1   **6 REQUIREMENTS FOR MOBILE STATION CDMA OPERATION**

2   This section only details requirements that are specific to CDMA mobile station equipment
3   and operation. See Section 2 and Section 4 for analog mobile station requirements.

4   **6.1 Transmitter**

5   6.1.1 Frequency Parameters

6   6.1.1.1 Channel Spacing and Designation

7   Channel spacing and designation for the dual-mode mobile station transmissions shall be
8   as specified in 2.1.1.1. The mobile station shall support CDMA operations on channel
9   numbers 1013 through 1023, and 1 through 777 inclusive, as shown in Table 6.1.1.1-1.

10   The CDMA frequency assignment in MHz corresponding to the CDMA Channel number
11   shown in Table 6.1.1.1-1 (expressed as N) is calculated as shown in Table 6.1.1.1-2.

12   6.1.1.2 Frequency Tolerance

13   When operating in the CDMA transmission mode, the mobile station transmit carrier
14   frequency shall be 45.0 MHz ±300 Hz lower than the frequency of the base station transmit
15   signal as measured at the mobile station receiver.

16   6.1.2 Power Output Characteristics

17   All power levels are referenced to the mobile station antenna connector unless otherwise
18   specified.

19   6.1.2.1 Maximum Output Power

20   The absolute maximum effective radiated power (ERP) with respect to a half-wave dipole for
21   any class mobile station transmitter shall be 8 dBW (6.3 Watts). ERP measured during a
22   transmitted power control group (see 6.1.3.1.7.1) for each mobile station class when
23   commanded to maximum output power shall be within the limits given in Table 6.1.2.1-1.
24   Transmission at maximum power shall not degrade the spurious emission levels as
25   specified in 6.1.4.2. An inoperative antenna assembly shall not degrade spurious emission
26   levels as specified in 6.1.4.2.

1   **Table 6.1.1.1-1. CDMA Channel Numbers and Corresponding Frequencies**

System	Valid CDMA Frequency Assignments	Analog Channel Count	CDMA Channel Number	Transmitter Frequency Assignment (MHz)	
				Mobile	Base
A" (1 MHz)	////////	22	991 1012	824.040 824.670	869.040 869.670
	CDMA	11	1013 1023	824.700 825.000	869.700 870.000
A (10 MHz)	CDMA	333	1 333	825.030 834.990	870.030 879.990
B (10 MHz)	CDMA	333	334 666	835.020 844.980	880.020 889.980
A' (1.5 MHz)	CDMA	50	667 716	845.010 846.480	890.010 891.480
B' (2.5 MHz)	CDMA	61	717 777	846.510 848.310	891.510 893.310
	////////	22	778 799	848.340 848.970	893.340 893.970

2   Frequencies in shaded (///////) regions are not valid for CDMA frequency assignments.

Table 6.1.1.1-2. CDMA Channel Number to CDMA Frequency Assignment Correspondence

Transmitter	CDMA Channel Number	CDMA Frequency Assignment, MHz
Mobile Station	$1 \leq N \leq 777$	0.030 N + 825.000
	$1013 \leq N \leq 1023$	0.030 (N-1023) + 825.000
Base Station	$1 \leq N \leq 777$	0.030 N + 870.000
	$1013 \leq N \leq 1023$	0.030 (N-1023) + 870.000

Table 6.1.2.1-1. Effective Radiated Power at Maximum Output Power

Mobile Station Class	ERP at Maximum Output Shall Exceed	ERP at Maximum Output Shall not Exceed
I	1 dBW (1.25 watts)	8 dBW (6.3 watts)
II	-3 dBW (0.5 watts)	4 dBW (2.5 watts)
III	-7 dBW (0.2 watts)	0 dBW (1.0 watts)

6.1.2.2 Output Power Limits

6.1.2.2.1 Minimum Controlled Output Power

With both closed loop and open loop power control functions set to minimum (see 6.1.2.3), the mean output power of the mobile station shall be less than -50 dBm/1.23 MHz (-111 dBm/Hz) for all frequencies within ±615 kHz of the center frequency.

6.1.2.2.2 Gated Output Power

When operating in variable data rate transmission mode (see 6.1.3.1.7.1), the mobile station shall transmit at nominal controlled power levels only during gated-on periods. During gated-off periods, the mobile station shall reduce its ERP either by at least 20 dB with respect to the power of the most recent gated-on period, or to the transmitter noise floor, whichever is greater. The transmitter noise floor should be less than -60 dBm/1.23 MHz and shall be less than -54 dBm/1.23 MHz. The duration of a single gated-on power control group shall be at least 1.25 ms. The transition time from either the gated-on level to the gated-off level or from the gated-off level to the gated-on level shall be within the limits shown in Figure 6.1.2.2.2-1.
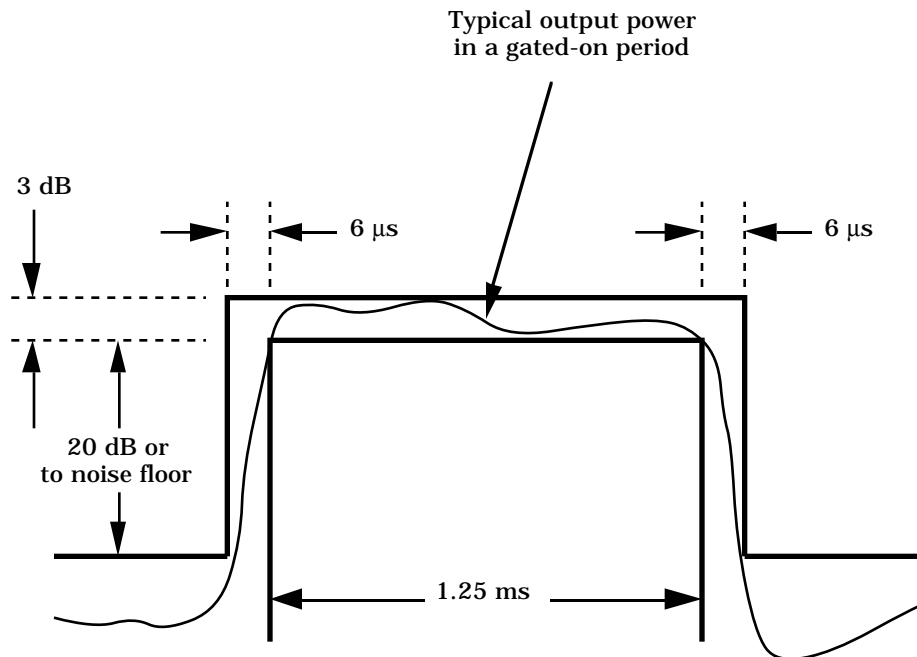
Figure 6.1.2.2.2-1. Transmission Envelope Mask (Single Gated-on Power Control Group)

6.1.2.2.3 Standby Output Power

The mobile station shall disable its transmitter except when transmitting an access probe when in the *System Access State* or when in the *Mobile Station Control on the Traffic Channel State* (see 6.6.3 and 6.6.4). When the transmitter is disabled, the output noise density of the mobile station shall be less than -60 dBm/1.23 MHz for all frequencies within the mobile station's transmit band between 824 and 849 MHz.

6.1.2.3 Controlled Output Power

When operating in the CDMA transmission mode, mobile stations shall provide two independent means for output power adjustment: open loop estimation, solely a mobile station operation, and closed loop correction, involving both the mobile station and the base station.

Accuracy requirements on the controlled range of mean output power (see 6.1.2.3 and 6.1.2.4) need not apply for the following three cases: mean output power levels exceeding the minimum ERP at the maximum output power for the corresponding mobile station class (see Table 6.1.2.1-1); mean output power levels less than the minimum controlled output power (see 6.1.2.2.1); or mean input power levels exceeding -25 dBm.

6.1.2.3.1 Estimated Open Loop Output Power

In the following equations, mean power is referenced to the nominal CDMA Channel bandwidth of 1.23 MHz.

For open loop probing on the Access Channel (with closed loop correction inactive) the mobile station shall transmit the first probe at a mean output power level defined by[1]

$$
\begin{aligned}
\text{mean output power (dBm)} = \; &\text{- mean input power (dBm)} \\
&\text{- 73} \\
&+ 0.5 \times \text{NOM\_PWR (dB)} \\
&+ 0.5 \times \text{INIT\_PWR (dB).}
\end{aligned}
$$

Subsequent probes in an access probe sequence are sent at increased power levels until a response is obtained or the sequence ends (see 6.6.3.1).

The initial transmission on the Reverse Traffic Channel shall be at a mean output power defined by[2]

$$
\begin{aligned}
\text{mean output power (dBm)} = \; &\text{- mean input power (dBm)} \\
&\text{- 73} \\
&+ 0.5 \times \text{NOM\_PWR (dB)} \\
&+ 0.5 \times \text{INIT\_PWR (dB)} \\
&+ \text{the sum of all access probe corrections (dB).}
\end{aligned}
$$

Once the first power control bit has been received after initializing Reverse Traffic Channel transmissions, the mean output power shall be defined by

$$
\begin{aligned}
\text{mean output power (dBm)} = \; &\text{- mean input power (dBm)} \\
&\text{- 73} \\
&+ 0.5 \times \text{NOM\_PWR (dB)} \\
&+ 0.5 \times \text{INIT\_PWR (dB)} \\
&+ \text{the sum of all access probe corrections (dB)} \\
&+ \text{the sum of all closed loop power control corrections (dB).}
\end{aligned}
$$

The values for NOM_PWR and INIT_PWR are system parameters, specified in the *Access Parameters Message* (see 7.7.2.3.2) and acquired by the mobile station prior to transmitting. The range of the NOM_PWR parameter is ±64 dB, with a nominal value of 0dB. The range of the INIT_PWR parameter is ±16 dB, with a nominal value of 0 dB.

Prior to application of access probe corrections, closed loop power control corrections, and with NOM_PWR set to zero, the mobile station's estimated open loop mean output power

---

[1] The purpose of having two parameters is to distinguish between their use. If INIT_PWR were 0, then NOM_PWR is the correction that should provide the correct received power at the base station. INIT_PWR is the adjustment that is made to the first Access Channel probe so that it should be received at somewhat less than the required signal power. This conservatism partially compensates for occasional, partially decorrelated path losses between the Forward CDMA Channel and the Reverse CDMA Channel.

[2] The terms (-mean input power (dBm) - 73 + 0.5 × NOM_PWR (dB)) can be thought of as an open loop estimate of the required power for an Access Channel transmission. The terms (0.5 × INIT_PWR (dB) + the sum of all access probe corrections) can be thought of as the closed loop correction for Access Channel transmissions with the loop being through the base station. The total is an open estimate of the initial required transmit power on the Reverse Traffic Channel.

1 should be within ±6 dB and shall be within ±9 dB of the value determined by the following
2 relationship:

3   mean output power (dBm) = - mean input power (dBm)
4   -73
5   + 0.5 × INIT_PWR (dB).

6 This requirement shall be met over the full range of INIT_PWR (from -16 to +16).

7 6.1.2.3.2 Closed Loop Output Power

8 For closed loop correction on the Reverse Traffic Channel (with respect to the open loop
9 estimate), the mobile station shall adjust its mean output power level in response to each
10 valid power control bit (see 7.1.3.1.7) received on the Forward Traffic Channel. A power
11 control bit shall be considered valid if it is received in a 1.25 ms timeslot (see 6.1.3.1.7.1)
12 that is the second timeslot following a timeslot in which the mobile station transmitted.
13 When the mobile station is transmitting at the full data rate (9600 bps),[3] the change in
14 mean output power level per single power control bit shall be 0.5 dB. When the mobile
15 station is transmitting at less than the full data rate, the change in the mean output power
16 level for each valid power control bit shall vary according to the number of timeslots since
17 the last valid power control bit was received, in accordance with Table 6.1.2.3.2-1. The
18 total changed closed loop mean output power shall be the accumulation of the level
19 changes. The mobile station shall lock the accumulation of level changes and shall ignore
20 received power control bits when the transmitter is disabled.

21 After accumulating the power control steps (with 0.25 dB resolution), the mobile station
22 may truncate the mean output power but shall preserve at least 0.5 dB resolution.[4] That
23 is, if the total accumulation is 1.0 dB and 2 timeslots have elapsed since the last valid
24 power control bit, then the mean output power may increase by 0.5 dB instead of 0.75 dB;
25 if the total accumulation is 1.25 dB and two timeslots have elapsed since the last valid
26 power control bit, then the mean output power may increase by 1.0 dB.[5] After the allowed
27 truncation, the change in mean output power per single power control bit shall be within
28 ±0.3 dB of the values specified by Table 6.1.2.3.2-1, and the change in mean output power
29 level per 10 valid power control bits of the same sign and level change shall be within ±20%
30 of 10 times the values specified in Table 6.1.2.3.2-1. A '0' power control bit implies an
31 increase in transmit power; a '1' power control bit implies a decrease in transmit power.

32 The mobile station shall provide a closed loop adjustment range greater than ±24 dB
33 around its open loop estimate.

---

[3]At the full data rate, every power control bit is valid.

[4]The purpose of the 0.25 dB steps in the table is to provide finer control of the power level when averaged over several power control bits.

[5]In the first case, the accumulated value would be 1.0 dB + 0.75 dB equalling 1.75 dB. If truncation is used, the previous output level would be 1.0 dB, and the new output level would be 1.5 dB. In the

[1] See 6.6.6.2.7.2 for combining power control bits received from different multipath
[2] components or from different base stations during handoff.

[3]

[4] **Table 6.1.2.3.2-1. Power Level Change per Power Control Bit**

Timeslots since Last Valid Power Control Bit[6]	Level Change per Power Control Bit
1	0.50 dB
2	0.75 dB
3	0.75 dB
4	1.00 dB
5	1.00 dB
6	1.25 dB
7	1.25 dB
8	1.50 dB
9	1.50 dB
10	1.50 dB
11	1.75 dB
12	1.75 dB
13	1.75 dB
14	1.75 dB
15	1.75 dB

[5]

[6] 6.1.2.4 Power Transition Characteristics

[7] 6.1.2.4.1 Open Loop Estimation

[8] Following a step change in mean input power, the mean output power of the mobile station
[9] shall transition between levels within the limits shown in Figure 6.1.2.4.1-1. These limits
[10] shall apply for step changes in mean input power of ±30 dB or less. As an example, if the
[11] mean input power change step is -30 dB, the expected change in mean output power is
[12] +30dB. The upper limit on the change is 1.2×30 dB = 36 dB, and the lower limit is
[13] 0.8×30 dB = 24 dB, as shown in Figure 6.1.2.4.1-1.

---

second case, the accumulated value would be 1.25 dB + 0.75 dB which equals 2.0 dB. If truncation
is used, the previous output level would be 1.0 dB, and the new output level would be 2.0 dB.

[6]For example, one timeslot since the last valid power control bit means that the previous timeslot
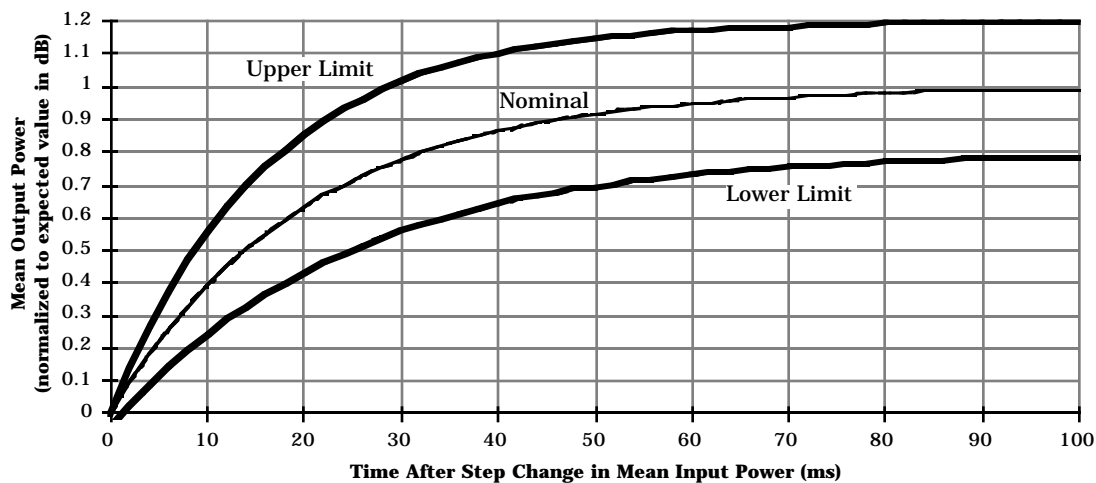contained a valid power control bit.

Figure 6.1.2.4.1-1. Open Loop Power Transition Mask

6.1.2.4.2 Closed Loop Correction

Following the reception of a valid closed loop power control bit, the mean output power of the mobile station shall be within 0.3 dB of final value in less than 500 μs.

6.1.3 Modulation Characteristics

6.1.3.1 Reverse CDMA Channel Signals

The Reverse CDMA Channel is composed of Access Channels and Reverse Traffic Channels. These channels shall share the same CDMA frequency assignment using direct-sequence CDMA techniques. Figure 6.1.3.1-1 shows an example of all of the signals received by a base station on the Reverse CDMA Channel. Each Traffic Channel or Access Channel is identified by a distinct user long code. Multiple Reverse CDMA Channels may be used by a base station in a frequency multiplexed manner.

The modulation process for the Reverse CDMA Channel is as shown in Figure 6.1.3.1-2. Data transmitted on the Reverse CDMA Channel is grouped into 20 ms frames. All data transmitted on the Reverse CDMA Channel is convolutionally encoded, block interleaved, modulated by the 64-ary orthogonal modulation, and direct-sequence spread prior to transmission.
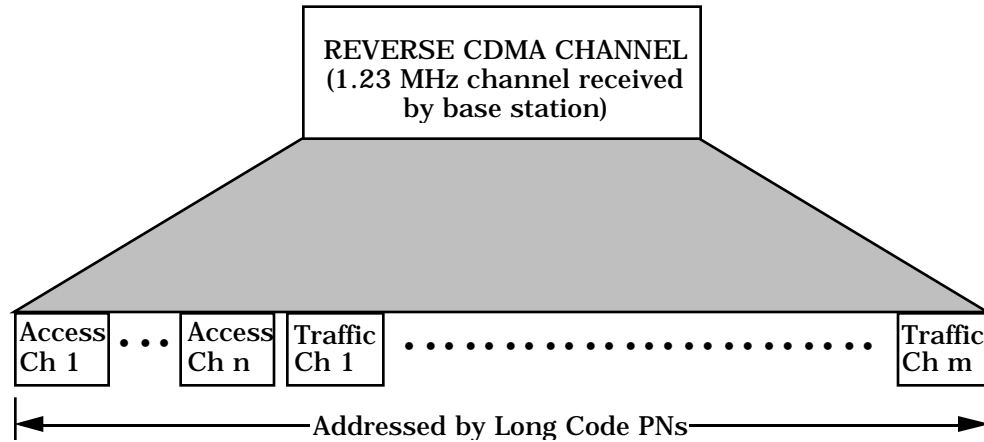
Figure 6.1.3.1-1. Example of Logical Reverse CDMA Channels Received at a Base Station
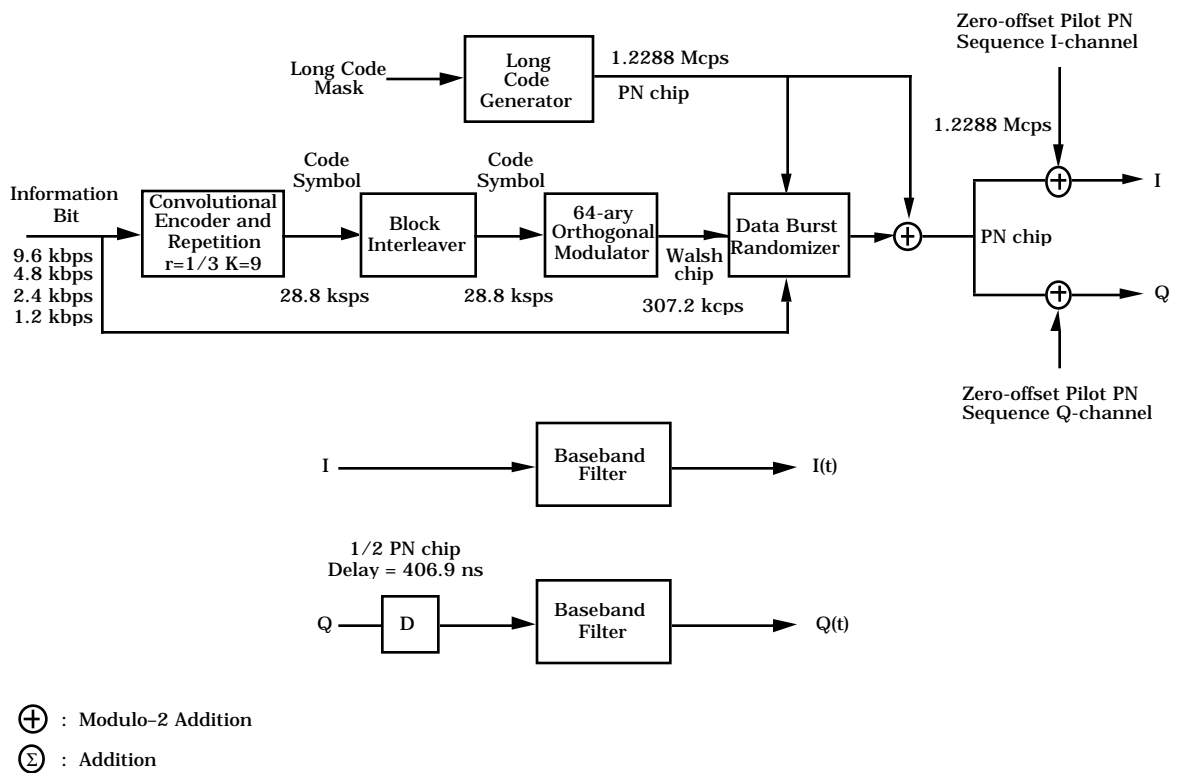

Figure 6.1.3.1-2. Reverse CDMA Channel Modulation Process

1   Data frames may be transmitted on the Reverse CDMA Channel at a data rate of 9600,
2   4800, 2400, or 1200 bps. The Reverse Traffic Channel may use any of these data rates for
3   transmission. The transmission duty cycle on the Reverse Traffic Channel varies with the
4   transmission data rate. Specifically, the transmission duty cycle for 9600 bps frames is
5   100 percent, the transmission duty cycle for 4800 bps frames is 50 percent, the
6   transmission duty cycle for 2400 bps frames is 25 percent, and the transmission duty cycle
7   for 1200 bps frames is 12.5 percent as shown in Table 6.1.3.1.1-1. As the duty cycle for
8   transmission varies proportionately with the data rate, the actual burst transmission rate is
9   fixed at 28,800 code symbols per second. Since six code symbols are modulated as one of
10 64 Walsh symbols for transmission, the Walsh symbol transmission rate is fixed at 4800
11 Walsh symbols per second. This results in a fixed Walsh chip rate of 307.2 kcps. The rate
12 of the spreading PN sequence is fixed at 1.2288 Mcps, so that each Walsh chip is spread by
13 four PN chips. Table 6.1.3.1.1-1 defines the signal rates and their relationship for the
14 various transmission rates on the Reverse Traffic Channel.

15 The numerology is identical for the Access Channel except that the transmission rate is
16 fixed at 4800 bps, each code symbol is repeated once, and the transmission duty cycle is
17 100 percent. Table 6.1.3.1.1-2 defines the signal rates and their relationship on the Access
18 Channel.

19 6.1.3.1.1 Modulation Parameters

20 The modulation parameters for the Reverse Traffic Channel and the Access Channel are
21 shown in Table 6.1.3.1.1-1 and Table 6.1.3.1.1-2, respectively.

1

Table 6.1.3.1.1-1. Reverse Traffic Channel Modulation Parameters

Parameter	Data Rate (bps)				Units
	9600	4800	2400	1200	
PN Chip Rate	1.2288	1.2288	1.2288	1.2288	Mcps
Code Rate	1/3	1/3	1/3	1/3	bits/code sym
TX Duty Cycle	100.0	50.0	25.0	12.5	%
Code Symbol Rate	28,800	28,800	28,800	28,800	sps
Modulation	6	6	6	6	code sym/Walsh sym
Walsh Symbol Rate	4800	4800	4800	4800	sps
Walsh Chip Rate	307.20	307.20	307.20	307.20	kcps
Walsh Symbol	208.33	208.33	208.33	208.33	μs
PN Chips/Code Symbol	42.67	42.67	42.67	42.67	PN chip/code sym
PN Chips/Walsh Symbol	256	256	256	256	PN chip/Walsh sym
PN Chips/Walsh Chip	4	4	4	4	PN chips/Walsh chip

2

3

Table 6.1.3.1.1-2. Access Channel Modulation Parameters

Parameter	Data Rate (bps)	Units
	4800	
PN Chip Rate	1.2288	Mcps
Code Rate	1/3	bits/code sym
Code Symbol Repetition	2	symbols/code sym
TX Duty Cycle	100.0	%
Code Symbol Rate	28,800	sps
Modulation	6	code sym/Walsh sym
Walsh Symbol Rate	4800	sps
Walsh Chip Rate	307.20	kcps
Walsh Symbol	208.33	μs
PN Chips/Code Symbol	42.67	PN chip/code sym
PN Chips/Walsh Symbol	256	PN chip/Walsh sym
PN Chips/Walsh Chip	4	PN chips/Walsh chip

4

6.1.3.1.2 Data Rates

Data shall be transmitted on the Reverse CDMA Channel by frames. Each frame shall be 20 ms in length.

The mobile station shall transmit data frames on the Reverse Traffic Channel at a variable data rate of 9600, 4800, 2400, or 1200 bps. The data rate on the Reverse Traffic Channel shall be selected on a frame-by-frame basis.

The mobile station shall transmit data frames on the Access Channel at a fixed data rate of 4800 bps.

6.1.3.1.3 Convolutional Encoding

The mobile station shall convolutionally encode the data transmitted on the Reverse Traffic Channel and the Access Channel prior to interleaving. The convolutional code shall be rate 1/3 and has constraint length (K) of 9. The generator functions for this code shall be g_0 equals 557 (octal), g_1 equals 663 (octal), and g_2 equals 711 (octal). Since this is a rate 1/3 code, three code symbols are generated for each data bit input to the encoder. These code symbols shall be output so that the code symbol (c_0) encoded with generator function g_0 shall be output first, the code symbol (c_1) encoded with generator function g_1 shall be output second, and the code symbol (c_2) encoded with generator function g_2 shall be output last. The state of the convolutional encoder, upon initialization, shall be the all-zero state. The first code symbol output after initialization shall be a code symbol encoded with generator function g_0.

Convolutional encoding involves the modulo-2 addition of selected taps of a serially time-delayed data sequence. The length of the data sequence delay is equal to K-1, where K is the constraint length of the code. Figure 6.1.3.1.3-1 illustrates the encoder for the code specified in this section.

6.1.3.1.4 Code Symbol Repetition

Code symbols output from the convolutional encoder are repeated before being interleaved when the data rate is lower than 9600 bps.

Code symbol repetition on the Reverse Traffic Channel is only used as an expedient method for describing the operation of the block interleaver specified in 6.1.3.1.5 and the data burst randomizer specified in 6.1.3.1.7.2. Implementations other than code symbol repetition that achieve the same result are allowed.
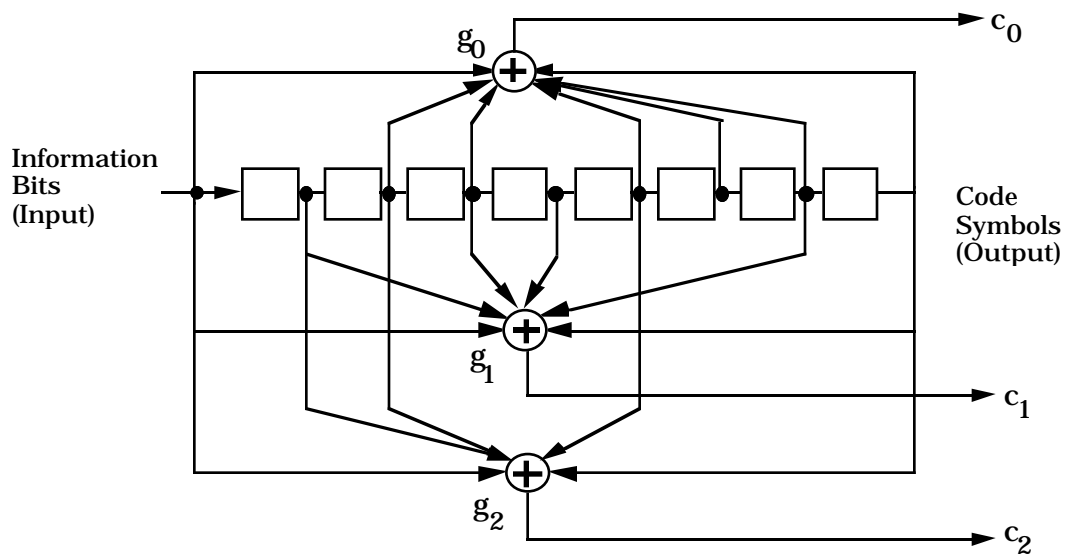
Figure 6.1.3.1.3-1. K = 9, Rate 1/3 Convolutional Encoder

The code symbol repetition rate on the Reverse Traffic Channel varies with data rate. Code symbols shall not be repeated for the 9600 bps data rate. Each code symbol at the 4800 bps data rate shall be repeated 1 time (each symbol occurs 2 consecutive times). Each code symbol at the 2400 bps data rate shall be repeated 3 times (each symbol occurs 4 consecutive times). Each code symbol at the 1200 bps data rate shall be repeated 7 times (each symbol occurs 8 consecutive times). For all of the data rates (9600, 4800, 2400, and 1200 bps), this results in a constant code symbol rate of 28800 code symbols per second. On the Reverse Traffic Channel these repeated code symbols shall not be transmitted multiple times. Rather, the repeated code symbols shall be input to the block interleaver function, and all but one of the code symbol repetitions shall be deleted prior to actual transmission due to the variable transmission duty cycle.

Each code symbol on the Access Channel, which has a fixed data rate of 4800 bps, shall be repeated 1 time (each symbol occurs 2 consecutive times). On the Access Channel both repeated code symbols shall be transmitted.

6.1.3.1.5 Block Interleaving

The mobile station shall interleave all code symbols on the Reverse Traffic Channel and the Access Channel prior to modulation and transmission. A block interleaver spanning 20 ms shall be used. The interleaver shall be an array with 32 rows and 18 columns (i.e., 576 cells). Code symbols (repeated code symbols when at data rates lower than 9600 bps) shall be written into the interleaver by columns filling the complete 32×18 matrix. Tables 6.1.3.1.5-1 through 6.1.3.1.5-4 illustrate the ordering of write operations of code symbols (or repeated code symbols) into the interleaver array for transmission data rates of 9600, 4800, 2400, and 1200 bps, respectively.

Reverse Traffic Channel code symbols shall be output from the interleaver by rows. The interleaver rows shall be output in the following order:

At 9600 bps:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

At 4800 bps:

1 3 2 4 5 7 6 8 9 11 10 12 13 15 14 16 17 19 18 20 21 23 22 24 25 27 26 28 29 31 30 32

At 2400 bps:

1 5 2 6 3 7 4 8 9 13 10 14 11 15 12 16 17 21 18 22 19 23 20 24 25 29 26 30 27 31 28 32

At 1200 bps:

1 9 2 10 3 11 4 12 5 13 6 14 7 15 8 16 17 25 18 26 19 27 20 28 21 29 22 30 23 31 24 32

Access Channel code symbols shall be output from the interleaver by rows. The interleaver rows shall be output in the following order:[7]

1 17 9 25 5 21 13 29 3 19 11 27 7 23 15 31 2 18 10 26 6 22 14 30 4 20 12 28 8 24 16 32

---

[7]This is a bit-reversed readout of the row addresses. If there is a binary counter $c_4c_3c_2c_1c_0$, counting from 0 through 31, and n is a 5-bit binary number, $n = a_4a_3a_2a_1a_0$, where $a_4=c_0$, $a_3=c_1$, $a_2=c_2$, $a_1=c_3$, $a_0=c_4$, then the row address is given by n+1.

Table 6.1.3.1.5-1. Reverse Traffic Channel Interleaver Memory (Write Operation)
(9600 bps)

```
 1   33   65   97  129  161  193  225  257  289  321  353  385  417  449  481  513  545
 2   34   66   98  130  162  194  226  258  290  322  354  386  418  450  482  514  546
 3   35   67   99  131  163  195  227  259  291  323  355  387  419  451  483  515  547
 4   36   68  100  132  164  196  228  260  292  324  356  388  420  452  484  516  548
 5   37   69  101  133  165  197  229  261  293  325  357  389  421  453  485  517  549
 6   38   70  102  134  166  198  230  262  294  326  358  390  422  454  486  518  550
 7   39   71  103  135  167  199  231  263  295  327  359  391  423  455  487  519  551
 8   40   72  104  136  168  200  232  264  296  328  360  392  424  456  488  520  552
 9   41   73  105  137  169  201  233  265  297  329  361  393  425  457  489  521  553
10   42   74  106  138  170  202  234  266  298  330  362  394  426  458  490  522  554
11   43   75  107  139  171  203  235  267  299  331  363  395  427  459  491  523  555
12   44   76  108  140  172  204  236  268  300  332  364  396  428  460  492  524  556
13   45   77  109  141  173  205  237  269  301  333  365  397  429  461  493  525  557
14   46   78  110  142  174  206  238  270  302  334  366  398  430  462  494  526  558
15   47   79  111  143  175  207  239  271  303  335  367  399  431  463  495  527  559
16   48   80  112  144  176  208  240  272  304  336  368  400  432  464  496  528  560
17   49   81  113  145  177  209  241  273  305  337  369  401  433  465  497  529  561
18   50   82  114  146  178  210  242  274  306  338  370  402  434  466  498  530  562
19   51   83  115  147  179  211  243  275  307  339  371  403  435  467  499  531  563
20   52   84  116  148  180  212  244  276  308  340  372  404  436  468  500  532  564
21   53   85  117  149  181  213  245  277  309  341  373  405  437  469  501  533  565
22   54   86  118  150  182  214  246  278  310  342  374  406  438  470  502  534  566
23   55   87  119  151  183  215  247  279  311  343  375  407  439  471  503  535  567
24   56   88  120  152  184  216  248  280  312  344  376  408  440  472  504  536  568
25   57   89  121  153  185  217  249  281  313  345  377  409  441  473  505  537  569
26   58   90  122  154  186  218  250  282  314  346  378  410  442  474  506  538  570
27   59   91  123  155  187  219  251  283  315  347  379  411  443  475  507  539  571
28   60   92  124  156  188  220  252  284  316  348  380  412  444  476  508  540  572
29   61   93  125  157  189  221  253  285  317  349  381  413  445  477  509  541  573
30   62   94  126  158  190  222  254  286  318  350  382  414  446  478  510  542  574
31   63   95  127  159  191  223  255  287  319  351  383  415  447  479  511  543  575
32   64   96  128  160  192  224  256  288  320  352  384  416  448  480  512  544  576
```

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Table 6.1.3.1.5-2. Reverse Traffic Channel or Access Channel Interleaver Memory (Write Operation) (4800 bps)

1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241	257	273
1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241	257	273
2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242	258	274
2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242	258	274
3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243	259	275
3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243	259	275
4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244	260	276
4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244	260	276
5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245	261	277
5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245	261	277
6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246	262	278
6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246	262	278
7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247	263	279
7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247	263	279
8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280
8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280
9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249	265	281
9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249	265	281
10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250	266	282
10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250	266	282
11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251	267	283
11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251	267	283
12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252	268	284
12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252	268	284
13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253	269	285
13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253	269	285
14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254	270	286
14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254	270	286
15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255	271	287
15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255	271	287
16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288
16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288

Table 6.1.3.1.5-3. Reverse Traffic Channel Interleaver Memory (Write Operation)
(2400 bps)

1	9	17	25	33	41	49	57	65	73	81	89	97	105	113	121	129	137
1	9	17	25	33	41	49	57	65	73	81	89	97	105	113	121	129	137
1	9	17	25	33	41	49	57	65	73	81	89	97	105	113	121	129	137
1	9	17	25	33	41	49	57	65	73	81	89	97	105	113	121	129	137
2	10	18	26	34	42	50	58	66	74	82	90	98	106	114	122	130	138
2	10	18	26	34	42	50	58	66	74	82	90	98	106	114	122	130	138
2	10	18	26	34	42	50	58	66	74	82	90	98	106	114	122	130	138
2	10	18	26	34	42	50	58	66	74	82	90	98	106	114	122	130	138
3	11	19	27	35	43	51	59	67	75	83	91	99	107	115	123	131	139
3	11	19	27	35	43	51	59	67	75	83	91	99	107	115	123	131	139
3	11	19	27	35	43	51	59	67	75	83	91	99	107	115	123	131	139
3	11	19	27	35	43	51	59	67	75	83	91	99	107	115	123	131	139
4	12	20	28	36	44	52	60	68	76	84	92	100	108	116	124	132	140
4	12	20	28	36	44	52	60	68	76	84	92	100	108	116	124	132	140
4	12	20	28	36	44	52	60	68	76	84	92	100	108	116	124	132	140
4	12	20	28	36	44	52	60	68	76	84	92	100	108	116	124	132	140
5	13	21	29	37	45	53	61	69	77	85	93	101	109	117	125	133	141
5	13	21	29	37	45	53	61	69	77	85	93	101	109	117	125	133	141
5	13	21	29	37	45	53	61	69	77	85	93	101	109	117	125	133	141
5	13	21	29	37	45	53	61	69	77	85	93	101	109	117	125	133	141
6	14	22	30	38	46	54	62	70	78	86	94	102	110	118	126	134	142
6	14	22	30	38	46	54	62	70	78	86	94	102	110	118	126	134	142
6	14	22	30	38	46	54	62	70	78	86	94	102	110	118	126	134	142
6	14	22	30	38	46	54	62	70	78	86	94	102	110	118	126	134	142
7	15	23	31	39	47	55	63	71	79	87	95	103	111	119	127	135	143
7	15	23	31	39	47	55	63	71	79	87	95	103	111	119	127	135	143
7	15	23	31	39	47	55	63	71	79	87	95	103	111	119	127	135	143
7	15	23	31	39	47	55	63	71	79	87	95	103	111	119	127	135	143
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144

Table 6.1.3.1.5-4. Reverse Traffic Channel Interleaver Memory (Write Operation) (1200 bps)

1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61	65	69
1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61	65	69
1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61	65	69
1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61	65	69
1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61	65	69
1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61	65	69
1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61	65	69
1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61	65	69
2	**6**	**10**	**14**	**18**	**22**	**26**	**30**	**34**	**38**	**42**	**46**	**50**	**54**	**58**	**62**	**66**	**70**
2	**6**	**10**	**14**	**18**	**22**	**26**	**30**	**34**	**38**	**42**	**46**	**50**	**54**	**58**	**62**	**66**	**70**
2	**6**	**10**	**14**	**18**	**22**	**26**	**30**	**34**	**38**	**42**	**46**	**50**	**54**	**58**	**62**	**66**	**70**
2	**6**	**10**	**14**	**18**	**22**	**26**	**30**	**34**	**38**	**42**	**46**	**50**	**54**	**58**	**62**	**66**	**70**
2	**6**	**10**	**14**	**18**	**22**	**26**	**30**	**34**	**38**	**42**	**46**	**50**	**54**	**58**	**62**	**66**	**70**
2	**6**	**10**	**14**	**18**	**22**	**26**	**30**	**34**	**38**	**42**	**46**	**50**	**54**	**58**	**62**	**66**	**70**
2	**6**	**10**	**14**	**18**	**22**	**26**	**30**	**34**	**38**	**42**	**46**	**50**	**54**	**58**	**62**	**66**	**70**
2	**6**	**10**	**14**	**18**	**22**	**26**	**30**	**34**	**38**	**42**	**46**	**50**	**54**	**58**	**62**	**66**	**70**
3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63	67	71
3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63	67	71
3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63	67	71
3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63	67	71
3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63	67	71
3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63	67	71
3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63	67	71
3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63	67	71
4	**8**	**12**	**16**	**20**	**24**	**28**	**32**	**36**	**40**	**44**	**48**	**52**	**56**	**60**	**64**	**68**	**72**
4	**8**	**12**	**16**	**20**	**24**	**28**	**32**	**36**	**40**	**44**	**48**	**52**	**56**	**60**	**64**	**68**	**72**
4	**8**	**12**	**16**	**20**	**24**	**28**	**32**	**36**	**40**	**44**	**48**	**52**	**56**	**60**	**64**	**68**	**72**
4	**8**	**12**	**16**	**20**	**24**	**28**	**32**	**36**	**40**	**44**	**48**	**52**	**56**	**60**	**64**	**68**	**72**
4	**8**	**12**	**16**	**20**	**24**	**28**	**32**	**36**	**40**	**44**	**48**	**52**	**56**	**60**	**64**	**68**	**72**
4	**8**	**12**	**16**	**20**	**24**	**28**	**32**	**36**	**40**	**44**	**48**	**52**	**56**	**60**	**64**	**68**	**72**
4	**8**	**12**	**16**	**20**	**24**	**28**	**32**	**36**	**40**	**44**	**48**	**52**	**56**	**60**	**64**	**68**	**72**
4	**8**	**12**	**16**	**20**	**24**	**28**	**32**	**36**	**40**	**44**	**48**	**52**	**56**	**60**	**64**	**68**	**72**

1   6.1.3.1.6 Orthogonal Modulation

2   Modulation for the Reverse CDMA Channel shall be 64-ary orthogonal modulation. One of

3   64 possible modulation symbols is transmitted for each six code symbols. The modulation

4   symbol shall be one of 64 mutually orthogonal waveforms generated using Walsh functions.

