:PICH:DATA.	752
:DLINK:PICH:DATA:FIX4.	752
:DLINK:PICH:POWer.	753
:DLINK:PICH[:STATe]	753
:DLINK:POLarity	753
:DLINK:PSCH:POWer	754
:DLINK:PSCH[:STATe].	754
:DLINK:SCRamblecode	754
:DLINK:SSCH:POWer	755
:DLINK:SSCH[:STATe].	755
:DLINK:TXDiversity	755
:LINK	756
:ULINK:APPLY	756
:ULINK:AWGN:CN	757

Contents

:ULINK:AWGN[:STATe]	757
:ULINK:BBReference:EXternal:MRATe	757
:ULINK:BBReference[:SOURce]	758
:ULINK:DPCCh:CCODE	758
:ULINK:DPCCh:DATA	758
:ULINK:DPCCh:DATA:FIX4	759
:ULINK:DPCCh:FBI:PATtern	759
:ULINK:DPCCh:FBI:PATtern:FIX	760
:ULINK:DPCCh:POWER	760
:ULINK:DPCCh:SFORMAT	761
:ULINK:DPCCh[:STATe]	761
:ULINK:DPCCh:TFCI	761
:ULINK:DPCCh:TPC:NSTeps	762
:ULINK:DPCCh:TPC:PATtern	762
:ULINK:DPDCh:CCODE	763
:ULINK:DPDCh:DATA	763
:ULINK:DPDCh:DATA:FIX4	763
:ULINK:DPDCh:DCH[1] 2 3 4 5 6:BSIZE	764
:ULINK:DPDCh:DCH[1] 2 3 4 5 6:CRC	764
:ULINK:DPDCh:DCH[1] 2 3 4 5 6:CTYPE	764
:ULINK:DPDCh:DCH[1] 2 3 4 5 6:DATA	765
:ULINK:DPDCh:DCH[1] 2 3 4 5 6:DATA:FIX4	765
:ULINK:DPDCh:DCH[1] 2 3 4 5 6:NBLocks	766
:ULINK:DPDCh:DCH[1] 2 3 4 5 6:RMATtribute	766
:ULINK:DPDCh:DCH[1] 2 3 4 5 6:TTI	767
:ULINK:DPDCh:DCH2 3 4 5 6[:STATe]	767
:ULINK:DPDCh:POWER	768
:ULINK:DPDCh:SFORMAT	768
:ULINK:DPDCh[:STATe]	768
:ULINK:FCLock:INTERval	769
:ULINK:FCLock:POLarity	769
:ULINK:FILTer	770
ULINK:FILTer:ALPHA	770
:ULINK:FILTer:BBT	771
:ULINK:FILTer:CHANnel	771
:ULINK:FOFFset	772
:ULINK:HSDPcch:APATtern	772
:ULINK:HSDPcch:APOWER	773

:ULINK:HSDPcch:CCODE	773
:ULINK:HSDPcch:CPATtern	774
:ULINK:HSDPcch:CPOWer	774
:ULINK:HSDPcch:NPOWer	775
:ULINK:HSDPcch:SFDelay	775
:ULINK:HSDPcch[:STATe]	775
:ULINK:POLarity	776
:ULINK:SCRamblecode	776
:ULINK:SDElay	776
:ULINK:SFNRst:POLarity	777
:ULINK:SYNC:MODE	777
:ULINK:SYNC[:SOURce]	777
:ULINK:TOFFset	778
[:STATe]	778
NADC Subsystem–Option 402 ([:SOURce]:RADio[:NADC])	779
:ALPha	779
:BBClock	779
:BBT	780
:BRATe	780
:BURSt:PN9	781
:BURSt:SHAPe[:TYPE]	782
:BURSt:SHAPe:FALL:DElay	782
:BURSt:SHAPe:FALL:TIME	783
:BURSt:SHAPe:FDElay	784
:BURSt:SHAPe:FTIME	784
:BURSt:SHAPe:RDElay	785
:BURSt:SHAPe:RISE:DElay	786
:BURSt:SHAPe:RISE:TIME	786
:BURSt:SHAPe:RTIME	787
:BURSt[:STATe]	788
:BURSt:SHAPe[:TYPE]	788
:CHANnel	789
:DATA	789
:DATA:PRAM	790
:DATA:FIX4	790
:DEFault	790
:EDATa:DElay	791
:EDCLock	791

Contents

:EReference	792
:EReference:VALue	792
:FILTer	793
:FRATe	794
:IQ:SCALe	794
:MODulation:FSK[:DEVIation]	794
:MODulation:MSK[:PHASe]	795
:MODulation:UFSK	795
:MODulation:UIQ	796
:MODulation[:TYPE]	796
:REPeat	796
:POLarity[:ALL]	797
:SECondary:RECall	797
:SECondary:SAVE	797
:SECondary:TRIGger[:SOURce]	798
:SECondary[:STATe]	798
:SLOT[1] 2 3 4 5 6:DCUStom	798
:SLOT[1] 2 3 4 5 6:DCUStom:FIX4	799
:SLOT[1] 2 3 4 5 6:DTCHannel:CDLocator	799
:SLOT[1] 2 3 4 5 6:DTCHannel:CDVCcode	800
:SLOT[1] 2 3 4 5 6:DTCHannel:SACChannel	800
:SLOT[1] 2 3 4 5 6:DTCHannel:SWORd	800
:SLOT[1] 2 3 4 5 6:DTCHannel[:DATA]	801
:SLOT[1] 2 3 4 5 6:DTCHannel[:DATA]FIX4	801
:SLOT[1] 2 3 4 5 6:POWer	802
:SLOT[1] 2 3 4 5 6:STATe	802
:SLOT[1] 2 3 4 5 6:UCUStom	802
:SLOT[1] 2 3 4 5 6:UCUStom:FIX4	803
:SLOT[1] 2 3 4 5 6:UTCHannel:CDVCcode	803
:SLOT[1] 2 3 4 5 6:UTCHannel:SACChannel	804
:SLOT[1] 2 3 4 5 6:UTCHannel:SWORd	804
:SLOT[1] 2 3 4 5 6:UTCHannel[:DATA]	804
:SLOT[1] 2 3 4 5 6:UTCHannel[:DATA]:FIX4	805
:SLOT[1] 2 3 4 5 6[:TYPE]	805
:SOUT	806
:SOUT:OFFSet	806
:SOUT:SLOT	807
:SRATe	807

:TRIGger:TYPE	808
:TRIGger:TYPE:CONTInuous[:TYPE]	809
:TRIGger:TYPE:GATE:ACTive	810
:TRIGger[:SOURce]	810
:TRIGger[:SOURce]:EXTernal:DELay	811
:TRIGger[:SOURce]:EXTernal:DELay:STATe	812
:TRIGger[:SOURce]:EXTernal:SLOPe	812
:TRIGger[:SOURce]:EXTernal[:SOURce]	812
	813
PDC Subsystem–Option 402 ([:SOURce]:RADio:PDC)	814
:ALPha	814
:BBCLock	814
:BBT	815
:BRATe	815
:BURSt:PN9	817
:BURSt:SHAPe:FALL:DELay	817
:BURSt:SHAPe:FALL:TIME	818
:BURSt:SHAPe:FDELay	818
:BURSt:SHAPe:FTIME	819
:BURSt:SHAPe:RDELay	820
:BURSt:SHAPe:RISE:DELay	820
:BURSt:SHAPe:RISE:TIME	821
:BURSt:SHAPe:RTIME	822
:BURSt:SHAPe[:TYPE]	822
:BURSt[:STATe]	823
:CHANnel	823
:DATA	824
:DATA:PRAM	824
:DATA:FIX4	825
:DEFault	825
:EDATa:DELay	825
:EDCLock	826
:EREference	826
:EREference:VALue	827
:FILTer	827
:FRATe	828
:IQ:SCALE	828
:MODulation:FSK[:DEViation]	829

Contents

:MODulation:MSK[:PHASe]	829
:MODulation:UFSK	830
:MODulation:UIQ	830
:MODulation[:TYPE]	830
:POLarity[:ALL]	831
:SECondary:RECall	831
:SECondary:SAVE	832
:SECondary:TRIGger[:SOURce]	832
:SECondary[:STATe]	833
:SLOT0[1]2 3 4 5:DCUStom	833
:SLOT0[1]2 3 4 5:DCUSTom:FIX4	834
:SLOT0[1]2 3 4 5:DTCHannel:CCODE	834
:SLOT0[1]2 3 4 5:DTCHannel:SACChannel	834
:SLOT0[1]2 3 4 5:DTCHannel:SWORd	835
:SLOT0[1]2 3 4 5:DTCHannel[:TCHannel]	835
:SLOT0[1]2 3 4 5:DTCHannel[:TCHannel]:FIX4	836
:SLOT0[1]2 3 4:POWer	836
:SLOT0[1]2 3 4 5:STATe	836
:SLOT0[1]2 3 4 5:UCUStom	837
:SLOT0[1]2 3 4 5:UCUStom:FIX4	837
:SLOT0[1]2 3 4 5:UTCHannel:CCODE	838
:SLOT0[1]2 3 4 5:UTCHannel:SACChannel	838
:SLOT0[1]2 3 4 5:UTCHannel:SWORd	838
:SLOT0[1]2 3 4 5:UTCHannel[:TCHannel]	839
:SLOT0[1]2 3 4 5:UTCHannel[:TCHannel]:FIX4	839
:SLOT0[1]2 3 4 5:UVOX:CCODE	840
:SLOT0[1]2 3 4 5:UVOX:SACChannel	840
:SLOT0[1]2 3 4 5:UVOX:SWORd	840
:SLOT0[1]2 3 4 5[:TYPE]	841
:SOUT	841
:SOUT:OFFSet	842
:SOUT:SLOT	842
:SRATe	843
:TRIGger:TYPE	844
:TRIGger:TYPE:CONTinuous[:TYPE]	845
:TRIGger:TYPE:GATE:ACTive	846
:TRIGger[:SOURce]	846
:TRIGger[:SOURce]:EXTernal:DELay	847

:TRIGger[:SOURce]:EXTernal:DELay:STATe	848
:TRIGger[:SOURce]:EXTernal:SLOPe	848
:TRIGger[:SOURce]:EXTernal[:SOURce]	848
[:STATe]	849
PHS Subsystem–Option 402 ([:SOURce]:RADio:PHS)	850
:ALPha	850
:BBCLock	850
:BBT	851
:BRATe	851
:BURSt:PN9	852
:BURSt:SCRamble:SEED	853
:BURSt:SCRamble[:STATe]	853
:BURSt:SHAPe:FALL:DELay	854
:BURSt:SHAPe:FALL:TIME	854
:BURSt:SHAPe:FDELay	855
:BURSt:SHAPe:FTIME	856
:BURSt:SHAPe:RDELay	856
:BURSt:SHAPe:RISE:DELay	857
:BURSt:SHAPe:RISE:TIME	858
:BURSt:SHAPe:RTIME	858
:BURSt:SHAPe[:TYPE]	859
:BURSt[:STATe]	859
:CHANnel	860
:DATA	860
:DATA:PRAM	861
:DATA:FIX4	861
:DEFault	862
:DLINK:SLOT[1] 2 3 4:CUSTom	862
:DLINK:SLOT[1] 2 3 4:CUSTom:FIX4	862
:DLINK:SLOT[1] 2 3 4:POWer	863
:DLINK:SLOT[1] 2 3 4:SCHannel:CSID	863
:DLINK:SLOT[1] 2 3 4:SCHannel:IDLE	863
:DLINK:SLOT[1] 2 3 4:SCHannel:PSID	864
:DLINK:SLOT[1] 2 3 4:SCHannel:UWORD	864
:DLINK:SLOT[1] 2 3 4:STATe	864
:DLINK:SLOT[1] 2 3 4:TCHannel:SACChannel	865
:DLINK:SLOT[1] 2 3 4:TCHannel:UWORD	865
:DLINK:SLOT[1] 2 3 4:TCHannel[:TCHannel]	866

Contents

:DLINK:SLOT[1]2 3 4:TCHannel[:TCHannel]:FIX4	866
:DLINK:SLOT[1]2 3 4[:TYPE]	867
:EDATa:DELay	867
:EDCLock	867
:EREFerence	868
:EREFerence:VALue	868
:FILTer	869
:IQ:SCALe	870
:MODulation:FSK[:DEViation]	870
:MODulation:MSK[:PHASe]	872
:MODulation:UFSK	872
:MODulation:UIQ	872
:MODulation[:TYPE]	873
:POLarity[:ALL]	873
:SECondary:RECall	874
:SECondary:SAVE	874
:SECondary:TRIGger[:SOURce]	874
:SECondary[:STATe]	875
:SOUT	875
:SOUT:OFFSet	876
:SOUT:SLOT	876
:SRATe	877
:TRIGger:TYPE	878
:TRIGger:TYPE:CONTinuous[:TYPE]	879
:TRIGger:TYPE:GATE:ACTive	880
:TRIGger[:SOURce]:EXTernal:DELay	880
:TRIGger[:SOURce]:EXTernal:DELay:STATe	881
:TRIGger[:SOURce]:EXTernal:SLOPe	881
:TRIGger[:SOURce]:EXTernal[:SOURce]	882
:TRIGger[:SOURce]	882
:ULINK:SLOT[1]2 3 4:CUSTom	883
:ULINK:SLOT[1]2 3 4:CUSTom:FIX4	884
:ULINK:SLOT[1]2 3 4:POWer	884
:ULINK:SLOT[1]2 3 4:SCHannel:CSID	884
:ULINK:SLOT[1]2 3 4:SCHannel:IDLE	885
:ULINK:SLOT[1]2 3 4:SCHannel:PSID	885
:ULINK:SLOT[1]2 3 4:SCHannel:UWORD	885
:ULINK:SLOT[1]2 3 4:STATe	886

:ULINK:SL0T[1]2 3 4:TCHannel:SACChannel	886
:ULINK:SL0T[1]2 3 4:TCHannel:UWORD	886
:ULINK:SL0T[1]2 3 4:TCHannel[:TCHannel]	887
:ULINK:SL0T[1]2 3 4:TCHannel[:TCHannel:FIX4]	887
:ULINK:SL0T[1]2 3 4[:TYPE]	888
[:STATe]	888
TETRA Subsystem–Option 402 ([:SOURce]:RADio:TETRa)	889
:ALPha	889
:BBCLock	889
:BBT	890
:BRATe	890
:BURSt:PN9	892
:BURSt:SCRamble:SEED	892
:BURSt:SCRamble[:STATe]	893
:BURSt:SHAPe:FALL:DELay	893
:BURSt:SHAPe:FALL:TIME	894
:BURSt:SHAPe:FDELay	894
:BURSt:SHAPe:FTIME	895
:BURSt:SHAPe:RDELay	896
:BURSt:SHAPe:RISE:DELay	896
:BURSt:SHAPe:RISE:TIME	897
:BURSt:SHAPe:RTIME	898
:BURSt:SHAPe[:TYPE]	898
:BURSt[:STATe]	899
:CHANnel	899
:DATA	900
:DATA:PRAM	900
:DATA:FIX4	901
:DEFault	901
:EDATa:DELay	901
:EDCLock	902
:EREFerence	902
:EREFerence:VALue	903
:FILTer	903
:IQ:SCALE	904
:MODulation:FSK[:DEViation]	904
:MODulation:MSK[:PHASe]	905
:MODulation:UFSK	905

Contents

:MODulation:UIQ	906
:MODulation[:TYPE]	906
:POLarity[:ALL]	907
:SECondary:RECall	907
:SECondary:SAVE	907
:SECondary:TRIGger[:SOURce]	908
:SECondary[:STATE]	908
:SLOT[1] 2 3 4:DCCustom	908
:SLOT[1] 2 3 4:DCCustom:FIX4	909
:DCNormal:B1	909
:DCNormal:B2	910
:SLOT[1] 2 3 4:DCNormal:TSEquence	910
:SLOT[1] 2 3 4:DCNormal[:DATA]	910
:SLOT[1] 2 3 4:DCNormal[:DATA]:FIX4	911
:SLOT[1] 2 3 4:DCSync:B	911
:SLOT[1] 2 3 4:DCSync:FCOR	912
:SLOT[1] 2 3 4:DCSync:SSB	912
:SLOT[1] 2 3 4:DCSync:STS	912
:SLOT[1] 2 3 4:DCSync[:DATA]	913
:SLOT[1] 2 3 4:DCSync[:DATA]:FIX4	913
:SLOT[1] 2 3 4:DDCustom	914
:SLOT[1] 2 3 4:DDCustom:FIX4	914
:SLOT[1] 2 3 4:DDNormal:B1	914
:SLOT[1] 2 3 4:DDNormal:B2	915
:SLOT[1] 2 3 4:DDNormal:TSEquence	915
:SLOT[1] 2 3 4:DDNormal[:DATA]	916
:SLOT[1] 2 3 4:DDNormal[:DATA]:FIX4	916
:SLOT[1] 2 3 4:DDSync:B	917
:SLOT[1] 2 3 4:DDSync:FCOR	917
:SLOT[1] 2 3 4:DDSync:SSB	917
:SLOT[1] 2 3 4:DDSync:STS	918
:SLOT[1] 2 3 4:DDSync[:DATA]	918
:SLOT[1] 2 3 4:DDSync[:DATA]:FIX4	918
:SLOT[1] 2 3 4:POWer	919
:SLOT[1] 2 3 4:STATE	919
:SLOT[1] 2 3 4:UC1:TSEquence	919
:SLOT[1] 2 3 4:UC1[:DATA]	920
:SLOT[1] 2 3 4:UC1[:DATA]:FIX4	920

:SLOT[1] 2 3 4:UC2:TSEQuence	920
:SLOT[1] 2 3 4:UC2[:DATA]	921
:SLOT[1] 2 3 4:UC2[:DATA]:FIX4	921
:SLOT[1] 2 3 4:UCUStom.	922
:SLOT[1] 2 3 4:UCUStom:FIX4.	922
:SLOT[1] 2 3 4:UNORmal:TSEQuence	922
:SLOT[1] 2 3 4:UNORmal[:DATA]	923
:SLOT[1] 2 3 4:UNORmal[:DATA]:FIX4.	923
:SLOT[1] 2 3 4[:TYPE].	924
:SOUT	924
:SOUT:OFFSet	925
:SOUT:SLOT	926
:SRATe	926
:TRIGger:TYPE	928
:TRIGger:TYPE:CONTInuous[:TYPE]	928
:TRIGger:TYPE:GATE:ACTive.	929
:TRIGger[:SOURce]	930
:TRIGger[:SOURce]:EXTErnal:DELay	931
:TRIGger[:SOURce]:EXTErnal:DELay:STATe	931
:TRIGger[:SOURce]:EXTErnal:SLOPe	932
:TRIGger[:SOURce]:EXTErnal[:SOURce].	933
[:STATe]	933
Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURce]:RADio:WCDMa:TGPP[:BBG])	934
:BBCLock	934
:BBCLock:EXT:RATE	934
:DLINK:APPLy	935
:DLINK:AWGN:CN	935
:DLINK:AWGN:CPOWer	935
:DLINK:AWGN:ECNO	936
:DLINK:AWGN:ECRPower	936
:DLINK:AWGN:ECRef.	936
:DLINK:AWGN:FNBW	937
:DLINK:AWGN:NPOWer	937
:DLINK:AWGN:TICPower	937
:DLINK:AWGN[:STATe]	938
:DLINK:BBCLock.	938
:DLINK:CARB:CMODE:CCODE.	938
:DLINK:CARB:CMODE:DATA	938

Contents

:DLINK:CARB:CMODE:FOFFset	939
:DLINK:CARB:CMODE:FSTRuct	939
:DLINK:CARB:CMODE:POWer	940
:DLINK:CARB:CMODE:PRATio	940
:DLINK:CARB:CMODE:SCTYpe	940
:DLINK:CARB:CMODE:SFORmat	941
:DLINK:CARB:CMODE:SSCodeos	941
:DLINK:CARB:CMODE:TFIRst	942
:DLINK:CARB:CMODE:TGL	942
:DLINK:CARB:CMODE[:STATe]	942
:DLINK:CPICH:CCODE	942
:DLINK:CPICH:POWer	943
:DLINK:CPICH[:STATe]	943
:DLINK:CRATe	943
:DLINK:DPCH[1]:BALance	944
:DLINK:DPCH[1]:BINitalize	944
:DLINK:DPCH[1]2:ALL[:STATe]	944
:DLINK:DPCH[1]2:CCODE	945
:DLINK:DPCH[1]2:DATA	945
:DLINK:DPCH[1]2:DATA:FIX4	946
:DLINK:DPCH[1]2:POWer	946
:DLINK:DPCH[1]2:RCSetup	947
:DLINK:DPCH[1]2:SLOTformat	948
:DLINK:DPCH[1]2:SRATe	948
:DLINK:DPCH[1]2:SSCodeos	948
:DLINK:DPCH[1]2:TFCI:PATtern	949
:DLINK:DPCH[1]2:TOFFset	949
:DLINK:DPCH[1]2:TPC:NUMSteps	950
:DLINK:DPCH[1]2:TPC:PATtern	950
:DLINK:DPCH[1]2[:STATe]	951
:DLINK:FILTer	951
:DLINK:FILTer:ALPHa	952
:DLINK:FILTer:BBT	952
:DLINK:FILTer:CHANnel	953
:DLINK:MSYNc	953
:DLINK:OCNS[1]2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:ALL[:STATe]	953
:DLINK:OCNS[1]2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:CCODE	954
:DLINK:OCNS[1]2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:DATA	954

:DLINK:OCNS[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:POWer	954
:DLINK:OCNS[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:SRATe	955
:DLINK:OCNS[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:SSCodeos	955
:DLINK:OCNS[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:TOFFset	956
:DLINK:OCNS[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16[:STATe]	956
:DLINK:OOSTest[:STATe]	956
:DLINK:OOSTest:DTXGate:POLarity	957
:DLINK:PADJust	957
:DLINK:PCCPch:BCHData	957
:DLINK:PCCPch:BCHData:FIX4	958
:DLINK:PCCPch:CCODE	958
:DLINK:PCCPch:POWer	958
:DLINK:PCCPch[:STATe]	959
:DLINK:PICH:CCODE	959
:DLINK:PICH:DATA	959
:DLINK:PICH:DATA:FIX4	960
:DLINK:PICH:PIBits	960
:DLINK:PICH:PINDicator	960
:DLINK:PICH:POWer	961
:DLINK:PICH[:STATe]	961
:DLINK:POLarity	961
:DLINK:PSCH:POWer	962
:DLINK:PSCH[:STATe]	962
:DLINK:RPANel:INPut:ALTPower	962
:DLINK:RPANel:INPut:BBGRef	963
:DLINK:RPANel:INPut:BGATe	963
:DLINK:RPANel:INPut:PTRigger1	963
:DLINK:RPANel:INPut:PTRigger2	964
:DLINK:RPANel:OUTPut:DCLock	964
:DLINK:RPANel:OUTPut:DOUT	966
:DLINK:RPANel:OUTPut:EVENT1	967
:DLINK:RPANel:OUTPut:EVENT2	967
:DLINK:RPANel:OUTPut:EVENT3	968
:DLINK:RPANel:OUTPut:EVENT4	968
:DLINK:RPANel:OUTPut:SSYNc	969
:DLINK:SCH[:STATe]	969
:DLINK:SCRamblecode	969
:DLINK:SDElay	970

Contents

:DLINK:SSCH:POWer	970
:DLINK:SSCH:SSGRoup	970
:DLINK:SSCH[:STATe]	971
:DLINK:TGAP:FSTRuct.	971
:DLINK:TGAP:POFFset	971
:DLINK:TGAP:PSI[1]:CFN	972
:DLINK:TGAP:PSI[1]:CMMethod	972
:DLINK:TGAP:PSI[1]:D	973
:DLINK:TGAP:PSI[1]:L1	973
:DLINK:TGAP:PSI[1]:L2	973
:DLINK:TGAP:PSI[1]:PL1	974
:DLINK:TGAP:PSI[1]:PL2	974
:DLINK:TGAP:PSI[1]:PRC	975
:DLINK:TGAP:PSI[1]:PS	975
:DLINK:TGAP:PSI[1]:SN	975
:DLINK:TGAP:RPARameter	976
:DLINK:TGAP:SCFN	976
:DLINK:TGAP:START:TRIGger	977
:DLINK:TGAP:START:TRIGger:POLarity	977
:DLINK:TGAP:STOP:TRIGger	977
:DLINK:TGAP:STOP:TRIGger:POLarity	978
:DLINK:TGAP[:STATe]	978
:DLINK:TSETup	979
:DLINK:TXDV	980
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:BLKSize	980
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:BPFRame	981
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:BRATe	981
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:BSSize	981
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:CODE	982
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:CRC	982
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:DATA	983
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:DATA:EINsert	983
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:DATA:FIX4	984
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:NBLocks	984
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:POSition	985
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:PPERcentage	985
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:RMATch	985
:DLINK[:TGRoup [A]B]:DCH[1]2 3 4 5 6:TTI	986

:DLINK[:TGRoup [A] B]:DCH[1] 2 3 4 5 6[:STATe]	986
:LINK	987
:POLarity[:ALL]	987
:ULINK:APPLy	987
:ULINK:AWGN:CN	988
:ULINK:AWGN:CPOWer	988
:ULINK:AWGN:DRATe	988
:ULINK:AWGN:EBNO	989
:ULINK:AWGN:EBRef	990
:ULINK:AWGN:FNBW	990
:ULINK:AWGN:NPOWer	991
:ULINK:AWGN:TICPower	991
:ULINK:AWGN[:STATe]	991
:ULINK:CRATe	992
:ULINK:DPCCh:BETA	992
:ULINK:DPCCh:CCODE	993
:ULINK:DPCCh:DATA	993
:ULINK:DPCCh:DATA:FIX4	994
:ULINK:DPCCh:FBI:PATTem	994
:ULINK:DPCCh:FBI:PATTem:FIX	995
:ULINK:DPCCh:FBI[:STATe]	995
:ULINK:DPCCh:POWer	996
:ULINK:DPCCh:RATE	996
:ULINK:DPCCh:SLOTformat	996
:ULINK:DPCCh:TFCI:PATTem	997
:ULINK:DPCCh:TFCI:PATTem:FIX	997
:ULINK:DPCCh:TFCI[:STATe]	998
:ULINK:DPCCh:TPC:NSTeps	998
:ULINK:DPCCh:TPC:PATTem	999
:ULINK:DPCCh:TPC:PATTem:FIX4	1000
:ULINK:DPCCh:TPC:PATTem:TRIGger:POLarity	1000
:ULINK:DPCCh:TPC:PATTem:TRIGger[:STATe]	1001
:ULINK:DPCCh:TPOWer	1001
:ULINK:DPCCh[:STATe]	1002
:ULINK:DPDCh:BETA	1002
:ULINK:DPDCh:CCODE	1003
:ULINK:DPDCh:DATA	1004
:ULINK:DPDCh:DATA:FIX4	1004

Contents

:ULINK:DPDCh:POWer	1005
:ULINK:DPDCh:RATE	1005
:ULINK:DPDCh:RBER	1006
:ULINK:DPDCh:SLOTformat	1007
:ULINK:DPDCh:TBER[:CLENgth]	1008
:ULINK:DPDCh:TBER:ELENgth	1008
:ULINK:DPDCh:TPOWer	1009
:ULINK:DPDCh[:STATe]	1009
:ULINK:FCLock:INTErval	1009
:ULINK:FCLock:POLarity	1010
:ULINK:FILTEr	1010
:ULINK:FILTEr:ALPHa	1011
:ULINK:FILTEr:BBT	1012
:ULINK:FILTEr:CHANnel	1012
:ULINK:FOFFset	1012
:ULINK:PADJust	1013
:ULINK:PHYSical[1]:TYPE	1013
:ULINK:PMODE:TPControl:HOLD	1014
:ULINK:PMODE:TPControl:POWer:INITial	1014
:ULINK:PMODE:TPControl:POWer:MAXimum	1015
:ULINK:PMODE:TPControl:POWer:MINimum	1015
:ULINK:PMODE:TPControl:POWer:RESet	1016
:ULINK:PMODE:TPControl:POWer:STEP	1016
:ULINK:PMODE:TPControl:TRIGger:POLarity	1017
:ULINK:PMODE[:SElect]	1017
:ULINK:PRACH:AICH:NUMBer	1018
:ULINK:PRACH:AICH:POLarity	1018
:ULINK:PRACH:AWGN:CN	1019
:ULINK:PRACH:AWGN:CPOWer	1019
:ULINK:PRACH:AWGN:DRATE	1019
:ULINK:PRACH:AWGN:EBNO	1020
:ULINK:PRACH:AWGN:ECNO	1020
:ULINK:PRACH:AWGN:EREF	1021
:ULINK:PRACH:AWGN:NPOWer	1021
:ULINK:PRACH:AWGN:TICPower	1022
:ULINK:PRACH:AWGN[:STATe].	1022
:ULINK:PRACH:MESSAge:CPART:BETA	1023
:ULINK:PRACH:MESSAge:CPART:DATA	1023

:ULINK:PRACH:MESSAge:CPART:DATA:FIX4	1024
:ULINK:PRACH:MESSAge:CPART:POWer	1024
:ULINK:PRACH:MESSAge:CPART:RATE	1025
:ULINK:PRACH:MESSAge:CPART:SLOTformat	1025
:ULINK:PRACH:MESSAge:CPART:TFCI:PATtern	1026
:ULINK:PRACH:MESSAge:CPART:TFCI:PATtern:FIX	1026
:ULINK:PRACH:MESSAge:CPART:TFCI[:STATe]	1027
:ULINK:PRACH:MESSAge:DPART:BETA	1027
:ULINK:PRACH:MESSAge:DPART:DATA	1028
:ULINK:PRACH:MESSAge:DPART:DATA:FIX4	1028
:ULINK:PRACH:MESSAge:DPART:POWer	1029
:ULINK:PRACH:MESSAge:DPART:RATE	1030
:ULINK:PRACH:MESSAge:DPART:SLOTformat	1031
:ULINK:PRACH:MODE[:SElect]	1032
:ULINK:PRACH:MULTi:MESSAge:TPOWer	1032
:ULINK:PRACH:MULTi:MESSAge[:STATe]	1033
:ULINK:PRACH:MULTi:NUMBer	1033
:ULINK:PRACH:MULTi:PREamble:NUMBer	1034
:ULINK:PRACH:MULTi:PREamble:POWer:INITial	1034
:ULINK:PRACH:MULTi:PREamble:POWer:MAX	1034
:ULINK:PRACH:MULTi:PREamble:POWer:RSTep	1035
:ULINK:PRACH:MULTi:PREamble:PPM	1035
:ULINK:PRACH:MULTi:UE[1] 2 3 4 5 6 7 8:MESSAge:CPART:CCODE	1035
:ULINK:PRACH:MULTi:UE[1] 2 3 4 5 6 7 8:MESSAge:DPART:CCODE	1036
:ULINK:PRACH:MULTi:UE[1] 2 3 4 5 6 7 8:PREamble:SIGNature	1036
:ULINK:PRACH:MULTi:UE[1] 2 3 4 5 6 7 8:SPOsition[1] 2 3 4 5 6 7 8[:ASLot]	1037
:ULINK:PRACH:MULTi:UE[1] 2 3 4 5 6 7 8[:STATe]	1038
:ULINK:PRACH:PREamble:POWer:AVERAge	1038
:ULINK:PRACH:PREamble:POWer:MODE	1039
:ULINK:PRACH:RPARAmeter	1040
:ULINK:PRACH:SCRamblecode	1040
:ULINK:PRACH:SDElay	1041
:ULINK:PRACH:SUBChannel	1041
:ULINK:PRACH:TOFFset	1042
:ULINK:PRACH:TPA	1042
:ULINK:PRACH:TPM	1043
:ULINK:PRACH:TPOWer	1043
:ULINK:PRACH:TPP	1044

Contents

:ULINK:PRACH:TRIGGER.	1044
:ULINK:PRACH:TRIGGER:POLARITY.	1045
:ULINK:PRACH:TRIGGER:SOURCE.	1045
:ULINK:PRACH:TTI.	1046
:ULINK:PRACH[:SINGLE]:MESSAGE[:STATE]	1046
:ULINK:PRACH[:SINGLE]:NUMBER	1047
:ULINK:PRACH[:SINGLE]:MESSAGE:CPART:CCODE.	1047
:ULINK:PRACH[:SINGLE]:MESSAGE:DPART:CCODE	1048
:ULINK:PRACH[:SINGLE]:MESSAGE:TPOWER	1049
:ULINK:PRACH[:SINGLE]:NUMBER	1049
:ULINK:PRACH[:SINGLE]:PREAMBLE:NUMBER	1050
:ULINK:PRACH[:SINGLE]:PREAMBLE:POWER:INITIAL	1050
:ULINK:PRACH[:SINGLE]:PREAMBLE:POWER:MAX.	1050
:ULINK:PRACH[:SINGLE]:PREAMBLE:POWER:RSTEP	1051
:ULINK:PRACH[:SINGLE]:PREAMBLE:PPM.	1052
:ULINK:PRACH[:SINGLE]:PREAMBLE:SIGNATURE	1052
:ULINK:RMCHANNEL	1053
:ULINK:RPANEL:DPCH:INPUT:ALTPower	1054
:ULINK:RPANEL:DPCH:INPUT:BBGRef	1054
:ULINK:RPANEL:DPCH:INPUT:BGATE	1054
:ULINK:RPANEL:DPCH:INPUT:PTRigger1.	1055
:ULINK:RPANEL:DPCH:INPUT:PTRigger2.	1055
:ULINK:RPANEL:DPCH:OUTPUT:DCLock	1055
:ULINK:RPANEL:DPCH:OUTPUT:DOUT.	1057
:ULINK:RPANEL:DPCH:OUTPUT:EVENT1	1057
:ULINK:RPANEL:DPCH:OUTPUT:EVENT2	1058
:ULINK:RPANEL:DPCH:OUTPUT:EVENT3	1058
:ULINK:RPANEL:DPCH:OUTPUT:EVENT4	1059
:ULINK:RPANEL:DPCH:OUTPUT:SSYNc	1059
:ULINK:RPANEL:PRACH:INPUT:ALTPower	1060
:ULINK:RPANEL:PRACH:INPUT:BBGRef	1060
:ULINK:RPANEL:PRACH:INPUT:BGATE	1060
:ULINK:RPANEL:PRACH:INPUT:PTRigger1.	1061
:ULINK:RPANEL:PRACH:INPUT:PTRigger2.	1061
:ULINK:RPANEL:PRACH:OUTPUT:DCLock	1062
:ULINK:RPANEL:PRACH:OUTPUT:DOUT	1064
:ULINK:RPANEL:PRACH:OUTPUT:EVENT1	1064
:ULINK:RPANEL:PRACH:OUTPUT:EVENT2	1065

:ULINK:RPANel:PRACH:OUTPut:EVENT3	1066
:ULINK:RPANel:PRACH:OUTPut:EVENT4	1067
:ULINK:RPANel:PRACH:OUTPut:SSYNc	1068
:ULINK:SCRamblecode	1068
:ULINK:SDElay	1069
:ULINK:SFNRst:POLarity	1069
:ULINK:SYNC:MODE	1070
:ULINK:SYNC[:SOURce]	1070
:ULINK:TGAP:POFFset	1071
:ULINK:TGAP:PSI[1] 2 3 4 5 6:CFN	1071
:ULINK:TGAP:PSI[1]:CMMethod	1072
:ULINK:TGAP:PSI[1] 2 3 4 5 6:D	1072
:ULINK:TGAP:PSI[1] 2 3 4 5 6:L1	1073
:ULINK:TGAP:PSI[1] 2 3 4 5 6:L2	1073
:ULINK:TGAP:PSI[1] 2 3 4 5 6:PL1	1073
:ULINK:TGAP:PSI[1] 2 3 4 5 6:PL2	1074
:ULINK:TGAP:PSI[1] 2 3 4 5 6:POWer	1074
:ULINK:TGAP:PSI[1] 2 3 4 5 6:PRC	1075
:ULINK:TGAP:PSI[1] 2 3 4 5 6:PS	1075
:ULINK:TGAP:PSI[1] 2 3 4 5 6:SN	1076
:ULINK:TGAP:RPARameter	1076
:ULINK:TGAP:SCFN	1076
:ULINK:TGAP[:STATe]	1077
:ULINK:TGAP:STARt:TRIGger	1077
:ULINK:TGAP:STARt:TRIGger:POLarity	1078
:ULINK:TGAP:STOP:TRIGger	1078
:ULINK:TGAP:STOP:TRIGger:POLarity	1078
:ULINK:TOFFset	1079
:ULINK:TSTatus:COMPRessed	1079
:ULINK:TSTatus:RACH	1079
:ULINK:TSTatus:RECeive	1080
:ULINK:TSTatus:SYNC	1080
:ULINK:[TGRoup[1]]:DCH[1] 2 3 3 5 6:BLKSize	1080
:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6:BPFRame	1081
:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6:BRATe	1081
:ULINK:[TGRoup[1]]:DCH[1] 2 3 3 5 6:CODE	1081
:ULINK:[TGRoup[1]]:DCH[1] 2 3 3 5 6:CRc	1082
:ULINK:[TGRoup[1]]:DCH[1] 2 3 3 5 6:DATA	1082

Contents

:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6:DATA:BER:ACTual	1083
:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6:DATA:BER:ERRor:BIT	1083
:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6:DATA:BER:TOTal:BIT	1083
:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6:DATA:BER[:VALue]	1084
:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6:DATA:BLER:ACTual	1084
:ULINK[:TGRoup[1]]:2:DCH[1] 2 3 4 5 6:DATA:BLER:ERRor:BLOCK	1084
:ULINK[:TGRoup[1]]:2:DCH[1] 2 3 4 5 6:DATA:BLER:TOTal:BLOCK	1085
:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6:DATA:BLER[:VALue]	1085
:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6:DATA:EINsert	1086
:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6:DATA:FIX4	1086
:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6:NBLock	1087
:ULINK[:TGRoup [1]]:DCH[1] 2 3 4 5 6:PPERcentage	1087
:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6:RMATch	1087
:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6:TTI	1088
:ULINK[:TGRoup[1]]:DCH[1] 2 3 4 5 6[:STATe]	1088
:ULINK[:TGRoup[1]]:RACH[1]:BLKSize	1089
:ULINK[:TGRoup [1]]:RACH[1]:BPF rame	1089
:ULINK[:TGRoup [1]]:RACH[1]:BRATe	1089
:ULINK[:TGRoup[1]]:RACH[1]:CODE	1090
:ULINK[:TGRoup[1]]:RACH[1]:CRC	1090
:ULINK[:TGRoup[1]]:RACH[1]:DATA	1090
:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER:ACTual	1091
:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER:ERRor:BIT	1091
:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER:TOTal:BIT	1091
:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER[:VALue]	1092
:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER:ACTual	1092
:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER:ERRor:BLOCK	1092
:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER:TOTal:BLOCK	1093
:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER[:VALue]	1093
:ULINK[:TGRoup[1]]:RACH[1]:DATA:EINsert	1094
:ULINK[:TGRoup[1]]:RACH[1]:DATA:FIX4	1094
:ULINK[:TGRoup[1]]:RACH[1]:NBLock	1095
:ULINK[:TGRoup [1]]:RACH[1]:PPERcentage	1095
:ULINK[:TGRoup[1]]:RACH[1]:RMATch	1095
:ULINK[:TGRoup[1]]:RACH[1]:TTI	1096
:ULINK[:TGRoup[1]]:RACH[1][:STATe]	1096
[:STATe]	1096

9 Receiver Test Digital Commands (continued)

This chapter provides a continuation of SCPI descriptions for commands dedicated to digital real-time testing using the E4438C ESG Vector Signal Generator. This chapter contains the following sections:

- “GPS Subsystem–Option 409 ([:SOURce]:RADio[1]|2|3|4:GPS)” on page 670
- “GSM Subsystem–Option 402 ([:SOURce]:RADio:GSM)” on page 677
- “HSDPA over W-CDMA Subsystem–Option 418 ([:SOURce]:RADio:WCDMa:HSDPa[:BBG])” on page 717
- “NADC Subsystem–Option 402 ([:SOURce]:RADio[:NADC])” on page 779
- “PDC Subsystem–Option 402 ([:SOURce]:RADio:PDC)” on page 814
- “PHS Subsystem–Option 402 ([:SOURce]:RADio:PHS)” on page 850
- “TETRA Subsystem–Option 402 ([:SOURce]:RADio:TETRa)” on page 889
- “Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURce]:RADio:WCDMa:TGPP[:BBG])” on page 934

GPS Subsystem–Option 409 ([:SOURce]:RADio[1] | 2 | 3 | 4:GPS)

:DATA

Supported E4438C with Option 409

```
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS :DATA PN9 | PN15 | FIX4 | "<user file>"
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS :DATA ?
```

This command sets the data type for the selected data mode.

***RST** PN9

Key Entry PN9 PN15 FIX4 User file

Remarks This command is only effective when the data mode is RAW or ENCOded. To set the data mode, refer to **”:DMODE”**.

:DMODE

Supported E4438C with Option 409

```
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS :DMODE RAW | ENCOded | TLM
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS :DMODE ?
```

This command sets the data mode.

RAW This choice modulates data onto the C/A (coarse acquisition) code at 50-bits per second. No parity bits are computed by the signal generator. Every 6 seconds, 300-bits from the source data are transmitted.

ENCOded This choice modulates data onto the C/A (coarse acquisition) code at 50-bits per second. The signal generator computes 6 parity bits for every 24 data bits from the selected data source. Every six seconds, 240-bits of the source data are transmitted along with 60-bits of computed parity.

TLM This choice transmits a standard default navigation data transmission which includes a telemetry word (TLM), a handover word (HOW), and default navigation data. The signal generator transmits an incrementing time-of-week (TOW) as part of the HOW.

***RST** RAW

Key Entry Data Mode Raw Enc TLM

Remarks Since the TLM mode transmits default navigation data, there is no data selection for this mode.

For selecting the data type when RAW or ENCOded is the selection, refer to “:DATA” on page 670.

:DSHift

Supported E4438C with Option 409

```
[:SOURce]:RADio[1] | 2 | 3 | 4:GPS:DSHift <val>
[:SOURce]:RADio[1] | 2 | 3 | 4:GPS:DSHift?
```

This command sets the frequency and chip rate offsets to simulate a doppler shift.

The variable <val> is expressed in units of hertz (Hz to kHz).

***RST** +0.00000000E+000

Range –125 to 125

Key Entry Doppler Shift

Remarks The lower bound of the doppler shift is limited by the frequency set on the signal generator. For example, if the signal generator frequency is set to 100 kHz, then the lower limit of the doppler shift would be 0.00 Hz. The doppler shift can not extend lower than the limitations of the signal generator

:FILTer

Supported E4438C with Option 409

```
[:SOURce]:RADio[1] | 2 | 3 | 4:GPS:FILTer RNYQuist | NYQuist | GAUSSian | RECTangle |
IS95 | IS95_EQ | IS95_MOD | IS95_MOD_EQ | AC4Fm | UGGaussian | "<user FIR>"
[:SOURce]:RADio[1] | 2 | 3 | 4:GPS:FILTer?
```

This command sets the pre-modulation filter type.

IS95 This choice selects a filter that meets the criteria of the IS-95 standard.

IS95_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

IS95_MOD This choice selects a filter that meets the criteria of the IS-95 error function (for

GPS Subsystem–Option 409 ([:SOURce]:RADio[1] | 2 | 3 | 4:GPS)

	improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.																		
IS95_MOD_EQ	This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection.																		
AC4Fm	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.																		
UGGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.																		
"<user FIR>"	This variable is any filter file that you have stored into memory.																		
*RST	RECT																		
Key Entry	<table> <tr> <td>Root Nyquist</td> <td>Nyquist</td> <td>Gaussian</td> <td>Rectangle</td> <td>IS-95</td> <td>IS-95 w/EQ</td> </tr> <tr> <td>IS-95 Mod</td> <td>IS-95 Mod w/EQ</td> <td>APC025 C4FM</td> <td>UN3/4 GSM</td> <td>Gaussian</td> <td></td> </tr> <tr> <td>User FIR</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Root Nyquist	Nyquist	Gaussian	Rectangle	IS-95	IS-95 w/EQ	IS-95 Mod	IS-95 Mod w/EQ	APC025 C4FM	UN3/4 GSM	Gaussian		User FIR					
Root Nyquist	Nyquist	Gaussian	Rectangle	IS-95	IS-95 w/EQ														
IS-95 Mod	IS-95 Mod w/EQ	APC025 C4FM	UN3/4 GSM	Gaussian															
User FIR																			

:FILTer:ALPHa

Supported E4438C with Option 409

```
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS :FILTer :ALPHa <val>
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS :FILTer :ALPHa ?
```

This command sets the Nyquist or root Nyquist filter's alpha value.

The filter alpha value can be set to the minimum value (0), maximum value (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +2.20000000E-001

Range 0.000–1.000

Key Entry Filter Alpha

Remarks To change the current filter type, refer to “:FILTer” on page 671.

:FILTer:BBT

Supported E4438C with Option 409

```
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS :FILTer :BBT <val>
```

```
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS :FILTer :BBT ?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameters.

The filter BbT value can be set to the minimum value (0), the maximum value (1), or in between by using fractional numeric values (0.001–0.999)

***RST** +5.00000000E-001

Range 0.000–1.000

Key Entry Filter BbT

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to “:FILTer” on page 671.

:FILTer:CHANnel

Supported E4438C with Option 409

```
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS :FILTer :CHANnel
```

```
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS :FILTer :CHANnel ?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** EVM

Key Entry Optimize FIR For EVM ACP

Remarks To change the current filter type, refer to “:FILTer” on page 671.

:IQPHase**Supported** E4438C with Option 409[:SOURCE]:RADio[1] | 2 | 3 | 4:GPS:IQPHase NORMal | INVerted
[:SOURCE]:RADio[1] | 2 | 3 | 4:GPS:IQPHase?

This command sets the I/Q phase for the GPS signal.

NORMal This choice selects normal phase polarity.**INVerted** This choice inverts the internal Q signal.***RST** NORM**Key Entry** IQ Phase Normal Invert**:PCODE****Supported** E4438C with Option 409[:SOURCE]:RADio[1] | 2 | 3 | 4:GPS:PCODE <val>
[:SOURCE]:RADio[1] | 2 | 3 | 4:GPS:PCODE?

This command sets the P code power relative to the C/A code power.

RST** -3**Range** -40 to 0**Key Entry** P Code Pwr**Remarks** This command is normally used when the CAP (C/A+P) ranging mode choice is selected. Refer to **":RCODE"** for selecting the ranging mode.**:RCODE*Supported** E4438C with Option 409[:SOURCE]:RADio[1] | 2 | 3 | 4:GPS:RCODE CA | P | CAP
[:SOURCE]:RADio[1] | 2 | 3 | 4:GPS:RCODE?

This command selects the ranging code for the GPS transmission.

CA This choice selects a 1023-bit pseudorandom C/A (coarse acquisition) code that is BPSK modulated onto the L1 (1575.42 MHz) carrier. The C/A code factory set chip rate is 1.023 Mcps using a 10.23 Mcps reference clock.**P** This choice selects the precise (P) code which is a very long pseudorandom sequence that is BPSK modulated onto the L2

(1227.6 MHz) carrier. The P code factory set chip rate is 10.23 Mcps using a 10.23 Mcps reference clock.

CAP This choice permits both the C/A (coarse acquisition) and P (precise) codes to modulate the L1 (1575.42 MHz) carrier simultaneously by providing the P code on the Q component and the C/A code in quadrature on the I component.

***RST** CA

Key Entry Ranging Code C/A P C/A+P

:REFClk

Supported E4438C with Option 409

```
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS:REFClk [ INT ] | Ext
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS:REFClk?
```

This command sets the GPS reference clock to either internal or external.

INT This selection sets the signal generator to use the internal chip clock.

EXT This selection sets the signal generator to use an external chip clock which is supplied to the DATA CLOCK INPUT connector.

***RST** INT

Key Entry GPS Ref Clk

:REFFreq

Supported E4438C with Option 409

```
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS:REFFreq <val><unit>
[ :SOURce ] :RADio[1] | 2 | 3 | 4 :GPS:REFFreq?
```

This command sets the GPS reference clock frequency. If an external source is being used, its frequency must match the value set with this command

***RST** +1.02300000E+007

Range 1kCPS–12.5MCPS

Key Entry GPS Ref (f0)

Remarks Changing the GPS reference frequency will change the P and C/A code chip rates.

GPS Subsystem–Option 409 ([:SOURCE]:RADio[1] | 2 | 3 | 4:GPS)

:SATid

Supported E4438C with Option 409

[:SOURCE] :RADio[1] | 2 | 3 | 4 :GPS :SATid <val>

[:SOURCE] :RADio[1] | 2 | 3 | 4 :GPS :SATid?

This command selects the pseudorandom number (PRN) code used for transmission.

Satellite identification numbers 1–32 are used for GPS satellites. Satellite identification numbers 33–37 are reserved for ground transmitter use in the real-world system.

***RST** +1

Range 1–37

Key Entry Satellite ID

[:STATE]

Supported E4438C with Option 409

[:SOURCE] :RADio[1] | 2 | 3 | 4 :GPS [:STATE] ON | OFF | 1 | 0

[:SOURCE] :RADio[1] | 2 | 3 | 4 :GPS [:STATE]?

This command enables or disables the real-time GPS signal.

***RST** 0

Key Entry Real-time GPS Off On

GSM Subsystem–Option 402 ([:SOURce]:RADio:GSM)

:ALPha

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :GSM :ALPha <val>  
[ :SOURce ] :RADio :GSM :ALPha ?
```

This command changes the Nyquist or root Nyquist filter’s alpha value.

The filter alpha value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +5.00000000E–001

Range 0.000–1.000

Key Entry Filter Alpha

Remarks To change the current filter type, refer to “:FILTer” on page 691.

:BBCLock

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :GSM :BBCLock INT[1] | EXT[1]  
[ :SOURce ] :RADio :GSM :BBCLock ?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Key Entry BBG Data Clock Ext Int

Remarks A data clock or continuous symbol sync input must be supplied when external mode is used.

This will be ignored if the external reference is set to EXTERNAL. To change the external reference type, refer to “:EREFerence” on page 690.

:BBT

Supported E4438C with Option 402

[:SOURCE] :RADIO:GSM:BBT <val>

[:SOURCE] :RADIO:GSM:BBT?

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +3.00000000E–001

Range 0.100–1.000

Key Entry Filter BbT

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to “:FILTER” on page 691.

:BRATe

Supported E4438C with Option 402

[:SOURCE] :RADIO:GSM:BRATe <val>

[:SOURCE] :RADIO:GSM:BRATe?

This command sets the bit rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +2.70833333E+005

Range	Modulation Type	Bits per Symbol	Internal Data	External Serial Data
	BPSK	1	1–50 Mbps	1–50 Mbps
	FSK2			
	MSK			

Range

Modulation Type	Bits per Symbol	Internal Data	External Serial Data
C4FM	2	2–100 Mbps	2–50 Mbps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			
QPSK			
QPSKIS95			
QPSKISAT			
D8PSK	3	3–100 Mbps	3–50 Mbps
EDGE			
FSK8			
PSK8			
FSK16	4	4–100 Mbps	4–50 Mbps
PSK16			
QAM16			
QAM32	5	5–100 Mbps	5–50 Mbps
QAM64	6	6–100 Mbps	6–50 Mbps
QAM256	7	8–100 Mbps	8–50 Mbps

Key Entry

Symbol Rate

Remarks

When user-defined filters are selected using the command in section “:FILTer” on page 691, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated and will impact the relative timing of the modulated data, as well as the actual filter response (see “:SRATe” on page 709).

A change in the bit rate value will affect the symbol rate value; refer to “:SRATe” on page 709 for a list of the minimum and maximum symbol rate values.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 694.

:BURSt:PN9

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO:GSM:BURSt:PN9 NORMal | QUICK  
[ :SOURCE ] :RADIO:GSM:BURSt:PN9?
```

This command controls the software PN9 generation.

NORMAL This choice produces a maximum length PN9 sequence.

QUICK This choice produces a truncated PN9 sequence.

***RST** NORM

Key Entry PN9 Mode Normal Quick

Remarks Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

:BURSt:SHAPE:FALL:DELay

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO:GSM:BURSt:SHAPE:FALL:DELay <val>  
[ :SOURCE ] :RADIO:GSM:BURSt:SHAPE:FALL:DELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –11.0625 to 99

Key Entry Fall Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 694. Refer to “:SRATE” on page 709 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPE:FDELay” on page 681 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FALL:TIME

Supported E4438C with Option 402

[:SOURce] :RADio:GSM:BURSt:SHAPe:FALL:TIME <val>

[:SOURce] :RADio:GSM:BURSt:SHAPe:FALL:TIME?

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.0625–127.9375

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 694. Refer to “:SRATE” on page 709 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FTIME” on page 682 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FDElay

Supported E4438C with Option 402

[:SOURce] :RADio:GSM:BURSt:SHAPe:FDElay <val>

[:SOURce] :RADio:GSM:BURSt:SHAPe:FDElay?

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –11.0625 to 99

Key Entry Fall Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 694. Refer to “:SRATE” on page 709 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:DELay” on page 680 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FTIME

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:GSM:BURSt:SHAPe:FTIME <val>  
[ :SOURce ] :RADio:GSM:BURSt:SHAPe:FTIME?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +3.00000000E+000

Range 0.0625–127.9375

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 694. Refer to “:SRATE” on page 709 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:TIME” on page 681 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RDELaY

Supported E4438C with Option 402

[:SOURce] :RADIo:GSM:BURSt:SHAPe:RDELaY <val>

[:SOURce] :RADIo:GSM:BURSt:SHAPe:RDELaY?

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate. For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

***RST** +0.00000000E+000

Range –8.0625 to 99

Key Entry Rise Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 694. Refer to “:SRAtE” on page 709 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:DELaY” on page 683 performs the same function; in compliance with the SCPI standard, both commands are listed.

:BURSt:SHAPe:RISE:DELaY

Supported E4438C with Option 402

[:SOURce] :RADIo:GSM:BURSt:SHAPe:RISE:DELaY <val>

[:SOURce] :RADIo:GSM:BURSt:SHAPe:RISE:DELaY?

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate. For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

***RST** +0.00000000E+000

Range –8.0625 to 99

Key Entry Rise Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 694. Refer to “:SRATE” on page 709 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPE:RDElay” on page 683 performs the same function; in compliance with the SCPI standard, both commands are listed.

:BURSt:SHAPE:RISE:TIME

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO:GSM:BURSt:SHAPE:RISE:TIME <val>  
[ :SOURCE ] :RADIO:GSM:BURSt:SHAPE:RISE:TIME?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate. For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

***RST** +3.00000000E+000

Range 0.0625–11.1875

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 694. Refer to “:SRATE” on page 709 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPE:RTIME” on page 685 performs the same function; in compliance with the SCPI standard, both commands are listed.

:BURSt:SHAPe:RTIME

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:BURSt:SHAPe:RTIME <val>
```

```
[ :SOURce ]:RADio:GSM:BURSt:SHAPe:RTIME?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate. For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

***RST** +3.00000000E+000

Range 0.0625–11.1875

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 694. Refer to “:SRATE” on page 709 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:TIME” on page 684 performs the same function; in compliance with the SCPI standard, both commands are listed.

:BURSt:SHAPe[:TYPE]

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:BURSt:SHAPe[:TYPE] SINE| "<file name>"
```

```
[ :SOURce ]:RADio:GSM:BURSt:SHAPe[:TYPE]?
```

This command specifies the burst shape as either SINE or a user-defined file ("<file name>").

SINE This choice selects a state that is defined by the burst rise and fall *RST values, as the default burst shape type.

"<file name>" This choice selects a user designated file from signal generator memory (non-volatile).

***RST** SINE

Key Entry Sine User File

:BURSt[:STATe]

Supported E4438C with Option 402

[:SOURCE] :RADIo:GSM:BURSt [:STATe] ON | OFF | 1 | 0

[:SOURCE] :RADIo:GSM:BURSt [:STATe] ?

This command enables or disables the burst function.

ON (1) This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

OFF (0) This choice enables the transmission of unframed data.

***RST** 0

Key Entry Data Format Pattern Framed

:CHANnel

Supported E4438C with Option 402

[:SOURCE] :RADIo:GSM:CHANnel EVM | ACP

[:SOURCE] :RADIo:GSM:CHANnel ?

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** ACP

Key Entry Optimize FIR For Evm ACP

Remarks To change the current filter type, refer to “:FILTer” on page 691.

:DATA

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:DATA PN9 | PN11 | PN15 | PN20 | PN23 | FIX4 | "<file_name>" |
EXT | P4 | P8 | P16 | P32 | P64 | PRAM
[ :SOURce ]:RADio:GSM:DATA?
```

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) for unframed data transmission.

***RST** PN23

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	Ext
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's			64 1's & 64 0's	PRAM File

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:DATA:PRAM

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:DATA:PRAM "<file_name>"
[ :SOURce ]:RADio:GSM:DATA:PRAM?
```

This command selects a pattern RAM (PRAM) file as the pattern data type for the GSM (Global System for Mobile communication) format.

"<file_name>" This variable designates the PRAM file in WFM1. Refer to “File Name Variables” on page 12 for information on the file name syntax.

Key Entry **PRAM File**

Remarks Selecting this data source forces the burst source to INTERNAL to allow framing control.

The PRAM file must reside in the signal generator's volatile memory (WFM1) in order to be accessed by this command. For more information on PRAM files, refer to “:DATA:PRAM:FILE:BLOCK” on page 111.

:DATA:FIX4

Supported E4438C with Option 402

[:SOURCE] :RADio:GSM:DATA:FIX4 <val>

[:SOURCE] :RADio:GSM:DATA:FIX4?

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the GSM modulation format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:DEFAULT

Supported E4438C with Option 402

[:SOURCE] :RADio:GSM:DEFAULT

This command returns all of the GSM format parameters to their factory default conditions. It does not affect any other signal generator parameters.

Key Entry Restore GSM Factory Default

:DENCODE

Supported E4438C with Option 402

[:SOURCE] :RADio:GSM:DENCODE ON|OFF|1|0

[:SOURCE] :RADio:GSM:DENCODE?

This command enables or disables the differential data encoding function. Once this function is enabled, data bits are encoded prior to modulation; each modulated bit is 1 if the data bit is different from the previous one, or 0 if the data bit is the same as the previous one.

***RST** 1

Key Entry Diff Data Encode Off On

:EDATa:DELay

Supported E4438C with Option 402

[:SOURCE] :RADIo:GSM:EDATa:DELay?

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

Remarks When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported E4438C with Option 402

[:SOURCE] :RADIo:GSM:EDCLock SYMBol |NORMal

[:SOURCE] :RADIo:GSM:EDCLock?

This command sets the external data clock use.

SYMBol This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

NORMal This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

***RST** NORM

Key Entry Ext Data Clock Normal Symbol

Remarks Both choices have no effect in internal clock mode. Refer to “:BBCLock” on [page 677](#) to select EXT as the data clock type.

:EREFERENCE

Supported E4438C with Option 402

[:SOURCE] :RADIO:GSM:EREFERENCE INT|EXT

[:SOURCE] :RADIO:GSM:EREFERENCE?

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Key Entry BBG Ref Ext Int

Remarks If the EXT choice is selected, the external source's frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

:EREFERENCE:VALUE

Supported E4438C with Option 402

[:SOURCE] :RADIO:GSM:EREFERENCE:VALUE <val>

[:SOURCE] :RADIO:GSM:EREFERENCE:VALUE?

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST** +1.30000000E+007

Range 2.5E5–1E8

Key Entry Ext BBG Ref Freq

Remarks The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.
Refer to [“:EREFERENCE” on page 690](#) to select EXT (external source) as the reference for the bit-clock reference.

:FILTer

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:FILTer RNYQuist|NYQuist|GAUSSian|RECTangle|
IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURce]:RADio:GSM:FILTer?
```

This command selects the pre-modulation filter type.

- IS95 This choice selects a filter that meets the criteria of the IS-95 standard.
- IS95_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
- IS95_MOD This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
- IS95_MOD_EQ This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
- AC4Fm This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
- UGGaussian This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
- "<user FIR>" This variable is any filter file that you have stored into memory.

***RST** GAUS

Key Entry **Root Nyquist Nyquist Gaussian Rectangle IS-95 IS-95 w/EQ**
IS-95 Mod IS-95 Mod w/EQ APCO 25 C4FM UN3/4 GSM Gaussian
User FIR

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:IQ:SCALE

Supported E4438C with Option 402

[:SOURCE] :RADIO:GSM:IQ:SCALE <val>

[:SOURCE] :RADIO:GSM:IQ:SCALE?

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST** +100

Range 1–200

Key Entry I/Q Scaling

Remarks This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEVIation]

Supported E4438C with Option 402

[:SOURCE] :RADIO:GSM:MODulation:FSK[:DEVIation] <val>

[:SOURCE] :RADIO:GSM:MODulation:FSK[:DEVIation]?

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

***RST** +4.00000000E+002

Range 0–2E7

Key Entry Freq Dev

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 694.

Refer to “:SRATE” on page 709 for a list of the minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *E4428C/38C ESG Signal Generators User’s Guide* for more information.

:MODulation:MSK[:PHASe]

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:MODulation:MSK[:PHASe] <val>  
[ :SOURce ]:RADio:GSM:MODulation:MSK[:PHASe]?
```

This command sets the MSK phase deviation value. The variable <val> is in units of degrees

***RST** +9.00000000E+001

Range 0–100

Key Entry Phase Dev

:MODulation:UFSK

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:MODulation:UFSK "<file name>"  
[ :SOURce ]:RADio:GSM:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

Key Entry User FSK

Remarks The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. See “:MODulation[:TYPE]” on page 694 to change the current modulation type.

See “File Name Variables” on page 13 for information on the file name syntax.

:MODulation:UIQ

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:MODulation:UIQ "<file name>"  
[ :SOURce ]:RADio:GSM:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

Key Entry User I/Q

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to “:MODulation[:TYPE]” on page 694 to change the current modulation type.

See “File Name Variables” on page 13 for information on the file name syntax.

:MODulation[:TYPE]

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:MODulation[ :TYPE ] BPSK | QPSK | IS95QPSK |
GRAYQPSK | OQPSK | IS95OQPSK | P4DQPSK | PSK8 | PSK16 | D8PSK | MSK | FSK2 | FSK4 | FSK8 |
FSK16 | C4FM | QAM4 | QAM16 | QAM32 | QAM64 | QAM128 | QAM256 | UIQ | UFSK
[ :SOURce ]:RADio:GSM:MODulation[ :TYPE ]?
```

This command sets the modulation type for the GSM personality.

***RST** MSK

Key Entry	BPSK	QPSK	IS-95 QPSK	Gray Coded QPSK	OQPSK			
	IS-95 OQPSK	$\pi/4$ DQPSK	8PSK	16PSK	D8PSK	MSK	2-Lvl FSK	
	4-Lvl FSK	8-Lvl FSK	16-Lvl FSK	C4FM	4QAM	16QAM	32QAM	
	64QAM	128QAM	256QAM	User I/Q	User FSK			

:POLarity[:ALL]

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:POLarity[ :ALL ] NORMal | INVerted
[ :SOURce ]:RADio:GSM:POLarity[ :ALL ]?
```

This command sets the rotation direction of the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Key Entry Phase Polarity Normal Invert

Remarks This command is useful for lower sideband mixing applications.

:SECondary:RECall

Supported E4438C with Option 402

[:SOURCE] :RADIo:GSM:SECondary:RECall

This command recalls the secondary frame configuration, overwriting the current state.

Key Entry Recall Secondary Frame State

Remarks To save a secondary frame state, refer to “:SECondary:SAVE” on page 695.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to “:SECondary[:STATe]” on page 696.

:SECondary:SAVE

Supported E4438C with Option 402

[:SOURCE] :RADIo:GSM:SECondary:SAVE

This command saves the current frame configuration as the secondary frame with the filename GSM_SECONDARY_FRAME.

Key Entry Save Secondary Frame State

Remarks To recall the secondary frame state (saved in non-volatile signal generator memory), refer to “:SECondary:RECall” on page 695.

:SECondary:TRIGger[:SOURCE]

Supported E4438C with Option 402

[:SOURCE] :RADIo:GSM:SECondary:TRIGger [:SOURCE] KEY | EXT | BUS

[:SOURCE] :RADIo:GSM:SECondary:TRIGger [:SOURCE] ?

This command selects the type of triggering for the secondary frame.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to “:TRIGger[:SOURCE]:EXTErnal[:SOURCE]” on page 715.

BUS This choice enables GPIB triggering using the *TRG or GET command or LAN and RS-232 triggering using the *TRG command.

Key Entry Trigger Key Ext Bus

:SECondary[:STATe]

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:GSM:SECondary[ :STATe ] ON|OFF|1|0
[ :SOURCE ]:RADio:GSM:SECondary[ :STATe ]?
```

This command enables or disables the ability to switch to the secondary frame.

***RST** 0

Key Entry Secondary Frame Off On

Remarks A frame must already be saved as the secondary frame in order to turn the secondary state function on. To save a frame as the secondary frame, refer to “:SECondary:SAVE” on page 695.

:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption
PN9|PN15|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[ :SOURCE ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption?
```

This command creates and configures an access encrypted data field.

***RST** PN9

Key Entry PN9 PN15 FIX4 User File Ext 4 1's & 4 0's 8 1's & 8 0's
 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's

Remarks See “File Name Variables” on page 13 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption:FIX4

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption:FIX4 <val>
[ :SOURCE ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected access timeslot encryption field.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4|5|6|7:ACCess:ETAIL

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ETAIL <bit_pattern>
[ :SOURce ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ETAIL?
```

This command specifies the extended tail bits (8 bits) field for the selected access timeslot.

***RST** #H3A

Range #H00–#HFF

Key Entry ET

:SLOT0|[1]|2|3|4|5|6|7:ACCess:SSEquence

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:SSEquence <bit_pattern>
[ :SOURce ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:SSEquence?
```

This command specifies the synchronization sequence bits (41 bits) for the selected access timeslot.

***RST** #H096FF335478

Range #H0–#H1FFFFFFFF

Key Entry SS

:SLOT0|[1]|2|3|4|5|6|7:ACCess:CUSTom

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:CUSTom PN9|PN15|FIX4|
"<file name>"|EXT|P4|P8|P16|P32|P64
[ :SOURce ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:CUSTom?
```

This command configures the data field for the selected custom timeslot.

***RST** PN9

Key Entry PN9 PN15 FIX4 User File Ext 4 1's & 4 0's 8 1's & 8 0's
 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's

Remarks See “File Name Variables” on page 13 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5|6|7:CUSToM:FIX4

Supported E4438C with Option 402

```
[ :SOURCE ]:RADIo:GSM:SLOT0|[1]|2|3|4|5|6|7:CUSToM:FIX4 <val>  
[ :SOURCE ]:RADIo:GSM:SLOT0|[1]|2|3|4|5|6|7:CUSToM:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4|5|6|7:DUMMy:TSEquence

Supported E4438C with Option 402

```
[ :SOURCE ]:RADIo:GSM:SLOT0|[1]|2|3|4|5|6|7:DUMMy:TSEquence TSC0|  
TSC1|TSC2|TSC3|TSC4|TSC5|TSC6|TSC7|<bit_pattern>  
[ :SOURCE ]:RADIo:GSM:SLOT0|[1]|2|3|4|5|6|7:DUMMy:TSEquence?
```

This command changes the 26-bit dummy training sequence (TS) for the selected dummy timeslot.

***RST** #H0000000

Range <bit_pattern>: #H0–#H3FFFFFF

Key Entry TSC0 TSC1 TSC2 TSC3 TSC4 TSC5 TSC6 TSC7
Custom TS

Remarks When normal preset is selected, the preset hexadecimal value for TS reflects the GSM protocol, however you may use this command to enter a new value.

:SLOT0|[1]|2|3|4|5|6|7:MULTIslot

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:SLOT0 |[1]|2|3|4|5|6|7:MULTIslot ON|OFF|1|0
[ :SOURce ]:RADio:GSM:SLOT0 |[1]|2|3|4|5|6|7:MULTIslot?
```

This command turns bursting (ramping) on or off between the selected timeslot and the next higher numbered adjacent timeslot.

ON (1) This choice turns ramping off between timeslots.

OFF (0) This choice turns ramping on between timeslots.

***RST** 0

Key Entry **Multislot Off On**

:SLOT0|[1]|2|3|4|5|6|7:NORMAl:ENCryption

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:SLOT0 |[1]|2|3|4|5|6|7:NORMAl:ENCryption
PN9|PN15|FIX4| "<filename>"|EXT|P4|P8|P16|P32|P64|TCHFS|TCHHS|CS1|CS4|
DMCS1|UMCS1|BCH1|BCH2
[ :SOURce ]:RADio:GSM:SLOT0 |[1]|2|3|4|5|6|7:NORMAl:ENCryption?
```

This command creates and configures an encrypted data field for a normal timeslot.

PN9 This choice uses a standard PN9 bit pattern. In the case of TDMA bursted data, a PN9 repeats continuously, running from one timeslot to the matching timeslot in the next frame.

PN15 This choice uses a standard PN15 bit pattern. In the case of TDMA bursted data, a PN15 repeats continuously, running from one timeslot to the matching timeslot in the next frame.

FIX4 This choice uses a fixed 4-bit pattern. The selected 4-bit pattern will be repeated as necessary to fill the selected data to set the desired pattern.

User File This choice selects a user-supplied file to be used as the bit pattern. In the case of TDMA bursted data, enough bits must be supplied to fill the desired number of timeslots (left over bit are ignored). User files contain 8 data bits per byte.

EXT This choice uses an external user signal as the modulating data stream. Serial data is supplied via the front panel DATA BNC connector.

P4 This choice selects a data pattern with 4 1's followed by 4 0's. The selected pattern will be repeated as necessary to fill the selected data area.

P8	This choice selects a data pattern with 8 1's followed by 8 0's. The selected pattern will be repeated as necessary to fill the selected data area.
P16	This choice selects a data pattern with 16 1's followed by 16 0's. The selected pattern will be repeated as necessary to fill the selected data area.
P32	This choice selects a data pattern with 32 1's followed by 32 0's. The selected pattern will be repeated as necessary to fill the selected data area.
P64	This choice selects a data pattern with 64 1's followed by 64 0's. The selected pattern will be repeated as necessary to fill the selected data area.
TCHFS	This choice selects traffic channel with full rate speech (TCH/FS). This channel would be represented by a 26 frame multiframe with an SACCH and IDLE frame.
TCHHS	This choice selects traffic channel with half rate speech (TCH/HS). This is when a complex coding scheme is used that can allow two mobile stations to share the same timeslot. On an ESG this is represented by having one timeslot with a normal burst and user definable training sequence and the same timeslot on an alternate frame using a dummy burst. This represents the situation where TCH/HS is being used in one timeslot and the other timeslot is not being used.
CS-1	This choice selects the CS-1 channel, a packet data traffic channel with block type 1 as per 3GPP standard GSM 05.03.
CS4	This choice selects the CS-4 channel, a packet data traffic channel with block type 4 as per 3GPP standard GSM 05.03.
DMCS1	This choice selects the downlink MCS-1 channel, a packet data traffic channel with block type 5 as per 3GPP standard GSM 05.03.
UMCS1	This choice selects the uplink MCS-1 channel, a packet data traffic channel with block type 5 as per 3GPP standard GSM 05.03.
BCH1	This choice selects a non-combined broadcast channel. BCH1 can only be set in timeslot zero and can be the only multiframe type in a frame. This means that BCH1 will conflict with the following parameters: TCH/FS, TCH/HS, CS-1, CS-4, DMCS-1 and UMCS-1.
BCH2	This choice selects a combined broadcast channel. BCH2 can only be set in timeslot zero and can be the only multiframe type in a frame. This means that BCH2 will conflict with the following parameters: TCH/FS, TCH/HS, CS-1, CS-4, DMCS-1, and UMCS-1.
*RST	PN9
Range	BCH1: 0–65535

	BCH2: 0–65535						
Key Entry	PN9	PN15	FIX4	User File	Ext	4 1's & 4 0's	8 1's & 8 0's
	16 1's & 16 0's		32 1's & 32 0's		64 1's & 64 0's		TCH/FS TCH/HS
	CS-1	CS-4	Downlink MCS-1		Uplink MCS-1		

Remarks See “File Name Variables” on page 13 for information on the file name syntax.

:SLOT0:NORMAL:ENCRyption:BCH:BCC

Supported E4438C with Option 416

```
[ :SOURce ] :RADio :GSM :SLOT0 :NORMAl :ENCRyption :BCH :BCC <val>
[ :SOURce ] :RADio :GSM :SLOT0 :NORMAl :ENCRyption :BCH :BCC?
```

This command sets the broadcast control code (BCC) which is used to indicate what training sequence is being used by the basestation in the forward channels. This code will allow the mobile station to decode the other channels in the broadcast channel.

***RST** 0

Range 0–7

:SLOT0:NORMAL:ENCRyption:BCH:CELLid

Supported E4438C with Option 416

```
[ :SOURce ] :RADio :GSM :SLOT0 :NORMAl :ENCRyption :BCH :CELLid <val>
[ :SOURce ] :RADio :GSM :SLOT0 :NORMAl :ENCRyption :BCH :CELLid?
```

This command sets the cell identification. This will identify a cell within a location area.

***RST** 0

Range 0–65535

:SLOT0:NORMAL:ENCRyption:BCH:LAC

Supported E4438C with Option 416

```
[ :SOURce ] :RADio :GSM :SLOT0 :NORMAl :ENCRyption :BCH :LAC <val>
[ :SOURce ] :RADio :GSM :SLOT0 :NORMAl :ENCRyption :BCH :LAC?
```

This command sets the location area code (LAC). The location area code provides 16 bits to allow the administrator to define a location.

***RST** 0

Range 0–65535

:SLOT0:NORMAL:ENCRyption:BCH:MCC

Supported E4438C with Option 416

[:SOURCE] :RADIo:GSM:SLOT0:NORMAl:ENCRyption:BCH:MCC <val>

[:SOURCE] :RADIo:GSM:SLOT0:NORMAl:ENCRyption:BCH:MCC?

This command sets the mobile country code (MCC). The mobile country code is a 12 bit number used to represent the country where the basestation is located.

***RST** 0

Range 0–4095

:SLOT0:NORMAL:ENCRyption:BCH:MNC

Supported E4438C with Option 416

[:SOURCE] :RADIo:GSM:SLOT0:NORMAl:ENCRyption:BCH:MNC <val>

[:SOURCE] :RADIo:GSM:SLOT0:NORMAl:ENCRyption:BCH:MNC?

This command sets the mobile network code (MNC). The mobile network code is the individual number a network will be assigned.

***RST** 0

Range 0–255

Remarks Federal regulation mandates that a 3-digit MNC will be used. For the ESG implementation the upper four bits are set to 1111.

:SLOT0:NORMAL:ENCRyption:BCH:PLMN

Supported E4438C with Option 416

[:SOURCE] :RADIo:GSM:SLOT0:NORMAl:ENCRyption:BCH:PLMN <val>

[:SOURCE] :RADIo:GSM:SLOT0:NORMAl:ENCRyption:BCH:PLMN?

This command is used to set the Public Land Mobile Network (PLMN) which is used to indicate the country the phone is in. PLMN is also referred to as the National Country Code (NCC).

***RST** 0

Range 0–7

:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:CS1:DATA

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIo:GSM:SLOT0 |[1]|2|3|4|5|6|7:NORMAl:ENCRyption:CS1:DATA  
PN9 |PN15  
[ :SOURCE ] :RADIo:GSM:SLOT0 |[1]|2|3|4|5|6|7:NORMAl:ENCRyption:CS1:DATA?
```

This command sets the bit pattern for the CS1 packet data traffic channel.

***RST** PN9

Key Entry PN9 PN15

:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:CS4:DATA

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIo[1]|2|3|4:GSM:SLOT0 |[1]|2|3|4|5|6|7:NORMAl:ENCRyption:CS4  
:DATA PN9 |PN15  
[ :SOURCE ] :RADIo[1]|2|3|4:GSM:SLOT0 |[1]|2|3|4|5|6|7:NORMAl:ENCRyption:CS4  
:DATA?
```

This command selects the encryption field data, if the selected timeslot uses the packet data block type 4 coding scheme.

***RST** PN9

Key Entry PN9 PN15

Remarks Refer to “[:SLOT0|\[1\]|2|3|4|5|6|7:NORMAL:ENCRyption](#)” on page 699 for selecting the coding scheme.

:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:DLINK:MCS1:DATA

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIo:GSM:SLOT0 |[1]|2|3|4|5|6|7:NORMAl:ENCRyption:DLINK:MCS1:  
DATA PN9 |PN15  
[ :SOURCE ] :RADIo:GSM:SLOT0 |[1]|2|3|4|5|6|7:NORMAl:ENCRyption:DLINK:MCS1:  
DATA?
```

This command sets the bit pattern for the downlink MCS1 packet data traffic channel.

***RST** PN9

Key Entry PN9 PN15

:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:FIX4

Supported E4438C with Option 402

```
[ :SOURCE ]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:FIX4 <val>  
[ :SOURCE ]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected normal timeslot encryption field.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:TCH:FS:DATA

Supported E4438C with Option 402

```
[ :SOURCE ]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:TCH:FS:DATA  
PN9|PN15  
[ :SOURCE ]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:TCH:FS:DATA?
```

This command sets the bit pattern for the TCH/FS channel.

***RST** PN9

Key Entry PN9 PN15

:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:ULINK:MCS1:DATA

Supported E4438C with Option 402

```
[ :SOURCE ]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:ULINK:MCS1:  
DATA PN9|PN15  
[ :SOURCE ]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:ULINK:MCS1:  
DATA?
```

This command sets the bit pattern for the uplink MCS1 packet data traffic channel.

***RST** PN9

Key Entry PN9 PN15

:SLOT0|[1]|2|3|4|5|6|7:NORMAL:STeal

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIo:GSM:SLOT0 |[1]|2|3|4|5|6|7:NORMAl:STeal <val>
[ :SOURCE ] :RADIo:GSM:SLOT0 |[1]|2|3|4|5|6|7:NORMAl:STeal?
```

This command specifies the normal stealing bits for the selected timeslot. The single bit defines the value for both 1-bit fields.

***RST** #H0

Range #H0–#H1

Key Entry S

:SLOT0|[1]|2|3|4|5|6|7:NORMAL:TSEquence

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIo:GSM:SLOT0 |[1]|2|3|4|5|6|7:NORMAl:TSEquence
TSC0|TSC1|TSC2|TSC3|TSC4|TSC5|TSC6|TSC7|<bit_pattern>
[ :SOURCE ] :RADIo:GSM:SLOT0 |[1]|2|3|4|5|6|7:NORMAl:TSEquence?
```

This command changes the 26-bit training sequence (TS) for a normal timeslot. The preset hexadecimal value (when normal preset is selected) for TS reflects the GSM protocol, however you can enter a new value by using this command. The hexadecimal values for the 8 training sequence codes are listed below:

***RST** #H0000000

Range <bit_pattern>: #H0–#H3FFFFFF

Key Entry TSC0 TSC1 TSC2 TSC3 TSC4 TSC5 TSC6 TSC7
Custom TS

Remarks The preset hexadecimal value (when normal preset is selected) for TS reflects the GSM protocol, however you can enter a new value by using this command.

:SLOT0|[1]|2|3|4|5|6|7:POWer

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:SLOT0 |[1]|2|3|4|5|6|7:POWer MAIN|DELTA
[ :SOURce ]:RADio:GSM:SLOT0 |[1]|2|3|4|5|6|7:POWer?
```

This command defines the RF output power level for the selected timeslot.

- MAIN This choice specifies RF output as the main power level.
- DELTA This choice specifies RF output as the alternative power level.
- *RST MAIN

Key Entry Timeslot Ampl Main Delta

:SLOT0|[1]|2|3|4|5|6|7:STATe

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:SLOT0 |[1]|2|3|4|5|6|7:STATe ON|OFF|1|0
[ :SOURce ]:RADio:GSM:SLOT0 |[1]|2|3|4|5|6|7:STATe?
```

This command enables or disables the operating state of the selected timeslot.

*RST Timeslot 0: 1 Timeslot 1–7: 0

Key Entry Timeslot Off On

:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCRyption

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:SLOT0 |[1]|2|3|4|5|6|7:SYNC:ENCRyption PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[ :SOURce ]:RADio:GSM:SLOT0 |[1]|2|3|4|5|6|7:SYNC:ENCRyption?
```

This command creates and configures an encrypted data field for a synchronization timeslot.

