Tune-Up Procedure

Tune-Up TX

Content

1 Purpose

This panel gives the possibility to manage the mobile in the transmit mode. This window includes both:

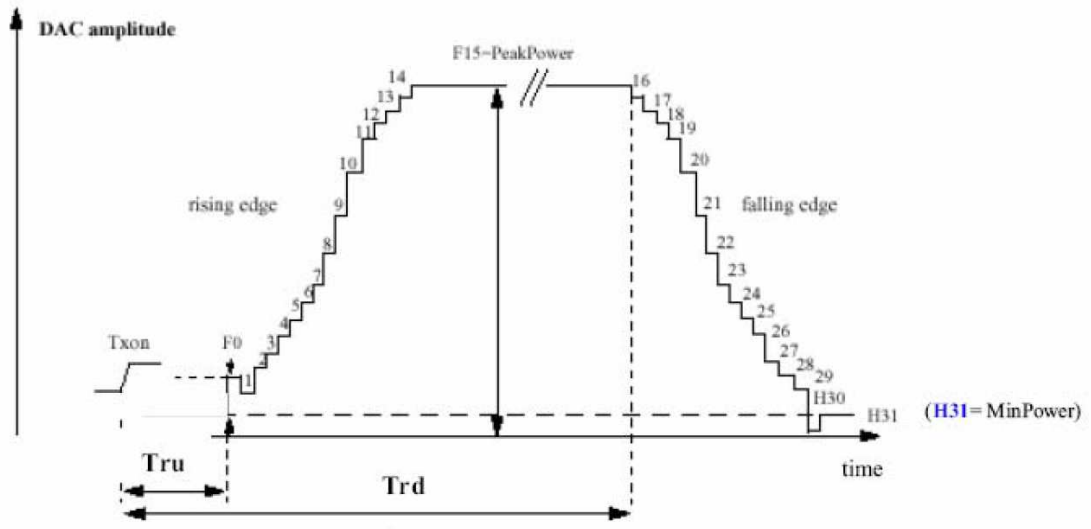
-all the parameters (frequency band, RF channel, RF level to get the desire antenna output power…) the user needs to make the mobile transmitting,
- all the parameters needed to define a transmit burst,
-all the compensation table to be able to align the mobile in production.

This Tx commands user guide is describing:
- the characteristics of the transmit burst,
- all the parameters used in the transmit mode,
- the operating mode to make the mobile transmitting

2 General description

2.1 Characteristics of the transmit burst

The power levels and the shape of a transmit burst are controlled by the power amplifier controller integrated in the MT6166. The burst is generated by a 10-bits DAC from the MT6166 as shown below: The ramping shape is referenced with the rising edge of Tx-ON (from the Baseband).There are two types of parameters define the transmit burst: the first one define the shapes of the burst, and the second one define the temporal position of the burst. The rising and the falling edge of the transmit burst are determined by a set of 32 DAC code values n = 0 … 31.



Tru = TxTRUDefault + △ TRU_P + △ TRU_T
Trd = TxTRD_NBDefault + △ TRD_P (for a normal burst).
Trd = TxTRD_ABDefault + △ TRD_P (for an access burst).

3 Parameters

F(n) are values coming from the DAC to shape the transmit burst. Some F(n) values have a corresponding parameter used in the TAT to align the mobiles.
Parameter used in TAT = [F(n)].

3.1 Parameters used to shape the burst

-H0 = [F(1)] controls the rate at which energy is given to the control loop at the beginning of the ramp. This energy is needed to bring the PA system control in a closed loop. This is the second code coming from the VC5268 DAC.
-PeakPow = [F(15)] corresponds to the peak power of the transmit burst.
-H30 = [F(30)] corresponds to the last ramping coefficients used to shape the ramp.
-MinPow = [F(31)] is a fixed parameter and corresponds to the Code Start of the SKY77569 specification. It ensures a fast discharge of accumulated energy during the open loop mode in the summing node.

3.2 Parameters used to define the temporal position of the burst

3.2.1 Optimum position of the burst

This parameter is TRU (or △ TRU_P) on the panel, in the Optimal Burst. This is the burst starting time correction, which is optimized for each power control level. (Note that _P means that the parameter is a power compensation parameter).