5   These modulation symbols are given in Table 6.1.3.1.6-1 and are numbered 0 through 63.

6   The modulation symbols shall be selected according to the following formula:

7   Modulation symbol number = $c_0 + 2c_1 + 4c_2 + 8c_3 + 16c_4 + 32c_5$,

8   where c_5 shall represent the last (or most recent) and c_0 the first (or oldest) binary valued

9   ('0' and '1') code symbol of each group of six code symbols that form a modulation symbol.

10   The 64 by 64 matrix shown in Table 6.1.3.1.6-1 can be generated by means of the following

11   recursive procedure:

12           $H_1 = 0,$ $H_2 = \begin{matrix} 0 & 0 \\ 0 & 1 \end{matrix}$,

13           $H_4 = \begin{matrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 \\ 0 & 1 & 1 & 0 \end{matrix}$, $H_{2N} = \begin{matrix} H_N & H_N \\ H_N & \overline{H_N} \end{matrix}$, N is a power of 2.

14   The period of time required to transmit a single modulation symbol is referred to as a Walsh

15   symbol interval and shall be equal to 1/4800 second (= 208.333... µs). The period of time

16   associated with one-sixty-fourth of the modulation symbol is referred to as a Walsh chip

17   and shall be equal to 1/307200 second (= 3.255... µs).

18   Within a Walsh symbol, Walsh chips shall be transmitted in the order of 0, 1, 2, ..., 63.

Table 6.1.3.1.6-1. 64-ary Orthogonal Symbol Set

Walsh Chip within Symbol

Walsh Symbol Index	0 1 2 3	4 5 6 7	8 9 10 11	12 13 14 15	16 17 18 19	20 21 22 23	24 25 26 27	28 29 30 31	32 33 34 35	36 37 38 39	40 41 42 43	44 45 46 47	48 49 50 51	52 53 54 55	56 57 58 59	60 61 62 63
0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1
2	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1
3	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0
4	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1
5	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0
6	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0
7	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1
8	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1
9	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0
10	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0
11	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1
12	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0
13	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1
14	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1
15	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0
16	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1
17	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0
18	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0
19	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1
20	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0
21	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1
22	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1
23	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0
24	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0
25	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1
26	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1
27	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0
28	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1
29	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0
30	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0
31	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1
32	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1
33	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0
34	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0
35	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1
36	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0
37	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1
38	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1
39	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0
40	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0
41	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1
42	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1
43	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0
44	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1
45	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0
46	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0
47	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1
48	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
49	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1
50	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1
51	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0
52	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1
53	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0
54	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0
55	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1
56	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1
57	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0
58	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0
59	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1
60	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0	0 0 0 0	1 1 1 1	0 0 0 0	1 1 1 1	1 1 1 1	0 0 0 0
61	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1	0 1 0 1	1 0 1 0	0 1 0 1	1 0 1 0	1 0 1 0	0 1 0 1
62	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1	0 0 1 1	1 1 0 0	0 0 1 1	1 1 0 0	1 1 0 0	0 0 1 1
63	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0	0 1 1 0	1 0 0 1	0 1 1 0	1 0 0 1	1 0 0 1	0 1 1 0

1   6.1.3.1.7 Variable Data Rate Transmission

2   6.1.3.1.7.1 Rates and Gating

3   Prior to transmission, the Reverse Traffic Channel interleaver output stream is gated with a
4   time filter that allows transmission of certain interleaver output symbols and deletion of
5   others. This process is illustrated in Figure 6.1.3.1.7.1-1. As shown in the figure, the duty
6   cycle of the transmission gate varies with the transmit data rate. When the transmit data
7   rate is 9600 bps, the transmission gate allows all interleaver output symbols to be
8   transmitted. When the transmit data rate is 4800 bps, the transmission gate allows one-
9   half of the interleaver output symbols to be transmitted, and so forth. The gating process
10   operates by dividing the 20 ms frame into 16 equal length (i.e., 1.25 ms) periods, called
11   power control groups. Certain power control groups are gated-on (i.e., transmitted), while
12   other groups are gated-off (i.e., not transmitted).

13   The assignment of gated-on and gated-off groups, referred to as the data burst randomizing
14   function, is specified in 6.1.3.1.7.2. The gated-on power control groups are
15   pseudorandomized in their positions within the frame. The data burst randomizer ensures
16   that every code symbol input to the repetition process is transmitted exactly once. During
17   the gated-off periods, the mobile station shall comply with the requirement in 6.1.2.2.2,
18   thus reducing the interference to other mobile stations operating on the same Reverse
19   CDMA Channel.

20   When transmitting on the Access Channel, the code symbols are repeated once (each
21   symbol occurs twice) prior to transmission. The data burst randomizer is not used when
22   the mobile station transmits on the Access Channel. Therefore, both copies of the repeated
23   code symbols are transmitted as shown in Figure 6.1.3.1.7.1-2.

24   6.1.3.1.7.2 Data Burst Randomizing Algorithm

25   The data burst randomizer generates a masking pattern of '0's and '1's that randomly
26   masks out the redundant data generated by the code repetition. The masking pattern is
27   determined by the data rate of the frame and by a block of 14 bits taken from the long code.
28   These 14 bits shall be the last 14 bits of the long code used for spreading in the second last
29   power control group of the previous frame. In other words, these are the 14 bits which
30   occur exactly one power control group (1.25 ms) before each Reverse Traffic Channel frame
31   boundary. These 14 bits are denoted as

32   $$b_0 \ b_1 \ b_2 \ b_3 \ b_4 \ b_5 \ b_6 \ b_7 \ b_8 \ b_9 \ b_{10} \ b_{11} \ b_{12} \ b_{13},$$

33   where b_0 represents the oldest bit, and b_{13} represents the latest bit.[8]

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[8]In order to randomize the position of the data bursts, only 8 bits are strictly necessary. The
algorithm described here uses 14 bits to assure that the slots used for data transmission at the
quarter rate are a subset of the slots used at the half rate and that the slots used at the one-eighth
rate are a subset of the slots used at the quarter rate.

20 ms = { 192 bits = 576 code symbols =
            96 Walsh symbols = 16 Power Control Groups

1.25 ms = { 12 bits = 36 code symbols =
              6 Walsh symbols = 1 Power Control Group

Previous Frame

| 12 | 13 | 14 | 15 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

9600 bps frame

Power Control Group Number

Code Symbols Transmitted:
1 33 65 97 ... 481 513 545 2 34 66 98 ... 482 514 546

Previous Frame

| 12 | 13 | 14 | 15 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

4800 bps frame

Code Symbols Transmitted:
1 17 33 49 ... 241 257 273 2 18 34 50 ... 242 258 274

Previous Frame

| 12 | 13 | 14 | 15 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

2400 bps frame

Code Symbols Transmitted:
1 9 17 25 ... 121 129 137 2 10 18 26 ... 122 130 138

Previous Frame

| 12 | 13 | 14 | 15 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

1200 bps frame

Code Symbols Transmitted:
1 5 9 13 ... 61 65 69 2 6 10 14 ... 62 66 70

Sample masking streams shown
are for the 14-bit PN sequence:
(b0, b1, ..., b13) = 0 0 1 0 1 1 0 1 1 0 0 1 0 0

PN bits used
for scrambling

| b0 | b1 | b2 | b3 | b4 | b5 | b6 | b7 | b8 | b9 | b10 | b11 | b12 | b13 |

PCG 14   PCG 15

Figure 6.1.3.1.7.1-1. Reverse CDMA Channel Variable Data Rate Transmission Example

20 ms
96 information bits
576 code symbols
96 Walsh symbols

Code Symbols (refer to Table 6.1.3.1.5-2):
1 17 33 49 ... 241 257 273 9 25 41 57 ... 249 265 281

Code Symbols:
5 21 37 53 ... 245 261 277 13 29 45 61 ... 253 269 285

Repeat of Code Symbols:
5 21 37 53 ... 245 261 277 13 29 45 61 ... 253 269 285

Repeat of Code Symbols:
1 17 33 49 ... 241 257 273 9 25 41 57 ... 249 265 281
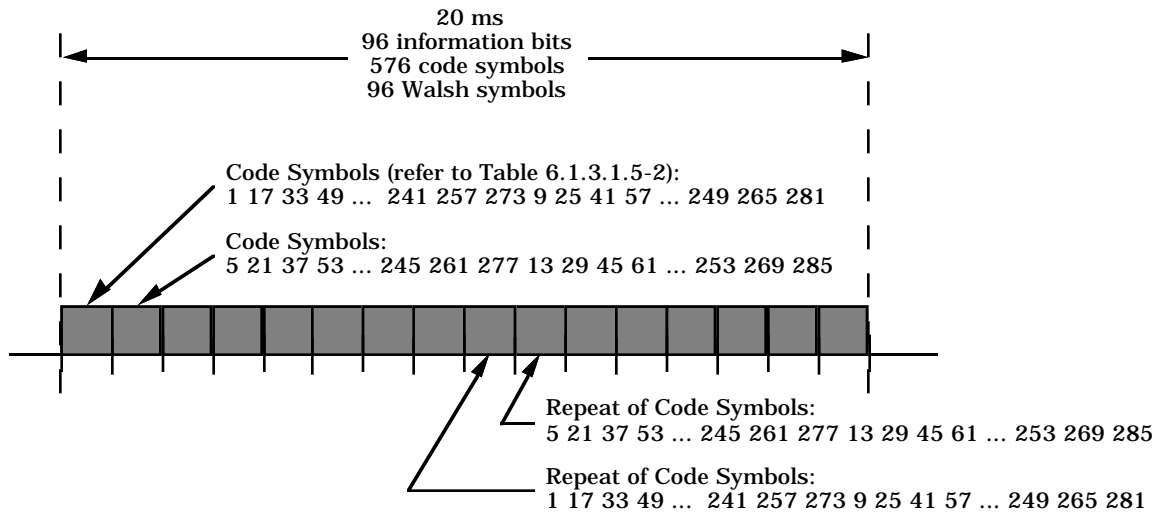
Figure 6.1.3.1.7.1-2. Access Channel Transmission Structure

Each 20 ms Reverse Traffic Channel frame shall be divided into 16 equal length (i.e., 1.25ms) power control groups numbered from 0 to 15 as shown in Figure 6.1.3.1.7.1-1. The data burst randomizer algorithm shall be as follows:

Data Rate Selected: 9600 bps

Transmission shall occur on power control groups numbered:

        0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15.

Data Rate Selected: 4800 bps

Transmission shall occur on power control groups numbered:

        b_0 , 2 + b_1, 4 + b_2 , 6 + b_3 , 8 + b_4 , 10 + b_5 , 12 + b_6, 14 + b_7.

Data Rate Selected: 2400 bps

Transmission shall occur on power control groups numbered:

        b_0 if $b_8 = 0$,   or   2 + b_1 if $b_8 = 1$;

        4 + b_2 if $b_9 = 0$,   or   6 + b_3 if $b_9 = 1$;

        8 + b_4 if $b_{10} = 0$,   or   10 + b_5 if $b_{10} = 1$;

        12 + b_6 if $b_{11} = 0$,   or   14 + b_7 if $b_{11} = 1$.

1   Data Rate Selected: 1200 bps

2   Transmission shall occur on power control groups numbered:

3   b_0 if $(b_8 = 0$ and $b_{12} = 0)$,   or $2 + b_1$ if $(b_8 = 1$ and $b_{12} = 0)$,

4   or $4 + b_2$ if $(b_9 = 0$ and $b_{12} = 1)$, or $6 + b_3$ if $(b_9 = 1$ and $b_{12} = 1)$;

5         $8 + b_4$ if $(b_{10} = 0$ and $b_{13} = 0)$, or $10 + b_5$ if $(b_{10} = 1$ and $b_{13} = 0)$,

6   or $12 + b_6$ if $(b_{11} = 0$ and $b_{13} = 1)$, or $14 + b_7$ if $(b_{11} = 1$ and $b_{13} = 1)$.

7   6.1.3.1.8 Direct Sequence Spreading

8   Prior to transmission, the Reverse Traffic Channel and the Access Channel shall be direct
9   sequence spread by the long code. This spreading operation involves modulo-2 addition of
10   the data burst randomizer output stream and the long code.

11   This long code shall be periodic with period 2^{42}-1 chips and shall satisfy the linear
12   recursion specified by the following characteristic polynomial:

13        $p(x) = x^{42} + x^{35} + x^{33} + x^{31} + x^{27} + x^{26} + x^{25} + x^{22} + x^{21} + x^{19} +$

14        $x^{18} + x^{17} + x^{16} + x^{10} + x^7 + x^6 + x^5 + x^3 + x^2 + x^1 + 1.$

15   Each PN chip of the long code shall be generated by the modulo-2 inner product of a 42-bit
16   mask and the 42-bit state vector of the sequence generator as shown in Figure 6.1.3.1.8-1.

17   The time alignment of the long code generator shall be as shown in Figure 1.2-1.

18   The mask used for the long code varies depending on the channel type on which the mobile
19   station is transmitting. See Figure 6.1.3.1.8-2. Specifically, when transmitting on the
20   Access Channel, the mask shall be as follows: M_{41} through M_{29} shall be set to
21   '1100011001101'; M_{28} through M_{24} shall be set to the Access Channel number chosen (see
22   6.6.3.1.1.2); M_{23} through M_{21} shall be set to the code channel number for the associated
23   Paging Channel (the range is 1 through 7), M_{20} through M_9 shall be set to the REG_ZONE
24   value (see 7.7.2.3.2.1) for the current base station; and M_8 through M_0 shall be set to the
25   PILOT_PN value for the current CDMA Channel (see 7.7.1.3).

26   When transmitting on the Reverse Traffic Channel, the mobile station shall use one of two
27   long code masks unique to that mobile station: a public long code mask unique to the
28   mobile station's ESN or a private long code mask unique for each MIN. The public long
29   code mask shall be as follows: M_{41} through M_{32} shall be set to '1100011000', and M_{31}
30   through M_0 shall be set to a permutation of the mobile station's ESN bits. This
31   permutation is specified as follows:

32   ESN = $(E_{31}, E_{30}, E_{29}, E_{28}, E_{27}, E_{26}, E_{25}, \ldots E_2, E_1, E_0)$

33   Permuted ESN = $(E_0, E_{31}, E_{22}, E_{13}, E_4, E_{26}, E_{17}, E_8, E_{30}, E_{21}, E_{12}, E_3, E_{25}, E_{16},$
34                    $E_7, E_{29}, E_{20}, E_{11}, E_2, E_{24}, E_{15}, E_6, E_{28}, E_{19}, E_{10}, E_1, E_{23}, E_{14},$
35                    $E_5, E_{27}, E_{18}, E_9)$.[9]

36   The private long code mask shall be as follows: M_{41} through M_{40} shall be set to '01', and
37   M_{39} through M_0 shall be set as specified in 6.3.12.3.

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[9]This permutation prevents high correlation between long codes corresponding to consecutive ESNs.
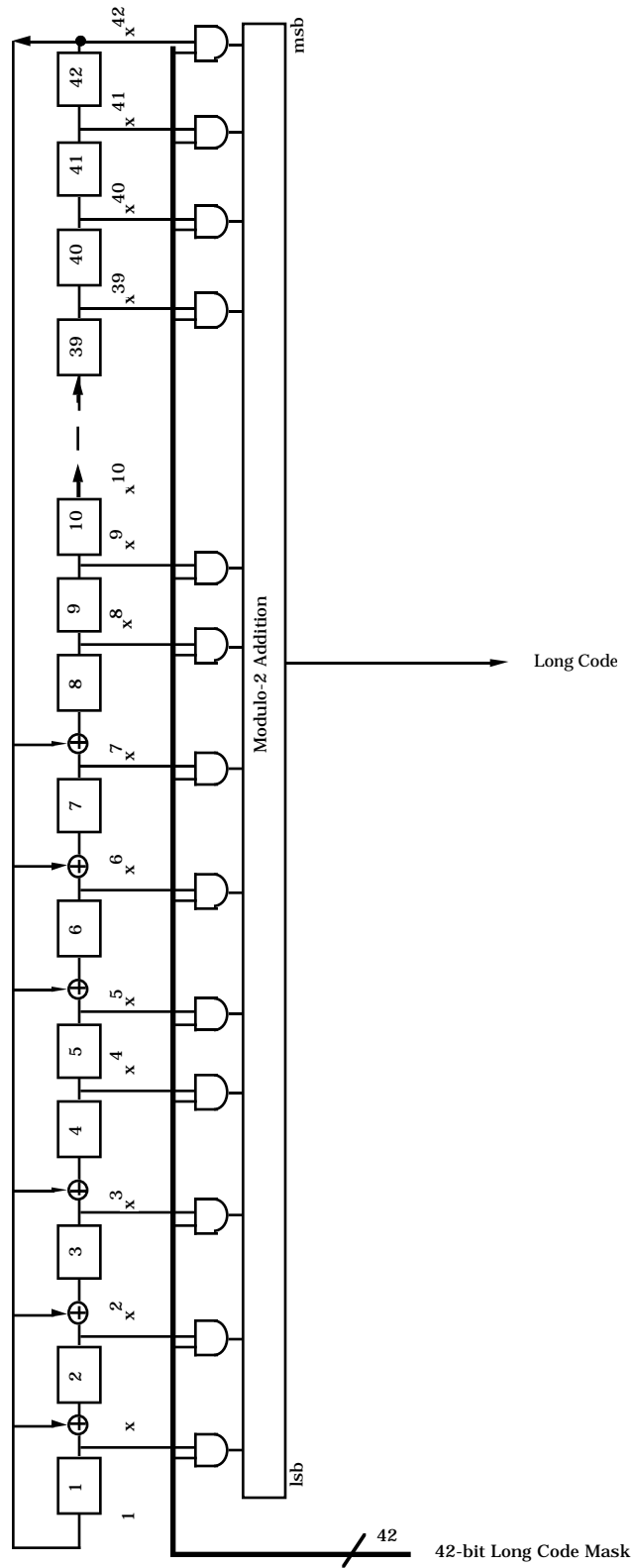
Figure 6.1.3.1.8-1. Long Code Generator

Access Channel Long Code Mask

41 29	28 24	23 21	20 9	8 0
1100011001101	ACN	PCN	REG_ZONE	PILOT_PN

ACN - Access Channel Number
PCN - Paging Channel Number
REG_ZONE - Registration zone for the Forward CDMA Channel
PILOT_PN - PN offset for the Forward CDMA Channel

Public Long Code Mask

41 32	31 0
1100011000	Permuted ESN

Private Long Code Mask

41	40	39 0
0	1	Private Long Code
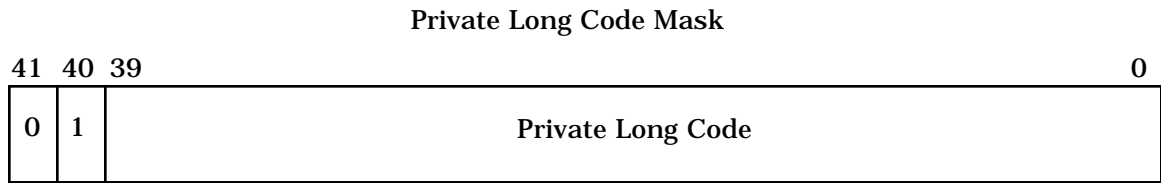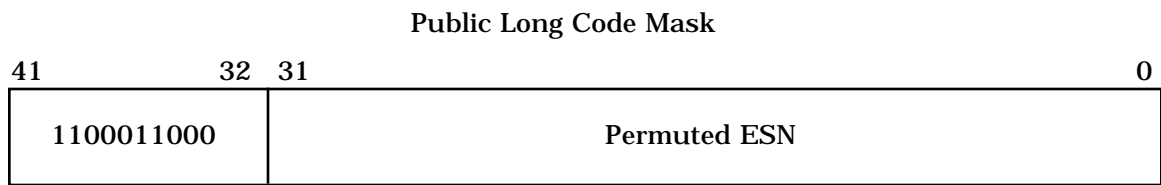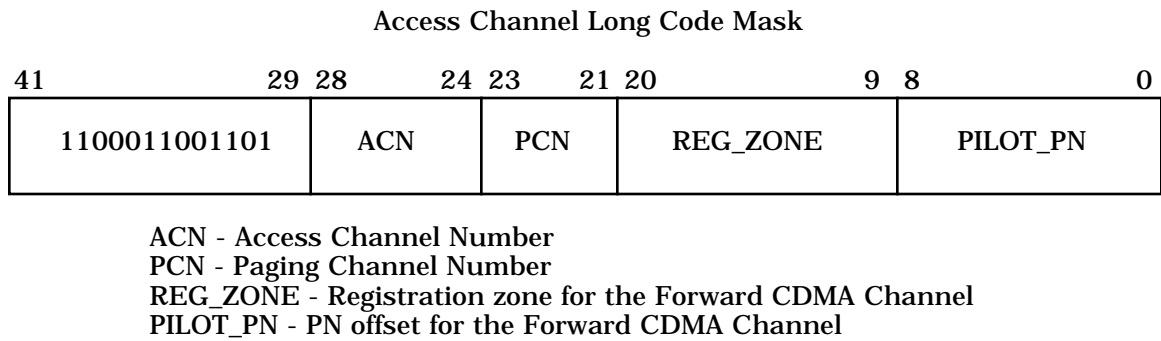
Figure 6.1.3.1.8-2. Long Code Mask Format

1   6.1.3.1.9 Quadrature Spreading

2   Following the direct sequence spreading, the Reverse Traffic Channel and Access Channel
3   are spread in quadrature as shown in Figure 6.1.3.1-2.   The sequences used for this
4   spreading shall be the zero-offset I and Q pilot PN sequences used on the Forward CDMA
5   Channel (see 7.1.3.2.1).   These sequences are periodic with period 2^{15} chips and shall be
6   based on the following characteristic polynomials, respectively:

7            $P_I(x) = x^{15} + x^{13} + x^9 + x^8 + x^7 + x^5 + 1$

8   (for the in-phase (I) sequence)

9   and

10           $P_Q(x) = x^{15} + x^{12} + x^{11} + x^{10} + x^6 + x^5 + x^4 + x^3 + 1$

11   (for the quadrature-phase (Q) sequence).

12   The maximum length linear feedback shift register sequences, {i(n)} and {q(n)}, based on the
13   above polynomials are of period 2^{15}-1 and can be generated by using the following linear
14   recursions:

15           $i(n) = i(n-15) \oplus i(n-10) \oplus i(n-8) \oplus i(n-7) \oplus i(n-6) \oplus i(n-2)$

16   (based on $P_I(x)$ as the characteristic polynomial)

17   and

18           $q(n) = q(n-15) \oplus q(n-12) \oplus q(n-11) \oplus q(n-10) \oplus q(n-9) \oplus q(n-5) \oplus q(n-4) \oplus q(n-3)$

19   (based on $P_Q(x)$ as the characteristic polynomial),

20   where i(n) and q(n) are binary-valued ('0' and '1') and the additions are modulo-2.   In order
21   to obtain the I and Q pilot PN sequences (of period 2^{15}), a '0' is inserted in {i(n)} and {q(n)}
22   after 14 consecutive '0' outputs (this occurs only once in each period).   Therefore, the pilot
23   PN sequences have one run of 15 consecutive '0' outputs instead of 14.

24   The mobile station shall align the I and Q pilot PN sequences such that the first chip on
25   every even second mark as referenced to the transmit time reference (see 6.1.5.1) is the '1'
26   after the 15 consecutive '0's (see Figure 1.2-1).

27   The pilot PN sequences repeat every 26.666... ms (= 2^{15}/1228800 seconds).   There are
28   exactly 75 repetitions in every 2 seconds.

29   The spreading modulation shall be offset quadrature phase shift keying (OQPSK).   The data
30   spread by the Q pilot PN sequence is delayed by half a chip time (406.901 ns) with respect
31   to the data spread by the I pilot PN sequence.

32   The binary data ('0's and '1's) I and Q shown in Figure 6.1.3.1-2 shall be mapped into
33   phase according to Table 6.1.3.1.9-1.

1   **Table 6.1.3.1.9-1. Reverse CDMA Channel I and Q Mapping**

I	Q	Phase
0	0	$\pi/4$
1	0	$3\pi/4$
1	1	$-3\pi/4$
0	1	$-\pi/4$

2

3   The resulting signal constellation and phase transition are shown in Figure 6.1.3.1.9-1.

4

5
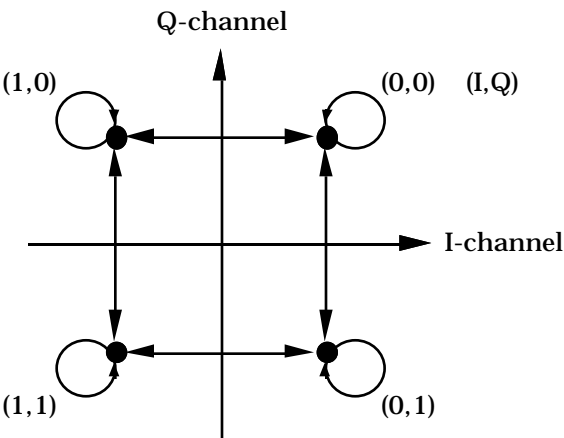
6   **Figure 6.1.3.1.9-1. Reverse CDMA Channel Signal Constellation and Phase Transition**

7

8   6.1.3.1.10 Baseband Filtering

9   Following the spreading operation, the I and Q data are applied to the inputs of the I and Q
10   baseband filters as shown in Figure 6.1.3.1-2. The baseband filters shall have linear
11   phase. The baseband filters shall have a frequency response S(f) that satisfies the limits
12   given in Figure 6.1.3.1.10-1. Specifically, the normalized frequency response of the filter
13   shall be contained within $\pm\delta_1$ in the passband $0 \leq f \leq f_p$ and shall be less than or equal to δ_2
14   in the stopband $f \geq f_s$. The numerical values for the parameters are $\delta_1 = 1.5$ dB, $\delta_2 = -40$
15   dB, $f_p = 590$ kHz, and $f_s = 740$ kHz.
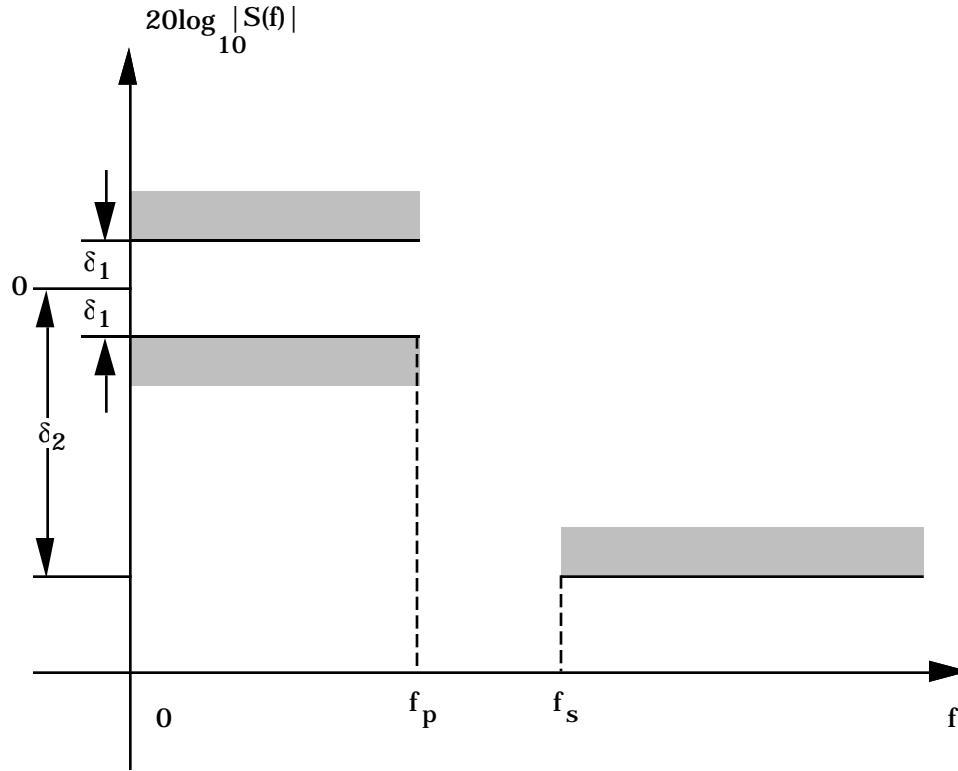
Figure 6.1.3.1.10-1. Baseband Filters Frequency Response Limits

Let s(t) be the impulse response of the baseband filter. Then s(t) shall satisfy the following equation:

$$\text{Mean Squared Error} = \sum_{k=0}^{47}[\alpha s(kT_s - \tau) - h(k)]^2 \leq 0.03,$$

where the constants α and τ are used to minimize the mean squared error. The constant T_s is equal to 203.451... ns, which equals one quarter of a PN chip. The values of coefficients h(k) are given in Table 6.1.3.1.10-1. Note that h(k) equals h(47 - k).

1   **Table 6.1.3.1.10-1. Coefficients h(k)**

k	h(k)
0, 47	-0.025288315
1, 46	-0.034167931
2, 45	-0.035752323
3, 44	-0.016733702
4, 43	0.021602514
5, 42	0.064938487
6, 41	0.091002137
7, 40	0.081894974
8, 39	0.037071157
9, 38	-0.021998074
10, 37	-0.060716277
11, 36	-0.051178658
12, 35	0.007874526
13, 34	0.084368728
14, 33	0.126869306
15, 32	0.094528345
16, 31	-0.012839661
17, 30	-0.143477028
18, 29	-0.211829088
19, 28	-0.140513128
20, 27	0.094601918
21, 26	0.441387140
22, 25	0.785875640
23, 24	1.0

1   6.1.3.2 Access Channel

2   The Access Channel is used by the mobile station to initiate communication with the base
3   station and to respond to Paging Channel messages. An Access Channel transmission is a
4   coded, interleaved, and modulated spread-spectrum signal.   The Access Channel is
5   random-access (see 6.6.3.1.1). Access Channels are uniquely identified by their long codes
6   (see 6.1.3.1.8).

7   6.1.3.2.1 Access Channel Time Alignment and Modulation Rate

8   The mobile station shall transmit information on the Access Channel at a fixed data rate of
9   4800 bps. An Access Channel frame shall be 20 ms in length. An Access Channel frame
10 shall begin only when System Time (see Figure 1.2-1) modulo 20 ms equals zero.

11 The synchronization, timing, and structure of the Access Channel are specified in 6.6.3.1.1
12 and 6.7.1.1.

13 The Reverse CDMA Channel may contain up to 32 Access Channels numbered 0 through
14 31 per supported Paging Channel. At least one Access Channel exists on the Reverse
15 CDMA Channel for each Paging Channel on the corresponding Forward CDMA Channel.
16 Each Access Channel is associated with a single Paging Channel.

17 6.1.3.2.2 Access Channel Convolutional Encoding

18 The Access Channel data shall be convolutionally encoded prior to transmission as
19 specified in 6.1.3.1.3.

20 When generating Access Channel data, the encoder shall be initialized to the all zero state
21 at the end of each 20 ms frame.

22 6.1.3.2.3 Access Channel Code Symbol Repetition

23 Each code symbol output from the convolutional encoder on the Access Channel shall be
24 repeated once (each symbol occurs two consecutive times) as specified in 6.1.3.1.4.

25 6.1.3.2.4 Access Channel Interleaving

26 The repeated code symbols on the Access Channel shall be interleaved as specified in
27 6.1.3.1.5.

28 6.1.3.2.5 Access Channel Modulation

29 The Access Channel data shall be modulated as specified in 6.1.3.1.6.

30 6.1.3.2.6 Access Channel Gating

31 The mobile station shall not gate off any power control group while transmitting on the
32 Access Channel as specified in 6.1.3.1.7.1.

33 6.1.3.2.7 Access Channel Direct Sequence Spreading

34 The Access Channel shall be spread by the long code as specified in 6.1.3.1.8.

1   6.1.3.2.8 Access Channel Quadrature Spreading

2   The Access Channel shall be quadrature spread by the pilot PN sequences as specified in
3   6.1.3.1.9.

4   6.1.3.2.9 Access Channel Baseband Filtering

5   The Access Channel shall be filtered as specified in 6.1.3.1.10.

6   6.1.3.2.10 Access Channel Frame Structure

7   Each Access Channel frame contains 96 bits (20 ms frame at 4800 bps). Each Access
8   Channel frame shall consist of 88 information bits and eight Encoder Tail Bits (see Figure
9   6.1.3.2.10-1). The 8-bit CRC used for Reverse Traffic Channel frames at 4800 bps shall not
10 be used.

11
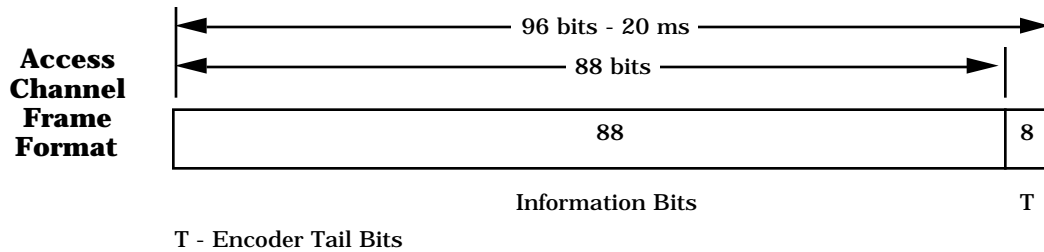
Figure 6.1.3.2.10-1. Access Channel Frame Structure

14

15 6.1.3.3 Reverse Traffic Channel

16 The Reverse Traffic Channel is used for the transmission of primary traffic, secondary
17 traffic, and signaling traffic to the base station during a call.