*RST PN9

Key Entry

PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's				
64 1's & 64 0's							

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCryption:FIX4

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCryption:FIX4 <val>
[ :SOURce ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCryption:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected synchronization timeslot encryption field.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4|5|6|7:SYNC:TSEquence

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:TSEquence <bit_pattern>
[ :SOURce ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:TSEquence?
```

This command customizes the training sequence (TS) for the selected synchronization timeslot. The preset hexadecimal value (when normal preset is selected) for TS reflects the GSM protocol, however you can enter a new value by using this command.

***RST** #HB962040F2D45761B

Range #H0–#HFFFFFFFFFFFFFFFF

Key Entry TS

:SLOT0|[1]|2|3|4|5|6|7[:TYPE]

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7[:TYPE] CUSTom|NORMaL|
FCORrection|SYNC|DUMMy|ACCess|NORMAL_ALL
[ :SOURce ]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7[:TYPE]?
```

This command sets the timeslot type for the selected timeslot.

***RST** NORMAL

Key Entry Custom Normal FCorr Sync Dummy Access Normal All

:SOUT

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO:GSM:SOUT FRAME | SLOT | ALL
[ :SOURCE ] :RADIO:GSM:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

FRAME This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

SLOT This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

ALL This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

***RST** FRAME

Key Entry	Begin Frame	Begin Timeslot #	All Timeslots
------------------	--------------------	-------------------------	----------------------

:SOUT:OFFSet

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO:GSM:SOUT:OFFSet <val>
[ :SOURCE ] :RADIO:GSM:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number of bits.

***RST** +0

Range –155 to 155

Key Entry Sync Out Offset

Remarks Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to [“:SOUT” on page 708](#).

:SOUT:SLOT

Supported E4438C with Option 402

[:SOURce]:RADio:GSM:SOUT:SLOT <val>

[:SOURce]:RADio:GSM:SOUT:SLOT?

This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.

***RST** +0

Range 0–7

Key Entry Begin Timeslot #

Remarks To change the output of the EVENT1 rear panel connector to SLOT, refer to [“:SOUT” on page 708](#).

:SRATe

Supported E4438C with Option 402

[:SOURce]:RADio:GSM:SRATe <val>

[:SOURce]:RADio:GSM:SRATe?

This command sets the transmission symbol rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +2.70833333E+005

Range	Modulation Type	Bits per Symbol	Internal Data	External Serial Data
	BPSK	1	1–50 Msps	1–50 Msps
	FSK2			
	MSK			
	C4FM	2	1–50 Msps	1–25 Msps
	FSK4			
	OQPSK			
	OQPSK195			
	P4QPPSK			
	QAM4			
	QPSK			
	QPSKIS95			
	QPSKISAT			

Range	Modulation Type	Bits per Symbol	Internal Data	External Serial Data
	D8PSK	3	1–33.33 Msps	1–16.67 Msps
	EDGE			
	FSK8			
	PSK8			
	FSK16	4	1–25 Msps	1–12.5 Msps
	PSK16			
	QAM16			
	QAM32	5	1–20 Msps	1–10 Msps
	QAM64	6	1–16.67 Msps	1–8.33 Msps
	QAM256	7	1–12.50 Msps	1–6.25 Msps

Key Entry

Symbol Rate

Remarks

When user-defined filters are selected using the command “:FILTer” on page 691, the upper bit rate will be restricted by the symbol rate as follows:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated as follows:

- Above 12.5 Msps, the FIR length will be truncated to 32 symbols
- Above 25 Msps, the FIR length will be truncated to 16 symbols

This will impact the relative timing of the modulated data, as well as the actual filter response (see “:BRATe” on page 678).

A change in the symbol rate value will affect the bit rate value; refer to “:BRATe” on page 678 for a list of the minimum and maximum symbol rate values. To change the modulation type, refer to “:MODulation[:TYPE]” on page 694.

:TRIGger:EXTernal:DELay

Supported E4438C with Option 416

```
[ :SOURce ]:RADio:GSM:TRIGger:EXTernal:DELay <val>
[ :SOURce ]:RADio:GSM:TRIGger:EXTernal:DELay?
```

This command sets the trigger delay for synchronizing the ESG. The variable <val> is expressed in number of symbols.

***RST** +0

Range 0–1048575

:TRIGger:TYPE

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:GSM:TRIGger:TYPE CONTInuous | SINGle | GATE
[ :SOURce ] :RADio:GSM:TRIGger:TYPE?
```

This command sets the trigger type.

CONTInuous The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to [“:TRIGger:TYPE:CONTInuous\[:TYPE\]” on page 711](#).

SINGle The framed data sequence plays once for every trigger received.

GATE An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

***RST** CONT

Key Entry Continuous Single Gated

:TRIGger:TYPE:CONTInuous[:TYPE]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:GSM:TRIGger:TYPE:CONTInuous[ :TYPE ] FREE | TRIGger | RESet
[ :SOURce ] :RADio:GSM:TRIGger:TYPE:CONTInuous[ :TYPE ]?
```

This commands selects the waveform’s response to a trigger signal while using the continuous trigger mode. See [“:TRIGger:TYPE” on page 711](#) for more information on triggering modes.

The following list describes the waveform’s response to each of the command choices:

FREE Turning the ARB format on immediately triggers the waveform. The waveform repeats until the format is turned off or another trigger or waveform is selected.

TRIGger The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously until you turn the format off, select another trigger, or choose another waveform file.

RESet The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously. Subsequent triggers reset the waveform to the beginning. For a waveform sequence, this means to the beginning of the first segment in the sequence.

***RST** FREE

Key Entry Free Run Trigger & Run Reset & Run

:TRIGger:TYPE:GATE:ACTive

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:GSM:TRIGger:TYPE:GATE:ACTive LOW|HIGH  
[ :SOURCE ] :RADio:GSM:TRIGger:TYPE:GATE:ACTive?
```

This command selects the active state (gate polarity) of the gate while using the gating trigger mode.

The LOW and HIGH selections correspond to the low and high states of an external trigger signal. For example, when you select HIGH, the active state occurs during the high of the trigger signal. When the active state occurs, the ESG stops the waveform playback at the last played sample point, then restarts the playback at the next sample point when the inactive state occurs. For more information on triggering and to select gating as the trigger mode, see “:TRIGger:TYPE” on page 711.

The following list describes the signal generator’s gating behavior for the external trigger signal polarity selections:

LOW	The waveform playback stops when the trigger signal goes low (active state) and restarts when the trigger signal goes high (inactive state).
HIGH	The waveform playback stops when the trigger signal goes high (active state) and restarts when the trigger signal goes low (inactive state).
*RST	HIGH
Key Entry	Gate Active Low High

:TRIGger[:SOURCE]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] KEY|EXT|BUS  
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] ?
```

This command sets the trigger source.

For more information on triggering, see “:TRIGger:TYPE” on page 711. The following list describes the command choices:

KEY	This choice enables manual triggering by pressing the front-panel Trigger hardkey.
EXT	An externally applied signal triggers the waveform. This is the only choice that works with gating. The following conditions affect an external trigger: <ul style="list-style-type: none">• The input connector selected for the trigger signal. You have a choice between the rear-panel PATTERN TRIG IN connector or the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. To make the connector selection, see “:TRIGger[:SOURCE]:EXTernal[:SOURCE]” on page 715.

For more information on the connectors and on connecting the cables, see the *ESG User's Guide*.

- The trigger signal polarity:
 - gating mode, see “:TRIGger:TYPE:GATE:ACTive” on page 712
 - continuous and single modes, see “:TRIGger[:SOURce]:EXTernal:SLOPe” on page 714
- The time delay between when the ESG receives a trigger and when the waveform responds to the trigger. There are two parts to setting the delay:
 - setting the amount of delay, see “:TRIGger[:SOURce]:EXTernal:DELay” on page 713
 - turning the delay on, see “:TRIGger[:SOURce]:EXTernal:DELay:STATe” on page 714

BUS This choice enables triggering over the GPIB or LAN using the *TRG or GET commands or the AUXILIARY INTERFACE (RS-232) using the *TRG command.

*RST	KEY		
Key Entry	Trigger Key	Ext	Bus

:TRIGger[:SOURce]:EXTernal:DELay

Supported E4438C with Option 402

This command sets the number of bits to delay the signal generator's response to an external trigger.

The bit delay is a delay between when the ESG receives the trigger and when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the ESG receives the trigger and the set number of delay bits (clocks) occurs, the ESG transmits the data pattern.

The delay occurs after you enable the state. See “:TRIGger[:SOURce]:EXTernal:DELay:STATe” on page 714. You can set the number of bits either before or after enabling the state.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 712.

*RST	+0
Range	0–1048575
Key Entry	Ext Delay Bits

:TRIGger[:SOURCE]:EXTErnal:DELay:FINE

Supported E4438C with Option 416

```
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXTErnal:DELay:FINE <val>  
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXTErnal:DELay:FINE?
```

This command sets the fine trigger delay for synchronizing the ESG.

The fine delay value is added to the coarse delay setting (see “:TRIGger[:SOURCE]:EXTErnal:DELay” on page 713).

The variable <val> is expressed as a fraction of one symbol.

***RST** +0.00000000E+000

Range 0–1

:TRIGger[:SOURCE]:EXTErnal:DELay:STATe

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXTErnal:DELay:STATe ON|OFF|1|0  
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXTErnal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

For setting the delay time, see “:TRIGger[:SOURCE]:EXTErnal:DELay” on page 713, and for more information on configuring an external source, see “:TRIGger[:SOURCE]” on page 712.

***RST** 0

Key Entry Ext Delay Off On

:TRIGger[:SOURCE]:EXTErnal:SLOPe

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXTErnal:SLOPe POSitive|NEGative  
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXTErnal:SLOPe?
```

This command sets the polarity for an external trigger signal while using the continuous, single triggering mode. To set the polarity for gating, see “:TRIGger:TYPE:GATE:ACTive” on page 712.

The POSitive and NEGative selections correspond to the high (positive) and low (negative) states of the external trigger signal. For example, when you select POSitive, the waveform responds (plays) during the high state of the trigger signal. When the PSG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 712.

***RST** NEG
Key Entry Ext Polarity Neg Pos

:TRIGger[:SOURce]:EXtErnal[:SOURce]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:GSM:TRIGger [ :SOURce ] :EXtErnal [ :SOURce ] EPT1 |
EPT2 | EPTRIGGER1 | EPTRIGGER2
[ :SOURce ] :RADio:GSM:TRIGger [ :SOURce ] :EXtErnal [ :SOURce ] ?
```

This command selects which PATTERN TRIG IN connection the ESG uses to accept an externally applied trigger signal when external is the trigger source selection.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 712. For more information on the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User’s Guide*.

The following list describes the command choices:

EPT1	This choice is synonymous with EPTRIGGER1 and selects the PATTERN TRIG IN rear-panel connector.
EPT2	This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
EPTRIGGER1	This choice is synonymous with EPT1 and selects the PATTERN TRIG IN rear-panel connector.
EPTRIGGER2	This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
*RST	EPT1
Key Entry	Patt Trig In 1 Patt Trig In 2

[:STATE]

Supported E4438C with Option 402

[:SOURCE] :RADio:GSM [:STATE] ON | OFF | 1 | 0
[:SOURCE] :RADio:GSM [:STATE] ?

This command enables or disables the GSM modulation format.

***RST** 0

Key Entry GSM Off On

Remarks Although the GSM modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

HSDPA over W-CDMA Subsystem–Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])

The commands in this subsystem support the remote functionality of the Signal Studio for HSDPA over W-CDMA software. For a complete description of terms and HSDPA functionality, refer to the software online help. Commands used for configuring the carrier signal and performing general signal generator functions are located in different SCPI command subsystems found within the SCPI Command Reference volumes.

There are two methods to determine the SCPI commands for a setup. One method is to locate each individual command listed in this subsystem and others within the *SCPI Command Reference* volumes. The other method is to use the HSDPA software UI. After downloading a UI setup to the ESG, the software lets you export a SCPI file that contains the commands used in the UI setup. Refer to the HSDPA software online help for information on this feature.

File Overview

The ESG's memory catalog (signal generator memory) uses several file types, each assigned with a unique syntax to recall the file. This section provides information on using files with SCPI commands.

This subsystem uses the following two command variables to represent two different file types stored in signal generator memory:

"<file name>" Bit file
"<user FIR>" FIR file

For more information on managing and using files, refer to the resources in the following list:

- “File Name Variables” on page 13 for information on the file name syntax
- Table 3-1 on page 122 for a listing of the different file types
- *E4428C/38C ESG Signal Generators Programming Guide* for information on downloading bit files
- *E4428C/38C ESG Signal Generators User's Guide* for information on creating and editing bit and FIR files using the signal generator

NOTE To create or edit HSDPA files with the ESG, use the table editors located in the Real Time W-CDMA modulation format. Access the bit table editor through the **Data** field and then select **User File** as the data source. Access the FIR filter table editor through the **Filter** field and then select **Define User FIR** as the filter type.

The HSDPA software interface downloads user files (bit and FIR file types) to the ESG when **USER** is the software data or filter type selection. You can see these files on the ESG by pressing **Utility > Memory Catalog > Catalog Type** and then selecting the file type, or by using the SCPI commands located in the Memory subsystem. User files are located on the ESG in the following directory path: /USER/<file type directory>/<file name>. **Table 9-1** shows the software naming convention for the different files created by the HSDPA software.

Table 9-1 HSDPA Software Downloaded File Names

Link Direction	Data Source	File Name	ESG File Type
Downlink and Uplink	Filter	<project name>–FIR	FIR
Downlink	BCH	<project name>–BCH	Bit
	PICH	<project name>–PICH	
	DPCH	<project name>–DPCH	
	DCH _x ^a	<project name>–DCH _x ^a	
	Inter-TTI	<project name>–ITTI _x ^b	
	HARQ ACK/NACK Pattern	<project name>–DLCPT	
	AMC CQI Pattern	<project name>–DLAPT	
	HS-DSCH	<project name>–DSCH1	
	HS-PDSCH	<project name>–HSPD _x ^b	
	HS-SCCH	<project name>–HSSCC _x ^b	
Uplink	DPCCH	<project name>–DPCCH	
	FBI	<project name>–FBI	
	TPC	<project name>–TPC	
	DPDCH	<project name>–DPDCH	
	DCH _x ^a	<project name>–DCH _x ^a	
	ACK Pattern	<project name>–APAT	
	CQI Pattern	<project name>–CPAT	

a. x is the DCH number (1–6).

b. x is the channel number (1–4) for the HSDPA, the HS-PDSCH and the HS-SCCH.

Managing ESG Setting Conflicts and Error Messages

The ESG reports setting conflicts as error messages. When a setting conflict occurs, an error number and a brief message appear at the bottom of the ESG display. You can view the full text of the error message in either of two ways: by using the front panel of the ESG, or by executing SCPI commands.

Front Panel Press **Utility > Error Info**.

SCPI Execute the SCPI error commands described in the “System Subsystem (:SYSTEM)” on page 155.

For more information on Error messages, refer to the *E4428C/38C ESG Signal Generators Programming Guide* for remote viewing or the *E4428C/38C ESG Signal Generators User’s Guide* for front panel viewing.

:DLINK:APPLY

Supported E4438C with Option 418418

```
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : APPLY
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : APPLY ?
```

This command applies changes to the channel setup and data for active downlink physical and transport channels, immediately starting the channel coding generation process. A progress bar may appear on the ESG display indicating that the new signal parameters are being applied. Signal parameters are also applied when the HSDPA modulation format is turned on.

Use the query to determine whether or not execution of this command is required. It returns the following responses:

```
0                    Command execution is not required.
1                    Command execution is required.
```

NOTE The apply query response is valid only when downlink HSDPA format is active.

The apply function will not work if there is a conflict with range values and coupled parameters. For example, if all the physical channel codes are not orthogonal to each other, the new settings are not applied to the signal when this command is executed. Resolve any conflicts before reapplying the changes. The ESG reports an error when conflicts occur.

Nk:AWGN:CN**Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:AWGN:CN <val>

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:AWGN:CN?

This command sets the downlink in-band carrier to noise ratio (C/N) value using AWGN.

RST** 0**Range** –30 to 30**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:AWGN[:STATE]*Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:AWGN[:STATE] ON|OFF|0|1

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:AWGN[:STATE]?

This command turns the downlink AWGN on or off.

RST** 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:BBClock[:SOURCE]*Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:BBClock[:SOURCE] INT|EXT

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:BBClock[:SOURCE]?

This command selects the downlink baseband generator chip clock source, which is either internal to the signal generator or applied externally.

***RST** INT**Remarks** When using an external chip clock source, connect the signal to the DATA CLOCK connector on the front panel of the ESG.

:DLINK:CPICH:CCODE

Supported E4438C with Option 418

[:SOURCE] :RADIO:WCDMA:HSDPA[:BBG] :DLINK:CPICH:CCODE?

This query returns the CPICH channelization code, which is always set to zero.

:DLINK:CPICH:POWER

Supported E4438C with Option 418

[:SOURCE] :RADIO:WCDMA:HSDPA[:BBG] :DLINK:CPICH:POWER <val>

[:SOURCE] :RADIO:WCDMA:HSDPA[:BBG] :DLINK:CPICH:POWER?

This command sets the CPICH power level. The variable <val> is expressed in decibels (dB).

***RST** 3.30000000E+000

Range -40 to 0

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:CPICH[:STATE]

Supported E4438C with Option 418

[:SOURCE] :RADIO:WCDMA:HSDPA[:BBG] :DLINK:CPICH[:STATE] ON|OFF|1|0

[:SOURCE] :RADIO:WCDMA:HSDPA[:BBG] :DLINK:CPICH[:STATE]?

This command turns the CPICH on or off.

***RST** 1

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:DPCH:CCODE

Supported E4438C with Option 418

[:SOURCE] :RADIO:WCDMA:HSDPA[:BBG] :DLINK:DPCH:CCODE <val>

[:SOURCE] :RADIO:WCDMA:HSDPA[:BBG] :DLINK:DPCH:CCODE?

This command sets the downlink DPCH channel code number.

***RST** 10

Range 0–511

HSDPA over W-CDMA Subsystem–Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

- Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.
- The channel code is coupled with the slot format and all other physical channel codes. Set the channel code to not exceed limits of the slot format and ensure that all physical channel codes are orthogonal to each other. If any channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

:DLINK:DPCH:DATA

Supported E4438C with Option 418

```
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : DPCH : DATA PN9 | PN15 | FIX4 | DCH |
"<file name>"
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : DPCH : DATA?
```

This command configures the downlink DPCH data pattern.

DCH This selects the transport channel as the data source. The DCH selection is not available for a DPCH slot format of 16.

"<file name>" This represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “File Overview” on page 717 for more information on files.

***RST** PN9

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:DPCH:DATA:FIX4

Supported E4438C with Option 418

```
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : DPCH : DATA : FIX4 <val>
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : DPCH : DATA : FIX4?
```

This command sets the downlink DPCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

***RST** 0

Range 0–15

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:BSIZE

Supported E4438C with Option 418

```
[ :SOURce ] :RADIo:WCDMA:HSDPa [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6
:BSIZE <val>
[ :SOURce ] :RADIo:WCDMA:HSDPa [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :BSIZE?
```

This command sets the block size for the selected downlink DCH.

***RST** 20

Range 0–5000

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 719.

The number of data bits per DCH cannot exceed 200,000. To maintain this data bit limit, the ESG calculates the product of the block size and the number of blocks. If the product of these two parameters exceeds 200,000, the apply function (downlink apply command) will not work.

:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:CTYPE

Supported E4438C with Option 418

```
[ :SOURce ] :RADIo:WCDMA:HSDPa [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6
:CTYPE HCONv | TCONv | TURBo | NONE
[ :SOURce ] :RADIo:WCDMA:HSDPa [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :CTYPE?
```

This command sets the coder type for the selected downlink DCH.

HCONv This choice selects the 1/2 rate convolutional encoder.

TCONv This choice selects the 1/3 rate convolutional encoder.

TURBo This choice selects the turbo coder.

NONE This choice selects no coding.

***RST** HCON

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 719.

:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:CRC**Supported** E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:CRC 0 | 8 | 12 | 16 | 24

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:CRC?

This command sets the number of CRC bits for the selected downlink DCH.

RST** 8**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[DLINK:APPLY](#)” on page 719.**:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA*Supported** E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA PN9 | PN15 | FIX4 | "<file name>"

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA?

This command configures the data for the selected downlink DCH.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “[File Overview](#)” on page 717 for more information on files.***RST** PN9**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[DLINK:APPLY](#)” on page 719.**:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:FIX4****Supported** E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:FIX4 <val>

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:FIX4?

This command sets the repeating 4-bit binary data pattern for the selected downlink DCH.

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

*RST	0
Range	0–15
Remarks	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:NBLocks

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :DLINK:DPCH:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :
NBLocks <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :DLINK:DPCH:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :NBLocks?
```

This command sets the number of data blocks for the selected downlink DCH.

*RST	1
Range	0–512
Remarks	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719. The number of data bits per DCH cannot exceed 200,000. To maintain this data bit limit, the ESG calculates the product of the block size and the number of blocks. If the product of these two parameters exceeds 200,000, the apply function (downlink apply command) will not work.

:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:RMATtribute

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :DLINK:DPCH:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :
RMATtribute <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :DLINK:DPCH:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :
RMATtribute?
```

This command sets the rate matching attribute for the selected downlink DCH.

*RST	1
Range	1–256
Remarks	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:TTI**Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:TTI 10 | 20 | 40 | 80

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:TTI?

This command sets the TTI for the selected downlink DCH.

The choices are expressed in millisecond (ms).

RST** 10**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:DPCH:DCH2 | 3 | 4 | 5 | 6[:STATE]*Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH2 | 3 | 4 | 5 | 6[:STATE] ON | OFF | 1 | 0

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH2 | 3 | 4 | 5 | 6[:STATE]?

This command turns the selected downlink DCH on or off; DCH1 is always on.

***RST** DCH 1: 1 DCH 2–6: 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

The apply command will not work and the ESG will report an error if you turn on a DCH where lower numbered DCHs are off. For example, turning on DCH5 requires turning on DCH2–4. The reverse is true when turning off the DCHs.

:DLINK:DPCH:POWer**Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:POWer <val>

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:POWer?

This command sets the downlink DPCH power level.

***RST** –1.02000000E+001**Range** –40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:DPCH:SFORmat

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:SFORmat <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:SFORmat?
```

This command configures the downlink DPCH slot format.

***RST** 0

Range 0–16

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

The slot format is coupled with the channel code, so a change in one value may require a change in the other. If the channel code exceeds the limits of the slot format or if it is not orthogonal with all other physical channel codes, the apply function (downlink apply command) will not work.

:DLINK:DPCH:SSCOffset

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:SSCOffset <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:SSCOffset?
```

This command sets the downlink DPCH secondary scrambling code offset.

***RST** +0

Range 0–15

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:DPCH:TFCI**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:TFCI <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:TFCI?

This command sets the TFCI 10-bit pattern for the downlink DPCH.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

***RST** +0**Range** 0–1023**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

Setting the TFCI bits is optional; they describe the type of service in use, for example voice or data.

:DLINK:DPCH:TOFFset**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:TOFFset <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:TOFFset?

This command adjusts the downlink DPCH timing offset.

The variable <val> is expressed in chips.

***RST** +0**Range** 0–149**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

:DLINK:DPCH:TPC:NSTeps**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:TPC:NSTeps <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:TPC:NSTeps?

This command sets the number of steps for the down and up (DUP) or up and down (UDOWn) TPC pattern selections.

***RST** +1**Range** 1–80

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 719.

:DLINK:DPCH:TPC:PATtern**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:TPC:PATtern UDOWn|DUP|UALL|DALL|"<file name>"

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:TPC:PATtern?

This command configures the downlink DPCH TPC pattern for increasing or decreasing, or increasing and decreasing the UE power level.

UDOWn The TPC pattern repetitively steps up and down.

DUP The TPC pattern repetitively steps down and up.

UALL The TPC pattern consecutively steps up.

DALL The TPC pattern consecutively steps down.

"<file name>" This variable represents a TPC pattern file stored in signal generator memory. The pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “[File Overview](#)” on page 717 for more information on files.

***RST** UDOW

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 719.

Each step in a TPC pattern signals an increase or decrease of 1 dB in the UE output power level.

:DLINK:DPCH:TRPosition**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:TRPosition?

This query returns the downlink DPCH transport channel position that is always set to FIX.

:DLINK:DPCH[:STATE]**Supported** E4438C with Option 418[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH[:STATE] ON|OFF|1|0
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH[:STATE]?

This command turns the downlink DPCH on or off.

RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:FILTER*Supported** E4438C with Option 418[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:FILTER RNYQuist|NYQuist|
GAUSSian|RECTangle|IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|
"<user FIR>"
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:FILTER?

This command selects the downlink filter type.

IS95 This filter meets the criteria of the IS-95 standard.**IS95_EQ** This filter is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard and is best suited for IS-95 baseband filtering.**IS95_MOD** This filter meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.**IS95_MOD_EQ** This filter is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.**UGGaussian** This is a GSM Gaussian filter with a fixed BbT value of 0.300.**AC4Fm** This is a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

"<user FIR>"	This variable represents any FIR filter file stored in signal generator memory. Refer to “File Overview” on page 717 for more information on files.
*RST	RNYQ
Remarks	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719 .

:DLINK:FILTer:ALPHA

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMA:HSDPa[ :BBG ] :DLINK:FILTer:ALPHA <val>
[ :SOURCE ] :RADIo:WCDMA:HSDPa[ :BBG ] :DLINK:FILTer:ALPHA?
```

This command sets the downlink Nyquist or root Nyquist filter alpha value.

***RST** +2.20000000E-001

Range 0-1

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:DLINK:APPLY” on page 719](#).

Executing this command while a filter other than Nyquist or root Nyquist is selected changes the parameter value, but it is not used by the signal generator until one of the Nyquist filters is selected.

:DLINK:FILTer:BBT

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMA:HSDPa[ :BBG ] :DLINK:FILTer:BBT <val>
[ :SOURCE ] :RADIo:WCDMA:HSDPa[ :BBG ] :DLINK:FILTer:BBT?
```

This command sets the downlink Gaussian filter BbT value.

***RST** +5.00000000E-001

Range 0-1

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:DLINK:APPLY” on page 719](#).

Executing this command while a filter other than the Gaussian filter is selected changes the parameter value, but it is not used by the signal generator until the Gaussian filter is selected.

:DLINK:FILTer:CHANnel**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :DLINK:FILTer:CHANnel EVM|ACP
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :DLINK:FILTer:CHANnel?
```

Execute this command to optimize a downlink filter for minimized EVM or for minimized ACP.

EVM This choice provides the most ideal passband

ACP This choice improves stopband rejection for the root Nyquist and Nyquist filters.

***RST** EVM

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 719.

To change the filter selection, refer to “[:DLINK:FILTer](#)” on page 730.

:DLINK:HSBurst**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :DLINK:HSBurst ON|OFF|1|0
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :DLINK:HSBurst?
```

This command sets the handling of the off slot periods for the downlink HSDPA channels.

ON|1 This choice turns off the ESG ALC feature and uses DTX during the off slots.

OFF|0 This choice continuously transmits the HSDPA channels filling the off slots with dummy bits.

***RST** 0

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 719.

:DLINK:HSDPA:AMC:CQIMapping:UECategory**Supported** E4438C with Option 418

```
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : HSDPA : AMC : CQIMapping :
UECategory <val>
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : HSDPA : AMC : CQIMapping : UECategory ?
```

This command sets the UE category that determines the CQI mapping table per the 3GPP standards.

***RST** 5**Range** 1–12

Remarks To use this command's parameter in a setup, you must also set AMC as the feedback selection. Refer to the “[:DLINK:HSDPA:FCONtrol](#)” on page 734 for selecting the feedback type.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 719.

:DLINK:HSDPA:AMC:CPATtern**Supported** E4438C with Option 418

```
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : HSDPA : AMC : CPATtern ALL_1 | ALL_2 |
ALL_3 | ALL_4 | ALL_5 | ALL_6 | ALL_7 | ALL_8 | ALL_9 | ALL_10 | ALL_11 | ALL_12 | ALL_13 |
ALL_14 | ALL_15 | ALL_16 | ALL_17 | ALL_18 | ALL_19 | ALL_20 | ALL_21 | ALL_22 | ALL_23 |
ALL_24 | ALL_25 | ALL_26 | ALL_27 | ALL_28 | ALL_29 | ALL_30 | "<file_name>"
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : HSDPA : AMC : CPATtern ?
```

This command sets a simulated UE CQI pattern that determines HSDPA1's response including the modulation type (QPSK or 16QAM) and the constellation version for 16QAM per the set UE category.

ALL_<val> These choices configure a simulated UE ACK response with a single CQI value for 1,280 subframes.

"<file name>" This variable represents a CQI pattern file stored in signal generator memory. Create this file either by using the AMC CQI pattern Data Type Entry window and downloading the file to the ESG, or by using the ESG Real Time W-CDMA table editor to create a bit file with the following bit patterns:

- CQI value of 1–30 using an 8-bit pattern, 00000001 to 00011110
- DTX is represented by 11111111

In the file, do not use delimiters between subframes; enter subframe bits as a binary string.

HSDPA over W-CDMA Subsystem–Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])

When creating a pattern, you can determine the number of active subframes from 1 to 1,280. The subframes are numbered 0 to 1,279. A subframe is active when it contains 8-bits. If a subframe contains at least 1-bit but less than 8-bits, the apply function (downlink apply command) will not work.

***RST** ALL_21

Remarks To use this command's parameter in a setup, you must also set AMC as the feedback selection. Refer to the **":DLINK:HSDPa:FCONtrol"** for selecting the feedback type.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to **":DLINK:APPLY"** on page 719.

:DLINK:HSDPa:FCONtrol

Supported E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa[ :BBG ] :DLINK:HSDPa:FCONtrol NONE | HARQ | AMC
[ :SOURCE ] :RADio:WCDMa:HSDPa[ :BBG ] :DLINK:HSDPa:FCONtrol?
```

This command sets the HSDPA1 feedback control type.

NONE This choice turns off the feedback control.

HARQ This choice provides UE feedback using the HARQ process. This selection provides the capability of configuring a simulated UE ACK/NACK response, setting the maximum number of HARQ transmissions, and providing up to eight different RV parameters.

AMC This choice provides UE feedback using adaptive modulation coding. This selection provides the capability of configuring a simulated UE CQI response aligned with a UE category input.

***RST** NONE

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to **":DLINK:APPLY"** on page 719

:DLINK:HSDPa:HARQ:APATtern

Supported E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa[ :BBG ] :DLINK:HSDPa:HARQ:APATtern ACK_ALL |
"<file name>"
[ :SOURCE ] :RADio:WCDMa:HSDPa[ :BBG ] :DLINK:HSDPa:HARQ:APATtern?
```

This command sets a simulated UE ACK/NACK pattern that determines HSDPA1's HARQ response.

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

ACK_ALL	This choice configures 1,280 subframes for a simulated ACK only response.
"<file name>"	<p>This variable represents an ACK pattern file stored in signal generator memory. Create this file either by using the HARQ ACK/NACK pattern Data Type Entry window and download the file to the ESG, or by using the ESG Real Time W-CDMA table editor to create a bit file with the following bit patterns:</p> <ul style="list-style-type: none"> • An ACK response is represented by 00. • A NACK response is represented by 01. • DTX is represented by 10. <p>In the file, do not use delimiters between subframes; enter subframe bits as a binary string.</p> <p>When creating a pattern, you can determine the number of active subframes from 1 to 1,280. The subframes are numbered 0 to 1,279. A subframe is active when it contains 2-bits. If a subframe contains only 1-bit, the apply function (downlink apply command) will not work.</p>
*RST	ACK_ALL
Remarks	<p>To use this command's parameter in a setup, you must also set HARQ as the feedback selection. Refer to the ":DLINK:HSDPA:FCONtrol" for selecting the feedback type.</p> <p>Setting the command parameter while the signal is active also requires executing the apply command. Refer to ":DLINK:APPLY" on page 719.</p>

:DLINK:HSDPA:HARQ:MNHTrans

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :DLINK:HSDPA:HARQ:MNHTrans <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :DLINK:HSDPA:HARQ:MNHTrans?
```

This command configures the HSDPA1 maximum number of HARQ transmissions for the HARQ function.

Use the command for UE performance testing or for specifying an arbitrary number of HARQ transmissions. When the software encounters a UE NACK response that is set by the HARQ ACK pattern command (see **":DLINK:HSDPA:HARQ:APATtern"**), the software re-sends the same packet payload until either the maximum number of HARQ transmissions is reached or a simulated ACK

HSDPA over W-CDMA Subsystem–Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])

response is encountered. Whenever the software re-sends the same packet payload, it also transmits another RV parameter that is configured by the RV sequence command.

***RST** 1

Range 1–8

Remarks To use this command's parameter in a setup, you must also set HARQ as the feedback selection. Refer to the “:DLINK:HSDPa:FCONtrol” on page 734 for selecting the feedback type.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:HSDPa:HARQ:RVSequence[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8

Supported E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa:HARQ:RVSequence[1] | 2 | 3 | 4 |
5 | 6 | 7 | 8 <val>
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa:HARQ:RVSequence[1] | 2 | 3 | 4 |
5 | 6 | 7 | 8?
```

This command sets the HSDPA1 RV parameter sequence used with the maximum number of HARQ transmission setting. You can set eight different RV parameters for the RV sequence.

During simulated ACK responses, the software uses the first RV parameter. When the software encounters a simulated NACK response, it sends data using the next RV parameter. The software keeps incrementing to the next RV parameter in the sequence until it receives a simulated ACK response. When the software encounters an ACK response, the RV sequence resets to the first RV parameter.

***RST** 0

Range 0–7

Remarks To use this command's parameter in a setup, you must also set HARQ as the feedback selection. Refer to the “:DLINK:HSDPa:FCONtrol” on page 734 for selecting the feedback type.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

HSDPA over W-CDMA Subsystem—Option 418 (:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

:DLINK:HSDPA[1] | 2 | 3 | 4:BSINFO**Supported** E4438C with Option 418

```
[ :SOURCE ]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:BSINFO <val>
[ :SOURCE ]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:BSINFO?
```

This command sets the HS-DSCH block size. HSDPA1 is the only HSDPA channel configuration that supports the HS-DSCH, however the block size information parameter is also available for HSDPA2–4 for HS-SCCH coding purposes.

RST** 36**Range** 0–63**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSCH:COFFSET*Supported** E4438C with Option 418

```
[ :SOURCE ]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSCH:
COFFSET <val>
[ :SOURCE ]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSCH:COFFSET?
```

This command sets the HS-PDSCH code offset. The code offset is used in determining the HS-PDSCH channel code.

***RST** HSDPA1: 4 HSDPA2: 8 HSDPA3: 9 HSDPA4: 10**Range** 1–15**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

Set all physical channel codes orthogonal to each other. For any channel codes that fail this criteria, the apply function (downlink apply command) will not work.

:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSCH:DATA**Supported** E4438C with Option 418

```
[ :SOURCE ]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSCH:DATA PN9 |
FIX4 | "<file name>" | DSCH
[ :SOURCE ]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSCH:DATA?
```

This command configures the HS-PDSCH data type.

DSCH This choice is the HS-DSCH selection that is supported on only HSDPA1. Selecting the DSCH choice for HSDPA2–4 will generate an error.

HSDPA over W-CDMA Subsystem–Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to [“File Overview” on page 717](#) for more information on files.

***RST** PN9

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“DLINK:APPLY” on page 719](#).

:DLINK:HSDPa[1] | 2 | 3 | 4:HSPDSch:DATA:FIX4

Supported E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa [ 1 ] | 2 | 3 | 4 :HSPDSch:DATA:
FIX4 <val>
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa [ 1 ] | 2 | 3 | 4 :HSPDSch:DATA:
FIX4?
```

This command sets the HS-PDSCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

***RST** 0

Range 0–15

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“DLINK:APPLY” on page 719](#).

:DLINK:HSDPa:HSPDsch:DSCH:DATA

Supported E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa:HSPDsch:DSCH:DATA PN9 |
FIX4 | "<file name>"
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa:HSPDsch:DSCH:DATA?
```

This command defines the HS-DSCH data type for HSDPA1. The HS-DSCH is not supported on HSDPA2–4.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to [“File Overview” on page 717](#) for more information on files.

***RST** PN9

HSDPA over W-CDMA Subsystem—Option 418 [:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:HSDPA:HSPDSch:DSCH:DATA:FIX4

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA:HSPDSch:DSCH:DATA:
FIX4 <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA:HSPDSch:DSCH:DATA:FIX4?
```

This command defines the HS-DSCH repeating 4-bit binary data pattern for HSDPA1. The HS-DSCH is not supported on HSDPA2–4.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

***RST** 0

Range 0–15

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:HSDPA:HSPDSch:DSCH:IRBSize

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA:HSPDSch:DSCH:IRBSize <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA:HSPDSch:DSCH:IRBSize?
```

This command sets the HS-DSCH IR buffer size per the HARQ process for HSDPA1. The HS-DSCH is not supported on HSDPA2–4.

***RST** 9600

Range 960–28800

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

HSDPA over W-CDMA Subsystem–Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])**:DLINK:HSDPA:HSPDSch:NCODE****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA:HSPDSch:NCODE <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA:HSPDSch:NCODE?

This command sets number of codes for the HS-PDSCH on HSDPA1. HSDPA2–4 do not support multicodes.

***RST** 1**Range** 1–15

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

Set all physical channel codes so they are orthogonal to each other. If any of the channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSch:POWER**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSch:POWER <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSch:POWER?

This command sets the HS-PDSCH power level.

The variable <val> is expressed in decibels (dB).

***RST** –1.02000000E+001**Range** –40 to 0

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSch:SFORmat**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSch:SFORmat 0 | 1

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSch:SFORmat?

This command sets the HS-PDSCH slot format.

0 This sets the modulation type to QPSK.

1 This sets the modulation type to 16QAM.

RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSch[:STATE]*Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSch[:STATE] ON | OFF | 1 | 0

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSch[:STATE]?

This command turns the selected HS-PDSCH on or off.

***RST** HSDPA1: 1 HSDPA2–4: 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

The HS-SCCH must be on for the HS-PDSCH to turn on. Turning off the HS-SCCH also turns off the active HS-PDSCH. See “:DLINK:HSDPA[1]|2|3|4[:STATE]” on page 746 for turning the HS-SCCH on or off.

HSDPA over W-CDMA Subsystem–Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])**:DLINK:HSDPa[1] | 2 | 3 | 4:HSSCch:CCODE****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1] | 2 | 3 | 4:HSSCch:CCODE <val>

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1] | 2 | 3 | 4:HSSCch:CCODE?

This command sets the HS-SCCH channel code.

***RST** HSDPA1: 4 HSDPA2: 5 HSDPA3: 6 HSDPA4: 7**Range** 1–127**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 719.

Set all physical channel codes so they are orthogonal to each other. If any of the channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

:DLINK:HSDPa[1] | 2 | 3 | 4:HSSCch:DATA**Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1] | 2 | 3 | 4:HSSCch:DATA PN9 | FIX4 | "<file name>" | STD

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1] | 2 | 3 | 4:HSSCch:DATA?

This command sets the data type for the selected downlink HS-SCCH.

STD This choice configures the bit field as defined by the 3GPP standards."<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “[File Overview](#)” on page 717 for more information on files.***RST** STD**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 719.

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

:DLINK:HSDPA[1] | 2 | 3 | 4:HSSCch:DATA:FIX4**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSSCch:DATA:FIX4 <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSSCch:DATA:FIX4?

This command sets the HS-SCCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

RST** 0**Range** 0–15**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:HSDPA[1] | 2 | 3 | 4:HSSCch:POWER*Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSSCch:POWER <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:HSSCch:POWER?

This command sets the HS-SCCH power level.

The variable <val> is expressed in decibels (dB).

***RST** -1.02000000E+001**Range** -40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:HSDPA[1]|2|3|4:ITTI**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:ITTI <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:ITTI?
```

This command sets the static inter-TTI pattern value for the selected HSDPA.

The variable <val> is expressed in subframes (one subframe = 2 ms).

***RST** 8**Range** 1–16

Remarks To use a static pattern, select FIX as the choice for the [:DLINK:HSDPA\[1\]|2|3|4:ITTI:PATTERN](#) command.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 719.

:DLINK:HSDPA[1]|2|3|4:ITTI:PATTERN**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:ITTI:
PATTERN FIX | "<file name>"
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:ITTI:PATTERN?
```

This command selects which method sets the inter-TTI pattern for the selected HSDPA.

FIX This choice enables a static pattern. To configure the pattern, see “[:DLINK:HSDPA\[1\]|2|3|4:ITTI](#)”.

"<file name>" This variable represents an inter-TTI pattern file stored in signal generator memory. Creating and using a file provides the option of having a flexible inter-TTI pattern where you can vary the distance between HS-PDSCH transmissions. To create a file, use one or a combination of the following methods:

- To create a file internal to the software, use the inter-TTI user pattern editor.
- To create a file external to the software, use a text editor.

For more information, see the Signal Studio for HSDPA over W-CDMA software online help.

The file name follows the form <project name>-ITTIx, where 'x' is the HSDPA number from one to four. The inter-TTI pattern must contain at least one bit, or the apply function (downlink apply command) will not work.

HSDPA over W-CDMA Subsystem—Option 418 [:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]***RST** FIX**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:HSDPA:NHPRocess****Supported** E4438C with Option 418[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA:NHPRocess <val>
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA:NHPRocess?

This command sets the HS-DSCH number of HARQ processes for HSDPA1. For HSDPA2–4, this parameter is fixed at one and is used only for HS-SCCH coding purposes.

RST** 4**Range** 1–8**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:HSDPA[1] | 2 | 3 | 4:RVParameter*Supported** E4438C with Option 418[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:RVParameter <val>
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:RVParameter?

This command sets the HS-DSCH RV parameter. For HSDPA2–4, which do not support an HS-DSCH, this parameter is used only for HS-SCCH coding purposes.

***RST** 0**Range** 0–7**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

HSDPA over W-CDMA Subsystem–Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])**:DLINK:HSDPa[1] | 2 | 3 | 4:UEID****Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa[1] | 2 | 3 | 4:UEID <val>
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa[1] | 2 | 3 | 4:UEID?
```

This command sets the UEID.

RST** HSDPA1: 0 HSDPA2: 1 HSDPA3: 2 HSDPA4: 3**Range** 0–65535**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:HSDPa[1] | 2 | 3 | 4[:STATE]*Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa[1] | 2 | 3 | 4 [ :STATe ] ON|OFF |
1 | 0
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa[1] | 2 | 3 | 4 [ :STATe ] ?
```

This command turns the selected downlink HSDPA channel on or off.

- | | |
|---------|---|
| ON (1) | <ul style="list-style-type: none"> • Turns on the HS-SCCH for the selected HSDPA. • Enables turning on the HS-PDSCH for the selected HSDPA. |
| OFF (0) | <ul style="list-style-type: none"> • Turns off the HS-SCCH for the selected HSDPA. • Turns off the active HS-PDSCH for the selected HSDPA. |

***RST** HSDPA1: 1 HSDPA2–4: 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

Refer to “:DLINK:HSDPa[1]|2|3|4:HSPDsch[:STATE]” on page 741 for turning the HS-PDSCH on or off.

An HSDPA consists of a HS-SCCH and a HS-PDSCH, however the HS-DSCH is supported on only HSDPA1.

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:CCODE**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:CCODE <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:CCODE?

This command sets the channel code for the selected downlink OCNS.

*RST	OCNS1: 2	OCNS2: 3	OCNS3: 4	OCNS4: 5
	OCNS5: 6	OCNS6: 7	OCNS7: 8	OCNS8: 9
	OCNS9: 10	OCNS10: 11	OCNS11: 12	OCNS12: 13
	OCNS13: 14	OCNS14: 15	OCNS15: 16	OCNS16: 17

Range 1–127**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:DATA****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:DATA PN9 | PN15

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:DATA?

This command configures the data pattern for the selected downlink OCNS.

***RST** PN9**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

HSDPA over W-CDMA Subsystem–Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:POWER****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:POWER <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:POWER?

This command sets the power level for the selected downlink OCNS.

The variable <val> is expressed in units of dB.

*RST	OCNS1: -6	OCNS2: -8	OCNS3: -8	OCNS4: -10
	OCNS5: -7	OCNS6: -9	OCNS7-16: -10	

Range -40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SSCOffset****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SSCOffset <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SSCOffset?

This command sets the secondary scrambling code offset for the selected downlink OCNS.

***RST** 0**Range** 0–15**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:TOFFset**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:TOFFset <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:TOFFset?

This command adjusts the timing offset for the OCNS.

*RST	OCNS1: 1	OCNS2: 2	OCNS3: 3	OCNS4: 4
	OCNS5: 5	OCNS6: 6	OCNS7: 7	OCNS8: 8
	OCNS9: 9	OCNS10: 10	OCNS11: 11	OCNS12: 12
	OCNS13: 13	OCNS14: 14	OCNS15: 15	OCNS16: 16

Range 0–149**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATE]****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATE] ON|OFF|1|0

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATE]?

This command turns the selected OCNS on or off.

RST** 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:PCCPch:BCH:DATA*Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:PCCPch:BCH:DATA PN9|PN15|FIX4|<file name>"

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:PCCPch:BCH:DATA?

This command sets the BCH data format that is transmitted on the P-CCPCH.

" <file name> " This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply

HSDPA over W-CDMA Subsystem–Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

command) will not work. Refer to “File Overview” on page 717 for more information on files.

***RST** FIX4

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:PCCPch:BCH:DATA:FIX4

Supported E4438C with Option 418

```
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : PCCPch : BCH : DATA : FIX4 <val>
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : PCCPch : BCH : DATA : FIX4?
```

This command sets the BCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

***RST** 0

Range 0–15

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:PCCPch:CCODE

Supported E4438C with Option 418

```
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : PCCPch : CCODE <val>
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : PCCPch : CCODE?
```

This command sets the P-CCPCH channel code.

***RST** +1

Range 0–255

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

Set all physical channel codes so they are orthogonal to each other. If any of the channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

:DLINK:PCCPch:POWer

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMa:HSDPa[ :BBG ] :DLINK:PCCPch:POWer <val>  
[ :SOURCE ] :RADIo:WCDMa:HSDPa[ :BBG ] :DLINK:PCCPch:POWer?
```

This command sets the P-CCPCH power level.

The variable <val> is expressed in decibels (dB).

***RST** -5.30000000E+000

Range -40 to 0

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:PCCPch[:STATE]

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMa:HSDPa[ :BBG ] :DLINK:PCCPch[ :STATE ] ON|OFF|1|0  
[ :SOURCE ] :RADIo:WCDMa:HSDPa[ :BBG ] :DLINK:PCCPch[ :STATE ]?
```

This command turns the P-CCPCH on or off.

***RST** 1

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:PICH:CCODE

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMa:HSDPa[ :BBG ] :DLINK:PICH:CCODE <val>  
[ :SOURCE ] :RADIo:WCDMa:HSDPa[ :BBG ] :DLINK:PICH:CCODE?
```

This command sets the PICH channelization code.

***RST** +3

Range 0–255

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

Set all physical channel codes so they are orthogonal to each other. If any of the channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

:DLINK:PICH:DATA

Supported E4438C with Option 418

```
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : PICH : DATA PN9 | PN15 | FIX4 |
"<file name>"
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : PICH : DATA?
```

This command sets the PICH data type.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to [“File Overview” on page 717](#) for more information on files.

***RST** PN9

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:DLINK:APPLY” on page 719](#).

:DLINK:PICH:DATA:FIX4

Supported E4438C with Option 418

```
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : PICH : DATA : FIX4 <val>
[ :SOURCE ] : RADIO : WCDMA : HSDPA [ : BBG ] : DLINK : PICH : DATA : FIX4?
```

This command sets the PICH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

***RST** 0

Range 0–15

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:DLINK:APPLY” on page 719](#).

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

:DLINK:PICH:POWER**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:PICH:POWER <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:PICH:POWER?
```

This command sets the PICH power level.

The variable <val> is expressed in decibels (dB).

RST** -8.300000000E+000**Range** -40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:PICH[:STATE]*Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:PICH[:STATE] ON|OFF|1|0
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:PICH[:STATE]?
```

This command turns the PICH on or off.

RST** 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:POLarity*Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:POLarity NORMAL|INVERTed|INVERT
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:DLINK:POLarity?
```

This command selects the phase polarity of the downlink signal.

NORMAL This choice selects normal polarity.**INVERTed, INVERT** These choices perform the same function, inverting the internal Q signal.***RST** NORM**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. For more information, refer to “:DLINK:APPLY” on page 719.

:DLINK:PSCH:POWer**Supported** E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:PSCH:POWer <val>

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:PSCH:POWer?

This command sets the PSCH power level.

The variable <val> is expressed in decibels (dB).

RST** -8.30000000E+000**Range** -40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.**:DLINK:PSCH[:STATE]*Supported** E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:PSCH[:STATE] ON|OFF|1|0

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:PSCH[:STATE]?

This command turns the PSCH on or off.

RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. For more information, refer to “:DLINK:APPLY” on page 719.**:DLINK:SCRamblecode*Supported** E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:SCRamblecode <val>

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:SCRamblecode?

This command sets the downlink scramble code number.

***RST** +0**Range** 0–511**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:SSCH:POWer

Supported E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:SSCH:POWer <val>

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:SSCH:POWer?

This command sets the SSCH power level. The variable <val> is expressed in decibels (dB)

***RST** -8.3000000E+000

Range -40 to 0

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:SSCH[:STATe]

Supported E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:SSCH[:STATe] ON|OFF|1|0

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:SSCH[:STATe]?

This command turns the SSCH on or off.

***RST** 1

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:DLINK:TXDiversity

Supported E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:TXDiversity NONE|OANT1|OANT2

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:TXDiversity?

This command selects the downlink signal transmit diversity mode.

NONE This choice disables the transmit diversity mode.

OANT1 This choice selects the transmit diversity openloop antenna 1 mode.

OANT2 This choice selects the transmit diversity openloop antenna 2 mode.

***RST** NONE

Remarks To configure both antennas (one and two) requires two ESGs.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 719.

:LINK

Supported E4438C with Option 418

[:SOURCE] :RADIO:WCDMA:HSDPA [:BBG] :LINK DOWN|UP

[:SOURCE] :RADIO:WCDMA:HSDPA [:BBG] :LINK?

This command sets the uplink or downlink mode.

***RST** DOWN

:ULINK:APPLY

Supported E4438C with Option 418

[:SOURCE] :RADIO:WCDMA:HSDPA [:BBG] :ULINK:APPLY

[:SOURCE] :RADIO:WCDMA:HSDPA [:BBG] :ULINK:APPLY?

This command applies changes to the channel setup and data for active physical and transport channels, immediately starting the channel coding generation process. A progress bar may appear on the ESG display indicating that the new signal parameters are being applied. Turning on the HSDPA modulation format also applies the signal parameters.

The query response determines whether or not there is a need to execute the command. It returns the following responses:

0 Command execution is not required.

1 Command execution is required.

NOTE The query response is only valid while the HSDPA format is active.

When there is a setting conflict (ESG reports an error) with the range values or coupled parameters, or both, executing the uplink apply command does not apply the new changes until the conflicts are resolved. After resolving the setting conflicts, execute the command to apply the new settings.

:ULINK:AWGN:CN

Supported E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa[ :BBG ] :ULINK:AWGN:CN <val>
[ :SOURce ] :RADio:WCDMa:HSDPa[ :BBG ] :ULINK:AWGN:CN?
```

This command sets the uplink in-band carrier to noise ratio (C/N) value using AWGN.

***RST** 0

Range -30 to 30

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to [:ULINK:APPLY](#) .

:ULINK:AWGN[:STATe]

Supported E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa[ :BBG ] :ULINK:AWGN[ :STATe ] ON | OFF | 0 | 1
[ :SOURce ] :RADio:WCDMa:HSDPa[ :BBG ] :ULINK:AWGN[ :STATe ] ?
```

This command turns the uplink AWGN on or off.

***RST** 0

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 756](#).

:ULINK:BBReference:EXternal:MRATe

Supported E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa[ :BBG ] :ULINK:BBReference:EXternal:MRATe X1 |
X2 | X4
[ :SOURce ] :RADio:WCDMa:HSDPa[ :BBG ] :ULINK:BBReference:EXternal:MRATe?
```

This command configures the ESG, so it can accept an external baseband generator clock that is a multiple of the internal 3.84 MHz chip clock.

X1 This sets the ESG to accept an external clock rate identical to the chip clock.

X2 This sets the ESG to accept an external clock rate that is two times the rate of the chip clock.

X4 This sets the ESG to accept an external clock rate that is four times the rate of the chip clock.

***RST** X1

:ULINK:BBReference[:SOURCE]**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:BBReference [ :SOURCE ] INT[1] |
EXT[1]
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:BBReference [ :SOURCE ] ?
```

This command selects the baseband generator reference source for the radio uplink channel.

RST** INT**:ULINK:DPCCh:CCODE*Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:DPCCh:CCODE?
```

This query returns the channelization code for the uplink DPCCH.

The slot format determines the channelization code in accordance with the 3GPP standards. See [“:ULINK:DPCCh:SFORmat” on page 761](#) for setting the slot format.

:ULINK:DPCCh:DATA**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:DPCCh:DATA PN9 | PN15 | FIX4 |
"<file name>" | STD
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:DPCCh:DATA?
```

This command configures the uplink DPCCH data pattern.

STD This sets the DPCCH bit fields according to the 3GPP standards.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (uplink apply command) will not work. Refer to [“File Overview” on page 717](#) for more information on files.

***RST** STD

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 756](#).

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

:ULINK:DPCCh:DATA:FIX4**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:DATA:FIX4 <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:DATA:FIX4?

This command sets the uplink DPCCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

***RST** 0**Range** 0–15

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:ULINK:APPLY](#)” on page 756.

:ULINK:DPCCh:FBI:PATtern**Supported** E4438C with Option 418[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:FBI:PATtern PN9|PN15|FIX|
"<file name>"

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:FBI:PATtern?

This command configures the uplink DPCCH FBI pattern.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (uplink apply command) will not work. Refer to “[File Overview](#)” on page 717 for more information on files.

***RST** FIX

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:ULINK:APPLY](#)” on page 756.

:ULINK:DPCCh:FBI:PATtern:FIX**Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:FBI:PATtern:FIX <val>

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:FBI:PATtern:FIX?

This command sets the 30-bit FBI pattern for the uplink DPCCH.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

RST** +0**Range** 0–10737418235**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.**:ULINK:DPCCh:POWer*Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:POWer <val>

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:POWer?

This command sets the uplink DPCCH power level.

The variable <val> is expressed in decibels (dB)

***RST** –2.69000000E+000**Range** –40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

:ULINK:DPCCh:SFORmat**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:SFORmat <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:SFORmat?

This command sets the uplink DPCCH slot format.

***RST** +0**Range** 0–5**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

The slot format determines the settings for other parameters in accordance with 3GPP standards.

:ULINK:DPCCh[:STATe]**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh[:STATe] ON|OFF|1|0

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh[:STATe]?

This command turns the uplink DPCCH on or off.

RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.**:ULINK:DPCCh:TFCI*Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:TFCI <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:TFCI?

This command sets the uplink DPCCH TFCI 10-bit data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only decimal values.

***RST** +0**Range** 0–1023**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

:ULINK:DPCCh:TPC:NSTeps**Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:TPC:NSTeps <val>
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:TPC:NSTeps?
```

This command sets the number of steps for the down and up (DUP) or up and down (UDOWn) TPC pattern selections.

The variable <val> is expressed in decibels (dB).

***RST** +1**Range** 1–80

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

:ULINK:DPCCh:TPC:PATtern**Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:TPC:PATtern
UDOWn|DUP|UALL|DALL|"<file name>"
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:TPC:PATtern?
```

This command configures the uplink DPCCH TPC pattern for increasing or decreasing, or increasing and decreasing the BTS power level.

UDOWn The TPC pattern repetitively steps up and down.

DUP The TPC pattern repetitively steps down and up.

UALL The TPC pattern consecutively steps up.

DALL The TPC pattern consecutively steps down.

"<file name>" This variable represents a power pattern file stored in signal generator memory. The pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “File Overview” on page 717 for more information on files.

***RST** UDOW

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

Each step in a TPC pattern signals an increase or decrease of 1 dB in the BTS output power level.

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

:ULINK:DPDCh:CCODE**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPDCh:CCODE?

This query returns the uplink DPDCH channelization code.

The slot format determines the channelization code in accordance with the 3GPP standards. See “:ULINK:DPDCh:SFORmat” on page 768 for setting the slot format.

:ULINK:DPDCh:DATA**Supported** E4438C with Option 418[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPDCh:DATA PN9|PN15|FIX4|DCH|
"<file name>"

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPDCh:DATA?

This command configures the uplink DPDCH data pattern.

DCH This choice selects the transport channel as the data source.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (uplink apply command) will not work. Refer to “File Overview” on page 717 for more information on files.

RST** PN9**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.**:ULINK:DPDCh:DATA:FIX4*Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPDCh:DATA:FIX4 <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPDCh:DATA:FIX4?

This command sets the uplink DPDCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

***RST** 0**Range** 0–15**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:BSIZE**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :ULINK:DPDCh:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :
BSIZE <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :ULINK:DPDCh:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :BSIZE?
```

This command sets the block size for the selected uplink DCH.

***RST** 20**Range** 0–5000

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

The number of data bits per DCH cannot exceed 200,000. To maintain this data bit limit, the ESG calculates the product of the block size and the number of blocks. If the product of these two parameters exceeds 200,000, the apply function (uplink apply command) will not work.

:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:CRC**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :ULINK:DPDCh:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :
CRC 0 | 8 | 12 | 16 | 24
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :ULINK:DPDCh:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :CRC?
```

This command sets the number of CRC bits for the selected uplink DCH.

***RST** 8

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:CTYPe**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :ULINK:DPDCh:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :
CTYPe HCONv | TCONv | TURBo | NONE
[ :SOURCE ] :RADIO:WCDMA:HSDPA[ :BBG ] :ULINK:DPDCh:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :CTYPe?
```

This command selects the encoder type for the selected uplink DCH.

HCONv This choice selects the 1/2 rate convolutional encoder.

TCONv This choice selects the 1/3 rate convolutional encoder.

HSDPA over W-CDMA Subsystem—Option 418 [:SOURce]:RADio:WCDMa:HSDPa[:BBG]

TURBo	This choice selects the turbo coder.
NONE	This choice selects no coding.
*RST	HCON
Remarks	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA

Supported E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa[ :BBG ] :ULINK:DPDCh:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :DATA PN9 |
PN15 | FIX4 | "<file name>"
[ :SOURce ] :RADio:WCDMa:HSDPa[ :BBG ] :ULINK:DPDCh:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :DATA?
```

This command configures the data for the selected uplink DCH.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (uplink apply command) will not work. Refer to “File Overview” on page 717 for more information on files.

***RST** PN9

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:FIX4

Supported E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa[ :BBG ] :ULINK:DPDCh:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :DATA :
FIX4 <val>
[ :SOURce ] :RADio:WCDMa:HSDPa[ :BBG ] :ULINK:DPDCh:DCH[ 1 ] | 2 | 3 | 4 | 5 | 6 :DATA :
FIX4?
```

This command sets the repeating 4-bit binary data pattern for the selected uplink DCH.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

***RST** 0

Range 0–15

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

HSDPA over W-CDMA Subsystem–Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])**:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:NBLocks****Supported** E4438C with Option 418[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:
NBLocks <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:NBLocks?

This command sets the number of blocks for the selected uplink DCH.

***RST** 1**Range** 0–512**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

The number of data bits per DCH cannot exceed 200,000. To maintain this data bit limit, the block size is multiplied by the number of blocks. If the product of these two parameters exceeds 200,000, the apply function (uplink apply command) will not work.

:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:RMATtribute**Supported** E4438C with Option 418[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:
RMATtribute <val>[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:
RMATtribute?

This command sets the rate matching attribute for the selected uplink DCH.

***RST** 1**Range** 1–256**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. For more information, refer to “:ULINK:APPLY” on page 756.

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

:ULINK:DPDCh:DCH[1]|2|3|4|5|6:TTI**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPDCh:DCH[1]|2|3|4|5|6:

TTI 10|20|40|80

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPDCh:DCH[1]|2|3|4|5|6:TTI?

This command sets the TTI for the selected uplink DCH.

The choices are expressed in millisecond (ms).

***RST** 10

Remarks Setting the command parameter while the signal is active also requires executing the apply command. For more information, refer to “:ULINK:APPLY” on page 756.

:ULINK:DPDCh:DCH2|3|4|5|6[:STATE]**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPDCh:

DCH2|3|4|5|6[:STATE] ON|OFF|1|0

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPDCh:DCH2|3|4|5|6[:STATE]?

This command turns the selected uplink DCH on or off; DCH1 is always on.

***RST** *DCH 1: 1 DCH 2–6: 0*

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

The apply command will not work and the ESG will report an error if you turn on a DCH where lower numbered DCHs are off. For example, turning on DCH5 requires turning on DCH2–4. The reverse is true when turning off the DCHs.

:ULINK:DPDCh:POWer**Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPDCh:POWer <val>

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPDCh:POWer?

This command sets the uplink DPDCH power level.

The variable <val> is expressed in decibels (dB).

RST** +0.00000000E+000**Range** –40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.**:ULINK:DPDCh:SFORmat*Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPDCh:SFORmat <val>

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPDCh:SFORmat?

This command sets the uplink DPDCH slot format.

***RST** +2**Range** 0– 6**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

The slot format determines the settings for other parameters in accordance with the 3GPP standards.

:ULINK:DPDCh[:STATe]**Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPDCh[:STATe] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPDCh[:STATe]?

This command turns the uplink DPDCH on or off.

***RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

:ULINK:FCLock:INTerval**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:FCLock:INTerval 10|20|40|80|2560

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:FCLock:INTerval?

This command selects the frame clock interval for the synchronization signal.

The frame clock interval is set in milliseconds (ms).

***RST** 80**Remarks** Ensure that the selected interval is equal to or longer than the longest transport channel TTI period.

This command is applicable only when FCLock is the sync source selection. See “:ULINK:SYNC[:SOURCE]” on page 777 for selecting the sync source.

:ULINK:FCLock:POLarity**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:FCLock:POLarity POSitive|NEGative

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:FCLock:POLarity?

This command sets the frame clock polarity.

POSitive This choice sets the clock gate to trigger when the signal is high.

NEGative This choice sets the clock gate to trigger when the signal is low.

***RST** POS**Remarks** This command is applicable only when FCLock is the sync source selection. See “:ULINK:SYNC[:SOURCE]” on page 777 for selecting the sync source.

:ULINK:FILTER

Supported E4438C with Option 418

```
[ :SOURCE ]:RADio:WCDMa:HSDPa[:BBG]:ULINK:FILTER RNYQuist|NYQuist|
GAUSSian|RECTangle|IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|
"<user FIR>"
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:FILTER?
```

This command selects the uplink filter type.

IS95	This filter meets the criteria of the IS-95 standard.
IS95_EQ	This filter is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard and is best suited for IS-95 baseband filtering.
IS95_MOD	This filter meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
IS95_MOD_EQ	This filter is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
UGGaussian	This is a GSM Gaussian filter with a fixed BbT value of 0.300.
AC4Fm	This is a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
"<user FIR>"	This variable represents any FIR filter file stored in signal generator memory. Refer to “File Overview” on page 717 for more information on files.
*RST	RNYQ
Remarks	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756 .

ULINK:FILTER:ALPHA

Supported E4438C with Option 418

```
[ :SOURCE ]:RADio:WCDMa:HSDPa[:BBG]:ULINK:FILTER:ALPHA <val>
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:FILTER:ALPHA?
```

This command sets the uplink Nyquist or root Nyquist filter alpha value.

*RST	+2.20000000E-001
Range	0–1
Remarks	Setting the command parameter while the signal is active also requires executing the apply command. Executing this command while a filter other than Nyquist or

HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

root Nyquist is selected changes the parameter value, but it is not used by the signal generator until one of the Nyquist filters is selected. Refer to “:ULINK:APPLY” on page 756.

:ULINK:FILTer:BBT

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMA:HSDPa [ :BBG ] :ULINK:FILTer:BBT <val>
[ :SOURCE ] :RADIo:WCDMA:HSDPa [ :BBG ] :ULINK:FILTer:BBT?
```

This command sets the uplink Gaussian filter BbT value.

***RST** +5.00000000E-001

Range 0–1

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

Executing this command while a filter other than the Gaussian filter is selected changes the parameter value, but it is not used by the signal generator until the Gaussian filter is selected.

:ULINK:FILTer:CHANnel

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMA:HSDPa [ :BBG ] :ULINK:FILTer:CHANnel EVM|ACP
[ :SOURCE ] :RADIo:WCDMA:HSDPa [ :BBG ] :ULINK:FILTer:CHANnel?
```

This command optimizes an uplink filter for minimized EVM or for minimized ACP.

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection for the root Nyquist and Nyquist filters.

***RST** EVM

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

To change the filter selection, refer to “:ULINK:FILTer” on page 770.

:ULINK:FOFFset**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:FOFFset <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:FOFFset?

This command sets the CFN starting frame within the SFN by setting a frame offset relative to SFN zero.

***RST** 0**Range** 0–255

Remarks The command adds delays to the internal frame counter by specifying the starting frame number count. When the frame offset (FOFFset) is set to 0, the frame number starts at the system sync trigger. When the FOFFset is set to 2, the signal generator triggers two frames after the SFN RST. For additional information, refer to 3GPP TS25.402 for SFN and CFN relationship.

:ULINK:HSDPcch:APATtern**Supported** E4438C with Option 418[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:HSDPcch:APATtern NONE|ACK_ALL|"
"<file name>"

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:HSDPcch:APATtern?

This command sets the HS-DPCCH ACK/NACK transmission pattern for each of the 1280 sub-frames that make up the pattern.

NONE This choice sets all subframes to DTX.

"<file name>" This variable represents an ACK pattern file stored in signal generator memory. The file must contain 2,560-bits of data (2-bits per subframe) or the apply function (uplink apply command) will not work.

- An ACK response is represented by 00.
- A NACK response is represented by 01.
- DTX is represented by 10.

Enter the 2,560-bits into the file as a binary string.

Refer to [“File Overview” on page 717](#) for more information on files.

***RST** NONE

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 756](#).

:ULINK:HSDPcch:APOWer**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:HSDPcch:APOWer <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:HSDPcch:APOWer?

This command sets the HS-DPCCH ACK part power level.

The variable <val> is expressed in decibels (dB).

RST** -2.69000000E+000**Range** -40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.**:ULINK:HSDPcch:CCODE*Supported** E4438C with Option 418

[:SOURCE]RADIO:WCDMA:HSDPA[:BBG]:ULINK:HSDPcch:CCODE?

This query returns the HS-DPCCH channelization code.

:ULINK:HSDPcch:CPATtern**Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:HSDPcch:CPATtern NONE |
"<file name>"
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:HSDPcch:CPATtern?
```

This command sets the HS-DPCCH CQI transmission pattern for each of the 1280 sub-frames that make up the pattern.

NONE This choice sets all subframes to DTX.

"<file name>" This variable represents a bit file stored in signal generator memory. The file must contain 10,240-bits of data (8-bits per subframe) or the apply function (uplink apply command) will not work.

- A CQI response range is one to thirty using 8-bits, 00000001 to 00011110.
- DTX is represented by 11111111.

Enter the 10,240-bits into the file as a binary string.

Refer to [“File Overview” on page 717](#) for more information on files.

***RST** NONE

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 756](#).

:ULINK:HSDPcch:CPOWer**Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:HSDPcch:CPOWer <val>
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:HSDPcch:CPOWer?
```

This command sets the HS-DPCCH CQI part power level.

The variable <val> is expressed in decibels (dB).

***RST** -2.69000000E+000**Range** -40 to 0

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 756](#).

:ULINK:HSDPcch:NPOWER

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:ULINK:HSDPcch:NPOWER <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:ULINK:HSDPcch:NPOWER?
```

This command sets the HS-DPCCH NACK part power level. The variable <val> is expressed in decibels (dB).

***RST** -2.69000000E+000

Range -40 to 0

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

:ULINK:HSDPcch:SFDelay

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:ULINK:HSDPcch:SFDelay <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:ULINK:HSDPcch:SFDelay?
```

This command sets the HS-DPCCH subframe delay. The variable <val> is expressed in units of 256 chips.

***RST** 0

Range 0–150

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

:ULINK:HSDPcch[:STATe]

Supported E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:ULINK:HSDPcch[:STATe] ON|OFF|1|0
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA[:BBG]:ULINK:HSDPcch[:STATe]?
```

This command turns the HS-DPCCH on or off.

***RST** 1

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.

:ULINK:POLarity**Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:POLarity NORMAL|INVerted|INVert
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:POLarity?
```

This command selects the phase polarity of the uplink signal.

NORMAL This choice selects normal polarity.**INVerted, INVert** These choices perform the same function, inverting the internal Q signal.***RST** NORM**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 756.**:ULINK:SCRamblecode****Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:SCRamblecode <val>
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:SCRamblecode?
```

This command sets the scramble code.

RST** +0**Range** 0–16777215**:ULINK:SDElay*Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:SDElay <val>
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:SDElay?
```

This command sets the uplink DPCH delay, measured in slots.

***RST** +0**Range** 0–119**Remarks** Calculate the delay between downlink and uplink DPCH, in slots, using the following formulas. Total Delay = (T0) + (TOFFset) + ((SDElay) * 2560 chips)

- T0 = 1024 chips
- TOFFset is set by “:ULINK:TOFFset” on page 778

Slot Delay = (Total Delay – T0) / 2560

:ULINK:SFNRst:POLarity

Supported E4438C with Option 418

```
[ :SOURce ]:RADIo:WCDMa:HSDPa[ :BBG]:ULINK:SFNRst:POLarity POSitive|
NEGative
[ :SOURce ]:RADIo:WCDMa:HSDPa[ :BBG]:ULINK:SFNRst:POLarity?
```

This command sets the polarity of the system frame number reset signal for the uplink synchronization source.

POSitive This choice sets the signal to trigger when the trigger signal is high.

NEGative This choice sets the signal to trigger when the trigger signal is low.

***RST** POS

Remarks This command is applicable only when SFN_RST is the sync source selection. See “:ULINK:SYNC[:SOURce]” on page 777 for selecting the sync source.

:ULINK:SYNC:MODE

Supported E4438C with Option 418

```
[ :SOURce ]:RADIo:WCDMa:HSDPa[ :BBG]:ULINK:SYNC:MODE SINGle|CONTInuous
[ :SOURce ]:RADIo:WCDMa:HSDPa[ :BBG]:ULINK:SYNC:MODE?
```

This command selects the uplink frame synchronization triggering mode.

SINGle The signal generator, once triggered, generates frames based on the reference clock.

CONTInuous The signal generator continuously aligns the frame timing with the frame sync trigger signal.

***RST** SING

:ULINK:SYNC[:SOURce]

Supported E4438C with Option 418

```
[ :SOURce ]:RADIo:WCDMa:HSDPa[ :BBG]:ULINK:SYNC[ :SOURce ] SFN_RST|FCLock
[ :SOURce ]:RADIo:WCDMa:HSDPa[ :BBG]:ULINK:SYNC[ :SOURce ]?
```

This command selects the uplink frame synchronization source type.

SFN_RST The uplink signal triggers on the system frame number reset signal.

FCLock The uplink signal triggers on the frame clock.

***RST** FCL

:ULINK:TOFFset**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:TOFFset <val>

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:TOFFset?

This command sets the uplink DPCH timing offset (delay), measured in chips.

***RST** +0**Range** –512 to 2560**Remarks** The downlink signal timing is provided by the synchronization signal.

Calculate the delay between downlink and uplink DPCH, in chips, using the following formulas:

Total Delay = (T0) + (TOFFset) + ((SDElay) * 2560 chips)

- T0 = 1024 chips
- SDElay is set by “:ULINK:SDElay” on page 776

Chip Delay = (Total Delay - T0) mod 2560

[:STATE]**Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG][:STATE] ON|OFF|1|0

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG][:STATE]?

This command turns the HSDPA functionality on or off.

***RST** 0**Remarks** This command only works when there is at least one active physical channel within the selected link.

NADC Subsystem–Option 402 ([:SOURce]:RADio[:NADC])

:ALPha

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :ALPha <val>  
[ :SOURce ] :RADio [ :NADC ] :ALPha?
```

This command changes the Nyquist or root Nyquist filter’s alpha value.

The filter alpha value can be set to a minimum level (0), a maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +3.50000000E–001

Range 0.000–1.000

Key Entry Filter Alpha

Remarks This command is effective only after choosing a root Nyquist or Nyquist filter; it does not effect other types of filters. To change the current filter type, refer to “:FILTer” on page 793.

:BBCLock

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :BBClock INT[1] | EXT[1]  
[ :SOURce ] :RADio [ :NADC ] :BBClock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Key Entry BBG Data Clock Ext Int

Remarks A data clock or continuous symbol sync input must be supplied when external mode is used.

:BBT

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :BBT <val>
[ :SOURce ] :RADio [ :NADC ] :BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +5.00000000E–001

Range 0.100–1.000

Key Entry Filter BbT

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters. To change the current filter type, refer to [“:FILTer” on page 793](#).

:BRATe

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :BRATe <val>
[ :SOURce ] :RADio [ :NADC ] :BRATe?
```

This command sets the bit rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +4.86000000E+004

Range	Modulation Type	Bits per Symbol	Internal Data	External Serial Data
	BPSK	1	1–50 Mbps	1–50 Mbps
	FSK2			
	MSK			
	C4FM	2	2–100 Mbps	2–50 Mbps
	FSK4			
	OQPSK			
	OQPSK195			
	P4QPPSK			
	QAM4			
	QPSK			
	QPSKIS95			
	QPSKISAT			

Range	Modulation Type	Bits per Symbol	Internal Data	External Serial Data
	D8PSK	3	3–100 Mbps	3–50 Mbps
	EDGE			
	FSK8			
	PSK8			
	FSK16	4	4–100 Mbps	4–50 Mbps
	PSK16			
	QAM16			
	QAM32	5	5–100 Mbps	5–50 Mbps
	QAM64	6	6–100 Mbps	6–50 Mbps
	QAM256	7	8–100 Mbps	8–50 Mbps

Key Entry

Symbol Rate

Remarks

When user-defined filters are selected using the command in section “:FILTer” on page 793, the upper bit rate will be restricted by the symbol rate as follows:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated and will impact the relative timing of the modulated data, as well as the actual filter response (see “:SRATe” on page 807).

A change in the bit rate value will affect the symbol rate value; refer to “:SRATe” on page 807 for a list of the minimum and maximum symbol rate values.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 796.

:BURSt:PN9

Supported

E4438C with Option 402

[:SOURce] :RADio [:NADC] :BURSt :PN9 NORMal | QUICk

[:SOURce] :RADio [:NADC] :BURSt :PN9?

This command controls the software PN9 generation.

NORMAL This choice produces a maximum length PN9 sequence.

QUICK This choice produces a truncated PN9 sequence.

***RST** NORM

Key Entry PN9 Mode Normal Quick

Remarks Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

:BURSt:SHAPe[:TYPE]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe [ :TYPE ] SINE | "<file name>"  
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe [ :TYPE ] ?
```

This command specifies the burst shape as either SINE or a user-defined file ("`<file name>`").

SINE This choice selects a state that is defined by the burst rise and fall *RST values, as the default burst shape type.

"`<file name>`" This choice selects a user designated file from signal generator memory (non-volatile).

***RST** SINE

Key Entry Sine User File

:BURSt:SHAPe:FALL:DELay

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe :FALL :DELay <val>  
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe :FALL :DELay ?
```

This command sets the burst shape fall delay.

The variable `<val>` is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range -22.3750 to 99

Key Entry Fall Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to [“:MODulation\[:TYPE\]” on page 796](#). Refer to [“:SRATE” on page 807](#) for a list of the minimum and maximum symbol rate values.

[“:BURSt:SHAPe:FDELay” on page 784](#) performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FALL:TIME

Supported E4438C with Option 402

[:SOURce] :RADio [:NADC] :BURSt :SHAPe :FALL :TIME <val>

[:SOURce] :RADio [:NADC] :BURSt :SHAPe :FALL :TIME?

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +5.00000000E+000

Range 0.1250–255.8750

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal

generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 796.

Refer to “:SRATE” on page 807 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FTIME” on page 784 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FDElay

Supported E4438C with Option 402

[:SOURCE] :RADIO [:NADC] :BURSt:SHAPe:FDElay <val>

[:SOURCE] :RADIO [:NADC] :BURSt:SHAPe:FDElay?

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range -22.3750 to 99

Key Entry Fall Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 796. Refer to “:SRATE” on page 807 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:DElay” on page 782 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FTIME

Supported E4438C with Option 402

[:SOURCE] :RADIO [:NADC] :BURSt:SHAPe:FTIME <val>

[:SOURCE] :RADIO [:NADC] :BURSt:SHAPe:FTIME?

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range 0.1250–255.8750

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 796. Refer to “:SRATE” on page 807 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:TIME” on page 783 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RDElay

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe :RDElay <val>  
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe :RDElay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –17.3750 to 99

Key Entry Rise Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 796. Refer to “:SRATE” on page 807 for minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:DElay” on page 786 performs the same function; in compliance with the SCPI standard, both commands are listed.

Refer to the *E4428C/38C ESG User’s Guide* for more information.

:BURSt:SHAPe:RISE:DELay

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe :RISE :DELay <val>  
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe :RISE :DELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –17.3750 to 99

Key Entry Rise Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 796. Refer to “:SRATe” on page 807 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RDELay” on page 785 performs the same function; in compliance with the SCPI standard, both commands are listed.

Refer to the *E4428C/38C ESG User’s Guide* for more information.

:BURSt:SHAPe:RISE:TIME

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe :RISE :TIME <val>  
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe :RISE :TIME?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +5.00000000E+000

Range 0.1250–22.5000

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 796. Refer to “:SRATE” on page 807 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RTIME” on page 787 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RTIME

Supported E4438C with Option 402

[:SOURce] :RADio [:NADC] :BURSt :SHAPe :RTIME <val>

[:SOURce] :RADio [:NADC] :BURSt :SHAPe :RTIME?

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +5.00000000E+000

Range 0.1250–22.5000

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 796. Refer to “:SRATE” on page 807 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:TIME” on page 786 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt[:STATe]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :BURSt [ :STATe ] ON | OFF | 1 | 0  
[ :SOURce ] :RADio [ :NADC ] :BURSt [ :STATe ] ?
```

This command enables or disables the burst function.

ON (1) This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

OFF (0) This choice enables the transmission of unframed data.

***RST** 0

Key Entry Data Format Pattern Framed

:BURSt:SHAPE[:TYPE]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPE [ :TYPE ] SINE | "<file name>"  
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPE [ :TYPE ] ?
```

This command specifies the burst shape as either SINE or a user-defined file ("<file name>").

SINE This choice selects a state that is defined by the burst rise and fall *RST values, as the default burst shape type.

"<file name>" This choice selects a user designated file from signal generator memory (non-volatile).

***RST** SINE

Key Entry Sine User File

:CHANnel

Supported E4438C with Option 402

```
[ :SOURce ] :RADIO [ :NADC ] :CHANnel EVM | ACP
[ :SOURce ] :RADIO [ :NADC ] :CHANnel ?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** ACP

Key Entry Optimize FIR For EVM ACP

Remarks To change the current filter type, refer to “:FILTer” on page 793.

:DATA

Supported E4438C with Option 402

```
[ :SOURce ] :RADIO [ :NADC ] :DATA PN9 | PN11 | PN15 | PN20 | PN23 | FIX4 | "<file name>" |
EXT | P4 | P8 | P16 | P32 | P64 | PRAM
[ :SOURce ] :RADIO [ :NADC ] :DATA ?
```

This command sets a pseudo-random number sequence, 4-bit pattern, sequence of 1’s and 0’s, data from an external source, or a user file as the data pattern for unframed transmission.

***RST** PN23

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	Ext
	4 1’s & 4 0’s	8 1’s & 8 0’s	16 1’s & 16 0’s	32 1’s & 32 0’s	64 1’s & 64 0’s	PRAM File		

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:DATA:PRAM

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO : [ NADC ] :DATA :PRAM "<file_name>"  
[ :SOURCE ] :RADIO : [ NADC ] :DATA :PRAM?
```

This command selects a pattern RAM (PRAM) file as the pattern data type for the NADC (North American Digital Cellular) format.

"<file_name>" This variable designates the PRAM file in WFM1. Refer to “File Name Variables” on page 13 for information on the file name syntax.

Key Entry PRAM File

Remarks Selecting this data source forces the burst source to INTERNAL to allow framing control. The PRAM file must reside in the signal generator’s volatile memory (WFM1) in order to be accessed by this command. For more information refer to “:DATA:PRAM:FILE:BLOCK” on page 111

:DATA:FIX4

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO [ :NADC ] :DATA :FIX4 <val>  
[ :SOURCE ] :RADIO [ :NADC ] :DATA :FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the NADC (North American Digital Cellular) modulation format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:DEFault

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO [ :NADC ] :DEFault
```

This command returns all of the NADC (North American Digital Cellular) modulation format parameters to factory settings. It does not affect any other signal generator parameters.

Key Entry Restore NADC Factory Default

:EDATa:DELay

Supported E4438C with Option 402

[:SOURCE] :RADIO [:NADC] :EDATa:DELay?

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

Remarks When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported E4438C with Option 402

[:SOURCE] :RADIO [:NADC] :EDCLock SYMBol | NORMal

[:SOURCE] :RADIO [:NADC] :EDCLock?