3.2.2 Optimum length of the burst

This parameter is TRD (or △ TRD_P) on the panel, in the Optimal Burst. This is the burst length compensation, which is optimized for each power control level. (Note that
_P means that the parameter is a power compensation parameter).

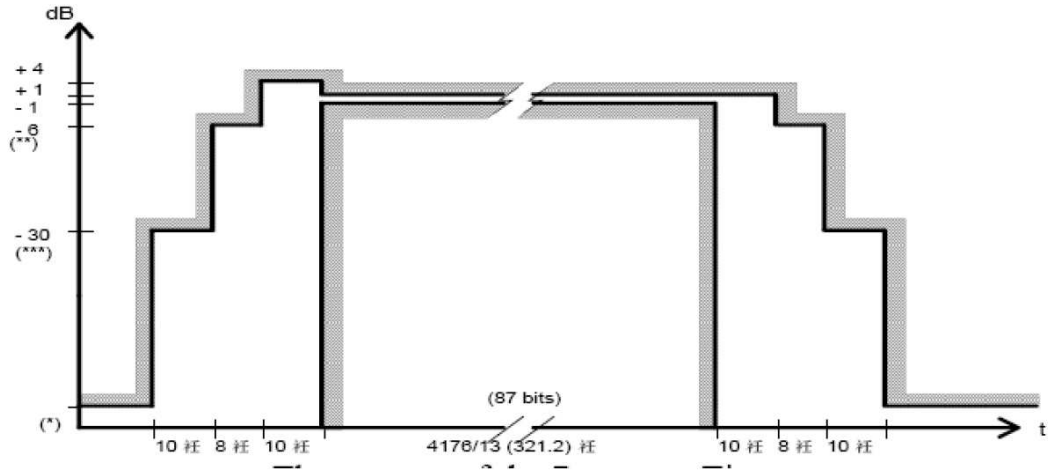
4 Operating mode

4.1 How to transmit a Traffic Channel burst (Random data), in GSM850/EGSM900 mode; DCS1800/PCS1900 mode at power control level max:

Connect the mobile with a special software, Configuration of the common parameters:

- band: GSM850/ EGSM900/DCS1800/PCS1900,
- channel: 192/62/699/661,
- RF level: PCL5/ PCL5/PCL0/PCL0,
-Burst select: Mode Tch Random

Press STAR command to start continuous TX, you can check the burst with CMU200 or Agilent 8960, it must fit the curve below.



The request of the Power vs Time.

4.2 How to stop Tx measurements:

Press STOP command to stop the TX.

4.3 How to transmit a burst after modifying parameters.

Please note that each time a parameter (such as parameter used to shape the burst) is changed, then the user have to: ” Download to flash” to validate the parameter modification. If the command is not performed, the old parameters are taken into account.

Tune-Up Frequency

Content

5 Purpose

This panel gives the description of the Frequency plan.
This window includes both:

- Automatic frequency control(AFC),
- Static frequency error and range,
- Dynamic frequency error and range

6 Automatic frequency controls

Depending on the chosen 26 MHz Crystal and on the spread on the Crystal, the init voltage for the AFC command could change. On production line, on each handset, an initial frequency alignment procedure is done to compensate all components tolerances.
In Case of **DCXO** implementation, 2 parameters are used for the Reference Clock alignment in order to guarantee a low frequency error at each switch-ON of the handset.
This compensation is done by internal capacitors data bank of the MT6166 that can be switched.
One parameter called **DCXO_CDAC** defining the coarse initial frequency tuning by the 7 CDAC bits of the MT6166.
Second parameter called **DCXO_CAFC** defining the fine initial frequency tuning by the 13 CAFC bits of the MT6166.

Table 1: Alignment parameter related to reference clock - Generic

	Name	Description/Comments	Unit	Range	Value	Dyn	Dim	Comments
Generic	DCXO_CDAC	Coarse Init voltage for the AFC command (coarse capacitor data bank)	LSB		2_8-1	Default is mid scale (*) 64d	1 byte	1
Generic	DCXO_CAFC	Fine Init voltage for the AFC command (fine capacitor data bank)	LSB		2_{16}-1	Default is mid scale (*) 4096d	2 bytes	1

General conditions:

Power supply is set to nominal battery voltage on VBAT. Switch ON the mobile in TAT mode.

Step1: **DCXO_CDAC** tuning (Coarse AFC)

-Switch the mobile in TX PCS (channel 661 level 15 for PCS).