18 6.1.3.3.1 Reverse Traffic Channel Time Alignment and Modulation Rates

19 The mobile station shall transmit information on the Reverse Traffic Channel at a variable
20 data rate of 9600, 4800, 2400, or 1200 bps. A Reverse Traffic Channel frame shall be fixed
21 at 20 ms in length.

22 A zero-offset Reverse Traffic Channel frame shall begin only when System Time (see Figure
23 1.2-1) modulo 20 ms equals zero. A zero-offset Traffic Channel frame shall have the
24 FRAME_OFFSET parameter (see the *Channel Assignment Message* in 7.7.2.3.2.8) set to
25 zero. A mobile station shall support staggered Traffic Channel frames. A staggered frame
26 shall begin $1.25 \times$ FRAME_OFFSET ms later than the zero-offset Traffic Channel frame.
27 The Reverse Traffic Channel interleaver block shall be aligned with the Reverse Traffic
28 Channel frame.

29 6.1.3.3.2 Reverse Traffic Channel Convolutional Encoding

30 The Reverse Traffic Channel data shall be convolutionally encoded prior to transmission as
31 specified in 6.1.3.1.3.

When generating Reverse Traffic Channel data, the encoder shall be initialized to the all zero state at the end of each 20 ms frame.

6.1.3.3.3 Reverse Traffic Channel Code Symbol Repetition

Reverse Traffic Channel code symbol repetition shall be as specified in 6.1.3.1.4.

6.1.3.3.4 Reverse Traffic Channel Interleaving

The code symbols (or repeated code symbols when a data rate lower than 9600 bps is used) on the Reverse Traffic Channel shall be interleaved as specified in 6.1.3.1.5.

6.1.3.3.5 Reverse Traffic Channel Modulation

The Reverse Traffic Channel data shall be modulated as specified in 6.1.3.1.6.

6.1.3.3.6 Reverse Traffic Channel Gating

The mobile station shall perform the data burst randomizing function as specified in 6.1.3.1.7 while transmitting on the Reverse Traffic Channel.

6.1.3.3.7 Reverse Traffic Channel Direct Sequence Spreading

The Reverse Traffic Channel shall be spread by the long code as specified in 6.1.3.1.8.

6.1.3.3.8 Reverse Traffic Channel Quadrature Spreading

The Reverse Traffic Channel shall be quadrature spread by the pilot PN sequences as specified in 6.1.3.1.9.

6.1.3.3.9 Reverse Traffic Channel Baseband Filtering

The Reverse Traffic Channel shall be filtered as specified in 6.1.3.1.10.

6.1.3.3.10 Reverse Traffic Channel Frame Structure

Reverse Traffic Channel frames sent at the 9600 bps transmission rate shall consist of 192 bits. These 192 bits shall be composed of 172 information bits followed by 12 frame quality indicator (CRC) bits and eight Encoder Tail Bits as shown in Figure 6.1.3.3.10-1.

Reverse Traffic Channel frames sent at the 4800 bps transmission rate shall consist of 96 bits. These 96 bits shall be composed of 80 information bits followed by eight frame quality indicator (CRC) bits and eight Encoder Tail Bits as shown in Figure 6.1.3.3.10-1.

Reverse Traffic Channel frames sent at the 2400 bps transmission rate shall consist of 48 bits. These 48 bits shall be composed of 40 information bits followed by eight Encoder Tail Bits as shown in Figure 6.1.3.3.10-1.

Reverse Traffic Channel frames sent at the 1200 bps transmission rate shall consist of 24 bits. These 24 bits shall be composed of 16 information bits followed by eight Encoder Tail Bits as shown in Figure 6.1.3.3.10-1.

The number of bits in the frame and the frame format (see 6.1.3.3.11) shall be variable on a frame-by-frame basis.

Figure 6.1.3.3.10-1. Reverse Traffic Channel Frame Structure
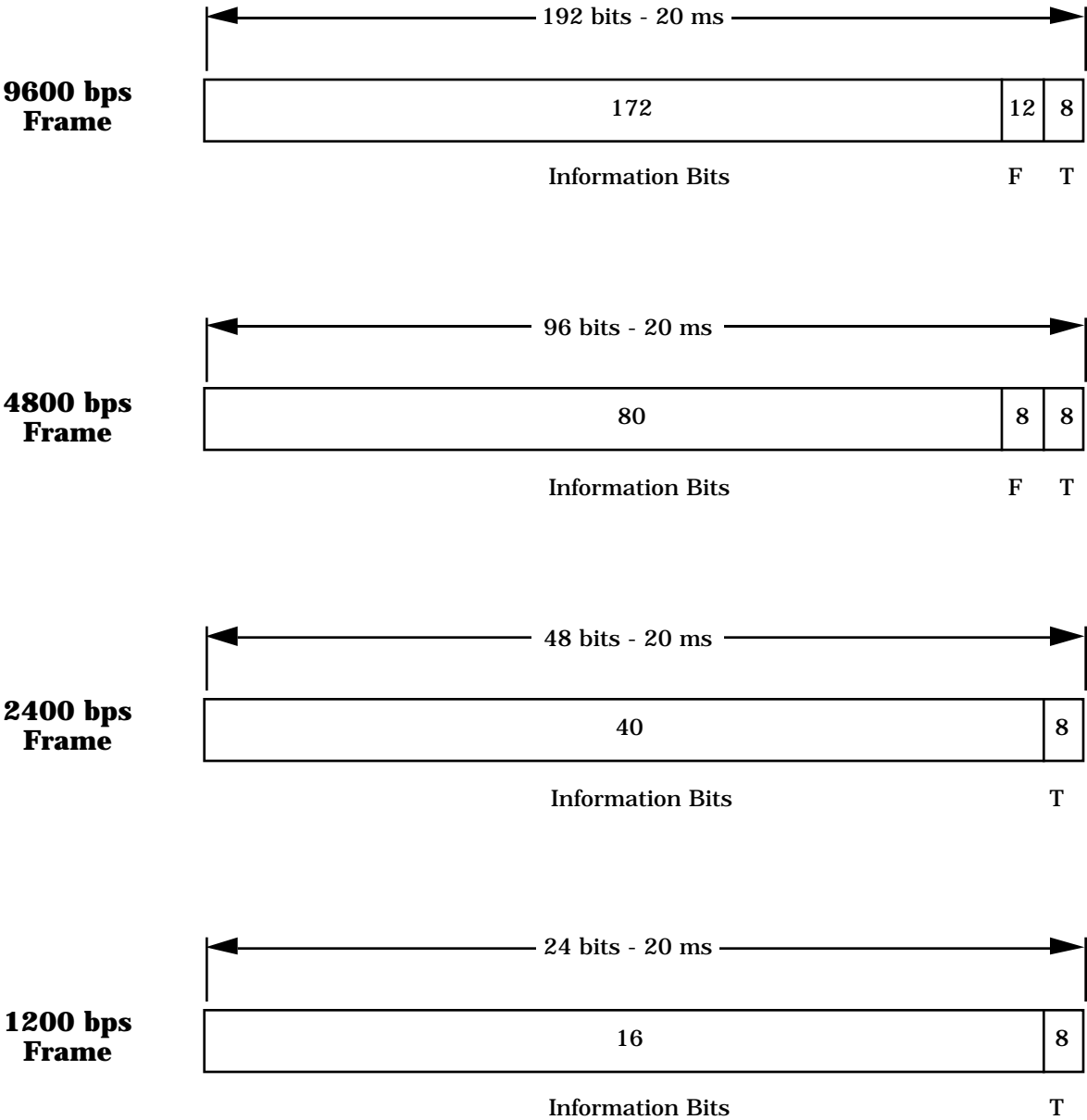
Notation

F - Frame Quality Indicator
T - Encoder Tail Bits

1   6.1.3.3.10.1 Reverse Traffic Channel Frame Quality Indicator

2   Each 9600 bps and 4800 bps frame shall include a frame quality indicator. This frame
3   quality indicator is a CRC.[10] No frame quality indicator is used for the 2400 bps and 1200
4   bps transmission rates.

5   For both the 9600 bps and 4800 bps rates, the frame quality indicator shall be calculated
6   on all bits within the frame, except the frame quality indicator itself and the Encoder Tail
7   Bits. The 9600 bps transmission rate shall use a 12-bit frame quality indicator. The
8   generator polynomial for this frame quality indicator shall be as follows:

9   $$g(x) = x^{12} + x^{11} + x^{10} + x^9 + x^8 + x^4 + x + 1.$$

10 The 4800 bps transmission rate shall use an 8-bit frame quality indicator. The generator
11 polynomial for this frame quality indicator shall be as follows:

12 $$g(x) = x^8 + x^7 + x^4 + x^3 + x + 1.$$

13 The CRCs shall be computed according to the following procedure using the logic shown in
14 Figures 6.1.3.3.10.1-1 and 6.1.3.3.10.1-2:

15   • Initially, all shift register elements shall be set to logical one and the switches shall
16   be set in the up position.

17   • The register shall be clocked 172 times (for 192-bit frame) or 80 times (for 96-bit
18   frame) with the information bits as input.

19   • The switches shall be set in the down position, and the register shall be clocked an
20   additional 12 times (for 192-bit frame) or 8 times (for 96-bit frame). The 12 or 8
21   additional output bits shall be the check bits.

22   • The bits shall be transmitted in the order calculated.

23 6.1.3.3.10.2 Reverse Traffic Channel Encoder Tail Bits

24 The last 8 bits of each Reverse Traffic Channel frame are called the Encoder Tail Bits.
25 These 8 bits shall be set to '0'. The mobile station shall not include these bits in the
26 computation of the 9600 and 4800 bps frame quality indicators.

---

[10]The frame quality indicator supports two functions at the receiver. The first function is to
determine the transmission rate of the frame; the second is to determine whether the frame is in
error.

Input

0

X^0　X^1　X^3　X^4　X^7　X^8　X^9　X^{10}　X^{11}

Output

Denotes one-bit storage element

Denotes modulo-2 addition

Up for first 172 bits
Down for last 12 bits

0
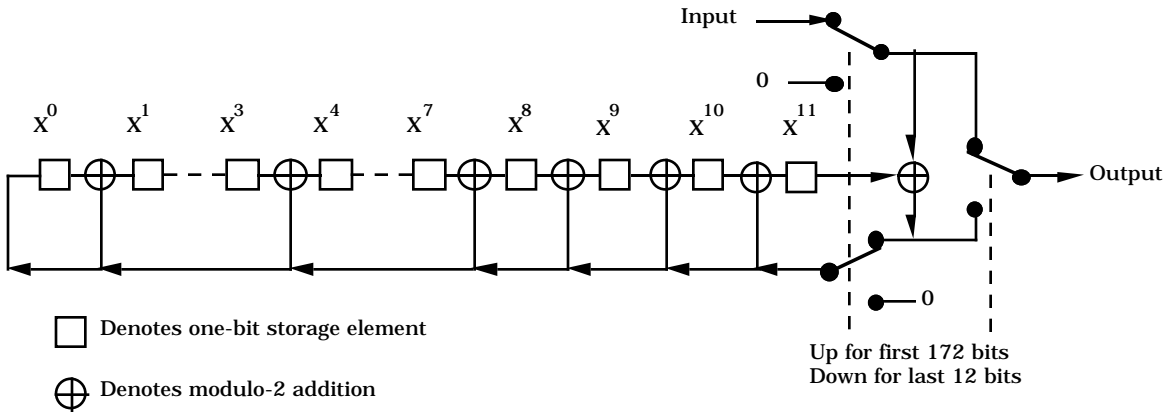
**Figure 6.1.3.3.10.1-1. Reverse Traffic Channel Frame Quality Indicator Calculation
at the 9600bps Rate**

Input

0

X^0　X^1　X^2　X^3　X^4　X^5　X^6　X^7

Output

Denotes one-bit storage element

Denotes modulo-2 addition

Up for first 80 bits
Down for last 8 bits

0
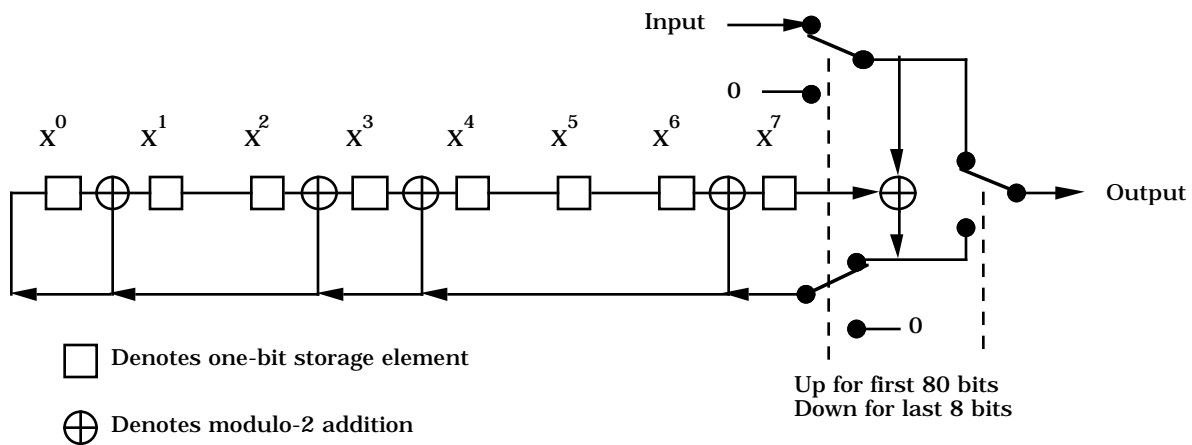
**Figure 6.1.3.3.10.1-2. Reverse Traffic Channel Frame Quality Indicator Calculation
at the 4800bps Rate**

1   6.1.3.3.10.3 Traffic Channel Preamble

2   The Traffic Channel preamble shall consist of frames of 192 zeros that are transmitted at
3   the 9600 bps rate. The Traffic Channel preamble shall not include the frame quality
4   indicator.

5   The Traffic Channel preamble is transmitted to aid the base station in performing initial
6   acquisition of the Reverse Traffic Channel. The Traffic Channel preamble transmission
7   occurs after the mobile station's transmitter has been enabled during the *Traffic Channel*
8   *Initialization Substate* of the *Mobile Station Control on the Traffic Channel State* and before
9   receipt of the first valid message on the Forward Traffic Channel (see 6.6.4.2).

10   6.1.3.3.10.4 Null Traffic Channel Data

11   Null Traffic Channel data shall consist of frames of 16 ones followed by 8 zeros (the
12   Encoder Tail Bits) sent at the 1200 bps rate.

13   The mobile station transmits null Traffic Channel data when no service option is active.
14   Typically this occurs for a mobile station terminated call when the mobile station is in
15   either the *Waiting for Order Substate* or the *Waiting for Mobile Station Answer Substate* of
16   the *Mobile Station Control on the Traffic Channel State*. Null Traffic Channel data serves as
17   a "keep-alive" operation so that the base station can maintain synchronization with the
18   mobile station.

19   6.1.3.3.11 Multiplex Option 1 Information Bits

20   Multiplex Option 1 is also referred to as the default multiplex option.[11] It provides for the
21   transmission of primary traffic and signaling traffic. Signaling traffic may be transmitted
22   via blank-and-burst with the signaling traffic using all of the frame or via dim-and-burst
23   with the primary traffic and signaling traffic sharing the frame. Multiplex Option 1 also
24   supports the transmission of secondary traffic. When primary traffic is active, secondary
25   traffic is transmitted via dim-and-burst with the primary traffic and secondary traffic
26   sharing the frame. When primary traffic is not active, secondary traffic is transmitted via
27   blank-and-burst with the secondary traffic using all of the frame. The information bit
28   structures for primary and signaling traffic are specified in 6.1.3.3.11.1; the information bit
29   structures for secondary traffic are specified in 6.1.3.3.11.2. Table 6.1.3.3.11-1 shows the
30   information bit structures supported by Multiplex Option 1.

31   The mobile station shall support Multiplex Option 1. The mobile station shall support the
32   transmission of primary traffic and signaling traffic using the information bit structures
33   specified in 6.1.3.3.11.1. The mobile station may support secondary traffic, and if so, the
34   mobile station shall also use the information bit structures specified in 6.1.3.3.11.2.

---

[11]The multiplex option is the same on both the Forward Traffic Channel and the Reverse Traffic
Channel.

Table 6.1.3.3.11-1. Reverse Traffic Channel Information Bits for Multiplex Option 1

Transmit Rate (bits/sec)	Format Bits				Primary Traffic		Signaling Traffic		Secondary Traffic	
	Mixed Mode (MM)	Burst Format (BF)	Traffic Type (TT)	Traffic Mode (TM)	bits/ frame	bits/ sec	bits/ frame	bits/ sec	bits/ frame	bits/ sec
9600 * * * *	0	–	–	–	171	8550	0	0	0	0
	1	0	0	00	80	4000	86	4300	0	0
	1	0	0	01	40	2000	126	6300	0	0
	1	0	0	10	16	800	150	7500	0	0
	1	1	0	–	0	0	168	8400	0	0
	1	1	1	–	0	0	0	0	169	8450
	1	0	1	00	80	4000	0	0	87	4350
	1	0	1	01	40	2000	0	0	127	6350
	1	0	1	10	16	800	0	0	151	7550
4800	–	–	–	–	80	4000	0	0	0	0
2400	–	–	–	–	40	2000	0	0	0	0
1200	–	–	–	–	16	800	0	0	0	0

Notes: Secondary traffic structures, marked with *, are optional.
         Signaling traffic bits do not include the SOM bit.

6.1.3.3.11.1 Primary and Signaling Traffic with Multiplex Option 1

The mobile station shall support the information bit structures described in Table 6.1.3.3.11-1 and Figure 6.1.3.3.11.1-1.

For signaling traffic, the first bit of the frame's signaling portion shall be a SOM (Start of Message) Bit. The SOM Bit shall be a '1' if a Reverse Traffic Channel message (signaling message) begins at the following bit. A Reverse Traffic Channel message capsule shall not begin anywhere else in the frame. The SOM Bit shall be a '0' if a message does not begin at the following bit. This occurs if the frame contains part of a message that began in a previous frame.

9600 bps Primary Traffic Only

←	172 bits	→
1	171	
MM =0	Primary Traffic	

Dim and Burst with Rate 1/2 Primary and Signaling Traffic

1	1	1	2	80	1	86
MM =1	BF =0	TT =0	TM =00	Primary Traffic	SOM	Signaling Traffic

172 bits

Dim and Burst with Rate 1/4 Primary and Signaling Traffic

1	1	1	2	40	1	126
MM =1	BF =0	TT =0	TM =01	Primary Traffic	SOM	Signaling Traffic

172 bits

Dim and Burst with Rate 1/8 Primary and Signaling Traffic

1	1	1	2	16	1	150
MM =1	BF =0	TT =0	TM =10	Primary Traffic	SOM	Signaling Traffic

172 bits

Blank and Burst with Signaling Traffic Only

1	1	1	1	168
MM =1	BF =1	TT =0	SOM	Signaling Traffic

172 bits

Notation

MM - Mixed Mode Bit
0 - Primary Traffic Only
1 - Primary Traffic and/or Signaling/Secondary Traffic
BF - Burst Format Bit
0 - Dim-and-burst
1 - Blank-and-burst
TT - Traffic Type Bit
0 - Signaling
1 - Secondary

TM - Traffic Mode Bits
00 - 80 Primary Traffic Bits and either 86 Signaling Traffic or 87 Secondary Traffic Bits
01 - 40 Primary Traffic Bits and either 126 Signaling Traffic Bits or 127 Secondary Traffic Bits
10 - 16 Primary Traffic Bits and either 150 Signaling Traffic Bits or 151 Secondary Traffic Bits
11 - Reserved
SOM - Start of Message Bit
0 - Message does not begin at the following bit
1 - Message begins at the following bit

Figure 6.1.3.3.11.1-1. Information Bits for Primary Traffic and Signaling Traffic (Part 1 of 2)

4800 bps Primary Traffic Only

← 80 bits →

| 80 |

Primary Traffic

2400 bps Primary Traffic Only

← 40 bits →

| 40 |

Primary Traffic

1200 bps Primary Traffic Only

← 16 bits →

| 16 |

Primary Traffic

Notation

MM - Mixed Mode Bit
0 - Primary Traffic Only
1 - Primary Traffic and/or
Signaling/Secondary Traffic
BF - Burst Format Bit
0 - Dim-and-burst
1 - Blank-and-burst
TT - Traffic Type Bit
0 - Signaling
1 - Secondary

TM - Traffic Mode Bits
00 - 80 Primary Traffic Bits and either 86
  Signaling Traffic or 87 Secondary Traffic Bits
01 - 40 Primary Traffic Bits
  and either 126 Signaling Traffic Bits or
  127 Secondary Traffic Bits
10 - 16 Primary Traffic Bits
  and either 150 Signaling Traffic Bits or
  151 Secondary Traffic Bits
11 - Reserved
SOM - Start of Message Bit
0 - Message does not begin at the following bit
1 - Message begins at the following bit

Figure 6.1.3.3.11.1-1. Information Bits for Primary Traffic and Signaling Traffic (Part 2 of 2)

1   6.1.3.3.11.2 Secondary Traffic with Multiplex Option 1

2   If the mobile station supports secondary traffic, the mobile station shall use the information
3   bit structures described in Table 6.1.3.3.11-1 and Figure 6.1.3.3.11.2-1.

4

Blank and Burst with Secondary Traffic Only

1	1	1	169

MM=1 BF=1 TT=1   Secondary Traffic

Dim and Burst with Rate 1/2 Primary and Secondary Traffic

1	1	1	2	80	87

MM=1 BF=0 TT=1 TM=00   Primary Traffic   Secondary Traffic

Dim and Burst with Rate 1/4 Primary and Secondary Traffic

1	1	1	2	40	127

MM=1 BF=0 TT=1 TM=01   Primary Traffic   Secondary Traffic

Dim and Burst with Rate 1/8 Primary and Secondary Traffic

1	1	1	2	16	151

MM=1 BF=0 TT=1 TM=10   Primary Traffic   Secondary Traffic

Notation

MM - Mixed Mode Bit
0 - Primary Traffic Only
1 - Primary Traffic and/or
Signaling/Secondary Traffic
BF - Burst Format Bit
0 - Dim-and-burst
1 - Blank-and-burst
TT - Traffic Type Bit
0 - Signaling
1 - Secondary

TM - Traffic Mode Bits
    00 - 80 Primary Traffic Bits and either 86
         Signaling Traffic or 87 Secondary Traffic Bits
    01 - 40 Primary Traffic Bits
         and either 126 Signaling Traffic Bits or
         127 Secondary Traffic Bits
    10 - 16 Primary Traffic Bits
         and either 150 Signaling Traffic Bits or
         151 Secondary Traffic Bits
    11 - Reserved
SOM - Start of Message Bit
0 - Message does not begin at the following bit
1 - Message begins at the following bit

5

6   **Figure 6.1.3.3.11.2-1. Information Bits for Secondary Traffic**

6.1.3.3.11.3 Use of Various Information Bit Formats

When neither a primary traffic service option nor a secondary traffic service option is active, the mobile station shall transmit signaling traffic using only blank-and-burst frames. When not transmitting signaling traffic, the mobile station shall transmit only null Traffic Channel data frames.

When a primary traffic service option is active and a secondary traffic service option is not active, the mobile station shall use the information formats specified in 6.1.3.3.11.1. The mobile station shall not transmit null Traffic Channel data. The mobile station should use the dim-and-burst information format specified in 6.1.3.3.11.1 for signaling traffic.

When a primary traffic service option is not active and a secondary traffic service option is active, the mobile station shall use the information formats specified in 6.1.3.3.11.2 to transmit secondary traffic. The mobile station shall use the blank-and-burst format specified in 6.1.3.3.11.1 for signaling traffic. The mobile station shall transmit null Traffic Channel data when neither secondary traffic nor signaling traffic is to be sent.

When both a primary traffic service option and a secondary traffic service option are active, the mobile station shall use the information formats specified in 6.1.3.3.11.1 and 6.1.3.3.11.2. The mobile station shall not transmit null Traffic Channel data. The mobile station should use the dim-and-burst information format specified in 6.1.3.3.11.1 for signaling traffic.

6.1.3.3.11.4 Control of Service Options

Multiplex Option 1 controls the number of bits that the connected service options supplies for a frame (see Appendix A).

The mobile station shall use the following rules when a primary traffic service option is active: If signaling traffic is to be transmitted in a frame, Multiplex Option 1 shall either restrict the primary traffic service option to generate zero bits (for a blank-and-burst frame) or to generate less than 171 bits (for a dim-and-burst frame). If secondary traffic is to be transmitted in a frame, Multiplex Option 1 may restrict the primary traffic service option to generate less than 171 bits but shall allow the primary traffic service option to generate at least 16 bits. In all other cases, Multiplex Option 1 shall allow the primary traffic service option to generate either 16, 40, 80, or 171 bits for a frame.

6.1.4 Limitations on Emissions

6.1.4.1 Bandwidth Occupied

Modulation products in a bandwidth of 30 kHz centered ±750 kHz from the channel center frequency should be at least 45 dB and shall be at least 42 dB below the mean output power level.

1   6.1.4.2 Conducted Spurious Emissions

2   6.1.4.2.1 Suppression Inside Cellular Band

3   When transmitting on any CDMA Channel, spurious emission levels in the mobile station
4   transmit band between 824 and 849 MHz shall be less than the limits specified in Table
5   6.1.4.2.1-1.

6   In addition, spurious emissions in each 1.23 MHz band located anywhere in the mobile
7   station receive band between 869 and 894 MHz shall be less than -80 dBm. These
8   requirements shall apply to measurements made at the mobile station antenna connector.

9

10   **Table 6.1.4.2.1-1. Spurious Emission Limits When Transmitting**

For Frequency f, with |f - Center Frequency|	Greater than 780 kHz	Greater than 1.98 MHz
Spurious emission levels shall be less than either (a), or both (b) and (c)	(a) -42 dBc/30 kHz	(a) -54 dBc/30 kHz
	(b) -60 dBm/30 kHz (c) -54 dBm/1.23 MHz	
Spurious emission levels should be less than either (a), or both (b) and (c)	(a) -45 dBc/30 kHz	(a) -60 dBc/30 kHz
	(b) -66 dBm/30 kHz (c) -60 dBm/1.23 MHz	

11   Note: All frequencies in the measurement bandwidth shall satisfy the restrictions
12   on |f - Center Frequency|.

13

14   6.1.4.2.2 Suppression Outside Cellular Band

15   Current FCC rules shall apply.

16   6.1.4.3 Radiated Spurious Emissions

17   Radiated spurious emissions (from sources other than the antenna connector) shall meet
18   levels corresponding to the conducted spurious requirements listed in 6.1.4.2.

19   6.1.5 Synchronization and Timing

20   6.1.5.1 Time Reference

21   Figure 1.2-1 illustrates the nominal relationship between the mobile station and base
22   station transmit and receive time references. The mobile station shall establish a time
23   reference which is used to derive timing for the transmit chip, symbol, frame slot, and
24   system timing. The mobile station time reference shall be synchronized to the time of
25   occurrence, as measured at the mobile station antenna connector, of the earliest arriving
26   multipath component being used for demodulation. If another multipath component
27   (belonging to the same Pilot Channel or to a different Pilot Channel) becomes the earliest

arriving multipath component to be used, the mobile station time reference shall track to the new component.

When receiving the Forward Traffic Channel, the mobile station time reference shall be used to determine the transmit timing of the Reverse Traffic Channel. When receiving the Paging Channel, the mobile station time reference shall be used to determine the transmit timing of the Access Channel.

The mobile station transmit time (see Figure 1.2-1) as measured at the mobile station antenna connector shall be maintained within ±1 μs of the time of occurrence, as measured at the mobile station antenna connector, of the earliest arriving multipath component being used for demodulation.

If a new multipath component becomes the earliest arriving multipath component used for demodulation, the mobile station time reference shall be corrected by no faster than 1/4 chip (203.451 ns) in any 200 ms period and no slower than 300 ns per second.

6.1.5.2 PN Time Tolerance

The time error between the long code timing and the 64-ary Walsh symbol sequence timing shall be less than ±50 ns.

6.1.6 Transmitter Performance Requirements

System performance is predicated on transmitters meeting the requirements set forth in the document titled "Recommended Minimum Performance Standards for 800 MHz Wideband Spread Spectrum Dual-Mode Mobile Stations."

6.2 Receiver

6.2.1 Frequency Parameters

6.2.1.1 Channel Spacing and Designation

Channel spacing and designation for the mobile station reception shall be as specified in 2.1.1.1. Valid channels for CDMA operations shall be as specified in 6.1.1.1.

6.2.2 Demodulation Characteristics

6.2.2.1 Processing

The mobile station demodulation process shall perform complementary operations to the base station modulation process on the Forward CDMA Channel (see 7.1.3).

6.2.2.2 Forward Traffic Channel Frame Categorization

The multiplex sublayer in the mobile station shall classify received Forward Traffic Channel frames into the following 14 categories (see 7.1.3.5.11):

   1.   9600 bps frame, primary traffic only

   2.   9600 bps frame, dim-and-burst with Rate 1/2 primary and signaling traffic

3.   9600 bps frame, dim-and-burst with Rate 1/4 primary and signaling traffic

4.   9600 bps frame, dim-and-burst with Rate 1/8 primary and signaling traffic

5.   9600 bps frame, blank-and-burst with signaling traffic only

6.   4800 bps frame, primary traffic only

7.   2400 bps frame, primary traffic only

8.   1200 bps frame, primary traffic or null data only

9.   9600 bps frame, primary traffic only, with probable bit errors[12]

10. Frame quality insufficient to decide upon rate

11. 9600 bps frame, dim-and-burst with Rate 1/2 primary and secondary traffic

12. 9600 bps frame, dim-and-burst with Rate 1/4 primary and secondary traffic

13. 9600 bps frame, dim-and-burst with Rate 1/8 primary and secondary traffic

14. 9600 bps frame, blank-and-burst with secondary traffic only

Frames in categories 9 and 10 are bad frames; all frames otherwise categorized are considered good frames.

The Forward Traffic Channel frame classification shall be done for each frame via frame quality indicator (CRC checks, available for 9600 and 4800 bps frames), decoder quality information, and the Mixed Mode Bit, Burst Format Bit, Traffic Type Bit, and Traffic Mode Bits. If primary traffic is active and secondary traffic is not active, then the mobile station shall categorize the received frames into one of categories 1 through 10. If primary traffic is not active and secondary traffic is active, then the mobile station shall categorize the received frames into one of categories 5, 8, 10 and 14. If neither primary traffic nor secondary traffic is active, then the mobile station shall categorize the received frames into one of categories 5, 8, and 10. Mobile stations that do not implement secondary traffic services are not required to implement categories 11 through 14.

6.2.2.3 Forward Traffic Channel Time Alignment

The Forward Traffic Channel frame time alignment is specified in 7.1.3.5.1. A mobile station shall support staggered Forward Traffic Channel frames.

6.2.3 Limitations on Emissions

6.2.3.1 Conducted Spurious Emissions

6.2.3.1.1 Suppression Inside Cellular Band

Total spurious emissions in each 1.23 MHz band located in the mobile station's receive band between 869 and 894 MHz shall not exceed -80 dBm. Total spurious emissions in

---

[12]Certain service options, which can be connected to the multiplex sublayer, can satisfactorily handle some bit errors.

1 each 1.23 MHz band located in the mobile station's transmit band between 824 and 849
2 MHz shall not exceed -60 dBm. These requirements shall apply to measurements made at
3 the mobile station antenna connector, with the transmitter disabled.

4 6.2.3.1.2 Suppression Outside Cellular Band

5 Current FCC rules shall apply.

6 6.2.3.2 Radiated Spurious Emissions

7 Current FCC rules shall apply.

8 6.2.4 Receiver Performance Requirements

9 System performance is predicated on receivers meeting the requirements set forth in the
10 document titled "Recommended Minimum Performance Standards for 800 MHz Wideband
11 Spread Spectrum Dual-Mode Mobile Stations."

12 **6.3 Security and Identification**

13 6.3.1 Mobile Station Identification Number

14 See 2.3.1.

15 6.3.2 Electronic Serial Number

16 See 2.3.2.

17 6.3.3 Station Class Mark

18 See 2.3.3.

19 6.3.4 Registration Memory

20 See 2.3.4 for registration memory when operating in the analog mode.

21 The mobile station shall have memory to store one element in the zone-based registration
22 list $ZONE\_LIST_{s-p}$ (see 6.6.5.1.5). This stored element shall include both REG_ZONE and
23 the corresponding (SID, NID) pair. The data retention time under power-off conditions shall
24 be at least 48 hours. If, after 48 hours, the data integrity cannot be guaranteed, then the
25 entry in $ZONE\_LIST_{s-p}$ shall be deleted upon power-on.

26 The mobile station shall have memory to store one element in the system/network
27 registration list $SID\_NID\_LIST_{s-p}$ (see 6.6.5.1.5). The data retention time under power-off
28 conditions shall be at least 48 hours. If, after 48 hours, the data integrity cannot be
29 guaranteed, then the entry in $SID\_NID\_LIST_{s-p}$ shall be deleted upon power-on.

30 The mobile station shall have memory to store the distance-based registration variables
31 $BASE\_LAT\_REG_{s-p}$, $BASE\_LONG\_REG_{s-p}$, and $REG\_DIST\_REG_{s-p}$ (see 6.6.5.1.4). The data
32 retention time under power-off conditions shall be at least 48 hours. If, after 48 hours, the
33 data integrity cannot be guaranteed, then $REG\_DIST\_REG_{s-p}$ shall be set to zero upon
34 power-on.

1   6.3.5 Access Overload Class

2   See 2.3.5.

3   6.3.6 Reserved

4   6.3.7 Reserved

5   6.3.8 Home System and Network Identification

6   In addition to the HOME_SID$_p$ parameter that the mobile station stores for each MIN that

7   can be associated with the mobile station (see 2.3.8), the mobile station shall provide

8   memory to store at least one home (SID$_p$, NID$_p$) pair for each MIN that can be associated

9   with the mobile station. The mobile station shall also provide memory to store the 1-bit

10   parameters MOB_TERM_HOME$_p$, MOB_TERM_FOR_SID$_p$, and MOB_TERM_FOR_NID$_p$ for

11   each MIN that can be associated with the mobile station (see 6.6.5.3).

12   6.3.9 Local Control Option

13   See 2.3.9.

14   6.3.10 Preferred Operation Selection

15   6.3.10.1 Preferred System

16   See 2.3.10.1.

17   6.3.10.2 Preferred CDMA or Analog

18   See 2.3.10.2.

19   6.3.11 Discontinuous Reception

20   The mobile station shall provide memory to store the preferred slot cycle index,

21   SLOT_CYCLE_INDEX$_p$ (see 6.6.2.1.1.3).

22   6.3.12 Authentication, Encryption of Signaling Information/User Data and Voice Privacy

23   6.3.12.1 Authentication

24   Authentication is the process by which information is exchanged between a mobile station

25   and base station for the purpose of confirming the identity of the mobile station. The intent

26   of the authentication process is to demonstrate that the mobile station and base station

27   possess identical sets of Shared Secret Data (SSD). During the authentication process, the

28   mobile station processes all messages received, whether related to authentication or not.

29   6.3.12.1.1 Shared Secret Data (SSD)

30   SSD is a 128-bit quantity that is stored in semi-permanent memory in the mobile station,

31   as specified in 2.3.12.1.1.

SSD_A is used to support the authentication procedures and SSD_B is used to support voice privacy and message encryption. SSD is generated according to the procedure specified in 2.3.12.1.8 or 6.3.12.1.9.

6.3.12.1.2 Random Challenge Memory (RAND)

See 2.3.12.1.2.

6.3.12.1.3 Call History Parameter (COUNT)

See 2.3.12.1.3.

6.3.12.1.4 Authentication of Mobile Station Registrations

The following authentication procedures shall be performed when the AUTH field of the *Access Parameters Message* is set to '01' (standard authentication mode), and the mobile station attempts to register (by sending an *Initial Registration Message* on the Access Channel) or to update its registration (by sending a *Registration Update Message* on the Access Channel):

The mobile station shall initialize the authentication algorithm (CAVE) as illustrated in Figure 6.3.12.1.4-1. If more than one MIN is specified in the message, the CAVE algorithm shall be initialized using the first MIN in the message, whether added or deleted. If the message contains no MIN, the CAVE algorithm shall be initialized using the least significant 24 bits of the ESN in place of MIN1.

The mobile station shall then execute the CAVE algorithm (see 2.3.12.1.9). The 18-bit output of CAVE shall be used to fill the AUTHR field of the *Initial Registration Message* or *Registration Update Message*, as appropriate. The RANDC (eight most significant bits of RAND) and COUNT fields of the message shall be filled with the current values stored in the mobile station.

The base station computes the value of AUTHR using its internally stored value of SSD_A. The base station compares its computed value of AUTHR to the value received from the mobile station.

The base station also compares the received value of RANDC to the most significant eight bits of its internally stored value of RAND.

The base station may also compare the received value of COUNT with its internally stored value associated with the received MIN/ESN.