This command sets the external data clock use.

SYMBol This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

NORMal This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

***RST** NORM

Key Entry Ext Data Clock Normal Symbol

Remarks Both choices have no effect in internal clock mode. Refer to “:BBClock” on [page 779](#) to select EXT as the data clock type.

:EREFerence

Supported E4438C with Option 402

[:SOURce] :RADio [:NADC] :EREFerence INT | EXT

[:SOURce] :RADio [:NADC] :EREFerence?

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Key Entry BBG Ref Ext Int

Remarks If the EXT choice is selected, the external source's frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, “:EREFerence:VALue” on page 792 to enter the external reference frequency setting.

:EREFerence:VALue

Supported E4438C with Option 402

[:SOURce] :RADio [:NADC] :EREFerence:VALue <val>

[:SOURce] :RADio [:NADC] :EREFerence:VALue?

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST** +1.30000000E+007

Range 2.5E5–1E8

Key Entry Ext BBG Ref Freq

Remarks The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to “:EREFerence” on page 792 to select EXT (external source) as the reference for the bit-clock.

:FILTer

Supported E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:FILTer RNYQuist|NYQuist|GAUSSian|RECTangle|IS95|
IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURCE]:RADIO[:NADC]:FILTer?
```

This command selects the pre-modulation filter type.

- IS95 This choice selects a filter that meets the criteria of the IS-95 standard.
- IS95_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
- IS95_MOD This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
- IS95_MOD_EQ This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
- AC4Fm This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
- UGGaussian This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
- "<user FIR>" This variable is any filter file that you have stored into memory.

***RST** RNYQ

Key Entry **Root Nyquist Nyquist Gaussian Rectangle IS-95 IS-95 w/EQ**
IS-95 Mod IS-95 Mod w/EQ APCO 25 C4FM UN3/4 GSM Gaussian
User FIR

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:FRATe

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :FRATe FULL | HALF  
[ :SOURce ] :RADio [ :NADC ] :FRATe?
```

This command toggles between a full- or half-rate traffic channel.

FULL Selects two equally spaced timeslots of the frame. Since there are six timeslots per frame, timeslots 1, 2, and 3 are paired with timeslots 4, 5, and 6, respectively.

HALF Selects one timeslot of the frame (6 individual timeslots per frame).

***RST** FULL

Key Entry Rate Full Half

:IQ:SCALe

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :IQ:SCALe <val>  
[ :SOURce ] :RADio [ :NADC ] :IQ:SCALe?
```

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST** +100

Range 1–200

Key Entry I/Q Scaling

Remarks This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEViation]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :MODulation:FSK [ :DEViation ] <val>  
[ :SOURce ] :RADio [ :NADC ] :MODulation:FSK [ :DEViation ]?
```

This command sets the symmetric FSK frequency deviation value. The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz

***RST** +4.00000000E+002

Range	0–2E7
Key Entry	Freq Dev
Remarks	To change the modulation type, refer to “:MODulation[:TYPE]” on page 796. Refer to “:SRATe” on page 807 for a list of the minimum and maximum symbol rate values. To set an asymmetric FSK deviation value, refer to the <i>E4428C/38C ESG Signal Generators User’s Guide</i> for more information.

:MODulation:MSK[:PHASe]

Supported E4438C with Option 402

```
[ :SOURCE ] : RADIo [ :NADC ] : MODulation : MSK [ :PHASe ] <val>  
[ :SOURCE ] : RADIo [ :NADC ] : MODulation : MSK [ :PHASe ] ?
```

This command sets the MSK phase deviation value. The variable <val> is expressed in units of degrees.

***RST** +9.00000000E+001

Range 0–100

Key Entry Phase Dev

:MODulation:UFSK

Supported E4438C with Option 402

```
[ :SOURCE ] : RADIo [ :NADC ] : MODulation : UFSK "<file name>"  
[ :SOURCE ] : RADIo [ :NADC ] : MODulation : UFSK ?
```

This command selects a user-defined FSK file from the signal generator memory.

Key Entry User FSK

Remarks The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to “:MODulation[:TYPE]” on page 796 to change the current modulation type.
Refer to “File Name Variables” on page 13 for information on the file name syntax.

:MODulation:UIQ

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :MODulation :UIQ "<file name>"
```

```
[ :SOURce ] :RADio [ :NADC ] :MODulation :UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

Key Entry User I/Q

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to “:MODulation[:TYPE]” on page 796 to change the current modulation type.

Refer to “File Name Variables” on page 13 for information on the file name syntax.

:MODulation[:TYPE]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :MODulation [ :TYPE ] BPSK | QPSK | IS95QPSK | GRAYQPSK |  
OQPSK | IS95OQPSK | P4DQPSK | PSK8 | PSK16 | D8PSK | MSK | FSK2 | FSK4 | FSK8 | FSK16 | C4FM |  
QAM4 | QAM16 | QAM32 | QAM64 | QAM128 | QAM256 | UIQ | UFSK  
[ :SOURce ] :RADio [ :NADC ] :MODulation [ :TYPE ]?
```

This command sets the modulation type for the NADC personality.

***RST** P4DQPSK

Key Entry	BPSK	QPSK	IS-95 QPSK	Gray Coded QPSK	OQPSK			
	IS-95 OQPSK	$\pi/4$ DQPSK	8PSK	16PSK	D8PSK	MSK	2-Lvl FSK	
	4-Lvl FSK	8-Lvl FSK	16-Lvl FSK	C4FM	4QAM	16QAM	32QAM	
	64QAM	128QAM	256QAM	User I/Q	User FSK			

:REPeat

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :REPeat SINGLE | CONTinuous
```

```
[ :SOURce ] :RADio [ :NADC ] :REPeat?
```

This command sets the rotation direction of the phase modulation vector.

SINGLE This choice outputs one occurrence of the selected frame.

CONTinuous This choice outputs a continuous stream of the selected frame.

***RST** SING
Key Entry Frame Repeat Single Cont

:POLarity[:ALL]

Supported E4438C with Option 402
[:SOURce]:RADio[:NADC]:POLarity[:ALL] NORMal | INVerted
[:SOURce]:RADio[:NADC]:POLarity[:ALL]?

This command sets the rotation direction of the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Key Entry Polarity Normal Invert

:SECondary:RECall

Supported E4438C with Option 402
[:SOURce]:RADio[:NADC]:SECondary:RECall

This command recalls the secondary frame configuration, overwriting the current state.

Key Entry Recall Secondary Frame State

Remarks To save a secondary frame state, refer to “:SECondary:SAVE” on page 797.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to “:SECondary[:STATE]” on page 798.

:SECondary:SAVE

Supported E4438C with Option 402
[:SOURce]:RADio[:NADC]:SECondary:SAVE

This command saves the current frame configuration as the secondary frame with the filename NADC_SECONDARY_FRAME.

Key Entry Save Secondary Frame State

Remarks To recall the secondary frame (saved in non-volatile signal generator memory), refer to “:SECondary:RECall” on page 797.

:SECondary:TRIGger[:SOURce]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :SECondary :TRIGger [ :SOURce ] KEY | EXT | BUS  
[ :SOURce ] :RADio [ :NADC ] :SECondary :TRIGger [ :SOURce ] ?
```

This command selects the type of triggering for the secondary frame.

- KEY** This choice enables triggering by pressing the front panel **Trigger** hardkey.
- EXT** This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to [“:TRIGger\[:SOURce\]:EXTErnal\[:SOURce\]” on page 812](#).
- BUS** This choice enables GPIB triggering using the *TRG or GET command or LAN and RS-232 triggering using the *TRG command.

Key Entry Trigger Key Ext Bus

:SECondary[:STATe]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :SECondary [ :STATe ] ON | OFF | 1 | 0  
[ :SOURce ] :RADio [ :NADC ] :SECondary [ :STATe ] ?
```

This command enables or disables the ability to switch to the secondary frame.

***RST** 0

Key Entry Secondary Frame Off On

Remarks A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to [“:SECondary:SAVE” on page 797](#).

:SLOT[1] | 2 | 3 | 4 | 5 | 6:DCUStom

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DCUStom  
PN9 | PN11 | PN15 | PN20 | PN23 | FIX4 | " <file name> " | EXT | P4 | P8 | P16 | P32 | P64  
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DCUStom ?
```

This command configures the data field for the selected downlink custom timeslot.

*RST	PN9							
Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's		8 1's & 8 0's		16 1's & 16 0's		32 1's & 32 0's	
	64 1's & 64 0's							
Remarks	Refer to “File Name Variables” on page 13 for information on the file name syntax.							

:SLOT[1] | 2 | 3 | 4 | 5 | 6:DCUStom:FIX4

Supported E4438C with Option 402

```
[ :SOURCE ] : RADIO [ :NADC ] : SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 : DCUStom : FIX4 <val>
[ :SOURCE ] : RADIO [ :NADC ] : SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 : DCUStom : FIX4 ?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink custom timeslot.

*RST	#B0000
Range	#B0000–#B1111 or 0–15
Key Entry	FIX4
Remarks	FIX4 must already be defined as the data type.

:SLOT[1] | 2 | 3 | 4 | 5 | 6:DTCHannel:CDLocator

Supported E4438C with Option 402

```
[ :SOURCE ] : RADIO [ :NADC ] : SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 : DTCHannel :
CDLocator <bit_pattern>
[ :SOURCE ] : RADIO [ :NADC ] : SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 : DTCHannel : CDLocator ?
```

This command changes the 11-bit coded digital control channel locator (CDL) field.

*RST	#H000
Range	#H0–#H7FF
Key Entry	CDL
Remarks	The preset hexadecimal value (when normal preset is selected) for CDL reflects the NADC protocol, however you can enter a new value by using this command.

:SLOT[1]|2|3|4|5|6:DTCHannel:CDVCode

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel :  
CDVCode <bit_pattern>  
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel :CDVCode?
```

This command changes the 12-bit coded digital verification color code (CDVCC).

***RST** #H000

Range #H0–#HFFF

Key Entry CDVCC

Remarks The preset hexadecimal value (when normal preset is selected) for CDVCC reflects the NADC protocol, however you can enter a new value by using this command.

:SLOT[1]|2|3|4|5|6:DTCHannel:SACChannel

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel :  
SACChannel <bit_pattern>  
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel :SACChannel?
```

This command changes the 15-bit slow associated control channel.

***RST** #H000

Range #H0–#HFFF

Key Entry SACCH

Remarks The preset hexadecimal value (when normal preset is selected) for SACCH reflects the value specified by the standard.

:SLOT[1]|2|3|4|5|6:DTCHannel:SWORd

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel :SWORd <bit_pattern>  
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel :SWORd?
```

This command sets the 28-bit synchronization word as the active function. This is used for slot synchronization, equalizer training, and timeslot identification.

***RST** #HA91DE4A
Range #H0–#HFFFFFFF
Key Entry SYNC

:SLOT[1] | 2 | 3 | 4 | 5 | 6:DTCHannel[:DATA]

Supported E4438C with Option 402

```
[ :SOURce ] :RADIo [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel [ :DATA ] PN9 |
PN11 | PN15 | PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[ :SOURce ] :RADIo [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel [ :DATA ] ?
```

This command sets a pseudo-random number sequence, 4-bit pattern, sequence of 1’s and 0’s, data from an external source, or a user file as the data pattern for the selected downlink traffic channel timeslot during framed transmission.

***RST** PN9
Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT**
 4 1’s & 4 0’s 8 1’s & 8 0’s 16 1’s & 16 0’s 32 1’s & 32 0’s
 64 1’s & 64 0’s

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT[1] | 2 | 3 | 4 | 5 | 6:DTCHannel[:DATA]FIX4

Supported E4438C with Option 402

```
[ :SOURce ] :RADIo [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel [ :DATA ] :FIX4 <val>
[ :SOURce ] :RADIo [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel [ :DATA ] :FIX4 ?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink traffic channel timeslot.

***RST** #B0000
Range #B0000–#B1111 or 0–15
Key Entry **FIX4**
Remarks FIX4 must already be defined as the data type.

:SLOT[1]|2|3|4|5|6:POWer

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :POWer MAIN | DELTa
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :POWer?
```

This command toggles the RF output power level function for the selected timeslot.

- MAIN This choice specifies RF output as the main power level.
- DELTA This choice specifies RF output as the alternative power level.
- *RST MAIN

Key Entry Timeslot Ampl Main Delta

:SLOT[1]|2|3|4|5|6:STATe

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :STATe ON | OFF | 1 | 0
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :STATe?
```

This command enables or disables the operating state of the selected timeslot.

*RST Timeslot 1: 1 Timeslots 2–6: 0

Key Entry Timeslot Off On

:SLOT[1]|2|3|4|5|6:UCUStom

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :UCUStom PN9 | PN11 | PN15 |
PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :UCUStom?
```

This command configures the data field for the selected uplink custom timeslot.

*RST PN9

Key Entry

PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's			

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT[1]|2|3|4|5|6:UCUStom:FIX4

Supported E4438C with Option 402

```
[ :SOURCE ] : RADIo [ :NADC ] : SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 : UCUS tom : FIX4 <val>
```

```
[ :SOURCE ] : RADIo [ :NADC ] : SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 : UCUS tom : FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:SLOT[1]|2|3|4|5|6:UTCHannel:CDVCcode

Supported E4438C with Option 402

```
[ :SOURCE ] : RADIo [ :NADC ] : SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 : UTCH an n el :
```

```
CDVCcode <bit_pattern>
```

```
[ :SOURCE ] : RADIo [ :NADC ] : SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 : UTCH an n el : CDVCcode?
```

This command changes the 12-bit coded digital verification color code (CDVCC).

***RST** #H000

Range #H0–#HFFF

Key Entry CDVCC

Remarks The preset hexadecimal value (when normal preset is selected) for CDVCC reflects the NADC protocol, however you can enter a new value by using this command.

:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel:SACChannel

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :UTCHannel :SACChannel  
<bit_pattern>  
[ :SOURCE ] :RADIO [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :UTCHannel :SACChannel?
```

This command changes the 15-bit slow associated control channel.

***RST** #H000

Range #H0–#HFFF

Key Entry SACCH

Remarks The preset hexadecimal value (when normal preset is selected) for SACCH reflects the value specified by the standard.

:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel:SWORd

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :UTCHannel :SWORd <bit_pattern>  
[ :SOURCE ] :RADIO [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :UTCHannel :SWORd?
```

This command sets the 28-bit synchronization word as the active function. This is used for slot synchronization, equalizer training, and timeslot identification.

***RST** #HA91DE4A

Range #H0–#HFFFFFFF

Key Entry SYNC

:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel[:DATA]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :UTCHannel [ :DATA ] PN9 | PN15 |  
FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64  
[ :SOURCE ] :RADIO [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :UTCHannel [ :DATA ]?
```

This command sets a pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file as the data pattern for the selected uplink traffic channel timeslot during framed transmission.

***RST** PN9

Key Entry PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT
 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's
 64 1's & 64 0's

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel[:DATA]:FIX4

Supported E4438C with Option 402

[:SOURCE]:RADIO[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel[:DATA]:FIX4 <val>
 [:SOURCE]:RADIO[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel[:DATA]:FIX4?

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink traffic channel timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:SLOT[1] | 2 | 3 | 4 | 5 | 6[:TYPE]

Supported E4438C with Option 402

[:SOURCE]:RADIO[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6[:TYPE] UCUSom|DCUSom|UTCH|
 UTCH_ALL|DTCH|DTCH_ALL
 [:SOURCE]:RADIO[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6[:TYPE]?

This command sets the timeslot type for the selected timeslot.

***RST** Timeslot 1: UTCH Timeslots 2–6: UCUS

Key Entry Up Custom Down Custom Up TCH Up TCH All Down TCH
 Down TCH All

:SOUT

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :SOUT FRAME | SLOT | ALL
[ :SOURCE ] :RADio [ :NADC ] :SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

FRAME This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

SLOT This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

ALL This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

***RST** FRAME

Key Entry	Begin Frame	Begin Timeslot #	All Timeslots
------------------	--------------------	-------------------------	----------------------

:SOUT:OFFSet

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :SOUT:OFFSet <val>
[ :SOURCE ] :RADio [ :NADC ] :SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number of bits.

***RST** +0

Range -323 to 323

Key Entry Sync Out Offset

Remarks Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to [“:SOUT” on page 806](#).

:SOUT:SLOT

Supported E4438C with Option 402

[:SOURce]:RADio[:NADC]:SOUT:SLOT <val>

[:SOURce]:RADio[:NADC]:SOUT:SLOT?

This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.

***RST** +1

Range 1–3

Key Entry Begin Timeslot #

Remarks To change the output of the EVENT1 rear panel connector to SLOT, refer to [“:SOUT” on page 806](#).

:SRATe

Supported E4438C with Option 402

[:SOURce]:RADio[:NADC]:SRATe <val>

[:SOURce]:RADio[:NADC]:SRATe?

This command sets the transmission symbol rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +2.43000000E+004

Range	Modulation Type	Bits per Symbol	Internal Data	External Serial Data
	BPSK	1	1–50 Msps	1–50 Msps
	FSK2			
	MSK			
	C4FM	2	1–50 Msps	1–25 Msps
	FSK4			
	OQPSK			
	OQPSK195			
	P4QPPSK			
	QAM4			
	QPSK			
	QPSKIS95			
	QPSKISAT			

Receiver Test Digital Commands (continued)
NADC Subsystem–Option 402 ([:SOURce]:RADio[:NADC])

Range	Modulation Type	Bits per Symbol	Internal Data	External Serial Data
	D8PSK	3	1–33.33 Msps	1–16.67 Msps
	EDGE			
	FSK8			
	PSK8			
	FSK16	4	1–25 Msps	1–12.5 Msps
	PSK16			
	QAM16			
	QAM32	5	1–20 Msps	1–10 Msps
	QAM64	6	1–16.67 Msps	1–8.33 Msps
	QAM256	7	1–12.50 Msps	1–6.25 Msps

Key Entry

Symbol Rate

Remarks

When user-defined filters are selected using the command in section “:FILTer” on page 793, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated as follows:

- Above 12.5 Msps, the FIR length will be truncated to 32 symbols
- Above 25 Msps, the FIR length will be truncated to 16 symbols

This will impact the relative timing of the modulated data, as well as the actual filter response (see “:BRATe” on page 780).

A change in the symbol rate value will affect the bit rate value; refer to “:BRATe” on page 780 for a list of the minimum and maximum symbol rate values.

To change the modulation type, refer to “:MODUlation[:TYPE]” on page 796.

:TRIGger:TYPE

Supported

E4438C with Option 402

[:SOURce] :RADio [:NADC] :TRIGger :TYPE CONTInuous | SINGLE | GATE
 [:SOURce] :RADio [:NADC] :TRIGger :TYPE?

This command sets the trigger type.

CONTInuous	The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to “:TRIGger:TYPE:CONTInuous[:TYPE]” on page 809.		
SINGle	The framed data sequence plays once for every trigger received.		
GATE	An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.		
*RST	CONT		
Key Entry	Continuous	Single	Gated

:TRIGger:TYPE:CONTInuous[:TYPE]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :TRIGger :TYPE :CONTInuous [ :TYPE ] FREE | TRIGger | RESet
[ :SOURce ] :RADio [ :NADC ] :TRIGger :TYPE :CONTInuous [ :TYPE ] ?
```

This commands selects the waveform’s response to a trigger signal while using the continuous trigger mode.

For more information on triggering and to select the continuous trigger mode, see “:TRIGger:TYPE” on page 808.

The following list describes the waveform’s response to each of the command choices:

FREE	Turning the ARB format on immediately triggers the waveform. The waveform repeats until you turn the format off, select another trigger, or choose another waveform file.		
TRIGger	The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously until you turn the format off, select another trigger, or choose another waveform file.		
RESet	The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously. Subsequent triggers reset the waveform to the beginning. For a waveform sequence, this means to the beginning of the first segment in the sequence.		
*RST	FREE		
Key Entry	Free Run	Trigger & Run	Reset & Run

:TRIGger:TYPE:GATE:ACTive

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :TRIGger :TYPE :GATE :ACTive LOW | HIGH  
[ :SOURCE ] :RADio [ :NADC ] :TRIGger :TYPE :GATE :ACTive ?
```

This command selects the active state (gate polarity) of the gate while using the gating trigger mode.

The LOW and HIGH selections correspond to the low and high states of an external trigger signal. For example, when you select HIGH, the active state occurs during the high of the trigger signal. When the active state occurs, the ESG stops the waveform playback at the last played sample point, then restarts the playback at the next sample point when the inactive state occurs. For more information on triggering and to select gating as the trigger mode, see “:TRIGger:TYPE” on page 808.

The following list describes the signal generator’s external trigger signal gating behavior for the polarity selections:

LOW	The waveform playback stops when the trigger signal goes low (active state) and restarts when the trigger signal goes high (inactive state).
HIGH	The waveform playback stops when the trigger signal goes high (active state) and restarts when the trigger signal goes low (inactive state).
*RST	HIGH
Key Entry	Gate Active Low High

:TRIGger[:SOURCE]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :TRIGger [ :SOURCE ] KEY | EXT | BUS  
[ :SOURCE ] :RADio [ :NADC ] :TRIGger [ :SOURCE ] ?
```

This command sets the trigger source.

For more information on triggering, see “:TRIGger:TYPE” on page 808. The following list describes the command choices:

KEY	This choice enables manual triggering by pressing the front-panel Trigger hardkey.
EXT	An externally applied signal triggers the waveform. This is the only choice that works with gating. The following conditions affect an external trigger: <ul style="list-style-type: none">• The input connector selected for the trigger signal. You have a choice between the rear-panel PATTERN TRIG IN connector or the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. To make the connector selection, see “:TRIGger[:SOURCE]:EXTernal[:SOURCE]” on page 812.

For more information on the connectors and on connecting the cables, see the *ESG User's Guide*.

- The trigger signal polarity:
 - gating mode, see “:TRIGger:TYPE:GATE:ACTive” on page 810
 - continuous and single modes, see “:TRIGger[:SOURce]:EXTernal:SLOPe” on page 812
- The time delay between when the ESG receives a trigger and when the waveform responds to the trigger. There are two parts to setting the delay:
 - setting the amount of delay, see “:TRIGger[:SOURce]:EXTernal:DELay” on page 811
 - turning the delay on, see “:TRIGger[:SOURce]:EXTernal:DELay:STATe” on page 812

BUS This choice enables triggering over the GPIB or LAN using the *TRG or GET commands or the AUXILIARY INTERFACE (RS-232) using the *TRG command.

***RST** KEY

Key Entry	Trigger Key	Ext	Bus
------------------	--------------------	------------	------------

:TRIGger[:SOURce]:EXTernal:DELay

Supported E4438C with Option 402

```
[ :SOURce ] :RADio[ :NADC ] :TRIGger[ :SOURce ] :EXTernal :DELay <val>
[ :SOURce ] :RADio[ :NADC ] :TRIGger[ :SOURce ] :EXTernal :DELay?
```

This command sets the number of bits to delay the ESG’s response to an external trigger.

The bit delay is a delay between when the ESG receives the trigger and when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the ESG receives the trigger and the set number of delay bits (clocks) occurs, the ESG transmits the data pattern.

The delay occurs after you enable the state. See “:TRIGger[:SOURce]:EXTernal:DELay:STATe” on page 812. You can set the number of bits either before or after enabling the state.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 810.

***RST** +0

Range 0–1048575

Key Entry Ext Delay Bits

:TRIGger[:SOURce]:EXTErnal:DELay:STATe

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :TRIGger [ :SOURce ] :EXTErnal :DELay :STATe ON | OFF | 1 | 0  
[ :SOURce ] :RADio [ :NADC ] :TRIGger [ :SOURce ] :EXTErnal :DELay :STATe?
```

This command enables or disables the operating state of the external trigger delay function.

For setting the delay time, see “:TRIGger[:SOURce]:EXTErnal:DELay” on page 811, and for more information on configuring an external source, see “:TRIGger[:SOURce]” on page 810.

***RST** 0

Key Entry Ext Delay Off On

:TRIGger[:SOURce]:EXTErnal:SLOPe

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :TRIGger [ :SOURce ] :EXTErnal :SLOPe POSitive | NEGative  
[ :SOURce ] :RADio [ :NADC ] :TRIGger [ :SOURce ] :EXTErnal :SLOPe?
```

This command sets the polarity for an external trigger signal while using the continuous, single triggering mode. To set the polarity for gating, see “:TRIGger:TYPE:GATE:ACTive” on page 810.

The POSitive and NEGative selections correspond to the high (positive) and low (negative) states of the external trigger signal. For example, when you select POSitive, the waveform responds (plays) during the high state of the trigger signal. When the PSG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 810.

***RST** POS

Key Entry Ext Polarity Neg Pos

:TRIGger[:SOURce]:EXTErnal[:SOURce]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :TRIGger [ :SOURce ] :EXTErnal [ :SOURce ] EPT1 | EJPT2 |  
EPTRIGGER1 | EPTRIGGER2  
[ :SOURce ] :RADio [ :NADC ] :TRIGger [ :SOURce ] :EXTErnal [ :SOURce ]?
```

This command selects which PATTERN TRIG IN connection the ESG uses to accept an externally applied trigger signal when external is the trigger source selection.

For more information on configuring an external trigger source and to select external as the trigger

source, see “:TRIGger[:SOURce]” on page 810. For more information on the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User’s Guide*.

The following list describes the command choices:

EPT1	This choice is synonymous with EPTRIGGER1 and selects the PATTERN TRIG IN rear-panel connector.
EPT2	This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
EPTRIGGER1	This choice is synonymous with EPT1 and selects the PATTERN TRIG IN rear-panel connector.
EPTRIGGER2	This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
*RST	EPT1
Key Entry	Patt Trig In 1 Patt Trig In 2

[:STATe]

Supported E4438C with Option 402

```
[ :SOURce ] :RADIo [ :NADC ] [ :STATe ] ON | OFF | 1 | 0
[ :SOURce ] :RADIo [ :NADC ] [ :STATe ] ?
```

This command enables or disables the NADC modulation format.

***RST** OFF

Key Entry **NADC Off On**

Remarks Although the NADC modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

PDC Subsystem–Option 402 ([:SOURce]:RADio:PDC)

:ALPha

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PDC :ALPha <val>  
[ :SOURce ] :RADio :PDC :ALPha ?
```

This command changes the Nyquist or root Nyquist filter’s alpha value.

The filter alpha value can be set to a minimum level (0), a maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +5.00000000E–001

Range 0.000–1.000

Key Entry Filter Alpha

Remarks To change the current filter type, refer to “:FILTer” on page 827.

:BBCLock

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PDC :BBCLock INT[1] | EXT[1]  
[ :SOURce ] :RADio :PDC :BBCLock ?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Key Entry Ext Data Clock Ext Int

Remarks A data clock or continuous symbol sync input must be supplied when external mode is used.

:BBT

Supported E4438C with Option 402

[:SOURce]:RADio:PDC:BBT <val>

[:SOURce]:RADio:PDC:BBT?

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +5.00000000E–001

Range 0.100–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to “:FILTer” on page 827.

:BRATe

Supported E4438C with Option 402

[:SOURce]:RADio:PDC:BRATe <val>

[:SOURce]:RADio:PDC:BRATe?

This command sets the bit rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +4.20000000E+004

Range	Modulation Type	Bits per Symbol	Internal Data	External Serial Data
	BPSK	1	1–50 Mbps	1–50 Mbps
	FSK2			
	MSK			
	C4FM	2	2–100 Mbps	2–50 Mbps
	FSK4			
	OQPSK			
	OQPSK195			
	P4QPPSK			
	QAM4			

Receiver Test Digital Commands (continued)
PDC Subsystem–Option 402 ([:SOURce]:RADio:PDC)

Range

Modulation Type	Bits per Symbol	Internal Data	External Serial Data
QPSK	2	2–100 Mbps	2–50 Mbps
QPSKIS95			
QPSKISAT			
D8PSK	3	3–100 Mbps	3–50 Mbps
EDGE			
FSK8			
PSK8			
FSK16	4	4–100 Mbps	4–50 Mbps
PSK16			
QAM16			
QAM32	5	5–100 Mbps	5–50 Mbps
QAM64	6	6–100 Mbps	6–50 Mbps
QAM256	7	8–100 Mbps	8–50 Mbps

Key Entry

Symbol Rate

Remarks

When user-defined filters are selected using the command in section “:FILTer” on page 827, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated and will impact the relative timing of the modulated data, as well as the actual filter response (see “:SRATe” on page 843).

A change in the bit rate value will affect the value of the symbol rate; refer to “:SRATe” on page 843 for a list of minimum and maximum symbol rate values.

To change the modulation type, refer to “:MODUlation[:TYPE]” on page 830.

:BURSt:PN9

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PDC :BURSt :PN9 NORMal | QUICk  
[ :SOURce ] :RADio :PDC :BURSt :PN9 ?
```

This command controls the software PN9 generation.

NORMal This choice produces a maximum length PN9 sequence.

QUICk This choice produces a truncated PN9 sequence.

***RST** NORM

Key Entry PN9 Mode Normal Quick

Remarks Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

:BURSt:SHAPe:FALL:DELay

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PDC :BURSt :SHAPe :FALL :DELay <val>  
[ :SOURce ] :RADio :PDC :BURSt :SHAPe :FALL :DELay ?
```

This command sets the period of time that the start of the burst fall is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range -22.3750 to 99

Key Entry Fall Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 830. Refer to “:SRATe” on page 843 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:FDELay” on page 818 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FALL:TIME

Supported E4438C with Option 402

[:SOURce] :RADio:PDC:BURSt:SHAPe:FALL:TIME <val>

[:SOURce] :RADio:PDC:BURSt:SHAPe:FALL:TIME?

This command sets the period of time where the burst decreases from full power to minimum power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.1250–255.8750

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 830. Refer to “:SRATe” on page 843 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:FTIME” on page 819 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FDElay

Supported E4438C with Option 402

[:SOURce] :RADio:PDC:BURSt:SHAPe:FDElay <val>

[:SOURce] :RADio:PDC:BURSt:SHAPe:FDElay?

This command sets the period of time that the start of the burst fall is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –22.3750 to 99

Key Entry Fall Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 830. Refer to “:SRATE” on page 843 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:DELay” on page 817 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FTIME

Supported E4438C with Option 402

[:SOURCE] :RADIO:PDC:BURSt:SHAPe:FTIME <val>

[:SOURCE] :RADIO:PDC:BURSt:SHAPe:FTIME?

This command sets the period of time where the burst decreases from full power to minimum power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range 0.1250–255.8750

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 830. Refer to “:SRATE” on page 843 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:TIME” on page 818 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RDELay

Supported E4438C with Option 402

[:SOURce] :RADio :PDC :BURSt :SHAPe :RDELay <val>

[:SOURce] :RADio :PDC :BURSt :SHAPe :RDELay?

This command sets the period of time that the start of the burst rise is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –18.3750 to 99

Key Entry Rise Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 830.

Refer to “:SRATe” on page 843 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:DELay” on page 820 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RISE:DELay

Supported E4438C with Option 402

[:SOURce] :RADio :PDC :BURSt :SHAPe :RISE :DELay <val>

[:SOURce] :RADio :PDC :BURSt :SHAPe :RISE :DELay?

This command sets the period of time that the start of the burst rise is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –18.3750 to 99

Key Entry Rise Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 830. Refer to “:SRATe” on page 843 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:RDElay” on page 820 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RISE:TIME

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:BURSt:SHAPe:RISE:TIME <val>  
[ :SOURce ] :RADio:PDC:BURSt:SHAPe:RISE:TIME?
```

This command sets the period of time where the burst increases from a minimum power to full power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.1250–22.5000

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 830. Refer to “:SRATe” on page 843 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:RTIME” on page 822 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RTIME

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:BURSt:SHAPe:RTIME <val>
[ :SOURce ]:RADio:PDC:BURSt:SHAPe:RTIME?
```

This command sets the period of time where the burst increases from a minimum power to full power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.1250–22.5000

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 830.

Refer to “:SRATe” on page 843 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:TIME” on page 821 performs the same function. In compliance with the SCPI standard, both commands are listed.

Refer to the *E4428C/38C ESG User’s Guide* for concept information.

:BURSt:SHAPe[:TYPE]

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:BURSt:SHAPe[:TYPE] SINE| "<file name>"
[ :SOURce ]:RADio:PDC:BURSt:SHAPe[:TYPE]?
```

This command specifies the burst shape as either SINE or a user-defined file (“<file name>”).

SINE This choice selects a state that is defined by the burst rise and fall *RST values, as the default burst shape type.

"<file name>" This choice selects a user designated file from signal generator memory.

***RST** SINE

Key Entry Sine User File

:BURSt[:STATe]

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:BURSt [ :STATe ] ON|OFF|1|0
[ :SOURce ]:RADio:PDC:BURSt [ :STATe ]?
```

This command enables or disables the burst function.

ON (1) This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

OFF (0) This choice enables the transmission of unframed data.

***RST** 0

Key Entry **Data Format Pattern Framed**

:CHANnel

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:CHANnel EVM|ACP
[ :SOURce ]:RADio:PDC:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** EVM

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to “:FILTer” on page 827.

:DATA

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PDC :DATA PN9 | PN11 | PN15 | PN20 | PN23 | FIX4 | "<file_name>" |
EXT | P4 | P8 | P16 | P32 | P64 | PRAM
[ :SOURce ] :RADio :PDC :DATA ?
```

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) for unframed data transmission.

***RST** PN23

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	Ext
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's	PRAM File		

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:DATA:PRAM

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PDC :DATA :PRAM "<file_name>"
[ :SOURce ] :RADio :PDC :DATA :PRAM ?
```

This command selects a pattern RAM (PRAM) file as the pattern data type for the PDC (Personal Digital Cellular) format.

"<file_name>" This variable designates the PRAM file in WFM1. Refer to “File Name Variables” on page 13 for information on the file name syntax.

Key Entry PRAM File

Remarks Selecting this data source forces the burst source to INTERNAL to allow framing control.

The PRAM file must reside in the ESG's volatile memory (WFM1) in order to be accessed by this command. See “:DATA:PRAM:FILE:BLOCK” on page 111.

:DATA:FIX4

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:DATA:FIX4 <val>
```

```
[ :SOURce ]:RADio:PDC:DATA:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the protocols (modulation type, symbol rate, filter, and burst shape) selected for the PDC format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:DEFault

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:DEFault
```

This command returns all of the PDC modulation format parameters to factory settings. It does not affect any other signal generator parameters.

Key Entry Restore PDC Factory Default

:EDATa:DELay

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:EDATa:DELay?
```

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

Remarks When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported E4438C with Option 402

[:SOURCE] :RADio :PDC :EDCLock SYMBOL | NORMal

[:SOURCE] :RADio :PDC :EDCLock?

This command sets the external data clock use.

SYMBOL This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

NORMal This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

***RST** NORM

Key Entry Ext Data Clock Normal Symbol

Remarks Both choices have no effect in internal clock mode. Refer to “:BBCLock” on page 814 to select EXT as the data clock type.

:EREFerence

Supported E4438C with Option 402

[:SOURCE] :RADio :PDC :EREFerence INT | EXT

[:SOURCE] :RADio :PDC :EREFerence?

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Key Entry BBG Ref Ext Int

Remarks If the EXT choice is selected, the external source’s frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, “:EREFerence:VALue” on page 827 to enter the external reference frequency setting.

:EREFerence:VALue

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO :PDC :EREFerence :VALue <val>
[ :SOURCE ] :RADIO :PDC :EREFerence :VALue?
```

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST** +1.30000000E+007

Range 2.5E5–1E8

Key Entry Ext BBG Ref Freq

Remarks The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to “[:EREFerence](#)” on page 826 to select EXT (external source) as the reference for the bit-clock.

:FILTer

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO :PDC :FILTer RNYQuist | NYQuist | GAUSSian | RECTangle |
IS95 | IS95_EQ | IS95_MOD | IS95_MOD_EQ | AC4Fm | UGGaussian | "<user FIR>"
[ :SOURCE ] :RADIO :PDC :FILTer?
```

This command selects the pre-modulation filter type.

IS95 This choice selects a filter that meets the criteria of the IS-95 standard.

IS95_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

IS95_MOD This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.

IS95_MOD_EQ This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.

AC4Fm Selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.

Receiver Test Digital Commands (continued)
PDC Subsystem–Option 402 ([:SOURce]:RADio:PDC)

UGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
"<user FIR>"	This variable is any filter file that you have stored into memory.
*RST	RYNQ
Key Entry	Root Nyquist Nyquist Gaussian Rectangle IS-95 IS-95 w/EQ IS-95 Mod IS-95 Mod w/EQ APCO 25 C4FM UN3/4 GSM Gaussian User FIR
Remarks	Refer to “File Name Variables” on page 13 for information on the file name syntax.

:FRATe

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:FRATe FULL|HALF
[ :SOURce ]:RADio:PDC:FRATe?
```

This command toggles between a full- or half-rate traffic channel.

FULL Selects two equally spaced timeslots of the frame. Since there are six timeslots per frame, timeslots 1, 2, and 3 are paired with timeslots 4, 5, and 6, respectively.

HALF Selects one timeslot of the frame (6 individual timeslots per frame).

***RST** FULL

Key Entry **Rate Full Half**

:IQ:SCALE

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:IQ:SCALE <val>
[ :SOURce ]:RADio:PDC:IQ:SCALE?
```

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST** +100

Range 1–200

Key Entry **I/Q Scaling**

Remarks This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEViation]

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PDC:MODulation:FSK[:DEViation] <val>  
[ :SOURCE ]:RADio:PDC:MODulation:FSK[:DEViation]?
```

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

***RST** +4.00000000E+002

Range 0–2E7

Key Entry Freq Dev

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 830.
Refer to “:SRATe” on page 843 for minimum and maximum symbol rate values.
To set an asymmetric FSK deviation value, refer to the *E4428C/38C ESG Signal Generators User’s Guide* for more information.

:MODulation:MSK[:PHASe]

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PDC:MODulation:MSK[:PHASe] <val>  
[ :SOURCE ]:RADio:PDC:MODulation:MSK[:PHASe]?
```

This command sets the MSK phase deviation value.

The variable <val> is expressed in units of degrees.

***RST** +9.00000000E+001

Range 0–100

Key Entry Phase Dev

:MODulation:UFSK

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PDC:MODulation:UFSK "<file name>"
```

```
[ :SOURCE ]:RADio:PDC:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

Key Entry User FSK

Remarks The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to [“:MODulation\[:TYPE\]” on page 830](#) to change the current modulation type.

Refer to “File Name Variables” on page 13 for information on the file name syntax.

:MODulation:UIQ

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PDC:MODulation:UIQ "<file name>"
```

```
[ :SOURCE ]:RADio:PDC:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

Key Entry User I/Q

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to [“:MODulation\[:TYPE\]” on page 830](#) to change the current modulation type.

Refer to “File Name Variables” on page 13 for information on the file name syntax.

:MODulation[:TYPE]

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PDC:MODulation[ :TYPE ] BPSK | QPSK | IS95QPSK |  
GRAYQPSK | OQPSK | IS95OQPSK | P4DQPSK | PSK8 | PSK16 | D8PSK | MSK |  
FSK2 | FSK4 | FSK8 | FSK16 | C4FM | QAM4 | QAM16 | QAM32 | QAM64 | QAM128 | QAM256 | UIQ | UFSK  
[ :SOURCE ]:RADio:PDC:MODulation[ :TYPE ]?
```

This command sets the modulation type for the PDC personality.

*RST	P4DQPSK							
Key Entry	BPSK	QPSK	IS-95 QPSK	Gray Coded QPSK	OQPSK			
	IS-95 OQPSK	$\pi/4$ DQPSK	8PSK	16PSK	D8PSK	MSK	2-Lvl FSK	
	4-Lvl FSK	8-Lvl FSK	16-Lvl FSK	C4FM	4QAM	16QAM	32QAM	
	64QAM	128QAM	256QAM	User I/Q	User FSK			

:POLarity[:ALL]

Supported E4438C with Option 402

```
[ :SOURCE ] : RADIo : PDC : POLarity [ : ALL ] NORMal | INVerted
[ : SOURCE ] : RADIo : PDC : POLarity [ : ALL ] ?
```

This command sets the rotation direction for of the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Key Entry Phase Polarity Normal Invert

:SECondary:RECall

Supported E4438C with Option 402

```
[ : SOURCE ] : RADIo : PDC : SECondary : RECall
```

This command recalls the secondary frame configuration, overwriting the current state.

Key Entry Recall Secondary Frame State

Remarks To save a secondary frame state, refer to “[:SECondary:SAVE](#)” on page 832.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to “[:SECondary\[:STATE\]](#)” on page 833.

:SECondary:SAVE

Supported E4438C with Option 402

[:SOURce] :RADio:PDC:SECondary:SAVE

This command saves the current frame configuration as the secondary frame with the filename PDC_SECONDARY_FRAME.

Key Entry Save Secondary Frame State

Remarks To recall the secondary frame (saved in non-volatile signal generator memory), refer to “:SECondary:SAVE” on page 832.

:SECondary:TRIGger[:SOURce]

Supported E4438C with Option 402

[:SOURce] :RADio:PDC:SECondary:TRIGger [:SOURce] KEY | EXT | BUS
[:SOURce] :RADio:PDC:SECondary:TRIGger [:SOURce] ?

This command selects the type of triggering for the secondary frame.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to “:TRIGger[:SOURce]:EXTernal[:SOURce]” on page 848.

BUS This choice enables GPIB triggering using the *TRG or GET command or LAN and RS-232 triggering using the *TRG command.

Key Entry Trigger Key Ext Bus

:SECondary[:STATe]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIo:PDC:SECondary[ :STATe] ON|OFF|1|0
[ :SOURCE ] :RADIo:PDC:SECondary[ :STATe] ?
```

This command enables or disables the ability to switch to the secondary frame.

***RST** 0

Key Entry **Secondary Frame Off On**

Remarks A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to “[:SECondary[:STATe]]” on [page 833](#).

:SLOT0|[1]|2|3|4|5:DCUStom

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIo:PDC:SLOT0|[1]|2|3|4|5:DCUStom PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[ :SOURCE ] :RADIo:PDC:SLOT0|[1]|2|3|4|5:DCUStom?
```

This command configures the data field for the selected downlink custom timeslot.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's			

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5:DCUStom:FIX4

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:SLOT0|[1]|2|3|4|5:DCUStom:FIX4 <val>  
[ :SOURce ]:RADio:PDC:SLOT0|[1]|2|3|4|5:DCUStom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type. To change the data type, refer to “:SLOT0|[1]|2|3|4|5:DCUStom” on page 833.

:SLOT0|[1]|2|3|4|5:DTCHannel:CCODE

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel:CCODE <bit_pattern>  
[ :SOURce ]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel:CCODE?
```

This command changes the 8-bit color code (CC). The preset hexadecimal value (when normal preset is selected) for CC reflects the PDC protocol, however you can enter a new value using this command.

***RST** #H00

Range #H00–#HFF

Key Entry CC

:SLOT0|[1]|2|3|4|5:DTCHannel:SACChannel

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel:SACChannel <bit_pattern>  
[ :SOURce ]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel (SACCH). The preset hexadecimal value (when normal preset is selected) for SACCH reflects the PDC protocol, however you can enter a new value by executing this command.

***RST** #H00000

Range #H0–#HFFFFFF

Key Entry SACCH

:SLOT0|[1]|2|3|4|5:DTCHannel:SWORd

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIo:PDC:SLOT0 |[1]|2|3|4|5:DTCHannel:SWORd <bit_pattern>
[ :SOURCE ] :RADIo:PDC:SLOT0 |[1]|2|3|4|5:DTCHannel:SWORd?
```

This command sets the 20-bit synchronization word as the active function. This is used for the control and traffic physical channels.

***RST** #H87A4B

Range #H0–#HFFFFFF

Key Entry SW

:SLOT0|[1]|2|3|4|5:DTCHannel[:TCHannel]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIo:PDC:SLOT0 |[1]|2|3|4|5:DTCHannel[ :TCHannel ] PN9 |
PN11 |PN15 |PN20 |PN23 |FIX4 | "<file name>" |EXT |P4 |P8 |P16 |P32 |P64
[ :SOURCE ] :RADIo:PDC:SLOT0 |[1]|2|3|4|5:DTCHannel[ :TCHannel ]?
```

This command configures the data field for the selected downlink traffic channel field.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's			

Remarks See “File Name Variables” on page 13 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5:DTCHannel[:TCHannel]:FIX4

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel[:TCHannel]:FIX4 <val>  
[ :SOURce ]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel[:TCHannel]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink traffic channel timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4:POWer

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:DLINK:SLOT0|[1]|2|3|4:POWer MAIN|DELTA  
[ :SOURce ]:RADio:PDC:DLINK:SLOT0|[1]|2|3|4:POWer?
```

This command toggles the RF output power level function for the selected timeslot.

MAIN This choice specifies RF output as the main power level.

DELTA This choice specifies RF output as the alternative power level.

***RST** MAIN

Key Entry Timeslot Ampl Main Delta

:SLOT0|[1]|2|3|4|5:STATe

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:SLOT0|[1]|2|3|4|5:STATe ON|OFF|1|0  
[ :SOURce ]:RADio:PDC:SLOT0|[1]|2|3|4|5:STATe?
```

This command enables or disables the operating state of the selected timeslot.

***RST** Timeslot 0: 1 Timeslots 1–5: 0

Key Entry Timeslot Off On

:SLOT0|[1]|2|3|4|5:UCUStom

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio :PDC :SLOT0 |[1]|2|3|4|5 :UCUStom PN9|PN11|PN15|
PN20|PN23|FIX4|" <file name>"|EXT|P4|P8|P16|P32|P64
[:SOURCE]:RADio:PDC:SLOT0|[1]|2|3|4|5:UCUStom?
```

This command configures the data field for the selected uplink custom timeslot.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's			

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5:UCUStom:FIX4

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio :PDC :SLOT0 |[1]|2|3|4|5 :UCUStom:FIX4 <val>
[:SOURCE]:RADio:PDC:SLOT0|[1]|2|3|4|5:UCUStom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4|5:UTCHannel:CCODE

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel:CCODE <bit_pattern>  
[ :SOURCE ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel:CCODE?
```

This command changes the 8-bit color code (CC). The preset hexadecimal value (when normal preset is selected) for CC reflects the PDC protocol, however you can enter a new value using this command.

***RST** #H00

Range #H00–#HFF

Key Entry CC

:SLOT0|[1]|2|3|4|5:UTCHannel:SACChannel

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel:SACChannel <bit_pattern>  
[ :SOURCE ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel (SACCH). The preset hexadecimal value (when normal preset is selected) for SACCH reflects the PDC protocol, however you can enter a new value by executing this command.

***RST** #H0000

Range #H0–#H7FFF

Key Entry SACCH

:SLOT0|[1]|2|3|4|5:UTCHannel:SWORd

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel:SWORd <bit_pattern>  
[ :SOURCE ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel:SWORd?
```

This command sets the 20-bit synchronization word as the active function. This is used for the control and traffic physical channels.

***RST** #H785B4

Range #H0–#HFFFFFF

Key Entry SW

:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel] PN9|
PN11|PN15|PN20|PN23|FIX4| "<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]?
```

This command sets a pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file as the data pattern type for the uplink traffic channel field.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's			

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]:FIX4

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]:FIX4 <val>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink traffic channel timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4|5:UVOX:CCODE

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UVOX:CCODE <bit_pattern>  
[ :SOURCE ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UVOX:CCODE?
```

This command changes the 8-bit color code (CC). The preset hexadecimal value (when normal preset is selected) for CC reflects the PDC protocol, however you can enter a new value using this command.

***RST** #H00

Range #H00–#HFF

Key Entry CC

:SLOT0|[1]|2|3|4|5:UVOX:SACChannel

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UVOX:SACChannel <bit_pattern>  
[ :SOURCE ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UVOX:SACChannel?
```

This command changes the 15-bit slow associated control channel (SACCH). The preset hexadecimal value (when normal preset is selected) for SACCH reflects the PDC protocol, however you can enter a new value by executing this command.

***RST** #H0000

Range #H0–#H7FFF

Key Entry SACCH

:SLOT0|[1]|2|3|4|5:UVOX:SWORD

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UVOX:SWORD <bit_pattern>  
[ :SOURCE ]:RADio:PDC:SLOT0|[1]|2|3|4|5:UVOX:SWORD?
```

This command changes the synchronization word, which is used for slot synchronization, equalizer training, and timeslot identification.

***RST** UTCH & UVOX: 785B4 DTCH: 87A4B

Range #H0–#HFFFFFF

Key Entry SW

Remarks The *RST hexadecimal value reflects the value specified by the indicated standard.

:SLOT0|[1]|2|3|4|5[:TYPE]

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:SLOT0|[1]|2|3|4|5[:TYPE] UCUsTom|DCUsTom|
UTCH|UTCH_ALL|UVOX|DTCH|DTCH_ALL
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5[:TYPE]?
```

This command sets the timeslot type for the selected timeslot.

***RST** UTCH

Key Entry	Up Custom	Down Custom	Up TCH	UP TCH All	Up VOX
	Down TCH	Down TCH All			

:SOUT

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:SOUT FRAME|SLOT|ALL
[:SOURce]:RADio:PDC:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

FRAME This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

SLOT This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

ALL This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

***RST** FRAME

Key Entry	Begin Frame	Begin Timeslot #	All Timeslots
------------------	--------------------	-------------------------	----------------------

:SOUT:OFFSet

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:SOUT:OFFSet <val>  
[ :SOURCE ] :RADio:PDC:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number bits.

***RST** +0

Range –279 to 279

Key Entry Sync Out Offset

Remarks Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to [“:SOUT” on page 841](#).

:SOUT:SLOT

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:SOUT:SLOT <val>  
[ :SOURCE ] :RADio:PDC:SOUT:SLOT?
```

This command selects the timeslot that will trigger a 1-bit signal at the EVENT 1 rear panel connector.

***RST** +0

Range 0–5

Key Entry Begin Timeslot #

Remarks To change the output of the EVENT1 rear panel connector to SLOT, refer to [“:SOUT” on page 841](#).

:SRATe

Supported E4438C with Option 402

[:SOURce]:RADio:PDC:SRATe <val>

[:SOURce]:RADio:PDC:SRATe?

This command sets the transmission symbol rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +2.1000000E+004

Range

Modulation Type	Bits per Symbol	Internal Data	External Serial Data
BPSK	1	1–50 Msps	1–50 Msps
FSK2			
MSK			
C4FM	2	1–50 Msps	1–25 Msps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			
QPSK			
QPSKIS95			
QPSKISAT			
D8PSK			
EDGE			
FSK8			
PSK8			
FSK16	4	1–25 Msps	1–12.5 Msps
PSK16			
QAM16			
QAM32	5	1–20 Msps	1–10 Msps
QAM64	6	1–16.67 Msps	1–8.33 Msps
QAM256	7	1–12.50 Msps	1–6.25 Msps

Key Entry Symbol Rate

Remarks When user-defined filters are selected using the command in section “:FILTer” on page 827, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated as follows:

- Above 12.5 Msps, the FIR length will be truncated to 32 symbols
- Above 25 Msps, the FIR length will be truncated to 16 symbols

This will impact the relative timing of the modulated data, as well as the actual filter response (see “:BRATe” on page 815).

A change in the symbol rate value will affect the value of the bit rate; refer to “:BRATe” on page 815 for a list of minimum and maximum symbol rate values.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 830.

:TRIGger:TYPE

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:TRIGger:TYPE CONTInuous | SINGle | GATE
[ :SOURCE ] :RADio:PDC:TRIGger:TYPE?
```

This command sets the trigger type.

CONTInuous The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to “:TRIGger:TYPE:CONTInuous[:TYPE]” on page 845.

SINGle The framed data sequence plays once for every trigger received.

GATE An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

***RST** CONT

Key Entry Continuous Single Gated

:TRIGger:TYPE:CONTInuous[:TYPE]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:TRIGger:TYPE:CONTInuous[ :TYPE ] FREE | TRIGger | RESet
[ :SOURce ] :RADio:PDC:TRIGger:TYPE:CONTInuous[ :TYPE ] ?
```

This commands selects the waveform’s response to a trigger signal while using the continuous trigger mode.

For more information on triggering and to select the continuous trigger mode, see “[:TRIGger:TYPE](#)” on page 844.

The following list describes the waveform’s response to each of the command choices:

FREE	Turning the ARB format on immediately triggers the waveform. The waveform repeats until you turn the format off, select another trigger, or choose another waveform file.
TRIGger	The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously until you turn the format off, select another trigger, or choose another waveform file.
RESet	The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously. Subsequent triggers reset the waveform to the beginning. For a waveform sequence, this means to the beginning of the first segment in the sequence.
*RST	FREE
Key Entry	Free Run Trigger & Run Reset & Run

:TRIGger:TYPE:GATE:ACTive

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:TRIGger:TYPE:GATE:ACTive LOW|HIGH  
[ :SOURCE ] :RADio:PDC:TRIGger:TYPE:GATE:ACTive?
```

This command selects the active state (gate polarity) of the gate while using the gating trigger mode.

The LOW and HIGH selections correspond to the low and high states of an external trigger signal. For example, when you select HIGH, the active state occurs during the high of the trigger signal. When the active state occurs, the ESG stops the waveform playback at the last played sample point, then restarts the playback at the next sample point when the inactive state occurs. For more information on triggering and to select gating as the trigger mode, see “:TRIGger:TYPE” on page 844.

The following list describes the ESG’s gating behavior for the polarity selections:

LOW The waveform playback stops when the trigger signal goes low (active state) and restarts when the trigger signal goes high (inactive state).

HIGH The waveform playback stops when the trigger signal goes high (active state) and restarts when the trigger signal goes low (inactive state).

*RST HIGH

Key Entry Gate Active Low High

:TRIGger[:SOURCE]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:TRIGger[:SOURCE] KEY|EXT|BUS  
[ :SOURCE ] :RADio:PDC:TRIGger[:SOURCE]?
```

This command sets the trigger source.

For more information on triggering, see “:TRIGger:TYPE” on page 844. The following list describes the command choices:

KEY This choice enables manual triggering by pressing the front-panel **Trigger** hardkey.

EXT An externally applied signal triggers the waveform. This is the only choice that works with gating. The following conditions affect an external trigger:

- The input connector selected for the trigger signal. You have a choice between the rear-panel PATTERN TRIG IN connector or the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. To make the connector selection, see “:TRIGger[:SOURCE]:EXTernal[:SOURCE]” on page 848.

For more information on the connectors and on connecting the cables, see the

ESG User's Guide.

- The trigger signal polarity:
 - gating mode, see “[:TRIGger:TYPE:GATE:ACTive]” on page 846
 - continuous and single modes, see “[:TRIGger[:SOURCE]:EXTernal:SLOPe]” on page 848
- The time delay between when the ESG receives a trigger and when the waveform responds to the trigger. There are two parts to setting the delay:
 - setting the amount of delay, see “[:TRIGger[:SOURCE]:EXTernal:DELay]” on page 847
 - turning the delay on, see “[:TRIGger[:SOURCE]:EXTernal:DELay:STATe]” on page 848

BUS This choice enables triggering over the GPIB or LAN using the *TRG or GET commands or the AUXILIARY INTERFACE (RS-232) using the *TRG command.

***RST** KEY

Key Entry Trigger Key Ext Bus

[:TRIGger[:SOURCE]:EXTernal:DELay

Supported E4438C with Option 402

[:SOURCE] : RADio : PDC : TRIGger [: SOURCE] : EXTernal : DELay <val>

[:SOURCE] : RADio : PDC : TRIGger [: SOURCE] : EXTernal : DELay?

This command sets the number of bits to delay the ESG's response to an external trigger.

The bit delay is a delay between when the ESG receives the trigger and when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the ESG receives the trigger and the set number of delay bits (clocks) occurs, the ESG transmits the data pattern.

The delay occurs after you enable the state. See “[:TRIGger[:SOURCE]:EXTernal:DELay:STATe]” on page 848. You can set the number of bits either before or after enabling the state.

For more information on configuring an external trigger source and to select external as the trigger source, see “[:TRIGger[:SOURCE]]” on page 846.

***RST** +0

Range 0–1048575

Key Entry Ext Delay Bits

:TRIGger[:SOURce]:EXTernal:DELay:STATe

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:TRIGger [ :SOURce ]:EXTernal:DELay:STATe ON|OFF|1|0  
[ :SOURce ]:RADio:PDC:TRIGger [ :SOURce ]:EXTernal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

For setting the delay time, see “:TRIGger[:SOURce]:EXTernal:DELay” on page 847, and for more information on configuring an external source, see “:TRIGger[:SOURce]” on page 846.

***RST** 0

Key Entry Ext Delay Off On

:TRIGger[:SOURce]:EXTernal:SLOPe

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:TRIGger [ :SOURce ]:EXTernal:SLOPe POSitive|NEGative  
[ :SOURce ]:RADio:PDC:TRIGger [ :SOURce ]:EXTernal:SLOPe?
```

This command sets the polarity for an external trigger signal while using the continuous, single triggering mode. To set the polarity for gating, see “:TRIGger:TYPE:GATE:ACTive” on page 846.

The POSitive and NEGative selections correspond to the high (positive) and low (negative) states of the external trigger signal. For example, when you select POSitive, the waveform responds (plays) during the high state of the trigger signal. When the PSG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 846.

***RST** NEG

Key Entry Ext Polarity Neg Pos

:TRIGger[:SOURce]:EXTernal[:SOURce]

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PDC:TRIGger [ :SOURce ]:EXTernal [ :SOURce ] EPT1|EPT2|  
EPTRIGGER1|EPTRIGGER2  
[ :SOURce ]:RADio:PDC:TRIGger [ :SOURce ]:EXTernal [ :SOURce ]?
```

This command selects which PATTERN TRIG IN connection the ESG uses to accept an externally applied trigger signal when external is the trigger source selection.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 846. For more information on the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User’s Guide*.

The following list describes the command choices:

EPT1	This choice is synonymous with EPTRIGGER1 and selects the PATTERN TRIG IN rear-panel connector.
EPT2	This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
EPTRIGGER1	This choice is synonymous with EPT1 and selects the PATTERN TRIG IN rear-panel connector.
EPTRIGGER2	This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
*RST	EPT1
Key Entry	Patt Trig In 1 Patt Trig In 2

[[:STATe]

Supported E4438C with Option 402

[[:SOURce]:RADio:PDC[:STATe] ON|OFF|1|0 [:SOURce]:RADio:PDC[:STATe]?

This command enables or disables the PDC modulation format.

***RST** OFF

Key Entry **PDC Off On**

Remarks Although the PDC modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

PHS Subsystem–Option 402 ([:SOURce]:RADio:PHS)

:ALPha

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :ALPha <val>  
[ :SOURce ] :RADio :PHS :ALPha ?
```

This command changes the Nyquist or root Nyquist filter’s alpha value.

The filter alpha value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +5.00000000E–001

Range 0.000–1.000

Key Entry Filter Alpha

Remarks To change the current filter type, refer to “:FILTer” on page 869.

:BBCLock

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :BBCLock INT[1] | EXT[1]  
[ :SOURce ] :RADio :PHS :BBCLock ?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Key Entry BBG Data Clock Ext Int

Remarks A data clock or continuous symbol sync input must be supplied when external mode is used.

:BBT

Supported E4438C with Option 402

[:SOURce]:RADio:PHS:BBT <val>

[:SOURce]:RADio:PHS:BBT?

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +5.00000000E–001

Range 0.100–1.000

Key Entry Filter BbT

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to “:FILTer” on page 869.

:BRATe

Supported E4438C with Option 402

[:SOURce]:RADio:PHS:BRATe <val>

[:SOURce]:RADio:PHS:BRATe?

This command sets the bit rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +3.84000000E+005

Range	Modulation Type	Bits per Symbol	Internal Data	External Serial Data
	BPSK	1	1–50 Mbps	1–50 Mbps
	FSK2			
	MSK			
	C4FM	2	2–100 Mbps	2–50 Mbps
	FSK4			
	OQPSK			
	OQPSK195			
	P4QPPSK			
	QAM4			

Receiver Test Digital Commands (continued)
PHS Subsystem–Option 402 ([:SOURce]:RADio:PHS)

Range

Modulation Type	Bits per Symbol	Internal Data	External Serial Data
QPSK	2	2–100 Mbps	2–50 Mbps
QPSKIS95			
QPSKISAT			
D8PSK	3	3–100 Mbps	3–50 Mbps
EDGE			
FSK8			
PSK8			
FSK16	4	4–100 Mbps	4–50 Mbps
PSK16			
QAM16			
QAM32	5	5–100 Mbps	5–50 Mbps
QAM64	6	6–100 Mbps	6–50 Mbps
QAM256	7	8–100 Mbps	8–50 Mbps

Key Entry

Symbol Rate

Remarks

When user-defined filters are selected using the command in section “:FILTer” on page 869, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated and will impact the relative timing of the modulated data, as well as the actual filter response (see “:SRATe” on page 877).

A change in the bit rate value will affect the symbol rate value; refer to “:SRATe” on page 877 for a list of the minimum and maximum symbol rate values.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 873.

:BURSt:PN9

Supported

E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :BURSt :PN9 NORMAl | QUICk
[ :SOURce ] :RADio :PHS :BURSt :PN9 ?
```

This command controls the software PN9 generation.

NORMAl This choice produces a maximum length PN9 sequence.

QUICk This choice produces a truncated PN9 sequence.

*RST	NORM
Key Entry	PN9 Mode Normal Quick
Remarks	Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

:BURSt:SCRamble:SEED

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :BURSt :SCRamble :SEED <16-bit val>  
[ :SOURce ] :RADio :PHS :BURSt :SCRamble :SEED?
```

This command select a 16-bit scramble seed value for scrambling.

*RST	#H3FF
Range	#H0–#H3FF
Key Entry	Scramble Seed
Remarks	Although values may be set using this command, it does not active that scramble function. To enable the scrambling function, refer to “:BURSt:SCRamble[:STATe]” on page 853 .

:BURSt:SCRamble[:STATe]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :BURSt :SCRamble [ :STATe ] ON | OFF | 1 | 0  
[ :SOURce ] :RADio :PHS :BURSt :SCRamble [ :STATe ] ?
```

This command enables or disables the operating state of the scramble function.

ON (1)	This choice scrambles data on the related fields, using the seed setting.
OFF (0)	This choice disables the scramble function.

*RST	0
Key Entry	Scramble Off On
Remarks	To set the seed setting, refer to “:BURSt:SCRamble:SEED” on page 853 .

:BURSt:SHAPe:FALL:DELay

Supported E4438C with Option 402

[:SOURce] :RADio:PHS: BURSt :SHAPe :FALL :DELay <val>

[:SOURce] :RADio:PHS: BURSt :SHAPe :FALL :DELay?

This command sets the burst shape fall delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –22.1250 to 99

Key Entry Fall Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 873. Refer to “:SRATe” on page 877 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FDELay” on page 855 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FALL:TIME

Supported E4438C with Option 402

[:SOURce] :RADio:PHS: BURSt :SHAPe :FALL :TIME <val>

[:SOURce] :RADio:PHS: BURSt :SHAPe :FALL :TIME?

This command sets the burst shape fall time.

The variable <val> is expressed in bits.

***RST** +4.00000000E+001

Range 0.1250–255.8750

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 873.

Refer to “:SRATe” on page 877 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FTIME” on page 856 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FDElay

Supported E4438C with Option 402

[:SOURce] :RADio:PHS:BURSt:SHAPe:FDElay <val>

[:SOURce] :RADio:PHS:BURSt:SHAPe:FDElay?

This command sets the burst shape fall delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –22.1250 to 99

Key Entry Fall Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 873. Refer to “:SRATe” on page 877 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:DElay” on page 854 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FTIME

Supported E4438C with Option 402

[:SOURce] :RADio:PHS: BURSt: SHAPe: FTIME <val>

[:SOURce] :RADio:PHS: BURSt: SHAPe: FTIME?

This command sets the burst shape fall time.

The variable <val> is expressed in bits.

***RST** +4.00000000E+001

Range 0.1250–255.8750

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 873. Refer to “:SRATe” on page 877 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:TIME” on page 854 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RDELay

Supported E4438C with Option 402

[:SOURce] :RADio:PHS: BURSt: SHAPe: RDELay <val>

[:SOURce] :RADio:PHS: BURSt: SHAPe: RDELay?

This command sets the burst shape rise delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –18.1250 to 99

Key Entry Rise Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 873. Refer to “:SRATE” on page 877 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:DELay” on page 857 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RISE:DELay

Supported E4438C with Option 402

[:SOURce] :RADio:PHS:BURSt:SHAPe:RISE:DELay <val>

[:SOURce] :RADio:PHS:BURSt:SHAPe:RISE:DELay?

This command sets the burst shape rise delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –18.1250 to 99

Key Entry Rise Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 873. Refer to “:SRATE” on page 877 for minimum and maximum symbol rate values.

“:BURSt:SHAPe:RDELay” on page 856 performs the same function; in compliance with the SCPI standard, both commands are listed.

See the *E4428C/38C ESG User’s Guide* for concept information.

:BURSt:SHAPe:RISE:TIME

Supported E4438C with Option 402

[:SOURce] :RADio:PHS:BURSt:SHAPe:RISE:TIME <val>

[:SOURce] :RADio:PHS:BURSt:SHAPe:RISE:TIME?

This command sets the burst shape rise time. The variable <val> is expressed in bits.

***RST** +4.00000000E+001

Range 0.1250–22.500

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 873. Refer to “:SRATe” on page 877 for a list of the minimum and maximum symbol rate values. The command “:BURSt:SHAPe:RTIME” on page 858 performs the same function. See the *E4428C/38C ESG User’s Guide* for more information.

:BURSt:SHAPe:RTIME

Supported E4438C with Option 402

[:SOURce] :RADio:PHS:BURSt:SHAPe:RTIME <val>

[:SOURce] :RADio:PHS:BURSt:SHAPe:RTIME?

This command sets the burst shape rise time. The variable <val> is expressed in bits.

***RST** +4.00000000E+001

Range 0.1250–22.500

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 873. Refer to “:SRATe” on page 877 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:TIME” on page 858 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe[:TYPE]

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PHS:BURSt:SHAPe[:TYPE] SINE| "<file name>"  
[:SOURce]:RADio:PHS:BURSt:SHAPe[:TYPE]?
```

This command specifies the burst shape as either SINE or a user-defined file ("<file name>").

SINE This choice selects a state that is defined by the burst rise and fall *RST values, as the default burst shape type.

"<file name>" This choice selects a user designated file from signal generator memory (non-volatile).

***RST** SINE

Key Entry Sine User File

:BURSt[:STATe]

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PHS:BURSt[:STATe] ON|OFF|1|0  
[:SOURce]:RADio:PHS:BURSt[:STATe]?
```

This command enables or disables the burst function.

ON (1) This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

OFF (0) This choice enables the transmission of unframed data.

***RST** 0

Key Entry Data Format Pattern Framed

:CHANnel

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :CHANnel EVM | ACP
[ :SOURce ] :RADio :PHS :CHANnel ?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** EVM

Key Entry Optimize FIR For EVM ACP

Remarks To change the current filter type, refer to “:FILTer” on page 869.

:DATA

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :DATA PN9 | PN11 | PN15 | PN20 | PN23 | FIX4 |
"<file name>" | EXT | P4 | P8 | P16 | P32 | P64 | PRAM
[ :SOURce ] :RADio :PHS :DATA ?
```

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1’s and 0’s, data from an external source, or a user file) for unframed data transmission.

***RST** PN23

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	Ext
	4 1’s & 4 0’s	8 1’s & 8 0’s	16 1’s & 16 0’s	32 1’s & 32 0’s	64 1’s & 64 0’s	PRAM File		

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:DATA:PRAM

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PHS:DATA:PRAM "<file_name>"
```

```
[ :SOURce ]:RADio:PHS:DATA:PRAM?
```

This command selects a pattern RAM (PRAM) file as the pattern data type for the PHS (Personal Handy-phone System) format.

"<file_name>" This variable designates the PRAM file in WFM1. Refer to “File Name Variables” on page 13 for information on the file name syntax.

Key Entry PRAM File

Remarks Selecting this data source forces the burst source to INTERNAL to allow framing control.

The PRAM file must reside in the signal generator’s volatile memory (WFM1) in order to be accessed by this command. For more information on PRAM files, refer to “:DATA:PRAM:FILE:BLOCK” on page 111.

:DATA:FIX4

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PHS:DATA:FIX4 <val>
```

```
[ :SOURce ]:RADio:PHS:DATA:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the protocols (modulation type, symbol rate, filter, and burst shape) selected for the PHS format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:DEFault

Supported E4438C with Option 402

[:SOURce] :RADio :PHS :DEFault

This command returns all of the PHS modulation format parameters to factory settings. It does not affect any other signal generator parameters.

Key Entry Restore PHS Factory Default

:DLINK:SLOT[1] | 2 | 3 | 4:CUSTom

Supported E4438C with Option 402

[:SOURce] :RADio :PHS :DLINK :SLOT [1] | 2 | 3 | 4 :CUSTom PN9 | PN11 | PN15 | PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
 [:SOURce] :RADio :PHS :DLINK :SLOT [1] | 2 | 3 | 4 :CUSTom?

This command configures the data field for the selected downlink custom timeslot.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's		8 1's & 8 0's		16 1's & 16 0's		32 1's & 32 0's	
	64 1's & 64 0's							

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:DLINK:SLOT[1] | 2 | 3 | 4:CUSTom:FIX4

Supported E4438C with Option 402

[:SOURce] :RADio :PHS :DLINK :SLOT [1] | 2 | 3 | 4 :CUSTom :FIX4 <val>
 [:SOURce] :RADio :PHS :DLINK :SLOT [1] | 2 | 3 | 4 :CUSTom :FIX4?

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:DLINK:SLOT[1] | 2 | 3 | 4:POWer

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :DLINK :SLOT [ 1 ] | 2 | 3 | 4 :POWer MAIN | DELTa  
[ :SOURce ] :RADio :PHS :DLINK :SLOT [ 1 ] | 2 | 3 | 4 :POWer?
```

This command toggles the RF output power level function for the selected timeslot.

MAIN This choice specifies RF output as the main power level.

DELTA This choice specifies RF output as the alternative power level.

***RST** MAIN

Key Entry Timeslot Ampl Main Delta

:DLINK:SLOT[1] | 2 | 3 | 4:SCHannel:CSID

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :DLINK :SLOT [ 1 ] | 2 | 3 | 4 :SCHannel :CSID <bit_pattern>  
[ :SOURce ] :RADio :PHS :DLINK :SLOT [ 1 ] | 2 | 3 | 4 :SCHannel :CSID?
```

This command changes the 42-bit cell station identification code (CSID) field of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for CSID reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H20200020001

Range #H0–#H3FFFFFFFF

Key Entry CSID

:DLINK:SLOT[1] | 2 | 3 | 4:SCHannel:IDLE

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :DLINK :SLOT [ 1 ] | 2 | 3 | 4 :SCHannel :IDLE <bit_pattern>  
[ :SOURce ] :RADio :PHS :DLINK :SLOT [ 1 ] | 2 | 3 | 4 :SCHannel :IDLE?
```

This command changes the 34-bit idle (IDLE) field of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for IDLE reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H000000000

Range #H0–#H3FFFFFFFF

Key Entry IDLE

:DLINK:SLOT[1] | 2 | 3 | 4:SCHannel:PSID

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:DLINK:SLOT[1] | 2 | 3 | 4:SCHannel:PSID <bit_pattern>  
[ :SOURCE ] :RADio:PHS:DLINK:SLOT[1] | 2 | 3 | 4:SCHannel:PSID?
```

This command changes the 28-bit personal station identification code (PSID) field in the synchronization channel of the selected downlink timeslot. The normal preset hexadecimal value for PSID reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H0000001

Range #H0–#H3FFFFFFF

Key Entry PSID

:DLINK:SLOT[1] | 2 | 3 | 4:SCHannel:UWORD

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:DLINK:SLOT[1] | 2 | 3 | 4:SCHannel:UWORD <bit_pattern>  
[ :SOURCE ] :RADio:PHS:DLINK:SLOT[1] | 2 | 3 | 4:SCHannel:UWORD?
```

This command changes the unique word (UW) field of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for UW reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H50EF2993

Range #H0–#HFFFFFFF

Key Entry UW

:DLINK:SLOT[1] | 2 | 3 | 4:STATe

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:DLINK:SLOT[1] | 2 | 3 | 4:STATe ON|OFF|1|0  
[ :SOURCE ] :RADio:PHS:DLINK:SLOT[1] | 2 | 3 | 4:STATe?
```

This command enables or disables the operating state of the selected downlink timeslot.

***RST** Timeslot 1: 1 *Timeslots 2–4: 0*

Key Entry Timeslot Off On

:DLINK:SLOT[1] | 2 | 3 | 4:TCHannel:SACChannel

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PHS:DLINK:SLOT[1] | 2 | 3 | 4:TCHannel:SACChannel  
<bit_pattern>  
[ :SOURCE ]:RADio:PHS:DLINK:SLOT[1] | 2 | 3 | 4:TCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for SACCH reflects the value specified by the standard.

***RST** #H8000
Range #H0–#HFFFF
Key Entry SA

:DLINK:SLOT[1] | 2 | 3 | 4:TCHannel:UWORD

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PHS:DLINK:SLOT[1] | 2 | 3 | 4:TCHannel:UWORD <bit_pattern>  
[ :SOURCE ]:RADio:PHS:DLINK:SLOT[1] | 2 | 3 | 4:TCHannel:UWORD?
```

This command changes the unique word (UW) field of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for UW reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H3D4C
Range #H0–#HFFFF
Key Entry UW

:DLINK:SLOT[1] | 2 | 3 | 4:TCHannel[:TCHannel]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :DLINK :SLOT [ 1 ] | 2 | 3 | 4 :TCHannel  
[ :TCHannel ] PN9 | PN11 | PN15 | PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 |  
P64  
[ :SOURce ] :RADio :PHS :DLINK :SLOT [ 1 ] | 2 | 3 | 4 :TCHannel [ :TCHannel ] ?
```

This command customizes the selected downlink traffic channel timeslot.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's			

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:DLINK:SLOT[1] | 2 | 3 | 4:TCHannel[:TCHannel]:FIX4

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :DLINK :SLOT [ 1 ] | 2 | 3 | 4 :TCHannel [ :TCHannel ] :FIX4 <val>  
[ :SOURce ] :RADio :PHS :DLINK :SLOT [ 1 ] | 2 | 3 | 4 :TCHannel [ :TCHannel ] :FIX4 ?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink traffic channel timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type. To change the data type, refer to “:DLINK:SLOT[1]|2|3|4:TCHannel[:TCHannel]” on page 866.

:DLINK:SLOT[1] | 2 | 3 | 4[:TYPE]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO :PHS :DLINK :SLOT [ 1 ] | 2 | 3 | 4 [ :TYPE ]  CUSTom | TCH | TCH_ALL | SYNC
[ :SOURCE ] :RADIO :PHS :DLINK :SLOT [ 1 ] | 2 | 3 | 4 [ :TYPE ] ?
```

This command sets the downlink timeslot type for the selected timeslot.

***RST** Timeslot 1: TCH Timeslots 2–4: CUST

Key Entry Custom TCH TCH All SYNC

:EDATa:DELAy

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO :PHS :EDATa :DELAy ?
```

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

Remarks When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO :PHS :EDCLock  SYMBol | NORMal
[ :SOURCE ] :RADIO :PHS :EDCLock ?
```

This command sets the external data clock use.

SYMBol This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

NORMal This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

***RST** NORM

Key Entry Ext Data Clock Normal Symbol

Remarks Both choices have no effect in internal clock mode. Refer to “[:BBCLock](#)” on [page 850](#) to select EXT as the data clock type.

:EREFerence

Supported E4438C with Option 402

[:SOURce]:RADio:PHS:EREFerence INT|EXT

[:SOURce]:RADio:PHS:EREFerence?

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Key Entry BBG Ref Ext Int

Remarks If the EXT choice is selected, the external source's frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, “:EREFerence:VALue” on page 868 to enter the external reference frequency setting.

:EREFerence:VALue

Supported E4438C with Option 402

[:SOURce]:RADio:PHS:EREFerence:VALue <val>

[:SOURce]:RADio:PHS:EREFerence:VALue?

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST** +1.30000000E+007

Range 2.5E5–1E8

Key Entry Ext BBG Ref Freq

Remarks The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to “:EREFerence” on page 868 to select EXT (external source) as the reference for the bit-clock.

:FILTER

Supported E4438C with Option 402

```
[ :SOURCE ]:RADIO:PHS:FILTER RNYquist|NYquist|GAUSSian|RECTangle|
IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURCE]:RADIO:PHS:FILTER?
```

This command selects the pre-modulation filter type.

- IS95 This choice selects a filter that meets the criteria of the IS-95 standard.
- IS95_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
- IS95_MOD This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
- IS95_MOD_EQ This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
- AC4Fm This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
- UGGaussian This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
- "<user FIR>" This variable is any filter file that you have stored into memory.

***RST** RNYQ

Key Entry

Root Nyquist	Nyquist	Gaussian	Rectangle	IS-95	IS-95 w/EQ
IS-95 Mod	IS-95 Mod w/EQ	APCO 25 C4FM	UN3/4	GSM	Gaussian
User FIR					

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:IQ:SCALe

Supported E4438C with Option 402

[:SOURce] :RADio :PHS :IQ :SCALe <val>

[:SOURce] :RADio :PHS :IQ :SCALe?

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST** +100

Range 1–200

Key Entry I/Q Scaling

Remarks This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEViation]

Supported E4438C with Option 402

[:SOURce] :RADio :PHS :MODulation :FSK [:DEViation] <val>

[:SOURce] :RADio :PHS :MODulation :FSK [:DEViation]?

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

***RST** +4.00000000E+002

Range 0–2E7

Key Entry Freq Dev

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 873.

Refer to “:SRATE” on page 877 for a list of the minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *E4428C/38C ESG Signal Generators User’s Guide* for more information.

:MODulation:MSK[:PHASe]

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PHS:MODulation:MSK[ :PHASe ] <val>  
[ :SOURce ]:RADio:PHS:MODulation:MSK[ :PHASe ]?
```

This command sets the MSK phase deviation value. The variable <val> is in units of degrees.

***RST** +9.00000000E+001

Range 0–100

Key Entry Phase Dev

:MODulation:UFSK

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PHS:MODulation:UFSK "<file name>"  
[ :SOURce ]:RADio:PHS:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

Key Entry User FSK

Remarks The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to [“:MODulation\[:TYPE\]” on page 873](#) to change the current modulation type.

Refer to “File Name Variables” on page 13 for information on the file name syntax.

:MODulation:UIQ

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PHS:MODulation:UIQ "<file name>"  
[ :SOURce ]:RADio:PHS:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

Key Entry User I/Q

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to [“:MODulation\[:TYPE\]” on page 873](#) to change the current modulation type.

Refer to “File Name Variables” on page 13 for information on the file name syntax.

:MODulation[:TYPE]

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PHS:MODulation[ :TYPE ] BPSK | QPSK | IS95QPSK |
GRAYQPSK | OQPSK | IS95OQPSK | P4DQPSK | PSK8 | PSK16 | D8PSK | MSK | FSK2 | FSK4 |
FSK8 | FSK16 | C4FM | QAM4 | QAM16 | QAM32 | QAM64 | QAM128 | QAM256 | UIQ | UFSK
[ :SOURCE ]:RADio:PHS:MODulation[ :TYPE ]?
```

This command sets the modulation type for the PHS personality.

***RST** P4DQPSK

Key Entry	BPSK	QPSK	IS-95 QPSK	Gray Coded QPSK	OQPSK			
	IS-95 OQPSK	$\pi/4$ DQPSK	8PSK	16PSK	D8PSK	MSK	2-Lvl FSK	
	4-Lvl FSK	8-Lvl FSK	16-Lvl FSK	C4FM	4QAM	16QAM	32QAM	
	64QAM	128QAM	256QAM	User I/Q	User FSK			

:POLarity[:ALL]

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PHS:POLarity[ :ALL ] NORMal | INVerted
[ :SOURCE ]:RADio:PHS:POLarity[ :ALL ]?
```

This command sets the rotation direction of the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Key Entry Phase Polarity Normal Invert

:SECondary:RECall

Supported E4438C with Option 402

[:SOURCE] :RADio:PHS:SECondary:RECall

This command recalls the secondary frame configuration, overwriting the current state.

Key Entry Recall Secondary Frame State

Remarks To save a secondary frame state, refer to “:SECondary:SAVE” on page 874.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to “:SECondary[:STATE]” on page 875.

:SECondary:SAVE

Supported E4438C with Option 402

[:SOURCE] :RADio:PHS:SECondary:SAVE

This command saves the current frame configuration as the secondary frame with the filename PHS_SECONDARY_FRAME.

Key Entry Save Secondary Frame State

Remarks To recall the secondary frame (saved in non-volatile signal generator memory), refer to “:SECondary:RECall” on page 874.

:SECondary:TRIGger[:SOURCE]

Supported E4438C with Option 402

[:SOURCE] :RADio:PHS:SECondary:TRIGger [:SOURCE] KEY | EXT | BUS
[:SOURCE] :RADio:PHS:SECondary:TRIGger [:SOURCE] ?

This command selects the type of triggering for the secondary frame.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to “:TRIGger[:SOURCE]:EXTErnal[:SOURCE]” on page 882.

BUS This choice enables GPIB triggering using the *TRG or GET command or LAN and RS-232 triggering using the *TRG command.

Key Entry Trigger Key Ext Bus

:SECondary[:STATe]

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PHS:SECondary[ :STATe ] ON|OFF|1|0
[ :SOURCE ]:RADio:PHS:SECondary[ :STATe ]?
```

This command enables or disables the ability to switch to the secondary frame.