-Measure the frequency error in TX Mode with a CMU200 (reference board radio tester)

- Calculate the **DCXO_CDAC** (tuned) value
- Enter this value in the fixed parameter window: parameter **DCXO_CDAC**
-Save **DCXO_CDAC** (tuned) value in EEPROM with the TAT software menu.
-Switch-OFF and switch-ON the mobile to validate the new value

Step2: **DCXO_CAFC** tuning (Fine AFC)

-Switch the mobile in TX PCS (channel 661 level 15 for PCS).

-Measure the frequency error in TX Mode with a CMU200 (reference board radio tester)

- Calculate the **DCXO_CAFC** (tuned) value
- Enter this value in the fixed parameter window: parameter **DCXO_CAFC**
-Save **DCXO_CAFC** (tuned) value in EEPROM with the TAT software menu.
-Switch-OFF and switch-ON the mobile to validate the new value

Output Power

1. Manufacturing tolerance

Table for GSM Speech

GSM 850			
Channel	Channel 251	Channel 190	Channel 128
Target (dBm)	32	32	32
Maximum (dBm)	33.5	33.5	33.5
GSM 1900			
Channel	Channel 810	Channel 661	Channel 512
Target (dBm)	30	30	30
Maximum (dBm)	32	32	32

Table for GPRS (GMSK Modulation)

GSM 850 GPRS				
Channel		**251**	**190**	**128**
1 Txslot	Target (dBm)	32	32	32
	Maximum (dBm)	33.5	33.5	33.5
2 Txslots	Target (dBm)	31	31	31
	Maximum (dBm)	33	33	33
3Txslots	Target (dBm)	29	29	29
	Maximum (dBm)	31	31	31
4 Txslots	Target (dBm)	28	28	28
	Maximum (dBm)	30	30	30
GSM 850 EGPRS				
Channel		**251**	**190**	**128**
1 Txslot	Target (dBm)	32	32	32
	Maximum (dBm)	33.5	33.5	33.5
2 Txslots	Target (dBm)	31	31	31
	Maximum (dBm)	33	33	33
3Txslots	Target (dBm)	29	29	29
	Maximum (dBm)	31	31	31
4 Txslots	Target (dBm)	28	28	28
	Maximum (dBm)	30	30	30

GSM 1900 GPRS				
Channel		**810**	**661**	**512**
1 Txslot	Target (dBm)	30	30	30
	Maximum (dBm)	32	32	32
2 Txslots	Target (dBm)	28	28	28
	Maximum (dBm)	30	30	30
3Txslots	Target (dBm)	27	27	27
	Maximum (dBm)	29	29	29
4 Txslots	Target (dBm)	25	25	25
	Maximum (dBm)	26.5	26.5	26.5
GSM 1900 EGPRS				
Channel		**810**	**661**	**512**
1 Txslot	Target (dBm)	30	30	30
	Maximum (dBm)	32	32	32
2 Txslots	Target (dBm)	28	28	28
	Maximum (dBm)	30	30	30
3Txslots	Target (dBm)	27	27	27
	Maximum (dBm)	29	29	29
4 Txslots	Target (dBm)	25	25	25
	Maximum (dBm)	26.5	26.5	26.5

Table for WCDMA and WIFI

WCDMA 850 CS			
Channel	Channel 4132	Channel 4182	Channel 4233
Target (dBm)	23	23	23
Maximum (dBm)	25	25	25
WCDMA 1900 CS			
Channel	Channel 9262	Channel 9400	Channel 9538
Target (dBm)	23	23	23
Maximum (dBm)	24.5	24.5	24.5

Table 10.4: WiFi

WiFi 802.11b			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	13	13	13
Maximum (dBm)	14.5	14.5	14.5
WiFi 802.11g			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	12	12	12
Maximum (dBm)	14	14	14
WiFi 802.11n			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	11	11	11
Maximum (dBm)	13	13	13

Table for BT

Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	3	3	3
Maximum (dBm)	5	5	5

7. WIFI and BT Operating Mode

WIFI Operating Frequency Band (RF): 2.412- 2.462GHz (TX/RX)

Modulation mode：802.11b/g/n20MHz/40MHz

BT Operating Mode (RF): 2400MHz~2483.5MHz

Type of Modulation: GFSK/π/4 DQPSK/8DPSK