If any of the comparisons fail, the base station may deem the registration attempt unsuccessful, initiate the Unique Challenge-Response Procedure (see 6.3.12.1.5) or commence the process of updating SSD (see 6.3.12.1.9).

RAND	ESN	MIN1 (see text)	SSD_A
32	32	24	64

CAVE

AUTHR

18
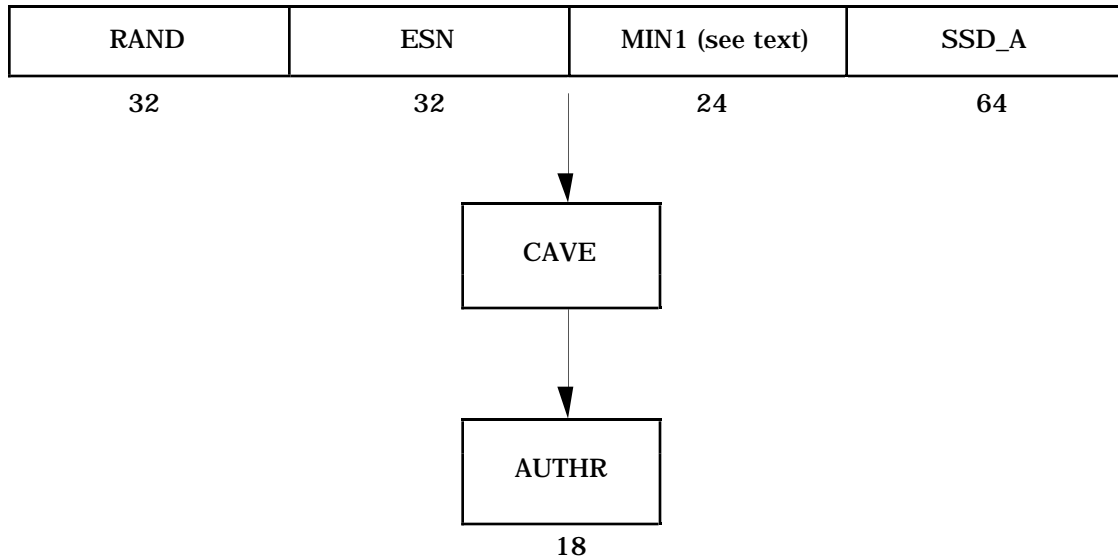
Figure 6.3.12.1.4-1. Computation of AUTHR for Authentication of Mobile Station Registrations

6.3.12.1.5 Unique Challenge-Response Procedure

The Unique Challenge-Response Procedure is initiated by the base station and can be carried out over either on the Paging Channel and Access Channel, or on the Forward Traffic Channel and Reverse Traffic Channel. The procedure is as follows:

The base station generates the 24-bit quantity RANDU and sends it to the mobile station in the *Authentication Challenge Message* on either the Paging Channel or the Forward Traffic Channel. Upon receipt of the *Authentication Challenge Message*, the mobile station shall initialize the authentication algorithm (CAVE) as illustrated in Figure 6.3.12.1.5-1. On the Paging Channel, the *Authentication Challenge Message* contains the MIN and ESN of the mobile station being challenged. On the Forward Traffic Channel, the *Authentication Challenge Message* does not contain the MIN and ESN; the MIN and ESN used by both the base station and the mobile station shall be the MIN and ESN used to establish the call.

The mobile station shall then execute the CAVE algorithm (see 2.3.12.1.9). The 18-bit output of CAVE shall be used to fill the AUTHU field of the *Authentication Challenge Response Message*, which shall be sent to the base station.

The base station computes the value of AUTHU using its internally stored value of SSD_A. The base station compares its computed value of AUTHU to the value received from the mobile station. If the comparison fails, the base station may deny further access attempts by the mobile station, drop the call in progress, or initiate the process of updating SSD (see 6.3.12.1.9).

RANDU	MIN2	ESN	MIN1 (see text)	SSD_A
24	8*	32	24	64

CAVE

AUTHU

18   * Eight least significant bits of MIN2
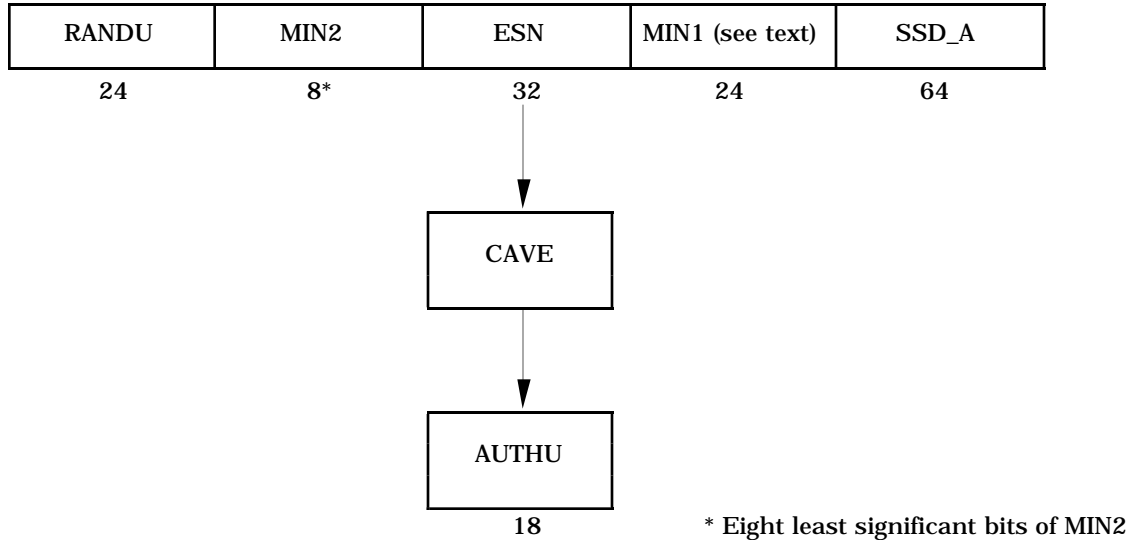
Figure 6.3.12.1.5-1. Computation of AUTHU for the Unique Challenge-Response Procedure

6.3.12.1.6 Authentication of Mobile Station Originations

When the AUTH field of the *Access Parameters Message* sent on the Paging Channel is set to '01' (standard authentication mode), and the mobile station attempts to originate a call (by sending an *Origination Message* on the Access Channel), the following authentication procedures shall be performed:

The mobile station shall initialize the authentication algorithm (CAVE) as illustrated in Figure 6.3.12.1.6-1. The DIGITS field shall contain the least significant four bits of each of the last six digits contained in the *Origination Message*. If fewer than six digits are included in the *Origination Message*, the most significant bits of MIN1 shall be used to replace the missing digits.

The mobile station shall then execute the CAVE algorithm (see 2.3.12.1.9). The 18-bit output of CAVE shall be used to fill the AUTHR field of the *Origination Message*. The RANDC (eight most significant bits of RAND) and COUNT fields of the message shall be filled with the current values stored in the mobile station.

The base station computes the value of AUTHR using its internally stored value of SSD_A. The base station compares its computed value of AUTHR to the value received from the mobile station.

The base station also compares the received value of RANDC to the most significant eight bits of its internally stored value of RAND.

The base station may also compare the received value of COUNT with its internally stored value associated with the received MIN/ESN.

If the comparisons executed at the base station are successful, the base station initiates the appropriate channel assignment procedures. After channel assignment, the base station

may issue a *Set Parameters Message* on the Forward Traffic Channel, modifying the value of COUNT in the mobile station.

If any of the comparisons fail, the base station may deny service, initiate the Unique Challenge-Response Procedure (see 6.3.12.1.5) or commence the process of updating SSD (see 6.3.12.1.9).

RAND	ESN	DIGITS (see text)	SSD_A
32	32	24	64

CAVE

AUTHR

18
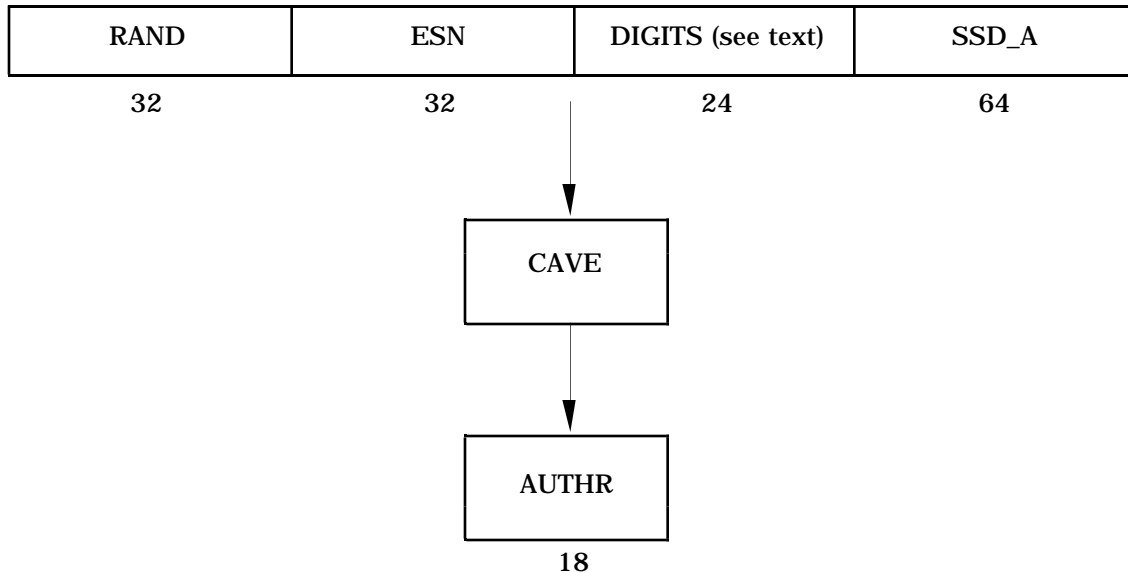
Figure 6.3.12.1.6-1. Computation of AUTHR for Authentication of Mobile Station Originations

6.3.12.1.7 Authentication of Mobile Station Terminations

When the AUTH field of the *Access Parameters Message* sent on the Paging Channel is set to '01' (standard authentication mode), and the mobile station responds to a page (by sending a *Page Response Message* on the Access Channel), the following authentication procedures shall be performed:

The mobile station shall initialize the authentication algorithm (CAVE) as illustrated in Figure 6.3.12.1.7-1. MIN1 shall be as specified in the *Page Response Message*.

The mobile station shall then execute the CAVE algorithm (see 2.3.12.1.9). The 18-bit output of CAVE shall be used to fill the AUTHR field of the *Page Response Message*. The RANDC (eight most significant bits of RAND) and COUNT fields of the message shall be filled with the current values stored in the mobile station.

The base station computes the value of AUTHR using its internally stored value of SSD_A. The base station compares its computed value of AUTHR to the value received from the mobile station.

The base station also compares the received value of RANDC to the eight most significant bits of its internally stored value of RAND.

1   The base station may also compare the received value of COUNT with its internally stored

2   value associated with the received MIN/ESN.

3   If the comparisons executed at the base station are successful, the base station may initiate

4   the appropriate channel assignment procedures.   After channel assignment, the base

5   station may issue a *Set Parameters Message* on the Forward Traffic Channel, modifying the

6   value of COUNT in the mobile station.

7   If any of the comparisons fail, the base station may deny service, initiate the Unique

8   Challenge Response Procedure (see 6.3.12.1.5) or commence the process of updating SSD

9   (see 6.3.12.1.9).

10

RAND	ESN	MIN1	SSD_A
32	32	24	64

CAVE

AUTHR

18

11

12   **Figure 6.3.12.1.7-1. Computation of AUTHR for Authentication of Mobile Station**
13   **Terminations**

14

15   6.3.12.1.8 Authentication of Mobile Station Data Bursts

16   When the AUTH field of the *Access Parameters Message* sent on the Paging Channel is set

17   to '01' (standard authentication mode), and the mobile station attempts to send a *Data*

18   *Burst Message* on the Access Channel, the following authentication procedures shall be

19   performed:

20   The mobile station shall initialize the authentication algorithm (CAVE) as illustrated in

21   Figure 6.3.12.1.8-1. The CHARS field shall contain the least significant four bits of each of

22   the last six characters contained in the *Data Burst Message*. If fewer than six characters

23   are included in the *Data Burst Message*, the most significant bits of MIN1 shall be used to

24   replace the missing characters.

25   The mobile shall then execute the CAVE algorithm (see 2.3.12.1.9). The 18-bit output of

26   CAVE shall be used to fill the AUTHR field of the *Data Burst Message*. The RANDC (eight

1   most significant bits of RAND) and COUNT fields of the message shall be filled with the
2   current values stored in the mobile station.

3   The base station computes the value of AUTHR using its internally stored value of SSD_A.
4   The base station compares its computed value of AUTHR to the value received from the
5   mobile station.

6   The base station also compares the received value of RANDC to the most significant eight
7   bits of its internally stored value of RAND.

8   The base station may also compare the received value of COUNT with its internally stored
9   value associated with the received MIN/ESN.

10 If the comparisons are successful, the base station processes the message.

11 If any of the comparisons fail, the base station may ignore the message, initiate the Unique
12 Challenge-Response Procedure (see 6.3.12.1.5) or commence the process of updating SSD
13 (see 6.3.12.1.9).

14

RAND	ESN	CHARS (see text)	SSD_A
32	32	24	64

CAVE

AUTHR

18
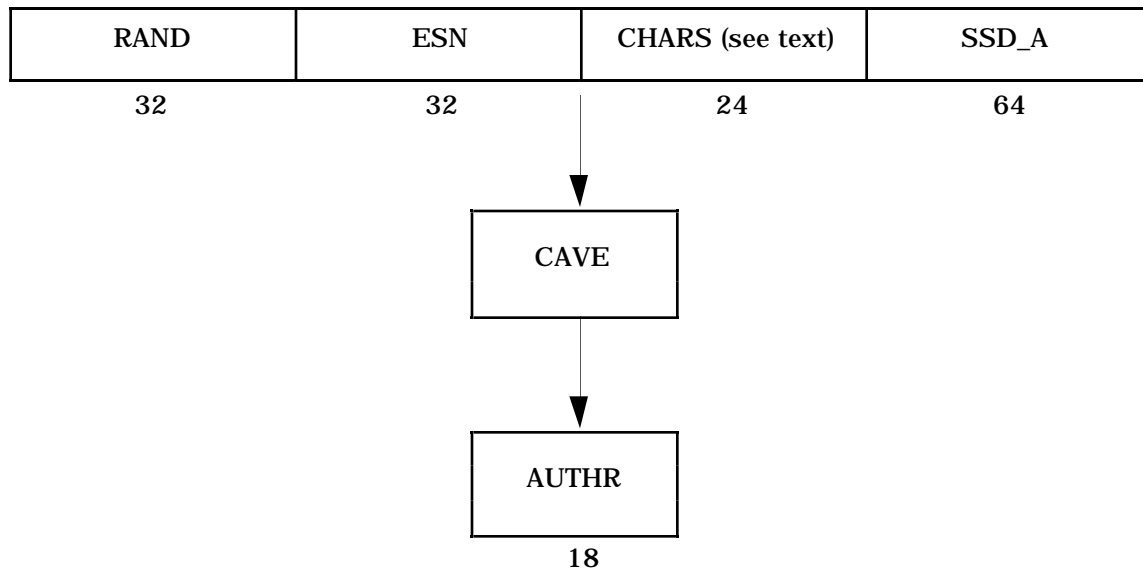
**Figure 6.3.12.1.8-1. Computation of AUTHR for Authentication of Mobile Station
Data Bursts**

18

19 6.3.12.1.9 Updating the Shared Secret Data (SSD)

20 SSD is updated using CAVE (see 2.3.12.1.9), initialized with mobile station specific
21 information, random data and the mobile station's A-key. The A-key is 64 bits long. It is
22 assigned to the mobile station and is stored in the mobile station's permanent security and
23 identification memory. The A-key is known only to the mobile station and to its associated
24 Home Location Register/Authentication Center (HLR/AC) (see EIA/TIA/IS-41).   See
25 "Wideband Spread Spectrum Dual-Mode Cellular System Authentication and Privacy
26 Procedures" for details of A-key entry into the mobile station.

1   The SSD update procedure is performed as follows:

2   The base station sends an *SSD Update Message* on either the Paging Channel or the
3   Forward Traffic Channel. The RANDSSD field of the *SSD Update Message* contains the
4   same value used for the HLR/AC computation of SSD. On the Paging Channel, the *SSD*
5   *Update Message* contains the MIN and ESN of the mobile station being addressed. On the
6   Forward Traffic Channel, the *SSD Update Message* does not contain the MIN and ESN; the
7   MIN and ESN used by both the base station and the mobile station for initializing CAVE
8   shall be the MIN and ESN used to establish the call.

9   Upon receipt of the *SSD Update Message* the mobile station shall initialize CAVE as shown
10   in Figure 6.3.12.1.9-1. The mobile station shall then execute the CAVE algorithm (see
11   2.3.12.1.9). The 64 most significant bits of the CAVE algorithm output are designated
12   SSD_A_NEW and the 64 least significant bits of the output are designated SSD_B_NEW.

13   The mobile station shall then select a 32-bit random number RANDBS and shall send it to
14   the base station in a *Base Station Challenge Order* on the Access Channel or Reverse Traffic
15   Channel.

16   Both the mobile station and the base station shall then initialize CAVE as shown in Figure
17   6.3.12.1.9-2 and shall execute the CAVE algorithm. For transactions on the Paging
18   Channel and Access Channel, the value of MIN1 to be used shall be the same as the value
19   specified in the *SSD Update Message* sent by the base station. For Traffic Channel
20   transactions, the value of MIN1 to be used shall be the MIN1 used to establish the call. The
21   18-bit result is designated AUTHBS. The base station sends its computed value of AUTHBS
22   to the mobile station in a *Base Station Challenge Confirmation Order* on the Paging Channel
23   or the Forward Traffic Channel.

24   Upon receipt of the *Base Station Challenge Confirmation Order* the mobile station shall
25   compare the received value of AUTHBS to its internally computed value. (If the mobile
26   station receives a *Base Station Challenge Confirmation Order* without having previously
27   received an *SSD Update Message*, the mobile station shall respond with an *SSD Update*
28   *Rejection Order*.)

29   If the comparison is successful, the mobile station shall set SSD_A equal to SSD_A_NEW
30   and shall set SSD_B equal to SSD_B_NEW. The mobile station shall then send an *SSD*
31   *Update Confirmation Order* to the base station, indicating successful completion of the SSD
32   update.

33   If the comparison is not successful, the mobile station shall discard SSD_A_NEW and
34   SSD_B_NEW. The mobile station shall then send an *SSD Update Rejection Order* to the
35   base station, indicating unsuccessful completion of the SSD update.

36   Upon receipt of the *SSD Update Confirmation Order*, the base station sets SSD_A and
37   SSD_B to the values received from the HLR/AC (see EIA/TIA/IS-41).

1

2

RANDSSD	ESN	A-key
56	32	64

CAVE

SSD_A_NEW	SSD_B_NEW
64	64

3
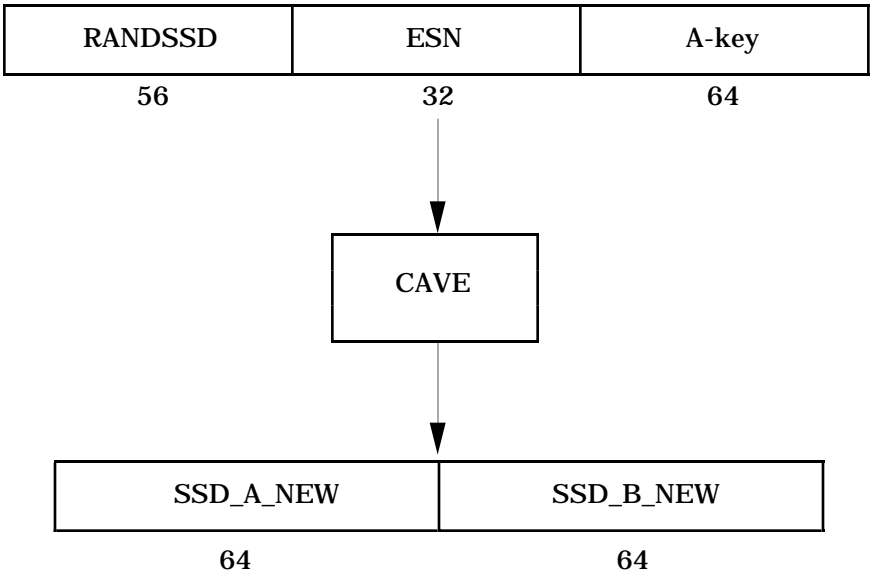
4   **Figure 6.3.12.1.9-1. Computation of Shared Secret Data (SSD)**

5

6

7

RANDBS	ESN	MIN1 (see text)	SSD_A_NEW
32	32	24	64

CAVE

AUTHBS

18

8
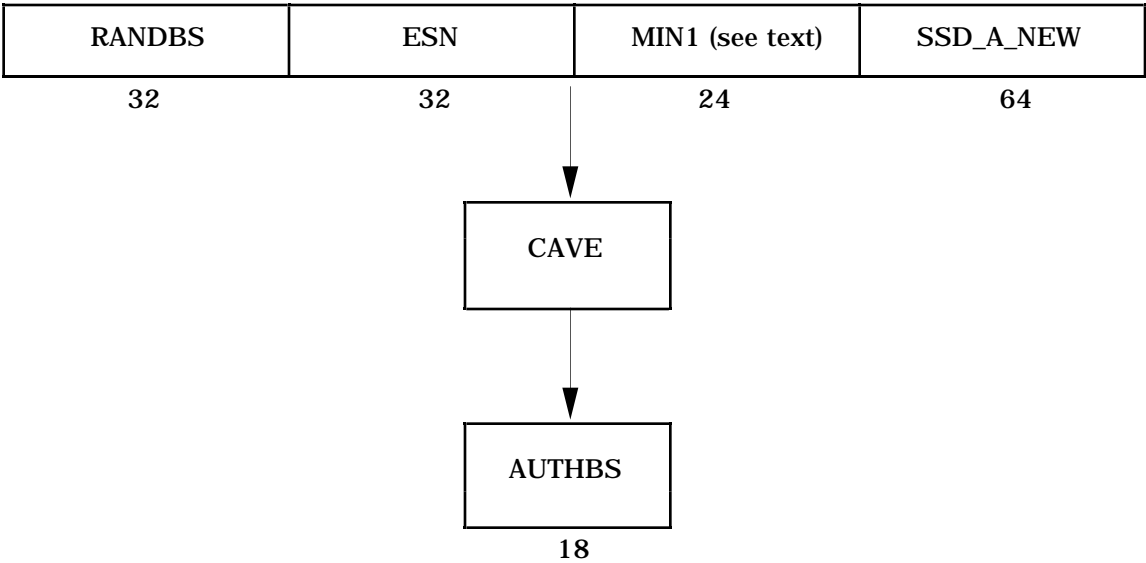
9   **Figure 6.3.12.1.9-2. Computation of AUTHBS**

1　6.3.12.2 Signaling Message Encryption

2　In an effort to enhance the authentication process and to protect sensitive subscriber
3　information (such as PINs), a method is provided to encrypt certain fields of selected Traffic
4　Channel signaling messages.

5　The standard message encryption algorithm is identical to the CMEA algorithm specified in
6　Appendix A of EIA/TIA/IS-54-B.

7　The availability of encryption algorithm information is governed under the U. S.
8　International Traffic and Arms Regulation (ITAR) and the Export Administration
9　Regulations.　TIA acts as the focal point and facilitator for making such information
10　available.　See EIA/TIA/IS-54-B for further details.

11　Messages shall not be encrypted if authentication is not performed (AUTH field equal to '00'
12　in the *Access Parameters Message*).

13　Signaling message encryption is controlled for each call individually.　The initial encryption
14　mode for the call is established by the value of the ENCRYPT_MODE field in the *Channel*
15　*Assignment Message.*　If ENCRYPT_MODE is set to '0000', message encryption is off.　To
16　turn encryption on after channel assignment, the base station sends one of the following
17　messages to the mobile station:

18　　• *Handoff Direction Message* with the ENCRYPT_MODE field set to '0001'

19　　• *Analog Handoff Direction Message* with the MEM field set to '1'

20　　• *Message Encryption Mode Order* with the ENCRYPT_MODE field set to '0001'

21　Regardless of the time at which encryption is turned on, the data used to initialize the
22　algorithm shall be computed using CAVE parameter values in effect at the end of the
23　computation of AUTHR for the *Origination Message* or *Page Response Message* (see
24　6.3.12.1.6 and 6.3.12.1.7, respectively).

25　Encryption shall apply only to the part of the message body following the ENCRYPTED field,
26　including any RESERVED field at the end of the message.　The message CRC shall never be
27　encrypted.

28　A message containing only one octet following the ENCRYPTED field cannot be encrypted.

29　When encryption is off, all fields of all signaling messages sent by the mobile station and
30　base station are unencrypted.

31　When encryption is on (ENCRYPT_MODE equal to binary '0001'), the encryptable fields of
32　the following Forward Traffic Channel messages are encrypted.　All other Forward Traffic
33　Channel messages are unencrypted.

34　　• *Alert With Information Message*

35　　• *Flash With Information Message*

36　　• *Data Burst Message*

37　　• *Send Burst DTMF Message*

38　　• *Continuous DTMF Tone Order*

1   • *Retrieve Parameters Message*

2   • *Set Parameters Message*

3 When encryption is on (ENCRYPT_MODE equal to binary '0001') the encryptable fields of
4 the following Reverse Traffic Channel messages shall always be encrypted.   All other
5 Reverse Traffic Channel messages shall be unencrypted.

6   • *Origination Continuation Message*

7   • *Flash With Information Message*

8   • *Data Burst Message*

9   • *Send Burst DTMF Message*

10   • *Continuous DTMF Tone Order*

11   • *Parameters Response Message*

12 To turn signaling message encryption off, the base station sends one of the following
13 Forward Traffic Channel messages to the mobile station

14   • *Handoff Direction Message* with the ENCRYPT_MODE field set to '0000'.

15   • *Analog Handoff Direction Message* with the MEM field set to '0'.

16   • *Message Encryption Mode Order* with the ENCRYPT_MODE field set to '0000'.

17 6.3.12.3 Voice Privacy

18 Voice privacy is provided in the CDMA system by means of the private long code mask used
19 for PN spreading (see 6.1.3.1.8).

20 The generation and application of the private long code mask is specified in "Wideband
21 Spread Spectrum Dual-Mode Cellular System Authentication and Privacy Procedures."

22 Voice privacy control is provided on the Traffic Channels only. All calls are initiated using
23 the public long code mask for PN spreading (see 6.1.3.1.8).

24 The transition to private long code mask shall not be performed if authentication is not
25 performed (AUTH field set to '00' in the *Access Parameters Message* or mobile station
26 unable to perform authentication).

27 To initiate a transition to the private or public long code mask, either the base station or
28 the mobile station sends a *Long Code Transition Request Order* on the Traffic Channel. The
29 mobile station actions in response to receipt of this order are specified in 6.6.4, and the
30 base station actions in response to receipt of this order are specified in 7.6.4.

31 The base station can also cause a transition to the public long code mask by sending the
32 *Handoff Direction Message* with the PRIVATE_LCN bit set appropriately.

33 6.3.13 Lock Orders

34 The mobile station shall have memory to store the lock reason codes (LCKRSN$_{s-p}$ and
35 LCKRSN_P$_{s-p}$) received in the *Lock Order* and *Lock Until Power-Cycled Order*. The data
36 retention time under power-off conditions shall be at least 48 hours.

6.3.14 Mobile Station Revision Identification

The mobile station shall provide memory to store the following parameters sent in the *Status Message* (*Terminal Information* information record):

- CAI revision number (MOB_CAI_REV$_p$)

- Manufacturer's model number (MOB_MODEL$_p$)

- Firmware revision number (MOB_FIRM_REV$_p$)

6.4 Supervision

This section details the supervision mechanisms in CDMA. The time and numerical constant values (e.g. T_{30m} and N_{2m}) are given in Appendix D.

6.4.1 Pilot Channel

The mobile station shall monitor the Pilot Channel at all times. The mobile station shall measure the strength of the Pilot Channel as specified in 6.6.6.2.2.

6.4.2 Sync Channel

The mobile station shall check the CRC of all received Sync Channel messages (see 7.7.1.2.2). The mobile station shall ignore any message that has a CRC that does not check.

6.4.3 Paging Channel

The mobile station shall check the CRC of all received Paging Channel messages (see 7.7.2.2.2). The mobile station shall ignore the body of a message that has a CRC that does not check.

If the mobile station is operating in the non-slotted mode in the *Mobile Station Idle State,* it shall monitor the Paging Channel at all times. The mobile station shall reset a timer for T_{30m} seconds whenever a valid message is received on the Paging Channel, whether addressed to the mobile station or not. If the timer expires, the mobile station shall declare a loss of the Paging Channel.

If the mobile station is operating in the slotted mode in the *Mobile Station Idle State*, it shall set a timer for T_{30m} seconds at the start of the first slot in which the Paging Channel is monitored, and shall reset the timer for T_{30m} seconds whenever a valid message is received, whether addressed to the mobile station or not. If the timer expires while the mobile station is monitoring the Paging Channel, the mobile station shall declare a loss of the Paging Channel. The mobile station shall disable the timer when not monitoring the Paging Channel.

When in the *System Access State,* the mobile station shall monitor the Paging Channel at all times. The mobile station shall reset a timer for T_{40m} seconds whenever a valid message is received on the Paging Channel, whether addressed to the mobile station or not. If the timer expires, the mobile station shall declare a loss of the Paging Channel.

1   6.4.4 Forward Traffic Channel

2   The mobile station shall check the CRC of all received Forward Traffic messages (see
3   7.7.3.2.2). The mobile station shall ignore any message that has a CRC that does not
4   check.

5   When in the *Mobile Station Control on the Traffic Channel State,* the mobile station shall
6   monitor the Forward Traffic Channel at all times. If the mobile station receives N_{2m}
7   consecutive bad frames on the Forward Traffic Channel (see 6.2.2.2), it shall disable its
8   transmitter. Thereafter, if the mobile station receives N_{3m} consecutive good frames, the
9   mobile station should re-enable its transmitter.

10   The mobile station shall establish a Forward Traffic Channel fade timer. The timer shall be
11   enabled when the mobile station first enables its transmitter when in the *Traffic Channel*
12   *Initialization Substate* of the *Mobile Station Control on the Traffic Channel State*. The fade
13   timer shall be reset for T_{5m} seconds whenever N_{3m} consecutive good frames are received on
14   the Forward Traffic Channel. If the timer expires, the mobile station shall disable its
15   transmitter and declare a loss of the Forward Traffic Channel. The mobile station also
16   resets this timer when it re-enables its transmitter when performing a CDMA to CDMA hard
17   handoff (see 6.6.6.2.8).

18   6.4.5 Accumulated Statistics

19   6.4.5.1 Accumulated Access Channel Statistics

20   The mobile station shall maintain the counters shown in Table 6.4.5.1-1. Each counter
21   shall be 16 bits long. The mobile station shall initialize each counter described herein to
22   zero upon power-on; the mobile station shall not re-initialize any counter described herein
23   at any other time.

24   The mobile station shall increment the ACC_1 counter for each Access Channel request
25   message it generates. The mobile station shall increment the ACC_2 counter for each
26   Access Channel response messages it generates. The mobile station shall increment the
27   ACC_i counter during the i-1 transmission of an access probe in the access attempt, for i
28   equal 3 to 7. The mobile station shall increment ACC_10 if the access attempt is
29   unsuccessful due to the transmission of MAX_REQ_SEQ or MAX_RSP_SEQ probe
30   sequences.

Table 6.4.5.1-1. Accumulated Access Channel Statistics

Counter Identifier	Length (bits)	Description
ACC_1	16	Number of Access Channel request messages generated by layer 3
ACC_2	16	Number of Access Channel response messages generated by layer 3
ACC_3	16	Number of times that an access probe was transmitted at least twice
ACC_4	16	Number of times that an access probe was transmitted at least three times
ACC_5	16	Number of times that an access probe was transmitted at least four times
ACC_6	16	Number of times that an access probe was transmitted at least five times
ACC_7	16	Number of times that an access probe was transmitted at least six times
ACC_8	-	Reserved
ACC_9	-	Reserved
ACC_10	16	Number of unsuccessful access attempts

6.4.5.2 Accumulated Reverse Traffic Channel Statistics

The mobile station shall maintain the counters shown in Table 6.4.5.2-1 when supporting Multiplex Option 1. Each counter shall be 32 bits long. The mobile station shall initialize each counter described herein to zero upon power-on; the mobile station shall not re-initialize any counter described herein at any other time.

Each time a Multiplex Option 1 Reverse Traffic Channel frame is transmitted, the mobile station shall increment the counter corresponding to the type of frame.

Table 6.4.5.2-1. Accumulated Reverse Traffic Channel Statistics

Counter Identifier	Length (bits)	Type of Frame
MUX1_REV_1	32	9600 bps frame, primary traffic only
MUX1_REV_2	32	9600 bps frame, dim-and-burst with Rate 1/2 primary and signaling traffic
MUX1_REV_3	32	9600 bps frame, dim-and-burst with Rate 1/4 primary and signaling traffic
MUX1_REV_4	32	9600 bps frame, dim-and-burst with Rate 1/8 primary and signaling traffic
MUX1_REV_5	32	9600 bps frame, blank-and-burst with signaling traffic only
MUX1_REV_6	32	4800 bps frame, primary traffic only
MUX1_REV_7	32	2400 bps frame, primary traffic only
MUX1_REV_8	32	1200 bps frame, primary traffic or null Traffic Channel data only
MUX1_REV_9	-	Reserved
MUX1_REV_10	-	Reserved
MUX1_REV_11	32	9600 bps frame, dim-and-burst with Rate 1/2 primary and secondary traffic
MUX1_REV_12	32	9600 bps frame, dim-and-burst with Rate 1/4 primary and secondary traffic
MUX1_REV_13	32	9600 bps frame, dim-and-burst with Rate 1/8 primary and secondary traffic
MUX1_REV_14	32	9600 bps frame, blank-and-burst with secondary traffic only

6.4.5.3 Accumulated Paging Channel Statistics

The mobile station shall maintain the counters shown in Table 6.4.5.3-1. The counters shall have the length specified in the Table 6.4.5.3-1. The mobile station shall initialize each counter described herein to zero upon power-on; the mobile station shall not re-initialize any counter described herein at any other time.

The mobile station shall increment the counter PAG_1 for each Paging Channel message CRC that it tests. The mobile station shall increment the counter PAG_2 for each valid Paging Channel message. The mobile station shall increment the counter PAG_3 for each record or message that it receives addressed to the mobile station's ESN or to an active MIN

at the mobile station. The PAG_3 counter shall not be incremented for messages detected as duplicates or for acknowledgements.[13] The mobile station shall increment the counter PAG_4 each time that it has determined that synchronization was lost on the Paging Channel during the time that the mobile station is active.[14] PAG_4 shall not count the initial synchronization performed by a slotted mobile station for each of its assigned timeslots. The mobile station shall increment the counter PAG_5 each time that it declares a loss of the Paging Channel (see 6.4.3). The mobile station shall increment the counter PAG_6 for each idle handoff it performs.

Table 6.4.5.3-1. Accumulated Paging Channel Statistics

Counter Identifier	Length (bits)	Description
PAG_1	32	Number of Paging Channel messages the mobile station attempted to receive
PAG_2	32	Number of Paging Channel messages the mobile station received with a good CRC
PAG_3	16	Number of Paging Channel messages or records the mobile station received that were addressed to it
PAG_4	16	Number of times that the mobile station had to resynchronize to the Paging Channel
PAG_5	16	Number of times that the mobile station declared a loss of the Paging Channel
PAG_6	16	Number of mobile station idle handoffs

6.4.5.4 Accumulated Forward Traffic Channel Statistics

The mobile station shall maintain the counters shown in Table 6.4.5.4-1 when supporting Multiplex Option 1. Each counter shall be 32 bits long. The mobile station shall initialize each counter described herein to zero upon power-on; the mobile station shall not re-initialize any counter described herein at any other time.

Each time a mobile station categorizes a received Multiplex Option 1 Forward Traffic Channel frame (see 6.2.2.2), the mobile station shall increment the counter corresponding to the type of frame. The accumulation shall start when the mobile station enables its

---

[13]PAG_3 counts those messages processed by layer 3.

[14]A typical mobile station implementation can assume that the mobile station is synchronized with the Paging Channel message stream until several successive messages do not have good CRCs. At this point, the mobile station can search for an SOM bit that is a '1'. PAG_4 counts these events.