***RST** 0

Key Entry **Secondary Frame Off On**

Remarks A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to “[\[:SECondary:SAVE\]](#)” on [page 874](#).

:SOUT

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:PHS:SOUT FRAME|SLOT|ALL
[ :SOURCE ]:RADio:PHS:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

FRAME This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

SLOT This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

ALL This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

***RST** FRAME

Choices FRAME SLOT ALL

:SOUT:OFFSet

Supported E4438C with Option 402

[:SOURCE] :RADio:PHS:SOUT:OFFSet <val>

[:SOURCE] :RADio:PHS:SOUT:OFFSet?

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number of bits.

***RST** +0

Range –239 to 239

Key Entry Sync Out Offset

Remarks Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to [“:SOUT” on page 875](#).

:SOUT:SLOT

Supported E4438C with Option 402

[:SOURCE] :RADio:PHS:SOUT:SLOT <val>

[:SOURCE] :RADio:PHS:SOUT:SLOT?

This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.

***RST** +0

Range 1–4

Key Entry Begin Timeslot #

Remarks To change the output of the EVENT1 rear panel connector to SLOT, refer to [“:SOUT” on page 875](#).

:SRATe

Supported E4438C with Option 402

[:SOURce]:RADio:PHS:SRATe <val>

[:SOURce]:RADio:PHS:SRATe?

This command sets the transmission symbol rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +1.92000000E+005

Range

Modulation Type	Bits per Symbol	Internal Data	External Serial Data
BPSK	1	1–50 Msps	1–50 Msps
FSK2			
MSK			
C4FM	2	1–50 Msps	1–25 Msps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			
QPSK			
QPSKIS95			
QPSKISAT			
D8PSK			
EDGE			
FSK8			
PSK8			
FSK16	4	1–25 Msps	1–12.5 Msps
PSK16			
QAM16			
QAM32	5	1–20 Msps	1–10 Msps
QAM64	6	1–16.67 Msps	1–8.33 Msps
QAM256	7	1–12.50 Msps	1–6.25 Msps

Key Entry

Symbol Rate

Remarks When user-defined filters are selected using the command in section “:FILTer” on page 869, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated as follows:

- Above 12.5 Msps, the FIR length will be truncated to 32 symbols
- Above 25 Msps, the FIR length will be truncated to 16 symbols

This will impact the relative timing of the modulated data, as well as the actual filter response (see “:BRATe” on page 851).

A change in the symbol rate value will affect the bit rate value; refer to “:BRATe” on page 851 for a list of the minimum and maximum symbol rate values.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 873.

:TRIGger:TYPE

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:TRIGger:TYPE CONTinuous | SINGle | GATE
[ :SOURCE ] :RADio:PHS:TRIGger:TYPE?
```

This command sets the trigger type.

CONTinuous The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to “:TRIGger:TYPE:CONTinuous[:TYPE]” on page 879.

SINGle The framed data sequence plays once for every trigger received.

GATE An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

***RST** CONT

Key Entry Continuous Single Gated

:TRIGger:TYPE:CONTInuous[:TYPE]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:TRIGger:TYPE:CONTInuous[ :TYPE ] FREE | TRIGger | RESet
[ :SOURce ] :RADio:PHS:TRIGger:TYPE:CONTInuous[ :TYPE ] ?
```

This commands selects the waveform’s response to a trigger signal while using the continuous trigger mode.

For more information on triggering and to select the continuous trigger mode, see “[:TRIGger:TYPE](#)” on page 878.

The following list describes the waveform’s response to each of the command choices:

FREE	Turning the ARB format on immediately triggers the waveform. The waveform repeats until you turn the format off, select another trigger, or choose another waveform file.
TRIGger	The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously until you turn the format off, select another trigger, or choose another waveform file.
RESet	The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously. Subsequent triggers reset the waveform to the beginning. For a waveform sequence, this means to the beginning of the first segment in the sequence.
*RST	FREE
Key Entry	Free Run Trigger & Run Reset & Run

:TRIGger:TYPE:GATE:ACTive

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:TRIGger:TYPE:GATE:ACTive LOW|HIGH  
[ :SOURce ] :RADio:PHS:TRIGger:TYPE:GATE:ACTive?
```

This command selects the active state (gate polarity) of the gate while using the gating trigger mode.

The LOW and HIGH selections correspond to the low and high states of an external trigger signal. For example, when you select HIGH, the active state occurs during the high of the trigger signal. When the active state occurs, the ESG stops the waveform playback at the last played sample point, then restarts the playback at the next sample point when the inactive state occurs. For more information on triggering and to select gating as the trigger mode, see “:TRIGger:TYPE” on page 878.

The following list describes the ESG’s gating behavior for the polarity selections:

LOW	The waveform playback stops when the trigger signal goes low (active state) and restarts when the trigger signal goes high (inactive state).
HIGH	The waveform playback stops when the trigger signal goes high (active state) and restarts when the trigger signal goes low (inactive state).
*RST	HIGH
Key Entry	Gate Active Low High

:TRIGger[:SOURce]:EXTErnal:DELAy

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:TRIGger[:SOURce]:EXTErnal:DELAy <val>  
[ :SOURce ] :RADio:PHS:TRIGger[:SOURce]:EXTErnal:DELAy?
```

This command sets the number of bits to delay the ESG’s response to an external trigger.

The bit delay is a delay between when the ESG receives the trigger and when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the ESG receives the trigger and the set number of delay bits (clocks) occurs, the ESG transmits the data pattern.

The delay occurs after you enable the state. See “:TRIGger[:SOURce]:EXTErnal:DELAy:STATE” on page 881. You can set the number of bits either before or after enabling the state.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 882.

*RST	+0
Range	0–1048575
Key Entry	Ext Delay Bits

:TRIGger[:SOURce]:EXTErnal:DELay:STATe

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:TRIGger [ :SOURce ] :EXTErnal:DELay:STATe ON|OFF|1|0  
[ :SOURce ] :RADio:PHS:TRIGger [ :SOURce ] :EXTErnal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

For setting the delay time, see “:TRIGger[:SOURce]:EXTErnal:DELay” on page 880, and for more information on configuring an external source, see “:TRIGger[:SOURce]” on page 882.

***RST** 0

Key Entry Ext Delay Off On

:TRIGger[:SOURce]:EXTErnal:SLOPe

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:TRIGger [ :SOURce ] :EXTErnal:SLOPe POSitive|NEGative  
[ :SOURce ] :RADio:PHS:TRIGger [ :SOURce ] :EXTErnal:SLOPe?
```

This command sets the polarity for an external trigger signal while using the continuous, single triggering mode. To set the polarity for gating, see “:TRIGger:TYPE:GATE:ACTive” on page 880.

The POSitive and NEGative selections correspond to the high (positive) and low (negative) states of the external trigger signal. For example, when you select POSitive, the waveform responds (plays) during the high state of the trigger signal. When the PSG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 882.

***RST** NEG

Key Entry Ext Polarity Neg Pos

:TRIGger[:SOURCE]:EXTernal[:SOURCE]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:TRIGger [ :SOURCE ] :EXTernal [ :SOURCE ] EPT1 |  
EPT2 | EPTRIGGER1 | EPTRIGGER2  
[ :SOURCE ] :RADio:PHS:TRIGger [ :SOURCE ] :EXTernal [ :SOURCE ] ?
```

This command selects which PATTERN TRIG IN connection the ESG uses to accept an externally applied trigger signal when external is the trigger source selection.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURCE]” on page 882. For more information on the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User’s Guide*.

The following list describes the command choices:

EPT1	This choice is synonymous with EPTRIGGER1 and selects the PATTERN TRIG IN rear-panel connector.
EPT2	This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
EPTRIGGER1	This choice is synonymous with EPT1 and selects the PATTERN TRIG IN rear-panel connector.
EPTRIGGER2	This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
*RST	EPT1
Key Entry	Patt Trig In 1 Patt Trig In 2

:TRIGger[:SOURCE]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:TRIGger [ :SOURCE ] KEY | EXT | BUS  
[ :SOURCE ] :RADio:PHS:TRIGger [ :SOURCE ] ?
```

This command sets the trigger source.

For more information on triggering, see “:TRIGger:TYPE” on page 878. The following list describes the command choices:

KEY	This choice enables manual triggering by pressing the front-panel Trigger hardkey.
EXT	An externally applied signal triggers the waveform. This is the only choice that works with gating. The following conditions affect an external trigger:

- The input connector selected for the trigger signal. You have a choice between the rear-panel PATTERN TRIG IN connector or the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. To make the connector selection, see “:TRIGger[:SOURce]:EXTErnal[:SOURce]” on page 882.

For more information on the connectors and on connecting the cables, see the *ESG User’s Guide*.

- The trigger signal polarity:
 - gating mode, see “:TRIGger:TYPE:GATE:ACTive” on page 880
 - continuous and single modes, see “:TRIGger[:SOURce]:EXTErnal[:SOURce]” on page 882
- The time delay between when the ESG receives a trigger and when the waveform responds to the trigger. There are two parts to setting the delay:
 - setting the amount of delay, see “:TRIGger[:SOURce]:EXTErnal:DELay” on page 880
 - turning the delay on, see “:TRIGger[:SOURce]:EXTErnal:DELay:STATe” on page 881

BUS This choice enables triggering over the GPIB or LAN using the *TRG or GET commands or the AUXILIARY INTERFACE (RS-232) using the *TRG command.

***RST** KEY
Key Entry Trigger Key Ext Bus

:ULINK:SLOT[1] | 2 | 3 | 4:CUSTom

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT[ 1 ] | 2 | 3 | 4 :CUSTom PN9 | PN11 | PN15 |
PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[ :SOURce ] :RADio:PHS:ULINK:SLOT[ 1 ] | 2 | 3 | 4 :CUSTom?
```

This command configures the data field for the selected uplink custom timeslot.

***RST** PN9

Key Entry

PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
4 1's & 4 0's		8 1's & 8 0's		16 1's & 16 0's		32 1's & 32 0's	
64 1's & 64 0's							

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:ULINK:SLOT[1] | 2 | 3 | 4:CUSTom:FIX4

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:CUSTom:FIX4 <val>  
[ :SOURce ] :RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:CUSTom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:ULINK:SLOT[1] | 2 | 3 | 4:POWer

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:POWer MAIN|DELTA  
[ :SOURce ] :RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:POWer?
```

This command toggles the RF output power level function for the selected timeslot.

MAIN This choice specifies RF output as the main power level.

DELTA This choice specifies RF output as the alternative power level.

***RST** MAIN

Key Entry Timeslot Ampl Main Delta

:ULINK:SLOT[1] | 2 | 3 | 4:SCHannel:CSID

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:SCHannel:CSID <bit_pattern>  
[ :SOURce ] :RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:SCHannel:CSID?
```

This command changes the 42-bit cell station identification code (CSID) field of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for CSID reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H20200020001

Range #H0–#H3FFFFFFFFF

Key Entry CSID

:ULINK:SLOT[1] | 2 | 3 | 4:SCHannel:IDLE

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:SCHannel:IDLE <bit_pattern>  
[ :SOURce ] :RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:SCHannel:IDLE?
```

This command changes the 34-bit idle (IDLE) field of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for IDLE reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H00000000

Range #H0–#H3FFFFFFFF

Key Entry IDLE

:ULINK:SLOT[1] | 2 | 3 | 4:SCHannel:PSID

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:SCHannel:PSID <bit_pattern>  
[ :SOURce ] :RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:SCHannel:PSID?
```

This command changes the 28-bit personal station identification code (PSID) field in the synchronization channel of the selected uplink timeslot. The preset (normal) hexadecimal value for PSID reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H0000001

Range #H0–#H3FFFFFFFF

Key Entry PSID

:ULINK:SLOT[1] | 2 | 3 | 4:SCHannel:UWORD

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:SCHannel:UWORD <bit_pattern>  
[ :SOURce ] :RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:SCHannel:UWORD?
```

This command changes the unique word (UW) field of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for UW reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H050EF2993

Range #H0–#H0FFFFFFFF

Key Entry UW

:ULINK:SLOT[1] | 2 | 3 | 4:STATe

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:STATe ON|OFF | 1 | 0  
[ :SOURce ]:RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:STATe?
```

This command enables or disables the operating state of the selected uplink timeslot.

***RST** Timeslot 1: 1 Timeslots 2–4: 0

Key Entry Timeslot Off On

:ULINK:SLOT[1] | 2 | 3 | 4:TCHannel:SACChannel

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:TCHannel:SACChannel  
<bit_pattern>  
[ :SOURce ]:RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:TCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for SACCH reflects the value specified by the standard.

***RST** #H8000

Range #H0–#HFFFF

Key Entry SA

:ULINK:SLOT[1] | 2 | 3 | 4:TCHannel:UWORD

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:TCHannel:UWORD <bit_pattern>  
[ :SOURce ]:RADio:PHS:ULINK:SLOT[1] | 2 | 3 | 4:TCHannel:UWORD?
```

This command changes the unique word (UW) field of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for UW reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H3D4C

Range #H0–#HFFFF

Key Entry UW

:ULINK:SLOT[1] | 2 | 3 | 4:TCHannel[:TCHannel]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :ULINK :SLOT [ 1 ] | 2 | 3 | 4 :TCHannel
[ :TCHannel ] PN9 | PN11 | PN15 | PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 |
P64
[ :SOURce ] :RADio :PHS :ULINK :SLOT [ 1 ] | 2 | 3 | 4 :TCHannel [ :TCHannel ] ?
```

This command selects the data pattern for the selected uplink traffic channel timeslot.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's			

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:ULINK:SLOT[1] | 2 | 3 | 4:TCHannel[:TCHannel:FIX4]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :PHS :ULINK :SLOT [ 1 ] | 2 | 3 | 4 :TCHannel [ :TCHannel ] :FIX4 <val>
[ :SOURce ] :RADio :PHS :ULINK :SLOT [ 1 ] | 2 | 3 | 4 :TCHannel [ :TCHannel ] :FIX4 ?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink traffic channel timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:ULINK:SLOT[1] | 2 | 3 | 4[:TYPE]

Supported E4438C with Option 402

[:SOURce] :RADio :PHS :ULINK :SLOT [1] | 2 | 3 | 4 [:TYPE] CUSTom | TCH | TCH_ALL | SYNC
[:SOURce] :RADio :PHS :ULINK :SLOT [1] | 2 | 3 | 4 [:TYPE] ?

This command sets the uplink timeslot type for the selected uplink timeslot.

***RST** Timeslot 1: TCH Timeslots 2–4: CUST

Key Entry Timeslot Type

[:STATe]

Supported E4438C with Option 402

[:SOURce] :RADio :PHS [:STATe] ON | OFF | 1 | 0
[:SOURce] :RADio :PHS [:STATe] ?

This command enables or disables the PHS modulation format.

***RST** 0

Key Entry PHS Off On

Remarks Although the PHS modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

TETRA Subsystem–Option 402 ([:SOURce]:RADio:TETRa)

:ALPha

Supported E4438C with Option 402

[:SOURce] :RADio:TETRa:ALPha <val>

[:SOURce] :RADio:TETRa:ALPha?

This command changes the Nyquist or root Nyquist filter’s alpha value.

The filter alpha value can be set to a minimum level (0), a maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +3.50000000E–001

Range 0.000–1.000

Key Entry Filter Alpha

Remarks To change the current filter type, refer to “:FILTer” on page 903.

:BBCLock

Supported E4438C with Option 402

[:SOURce] :RADio:TETRa:BBCLock INT[1] | EXT[1]

[:SOURce] :RADio:TETRa:BBCLock?

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Key Entry BBG Data Clock Ext Int

Remarks A data clock or continuous symbol sync input must be supplied when external mode is used.

:BBT

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:TETRa:BBT <val>
[ :SOURce ]:RADio:TETRa:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +5.00000000E–001

Range 0.100–1.000

Key Entry Filter BbT

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to “:FILTer” on page 903.

:BRATe

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:TETRa:BRATe <val>
[ :SOURce ]:RADio:TETRa:BRATe?
```

This command sets the bit rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +3.60000000E+004

Range	Modulation Type	Bits per Symbol	Internal Data	External Serial Data
	BPSK	1	1–50 Mbps	1–50 Mbps
	FSK2			
	MSK			
	C4FM	2	2–100 Mbps	2–50 Mbps
	FSK4			
	OQPSK			
	OQPSK195			
	P4QPPSK			
	QAM4			

Range

Modulation Type	Bits per Symbol	Internal Data	External Serial Data
QPSK	2	2–100 Mbps	2–50 Mbps
QPSKIS95			
QPSKISAT			
D8PSK	3	3–100 Mbps	3–50 Mbps
EDGE			
FSK8			
PSK8			
FSK16	4	4–100 Mbps	4–50 Mbps
PSK16			
QAM16			
QAM32	5	5–100 Mbps	5–50 Mbps
QAM64	6	6–100 Mbps	6–50 Mbps
QAM256	7	8–100 Mbps	8–50 Mbps

Key Entry

Symbol Rate

Remarks

When user-defined filters are selected using the command in section “:FILTer” on page 903, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated and will impact the relative timing of the modulated data, as well as the actual filter response (see “:SRATe” on page 926).

A change in the bit rate value will affect the symbol rate value; refer to “:SRATe” on page 926 for a list of the minimum and maximum symbol rate values.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 906.

:BURSt:PN9

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :BURSt :PN9 NORMal | QUICk  
[ :SOURce ] :RADio :TETRa :BURSt :PN9 ?
```

This command controls the software PN9 generation.

NORMal This choice produces a maximum length PN9 sequence.

QUICk This choice produces a truncated PN9 sequence.

***RST** NORM

Key Entry PN9 Mode Normal Quick

Remarks Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

:BURSt:SCRamble:SEED

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :BURSt :SCRamble :SEED <32-bit val>  
[ :SOURce ] :RADio :TETRa :BURSt :SCRamble :SEED ?
```

This command sets the 32-bit scramble seed value.

***RST** #HFFFFFFF

Range #H0–#HFFFFFFF

Key Entry Scramble Seed

Remarks Although values may be set using this command, it does not activate that scramble function.

Refer to “:BURSt:SCRamble[:STATe]” on page 893 to enable the scrambling function.

:BURSt:SCRamble[:STATe]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:BURSt:SCRamble[ :STATe ] ON | OFF | 1 | 0
[ :SOURCE ] :RADio:TETRa:BURSt:SCRamble[ :STATe ] ?
```

This command enables or disables the scramble function.

ON (1) This choice scrambles data on the related fields, using the seed setting.

OFF (0) This choice disables the scramble function.

***RST** 0

Key Entry Scramble Off On

Remarks To set the seed value, refer to “:BURSt:SCRamble:SEED” on page 892.

:BURSt:SHAPE:FALL:DELAy

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:BURSt:SHAPE:FALL:DELAy <val>
[ :SOURCE ] :RADio:TETRa:BURSt:SHAPE:FALL:DELAy ?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –22.3750 to 99

Key Entry Fall Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 906. Refer to “:SRATE” on page 926 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPE:FDELAy” on page 894 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FALL:TIME

Supported E4438C with Option 402

[:SOURCE] :RADio:TETRa:BURSt:SHAPe:FALL:TIME <val>

[:SOURCE] :RADio:TETRa:BURSt:SHAPe:FALL:TIME?

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +8.00000000E+000

Range 0.1250–50

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 906. Refer to “:SRATE” on page 926 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FTIME” on page 895 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FDElay

Supported E4438C with Option 402

[:SOURCE] :RADio:TETRa:BURSt:SHAPe:FDElay <val>

[:SOURCE] :RADio:TETRa:BURSt:SHAPe:FDElay?

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –22.3750 to 99

Key Entry Fall Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 906. Refer to “:SRATE” on page 926 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:DELaY” on page 893 performs the same

function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FTIME

Supported E4438C with Option 402

[:SOURce] :RADio :TETRa :BURSt :SHAPe :FTIME <val>

[:SOURce] :RADio :TETRa :BURSt :SHAPe :FTIME?

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +8.00000000E+000

Range 0.1250–50

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 906. Refer to “:SRATE” on page 926 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:TIME” on page 894 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RDELay

Supported E4438C with Option 402

[:SOURCE] :RADio:TETRa:BURSt:SHAPe:RDELay <val>

[:SOURCE] :RADio:TETRa:BURSt:SHAPe:RDELay?

This command sets the burst shape rise delay. The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –14.3750 to 99

Key Entry Rise Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 906. Refer to “:SRATe” on page 926 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:DELay” on page 896 performs the same function; in compliance with the SCPI standard, both commands are listed.

See the *E4428C/38C ESG User’s Guide* for concept information.

:BURSt:SHAPe:RISE:DELay

Supported E4438C with Option 402

[:SOURCE] :RADio:TETRa:BURSt:SHAPe:RISE:DELay <val>

[:SOURCE] :RADio:TETRa:BURSt:SHAPe:RISE:DELay?

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –14.3750 to 99

Key Entry	Rise Delay
Remarks	<p>The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.</p> <p>To change the modulation type, refer to “:MODulation[:TYPE]” on page 906. Refer to “:SRATE” on page 926 for a list of the minimum and maximum symbol rate values.</p> <p>“:BURSt:SHAPe:RDElay” on page 896 performs the same function; in compliance with the SCPI standard, both commands are listed.</p> <p>For concept information on burst shaping, refer to the <i>E4428C/38C ESG Signal Generators User’s Guide</i>.</p>

:BURSt:SHAPe:RISE:TIME

Supported	E4438C with Option 402
	<pre>[:SOURCE] :RADIO:TETRA: BURSt: SHAPe:RISE:TIME <val> [:SOURCE] :RADIO:TETRA: BURSt: SHAPe:RISE:TIME?</pre>
	<p>This command sets the burst shape rise time.</p> <p>The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.</p>
*RST	+8.00000000E+000
Range	0.1250–22.5000
Key Entry	Rise Time
Remarks	<p>The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.</p> <p>To change the modulation type, refer to “:MODulation[:TYPE]” on page 906. Refer to “:SRATE” on page 926 for a list of the minimum and maximum symbol rate values.</p> <p>“:BURSt:SHAPe:RTIME” on page 898 performs the same function; in compliance with the SCPI standard, both commands are listed.</p> <p>For concept information on burst shaping, refer to the <i>E4428C/38C ESG Signal Generators User’s Guide</i>.</p>

:BURSt:SHAPe:RTIME

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:BURSt:SHAPe:RTIME <val>
[ :SOURCE ] :RADio:TETRa:BURSt:SHAPe:RTIME?
```

This command sets the burst shape rise time. The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +8.00000000E+000

Range 0.1250–22.5000

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 906. Refer to “:SRATe” on page 926 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:TIME” on page 897 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe[:TYPE]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:BURSt:SHAPe[:TYPE] SINE | "<file name>"
[ :SOURCE ] :RADio:TETRa:BURSt:SHAPe[:TYPE]?
```

This command specifies the burst shape as either SINE or a user-defined file ("<file name>").

SINE This choice selects a state that is defined by the burst rise and fall *RST values as the default burst shape type.

"<file name>" This choice selects a user designated file from signal generator memory (non-volatile).

***RST** SINE

Key Entry Sine User File

:BURSt[:STATe]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:BURSt [ :STATe ] ON|OFF|1|0
[ :SOURce ] :RADio:TETRa:BURSt [ :STATe ] ?
```

This command enables or disables the burst function.

ON (1) This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

OFF (0) This choice enables the transmission of unframed data.

***RST** 0

Key Entry **Data Format Pattern Framed**

:CHANnel

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:CHANnel EVM|ACP
[ :SOURce ] :RADio:TETRa:CHANnel ?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** EVM

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to “:FILTer” on page 903.

:DATA

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio :TETRa :DATA PN9 | PN11 | PN15 | PN20 | PN23 | FIX4 |
"<file_name>" | EXT | P4 | P8 | P16 | P32 | P64 | PRAM
[ :SOURCE ] :RADio :TETRa :DATA?
```

This command sets the data pattern for unframed transmission.

***RST** PN23

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	Ext
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's	PRAM File		

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:DATA:PRAM

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio :TETRa :DATA :PRAM "<file_name>"
[ :SOURCE ] :RADio :TETRa :DATA :PRAM?
```

This command selects a pattern RAM (PRAM) file as the pattern data type for the TETRA (Trans-European Trunked Radio) format.

"<file_name>" This variable designates the PRAM file in WFM1. Refer to “File Name Variables” on page 13 for information on the file name syntax.

Key Entry PRAM File

Remarks Selecting this data source forces the burst source to INTERNAL to allow framing control.

The PRAM file must reside in the signal generator’s volatile memory (WFM1) in order to be accessed by this command. For more information on PRAM files, refer to “:DATA:PRAM:FILE:BLOCK” on page 111.

:DATA:FIX4

Supported E4438C with Option 402

[:SOURCE] :RADIO:TETRA:DATA:FIX4 <val>

[:SOURCE] :RADIO:TETRA:DATA:FIX4?

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the TETRA modulation format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type. To change the data type, refer to [“:DATA” on page 900](#).

:DEFAULT

Supported E4438C with Option 402

[:SOURCE] :RADIO:TETRA:DEFAULT

This command returns all of the TETRA modulation format parameters to factory settings. It does not affect any other signal generator parameters.

Key Entry Restore TETRA Factory Default

:EDATa:DELaY

Supported E4438C with Option 402

[:SOURCE] :RADIO:TETRA:EDATa:DELaY?

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

Remarks When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported E4438C with Option 402

[:SOURCE] :RADio :TETRa :EDCLock SYMBOL | NORMal

[:SOURCE] :RADio :TETRa :EDCLock?

This command sets the external data clock use.

SYMBOL This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

NORMal This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

***RST** NORM

Key Entry Ext Data Clock Normal Symbol

Remarks Both choices have no effect in internal clock mode. Refer to “:BBCLock” on page 889 to select EXT as the data clock type.

:EREFerence

Supported E4438C with Option 402

[:SOURCE] :RADio :TETRa :EREFerence INT | EXT

[:SOURCE] :RADio :TETRa :EREFerence?

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Key Entry BBG Ref Ext Int

Remarks If the EXT choice is selected, the external source’s frequency value

must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, “:EREFerence:VALue” on page 903 to enter the external reference frequency setting.

:EREFerence:VALue

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:TETRa:EREFerence:VALue <val>
```

```
[ :SOURCE ]:RADio:TETRa:EREFerence:VALue?
```

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST** +1.30000000E+007

Range 2.5E5–1E8

Key Entry Ext BBG Ref Freq

Remarks The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to “:EREFerence” on page 902 to select EXT (external source) as the reference for the bit-clock.

:FILTer

Supported E4438C with Option 402

```
[ :SOURCE ]:RADio:TETRa:FILTer RNYQuist|NYQuist|GAUSSian|RECTangle|
```

```
IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
```

```
[ :SOURCE ]:RADio:TETRa:FILTer?
```

This command selects the pre-modulation filter type.

IS95 This choice selects a filter that meets the criteria of the IS-95 standard.

IS95_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

IS95_MOD This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.

IS95_MOD_EQ This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.

TETRA Subsystem–Option 402 ([:SOURce]:RADio:TETRa)

AC4Fm	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.																		
UGGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.																		
"<user FIR>"	This variable is any filter file that you have stored into memory.																		
*RST	RNYQ																		
Key Entry	<table> <tr> <td>Root Nyquist</td> <td>Nyquist</td> <td>Gaussian</td> <td>Rectangle</td> <td>IS-95</td> <td>IS-95 w/EQ</td> </tr> <tr> <td>IS-95 Mod</td> <td>IS-95 Mod w/EQ</td> <td>APCO 25 C4FM</td> <td>UN3/4 GSM Gaussian</td> <td></td> <td></td> </tr> <tr> <td>User FIR</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Root Nyquist	Nyquist	Gaussian	Rectangle	IS-95	IS-95 w/EQ	IS-95 Mod	IS-95 Mod w/EQ	APCO 25 C4FM	UN3/4 GSM Gaussian			User FIR					
Root Nyquist	Nyquist	Gaussian	Rectangle	IS-95	IS-95 w/EQ														
IS-95 Mod	IS-95 Mod w/EQ	APCO 25 C4FM	UN3/4 GSM Gaussian																
User FIR																			
Remarks	Refer to “File Name Variables” on page 13 for information on the file name syntax.																		

:IQ:SCALe

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :IQ :SCALe <val>
[ :SOURce ] :RADio :TETRa :IQ :SCALe ?
```

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST** +65

Range 1–200

Key Entry I/Q Scaling

Remarks This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEViation]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :MODulation :FSK [ :DEViation ] <val>
[ :SOURce ] :RADio :TETRa :MODulation :FSK [ :DEViation ] ?
```

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

*RST	+4.00000000E+002
Range	0–2E7
Key Entry	Freq Dev
Remarks	To change the modulation type, refer to “:MODulation[:TYPE]” on page 906. Refer to “:SRATe” on page 926 for a list of the minimum and maximum symbol rate values. To set an asymmetric FSK deviation value, refer to the <i>E4428C/38C ESG Signal Generators User’s Guide</i> for more information.

:MODulation:MSK[:PHASe]

Supported	E4438C with Option 402
	[:SOURCE] :RADio :TETRa :MODulation :MSK [:PHASe] <val> [:SOURCE] :RADio :TETRa :MODulation :MSK [:PHASe] ?

This command sets the MSK phase deviation value.

The variable <val> is expressed in units of degrees.

*RST	+9.00000000E+001
Range	0–100
Key Entry	Phase Dev

:MODulation:UFSK

Supported	E4438C with Option 402
	[:SOURCE] :RADio :TETRa :MODulation :UFSK "<file name>" [:SOURCE] :RADio :TETRa :MODulation :UFSK ?

This command selects a user-defined FSK file from the signal generator memory.

Key Entry	User FSK
Remarks	The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to “:MODulation[:TYPE]” on page 906 to change the current modulation type. Refer to “File Name Variables” on page 13 for information on the file name syntax.

:MODulation:UIQ

Supported E4438C with Option 402

[:SOURce] :RADio :TETRa :MODulation :UIQ "<file name>"

[:SOURce] :RADio :TETRa :MODulation :UIQ?

This command selects a user-defined I/Q file from the signal generator memory.

Key Entry User I/Q

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to “:MODulation[:TYPE]” on page 906 to change the current modulation type.
 Refer to “File Name Variables” on page 13 for information on the file name syntax.

:MODulation[:TYPE]

Supported E4438C with Option 402

[:SOURce] :RADio :TETRa :MODulation [:TYPE] BPSK | QPSK | IS95QPSK | GRAYQPSK | OQPSK | IS95OQPSK | P4DQPSK | PSK8 | PSK16 | D8PSK | MSK | FSK2 | FSK4 | FSK8 | FSK16 | C4FM | QAM4 | QAM16 | QAM32 | QAM64 | QAM128 | QAM256 | UIQ | UFSK
 [:SOURce] :RADio :TETRa :MODulation [:TYPE] ?

This command sets the modulation type for the TETRA personality.

***RST** P4DQPSK

Key Entry	BPSK	QPSK	IS-95 QPSK	Gray Coded QPSK	OQPSK			
	IS-95 OQPSK	$\pi/4$ DQPSK	8PSK	16PSK	D8PSK	MSK	2-Lvl FSK	
	4-Lvl FSK	8-Lvl FSK	16-Lvl FSK	C4FM	4QAM	16QAM	32QAM	
	64QAM	128QAM	256QAM	User I/Q	User FSK			

:POLarity[:ALL]

Supported E4438C with Option 402
[:SOURCE]:RADio:TETRa:POLarity[:ALL] NORMal|INVerted
[:SOURCE]:RADio:TETRa:POLarity[:ALL]?

This command sets the rotation direction of the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Key Entry Phase Polarity Normal Invert

:SECondary:RECall

Supported E4438C with Option 402
[:SOURCE]:RADio:TETRa:SECondary:RECall

This command recalls the secondary frame configuration, overwriting the current state.

Key Entry Recall Secondary Frame State

Remarks To save a secondary frame state, refer to “:SECondary:SAVE” on page 907.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to “:SECondary[:STATE]” on page 908.

:SECondary:SAVE

Supported E4438C with Option 402
[:SOURCE]:RADio:TETRa:SECondary:SAVE

This command saves the current frame configuration as the secondary frame with the file name TETRa_SECONDARY_FRAME.

Key Entry Save Secondary Frame State

Remarks To recall the secondary frame (saved in non-volatile signal generator memory), refer to “:SECondary:RECall” on page 907.

:SECondary:TRIGger[:SOURce]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SECondary:TRIGger [ :SOURce ] KEY | EXT | BUS  
[ :SOURce ] :RADio:TETRa:SECondary:TRIGger [ :SOURce ] ?
```

This command selects the type of triggering for the secondary frame.

- KEY** This choice enables triggering by pressing the front panel **Trigger** hardkey.
- EXT** This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to [“:TRIGger\[:SOURce\]:EXTErnal\[:SOURce\]” on page 933](#).
- BUS** This choice enables GPIB triggering using the *TRG or GET command or LAN and RS-232 triggering using the *TRG command.

Key Entry Trigger Key Ext Bus

:SECondary[:STATe]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SECondary [ :STATe ] ON | OFF | 1 | 0  
[ :SOURce ] :RADio:TETRa:SECondary [ :STATe ] ?
```

This command enables or disables the ability to switch to the secondary frame.

***RST** 0

Key Entry Secondary Frame Off On

Remarks A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to [“:SECondary:SAVE” on page 907](#).

:SLOT[1] | 2 | 3 | 4:DCCustom

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SLOT[1] | 2 | 3 | 4:DCCustom PN9 | PN11 | PN15 |  
PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64  
[ :SOURce ] :RADio:TETRa:SLOT[1] | 2 | 3 | 4:DCCustom?
```

This command configures the downlink continuous custom timeslot data field.

*RST	PN9
Key Entry	PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT
	4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's
	64 1's & 64 0's
Remarks	Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT[1] | 2 | 3 | 4:DCCustom:FIX4

Supported E4438C with Option 402

```
[ :SOURCE ] : RADio : TETRa : SLOT [ 1 ] | 2 | 3 | 4 : DCCustom : FIX4 <val>
[ :SOURCE ] : RADio : TETRa : SLOT [ 1 ] | 2 | 3 | 4 : DCCustom : FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink continuous custom timeslot.

*RST	#B0000
Range	#B0000–#B1111 or 0–15
Key Entry	FIX4
Remarks	FIX4 must already be defined as the data type.

:DCNormal:B1

Supported E4438C with Option 402

```
[ :SOURCE ] : RADio : TETRa : SLOT [ 1 ] | 2 | 3 | 4 : DCNormal : B1 <val>
[ :SOURCE ] : RADio : TETRa : SLOT [ 1 ] | 2 | 3 | 4 : DCNormal : B1?
```

This command sets the first 14 broadcast bits for the selected downlink continuous normal timeslot.

*RST	#H0000
Range	#H0–#H3FFF
Key Entry	B1

TETRA Subsystem–Option 402 ([:SOURce]:RADio:TETRa)**:DCNormal:B2****Supported** E4438C with Option 402

[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal:B2 <val>

[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal:B2?

This command sets the last 16 broadcast bits for the selected downlink continuous normal timeslot.

RST** #H0000**Range** #H0–#HFFFF**Key Entry** B2**:SLOT[1]|2|3|4:DCNormal:TSEquence*Supported** E4438C with Option 402

[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal:

TSEquence <val>

[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal:TSEquence?

This command sets the normal training sequence bits (30-bit mid-amble) for the selected downlink continuous normal timeslot.

RST** #H343A74**Range** #H0–#H3FFFFFF**Key Entry** TS**Remarks** When 1E90DE is selected, the data fields are scrambled as separate logical channels.**:SLOT[1]|2|3|4:DCNormal[:DATA]*Supported** E4438C with Option 402

[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal[:DATA] PN9|PN11|

PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64

[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal[:DATA]?

This command configures the selected downlink continuous normal timeslot data field.

*RST	PN9
Key Entry	PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's
Remarks	Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT[1] | 2 | 3 | 4:DCNormal[:DATA]:FIX4

Supported E4438C with Option 402

[:SOURCE] :RADio :TETRa :SLOT[1] | 2 | 3 | 4 :DCNormal [:DATA] :FIX4 <val>
[:SOURCE] :RADio :TETRa :SLOT[1] | 2 | 3 | 4 :DCNormal [:DATA] :FIX4?

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink continuous normal timeslot.

*RST	#B0000
Range	#B0000–#B1111 or 0–15
Key Entry	FIX4
Remarks	FIX4 must already be defined as the data type.

:SLOT[1] | 2 | 3 | 4:DCSync:B

Supported E4438C with Option 402

[:SOURCE] :RADio :TETRa :SLOT[1] | 2 | 3 | 4 :DCSync :B <val>
[:SOURCE] :RADio :TETRa :SLOT[1] | 2 | 3 | 4 :DCSync :B?

This command sets the broadcast bits for the selected downlink continuous synchronization timeslot.

*RST	#H00000000
Range	#H0–#H3FFFFFFF
Key Entry	B

:SLOT[1] | 2 | 3 | 4:DCSync:FCOR

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DCSync :FCOR <val>  
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DCSync :FCOR?
```

This command sets the frequency correction bits for the selected downlink continuous synchronization timeslot.

***RST** #HFF0000000000000000FF

Range #H0–#HFFFFFFFFFFFFFFFFFFFFF

Key Entry FCOR

:SLOT[1] | 2 | 3 | 4:DCSync:SSB

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DCSync :SSB <val>  
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DCSync :SSB?
```

This command sets the synchronization block bits for the selected downlink synchronization continuous timeslot.

***RST** #H000000000000000000000000

Range #H0–#HFFFFFFFFFFFFFFFFFFFFFFFFF

Key Entry SSB

:SLOT[1] | 2 | 3 | 4:DCSync:STS

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DCSync :STS <val>  
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DCSync :STS?
```

This command sets the synchronization training sequence for the selected downlink continuous synchronization timeslot.

***RST** #H30673A7067

Range #H0–#H3FFFFFFFFF

Key Entry STS

:SLOT[1]|2|3|4:DCSync[:DATA]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:SLOT[1]|2|3|4:DCSync[:DATA] PN9|PN11|
PN15|PN20|PN23FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DCSync[:DATA]?
```

This command configures the selected downlink continuous synchronization timeslot data field.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's			

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT[1]|2|3|4:DCSync[:DATA]:FIX4

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:SLOT[1]|2|3|4:DCSync[:DATA]:FIX4 <val>
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DCSync[:DATA]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink continuous synchronization timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

TETRA Subsystem–Option 402 ([:SOURCE]:RADio:TETRa)**:SLOT[1] | 2 | 3 | 4:DDCustom****Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DDCustom PN9 | PN11 | PN15 |
PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DDCustom?
```

This command configures the downlink discontinuous custom timeslot data field.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's			

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT[1] | 2 | 3 | 4:DDCustom:FIX4**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DDCustom :FIX4 <val>
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DDCustom :FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink discontinuous custom timeslot.

RST** #B0000**Range** #B0000–#B1111 or 0–15**Key Entry** FIX4**Remarks** FIX4 must already be defined as the data type.**:SLOT[1] | 2 | 3 | 4:DDNormal:B1*Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DDNormal :B1 <val>
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DDNormal :B1?
```

This command sets the first 14 broadcast bits for the selected downlink discontinuous normal timeslot.

***RST** #H0000
Range #H0–#H3FFF
Key Entry B1

:SLOT[1] | 2 | 3 | 4:DDNormal:B2

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DDNormal :B2 <val>  
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DDNormal :B2?
```

This command sets the last 16 broadcast bits for the selected downlink continuous normal timeslot.

***RST** #H0000
Range #H0–#HFFFF
Key Entry B2

:SLOT[1] | 2 | 3 | 4:DDNormal:TSEquence

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DDNormal :TSEquence <val>  
[ :SOURCE ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :DDNormal :TSEquence?
```

This command specifies the normal training sequence bits (30-bit mid-amble) for the selected downlink discontinuous normal timeslot.

***RST** #H343A74
Range #H0–#H3FFFFFFF
Key Entry TS
Remarks When 1E90DE is selected, the data fields are scrambled as separate logical channels.

:SLOT[1] | 2 | 3 | 4:DDNormal[:DATA]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO:TETRA:SLOT[ 1 ] | 2 | 3 | 4:DDNormal[ :DATA ] PN9 | PN11 |
PN15 | PN20 | PN23FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[ :SOURCE ] :RADIO:TETRA:SLOT[ 1 ] | 2 | 3 | 4:DDNormal[ :DATA ] ?
```

This command configures the selected downlink discontinuous normal timeslot data field.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's			

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT[1] | 2 | 3 | 4:DDNormal[:DATA]:FIX4

Supported E4438C with Option 402

```
[ :SOURCE ] :RADIO:TETRA:SLOT[ 1 ] | 2 | 3 | 4:DDNormal[ :DATA ] :FIX4 <val>
[ :SOURCE ] :RADIO:TETRA:SLOT[ 1 ] | 2 | 3 | 4:DDNormal[ :DATA ] :FIX4 ?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink discontinuous normal timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:SLOT[1]|2|3|4:DDSync:B

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio :TETRa :SLOT[ 1 ] | 2 | 3 | 4 :DDSync :B <val>  
[ :SOURCE ] :RADio :TETRa :SLOT[ 1 ] | 2 | 3 | 4 :DDSync :B?
```

This command sets the broadcast bits for the selected downlink discontinuous synchronization timeslot.

***RST** #H00000000

Range #H0–#H3FFFFFFF

Key Entry B

:SLOT[1]|2|3|4:DDSync:FCOR

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio :TETRa :SLOT[ 1 ] | 2 | 3 | 4 :DDSync :FCOR <val>  
[ :SOURCE ] :RADio :TETRa :SLOT[ 1 ] | 2 | 3 | 4 :DDSync :FCOR?
```

This command sets the frequency correction bits for the selected downlink discontinuous synchronization timeslot.

***RST** #HFF0000000000000000FF

Range #H0–#HFFFFFFFFFFFFFFFFFFFF

Key Entry FCOR

:SLOT[1]|2|3|4:DDSync:SSB

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio :TETRa :SLOT[ 1 ] | 2 | 3 | 4 :DDSync :SSB <val>  
[ :SOURCE ] :RADio :TETRa :SLOT[ 1 ] | 2 | 3 | 4 :DDSync :SSB?
```

This command sets the synchronization block bits for the selected downlink synchronization discontinuous timeslot.

***RST** #H00000000000000000000000000000000

Range #H0–#HFFFFFFFFFFFFFFFFFFFFFFFF

Key Entry SSB

TETRA Subsystem–Option 402 ([:SOURCE]:RADio:TETRa)**:SLOT[1] | 2 | 3 | 4:DDSync:STS****Supported** E4438C with Option 402

[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DDSync:STS <val>

[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DDSync:STS?

This command sets the synchronization training sequence for the selected downlink discontinuous synchronization timeslot.

RST** #H30673A7067**Range** #H0–#H3FFFFFFFF**Key Entry** STS**:SLOT[1] | 2 | 3 | 4:DDSync[:DATA]*Supported** E4438C with Option 402

[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DDSync[:DATA] PN9 | PN11 |

PN15 | PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64

[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DDSync[:DATA]?

This command configures the selected downlink discontinuous synchronization timeslot data field.

***RST** PN9**Key Entry** PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT

4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's

64 1's & 64 0's

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.**:SLOT[1] | 2 | 3 | 4:DDSync[:DATA]:FIX4****Supported** E4438C with Option 402

[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DDSync[:DATA]:FIX4 <val>

[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DDSync[:DATA]:FIX4?

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink discontinuous synchronization timeslot.

***RST** #B0000**Range** #B0000–#B1111 or 0–15**Key Entry** FIX4

Remarks FIX4 must already be defined as the data type. To change the data type, refer to “:SLOT[1]|2|3|4:DCNormal[:DATA]” on page 910.

:SLOT[1]|2|3|4:POWer

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SLOT[ 1 ] | 2 | 3 | 4 :POWer MAIN|DELTA
[ :SOURce ] :RADio:TETRa:SLOT[ 1 ] | 2 | 3 | 4 :POWer?
```

This command toggles the RF output power level function for the selected timeslot.

MAIN This choice specifies RF output as the main power level.

DELTA This choice specifies RF output as the alternative power level.

***RST** **MAIN**

Key Entry **Timeslot Ampl Main Delta**

:SLOT[1]|2|3|4:STATe

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SLOT[ 1 ] | 2 | 3 | 4 :STATe ON|OFF|1|0
[ :SOURce ] :RADio:TETRa:SLOT[ 1 ] | 2 | 3 | 4 :STATe?
```

This command enables or disables the selected timeslot.

***RST** **Timeslot 1: 1 Timeslot 2-4:**

Key Entry **Timeslot Off On**

Remarks Continuous timeslots cannot be disabled.

:SLOT[1]|2|3|4:UC1:TSEquence

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SLOT[ 1 ] | 2 | 3 | 4 :UC1:TSEquence <val>
[ :SOURce ] :RADio:TETRa:SLOT[ 1 ] | 2 | 3 | 4 :UC1:TSEquence?
```

This command specifies the extended training sequence bits (30-bit mid-amble) for the selected uplink control 1 timeslot.

***RST** **#H2743A743**

Range **#H0–#H3FFFFFFF**

Key Entry **TS**

:SLOT[1] | 2 | 3 | 4:UC1[:DATA]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UC1 [ :DATA ] PN9 | PN11 | PN15 |
PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UC1 [ :DATA ] ?
```

This command configures the selected uplink control 1 data field.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's			

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT[1] | 2 | 3 | 4:UC1[:DATA]:FIX4

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UC1 [ :DATA ] :FIX4 <val>
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UC1 [ :DATA ] :FIX4 ?
```

This command configures the uplink control 1 data field FIX4 value for the selected timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

:SLOT[1] | 2 | 3 | 4:UC2:TSEquence

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UC2 :TSEquence <val>
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UC2 :TSEquence ?
```

This command specifies the extended training sequence bits (30-bit mid-amble) for the selected uplink control 2 timeslot.

***RST** #H2743A743

Range #H0–#H3FFFFFF

Key Entry TS

:SLOT[1] | 2 | 3 | 4:UC2[:DATA]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UC2 [ :DATA ] PN9 | PN11 | PN15 |
PN20 | PN23 | FIX4 | " <file name> " | EXT | P4 | P8 | P16 | P32 | P64
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UC2 [ :DATA ] ?
```

This command configures the selected uplink control 2 data field.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's	8 1's & 8 0's	16 1's & 16 0's	32 1's & 32 0's	64 1's & 64 0's			

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT[1] | 2 | 3 | 4:UC2[:DATA]:FIX4

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UC2 [ :DATA ] :FIX4 <val>
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UC2 [ :DATA ] :FIX4 ?
```

This command configures the uplink control 2 data field FIX4 value for the selected timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

:SLOT[1] | 2 | 3 | 4:UCUStom

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UCUStom PN9 | PN11 | PN15 |
PN20 | PN23 | FIX4 | " <file name> " | EXT | P4 | P8 | P16 | P32 | P64
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UCUStom?
```

This command configures the uplink custom data field.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's	8 1's & 8 0's	8 1's & 8 0's	16 1's & 16 0's	16 1's & 16 0's	32 1's & 32 0's	32 1's & 32 0's	
	64 1's & 64 0's							

Remarks See “File Name Variables” on page 13 for information on the file name syntax.

:SLOT[1] | 2 | 3 | 4:UCUStom:FIX4

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UCUStom :FIX4 <val>
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UCUStom :FIX4?
```

This command configures the uplink custom data field to FIX4 (4-bit repeating sequence data pattern).

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

:SLOT[1] | 2 | 3 | 4:UNORmal:TSEquence

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UNORmal :TSEquence <val>
[ :SOURce ] :RADio :TETRa :SLOT [ 1 ] | 2 | 3 | 4 :UNORmal :TSEquence?
```

This command specifies the extended training sequence bits (22-bit mid-amble) for the selected uplink normal timeslot.

***RST** #H343A74

Range #H0–#H3FFFFFF

Key Entry TS

Remarks When 1E90DE is selected, data fields are scrambled as separate logical channels.

:SLOT[1] | 2 | 3 | 4:UNORmal[:DATA]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :SLOT[ 1 ] | 2 | 3 | 4 :UNORmal [ :DATA ] PN9 | PN11 |
PN15 | PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[ :SOURce ] :RADio :TETRa :SLOT[ 1 ] | 2 | 3 | 4 :UNORmal [ :DATA ] ?
```

This command configures the selected uplink normal data field.

***RST** PN9

Key Entry	PN9	PN11	PN15	PN20	PN23	FIX4	User File	EXT
	4 1's & 4 0's		8 1's & 8 0's		16 1's & 16 0's		32 1's & 32 0's	
	64 1's & 64 0's							

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:SLOT[1] | 2 | 3 | 4:UNORmal[:DATA]:FIX4

Supported E4438C with Option 402

```
[ :SOURce ] :RADio :TETRa :SLOT[ 1 ] | 2 | 3 | 4 :UNORmal [ :DATA ] :FIX4 <val>
[ :SOURce ] :RADio :TETRa :SLOT[ 1 ] | 2 | 3 | 4 :UNORmal [ :DATA ] :FIX4 ?
```

This command configures the uplink normal data field FIX4 value for the selected timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

TETRA Subsystem–Option 402 ([:SOURce]:RADio:TETRa)**:SLOT[1] | 2 | 3 | 4[:TYPE]****Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SLOT[ 1 ] | 2 | 3 | 4 [ :TYPE ] UCUSTom | UC1 | UC2 |
UNORmal | DDNormal | DDSync | DCNormal | DCSync | DCCustom | DDCustom
[ :SOURce ] :RADio:TETRa:SLOT[ 1 ] | 2 | 3 | 4 [ :TYPE ] ?
```

This command sets the timeslot type for the selected timeslot.

***RST** *Timeslot 1:* UCUS *Timeslot 2-4:* UNOR

Key Entry **Up Custom** **Up Control 1** **Up Control 2** **Up Normal** **Dn Normal Disc**
Dn Sync Disc **Dn Normal Cont** **Dn Sync Cont** **Dn Custom Cont**
Dn Custom Disc

Remarks When downlink is selected and the frame is uplink, the following mapping is made to convert the uplink protocols to downlink; an error will be generated.

From	To (Continuous Downlink)	To (Discontinuous Downlink)
UC1	DCCustom	DDCustom
UC2	DCCustom	DDCustom
UCUSTom	DCCustom	DDCustom
UNORmal	DCNormal	DDNormal

When uplink is selected and the frame is downlink, the following mapping is made to convert the downlink protocols to uplink; an error will be generated.

From	To
DCCustom/ DDCustom	UCUSTom
DCNormal/ DDNormal	UNORmal
DCSync/ DDSync	UCUSTom

When continuous downlink protocols are selected, all timeslots must be on, and they cannot be turned off. Any attempts to do so will generate an error.

:SOUT**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SOUT FRAME | SLOT | ALL
[ :SOURce ] :RADio:TETRa:SOUT ?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

FRAME	This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.
SLOT	This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.
ALL	This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.
*RST	FRAME
Key Entry	Begin Frame Begin Timeslot # All Timeslots
Remarks	See “:SOUT:OFFSet” on page 925 to change the synchronization output offset.

:SOUT:OFFSet

Supported	E4438C with Option 402
	[:SOURce] :RADio:TETRa:SOUT:OFFSet <val> [:SOURce] :RADio:TETRa:SOUT:OFFSet?
	This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.
	The variable <val> is expressed as a number of bits.
*RST	+0
Range	–509 to 509
Key Entry	Sync Out Offset
Remarks	Negative values move the synchronization output signal earlier; positive values move it later.
	To change the output of the EVENT1 rear panel connector to SLOT, refer to “:SOUT” on page 924.

:SOUT:SLOT

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SOUT:SLOT <val>
[ :SOURce ] :RADio:TETRa:SOUT:SLOT?
```

This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.

***RST** +1

Range 1–4

Key Entry **Begin Timeslot #**

Remarks SLOT must be selected as the output signal type for the EVENT 1 rear panel connector.

To change the output of the EVENT1 rear panel connector to SLOT, refer to [“:SOUT” on page 924](#).

:SRATe

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SRATe <val>
[ :SOURce ] :RADio:TETRa:SRATe?
```

This command sets the transmission symbol rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +1.80000000E+004

Modulation Type	Bits per Symbol	Internal Data	External Serial Data
BPSK	1	1–50 Msps	1–50 Msps
FSK2			
MSK			

Range

Modulation Type	Bits per Symbol	Internal Data	External Serial Data
C4FM	2	1–50 Msps	1–25 Msps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			
QPSK			
QPSKIS95			
QPSKISAT			
D8PSK	3	1–33.33 Msps	1–16.67 Msps
EDGE			
FSK8			
PSK8			
FSK16	4	1–25 Msps	1–12.5 Msps
PSK16			
QAM16			
QAM32	5	1–20 Msps	1–10 Msps
QAM64	6	1–16.67 Msps	1–8.33 Msps
QAM256	7	1–12.50 Msps	1–6.25 Msps

Key Entry

Symbol Rate

Remarks

When user-defined filters are selected using the command in section “:FILTer” on page 903, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated as follows:

- Above 12.5 Msps, the FIR length will be truncated to 32 symbols
- Above 25 Msps, the FIR length will be truncated to 16 symbols

This will impact the relative timing of the modulated data, as well as the actual filter response (see “:BRATe” on page 890).

A change in the symbol rate value will affect the bit rate value; refer to “:BRATe” on page 890 for a list of the minimum and maximum bit rate values.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 906.

TETRA Subsystem–Option 402 ([:SOURCE]:RADio:TETRa)**:TRIGger:TYPE**

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:TRIGger:TYPE CONTInuous | SINGle | GATE
[ :SOURCE ] :RADio:TETRa:TRIGger:TYPE?
```

This command sets the trigger type.

CONTInuous The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to “[:TRIGger:TYPE:CONTInuous\[:TYPE\]](#)” on page 928.

SINGle The framed data sequence plays once for every trigger received.

GATE An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

***RST** CONT

Key Entry Continuous Single Gated

:TRIGger:TYPE:CONTInuous[:TYPE]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:TRIGger:TYPE:CONTInuous[ :TYPE ] FREE |
TRIGger | RESet
[ :SOURCE ] :RADio:TETRa:TRIGger:TYPE:CONTInuous[ :TYPE ]?
```

This commands selects the waveform’s response to a trigger signal while using the continuous trigger mode.

For more information on triggering and to select the continuous trigger mode, see “[:TRIGger:TYPE](#)” on page 928.

The following list describes the waveform’s response to each of the command choices:

FREE Turning the ARB format on immediately triggers the waveform. The waveform repeats until you turn the format off, select another trigger, or choose another waveform file.

TRIGger The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously until you turn the format off, select another trigger, or choose another waveform file.

RESet The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously. Subsequent triggers reset the waveform to the beginning. For a waveform sequence, this means to the beginning of the

first segment in the sequence.

*RST	FREE		
Key Entry	Free Run	Trigger & Run	Reset & Run

:TRIGger:TYPE:GATE:ACTIVE

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[ :SOURce ] :RADio:TETRa:TRIGger:TYPE:GATE:ACTive?
```

This command selects the active state (gate polarity) of the gate while using the gating trigger mode.

The LOW and HIGH selections correspond to the low and high states of an external trigger signal. For example, when you select HIGH, the active state occurs during the high of the trigger signal. When the active state occurs, the ESG stops the waveform playback at the last played sample point, then restarts the playback at the next sample point when the inactive state occurs. For more information on triggering and to select gating as the trigger mode, see “:TRIGger:TYPE” on page 928.

The following list describes the ESG’s gating behavior for the polarity selections:

LOW The waveform playback stops when the trigger signal goes low (active state) and restarts when the trigger signal goes high (inactive state).

HIGH The waveform playback stops when the trigger signal goes high (active state) and restarts when the trigger signal goes low (inactive state).

***RST** HIGH

Key Entry Gate Active Low High

:TRIGger[:SOURce]

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:TRIGger [ :SOURce ] KEY | EXT | BUS  

[ :SOURce ] :RADio:TETRa:TRIGger [ :SOURce ] ?
```

This command sets the trigger source.

For more information on triggering, see “:TRIGger:TYPE” on page 928. The following list describes the command choices:

KEY This choice enables manual triggering by pressing the front-panel **Trigger** hardkey.

EXT An externally applied signal triggers the waveform. This is the only choice that works with gating. The following conditions affect an external trigger:

- The input connector selected for the trigger signal. You have a choice between the rear-panel PATTERN TRIG IN connector or the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. To make the connector selection, see “:TRIGger[:SOURce]:EXTErnal[:SOURce]” on page 933.

For more information on the connectors and on connecting the cables, see the *ESG User’s Guide*.

- The trigger signal polarity:
 - gating mode, see “:TRIGger:TYPE:GATE:ACTive” on page 929
 - continuous and single modes, see “:TRIGger[:SOURce]:EXTErnal:SLOPe” on page 932
- The time delay between when the ESG receives a trigger and when the waveform responds to the trigger. There are two parts to setting the delay:
 - setting the amount of delay, see “:TRIGger[:SOURce]:EXTErnal:DELay” on page 931
 - turning the delay on, see “:TRIGger[:SOURce]:EXTErnal:DELay:STATe” on page 931

BUS This choice enables triggering over the GPIB or LAN using the *TRG or GET commands or the AUXILIARY INTERFACE (RS-232) using the *TRG command.

***RST** KEY

Key Entry Trigger Key Ext Bus

:TRIGger[:SOURce]:EXTErnal:DELay

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:TRIGger [ :SOURce ] :EXTErnal:DELay <val>
[ :SOURce ] :RADio:TETRa:TRIGger [ :SOURce ] :EXTErnal:DELay?
```

This command sets the number of bits to delay the ESG’s response to an external trigger.

The bit delay is a delay between when the ESG receives the trigger and when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the ESG receives the trigger and the set number of delay bits (clocks) occurs, the ESG transmits the data pattern.

The delay occurs after you enable the state. See “:TRIGger[:SOURce]:EXTErnal:DELay:STATE” on page 931. You can set the number of bits either before or after enabling the state.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 930.

***RST** +0
Range 0–1048575
Key Entry Ext Delay Bits

:TRIGger[:SOURce]:EXTErnal:DELay:STATE

Supported E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:TRIGger [ :SOURce ] :EXTErnal:DELay:STATE
ON|OFF|1|0
[ :SOURce ] :RADio:TETRa:TRIGger [ :SOURce ] :EXTErnal:DELay:STATE?
```

This command enables or disables the operating state of the external trigger delay function.

For setting the delay time, see “:TRIGger[:SOURce]:EXTErnal:DELay” on page 931, and for more information on configuring an external source, see “:TRIGger[:SOURce]” on page 930.

***RST** 0
Key Entry Ext Delay Off On

:TRIGger[:SOURce]:EXTernal:SLOPe

Supported E4438C with Option 402

```
[ :SOURce ]:RADio:TETRa:TRIGger[ :SOURce ]:EXTernal:SLOPe POSitive|NEGative  
[ :SOURce ]:RADio:TETRa:TRIGger[ :SOURce ]:EXTernal:SLOPe?
```

This command sets the polarity for an external trigger signal while using the continuous, single triggering mode. To set the polarity for gating, see “[:TRIGger:TYPE:GATE:ACTive](#)” on page 929.

The POSitive and NEGative selections correspond to the high (positive) and low (negative) states of the external trigger signal. For example, when you select POSitive, the waveform responds (plays) during the high state of the trigger signal. When the PSG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest.

For more information on configuring an external trigger source and to select external as the trigger source, see “[:TRIGger\[:SOURce\]](#)” on page 930.

***RST** NEG

Key Entry Ext Polarity Neg Pos

:TRIGger[:SOURCE]:EXTeRnal[:SOURCE]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:TRIGger [ :SOURCE ] :EXTeRnal [ :SOURCE ] EPT1 |
EPT2 | EPTRIGGER1 | EPTRIGGER2
[ :SOURCE ] :RADio:TETRa:TRIGger [ :SOURCE ] :EXTeRnal [ :SOURCE ] ?
```

This command selects which PATTERN TRIG IN connection the ESG uses to accept an externally applied trigger signal when external is the trigger source selection.

For more information on configuring an external trigger source and to select external as the trigger source, see “[:TRIGger\[:SOURCE\]](#)” on page 930. For more information on the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User’s Guide*.

The following list describes the command choices:

EPT1	This choice is synonymous with EPTRIGGER1 and selects the PATTERN TRIG IN rear-panel connector.
EPT2	This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
EPTRIGGER1	This choice is synonymous with EPT1 and selects the PATTERN TRIG IN rear-panel connector.
EPTRIGGER2	This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
*RST	EPT1
Key Entry	Patt Trig In 1 Patt Trig In 2

[:STAtE]

Supported E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa [ :STAtE ] ON | OFF | 1 | 0
[ :SOURCE ] :RADio:TETRa [ :STAtE ] ?
```

This command enables or disables the TETRA modulation format.

***RST** OFF

Key Entry TETRA Off On

Remarks Although the TETRA modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

Wideband CDMA Base Band Generator Subsystem–Option 400 [:SOURce]:RADio:WCDMa:TGPP[:BBG])

:BBClock

Supported E4438C with Option 400

```
[ :SOURce ] :RADio:WCDMa:TGPP[ :BBG ] :BBClock INT[ 1 ] | EXT[ 1 ]
```

```
[ :SOURce ] :RADio:WCDMa:TGPP[ :BBG ] :BBClock?
```

This command selects the baseband generator chip clock source for the radio uplink channel.

***RST** INT

Key Entry BBG Chip Clock Ext Int

Remarks Refer to “:BBClock:EXT:RATE” on page 934 for the EXT clock rate selections.

:BBClock:EXT:RATE

Supported E4438C with Option 400

```
[ :SOURce ] :RADio:WCDMa:TGPP[ :BBG ] :BBClock:EXT:RATE X1 | X2 | X4
```

```
[ :SOURce ] :RADio:WCDMa:TGPP[ :BBG ] :BBClock:EXT:RATE?
```

This command sets the external clock rate for the baseband generator.

X1 This choice sets an external clock rate that is identical to the chip clock (3.84 MHz).

X2 This choice sets an external clock rate that is two times the rate of the chip clock.

X4 This choice sets an external clock rate that is four times the rate of the chip clock.

***RST** X1

Key Entry Ext Clock Rate x1 x2 x4

Remarks This command only applies to uplink.

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:DLINK:APPLY**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:APPLY

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:APPLY?

This command immediately starts the channel coding generation process according to the channel setup and data entered for the downlink physical and transport channels.

Key Entry Apply Channel Setup

Remarks If pre-computing is required, then a progress bar will appear on the signal generator's display.

:DLINK:AWGN:CN**Supported** E4438C with Option 400 and 403

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:AWGN:CN <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:AWGN:CN?

This command sets the in band carrier to noise ratio (C/N) value in the AWGN carrier to noise.

RST** -10.2**Range** -20 to 20**Field Entry** C/N value**:DLINK:AWGN:CPOWER*Supported** E4438C with Option 400 and 403

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:AWGN:CPOWER?

This query returns the carrier power of the RF signal.

***RST** 0**Field Entry** C Power

:DLINK:AWGN:ECNO**Supported** E4438C with Option 400 and 403

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:AWGN:ECNO <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:AWGN:ECNO?

This command sets the Ec/No value of the Ec Ref channel.

The variable <val> is expressed in decibels (dB).

RST** 0**Range** -30 to 30**Field Entry** Ec/No value**:DLINK:AWGN:ECRPower*Supported** E4438C with Option 400 and 403

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:AWGN:ECRPower?

This query returns the carrier noise power in the Ec Ref channel.

RST** 0**Field Entry** Ec Ref Power**:DLINK:AWGN:ECRef*Supported** E4438C with Option 400 and 403

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:AWGN:ECRef DPCH1 | DPCH2 | PCCPCH | PICH | CPICH

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:AWGN:ECRef?

This command selects the reference used for the Ec/No value.

DPCH1 This choice selects 1 dedicated physical channel.

DPCH2 This choice selects 2 dedicated physical channel.

PCCPCH This choice selects a primary command control physical channel.

PICH This choice selects a paging indicator channel.

CPICH This choice selects a common pilot channel.

***RST** DPCH1**Key Entry** DPCH + 1 DPCH + 2 PCCPCH PICH CPICH

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

Remarks White noise is a frequency spectrum that is uniform over a specific frequency band. White noise has equal power per hertz over the specific frequency band.

:DLINK:AWGN:FNBW

Supported E4438C with Option 400 and 403

[:SOURCE] : RADIO : WCDMA : TGPP [: BBG] : DLINK : AWGN : FNBW ?

This query returns the flat noise bandwidth value.

***RST** +6.1440000E+006

:DLINK:AWGN:NPOWER

Supported E4438C with Option 400 and 403

[:SOURCE] : RADIO : WCDMA : TGPP [: BBG] : DLINK : AWGN : NPOWER ?

This query returns the in-band noise power portion of the total RF power.

***RST** +0

:DLINK:AWGN:TICPower

Supported E4438C with Option 400 and 403

[:SOURCE] : RADIO : WCDMA : TGPP [: BBG] : DLINK : AWGN : TICPower ?

This query returns the total in-channel power (carrier with noise) as defined by the 3GPP standard.

***RST** +0

Field Entry Total Pwr

Remarks The total in-channel power is a sum of carrier power and in-channel noise power. Changing the noise related parameters such as C/N, Eb/No, and Eb Ref will cause a recalculation of the total in-channel power.

The maximum value returned by this query depends on the power option that is installed in the signal generator.

:DLINK:AWGN[:STATe]**Supported** E4438C with Option 400 and 403

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:AWGN:STATe ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:AWGN:STATe?

This command enables or disables the additive white gaussian noise (AWGN) physical channel.

RST** 0**Key Entry** Channel State Off On**:DLINK:BBClock*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:BBClock INT[1]|EXT[1]

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:BBClock?

This command selects the baseband generator chip clock source for the channel.

RST** INT**Key Entry** BBG Data Clock Ext Int**:DLINK:CARB:CMODE:CCODE*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:CCODE <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:CCODE?

This command sets the channel code for the chip ARB based dedicated physical channel (DPCH) in compressed mode.

RST** 6**Range** 0–511**Field Entry** Channel Code**:DLINK:CARB:CMODE:DATA*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:DATA PN9|PN15

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:DATA?

This command sets the dedicated physical channel (DPCH) data pattern in compressed mode (CM).

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

*RST	PN9
Key Entry	PN9 PN15
Remarks	The data pattern contains one frame of each normal DPCH frame with a chosen slot structure. CM is enabled via spread factor reduction using a single frame method.

:DLINK:CARB:CMODE:FOFFset

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : DLINK : CARB : CMODE : FOFFset <val>
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : DLINK : CARB : CMODE : FOFFset ?
```

This command sets the frame offset for the dedicated physical channel (DPCH) in compressed mode.

*RST	0
Range	0–149
Field Entry	Frame Offset

:DLINK:CARB:CMODE:FSTRuct

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : DLINK : CARB : CMODE : FSTRuct A|B
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : DLINK : CARB : CMODE : FSTRuct ?
```

This command selects the frame structure for the downlink compressed mode.

A This choice maximizes the transmission gap length in a compressed frame.

B This choice optimized for power control during a compressed frame.

*RST	A
Key Entry	A B

:DLINK:CARB:CMODE:POWER**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:POWER <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:POWER?

This command sets the power for the downlink compressed mode.

The variable <val> is expressed in units of decibels (dB).

RST** +0.00000000E+000**Range** -40 to 0**Field Entry** Power**:DLINK:CARB:CMODE:PRATio*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:PRATio <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:PRATio?

This command sets the playback ratio for the downlink compressed mode.

***RST** 2**Range** 0–4096**Field Entry** Playback Ratio**Remarks** The value that is set represents the number of normal frames played between each compressed frame.

For example: 1:30

30 represents the un-compressed (normal) DPCH frames. The 30 frames will be played and then 1 compressed DPCH frame. The sequence then repeats.

:DLINK:CARB:CMODE:SCTYpe**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:SCTYpe NORMal | RIGHT | LEFT

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:SCTYpe?

This command sets the scramble type for the downlink compressed mode.

NORMal This choice selects scramble codes 0–8191 (16 x 511 + 15 = 8191).

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

RIGHT	This choice selects scramble codes 8192–16383 (Normal + 8192).		
LEFT	This choice selects scramble codes 16384–24575 (Normal + 16384).		
*RST	NORM		
Key Entry	Normal	Right	Left

:DLINK:CARB:CMODE:SFORmat

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : DLINK : CARB : CMODE : SFORmat <val>
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : DLINK : CARB : CMODE : SFORmat ?
```

This command sets the slot format value for the dedicated physical channel (DPCH) in compressed mode. This value is used for both compressed and uncompressed frames.

*RST	+11
Range	1–15
Field Entry	Slot Format

:DLINK:CARB:CMODE:SSCodeos

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : DLINK : CARB : CMODE : SSCodeos <val>
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : DLINK : CARB : CMODE : SSCodeos ?
```

This command sets the secondary scramble code offset for the dedicated physical channel (DPCH) in compressed mode.

*RST	+0
Range	0–15
Field Entry	SecScr Code OS

:DLINK:CARB:CMODE:TFIRST**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:CARB:CMODE:TFIRST <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:CARB:CMODE:TFIRST?

This command sets the first slot at which a gap appears.

RST** 7**Range** 0–7**Field Entry** Tfirst**:DLINK:CARB:CMODE:TGL*Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:CARB:CMODE:TGL <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:CARB:CMODE:TGL?

This command sets the number of slots in the gap.

RST** 7**Range** 1–7**Field Entry** Tgl**:DLINK:CARB:CMODE[:STATE]*Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:CARB:CMODE[:STATE] ON|OFF|1|0

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:CARB:CMODE[:STATE]?

This command enables or disables the downlink dedicated physical channel (DPCH) in compressed mode.

RST** 0**Key Entry** Channel State Off On**:DLINK:CPICH:CCODE*Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:CPICH:CCODE?

This query returns the common paging indicator channel (CPICH) channel code value.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

***RST** +0

Remarks The channelization code is always expected to be 0.

:DLINK:CPICH:POWER

Supported E4438C with Option 400

[:SOURCE] :RADIO:WCDMA:TGPP [:BBG] :DLINK:CPICH:POWER <val>

[:SOURCE] :RADIO:WCDMA:TGPP [:BBG] :DLINK:CPICH:POWER?

This command sets the power level for the common paging indicator channel (CPICH). The variable <val> is expressed in units of decibels (dB).

***RST** -3.30000000E+000

Range -40 to 0

Field Entry Power

:DLINK:CPICH[:STATE]

Supported E4438C with Option 400

[:SOURCE] :RADIO:WCDMA:TGPP [:BBG] :DLINK:CPICH [:STATE]

[:SOURCE] :RADIO:WCDMA:TGPP [:BBG] :DLINK:CPICH [:STATE]?

This command enables or disables the common paging indicator channel (CPICH).

***RST** 1

Key Entry Channel State Off On

:DLINK:CRATE

Supported E4438C with Option 400

[:SOURCE] :RADIO:WCDMA:TGPP [:BBG] :DLINK:CRATE <val>

[:SOURCE] :RADIO:WCDMA:TGPP [:BBG] :DLINK:CRATE?

This command adjusts the chip rate.

The variable <val> is expressed in units of cycle per second (cps).

***RST** +3.84000000E+006

Range 1000∠4250000

Field Entry Chip Rate

Remarks The chip rate is equivalent to the spreading rate.

:DLINK:DPCH[1]:BALance**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1]:BALance <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1]:BALance?

This command sets DPCH1 power while scaling the power of all available OCNS channels in order to maintain a total power of 0 dB.

The variable <val> is expressed in units of decibels (dB).

Key Entry DPCH Channel Balance

Remarks At least one DPCH and one OCNS channel must be on prior to channel balancing. Refer to “:DLINK:DPCH[1]2[:STATE]” on page 951 and “:DLINK:OCNS[1]2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATE]” on page 956.

The command [:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1]:BINitalize must be initiated prior to channel balancing.

:DLINK:DPCH[1]:BINitalize**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1]:BINitalize

This command initializes the DPCH1 or DPCH2 power of the OCNS channel balancing.

Remarks To insure proper balancing, this command must be called before the channel balancing.

:DLINK:DPCH[1] | 2:ALL[:STATE]**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:ALL[:STATE] ON|OFF|1|0

This command enables or disables both of the downlink dedicated physical channels.

Key Entry Channel State Off On

Remarks If the parameter is changed, the apply command must be executed after the change. Refer to “:DLINK:APPLY” on page 935.

To query the state of the individual channel, refer to “:DLINK:DPCH[1]2[:STATE]” on page 951

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:DLINK:DPCH[1] | 2:CCODE**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:DPCH[1] | 2:CCODE <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:DPCH[1] | 2:CCODE?

This command sets the downlink dedicated physical channel (DPCH) code number.

***RST** DPCH 1: 10 DPCH 2: 11**Range** 0–511**Field Entry** Chan Code**Remarks** The channel code is coupled with the slot format and symbol rate. Refer to “:DLINK:DPCH[1]|2:SLOTformat” on page 948 and “:DLINK:DPCH[1]|2:SRATE” on page 948.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 935.

:DLINK:DPCH[1] | 2:DATA**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:DPCH[1] | 2:DATA PN9 | PN15 | FIX4 |

"<file name>" | TGRA | TGRB

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:DPCH[1] | 2:DATA?

This command configures the data pattern for the downlink dedicated physical channel (DPCH).

TGRA This choice selects transport channel A.**TGRB** This choice selects transport channel B.

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** PN9**Key Entry** PN9 PN15 FIX4 “User File” Transp Chan A Transp Chan B**Remarks** The data is now independent, on each of the DPCH channels. The data is limited to PN9 and PN15 when the DPCH is in slot format 16.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 935.

:DLINK:DPCH[1] | 2:DATA:FIX4**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:DATA:FIX4 <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:DATA:FIX4?

This command sets the data type to a FIX4 pattern for the downlink dedicated physical channel (DPCH). While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

***RST** #B0000**Range:** 0–15**Key Entry** FIX4

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 935.

:DLINK:DPCH[1] | 2:POWer**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:DATA:POWer <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:DATA:POWer?

This command sets the power level for the downlink dedicated physical channel (DPCH). The variable <val> is expressed in units of decibels (dB).

***RST** –1.02000000E+001**Range:** –40 to 0**Field Entry** Power

:DLINK:DPCH[1] | 2:RCSetup**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:DPCH [ 1 ] | 2:RCSetup REF122 | REF64 |
REF144 | REF384 | AMR122 | ISDN
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:DPCH [ 1 ] | 2:RCSetup?
```

This command configures the downlink reference measurement setup for the transport channel.

REF122	This choice configures the transport channel per the 3G TS 34.121 specification to a downlink reference measurement channel 12.2 kbps rate.			
REF64	This choice configures the transport channel per the 3G TS 34.121 specification to a downlink reference measurement channel 64 kbps rate.			
REF144	This choice configures the transport channel per the 3G TS 34.121 specification to a downlink reference measurement channel 144 kbps rate.			
REF384	This choice configures the transport channel per the 3G TS 34.121 specification to a downlink reference measurement channel 384 kbps rate.			
AMR122	This choice configures the transport channel per the 3G TS 25.944 specification to a downlink reference measurement channel AMR 12.2 kbps rate.			
ISDN	This choice configures the transport channel as follows: 64 kbps rate, channel 1 with 4 blocks of 640 and channel 2 with 1 block of 148.			
Key Entry	12.2 kbps (34.121 v3.10)	64 kbps (34.121 v3.10)	144 kbps (34.121 v3.10)	384 kbps (34.121 v3.10)
	AMR 12.2 (25.944 v4.1)	UDI ISDN (25.944 v4.1)		
Remarks	If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 935 .			

:DLINK:DPCH[1] | 2:SLOTformat**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:DPCH [ 1 ] | 2:DATA:SLOTformat <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:DPCH [ 1 ] | 2:DATA:SLOTformat?
```

This command configures the slot format for the dedicated physical channel (DPCH).

***RST** 0**Range:** 0–16**Field Entry** Slot Format

Remarks The slot format is coupled with the channel code and symbol rate. The transmit power control (TPC), the transport format combination indicator (TFCI), and the Pilot bits are also set as per specification and not displayed.

For a description of slot formats, see the 3GPP Technical Specifications (TS 25.211 v3.10).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 935.

:DLINK:DPCH[1] | 2:SRATE**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:DPCH [ 1 ] | 2:SRATE?
```

This query returns the symbol rate for the downlink dedicated physical channel.

RST** +7.50000000E+003**:DLINK:DPCH[1] | 2:SSCodeos*Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:DPCH [ 1 ] | 2:SSCodeos <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:DPCH [ 1 ] | 2:SSCodeos?
```

This command sets the secondary scrambling code offset for the downlink dedicated physical channel (DPCH).

***RST** +0**Range:** 0–15

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

Field Entry 2nd Scr Offset

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 935.

:DLINK:DPCH[1] | 2:TFCI:PATtern

Supported E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :DLINK:DPCH[ 1 ] | 2:TFCI:PATtern <val>
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :DLINK:DPCH[ 1 ] | 2:TFCI:PATtern?
```

This command sets a 10-bit pattern for the transport format combination indicator (TFCI) for the dedicated physical channel (DPCH).

While the variable <val> is expressed in binary or decimal formats, the query returns only decimal values.

***RST** +0

Range: 0–1023

Field Entry TFCI Pat

Remarks The TFCI is optional and describes the services in use (for example, voice or data). If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 935.

:DLINK:DPCH[1] | 2:TOFFset

Supported E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :DLINK:DPCH[ 1 ] | 2:TOFFset <val>
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :DLINK:DPCH[ 1 ] | 2:TOFFset?
```

This command adjusts the timing offset for the dedicated physical channel (DPCH). The variable <val> is expressed in chips.

***RST** +0

Range: 0–149

Field Entry tDPCH Offset

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 935.

:DLINK:DPCH[1] | 2:TPC:NUMSteps**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:TPC:NUMSteps <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:TPC:NUMSteps?

This command sets the number of steps for increasing/decreasing the user's equipment (UE) power.

RST** +1**Range:** 1–80**Field Entry** TPC Steps**Remarks** The command is used with the transmit power control (TPC) patterns up/down (UDOWN), down/up (DUP), all down(DALL), all up (UALL), external (EXT), or user file ("<file name>"). Refer to **“:DLINK:DPCH[1]|2:TPC:PATtern”**If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to **“:DLINK:APPLY”** on page 935.**:DLINK:DPCH[1] | 2:TPC:PATtern*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:TPC:PATtern UDOWN | DUP |

UALL | DALL | EXT | "<file name>"

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:TPC:PATtern?

This command controls the power of the user's equipment (UE). The increase/decrease direction for UE power level changes is determined by the transmit power control (TPC) pattern.

UDOWN This choice repetitively steps up and down the TPC pattern.

DUP This choice repetitively steps down and up the TPC pattern.

UALL This choice consecutively steps up the TPC pattern.

DALL This choice consecutively steps down the TPC pattern.

EXT This choice specifies an external TPC pattern.

"<file name>" This choice specifies a user file.

***RST** UDOW**Key Entry** All Down All Up Down/Up Up/Down Ext User File

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 935.

:DLINK:DPCH[1] | 2[:STATE]

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : DLINK : DPCH [ 1 ] | 2 : ALL [ : STATE ] ON | OFF | 1 | 0
[ : SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : DLINK : DPCH [ 1 ] | 2 : ALL [ : STATE ] ?
```

This command enables or disables the dedicated physical channels (DPCH1 or DPCH2).

***RST** DPCH1: 1 DPCH2: 0

Key Entry Channel State Off On

Remarks If the parameter is changed, the apply command must be executed after the change. Refer to “:DLINK:APPLY” on page 935.

:DLINK:FILTER

Supported E4438C with Option 400

```
[ : SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : DLINK : FILTER RNYQuist | NYQuist | GAUSSian |
RECTangle | IS95 | IS95_EQ | IS95_MOD | IS95_MOD_EQ | AC4Fm | UGGaussian |
" <user FIR > "
[ : SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : DLINK : FILTER ?
```

This command selects the filter type for the downlink configuration.

IS95 This choice selects a filter that meets the criteria of the IS-95 standard.

IS95_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

IS95_MOD This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.

IS95_MOD_EQ This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.

UGGaussian This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

AC4Fm	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.					
"<user FIR>"	This variable is any filter file that you have stored into memory.					
*RST	RNYQ					
Key Entry	Root Nyquist	Nyquist	Gaussian	Rectangle	IS-95	IS-95 w/EQ
	IS-95 Mod	IS-95 Mod w/EQ	APCO 25 C4FM	UN3/4 GSM	Gaussian	
	User FIR					
Remarks	See “File Name Variables” on page 13 for information on the file name syntax.					

:DLINK:FILTER:ALPHA

Supported E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:FILTER:ALPHA <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:FILTER:ALPHA?
```

Execute this command to change the alpha value for a Nyquist or root Nyquist filter.