1 transmitter while in the *Traffic Channel Initialization Substate* of the *Mobile Station Control*
2 *on the Traffic Channel State* (see 6.6.4.2). The accumulation shall stop when the mobile
3 station exits the *Mobile Station Control on the Traffic Channel State.*

4

5   **Table 6.4.5.4-1. Accumulated Forward Traffic Channel Statistics**

Counter Identifier	Length (bits)	Type of Frame
MUX1_FOR_1	32	9600 bps frame, primary traffic only
MUX1_FOR_2	32	9600 bps frame, dim-and-burst with Rate 1/2 primary and signaling traffic
MUX1_FOR_3	32	9600 bps frame, dim-and-burst with Rate 1/4 primary and signaling traffic
MUX1_FOR_4	32	9600 bps frame, dim-and-burst with Rate 1/8 primary and signaling traffic
MUX1_FOR_5	32	9600 bps frame, blank-and-burst with signaling traffic only
MUX1_FOR_6	32	4800 bps frame, primary traffic only
MUX1_FOR_7	32	2400 bps frame, primary traffic only
MUX1_FOR_8	32	1200 bps frame, primary traffic or null Traffic Channel data only
MUX1_FOR_9	32	9600 bps frame, primary traffic only, probable bit errors
MUX1_FOR_10	32	Frame quality insufficient to decide upon rate
MUX1_FOR_11	32	9600 bps frame, dim-and-burst with Rate 1/2 primary and secondary traffic
MUX1_FOR_12	32	9600 bps frame, dim-and-burst with Rate 1/4 primary and secondary traffic
MUX1_FOR_13	32	9600 bps frame, dim-and-burst with Rate 1/8 primary and secondary traffic
MUX1_FOR_14	32	9600 bps frame, blank-and-burst with secondary traffic only

1   6.4.5.5 Accumulated Layer Two Statistics

2   The mobile station shall maintain the counters shown in Table 6.4.5.5-1. Each counter
3   shall be 16 bits long. The mobile station shall initialize each counter described herein to
4   zero upon power-on; the mobile station shall not re-initialize any counter described herein
5   at any other time.

6   When the mobile station transmits a Reverse Traffic Channel message requiring an
7   acknowledgement for the ith time, for i equal 1 to 3, it shall increment the counter
8   LAYER2_RTCi.

9   The mobile station shall increment the counter LAYER2_RTC5 each time it aborts using the
10   Traffic Channel because the timeout expired after the N_{1m} transmission of a message
11   requiring an acknowledgement.

12   The mobile station shall increment the counter LAYER2_RTC6 for each transmission of a
13   message not requiring an acknowledgement on the Reverse Traffic Channel. This count
14   shall include all transmissions, including those that were repeated multiple times or those
15   carrying an identical layer 3 content.

16

17   **Table 6.4.5.5-1. Accumulated Layer 2 Statistics**

Counter Identifier	Length (bits)	Description
LAYER2_RTC1	16	Number of messages requiring acknowledgement that were transmitted at least once on the Reverse Traffic Channel
LAYER2_RTC2	16	Number of messages requiring acknowledgement that were transmitted at least twice on the Reverse Traffic Channel
LAYER2_RTC3	16	Number of messages requiring acknowledgement that were transmitted at least three times on the Reverse Traffic Channel
LAYER2_RTC4	16	Reserved
LAYER2_RTC5	16	Number of times that the mobile station aborted a call as a result of the timeout expiring after the N_{1m} transmission of a message requiring acknowledgement
LAYER2_RTC6	16	Number of times a message not requiring an acknowledgement was sent on the Reverse Traffic Channel

1   6.4.5.6 Other Monitored Quantities and Statistics

2   The mobile station shall store the value described in Table 6.4.5.6-1.

3

4   **Table 6.4.5.6-1. Other Monitored Quantities and Statistics**

Quantity Identifier	Length (bits)	Description
OTHER_SYS_TIME	36	The SYS_TIME field from the first *Sync Channel Message* received after power-on

5

6   **6.5 Malfunction Detection**

7   The mobile station shall include methods to detect malfunctions that would cause
8   degradation to system capacity. Once a failure has been detected, transmission from the
9   mobile station shall remain disabled until the failed test is successfully performed on two
10   consecutive test attempts.

11   6.5.1 Malfunction Timer

12   The mobile station shall have a malfunction timer which meets the requirements of 2.5.1.

13   6.5.2 Transmit Waveform Quality

14   To ensure that the majority of mobile stations transmit spread spectrum signals which do
15   not adversely affect system capacity, the transmit waveform of each mobile station shall
16   exceed a specified waveform quality with a specified probability, called the availability. This
17   transmit waveform quality, ρ, is defined as

18
$$\rho = \max_{\o, \tau} \; \frac{\left| \int_0^T x(t;\o)\, y(t + \tau;\theta)\, dt \right|^2}{\int_0^T x^2(t;\o)\, dt \; \int_0^T y^2(t;\theta)\, dt}$$

19

20   where x(t; ø) is the transmit waveform with phase ø, y(t; θ) is the waveform defined in 6.1
21   with phase θ, and T is the integration interval.[15] During the entire service life of the mobile
22   station, the transmit waveform quality shall exceed the waveform quality value given in

---

[15]Transmit waveform quality can be viewed as the output of a normalized ideal matched filter. The range of values for the transmit waveform quality is from 1.0 for a perfect CDMA waveform to 0.0 for a non-CDMA signal. As an example, a mobile station with a 0.5 dB degradation in its transmit waveform would have a quality, ρ, of $10^{(-0.5/10)} = 0.89$.

1 Table 6.5.2-1 with the given availability value or the transmitter shall be disabled.[16] Refer
2 to "Recommended Minimum Performance Standards for 800 MHz Wideband Spread
3 Spectrum Dual-Mode Mobile Stations."

4

5   **Table 6.5.2-1. Required Availability of Transmit Waveform Quality**

Transmit Waveform Quality, ρ	Transmit Waveform Degradation	Availability
≥ 0.89	≤ 0.5 dB	$\geq 98\%$
≥ 0.45	≤ 3.5 dB	$\geq 99.9\%$
≥ 0.1	≤ 10.0 dB	$\geq 99.999\%$

---

[16]Manufacturers can achieve these availability numbers through a combination of self-tests, reliability analysis, and reliability tests.

The requirement can also be stated as follows: A manufacturer's mobile station cannot transmit and exceed the minimum performance requirements by more than the specified transmit waveform degradation with greater than the specified probability at any point in its service life. No more than two percent of a manufacturer's mobile stations can have up to a 0.5 dB degradation; no more than 0.1% can have up to a 3.5 dB degradation; and no more than 0.001% can have up to a 10.0 dB degradation.

1   **6.6 Call Processing**

2   This section describes mobile station call processing. It contains frequent references to the
3   messages that flow between the mobile station and base station. While reading this
4   section, it may be helpful to refer to the message formats (see 6.7 and 7.7), and to the
5   message flow examples (see Appendix B).

6   The values for the time and numerical constants used in this section (e.g., T_{20m}, N_{4m}) are
7   specified in Appendix D.

8   As illustrated in Figure 6.6-1, mobile station call processing consists of the following states:

9   • *Mobile Station Initialization State* - In this state, the mobile station selects and
10   acquires a system.

11 • *Mobile Station Idle State* - In this state, the mobile station monitors messages on the
12   Paging Channel.

13 • *System Access State* - In this state, the mobile station sends messages to the base
14   station on the Access Channel.

15 • *Mobile Station Control on the Traffic Channel State* - In this state, the mobile station
16   communicates with the base station using the Forward and Reverse Traffic Channels.

17 After power is applied to the mobile station, it shall enter the *System Determination*
18 *Substate* of the *Mobile Station Initialization State* with a power-up indication.

1

Power-up

Initialization
Task
(2.6.1)

Begin analog
mode
operation

End analog
mode
operation

*Mobile
Station
Initialization
State*
(6.6.1)

Mobile station
has fully
acquired system
timing

*Mobile Station
Idle Handoff
Operation* with
NGHBR_CONFIG
equal to '011' or
unable to receive
Paging Channel
message

*Mobile
Station
Idle State*
(6.6.2)

Receives an
acknowledgment
to an Access
Channel
transmission
other than an
*Origination
Message* or a
*Page Response
Message*

Receives a Paging
Channel message
requiring an
acknowledgment
or response;
originates a call or
performs
registration.

*System
Access State*
(6.6.3)

Ends use of
the Traffic
Channel

Note: Not all state
transitions are shown.

Directed to a Traffic Channel

*Mobile Station
Control on the
Traffic Channel
State*
(6.6.4)

2

3   **Figure 6.6-1. Mobile Station Call Processing States**

1   6.6.1 Mobile Station Initialization State

2   In this state, the mobile station first selects a system to use. If the selected system is a
3   CDMA system, the mobile station proceeds to acquire and then synchronize to the CDMA
4   system. If the selected system is an analog system, the mobile station begins analog mode
5   operation.

6   As illustrated in Figure 6.6.1-1, the *Mobile Station Initialization State* consists of the
7   following substates:

8   • *System Determination Substate* - In this substate, the mobile station selects which
9   system to use.

10 • *Pilot Channel Acquisition Substate* - In this substate, the mobile station acquires the
11   Pilot Channel of a CDMA system.

12 • *Sync Channel Acquisition Substate* - In this substate, the mobile station obtains
13   system configuration and timing information for a CDMA system.

14 • *Timing Change Substate* - In this substate, the mobile station synchronizes its timing
15   to that of a CDMA system.

16 While in the *Mobile Station Initialization State*, the mobile station shall update all active
17 registration timers as specified in 6.6.5.6.1.2.

1

2

3

(Power up)

System Determination Substate (6.6.1.1)

Begin analog mode operation

Initialization Task (2.6.1)

End analog mode operation

CDMA system selected

Pilot Channel Acquisition Substate (6.6.1.2)

Acquires Pilot Channel

Sync Channel Acquisition Substate (6.6.1.3)

Receives *Sync Channel Message*

Timing Change Substate (6.6.1.4)

Note: Not all state transitions are shown.
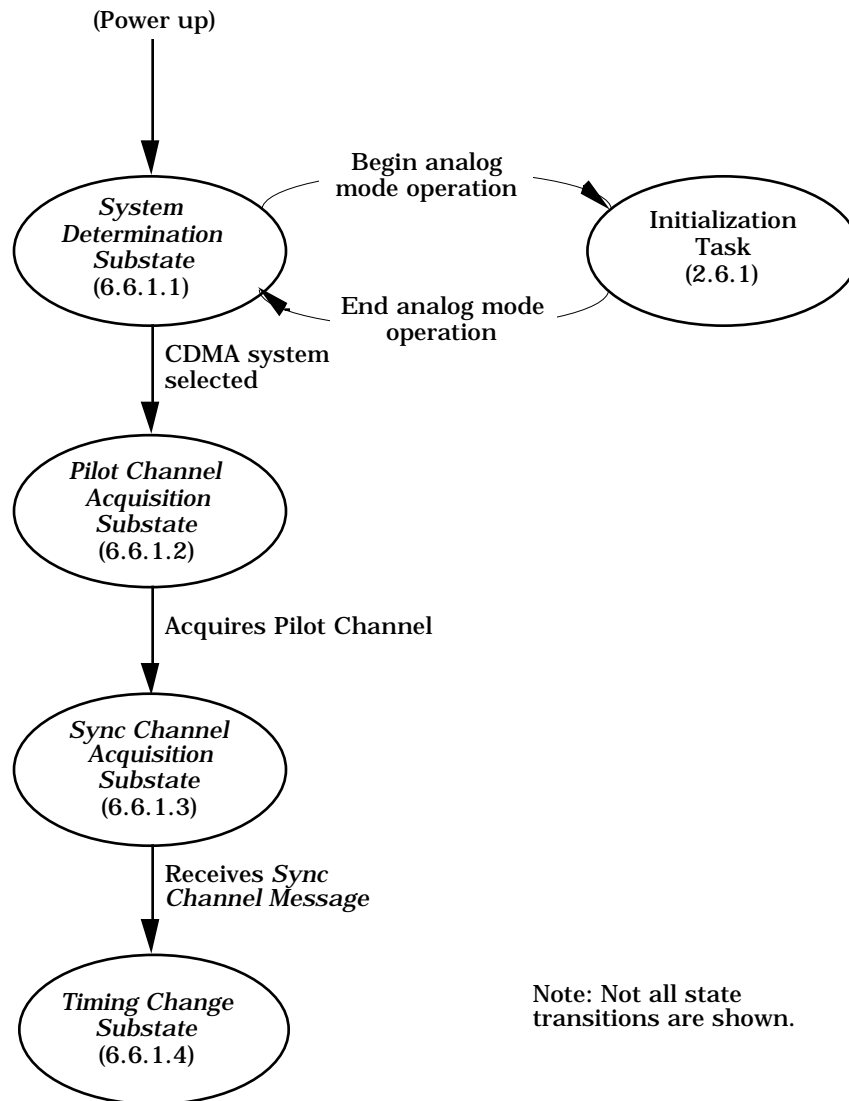
4

5   **Figure 6.6.1-1. Mobile Station Initialization State**

¹ 6.6.1.1 System Determination Substate

² In this substate, the mobile station selects the system to use. The precise process for
³ system selection is left to the mobile station manufacturer. It is typically influenced by a
⁴ set of expressed user preferences, such as the following:

⁵   • System A (or B) only

⁶   • System A (or B) preferred

⁷   • CDMA (or analog) system only

⁸   • CDMA (or analog) system preferred

⁹   • CDMA Primary (or Secondary) Channel preferred

¹⁰ Upon entering the *System Determination Substate*, the mobile station shall initialize
¹¹ registration parameters as specified in 6.6.5.6.1.1. If the mobile station enters the *System
¹² Determination Substate* with a power-up indication, the mobile station shall set the First-
¹³ Idle ID status to enabled (see 2.6.3.11), and the $RAND_s$ variable to 0 (see 2.3.12.1.2).

¹⁴ In the *System Determination Substate*, the mobile station shall perform the following:

¹⁵   • The mobile station shall determine which system to use.

¹⁶   • If the mobile station is to use System A, it shall set $SERVSYS_s$ to SYS_A. If the
¹⁷   mobile station is to use System B, it shall set $SERVSYS_s$ to SYS_B.

¹⁸   • If the mobile station is to use an analog system, it shall enter the Initialization Task
¹⁹   (see 2.6.1).

²⁰   • If the mobile station is to use a CDMA system, it shall set $CDMACH_s$ either to the
²¹   Primary or Secondary CDMA Channel number for the selected serving system
²²   ($SERVSYS_s$). The mobile station shall enter the *Pilot Channel Acquisition Substate*.

²³   If the mobile station fails to acquire a CDMA system on the first CDMA Channel it
²⁴   tries, the mobile station should attempt to acquire on the alternate CDMA Channel
²⁵   (Primary or Secondary) before performing the system selection process again.

²⁶ 6.6.1.2 Pilot Channel Acquisition Substate

²⁷ In this substate, the mobile station acquires the Pilot Channel of the selected CDMA
²⁸ system.

²⁹ Upon entering the *Pilot Channel Acquisition Substate*, the mobile station shall tune to the
³⁰ CDMA Channel number equal to $CDMACH_s$ and set its code channel for the Pilot Channel.

³¹ The mobile station shall search for the Pilot Channel. If the mobile station acquires the
³² Pilot Channel within T_{20m} seconds, the mobile station shall enter the *Sync Channel
³³ Acquisition Substate*.

³⁴ If the mobile station does not acquire the Pilot Channel within T_{20m} seconds, the mobile
³⁵ station shall enter the *System Determination Substate*.

1   6.6.1.3 Sync Channel Acquisition Substate

2   In this substate, the mobile station receives and processes the *Sync Channel Message* to
3   obtain system configuration and timing information.

4   Upon entering the *Sync Channel Acquisition Substate*, the mobile station shall set its code
5   channel for the Sync Channel.

6   If the mobile station does not receive a valid *Sync Channel Message* (see 6.4.2) within T_{21m}
7   seconds, the mobile station shall enter the *System Determination Substate*.

8   If the mobile station receives a valid *Sync Channel Message* within T_{21m} seconds but the
9   CAI revision level supported by mobile station ($MOB\_CAI\_REV_p$) is less than the minimum
10 CAI revision level supported by the base station ($MIN\_CAI\_REV_r$), the mobile station shall
11 enter the *System Determination Substate*.

12 If the mobile station receives a valid *Sync Channel Message* within T_{21m} seconds and the
13 CAI revision level supported by the mobile station ($MOB\_CAI\_REV_p$) is greater than or equal
14 to the minimum CAI revision level supported by the base station ($MIN\_CAI\_REV_r$), the
15 mobile station shall store the following information from the message:

16   • Common Air Interface revision level ($CAI\_REV_s = CAI\_REV_r$)

17   • Minimum Common Air Interface revision level ($MIN\_CAI\_REV_s = MIN\_CAI\_REV_r$)

18   • System identification ($SID_s = SID_r$)

19   • Network identification ($NID_s = NID_r$)

20   • Pilot PN sequence offset ($PILOT\_PN_s = PILOT\_PN_r$)

21   • Long code state ($LC\_STATE_s = LC\_STATE_r$)

22   • Paging Channel data rate ($PRAT_s = PRAT_r$)

23   • System Time ($SYS\_TIME_s = SYS\_TIME_r$)

24 The mobile station may store the following information from the message:

25   • Number of leap seconds that have occurred since the start of System Time
26   ($LP\_SEC_s = LP\_SEC_r$)

27   • Offset of local time from System Time ($LTM\_OFF_s = LTM\_OFF_r$)

28   • Daylight savings time indicator ($DAYLT_s = DAYLT_r$)

29 The mobile station shall enter the *Timing Change Substate*.

30 6.6.1.4 Timing Change Substate

31 In this substate, the mobile station synchronizes its long code timing and system timing to
32 those of the CDMA system, using the LC_STATE_s and SYS_TIME_s values obtained from the
33 received *Sync Channel Message*. SYS_TIME_s is equal to the System Time corresponding to
34 320 ms past the end of the last 80 ms superframe (see Figure 7.7.1.1-1) of the received
35 *Sync Channel Message* minus the pilot PN offset. LC_STATE_s is equal to the system long
36 code state corresponding to SYS_TIME_s (see Figure 6.6.1.4-1).

1   In the *Timing Change Substate*, the mobile station shall synchronize its long code timing to

2   the CDMA system long code timing derived from LC_STATE$_S$, and synchronize its system

3   timing to the CDMA system timing derived from SYS_TIME$_S$.

4   The mobile station shall set PAGECH$_S$ to the Primary CDMA Paging Channel number and

5   perform registration initialization as specified in 6.6.5.6.1.3. The mobile station shall enter

6   the *Mobile Station Idle State*.

7
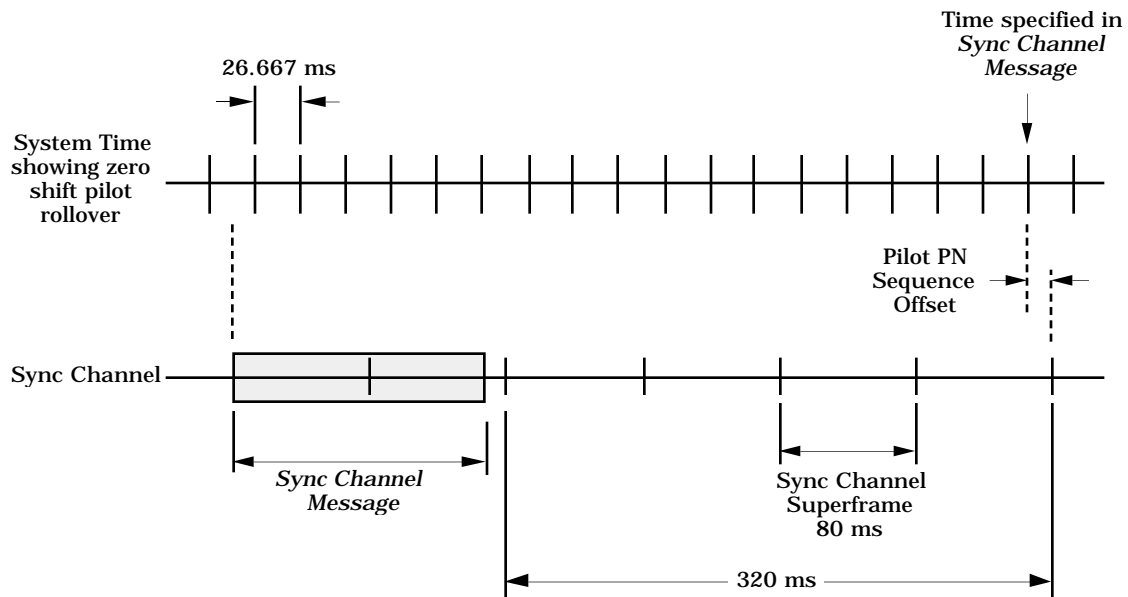
9   **Figure 6.6.1.4-1. Mobile Station Internal Timing**

10

11   6.6.2 Mobile Station Idle State

12   In this state, the mobile station monitors the Paging Channel. The mobile station can

13   receive messages, receive an incoming call (mobile station terminated call), initiate a call

14   (mobile station originated call), initiate a registration request, or initiate a message

15   transmission.

16   Upon entering the *Mobile Station Idle State,* the mobile station shall set its code channel to

17   PAGECH$_S$, set the Paging Channel data rate as determined by PRAT$_S$ and shall perform

18   Paging Channel supervision as specified in 6.4.3.

19   At any time, the mobile station may exit the *Mobile Station Idle State* and enter the *System*

20   *Determination Substate* of the *Mobile Station Initialization State*.

21   While in the *Mobile Station Idle State*, the mobile station shall perform the following

22   procedures:

23   • The mobile station shall perform Paging Channel monitoring procedures as specified

24   in 6.6.2.1.1.

- The mobile station shall perform message acknowledgement procedures as specified in 6.6.2.1.2.

- The mobile station shall perform registration procedures as specified in 6.6.2.1.3.

- The mobile station shall perform idle handoff procedures as specified in 6.6.2.1.4.

- The mobile station shall perform the *Response to Overhead Information Operation* as specified in 6.6.2.2 whenever the mobile station receives a system overhead message (*System Parameter Message*, *CDMA Channel List Message*, *Neighbor List Message* or *Access Parameters Message*).

- The mobile station shall perform the *Mobile Station Page Match Operation* as specified in 6.6.2.3 whenever it receives a *Page Message* or *Slotted Page Message*.

- The mobile station shall perform the *Mobile Station Order and Message Processing Operation* as specified in 6.6.2.4 whenever the mobile station receives a message other than a system overhead message or a page message.

- The mobile station shall perform the *Mobile Station Origination Operation* as specified in 6.6.2.5 if directed by the user to initiate a call.

- If the mobile station supports message transmission, it shall perform the *Mobile Station Message Transmission Operation* as specified in 6.6.2.6 if directed by the user to transmit a message.

- The mobile station shall perform the *Mobile Station Power-Down Operation* as specified in 6.6.2.7 if directed by the user to power down.

6.6.2.1 Idle Procedures

6.6.2.1.1 Paging Channel Monitoring Procedures

6.6.2.1.1.1 General Overview

The Paging Channel is divided into 200 ms time slots called Paging Channel slots. Paging and control messages for a mobile station operating in the non-slotted mode can be received in any of the Paging Channel slots. Therefore, the non-slotted mode of operation requires the mobile station to monitor all slots.

The Paging Channel protocol also provides for scheduling the transmission of messages for a specific mobile station in certain assigned time slots. Support of this feature is optional and may be enabled independently for each mobile station. A mobile station that monitors the Paging Channel only during its assigned timeslot is referred to as operating in the slotted mode. During the time slots in which the Paging Channel is not being monitored, the mobile station can stop or reduce its processing for power conservation. A mobile station may not operate in the slotted mode in any state except the *Mobile Station Idle State.*

A mobile station operating in the slotted mode generally monitors the Paging Channel for one or two slots per slot cycle. The mobile station can control the length of the slot cycle through the SLOT_CYCLE_INDEX field in the *Initial Registration Message* or *Registration Update Message.* The length of the slot cycle, T, in seconds, is given by

1          $$T = 2^{SLOT\_CYCLE\_INDEX}.$$

2   There are 5×T slots in a slot cycle.

3   The SLOT_NUM field of the *Slotted Page Message* is the Paging Channel slot number,
4   modulo the maximum length slot cycle (640 slots). That is, the value of SLOT_NUM is

5          $$SLOT\_NUM = \lfloor t/10 \rfloor \bmod 640,$$

6   where t is the System Time in frames. For each mobile station, the starting times of its slot
7   cycles are offset from the slot in which SLOT_NUM equals zero by a fixed, randomly selected
8   number of slots as specified in 6.6.2.1.1.3. A mobile station operating in the slotted mode
9   can use the SLOT_NUM field to determine its slot cycle time alignment with the base
10   station.

11   Figure 6.6.2.1.1.1-1 shows an example for a slot cycle length of two seconds, in which the
12   computed value of PGSLOT (see 6.6.2.1.1.3) is equal to 6, so that one of the mobile station's
13   slot cycles begins when SLOT_NUM equals 6. The mobile station begins monitoring the
14   Paging Channel at the start of the slot in which SLOT_NUM equals 6. The next slot in
15   which the mobile station must begin monitoring the Paging Channel is 10 slots later, i.e.,
16   the slot in which SLOT_NUM is (6+5×T) modulo 640, which is 16.

17
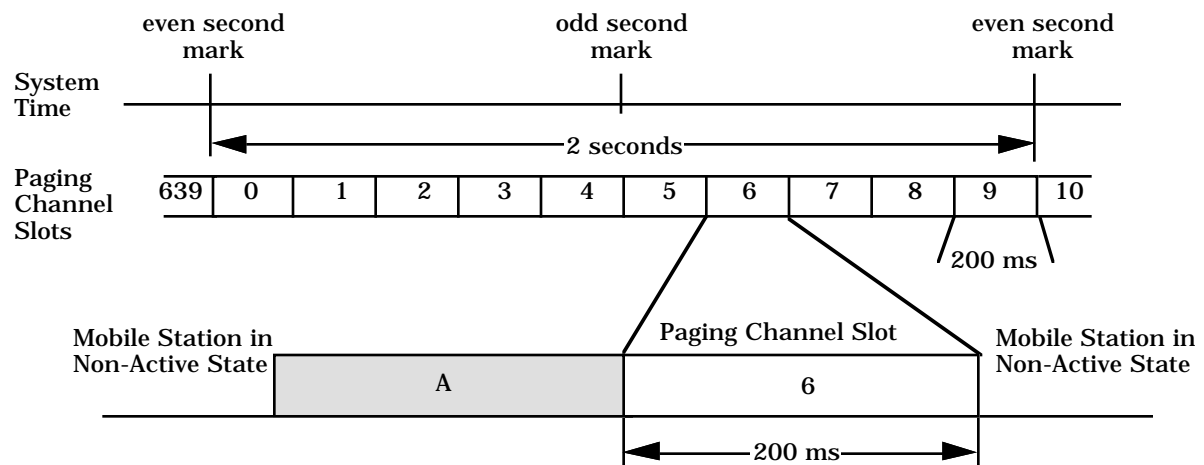
A- Reacquisition of CDMA System
6- Mobile Station's Assigned Paging Channel Slot

19   **Figure 6.6.2.1.1.1-1. Mobile Station Idle Slotted Mode Structure Example (see text)**

20

21   *Slotted Page Messages* contain a field called MORE_PAGES which, when set to '0' during a
22   mobile station's assigned slot, indicates that the remainder of the slot will contain no more
23   messages addressed to that mobile station. This allows a mobile station operating in the
24   slotted mode to stop monitoring the Paging Channel as soon as possible.

25   If a *Slotted Page Message* containing the MORE_PAGES field equal to '0' is not received in
26   the assigned slot, the mobile station continues to monitor the Paging Channel for one

additional slot. This allows the base station to carry over a message begun in the assigned slot into the following slot if necessary.

6.6.2.1.1.2 Non-Slotted Mode Requirements

A mobile station operating in the non-slotted mode shall monitor the Paging Channel at all times. If the mobile station declares loss of the Paging Channel (see 6.4.3), the mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*.

When a mobile station monitors the Paging Channel in any state other than the *Mobile Station Idle State*, it shall operate in the non-slotted mode.

6.6.2.1.1.3 Slotted Mode Requirements

A mobile station operating in the slotted mode is not required to monitor the Paging Channel at all times.

If the mobile station declares loss of the Paging Channel (see 6.4.3), the mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*.

If the mobile station's slot cycle is modified, the mobile station performs parameter-change registration (see 6.6.5.1.6).

If the mobile station user configures a mobile station for slotted mode operation, the mobile station shall specify its preferred slot cycle index in the SLOT_CYCLE_INDEX field of the *Initial Registration Message* or a *Registration Update Message*. Operation with the modified slot cycle shall begin only after an acknowledgement of the registration has been received. A mobile station equipped for slotted operation may disable slotted operation by setting bit 5 of the station class mark to '0' (see 2.3.3).

If any of the following conditions is true, the mobile station shall operate either in the non-slotted mode or in the slotted mode with either a 1 or 2 second slot cycle (SLOT_CYCLE_INDEX equal to 0 or 1):

- The system configuration parameters are not current (see 6.6.2.2); or

- If the current base station's SID and NID (SID_S and NID_S, as stored from the *System Parameters Message*) do not match any entry of $SID\_NID\_LIST_S$.

If the mobile station's stored system configuration parameters are current (see 6.6.2.2) and $SID\_NID\_LIST_S$ contains an entry corresponding to SID_S and NID_S, then the mobile station should use the value of SLOT_CYCLE_INDEX sent in the last registration message to determine its assigned slot. If the mobile station does not use this value, it shall operate either in the non-slotted mode or in the slotted mode with either a 1 or 2 second slot cycle (SLOT_CYCLE_INDEX equal to 0 or 1).

A mobile station operating in the slotted mode shall use the hash function specified in 6.6.7.1 to select a number PGSLOT in the range 0 to 639 (spanning the maximum slot cycle length, which is 128 seconds). The mobile station's assigned slots shall be those slots in which

$$(\lfloor t/10 \rfloor - \text{PGSLOT}) \bmod (5 \times T) = 0,$$

where t is the System Time in frames and T is the slot cycle length in seconds given by

$$T = 2^{SLOT\_CYCLE\_INDEX}.$$

The mobile station shall begin monitoring the Paging Channel in time to receive the first bit of each assigned slot.

If a mobile station operating in the slotted mode determines that the configuration information is not current, as specified in 6.6.2.2, it shall continue to monitor the Paging Channel until either the configuration information has been updated and is current or the mobile station declares loss of the Paging Channel (see 6.4.3). When the configuration information is current, the mobile station shall continue to monitor the Paging Channel until one of the following conditions is true:

- A *Slotted Page Message* has been received during the assigned slot with the MORE_PAGES bit equal to '0'; or

- The mobile station has monitored the Paging Channel for two time slots, starting with the assigned slot, and has received at least one valid message (see 6.4.3); or

- The mobile station declares loss of the Paging Channel (see 6.4.3).

6.6.2.1.2 Acknowledgement Procedures

Acknowledgement procedures facilitate the reliable exchange of messages between the base station and the mobile station. The mobile station uses the fields ACK_SEQ (acknowledgement sequence number), MSG_SEQ (message sequence number), ACK_REQ (acknowledgement required), and VALID_ACK (valid acknowledgement) to support this mechanism. These fields are referred to as layer 2 fields, and the acknowledgement procedures are referred to as layer 2 procedures. All other message fields and the processing thereof are referred to as pertaining to layer 3. (See Appendix C for further discussion of layering.)

Acknowledgements of messages received on the Paging Channel shall be sent on the Access Channel (see 6.6.3).

When sending a message that includes an acknowledgement, the mobile station shall set the VALID_ACK field to '1' and shall set the ACK_SEQ field equal to the MSG_SEQ field of the message being acknowledged. For acknowledgement of a *Page Message* or *Slotted Page Message*, the mobile station shall set the ACK_SEQ field equal to the MSG_SEQ field of the record containing the MIN that matched one of the mobile station's active MINs.

When sending a message that does not include an acknowledgement, the mobile station shall set the VALID_ACK field to '0' and shall set the ACK_SEQ field equal to the ACK_SEQ field of the previous message sent. If no previous message has been sent, the mobile station shall set the ACK_SEQ field to '00'.

Unless otherwise specified in the requirements for processing a specific message, the mobile station shall transmit an acknowledgement in response to any message received that is addressed to the mobile station and that has the ACK_REQ field set to '1'. The mobile station shall transmit a *Page Response Message* including an acknowledgement in response to each record of a *Page Message* or *Slotted Page Message* addressed to one of the mobile

station's active MINs.[17] If a specific message is required in response to any other message requiring acknowledgement, the acknowledgement shall be included with the response. If no specific message is required to be transmitted in response to a received message requiring acknowledgement, the mobile station shall include the acknowledgement in a *Mobile Station Acknowledgement Order* (see 6.7.3).

If no message requiring acknowledgement has been received, the mobile station shall not include an acknowledgement in any transmitted message until a message is received that requires acknowledgement. After a message including an acknowledgement has been sent, the mobile station shall not include an acknowledgement in any subsequent transmitted message until another message is received that requires acknowledgement.

The mobile station shall detect duplicate received messages by the following rules.

The mobile station shall consider two messages (or order records) addressed to the mobile station's ESN (all directed messages except *Page Messages* and *Slotted Page Messages*) to be duplicates if all of the following are true:

- The messages (records) were received on the same Paging Channel; and

- The messages (records) contain the same values in both the MSG_SEQ and ACK_REQ fields;[18] and

- The messages (records) were received within T_{4m} seconds (see Appendix D) of each other (see Figure 6.6.2.1.2-1); and

The mobile station shall consider two page records (addressed by MIN, as contained in *Page Messages* and *Slotted Page Messages*) to be duplicates if all of the following are true:

- The records were received on the same Paging Channel; and

- The records contain the same values in the MSG_SEQ field; and

- The records were received in messages received within T_{4m} seconds of each other (see Figure 6.6.2.1.2-1), or in the same message; and

- Both records are addressed to the same MIN.

The mobile station shall discard, without further processing, any message or page record that is a duplicate of one previously received.

Paging Channels shall be considered different if they are transmitted by different base stations, if they are transmitted on different code channels or if they are transmitted on different CDMA Channels.

The mobile station shall consider messages to be different if they are not duplicates according to the rules given above. The mobile station shall process all messages that are considered to be different.

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[17]These messages do not have an ACK_REQ field.

[18]Separate sequence numbers are used for messages requiring acknowledgement and messages not requiring acknowledgement on the Paging Channel.
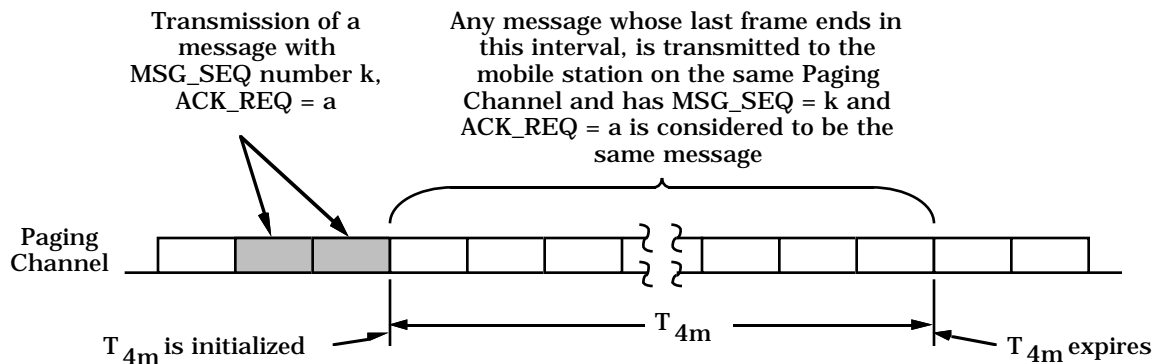
Figure 6.6.2.1.2-1. Time Interval for Duplicate Message Detection

6.6.2.1.3 Registration

While in the *Mobile Station Idle State*, the mobile station shall maintain all active registration timers (see 6.6.5.5), and shall perform the registration procedures specified in 6.6.5.6.2.1.

6.6.2.1.4 Idle Handoff

6.6.2.1.4.1 Pilot Search

An idle handoff occurs when a mobile station has moved from the area of coverage of one base station into the coverage of a second base station during the *Mobile Station Idle State*. The mobile station determines that an idle handoff should occur when it detects a sufficiently strong Pilot Channel signal other than that of the current base station's Pilot Channel signal.

Pilot Channels are identified by their offsets relative to the zero offset pilot PN sequence (see 7.1.3.2.1). Pilot offsets are grouped into sets describing their status with regard to pilot searching.

The following sets of pilot offsets are defined for a mobile station in the *Mobile Station Idle State*. Each pilot offset is a member of only one set.

- Active Set: The pilot offset of the Forward CDMA Channel whose Paging Channel is being monitored.

- Neighbor Set: The offsets of the Pilot Channels that are likely candidates for idle handoff. The members of the Neighbor Set are specified in the *Neighbor List Message*.

- Remaining Set: The set of all possible pilot offsets in the current system (integer multiples of PILOT_INC$_S$) on the current CDMA frequency assignment, excluding the pilots in the Neighbor Set and the Active Set.

The mobile station shall be capable of storing the information from the *Neighbor List Message* for at least N_{8m} members of the neighbor set (see Appendix D).

In the *Mobile Station Idle State*, the mobile station shall continuously search for the strongest Pilot Channel signal on the current CDMA frequency assignment (CDMACH$_S$). Search performance criteria are defined in the "Recommended Minimum Performance Standards for 800 MHz Wideband Spread Spectrum Dual-Mode Mobile Stations."

This search should be governed by the following:

- Active Set: The search window size for each pilot in the Active Set should be the number of PN chips specified in Table 6.6.6.2.1-1 corresponding to SRCH_WIN_A$_S$. The mobile station should center the search window for each pilot of the Active Set around the earliest arriving usable multipath component of the pilot.

- Neighbor Set: The search window size for each pilot in the Neighbor Set should be the number of PN chips specified in Table 6.6.6.2.1-1 corresponding to SRCH_WIN_N$_S$. The mobile station should center the search window for each pilot in the Neighbor Set around the pilot's PN sequence offset using timing defined by the mobile station's time reference (see 6.1.5.1).

- Remaining Set: The search window size for each pilot in the Remaining Set should be the number of PN chips specified in Table 6.6.6.2.1-1 corresponding to SRCH_WIN_R$_S$. The mobile station should center the search window for each pilot in the Remaining Set around the pilot's PN sequence offset using timing defined by the mobile station's time reference (see 6.1.5.1).

If the mobile station determines that one of the Neighbor Set or Remaining Set Pilot Channel signals is sufficiently stronger than the Pilot Channel of the Active Set, the mobile station should perform idle handoff as specified in 6.6.2.1.4.2.

6.6.2.1.4.2 Idle Handoff Procedures

While performing an idle handoff, the mobile station shall operate in the non-slotted mode until the mobile station has received at least one valid message on the new Paging Channel.

If the new base station is listed in the *Neighbor List Message*, the mobile station shall use the 3-bit NGHBR_CONFIG field to determine the actions required to transition to the new base station. If the new base station is not listed in the *Neighbor List Message*, the mobile station shall perform the handoff operation using the same procedure as for a pilot in the list with the NGHBR_CONFIG field set to '011'.

If the NGHBR_CONFIG field is '000', the mobile station shall set ACC_MSG_SEQ$_S$ to NULL (see 6.6.2.2) and shall set PILOT_PN$_S$ to the pilot offset index of the base station transmitting the new Paging Channel. If the mobile station has not stored configuration parameters for the new Paging Channel, or if the stored information is not current (see 6.6.2.2), the mobile station shall set CONFIG_MSG_SEQ$_S$, SYS_PAR_MSG_SEQ$_S$, NGHBR_LST_MSG_SEQ$_S$, and CHAN_LST_MSG_SEQ$_S$ to NULL. The mobile station shall begin monitoring the Paging Channel of the new base station, using the same Code Channel and CDMA Channel.

1 If the NGHBR_CONFIG field is '001', the mobile station shall set $ACC\_MSG\_SEQ_S$ to NULL
2 and shall set $PILOT\_PN_S$ to the pilot offset index of the base station transmitting the new
3 Paging Channel. If the mobile station has not stored configuration parameters for the
4 Primary Paging Channel of the new base station, or if the stored information is not current
5 (see 6.6.2.2), the mobile station shall set $CONFIG\_MSG\_SEQ_S$, $SYS\_PAR\_MSG\_SEQ_S$,
6 $NGHBR\_LST\_MSG\_SEQ_S$, and $CHAN\_LST\_MSG\_SEQ_S$ to NULL. The mobile station shall
7 begin monitoring the Primary Paging Channel of the new base station, using the same
8 CDMA Channel.

9 If the NGHBR_CONFIG field is '010', the mobile station shall set $ACC\_MSG\_SEQ_S$ to NULL
10 and shall set $PILOT\_PN_S$ to the pilot offset index of the base station transmitting the new
11 Paging Channel. If the mobile station has not stored configuration parameters for the
12 Primary Paging Channel of the new base station, or if the stored information is not current
13 (see 6.6.2.2), the mobile station shall set $CONFIG\_MSG\_SEQ_S$, $SYS\_PAR\_MSG\_SEQ_S$,
14 $NGHBR\_LST\_MSG\_SEQ_S$ and $CHAN\_LST\_MSG\_SEQ_S$ to NULL. The mobile station shall
15 tune to the first CDMA Channel given in the *CDMA Channel List Message* for the new base
16 station and begin monitoring the Primary Paging Channel of the new base station.

17 If the NGHBR_CONFIG field is '011', the mobile station shall enter the *Sync Channel*
18 *Acquisition Substate* of the *Mobile Station Initialization State*.

19 6.6.2.2 Response to Overhead Information Operation

20 The *Response to Overhead Information Operation* is performed whenever the mobile station
21 receives an overhead message *(System Parameters Message*, *CDMA Channel List Message*,
22 *Neighbor List Message* or *Access Parameters Message)*. The mobile station updates
23 internally stored information from the received message's data fields.

24 Configuration information and access parameters are received in the configuration
25 messages and the *Access Parameters Message*. The configuration messages are:

26   • *System Parameters Message*

27   • *CDMA Channel List Message*

28   • *Neighbor List Message*

29 Associated with the set of configuration messages sent on each Paging Channel is a
30 configuration message sequence number (CONFIG_MSG_SEQ). When the contents of one
31 or more of the configuration messages change, the configuration message sequence number
32 is incremented. For each of the configuration messages received, the mobile station stores
33 the configuration message sequence number contained in the configuration message
34 ($SYS\_PAR\_MSG\_SEQ_S$, $CHAN\_LIST\_MSG\_SEQ_S$, $NGHBR\_LIST\_MSG\_SEQ_S$). The mobile
35 station also stores the most recently received configuration message sequence number
36 ($CONFIG\_MSG\_SEQ_S$) contained in any message. (See 6.6.2.2.1, 6.6.2.2.3, 6.6.2.2.4 and
37 6.6.2.3.) The mobile station examines the stored values of the configuration message
38 sequence numbers to determine whether the configuration parameter values stored by the
39 mobile station are current.

1   The configuration message sequence number is also included in the *Page Message* and the
2   *Slotted Page Message*. This allows the mobile station to determine whether the stored
3   configuration parameters are current without waiting for a configuration message.

4   *Access Parameters Messages* are independently sequence-numbered by the ACC_MSG_SEQ
5   field. The mobile station stores the most recently received *Access Parameters Message*
6   sequence number (ACC_MSG_SEQ$_S$).

7   Paging Channels shall be considered different if they are transmitted by different base
8   stations, if they are transmitted on different code channels, or if they are transmitted on
9   different CDMA Channels. Configuration and access parameters from one Paging Channel
10 shall not be used while monitoring a different Paging Channel. The mobile station shall
11 ignore any overhead message whose PILOT_PN$_r$ field is not equal to the pilot offset index
12 (PILOT_PN$_S$) of the base station whose Paging Channel is being monitored.

13 The mobile station may store the configuration message parameters from Paging Channels
14 it has recently monitored. When a mobile station performs an idle handoff (see 6.6.2.1.4.2)
15 or other transition to a Paging Channel that it has recently monitored, the mobile station
16 can determine whether the stored parameters are current by examining the
17 CONFIG_MSG_SEQ$_S$ in a configuration message, in a *Slotted Page Message*, or in a *Page*
18 *Message*.

19 The mobile station shall define a special value, NULL, to be stored in place of sequence
20 numbers for messages that have not been received or are marked as not current. The
21 special value NULL shall be unequal to any valid message sequence number.

22 The mobile station shall consider the stored configuration parameters to be current only if
23 all the following conditions are true:

24   • All three stored configuration message sequence numbers (SYS_PAR_MSG_SEQ$_S$,
25   CHAN_LIST_MSG_SEQ$_S$, NGHBR_LIST_MSG_SEQ$_S$) are equal to CONFIG_MSG-
26   _SEQ$_S$; and

27   • CONFIG_MSG_SEQ$_S$ is not equal to NULL; and

28   • No more than T$_{31m}$ seconds (see Appendix D) have elapsed since the mobile station
29   last received a valid message on the Paging Channel for which the parameters were
30   stored.

31 6.6.2.2.1 System Parameters Message

32 Whenever a *System Parameters Message* is received on the Paging Channel, the
33 configuration message sequence number, CONFIG_MSG_SEQ$_r$, shall be compared to that
34 stored in SYS_PAR_MSG_SEQ$_S$. If the comparison results in a mismatch, then the mobile
35 station shall process the remaining fields in the message as described in 6.6.2.2.1.1,
36 6.6.2.2.1.2, 6.6.2.2.1.3, 6.6.2.2.1.4, and 6.6.2.2.1.5.

37 6.6.2.2.1.1 Stored Parameters

38 The mobile station shall store the following parameters:

1 • Configuration message sequence number
2   (CONFIG_MSG_SEQ$_s$=CONFIG_MSG_SEQ$_r$,
3   SYS_PAR_MSG_SEQ$_s$=CONFIG_MSG_SEQ$_r$)

4 • System identification (SID$_s$=SID$_r$)

5 • Network identification (NID$_s$=NID$_r$)

6 • Registration zone (REG_ZONE$_s$=REG_ZONE$_r$)

7 • Number of registration zones to be retained (TOTAL_ZONES$_s$=TOTAL_ZONES$_r$)

8 • Zone timer length (ZONE_TIMER$_s$=ZONE_TIMER$_r$)

9 • Base station identification (BASE_ID$_s$=BASE_ID$_r$)

10 • Base station class (BASE_CLASS$_s$=BASE_CLASS$_r$)

11 • Home registration indicator (HOME_REG$_s$=HOME_REG$_r$)

12 • NID roamer registration indicator (FOR_NID_REG$_s$=FOR_NID_REG$_r$)

13 • SID roamer registration indicator (FOR_SID_REG$_s$=FOR_SID_REG$_r$)

14 • Power-up registration indicator (POWER_UP_REG$_s$=POWER_UP_REG$_r$)

15 • Power-down registration indicator (POWER_DOWN_REG$_s$=POWER_DOWN_REG$_r$)

16 • Parameter-change registration indicator (PARAMETER_REG$_s$=PARAMETER_REG$_r$)

17 • Registration period (REG_PRD$_s$=REG_PRD$_r$)

18 • Base station latitude (BASE_LAT$_s$=BASE_LAT$_r$)

19 • Base station longitude (BASE_LONG$_s$=BASE_LONG$_r$)

20 • Registration distance (REG_DIST$_s$=REG_DIST$_r$)

21 • Search window size for the Active Set and Candidate Set
22   (SRCH_WIN_A$_s$=SRCH_WIN_A$_r$)

23 • Search window size for the Neighbor Set (SRCH_WIN_N$_s$=SRCH_WIN_N$_r$)

24 • Search window size for the Remaining Set (SRCH_WIN_R$_s$=SRCH_WIN_R$_r$)

25 • Maximum age for retention of Neighbor Set members
26   (NGHBR_MAX_AGE$_s$=NGHBR_MAX_AGE$_r$)

27 • Power control reporting frame count (PWR_REP_FRAMES$_s$=PWR_REP_FRAMES$_r$)

28 • Power control reporting threshold (PWR_REP_THRESH$_s$=PWR_REP_THRESH$_r$)

29 • Power report mode indicator (PWR_REP_MODE$_s$=PWR_REP_MODE$_r$)

30 • Power report delay (PWR_REP_DELAY$_s$=PWR_REP_DELAY$_r$)

31 • Pilot detection threshold (T_ADD$_s$ =T_ADD$_r$)

32 • Pilot drop threshold (T_DROP$_s$=T_DROP$_r$)

33 • Active Set versus Candidate Set comparison threshold (T_COMP$_s$=T_COMP$_r$)

34 • Drop timer value (T_TDROP$_s$=T_TDROP$_r$)

6.6.2.2.1.2 Paging Channel Assignment Change

If the number of Paging Channels specified in the message (PAGE_CHAN$_r$) is different from PAGE_CHAN$_s$, the mobile station shall use the hash algorithm specified in 6.6.7.1 to select a new Paging Channel number in the range 1 to PAGE_CHAN$_r$. The mobile station shall store the new Paging Channel number as PAGECH$_s$. The mobile station shall then set PAGE_CHAN$_s$ to PAGE_CHAN$_r$. The mobile station shall set ACC_MSG_SEQ$_s$ to NULL. If the mobile station has not stored configuration parameters for the new Paging Channel, or if the stored parameters are not current (see 6.6.2.2), the mobile station shall set CONFIG-_MSG_SEQ$_s$, SYS_PAR_MSG_SEQ$_s$, NGHBR_LST_MSG_SEQ$_s$, and CHAN_LST_MSG_SEQ$_s$ to NULL. The mobile station shall then begin monitoring the new Paging Channel as specified in 6.6.2.1.1.

6.6.2.2.1.3 RESCAN Parameter

If the RESCAN$_r$ field in the *System Parameters Message* equals '1', the mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*.

6.6.2.2.1.4 Roaming Status

The mobile station shall determine the roaming status for each of the MINs active at the mobile station (see 6.6.5.3). The mobile station should indicate to the user whether any MIN active at the mobile station is roaming.[19]

6.6.2.2.1.5 Registration

The mobile station shall update stored variables and perform other registration procedures as specified in 6.6.5.6.2.2.

6.6.2.2.2 Access Parameters Message

Whenever an *Access Parameters Message* is received on the Paging Channel, the sequence number, ACC_MSG_SEQ$_r$, shall be compared to ACC_MSG_SEQ$_s$. If the comparison results in a mismatch, then the mobile station shall process the remaining fields in the message as follows.

The mobile station shall store the following parameters:

- *Access Parameters Message* sequence number (ACC_MSG_SEQ$_s$=ACC_MSG_SEQ$_r$)

- Number of Access Channels (ACC_CHAN$_s$=ACC_CHAN$_r$)

- Nominal transmit power offset (NOM_PWR$_s$=NOM_PWR$_r$)

- Initial power offset for access (INIT_PWR$_s$=INIT_PWR$_r$)

- Power increment (PWR_STEP$_s$=PWR_STEP$_r$)

- Number of access probes (NUM_STEP$_s$=NUM_STEP$_r$)

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[19]If the mobile station user has entered a particular MIN, e.g., prior to an origination, then the mobile station should indicate whether that MIN is roaming.

1   • Maximum Access Channel message capsule size ($MAX\_CAP\_SZ_s$=$MAX\_CAP\_SZ_r$)

2   • Access Channel preamble length (PAM_SZ_s=PAM_SZ_r)

3   • Persistence modifier for Access Channel attempts for registrations which are not
4   responses to the *Registration Request Order* (REG_PSIST_s=REG_PSIST_r)

5   • Persistence modifier for Access Channel attempts for message transmissions
6   (MSG_PSIST_s=MSG_PSIST_r)

7   • Time randomization for Access Channel probes ($PROBE\_PN\_RAN_s$=$PROBE\_PN\_RAN_r$)

8   • Acknowledgement timeout (ACC_TMO_s=ACC_TMO_r)

9   • Access Channel probe backoff range ($PROBE\_BKOFF_s$=$PROBE\_BKOFF_r$)

10   • Access Channel probe sequence backoff range ($BKOFF_s$=$BKOFF_r$)

11   • Maximum number of probe sequences for an Access Channel request
12   ($MAX\_REQ\_SEQ_s$=$MAX\_REQ\_SEQ_r$)

13   • Maximum number of probe sequences for an Access Channel response
14   ($MAX\_RSP\_SEQ_s$=$MAX\_RSP\_SEQ_r$)

15   • Authentication mode ($AUTH_s$=$AUTH_r$)

16   • Random challenge value ($RAND_s$=$RAND_r$)

17   For each MIN active at the mobile station, the mobile station shall record the persistence
18   parameter number that corresponds to the MIN's overload class as follows:

19   • Persistence value for access overload class ($PSIST_s$=$PSIST_r$)

20   6.6.2.2.3 Neighbor List Message

21   Whenever a valid *Neighbor List Message* is received on the current Paging Channel
22   ($PAGECH_s$), the configuration message sequence number, $CONFIG\_MSG\_SEQ_r$, shall be
23   compared to that stored in $NGHBR\_LST\_MSG\_SEQ_s$. If the comparison results in a
24   mismatch, then the mobile station shall process the remaining fields in the message as
25   follows.

26   The mobile station shall store the following parameters:

27   • Configuration message sequence number
28   ($CONFIG\_MSG\_SEQ_s$=$CONFIG\_MSG\_SEQ_r$,
29     $NGHBR\_LST\_MSG\_SEQ_s$=$CONFIG\_MSG\_SEQ_r$)

30   • Pilot PN sequence offset increment ($PILOT\_INC_s$=$PILOT\_INC_r$)

31   For each of the neighboring base stations contained in the *Neighbor List Message*, the
32   mobile station shall store the following:

33   • Neighbor configuration ($NGHBR\_CONFIG_s$=$NGHBR\_CONFIG_r$)

34   • Neighbor pilot PN sequence offset ($NGHBR\_PN_s$=$NGHBR\_PN_r$)

35   The mobile station shall update the idle handoff Neighbor Set and Remaining Set (see
36   6.6.2.1.4) so that the Neighbor Set consists only of pilot offsets listed in the *Neighbor List*

1 *Message.* If the *Neighbor List Message* contains more pilot offsets than the mobile station
2 can store, the mobile station shall store the pilot offsets beginning at the start of the
3 *Neighbor List Message*, up to the limits of the mobile station's Neighbor Set storage
4 capacity.

5 6.6.2.2.4 CDMA Channel List Message

6 Whenever a *CDMA Channel List Message* is received on the Paging Channel, the
7 configuration message sequence number, $CONFIG\_MSG\_SEQ_r$, shall be compared to that
8 stored in $CHAN\_LST\_MSG\_SEQ_s$. If the comparison results in a mismatch, then the mobile
9 station shall process the remaining fields in the message as follows.

10 The mobile station shall store the following parameters:

11 • Configuration message sequence number
12   ($CONFIG\_MSG\_SEQ_s=CONFIG\_MSG\_SEQ_r$,
13     $CHAN\_LST\_MSG\_SEQ_s=CONFIG\_MSG\_SEQ_r$)

14 The mobile station shall use the hash algorithm specified in 6.6.7.1 and the number of
15 channels listed in the *CDMA Channel List Message* to determine the CDMA Channel
16 (frequency assignment) for its Paging Channel. If the CDMA frequency assignment has
17 changed (the computed CDMA Channel is different from $CDMACH_s$), the mobile station
18 shall perform the following actions:

19 • Set $CDMACH_s$ to the new CDMA Channel.

20 • Set $PAGECH_s$ to the Primary Paging Channel.

21 • Set $CONFIG\_MSG\_SEQ_s$, $SYS\_PAR\_MSG\_SEQ_s$, $NGHBR\_LST\_MSG\_SEQ_s$,
22     $CHAN\_LST\_MSG\_SEQ_s$, and $ACC\_MSG\_SEQ_s$ to NULL.

23 • Tune to the new CDMA Channel.

24 6.6.2.3 Mobile Station Page Match Operation

25 The *Mobile Station Page Match Operation* is performed whenever the mobile station receives
26 a *Page Message* or a *Slotted Page Message*. The mobile station searches each message to
27 determine whether it contains one of the mobile station's active MINs. If so, the mobile
28 station transmits a response to the *Page Message* or the *Slotted Page Message* on the
29 Access Channel.

30 The mobile station shall compare the configuration message sequence number, CONFIG-
31 $\_MSG\_SEQ_r$, to $CONFIG\_MSG\_SEQ_s$. If the comparison results in a mismatch, then the
32 mobile station shall set $CONFIG\_MSG\_SEQ_s$ to $CONFIG\_MSG\_SEQ_r$. The mobile station
33 shall also compare the *Access Parameters Message* sequence number, $ACC\_MSG\_SEQ_r$,
34 with that stored in $ACC\_MSG\_SEQ_s$. If the comparison results in a mismatch, then the
35 mobile station shall set $ACC\_MSG\_SEQ_s$ to NULL (see 6.6.2.2).

36 The mobile station shall compare each of its active MINs with the MIN in each record of the
37 *Page Message* or *Slotted Page Message*. If both MIN1 and MIN2 are present in a page
38 record and both MIN1 and MIN2 match MIN1 and MIN2 for an active MIN at the mobile
39 station, then a match shall be declared. If MIN1 but not MIN2 is present in a page record,

MIN1 matches MIN1 for an active MIN at the mobile station, and a home (SID, NID) pair for the same active MIN matches the SID and NID of the base station, then a match shall be declared (see 6.6.5.3). Any other combination shall be considered a mismatch.

If a match is declared, and the MIN is configured to receive mobile station terminated calls in its present roaming status (see 6.6.5.3), the mobile station shall enter the *Update Overhead Information Substate* of the *System Access State* (see 6.6.3) with a page response indication within T_{33m} seconds after the page message is received.

If the MIN is not configured to receive mobile station terminated calls in its present roaming status, the mobile station may ignore the page record.

6.6.2.4 Mobile Station Order and Message Processing Operation

During the *Mobile Station Order and Message Processing Operation*, the mobile station processes mobile station directed messages (addressed by ESN), including order messages. Directed messages include all messages except overhead messages and page messages.

The mobile station shall compare its ESN to the ESN field of the message. If the ESN matches, the mobile station shall process the message; otherwise the mobile station shall ignore the message.

The following cases occur for messages received on the Paging Channel whose ESN field matches the mobile station's ESN:

- If the message requires acknowledgement, and is not the *Lock Order*, the *Lock Until Power-Cycled Order*, or the *Unlock Order*, the mobile station shall acknowledge the message as specified in 6.6.2.1.2. The mobile station shall enter the *Update Overhead Information Substate* of the *System Access State* with an order/message response indication within T_{33m} seconds, unless otherwise specified for a particular message.

- If the message does not require acknowledgement, the mobile station shall transmit a response only if it is required by the message or order. If a response is required, the mobile station shall enter the *Update Overhead Information Substate* of the *System Access State* with an order/message response indication within T_{33m} seconds, unless otherwise specified for a particular message.

- If the message is a message that cannot be processed by the mobile station, the mobile station shall respond with a *Mobile Station Reject Order* with the ORDQ field set to indicate the reason for rejection. The mobile station shall enter the *Update Overhead Information Substate* of the *System Access State* with an order/message response indication within T_{33m} seconds, unless otherwise specified for a particular message.

The following directed messages and orders can be received. If any field value of the message is outside its permissible range, the mobile station shall send a *Mobile Station Reject Order* with ORDQ equal to '00000100' (message field not in valid range) or '00000010' (message not accepted in this state), as appropriate.

1. *Abbreviated Alert Order:* The mobile station shall compare each of its active MINs with the MIN specified in the *Abbreviated Alert Order*. If the received MIN1 and

MIN2 match the MIN1 and MIN2 for an active MIN at the mobile station, then the mobile station may alert the user.

2. *Added MIN Rejected Order;* No requirements.

3. *Authentication Challenge Message:* The mobile station shall process the message and shall respond with an *Authentication Challenge Response Message* as specified in 6.3.12.1.5. The mobile station shall enter the *Update Overhead Information Substate* of the *System Access State* with an order/message response indication within T_{32m} seconds

4. *Base Station Acknowledgement Order:* No requirements.

5. *Base Station Challenge Confirmation Order:* The mobile station shall process the message and shall respond with an *SSD Update Confirmation Order* or *SSD Update Rejection Order* as specified in 6.3.12.1.9. The mobile station shall enter the *Update Overhead Information Substate* of the *System Access State* with an order/message response indication within T_{32m} seconds.

6. *Channel Assignment Message:* If the message specifies a Paging Channel assignment (ASSIGN_MODE equal to '001'), the mobile station shall store the specified CDMA Channel (CDMACH$_s$=CDMA_FREQ$_r$) and Paging Channel (PAGECH$_s$=CODE_CHAN$_r$). The mobile station shall set CONFIG_MSG_SEQ$_s$, SYS_PAR_MSG_SEQ$_s$, NGHBR_LST_MSG_SEQ$_s$, CHAN_LST_MSG_SEQ$_s$, and ACC_MSG_SEQ$_s$ to NULL and begin monitoring the new Paging Channel.

If the ASSIGN_MODE field is any value other than '001', the mobile station shall respond with a *Mobile Station Reject Order* with ORDQ equal to '00000010' (message not accepted in this state).

7. *Data Burst Message:* No requirements.

8. *Local Control Order:* No requirements.

9. *Lock Order:* The mobile station shall record the reason for the *Lock Order* in the mobile station's semi-permanent memory (LCKRSN$_{s-p}$ = ORDQ$_r$). After a mobile station receives this order, it shall not enter the *System Access State* (see 6.6.3) until it has received an *Unlock Order*. This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*. The mobile station should notify the user of the locked condition. The mobile station may exit the *Mobile Station Idle State* and enter the *System Determination Substate* of the *Mobile Station Initialization State*.

10. *Lock Until Power-Cycled Order:* The mobile station shall record the reason for the *Lock Order* in the mobile station's semi-permanent memory (LCKRSN_P$_{s-p}$ = ORDQ$_r$). After a mobile station receives this order, it shall not enter the *System Access State* (see 6.6.3) until it has received an *Unlock Order* or until after power-cycling the mobile station (i.e., after the next mobile station power-up). This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*. The mobile station should notify the user of the locked condition. The mobile station may exit the *Mobile Station Idle State* and enter the *System Determination Substate* of the *Mobile Station Initialization State*.

11. *Message Waiting Order:* No requirements.

12. *Registration Accepted Order:* No requirements.

13. *Registration Rejected Order:* No requirements.

14. *Registration Request Order:* The mobile station shall process the message and perform registration procedures as specified in 6.6.5.6.2.3.

15. *SSD Update Message:* The mobile station shall process the message and shall respond with a *Base Station Challenge Order* as specified in 6.3.12.1.9. The mobile station shall enter the *Update Overhead Information Substate* of the *System Access State* with an order/message response indication within T_{32m} seconds.

16. *Unlock Order:* After receiving this order, the mobile station is no longer locked. The mobile station should notify the user that the locked condition has been removed. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*.

If any message or order is received that is not listed above, the mobile station shall respond with a *Mobile Station Reject Order* with ORDQ equal to '00000010' (message not accepted in this state).

6.6.2.5 Mobile Station Origination Operation

The *Mobile Station Origination Operation* is performed when the mobile station is directed by the user to initiate a call.

The mobile station shall enter the *Update Overhead Information Substate* of the *System Access State* (see 6.6.3) with a call origination indication within T_{33m} seconds.

6.6.2.6 Mobile Station Message Transmission Operation

Support of this operation is optional. If the mobile station supports the *Mobile Station Message Transmission Operation*, the operation is performed when the user directs the mobile station to transmit a message.

If the mobile station supports this operation, the mobile station shall enter the *Update Overhead Information Substate* of the *System Access State* (see 6.6.3) with a message transmission indication within T_{33m} seconds.

6.6.2.7 Mobile Station Power-Down Operation

The *Mobile Station Power-Down Operation* is performed when the user directs the mobile station to power down.

The mobile station shall update stored parameters and perform other registration procedures as specified in 6.6.5.6.2.4.

If no power-down registration is performed (see 6.6.5.6.2.4), the mobile station may power down.

1   6.6.3 System Access State

2   In this state, the mobile station sends messages to the base station on the Access
3   Channel(s) and receives messages from the base station on the Paging Channel.

4   As illustrated in Figure 6.6.3-1, the System Access State consists of the following substates:

5   • *Update Overhead Information Substate* - In this substate, the mobile station monitors
6   the Paging Channel until it has received a current set of configuration messages.

7   • *Mobile Station Origination Attempt Substate* - In this substate, the mobile station
8   sends an *Origination Message* to the base station.

9   • *Page Response Substate* - In this substate, the mobile station sends a *Page Response*
10   *Message* to the base station.

11   • *Mobile Station Order/Message Response Substate* - In this substate, the mobile
12   station sends a response to a message received from the base station.

13   • *Registration Access Substate* - In this substate, the mobile station sends a
14   *Registration Message* or *Registration Update Message* to the base station.

15   • *Mobile Station Message Transmission Substate* - In this substate, the mobile station
16   sends a *Data Burst Message* to the base station.

17

(Enter from *Mobile Station Idle State*)

Note: Transitions arising
from error conditions and
lock orders are not shown.

Update Overhead Information Substate (6.6.3.2)

Received message or order requiring an acknowledgement or response

Regis-tration access

User generated *Data Burst Message*

Received *Page Message* or *Slotted Page Message*

User initiated a call

Mobile Station Order/Message Response Substate (6.6.3.4)

Registration Access Substate (6.6.3.6)

Page Response Substate (6.6.3.3)

Mobile Station Message Transmission Substate (6.6.3.7)

Mobile Station Origination Attempt Substate (6.6.3.5)

(enter *Mobile Station Idle State*)

(Enter *Mobile Station Control on the Traffic Channel State* or go to analog)

18

19   **Figure 6.6.3-1. System Access State**

1 6.6.3.1 Access Procedures

2 6.6.3.1.1 Access Attempts

3 6.6.3.1.1.1 Overview

4 The mobile station transmits on the Access Channel using a random access protocol. Many
5 parameters of the random access protocol are supplied by the base station in the A*ccess*
6 *Parameters Message.* The mobile station transmits a single message repeatedly until it
7 receives an acknowledgement from the base station on the Paging Channel.   Each
8 transmission is called an access probe. The entire process of sending one message and
9 receiving (or failing to receive) an acknowledgement for that message is called an access
10 attempt (see Figures6.6.3.1.1.1-1 and 6.6.3.1.1.1-2).

11 Within an access attempt, access probes are grouped into access probe sequences. Each
12 access probe sequence consists of up to NUM_STEP + 1 access probes, all transmitted on
13 the same Access Channel. The Access Channel used for each access probe sequence is
14 chosen pseudorandomly from among all the Access Channels associated with the current
15 Paging Channel. The first access probe of each access probe sequence is transmitted at a
16 specified power level relative to the nominal open loop power level. Each subsequent access
17 probe is transmitted at a power level a specified amount higher than the previous access
18 probe (see 6.1.2.3.1).

19 The timing of access probes and access probe sequences is expressed in terms of Access
20 Channel slots (see 6.7.1.1). Each slot is the length of one Access Channel transmission
21 (access probe) and each access probe occurs in a particular slot.

22 The timing of the start of each access probe sequence is determined pseudorandomly.
23 Different procedures are used for sending a response message (one that is a response to a
24 base station message) and for sending a request message (one that is sent autonomously by
25 the mobile station). For every access probe sequence except the first access probe sequence
26 of a request access attempt, a backoff delay RS of between 0 and BKOFF + 1 slots is
27 generated pseudorandomly. For a response access probe sequence, the first access probe
28 of the sequence begins after RS slots. For request access probe sequences only, an
29 additional delay is imposed by the use of a persistence test.[20] For each slot after the
30 backoff delay RS, the mobile station performs a pseudorandom test, with parameters that
31 depend on the reason for the access attempt and the access overload class ($ACCOLC_p$) of
32 the mobile station. If the test passes, the first access probe of the sequence begins in that
33 slot. If the test fails, the access probe sequence is deferred until at least the next slot.

34 Timing between access probes of an access probe sequence is also generated
35 pseudorandomly. After transmitting each access probe, the mobile station waits a specified
36 period TA = ACC_TMO $\times$ 80 ms to receive an acknowledgement from the base station. If an
37 acknowledgement is received, the access attempt ends. If no acknowledgement is received,

---

[20]A persistence test is not needed for response access attempts, because the base station controls the
arrival rate of response messages directly by controlling the rate at which it transmits messages
requiring responses.

1   the next access probe is transmitted after an additional backoff delay RT of between 0 and

2   PROBE_BKOFF + 1 slots.

3   The precise timing of the Access Channel transmissions in an access attempt is determined

4   by a procedure called PN randomization. For each access attempt, the mobile station

5   computes a delay RN of from 0 to $2^{PROBE\_PN\_RAN} - 1$ PN chips using a (non-random) hash

6   function that depends on its ESN. The mobile station delays its transmit timing by RN

7   PNchips. This transmit timing adjustment includes delay of the direct sequence spreading

8   long code and of the quadrature spreading I and Q pilot PN sequences, so it effectively

9   increases the apparent range from the mobile station to the base station.[21]

---

[21] This increases the probability that the base station will be able to separately demodulate transmissions from multiple mobile stations in the same Access Channel slot, especially when many mobile stations are at a similar range from the base station. Use of a non-random algorithm for PN randomization permits the base station to separate the PN randomization from the actual propagation delay from the mobile station, so it can accurately estimate the timing of Reverse Traffic Channel transmissions from the mobile station.
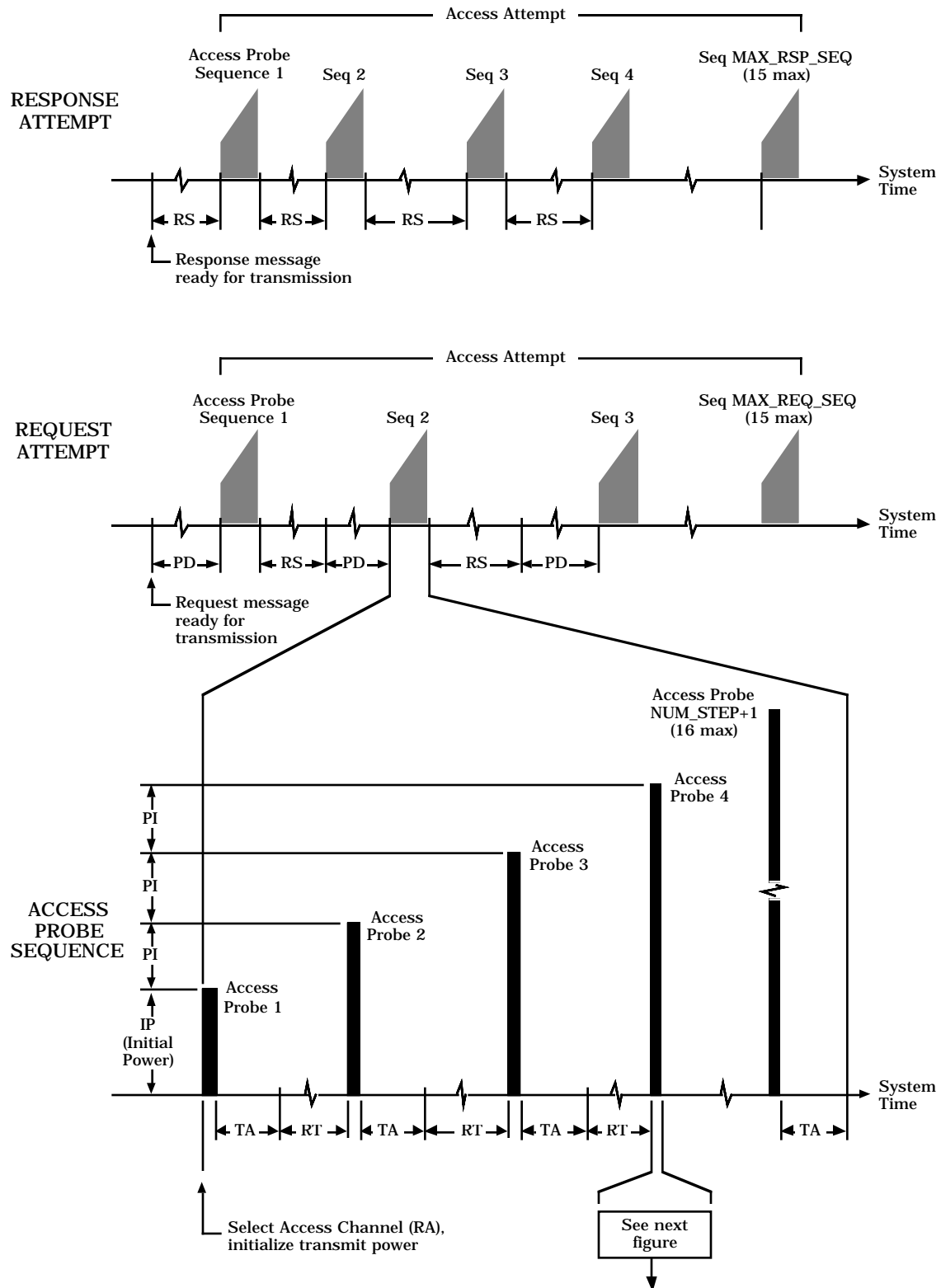
Figure 6.6.3.1.1.1-1A. Access Channel Request and Response Attempts
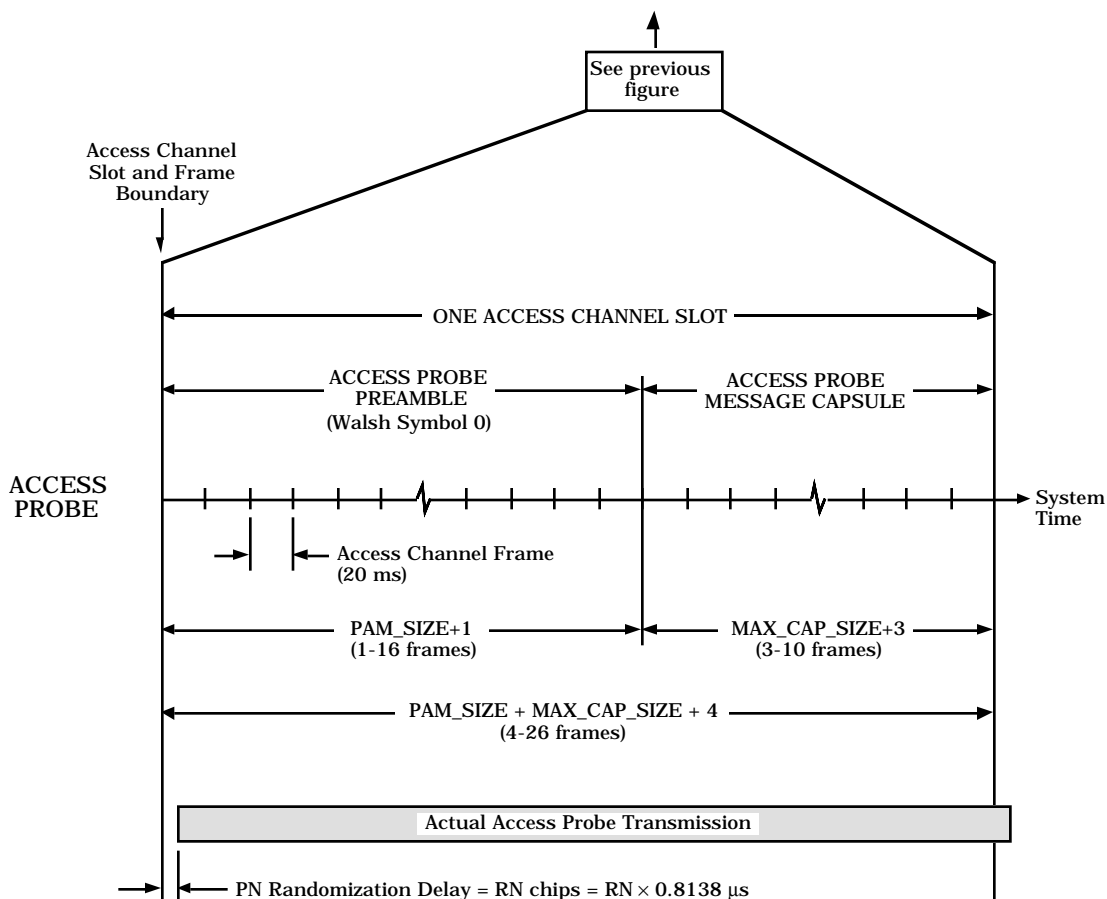
Calculated, Random, and Hashed Variables