***RST** +2.20000000E-001

Range 0-1

Key Entry Filter Alpha

Remarks This command is effective only after selection of a root Nyquist or Nyquist filter; it does not affect other types of filters. To change the current filter type, refer to “:DLINK:FILTER” on page 951.

:DLINK:FILTER:BBT

Supported E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:FILTER:BBT <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:FILTER:BBT?
```

Execute this command to change the bandwidth-multiplied-by-bit-time filter parameter value.

***RST** +5.00000000E-001

Range 0.0000-1.0

Key Entry Filter BbT

Remarks This command is effective only after selecting a Gaussian filter; it does not affect other types of filters. See “:DLINK:FILTER” on page 951 to change the filter type.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

:DLINK:FILTer:CHANnel**Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:FILTer:CHANnel EVM|ACP
[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:FILTer:CHANnel?

Execute this command to optimize a filter for minimized error vector magnitude (EVM) or for minimized adjacent channel power (ACP).

EVM This choice provides the most ideal passband.**ACP** This choice improves stopband rejection. This feature only applies to root Nyquist and Nyquist filters.***RST** EVM**Key Entry** Optimize FIR For EVM ACP**Remarks** To change the current filter type, refer to “:DLINK:FILTer” on page 951.**:DLINK:MSYNc****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:MSYNc

This command generates a one shot trigger pulse to synchronize multiple ESGs. This is a command only; there is no query.

Key Entry Multi ESG Sync Trigger**Remarks** The trigger pulse will be generated when the user assigns the DRPS42 signal to any output port.**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:ALL[:STATE]****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:ALL[:STATE] ON|OFF|1|0

This command enables or disables all of the orthogonal channel noise simulator (OCNS) channels.

***RST** +0**Key Entry** Channel State Off On**Remarks** To query the state of the individual channel, refer to “:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATE]” on page 956.

:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:CCODE**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:CCODE <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:CCODE?

This command sets the channel code number for the downlink orthogonal channel noise simulator (OCNS).

***RST** +24**Range** 0–255**Field Entry** Chan Code

Remarks The channel code is coupled with the symbol rate. Refer to “:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SRATe” on page 955.

:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:DATA**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:DATA PN9 | PN15

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:DATA?

This command configures the data pattern for the downlink orthogonal channel noise simulator (OCNS).

RST** PN9**Key Entry** PN9 PN15**:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:POWer*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:POWer <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:POWer?

This command sets the power level for the orthogonal channel noise simulator (OCNS).

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

The variable <val> is expressed in units of decibels (dB).

***RST** -1.200000000E+001

Range -40 to 0

Field Entry Power

:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SRATE

Supported E4438C with Option 400

```
[ :SOURCE ] :RADIo:WCDMa:TGPP[ :BBG ] :DLINK:OCNS[ 1 ] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
13 | 14 | 15 | 16 :SRATE <val>
```

```
[ :SOURCE ] :RADIo:WCDMa:TGPP[ :BBG ] :DLINK:OCNS[ 1 ] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
13 | 14 | 15 | 16 :SRATE?
```

This command selects the symbol rate for the orthogonal channel noise simulator (OCNS).

The choices are expressed in units of kilo symbols per second (ksps).

***RST** +1.50000000E+004

Key Entry **7.5 ksps 15 ksps 30 ksps 60 ksps 120 ksps 240 ksps**
480 ksps 960 ksps

Remarks The symbol rate is coupled with the channel code. Refer to
“:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:CCODE” on page 954.

:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SSCodeos

Supported E4438C with Option 400

```
[ :SOURCE ] :RADIo:WCDMa:TGPP[ :BBG ] :DLINK:OCNS[ 1 ] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
13 | 14 | 15 | 16 :SSCodeos <val>
```

```
[ :SOURCE ] :RADIo:WCDMa:TGPP[ :BBG ] :DLINK:OCNS[ 1 ] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
13 | 14 | 15 | 16 :SSCodeos?
```

This command sets the secondary scrambling code offset for the orthogonal channel noise simulator (OCNS).

***RST** +0

Range 0–15

Field Entry 2nd Scr Offset

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:TOffset**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:TOffset <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:TOffset?

This command adjusts the timing offset for the orthogonal channel noise simulator (OCNS) channel.

RST** +0**Range:** 0–149**Field Entry** tOCNS Offset**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATe]*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATe] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATe]?

This command enables or disables the orthogonal channel noise simulator (OCNS) channel.

RST** +0**Field Entry** On/Off**:DLINK:OOSTest[:STATe]*Supported** E4438C with Option 400 and 403

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OOSTest[:STATe] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OOSTest[:STATe]?

This command enables or disables the Out-of-Sync-Test mode.

***RST** 0**Key Entry** Out-of-Sync Test Off On**Remarks** When **Compressed Mode Off On** is set to On, Out-of-Sync Test mode cannot be enabled.When **Out-of-Sync Test Off On** is set to On, ALC is automatically disabled; when **Out-of-Sync Test Off On** is set to Off, **ALC Off On** is automatically enabled.

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

:DLINK:OOSTest:DTXGate:POLarity**Supported** E4438C with Option 400 and 403

```
[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:OOSTest:DTXGate:
POLarity POSitive|NEGative
[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:OOSTest:DTXGate:POLarity?
```

This command sets the multiple ESG synchronization trigger signal polarity.

RST** POS**Key Entry** DPCH1 DTX-Gate Trigger Polarity Neg Pos**:DLINK:PADJust*Supported** E4438C with Option 400

```
[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:PADJust EQUal|SCALE
[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:PADJust?
```

This command adjusts the code domain power levels of all downlink channels.

EQUal This choice will adjust all channel powers to equal power settings.

SCALE This choice will scale the channel power levels so that the sum of the powers are equal to 0 dB.

RST** EQU**Key Entry** Equal Powers Scale To 0dB**:DLINK:PCCPch:BCHData*Supported** E4438C with Option 400

```
[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:PCCPch:BCHData PN9|PN15|FIX4|
"<file name>"|TRANspch
[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:PCCPch:BCHData?
```

This command sets the broadcast channel (BCH) data format that will be transmitted on the physical common control physical channel (PCCPCH).

TRANspch This choice selects a dedicated transport channel data pattern.

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** FIX4**Key Entry** PN9 PN15 FIX4 User File Transport CH

:DLINK:PCCPch:BCHData:FIX4**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:BCHData:FIX4 <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:BCHData:FIX4?

This command sets a fixed 4-bit binary data pattern for the primary common control physical channel (PCCPCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

RST** #B0000**Range** 0–15**Key Entry** FIX4**:DLINK:PCCPch:CCODE*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:CCODE <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:CCODE?

This command sets the primary common control physical channel (PCCPCH) code to the desired code number.

RST** +1**Range** 0–255**Field Entry** Channel Code**:DLINK:PCCPch:POWer*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:POWer <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:POWer?

This command sets the power level for the primary common control physical channel (PCCPCH). The variable <val> is expressed in units of decibels (dB).

***RST** -5.30000000E+000**Range** -40 to 0**Field Entry** Power

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:DLINK:PCCPch[:STATE]**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:PCCPch[:STATE] ON|OFF|1|0

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:PCCPch[:STATE]?

This command enables or disables the primary common control physical channel (PCCPCH).

RST** 1**Key Entry** Channel State Off On**:DLINK:PICH:CCODE*Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:PICH:CCODE <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:PICH:CCODE?

This command sets the paging indicator channel (PICH) code to the desired code number.

RST** +3**Range** 0–255**Field Entry** Channel Code**:DLINK:PICH:DATA*Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:PICH:DATA PN9|PN15|FIX4|

<file name>"

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:PICH:DATA?

This command configures the data pattern for the downlink paging indicator channel (PICH).

<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** PN9**Key Entry** PN9 PN15 FIX4 User File

:DLINK:PICH:DATA:FIX4

Supported E4438C with Option 400

[:SOURCE] :RADIO:WCDMA:TGPP [:BBG] :DLINK:PICH:DATA:FIX4 <val>

[:SOURCE] :RADIO:WCDMA:TGPP [:BBG] :DLINK:PICH:DATA:FIX4?

This command sets a fixed 4-bit data pattern to be transmitted on a paging indicator channel (PICH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

***RST** #B0000

Range 0–15

Key Entry FIX4

:DLINK:PICH:PIBits

Supported E4438C with Option 400

[:SOURCE] :RADIO:WCDMA:TGPP [:BBG] :DLINK:PICH:PIBits?

This query returns the number of bits in the paging indicator field.

***RST** +288

Field Entry PI Bits

:DLINK:PICH:PINIndicator

Supported E4438C with Option 400

[:SOURCE] :RADIO:WCDMA:TGPP [:BBG] :DLINK:PICH:PINIndicator?

This query returns the number of paging indicator fields per frame.

***RST** +144

Field Entry Paging Indicator

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:DLINK:PICH:POWer**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PICH:POWer <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PICH:POWer?

This command sets the power level of the paging indicator channel (PICH). The variable <val> is expressed in units of decibels (dB)

RST** -8.300000000E+000**Range** -40 to 0**Field Entry** Power**:DLINK:PICH[:STATe]*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PICH[:STATe] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PICH[:STATe]?

This command enables or disables the paging indicator channel (PICH).

RST** 0**Key Entry** Channel State Off On**:DLINK:POLarity*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:POLarity NORMAL|INVERTed

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:POLarity?

This command selects the phase polarity of the downlink signal.

NORMAL This choice selects normal polarity.

INVERTed This choice inverts the internal Q signal.

***RST** NORM**Key Entry** Phase Polarity Normal Invert

:DLINK:PSCH:POWer**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PSCH:POWer <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PSCH:POWer?

This command sets the power level for the primary synchronization physical channel (PSCH).

The variable <val> is expressed in units of decibels (dB).

RST** -8.30000000E+000**Range** -40 to 0**Field Entry** Power**:DLINK:PSCH[:STATE]*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PSCH[:STATE] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PSCH[:STATE]?

This command enables or disables the primary synchronization physical channel (PSCH).

RST** 1**Field Entry** PSCH State**:DLINK:RPANel:INPut:ALTPower*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:INPut:ALTPower?

This query returns the type of signal at the alternate power input (Alt power in AUX I/O connector pin#16) for the dedicated physical channel (DPCH) mode.

***RST** NONE

Remarks When **Compressed Mode Off On** is set to On, Compressed-mode stop-trigger Compressed-mode stop-trigger signal is assigned to pin 16 of the rear panel AUX I/O connector. For more information about the rear panel AUX I/O connector configuration, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:DLINK:RPANel:INPut:BBGRef**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:RPANel:INPut:BBGRef?

This query returns the type of signal at the baseband generator reference input (BASEBAND GEN REF IN, rear panel connector) for the dedicated physical channel (DPCH) mode.

***RST** CCL

Remarks The signal name is baseband generator chip clock (CCL). For more information about the rear panel connector configuration, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:DLINK:RPANel:INPut:BGATe**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:RPANel:INPut:BGATe?

This query returns the type of signal at the gate burst (BURST GATE IN, rear panel connector) for the dedicated physical channel (DPCH) mode.

***RST** SFNR

Remarks System Frame Number Reset (SFNR) is used for synchronization in a two ESG setup. This signal is used to tell where the frame starts.

:DLINK:RPANel:INPut:PTRigger1**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:RPANel:INPut:PTRigger1?

This query returns the type of signal at the pattern trigger input 1 (PATT TRIG IN, rear panel connector) for the dedicated physical channel (DPCH) mode.

***RST** MSTI

Remarks When **Compressed Mode Off On** is set to On, Compressed-mode start-trigger (CSTT) signal is assigned to the rear panel PATT TRIG IN connector; when **Out-of-Sync Test Off On** is set to On, DPCH1 DTX-Gate (DDTX) signal is assigned to the rear panel PATT TRIG IN connector.

Multiple ESG Synchronization Trigger In (MSTI) signal is used to synchronize signals from two ESGs that have different coding to simulate transmit diversity.

:DLINK:RPANel:INPut:PTRigger2**Supported** E4438C with Option 400

[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:INPut:PTRigger2?

This query returns the type of signal at the pattern trigger input 2 (PATT TRIG IN 2, AUX I/O connector pin#17) for the dedicated physical channel (DPCH) mode.

RST** TPCB**Remarks** Transmit Power Control Bit (TPCB) signal is used to control the DPCH TPC bit.**:DLINK:RPANel:OUTPut:DCLock*Supported** E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:OUTPut:DCLock
DRPS0|DRPS4|DRPS5|DRPS6|DRPS10|DRPS11|DRPS13|DRPS20|DRPS21|DRPS22|
DRPS23|DRPS24|DRPS25|DRPS26|DRPS28|DRPS30|DRPS32|DRPS33|DRPS34|DRPS35|
DRPS36|DRPS37|DRPS38|DRPS39|DRPS40|DRPS41|DRPS42
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:OUTPut:DCLock?
```

This command assigns a signal to the data clock output at the selected rear panel AUX I/O connector pin#6. Refer to [Table 9-2 on page 964](#) for command parameters for the variable and output signal names.

Table 9-2 Downlink Rear Panel Signal (DRPS) Output Type

Command Parameter	Signal Out
DRPS0	NONE
DRPS4	3.84 MHz chip clock
DRPS5	SFN reset signal
DRPS6	SFN sync pulse
DRPS10	SCH slot pulse
DRPS11	10ms Frame pulse
DRPS13	80ms Frame pulse
DRPS20	DPCH data clock with DTX
DRPS21	DPCCH TPC data clock

Table 9-2 Downlink Rear Panel Signal (DRPS) Output Type

Command Parameter	Signal Out
DRPS22	DPCCH TFCI data clock
DRPS23	DPCCH Pilot data clock
DRPS24	DPCH data stream
DRPS25	DPCH TimeSlot pulse
DRPS26	DPCH 10ms Frame Pulse
DRPS28	DPCH data clock
DRPS30	DPDCH data clock w/oDTX
DRPS32	DPCH comp Frm Indicator
DRPS33	DPCH Gap Indicator
DRPS34	PICH data clock
DRPS35	PICH data
DRPS36	PICH TimeSlot pulse
DRPS37	PICH 10ms FramePulse
DRPS38	P-CCPCH data clock
DRPS39	P-CCPCH data
DRPS40	DPCH Chip-ARB-frame-pulse
DRPS41	DPCH TPC-bits-out
DRPS42	Multi-ESG Sync Trigger Out

*RST

RPS0

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

Key Entry	NONE	3.84MHz chip-clk (DRPS4)	SFN reset-signal (DRPS5)
	SFN sync-pulse (DRPS6)	SCH slot-pulse (DRPS10)	
	10ms Frame Pulse (DRPS11)	80ms Frame Pulse (DRPS13)	
	DPDCH data-clk with DTX (DRPS20)	DPCCH TPC data-clk (DRPS21)	
	DPCCH TFC I data-clk (DRPS22)	DPCCH Pilot data-clk (DRPS23)	
	DPCH data stream (DRPS24)	DPCH TimeSlot pulse (DRPS25)	
	DPCH 10ms Frame-Pulse (DRPS26)	DPCH data-clk (0) (DRPS28)	
	DPDCH data-clk withoutDTX (DRPS30)		
	DPCH Compressed Frame Indicator (DRPS32)		
	DPCH Gap Indicator (DRPS33)	PICH data-clk (DRPS34)	
	PICH data (DRPS35)	PICH TimeSlot Pulse (DRPS36)	
	PICH 10ms FramePulse (DRPS37)	P-CCPCH data-clk (DRPS38)	
	P-CCPCH data (DRPS39)	DPCH ChipARB FramePulse (DRPS40)	
	DPCH TPC-Bit Out (DRPS41)	Mlt-ESG-Sync Trigger-Out (DRPS42)	
Remarks	For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the <i>E4428C/38C ESG Signal Generators User's Guide</i> .		

:DLINK:RPANel:OUTPut:DOUT

Supported E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:RPANel :OUTPut :DOUT
DRPS0 | DRPS4 | DRPS5 | DRPS6 | DRPS10 | DRPS11 | DRPS13 | DRPS20 | DRPS21 | DRPS22 |
DRPS23 | DRPS24 | DRPS25 | DRPS26 | DRPS28 | DRPS30 | DRPS32 | DRPS33 | DRPS34 | DRPS35 |
DRPS36 | DRPS37 | DRPS38 | DRPS39 | DRPS40 | DRPS41 | DRPS42
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:RPANel :OUTPut :DOUT?
```

This command assigns a signal to the data output at the selected rear panel AUX I/O connector pin#7. Refer to [Table 9-2 on page 964](#) for command parameters and output signal names.

***RST** RPS0

Key Entry Refer to **Key Entry** on [page 966](#).

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:DLINK:RPANel:OUTPut:EVENT1**Supported** E4438C with Option 400

```
[ :SOURCE ] : RADIo : WCDMa : TGPP [ : BBG ] : DLINk : RPANel : OUTPut : EVENt1
DRPS0 | DRPS4 | DRPS5 | DRPS6 | DRPS10 | DRPS11 | DRPS13 | DRPS20 | DRPS21 | DRPS22 |
DRPS23 | DRPS24 | DRPS25 | DRPS26 | DRPS28 | DRPS30 | DRPS32 | DRPS33 | DRPS34 | DRPS35 |
DRPS36 | DRPS37 | DRPS38 | DRPS39 | DRPS40 | DRPS41 | DRPS42
```

```
[ :SOURCE ] : RADIo : WCDMa : TGPP [ : BBG ] : DLINk : RPANel : OUTPut : EVENt1?
```

This command assigns a signal to the EVENT 1 rear panel output connector. Refer to [Table 9-2 on page 964](#) for command parameters and output signal names.

***RST** RPS0**Key Entry** Refer to **Key Entry** on [page 966](#).

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:DLINK:RPANel:OUTPut:EVENT2**Supported** E4438C with Option 400

```
[ :SOURCE ] : RADIo : WCDMa : TGPP [ : BBG ] : DLINk : RPANel : OUTPut : EVENt2
DRPS0 | DRPS4 | DRPS5 | DRPS6 | DRPS10 | DRPS11 | DRPS13 | DRPS20 | DRPS21 | DRPS22 |
DRPS23 | DRPS24 | DRPS25 | DRPS26 | DRPS28 | DRPS30 | DRPS32 | DRPS33 | DRPS34 | DRPS35 |
DRPS36 | DRPS37 | DRPS38 | DRPS39 | DRPS40 | DRPS41 | DRPS42
```

```
[ :SOURCE ] : RADIo : WCDMa : TGPP [ : BBG ] : DLINk : RPANel : OUTPut : EVENt2?
```

This command assigns a signal to the EVENT 2 rear panel output connector. Refer to [Table 9-2 on page 964](#) for command parameters and output signal names.

***RST** RPS0**Key Entry** Refer to **Key Entry** on [page 966](#).

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:DLINK:RPANel:OUTPut:EVENT3**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :DLINK:RPANel:OUTPut:EVENT3
DRPS0 | DRPS4 | DRPS5 | DRPS6 | DRPS10 | DRPS11 | DRPS13 | DRPS20 | DRPS21 | DRPS22 |
DRPS23 | DRPS24 | DRPS25 | DRPS26 | DRPS28 | DRPS30 | DRPS32 | DRPS33 | DRPS34 | DRPS35 |
DRPS36 | DRPS37 | DRPS38 | DRPS39 | DRPS40 | DRPS41 | DRPS42
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :DLINK:RPANel:OUTPut:EVENT3?
```

This command assigns a signal to the EVENT 3 at the selected rear panel AUX I/O connector pin#19. Refer to [Table 9-2 on page 964](#) for command parameters and output signal names.

RST** RPS0**Key Entry** Refer to **Key Entry** on [page 966](#).**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.**:DLINK:RPANel:OUTPut:EVENT4*Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :DLINK:RPANel:OUTPut:EVENT4
DRPS0 | DRPS4 | DRPS5 | DRPS6 | DRPS10 | DRPS11 | DRPS13 | DRPS20 | DRPS21 | DRPS22 |
DRPS23 | DRPS24 | DRPS25 | DRPS26 | DRPS28 | DRPS30 | DRPS32 | DRPS33 | DRPS34 | DRPS35
DRPS36 | DRPS37 | DRPS38 | DRPS39 | DRPS40 | DRPS41 | DRPS42
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :DLINK:RPANel:OUTPut:EVENT4?
```

This command assigns a signal to the EVENT 4 at the selected rear panel AUX I/O connector pin#18. Refer to [Table 9-2 on page 964](#) for command parameters and output signal names.

***RST** RPS0**Key Entry** Refer to **Key Entry** on [page 966](#).**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:DLINK:RPANel:OUTPut:SSYNc**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:OUTPut:SSYNc
DRPS0|DRPS4|DRPS5|DRPS6|DRPS10|DRPS11|DRPS13|DRPS20|DRPS21|DRPS22|
DRPS23|DRPS24|DRPS25|DRPS26|DRPS28|DRPS30|DRPS32|DRPS33|DRPS34|DRPS35|
DRPS36|DRPS37|DRPS38|DRPS39|DRPS40|DRPS41|DRPS42
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:OUTPut:SSYNc?
```

This command assigns a signal to the SYM SYNC OUT at the selected rear panel AUX I/O connector pin#5. Refer to [Table 9-2 on page 964](#) for command parameters and output signal names.

***RST** RPS0**Key Entry** Refer to **Key Entry** on [page 966](#).

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:DLINK:SCH[:STATe]**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SCH[:STATe] ON|OFF|1|0
```

This command enables or disables the primary and secondary synchronization channel (SSCH).

***RST** 1**Key Entry** Channel State Off On

Remarks To query the state of the individual channel, refer to “:DLINK:PSCH[:STATe]” on [page 962](#) and “:DLINK:SSCH[:STATe]” on [page 971](#).

:DLINK:SCRamblecode**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SCRamblecode <val>
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SCRamblecode?
```

This command selects the scramble code number.

***RST** +0**Range** 0–511**Field Entry** Scrambling Code

:DLINK:SDElay**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SDElay <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SDElay?

This command sets the delay of the system frame number (SFN) synchronization when a Multi-ESG-Sync Trigger-In signal is received. The variable <val> is expressed in unit of chips.

***RST** +0.00000000E+000**Range** 0–38399**Field Entry** Sync Delay

Remarks This function provides the capability of Inter-Cell Soft Handover test as described in TS.34.121 7.7.1 of the 3GPP standard. The test requires two basestations that generate the same signal but have a 10 chip timing offset. The two basestations are simulated by two ESGs and Sync Delay is the synchronization delay between the ESGs.

:DLINK:SSCH:POWer**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SSCH:POWer <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SSCH:POWer?

This command sets the power level for the secondary synchronization channel (SSCH). The variable <val> is expressed in units of decibels (dB).

RST** –8.30000000E+000**Range** –40 to 0**Field Entry** SSCH Power**:DLINK:SSCH:SSGRoup*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SSCH:SSGRoup?

This command query returns the secondary scramble code group for the secondary synchronization channel (SSCH).

***RST** +0**Field Entry** SSCH 2nd Scramble Group

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:DLINK:SSCH[:STATE]**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:SSCH[:STATE] ON|OFF|1|0

This command enables or disables the secondary synchronization channel (SSCH).

RST** 1**Field Entry** SSCH State**:DLINK:TGAP:FSTRUCT*Supported** E4438C with Option 400

[:SOURCE]:RADIO[1]|2|3|4:WCDMA:TGPP[:BBG]:DLINK:TGAP:FSTRUCT A|B

[:SOURCE]:RADIO[1]|2|3|4:WCDMA:TGPP[:BBG]:DLINK:TGAP:FSTRUCT?

This command selects the compressed frame structure for the transmission gaps.

A The pilot field of the last slot in the transmission gap is transmitted and transmission is turned off during the rest of the transmission gap.

B The TPC field of the first slot and the pilot field of the last slot in the transmission gap are transmitted and transmission is turned off during the rest of the transmission gap.

RST** A**Field Entry** Frame Struct**:DLINK:TGAP:POFFset*Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:POFFset <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:POFFset?

This command specifies the amount of power to be increased when the data is being compressed for the transmission gap power offset.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000**Range** 0–6**Field Entry** PwrOffs

:DLINK:TGAP:PSI[1]:CFN**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:CFN <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:CFN?

This command sets the connection frame number (CFN) for the first radio of the first pattern 1.

***RST** 0**Range** 1–255**Field Entry** TGCFN

Remarks The connection frame number (CFN) is counted internally relative to the system sync signal.

:DLINK:TGAP:PSI[1]:CMMethod**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:CMMehtod SF2|PUNcture

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:CMMethod?

This command selects the compressed mode (CM) method.

SF2 This choice selects a compressed mode method that reduces the spread factor (SF) by 2. This is done by reducing the spreading factor in half. When the dedicated physical data channel's (DPDCH) symbol rate is 960 kbps, the frame is not compressed because it uses the lowest SF value and cannot be reduced.

PUNcture This choice selects a compressed mode method that punctures the convolutional encoder to a lower rate which reduces the number of symbols to be transmitted.

***RST** SF2**Key Entry** SF2 Puncture

Remarks To edit the parameters for this command using the ESG front panel keys, highlight the **CM Method** field and select either **SF2** or **Puncture** softkeys.

If the parameter is changed, the apply command must be executed after the change. Refer to “:DLINK:APPLY” on page 935.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

:DLINK:TGAP:PSI[1]:D**Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:D <val>

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:D?

This command sets the transmission gap distance.

RST** +0**Range** 0, 15–269**Field Entry** TGD**Remarks** This command specifies the number of slots between the starting slot of two consecutive transmission gaps within a gap pattern.**:DLINK:TGAP:PSI[1]:L1*Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:L1 3|4|5|7|10|14

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:L1?

This command specifies the length of the first transmission gap (TGL1).

The length is expressed in number of slots.

RST** 7**Field Entry** TGL1**:DLINK:TGAP:PSI[1]:L2*Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:L2 3|4|5|7|10|

14|OMITted

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:L2?

This command specifies the length of the second transmission gap (TGL2).

The length is expressed in number of slots.

***RST** OMIT**Field Entry** TGL2**Key Entry** Omitted**Remarks** When OMITted is selected, TGL2 = TGL1.

:DLINK:TGAP:PSI[1]:PL1**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PL1 <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PL1?

This command specifies the duration of the transmission gap pattern length 1 (TGPL1).

The variable <val> is expressed in number of frames.

RST** +2**Range** 1–144**Field Entry** TGPL1**:DLINK:TGAP:PSI[1]:PL2*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PL2 <val>|OMITted

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PL2?

This command specifies the duration of the transmission gap pattern length 2 (TGPL2).

The variable is expressed in number of frames.

***RST** OMIT**Range** 1–144**Key Entry** Omitted**Remarks** When OMITted is selected, TGPL2 = TGPL1.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:DLINK:TGAP:PSI[1]:PRC**Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PRC <val>|INFINITY
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PRC?
```

This command sets the transmission gap pattern repetition count.

***RST** 1**Range** 1–511**Key Entry** INFINITY**Field Entry** TGPRC

Remarks The pattern repetition count (PRC) sets the number of transmission gap patterns within the transmission gap pattern sequence. When INFINITY is selected, the PRC will continue indefinitely.

:DLINK:TGAP:PSI[1]:PS**Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PS ACTIVE|INACTIVE
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PS?
```

This command sets the transmission gap pattern status.

ACTIVE This choice activates the compressed mode.

INACTIVE This choice sets the compressed mode to inactive.

RST** INAC**Key Entry** Active Inactive**:DLINK:TGAP:PSI[1]:SN*Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:PSI[1]:SN <val>
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:PSI[1]:SN?
```

This command specifies the timeslot number of the first transmission gap within the first radio frame.

***RST** +11**Range** 0–14**Field Entry** TGSN

:DLINK:TGAP:RPARAMeter**Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:RPARAMeter DREF11 | DREF12 |
DREF21 | DREF22

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:RPARAMeter?

This command sets the downlink reference compressed mode parameters as defined in 3GPP standard.

DREF11 This choice sets the reference parameter to 1.1.

DREF12 This choice sets the reference parameter to 1.2.

DREF21 This choice sets the reference parameter to 2.1.

DREF22 This choice sets the reference parameter to 2.2.

RST** CUST**Key Entry** DL Reference 1.1 DL Reference 1.2 DL Reference 2.1 DL Reference 2.2**Remarks** The query returns CUSTom when the parameters are set individually.**:DLINK:TGAP:SCFN*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:SCFN <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:SCFN?

This command sets the stop connection frame number (CFN) when the stop trigger is used.

When the stop trigger is received at the signal generator, the compressed mode will finish even if the transmission gap pattern repetition count (TGPRC) is still remaining.

***RST** +0**Range** 0–255**Field Entry** SCFN**Remarks** The compressed mode stop trigger must be executed for this command to work. Refer to, “[:DLINK:TGAP:STOP:TRIGger](#)” on page 977.

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:DLINK:TGAP:START:TRIGger**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:START:TRIGger

This command starts the signal generator compressed pattern transmission. Compressed pattern transmission begins with the specified transmission gap connection frame number (TGCFN).

Key Entry Compressed Mode Start Trigger**:DLINK:TGAP:START:TRIGger:POLarity****Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:START:TRIGger:POLarity
POSitive|NEGative

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:START:TRIGger:POLarity?

This command sets the compressed mode start trigger polarity. The compressed pattern transmission begins when this trigger is received.

POSitive This choice sets the trigger to start when the trigger signal is high.

NEGative This choice sets the trigger to start when the trigger signal is low.

RST** POS**Key Entry** Comp Mode Start Trigger Polarity Pos Neg**:DLINK:TGAP:STOP:TRIGger*Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:STOP:TRIGger

This command stops the signal generator compressed pattern transmission. Compressed pattern transmission begins with the specified transmission gap connection frame number (TGCFN).

Key Entry Compressed Mode Stop Trigger

:DLINK:TGAP:STOP:TRIGGER:POLARITY**Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:STOP:TRIGGER:POLARITY
POSITIVE|NEGATIVE
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP:STOP:TRIGGER:POLARITY?
```

This command sets the compressed mode stop trigger polarity. The compressed pattern transmission stops when this trigger is received.

POSITIVE This choice sets the trigger to stop when the trigger signal is high.

NEGATIVE This choice sets the trigger to stop when the trigger signal is low.

***RST** POS

Key Entry Comp Mode Stop Trigger Polarity Pos Neg

:DLINK:TGAP[:STATE]**Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP[:STATE] 1|0|ON|OFF
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:TGAP[:STATE]?
```

This command enables or disables the transmission gap compressed mode.

***RST** 0

Key Entry Compressed Mode On Off

Remarks When compressed mode is enabled, DPCH2 is automatically disabled and can't be enabled.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 935.

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:DLINK:TSETup**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TSETup REFSensitiv|MAXinput|ACS|BLOcking|SPURious|INTermod|PERFreq

This command configures the test setup for the downlink channels.

REFSensitivity	This choice selects reference sensitivity. This is the minimum receiver input power measured at the antenna connector.								
MAXinput	This choice selects maximum input interference. The receiver is stressed with high-levels of interference from unwanted signals.								
ACS	This choice selects adjacent channel selectivity (ACS). This is the receiver ability to receive a wanted signal at the assigned channel frequency with the presence of adjacent signals. ACS is the ratio of the receiver filter attenuation (on the assigned channel) to the receive filter attenuation on the adjacent channel(s).								
BLOcking	This choice selects the blocking characteristics. This is a measure of the receiver ability to receive a wanted signal at the assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the adjacent channels.								
SPURious	This choice selects spurious emission power. The emissions are generated or amplified by a receiver.								
INTermod	This choice selects intermodulation. Third order intermodulation (TIO) or higher mixing of the two interfering RF signals signal in the band of the desired channel.								
PERFreq	This choice selects the performance requirement of the dedicated channel. This is a static propagation conditions that is determined by the maximum block error rate (BLER) allowed when the receiver input signal is at a specified Eb/No limit.								
Key Entry	<table> <tr> <td>Ref Sensitivity</td> <td>Max Input</td> <td>ACS</td> <td>Blocking</td> </tr> <tr> <td>Spurious Response</td> <td>Intermod</td> <td>Performance Req</td> <td></td> </tr> </table>	Ref Sensitivity	Max Input	ACS	Blocking	Spurious Response	Intermod	Performance Req	
Ref Sensitivity	Max Input	ACS	Blocking						
Spurious Response	Intermod	Performance Req							

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURce]:RADio:WCDMa:TGPP[:BBG])

:DLINK:TXDV**Supported** E4438C with Option 400

```
[ :SOURce ] :RADio :WCDMa :TGPP [ :BBG ] :DLINK :TXDV NONE | OANT1 | OANT2 | OANTO1 | OANTO2
[ :SOURce ] :RADio :WCDMa :TGPP [ :BBG ] :DLINK :TXDV?
```

This command selects the transmit diversity mode of the downlink signal.

NONE This choice disables the transmit diversity mode.

OANT1 This choice selects a Transmit Diversity Openloop Antenna 1 mode.

OANT2 This choice selects a Transmit Diversity Openloop Antenna 2 mode.

OANTO1 This choice selects a Transmit Diversity Openloop Antenna 1 mode with the SCH TSTD (Synchronization Channel Transmit Switched Time Diversity) off.

OANTO2 This choice selects a Transmit Diversity Openloop Antenna 2 mode with the SCH TSTD (Synchronization Channel Transmit Switched Time Diversity) off.

***RST** NONE

Field Entry TX Diversity

Key Entry None OpenLoop Ant1 OpenLoop Ant2
OpenLoop Ant1 SCH TSTD OFF OpenLoop Ant2 SCH TSTD OFF

:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BLKSize**Supported** E4438C with Option 400

```
[ :SOURce ] :RADio :WCDMa :TGPP [ :BBG ] :DLINK [ :TGRoup [A] | B ] :DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
BLKSize <val>
[ :SOURce ] :RADio :WCDMa :TGPP [ :BBG ] :DLINK [ :TGRoup [A] | B ] :DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
BLKSSize?
```

This command sets the coupling block size for the selected dedicated transport channel (DCH).

With transportation position in fixed mode, block size is limited to 0 or equal to the block set size. Refer to, “[:DLINK\[:TGRoup \[A\]|B\]:DCH\[1\]|2|3|4|5|6:POSition](#)” on page 985 for more information.

***RST** 20

Range 0–5000

Field Entry Blk Size

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “[:DLINK:APPLY](#)” on page 935.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BPFRame**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BPFRame?

This query returns the block per frame for the selected dedicated transport channel (DCH).

RST** 20**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BRATe*Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BRATe?

This query returns the block rate for the selected dedicated transport channel (DCH).

RST** 20**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BSSize*Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BSSize?

This query returns the block set size for the selected dedicated transport channel (DCH).

Block set size is a multiple of block size and number of blocks. Changing the block size value will also change the value for block set size. The value for number of blocks does not change when changing block size.

***RST** 20**Range** 0–200000**Field Entry** Blk Set Size**Remarks** This field is grayed out for the transport position flexible and fixed modes.

To change the DCH positioning, refer to “[:DLINK\[:TGRoup \[A\] | B\]:DCH\[1\] | 2 | 3 | 4 | 5 | 6:POSITION](#)” on page 985.

:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:CODE**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:CODE HCONv | TCONv | TURBo | NONE

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:CODE?

This command selects the encoder type.

HCONv This choice selects coding with the 1/2 rate convolutional encoder.

TCONv This choice selects coding with the 1/3 rate convolutional encoder.

TURBo This choice selects coding with the turbo coder.

NONE This choice selects no coding.

RST** HCON**Key Entry** 1/2 Conv 1/3 Conv Turbo None**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:DLINK:APPLY” on page 935](#).**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:CRC*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:CRC <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:CRC?

This command sets the number of cyclic redundancy check (CRC) bits for the dedicated transport channel (DCH).

***RST** 8**Field Entry** CRC Size**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:DLINK:APPLY” on page 935](#).

:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIo :WCDMa :TGPP [ :BBG ] :DLINK [ :TGRoup [ A ] | B ] :DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
DATA PN9 | FIX4 | "<file name>"
[ :SOURCE ] :RADIo :WCDMa :TGPP [ :BBG ] :DLINK [ :TGRoup [ A ] | B ] :DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
DATA?
```

This command configures the data for the downlink dedicated transport channel (DCH) selected.

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** PN9**Key Entry** PN9 FIX4 "<User File>"

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:DLINK:APPLY” on page 935](#).

:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:EINSert**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIo :WCDMa :TGPP [ :BBG ] :DLINK [ :TGRoup [ A ] | B ] :DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
DATA :EINSert BLER | BER | NONE
[ :SOURCE ] :RADIo :WCDMa :TGPP [ :BBG ] :DLINK [ :TGRoup [ A ] | B ] :DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
DATA :EINSert?
```

This command selects the error insertion mode.

BLER This choice selects a block error rate (BLER) mode.

BER This choice selects a bit error rate (BER) mode.

NONE This choice selects no BLER or BER mode (no error blocks or bit are inserted)

***RST** NONE**Key Entry** BLER BER None

:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:FIX4**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK [ :TGRoup [ A ] | B ] :DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
DATA:FIX4 <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK [ :TGRoup [ A ] | B ] :DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
DATA:FIX4?
```

This command sets a fixed data type to be transmitted on the selected downlink dedicated transport channel (DCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

***RST** #B0000**Range** 0–15**Key Entry** FIX4

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:DLINK:APPLY” on page 935](#).

:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:NBLocks**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK [ :TGRoup [ A ] | B ] :DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
NBLocks <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK [ :TGRoup [ A ] | B ] :DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
NBLocks?
```

This command sets the number of blocks transmitted by the active downlink dedicated transport channel (DCH).

Number of blocks and block size are multiplied to equal the value in the block set size field. Refer to, [“:DLINK\[:TGRoup \[A\]|B\]:DCH\[1\]|2|3|4|5|6:BSSize” on page 981](#) for more information.

***RST** 1**Range** 1–64**Field Entry** # of Blocks

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:DLINK:APPLY” on page 935](#).

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:POSITION**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:POSITION FLEXible|FIXed

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:POSITION?

This command selects the coupling mode.

FLEXible This choice sets the block set size (BSSize) and tracks the block size.**FIXed** Allows editing of the block set size (BSSize) and block size. The values are limited to two values equal to BSSize or 0. An error message is generated if a value other than these is entered and the setting will default to the BSSize.***RST** FLEX**Key Entry** Transp Position Flexible Fixed**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:PPERcentage****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:PPERcentage?

This query returns the percentage of the total bits removed from or added to the fully coded channel.

:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:RMATch**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:RMATch <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:RMATch?

This command sets the rate matching attribute.

***RST** 1**Range** 1–256**Field Entry** Rate Match Attr**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 935.

:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:TTI**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:
TTI 10000 | 20000 | 40000 | 80000
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:
TTI?
```

This command sets the transmission time interval (TTI) allowed for the dedicated channel (DCH) to transmit.

The choices are expressed in units of milliseconds (msec) where 20000=20 msec.

***RST** 10000**Field Entry** TTI

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:DLINK:APPLY” on page 935](#).

:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6[:STATE]**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 |
6[:STATE] ON | OFF | 1 | 0
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 |
6[:STATE]?
```

This command enables or disables the selected dedicated transport channel (DCH).

***RST** DCH 1: 1 DCH 2–6: 0**Key Entry** TrCH State Off On

Remarks DCH1 reset value cannot be turned off. The channels must be turned on sequentially. If one channel is turned off then all higher numbered channels will automatically be turned off.

If the parameter is changed, the apply command must be executed after the change. Refer to [“:DLINK:APPLY” on page 935](#).

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:LINK**Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:LINK DOWN|UP
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:LINK?

This command sets the uplink or downlink mode.

RST** DOWN**Key Entry** Link Down Up**:POLarity[:ALL]*Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:POLarity[:ALL] NORMal|INVert
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:POLarity[:ALL]?

This command selects the polarity for the Q channel.

NORMal This choice selects normal phase polarity.

INVert This choice inverts the internal Q signal.

RST** NORM**Key Entry** Phase Polarity Normal Invert**:ULINK:APPLY*Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:APPLY
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:APPLY?

This command immediately starts the channel coding generation process according to the channel setup and data for the uplink physical and transport channels.

The query returns a response that determines whether or not the execution of the command is necessary. The response from the query is as follows:

1 This response is returned if the execution of the command is required.

0 This response is returned if the execution of the command is not required.

***RST** +0**Key Entry** Apply Channel Setup

:ULINK:AWGN:CN

Supported E4438C with Option 400 and 403

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:AWGN:CN <val>
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:AWGN:CN?
```

This command sets the in band carrier to noise ratio. The noise is the total noise level of the in-channel.

The variable <val> is expressed in units of decibels (dB).

***RST** -1.80000000E+001

Range -30 to 30

Field Entry C/N value

Remarks In compressed mode, carrier power means normal frame power. A change in the C/N value will change the Eb/No value and vice versa.

:ULINK:AWGN:CPOWER

Supported E4438C with Option 400 and 403

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:AWGN:CPOWER?
```

This query returns the carrier power level when the additive white gaussian noise (AWGN) is on.

The power value is expressed in units of decibels (dBm/3.84 MHz).

***RST** -1.56957537E+002

Field Entry C Power

Remarks In compressed mode, carrier power means normal frame power.

:ULINK:AWGN:DRATE

Supported E4438C with Option 400 and 403

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:AWGN:DRATE?
```

This query returns the data rate of the Eb reference channel.

***RST** +1.22000000E+004

Field Entry Ref Data Rate

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIo:WCDMA:TGPP[:BBG])

:ULINK:AWGN:EBNO

Supported E4438C with Option 400 and 403

```
[ :SOURCE ] :RADIo:WCDMA:TGPP [ :BBG ] :ULINK:AWGN:EBNO <val>
```

```
[ :SOURCE ] :RADIo:WCDMA:TGPP [ :BBG ] :ULINK:AWGN:EBNO?
```

This command sets the Eb/No ratio. The Eb is defined as the carrier power divided by the bit rate. No is noise power divided by the bandwidth (3.84MHz).

The variable <val> setting is affected by the carrier to noise ratio (C/N) and the data rate. A change to either of these values will affect your Eb/No setting. Use the formula in the range field to determine a correct Eb/No value.

***RST** +6.97971394E+000

Range $E_b/N_o = C/N \times 3.84\text{MHz}/\text{Data Rate}$

Field Entry Eb/No value (dB)

:ULINK:AWGN:EBRef

Supported E4438C with Option 400 and 403

```
[ :SOURce ] :RADio:WCDMa:TGPP[ :BBG ] :ULINK:AWGN:EBRef DPCCh | DPDCh | DCH1 |
DCH2 | DCH3 | DCH4 | DCH5 | DCH6
```

```
[ :SOURce ] :RADio:WCDMa:TGPP[ :BBG ] :ULINK:AWGN:EBRef?
```

This command selects the Eb reference and it is used in the Eb/No value.

DPCCh This choice selects a dedicated physical control channel.

DPDCh This choice selects a dedicated physical data channel.

DCH1 This choice select dedicated transport channel 1.

DCH2 This choice select dedicated transport channel 2.

DCH3 This choice select dedicated transport channel 3.

DCH4 This choice select dedicated transport channel 4.

DCH5 This choice select dedicated transport channel 5.

DCH6 This choice select dedicated transport channel 6.

***RST** DCH1

Key Entry DPCCH DPDCH DCH1 DCH2
DCH3 DCH4 DCH5 DCH6

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:AWGN:FNBW

Supported E4438C with Option 400 and 403

```
[ :SOURce ] :RADio:WCDMa:TGPP[ :BBG ] :ULINK:AWGN:FNBW?
```

This query returns the flat noise bandwidth (BW). Flat noise bandwidth is calculated by $BW=(1.6) \times$ (Chip rate) and the result is close to the 0 dB roll-off point.

***RST** +6.14400000E+006

Field Entry Flat Noise BW

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:AWGN:NPOWER**Supported** E4438C with Option 400 and 403

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:AWGN:NPOWER?

This query returns the in-channel noise level when the additive white gaussian noise (AWGN) is on.

The power value is expressed in units of decibels (dBm/3.84 MHz).

RST** -1.38957537E+002**Field Entry** N Power**:ULINK:AWGN:TICPower*Supported** E4438C with Option 400 and 403

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:AWGN:TICPower?

This query returns the total in-channel power (carrier with noise) as defined by the 3GPP standard.

Field Entry TotalPwr**Remarks** The total in-channel power is a sum of carrier power and in-channel noise power. Changing the noise related parameters such as C/N, Eb/No, and Eb Ref will cause a recalculation of the total in-channel power.

The maximum value returned by this query depends on the power option that is installed in the signal generator.

:ULINK:AWGN[:STATE]**Supported** E4438C with Option 400 and 403

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:AWGN:STATE ON|OFF|1|0

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:AWGN:STATE?

This command enables or disables the additive white gaussian noise (AWGN). AWGN can only be turned on when DPCCH is selected as the physical channel. Refer to “:ULINK:PHYSICAL[1]:TYPE” on page 1013.

***RST** 0**Key Entry** Channel State Off On**Remarks** If the parameter is changed, the apply command must be executed after the change. Refer to “:ULINK:APPLY” on page 987.

:ULINK:CRATe**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:CRATe <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:CRATe?

This command sets the chip rate for the uplink configuration. The variable <val> is expressed in cycles per second (cps).

RST** +3.84000000E+006**Range** 1E3–4.25E6**Field Entry** Chip Rate**Remarks** The chip rate is equivalent to the spreading rate of the channel.**:ULINK:DPCCh:BETA*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:BETA <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:BETA?

This command sets the beta value for the uplink dedicated physical control channel (DPCCH). The beta value and the power ratio are coupled. When the power ratio is updated, the beta value is converted to the beta ratio (amplitude ratio).

***RST** +11**Range** 0–15**Field Entry** Beta**Remarks** After this command is sent, the channel power level for the DPCCH is re-calculated. If the channel power is set directly, the beta value of this command becomes invalid and is reset to –1.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMA:TGPP[:BBG])

:ULINK:DPCCh:CCODE**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMA:TGPP[:BBG]:ULINK:DPCCh:CCODE <val>

[:SOURCE]:RADio:WCDMA:TGPP[:BBG]:ULINK:DPCCh:CCODE?

This command sets the channelization code for the uplink dedicated physical control channel (DPCCH).

***RST** 0**Range** 0–255**Field Entry** Channel Code

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:DPCCh:DATA**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMA:TGPP[:BBG]:ULINK:DPCCh:DATA PN9 | PN15 | FIX4 |

"<file name>" | STD

[:SOURCE]:RADio:WCDMA:TGPP[:BBG]:ULINK:DPCCh:DATA?

This command configures the data pattern for the uplink dedicated physical control channel (DPCCH).

STD This choice sets the DPCCH to use the bits field as defined by the slot format.

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** STD**Key Entry** PN9 PN15 FIX4 User File 3GPP STD

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:DPCCh:DATA:FIX4**Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:DPCCh:DATA:FIX4 <val>

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:DPCCh:DATA:FIX4?

This command sets the 4-bit data pattern of the uplink dedicated physical control channel (DPCCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

***RST** #B0000**Range** 0–15**Key Entry** FIX4

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:DPCCh:FBI:PATtern**Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:DPCCh:FBI:PATtern PN9|PN15|FIX|
"<file name>"

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:DPCCh:FBI:PATtern?

This command configures the pattern of the feedback information (FBI) for the uplink dedicated physical control channel (DPCCH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** FIX**Key Entry** PN9 PN15 FIX User File

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:DPCCh:FBI:PATtern:FIX

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : DPCCh : FBI : PATtern : FIX <val>
```

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : DPCCh : FBI : PATtern : FIX?
```

This command sets the 30-bit feedback information (FBI) pattern for the uplink dedicated physical control channel (DPCCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only decimal values.

***RST** +0

Range 0–10737418235

Key Entry FIX

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:DPCCh:FBI[:STATe]

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : DPCCh : FBI [ : STATe ] ?
```

This query returns whether or not the feedback information (FBI) bits are included in the uplink dedicated physical control channel (DPCCH). The FBI is included when a status of one is returned. A zero indicates no FBI.

***RST** 0

Range N/A

Field Entry FBI State

:ULINK:DPCCh:POWer**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:POWer <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:POWer?

This command sets the power level for the uplink dedicated physical control channel (DPCCH).

The variable <val> is expressed in units of decibels (dB).

***RST** -2.69000000E+000**Range** -40 to 0**Field Entry** DPCCH Power

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:DPCCh:RATE**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:RATE?

This query returns the symbol rate for the uplink dedicated physical control channel (DPCCH).

RST** +1.50000000E+004**Field Entry** Symbol Rate**:ULINK:DPCCh:SLOTformat*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:SLOTformat <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:SLOTformat?

This command sets the slot format for the uplink dedicated physical control channel (DPCCH). The variable <val> is expressed in unit of bits.

***RST** +0**Range** 0–5**Field Entry** Slot Format

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:DPCCh:TFCI:PATtern

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : DPCCh : TFCI : PATtern PN9 | PN15 | FIX |
"<file name>"
```

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : DPCCh : TFCI : PATtern?
```

This command configures the transport format combination indicator (TFCI) bit pattern for the uplink dedicated physical control channel (DPCCH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** FIX

Key Entry PN9 PN15 FIX User File

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:DPCCh:TFCI:PATtern:FIX

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : DPCCh : TFCI : PATtern : FIX <val>
```

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : DPCCh : TFCI : PATtern : FIX?
```

This command sets the transport format combination indicator (TFCI) 10-bit data pattern for the uplink dedicated physical control channel (DPCCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only decimal values.

***RST** +0

Range 0–1023

Field Entry TFCI Pattern

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:DPCCh:TFCI[:STATe]**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPCCh:TFCI[:STATe]?

This query returns the status of the transport format combination indicator (TFCI) for the uplink dedicated physical control channel (DPCCH).

RST** 1**Range** N/A**Field Entry** TFCI State**:ULINK:DPCCh:TPC:NSTeps*Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPCCh:TPC:NSTeps <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPCCh:TPC:NSTeps?

This command sets the number of steps to increase or decrease the transmit power control (TPC) for the uplink dedicated physical control channel (DPCCH).

The variable <val> is expressed in units of decibels (dB).

***RST** +1**Range** 1–80**Field Entry** TPC Pat Steps**Remarks** Refer to “:ULINK:DPCCh:TPC:PATtern” on page 999.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:DPCCh:TPC:PATtern**Supported** E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : DPCCh : TPC : PATtern PN9 | PN15 | FIX4 |
"<file name>" | UDOW | DUP | UALL | DALL
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : DPCCh : TPC : PATtern?
```

This command configures the transmit power control (TPC) pattern for the uplink dedicated physical control channel (DPCCH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

UDOW This choice repetitively steps up and down the TPC pattern.

DUP This choice repetitively steps down and up the TPC pattern.

UALL This choice consecutively steps up the TPC pattern.

DALL This choice consecutively steps down the TPC pattern.

***RST** PN9

Key Entry PN9 PN15 FIX4 "<file name>" Up/Down Down/Up All Up

All Down

Remarks Refer to [“:ULINK:DPCCh:TPC:NSTeps” on page 998](#).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:DPCCh:TPC:PATtern:FIX4**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern:FIX4 <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern:FIX4?

This command sets the transmit power control (TPC) 4 bit data pattern for the uplink dedicated physical control channel (DPCCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

***RST** #B0000**Range** 0–15**Field Entry** TPC Pattern

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:DPCCh:TPC:PATtern:TRIGger:POLarity**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern:TRIGger:POLarity POSitive|NEGative

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern:TRIGger:POLarity?

This command sets the transmit power control (TPC) pattern trigger polarity for the uplink dedicated physical control channel (DPCCH).

POSitive This choice sets the pattern signal to trigger when the signal is high.**NEGative** This choice sets the pattern signal to trigger when the signal is low.***RST** POS**Key Entry** TPC Pat Trig Polarity Neg Pos

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:DPCCh:TPC:PATtern:TRIGger[:STATe]**Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern:
TRIGger[:STATe] ON|OFF|1|0[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern:
TRIGger[:STATe]?

This command enables or disables the transmit power control (TPC) pattern trigger state for the uplink dedicated physical control channel (DPCCH).

***RST** 0**Field Entry** TPC UserFile Trig

Remarks The TPC pattern trigger input is located on the AUX I/O connector (ALT PWR IN, pin#16). For more information about the rear panel AUX I/O connector, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*. If the parameter is changed, the apply command must be executed after the change. Refer to "**:ULINK:APPLY**" on page 987.

:ULINK:DPCCh:TPOWer**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPCCh:TPOWer?

This query returns the "Total Power" value displayed on the user interface (UI). The power value is the relative power difference between the total in-channel signal power and the active channel reference power (0dB).

***RST** +0.00000000E+000

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to "**:ULINK:APPLY**" on page 987.

:ULINK:DPCCh[:STATe]**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh[:STATe] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh[:STATe]?

This command enables or disables the operating state for the uplink dedicated physical control channel (DPCCH).

***RST** 1**Field Entry** Channel State

Remarks If the parameter is changed, the apply command must be executed after the change. Refer to “:ULINK:APPLY” on page 987.

:ULINK:DPDCh:BETA**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:BETA <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:BETA?

This command sets the beta value for uplink dedicated physical data channel (DPDCH).

***RST** +15**Range** 0–15**Field Entry** Beta

Remarks The beta value and power ratio are coupled. After this command is sent, the value of the channel power level of the DPDCH is re-calculated.

If the channel power is set directly, the value of this command becomes invalid and is set to –1.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:DPDCh:CCODE**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPDCh:CCODE <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPDCh:CCODE?

This command sets the channelization code for the uplink dedicated physical data channel (DPDCH). There are commands that are associated with the channelization code and they are the slot format and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to [Table 9-3 on page 1003](#).

Table 9-3 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120
15	4	240
7	5	780
3	6	960

***RST** +16**Range** 0–255**Field Entry** Channel Code

Remarks Refer to “:ULINK:DPDCh:SLOTformat” on page 1007 and “:ULINK:DPDCh:RATE” on page 1005. If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:DPDCh:DATA

Supported E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPDCh:DATA PN9 | PN15 | FIX4 |
"<file name>" | TRANspch
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPDCh:DATA?
```

This command configures the data pattern of the uplink dedicated physical data channel (DPDCH).

TRANspch This choice sets the data that is generated from the transport channel setup.

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** TRAN

Key Entry **PN9 PN15 FIX4 User File Transport CH**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:DPDCh:DATA:FIX4

Supported E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPDCh:DATA:FIX4 <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPDCh:DATA:FIX4?
```

This command sets the fixed 4-bit binary data for the uplink dedicated physical data channel (DPDCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

***RST** #B0000

Range 0–15

Field Entry Data

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK:DPDCh:POWer**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:POWer <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:POWer?

This command sets the power level for the uplink dedicated physical data channel (DPDCH).

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000**Range** –40 to 0**Field Entry** DPDCH Power

Remarks The power ratio and the beta value are coupled. After the beta value is specified and sent, the value of the channel power level of the DPDCH is re-calculated.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:DPDCh:RATE**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:RATE <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:RATE?

This command sets the symbol rate for the uplink dedicated physical data channel (DPDCH). There are commands that are associated with the symbol rate and they are the channelization code and the slot format.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to [Table 9-4](#).

Table 9-4 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30

Table 9-4 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
63	2	60
31	3	120
15	4	240
7	5	780
3	6	960

The variable <val> is expressed in units of kilo symbols per second (ksps).

***RST** +6.00000000E+004

Range 15000–960000

Field Entry Symbol Rate

Remarks Refer to “:ULINK:DPDCh:CCODE” on page 1003 and “:ULINK:DPDCh:RATE” on page 1005. If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:DPDCh:RBER

Supported E4438C with Option 400

[:SOURce] :RADio :WCDMa :TGPP [:BBG] :ULINK :DPDCh :RBER?

This query returns inserted error bit rate which is specified by the transport channel cycle length and transport channel error length commands.

Inserted error bit rate is calculated by the following formula: $\text{TrCH BER ErrLen} / \text{TrCH BER Cycle}$. Refer to “:ULINK:DPDCh:TBER[:CLENgth]” on page 1008 and “:ULINK:DPDCh:TBER:ELENgth” on page 1008.

***RST** 0.0

Field Entry TrCH BER

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:DPDCh:SLOTformat**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPDCh:SLOTformat <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPDCh:SLOTformat?

This command sets the slot format for the uplink dedicated physical data channel (DPDCH).

There are commands that are associated with the slot format and they are the channelization code and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to [Table 9-5 on page 1007](#).

Table 9-5 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120
15	4	240
7	5	780
3	6	960

***RST** +2**Range** 0–6**Field Entry** Slot Format

Remarks Refer to “:ULINK:DPDCh:CCODE” on page 1003 and “:ULINK:DPDCh:RATE” on page 1005. If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:DPDCh:TBER[:CLENgth]**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:TBER[:CLENgth] <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:TBER[:CLENgth]?

This command sets the cycle length of the Transport Channel BER insertion of dedicated physical channel (DPCH).

***RST** 0**Range** 0–65535**Field Entry** TrCH BER Cycle

Remarks A zero in the TrCH BER Cycle field, disables the error insertion function (error rate equals 0%).

:ULINK:DPDCh:TBER:ELENgth**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:TBER:ELENgth <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:TBER:ELENgth?

This command sets the error length of the Transport Channel BER.

***RST** 0**Range** 0–4095**Field Entry** TrCH BER ErrLen

Remarks The Transport Channel BER error length must be smaller than or equal to the Transport Channel BER cycle length.

The TrCH ELEN (transport channel error length) is truncated by the TrCH CLEN (transport channel cycle length) when the TrCH BER cycle length is smaller than TrCH BER length.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK:DPDCh:TPOWer**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:TPOWer?

This query returns the “Total Power” value displayed on the user interface (UI). The power value is the relative power difference between the total in-channel signal power and the active channel reference power (0dB).

RST** +0**:ULINK:DPDCh[:STATe]*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh[:STATe] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh[:STATe]?

This command enables or disables the operating state for the uplink dedicated physical data channel (DPDCH).

***RST** 1**Field Entry** Channel State

Remarks If the parameter is changed, the apply command must be executed after the change. Refer to “:ULINK:APPLY” on page 987.

:ULINK:FCLock:INTerval**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:FCLock:INTerval FCL10|FCL20|FCL40|FCL80|FCL2560

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:FCLock:INTerval?

This command selects the frame clock interval supplied to the source.

The frame clock interval is set in units of milliseconds (msec).

***RST** FCL80**Key Entry** 10 msec 20 msec 40 msec 80 msec 2560 msec

Remarks This command is not used when the sync source is set to ESG. Refer to “:ULINK:SYNC[:SOURCE]” on page 1070.

:ULINK:FClock:POLarity**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:FClock:POLarity POSitive|NEGative
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:FClock:POLarity?
```

This command sets the polarity of the frame clock for the uplink synchronization source.

POSitive This choice sets the clock gate to trigger when the signal is high.

NEGative This choice sets the clock gate to trigger when the signal is low.

***RST** POS

Key Entry Frame Clock Polarity Neg Pos

Remarks This command is not used when the sync source is set to ESG. Refer to “:ULINK:SYNC[:SOURCE]” on page 1070.

:ULINK:FILTer**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:FILTer RNYQuist|NUQuist|GAUSSian|
RECTangle|IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm| UGGaussian|
"<user FIR>"
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:FILTer?
```

This command selects the filter type for the uplink configuration.

IS95 This choice selects a filter that meets the criteria of the IS-95 standard.

IS95_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

IS95_MOD This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.

IS95_MOD_EQ This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.

AC4Fm This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

UGGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.					
"<user FIR>"	This variable is any filter file that you have stored into memory.					
*RST	RNYQ					
Key Entry	Root Nyquist	Nyquist	Gaussian	Rectangle	IS-95	IS-95 w/EQ
	IS-95 Mod	IS-95 Mod w/EQ	APCO 25 C4FM	UN3/4 GSM Gaussian		
	User FIR					
Remarks	Refer to “File Name Variables” on page 13 for information on the file name syntax.					

:ULINK:FILTer:ALPHa

Supported E4438C with Option 400

[:SOURCE] :RADIO :WCDMA :TGPP [:BBG] :ULINK :FILTer :ALPHa <val>

[:SOURCE] :RADIO :WCDMA :TGPP [:BBG] :ULINK :FILTer :ALPHa?

This command changes the alpha value for the Nyquist or root Nyquist filter.

***RST** +2.20000000E-001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks This command is effective only after a root Nyquist or Nyquist filter is selected; it does not affect other types of filters.

To change the current filter type, refer to “:ULINK:FILTer” on page 1010.

:ULINK:FILTer:BBT

Supported E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:FILTer:BBT <value>
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:FILTer:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time filter parameter value for the Gaussian filter.

***RST** +5.00000000E-001

Range 0.000–1.000

Key Entry Filter BbT

Remarks This command is effective only after a Gaussian filter is selected; it does not affect other types of filters.

To change the current filter type, refer to “[:ULINK:FILTer](#)” on page 1010.

:ULINK:FILTer:CHANnel

Supported E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:FILTer:CHANnel EVM|ACP
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:FILTer:CHANnel?
```

This command optimizes a filter for minimized error vector magnitude (EVM) or for minimized adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection. This feature only applies to root Nyquist and Nyquist filters.

***RST** EVM

Key Entry Optimize FIR For EVM ACP

Remarks To change the current filter type, refer to “[:ULINK:FILTer](#)” on page 1010.

:ULINK:FOFFset

Supported E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:FOFFset <val>
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:FOFFset?
```

This command sets the SFN-CFN frame number offset. The command adds in delays of the internal

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

frame counter by specifying the starting frame number count.

When the FOFFset is set to “0,” the frame number starts at the system sync trigger.

An example of specifying a frame number count: Set the FOFFset to 2. This makes the signal generator to trigger 2 frames after the SFN RST.

*RST	0
Range	0–255
Key Entry	SFN-CFN Frame Offset
Remarks	For additional information, refer to 3GPP TS25.402 for SFN and CFN relationship.

:ULINK:PADJust

Supported E4438C with Option 400

[:SOURCE] :RADio:WCDMa:TGPP [:BBG] :ULINK:PADJust EQUal | SCALe

This command adjusts the code domain power levels of all uplink channels.

EQUal This choice will adjust all channel powers to equal power settings.

SCALe This choice will scale the channel power levels so that the sum of the powers are equal to 0 dB.

Key Entry Equal Powers Scale To 0dB

:ULINK:PHYSical[1]:TYPE

Supported E4438C with Option 400

[:SOURCE] :RADio:WCDMa:TGPP [:BBG] :ULINK:PHYSical [1] :TYPE PRACH | DPCCCh

[:SOURCE] :RADio:WCDMa:TGPP [:BBG] :ULINK:PHYSical [1] :TYPE?

This command sets the physical channel type.

PRACH This choice selects a physical random access channel type.

DPCCCh This choice selects a dedicated physical control channel type.

***RST** DPCC

Key Entry PRACH DPCCH

:ULINK:PMODE:TPControl:HOLD**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:HOLD 1|0|ON|OFF

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:HOLD?

This command sets the transmission power control of the dedicated physical channel (DPCH).

ON This choice enables the power hold mode.

OFF This choice disables the power hold mode and enables the dynamic power control

RST** 1**Key Entry** Power Hold Off On**Remarks** The power hold mode is automatically enabled when the dedicated physical channel (DPCH) **Power Mode Norm TPC** is set to **TPC** (refer to “:ULINK:PMODE[:SElect]” on page 1017).**:ULINK:PMODE:TPControl:POWER:INITIAL*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:POWER:

INITIAL <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:POWER:INITIAL?

This command sets the initial power (in dB; relative to Max Power: 0.00 dB) of the DPCH power control.

***RST** +0.00000000E+000**Range** 0 to –40**Field Entry** Init Power**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

The value of <val> must be smaller or equal to the value use for the command: “:ULINK:PMODE:TPControl:POWER:MINimum” on page 1015. Init Power is relative to Max Power (the amplitude set on the signal generator). For more information refer to “:ULINK:PMODE:TPControl:POWER:MAXimum” on page 1015.

:ULINK:PMODE:TPControl:POWER:MAXimum**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PMODE:TPControl:POWER:MAXimum?

This query returns the maximum power (in dB; relative to Max Power) of the dedicated physical channel (DPCH).

Max Power is a grayed out field that will always be 0.00 dB. The value of this field is a relative value to the maximum amplitude set for the signal generator. For example, if the signal generator amplitude is set to -20 dBm, the Min Power set to -40 dB, and the Init Power is set to -10 dB, then the absolute initial power level will be -30 dBm (10 dBm below the signal generator amplitude) and the absolute minimum power will be -60 dBm (40 dBm below the signal generator amplitude).

RST** +0.00000000E+000**Field Entry** Max Power**Remarks** The value of this query will always be zero. The maximum power is mapped to the actual RF output power.**:ULINK:PMODE:TPControl:POWER:MINimum*Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PMODE:TPControl:POWER:MINimum <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PMODE:TPControl:POWER:MINimum?

This command sets the minimum power of the dedicated physical channel (DPCH). The variable <val> is expressed in units of dB.

***RST** -4.00000000E+001**Range** -40 to 0**Field Entry** Min Power**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

The minimum power is decreased in increments determined by the value set for the Power Step. Refer to [“:ULINK:PMODE:TPControl:POWER:STEP” on page 1016](#). Minimum power is limited by the amplitude set on the signal generator. The signal generator amplitude must be set to -96 dBm or lower for the minimum power to be set to -40 dB. For more information, refer to [“:ULINK:PMODE:TPControl:POWER:MAXimum” on page 1015](#).

:ULINK:PMODE:TPControl:POWer:RESet**Supported** E4438C with Option 400

```
[ :SOURCE ] : RADio : WCDMa : TGPP [ : BBG ] : ULINK : PMODE : TPControl : POWer : RESet
[ :SOURCE ] : RADio : WCDMa : TGPP [ : BBG ] : ULINK : PMODE : TPControl : POWer : MINimum?
```

This command resets the transmit power of the dedicated physical channel (DPCH) to the initial power.

Key Entry Reset to Initial Power

Remarks When the DPCH power mode is changed to TPControl, this command is performed. Refer to “:ULINK:PMODE[:SElect]” on page 1017 to select the power mode. Any time the power mode is changed, the start power is always set to the initial power.

:ULINK:PMODE:TPControl:POWer:STEP**Supported** E4438C with Option 400

```
[ :SOURCE ] : RADio : WCDMa : TGPP [ : BBG ] : ULINK : PMODE : TPControl : POWer :
STEP DB0_5 | DB1_0 | DB2_0 | DB3_0
[ :SOURCE ] : RADio : WCDMa : TGPP [ : BBG ] : ULINK : PMODE : TPControl : POWer : STEP?
```

This command set the power step of the dedicated physical channel (DPCH) power control. Initial power can only be increased in steps set by the power step.

***RST** DB0_5**Key Entry** Power Step

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:PMODE:TPControl:TRIGger:POLarity**Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PMODE:TPControl:TRIGger:
POLarity POSitive|NEGative

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PMODE:TPControl:TRIGger:POLarity?

This command sets the uplink dedicated physical channel (DCPH) transmit power control signal polarity.

RST** POS**Key Entry** Power Control Signal Polarity Neg Pos**:ULINK:PMODE[:SElect]*Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PMODE[:SElect] NORMal|TPControl
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PMODE[:SElect]?

This command sets the dedicated physical channel (DPCH) power control mode.

NORMal This choice selects the normal power mode. Compressed frames are available.

TPC This choice selects the TPC power mode. Compressed gaps are not available.

***RST** NORM**Key Entry** Power Mode Norm TPC

:ULINK:PRACH:AICH:NUMBER

Supported E4438C with Option 400

[:SOURCE] :RADio:WCDMa:TGPP [:BBG] :ULINK:PRACH:AICH:NUMBER?

This query returns the number of received acquisition indication channel (AICH) trigger during one configured physical random access channel (PRACH) signal generation.

The result value can be queried after the PRACH signal generation is completed and until the next PRACH generation trigger is received.

The signal begins when the PRACH start trigger and ends when the specified number of signals are generated.

To specify a number of PRACHs, refer to “:ULINK:PRACH[:SINGLE]:PREAmble:NUMBER” on [page 1050](#).

***RST** -1

Field Entry Number of AICH

Remarks A -1 status represents a PRACH generation is on going.

:ULINK:PRACH:AICH:POLarity

Supported E4438C with Option 400

[:SOURCE] :RADio:WCDMa:TGPP [:BBG] :ULINK:PRACH:AICH:

POLarity POSition|NEGative

[:SOURCE] :RADio:WCDMa:TGPP [:BBG] :ULINK:PRACH:AICH:POLarity?

This command sets the trigger signal polarity for the acquisition indication channel (AICH).

POSitive This choice sets the signal polarity to trigger when the signal goes high.

NEGative This choice sets the signal polarity to trigger when the signal goes low.

***RST** POS

Key Entry AICH Trigger Polarity Pos Neg

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on [page 987](#)

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:PRACH:AWGN:CN

Supported E4438C with Option 400 and 403

[:SOURCE] : RADIO : WCDMA : TGPP [: BBG] : ULINK : PRACH : AWGN : CN <val>

[:SOURCE] : RADIO : WCDMA : TGPP [: BBG] : ULINK : PRACH : AWGN : CN?

This command sets the in band carrier to noise ratio.

The variable <val> is expressed in units of decibels (dB).

***RST** -2.25005194E+001

Range -30 to 30

Field Entry C/N value

Remarks A change in the C/N value will change the Eb/No value and vice versa.

:ULINK:PRACH:AWGN:CPOWER

Supported E4438C with Option 400 and 403

[:SOURCE] : RADIO : WCDMA : TGPP [: BBG] : ULINK : PRACH : AWGN : CPOWER?

This query returns the carrier power level when the physical random access channel's (PRACH) additive white gaussian noise (AWGN) is on.

***RST** -1.61435521E+002

Field Entry C Power

:ULINK:PRACH:AWGN:DRATE

Supported E4438C with Option 400 and 403

[:SOURCE] : RADIO : WCDMA : TGPP [: BBG] : ULINK : PRACH : AWGN : DRATE?

This query returns the data rate of the Eb reference channel.

***RST** +1.22000000E+004

Field Entry Ref Data Rate

:ULINK:PRACH:AWGN:EBNO

Supported E4438C with Option 400 and 403

```
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:AWGN:EBNO <val>
```

```
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:AWGN:EBNO?
```

This command sets the Eb/No value. The Eb is defined as carrier divided by the bit rate. No is noise power divided by the bandwidth (3.84 MHz). This ratio is only referred when EREF is CONTROL or DATA.

The variable <val> setting is affected by the carrier to noise ratio (C/N) and the data rate. A change to either of these values will affect your Eb/No setting. Use the formula in the range field to determine a correct Eb/No value.

***RST** +4.10000000E+000

Range $E_b/N_o = C/N \times 3.84\text{MHz}/\text{DataRate}$

Field Entry Eb/No

:ULINK:PRACH:AWGN:ECNO

Supported E4438C with Option 400 and 403

```
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:AWGN:ECNO <val>
```

```
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:AWGN:ECNO?
```

This command sets the Ec/No value. The Ec is defined as carrier divided by the chip rate. No is the noise power divided by the bandwidth (3.84 MHz). This ratio is only referred when EREF is PREAMBLE.

***RST** -2.05000000E+001

Range -30 to 30

Field Entry Ec/No value

:ULINK:PRACH:AWGN:EREF

Supported E4438C with Option 400 and 403

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : PRACH : AWGN : EREF PReAmble |
CONTRol | DATA | RACH
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : PRACH : AWGN : EREF?
```

This command selects the Eb (Ec) reference. It is used for specifying the bit (chip) rate of physical/transport channel.

PREAmble This choice selects a preamble part as the Eb/No reference.

CONTRol This choice selects a message control part as the Eb/No reference.

DATA This choice selects a message data part as the Eb/No reference.

RACH This choice selects a random access channel as the Eb/No reference.

***RST** RACH

Key Entry Preamble Msg Ctrl Msg Data **RACH TrCH**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:PRACH:AWGN:NPOWER

Supported E4438C with Option 400 and 403

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : PRACH : AWGN : NPOWER?
```

This query returns the in-channel noise level when the additive white gaussian noise (AWGN) is on.

***RST** -1.38935002E+002

Field Entry N Power

:ULINK:PRACH:AWGN:TICPower**Supported** E4438C with Option 400 and 403

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:AWGN:TICPower?

This query returns the in-channel power within the 3.84 MHz bandwidth.

***RST** **DPCH:** -1.38924800E+002

Single PRACH: -1.38924800E+002

Multiple PRACH: -1.56970651E+002

Field Entry TotalPwr**:ULINK:PRACH:AWGN[:STATE]****Supported** E4438C with Option 400 and 403

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:AWGN[:STATE] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:AWGN[:STATE]?

This command enables or disables the additive white gaussian noise (AWGN) for the physical random access channel (PRACH). The AWGN can only be turned on when PRACH is selected as the physical channel.

***RST** 0**Key Entry** Channel State Off On**Remarks** Refer to “:ULINK:PHYSical[1]:TYPE” on page 1013.

If the parameter is changed, the apply command must be executed after the change. Refer to “:ULINK:APPLY” on page 987.

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:PRACH:MESSAGE:CPART:BETA**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MESSAGE:CPART:BETA <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MESSAGE:CPART:BETA?

This command sets the beta ratio (amplitude ratio) for the physical random access channel (PRACH) message control part. The variable <val> is an integer value.

Changing the control power value (see “:ULINK:PRACH:MESSAGE:CPART:POWER” on page 1024 for information on setting PRACH control power) changes the beta to power ratio, and the ESG may not be able to compute a proper control beta value. If this occurs, the query will return a minus one (-1).

***RST** +11**Range** 0–15**Field Entry** Ctrl Beta**Remarks** A change to the beta value will also cause a change to the control power setting.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:PRACH:MESSAGE:CPART:DATA**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MESSAGE:CPART:DATA PN9 | PN15 | FIX4 | "<file name>" | STD

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MESSAGE:CPART:DATA?

This command selects the data type to be inserted into the physical random access channel (PRACH) message control part.

STD This choice selects a slot format defined in the 3GPP standard.

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** STD**Key Entry** PN9 PN15 FIX4 User File 3GPP STD

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:PRACH:MESSAge:CPART:DATA:FIX4**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:CPART:DATA:FIX4 <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:CPART:DATA:FIX4?

This command sets a fixed 4 bit pattern for use as physical random access channel (PRACH) message part data.

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

***RST** #B0000**Range** 0–15**Key Entry** Fix4

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:PRACH:MESSAge:CPART:POWER**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:CPART:POWER <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:CPART:POWER?

This command sets the power level for the physical random access channel (PRACH) message control part.

The variable <val> is expressed in units of decibels (dB).

***RST** –2.69000000E+000**Range** –40 to 0**Field Entry** Ctrl Pwr

Remarks Changing the control power changes the beta to power ratio. Refer to [“:ULINK:PRACH:MESSAge:CPART:BETA” on page 1023](#) for more information.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#)

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:PRACH:MESSAgE:CPARt:RATE**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MESSAgE:CPARt:RATE?

This query returns the message data part symbol rate for the physical random access channel (PRACH).

RST** +1.50000000E+004**Key Entry** Symbol Rate**Remarks** The symbol rate of 15 kbps is the only supported rate per the 3GPP standards, TS 25.211 v3.10 (2002-03).**:ULINK:PRACH:MESSAgE:CPARt:SLOTformat*Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MESSAgE:CPARt:SLOTformat?

This query returns the message control part slot format for the physical random access channel (PRACH).

***RST** 0**Range** 0–3**Field Entry** Slot Format**Remarks** The slot format is a static value set to zero in accordance with the 3GPP standards, TS 25.211 v3.10 (2002-03).

:ULINK:PRCh:MESSAge:CPARt:TFCI:PATtern**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRCh:MESSAge:CPARt:TFCI:PATtern PN9|PN15|FIX|"<file name>"

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRCh:MESSAge:CPARt:TFCI:PATtern?

This command selects data type to be inserted into the transport format combination indicator (TFCI) of the message control part located in the physical random access channel (PRACH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** FIX**Key Entry** PN9 PN15 FIX User File

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:PRCh:MESSAge:CPARt:TFCI:PATtern:FIX**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRCh:MESSAge:CPARt:TFCI:PATtern:FIX <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRCh:MESSAge:CPARt:TFCI:PATtern:FIX?

This command sets a fixed bit pattern to be inserted into the transport format combination indicator (TFCI).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only decimal values.

***RST** +0**Range** 0–1023**Field Entry** TFCI Pattern

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:PRACH:MESSAge:CPART:TFCI[:STATe]**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MESSAge:CPART:TFCI[:STATe]?

This query returns the transport format combination indicator (TFCI) bits to determine if they exist or not in the currently specified slot format. A query returned with a “1” determines a TFCI exists and a “0,” no bits exist.

RST** 1**Field Entry** TFCI State**:ULINK:PRACH:MESSAge:DPART:BETA*Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:BETA <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:BETA?

This command sets the beta ratio (amplitude ratio) for the message data part of the physical random access channel (PRACH).

The variable <val> is an integer value. Changing the data power value (refer to, “:ULINK:PRACH:MESSAge:DPART:POWer” on page 1029 for more information on setting PRACH data power) changes the beta to power ratio, and the signal generator may not be able to compute a proper data beta value. If this occurs, the query will return a minus one (-1).

***RST** +15**Range** 0–15**Field Entry** Data Beta**Remarks** A change to the beta value will also cause a change to the data power setting.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:PRACH:MESSAge:DPART:DATA**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:DATA PN9 |
PN15|FIX4|"<file name>"|TRANspch
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:DATA?
```

This command sets the data type to be inserted into physical random access channel (PRACH) message data part.

TRANspch This choice sets the data that is generated from the transport channel setup.

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** TRAN

Key Entry PN9 PN15 FIX4 User File Transport CH

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:PRACH:MESSAge:DPART:DATA:FIX4**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:DATA:
FIX4 <val>
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:DATA:FIX4?
```

This command sets a pseudo-random pattern as output data type in the message data part of the physical random access channel (PRACH).

While the variable <val> is expressed in binary or decimal formats, the query returns only binary values.

***RST** #B0000

Range 0∠15

Key Entry FIX4

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:PRACH:MESSAge:DPART:POWer**Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:POWer <val>

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:POWer?

This command sets the power level for the physical random access channel (PRACH) message data part.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000**Range** -40 to 0**Field Entry** Data Pwr

Remarks Changing the data power changes the beta to power ratio. Refer to [“:ULINK:PRACH:MESSAge:DPART:BETA” on page 1027](#) for more information.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#)

:ULINK:PRCh:MESSAge:DPART:RATE**Supported** E4438C with Option 400

[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRCh:MESSAge:DPART:RATE <val>

[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRCh:MESSAge:DPART:RATE?

This command sets the symbol rate for the message data part of the physical random access channel (PRACH).

There are commands that are associated with the symbol rate and they are the channelization code and the slot format.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to [Table 9-6](#).

Table 9-6 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120

The variable <val> is expressed in units of kilo symbols per second (ksps).

***RST** 60**Range** 15–120**Field Entry** Symbol Rate

Remarks Channel code value is determined by slot format choice. Refer to [“:ULINK:PRCh:MESSAge:DPART:SLOTformat”](#) on page 1031 and [“:ULINK:PRCh\[:SINGle\]:MESSAge:DPART:CCODE”](#) on page 1048.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY”](#) on page 987.

:ULINK:PRCh:MESSAge:DPART:SLOTformat**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRCh:MESSAge:DPART:SLOTformat <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRCh:MESSAge:DPART:SLOTformat?

This command sets the slot format value for the message data part of the physical random access channel (PRACH).

There are commands that are associated with the slot format and they are the channelization code and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to [Table 9-7](#).

Table 9-7 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120

The variable <val> is expressed in units of kilo symbols per second (ksps).

***RST** 2**Range** 0–3**Field Entry** Slot Format

Remarks Refer to “:ULINK:PRCh:MESSAge:DPART:RATE” on page 1030 and “:ULINK:PRCh[:SINGle]:MESSAge:DPART:CCODE” on page 1048.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:PRACH:MODE[:SElect]**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:MODE [ :SElect ] SINGLE | MULTi
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:MODE [ :SElect ] ?
```

This command sets the channel mode of the physical random access channel (PRACH).

SINGLE This choice generates a single PRACH.

MULTi This choice generates up to eight PRACHes.

***RST** SING

Key Entry PRACH Mode **Single** **Multi**

:ULINK:PRACH:MULTi:MESSAge:TPOWer**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:MULTi:MESSAge:TPOWer <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:MULTi:MESSAge:TPOWer ?
```

This command sets the message total power value in the physical random access channel (PRACH). The total power indicates a power of one PRACH.

***RST** -1.54060000E+002

Range -1.00 to 1.94

Field Entry Msg Pwr

Remarks This value is used only when POWER:MODE is set to TOTAL. Refer to [“:ULINK:PRACH:PREamble:POWer:MODE” on page 1039](#).

The maximum power for this command is limited by the power of the signal generator (ESG maximum power – 18.06 dBm). If the signal generator power is set to +20 dBm, the maximum value of this command is +1.94 dBm.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK:PRACH:MULTi:MESSAge[:STATe]**Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:MESSAge[:STATe]
ON|OFF

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:MESSAge[:STATe]?

This command enables or disables the message part of the physical random access channel (PRACH) for the multiple PRACH mode.

RST** ON**Field Entry** Message Part**:ULINK:PRACH:MULTi:NUMBer*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:NUMBer <val>|INFinity

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:NUMBer?

This command specifies the number of the physical random access channel (PRACH) 80 ms configuration patterns to be transmitted after the PRACH start trigger has been received.

INFinity This choice means the repeating number will continue while the PRACH mode is selected and the start trigger is ignored.

***RST** 1**Range** 1–2147447836**Field Entry** Number of 80ms

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:PRACH:MULTi:PREAmble:NUMBer**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:PREAmble:NUMBer?

This query returns the number of Preambles on the multiple physical random access channel (PRACH) mode. This number is fixed to 1 in the current version.

RST** 1**Field Entry** Num of Pre**:ULINK:PRACH:MULTi:PREAmble:POWer:INITial*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:PREAmble:POWer:INITial?

This query returns the initial power of PRACH preambles on the multiple physical random access channel (PRACH) mode.

RST** -1.54060000E+002**Range** -154.06 to 10**Field Entry** Init Pwr**Remarks** For the multiple PRACH mode, the initial power is the same as the maximum power for the PRACH preamble.**:ULINK:PRACH:MULTi:PREAmble:POWer:MAX*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:PREAmble:POWer:Max<val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:PREAmble:POWer:Max?

This command sets the power of the preamble on the multiple physical random access channel (PRACH) mode.

***RST** -1.54060000E+002**Range** -1.0 to 1.94**Field Entry** Max Pwr

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

Remarks The maximum power for this command is limited by the power of the signal generator (ESG maximum power – 18.06 dBm). If the signal generator power is set to +20 dBm, the maximum value of this command is +1.94 dBm.

:ULINK:PRACH:MULTi:PREAmble:POWer:RSTep

Supported E4438C with Option 400

[:SOURCE] :RADio:WCDMa:TGPP [:BBG] :ULINK:PRACH:MULTi:PREAmble:POWer:RSTep?

This query will always return zero for the multiple physical random access channel (PRACH) mode. Power ramping is not supported for the multiple PRACH mode.

***RST** +0

Field Entry Ramp Step

:ULINK:PRACH:MULTi:PREAmble:PPM

Supported E4438C with Option 400

[:SOURCE] :RADio:WCDMa:TGPP [:BBG] :ULINK:PRACH:MULTi:PREAmble:PPM <val>

[:SOURCE] :RADio:WCDMa:TGPP [:BBG] :ULINK:PRACH:MULTi:PREAmble:PPM?

This command sets the difference between the preamble and the message control part in the physical random access channel (PRACH).

***RST** -4.56000000E+000

Range -20 to 10

Field Entry Pp-m

:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8:MESSAge:CPART:CCODE

Supported E4438C with Option 400

[:SOURCE] :RADio:WCDMa:TGPP [:BBG] :ULINK:PRACH:MULTi:UE [1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 :
MESSAge:CPART:CCODE?

This query returns the channel code of the message control part of physical random access channel (PRACH) on the multiple PRACH mode.

***RST** 255

Range 0–255

Field Entry CHCode Ctl

Remarks This command affects the PRACH setting on the multiple PRACH mode only.

:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8:MESSAge:DPART:CCODE**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8:MESSAge:DPART:CCODE?

This query returns the channel code of the message data part of physical random access channel (PRACH) on the multiple PRACH mode.

RST** 245**Range** 0–255**Field Entry** ChCode Dat**Remarks** This command affects the PRACH setting on the multiple PRACH mode only.**:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8:PREAmble:SIGNature*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8:PREAmble:SIGNature <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8:PREAmble:SIGNature?

This command sets the signature encoded in the multiple physical random access channel's (PRACH) preamble.

***RST**

		Signature
UE	1	0
	2	1
	3	2
	4	3
	5	4
	6	5
	7	6
	8	7

Field Entry Pre Sig

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:PRACH:MULTi:UE[1]|2|3|4|5|6|7|8:SPOSITION[1]|2|3|4|5|6|7|8[:ASLot]

Supported E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1]|2|3|4|5|6|7|8:SPOSITION[1]|2|3|4|5|6|7|8[:ASLot] <val>|OFF

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1]|2|3|4|5|6|7|8:SPOSITION[1]|2|3|4|5|6|7|8[:ASLot]?

This command sets each physical random access channel (PRACH) start access slot position within 80ms.

*RST

		Start Access Slot Pos							
		1	2	3	4	5	6	7	8
UE	1	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	2	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	3	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	4	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	5	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
UE	6	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	7	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	8	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Range 0–59**Field Entry** Start Access Slot Position in 80ms Period

Remarks This command can only be executed while in the PRACH Mode is set to Multi. Refer to “:ULINK:PRACH:MODE[:SElect]” on page 1032.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8[:STATe]**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8
[:STATe] 0 | 1 | ON | OFF
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8
[:STATe]?
```

This command enables or disables each physical random access channel (PRACH) individually on the multiple PRACH mode.

***RST**

		State
UE	1	ON
	2	OFF
	3	OFF
	4	OFF
	5	OFF
	6	OFF
	7	OFF
	8	OFF

Field Entry On/Off**Remarks** This command will not run if the power of all assigned physical random access channels exceed the power of the signal generator.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:PRACH:PREamble:POWer:AVERage**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:PREamble:POWer:AVERage?
```

This query returns the average power of preambles that were sent before the acquisition indication channel (AICH) trigger was received.

***RST** -999**Field Entry** Preamble power average

Remarks The average power value can be queried after the physical random access channel’s (PRACH) signal generation is completed. Refer to “:ULINK:PRACH[:SINGLE]:PREamble:NUMBER” on page 1050.

:ULINK:PRACH:PREamble:POWer:MODE**Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:PREamble:POWer:MODE PPM|
TOTAl

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:PREamble:POWer:MODE?

This command sets the message power calculation mode for the physical random access channel (PRACH).

PPM This choice calculates the message power based on the power differences between the preamble and the message control part. The difference is specified by the PPM command. This is based on 3GPP standards.

TOTAL This choice calculates message power based on power differences between preamble and message total part. The message total power is specified by the MESSage:TPOWer command. Refer to [“:ULINK:PRACH\[:SINGLE\]:MESSAge:TPOWer”](#) on page 1049.

***RST** PPM**Key Entry** PRACH Power Setup Mode Pp-m Total

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY”](#) on page 987.

:ULINK:PRACH:RPARAMeter**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:RPARAMeter TB168 | TB360

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:RPARAMeter?

This command sets a set of parameters as defined in 3GPP Standard (TS25.104) Reference Measurement Channel for the uplink (UL) physical random access channel (PRACH).

TB168 This choice sets the parameters for the transport block size = 168.

TB360 This choice sets the parameters for the transport block size = 360.

***RST** TB168

Key Entry TrCh BlkSize 168 TrCh BlkSize 360

Remarks When parameters are sets individually, CUSTom is returned for the query.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:PRACH:SCRamblecode**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:SCRamblecode <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:SCRamblecode?

This command sets the physical random access channel’s (PRACH) scrambling code.

***RST** +0

Range 0–8191

Field Entry PRACH Scrambling Code

Remarks The signature data is scrambled against a 4096 chip segment of the 225 complex gold code generator.

If the parameter set by this command is changed while the signal is

active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:PRACH:SDElay**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:SDElay <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:SDElay?

This command sets the number of timeslots to be delayed from the uplink synchronization source. One timeslot is equivalent to 2560 chips.

The variable <val> range is dependent on the Tp-a setting.

***RST** +0

Range	Tp-a Setting	<val>
	0	-14 to 119
	7680	-11 to 119
	12800	-9 to 119

Key Entry Timeslot Offset

Remarks The actual amount of timing difference is (TOFFset + SDElay * 2560) – (Tp–a).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

To set the Tp-a value, refer to [“:ULINK:PRACH:TPA” on page 1042](#).

:ULINK:PRACH:SUBChannel**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:SUBChannel <val>

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:SUBChannel?

This command sets the sub-channel number to send the first preamble of the physical random access channel’s (PRACH).

***RST** +0**Range** 0–11**Field Entry** Start Sub-Channel#

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:PRACH:TOFFset**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TOFFset <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TOFFset?

This command sets additional timing offset for the physical random access channel (PRACH).

The timing offset is to adjust the time distance from the uplink PRACH frame timing which is the downlink's AICH framing timing minus the T_{p-a} to the actual uplink PRACH signal frame timing from the signal generator.

The downlink's AICH frame timing is provided by the synchronization signal. The

The variable <val> is expressed in chips.

***RST** +0**Range** -512 to 2560**Key Entry** Timing Offset

Remarks The actual timing offset is the timing difference from the synchronization signal from the signal generator's RF signal
 $(TOFFset + SDElay * 2560) - (T_{p-a})$.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to
[":ULINK:APPLY" on page 987.](#)

:ULINK:PRACH:TPA**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TPA 0|7680|12800

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TPA?

This command sets the time period (distance) between the physical random access channel's (PRACH) preamble to the acquisition indication channel's (AICH) frame.

The variable <val> is expressed in units of "chip".

***RST** 7680**Key Entry** Base Delay T_{p-a}

Remarks The actual timing offset is $(TOFFset + SDElay * 2560) - (T_{p-a})$.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

This command is not used when the sync source is set to ESG. Refer to “:ULINK:SYNC[:SOURCE]” on page 1070.

:ULINK:PRACH:TPM

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : PRACH : TPM <val>
```

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : PRACH : TPM?
```

This command sets the time period between the preamble and the message part.

The variable <val> is expressed in access slot units.

***RST** +3

Range 1–15

Field Entry Tp-m

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

This command is used for single and multiple physical random access channel (PRACH) modes.

:ULINK:PRACH:TPOWER

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : PRACH : TPOWER?
```

This query returns the total power value of the physical random access channels (PRACH).

The value is the relative power difference between the total in-channel signal power of the PRACH message part and the active channel reference power (0dB) in the message part.

***RST** +0

Remarks This command is used for single and multiple physical random access channel (PRACH) modes.

:ULINK:PRACH:TPP

Supported E4438C with Option 400

```
[ :SOURCE ] : RADio : WCDMa : TGPP [ : BBG ] : ULINK : PRACH : TPP <val>
```

```
[ :SOURCE ] : RADio : WCDMa : TGPP [ : BBG ] : ULINK : PRACH : TPP?
```

This command sets the time period between the preamble and another preamble before the message part.

The variable <val> is expressed in access slot units.

***RST** +3

Range 1–60

Field Entry Tp-p

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

This command is used for single and multiple physical random access channel (PRACH) modes.

:ULINK:PRACH:TRIGger

Supported E4438C with Option 400

```
[ :SOURCE ] : RADio : WCDMa : TGPP [ : BBG ] : ULINK : PRACH : TRIGger
```

This command specifies the start of the physical random access channel’s (PRACH) pattern.

Key Entry PRACH Trigger

Remarks The PRACH trigger source must be set to “Trigger” before executing this command. Refer to [“:ULINK:PRACH:TRIGger:SOURCE” on page 1045](#).

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK:PRACH:TRIGger:POLarity**Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TRIGger:
POLarity POSitive|NEGative

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TRIGger:POLarity?

This command sets the trigger polarity of the physical random access channel type (PRACH).

POSitive This choice sets the signal to trigger when the trigger signal is high.

NEGative This choice sets the signal to trigger when the trigger signal is low.

RST** POS**Key Entry** PRACH Trigger Polarity Neg Pos**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).**:ULINK:PRACH:TRIGger:SOURce*Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TRIGger:
SOURce IMMEDIATE|TRIGger

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TRIGger:SOURce?

This command sets the trigger source of the physical random access channel (PRACH).

IMMEDIATE This choice resets the waveform and immediately replays it from the start.

TRIGger This choice plays the waveform after receiving the trigger command.

***RST** IMMEDIATE**Key Entry** PRACH Trigger Source Immedi Trigger**Remarks** Refer to [“:ULINK:PRACH:TRIGger:POLarity” on page 1045](#) and [“:ULINK:PRACH:TRIGger” on page 1044](#) for additional information.If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:PRACH:TTI**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TTI 10000|20000

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TTI?

This command sets the transmission time interval (TTI) period of the message part.

The choices are expressed in units of milliseconds (msec) where 20000=20 msec.

RST** +20000**Field Entry** TTI**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).**:ULINK:PRACH[:SINGLE]:MESSAge[:STATe]*Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:MESSAge[:STATe]
ON|OFF|AICH

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:MESSAge[:STATe]?

This command enables or disables the message part of the physical random access channel (PRACH).

ON This choice enables the message part to be generated after the number of preambles are generated. The “Number of Preamble” must be specified.**OFF** This choice does not allow the message part to be generated. Only the preambles are transmitted.**AICH** This choice enables the acquisition indication channel preamble power ramping mode.***RST** ON**Key Entry** On Off AICH**Remarks** For more information about the rear panel AUX I/O connector, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

:ULINK:PRACH[:SINGLE]:NUMBER**Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:NUMBER <val>|
INFIinity

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:NUMBER?

This command specifies the number of the physical random access channel (PRACH) patterns to repeat after the PRACH start trigger has been received.

INFIinity This choice means the repeating number will continue while the PRACH mode is selected and the start trigger is ignored.

***RST** 1**Range** 1–2147483647**Field Entry** Number of PRACH

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:PRACH[:SINGLE]:MESSAGE:CPART:CCODE**Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:MESSAGE:CPART:
CCODE <val>[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:MESSAGE:CPART:
CCODE?

This command sets the channelization code for the physical random access channel (PRACH) message control part.

***RST** +15**Range** 0–255**Field Entry** Channel Code

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:PRACH[:SINGLE]:MESSAge:DPART:CCODE**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:MESSAge:DPART:CCODE <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:MESSAge:DPART:CCODE?

This command sets the channelization code for the physical random access channel (PRACH) message data part.

There are commands that are associated with the channelization code and they are the slot format and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to [Table 9-8](#).

Table 9-8 Channelization Code Maximum value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120

***RST** +0**Range** 0–255**Field Entry** Channel Code

Remarks Channel code value is determined by slot format choice. Refer to “:ULINK:PRACH:MESSAge:DPART:SLOTformat” on page 1031 and “:ULINK:PRACH:MESSAge:DPART:RATE” on page 1030.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:PRACH[:SINGLE]:MESSAge:TPOWer**Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:MESSAge:
TPOWer <val>

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:MESSAge:TPOWer?

This command sets the message total power value for the single physical random access channel (PRACH) and multiple PRACH modes. The variable <val> is expressed in units of decibels (dB). The RF output power is limited to the signal generator's specifications

***RST** -1.36000000E+002**Range** -136 to 20**Field Entry** Msg Pwr

Remarks This value is used only when POWER:MODE is set to TOTAL. Refer to [“:ULINK:PRACH:PREamble:POWer:MODE” on page 1039](#).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:PRACH[:SINGLE]:NUMBer**Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:
NUMBer <val>|INFinity

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:NUMBer?

This command specifies the number of the physical random access channel (PRACH) patterns to repeat after the PRACH start trigger has been received.

INFinity This choice means the repeating number will continue while the PRACH mode is selected and the start trigger is ignored.

***RST** 1**Range** 1–2147447836**Field Entry** Number of PRACH

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:PRACH[:SINGLE]:PREamble:NUMBER**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREamble:
NUMBER <val>|INfInity
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREamble:NUMBER?
```

This command specifies the number of preambles to repeat in one physical random access channel (PRACH) pattern.

INfInity This choice means the repeating preamble will play continuously while the PRACH mode is selected.

***RST** 1**Range** 1–8388607

Field Entry PRACH Timing Setup: Number of Preamble
PRACH Power Setup: Num of Pre

:ULINK:PRACH[:SINGLE]:PREamble:POWER:INITIAL**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREamble:
POWER:INITIAL?
```

This query returns the initial preamble power from POWER:Max value, RSTep (ramp step) and PREamble:NUMBER commands.

RST** -1.36000000E+002**Field Entry** Init Pwr**:ULINK:PRACH[:SINGLE]:PREamble:POWER:MAX*Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREamble:
POWER:MAX <val>
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREamble:
POWER:MAX?
```

This command sets the maximum preamble power for the physical random access channel (PRACH).

In power ramping mode (RSTep is a non-zero value), the preamble power can go up until the acquisition indication channel's (AICH) signal is not received (maximum power).

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

The variable <val> is expressed in units of decibels (dB).

***RST** -1.36000000E+002

Range -136 to 20

Field Entry Max Pwr

Remarks The actual RF output is limited to the signal generator’s specifications although the value can be entered up to 20 dBm.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:PRACH[:SINGLE]:PREamble:POWER:RSTep

Supported E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :PREamble:POWER:RSTep <val>
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :PREamble:POWER:RSTep?
```

This command sets the power ramping steps for the single physical random access channel (PRACH) preamble.

The variable <val> is expressed in units of decibels (dB).

***RST** 0

Range 0–10

Field Entry Ramp Step

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

This command is used for single and multiple physical random access channel (PRACH) modes.

:ULINK:PRACH[:SINGLE]:PREamble:PPM**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREamble:PPM <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREamble:PPM?

This command sets the power difference between the preamble and the message control part in the single physical random access channel (PRACH).

The variable <val> is expressed in units of decibels (dB).

***RST** -4.56032509E+000**Range** -20 to 10**Field Entry** Pp-m

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:PRACH[:SINGLE]:PREamble:SIGNature**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREamble:SIGNature <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREamble:SIGNature?

This command sets the signature encoded in the single physical random access channel's (PRACH) preamble.

***RST** +0**Range** 0–15**Field Entry** Signature

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK:RMCHannel**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RMCHannel RMC122 | RMC64 | RMC144 | RMC384 | UDI64 | AMR122

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RMCHannel?

This command configures the uplink reference measurement channel by providing a one command access to a typical service channel configuration.

RMC122	This choice selects a reference measurement channel with a 12.2 kbps rate (25.141 v3.9).	
RMC64	This choice selects a reference measurement channel with a 64.0 kbps rate (25.141 v3.9).	
RMC144	This choice selects a reference measurement channel with a 144.0 kbps rate (25.141 v3.9).	
RMC384	This choice selects a reference measurement channel with a 384.0 kbps rate (25.141 v3.9).	
ARM122	This choice selects an adaptive multiple rate of 12.2 kbps (25.141 v3.4).	
UDI64	This choice selects an ISDN unrestricted digital information 1B with a 64.0 kbps rate (25.141 v3.4).	
*RST	RMC122	
Key Entry	RMC122 kbps (25.141 v3.9)	RMC64 kbps (25.141 v3.9)
	RMC144 kbps (25.141 v3.9)	RMC384 kbps (25.141 v3.9)
	ARM122 kbps (25.141v3.4)	UDI64 kbps(25.141v3.4)

:ULINK:RPANel:DPCH:INPut:ALTPower**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:INPut:ALTPower?

This query returns the type of signal at the alternate power input (ALT PWR IN, AUX I/O connector pin#16) for the dedicated physical channel (DPCH) mode.

***RST** USER

Remarks The signal name is TPC user file trigger (USER). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:DPCH:INPut:BBGRef**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:INPut:BBGRef?

This query returns the type of signal at the baseband generator reference input (BASEBAND GEN REF IN, rear panel connector) for the dedicated physical channel (DPCH) mode.

***RST** CCL

Remarks The signal name is baseband generator chip clock (CCL). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:DPCH:INPut:BGATe**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:INPut:BGATe?

This query returns the type of signal at the gate burst (BURST GATE IN, rear panel connector) for the dedicated physical channel (DPCH) mode.

***RST** CSTT

Remarks In compressed mode the signal name is compressed mode start trigger (CSST). In power control mode, the signal name is DPCH power control signal (DPCS). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK:RPANel:DPCH:INPut:PTRigger1**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:INPut:PTRigger1?

This query returns the type of signal at the pattern trigger input 1 (PATT TRIG IN 1, rear panel) for the dedicated physical channel (DPCH) mode.

***RST** FSYN

Remarks The signal name is frame synchronization (FSYN). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:DPCH:INPut:PTRigger2**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:INPut:PTRigger2?

This query returns the type of signal at the pattern trigger input 2 (PATT TRIG IN 2, AUX I/O connector pin#17) for the dedicated physical channel (DPCH) mode.

***RST** CSPT

Remarks The signal name is compress mode stop trigger (CSPT). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:DPCH:OUTPut:DCLock**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:DCLock RPS0 |
RPS1 | RPS2 | RPS3 | RPS4 | RPS5 | RPS6 | RPS7 | RPS8 | RPS9 | RPS10
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:DCLock?
```

This command assigns a signal to the data clock output at the selected rear panel AUX I/O connector pin#6. Refer to [Table 9-9 on page 1055](#) for command parameters and output signal type.

Table 9-9 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None

Table 9-9 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS1	Chip Clock
RPS2	DPDCH raw data
RPS3	DPDCH raw data clock
RPS4	DPCCH raw data
RPS5	DPCCH raw data clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS8	Compressed frame
RPS9	TTI frame pulse
RPS10	CFN #0 frame pulse

***RST**

RPS1

Key Entry

NONE (RPS0) Chip Clock (RPS1) DPDCH Raw Data (RPS2)
DPDCH Data Raw Clock (RPS3) DPCCH Raw Data (RPS4)
DPCCH Raw Data Clock (RPS5) 10 ms Frame Pulse (RPS6)
Trigger Sync Reply (RPS7) Compressed Frame (RPS8)
TTI Frame Clock (RPS9) CFN #0 Frame Pulse (RPS10)

Remarks

For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

:ULINK:RPANel:DPCH:OUTPut:DOUT

Supported E4438C with Option 400

```
[ :SOURCE ] :RADIO:WCDMA:TGPP[ :BBG ] :ULINK:RPANel:DPCH:OUTPut:DOUT RPS0 |
RPS1 | RPS2 | RPS3 | RPS4 | RPS5 | RPS6 | RPS7 | RPS8 | RPS9 | RPS10
[ :SOURCE ] :RADIO:WCDMA:TGPP[ :BBG ] :ULINK:RPANel:DPCH:OUTPut:DOUT?
```

This command assigns a signal to the data output at the selected rear panel AUX I/O connector pin#7. Refer to [Table 9-9 on page 1055](#) for command parameters and output signal type.

***RST** RPS4

Key Entry	NONE (RPS0)	Chip Clock (RPS1)	DPDCH Raw Data (RPS2)
	DPDCH Data Raw Clock (RPS3)		DPCCH Raw Data (RPS4)
	DPCCH Raw Data Clock (RPS5)		10 ms Frame Pulse (RPS6)
	Trigger Sync Reply (RPS7)		Compressed Frame (RPS8)
	TTI Frame Clock (RPS9)		CFN #0 Frame Pulse (RPS10)

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:DPCH:OUTPut:EVENT1

Supported E4438C with Option 400

```
[ :SOURCE ] :RADIO:WCDMA:TGPP[ :BBG ] :ULINK:RPANel:DPCH:OUTPut:
EVENT1 RPS0 | RPS1 | RPS2 | RPS3 | RPS4 | RPS5 | RPS6 | RPS7 | RPS8 | RPS9 | RPS10
[ :SOURCE ] :RADIO:WCDMA:TGPP[ :BBG ] :ULINK:RPANel:DPCH:OUTPut:EVENT1?
```

This command assigns a signal to the EVENT 1 at the rear panel output connector. Refer to [Table 9-9 on page 1055](#) for command parameters and output signal type.

***RST** RPS2

Key Entry	NONE (RPS0)	Chip Clock (RPS1)	DPDCH Raw Data (RPS2)
	DPDCH Data Raw Clock (RPS3)		DPCCH Raw Data (RPS4)
	DPCCH Raw Data Clock (RPS5)		10 ms Frame Pulse (RPS6)
	Trigger Sync Reply (RPS7)		Compressed Frame (RPS8)
	Frame Clock (RPS9)		CFN #0 Frame Pulse (RPS10)

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:DPCH:OUTPut:EVENT2**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:DPCH:OUTPut:
EVENT2 RPS0 | RPS1 | RPS2 | RPS3 | RPS4 | RPS5 | RPS6 | RPS7 | RPS8 | RPS9 | RPS10
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:DPCH:OUTPut:EVENT2?
```

This command assigns a signal to the EVENT 2 at the rear panel output connector. Refer to [Table 9-9 on page 1055](#) for command parameters and output signal types.

***RST** RPS3

Key Entry	NONE (RPS0)	Chip Clock (RPS1)	DPDCH Raw Data (RPS2)
	DPDCH Data Raw Clock (RPS3)		DPCCH Raw Data (RPS4)
	DPCCH Raw Data Clock (RPS5)		10 ms Frame Pulse (RPS6)
	Trigger Sync Reply (RPS7)		Compressed Frame (RPS8)
	TTI Frame Clock (RPS9)		CFN #0 Frame Pulse (RPS10)

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:DPCH:OUTPut:EVENT3**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:DPCH:OUTPut:
EVENT3 RPS0 | RPS1 | RPS2 | RPS3 | RPS4 | RPS5 | RPS6 | RPS7 | RPS8 | RPS9 | RPS10
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:DPCH:OUTPut:EVENT3?
```

This command assigns a signal to the EVENT 3 output at the selected rear panel AUX I/O connector pin#19. Refer to [Table 9-9 on page 1055](#) for command parameters and output signal type.

***RST** RPS0

Key Entry	NONE (RPS0)	Chip Clock (RPS1)	DPDCH Raw Data (RPS2)
	DPDCH Data Raw Clock (RPS3)		DPCCH Raw Data (RPS4)
	DPCCH Raw Data Clock (RPS5)		10 ms Frame Pulse (RPS6)
	Trigger Sync Reply (RPS7)		Compressed Frame (RPS8)
	TTI Frame Clock (RPS9)		CFN #0 Frame Pulse (RPS10)

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *ESG E4428C/38C Signal Generators E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:DPCH:OUTPut:EVENT4**Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:
EVENT4 RPS0|RPS1|RPS2|RPS3|RPS4|RPS5|RPS6|RPS7|RPS8|RPS9|RPS10
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:EVENT4?
```

This command assigns a signal to the EVENT 4 output at the selected rear panel AUX I/O connector pin#18. Refer to [Table 9-9 on page 1055](#) for command parameters and output signal type.

***RST** RPS0

Key Entry	NONE (RPS0)	Chip Clock (RPS1)	DPDCH Raw Data (RPS2)
	DPDCH Data Raw Clock (RPS3)		DPCCH Raw Data (RPS4)
	DPCCH Raw Data Clock (RPS5)		10 ms Frame Pulse (RPS6)
	Trigger Sync Reply (RPS7)		Compressed Frame (RPS8)
	TTI Frame Clock (RPS9)		CFN #0 Frame Pulse (RPS10)

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *ESG E4428C/38C Signal Generators E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:DPCH:OUTPut:SSYNc**Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:SSYNc RPS0|
RPS1|RPS2|RPS3|RPS4|RPS5|RPS6|RPS7|RPS8|RPS9|RPS10
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:SSYNc?
```

This command assigns a signal to SYM SYNC OUT at the selected rear panel AUX I/O connector pin#5. Refer to [Table 9-9 on page 1055](#) for command parameters and output signal type.

***RST** RPS6

Key Entry	NONE (RPS0)	Chip Clock (RPS1)	DPDCH Raw Data (RPS2)
	DPDCH Data Raw Clock (RPS3)		DPCCH Raw Data (RPS4)
	DPCCH Raw Data Clock (RPS5)		10 ms Frame Pulse (RPS6)
	Trigger Sync Reply (RPS7)		Compressed Frame (RPS8)
	TTI Frame Clock (RPS9)		CFN #0 Frame Pulse (RPS10)

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *ESG E4428C/38C Signal Generators E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:PRACH:INPut:ALTPower**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:PRACH:INPut:ALTPower?

This query returns the signal type at the ALT PWR IN (alternate power in) connector pin for the physical random access channel (PRACH) mode.

***RST** NONE**Field Entry** Alt power in

Remarks For more information about the rear panel AUX I/O connector pin configuration, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:PRACH:INPut:BBGRef**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:PRACH:INPut:BBGRef?

This query returns the type of signal at the baseband generator reference input (BASEBAND GEN REF IN, rear panel connector) for the physical random access channel (PRACH) mode.

***RST** CCL

Remarks The signal name is baseband generator chip clock (CCL). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:PRACH:INPut:BGATe**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:PRACH:INPut:BGATe?

This query returns the signal type at the BURST GATE IN connector for the physical random access channel (PRACH) mode.

***RST** PSTR**Field Entry** Burst gate in

Remarks The signal name is PRACH start trigger (PSTR). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:PRACH:INPut:PTRigger1**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:RPANel:PRACH:INPut:PTRigger1?

This query returns the signal type at the pattern trigger in 1 (PATT TRIG IN) connector for the physical random access channel (PRACH) mode.

***RST** FSYN**Field Entry** Pattern trigger in 1

Remarks The signal name is frame synchronization (FSYN). For more information about the rear panel I/O connectors' configuration, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:PRACH:INPut:PTRigger2**Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:RPANel:PRACH:INPut:PTRigger2?

This query returns the signal type at the pattern trigger input 2 (PATT TRIG IN 2 AUX I/O connector pin#17) for the physical random access channel (PRACH) mode.

***RST** AITR**Field Entry** Pattern trigger in 2

Remarks The signal name is AICH trigger (AITR). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:PRACH:OUTPut:DCLock**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :ULINK:RPANel:PRACH:OUTPut:DCLock RPS0 |
RPS1 |RPS6 |RPS7 |RPS11 |RPS12 |RPS13 |RPS14 |RPS15 |RPS16 |
RPS17 |RPS19 |RPS20 |RPS21 |RPS22 |RPS23 |RPS24 |RPS25
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :ULINK:RPANel:PRACH:OUTPut:DCLock?
```

This command assigns a signal at the data clock output for the selected rear panel AUX I/O connector pin#6.

RPS0	none
RPS1	This choice assigns the chip clock signal.
RPS6	This choice assigns the 10ms frame pulse signal.
RPS7	This choice assigns the trigger sync reply signal.
RPS11	This choice assigns the message-data raw data signal. In the multiple PRACH mode, RPS11 outputs the message-data raw data signal of PRACH#1. If the PRACH#1 is not “on”, no signal output is output.
RPS12	This choice assigns the message-data raw clock signal. In the multiple PRACH mode, RPS12 outputs the message-data raw clock signal of PRACH#1. If the PRACH#1 is not “on”, no signal output is output.
RPS14	This choice assigns the message-ctrl raw data clock signal. In the multiple PRACH mode, RPS14 outputs the message-control raw data clock signal of PRACH#1. If the PRACH#1 is not “on”, no signal output is output.
RPS15	This choice assigns the preamble raw data signal. In the multiple PRACH mode, RPS15 outputs the preamble raw data signal of PRACH#1. If the PRACH#1 is not “on”, no signal output is output.
RPS16	This choice assigns the preamble raw data clock signal. In the multiple PRACH mode, RPS16 outputs the preamble raw data clock signal of PRACH#1. If the PRACH#1 is not “on”, no signal output is output.
RPS17	This choice assigns the sub channel timing signal. Sub channel timing is used on the single PRACH mode.
RPS19	This choice assigns the PRACH processing signal. This signal indicates the PRACH is generating.
RPS20	This choice assigns the 80ms frame pulse signal.
RPS21	This choice assigns the preamble pulse signal. This signal indicates the preamble timing of all configured PRACHes. One pulse for one preamble. In the multiple

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

	PRACH mode, this output relates to PRACH#1. If the PRACH#1 in not “on”, no signal is output.
RPS22	This choice assigns the message pulse signal. This signal indicates the message part timing of all configured PRACHes. In the multiple PRACH mode, this output relates to PRACH#1. If the PRACH#1 in not “on”, no signal is output.
RPS23	This choice assigns the PRACH pulse signal. This signal indicates the start timing of all configured PRACHes. In the multiple PRACH mode, this output relates to PRACH#1. If the PRACH#1 in not “on”, no signal is output.
RPS24	This choice assigns the ESG synchronization signal. This signal is used for the multiple EAG synchronization on the multiple PRACH mode.
RPS25	This choice assigns the PRACH start trigger echo back signal. The PRACH start trigger echo back signal is used for the multiple ESG connection on the multiple PRACH mode.
*RST	RPS0
Key Entry	<p>NONE (RPS0) Chip Clock (RPS1) Message-Data Raw Data (RPS11)</p> <p>10ms Frame Pulse (RPS6) Trigger Sync Reply (RPS7)</p> <p>Message-Data Raw Clock (RPS12) Message-Control Raw Data (RPS13)</p> <p>Message-Control Raw Data Clock(RPS14)</p> <p>Preamble Raw Data(RPS15) Preamble Raw Data Clock(RPS16)</p> <p>Sub Channel Timing(RPS17) PRACH Processing(RPS19)</p> <p>80ms Frame Pulse(RPS20) Preamble Pulse(RPS21)</p> <p>Message Pulse(RPS22) PRACH Pulse(RPS23)</p> <p>ESG-Sync Sig(RPS24) Start-Trigger EchoBack(RPS25)</p>
Remarks	For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the <i>E4428C/38C ESG Signal Generators User's Guide</i> .

:ULINK:RPANel:PRACH:OUTPut:DOUT**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :ULINK:RPANel:PRACH:OUTPut:DOUT RPS0 |
RPS1 | RPS6 | RPS7 | RPS11 | RPS12 | RPS13 | RPS14 | RPS14 | RPS15 | RPS16 | RPS17 | RPS19 |
RPS20 | RPS21 | RPS22 | RPS23 | RPS24 | RPS25
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :ULINK:RPANel:PRACH:OUTPut:DOUT?
```

This command assigns a signal to the data output at the selected rear panel AUX I/O connector pin#7.

For parameter descriptions refer to “[:ULINK:RPANel:PRACH:OUTPut:DCLock](#)” on page 1062.

***RST** RPS0

Key Entry	NONE (RPS0)	Chip Clock (RPS1)	Message-Data Raw Data (RPS11)
	10ms Frame Pulse (RPS6)	Trigger Sync Reply (RPS7)	
	Message-Data Raw Clock (RPS12)	Message-Control Raw Data (RPS13)	
	Message-Control Raw Data Clock(RPS14)		
	Preamble Raw Data(RPS15)	Preamble Raw Data Clock(RPS16)	
	Sub Channel Timing(RPS17)	PRACH Processing(RPS19)	
	80ms Frame Pulse(RPS20)	Preamble Pulse(RPS21)	
	Message Pulse(RPS22)	PRACH Pulse(RPS23)	
	ESG-Sync Sig(RPS24)	Start-Trigger EchoBack(RPS25)	

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:PRACH:OUTPut:EVENT1**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :ULINK:RPANel:PRACH:OUTPut:EVENT1 RPS0 |
RPS1 | RPS6 | RPS7 | RPS11 | RPS12 | RPS13 | RPS14 | RPS14 | RPS15 | RPS16 | RPS17 | RPS19 |
RPS20 | RPS21 | RPS22 | RPS23 | RPS24 | RPS25
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :ULINK:RPANel:PRACH:OUTPut:EVENT1?
```

This command assigns a signal to the EVENT 1 at the selected rear panel connector.

For parameter descriptions refer to “[:ULINK:RPANel:PRACH:OUTPut:DCLock](#)” on page 1062.

***RST** RPS0

Key Entry	NONE (RPS0)	Chip Clock (RPS1)	Message-Data Raw Data (RPS11)
------------------	--------------------	--------------------------	--------------------------------------

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURce]:RADio:WCDMa:TGPP[:BBG])

	10ms Frame Pulse (RPS6)	Trigger Sync Reply (RPS7)
	Message-Data Raw Clock (RPS12)	Message-Control Raw Data (RPS13)
	Message-Control Raw Data Clock(RPS14)	
	Preamble Raw Data(RPS15)	Preamble Raw Data Clock(RPS16)
	Sub Channel Timing(RPS17)	PRACH Processing(RPS19)
	80ms Frame Pulse(RPS20)	Preamble Pulse(RPS21)
	Message Pulse(RPS22)	PRACH Pulse(RPS23)
	ESG-Sync Sig(RPS24)	Start-Trigger EchoBack(RPS25)
Remarks	For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the <i>E4428C/38C ESG Signal Generators User's Guide</i> .	

:ULINK:RPANel:PRACH:OUTPut:EVENT2

Supported E4438C with Option 400

```
[ :SOURce ] :RADio :WCDMa :TGPP [ :BBG ] :ULINK :RPANel :PRACH :OUTPut :EVENT2 RPS0|
RPS1|RPS6|RPS7|RPS11|RPS12|RPS13|RPS14|RPS14|RPS15|RPS16|RPS17|RPS19|RPS20|RPS21|
RPS22|RPS23|RPS24|RPS25
[ :SOURce ] :RADio :WCDMa :TGPP [ :BBG ] :ULINK :RPANel :PRACH :OUTPut :EVENT2?
```

This command assigns a signal to the EVENT 2 at the rear panel connector.

For parameter descriptions refer to “:ULINK:RPANel:PRACH:OUTPut:DCLock” on page 1062.

***RST** RPS0

Key Entry	NONE (RPS0)	Chip Clock (RPS1)	Message-Data Raw Data (RPS11)
	10ms Frame Pulse (RPS6)	Trigger Sync Reply (RPS7)	
	Message-Data Raw Clock (RPS12)	Message-Control Raw Data (RPS13)	
	Message-Control Raw Data Clock(RPS14)		
	Preamble Raw Data(RPS15)	Preamble Raw Data Clock(RPS16)	
	Sub Channel Timing(RPS17)	PRACH Processing(RPS19)	
	80ms Frame Pulse(RPS20)	Preamble Pulse(RPS21)	
	Message Pulse(RPS22)	PRACH Pulse(RPS23)	
	ESG-Sync Sig(RPS24)	Start-Trigger EchoBack(RPS25)	

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:PRACH:OUTPut:EVENT3**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :ULINK:RPANel:PRACH:OUTPut:EVENT3 RPS0 |
RPS1 |RPS6 |RPS7 |RPS11 |RPS12 |RPS13 |RPS14 |RPS14 |RPS15 |RPS16 |RPS17 |RPS19 |
RPS20 |RPS21 |RPS22 |RPS23 |RPS24 |RPS25
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :ULINK:RPANel:PRACH:OUTPut:EVENT3?
```

This command assigns a signal to the EVENT 3 output at the selected rear panel AUX I/O connector pin#19.

For parameter descriptions refer to “[:ULINK:RPANel:PRACH:OUTPut:DCLock](#)” on page 1062.

***RST** RPS0

Key Entry	NONE (RPS0)	Chip Clock (RPS1)	Message-Data Raw Data (RPS11)
	10ms Frame Pulse (RPS6)	Trigger Sync Reply (RPS7)	
	Message-Data Raw Clock (RPS12)	Message-Control Raw Data (RPS13)	
	Message-Control Raw Data Clock(RPS14)		
	Preamble Raw Data(RPS15)	Preamble Raw Data Clock(RPS16)	
	Sub Channel Timing(RPS17)	PRACH Processing(RPS19)	
	80ms Frame Pulse(RPS20)	Preamble Pulse(RPS21)	
	Message Pulse(RPS22)	PRACH Pulse(RPS23)	
	ESG-Sync Sig(RPS24)	Start-Trigger EchoBack(RPS25)	

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:PRACH:OUTPut:EVENT4**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :ULINK:RPANel:PRACH:OUTPut:EVENT4 4RPS0 |
RPS1 |RPS6 |RPS7 |RPS11 |RPS12 |RPS13 |RPS14 |RPS14 |RPS15 |RPS16 |RPS17 |RPS19 |
RPS20 |RPS21 |RPS22 |RPS23 |RPS24 |RPS25
[ :SOURCE ] :RADio:WCDMa:TGPP[ :BBG ] :ULINK:RPANel:PRACH:OUTPut:EVENT4?
```

This command assigns a signal to the EVENT 4 output at the selected rear panel AUX I/O connector pin#18.

For parameter descriptions refer to “[:ULINK:RPANel:PRACH:OUTPut:DCLock](#)” on page 1062.

***RST** RPS0

Key Entry	NONE (RPS0)	Chip Clock (RPS1)	Message-Data Raw Data (RPS11)
	10ms Frame Pulse (RPS6)	Trigger Sync Reply (RPS7)	
	Message-Data Raw Clock (RPS12)	Message-Control Raw Data (RPS13)	
	Message-Control Raw Data Clock(RPS14)		
	Preamble Raw Data(RPS15)	Preamble Raw Data Clock(RPS16)	
	Sub Channel Timing(RPS17)	PRACH Processing(RPS19)	
	80ms Frame Pulse(RPS20)	Preamble Pulse(RPS21)	
	Message Pulse(RPS22)	PRACH Pulse(RPS23)	
	ESG-Sync Sig(RPS24)	Start-Trigger EchoBack(RPS25)	

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:RPANel:PRACH:OUTPut:SSYNc**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:PRACH:OUTPut:SSYNc RPS0 |
RPS1 | RPS6 | RPS7 | RPS11 | RPS12 | RPS13 | RPS14 | RPS14 | RPS15 | RPS16 | RPS17 | RPS19 |
RPS20 | RPS21 | RPS22 | RPS23 | RPS24 | RPS25
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:PRACH:OUTPut:SSYNc?
```

This command assigns a signal to SYM SYNC OUT at the selected rear panel AUX I/O connector pin#5.

For parameter descriptions refer to “[:ULINK:RPANel:PRACH:OUTPut:DCLock](#)” on page 1062.

***RST** RPS0

Key Entry	NONE (RPS0)	Chip Clock (RPS1)	Message-Data Raw Data (RPS11)
	10ms Frame Pulse (RPS6)	Trigger Sync Reply (RPS7)	
	Message-Data Raw Clock (RPS12)	Message-Control Raw Data (RPS13)	
	Message-Control Raw Data Clock(RPS14)		
	Preamble Raw Data(RPS15)	Preamble Raw Data Clock(RPS16)	
	Sub Channel Timing(RPS17)	PRACH Processing(RPS19)	
	80ms Frame Pulse(RPS20)	Preamble Pulse(RPS21)	
	Message Pulse(RPS22)	PRACH Pulse(RPS23)	
	ESG-Sync Sig(RPS24)	Start-Trigger EchoBack(RPS25)	

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

:ULINK:SCRamblecode**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SCRamblecode <val>
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SCRamblecode?
```

This command sets the uplink scramble code.

***RST** +0**Range** 0–16777215**Field Entry** Scrambling Code

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK:SDElay**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SDElay <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SDElay?

This command sets the number of timeslots to be delayed for the dedicated physical channel (DPCH).

***RST** +0**Range** 0–119**Key Entry** Timeslot Offset

Remarks The actual amount of timing offset is $(T0) + (TOFFset) + (SDElay) * 2560$ chips, where $T0 = 1024$ chips.

This command is not used when the sync source is set to ESG. Refer to “:ULINK:SYNC[:SOURCE]” on page 1070.

:ULINK:SFNRst:POLarity**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SFNRst:POLarity POSitive|NEGative

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SFNRst:POLarity?

This command sets the polarity of the system frame number reset signal for the uplink synchronization source.

POSitive This choice sets the signal to trigger when the trigger signal is high.

NEGative This choice sets the signal to trigger when the trigger signal is low.

***RST** POS**Key Entry** SFN RST Polarity Neg Pos

Remarks This command is not used when the sync source is set to ESG. Refer to “:ULINK:SYNC[:SOURCE]” on page 1070.

:ULINK:SYNC:MODE**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SYNC:MODE SINGLE|CONTinuous

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SYNC:MODE?

This command selects the uplink frame synchronization triggering mode.

SINGLE This choice sets the signal generator, once triggered, to generate frames based on the reference clock.**CONTinuous** This choice sets the signal generator to continuously align the frame sync trigger signal and the frame timing.***RST** SING**Key Entry** Frame Sync Trigger Mode Single Cont**:ULINK:SYNC[:SOURCE]****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SYNC[:SOURCE] SFN_RST|FCLock|ESG

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SYNC[:SOURCE]?

This command selects the uplink frame synchronization source type.

SFN_RST This choice sets the signal to trigger on the system frame number reset signal.**FCLock** This choice sets the signal to trigger on the frame clock.**ESG** This choice sets the signal to trigger on the synchronization signal of a primary ESG.***RST** FCL**Key Entry** Sync Source SFN FClk ESG

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK:TGAP:POFFset**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:POFFset <val> | AUTO

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:POFFset?

This command specifies the amount of power to be increased when the data is being compressed for the transmission gap power offset.

AUTO This choice sets the power to increase using the gap pattern parameters calculation based on 3GPP standard. When AUTO is selected, the query returns “AUTO” as the value.

The variable <val> is expressed in units of decibels (dB).

***RST** AUTO**Range** 0–6**Field Entry** PwrOffs

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:CFN**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:CFN <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:CFN?

This command sets the connection frame number (CFN) for the first radio frame of the first pattern 1.

***RST** 0**Range** 1–255**Field Entry** TGCFN

Remarks In the signal generator, CFN is counted internally relative to the system sync signal.

:ULINK:TGAP:PSI[1]:CMMethod**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:TGAP:PSI [ 1 ] :CMMethod SF2 | HIGHer
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:TGAP:PSI [ 1 ] :CMMethod?
```

This command selects the compressed mode (CM) method.

SF2 This choice selects a compressed mode method that reduced the spread factor (SF) by 2. This is done by increasing the data rate by reducing the spreading factor in half. When the dedicated physical data channel's (DPDCH) symbol rate is 960 kbps, the frame is not compressed because it uses the lowest SF value and it cannot be reduced.

HIGHer This choice selects a higher layer scheduling method. The emulated higher layer scheduling method mode keeps the same physical layer data rate even when a transmission gap is created.

***RST** SF2**Key Entry** SF/2 Higher Layer

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

The ULINK:APPLY command will fail if the CM method is higher layer and DPDCH data is TrCH. CM method should be SF/2 if the DPDCH data is TrCH.

:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6 :D**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:TGAP:PSI [ 1 ] | 2 | 3 | 4 | 5 | 6 :D
<val> | UNDeFined
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:TGAP:PSI [ 1 ] | 2 | 3 | 4 | 5 | 6 :D?
```

This command sets the transmission gap distance. The command specifies the number of slots between the starting slots of two consecutive transmission gaps within a transmission gap pattern.

UNDeFined This choice sets one transmission gap. When UNDeFined is selected, then there is only one transmission gap within the transmission gap pattern.

***RST** UND**Range** 15–269**Field Entry** TGD

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:L1**Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6
:L1 3 | 4 | 5 | 7 | 10 | 14

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:L1?

This command specifies the length of the first transmission gap (TGL1). The length is expressed in number of slots.

RST** +7**Field Entry** TGL1**:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:L2*Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6
:L2 3 | 4 | 5 | 7 | 10 | 14 | OMITted

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:L2?

This command specifies the length of the second transmission gap (TGL2). When OMITted is selected, TGL2=TGL1.

RST** OMIT**Field Entry** TGL2**:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:PL1*Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:PL1 <val>
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:PL1?

This command specifies the duration of the transmission gap pattern length 1 (TGPL1). The pattern length is expressed in number of frames.

***RST** +2**Range** 1–144**Field Entry** TGPL1

:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:PL2

Supported E4438C with Option 400

[:SOURCE] :RADio:WCDMa:TGPP [:BBG] :ULINK:TGAP:PSI [1] | 2 | 3 | 4 | 5 | 6 :PL2 <val> | OMITted

[:SOURCE] :RADio:WCDMa:TGPP [:BBG] :ULINK:TGAP:PSI [1] | 2 | 3 | 4 | 5 | 6 :PL2?

This command specifies the duration of the transmission gap pattern length 2 (TGPL2).

The variable <val> is expressed in number of frames. When OMITted is selected, TGPL2=TGPL1.

***RST** OMIT

Range 1–144

Field Entry TGPL2

Key Entry Omitted

:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:POWer

Supported E4438C with Option 400

[:SOURCE] :RADio:WCDMa:TGPP [:BBG] :ULINK:TGAP:PSI [1] | 2 | 3 | 4 | 5 | 6 :POWer?

This query returns each power level for a compressed slot.

The return string has five real numbers followed by dBm (for normal power) or dB (for before/after gap power) separated by a single space character. When a value does not exist because of a specified compressed pattern (Example: Gap2 does not exist when TGD is “UNDEFINED”), it returns “–dB.”

Normal power value represents an actual power level in dBm and relative power is represented in dB.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

:ULINK:TGAP:PSI[1]|2|3|4|5|6:PRC**Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:PRC <val> |
INFIInity

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:PRC?

This command sets the transmission gap pattern repetition count. The pattern repetition count (PRC) sets the number of transmission gap patterns within the transmission gap pattern sequence.

RST** INF**Range** 1–511**Field Entry** TGPRC**Key Entry** InFIInity**Remarks** When INFIInity is selected, the PRC will continue indefinitely.**:ULINK:TGAP:PSI[1]|2|3|4|5|6:PS*Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:PS ACTive |
INACTive

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:PS?

This command sets the transmission gap pattern status.

ACTive This choice sets the compressed mode active.**INACTive** This choice sets the compressed mode inactive.***RST** INAC**Key Entry** TGPS Active Inactive

:ULINK:TGAP:PSI[1]|2|3|4|5|6:SN**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:SN <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:SN?

This command specifies the timeslot number of the first transmission gap within the first radio frame.

RST** +11**Range** 0–14**Field Entry** TGSN**:ULINK:TGAP:RPARAMeter*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:RPARAMeter DREF11|DREF12|DREF21|DREF22

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:RPARAMeter?

This command sets the downlink reference compressed mode parameters as defined in 3GPP Standard TS25.101.

DREF11 This choice sets the reference parameter to 1.1.

DREF12 This choice sets the reference parameter to 1.2.

DREF21 This choice sets the reference parameter to 2.1.

DREF22 This choice sets the reference parameter to 2.2.

***RST** CUST**Key Entry** DL Reference 1.1 DL Reference 1.2 DL Reference 2.1
DL Reference 2.2**Remarks** The query returns CUSTom when the parameters are set individually.**:ULINK:TGAP:SCFN****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:SCFN <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:SCFN?

This command sets the stop connection frame number (CFN) when the stop trigger is used.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

When the stop trigger is received at the signal generator, the next stop CFN, the compressed mode will finish even if the transmission gap pattern repetition count (TGPRC) is still remaining.

***RST** +0

Range 0–255

Field Entry SCFN

Remarks The compressed mode stop trigger must be used for this command to executed. Refer to “:ULINK:TGAP:STOP:TRIGGER” on page 1078.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

This command is not used when the sync source is set to ESG. Refer to “:ULINK:SYNC[:SOURCE]” on page 1070.

:ULINK:TGAP[:STATE]

Supported E4438C with Option 400

[:SOURCE] :RADIO:WCDMA:TGPP [:BBG] :ULINK:TGAP [:STATE] ON | OFF | 1 | 0

[:SOURCE] :RADIO:WCDMA:TGPP [:BBG] :ULINK:TGAP [:STATE] ?

This command enables or disables the uplink transmission gap pattern.

***RST** 1

Key Entry Compress Mode Off On

:ULINK:TGAP:START:TRIGGER

Supported E4438C with Option 400

[:SOURCE] :RADIO:WCDMA:TGPP [:BBG] :ULINK:TGAP:START:TRIGGER

This command starts the compressed mode trigger.

Key Entry Compressed Mode Start Trigger

:ULINK:TGAP:START:TRIGGER:POLARITY

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : TGAP : START : TRIGGER :  
POLARITY POSITIVE | NEGATIVE
```

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : TGAP : START : TRIGGER : POLARITY?
```

This command sets the compressed mode start trigger signal polarity.

POSITIVE This choice sets the trigger to start when the trigger signal is high.

NEGATIVE This choice sets the trigger to start when the trigger signal is low.

***RST** POS

Key Entry Comp Mode Start Trigger Polarity Neg Pos

:ULINK:TGAP:STOP:TRIGGER

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : TGAP : STOP : TRIGGER
```

This command stops the compressed mode trigger.

Key Entry Compressed Mode Stop Trigger

:ULINK:TGAP:STOP:TRIGGER:POLARITY

Supported E4438C with Option 400

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : TGAP : STOP : TRIGGER :  
POLARITY POSITIVE | NEGATIVE
```

```
[ :SOURCE ] : RADIO : WCDMA : TGPP [ : BBG ] : ULINK : TGAP : STOP : TRIGGER : POLARITY?
```

This command sets the compressed mode stop trigger signal polarity.

POSITIVE This choice sets the trigger to stop when the trigger signal is high.

NEGATIVE This choice sets the trigger to stop when the trigger signal is low.

***RST** POS

Key Entry Comp Mode Stop Trigger Polarity Neg Pos

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK:TOFFset**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TOFFset <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TOFFset?

This command sets additional timing offset for the dedicated physical channel (DPCH). Timing offset is the time delay between the downlink signal and the uplink signal. The downlink signal timing is provided by the synchronization signal.

***RST** +0**Range** –512 to 2560**Key Entry** Timing Offset

Remarks The actual amount of timing offset is (T0) + (TOFFset) + (SDElay) where T0 = 1024 chips.

:ULINK:TStatus:COMPRESSED**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TStatus:COMPRESSED?

This query returns the status of compressed pattern generation. A “0” response indicates the compressed mode pattern signal is not generating. A “1” response indicates that the compressed mode pattern signal is generating.

RST** 0**:ULINK:TStatus:RACH*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TStatus:RACH?

This query returns the status of the physical random access channel (PRACH). A “0” response indicates the PRACH signal is not generating. A “1” response indicates that the PRACH signal is generating.

***RST** 0

:ULINK:TSTATUS:RECEIVE**Supported** E4438C with Option 400

[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINK:TSTATUS:RECEIVE?

This query returns the frame synchronization signal reception status.

When the frame synchronization signal is received after synchronization configuration, the received value becomes “1.” If the signal is not received, the value is “0.”

RST** 0**:ULINK:TSTATUS:SYNC*Supported** E4438C with Option 400

[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINK:TSTATUS:SYNC?

This query returns the frame synchronization status. A “0” status indicates frame synchronization is fine or no frame synchronization signal is received). A “1” indicates frame synchronization is out sync and the synchronization signal does not match with the signal generator’s timing. The signal generator will generate incorrect data

RST** 0**:ULINK:[TGRoup[1]]:DCH[1]|2|3|3|5|6:BLKSize*Supported** E4438C with Option 400[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINK:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:BLKSize <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINK:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:BLKSize?

This command sets the block size for the selected uplink dedicated channel (DCH).

***RST** DCH1: 244 DCH2: 100 DCH3,4,5,6: 20**Range** 0–5000**Key Entry** Blk Size**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:BPFRame**Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:BPFRame?

This query returns the block per frame for the selected dedicated transport channel (DCH).

RST** DCH1: 490 DCH2: 110 DCH3,4,5,6: 60**Range** 0–5000**:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:BRATe*Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:BRATe?

This query returns the bit rate for the selected dedicated transport channel (DCH)

RST** DCH1: 12200 DCH2: 2500 DCH3,4,5,6: 2000**Range** 0–5000**:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 3 | 5 | 6:CODE*Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:CODE HCONv | TCONv | TURBo | NONE
[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:CODE?

This command sets the encoder type for the uplink dedicated channel (DCH) selected.

HCONv This choice selects a coding with the 1/2 rate convolutional encoder.**TCONv** This choice selects a coding with the 1/3 rate convolutional encoder.**TURBo** This choice selects a coding with the turbo coder.**NONE** This choice selects no coding type.***RST** DCH1,2: TCONv DCH3,4,5,6: HCONv**Key Entry** 1/2 Conv 1/3 Conv Turbo NONE**Remarks** If the choice, set by this command, is changed while the signal is active, the apply command must be sent to set the change. See “:ULINK:APPLY” on page 987.

:ULINK:[TGRoup[1]]:DCH[1] | 2 | 3 | 3 | 5 | 6: CRC**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK : [ TGRoup [ 1 ] ] :DCH [ 1 ] |
2 | 3 | 4 | 5 | 6 :CRC 0 | 8 | 12 | 16 | 24
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK : [ TGRoup [ 1 ] ] :DCH [ 1 ] |
2 | 3 | 4 | 5 | 6 :CRC?
```

This command specifies the number of cyclic redundancy code (CRC) bits to be added to each transport channel block.