Variable	Name	Generation	Range	Units
IP	Initial Open-Loop Power	IP = –73 –Mean Input Power (dBm) + (0.5 × NOM_PWR) + (0.5 × INIT_PWR)	See Table 6.1.2.1-1	dBm
PD	Persistence Delay	Delay continues slot-by-slot until persistence test (run every slot) passes.	—	slots
PI	Power Increment	PI = 0.5 × PWR_STEP	0 to 7.5	dB
RA	Access Channel Number	Random between 0 and ACC_CHAN; generated before every sequence.	0 to 31	—
RN	PN Randomization Delay	Hash using ESN between 0 and $2^{PROBE\_PN\_RAN} - 1$; generated once at beginning of attempt.	0 to 511	chips
RS	Sequence Backoff	Random between 0 and BKOFF+1; generated before every sequence (except the first request sequence).	0 to 16	slots
RT	Probe Backoff	Random between 0 and PROBE_BKOFF+1; generated before subsequent probes.	0 to 16	slots
TA	Ack Response Timeout	TA = 80 × ACC_TMO	160 to 5040	ms

Figure 6.6.3.1.1.1-1B. Access Channel Request and Response Attempts

1

2
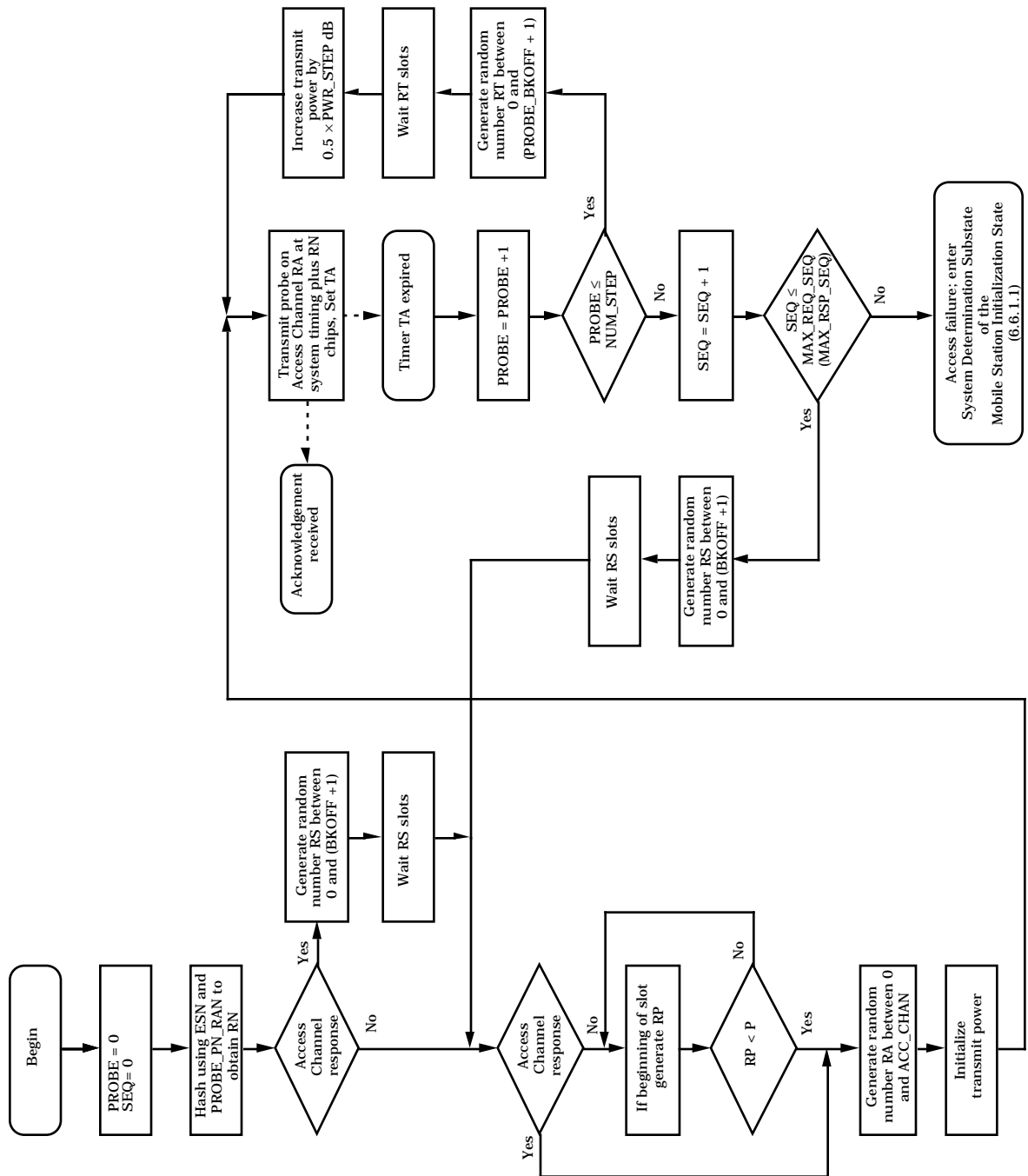
Figure 6.6.3.1.1.1-2. Access Procedure

3

4

6.6.3.1.1.2 Requirements

Each time the mobile station performs an access attempt, it shall compute a number, RN, from 0 to $2^{\text{PROBE\_PN\_RAN}} - 1$, using the hashing technique described in 6.6.7.1. For the duration of this access attempt, the mobile station shall delay its transmit timing, including long code direct sequence spreading (see 6.1.3.2.7) and I and Q pilot PN sequence quadrature spreading (see 6.1.3.2.8), by RN PN chips.

When the mobile station performs an access attempt, it shall transmit one or more access probe sequences. If the access attempt is an Access Channel request, the mobile station shall transmit no more than MAX_REQ_SEQ_S access probe sequences; if the access attempt is an Access Channel response, the mobile station shall transmit no more than MAX_RSP_SEQ_S access probe sequences.

Before transmitting each access probe sequence, the mobile station shall generate a random number, RA, from 0 to ACC_CHAN_S using the procedure described in 6.6.7.2. The mobile station shall use this random number, RA, as the Access Channel number for all access probes in that access probe sequence (see 6.1.3.1.8).

Before transmitting each access probe sequence of a response attempt and before each access probe sequence other than the first access probe sequence of a request attempt, the mobile station shall generate a random number, RS, from 0 to $(\text{BKOFF}_S + 1)$, using the procedure described in 6.6.7.2. The mobile station shall delay the transmission of the access probe sequence for RS slots.

If the access attempt is an Access Channel request, then before transmitting the first access probe in each access probe sequence, and after the delay of RS if applicable, the mobile station shall perform a persistence test for each Access Channel slot until the test passes. When the test passes, the mobile station shall transmit the first access probe in the corresponding slot. To perform the persistence test, the mobile station shall generate a random number RP, $0 \le \text{RP} \le 1$, using the technique described in 6.6.7.2. The persistence test is said to pass when RP is less than the current value of P for the type of this access attempt. If P equals 0, the access attempt fails, and the mobile station shall end the access attempt, update its registration variables as specified in 6.6.5.6.3.2, and enter the *System Determination Substate* of the *Mobile Station Initialization State*.

1   If the Access Channel request is a registration, P shall be computed[22] by

2    $$P = \begin{cases} 2^{-PSIST(n)/4} \times 2^{-REG\_PSIST} & \text{if } PSIST(n) \neq 63 \\ 0 & \text{otherwise} \end{cases} \quad n = 0, 1, ..., 9$$

3

4    $$P = \begin{cases} 2^{-PSIST(n)} \times 2^{-REG\_PSIST} & \text{if } PSIST(n) \neq 7 \\ 0 & \text{otherwise} \end{cases} \quad n = 10, 11, ..., 15$$

5   where n is the highest overload class ($ACCOLC_p$) assigned to a MIN being actively supported
6   by the mobile station.

7   If the Access Channel request is a message transmission, P shall be computed by

8    $$P = \begin{cases} 2^{-PSIST(n)/4} \times 2^{-MSG\_PSIST} & \text{if } PSIST(n) \neq 63 \\ 0 & \text{otherwise} \end{cases} \quad n = 0, 1, ..., 9$$

9

10   $$P = \begin{cases} 2^{-PSIST(n)} \times 2^{-MSG\_PSIST} & \text{if } PSIST(n) \neq 7 \\ 0 & \text{otherwise} \end{cases} \quad n = 10, 11, ..., 15$$

11   where n is the overload class assigned to the MIN sending the message.

12   If the Access Channel request is other than a registration or a message transmission, P
13   shall be computed by

14   $$P = \begin{cases} 2^{-PSIST(n)/4} & \text{if } PSIST(n) \neq 63 \\ 0 & \text{otherwise} \end{cases} \quad n = 0, 1, ..., 9$$

15

16   $$P = \begin{cases} 2^{-PSIST(n)} & \text{if } PSIST(n) \neq 7 \\ 0 & \text{otherwise} \end{cases} \quad n = 10, 11, ..., 15$$

17   where n is the overload class assigned to a MIN associated with the request.

18   The mobile station shall transmit the first probe in each access probe sequence at the
19   power level specified in 6.1.2.3.1. The mobile station shall transmit each subsequent probe
20   in the access probe sequence at a power level $PWR\_STEP_s \times 0.5$dB greater than that of the
21   previous probe. Between access probes, the mobile station shall disable its transmitter.

---

[22]The P calculations for PSIST(n), n=0, 1, ... 9 imply taking the number 2 exponentiated by a floating point number. The entire process can be implemented using integer arithmetic. Since the random variable z_n in 6.6.7.2 ranges from 0 through 2^{31}-2, the persistence calculations can be implemented with sufficient accuracy in the range from 0 to 2^{31}. The scaled probability value, P, can be written as: $2^{31} \times 2^{-\lfloor PSIST(n)/4 \rfloor} \times 2^{-[PSIST(n)-4 \times \lfloor PSIST(n)/4 \rfloor]/4}$. The second factor can be implemented by shifting; the third factor consists of only four values that can be implemented by a table lookup.

1   After transmitting each probe, the mobile station shall wait $TA = ACC\_TMO_S \times 80$ ms from
2   the end of the Access Channel slot. If no acknowledgement is received within TA seconds,
3   the mobile station shall perform the following:

4   • If NUM_STEP_S or fewer access probes have been transmitted in this access probe
5   sequence, the mobile station shall generate a random number, RT, from 0 to
6   PROBE_BKOFF + 1, using the procedure described in 6.6.7.2. The mobile station
7   shall delay RT additional Access Channel slots, and then transmit the next access
8   probe.

9   • Otherwise, if fewer than MAX_REQ_SEQ (for a request access) or MAX_RSP_SEQ (for
10   a response access) access probe sequences have been transmitted in this access
11   attempt, the mobile station shall begin the randomization procedures for another
12   access probe sequence.

13   • Otherwise, the mobile station shall update its registration variables as specified in
14   6.6.5.6.3.2 and enter the *System Determination Substate* of the *Mobile Station*
15   *Initialization State*.

16   6.6.3.1.2 Acknowledgement Procedures

17   The acknowledgement procedures facilitate the reliable exchange of messages between the
18   base station and the mobile station. The mobile station uses the fields ACK_SEQ
19   (acknowledgement sequence number), MSG_SEQ (message sequence number), ACK_REQ
20   (acknowledgement required), and VALID_ACK (valid acknowledgement) to support this
21   mechanism. These fields are referred to as layer 2 fields, and the acknowledgement
22   procedures are referred to as layer 2 procedures. All other message fields and the
23   processing thereof are referred to as pertaining to layer 3. (See Appendix C for further
24   discussion of layering.)

25   The mobile station shall set the ACK_SEQ and VALID_ACK fields of all messages sent on
26   the Access Channel as specified in 6.6.2.1.2.

27   The mobile station shall generate a single set of MSG_SEQ numbers for messages sent on
28   the Access Channel. The mobile station shall set the MSG_SEQ field of the first message
29   sent on the Access Channel after powering on to 0. The mobile station shall increment
30   MSG_SEQ, modulo 4, for each new access attempt, even if the contents of the new message
31   are identical to those of the previous message.

32   The mobile station shall monitor the Paging Channel while in the *System Access State.*
33   When the mobile station receives a message with the VALID_ACK field set to '1' and the
34   ACK_SEQ field set to the MSG_SEQ number of the message currently being sent, the
35   mobile station shall consider the current message to have been acknowledged and shall end
36   the access attempt.

37   The mobile station shall not begin a new access attempt until the previous access attempt
38   has ended.

1 6.6.3.1.3 Registration

2 When an access attempt ends by the receipt of an acknowledgement from the base station,
3 the mobile station shall update its registration variables as specified in 6.6.5.6.3.1.

4 6.6.3.1.4 Handoffs

5 While in the *System Access State*, the mobile station should continue its pilot search
6 (see6.6.2.1.4.1), but shall not perform idle handoffs.

7 6.6.3.2 Update Overhead Information Substate

8 In this substate, the mobile station monitors the Paging Channel until it has received the
9 current configuration messages. The mobile station compares sequence numbers to
10 determine whether all the configuration messages are up to date. To make sure it has the
11 latest access parameters, the mobile station receives at least one message containing the
12 ACC_MSG_SEQ field (except in case of a page response, since the initiating *Page Message*
13 or *Slotted Page Message* contains ACC_MSG_SEQ), and waits, if necessary, for an *Access*
14 *Parameters Message.*

15 Upon entering the *Update Overhead Information Substate*, the mobile station shall set the
16 *System Access State* timer to a value of T_{41m} seconds. The mobile station shall set PAGED
17 to NO. If the *Update Overhead Information Substate* was entered with a page response
18 indication, the mobile station shall set CURR_ACC_MSG_SEQ to ACC_MSG_SEQ$_s$;
19 otherwise, it shall set CURR_ACC_MSG_SEQ to NULL.

20 If the state timer expires while in this substate, the mobile station shall enter the *System*
21 *Determination Substate* of the *Mobile Station Initialization State.*

22 While in the *Update Overhead Information Substate*, the mobile station shall monitor the
23 Paging Channel. If the mobile station declares a loss of the Paging Channel (see 6.4.3), it
24 shall enter the *Mobile Station Idle State.* If the mobile station receives any of the following
25 messages or orders that contain the mobile station's ESN, the mobile station shall process
26 the message as follows:

27 1. *Local Control Order:* No requirements.

28 2. *Lock Order:* The mobile station shall record the reason for the *Lock Order* in the
29 mobile station's semi-permanent memory (LCKRSN$_{s-p}$ = ORDQ$_r$). The mobile
30 station should notify the user of the locked condition. The mobile station shall
31 enter the *System Determination Substate* of the *Mobile Station Initialization State*,
32 and shall not enter the *System Access State* again until it has received an *Unlock*
33 *Order.* This requirement shall take precedence over any other mobile station
34 requirement specifying entry to the *System Access State*.

35 3. *Lock Until Power-Cycled Order:* The mobile station shall record the reason for the
36 *Lock Until Power-Cycled Order* in the mobile station's semi-permanent memory
37 (LCKRSN_P$_{s-p}$ = ORDQ$_r$). The mobile station should notify the user of the locked
38 condition. The mobile station shall enter the *System Determination Substate* of the
39 *Mobile Station Initialization State*, and shall not enter the *System Access State* again
40 until after the next mobile station power-up or until it has received an *Unlock*

Order. This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*.

If the mobile station receives any of the following messages, it shall process the message as follows:

1. *System Parameters Message:* The mobile station shall store the parameters from the message (see 6.6.2.2.1.1).

2. *Access Parameters Message:* The mobile station shall store the parameters from the message (see 6.6.2.2.2).

3. *Neighbor List Message:* The mobile station shall store the parameters from the message (see 6.6.2.2.3).

4. *CDMA Channel List Message:* The mobile station shall store the parameters from the message (see 6.6.2.2.4).

5. *Slotted Page Message:* The mobile station shall set CURR_ACC_MSG_SEQ to ACC_MSG_SEQ$_r$. If this substate was not entered with an origination or page response indication, the mobile station shall compare each of its active MINs with the MIN in each record of the message. If a match is declared (see 6.6.2.3), the mobile station shall set PAGED to YES.

6. *Page Message:* The mobile station shall set CURR_ACC_MSG_SEQ to ACC_MSG_SEQ$_r$. If this substate was not entered with an origination or page response indication, the mobile station shall compare each of its active MINs with the MIN in each record of the message. If a match is declared (see 6.6.2.3), the mobile station shall set PAGED to YES.

7. *Any other message or order:* The mobile station may ignore any other order or message.

When the stored configuration parameters are current (see 6.6.2.2) and CURR_ACC_MSG_SEQ and ACC_MSG_SEQ$_s$ are equal and are not NULL, the mobile station shall disable the *System Access State* timer and do one of the following:

• If PAGED is equal to YES or if this substate was entered with a page response indication, the mobile station shall enter the *Page Response Substate*.

• If this substate was entered with an origination indication, the mobile station shall enter the *Mobile Station Origination Attempt Substate*.

• If this substate was entered with an order/message response indication, the mobile station shall enter the *Mobile Station Order/Message Response Substate*.

• If this substate was entered with a registration indication, the mobile station shall enter the *Registration Access Substate*.

• If this substate was entered with a message transmission indication, the mobile station shall enter the *Mobile Station Message Transmission Substate*.

6.6.3.3 Page Response Substate

In this substate, the mobile station sends a *Page Response Message* in response to a *Page Message* or *Slotted Page Message* from the base station. If the base station responds with an authentication request, the mobile station responds in this substate.

Upon entering the *Page Response Substate*, the mobile station shall send a *Page Response Message*, using the access procedures specified in 6.6.3.1.1.2.

While in this substate, the mobile station shall monitor the Paging Channel. If the mobile station declares a loss of the Paging Channel (see 6.4.3), it shall disable its transmitter and enter the *Mobile Station Idle State.* If the mobile station receives an acknowledgement to any message sent by the mobile station in this substate, the mobile station shall end the access attempt and update the registration variables as specified in 6.6.3.1.3. If the acknowledgement was not included in a *Channel Assignment Message*, *Authentication Challenge Message*, *Base Station Challenge Confirmation Order*, or *SSD Update Message*, the mobile station shall set the *System Access State* timer to T_{42m}.

If the *System Access State* timer expires while in this substate, the mobile station shall enter the *Mobile Station Idle State.*

If the mobile station receives any of the following messages and ESN_r matches the mobile station's ESN, then the mobile station shall process the message as described.

1. *Authentication Challenge Message:* If the mobile station receives this message while an access attempt is in progress, the mobile station shall ignore the message. If the mobile station receives this message after, or included in the same message as, the acknowledgement to any message sent by the mobile station in this substate, the mobile station shall disable the *System Access State* timer and respond to the message as specified in 6.3.12.1.5, using the access procedures specified in 6.6.3.1.1.2.

2. *Base Station Challenge Confirmation Order:* If the mobile station receives this message while an access attempt is in progress, the mobile station shall ignore the message. If the mobile station receives this message after, or included in the same message as, the acknowledgement to any message sent by the mobile station in this substate, the mobile station shall disable the *System Access State* timer and respond to the message as specified in 6.3.12.1.9, using the access procedures specified in 6.6.3.1.1.2.

3. *Channel Assignment Message:* The mobile station shall terminate any access attempt in progress. It shall then process the message as follows:

    If ASSIGN_MODE$_r$ equals '000', the mobile station shall store the Forward Traffic Channel code channel (CODE_CHAN$_s$ = CODE_CHAN$_r$), the frame offset (FRAME_OFFSET$_s$ = FRAME_OFFSET$_r$), the message encryption mode indicator (ENCRYPT_MODE$_s$ = ENCRYPT_MODE$_r$), and, if FREQ_INCL$_r$ equals '1', the frequency assignment (CDMACH$_s$ = CDMA_FREQ$_r$), and then enter the *Traffic Channel Initialization Substate* of the *Mobile Station Control on the Traffic Channel State.*

If ASSIGN_MODE$_r$ equals '001', the mobile station shall store the assigned Paging Channel (PAGECH$_s$ = CODE_CHAN$_r$). If FREQ_INCL$_r$ equals '1', the mobile station shall store the frequency assignment (CDMACH$_s$ = CDMA_FREQ$_r$). The mobile station shall then enter the *Mobile Station Idle State*.

If ASSIGN_MODE$_r$ equals '010' and RESPOND$_r$ equals '1', the mobile station shall enter the Initialization Task with a page response indication (see 2.6.1).

If ASSIGN_MODE$_r$ equals '010' and RESPOND$_r$ equals '0', the mobile station shall enter the Initialization Task (see 2.6.1).

If ASSIGN_MODE$_r$ equals '011', the mobile station shall store the system identification (SID$_s$ = SID$_r$), voice mobile station attenuation code (VMAC$_s$ = VMAC$_r$), voice channel number (ANALOG_CHAN$_s$ = ANALOG_CHAN$_r$), SAT color code (SCC$_s$ = SCC$_r$), and message encryption mode indicator (MEM$_s$ = MEM$_r$) and enter the Confirm Initial Voice Channel Task (see 2.6.4.2) with a page response indication.

4. *Local Control Order:* No requirements.

5. *Lock Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Order* in the mobile station's semi-permanent memory (LCKRSN$_{s-p}$=ORDQ$_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until it has received an *Unlock Order*. This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*.

6. *Lock Until Power-Cycled Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Until Power-Cycled Order* in the mobile station's semi-permanent memory (LCKRSN_P$_{s-p}$ = ORDQ$_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until after the next mobile station power-up or until it has received an *Unlock Order.* This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*.

7. *Release Order:* The mobile station shall enter the *Mobile Station Idle State* or the *System Determination Substate* of the *Mobile Station Initialization State*.

8. *SSD Update Message:* If the mobile station receives this message while an access attempt is in progress, the mobile station shall ignore the message. If the mobile station receives this message after, or included in the same message as, the acknowledgement to any message sent by the mobile station in this substate, the mobile station shall disable the *System Access State* timer and respond to the message as specified in 6.3.12.1.9, using the access procedures specified in 6.6.3.1.1.2.

9. *Any other message or order:* The mobile station may ignore any other order or message.

6.6.3.4 Mobile Station Order/Message Response Substate

In this substate, the mobile station sends a message that is a response to a message received from the base station. If the base station responds with an authentication request, the mobile station responds in this substate.

Upon entering the *Mobile Station Order/Message Response Substate,* the mobile station shall send the response message using the access procedures specified in 6.6.3.1.1.2.

While in this substate, the mobile station shall monitor the Paging Channel. If the mobile station declares a loss of the Paging Channel (see 6.4.3), it shall enter the *Mobile Station Idle State.* If the mobile station receives an acknowledgement to any message sent by the mobile station in this substate, it shall end the access attempt and update the registration variables as specified in 6.6.3.1.3. If the acknowledgement was not included in an *Authentication Challenge Message*, *Base Station Challenge Confirmation Order*, or *SSD Update Message*, the mobile station shall enter the *Mobile Station Idle State*.

If the mobile station receives any of the following messages and ESN_r matches the mobile station's ESN, then the mobile station shall process the message as follows:

1. *Authentication Challenge Message:* If the mobile station receives this message while an access attempt is in progress, the mobile station shall ignore the message. If the mobile station receives this message included in the acknowledgement to any message sent by the mobile station in this substate, the mobile station shall respond to the message as specified in 6.3.12.1.5, using the access procedures specified in 6.6.3.1.1.2.

2 *Base Station Challenge Confirmation Order:* If the mobile station receives this message while an access attempt is in progress, the mobile station shall ignore the message. If the mobile station receives this message included in the acknowledgement to any message sent by the mobile station in this substate, the mobile station shall respond to the message as specified in 6.3.12.1.9, using the access procedures specified in 6.6.3.1.1.2.

3. *Local Control Order:* No requirements.

4. *Lock Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Order* in the mobile station's semi-permanent memory ($LCKRSN_{s-p}=ORDQ_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until it has received an *Unlock Order.* This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*.

5. *Lock Until Power-Cycled Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Until Power-Cycled Order* in the mobile station's semi-permanent memory ($LCKRSN\_P_{s-p} = ORDQ_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until after the next mobile station power-up or until

1   it has received an *Unlock Order.* This requirement shall take precedence over any
2   other mobile station requirement specifying entry to the *System Access State.*

3   6.   *SSD Update Message:* If the mobile station receives this message while an access
4   attempt is in progress, the mobile station shall ignore the message. If the mobile
5   station receives this message included in the acknowledgement to any message
6   sent by the mobile station in this substate, the mobile station shall respond to the
7   message as specified in 6.3.12.1.9, using the access procedures specified in
8   6.6.3.1.1.2.

9   7.   *Any other message or order:* The mobile station may ignore any other message or
10   order.

11   6.6.3.5 Mobile Station Origination Attempt Substate

12   In this substate, the mobile station sends an *Origination Message.* If the base station
13   responds with an authentication request, the mobile station responds in this substate.

14   Upon entering the *Mobile Station Origination Attempt Substate*, the mobile station shall send
15   the *Origination Message* using the access procedures specified in 6.6.3.1.1.2. The mobile
16   station shall include in the *Origination Message* as many of the dialed digits as possible
17   without exceeding the message capsule size.

18   While in this substate, the mobile station shall monitor the Paging Channel. If the mobile
19   station declares a loss of the Paging Channel (see 6.4.3), it shall enter the *Mobile Station*
20   *Idle State.* If the mobile station receives an acknowledgement to any message sent by the
21   mobile station in this substate, it shall end the access attempt and update the registration
22   variables as specified in 6.6.3.1.3. If the acknowledgement was not included in a *Channel*
23   *Assignment Message*, *Authentication Challenge Message*, *Base Station Challenge*
24   *Confirmation Order*, or *SSD Update Message*, the mobile station shall set the *System Access*
25   *State* timer to T_{42m}.

26   If the *System Access State* timer expires while in this substate, the mobile station shall
27   enter the *Mobile Station Idle State.*

28   If the mobile station is directed by the user to disconnect the call, the mobile station shall
29   abort any access attempt in progress and enter the *System Determination Substate* of the
30   *Mobile Station Initialization State.*

31   If the mobile station receives any of the following messages and ESN_r matches the mobile
32   station's ESN, then the mobile station shall process the message as follows:

33   1.   *Authentication Challenge Message:* If the mobile station receives this message while
34   an access attempt is in progress, the mobile station shall ignore the message. If
35   the mobile station receives this message after, or included in the same message as,
36   the acknowledgement to any message sent by the mobile station in this substate,
37   the mobile station shall disable the *System Access State* timer and respond to the
38   message as specified in 6.3.12.1.5, using the access procedures specified in
39   6.6.3.1.1.2.

40   2.   *Base Station Challenge Confirmation Order:* If the mobile station receives this
41   message while an access attempt is in progress, the mobile station shall ignore the

message. If the mobile station receives this message after, or included in the same message as, the acknowledgement to any message sent by the mobile station in this substate, the mobile station shall disable the *System Access State* timer and respond to the message as specified in 6.3.12.1.9, using the access procedures specified in 6.6.3.1.1.2.

3. *Channel Assignment Message:* The mobile station shall terminate any access attempt in progress. It shall then process the message as follows:

If ASSIGN_MODE$_r$ equals '000', the mobile station shall store the Forward Traffic Channel code channel (CODE_CHAN$_s$ = CODE_CHAN$_r$), the frame offset (FRAME_OFFSET$_s$ = FRAME_OFFSET$_r$), the message encryption mode indicator (ENCRYPT_MODE$_s$ = ENCRYPT_MODE$_r$), and, if FREQ_INCL$_r$ equals '1', the frequency assignment (CDMACH$_s$ = CDMA_FREQ$_r$), and then enter the *Traffic Channel Initialization Substate* of the *Mobile Station Control on the Traffic Channel State*.

If ASSIGN_MODE$_r$ equals '001', the mobile station shall store the assigned Paging Channel (PAGECH$_s$ = CODE_CHAN$_r$). If FREQ_INCL$_r$ equals '1', the mobile station shall store the frequency assignment (CDMACH$_s$ = CDMA_FREQ$_r$). The mobile station shall then enter the *Mobile Station Idle State*.

If ASSIGN_MODE$_r$ equals '010' and RESPOND$_r$ equals '1', the mobile station shall enter the Initialization Task with a page response indication (see 2.6.1).

If ASSIGN_MODE$_r$ equals '010' and RESPOND$_r$ equals '0', the mobile station shall enter the Initialization Task (see 2.6.1).

If ASSIGN_MODE$_r$ equals '011', the mobile station shall store the system identification (SID$_s$ = SID$_r$), voice mobile station attenuation code (VMAC$_s$ = VMAC$_r$), voice channel number (ANALOG_CHAN$_s$ = ANALOG_CHAN$_r$), SAT color code (SCC$_s$ = SCC$_r$), and message encryption mode indicator (MEM$_s$ = MEM$_r$) and enter the Confirm Initial Voice Channel Task (see 2.6.4.2) with a page response indication.

4. *Intercept Order:* The mobile station shall terminate any access attempt in progress and enter the *Mobile Station Idle State*.

5. *Local Control Order:* No requirements.

6. *Lock Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Order* in the mobile station's semi-permanent memory (LCKRSN$_{s-p}$=ORDQ$_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until it has received an *Unlock Order*. This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*.

7. *Lock Until Power-Cycled Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Until Power-Cycled Order* in the mobile station's semi-permanent memory (LCKRSN_P$_{s-p}$ = ORDQ$_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System*

Determination Substate of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until after the next mobile station power-up or until it has received an *Unlock Order.* This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State.*

8. *Release Order:* The mobile station shall enter the *Mobile Station Idle State* or the *System Determination Substate* of the *Mobile Station Initialization State.*

9. *Reorder Order:* The mobile station shall terminate any access attempt in progress and enter the *Mobile Station Idle State.*

10. *SSD Update Message:* If the mobile station receives this message while an access attempt is in progress, the mobile station shall ignore the message. If the mobile station receives this message after, or included in the same message as, the acknowledgement to any message sent by the mobile station in this substate, the mobile station shall disable the *System Access State* timer and respond to the message as specified in 6.3.12.1.9, using the access procedures specified in 6.6.3.1.1.2.

11. *Any other message or order:* The mobile station may ignore any other message or order.

6.6.3.6 Registration Access Substate

In this substate, the mobile station sends an *Initial Registration Message,* a sequence of one or more *Registration Update Messages*, or both. If the base station responds with an authentication request, the mobile station responds in this substate.

Upon entering the *Registration Access Substate*, the mobile station shall send the first registration message, using the access procedures specified in 6.6.3.1.1.2.

While in this substate, the mobile station shall monitor the Paging Channel. If the mobile station declares a loss of the Paging Channel (see 6.4.3), it shall enter the *Mobile Station Idle State.* If the mobile station receives an acknowledgement to any message sent by the mobile station in this substate, it shall end the access attempt and update the registration variables as specified in 6.6.3.1.3. If the acknowledgement was not included in an *Authentication Challenge Message*, *Base Station Challenge Confirmation Order*, *SSD Update Message*, or *Release Order*, or if the registration access was initiated due to a user direction to power down, the mobile station shall do one of the following:

- If there are further registration messages to be sent, the mobile station shall send the next registration message using the access procedures specified in 6.6.3.1.1.2.

- Otherwise, if the registration access was initiated due to a user direction to power down, the mobile station shall update registration variables as specified in 6.6.5.6.3.3 and may power down.

- Otherwise, the mobile station shall enter the *Mobile Station Idle State.*

If the mobile station is directed by the user to originate a call, the mobile station may abort any access attempt in progress and enter the *Mobile Station Origination Attempt Substate.*

If the mobile station receives a *Page Message* or a *Slotted Page Message*, the mobile station may compare each of its active MINs with the MIN in each record of the message. If a match is declared (see 6.6.2.3), the mobile station shall abort any access attempt in progress and enter the *Page Response Substate*.

If the mobile station receives any of the following messages and ESN_r matches the mobile station's ESN, then the mobile station shall process the message as described.

1. *Added MIN Rejected Order:* No requirements.

2. *Authentication Challenge Message:* If the mobile station receives this message while an access attempt is in progress, or if the registration access was initiated due to a user direction to power down, the mobile station shall ignore the message. If the mobile station receives this message after, or included in, the acknowledgement to any message sent by the mobile station in this substate, the mobile station shall respond to the message as specified in 6.3.12.1.5, using the access procedures specified in 6.6.3.1.1.2.

3. *Base Station Challenge Confirmation Order:* If the mobile station receives this message while an access attempt is in progress, or if the registration access was initiated due to a user direction to power down, the mobile station shall ignore the message. If the mobile station receives this message after, or included in, the acknowledgement to its *Page Response Message*, the mobile station shall respond to the message as specified in 6.3.12.1.9, using the access procedures specified in 6.6.3.1.1.2.

4. *Local Control Order:* No requirements.

5   *Lock Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Order* in the mobile station's semi-permanent memory ($LCKRSN_{s-p}=ORDQ_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until it has received an *Unlock Order*. This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*.

6. *Lock Until Power-Cycled Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Until Power-Cycled Order* in the mobile station's semi-permanent memory ($LCKRSN\_P_{s-p} = ORDQ_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until after the next mobile station power-up or until it has received an *Unlock Order.* This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*.

7. *Registration Accepted Order:* No requirements.

8. *Registration Rejected Order:* No requirements.

9. *Release Order:* The mobile station shall enter the *Mobile Station Idle State* or the *System Determination Substate* of the *Mobile Station Initialization State*.

10. *SSD Update Message:* If the mobile station receives this message while an access attempt is in progress, or if the registration access was initiated due to a user direction to power down, the mobile station shall ignore the message. If the mobile station receives this message after, or included in, the acknowledgement to its *Page Response Message*, the mobile station shall respond to the message as specified in 6.3.12.1.9, using the access procedures specified in 6.6.3.1.1.2.

11. *Any other message or order:* The mobile station may ignore any other message or order.

6.6.3.7 Mobile Station Message Transmission Substate

In this substate, the mobile station sends a *Data Burst Message*. If the base station responds with an authentication request, the mobile station responds in this substate.

Support of this substate is optional.

Upon entering the *Mobile Station Message Transmission Substate*, the mobile station shall transmit the *Data Burst Message* using the access procedures specified in 6.6.3.1.1.2.

While in this substate, the mobile station shall monitor the Paging Channel. If the mobile station declares a loss of the Paging Channel (see 6.4.3), it shall enter the *Mobile Station Idle State.* If the mobile station receives an acknowledgement to any message sent by the mobile station in this substate, it shall end the access attempt and update the registration variables as specified in 6.6.3.1.3.   If the acknowledgement was not included in an *Authentication Challenge Message*, *Base Station Challenge Confirmation Order*, or *SSD Update Message*, the mobile station shall enter the *Mobile Station Idle State*.

If the mobile station receives a *Page Message* or a *Slotted Page Message*, the mobile station may compare each of its active MINs with the MIN in each record of the message. If a match is declared (see 6.6.2.3), the mobile station shall abort any access attempt in progress and enter the *Page Response Substate*. The mobile station may store the message for later transmission.

If the mobile station receives any of the following messages and ESN_r matches the mobile station's ESN, then the mobile station shall process the message as described.

1. *Authentication Challenge Message:* If the mobile station receives this message while an access attempt is in progress, the mobile station shall ignore the message. If the mobile station receives this message included in the acknowledgement to any message sent by the mobile station in this substate, the mobile station shall respond to the message as specified in 6.3.12.1.5, using the access procedures specified in 6.6.3.1.1.2.

2. *Base Station Challenge Confirmation Order:* If the mobile station receives this message while an access attempt is in progress, the mobile station shall ignore the message. If the mobile station receives this message included in the acknowledgement to any message sent by the mobile station in this substate, the mobile station shall respond to the message as specified in 6.3.12.1.9, using the access procedures specified in 6.6.3.1.1.2.

3. *Local Control Order:* No requirements.

4. *Lock Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Order* in the mobile station's semi-permanent memory (LCKRSN$_{s-p}$=ORDQ$_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until it has received an *Unlock Order*. This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*.

5. *Lock Until Power-Cycled Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Until Power-Cycled Order* in the mobile station's semi-permanent memory (LCKRSN_P$_{s-p}$ = ORDQ$_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until after the next mobile station power-up or until it has received an *Unlock Order*. This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*.

6. *Data Burst Message:* No requirements.

7. *SSD Update Message:* If the mobile station receives this message while an access attempt is in progress, the mobile station shall ignore the message. If the mobile station receives this message included in the acknowledgement to any message sent by the mobile station in this substate, the mobile station shall respond to the message as specified in 6.3.12.1.9, using the access procedures specified in 6.6.3.1.1.2.

8. *Any other message or order:* The mobile station may ignore any other message or order.