***RST** DCH1: 16 DCH2: 12 DCH3,4,5,6: 8**Field Entry** CRC Size

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK:[TGRoup[1]]:DCH[1] | 2 | 3 | 3 | 5 | 6: DATA**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK : [ TGRoup [ 1 ] ] :DCH [ 1 ] |
2 | 3 | 4 | 5 | 6 :DATA PN9 | FIX4 | "<file name>"
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK : [ TGRoup [ 1 ] ] :DCH [ 1 ] |
2 | 3 | 4 | 5 | 6 :DATA?
```

This command configures the data type to be inserted into the selected uplink dedicated channel (DCH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** PN9**Key Entry** PN9 FIX4 User File

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BER:ACTual**Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] |
2 | 3 | 4 | 5 | 6:DATA:BER:ACTual?

This query returns the actual inserted error ratio in the uplink dedicated channel (DCH) selected.

RST** +0.0000000E+000**Remarks** The actual bit error rate can be different from the specified bit error rate due to the internal bit generation.**:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BER:ERRor:BIT*Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:
DATA:BER:ERRor:BIT?

This query returns the actual error bits inserted in total number of bits.

RST** +0**Field Entry** Error Bits**:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BER:TOTal:BIT*Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:
DATA:BER:TOTal:BIT?

This query returns the total number of bits inserted for the bit error ratio calculation.

***RST** 0**Field Entry** Total Bits

:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BER[:VALue]**Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6 :
DATA:BER[:VALue] <val>[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6 :
DATA:BER[:VALue]?

This command specifies the bit error rate (BER) value to be inserted into the selected uplink dedicated channel (DCH). The variable <val> is expressed in decimal form as a percent ratio (1.0=100%).

***RST** 0.0000000+000**Range** 0.0001–1.0**Field Entry** BER

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER:ACTual**Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] |
2 | 3 | 4 | 5 | 6:DATA:BLER:ACTual?

This query returns the actual block error ratio inserted.

***RST** 0.0000000E+000

Remarks The actual block error rate can be different from the specified block error rate due to the internal bit generation.

:ULINK[:TGRoup[1] | 2]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER:ERRor:BLOCK**Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1] | 2]:DCH[1] | 2 | 3 | 4 | 5 | 6 :
DATA:BLER:ERRor:BLOCK?

This query returns the number of error blocks inserted.

***RST** +0**Field Entry** Error Blocks

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

:ULINK[:TGRoup[1] | 2:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER:TOTal:BLOCK**Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1] | 2:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER:TOTal:BLOCK?

This query returns the error blocks actually inserted in total number of blocks.

RST** +0**Field Entry** Total Blocks**:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER[:VALue]*Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER[:VALue] <val>

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER[:VALue]?

This command specifies the block error rate (BLER) value to be inserted into the selected uplink dedicated channel (DCH).

The variable <val> is expressed in decimal form as a percent ratio (1.0=100%).

***RST** +0.00000000E+000**Range** 0.0–1.00**Field Entry** BLER**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:EINSert**Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:
DATA:EINSert BLER|BER|NONE[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:
DATA:EINSert?

This command selects the error insertion mode.

BLER This choice selects a block error rate (BLER) mode.**BER** This choice selects a bit error rate (BER) mode.**NONE** This choice selects no BLER or BER mode (no error blocks or bits inserted).***RST** NONE**Key Entry** **BLER** **BER** **None****:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:FIX4****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:
DATA:FIX4 <val>[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:
DATA:FIX4?

This command sets the 4 bit data pattern for the selected uplink dedicated channel (DCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

***RST** #B0000**Range** 0–15**Key Entry** **FIX4**

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:NBLock**Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6 :
NBLock <val>[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6 :
NBLock?

This command specifies the number of transport blocks coded on to the selected dedicated channel (DCH).

RST** +1**Range** 0–4095**Field Entry** Num of Blk**:ULINK[:TGRoup [1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:PPERcentage*Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6 :
PPERcentage?

This query returns the percentage of the total bits removed from or added to the fully coded channel.

The value is returned in the unit of percent and a negative value means repetition.

Field Entry Puncture**:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:RMATch****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6 :
RMATch <val>[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6 :
RMATch?

This command specifies the rate matching parameters of each dedicated channel (DCH) selected.

***RST** DCH1: 2 DCH2: 12 DCH3,4,5,6: 1**Range** 1–256**Field Entry** Rate Match Attr

:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:TTI**Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
TTI 10000|20000|40000|80000

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:TTI?

This command sets the transmission time interval (TTI) period for the dedicated channel (DCH) selected. TTI is the time interval of the amount of data to be transmitted.

The choices are expressed in units of milliseconds (msec) where 20000 = 20 msec.

RST** DCH1: 20000 DCH2: 40000 DCH3,4,5,6: 10000**Field Entry** TTI**Remarks** The data amount equals the block size (BLKsize) times the number of transport blocks (NBlock).**:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6[:STATE]*Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|
2|3|4|5|6[:STATE] ON|OFF|1|0[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|
2|3|4|5|6[:STATE]?

This command enables or disables the operating state of the dedicated channel (DCH) selected.

***RST** DCH1,2: 1 DCH3,4,5,6: 0**Key Entry** TrCH State Off On

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK[:TGRoup[1]]:RACH[1]:BLKSize**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:BLKSize <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:BLKSize?

This command sets the transport block size for the random access channel (RACH) coding where the input data is carried.

***RST** +168**Range** 0–5000**Field Entry** Blk Size

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK[:TGRoup [1]]:RACH[1]:BPFRame**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:BPFRame?

This query returns the bits per frame for the selected random access channel (RACH).

RST** +600**:ULINK[:TGRoup [1]]:RACH[1]:BRATe*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:BRATe?

This query returns the bit rate for the random access transport channel (RACH).

***RST** +8400

:ULINK[:TGRoup[1]]:RACH[1]:CODE**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:CODE?

This query returns the type of channel coding for error protection.

RST** HCON**:ULINK[:TGRoup[1]]:RACH[1]:CRC*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:

CRC 0|8|12|16|24

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:CRC?

This command specifies the number of cyclic redundancy code (CRC) bits that are to be added to each transport channel block.

RST** +16**Field Entry** CRC Size**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).**:ULINK[:TGRoup[1]]:RACH[1]:DATA*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA PN9|FIX4|"<file name>"

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA?

This command sets the type of data to be inserted into the random access channel (RACH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** PN9**Key Entry** PN9 FIX4 User File**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER:ACTual**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER:ACTual?

This query returns the actual error ratio inserted.

RST** +0**Range** 0–5000**Key Entry** Actual BER**Remarks** The specified error ratio and actual ratio will not match when the internal bit generation goes into “pre-computing” mode.**:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER:ERRor:BIT*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER:ERRor:BIT?

This query returns the actual error bits inserted for the total number of bits.

RST** 0**:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER:TOTal:BIT*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER:TOTal:BIT?

This query returns the total number of bits inserted for the bit error ratio calculation.

***RST** 0**Remarks** The specified error ratio and actual ratio will not match when the internal bit generation goes into “pre-computing” mode.

:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER[:VALue]**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER[:VALue] <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER[:VALue]?

This command sets the bit error rate value for the random access channel (RACH).

RST** +0.00000000E+000**Range** 0.0000–1.0**Field Entry** BER**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).**:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER:ACTual*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER:ACTual?

This query returns the actual error ratio inserted.

RST** 0.00000000E+000**Remarks** The specified error ratio and actual error ratio will not match when the internal bit generation goes into “pre-computing” mode.**:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER:ERRor:BLOCK*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER:ERRor:BLOCK?

This query returns the actual block errors inserted in the total number of blocks.

***RST** +0**Remarks** The specified error ratio and actual error ratio will not match when the internal bit generation goes into “pre-computing” mode.

:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER:TOTal:BLOCK**Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER:TOTal:BLOCK?

This query returns the total blocks inserted for the block error ratio calculation.

RST** +0**Remarks** The specified error ratio and actual error ratio will not match when the internal bit generation goes into “pre-computing” mode.**:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER[:VALue]*Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER[:VALue] <val>

[:SOURCE]:RADIo:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER[:VALue]?

This command sets the inserted block error rate value. The variable <val> is expressed in decimal form, but it is a percent ratio (1.0=100%).

***RST** 0**Range** 0.0001–1.0**Field Entry** BLER**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK[:TGRoup[1]]:RACH[1]:DATA:EINSert**Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:
EINSert BLER|BER|NONE

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:EINSert?

This command selects an error mode or no error insertion.

BLER This choice selects block error rate (BLER) mode.**BER** This choice selects a bit error rate (BER) mode.**NONE** This choice selects no BLER or BER mode (no error blocks or bits inserted).***RST** NONE**Key Entry** **BLER** **BER** **None****Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).**:ULINK[:TGRoup[1]]:RACH[1]:DATA:FIX4****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:
FIX4 <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:DATA:FIX4?

This command sets a fixed 4 bit pattern for use as a data pattern.

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

***RST** #B0000**Range** 0–15**Field Entry** Data**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 987](#).

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

:ULINK[:TGRoup[1]]:RACH[1]:NBLOCK**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:NBLOCK <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:NBLOCK?

This command sets the number of transport blocks coded into one random access channel (RACH).

***RST** +1**Range** 0–4095**Field Entry** Num of Blk**Remarks** The total input data into one RACH is the block size (BLKsize) multiplied by the number of transport blocks (NBLOCK).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987

:ULINK[:TGRoup [1]]:RACH[1]:PPERcentage**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:PPERcentage?

This query returns the percentage of the total bits removed from or added to the fully coded channel.

RST** –2.12500000E+002**Field Entry** Puncture**:ULINK[:TGRoup[1]]:RACH[1]:RMArch*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RACH[1]:RMArch?

This query returns the rate match parameters of each random access channel (RACH).

***RST** +1

:ULINK[:TGRoup[1]]:RACH[1]:TTI**Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:
TTI 10000|20000

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:TTI?

This command sets the transmission time interval (TTI) period for the random access channel (RACH).

The choices are expressed in units of milliseconds (msec) where 20000=20 msec.

***RST** 20000**Field Entry** TTI

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 987.

:ULINK[:TGRoup[1]]:RACH[1][:STATe]**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1][:STATe]?

This query returns the state of the random access channel (RACH).

RST** 1**[:STATe]*Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG][:STATe] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:TGPP[:BBG][:STATe]?

This command enables or disables W-CDMA functionality.

***RST** 0**Key Entry** W-CDMA Off On

Symbols

of Blocks field, [984](#)
 # of Carriers softkey, [285](#), [287](#)
 # Points softkey, [56](#)
 # Skipped Points softkey, [304](#)
 ΦM Dev, [199](#)
 ΦM Dev Couple Off On, [199](#)
 FM ΦM Normal High BW, [194](#)
 ΦM Off On, [198](#)
 ΦM Path 1 2, [193](#)
 ΦM Stop Rate, [196](#)
 ΦM Sweep Time, [197](#)
 ΦM Tone 2 Ampl Percent of Peak, [196](#)

Numerics

0.7V,1.4V,1.65V,2.5V softkey, [417](#)
 1 DPCH softkey, [342](#), [347](#)
 1.23 MHz softkey, [266](#)
 1.25 MHz softkey, [266](#)
 1/2 Conv softkey, [982](#), [983](#), [1081](#)
 1/3 Conv softkey, [982](#), [983](#), [1081](#)
 10 msec softkey, [1009](#)
 1048576 softkey, [213](#)
 10ms Frame Pulse (DRPS11) softkey, [964](#), [966](#),
 [967](#), [968](#), [969](#)
 10ms Frame Pulse (RPS6) softkey
 See wideband CDMA base band generator
 subsystem keys and fields
 12.2 kbps (34.121 v3.8) softkey, [947](#)
 128QAM softkey
 See custom subsystem keys
 See DECT subsystem keys
 See Dmodulation subsystem keys
 See EDGE subsystem keys
 See GSM subsystem keys
 See NADC subsystem keys
 See PDC subsystem keys
 See PHS subsystem keys
 See TETRA subsystem keys
 131072 softkey, [213](#)
 144 kbps (34.121 v3.8) softkey, [947](#)
 16 1's & 16 0's softkey
 See custom subsystem keys
 See DECT subsystem keys

16 1's & 16 0's softkey (continued)
 See EDGE subsystem keys
 See GSM subsystem keys
 See NADC subsystem keys
 See PDC subsystem keys
 See PHS subsystem keys
 See TETRA subsystem keys
 16384 softkey, [213](#)
 16-Lvl FSK softkey
 See DECT subsystem keys
 See PHS subsystem keys
 16PSK softkey
 See custom subsystem keys
 See DECT subsystem keys
 See Dmodulation subsystem keys
 See EDGE subsystem keys
 See GSM subsystem keys
 See NADC subsystem keys
 See PDC subsystem keys
 See PHS subsystem keys
 See TETRA subsystem keys
 16QAM softkey
 See custom subsystem keys
 See DECT subsystem keys
 See Dmodulation subsystem keys
 See EDGE subsystem keys
 See GSM subsystem keys
 See NADC subsystem keys
 See PDC subsystem keys
 See PHS subsystem keys
 See TETRA subsystem keys
 2 Carriers softkey, [343](#)
 2 SR3 Carriers softkey, [251](#)
 2.100 MHz softkey, [31](#), [210](#), [224](#), [249](#), [279](#), [302](#),
 [324](#), [340](#), [471](#)
 20 msec softkey, [1009](#)
 2560 msec softkey, [1009](#)
 256QAM softkey
 See custom subsystem keys
 See DECT subsystem keys
 See Dmodulation subsystem keys
 See EDGE subsystem keys
 See GSM subsystem keys
 See NADC subsystem keys
 See PDC subsystem keys

Index

- 256QAM softkey (*continued*)
 - See PHS subsystem keys
 - See TETRA subsystem keys
- 262144 softkey, [213](#)
- 2-Lvl FSK softkey
 - See custom subsystem keys
 - See DECT subsystem keys
 - See Dmodulation subsystem keys
 - See EDGE subsystem keys
 - See GSM subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See PHS subsystem keys
 - See TETRA subsystem keys
- 2nd Scr Offset field, [948](#), [955](#)
- 3 Carriers softkey, [231](#), [251](#), [343](#)
- 3 DPCH softkey, [342](#), [347](#)
- 3.84MHz chip-clk (DRPS4) softkey, [964](#), [966](#), [967](#), [968](#), [969](#)
- 32 1's & 32 0's softkey
 - See custom subsystem keys
 - See DECT subsystem keys
 - See EDGE subsystem keys
 - See GSM subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See PHS subsystem keys
 - See TETRA subsystem keys
- 32 Ch Fwd softkey, [229](#), [232](#)
- 32768 softkey, [213](#)
- 32QAM softkey
 - See custom subsystem keys
 - See DECT subsystem keys
 - See Dmodulation subsystem keys
 - See EDGE subsystem keys
 - See GSM subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See PHS subsystem keys
 - See TETRA subsystem keys
- 384 kbps (34.121 v3.8) softkey, [947](#)
- 4 1's & 4 0's softkey
 - See custom subsystem keys
 - See DECT subsystem keys
 - See EDGE subsystem keys
- 4 1's & 4 0's softkey (*continued*)
 - See GSM subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See PHS subsystem keys
 - See TETRA subsystem keys
- 4 Carriers softkey, [231](#), [251](#), [343](#)
- 40 msec softkey, [1009](#)
- 40.000 MHz softkey, [31](#), [207](#), [210](#), [219](#), [224](#), [244](#), [249](#), [274](#), [279](#), [300](#), [302](#), [322](#), [324](#), [338](#), [340](#), [464](#), [471](#)
- 4-Lvl FSK softkey
 - See custom subsystem keys
 - See DECT subsystem keys
 - See Dmodulation subsystem keys
 - See EDGE subsystem keys
 - See GSM subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See PHS subsystem keys
 - See TETRA subsystem keys
- 4QAM softkey
 - See custom subsystem keys
 - See DECT subsystem keys
 - See Dmodulation subsystem keys
 - See EDGE subsystem keys
 - See GSM subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See PHS subsystem keys
 - See TETRA subsystem keys
- 5 Channel softkey, [257](#)
- 524288 softkeys, [213](#)
- 64 1's & 64 0's softkey
 - See custom subsystem keys
 - See DECT subsystem keys
 - See EDGE subsystem keys
 - See GSM subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See PHS subsystem keys
 - See TETRA subsystem keys
- 64 Ch Fwd softkey, [229](#), [232](#)
- 64 kbps (34.121 v3.8) softkey, [947](#)

- 64QAM softkey
See custom subsystem keys
See DECT subsystem keys
See Dmodulation subsystem keys
See EDGE subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See TETRA subsystem keys
- 65536 softkey, [213](#)
- 8 1's & 8 0's softkey
See custom subsystem keys
See DECT subsystem keys
See EDGE subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See TETRA subsystem keys
- 8 Bit Pattern softkey, [463](#)
- 8 Channel softkey, [257](#)
- 80 msec softkey, [1009](#)
- 80ms Frame Pulse (DRPS13) softkey, [964](#), [966](#),
[967](#), [968](#), [969](#)
- 80ms Frame Pulse (RPS20) softkey
See wideband CDMA base band generator
subsystem keys and fields
- 8648A/B/C/D softkey, [157](#), [159](#)
- 8656B,8657A/B softkey, [157](#), [159](#)
- 8657D NADC softkey, [157](#), [159](#)
- 8657D PDC softkey, [157](#), [159](#)
- 8657J PHS softkey, [157](#), [159](#)
- 8-Lvl FSK softkey
See DECT subsystem keys
See PHS subsystem keys
- 8PSK softkey
See custom subsystem keys
See DECT subsystem keys
See Dmodulation subsystem keys
See EDGE subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
- 8PSK softkey (*continued*)
See TETRA subsystem keys
- 9 Ch Fwd softkey, [229](#), [232](#)
- 9 Channel softkey, [250](#)
- ## A
- A field softkey
See DECT subsystem keys
- A softkey, [939](#)
- abort list/step sweep, [168](#)
- Access denied, [114](#), [125](#)
- Access softkey, [707](#)
- ACS softkey, [979](#)
- Activate Secure Display softkey, [162](#)
- Active softkey, [975](#)
- Actual BER softkey, [1091](#)
- Actual BLER field, [1084](#), [1092](#)
- Add Comment To Seq[n] Reg[nn] softkey, [121](#)
- Adjust Gain softkey, [433](#)
- Adjust Phase softkey, [47](#)
- AICH softkey, [1046](#)
- AICH Trigger Polarity Pos Neg softkey, [1018](#)
- ALC BW Normal Narrow, [57](#)
- ALC BW Normal Narrow softkey, [21](#)
- ALC BW softkey, [57](#)
- ALC level, [58](#)
- ALC Off On softkey, [60](#)
- All Down softkey, [950](#), [999](#)
- All softkey, [104](#), [120](#)
- All Timeslots softkey
See DECT subsystem keys
See EDGE subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See TETRA subsystem keys
- All Up softkey, [950](#), [999](#)
- Alt Amp Delta softkey, [61](#)
- Alt Ampl Off On softkey, [62](#)
- Alt power in field, [1060](#)
- AM softkeys
AM Depth, [179](#)
AM Depth Couple Off On, [180](#)
AM Off On, [179](#)

Index

- AM softkeys (*continued*)
 - AM Off On softkey, [175](#)
 - AM Path 1 2, [174](#)
 - AM Stop Rate, [176](#)
 - AM Sweep Rate, [177](#)
 - AM Tone 2 Ampl Percent Of Peak, [176](#)
 - AM Tone 2 Rate, [176](#)
- AM_ADDR softkey, [462](#)
- Ampl softkeys
 - Ampl, [48](#), [65](#)
 - Ampl Offset, [67](#)
 - Ampl Ref Off On, [66](#)
 - Ampl Ref Set, [65](#)
 - Ampl Start, [48](#), [66](#)
 - Ampl Stop, [48](#), [67](#)
- Amplitude hardkey, [65](#), [68](#)
- amplitude modulation subsystem keys
 - AM Depth, [179](#)
 - AM Depth Couple Off On, [180](#)
 - AM Off On, [175](#), [179](#)
 - AM Path 1 2, [174](#)
 - AM Stop Rate, [176](#)
 - AM Sweep Rate, [177](#)
 - AM Tone 2 Ampl Percent Of Peak, [176](#)
 - AM Tone 2 Rate, [176](#)
 - Bus, [178](#)
 - Dual-Sine, [177](#)
 - Ext, [178](#)
 - Ext Coupling DC AC, [175](#)
 - Ext1, [178](#)
 - Ext2, [178](#)
 - Free Run softkey, [178](#)
 - Incr Set, [174](#), [180](#)
 - Internal, [178](#)
 - Noise, [177](#)
 - Ramp, [177](#)
 - Sine, [177](#)
 - Square, [177](#)
 - Swept-Sine, [177](#)
 - Triangle, [177](#)
 - Trigger Key, [178](#)
- AMR 12.2 kbps softkey, [947](#), [1053](#)
- APCO 25 C4FM softkey
 - See* CDMA ARB subsystem keys
 - See* CDMA2000 ARB subsystem keys
- APCO 25 C4FM softkey (*continued*)
 - See* CDMA2000 BBG subsystem keys and fields
 - See* custom subsystem keys
 - See* DECT subsystem keys
 - See* Dmodulation subsystem keys
 - See* EDGE subsystem keys
 - See* GPS subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
 - See* wideband CDMA ARB subsystem keys
 - See* wideband CDMA base band generator subsystem keys and fields
- APCO 25 w/C4FM softkey, [284](#), [285](#), [286](#)
- APCO 25 w/C4QPSK softkey, [284](#), [285](#), [286](#)
- APCO 25 w/CQPSK softkey, [565](#)
- Apply Channel Setup softkey, [254](#), [258](#), [350](#), [359](#), [935](#), [987](#)
- Arb AWGN Off On softkey, [215](#)
- ARB Off On softkey, [320](#)
- ARB Reference Ext Int softkey
 - See* AWGN subsystem keys
 - See* bluetooth subsystem keys
 - See* CDMA ARB subsystem keys
 - See* CDMA2000 ARB subsystem keys
 - See* Dmodulation subsystem keys
 - See* dual ARB subsystem keys
 - See* multitone subsystem keys
 - See* wideband CDMA ARB subsystem keys
- ARB Sample Clock softkey, [214](#), [229](#), [264](#), [284](#), [311](#), [329](#), [366](#), [476](#)
- Atten Hold Off On softkey, [63](#)
- automatic leveling control, [60](#)
- Aux I/O Trigger Polarity Pos Neg softkey, [457](#)
- Aux softkey
 - See* sense subsystem keys
- Auxiliary Software Options softkey, [82](#)
- AWGN Off On softkey, [466](#)
- AWGN subsystem keys
 - 1048576, [213](#)
 - 131072, [213](#)
 - 16384, [213](#)
 - 2.100 MHz, [210](#)

- AWGN subsystem keys (*continued*)
- 262144, 213
 - 32768, 213
 - 40.000 MHz, 207, 210
 - 524288, 213
 - 65536, 213
 - Arb AWGN Off On, 215
 - ARB Reference Ext Int, 214
 - ARB Sample Clock, 214
 - Bandwidth, 207
 - Clear Header, 208
 - I/Q Mod Filter Manual Auto, 210
 - I/Q Output Filter Manual Auto, 208
 - Marker 1, 211
 - Marker 1 Polarity Neg Pos, 212
 - Marker 2, 211
 - Marker 2 Polarity Neg Pos, 212
 - Marker 3, 211
 - Marker 3 Polarity Neg Pos, 212
 - Marker 4, 211
 - Marker 4 Polarity Neg Pos, 212
 - Modulator Atten Manual Auto, 209
 - Noise Seed Fixed Random, 215
 - None, 211
 - Reference Freq, 213
 - Save Setup To Header, 208
 - Through, 207, 210
 - Waveform Length, 213
- B**
- B softkey, 911, 917, 939
 - B1 softkey, 909, 914
 - B2 softkey, 910, 915
 - Bandwidth softkey, 207, 461
 - Base Delay Tp-a softkey, 1042
 - BBG Chip Clock Ext Int softkey
 - See* wideband CDMA base band generator subsystem keys and fields
 - BBG Data Clock Ext Int softkey
 - See* custom subsystem keys
 - See* DECT subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
 - BBG Data Clock field, 478
 - BBG Ref Ext Int softkey
 - See* custom subsystem keys
 - See* DECT subsystem keys
 - See* EDGE subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
 - BBG1 softkey, 23, 35
 - BD_ADDR softkey, 462
 - Begin Data Format Pattern Framed softkey
 - See* DECT subsystem keys
 - See* EDGE subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
 - Begin Frame softkey
 - See* DECT subsystem keys
 - See* EDGE subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
 - Begin Timeslot # softkey
 - See* DECT subsystem keys
 - See* EDGE subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
 - BER Display % Exp softkey, 403
 - BER field, 1084, 1092
 - BER Mode Off On softkey
 - See* sense subsystem keys
 - BER softkey, 1086, 1094
 - BERT Off On softkey, 454
 - BERT Resync Off On softkey, 454
 - Beta field, 992, 1002
 - Binary softkey, 94, 122

Index

- binary values, [16](#)
- Bit Count softkey
 - See* sense subsystem keys
- Bit Delay Off On softkey, [456](#)
- Bit Rate field
 - See* CDMA2000 BBG subsystem keys and fields
- Bit softkey, [94](#)
- BLER field, [1085](#), [1093](#)
- BLER softkey, [1086](#), [1094](#)
- Blk Set Size field, [981](#)
- Blk Size field, [980](#), [1080](#), [1089](#)
- Block Count softkey
 - See* calculate subsystem keys
 - See* sense subsystem keys
- Block Erasure softkey
 - See* sense subsystem keys
- Blocking softkey, [979](#)
- Bluetooth Off On softkey, [476](#)
- Bluetooth softkey, [565](#)
- bluetooth subsystem keys
 - 2.100 MHz, [471](#)
 - 40.000 MHz, [464](#), [471](#)
 - 8 Bit Pattern, [463](#)
 - AM_ADDR, [462](#)
 - ARB Reference Ext Int, [475](#)
 - ARB Sample Clock, [476](#)
 - AWGN Off On, [466](#)
 - BD_ADDR, [462](#)
 - Bluetooth Off On, [476](#)
 - Burst Off On, [462](#)
 - Burst Power Ramp, [476](#)
 - C/N[1 MHz], [466](#)
 - Clear Header, [465](#)
 - Clock/Gate Delay, [463](#)
 - Continuous PN9, [463](#)
 - Drift Deviation, [467](#)
 - Freq Drift Type Linear Sine, [468](#)
 - Freq Offset, [469](#)
 - I/Q Mod Filter Manual Auto, [472](#)
 - I/Q Output Filter Manual Auto, [464](#)
 - Impairments Off On, [465](#)
 - Marker 1, [472](#), [473](#)
 - Marker 1 Polarity Neg Pos, [473](#)
 - Marker 2, [472](#), [473](#)
 - Marker 2 Polarity Neg Pos, [473](#)
 - bluetooth subsystem keys (*continued*)
 - Marker 3, [472](#), [473](#)
 - Marker 3 Polarity Neg Pos, [474](#)
 - Marker 4, [472](#), [473](#)
 - Marker 4 Polarity Neg Pos, [474](#)
 - Mod Index, [469](#)
 - Modulator Atten Manual Auto, [470](#), [471](#)
 - Noise Seed, [467](#)
 - None, [472](#), [473](#)
 - Packet (DH1), [474](#)
 - Reference Freq, [475](#)
 - Save Setup To Header, [465](#)
 - Symbol Timing Err, [470](#)
 - Through, [464](#), [471](#)
 - Truncated PN9, [463](#)
- boolean SCPI parameters, [10](#)
- boolean, numeric response data, [11](#)
- BPSK softkey
 - See* custom subsystem keys
 - See* DECT subsystem keys
 - See* Dmodulation subsystem keys
 - See* EDGE subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
- Brightness softkey, [86](#)
- Build New Waveform Sequence softkey, [312](#)
- Burst Envelope Int Ext Off softkey, [20](#)
- Burst gate in field, [1060](#)
- Burst Gate In Polarity Neg Pos softkey, [131](#), [132](#)
- Burst Off On softkey, [462](#)
- Burst Power Ramp softkey, [476](#)
- Bus softkey
 - list trigger source, [53](#)
 - See* amplitude modulation subsystem keys
 - See* CDMA ARB subsystem keys
 - See* CDMA2000 ARB subsystem keys
 - See* DECT subsystem keys
 - See* Dmodulation subsystem keys
 - See* dual ARB subsystem keys
 - See* EDGE subsystem keys
 - See* frequency modulation subsystem keys
 - See* GSM subsystem keys

Bus softkey (continued)

- See low frequency output subsystem keys
- See NADC subsystem keys
- See PDC subsystem keys
- See phase modulation subsystem keys
- See PHS subsystem keys
- See sense subsystem keys
- See TETRA subsystem keys
- See trigger subsystem keys
- See wideband CDMA ARB subsystem keys

C

- C Power field, 988, 1019
- C/N softkey, 504, 516
- C/N value field, 935, 988, 1019
- C/N[1 MHz] softkey, 466
- C4FM softkey, 873
- calculate subsystem keys
 - BER Display % Exp, 403
 - Block Count, 421
 - Class II RBER, 400, 401
 - Class Ib RBER, 400, 401
 - Cycle End, 401
 - Error Rate, 394, 395, 396, 397, 398, 399
 - Exceeds Any Limit, 401
 - Fail Hold, 401
 - Frame Erasure, 400, 401
 - No Limits, 395, 398, 399, 401
 - Pass/Fail Limits, 402
 - Pass/Fail Off On, 402
 - Update Display Cycle End Cont, 403
- calibration subsystem keys
 - DCFM/DCΦM Cal, 72
 - Execute Cal, 72, 73
 - I/Q Calibration, 72
 - Revert to Default Cal Settings, 73
 - Start Frequency, 74
 - Stop Frequency, 74
- Carrier Bandwidth, 308
- Carrier Phases Fixed Random softkey, 286
- Carrier to Noise Ratio, 309
- CC softkey, 834, 838, 840
- CDL softkey, 799
- CDMA ARB subsystem keys
 - 2.100 MHz, 224
 - CDMA ARB subsystem keys (*continued*)
 - 3 Carriers, 231
 - 32 Ch Fwd, 229, 232
 - 4 Carriers, 231
 - 40.000 MHz, 219, 224
 - 64 Ch Fwd, 229, 232
 - 9 Ch Fwd, 229, 232
 - APCO 25 C4FM, 220
 - ARB Reference Ext Int, 228
 - ARB Sample Clock, 229
 - Bus, 236
 - CDMA Off On, 241
 - Chip Rate, 218
 - Clear Header, 222
 - Clip |I+jQ| To, 218
 - Clip |I| To, 216
 - Clip |Q| To, 217
 - Clip At PRE POST FIR Filter, 216
 - Clipping Type |I+jQ| |I|,|Q|, 217
 - Continuous, 234, 266
 - CPICH, 352
 - Custom CDMA Multicarrier, 231
 - Custom CDMA State, 229, 232
 - Equal Powers, 230
 - Ext, 236
 - Ext Delay Off On, 238
 - Ext Delay Time, 238
 - Ext Polarity Neg Pos, 239
 - Filter Alpha, 221
 - Filter BbT, 221
 - Free Run, 235
 - Gate Active Low High, 236
 - Gated, 234, 266
 - Gaussian, 220
 - I/Q Mapping Normal Invert, 223
 - I/Q Mod Filter Manual Auto, 224
 - I/Q Output Filter Manual Auto, 219
 - Immediate, 228
 - IS-2000 SR3 DS, 220
 - IS-95, 220
 - IS-95 Mod, 220
 - IS-95 Mod w/EQ, 220
 - IS-95 w/EQ, 220
 - IS-97 Levels, 230
 - Marker 1, 225

Index

CDMA ARB subsystem keys (*continued*)

- Marker 1 Polarity Neg Pos, [226](#)
- Marker 2, [225](#)
- Marker 2 Polarity Neg Pos, [226](#)
- Marker 3, [225](#)
- Marker 3 Polarity Neg Pos, [226](#)
- Marker 4, [225](#)
- Marker 4 Polarity Neg Pos, [226](#)
- Modulator Atten Manual Auto, [223](#)
- Multicarrier Off On, [229](#)
- None, [225](#)
- Nyquist, [220](#)
- Off, [228](#)
- On, [228](#)
- Optimize FIR For EVM ACP, [222](#)
- Oversample Ratio, [227](#)
- Paging, [230](#)
- Patt Trig In 1, [239](#)
- Patt Trig In 2, [239](#)
- Pilot, [229](#), [230](#), [232](#)
- Rectangle, [220](#)
- Reference Freq, [227](#)
- Reset & Run, [235](#)
- Reverse, [229](#)
- Root Nyquist, [220](#)
- Save Setup To Header, [222](#)
- Scale to 0dB, [230](#)
- Single, [234](#), [266](#)
- Store Custom CDMA State, [233](#)
- Store Custom Multicarrier, [232](#)
- Sync, [230](#)
- Through, [219](#), [224](#)
- Traffic, [230](#)
- Trigger & Run, [235](#)
- Trigger Key, [236](#)
- UN3/4 GSM Gaussian, [220](#)
- User FIR, [220](#)
- Waveform Length, [240](#)
- WCDMA, [220](#)

CDMA Freq field, [498](#)

CDMA Off On softkey, [241](#)

CDMA softkey, [95](#)

CDMA2000 ARB subsystem keys

- 1.23 MHz, [266](#)
- 1.25 MHz, [266](#)

CDMA2000 ARB subsystem keys (*continued*)

- 2 SR3 Carriers, [251](#)
- 2.100 MHz, [249](#)
- 3 Carriers, [251](#)
- 4 Carriers, [251](#)
- 40.000 MHz, [244](#), [249](#)
- 5 Channel, [257](#)
- 8 Channel, [257](#)
- 9 Channel, [250](#)
- APCO 25 C4FM, [245](#)
- Apply Channel Setup, [254](#), [258](#)
- ARB Reference Ext Int, [263](#)
- ARB Sample Clock, [264](#)
- Bus, [269](#)
- CDMA2000 Off On, [273](#)
- Clear Header, [247](#)
- Clip $|I+jQ|$ To, [244](#)
- Clip $|I|$ To, [242](#)
- Clip $|Q|$ To, [243](#)
- Clip At PRE POST FIR Filter, [242](#)
- Clipping Type $|I+jQ|$ $|I|$, $|Q|$, [243](#)
- Config, [255](#), [259](#)
- Continuous, [266](#)
- Custom CDMA2000 Carrier, [250](#), [252](#)
- Custom CDMA2000 Multicarrier, [251](#)
- Custom CDMA2000 State, [257](#)
- Edit Channel Setup, [255](#), [259](#)
- Equal Powers, [256](#), [260](#)
- Ext, [269](#)
- Ext Delay Off On, [271](#)
- Ext Delay Time, [270](#)
- Ext Polarity Neg Pos, [271](#)
- Filter Alpha, [246](#)
- Filter BbT, [246](#)
- Free Run, [268](#)
- Gate Active Low High, [268](#)
- Gated, [266](#)
- Gaussian, [245](#)
- I/Q Mapping Normal Invert, [250](#)
- I/Q Mod Filter Manual Auto, [249](#)
- I/Q Output Filter Manual Auto, [244](#)
- Immediate, [264](#)
- Insert Row, [255](#), [259](#)
- IS-2000 SR3 DS, [245](#)
- IS-95, [245](#)

CDMA2000 ARB subsystem keys (*continued*)

IS-95 Mod, 245
 IS-95 Mod w/EQ, 245
 IS-95 w/EQ, 245
 Link Forward Reverse, 250
 Marker 1, 260, 261
 Marker 1 Polarity Neg Pos, 261
 Marker 2, 260, 261
 Marker 2 Polarity Neg Pos, 262
 Marker 3, 260, 261
 Marker 3 Polarity Neg Pos, 262
 Marker 4, 260, 261
 Marker 4 Polarity Neg Pos, 262
 Modulator Atten Manual Auto, 248
 Multicarrier Off On, 250
 None, 260, 261
 Nyquist, 245
 Off, 264
 On, 264
 Optimize FIR For EVM ACP, 247
 Patt Trig In 1, 272
 Patt Trig In 2, 272
 Pilot, 250, 257
 PN Offset, 255, 259
 Radio Config, 256
 Rate, 255, 259
 Rectangle, 245
 Reference Freq, 263
 Reset & Run, 268
 Root Nyquist, 245
 Save Setup To Header, 247
 Scale to 0dB, 256, 260
 Single, 266
 Spread Rate 1, 250, 257, 265
 Spread Rate 3, 250, 257, 265
 Spreading Type Direct Mcarrier, 250, 265
 SR1 9 Channel, 252
 SR1 Pilot, 252
 SR3 Direct 9 Channel, 252
 SR3 Direct Pilot, 252
 SR3 Mcarrier 9 Channel, 252
 SR3 MCarrier Pilot, 252
 Store Custom CDMA State, 254, 258
 Store Custom Multicarrier, 252
 Through, 244, 249

CDMA2000 ARB subsystem keys (*continued*)

Trigger & Run, 268
 Trigger Key, 269
 UN3/4 GSM Gaussian, 245
 User FIR, 245
 Walsh Code, 255, 259
 WCDMA, 245

CDMA2000 BBG subsystem keys and fields

APCO 25 C4FM, 479, 513
 BBG Data Clock, 478
 Bit Rate, 487, 491, 496, 510, 520, 522, 526, 531, 536, 540, 544
 C/N, 504, 516
 CDMA Freq, 498
 CDMA2000 Off On, 547
 Change, 508
 Chip Rate, 478, 512
 DAYLT, 498
 EbNo, 483, 488, 494, 499, 505, 508, 518, 524, 526, 530, 534, 538, 542
 EcNo, 492, 527, 532
 Equal Powers, 507, 516
 Even Second Delay, 479, 512
 Ext, 482, 493, 521
 Ext CDMA Freq, 499
 External, 511
 Falling, 546
 Field 1, 489
 Field 2, 489
 Field 3, 490
 Filter Alpha, 480, 514
 Filter BbT, 481, 484, 514
 FIX4, 482, 493, 517, 518, 521, 523, 524, 529, 534, 538, 541, 542
 Frame Length, 519, 521, 525, 535, 539, 543
 Frame Offset, 494, 519, 522, 525, 530, 536, 539, 543
 FSYNCH Type, 503
 Full, 528, 533
 Gaussian, 479, 513
 Half, 528, 533
 Header, 485, 495
 Internal, 511
 Inverted, 516
 IS-95, 479, 513

Index

CDMA2000 BBG subsystem keys and fields

(continued)

IS-95 MOD, 513
IS-95 Mod, 479
IS-95 MOD w/EQ, 513
IS-95 Mod w/EQ, 479
IS-95 w/EQ, 479, 513
Leap Seconds, 500
Link Forward Reverse, 477
Long Code Mask, 515
Long Code State, 482, 515
LTM OFF, 500
Message Type, 501
Network ID, 501
Noise Off On, 505, 517
Normal, 516
Nyquist, 479, 513
Optimize FIR For EVM ACP, 481, 515
P Rev, 502
P Rev Min, 500
Paging Indicator, 509
Permuted ESN, 484, 495
Phase Polarity, 508
PN Offset, 511
PN15, 482, 493, 517, 521, 523, 529, 534, 538, 541
PN9, 482, 493, 517, 521, 523, 529, 534, 538, 541
Power, 485, 490, 492, 496, 501, 506, 509, 519,
522, 525, 528, 531, 533, 536, 540, 543
PRAT, 502
QOF, 486, 496
Quarter, 528, 533
Radio Config, 487, 497, 520, 523, 531, 537, 540,
544
RadioConfig 1/2 Access, 477
RadioConfig 1/2 Traffic, 477
RadioConfig 3/4 Common Control, 477
RadioConfig 3/4 Enhanced Access, 477
RadioConfig 3/4 Traffic, 477
Ramp, 485
Ramp Time, 486
Rectangle, 479, 513
Reserved, 502
Rising, 546
Root Nyquist, 479, 513
Scale to 0dB, 507, 516

CDMA2000 BBG subsystem keys and fields

(continued)

Spread Rate, 510
State, 491, 493, 498, 504, 507, 510, 520, 523, 527,
529, 532, 534, 537, 541, 545
State field, 488
System ID, 503
Time, 503
Trigger Advance, 546
Turbo Coding, 497, 544
UN3/4 GSM Gaussian, 479, 513
User File, 482, 488, 493, 517, 521, 523, 529, 534,
538, 541
User FIR, 479, 513
Walsh, 491, 497, 504, 507, 510, 526, 528, 532,
533, 537, 541, 545
Walsh field, 487
CDMA2000 Off On softkey, 273, 547
CDPD softkey, 284, 285, 286, 565
CDVCC softkey, 800, 803
CFN #0 Frame Pulse (RPS10) softkey
See wideband CDMA base band generator
subsystem keys and fields
Chan Code field, 945, 954
Chan Code softkey, 944
Change field, 508
Channel Code field, 1003, 1047
See wideband CDMA base band generator
subsystem keys and fields
Channel Number softkey, 39
Channel softkey, 351, 359
Channel State field, 1002, 1009
Channel State Off On softkey, 1022
See wideband CDMA base band generator
subsystem keys and fields
ChCode Ctl field, 1035
ChCode Dat field, 1036
Chip Clock (RPS1) softkey
See wideband CDMA base band generator
subsystem keys and fields
Chip Rate field, 478, 512, 943, 992
Chip Rate softkey, 218, 335
Class Ib Bit Error softkey, 448, 449
Class II Bit Error softkey, 449
Class II RBER softkey, 400, 401

- Class Ib RBER softkey, [400](#), [401](#)
- Clear Header softkey, [208](#), [222](#), [247](#), [277](#), [298](#), [321](#), [338](#), [465](#)
- Clip |I+jQ| To softkey, [218](#), [244](#)
- Clip |I| To softkey, [216](#), [242](#), [333](#), [345](#)
- Clip |Q| To softkey, [217](#), [243](#), [334](#), [345](#)
- Clip At PRE POST FIR Filter, [216](#)
- Clip At PRE POST FIR Filter softkey, [242](#), [333](#)
- Clip Type |I+jQ| To softkey, [335](#), [346](#)
- Clipping Type |I+jQ| |I|,|Q| softkey, [217](#), [243](#), [297](#), [334](#), [346](#)
- Clock Delay Off On softkey, [415](#)
- Clock Polarity Neg Pos softkey, [416](#)
- Clock Time Delay softkey, [415](#)
- Clock/Gate Delay softkey, [463](#)
- command tree, SCPI, [6](#), [7](#)
- Common Mode I/Q Offset softkey, [24](#)
- communication subsystem keys
 - Default Gateway, [75](#)
 - GPIB Address, [75](#)
 - Hostname, [76](#)
 - IP Address, [76](#)
 - Meter Address, [77](#)
 - Meter Channel A B, [77](#)
 - Meter Timeout, [78](#)
 - Power Meter, [78](#)
 - Reset RS-232, [79](#)
 - RS-232 Baud Rate, [79](#)
 - RS-232 ECHO Off On, [79](#)
 - RS-232 Timeout, [80](#)
 - Subnet Mask, [76](#)
- Comp Mode Start Trigger Polarity Neg Pos softkey, [1078](#)
- Comp Mode Start Trigger Polarity Pos Neg softkey, [977](#), [978](#)
- Comp Mode Stop Trigger Polarity Neg Pos softkey, [1078](#)
- Comp Mode Stop Trigger Polarity Pos Neg softkey, [978](#)
- Compressed Frame (RPS8) softkey
 - See* wideband CDMA base band generator subsystem keys and fields
- Compressed Mode Off On softkey, [1077](#)
- Compressed Mode Start Trigger softkey, [953](#), [977](#), [1077](#)
- Compressed Mode Stop Trigger softkey, [977](#), [1078](#)
- Config softkey, [255](#), [259](#)
- Configure Cal Array softkey, [18](#)
- Continuous PN9 softkey, [463](#)
- Continuous softkey
 - See* CDMA ARB subsystem keys
 - See* CDMA2000 ARB subsystem keys
 - See* custom subsystem keys
 - See* DECT subsystem keys
 - See* Dmodulation subsystem keys
 - See* dual ARB subsystem keys
 - See* EDGE subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
 - See* wideband CDMA ARB subsystem keys
- Copy File softkey, [105](#), [113](#), [124](#)
- correction subsystem keys
 - Configure Cal Array, [18](#)
 - Flatness Off On, [19](#)
 - Load From Selected File, [18](#)
 - Preset List, [19](#)
 - Store To File, [19](#)
- CPICH softkey, [352](#)
- CRC Size field, [982](#), [1082](#), [1090](#)
- creating a waveform, multitone, [321](#)
- CS-1 softkey, [642](#), [643](#), [699](#)
- CS-4 softkey, [642](#), [644](#), [703](#)
- CSID softkey, [863](#), [884](#)
- Ctrl Beta field, [1023](#)
- Ctrl Pwr field, [1024](#)
- Custom CDMA Multicarrier softkey, [231](#)
- Custom CDMA State softkey, [229](#), [232](#)
- Custom CDMA2000 Carrier softkey, [250](#), [252](#)
- Custom CDMA2000 Multicarrier softkey, [251](#)
- Custom CDMA2000 State softkey, [257](#)
- Custom Digital Mod State softkey, [285](#), [286](#)
- Custom Off On softkey, [570](#)
- Custom softkey, [588](#), [600](#), [658](#), [707](#), [867](#)
- custom subsystem keys
 - 128QAM, [563](#)
 - 16 1's & 16 0's, [556](#)
 - 16PSK, [563](#)

Index

custom subsystem keys (*continued*)

- 16QAM, [563](#)
- 256QAM, [563](#)
- 2-Lvl FSK, [563](#)
- 32 1's & 32 0's, [556](#)
- 32QAM, [563](#)
- 4 1's & 4 0's, [556](#)
- 4-Lvl FSK, [563](#)
- 4QAM, [563](#)
- 64 1's & 64 0's, [556](#)
- 64QAM, [563](#)
- 8 1's & 8 0's, [556](#)
- 8PSK, [563](#)
- APCO 25 C4FM, [560](#)
- APCO 25 w/CQPSK, [565](#)
- BBG Data Clock Ext Int, [548](#)
- BBG Ref Ext Int, [559](#)
- Bluetooth, [565](#)
- BPSK, [563](#)
- Bus, [567](#)
- CDPD, [565](#)
- Continuous, [566](#)
- Custom Off On, [570](#)
- D8PSK, [563](#)
- Diff Data Encode Off On, [558](#)
- Ext, [556](#), [567](#)
- Ext BBG Ref Freq, [559](#)
- Ext Data Clock Normal Symbol, [558](#)
- Ext Delay Bits, [568](#)
- Ext Delay Off On, [569](#)
- Ext Polarity Neg Pos, [569](#)
- Fall Delay, [551](#), [552](#)
- Fall Time, [551](#), [552](#)
- Filter Alpha, [548](#)
- Filter BbT, [549](#)
- FIX4, [556](#), [557](#)
- Free Run, [566](#)
- Freq Dev, [561](#)
- Gate Active Low High, [567](#)
- Gated, [566](#)
- Gaussian, [560](#)
- Gray Coded QPSK, [563](#)
- I/Q Scaling, [561](#)
- IS-95, [560](#)
- IS-95 Mod, [560](#)

custom subsystem keys (*continued*)

- IS-95 Mod w/EQ, [560](#)
- IS-95 OQPSK, [563](#)
- IS-95 QPSK, [563](#)
- IS-95 w/EQ, [560](#)
- MSK, [563](#)
- None, [565](#)
- Nyquist, [560](#)
- Optimize FIR For EVM ACP, [556](#)
- OQPSK, [563](#)
- $\pi/4$ DQPSK, [563](#)
- Patt Trig In 1, [570](#)
- Patt Trig In 2, [570](#)
- Phase Dev, [562](#)
- Phase Polarity Normal Invert, [563](#)
- PN11, [556](#)
- PN15, [556](#)
- PN20, [556](#)
- PN23, [556](#)
- PN9, [556](#)
- PRAM Files, [557](#)
- QPSK, [563](#)
- Rectangle, [560](#)
- Reset & Run, [566](#)
- Rise Delay, [553](#), [554](#)
- Rise Time, [554](#), [555](#)
- Root Nyquist, [560](#)
- Single, [566](#)
- Symbol Rate, [564](#)
- Trigger & Run, [566](#)
- Trigger Key, [567](#)
- UN3/4 GSM Gaussian, [560](#)
- User File, [556](#)
- User FIR, [560](#)
- User FSK, [562](#), [563](#)
- User I/Q, [562](#), [563](#)
- Custom TS softkey, [646](#), [657](#), [698](#), [705](#)
- Custom WCDMA State softkey, [357](#)
- Cycle Count softkey, [457](#)
- Cycle End softkey, [401](#)

D

- D8PSK softkey
 - See* custom subsystem keys
 - See* DECT subsystem keys

- D8PSK softkey (continued)*
See Dmodulation subsystem keys
See EDGE subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See TETRA subsystem keys
- Data Beta field, 1027
- data block, 113
- Data Clock Out Neg Pos softkey, 134
- Data Clock Polarity Neg Pos softkey, 131, 133, 135
- Data field, 1004, 1094
- Data Mode Raw Enc TLM softkey, 670, 671
- Data Out Polarity Neg Pos softkey, 134, 136
- Data Polarity Neg Pos softkey, 132, 133, 416
- Data Pwr field, 1029
- Data Rate field, 955
- data subsystem keys
Error Out, 409
PN9, 409
Reference Out, 409
- DATA/CLK/SYNC Rear Outputs Off On softkey, 136
- DAYLT field, 498
- dBm softkey, 172
- dBuV softkey, 172
- dBuVemf softkey, 172
- DC softkey, 191
- DCFM/DCΦM Cal softkey, 72
- DCH1 softkey, 990
- DCH2 softkey, 990
- DCH3 softkey, 990
- DCH4 softkey, 990
- DCH5 softkey, 990
- DCH6 softkey, 990
- decimal values, 16
- Dect Off On softkey, 622
- DECT softkey, 284, 285, 286
- DECT subsystem keys
128QAM, 587
16 1's & 16 0's, 580, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612
16-Lvl FSK, 580
16PSK, 587
- DECT subsystem keys (*continued*)
16QAM, 587
256QAM, 587
2-Lvl FSK, 587
32 1's & 32 0's, 580, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612
32QAM, 587
4 1's & 4 0's, 580, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612
4-Lvl FSK, 587
4QAM, 587
64 1's & 64 0's, 580, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612
64QAM, 587
8 1's & 8 0's, 580, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612
8-Lvl FSK, 580
8PSK, 587
A field, 589, 592, 595, 597, 601, 602, 603, 606, 608, 611
All Timeslots, 614
APCO 25 C4FM, 584
BBG Data Clock Ext Int, 571
BBG Ref Ext Int, 583
Begin Frame, 614
Begin Timeslot #, 614, 615
BPSK, 587
Bus, 613, 619
Continuous, 617
Custom, 588, 600
D8PSK, 587
Data Format Pattern Framed, 579
Dect Off On, 622
DM0, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612
DM1, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612
Dummy Bearer 1, 600
Dummy Bearer 2, 600
Ext, 580, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612, 613, 619
Ext Data Clock Normal Symbol, 582
Ext Delay Bits, 620
Ext Delay Off On, 622
Ext Polarity Neg Pos, 620

Index

DECT subsystem keys (*continued*)

FACC, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612
Fall Delay, 574, 575
Fall Time, 575, 576
FDEV1_FS, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612
FDEV1_HS, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612
FDEV2_FS, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612
Filter Alpha, 571
Filter BbT, 572
FIX4, 580, 581, 588, 589, 591, 594, 596, 597, 599, 600, 601, 604, 605, 607, 608, 610, 612
Free Run, 618
Freq Dev, 585
Gate Active Low High, 618
Gated, 617
Gaussian, 584
Gray Coded QPSK, 587
I/Q Scaling, 585
IS-95, 584
IS-95 Mod, 584
IS-95 Mod w/EQ, 584
IS-95 OQPSK, 587
IS-95 QPSK, 587
IS-95 w/EQ, 584
Low Capacity, 588, 600
Low Capacity with Z field, 588, 600
MSK, 587
Nyquist, 584
Optimize FIR For EVM ACP, 580
OQPSK, 587
P, 590, 593, 595, 598, 602, 603, 604, 606, 609, 611
 $\pi/4$ DQPSK, 587
Patt Trig In 1, 621
Patt Trig In 2, 621
Phase Dev, 586
Phase Polarity Normal Invert, 587
PN11, 580, 588, 591, 594, 596, 599, 600, 607, 610, 612
PN15, 580, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612

DECT subsystem keys (*continued*)

PN20, 580, 588, 591, 594, 596, 599, 600, 607, 610, 612
PN23, 580, 588, 591, 594, 596, 599, 600, 607, 610, 612
PN9, 580, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612
PN9 Mode Normal Quick, 574
QPSK, 587
Recall Secondary Frame State, 613
Rectangle, 584
Reset & Run, 618
Restore DECT Factory Default, 582
Rise Delay, 576, 577
Rise Time, 578
Root Nyquist, 584
S, 590, 593, 596, 598, 602, 603, 604, 607, 609, 611
Save Secondary Frame State, 613
Secondary Frame Off On, 614
Sine, 555, 579
Single, 617
Symbol Rate, 616
Sync Out Offset, 615
Timeslot Ampl Main Delta, 592, 605
Timeslot Off On, 592, 606
Traffic Bearer, 588, 600
Traffic Bearer with Z field, 588, 600
Trigger & Run, 618
Trigger Key, 613, 619
UN3/4 GSM Gaussian, 584
User File, 555, 579, 580, 588, 591, 594, 596, 599, 600, 604, 607, 610, 612
User FIR, 584
User FSK, 586, 587
User I/Q, 586, 587
dect subsystem keys
PRAM File, 581
Default Gateway softkey, 75
Delay Bits softkey, 456
Delete All NVWFM Files softkey, 126
Delete All WFM Files softkey, 126
Delete All WFM1 Files softkey, 127
Delete File softkey, 127
Delete softkeys
Delete All ARB CDMA Files, 116

- Delete softkeys (*continued*)
 - Delete All ARB DMOD Files, [116](#)
 - Delete All ARB DWCDMA Files, [116](#)
 - Delete All ARB FCDMA Files, [117](#)
 - Delete All ARB MCDMA Files, [118](#)
 - Delete All ARB MDMOD Files, [118](#)
 - Delete All ARB MDWCDMA Files, [118](#)
 - Delete All ARB MFCDMA Files, [118](#)
 - Delete All ARB MTONE Files, [118](#)
 - Delete All ARB RCDMA Files, [119](#)
 - Delete All ARB UWCDMA Files, [120](#)
 - Delete All Binary Files, [116](#)
 - Delete All Bit Files, [116](#)
 - Delete All Files, [115](#)
 - Delete All FIR Files, [117](#)
 - Delete All FSK Files, [117](#)
 - Delete All I/Q Files, [117](#)
 - Delete All List Files, [117](#)
 - Delete All SEQ Files, [119](#)
 - Delete All SHAPE Files, [119](#)
 - Delete All State Files, [119](#)
 - Delete All UFLT Files, [119](#)
 - Delete File, [120](#)
- Diagnostic Info softkey, [81](#), [82](#), [84](#), [90](#)
- diagnostic subsystem keys
 - Auxiliary Software Options, [82](#)
 - Diagnostic Info, [81](#), [82](#), [84](#)
 - Installed Board Info, [81](#)
 - license value, [84](#)
 - Options Info, [83](#)
 - Waveform Licenses, [83](#)
- Diff Data Encode Off On softkey, [558](#), [688](#)
- Diff. Mode I Offset softkey, [24](#)
- Diff. Mode Q Offset softkey, [25](#)
- Digital Modulation Off On softkey, [296](#)
- digital modulation subsystem keys
 - 2.100 MHz, [31](#)
 - 40.000 MHz, [31](#)
 - ALC BW Normal Narrow, [21](#)
 - BBG1, [23](#), [35](#)
 - Burst Envelope Int Ext Off, [20](#)
 - Common Mode I/Q Offset, [24](#)
 - Diff. Mode I Offset, [24](#)
 - Diff. Mode Q Offset, [25](#)
 - Ext 50 Ohm, [23](#), [35](#)
 - digital modulation subsystem keys (*continued*)
 - Ext 600 Ohm, [23](#), [35](#)
 - Ext In 600 Ohm I Offset, [26](#)
 - Ext In 600 Ohm Q Offset, [27](#)
 - High Crest Mode Off On, [21](#)
 - I Offset, [28](#)
 - I/Q Adjustments Off On, [31](#)
 - I/Q Gain Balance Source 1, [27](#)
 - I/Q Mod Filter Manual Auto, [32](#)
 - I/Q Off On, [36](#)
 - I/Q Out Gain Balance, [25](#)
 - I/Q Output Atten, [26](#)
 - I/Q Timing Skew, [29](#)
 - I/Q Timing Skew Path softkey, [30](#)
 - Int I/Q Skew Corrections RF BB Off, [34](#)
 - Int Phase Polarity Normal Invert, [23](#), [33](#)
 - Modulator Atten Manual Auto, [32](#), [33](#)
 - Off, [23](#), [35](#)
 - Q Offset, [28](#)
 - Quadrature Skew, [29](#)
 - Sum, [23](#)
 - Summing Ratio (SRC1/SRC2) x.xx dB, [35](#)
 - Through, [31](#)
- digital signal interface module
 - N5102A, [376](#)
- digital subsystem
 - clock cps, [376](#)
 - clock phase, [376](#)
 - clock polarity, [377](#)
 - clock rate, [378](#)
 - data alignment, [380](#)
 - data border, [380](#)
 - direction, [381](#)
 - frame, [383](#)
 - igain, [381](#)
 - inagate, [382](#)
 - IQ polarity, [384](#)
 - iqswap, [383](#)
 - logic type, [389](#)
 - loopback, [389](#)
 - N5102A, [376](#)
 - nformat, [383](#)
 - pconfig, [390](#)
 - pthrough, [391](#)
 - qgain, [384](#)

Index

digital subsystem (*continued*)

qnegate, 385

qoffset, 386

reference frequency, 378

rotation, 386

scaling, 387

size, 387

skew, 379

source, 379

state, 391

Stype, 388

type, 388

digital subsystem

inegate, 382

discrete response data, 11

discrete SCPI parameters, 9

display

secure mode, 162

display contrast hardkeys, 87

display subsystem keys

Brightness, 86

display contrast, 87

Inverse Video Off On, 87

Update in Remote Off On, 88

DL Reference 1.1 softkey, 1076

wideband CDMA base band generator subsystem
softkeys

DL Reference 1.1, 976

DL Reference 1.2 softkey, 1076

wideband CDMA base band generator subsystem
softkeys

DL Reference 1.2, 976

DL Reference 2.1 softkey, 1076

wideband CDMA base band generator subsystem
softkeys

DL Reference 2.1, 976

DL Reference 2.2 softkey, 1076

wideband CDMA base band generator subsystem
softkeys

DL Reference 2.2, 976

DM0 softkey

See DECT subsystem keys

DM1 softkey

See DECT subsystem keys

DMOD softkey, 95

Dmodulation subsystem keys

of Carriers, 285, 287

128QAM, 281

16PSK, 281

16QAM, 281

2.100 MHz, 279

256QAM, 281

2-Lvl FSK, 281

32QAM, 281

40.000 MHz, 274, 279

4-Lvl FSK, 281

4QAM, 281

64QAM, 281

8PSK, 281

APCO 25 C4FM, 275

APCO 25 w/C4FM, 284, 285, 286

APCO 25 w/C4QPSK, 284, 285, 286

ARB Reference Ext Int, 283

ARB Sample Clock, 284

BPSK, 281

Bus, 292

Carrier Phases Fixed Random, 286

CDPD, 284, 285, 286

Clear Header, 277

Continuous, 289

Custom Digital Mod State, 285, 286

D8PSK, 281

DECT, 284, 285, 286

Digital Modulation Off On, 296

EDGE, 284, 285, 286

Ext, 292

Ext Delay Off On, 294

Ext Delay Time, 293

Ext Polarity Neg Pos, 294

Filter Alpha, 276

Filter BbT, 276

Free Run, 291

Freq Dev, 280

Freq Spacing, 285

Gate Active Low High, 291

Gated, 289

Gaussian, 275

Gray Coded QPSK, 281

GSM, 284, 285, 286

I/Q Mod Filter Manual Auto, 279

Dmodulation subsystem keys (*continued*)

I/Q Output Filter Manual Auto, [274](#)
 Immediate, [283](#)
 Initialize Table, [286](#)
 Insert Row, [252](#), [286](#)
 IS-2000 SR3 DS, [275](#)
 IS-95, [275](#)
 IS-95 Mod, [275](#)
 IS-95 Mod w/EQ, [275](#)
 IS-95 OQPSK, [281](#)
 IS-95 QPSK, [281](#)
 IS-95 w/EQ, [275](#)
 Load/Store, [286](#)
 Marker 1, [280](#)
 Marker 1 Polarity Neg Pos, [281](#)
 Marker 2, [280](#)
 Marker 2 Polarity Neg Pos, [282](#)
 Marker 3, [280](#)
 Marker 3 Polarity Neg Pos, [282](#)
 Marker 4, [280](#)
 Marker 4 Polarity Neg Pos, [282](#)
 Modulator Atten Manual Auto, [278](#)
 MSK, [281](#)
 Multicarrier Off On, [284](#)
 NADC, [284](#), [285](#), [286](#)
 None, [280](#)
 Nyquist, [275](#)
 Off, [283](#)
 On, [283](#)
 Optimize FIR For EVM ACP, [277](#)
 OQPSK, [281](#)
 $\pi/4$ DQPSK, [281](#)
 Patt Trig In 1, [295](#)
 Patt Trig In 2, [295](#)
 PDC, [284](#), [285](#), [286](#)
 PHS, [284](#), [285](#), [286](#)
 PWT, [284](#), [285](#), [286](#)
 QPSK, [281](#)
 Rectangle, [275](#)
 Reference Freq, [213](#), [282](#)
 Reset & Run, [291](#)
 Root Nyquist, [275](#)
 Save Setup To Header, [277](#)
 Select File, [252](#), [284](#)
 Single, [289](#)

Dmodulation subsystem keys (*continued*)

Store Custom Dig Mod State, [288](#)
 Symbol Rate, [288](#)
 TETRA, [284](#), [285](#), [286](#)
 Through, [274](#), [279](#)
 Trigger & Run, [291](#)
 Trigger Key, [292](#)
 UN3/4 GSM Gaussian, [275](#)
 User FIR, [275](#)
 WCDMA, [275](#)
 Dn Custom Cont softkey, [924](#)
 Dn Normal Cont softkey, [924](#)
 Dn Normal Disc softkey, [924](#)
 Dn Sync Cont softkey, [924](#)
 Dn Sync Disc softkey, [924](#)
 Do Power Search softkey, [58](#), [59](#), [60](#)
 Doppler Shift softkey, [671](#)
 Down Custom softkey, [805](#), [841](#)
 Down TCH All softkey, [805](#), [841](#)
 Down TCH softkey, [805](#), [841](#)
 Down/Up softkey, [950](#), [999](#)
 Downlink MCS-1 softkey, [642](#), [644](#), [699](#)
 Downlink MCS-5 softkey, [648](#)
 Downlink MCS-9 softkey, [648](#)
 downloading files, [114](#), [125](#)
 DPCCH + 1 DPDCH softkey, [357](#)
 DPCCH + 2 DPDCH softkey, [357](#)
 DPCCH + 3 DPCCH softkey, [357](#)
 DPCCH + 4 DPDCH softkey, [357](#)
 DPCCH + 5 DPDCH softkey, [357](#)
 DPCCH Pilot data-clk (DRPS23) softkey, [964](#), [966](#),
 [967](#), [968](#), [969](#)
 DPCCH Power field, [996](#)
 DPCCH Raw Data (RPS4) softkey
 See wideband CDMA base band generator
 subsystem keys and fields
 DPCCH Raw Data Clock (RPS5) softkey
 See wideband CDMA base band generator
 subsystem keys and fields
 DPCCH softkey, [357](#), [990](#), [1013](#)
 DPCCH TFC I data-clk (DRPS22) softkey, [964](#),
 [966](#), [967](#), [968](#), [969](#)
 DPCCH TPC indicator (DRPS21) softkey, [964](#), [966](#),
 [967](#), [968](#), [969](#)
 DPCH + 1 softkey, [936](#), [937](#)

Index

- DPCH + 2 softkey, [936](#), [937](#)
- DPCH Channel Balance softkey, [944](#)
- DPCH Compressed Frame Indicator (DRPS32) softkey, [964](#), [966](#), [967](#), [968](#), [969](#)
- DPCH data stream (DRPS24) softkey, [964](#), [966](#), [967](#), [968](#), [969](#)
- DPCH data-clk (0) (DRPS28) softkey, [964](#), [966](#), [967](#), [968](#), [969](#)
- DPCH Gap Indicator (DRPS33) softkey, [964](#), [966](#), [967](#), [968](#), [969](#)
- DPCH softkey, [352](#)
- DPCH TimeSlot pulse (DRPS25) softkey, [964](#), [966](#), [967](#), [968](#), [969](#)
- DPCH10ms Frame-Pulse (DRPS26) softkey, [964](#), [966](#), [967](#), [968](#), [969](#)
- DPDCH data-clk withDTX (DRPS20) softkey, [964](#), [966](#), [967](#), [968](#), [969](#)
- DPDCH data-clk WithOutDTX (DRPS30) softkey, [964](#), [966](#), [967](#), [968](#), [969](#)
- DPDCH Power field, [1005](#)
- DPDCH Raw Data (RPS2) softkey
 - See wideband CDMA base band generator subsystem keys and fields
- DPDCH Raw DataClock (RPS3) softkey
 - See wideband CDMA base band generator subsystem keys and fields
- DPDCH softkey, [990](#)
- Drift Deviation softkey, [467](#)
- dual ARB subsystem
 - Through, [300](#)
- dual ARB subsystem keys
 - # Skipped Points, [304](#)
 - 2.100 MHz, [302](#)
 - 40.000 MHz, [300](#), [302](#)
 - ARB Off On, [320](#)
 - ARB Reference Ext Int, [22](#), [310](#)
 - ARB Sample Clock, [311](#)
 - Build New Waveform Sequence, [312](#)
 - Bus, [315](#)
 - Carrier Bandwidth, [308](#)
 - Carrier to Noise Ratio, [309](#)
 - Clear Header, [298](#)
 - Clipping Type |I+jQ| |I|,|Q|, [297](#)
 - Continuous, [315](#)
 - Edit Repetitions, [312](#)
 - dual ARB subsystem keys (*continued*)
 - Edit Selected Waveform Sequence, [312](#)
 - Ext, [315](#)
 - Ext Delay Off On, [317](#)
 - Ext Delay Time, [316](#)
 - Ext Polarity Neg Pos, [317](#)
 - First Mkr Point, [303](#), [304](#)
 - Free Run, [314](#)
 - Gate Active Low High, [314](#)
 - Gated, [312](#)
 - Header RMS, [298](#)
 - I/Q Mod Filter Manual Auto, [302](#)
 - I/Q Output Filter Manual Auto, [299](#), [300](#)
 - Immediate, [310](#)
 - Last Mkr Point, [303](#), [304](#)
 - Marker 1, [305](#), [306](#)
 - Marker 1 2, [303](#), [304](#)
 - Marker 1 Polarity Neg Pos, [306](#)
 - Marker 2, [305](#), [306](#)
 - Marker 2 Polarity Neg Pos, [306](#)
 - Marker 3, [305](#), [306](#)
 - Marker 3 Polarity Neg Pos, [307](#)
 - Marker 4, [305](#), [306](#)
 - Marker 4 Polarity Neg Pos, [307](#)
 - Modulator Atten Manual Auto, [301](#)
 - Noise Bandwidth Factor, [308](#)
 - None, [305](#), [306](#)
 - Off, [310](#)
 - On, [310](#)
 - Patt Trig In 1, [318](#)
 - Patt Trig In 2, [318](#)
 - Real-time Noise Off On, [307](#)
 - Reference Freq, [309](#)
 - Reset & Run, [314](#)
 - Save Setup To Header, [299](#)
 - Scaling, [311](#)
 - Segment Advance, [312](#)
 - Select Waveform, [318](#), [319](#)
 - Set Marker Off All Points, [303](#)
 - Single, [312](#), [315](#)
 - Through, [300](#), [302](#)
 - Toggle Marker 1, [312](#)
 - Trigger & Run, [314](#)
 - Trigger Key, [315](#)
 - Waveform Runtime Scaling, [311](#)

Dual-Sine softkey, 177, 184, 191, 197
 Dummy Bearer 1 softkey, 600
 Dummy Bearer 2 softkey, 600
 Dummy softkey, 707
 DWCDMA softkey, 96
 Dwell Type List Step softkey, 50

E

Eb/No field, 1020
 Eb/No value (dB) field, 989
 EbNo field, 505
See CDMA2000 BBG subsystem keys and fields
 Ec/No value field, 936, 1020
 EcNo field, 492, 527, 532
 EDGE BERT Off On softkey, 438
 EDGE Off On softkey, 667
 EDGE softkey, 284, 285, 286, 635
 EDGE subsystem keys
 128QAM, 638
 16 1's & 16 0's, 631, 640, 642, 648
 16PSK, 638
 16QAM, 638
 256QAM, 638
 2-Lvl FSK, 638
 32 1's & 32 0's, 631, 640, 642, 648
 32QAM, 638
 4 1's & 4 0's, 631, 640, 642, 648
 4-Lvl FSK, 638
 4QAM, 638
 64 1's & 64 0's, 631, 640, 642, 648
 64QAM, 638
 8 1's & 8 0's, 631, 640, 642, 648
 8PSK, 638
 All Timeslots, 658
 APCO 25 C4FM, 635
 BBG Ref Ext Int, 634
 Begin Frame, 658
 Begin Timeslot #, 658, 660
 BPSK, 638
 Bus, 639, 663
 Continuous, 662
 CS-1, 642, 643
 CS-4, 642, 644
 Custom, 658
 Custom TS, 646, 657

EDGE subsystem keys (*continued*)
 D8PSK, 638
 Data Format Pattern Framed, 630
 Downlink MCS-1, 642, 644
 Downlink MCS-5, 648
 Downlink MCS-9, 648
 EDGE, 635
 EDGE Off On, 667
 E-TCH/F43.2, 648
 Ext, 631, 639, 640, 648, 663
 Ext BBG Ref Freq, 634
 Ext Data Clock Ext Int, 623
 Ext Data Clock Normal Symbol, 633
 Ext Delay Bits, 664
 Ext Delay Off On, 666
 Ext Polarity Neg Pos, 666
 Fall Delay, 624, 625
 Fall Time, 626
 Filter Alpha, 623
 Filter BbT, 624
 FIX4, 631, 632, 640, 641, 642, 644, 648, 654
 Free Run, 662
 Freq Dev, 636
 G, 641, 656
 Gate Active Low High, 663
 Gated, 662
 Gaussian, 635
 GMSK, 658
 Gray Coded QPSK, 638
 I/Q Scaling, 636
 IS-95, 635
 IS-95 Mod, 635
 IS-95 Mod w/EQ, 635
 IS-95 OQPSK, 638
 IS-95 QPSK, 638
 IS-95 w/EQ, 635
 MSK, 638
 Multislot Off On, 647
 Normal, 658
 Normal All, 658
 Nyquist, 635
 Optimize FIR For EVM ACP, 631
 OQPSK, 638
 $\pi/4$ DQPSK, 638
 Patt Trig In 1, 666

Index

EDGE subsystem keys (*continued*)

Patt Trig In 2, [666](#)
Phase Dev, [637](#)
Phase Polarity Normal Invert, [638](#)
PN11, [631](#), [640](#), [648](#)
PN15, [631](#), [640](#), [642](#), [643](#), [644](#), [645](#), [648](#), [652](#), [653](#),
[654](#), [655](#)
PN20, [631](#), [640](#), [648](#)
PN23, [631](#), [640](#), [648](#)
PN9, [631](#), [640](#), [642](#), [643](#), [644](#), [645](#), [648](#), [652](#), [653](#),
[654](#), [655](#)
QPSK, [638](#)
Recall Secondary Frame State, [638](#)
Rectangle, [635](#)
Reset & Run, [662](#)
Restore EDGE Factory Default, [633](#)
Rise Delay, [627](#), [628](#)
Rise Time, [628](#), [629](#)
Root Nyquist, [635](#)
S, [646](#)
Save Secondary Frame State, [639](#)
Secondary Frame Off On, [640](#)
Sine, [630](#)
Single, [662](#)
Symbol Rate, [660](#)
Sync Out Offset, [659](#)
T1, [656](#)
T2, [657](#)
TCH/FS, [642](#), [645](#)
Timeslot Ampl Main Delta, [657](#)
Timeslot Off On, [658](#)
Trigger & Run, [662](#)
Trigger Key, [639](#), [663](#)
TSC0, [646](#), [657](#)
TSC1, [646](#), [657](#)
TSC2, [646](#), [657](#)
TSC3, [646](#), [657](#)
TSC4, [646](#), [657](#)
TSC5, [646](#), [657](#)
TSC6, [646](#), [657](#)
TSC7, [646](#), [657](#)
UN3/4 GSM Gaussian, [635](#)
Uncoded, [648](#)
Uplink MCS-1, [642](#), [645](#)
Uplink MCS-5, [648](#)

EDGE subsystem keys (*continued*)

Uplink MCS-9, [648](#)
User File, [630](#), [631](#), [640](#), [642](#), [648](#)
User FIR, [635](#)
User FSK, [637](#), [638](#)
User I/Q, [637](#), [638](#)
edge subsystem keys
PRAM File, [632](#)
Edit Channel Setup softkey, [255](#), [259](#)
Edit Repetitions softkey, [312](#)
Edit Selected Waveform Sequence softkey, [312](#)
Enter Secure Mode softkey, [164](#)
Equal Energy per Symbol softkey, [356](#)
Equal Powers softkey
See CDMA ARB subsystem keys
See CDMA2000 ARB subsystem keys
See CDMA2000 BBG subsystem keys and fields
See wideband CDMA base band generator
subsystem keys and fields
Erase All softkey, [162](#)
Erase and Overwrite All softkey, [164](#)
Erase and Sanitize All softkey, [165](#)
Erase softkey, [163](#)
ERROR
[221](#), [114](#), [125](#)
Error BER softkey, [1091](#)
Error Bits softkey, [1083](#)
Error Blocks field, [1084](#)
Error Count softkey, [438](#)
See sense subsystem keys
Error Info softkey, [156](#)
error messages, resolving, [719](#)
Error Out softkey, [409](#)
Error Rate softkey
See calculate subsystem keys
See calculate subsystem keys
ESG file overview, [717](#)
ET softkey, [697](#)
E-TCH/F43.2 softkey, [648](#)
Even Second Delay field, [479](#), [512](#)
Exceeds Any Limit softkey, [401](#)
Exceeds Any Thresholds softkey
See sense subsystem keys
Execute Cal softkey, [72](#), [73](#)
Ext 50 Ohm softkey, [23](#), [35](#)

- Ext 600 Ohm softkey, [23](#), [35](#)
- Ext BBG Ref Freq softkey
 - See custom subsystem keys
 - See EDGE subsystem keys
 - See GSM subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See PHS subsystem keys
 - See TETRA subsystem keys
- Ext CDMA Freq field, [499](#)
- Ext Clock Rate x1 x2 x4 softkey, [934](#)
- Ext Data Clock Ext Int softkey
 - See EDGE subsystem keys
 - See PDC subsystem keys
- Ext Data Clock Normal Symbol softkey
 - See custom subsystem keys
 - See DECT subsystem keys
 - See EDGE subsystem keys
 - See GSM subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See PHS subsystem keys
 - See TETRA subsystem keys
- Ext Delay Bits softkey
 - See custom subsystem keys
 - See DECT subsystem keys
 - See EDGE subsystem keys
 - See GSM subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See PHS subsystem keys
 - See TETRA subsystem keys
- Ext Delay Off On softkey
 - See CDMA ARB subsystem keys
 - See CDMA2000 ARB subsystem keys
 - See custom subsystem keys
 - See DECT subsystem keys
 - See Dmodulation subsystem keys
 - See dual ARB subsystem keys
 - See EDGE subsystem keys
 - See GSM subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See PHS subsystem keys
 - See TETRA subsystem keys
- Ext Delay Off On softkey (continued)
 - See wideband CDMA ARB subsystem keys
- Ext Delay Time softkey, [238](#), [270](#), [293](#), [316](#), [370](#)
- Ext Frame Trigger Delay softkey, [423](#)
- Ext In 600 Ohm I Offset softkey, [26](#)
- Ext In 600 Ohm Q Offset softkey, [27](#)
- Ext Polarity Neg Pos softkey
 - See CDMA ARB subsystem keys
 - See CDMA2000 ARB subsystem keys
 - See custom subsystem keys
 - See DECT subsystem keys
 - See Dmodulation subsystem keys
 - See dual ARB subsystem keys
 - See EDGE subsystem keys
 - See GSM subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See PHS subsystem keys
 - See TETRA subsystem keys
 - See wideband CDMA ARB subsystem keys
- Ext softkey
 - List/Sweep subsystem, [53](#)
 - See amplitude modulation subsystem keys
 - See CDMA ARB subsystem keys
 - See CDMA2000 ARB subsystem keys
 - See CDMA2000 BBG subsystem keys and fields
 - See custom subsystem keys
 - See DECT subsystem keys
 - See Dmodulation subsystem keys
 - See dual ARB subsystem keys
 - See EDGE subsystem keys
 - See frequency modulation subsystem keys
 - See GSM subsystem keys
 - See low frequency output subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See phase modulation subsystem keys
 - See PHS subsystem keys
 - See sense subsystem keys
 - See TETRA subsystem keys
 - See trigger subsystem keys
 - See wideband CDMA ARB subsystem keys
 - See wideband CDMA base band generator subsystem keys and fields

Index

Ext softkeys

Ext Coupling DC AC, [175](#), [182](#), [195](#)

Ext Detector, [61](#)

Ext Pulse, [204](#)

Ext1, [178](#), [186](#), [198](#)

Ext2, [178](#), [186](#), [198](#)

extended numeric SCPI parameter, [8](#)

External Frame Trigger Polarity Neg Pos softkey, [423](#)

External softkey, [511](#)

F

FACC softkey

See DECT subsystem keys

Fail Hold softkey, [401](#)

Fall Delay softkey

See custom subsystem keys

See DECT subsystem keys

See EDGE subsystem keys

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

See PHS subsystem keys

See TETRA subsystem keys

Fall Time softkey

See custom subsystem keys

See DECT subsystem keys

See EDGE subsystem keys

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

See PHS subsystem keys

See TETRA subsystem keys

Falling softkey, [546](#)

FBI State field, [995](#)

FCDMA softkey, [96](#)

FCOR softkey, [912](#), [917](#)

FCorr softkey, [707](#)

FDEV1_FS softkey

See DECT subsystem keys

FDEV1_HS softkey

See DECT subsystem keys

FDEV2_FS softkey

See DECT subsystem keys

Field 1 field, [489](#)

Field 2 field, [489](#)

Field 3 field, [490](#)

file

retrieval, [114](#), [125](#)

systems, [122](#)

types, [122](#)

file overview, HDSPA, [717](#)

Filter Alpha softkey, [1011](#)

See CDMA ARB subsystem keys

See CDMA2000 ARB subsystem keys

See CDMA2000 BBG subsystem keys and fields

See custom subsystem keys

See DECT subsystem keys

See Dmodulation subsystem keys

See EDGE subsystem keys

See GPS subsystem keys

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

See PHS subsystem keys

See TETRA subsystem keys

See wideband CDMA ARB subsystem keys

See wideband CDMA base band generator
subsystem keys and fields

Filter BbT softkey, [1012](#)

See CDMA ARB subsystem keys

See CDMA2000 ARB subsystem keys

See CDMA2000 BBG subsystem keys and fields

See custom subsystem keys

See DECT subsystem keys

See Dmodulation subsystem keys

See EDGE subsystem keys

See GPS subsystem keys

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

See PHS subsystem keys

See TETRA subsystem keys

See wideband CDMA ARB subsystem keys

See wideband CDMA base band generator
subsystem keys and fields

FIR softkey, [97](#)

First Mkr Point softkey, [303](#), [304](#)

First Spread Code softkey, [351](#), [359](#)

FIX softkey, [995](#)

- FIX4 softkey, [644](#), [994](#), [1024](#), [1028](#)
 - See* CDMA2000 BBG subsystem keys and fields
 - See* custom subsystem keys
 - See* DECT subsystem keys
 - See* EDGE subsystem keys
 - See* GPS subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
 - See* wideband CDMA baseband generator subsystem keys and fields
- Flat Noise BW field, [990](#)
- Flatness Off On softkey, [19](#)
- FM softkeys
 - FM Dev, [187](#)
 - FM Dev Couple Off On, [187](#)
 - FM Off On, [186](#)
 - FM Path 1 2, [181](#)
 - FM Stop Rate, [183](#)
 - FM Sweep Rate, [185](#)
 - FM Tone 2 Amp Percent of Peak, [184](#)
 - FM Tone 2 Rate, [183](#)
- forgiving listening and precise talking, [7](#)
- Frame Clock Polarity Neg Pos softkey, [1010](#)
- Frame Count softkey
 - See* sense subsystem keys
- Frame Erasure softkey, [449](#)
 - See* calculate subsystem keys
- Frame Length field
 - See* CDMA2000 BBG subsystem keys and fields
- Frame Offset field
 - See* CDMA2000 BBG subsystem keys and fields
- Frame offset field, [536](#)
- Frame Repeat Single Cont softkey, [796](#)
- Frame Struct field, [971](#)
- Frame Sync Trigger Mode Single Cont softkey, [1070](#)
- Frame Trigger Source Int Ext softkey, [424](#)
- Free Run softkey
 - list trigger source, [53](#)
 - See* amplitude modulation subsystem keys
 - See* CDMA ARB subsystem keys
 - See* CDMA2000 ARB subsystem keys
- Free Run softkey (continued)*
 - See* custom subsystem keys
 - See* DECT subsystem keys
 - See* Dmodulation subsystem keys
 - See* dual ARB subsystem keys
 - See* EDGE subsystem keys
 - See* frequency modulation subsystem keys
 - See* GSM subsystem keys
 - See* low frequency output subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* phase modulation subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
 - See* trigger subsystem keys
 - See* wideband CDMA ARB subsystem keys
- Freq Dev softkey
 - See* custom subsystem keys
 - See* DECT subsystem keys
 - See* Dmodulation subsystem keys
 - See* EDGE subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* TETRA subsystem keys
- Freq softkeys
 - Freq, [41](#), [48](#)
 - Freq & Ampl, [48](#)
 - Freq Channels Off On, [40](#)
 - Freq Drift Type Linear Sine, [468](#)
 - Freq Multiplier, [41](#)
 - Freq Offset, [42](#), [469](#)
 - Freq Ref Off On, [43](#)
 - Freq Ref Set, [43](#)
 - Freq Spacing, [285](#), [330](#)
 - Freq Start, [44](#), [48](#)
 - Freq Stop, [44](#), [48](#)
- Frequency hardkey, [37](#), [40](#), [41](#), [45](#), [46](#)
- frequency modulation subsystem keys
 - Bus, [185](#)
 - Dual-Sine, [184](#)
 - Ext, [185](#)
 - Ext Coupling DC AC, [182](#)
 - Ext1, [186](#)
 - Ext2, [186](#)

Index

frequency modulation subsystem keys (*continued*)

FM Dev, [187](#)
FM Dev Couple Off On, [187](#)
FM Off On, [186](#)
FM Path 1 2, [181](#)
FM Stop Rate, [183](#)
FM Sweep Rate, [185](#)
FM Tone 2 Amp Percent of Peak, [184](#)
FM Tone 2 Rate, [183](#)
Free Run, [185](#)
Incr Set, [182](#)
Internal 1, [186](#)
Internal 2, [186](#)
Noise, [184](#)
Ramp, [184](#)
Sine, [184](#)
Square, [184](#)
Swept-Sine, [184](#)
Triangle, [184](#)
Trigger Key, [185](#)

frequency subsystem keys

Adjust Phase, [47](#)
Channel Number, [39](#)
Freq, [41](#), [48](#)
Freq Channels Off On, [40](#)
Freq Multiplier, [41](#)
Freq Offset, [42](#)
Freq Ref Off On, [43](#)
Freq Ref Set, [43](#)
Freq Start, [44](#), [48](#)
Freq Stop, [44](#), [48](#)
Frequency, [37](#), [40](#), [41](#), [45](#), [46](#)
Off, [41](#), [48](#)
Phase Ref Set, [46](#)
Ref Oscillator Source Auto Off On, [47](#)

FSK softkey, [97](#)

FSYNCH Type field, [503](#)

Full softkey, [528](#), [533](#)

Function Generator softkey, [192](#)

G

G softkey, [641](#), [656](#)

Gain Unit dB Lin Index softkey, [360](#)

Gate Active Low High softkey

See CDMA ARB subsystem keys

Gate Active Low High softkey (*continued*)

See CDMA2000 ARB subsystem keys
See custom subsystem keys
See DECT subsystem keys
See Dmodulation subsystem keys
See dual ARB subsystem keys
See EDGE subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See TETRA subsystem keys
See wideband CDMA ARB subsystem keys

Gate Clk Delay softkey, [412](#)

Gate Delay Off On softkey, [413](#)

Gate Mode Time Clk softkey, [412](#)

Gate Off On softkey, [414](#)

Gate Polarity Neg Pos softkey, [414](#)

Gate Time Delay softkey, [413](#)

Gated softkey

See CDMA ARB subsystem keys
See CDMA2000 ARB subsystem keys
See custom subsystem keys
See DECT subsystem keys
See Dmodulation subsystem keys
See dual ARB subsystem keys
See EDGE subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See TETRA subsystem keys
See wideband CDMA ARB subsystem keys

Gaussian softkey

See CDMA ARB subsystem keys
See CDMA2000 ARB subsystem keys
See CDMA2000 BBG subsystem keys and fields
See custom subsystem keys
See DECT subsystem keys
See Dmodulation subsystem keys
See EDGE subsystem keys
See GPS subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys

- Gaussian softkey (continued)*
 See PHS subsystem keys
 See TETRA subsystem keys
 See wideband CDMA ARB subsystem keys
 See wideband CDMA base band generator
 subsystem keys and fields
- GMSK softkey, [658](#)
- Goto Row softkey, [328](#)
- GPIB Address softkey, [75](#)
- GPS Ref (f0) softkey, [675](#)
- GPS Ref Clk Ext Int softkey, [675](#)
- GPS subsystem
 Data Mode Raw Enc TLM, [671](#)
- GPS subsystem keys
 APCO 25 C4FM, [671](#)
 Data Mode Raw Enc TLM, [670](#)
 Doppler Shift, [671](#)
 Filter Alpha, [672](#)
 Filter BbT, [673](#)
 FIX4, [670](#)
 Gaussian, [671](#)
 GPS Ref (f0), [675](#)
 GPS Ref Clk Ext Int, [675](#)
 IQ Phase Normal Invert, [674](#)
 IS-95, [671](#)
 IS-95 Mod, [671](#)
 IS-95 Mod w/EQ, [671](#)
 IS-95 w/EQ, [671](#)
 Nyquist, [671](#)
 Optimize FIR For EVM ACP, [673](#)
 P Code Pwr, [674](#)
 PN15, [670](#)
 PN9, [670](#)
 Ranging Code C/A P C/A+P, [674](#)
 Real-time GPS Off On, [676](#)
 Rectangle, [671](#)
 Root Nyquist, [671](#)
 Satellite ID, [676](#)
 UN3/4 GSM Gaussian, [671](#)
 User File, [670](#)
 User FIR, [671](#)
- Gray Coded QPSK softkey
 See custom subsystem keys
 See DECT subsystem keys
 See Dmodulation subsystem keys
- Gray Coded QPSK softkey (continued)*
 See EDGE subsystem keys
 See GSM subsystem keys
 See NADC subsystem keys
 See PDC subsystem keys
 See PHS subsystem keys
 See TETRA subsystem keys
- GSM BERT Off On softkey, [452](#)
- GSM Off On softkey, [716](#)
- GSM softkey, [284](#), [285](#), [286](#)
- GSM subsystem keys
 128QAM, [694](#)
 16 1's & 16 0's, [687](#), [696](#), [697](#), [699](#), [706](#)
 16PSK, [694](#)
 16QAM, [694](#)
 256QAM, [694](#)
 2-Lvl FSK, [694](#)
 32 1's & 32 0's, [687](#), [696](#), [697](#), [699](#), [706](#)
 32QAM, [694](#)
 4 1's & 4 0's, [687](#), [696](#), [697](#), [699](#), [706](#)
 4-Lvl FSK, [694](#)
 4QAM, [694](#)
 64 1's & 64 0's, [687](#), [696](#), [697](#), [699](#), [706](#)
 64QAM, [694](#)
 8 1's & 8 0's, [687](#), [696](#), [697](#), [699](#), [706](#)
 8PSK, [694](#)
 Access, [707](#)
 All Timeslots, [708](#)
 APCO 25 C4FM, [691](#)
 BBG Data Clock Ext Int, [677](#)
 BBG Ref Ext Int, [690](#)
 Begin Frame, [708](#)
 Begin Timeslot #, [708](#), [709](#)
 BPSK, [694](#)
 Bus, [695](#), [712](#)
 Continuous, [711](#)
 CS-1, [699](#)
 CS-4, [703](#)
 Custom, [707](#)
 Custom TS, [698](#), [705](#)
 D8PSK, [694](#)
 Data Format Pattern Framed, [686](#)
 Diff Data Encode Off On, [688](#)
 Downlink MCS-1, [699](#)
 Dummy, [707](#)

Index

GSM subsystem keys (*continued*)

ET, 697
Ext, 687, 695, 696, 697, 706, 712
Ext BBG Ref Freq, 583, 690
Ext Data Clock Normal Symbol, 689
Ext Delay Bits, 713
Ext Delay Off On, 714
Ext Polarity Neg Pos, 714
Fall Delay, 680, 681
Fall Time, 681, 682
FCorr, 707
Filter Alpha, 677
Filter BbT, 678
FIX4, 687, 688, 696, 697, 698, 699, 704, 706, 707
Free Run, 711
Freq Dev, 692
Gate Active Low High, 712
Gated, 711
Gaussian, 691
Gray Coded QPSK, 694
GSM Off On, 716
I/Q Scaling, 692
IS-95, 691
IS-95 Mod, 691
IS-95 Mod w/EQ, 691
IS-95 OQPSK, 694
IS-95 QPSK, 694
IS-95 w/EQ, 691
MSK, 694
Multislot Off On, 699
Normal, 707
Normal All, 707
Nyquist, 691
Optimize FIR For EVM ACP, 686
OQPSK, 694
 $\pi/4$ DQPSK, 694
Patt Trig In 1, 715
Patt Trig In 2, 715
Phase Dev, 693
Phase Polarity Normal Invert, 694
PN11, 687, 706
PN15, 687, 696, 697, 699, 703, 704, 706
PN20, 687, 706
PN23, 687, 706
PN9, 687, 696, 697, 699, 703, 704, 706

GSM subsystem keys (*continued*)

PN9 Mode Normal Quick, 680
QPSK, 694
Recall Secondary Frame State, 695
Rectangle, 691
Reset & Run, 711
Restore Factory Default, 688
Rise Delay, 683
Rise Time, 684, 685
Root Nyquist, 691
S, 705
Save Secondary Frame State, 695
Secondary Frame Off On, 696
Sine, 685
Single, 711
SS, 697
Symbol Rate, 709
Sync, 707
Sync Out Offset, 708
TCH/FS, 699
Timeslot Ampl Main Delta, 706
Timeslot Off On, 706
Trigger & Run, 711
Trigger Key, 695, 712
TS, 707
TSC0, 698, 705
TSC1, 698, 705
TSC2, 698, 705
TSC3, 698, 705
TSC4, 698, 705
TSC5, 698, 705
TSC6, 698, 705
TSC7, 698, 705
UN3/4 GSM Gaussian, 691
Uplink MCS-1, 699
User File, 685, 687, 696, 697, 699, 706
User FIR, 691
User FSK, 693, 694
User I/Q, 693, 694
gsm subsystem keys
PRAM Files, 687

H

Half softkey, 528, 533
Header field, 485, 495

- Help Mode Single Cont softkey, 157
 - hexadecimal values, 16
 - High Amplitude softkey
 - See* sense subsystem keys
 - High Crest Mode Off On softkey, 21
 - Higher Layer softkey, 1072
 - Hostname softkey, 76
 - HSDPA file overview, 717
 - HSDPA over W-CDMA SCPI commands, 717
 - HSDPA user files, 717
- I**
- I Offset softkey, 28
 - I/Q Adjustments Off On softkey, 31
 - I/Q Calibration softkey, 72
 - I/Q Gain Balance Source 1 softkey, 27
 - I/Q Mapping Normal Invert softkey, 223, 250, 339
 - I/Q Mod Filter Manual Auto softkey, 32, 210, 224, 249, 279, 302, 324, 341, 472
 - I/Q Off On softkey, 36
 - I/Q Out Gain Balance softkey, 25
 - I/Q Output Atten softkey, 26
 - I/Q Output Filter Manual Auto softkey, 208, 219, 244, 274, 299, 300, 322, 338, 464
 - I/Q Scaling softkey
 - See* custom subsystem keys
 - See* DECT subsystem keys
 - See* EDGE subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
 - I/Q softkey, 98
 - I/Q Timing Skew Path, 30
 - I/Q timing Skew softkey, 29
 - IDLE softkey, 863, 885
 - IEEE 488.2 common command keys
 - Diagnostic Info, 90
 - RECALL Reg, 91
 - Run Complete Self Test, 93
 - Save Reg, 92
 - Save Seq[n] Reg[nn], 92
 - Select Seq, 91
 - Immediate softkey, 228, 264, 283, 310
 - See* sense subsystem keys
 - Impairments Off On softkey, 465
 - Impedance 75 Ohm High softkey, 416
 - Incr Set hardkey
 - See* amplitude modulation subsystem keys
 - See* frequency modulation subsystem keys
 - See* phase modulation subsystem keys
 - Increment Scramble Code softkey, 346
 - Increment Timing Offset softkey, 349
 - Infinity softkey, 975, 1075
 - Init Power field, 1014
 - Init Pwr field, 1034, 1050
 - Initial Bit Count softkey, 437
 - Initial Block Count softkey, 427, 430
 - Initial Frame Count softkey, 447
 - Initialize Phase Fixed Random softkey, 331
 - Initialize Table softkey, 286
 - input subsystem keys
 - 0.7V, 417
 - 1.4V, 417
 - 1.6V, 417
 - 2.5V, 417
 - Clock Delay Off On, 415
 - Clock Polarity Neg Pos, 416
 - Clock Time Delay, 415
 - Data Polarity Neg Pos, 416
 - Gate Clk Delay, 412
 - Gate Delay Off On, 413
 - Gate Mode Time Clk, 412
 - Gate Off On, 414
 - Gate Polarity Neg Pos, 414
 - Gate Time Delay, 413
 - Impedance 75 Ohm High, 416
 - Resolution, 414
 - Insert Row softkey, 252, 255, 259, 286
 - Installed Board Info softkey, 81
 - Int I/Q Skew Corrections RF BB Off softkey, 34
 - Int softkeys
 - Int Doublet, 204
 - Int Free-Run, 204
 - Int Gated, 204
 - Int Phase Polarity Normal Invert, 23, 33
 - Int Triggered, 204
 - integer response data, 10

Index

Intermod softkey, [979](#)

Internal softkeys

Internal, [61](#), [178](#), [511](#)

Internal 1, [186](#), [198](#)

Internal 2, [186](#), [198](#)

Internal Monitor, [192](#)

Internal Square, [204](#)

Inverse Video Off On softkey, [87](#)

Inverted softkey, [516](#)

IP Address softkey, [76](#)

IQ Phase Normal Invert softkey, [674](#)

IS-2000 SR3 DS softkey

See CDMA ARB subsystem keys

See CDMA2000 ARB subsystem keys

See Dmodulation subsystem keys

See wideband CDMA ARB subsystem keys

IS-95 Mod softkey

See CDMA ARB subsystem keys

See CDMA2000 ARB subsystem keys

See CDMA2000 BBG subsystem keys and fields

See custom subsystem keys

See DECT subsystem keys

See Dmodulation subsystem keys

See EDGE subsystem keys

See GPS subsystem keys

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

See PHS subsystem keys

See TETRA subsystem keys

See wideband CDMA ARB subsystem keys

See wideband CDMA base band subsystem keys
and fields

IS-95 Mod w/EQ softkey

See CDMA ARB subsystem keys

See CDMA2000 ARB subsystem keys

See CDMA2000 BBG subsystem keys and fields

See custom subsystem keys

See DECT subsystem keys

See Dmodulation subsystem keys

See EDGE subsystem keys

See GPS subsystem keys

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

IS-95 Mod w/EQ softkey (continued)

See PHS subsystem keys

See TETRA subsystem keys

See wideband CDMA ARB subsystem keys

See wideband CDMA base band generator
subsystem keys and fields

IS-95 OQPSK softkey

See custom subsystem keys

See DECT subsystem keys

See Dmodulation subsystem keys

See EDGE subsystem keys

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

See PHS subsystem keys

See TETRA subsystem keys

IS-95 QPSK softkey

See custom subsystem keys

See DECT subsystem keys

See Dmodulation subsystem keys

See EDGE subsystem keys

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

See PHS subsystem keys

See TETRA subsystem keys

IS-95 softkey

See CDMA ARB subsystem keys

See CDMA2000 ARB subsystem keys

See CDMA2000 BBG subsystem keys and fields

See custom subsystem keys

See DECT subsystem keys

See Dmodulation subsystem keys

See EDGE subsystem keys

See GPS subsystem keys

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

See PHS subsystem keys

See TETRA subsystem keys

See wideband CDMA ARB subsystem keys

See wideband CDMA base band generator
subsystem keys and fields

IS-95 w/EQ softkey

See CDMA ARB subsystem keys

IS-95 w/EQ softkey (continued)

- See CDMA2000 ARB subsystem keys
- See CDMA2000 BBG subsystem keys and fields
- See custom subsystem keys
- See DECT subsystem keys
- See Dmodulation subsystem keys
- See EDGE subsystem keys
- See GPS subsystem keys
- See GSM subsystem keys
- See NADC subsystem keys
- See PDC subsystem keys
- See PHS subsystem keys
- See TETRA subsystem keys
- See wideband CDMA ARB subsystem keys

IS-97 Levels softkey, 230

L

Last Mkr Point softkey, 303, 304

Leap Seconds field, 500

Left Alternate softkey, 351

Left softkey, 940

LF Out softkeys

- LF Out Amplitude, 188

- LF Out Off On, 192

- LF Out Stop Freq, 188, 189, 195

- LF Out Sweep Rate, 190

- LF Out Sweep Time, 191

- LF Out Tone 2 Ampl % of Peak, 189

- LF Out Tone 2 Freq, 188, 189, 195

license, 83

license value, 84

Link Down Up softkey, 341, 987

Link Forward Reverse softkey, 250, 477

list data, 113

List softkey, 98, 122

list/sweep subsystem keys

- # Points, 56

- Ampl, 48, 65

- Ampl Start, 48, 66

- Ampl Stop, 48, 67

- Dwell Type List Step, 50

- Freq, 41, 48

- Freq & Ampl, 48

- Freq Start, 44, 48

- Freq Stop, 44, 48

list/sweep subsystem keys (*continued*)

- Load List From Step Sweep, 54

- Manual Mode Off On, 52

- Manual Point, 51

- Off, 41, 48, 65

- Preset List, 55

- Step Dwell, 55

- Sweep Direction Down Up, 49

- Sweep Retrace Off On, 53

- Sweep Type List Step, 54

Load From Selected File softkey, 18, 120, 128, 329

Load List From Step Sweep softkey, 54

Load/Store softkey, 286

Long Code Mask field, 515

Long Code State field, 482, 515

Low Amplitude softkey, 426, 429

- See sense subsystem keys

Low Capacity softkey, 588, 600

Low Capacity with Z field softkey, 588, 600

low frequency output subsystem keys

- Bus, 191

- DC, 191

- Dual-Sine, 191

- Ext, 191

- Free Run, 191

- Function Generator, 192

- Internal Monitor, 192

- LF Out Amplitude, 188

- LF Out Off On, 192

- LF Out Stop Freq, 188, 189, 195

- LF Out Sweep Rate, 190

- LF Out Sweep Time, 191

- LF Out Tone 2 Ampl % of Peak, 189

- LF Out Tone 2 Freq, 188, 189, 195

- Noise, 191

- Ramp, 191

- Sine, 191

- Square, 191

- Swept-Sine, 191

- Triangle, 191

- Trigger Key, 191

LTM OFF field, 500

M

Manual Mode Off On softkey, 52

Index

- Manual Point softkey, [51](#)
- Marker 1 2 softkey, [303](#), [304](#)
- Marker 1 Polarity Neg Pos softkey, [212](#), [226](#), [261](#), [281](#), [306](#), [326](#), [362](#), [473](#)
- Marker 1 softkey, [211](#), [225](#), [260](#), [261](#), [280](#), [305](#), [306](#), [325](#), [361](#), [362](#), [472](#), [473](#)
- Marker 2 Polarity Neg Pos softkey, [212](#), [226](#), [262](#), [282](#), [306](#), [326](#), [363](#), [473](#)
- Marker 2 softkey, [211](#), [225](#), [260](#), [261](#), [280](#), [305](#), [306](#), [325](#), [361](#), [362](#), [472](#), [473](#)
- Marker 3 Polarity Neg Pos softkey, [212](#), [226](#), [262](#), [282](#), [307](#), [326](#), [363](#), [474](#)
- Marker 3 softkey, [211](#), [225](#), [260](#), [261](#), [280](#), [305](#), [306](#), [325](#), [361](#), [362](#), [472](#), [473](#)
- Marker 4 Polarity Neg Pos softkey, [212](#), [226](#), [262](#), [282](#), [307](#), [326](#), [363](#), [474](#)
- Marker 4 softkey, [211](#), [225](#), [260](#), [261](#), [280](#), [305](#), [306](#), [325](#), [361](#), [362](#), [472](#), [473](#)
- mass memory subsystem keys
 - Binary, [122](#)
 - Copy File, [124](#)
 - Delete All NVWFM Files, [126](#)
 - Delete All WFM Files, [126](#)
 - Delete All WFM1 Files, [127](#)
 - Delete File, [127](#)
 - List, [122](#)
 - Load From Selected File, [128](#)
 - Rename File, [128](#)
 - State, [122](#)
 - Store To File, [128](#)
 - User Flatness, [122](#)
- Max Input softkey, [979](#)
- Max Power field, [1015](#)
- Max Pwr field, [1034](#), [1050](#)
- MCDMA softkey, [99](#)
- MDMOD softkey, [99](#)
- MDWCDMA softkey, [100](#)
- Measurement Mode BER% Search softkey, [446](#)
- Measurement Mode BLER% Search softkey, [432](#)
- memory subsystem keys, [112](#)
 - Add Comment To Seq[n] Reg[nn], [121](#)
 - All, [104](#), [120](#)
 - Binary, [94](#)
 - Bit, [94](#)
 - CDMA, [95](#)
 - memory subsystem keys, [112](#) (*continued*)
 - Copy File, [105](#), [113](#)
 - Data PRAM, [111](#)
 - Delete All ARB CDMA Files, [116](#)
 - Delete All ARB DMOD Files, [116](#)
 - Delete All ARB DWCDMA Files, [116](#)
 - Delete All ARB FCDMA Files, [117](#)
 - Delete All ARB MCDMA Files, [118](#)
 - Delete All ARB MDWCDMA Files, [118](#)
 - Delete All ARB MTONE Files, [118](#)
 - Delete All ARB RCDMA Files, [119](#)
 - Delete All ARB UWCDMA Files, [120](#)
 - Delete All Binary Files, [116](#)
 - Delete All Bit Files, [116](#)
 - Delete All Files, [115](#)
 - Delete All FIR Files, [117](#)
 - Delete All FSK Files, [117](#)
 - Delete All I/Q Files, [117](#)
 - Delete All List Files, [117](#)
 - Delete All MDMOD Files, [118](#)
 - Delete All MFCDMA Files, [118](#)
 - Delete All SEQ Files, [119](#)
 - Delete All SHAPE Files, [119](#)
 - Delete All State Files, [119](#)
 - Delete All UFLT Files, [119](#)
 - Delete File, [120](#)
 - DMOD, [95](#)
 - DWCDMA, [96](#)
 - FCDMA, [96](#)
 - FIR, [97](#)
 - FSK, [97](#)
 - I/Q, [98](#)
 - List, [98](#)
 - Load From Selected File, [120](#)
 - MCDMA, [99](#)
 - MDMOD, [99](#)
 - MDWCDMA, [100](#)
 - MFCDMA, [100](#)
 - MTONE, [101](#)
 - Oversample Ratio, [108](#)
 - RCDMA, [101](#)
 - Rename File, [121](#)
 - SEQ, [102](#)
 - SHAPE, [102](#)
 - State, [103](#)

- memory subsystem keys, 112 (*continued*)
 - Store To File, 121
 - User Flatness, 103
 - UWCDMA, 104
 - Message Data Raw Data (RPS11) softkey
 - See wideband CDMA base band generator subsystem keys and fields
 - Message Part field, 1033
 - Message Pulse (RPS22) softkey
 - See wideband CDMA base band generator subsystem keys and fields
 - Message Type field, 501
 - Message-Control Raw Data Clock (RPS12) softkey
 - See wideband CDMA base band generator subsystem keys and fields
 - Meter Address softkeys, 77
 - Meter Channel A B softkey, 77
 - Meter Timeout softkey, 78
 - MFCDMA softkey, 100
 - Min Power field, 1015
 - Mod Index softkey, 469
 - Mod On/Off hardkey, 129
 - Modulator Atten Manual Auto softkey, 32, 33, 209, 223, 248, 278, 301, 323, 339, 340, 470, 471
 - Msg Ctrl softkey, 1021
 - Msg Data softkey, 1021
 - Msg Pwr field, 1032, 1049
 - MSK softkey
 - See custom subsystem keys
 - See DECT subsystem keys
 - See Dmodulation subsystem keys
 - See EDGE subsystem keys
 - See GSM subsystem keys
 - See NADC subsystem keys
 - See PDC subsystem keys
 - See PHS subsystem keys
 - See TETRA subsystem keys
 - MTONE softkey, 101
 - Multicarrier Off On softkey, 229, 250, 284
 - Multislot Off On softkey, 647, 699
 - Multitone Off On softkey, 332
 - multitone subsystem keys
 - 2.100 MHz, 324
 - 40.000 MHz, 322, 324
 - ARB Reference Ext Int, 327
 - multitone subsystem keys (*continued*)
 - ARB Sample Clock, 329
 - Clear Header, 321
 - Freq Spacing, 330
 - Goto Row, 328
 - I/Q Mod Filter Manual Auto, 324
 - I/Q Output Filter Manual Auto, 322
 - Initialize Phase Fixed Random, 331
 - Load From Selected File, 329
 - Marker 1, 325
 - Marker 1 Polarity Neg Pos, 326
 - Marker 2, 325
 - Marker 2 Polarity Neg Pos, 326
 - Marker 3, 325
 - Marker 3 Polarity Neg Pos, 326
 - Marker 4, 325
 - Marker 4 Polarity Neg Pos, 326
 - Modulator Atten Manual Auto, 323
 - Multitone Off On, 332
 - None, 325
 - Number Of Tones, 330, 331
 - Random Seed Fixed Random, 332
 - Reference Freq, 327
 - Save Setup To Header, 321
 - Store To File, 329
 - Through, 322, 324
 - Toggle State, 328, 330
 - mV softkey, 172
 - mVemf softkey, 172
- ## N
- N Power field, 991, 1021
 - N5102A
 - See digital subsystem
 - NADC Off On softkey, 813
 - NADC softkey, 284, 285, 286
 - NADC subsystem keys
 - 128QAM, 796
 - 16 1's & 16 0's, 789, 798, 801, 802, 804
 - 16PSK, 796
 - 16QAM, 796
 - 256QAM, 796
 - 2-Lvl FSK, 796
 - 32 1's & 32 0's, 789, 798, 801, 802, 804
 - 32QAM, 796

Index

NADC subsystem keys (*continued*)

4 1's & 4 0's, 789, 798, 801, 802, 804
4-Lvl FSK, 796
4QAM, 796
64 1's & 64 0's, 789, 798, 801, 802, 804
64QAM, 796
8 1's & 8 0's, 789, 798, 801, 802, 804
8PSK, 796
All Timeslots, 806
APCO 25 C4FM, 793
BBG Data Clock Ext Int, 779
BBG Ref Ext Int, 792
Begin Frame, 806
Begin Timeslot #, 806, 807
BPSK, 796
Bus, 798, 810
CDL, 799
CDVCC, 800, 803
Continuous, 808
D8PSK, 796
Data Format Pattern Framed, 788
Down Custom, 805
Down TCH, 805
Down TCH All, 805
Ext, 789, 798, 801, 802, 804, 810
Ext BBG Ref Freq, 792
Ext Data Clock Normal Symbol, 791
Ext Delay Bits, 811
Ext Delay Off On, 812
Ext Polarity Neg Pos, 812
Fall Delay, 782, 784
Fall Time, 783, 784
Filter Alpha, 779
Filter BbT, 780
FIX4, 789, 790, 798, 799, 801, 802, 803, 804, 805
Frame Repeat Single Cont, 796
Free Run, 809
Freq Dev, 794
Gate Active Low High, 810
Gated, 808
Gaussian, 793
Gray Coded QPSK, 796
I/Q Scaling, 794
IS-95, 793
IS-95 Mod, 793

NADC subsystem keys (*continued*)

IS-95 Mod w/EQ, 793
IS-95 OQPSK, 796
IS-95 QPSK, 796
IS-95 w/EQ, 793
MSK, 796
NADC Off On, 813
Nyquist, 793
Optimize FIR For EVM ACP, 789
OQPSK, 796
 $\pi/4$ DQPSK, 796
Patt Trig In 1, 812
Patt Trig In 2, 812
Phase Dev, 795
PN11, 789, 798, 801, 802, 804
PN15, 789, 798, 801, 802, 804
PN20, 789, 798, 801, 802, 804
PN23, 789, 798, 801, 802, 804
PN9, 789, 798, 801, 802, 804
PN9 Mode Normal Quick, 781
Polarity Normal Invert, 797
QPSK, 796
Rate Full Half, 794
Recall Secondary Frame State, 797
Rectangle, 793
Reset & Run, 809
Restore NADC Factory Default, 790
Rise Delay, 785, 786
Rise Time, 786, 787
Root Nyquist, 793
SACCH, 800, 804
Save Secondary Frame State, 797
Secondary Frame Off On, 798
Sine, 782, 788
Single, 808
Symbol Rate, 807
SYNC, 800, 804
Sync Out Offset, 806
Timeslot Ampl Main Delta, 802
Timeslot Off On, 802
Trigger & Run, 809
Trigger Key, 798, 810
UN3/4 GSM Gaussian, 793
Up Custom, 805
Up TCH, 805

- NADC subsystem keys (*continued*)
 Up TCH All, [805](#)
 User File, [782](#), [788](#), [789](#), [798](#), [801](#), [802](#), [804](#)
 User FIR, [793](#)
 User FSK, [795](#), [796](#)
 User I/Q, [796](#)
- nadc subsystem keys
 PRAM Files, [790](#)
- Network ID field, [501](#)
- No Limits softkey
See calculate subsystem keys
- No Thresholds softkey
See sense subsystem keys
- Noise Bandwidth Factor, [308](#)
- Noise Off On softkey, [505](#), [517](#)
- Noise Seed Fixed Random softkey, [215](#)
- Noise Seed softkey, [467](#)
- Noise softkey, [177](#), [184](#), [191](#), [197](#)
- NONE (RPS0) softkey
See wideband CDMA base band generator subsystem keys and fields
- NONE softkey, [1081](#)
- None softkey, [163](#), [211](#), [225](#), [260](#), [261](#), [280](#), [305](#), [306](#), [325](#), [361](#), [362](#), [472](#), [473](#), [565](#), [982](#), [983](#), [1086](#), [1094](#)
- Normal All softkey, [658](#), [707](#)
- Normal softkey, [516](#), [658](#), [707](#), [940](#)
- Num of Blk field, [1087](#), [1095](#)
- Num of Pre field, [1034](#), [1050](#)
- Number of AICH field, [1018](#)
- Number of PRACH 80ms field, [1033](#)
- Number of PRACH field, [1047](#), [1049](#)
- Number of Preamble field, [1050](#)
- Number Of Tones softkey, [330](#), [331](#)
- numeric boolean response data, [11](#)
- numeric SCPI parameter, [8](#)
- numeric, extended SCPI parameter, [8](#)
- Nyquist softkey
See CDMA ARB subsystem keys
See CDMA2000 ARB subsystem keys
See CDMA2000 BBG subsystem keys and fields
See custom subsystem keys
See DECT subsystem keys
See Dmodulation subsystem keys
See EDGE subsystem keys
- Nyquist softkey (continued)*
See GPS subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See TETRA subsystem keys
See wideband CDMA ARB subsystem keys
See wideband CDMA base band generator subsystem keys and fields
- 0**
- OCNS softkey, [352](#)
- octal values, [16](#)
- Off softkey, [23](#), [35](#), [41](#), [48](#), [65](#), [228](#), [264](#), [283](#), [310](#), [1046](#)
- Omitted softkey, [974](#), [1074](#)
- On softkey, [228](#), [264](#), [283](#), [310](#), [1046](#)
- On/Off field, [956](#), [1038](#)
- OpenLoop Ant1 SCH TSTD OFF softkey, [980](#)
- OpenLoop Ant1 softkey, [980](#)
- OpenLoop Ant2 SCH TSTD OFF softkey, [980](#)
- OpenLoop Ant2 softkey, [980](#)
- Optimize ACP ADJ ALT softkey, [342](#), [356](#)
- Optimize FIR For EVM ACP softkey, [1012](#)
See CDMA ARB subsystem keys
See CDMA2000 ARB subsystem keys
See CDMA2000 BBG subsystem keys and fields
See custom subsystem keys
See DECT subsystem keys
See Dmodulation subsystem keys
See EDGE subsystem keys
See GPS subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See TETRA subsystem keys
See wideband CDMA ARB subsystem keys
See wideband CDMA base band generator subsystem keys and fields
- options
 001/002
 all subsystem, [206](#), [460](#)
 custom subsystem, [548](#)

Index

options (*continued*)

001/002

Dmodulation subsystem, [274](#)

dual ARB subsystem, [297](#)

multitone subsystem, [321](#)

400

wideband CDMA ARB subsystem, [333](#)

wideband CDMA base band generator
subsystem, [934](#)

401

CDMA ARB subsystem, [216](#)

CDMA2000 ARB subsystem, [242](#)

CDMA2000 BBG subsystem, [477](#)

402

DECT subsystem, [571](#)

EDGE subsystem, [623](#)

GSM subsystem, [677](#)

NADC subsystem, [779](#)

PDC subsystem, [814](#)

PHS subsystem, [850](#)

TETRA subsystem, [889](#)

403

AWGN real-time subsystem, [461](#)

AWGN subsystem, [207](#)

406

bluetooth subsystem, [462](#)

409

GPS subsystem, [670](#)

UN7/300

calculate subsystem, [394](#)

data subsystem, [404](#)

input subsystem, [412](#), [418](#)

sense subsystem, [421](#)

Options Info softkey, [83](#)

OQPSK softkey

See custom subsystem keys

See DECT subsystem keys

See Dmodulation subsystem keys

See EDGE subsystem keys

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

See PHS subsystem keys

See TETRA subsystem keys

Output Blanking Off On Auto softkey, [129](#)

output subsystem keys

Mod On/Off, [129](#)

Output Blanking Off On Auto, [129](#)

RF On/Off, [130](#)

Oversample Ratio softkey, [108](#), [227](#)

Overwrite softkey, [163](#)

P

P Code Pwr softkey, [674](#)

P Rev field, [502](#)

P Rev Min field, [500](#)

P softkey, [590](#)

$\pi/4$ DQPSK softkey

See custom subsystem keys

See DECT subsystem keys

See Dmodulation subsystem keys

See EDGE subsystem keys

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

See PHS subsystem keys

See TETRA subsystem keys

Packet (DH1) softkey, [474](#)

Paging Indicator field, [509](#), [960](#)

Paging softkey, [230](#)

parameter types. *See* SCPI commands parameter
types

Pass Amplitude softkey, [426](#), [430](#)

See sense subsystem keys

Pass/Fail Limits softkey, [402](#)

Pass/Fail Off On softkey, [402](#)

paths, SCPI command tree, [7](#)

Patt Trig In 1 softkey

See CDMA ARB subsystem keys

See CDMA2000 ARB subsystem keys

See custom subsystem keys

See DECT subsystem keys

See Dmodulation subsystem keys

See dual ARB subsystem keys

See EDGE subsystem keys

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

See PHS subsystem keys

See TETRA subsystem keys

Patt Trig In 1 softkey (continued)

See wideband CDMA ARB subsystem keys
subsystem keys

Patt Trig In 2 softkey

See CDMA ARB subsystem keys
See CDMA2000 ARB subsystem keys
See custom subsystem keys
See DECT subsystem keys
See Dmodulation subsystem keys
See dual ARB subsystem keys
See EDGE subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See TETRA subsystem keys
See wideband CDMA ARB subsystem keys
subsystem keys

Pattern trigger in 1 field, 1061

Pattern trigger in 2 field, 1061

PCCPCH + SCH + 3 DPCH softkey, 342, 347

PCCPCH + SCH +1 DPCH softkey, 342, 347

PCCPCH + SCH softkey, 342, 347

P-CCPCH data (DRPS39) softkey, 964, 966, 967,
968, 969

P-CCPCH data-clk (DRPS38) softkey, 964, 966,
967, 968, 969

PCCPCH softkey, 936, 937

PDC Off On softkey, 849

PDC softkey, 284, 285, 286

PDC subsystem keys

128QAM, 830

16 1's & 16 0's, 824, 833, 835, 837, 839

16PSK, 830

16QAM, 830

256QAM, 830

2-Lvl FSK, 830

32 1's & 32 0's, 824, 833, 835, 837, 839

32QAM, 830

4 1's & 4 0's, 824, 833, 835, 837, 839

4-Lvl FSK, 830

4QAM, 830

64 1's & 64 0's, 824, 833, 835, 837, 839

64QAM, 830

8 1's & 8 0's, 824, 833, 835, 837, 839

PDC subsystem keys (continued)

8PSK, 830

All Timeslots, 841

APCO 25 C4FM, 827

BBG Ref Ext Int, 826

Begin Frame, 841

Begin Timeslot #, 841, 842

BPSK, 830

Bus, 832, 846

CC, 834, 838, 840

Continuous, 844

D8PSK, 830

Data Format Pattern Framed, 823

Down Custom, 841

Down TCH, 841

Down TCH All, 841

Ext, 824, 832, 833, 835, 837, 839, 846

Ext BBG Ref Freq, 827

Ext Data Clock Ext Int, 814

Ext Data Clock Normal Symbol, 826

Ext Delay Bits, 847

Ext Delay Off On, 848

Ext Polarity Neg Pos, 848

Fall Delay, 817, 818

Fall Time, 818, 819

Filter Alpha, 814

Filter BbT, 815

FIX4, 824, 825, 833, 834, 835, 836, 837, 839

Free Run, 845

Freq Dev, 829

Gate Active Low High, 846

Gated, 844

Gaussian, 827

Gray Coded QPSK, 830

I/Q Scaling, 828

IS-95, 827

IS-95 Mod, 827

IS-95 Mod w/EQ, 827

IS-95 OQPSK, 830

IS-95 QPSK, 830

IS-95 w/EQ, 827

MSK, 830

Nyquist, 827

Optimize FIR For EVM ACP, 823

OQPSK, 830

Index

ΠΔΧ συβψσψτεμ κεψσ (*continued*)

$\pi/4$ DQPSK, 830
Patt Trig In 1, 848
Patt Trig In 2, 848
PDC Off On, 849
Phase Dev, 829
Phase Polarity Normal Invert, 831
PN11, 824, 835, 837, 839
PN15, 824, 833, 835, 837, 839
PN20, 824, 835, 837, 839
PN23, 824, 835, 837, 839
PN9, 824, 833, 835, 837, 839
PN9 Mode Normal Quick, 817
QPSK, 830
Rate Full Half, 828
Recall Secondary Frame State, 831
Rectangle, 827
Reset & Run, 845
Restore PDC Factory Default, 825
Rise Delay, 820
Rise Time, 821, 822
Root Nyquist, 827
SACCH, 834, 838, 840
Save Secondary Frame State, 832
Secondary Frame Off On, 833
Sine, 822
Single, 844
SW, 835, 838, 840
Symbol Rate, 843
Sync Out Offset, 842
Timeslot Ampl Main Delta, 836
Timeslot Off On, 836
Trigger & Run, 845
Trigger Key, 832, 846
UN3/4 GSM Gaussian, 827
Up Custom, 841
Up TCH, 841
Up TCH All, 841
Up VOX, 841
User File, 822, 824, 833, 835, 837, 839
User FIR, 827
User FSK, 830
User I/Q, 830
pdc subsystem keys
PRAM Files, 824

Performance Req softkey, 979
Permuted ESN field, 484, 495
Phase Dev softkey
 See custom subsystem keys
 See DECT subsystem keys
 See EDGE subsystem keys
 See GSM subsystem keys
 See NADC subsystem keys
 See PDC subsystem keys
 See PHS subsystem keys
 See TETRA subsystem keys
phase modulation subsystem keys
 ΦM Sweep Time softkey, 197
 FM ΦM Normal High BW softkey, 194
 ΦM Dev Couple Off On, 199
 ΦM Dev softkey, 199
 ΦM Off On softkey, 198
 ΦM Path 1 2, 193
 ΦM Tone 2 Ampl Percent of Peak, 196
 ΦM Tone 2 Rate, 196
Bus, 197
Dual-Sine, 197
Ext, 197
Ext Coupling DC AC, 195
Ext1, 198
Ext2, 198
Free Run, 197
Incr Set, 194, 200
Internal 1, 198
Internal 2, 198
Noise, 197
Ramp, 197
Sine, 197
Square, 197
Swept-Sine, 197
Triangle, 197
Trigger Key, 197
Phase Polarity field, 508
Phase Polarity Normal Invert softkey
 See custom subsystem keys
 See DECT subsystem keys
 See EDGE subsystem keys
 See GSM subsystem keys
 See PDC subsystem keys
 See PHS subsystem keys

- Phase Polarity Normal Invert softkey (continued)*
 See TETRA subsystem keys
 See wideband CDMA base band generator
 subsystem keys and fields
 Phase Polarity Normal Inverted softkey, 987
 Phase Ref Set softkey, 46
 PHS Off On softkey, 888
 PHS softkey, 284, 285, 286
 PHS subsystem keys
 128QAM, 873
 16 1's & 16 0's, 860, 862, 866, 883, 887
 16-Lvl FSK, 873
 16PSK, 873
 16QAM, 873
 256QAM, 873
 2-Lvl FSK, 873
 32 1's & 32 0's, 860, 862, 866, 883, 887
 32QAM, 873
 4 1's & 4 0's, 860, 862, 866, 883, 887
 4-Lvl FSK, 873
 4QAM, 873
 64 1's & 64 0's, 860, 862, 866, 883, 887
 64QAM, 873
 8 1's & 8 0's, 860, 862, 866, 883, 887
 8-Lvl FSK, 873
 8PSK, 873
 All Timeslots, 875
 APCO 25 C4FM, 869
 BBG Data Clock Ext Int, 850
 BBG Ref Ext Int, 868
 Begin Frame, 875
 Begin Timeslot #, 875, 876
 BPSK, 873
 Bus, 874, 882
 C4FM, 873
 Continuous, 878
 CSID, 863, 884
 Custom, 867
 D8PSK, 873
 Data Format Pattern Framed, 859
 Ext, 860, 862, 866, 874, 882, 883, 887
 Ext BBG Ref Freq, 868
 Ext Data Clock Normal Symbol, 867
 Ext Delay Bits, 880
 Ext Delay Off On, 881
- PHS subsystem keys (*continued*)
 Ext Polarity Neg Pos, 881
 Fall Delay, 854, 855
 Fall Time, 854, 856
 Filter Alpha, 850
 Filter BbT, 851
 FIX4, 860, 861, 862, 866, 883, 884, 887
 Free Run, 879
 Gate Active Low High, 880
 Gated, 878
 Gaussian, 869
 Gray Coded QPSK, 873
 I/Q Scaling, 870
 IDLE, 863, 885
 IS-95, 869
 IS-95 Mod, 869
 IS-95 Mod w/EQ, 869
 IS-95 OQPSK, 873
 IS-95 QPSK, 873
 IS-95 w/EQ, 869
 MSK, 873
 Nyquist, 869
 Optimize FIR For EVM ACP, 860
 OQPSK, 873
 $\pi/4$ DQPSK, 873
 Patt Trig In 1, 882
 Patt Trig In 2, 882
 Phase Dev, 870, 872
 Phase Polarity Normal Invert, 873
 PHS Off On, 888
 PN11, 860, 862, 866, 883, 887
 PN15, 860, 862, 866, 883, 887
 PN20, 860, 862, 866, 883, 887
 PN23, 860, 862, 866, 883, 887
 PN9, 860, 862, 866, 883, 887
 PN9 Mode Normal Quick, 852
 PSID, 864, 885
 QPSK, 873
 Recall Secondary Frame State, 874
 Rectangle, 869
 Reset & Run, 879
 Restore PHS Factory Default, 862
 Rise Delay, 856, 857
 Rise Time, 858
 Root Nyquist, 869

Index

PHS subsystem keys (*continued*)

SA, [865](#), [886](#)
Save Secondary Frame State, [874](#)
Scramble Off On, [853](#)
Scramble Seed, [853](#)
Secondary Frame Off On, [875](#)
Sine, [859](#)
Single, [878](#)
Symbol Rate, [877](#)
SYNC, [867](#)
Sync Out Offset, [876](#)
TCH, [867](#)
TCH All, [867](#)
Timeslot Ampl Main Delta, [863](#), [884](#)
Timeslot Off On, [864](#), [886](#)
Timeslot Type, [888](#)
Trigger & Run, [879](#)
Trigger Key, [874](#), [882](#)
UN3/4 GSM Gaussian, [869](#)
User File, [859](#), [860](#), [862](#), [866](#), [883](#), [887](#)
User FIR, [869](#)
User FSK, [872](#), [873](#)
User I/Q, [872](#), [873](#)
UW, [864](#), [865](#), [885](#), [886](#)

phs subsystem keys
PRAM Files, [861](#)
PI Bits field, [960](#)
PICH 10ms FramePulse (DRPS37) softkey, [964](#),
[966](#), [967](#), [968](#), [969](#)
PICH data (DRPS35) softkey, [964](#), [966](#), [967](#), [968](#),
[969](#)
PICH data-clk (DRPS34) softkey, [964](#), [966](#), [967](#),
[968](#), [969](#)
PICH softkey, [352](#), [936](#), [937](#)
PICH TimeSlot Pulse (DRPS36) softkey, [964](#), [966](#),
[967](#), [968](#), [969](#)
Pilot softkey, [229](#), [230](#), [232](#), [250](#), [257](#)
Playback Ratio field, [940](#)
PN Offset field, [511](#)
PN Offset softkey, [255](#), [259](#)
PN11 softkey
See custom subsystem keys
See DECT subsystem keys
See EDGE subsystem keys
See GSM subsystem keys

PN11 softkey (*continued*)

See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See sense subsystem keys
See TETRA subsystem keys

PN15 softkey
See CDMA2000 BBG subsystem keys and fields
See custom subsystem keys
See DECT subsystem keys
See EDGE subsystem keys
See GPS subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See sense subsystem keys
See TETRA subsystem keys
See wideband CDMA base band generator
subsystem keys and fields

PN20 softkey
See custom subsystem keys
See DECT subsystem keys
See EDGE subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See sense subsystem keys
See TETRA subsystem keys

PN23 softkey
See custom subsystem keys
See DECT subsystem keys
See EDGE subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See sense subsystem keys
See TETRA subsystem keys

PN9 Mode Normal Quick softkey
See DECT subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys

- PN9 Mode Normal Quick softkey (continued)*
 See PHS subsystem keys
 See TETRA subsystem keys
- PN9 Mode Preset softkey, [160](#)
- PN9 softkey
 See CDMA2000 BBG subsystem keys and fields
 See custom subsystem keys
 See data subsystem keys
 See DECT subsystem keys
 See EDGE subsystem keys
 See GPS subsystem keys
 See GSM subsystem keys
 See NADC subsystem keys
 See PDC subsystem keys
 See PHS subsystem keys
 See sense subsystem keys
 See TETRA subsystem keys
 See wideband CDMA base band generator
 subsystem keys and fields
- Polarity Normal Invert softkey, [797](#)
- Power Control Signal Polarity Neg Pos softkey,
[1017](#)
- Power field
 See CDMA2000 BBG subsystem keys and fields
 See wideband CDMA baseband generator
 subsystem keys and fields
- Power Hold Off On softkey, [1014](#)
- Power Meter softkey, [78](#)
- Power Mode Norm TPC softkey, [1017](#)
- Power On Last Preset softkey, [158](#)
- Power Search Manual Auto softkey, [58](#), [59](#), [60](#)
- Power softkey, [359](#)
- power subsystem keys
 ALC BW, [57](#)
 ALC BW Normal Narrow, [57](#)
 ALC Off On, [60](#)
 Alt Amp Delta, [61](#)
 Alt Ampl Off On, [62](#)
 Ampl, [48](#), [65](#)
 Ampl Offset, [67](#)
 Ampl Ref Off On, [66](#)
 Ampl Ref Set, [65](#)
 Ampl Start, [48](#), [66](#)
 Ampl Stop, [48](#), [67](#)
 Amplitude, [65](#), [68](#)
- power subsystem keys (*continued*)
 Atten Hold Off On, [63](#)
 Do Power Search, [58](#), [59](#), [60](#)
 Ext Detector, [61](#)
 Internal, [61](#)
 Off, [48](#), [65](#)
 Power Search Manual Auto, [58](#), [59](#), [60](#)
 Set ALC Level, [58](#)
 Set Atten, [64](#)
 Source Module, [61](#)
- PPCCPCH softkey, [352](#), [353](#)
- Pp-m field, [1035](#), [1052](#)
- PRACH Mode Single Multi softkey, [1032](#)
- PRACH Power Setup Mode Pp-m Total softkey,
[1039](#)
- PRACH Processing (RPS19) softkey
 See wideband CDMA base band generator
 subsystem keys and fields
- PRACH Scrambling Code field, [1040](#)
- PRACH softkey, [1013](#)
- PRACH Trigger Polarity Neg Pos softkey, [1045](#)
- PRACH Trigger softkey, [1044](#)
- PRACH Trigger Source Immedi Trigger softkey,
[1045](#)
- PRAM
 downloads, [111](#)
 list, [112](#)
- PRAM DATA BLOCK, [113](#)
- pram files
 CUSTOM subsystem keys, [557](#)
 DECTsubsystem keys, [581](#)
 EDGE subsystem keys, [632](#)
 GSM subsystem keys, [687](#)
 NADC subsystem keys, [790](#)
 PDC subsystem keys, [824](#)
 PHS subsystem keys, [861](#)
 TETRA subsystem keys, [900](#)
- PRAM LIST, [113](#)
- PRAM?, [113](#)
- PRAT field, [502](#)
- Pre Sig field, [1036](#)
- Preamble power average field, [1038](#)
- Preamble Pulse (RPS21) softkey
 See wideband CDMA base band generator
 subsystem keys and fields

Index

Preamble Raw Data (RPS15) softkey
 See wideband CDMA base band generator
 subsystem keys and fields

Preamble Raw Data Clock (RPS16) softkey
 See wideband CDMA base band generator
 subsystem keys and fields

Preamble softkey, [1021](#)

precise talking and forgiving listening, [7](#)

Preset hardkey, [159](#)

Preset List softkey, [19](#), [55](#)

Preset Normal User softkey, [161](#)

PSCH softkey, [352](#)

PSCH State field, [962](#)

PSID softkey, [864](#), [885](#)

pulse modulation subsystem keys

 Ext Pulse, [204](#)

 Int Doublet, [204](#)

 Int Free-Run, [204](#)

 Int Gated, [204](#)

 Int Triggered, [204](#)

 Internal Square, [204](#)

 Pulse Delay, [69](#)

 Pulse Off On, [204](#)

 Pulse Period, [202](#)

 Pulse Rate, [201](#)

 Pulse Width, [203](#)

Pulse softkeys

 Pulse Delay, [69](#)

 Pulse Off On, [204](#)

 Pulse Period, [202](#)

 Pulse Rate, [201](#)

 Pulse Width, [203](#)

Puncture fields, [1087](#), [1095](#)

Puncture softkey, [972](#)

PwrOffs field, [971](#), [1071](#)

PWT softkey, [284](#), [285](#), [286](#)

Q

Q Offset softkey, [28](#)

QOF field, [486](#), [496](#)

QPSK softkey

See custom subsystem keys

See DECT subsystem keys

See Dmodulation subsystem keys

See EDGE subsystem keys

QPSK softkey (continued)

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

See PHS subsystem keys

See TETRA subsystem keys

Quadrature Skew softkey, [29](#)

Quarter softkey, [528](#), [533](#)

quotes, SCPI command use of, [16](#)

R

RACH TrCH softkey, [1021](#)

Radio Config field

See CDMA2000 BBG subsystem keys and fields

Radio Config softkey, [256](#)

RadioConfig 1/2 Access softkey, [477](#)

RadioConfig 1/2 Traffic softkey, [477](#)

RadioConfig 3/4 Common Control softkey, [477](#)

RadioConfig 3/4 Enhanced Access softkey, [477](#)

RadioConfig 3/4 Traffic softkey, [477](#)

Ramp field, [485](#)

Ramp softkey, [177](#), [184](#), [191](#), [197](#)

Ramp Step field, [1035](#), [1051](#)

Ramp Time field, [486](#)

Random Seed Fixed Random softkey, [332](#)

Random softkey, [351](#), [359](#)

Ranging Code C/A P C/A+P softkey, [674](#)

Rate Full Half softkey, [794](#), [828](#)

Rate Match Attr field, [985](#), [1087](#), [1095](#)

Rate softkey, [255](#), [259](#)

RCDMA softkey, [101](#)

real response data, [10](#)

Real-time AWGN Off On softkey, [461](#)

real-time AWGN subsystem keys

 Bandwidth, [461](#)

 Real-time AWGN Off On, [461](#)

Real-time GPS Off On softkey, [676](#)

Real-time Noise, [307](#)

RECALL Reg softkey, [91](#)

Recall Secondary Frame State softkey

See DECT subsystem keys

See EDGE subsystem keys

See GSM subsystem keys

See NADC subsystem keys

See PDC subsystem keys

- Recall Secondary Frame State softkey (continued)*
 See PHS subsystem keys
 See TETRA subsystem keys
- Rectangle softkey
 See CDMA ARB subsystem keys
 See CDMA2000 ARB subsystem keys
 See CDMA2000 BBG subsystem keys and fields
 See custom subsystem keys
 See DECT subsystem keys
 See Dmodulation subsystem keys
 See EDGE subsystem keys
 See GPS subsystem keys
 See GSM subsystem keys
 See NADC subsystem keys
 See PDC subsystem keys
 See PHS subsystem keys
 See TETRA subsystem keys
 See wideband CDMA ARB subsystem keys
 See wideband CDMA base band generator subsystem keys and fields
- Ref Data Rate field, [988](#), [1019](#)
- Ref Oscillator Source Auto Off On softkey, [47](#)
- Ref Sensitivity softkey, [979](#)
- Reference Freq softkey, [475](#)
 See AWGN subsystem keys
 See bluetooth subsystem keys
 See CDMA ARB subsystem keys
 See CDMA2000 ARB subsystem keys
 See Dmodulation subsystem keys
 See dual ARB subsystem keys
 See multitone subsystem keys
 See wideband CDMA ARB subsystem keys
- Reference Out softkey, [409](#)
- Rename File, [121](#)
- Rename File softkey, [128](#)
- Reserved field, [502](#)
- Reset & Run softkey
 See CDMA ARB subsystem keys
 See CDMA2000 ARB subsystem keys
 See custom subsystem keys
 See DECT subsystem keys
 See Dmodulation subsystem keys
 See dual ARB subsystem keys
 See EDGE subsystem keys
 See GSM subsystem keys
- Reset & Run softkey (continued)*
 See NADC subsystem keys
 See PDC subsystem keys
 See PHS subsystem keys
 See TETRA subsystem keys
 See wideband CDMA ARB subsystem keys
- Reset RS-232 softkey, [79](#)
- Reset to Initial Power softkey, [1016](#)
- Resolution softkey, [414](#)
- resolving error messages/setting conflicts, [719](#)
- response data types. *See* SCPI commands response types
- Restore DECT Factory Default softkey, [582](#)
- Restore EDGE Factory Default softkey, [633](#)
- Restore Factory Default softkey, [688](#)
- Restore NADC Factory Default softkey, [790](#)
- Restore PDC Factory Default softkey, [825](#)
- Restore PHS Factory Default softkey, [862](#)
- Restore Sys Defaults softkey, [160](#)
- Restore TETRA Factory Default softkey, [901](#)
- Resync Limits softkey, [454](#)
- Retrigger Mode Off On softkey, [365](#)
- Reverse softkey, [229](#)
- Revert to Default Cal Settings softkey, [73](#)
- RF On/Off hardkey, [130](#)
- Right Alternate softkey, [351](#)
- Right softkey, [940](#)
- Rise Delay softkey
 See custom subsystem keys
 See DECT subsystem keys
 See EDGE subsystem keys
 See GSM subsystem keys
 See NADC subsystem keys
 See PDC subsystem keys
 See PHS subsystem keys
 See TETRA subsystem keys
- Rise Time softkey
 See custom subsystem keys
 See DECT subsystem keys
 See EDGE subsystem keys
 See GSM subsystem keys
 See NADC subsystem keys
 See PDC subsystem keys
 See PHS subsystem keys
 See TETRA subsystem keys

Index

- Rising softkey, [546](#)
- RMC 144 kbps (25.141 v3.9) softkey, [1053](#)
- RMC 384 kbps (25.141 v3.9) softkey, [1053](#)
- RMC 64 kbps (25.141 v3.9) softkey, [1053](#)
- RMC122 kbps (25.141 v3.9) softkey, [1053](#)
- RMS header info, [298](#)
- Root Nyquist softkey
 - See* CDMA ARB subsystem keys
 - See* CDMA2000 ARB subsystem keys
 - See* CDMA2000 BBG subsystem keys and fields
 - See* custom subsystem keys
 - See* DECT subsystem keys
 - See* Dmodulation subsystem keys
 - See* EDGE subsystem keys
 - See* GPS subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
 - See* wideband CDMA ARB subsystem keys
 - See* wideband CDMA base band generator subsystem keys and fields
- route subsystem keys
 - Burst Gate In Polarity Neg Pos, [131](#), [132](#)
 - Data Clock Out Neg Pos, [134](#)
 - Data Clock Polarity Neg Pos, [131](#), [133](#), [135](#)
 - Data Out Polarity Neg Pos, [134](#), [136](#)
 - Data Polarity Neg Pos, [132](#), [133](#)
 - DATA/CLK/SYNC Rear Outputs Off On, [136](#)
 - Symbol Sync Out Polarity Neg Pos, [135](#), [136](#)
 - Symbol Sync Polarity Neg Pos, [132](#), [133](#)
- RS-232 Baud Rate softkey, [79](#)
- RS-232 ECHO Off On softkeys, [79](#)
- RS-232 Timeout softkeys, [80](#)
- Run Complete Self Test softkey, [93](#)
- S**
- S softkey, [646](#), [705](#)
 - See* DECT subsystem keys
- SA softkey, [865](#), [886](#)
- SACCH softkey, [800](#), [804](#), [834](#), [838](#), [840](#)
- Sanitize softkey, [163](#)
- Satellite ID softkey, [676](#)
- Save Reg softkey, [92](#)
- Save Secondary Frame State softkey
 - See* DECT subsystem keys
 - See* EDGE subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
- Save Seq[n] Reg[nn] softkey, [92](#)
- Save Setup To Header softkey, [208](#), [222](#), [247](#), [277](#), [299](#), [321](#), [338](#), [465](#)
- Save User Preset softkey, [161](#)
- Scale to 0dB softkey
 - See* CDMA ARB subsystem keys
 - See* CDMA2000 ARB subsystem keys
 - See* CDMA2000 BBG subsystem keys and fields
 - See* wideband CDMA ARB subsystem keys
 - See* wideband CDMA base band generator subsystem keys and fields
- Scaling softkey, [311](#)
- SCCPCH softkey, [352](#), [353](#)
- SCFN field, [976](#), [1076](#)
- SCH slot-pulse (DRPS10) softkey, [964](#), [966](#), [967](#), [968](#), [969](#)
- SCPI
 - errors, [156](#)
- SCPI command subsystems
 - all, [460](#)
 - amplitude modulation, [174](#)
 - AWGN, [207](#)
 - AWGN real-time, [461](#)
 - bluetooth, [462](#)
 - calculate, [394](#)
 - calibration, [72](#)
 - CDMA ARB, [216](#)
 - CDMA2000 ARB, [242](#)
 - CDMA2000 BBG, [477](#)
 - communication, [75](#)
 - correction, [18](#)
 - custom, [548](#)
 - data, [404](#)
 - DECT, [571](#)
 - diagnostic, [81](#)
 - digital modulation, [20](#)
 - digital subsystem, [376](#)

SCPI command subsystems (*continued*)

- display, 85
- Dmodulation, 274
- Dual ARB, 297
- E4438C, 206
- EDGE, 623
- frequency, 37
- frequency modulation, 181
- GPS subsystem, 670
- GSM, 677
- HSDPA over W-CDMA, 717
- IEEE 488.2 common commands, 89
- input, 412, 418
- list/sweep, 48
- low frequency output, 188
- mass memory, 122
- memory, 94
- multitone, 321
- N5102A, 376
- NADC, 779
- output, 129
- PDC, 814
- phase modulation, 193
- PHS, 850
- power, 57
- pulse, 69
- pulse modulation, 201
- route, 131
- sense, 421
- status, 137
- system, 155
- TETRA, 889
- trigger, 168
- unit, 172
- wideband CDMA ARB, 333
- wideband CDMA base band generator, 934

SCPI commands

- command tree paths, 7
- parameter and response types, 7
- parameter types
 - boolean, 10
 - discrete, 9
 - extended numeric, 8
 - numeric, 8
 - string, 10

SCPI commands (*continued*)

- response data types
 - discrete, 11
 - integer, 10
 - numeric boolean, 11
 - real, 10
 - string, 11
- root command, 6
- SCPI softkey, 157, 159
- Scramble Code softkey, 351, 357, 359
- Scramble Off On softkey, 853, 893
- Scramble Offset softkey, 351, 359
- Scramble Seed softkey, 853, 892
- Scrambling Code field, 969, 970, 1068
- Screen Saver Delay
 - 1 hr softkey, 165
- Screen Saver Mode softkeys, 166
- Screen Saver Off On softkeys, 166
- Second DPDCH I Q softkey, 357
- Secondary Frame Off On softkey
 - See* DECT subsystem keys
 - See* EDGE subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
- secure wave directory, 114, 125
- security functions
 - erase, 162, 163
 - none, 163
 - overwrite, 163, 164
 - sanitize, 163, 165
 - secure display, 162
 - secure mode, 164
- Segment Advance softkey, 312
- Select File softkey, 252, 284
- Select Seq softkey, 91
- Select Waveform softkey, 318, 319
- sense subsystem keys
 - Adjust Gain, 433
 - Aux, 434, 451, 457
 - Aux I/O Trigger Polarity Pos Neg, 457
 - BER Mode Off On, 421, 425, 444
 - BERT Off On, 454

Index

sense subsystem keys (*continued*)

BERT Resync Off On, 454
Bit Count, 435, 437
Bit Delay Off On, 456
Block Count, 424, 426, 428, 440, 444
Block Erasure, 422, 427, 440, 441, 442, 444, 445
Bus, 434, 451, 457
Class Ib Bit Error, 448, 449
Class II Bit Error, 449
Cycle Count, 457
Delay Bits, 456
EDGE BERT Off On, 438
Error Count, 438, 455
Exceeds Any Thresholds, 449
Ext, 434, 451, 457
Ext Frame Trigger Delay, 423
External Frame Polarity Net Pos, 423
Frame Count, 443, 447
Frame Erasure, 449
Frame Trigger Source Int Ext, 424
GSM BERT Off On, 452
High Amplitude, 425, 429, 436
Immediate, 434, 451, 457
Initial Bit Count, 437
Initial Block Count, 427, 430
Initial Frame Count, 447
Low Amplitude, 426, 429, 436, 443
Measurement Mode BER% Search, 446
Measurement Mode BLER% Search, 432
No Thresholds, 422, 427, 442, 445, 449, 455
Pass Amplitude, 426, 430, 437
PN11, 453
PN15, 453
PN20, 453
PN23, 453
PN9, 453
Resync Limits, 454
Spcl Pattern 0's 1's, 452
Spcl Pattern Ignore Off On, 453
Spectrum Invert Off On, 433, 448
Stop Measurement, 432, 445
Sync Source BCH PDCH, 434
Sync Source BCH TCH, 451
Synchronize to BCH/PDCH, 433
Synchronize to BCH/TCH, 450

sense subsystem keys (*continued*)

Target BER %, 425, 428
Timeslot, 432, 446
Total Bits, 456
Trigger Key, 434, 451, 457
Uplink Timing Advance, 435, 452
SEQ softkey, 102
Set ALC Level softkey, 58
Set Atten softkey, 64
Set Marker Off All Points softkey, 303
setting conflicts, resolving, 719
setup sweep, 48
SF/2 softkey, 1072
SF2 softkey, 972
SFN reset-signal (DRPS5) softkey, 964, 966, 967,
968, 969
SFN RST Polarity softkey, 1069
SFN-CFN Frame Offset softkey, 1012
SHAPE softkey, 102
Signature field, 1052
Sine softkey
See amplitude modulation subsystem keys
See DECT subsystem keys
See EDGE subsystem keys
See frequency modulation subsystem keys
See GSM subsystem keys
See low frequency output subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See phase modulation subsystem keys
See PHS subsystem keys
See TETRA subsystem keys
Single softkey
See CDMA ARB subsystem keys
See CDMA2000 ARB subsystem keys
See custom subsystem keys
See DECT subsystem keys
See Dmodulation subsystem keys
See dual ARB subsystem keys
See EDGE subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See TETRA subsystem keys

Single softkey (continued)

See wideband CDMA ARB subsystem keys

Single Sweep softkey, 169

skew, 29, 30

skew, I/Q

adjustment, 29

Slot Format field, 941, 948, 996, 1007, 1025, 1031

softkey, 121

software options, 82

Source Module softkey, 61

Spcl Pattern 0's 1's softkey, 452

Spcl Pattern Ignore Off On softkey, 453

Spectrum Invert Off On softkey

See sense subsystem keys

Spread Rate 1 softkey, 250, 257, 265

Spread Rate 3, 257

Spread Rate 3 softkey, 250, 265

Spread Rate field, 510

Spreading Type Direct Mcarrier, 250

Spreading Type Direct Mcarrier softkey, 265

Spurious Response softkey, 979

Square softkey, 177, 184, 191, 197

square wave pulse rate

internally generated, 201

SR1 9 Channel softkey, 252

SR1 Pilot softkey, 252

SR3 Direct 9 Channel softkey, 252

SR3 Direct Pilot softkey, 252

SR3 Mcarrier 9 Channel softkey, 252

SR3 MCarrier Pilot softkey, 252

SS softkey, 697

SSB softkey, 912, 917

SSCH 2nd Scramble Group field, 970

SSCH Power field, 970

SSCH softkey, 352

SSCH State field, 971

Standard softkey, 351

Start Access Slot Position in 80ms Period field,
1037

Start Frequency softkey, 74

Start Sub-Channel# field, 1041

State field

See CDMA2000 BBG subsystem keys and fields

State softkey, 103, 122

STD softkey, 993

Step Dwell softkey, 55

Step Power field, 1016

Stop Frequency softkey, 74

Stop Measurement softkey

See sense subsystem keys

Store Custom CDMA State softkey, 233, 254, 258

Store Custom Dig Mod State softkey, 288

Store Custom Multicarrier softkey, 232, 252

Store Custom W-CDMA State softkey, 347, 350

Store To File softkey, 19, 121, 128, 329, 358

string response data, 11

string SCPI parameter, 10

strings, quote usage, 16

STS softkey, 912, 918

Sub Channel Timing (RPS17) softkey

See wideband CDMA base band generator
subsystem keys and fields

Subnet Mask softkey, 76

subsystems, SCPI commands

See SCPI command subsystems

Sum softkey, 23

Summing Ratio (SRC1/SRC2) x.xx dB softkey, 35

SW softkey, 835, 838, 840

Sweep Direction Down Up softkey, 49

Sweep Repeat Single Cont softkey, 168

Sweep Retrace Off On softkey, 53

sweep setup, 48

Sweep Type List Step softkey, 54

Swept-Sine softkey, 177, 184, 191, 197

Symbol Out Polarity Neg Pos softkey, 135

Symbol Rate field, 996, 1005, 1030

Symbol Rate softkey, 288, 351, 359, 660, 1025

Symbol Sync Out Polarity Neg Pos softkey, 136

Symbol Sync Polarity Neg Pos softkey, 132, 133

Symbol Timing Err softkey, 470

Sync Out Offset softkey, 615, 659, 708, 806, 842,
876, 925

SYNC softkey, 800, 804, 867

Sync softkey, 230, 707

Sync Source BCH PDCH softkey, 434

Sync Source BCH TCH softkey, 451

Sync Source SFN FCIk ESG softkey, 1070

Synchronize to BCH/PDCH softkey, 433

Synchronize to BCH/TCH softkey, 450

System ID field, 503

Index

system subsystem keys

8648A/B/C/D, [157](#), [159](#)
8656B,8657A/B, [157](#), [159](#)
8657D NADC, [157](#), [159](#)
8657D PDC, [157](#), [159](#)
8657J PHS, [157](#), [159](#)
Activate Secure Display, [162](#)
Enter Secure Mode, [164](#)
erase, [163](#)
Erase All, [162](#)
Erase and Overwrite All, [164](#)
Erase and Sanitize All, [165](#)
Error Info, [156](#)
Help Mode Single Cont, [157](#)
none, [163](#)
overwrite, [163](#)
PN9 Mode Preset, [160](#)
Power On Last Preset, [158](#)
Preset, [159](#)
Preset Normal User, [161](#)
Restore Sys Defaults, [160](#)
sanitize, [163](#)
Save User Preset, [161](#)
SCPI, [157](#), [159](#)
Screen Saver Delay
 1 hr, [165](#)
Screen Saver Mode, [166](#)
Screen Saver Off On, [166](#)
Time/Date, [155](#), [166](#)
View Next Error Message, [156](#)

T

T1 softkey, [656](#)
T2 softkey, [657](#)
Target BER % softkey
 See sense subsystem keys
TCH All softkey, [867](#)
TCH softkey, [867](#)
TCH/FS softkey, [642](#), [645](#), [699](#)
tDPCH Offset field, [949](#)
Test Model 1 w/16 DPCH softkey, [342](#), [347](#)
Test Model 1 w/32 DPCH softkey, [342](#), [347](#)
Test Model 1 w/64 DPCH softkey, [342](#), [347](#)
Test Model 2 softkey, [342](#), [347](#)
Test Model 3 w/16 DPCH softkey, [342](#), [347](#)

Test Model 3 w/32 DPCH softkey, [342](#), [347](#)
Test Model 4 softkey, [342](#), [347](#)
Test Model 5 w/2HSPDSCH softkey, [342](#), [347](#)
Test Model 5 w/4HSPDSCH softkey, [342](#), [347](#)
Test Model 5 w/8HSPDSCH softkey, [342](#), [347](#)
TETRA Off On softkey, [933](#)
TETRA softkey, [284](#), [285](#), [286](#)
TETRA subsystem keys
 128QAM, [906](#)
 16 1's & 16 0's, [900](#), [908](#), [910](#), [913](#), [914](#), [916](#), [918](#),
 [920](#), [921](#), [922](#), [923](#)
 16PSK, [906](#)
 16QAM, [906](#)
 256QAM, [906](#)
 2-Lvl FSK, [906](#)
 32 1's & 32 0's, [900](#), [908](#), [910](#), [913](#), [914](#), [916](#), [918](#),
 [920](#), [921](#), [922](#), [923](#)
 32QAM, [906](#)
 4 1's & 4 0's, [900](#), [908](#), [910](#), [913](#), [914](#), [916](#), [918](#),
 [920](#), [921](#), [922](#), [923](#)
 4-Lvl FSK, [906](#)
 4QAM, [906](#)
 64 1's & 64 0's, [900](#), [908](#), [910](#), [913](#), [914](#), [916](#), [918](#),
 [920](#), [921](#), [922](#), [923](#)
 64QAM, [906](#)
 8 1's & 8 0's, [900](#), [908](#), [910](#), [913](#), [914](#), [916](#), [918](#),
 [920](#), [921](#), [922](#), [923](#)
 8PSK, [906](#)
 All Timeslots, [924](#)
 APCO 25 C4FM, [903](#)
 B, [911](#), [917](#)
 B1, [909](#), [914](#)
 B2, [910](#), [915](#)
 BBG Data Clock Ext Int, [889](#)
 BBG Ref Ext Int, [902](#)
 Begin Frame, [924](#)
 Begin Timeslot #, [924](#), [926](#)
 BPSK, [906](#)
 Bus, [908](#), [930](#)
 Continuous, [928](#)
 D8PSK, [906](#)
 Data Format Pattern Framed, [899](#)
 Dn Custom Cont, [924](#)
 Dn Normal Cont, [924](#)
 Dn Normal Disc, [924](#)

TETRA subsystem keys (*continued*)

Dn Sync Cont, 924
Dn Sync Disc, 924
Ext, 900, 908, 910, 913, 914, 916, 918, 920, 921, 922, 923, 930
Ext BBG Ref Freq, 903
Ext Data Clock Normal Symbol, 902
Ext Delay Bits, 931
Ext Delay Off On, 931
Ext Polarity Neg Pos, 932
Fall Delay, 893, 894
Fall Time, 894, 895
FCOR, 912, 917
Filter Alpha, 889
Filter BbT, 890
FIX4, 900, 901, 908, 909, 910, 911, 913, 914, 916, 918, 920, 921, 922, 923
Free Run, 928
Freq Dev, 904
Gate Active Low High, 929
Gated, 928
Gaussian, 903
Gray Coded QPSK, 906
I/Q Scaling, 904
IS-95, 903
IS-95 Mod, 903
IS-95 Mod w/EQ, 903
IS-95 OQPSK, 906
IS-95 QPSK, 906
IS-95 w/EQ, 903
MSK, 906
Nyquist, 903
Optimize FIR For EVM ACP, 899
OQPSK, 906
 $\pi/4$ DQPSK, 906
Patt Trig In 1, 933
Patt Trig In 2, 933
Phase Dev, 905
Phase Polarity Normal Invert, 907
PN11, 900, 908, 910, 913, 914, 916, 918, 920, 921, 922, 923
PN15, 900, 908, 910, 913, 914, 916, 918, 920, 921, 922, 923
PN20, 900, 908, 910, 913, 914, 916, 918, 920, 921, 922, 923

TETRA subsystem keys (*continued*)

PN23, 900, 908, 910, 913, 914, 916, 918, 920, 921, 922, 923
PN9, 900, 908, 910, 913, 914, 916, 918, 920, 921, 922, 923
PN9 Mode Normal Quick, 892
QPSK, 906
Recall Secondary Frame State, 907
Rectangle, 903
Reset & Run, 928
Restore TETRA Factory Default, 901
Rise Delay, 896
Rise Time, 897, 898
Root Nyquist, 903
Save Secondary Frame State, 907
Scramble Off On, 893
Scramble Seed, 892
Secondary Frame Off On, 908
Sine, 898
Single, 928
SSB, 912, 917
STS, 912, 918
Symbol Rate, 926
Sync Out Offset, 925
TETRA Off On, 933
Timeslot Ampl Main Delta, 919
Timeslot Off On, 919
Trigger & Run, 928
Trigger Key, 908, 930
TS, 910, 915, 919, 920, 922
UN3/4 GSM Gaussian, 903
Up Control 1, 924
Up Control 2, 924
Up Custom, 924
Up Normal, 924
User File, 898, 900, 908, 910, 913, 914, 916, 918, 920, 921, 922, 923
User FIR, 903
User FSK, 905, 906
User I/Q, 906
tetra subsystem keys
PRAM Files, 900
TFCI Field Off On softkey, 351, 356, 359, 361
TFCI Pat field, 949
TFCI Pattern field, 997, 1026

Index

- TFCI State field, [998](#), [1027](#)
- Tfirst field, [942](#)
- TGCFN field, [972](#), [1071](#)
- TGD field, [973](#), [1072](#)
- Tgl field, [942](#)
- TGL1 field, [973](#), [1073](#)
- TGL2 field, [973](#), [1073](#), [1074](#)
- TGPL1 field, [974](#), [1073](#)
- TGPRC field, [1075](#)
- TGPS Inactive Active softkey, [1075](#)
- TGSN field, [975](#), [1076](#)
- Through softkey, [31](#), [207](#), [210](#), [219](#), [224](#), [244](#), [249](#),
[274](#), [279](#), [300](#), [302](#), [322](#), [324](#), [338](#), [340](#), [464](#), [471](#)
- Time field, [503](#)
- Time/Date softkey, [155](#), [166](#)
- Timeslot Ampl Main Delta softkey
 - See* DECT subsystem keys
 - See* EDGE subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
- Timeslot Off On softkey
 - See* DECT subsystem keys
 - See* EDGE subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
- Timeslot Offset softkey, [1041](#)
- Timeslot softkey
 - See* sense subsystem keys
- Timeslot Type softkey, [888](#)
- Timing Offset softkey, [1042](#), [1069](#), [1079](#)
- tOCNS Offset field, [956](#)
- Toggle Marker 1 softkey, [312](#)
- Toggle State softkey, [328](#), [330](#)
- Total Bits field, [1083](#)
- Total Bits softkey, [456](#)
- Total Block field, [1085](#)
- TotalPwr field, [991](#), [1022](#)
- TPC Pat Steps field, [998](#)
- TPC Pat Trig Polarity Neg Pos softkey, [1000](#)
- TPC Pattern field, [1000](#)
- TPC Steps field, [950](#)
- TPC UserFile Trig field, [1001](#)
- Tp-m field, [1043](#)
- Tp-p field, [1044](#)
- Traffic Bearer softkey, [588](#), [600](#)
- Traffic Bearer with Z field softkey, [588](#), [600](#)
- Traffic softkey, [230](#)
- Transp Chan A softkey, [945](#)
- Transp Chan B softkey, [945](#)
- Transp Position Flexible Fixed softkey, [985](#)
- Transport CH softkey, [957](#)
- TrCH BER field, [1006](#)
- TrCh BlkSize 168 softkey, [1040](#)
- TrCh BlkSize 360 softkey, [1040](#)
- TrCH State Off On softkey, [1096](#)
- TrCHI State Off On softkey, [986](#)
- Triangle softkey, [177](#), [184](#), [191](#), [197](#)
- Trigger & Run softkey
 - See* CDMA ARB subsystem keys
 - See* CDMA2000 ARB subsystem keys
 - See* custom subsystem keys
 - See* DECT subsystem keys
 - See* Dmodulation subsystem keys
 - See* dual ARB subsystem keys
 - See* EDGE subsystem keys
 - See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
 - See* wideband CDMA ARB subsystem keys
- Trigger Advance field, [546](#)
- Trigger In Polarity Neg Pos softkey, [170](#)
- Trigger Key softkey
 - list/sweep subsystem, [53](#)
 - See* amplitude modulation subsystem keys
 - See* CDMA ARB subsystem keys
 - See* CDMA2000 ARB subsystem keys
 - See* DECT subsystem keys
 - See* Dmodulation subsystem keys
 - See* dual ARB subsystem keys
 - See* EDGE subsystem keys
 - See* frequency modulation subsystem keys
 - See* GSM subsystem keys
 - See* low frequency output subsystem keys
 - See* NADC subsystem keys

- Trigger Key softkey (continued)*
See PDC subsystem keys
See phase modulation subsystem keys
See PHS subsystem keys
See sense subsystem keys
See TETRA subsystem keys
See trigger subsystem keys
See wideband CDMA ARB subsystem keys
- Trigger Out Polarity Neg Pos softkey, [169](#)
trigger source, list sweep, [53](#)
trigger subsystem keys
 Bus, [170](#), [546](#)
 Ext, [170](#), [546](#)
 Free Run, [170](#), [546](#)
 Single Sweep, [169](#)
 Sweep Repeat Single Cont, [168](#)
 Trigger In Polarity Neg Pos, [170](#)
 Trigger Key, [170](#), [546](#)
 Trigger Out Polarity Neg Pos, [169](#)
- Trigger Sync Reply (RPS7) softkey
See wideband CDMA base band generator
 subsystem keys and fields
- Truncated PN9 softkey, [463](#)
- TS softkey, [707](#), [910](#), [915](#), [919](#), [920](#), [922](#)
- TSC0 softkey, [646](#), [657](#), [698](#), [705](#)
- TSC1 softkey, [646](#), [657](#), [698](#), [705](#)
- TSC2 softkey, [646](#), [657](#), [698](#), [705](#)
- TSC3 softkey, [646](#), [657](#), [698](#), [705](#)
- TSC4 softkey, [646](#), [657](#), [698](#), [705](#)
- TSC5 softkey, [646](#), [657](#), [698](#), [705](#)
- TSC6 softkey, [646](#), [657](#), [698](#), [705](#)
- TSC7, [646](#), [698](#), [705](#)
- TSC7 softkey, [646](#), [657](#), [698](#), [705](#)
- TTI field, [986](#), [1046](#), [1088](#), [1096](#)
- TTI Frame Clock (RPS9) softkey
See wideband CDMA base band generator
 subsystem keys and fields
- Turbo Coding field, [497](#), [544](#)
- Turbo softkey, [982](#), [983](#), [1081](#)
- Type softkey, [351](#), [359](#)
- U**
- UDI 64 kbps softkey, [1053](#)
- UDI ISDN (25.101 v3.5) softkey, [947](#)
- UN3/4 GSM Gaussian softkey
See CDMA ARB subsystem keys
See CDMA2000 ARB subsystem keys
See CDMA2000 BBG subsystem keys and fields
See custom subsystem keys
See DECT subsystem keys
See Dmodulation subsystem keys
See EDGE subsystem keys
See GPS subsystem keys
See GSM subsystem keys
See NADC subsystem keys
See PDC subsystem keys
See PHS subsystem keys
See TETRA subsystem keys
See wideband CDMA ARB subsystem keys
See wideband CDMA base band generator
 subsystem keys and fields
- Uncoded softkey, [648](#)
- unit subsystem keys
 dBm, [172](#)
 dBuV, [172](#)
 dBuVemf, [172](#)
 mV, [172](#)
 mVemf, [172](#)
 uV, [172](#)
 uVemf, [172](#)
- unprotected
 memory subsystem, [114](#), [125](#)
- unspecified RMS, [298](#)
- Up Control 1 softkey, [924](#)
- Up Control 2 softkey, [924](#)
- Up Custom softkey, [805](#), [841](#), [924](#)
- Up Normal softkey, [924](#)
- Up TCH All softkey, [805](#), [841](#)
- Up TCH softkey, [805](#), [841](#)
- Up VOX softkey, [841](#)
- Up/Down softkey, [950](#), [999](#)
- Update Display Cycle End Cont softkey, [403](#)
- Update in Remote Off On softkey, [88](#)
- Uplink MCS-1 softkey, [642](#), [645](#), [699](#)
- Uplink MCS-5 softkey, [648](#)
- Uplink MCS-9 softkey, [648](#)
- Uplink Timing Advance softkey
See sense subsystem keys
- uploading files, [114](#), [125](#)

Index

User File softkey

- See* CDMA2000 BBG subsystem keys and fields
- See* custom subsystem keys
- See* DECT subsystem keys
- See* EDGE subsystem keys
- See* GPS subsystem keys
- See* GSM subsystem keys
- See* NADC subsystem keys
- See* PDC subsystem keys
- See* PHS subsystem keys
- See* TETRA subsystem keys
- See* wideband CDMA base band generator subsystem keys and fields

user files, HSDPA, [717](#)

User FIR softkey

- See* CDMA ARB subsystem keys
- See* CDMA2000 ARB subsystem keys
- See* CDMA2000 BBG subsystem keys and fields
- See* custom subsystem keys
- See* DECT subsystem keys
- See* Dmodulation subsystem keys
- See* EDGE subsystem keys
- See* GPS subsystem keys
- See* GSM subsystem keys
- See* NADC subsystem keys
- See* PDC subsystem keys
- See* PHS subsystem keys
- See* TETRA subsystem keys
- See* wideband CDMA ARB subsystem keys
- See* wideband CDMA base band generator subsystem keys and fields

User Flatness softkey, [103](#), [122](#)

User FSK softkey

- See* custom subsystem keys
- See* DECT subsystem keys
- See* EDGE subsystem keys
- See* GSM subsystem keys
- See* NADC subsystem keys
- See* PDC subsystem keys
- See* PHS subsystem keys
- See* TETRA subsystem keys

User I/Q softkey

- See* custom subsystem keys
- See* DECT subsystem keys
- See* EDGE subsystem keys

User I/Q softkey (continued)

- See* GSM subsystem keys
 - See* NADC subsystem keys
 - See* PDC subsystem keys
 - See* PHS subsystem keys
 - See* TETRA subsystem keys
- uV softkey, [172](#)
uVemf softkey, [172](#)
UW softkey, [864](#), [865](#), [885](#), [886](#)
UWCDMA softkey, [104](#)

V

View Next Error Message softkey, [156](#)

W

Walsh Code softkey, [255](#), [259](#)

Walsh field

- See* CDMA2000 BBG subsystem keys and fields
- Waveform Length softkey, [213](#), [240](#)
Waveform Licenses softkey, [83](#)
Waveform Runtime Scaling softkey, [311](#)
waveform, creating a multitone, [321](#)
W-CDMA Off On softkey, [373](#), [1096](#)

WCDMA softkey

- See* CDMA ARB subsystem keys
 - See* CDMA2000 ARB subsystem keys
 - See* Dmodulation subsystem keys
 - See* wideband CDMA ARB subsystem keys
- wideband CDMA ARB subsystem keys
- 1 DPCH, [342](#), [347](#)
 - 2 Carriers, [343](#)
 - 2.100 MHz, [340](#)
 - 3 Carriers, [343](#)
 - 3 DPCH, [342](#), [347](#)
 - 4 Carriers, [343](#)
 - 40.000 MHz, [338](#), [340](#)
 - APCO 25 C4FM, [336](#)
 - Apply Channel Setup, [350](#), [359](#)
 - ARB Reference Ext Int, [364](#)
 - ARB Sample Clock, [366](#)
 - Bus, [369](#)
 - Channel, [351](#), [359](#)
 - Chip Rate, [335](#)
 - Clear Header, [338](#)

- wideband CDMA ARB subsystem keys (*continued*)
- Clip |I| To, 333, 345
 - Clip |Q| To, 334, 345
 - Clip At PRE POST FIR Filter, 333
 - Clip Type |I+jQ| To, 335, 346
 - Clipping Type |I+jQ| |I|,|Q|, 334, 346
 - Continuous, 366
 - Custom WCDMA State, 357
 - DPCCH, 357
 - DPCCH + 1 DPDCH, 357
 - DPCCH + 2 DPDCH, 357
 - DPCCH + 3 DPDCH, 357
 - DPCCH + 4 DPDCH, 357
 - DPCCH + 5 DPDCH, 357
 - DPCH, 352
 - Equal Energy per Symbol, 356
 - Ext Delay Off On, 371
 - Ext Delay Time, 370
 - Ext Key, 369
 - Ext Polarity Neg Pos, 372
 - Filter Alpha, 336
 - Filter BbT, 337
 - First Spread Code, 351, 359
 - Free Run, 368
 - Gain Unit dB Lin Index, 360
 - Gate Active Low High, 369
 - Gated, 366
 - Gaussian, 336
 - I/Q Mapping Norma Invert, 339
 - I/Q Mod Filter Manual Auto, 341
 - I/Q Output Filter Manual Auto, 338
 - Increment Scramble Code, 346
 - Increment Timing Offset, 349
 - IS-2000 SR3 DS, 336
 - IS-95, 336
 - IS-95 Mod, 336
 - IS-95 Mod w/EQ, 336
 - IS-95 w/EQ, 336
 - Left Alternate, 351
 - Link Down Up, 341
 - Marker 1, 361, 362
 - Marker 1 Polarity Neg Pos, 362
 - Marker 2, 361, 362
 - Marker 2 Polarity Neg Pos, 363
 - Marker 3, 361, 362
- wideband CDMA ARB subsystem keys (*continued*)
- Marker 3 Polarity Neg Pos, 363
 - Marker 4, 361, 362
 - Marker 4 Polarity Neg Pos, 363
 - Modulator Atten Manual Auto, 339, 340
 - None, 361, 362
 - Nyquist, 336
 - OCNS, 352
 - Optimize ACP ADJ ALT, 342, 356
 - Optimize FIR For EVM ACP, 337
 - Patt Trig In 1, 372
 - Patt Trig In 2, 372
 - PCCPCH + SCH, 342, 347
 - PCCPCH + SCH + 1 DPCH, 342, 347
 - PCCPCH + SCH + 3 DPCH, 342, 347
 - PICH, 352
 - Power, 359
 - PPCCPCH, 352, 353
 - PSCH, 352
 - Random, 351, 359
 - Rectangle, 336
 - Reference Freq, 364
 - Reset & Run, 368
 - Retrigger Mode Off On, 365
 - Right Alternate, 351
 - Root Nyquist, 336
 - Save Setup To Header, 338
 - Scale to 0dB, 356
 - SCCPCH, 352, 353
 - Scramble Code, 351, 357, 359
 - Scramble Offset, 351, 359
 - Second DPDCH I Q, 357
 - Single, 366
 - SSCH, 352
 - Standard, 351
 - Store Custom W-CDMA State, 347, 350
 - Store To File, 358
 - Symbol Rate, 351, 359
 - Test Model 1 w/16 DPCH, 342, 347
 - Test Model 1 w/32 DPPCH, 342, 347
 - Test Model 1 w/64 DPCH, 342, 347
 - Test Model 2, 342, 347
 - Test Model 3 w/16 DPCH, 342, 347
 - Test Model 3 w/32 DPCH, 342, 347
 - Test Model 4, 342, 347

Index

wideband CDMA ARB subsystem keys (*continued*)

Test Model 5 w/2HSPDSCH, [342](#), [347](#)
Test Model 5 w/4HSPDSCH, [342](#), [347](#)
Test Model 5 w/8HSPDSCH, [342](#), [347](#)
TFCI Field Off On, [351](#), [356](#), [359](#), [361](#)
Through, [338](#), [340](#)
Trigger & Run, [368](#)
Trigger Key, [369](#)
Type, [351](#), [359](#)
UN3/4 GSM Gaussian, [336](#)
User FIR, [336](#)
WCDMA, [336](#)
W-CDMA Off On, [373](#)

wideband CDMA base band generator subsystem

keys and fields

of Blocks, [984](#)
1/2 Conv, [982](#), [983](#), [1081](#)
1/3 Conv, [982](#), [983](#), [1081](#)
10 msec, [1009](#)
10ms Frame Pulse (DRPS11), [964](#), [966](#), [967](#), [968](#),
[969](#)
10ms Frame Pulse (RPS6), [1062](#), [1064](#), [1065](#),
[1066](#), [1067](#), [1068](#)
12.2 kbps (34.121 v3.8), [947](#)
144 kbps (34.121 v3.8), [947](#)
20 msec, [1009](#)
2560 msec, [1009](#)
2nd Scr Offset, [948](#), [955](#)
3.84MHz chip-clk (DRPS4), [964](#), [966](#), [967](#), [968](#),
[969](#)
384 kbps (34.121 v3.8), [947](#)
40 msec, [1009](#)
64 kbps (34.121 v3.8), [947](#)
80 msec, [1009](#)
80ms Frame Pulse (DRPS13), [964](#), [966](#), [967](#), [968](#),
[969](#)
80ms Frame Pulse (RPS20), [1062](#), [1064](#), [1065](#),
[1066](#), [1067](#), [1068](#)
A, [939](#)
ACS, [979](#)
Active, [975](#)
Actual BER, [1091](#)
Actual BLER, [1084](#), [1092](#)
AICH, [1046](#)
AICH Trigger Polarity Pos Neg, [1018](#)

wideband CDMA base band generator subsystem

keys and fields (*continued*)

All Down, [950](#), [999](#)
All Up, [950](#), [999](#)
Alt power in, [1060](#)
AMR 12.2 kbps, [947](#), [1053](#)
APCO 25 C4FM, [951](#), [1010](#)
Apply Channel Setup, [935](#), [987](#)
B, [939](#)
Base Delay Tp-a, [1042](#)
BBG Chip Clock Ext Int, [934](#)
BBG Data Clock Ext In, [938](#)
BER, [1084](#), [1086](#), [1092](#), [1094](#)
Beta, [992](#), [1002](#)
BLER, [1085](#), [1086](#), [1093](#), [1094](#)
Blk Set Size, [981](#)
Blk Size, [980](#), [1080](#), [1089](#)
Blocking, [979](#)
Burst gate in, [1060](#)
C Power, [988](#)
C Power value, [1019](#)
C/N value, [935](#), [988](#), [1019](#)
CFN #0 Frame Pulse (RPS10), [1055](#)
Chan Code, [944](#), [945](#), [954](#)
Channel Code, [959](#), [993](#), [1003](#), [1047](#), [1048](#)
Channel Code field, [958](#)
Channel State, [1002](#), [1009](#)
Channel State Off On, [938](#), [942](#), [943](#), [944](#), [951](#),
[953](#), [956](#), [957](#), [959](#), [961](#), [969](#), [991](#), [1022](#), [1081](#),
[1088](#), [1089](#)
ChCode Ctl, [1035](#)
ChCode Dat, [1036](#)
Chip Clock (RPS1), [1055](#), [1062](#), [1064](#), [1065](#),
[1066](#), [1067](#), [1068](#)
Chip Rate, [943](#), [992](#)
Comp Mode Start Trigger Polarity Neg Pos, [1078](#)
Comp Mode Start Trigger Polarity Pos Neg, [977](#),
[978](#)
Comp Mode Stop Trigger Polarity Neg Pos, [1078](#)
Comp Mode Stop Trigger Polarity Pos Neg, [978](#)
Compressed Mode Off On, [1077](#)
Compressed Mode Start Trigger, [953](#), [977](#), [1077](#)
Compressed Mode Stop Trigger, [977](#), [1078](#)
CRC Size, [982](#), [1082](#), [1090](#)
Ctrl Beta, [1023](#)

- wideband CDMA base band generator subsystem
keys and fields (*continued*)
Ctrl Pwr, 1024
Data, 1004
Data Beta, 1027
Data field, 1094
Data Pwr, 1029
Data Rate, 955
DCH1, 990
DCH2, 990
DCH3, 990
DCH4, 990
DCH5, 990
DCH6, 990
DL Reference 1.1, 1076
DL Reference 1.2, 1076
DL Reference 2.1, 1076
DL Reference 2.2, 1076
Down/Up, 950, 999
DPCCH, 990, 1013
DPCCH Pilot data-clk (DRPS23), 964, 966, 967,
968, 969
DPCCH Power, 996
DPCCH Raw Data (RPS4), 1055
DPCCH Raw Data Clock (RPS5), 1055
DPCCH TFCI data-clk (DRPS22), 964, 966, 967,
968, 969
DPCCH TPC indicator (DRPS21), 964, 966, 967,
968, 969
DPCH + 1, 936, 937
DPCH + 2, 936, 937
DPCH 10ms Frame-Pulse (DRPS26), 964, 966,
967, 968, 969
DPCH Channel Balance, 944
DPCH Compressed Frame Indicator (DRPS32),
964, 966, 967, 968, 969
DPCH data stream (DRPS24), 964, 966, 967, 968,
969
DPCH data-clk (0) (DRPS28), 964, 966, 967, 968,
969
DPCH Gap Indicator (DRPS33), 964, 966, 967,
968, 969
DPCH TimeSlot pulse (DRPS25), 964, 966, 967,
968, 969
DPDCH, 990
- wideband CDMA base band generator subsystem
keys and fields (*continued*)
DPDCH data-clk withDTX (DRPS20), 964, 966,
967, 968, 969
DPDCH data-clk WithOutDTX (DRPS30), 964,
966, 967, 968, 969
DPDCH Power, 1005
DPDCH Raw Data (RPS2), 1055
DPDCH Raw Data Clock (RPS3), 1055
Eb/No, 1020
Eb/No value (dB), 989
Ec/No value, 936, 1020
Equal Powers, 957, 1013
Error BER, 1091
Error Bits, 1083
Error Blocks, 1084
Ext, 950
Ext Clock Rate x1 x2 x4, 934
FBI State, 995
Filter Alpha, 952, 1011
Filter BbT, 952, 1012
FIX, 995
FIX4, 946, 957, 958, 959, 960, 983, 984, 994,
1004, 1023, 1024, 1026, 1028, 1086, 1090
Flat Noise BW, 990
Frame Clock Polarity Neg Pos, 1010
Frame Struct, 971
Frame Sync Trigger Mode Single Cont, 1070
Gaussian, 951, 1010
Higher Layer, 1072
Infinity, 975, 1075
Init Power, 1014
Init Pwr, 1034, 1050
Intermod, 979
IS-95, 951, 1010
IS-95 Mod, 951, 1010
IS-95 Mod w/EQ, 951, 1010
IS-95 w/EQ, 1010
Left, 940
Link Down Up, 987
Max Input, 979
Max Power, 1015
Max Pwr, 1034, 1050
Message Data Raw Data (RPS11), 1062, 1064,
1065, 1066, 1067, 1068

Index

wideband CDMA base band generator subsystem
 keys and fields (*continued*)
 Message Part, [1033](#)
 Message Pulse (RPS22), [1062](#), [1064](#), [1065](#), [1066](#),
 [1067](#), [1068](#)
 Message-Control Raw Data (RPS13), [1064](#), [1065](#),
 [1066](#), [1067](#), [1068](#)
 Message-Control Raw Data Clock (RPS12), [1062](#),
 [1064](#), [1065](#), [1066](#), [1067](#), [1068](#)
 Min Power, [1015](#)
 Msg Ctrl, [1021](#)
 Msg Data, [1021](#)
 Msg Pwr, [1032](#), [1049](#)
 N Power, [991](#), [1021](#)
 NONE, [1081](#)
 None, [982](#), [983](#), [1086](#), [1094](#)
 NONE (RPS0), [1055](#), [1062](#), [1064](#), [1065](#), [1066](#),
 [1067](#), [1068](#)
 Normal, [940](#)
 Num of Blk, [1087](#), [1095](#)
 Num of Pre, [1034](#), [1050](#)
 Number of AICH, [1018](#)
 Number of PRACH, [1047](#), [1049](#)
 Number of PRACH 80ms, [1033](#)
 Number of Preamble, [1050](#)
 Nyquist, [951](#), [1010](#)
 Off, [1046](#)
 Omitted, [974](#), [1074](#)
 On, [1046](#)
 On/Off, [956](#), [1038](#)
 OpenLoop Ant1, [980](#)
 OpenLoop Ant1 SCH TSTD OFF, [980](#)
 OpenLoop Ant2, [980](#)
 OpenLoop Ant2 SCH TSTD OFF, [980](#)
 Optimize FIR For EVM ACP, [953](#), [1012](#)
 Paging Indicator, [960](#)
 Pattern trigger in 1, [1061](#)
 Pattern trigger in 2, [1061](#)
 PCCPCH, [936](#), [937](#)
 P-CCPCH data (DRPS39), [964](#), [966](#), [967](#), [968](#),
 [969](#)
 P-CCPCH data-clk (DRPS38), [964](#), [966](#), [967](#), [968](#),
 [969](#)
 Performance Req, [979](#)
 Phase Polarity Normal Invert, [961](#)

wideband CDMA base band generator subsystem
 keys and fields (*continued*)
 Phase Polarity Normal Inverted, [987](#)
 PI Bits, [960](#)
 PICH, [936](#), [937](#)
 PICH 10ms FramePulse (DRPS37), [964](#), [966](#), [967](#),
 [968](#), [969](#)
 PICH data (DRPS35), [964](#), [966](#), [967](#), [968](#), [969](#)
 PICH data-clk (DRPS34), [964](#), [966](#), [967](#), [968](#), [969](#)
 PICH TimeSlot Pulse (DRPS36), [964](#), [966](#), [967](#),
 [968](#), [969](#)
 Playback Ratio, [940](#)
 PN15, [938](#), [945](#), [954](#), [957](#), [959](#), [993](#), [994](#), [997](#), [999](#),
 [1004](#), [1023](#), [1026](#), [1028](#)
 PN9, [938](#), [945](#), [954](#), [957](#), [959](#), [983](#), [993](#), [994](#), [997](#),
 [999](#), [1004](#), [1023](#), [1026](#), [1028](#), [1082](#), [1090](#)
 Power, [940](#), [943](#), [946](#), [954](#), [958](#), [961](#), [962](#)
 Power Control Signal Polarity Neg Pos, [1017](#)
 Power Hold Off On, [1014](#)
 Power Mode Norm TPC, [1017](#)
 Pp-m, [1035](#), [1052](#)
 PRACH, [1013](#)
 PRACH Mode Single Multi, [1032](#)
 PRACH Power Setup Mode Pp-m Total, [1039](#)
 PRACH Processing (RPS19), [1062](#), [1064](#), [1065](#),
 [1066](#), [1067](#), [1068](#)
 PRACH Scrambling Code, [1040](#)
 PRACH Trigger, [1044](#)
 PRACH Trigger Polarity Neg Pos, [1045](#)
 PRACH Trigger Source Immedi Trigger, [1045](#)
 Pre Sig, [1036](#)
 Preamble, [1021](#)
 Preamble power average, [1038](#)
 Preamble Pulse (RPS21), [1062](#), [1064](#), [1065](#), [1066](#),
 [1067](#), [1068](#)
 Preamble Raw Data (RPS15), [1062](#), [1064](#), [1065](#),
 [1066](#), [1067](#), [1068](#)
 Preamble Raw Data Clock (RPS16), [1062](#), [1064](#),
 [1065](#), [1066](#), [1067](#), [1068](#)
 PSCH State, [962](#)
 Puncture, [972](#), [1087](#), [1095](#)
 PwrOffs, [971](#), [1071](#)
 RACH TrCH, [1021](#)
 Ramp Step, [1035](#), [1051](#)
 Rate Match Attr, [985](#), [1087](#), [1095](#)

- wideband CDMA base band generator subsystem
 keys and fields (*continued*)
 Rectangle, 951, 1010
 Ref Data Rate, 988, 1019
 Ref Sensitivity, 979
 Reset to Initial Power, 1016
 Right, 940
 RMC 144 kbps (25.141 v3.9), 1053
 RMC 384 kbps (25.141 v3.9), 1053
 RMC 64 kbps (25.141 v3.9), 1053
 RMC122 kbps (25.141 v3.9), 1053
 Root Nyquist, 951, 1010
 Scale to 0dB, 957, 1013
 SCFN, 976, 1076
 SCH slot-pulse (DRPS10), 964, 966, 967, 968, 969
 Scrambling Code, 969, 970, 1068
 SF/2, 1072
 SF2, 972
 SFN reset-signal (DRPS5), 964, 966, 967, 968, 969
 SFN RST Polarity, 1069
 SFN-CFN Frame Offset, 1012
 Signature, 1052
 Slot Format, 941, 948, 996, 1007, 1025, 1031
 Spurious Response, 979
 SSCH 2nd Scramble Group, 970
 SSCH Power, 970
 SSCH State, 971
 Start Access Slot Position in 80ms Period, 1037
 Start Sub-Channel#, 1041
 STD, 993
 Step Power, 1016
 Sub Channel Timing (RPS17), 1062, 1064, 1065, 1066, 1067, 1068
 Symbol Rate, 996, 1005, 1025, 1030
 Sync Source SFN FCk ESG, 1070
 tDPCH Offset, 949
 TFCI Pat, 949
 TFCI Pattern, 997, 1026
 TFCI State, 998, 1027
 Tfirst, 942
 TGCFN, 972, 1071
 TGD, 973, 1072
 Tgl, 942
- wideband CDMA base band generator subsystem
 keys and fields (*continued*)
 TGL1, 973, 1073
 TGL2, 973, 1073
 TGPL1, 974, 1073
 TGPL2, 1074
 TGPRC, 1075
 TGPS Inactive Active, 1075
 TGSN, 975, 1076
 Timeslot Offset, 1041
 Timing Offset, 1042, 1069, 1079
 tOCNS Offset, 956
 Total Bits, 1083
 Total Blocks, 1085
 TotalPwr, 991, 1022
 TPC Pat Steps, 998
 TPC Pat Trig Polarity Neg Pos, 1000
 TPC Pattern, 1000
 TPC Steps, 950
 TPC UserFile Trig, 1001
 Tp-m, 1043
 Tp-p, 1044
 Transp Chan A, 945
 Transp Chan B, 945
 Transp Position Flexible Fixed, 985
 Transport CH, 957
 TrCH BER, 1006
 TrCh BlkSize 168, 1040
 TrCh BlkSize 360, 1040
 TrCH State Off On, 986, 1096
 Trigger Sync Reply (RPS7), 1062, 1064, 1065, 1066, 1067, 1068
 TTI, 986, 1046, 1088, 1096
 TTI Frame Clock (RPS9), 1055
 Turbo, 982, 983, 1081
 UDI 64 kbps, 1053
 UDI ISDN (25.101 v3.5), 947
 UN3/4 GSM Gaussian, 951
 Up/Down, 950, 999
 User File, 945, 950, 957, 959, 983, 993, 994, 997, 1004, 1023, 1026, 1028, 1082, 1090
 User FIR, 951, 1010
 W-CDMA Off On, 1096