6.6.4 Mobile Station Control on the Traffic Channel State

In this state, the mobile station communicates with the base station using the Forward and Reverse Traffic Channels.

As illustrated in Figure 6.6.4-1, the *Mobile Station Control on the Traffic Channel State* consists of the following substates:

- *Traffic Channel Initialization Substate* - In this substate, the mobile station verifies that it can receive the Forward Traffic Channel and begins transmitting on the Reverse Traffic Channel.

- *Waiting for Order Substate* - In this substate, the mobile station waits for an *Alert With Information Message.*

- *Waiting for Mobile Station Answer Substate* - In this substate, the mobile station waits for the user to answer the call.

- *Conversation Substate* - In this substate, the mobile station's primary service option application exchanges primary traffic packets with the base station.

- *Release Substate* - In this substate, the mobile station disconnects the call.

1

(Enter from *System Access State*)

Traffic Channel Initialization Substate (6.6.4.2)

Mobile station terminated call and mobile station receives a *Base Station Acknowledgement Order* on the Forward Traffic Channel

Mobile station originated call and mobile station receives a *Base Station Acknowledgement Order* on the Forward Traffic Channel

Waiting for Order Substate (6.6.4.3.1)

Receives *Release Order*

Receives a *Maintenance Order* or an *Alert With Information Message*

Receives *Release Order*

Waiting for Mobile Station Answer Substate (6.6.4.3.2)

Receives *Maintenance Order*

Mobile station user answers call

Conversation Substate (6.6.4.4)

Receives *Alert With Information Message*

Mobile station user initiates disconnect or mobile station receives *Release Order*

Release Substate (6.6.4.5)

Note: Transitions arising from error conditions and lock orders are not shown.

System Determination Substate of the Mobile Station Initialization State

2

3   **Figure 6.6.4-1. Mobile Station Control on the Traffic Channel State**

1   6.6.4.1 Special Functions and Actions

2   The mobile station performs the following special functions and actions in one or more of
3   the substates of the *Mobile Station Control on the Traffic Channel State*.

4   6.6.4.1.1 Forward Traffic Channel Power Control

5   To support Forward Traffic Channel power control, the mobile station reports frame error
6   rate statistics to the base station. If the base station enables periodic reporting, the mobile
7   station reports frame error rate statistics at specified intervals. If the base station enables
8   threshold reporting, the mobile station reports frame error rate statistics when the frame
9   error rate reaches a specified threshold.

10 The mobile station shall maintain a counter (TOT_FRAMES_S) for the total number of
11 received frames and a counter (BAD_FRAMES_S) for the number of received bad frames (see
12 6.2.2.2).

13 The mobile station shall perform the following for each received frame:

14   • The mobile station shall increment TOT_FRAMES_S by 1.

15   • If the received frame is bad, the mobile station shall increment BAD_FRAMES_S by 1.

16   • If $PWR\_REP\_THRESH_S$ is not zero and BAD_FRAMES_S is equal to
17        $PWR\_REP\_THRESH_S$, the mobile station shall send a *Power Measurement Report*
18   *Message* and set TOT_FRAMES_S and BAD_FRAMES_S to zero. After sending the
19   message, the mobile station shall not increment either counter for a period of
20        $PWR\_REP\_DELAY_S \times 4$ frames.

21   • If $PWR\_REP\_MODE_S$ is equal to '0' and TOT_FRAMES_S is equal to
22        $\lfloor (2^{(PWR\_REP\_FRAMES_S/2)} \times 5) \rfloor$, the mobile station shall set TOT_FRAMES_S and
23   BAD_FRAMES_S to zero.

24   • If $PWR\_REP\_MODE_S$ is equal to '1' and TOT_FRAMES_S is equal to
25        $\lfloor (2^{(PWR\_REP\_FRAMES_S/2)} \times 5) \rfloor$, the mobile station shall send a *Power Measurement*
26   *Report Message* and set TOT_FRAMES_S and BAD_FRAMES_S to zero.

27 6.6.4.1.1.1 Forward Traffic Channel Power Control Initialization

28 To initialize Forward Traffic Channel power control, the mobile station shall set
29 TOT_FRAMES_S and BAD_FRAMES_S to zero.

30 6.6.4.1.1.2 Processing the Power Control Parameters Message

31 The mobile station shall store the following parameters from the *Power Control Parameters*
32 *Message*:

33   • Power control reporting threshold ($PWR\_REP\_THRESH_S = PWR\_REP\_THRESH_r$)

34   • Power control reporting frame count ($PWR\_REP\_FRAMES_S = PWR\_REP\_FRAMES_r$)

35   • Power report mode indicator ($PWR\_REP\_MODE_S = PWR\_REP\_MODE_r$)

36   • Power report delay ($PWR\_REP\_DELAY_S = PWR\_REP\_DELAY_r$)

1   The mobile station shall set TOT_FRAMES_S and BAD_FRAMES_S to zero.

2   6.6.4.1.2 Service Options

3   6.6.4.1.2.1 Overview

4   While operating on the Traffic Channel, the mobile station and base station can use the
5   default service option, Service Option 1, or request an alternative service option. The
6   mobile station can request an alternative service option at the time of call origination or
7   during operation on the Traffic Channel. If the service option request is acceptable to the
8   base station, the mobile station and the base station begin using the new service option.

9   If the mobile station requests a service option that is not acceptable to the base station, the
10   base station can reject the requested service option or request an alternative service option.
11   If the base station requests an alternative service option, the mobile station can accept or
12   reject the base station's alternative service option, or request another service option. This
13   process, called service option negotiation, ends when the mobile station and base station
14   find a mutually acceptable service option, or when the mobile station rejects a service
15   option request from the base station or the base station rejects a service option request
16   from the mobile station.

17   The mobile station and base station use the *Service Option Request Order* to request a
18   service option, and *Service Option Response Order* to accept or reject a service option
19   request. In addition, the mobile station can request a service option in the *Origination*
20   *Message*.

21   The mobile station uses a variable (SO_REQ_S) to record the number of the service option for
22   which the mobile station has sent a *Service Option Request Order* and is expecting a *Service*
23   *Option Response Order*. SO_REQ_S is set to a special value NULL when the mobile station is
24   not expecting a *Service Option Response Order*.

25   6.6.4.1.2.2 Requirements

26   6.6.4.1.2.2.1 Processing the *Service Option Request Order*

27   When the mobile station receives a *Service Option Request Order*, it shall perform the
28   following:

29   • If the mobile station supports and accepts the requested service option, the mobile
30   station shall set SO_REQ_S to NULL and send a *Service Option Response Order*
31   accepting the requested service option within the time limit required by the requested
32   service option. The mobile station shall begin using the requested service option in
33   accordance with the requirements for the requested service option.

34   • If the mobile station supports the requested service option and has an alternative
35   service option to request, the mobile station shall set SO_REQ_S to the alternative
36   service option number and send a *Service Option Request Order* requesting the
37   alternative service option within the time limit required by the service option specified
38   in the received order.

- If the mobile station supports the requested service option, does not accept the requesed service option, and does not have an alternative service option to request, the mobile station shall set SO_REQ$_S$ to NULL and send a *Service Option Response Order* to reject the request within the time limit required by the requested service option.

- If the mobile station does not support the requested service option and has an alternative service option to request, the mobile station shall set SO_REQ$_S$ to the alternative service option number and send a *Service Option Request Order* to request the alternative service option within T$_{56m}$ seconds.

- If the mobile station does not support the requested service option and does not have an alternative service option to request, the mobile station shall set SO_REQ$_S$ to NULL and send a *Service Option Response Order* to reject the request within T$_{56m}$ seconds.

6.6.4.1.2.2.2 Processing the *Service Option Response Order*

When the mobile station receives a *Service Option Response Order*, it shall perform the following:

- If the service option number specified in the order is equal to SO_REQ$_S$, the mobile station shall set SO_REQ$_S$ to NULL and begin using the specified service option in accordance with the requirements for the service option.

- If the order indicates a service option rejection, the mobile station shall set SO_REQ$_S$ to NULL.

- If the order does not indicate a service option rejection and the service option specified in the order is not equal to SO_REQ$_S$, the mobile station shall set SO_REQ$_S$ to NULL and send a *Mobile Station Reject Order* (ORDQ = '00000100') within T$_{56m}$ seconds.

6.6.4.1.2.2.3 Service Option Request Initialization

The mobile station shall set SO_REQ$_S$ to the selected service option number.

6.6.4.1.3 Acknowledgement Procedures

The acknowledgement procedures facilitate the reliable exchange of messages between the base station and the mobile station. The mobile station uses the fields ACK_SEQ (acknowledgement sequence number), MSG_SEQ (message sequence number) and ACK_REQ (acknowledgement required indicator) to detect duplicate messages and provide a reference for acknowledgements. These message fields are referred to as layer 2 fields, and the acknowledgement procedures are referred to as layer 2 procedures. All other message fields are referred to as layer 3 fields, and the processing of layer 3 fields is referred to as layer 3 processing. (See Appendix C for further discussion of layering.)

On both the Forward Traffic Channel and the Reverse Traffic Channel, the procedure for messages requiring acknowledgement is a selective repeat scheme in which a message is retransmitted only if an acknowledgement for it is not received.

6.6.4.1.3.1 Messages Requiring Acknowledgement

A Traffic Channel message requires acknowledgement when the ACK_REQ field is set to '1'.

6.6.4.1.3.1.1 Transmitting a Message and Receiving an Acknowledgement

If the mobile station requires that the base station receive one message before another message, the mobile station shall wait for an acknowledgement to the first message before transmitting the second. Otherwise, the mobile station may transmit up to four different messages requiring acknowledgement before receiving an acknowledgement for the first message.

The mobile station shall store the next message sequence number to be transmitted for messages requiring acknowledgement ($MSG\_SEQ\_ACK_S$). The mobile station shall store an acknowledgement status indicator ($ACK\_WAITING_S[n]$, where n is 0 through 7) for each possible value of the Reverse Traffic Channel message MSG_SEQ field. The mobile station shall not send a new message requiring acknowledgement when $ACK\_WAITING_S[(MSG\_SEQ\_ACK_S + 4)\text{mod } 8]$ is equal to YES.

The mobile station shall perform the following procedures:

- When the mobile station receives any message on the Forward Traffic Channel, it shall set $ACK\_WAITING_S[ACK\_SEQ_r]$ to NO.

- When the mobile station sends a new message requiring acknowledgement on the Reverse Traffic Channel, it shall set $ACK\_WAITING_S[MSG\_SEQ\_ACK_S]$ to YES and shall set the MSG_SEQ field of the message to $MSG\_SEQ\_ACK_S$. The mobile station shall then increment $MSG\_SEQ\_ACK_S$, modulo 8.

The mobile station shall not retransmit a message for which it has received an acknowledgement.

If the mobile station has not received an acknowledgement within T_{1m} seconds after transmitting the message, the mobile station shall retransmit the message (see Figure 6.6.4.1.3.1.1-1). If the mobile station retransmits a message, the mobile station shall use the same MSG_SEQ number for the retransmission. The mobile station shall not retransmit a message sooner than T_{1m} seconds after the previous transmission.

The mobile station shall store a retransmission counter ($RETRY\_COUNT_S$) for each transmitted message requiring acknowledgement. The mobile station shall set $RETRY\_COUNT_S$ to zero prior to the first transmission of the message. After each transmission of the message, the mobile station shall increment $RETRY\_COUNT_S$ if no acknowledgement is received. When $RETRY\_COUNT_S$ is equal to N_{1m}, the mobile station shall declare an acknowledgement failure.
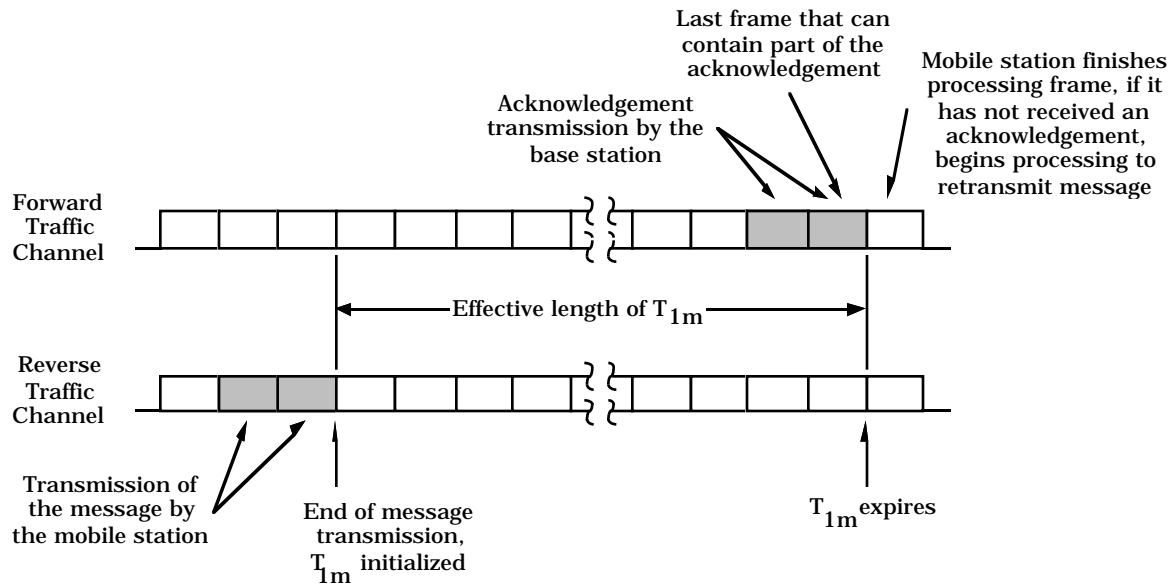
Figure 6.6.4.1.3.1.1-1. Time Limit for Acknowledgement

6.6.4.1.3.1.2 Receiving a Message and Returning an Acknowledgement

Messages received on the Forward Traffic Channel contain MSG_SEQ fields that are incremented by the same rules as messages transmitted on the Reverse Traffic Channel. Separate sequence numbers are maintained for Forward Traffic Channel Messages that require acknowledgement and for messages that do not require acknowledgement.

The mobile station acknowledges a received message by transmitting a message with the ACK_SEQ field set equal to the MSG_SEQ field of the received message. A message transmitted with the ACK_SEQ field set in this manner is referred to as including an acknowledgement of the received message.

Whenever a message requiring acknowledgement is received, the mobile station shall set the ACK_SEQ field of subsequent Reverse Traffic Channel messages to MSG_SEQ_r.

After receiving a message requiring acknowledgement, the mobile station shall transmit a message including an acknowledgement within T_{2m} seconds as shown in Figure 6.6.4.1.3.1.2-1.

When a received message requires acknowledgement and no message is available within T_{2m} seconds after the message is received, the mobile station shall transmit a *Mobile Station Acknowledgement Order* including the acknowledgement. The *Mobile Station Acknowledgement Order* shall be sent as a message not requiring acknowledgement.
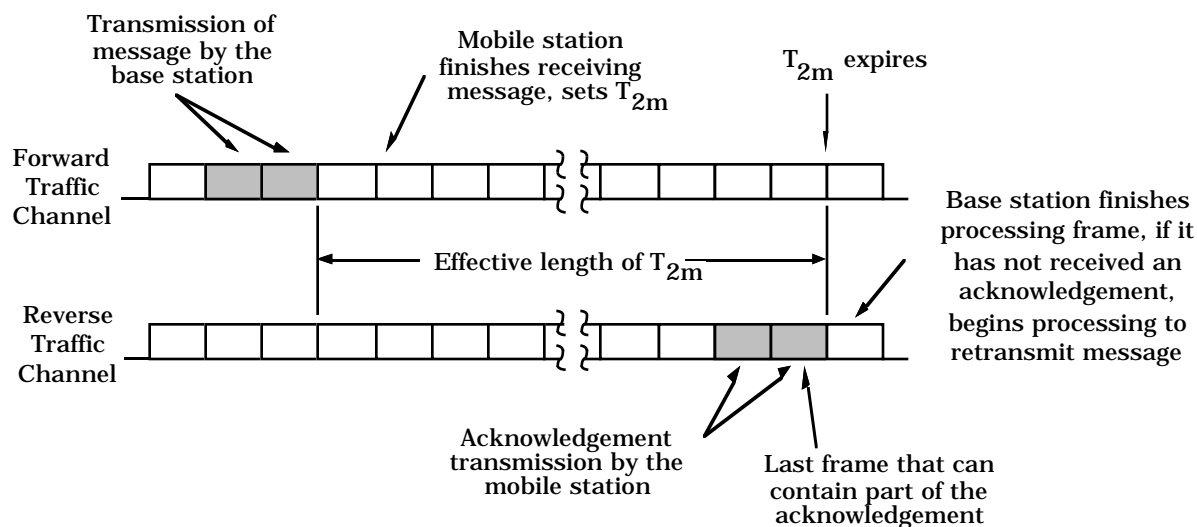
Figure 6.6.4.1.3.1.2-1. Time Limit for Acknowledgement

For duplicate message detection, the mobile station shall store a received status indicator for each possible value of the Forward Traffic Channel message MSG_SEQ field ($MSG\_SEQ\_RCVD_s[n]$, where n is 0 through 7). The mobile station shall perform the following procedures:

- When a message requiring acknowledgement is received and $MSG\_SEQ\_RCVD_s[MSG\_SEQ_r]$ is equal to NO, the mobile station shall process the message as a new message. The mobile station shall then set $MSG\_SEQ\_RCVD_s[MSG\_SEQ_r]$ to YES, and shall set $MSG\_SEQ\_RCVD_s[(MSG\_SEQ_r +4)\bmod 8]$ to NO.

- When a message requiring acknowledgement is received and $MSG\_SEQ\_RCVD_s[MSG\_SEQ_r]$ is equal to YES, the mobile station shall acknowledge the message but shall not perform any further processing of the message.

6.6.4.1.3.2 Messages Not Requiring Acknowledgement

A Traffic Channel message does not require acknowledgement when the ACK_REQ field is set to '0'.

The mobile station shall store the next message sequence number to be transmitted for messages not requiring acknowledgement ($MSG\_SEQ\_NOACK_s$). For each new message sent that does not require acknowledgement, the mobile station shall set the MSG_SEQ field of the message to $MSG\_SEQ\_NOACK_s$ and shall then increment $MSG\_SEQ\_NOACK_s$, modulo 8.

The mobile station shall consider all messages received within T_{3m} seconds that do not require acknowledgement and have the same MSG_SEQ number to be duplicates, as shown in Figure 6.6.4.1.3.2-1. If the mobile station receives multiple copies of a message as determined by the MSG_SEQ number, it shall discard the duplicate copies.
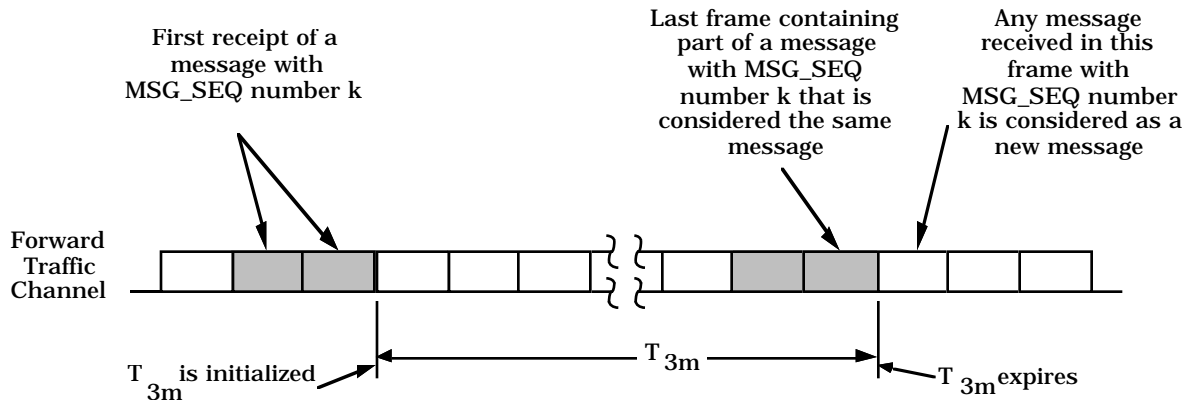
Figure 6.6.4.1.3.2-1. Time Window for Detecting Duplicate Messages not Requiring Acknowledgement

6.6.4.1.3.3 Acknowledgement Procedures Reset

The mobile station shall reset the acknowledgement procedures as follows:

- Message sequence number reset. The mobile station shall set $MSG\_SEQ\_ACK_s$ to 0, $MSG\_SEQ\_NOACK_s$ to 0, and shall set $ACK\_WAITING_s[n]$ to NO for all values of n from 0 to 7.

- Retransmission counter reset. The mobile station shall set the retransmission counter ($RETRY\_COUNT_s$) to zero.

- Acknowledgement sequence number reset. The mobile station shall set the ACK_SEQ field of all Reverse Traffic Channel messages to 7 until the first message requiring acknowledgement is received.

- Duplicate detection reset. The mobile station shall set $MSG\_SEQ\_RCVD_s[n]$ to NO for all values of n from 0 to 7.

6.6.4.1.4 Processing the *In-Traffic System Parameters Message*

The mobile station shall store the following parameters from the *In-Traffic System Parameters Message*:

- System identification ($SID_s = SID_r$)

- Network identification ($NID_s = NID_r$)

- Search window size for the Active Set and the Candidate Set ($SRCH\_WIN\_A_s = SRCH\_WIN\_A_r$)

- Search window size for the Neighbor Set ($SRCH\_WIN\_N_s = SRCH\_WIN\_N_r$)

- Search window size for the Remaining Set ($SRCH\_WIN\_R_s = SRCH\_WIN\_R_r$)

- Pilot detection threshold ($T\_ADD_s = T\_ADD_r$)

- Pilot drop threshold $T\_DROP_s = T\_DROP_r$)

1   • Active Set versus Candidate Set comparison threshold (T_COMP$_s$ = T_COMP$_r$)

2   • Drop timer value (T_TDROP$_s$ = T_TDROP$_r$)

3   • Maximum age for retention of Neighbor Set members
4   (NGHBR_MAX_AGE$_s$=NGHBR_MAX_AGE$_r$)

5   6.6.4.1.5 Message Action Times

6   A message without a USE_TIME field or with a USE_TIME field set to '0' has an implicit
7   action time. A message whose USE_TIME field is set to '1' has an explicit action time which
8   is specified in the ACTION_TIME field of the message. A message with a future action time
9   is called a pending message.

10   Unless otherwise specified, a message having an implicit action time shall take effect as
11   soon as it is processed, and a message with an explicit action time shall take effect when
12   System Time (in 80 ms units) modulo 64 becomes equal to the message's ACTION_TIME.

13   The mobile station shall support one pending message at any given time, not including
14   pending *Service Option Control Order*s. The number of pending *Service Option Control*
15   *Order*s that the mobile station is required to support is specific to the service option (see
16   Appendix A).

17   6.6.4.2 Traffic Channel Initialization Substate

18   In this substate, the mobile station verifies that it can receive the Forward Traffic Channel
19   and begins transmitting on the Reverse Traffic Channel.

20   Upon entering the *Traffic Channel Initialization Substate*, the mobile station shall perform
21   the following:

22   • The mobile station shall perform registration initialization as specified in 6.6.5.6.4.1.

23   • The mobile station shall reset the acknowledgement procedures as specified in
24   6.6.4.1.3.3.

25   • The mobile station shall initialize Forward Traffic Channel power control as specified
26   in 6.6.4.1.1.1.

27   • If the *Origination Message* requests a special service option, the mobile station shall
28   perform service option request initialization as specified in 6.6.4.1.2.2.3 using the
29   requested service option number; otherwise, the mobile station shall perform service
30   option request initialization using NULL.

31   While in the *Traffic Channel Initialization Substate,* the mobile station shall perform the
32   following:

33   • The mobile station shall perform pilot strength measurements as specified in
34   6.6.6.2.2, but shall not send *Pilot Strength Measurement Messages*.

35   • The mobile station shall perform registration timer maintenance as specified in
36   6.6.5.6.4.2.

If the mobile station does not support the assigned CDMA Channel (see6.2.1.1) or the assigned Forward Traffic code channel, the mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State.*

If the mobile station supports the assigned CDMA Channel and the assigned Forward Traffic code channel, the mobile station shall perform the following:

- The mobile station shall tune to the assigned CDMA Channel.

- The mobile station shall set its code channel for the assigned Forward Traffic code channel.

- The mobile station shall set its Forward and Reverse Traffic Channel frame offsets to the assigned frame offset.

- The mobile station shall set its Forward and Reverse Traffic Channel long code masks to the public long code mask (see 6.1.3.1.8).

If the mobile station does not receive N_{5m} consecutive good frames within T_{50m} seconds, the mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State.*

If the mobile station receives N_{5m} consecutive good frames within T_{50m} seconds, the mobile station shall perform the following additional functions while it remains in the *Traffic Channel Initialization Substate*:

- The mobile station shall perform Forward Traffic Channel supervision as specified in 6.4.4. If a loss of the Forward Traffic Channel is declared, the mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State.*

- The mobile station shall adjust its transmit power as specified in 6.1.2.3.2.

- The mobile station shall transmit the Traffic Channel preamble as specified in 6.1.3.3.10.3.

- The mobile station shall perform the acknowledgement procedures as specified in 6.6.4.1.3. If an acknowledgement failure is declared, the mobile station shall disable its transmitter and enter the *System Determination Substate* of the *Mobile Station Initialization State.*

If the mobile station does not receive a *Base Station Acknowledgement Order* within T_{51m} seconds, the mobile station shall disable its transmitter and enter the *System Determination Substate* of the *Mobile Station Initialization State.*

If the mobile station receives a *Base Station Acknowledgement Order* within T_{51m} seconds, the mobile station shall perform the following:

- If the call is mobile station terminated, the mobile station shall enter the *Waiting for Order Substate*.

- If the call is mobile station originated, the mobile station shall enter the *Conversation Substate*.

6.6.4.3 Alerting

6.6.4.3.1 Waiting for Order Substate

In this substate, the mobile station waits for an *Alert With Information Message*.

Upon entering the *Waiting for Order Substate*, the mobile station shall set the substate timer for T_{52m} seconds.

While in the *Waiting for Order Substate*, the mobile station shall perform the following:

- If the substate timer expires, the mobile station shall disable its transmitter and enter the *System Determination Substate* of the *Mobile Station Initialization State*.

- The mobile station shall perform Forward Traffic Channel supervision as specified in 6.4.4. If a loss of the Forward Traffic Channel is declared, the mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State.*

- The mobile station shall adjust its transmit power as specified in 6.1.2.3.2.

- The mobile station shall perform Forward Traffic Channel power control as specified in 6.6.4.1.1.

- The mobile station shall perform handoff processing as specified in 6.6.6.

- The mobile station shall transfer the received primary traffic packets to the primary traffic service option application.

- The mobile station shall transmit null Traffic Channel data on the Reverse Traffic Channel (see 6.1.3.3.10.4).

- The mobile station shall perform registration timer maintenance as specified in 6.6.5.6.4.2.

- If the mobile station is directed by the user to transmit a message, the mobile station shall send a *Data Burst Message*.

- If the mobile station is directed by the user to request a service option, the mobile station shall perform service option request initialization as specified in 6.6.4.1.2.2.3, and shall send a *Service Option Request Order* (ORDQ = requested service option number).

- If the mobile station is directed by the user to request a private long code transition and has the long code mask (see 6.3.12.3), the mobile station shall send a *Long Code Transition Request Order* (ORDQ = '00000001') as a message requiring acknowledgement.

- If the mobile station is directed by the user to request a public long code transition, the mobile station shall send a *Long Code Transition Request Order* (ORDQ = '00000000') as a message requiring acknowledgement.

- If the mobile station is directed by the user to operate in analog mode, the mobile station shall send the *Request Analog Service Order* as a message requiring acknowledgement.

- If the mobile station is directed by the user to power down, the mobile station shall enter the *Release Substate* with a power-down indication (see 6.6.4.5).

- The mobile station shall perform the acknowledgement procedures as specified in 6.6.4.1.3. If an acknowledgement failure is declared, the mobile station shall disable its transmitter and enter the *System Determination Substate* of the *Mobile Station Initialization State.*

- If the mobile station receives a message which is included in the following list and every message field value is within its permissible range, the mobile station shall process the message as described below and in accordance with the message's action time (see 6.6.4.1.5).

  1. *Alert With Information Message:* The mobile station should alert the user and shall enter the *Waiting for Mobile Station Answer Substate* (see 6.6.4.3.2).

  2. *Analog Handoff Direction Message:* The mobile station shall process the message as specified in 6.6.6.2.9, and enter the Waiting For Order Task (see 2.6.4.3.1) with a handoff from CDMA indication.

  3. *Authentication Challenge Message:* The mobile station shall reset the substate timer for T_{52m} seconds. The mobile station shall then process the message and respond as specified in 6.3.12.1.5 within T_{32m} seconds.

  4. *Base Station Acknowledgement Order:* No requirements.

  5. *Base Station Challenge Confirmation Order:* The mobile station shall reset the substate timer for T_{52m} seconds. The mobile station shall then process the message and respond with an *SSD Update Confirmation Order* or *SSD Update Rejection Order* as specified in 6.3.12.1.9 within T_{32m} seconds.

  6. *Data Burst Message:* No requirements.

  7. *Handoff Direction Message:* The mobile station shall process the message as specified in 6.6.6.2.5.1. The mobile station shall reset the substate timer for T_{52m} seconds.

  8. *In-Traffic System Parameters Message:* The mobile station shall process the message as specified in 6.6.4.1.4.

  9. *Local Control Order:* No requirements.

  10. *Lock Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Order* in the mobile station's semi-permanent memory (LCKRSN$_{s-p}$ = ORDQ$_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until it has received an *Unlock Order*. This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State.*

  11. *Lock Until Power-Cycled Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Until Power-Cycled Order* in the mobile

station's semi-permanent memory (LCKRSN_P_{s-p} = ORDQ$_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until after the next mobile station power-up or until it has received an *Unlock Order*. This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State.*

12. *Long Code Transition Request Order:* If the *Long Code Transition Request Order* requests a private long code transition, the mobile station is able to generate the private long code (see 6.3.12.3), and the mobile station accepts the request, the mobile station shall send a *Long Code Transition Response Order* (ORDQ = '00000011') within T_{56m} seconds. The mobile station shall use the private long code on both the Forward Traffic Channel and the Reverse Traffic Channel. If USE_TIME equals '0', the mobile station shall begin using the private long code at the first 80 ms boundary (relative to the start of System Time) after N_{4m} frames from the end of the response transmission. The mobile station should turn on the voice privacy indicator. If the *Long Code Transition Request Order* requests a private long code transition, and the mobile station is not able to generate the private long code or the mobile station does not accept the request, the mobile station shall send a *Long Code Transition Response Order* (ORDQ = '00000010') within T_{56m} seconds.

If the *Long Code Transition Request Order* requests a public long code transition and the mobile station accepts the request, the mobile station shall send a *Long Code Transition Response Order* (ORDQ = '00000010') within T_{56m} seconds. The mobile station should turn off the voice privacy indicator. If the *Long Code Transition Request Order* requests a public long code transition, and the mobile station does not accept the request, the mobile station shall send a *Long Code Transition Response Order* (ORDQ = '00000011') within T_{56m} seconds.

13. *Maintenance Order:* The mobile station shall enter the *Waiting for Mobile Station Answer Substate.*

14. *Message Encryption Mode Order:* The mobile station shall process the message as specified in 6.3.12.2.

15. *Message Waiting Order:* No requirements.

16. *Mobile Station Registered Message:* The mobile station shall process the message as specified in 6.6.5.6.4.3.

17. *Neighbor List Update Message:* The mobile station shall process the message as specified in 6.6.6.2.6.3.

18. *Pilot Measurement Request Order:* The mobile station shall process the order as specified in 6.6.6.2.5.1.

19. *Power Control Parameters Message:* The mobile station shall process the message as specified in 6.6.4.1.1.2.

20. *Release Order:* The mobile station shall enter the *Release Substate* with a base station release indication (see 6.6.4.5).

21. *Retrieve Parameters Message:* If the mobile station can supply values for all of the parameters specified by the PARAMETER_ID fields in the message, the mobile station shall send, within T_{56m} seconds, a *Parameters Response Message*; otherwise, the mobile station shall send, within T_{56m} seconds, a *Mobile Station Reject Order.*

22. *Service Option Control Order:* The mobile station shall transfer the *Service Option Control Order* to the primary traffic service option application.

23. *Service Option Request Order:* The mobile station shall process the message as specified in 6.6.4.1.2.2.1.

24. *Service Option Response Order:* The mobile station shall process the message as specified in 6.6.4.1.2.2.2.

25. *Set Parameters Message:* If the mobile station can set all of the parameters specified by the PARAMETER_ID fields in the message, the mobile station shall set them; otherwise, the mobile station shall send, within T_{56m} seconds, a *Mobile Station Reject Order.*

26. *SSD Update Message:* The mobile station shall reset the substate timer for T_{52m} seconds. The mobile station shall then process the message and respond with a *Base Station Challenge Order* as specified in 6.3.12.1.9 within T_{32m} seconds.

27. *Status Request Order:* The mobile station shall send, within T_{56m} seconds, a *Status Message* to the base station.

• If the mobile station receives a message which is included in the above list and any message field value is not within its permissible range, the mobile station shall discard the message and send a *Mobile Station Reject Order* (ORDQ = '00000100') within T_{56m} seconds.

• If the mobile station receives a message which is not included in the above list, the mobile station shall send the *Mobile Station Reject Order* (ORDQ = '00000010') within T_{56m} seconds.

6.6.4.3.2 Waiting for Mobile Station Answer Substate

In this substate, the mobile station waits for the user to answer the mobile station terminated call.

Upon entering the *Waiting for Mobile Station Answer Substate*, the mobile station shall set the substate timer for T_{53m} seconds.

While in the *Waiting for Mobile Station Answer Substate*, the mobile station shall perform the following:

• If the substate timer expires, the mobile station shall disable its transmitter and enter the *System Determination Substate* of the *Mobile Station Initialization State*.

- The mobile station shall perform Forward Traffic Channel supervision as specified in 6.4.4. If a loss of the Forward Traffic Channel is declared, the mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State.*

- The mobile station shall adjust its transmit power as specified in 6.1.2.3.2.

- The mobile station shall perform Forward Traffic Channel power control as specified in 6.6.4.1.1.

- The mobile station shall perform handoff processing as specified in 6.6.6.

- The mobile station shall transfer the received primary traffic packets to the primary traffic service option application.

- The mobile station shall transmit null Traffic Channel data on the Reverse Traffic Channel (see 6.1.3.3.10.4).

- The mobile station shall perform registration timer maintenance as specified in 6.6.5.6.4.2.

- If the mobile station is directed by the user to answer the call, the mobile station shall send a *Connect Order* to the base station as a message requiring acknowledgement. The mobile station shall enter the *Conversation Substate*.

- If the mobile station is directed by the user to transmit a message, the mobile station shall send a *Data Burst Message*.

- If the mobile station is directed by the user to request a service option, the mobile station shall perform service option request initialization as specified in 6.6.4.1.2.2.3, and shall send a *Service Option Request Order* (ORDQ = requested service option number).

- If the mobile station is directed by the user to request a private long code transition and has the long code mask (see 6.3.12.3), the mobile station shall send a *Long Code Transition Request Order* (ORDQ = '00000001') as a message requiring acknowledgement.

- If the mobile station is directed by the user to request a public long code transition, the mobile station shall send a *Long Code Transition Request Order* (ORDQ = '00000000') as a message requiring acknowledgement.

- If the mobile station is directed by the user to operate in analog mode, the mobile station shall send the *Request Analog Service Order* as a message requiring acknowledgement.

- If the mobile station is directed by the user to power down, the mobile station shall enter the *Release Substate* with a power-down indication (see 6.6.4.5).

- The mobile station shall perform the acknowledgement procedures as specified in 6.6.4.1.3. If an acknowledgement failure is declared, the mobile station shall disable its transmitter and enter the *System Determination Substate* of the *Mobile Station Initialization State.*

- If the mobile station receives a message which is included in the following list and every message field value is within its permissible range, the mobile station shall process the message as described below and in accordance with the message's action time (see 6.6.4.1.5).

   1. *Alert With Information Message:* The mobile station shall reset the substate timer for T_{53m} seconds.

   2. *Analog Handoff Direction Message:* The mobile station shall process the message as specified in 6.6.6.2.9 and enter the Waiting For Answer Task (see 2.6.4.3.2) with a handoff from CDMA indication.

   3. *Authentication Challenge Message:* The mobile station shall process the message and respond as specified in 6.3.12.1.5 within T_{32m} seconds.

   4. *Base Station Acknowledgement Order:* No requirements.

   5. *Base Station Challenge Confirmation Order:* The mobile station shall process the message and respond with an *SSD Update Confirmation Order* or *SSD Update Rejection Order* as specified in 6.3.12.1.9 within T_{32m} seconds.

   6. *Data Burst Message:* No requirements.

   7. *Handoff Direction Message:* The mobile station shall process the message as specified in 6.6.6.2.5.1.

   8. *In-Traffic System Parameters Message:* The mobile station shall process the message as specified in 6.6.4.1.4.

   9. *Local Control Order:* No requirements.

   10. *Lock Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Order* in the mobile station's semi-permanent memory ($LCKRSN_{s-p} = ORDQ_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until it has received an *Unlock Order*. This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*.

   11. *Lock Until Power-Cycled Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Until Power-Cycled Order* in the mobile station's semi-permanent memory ($LCKRSN\_P_{s-p} = ORDQ_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until after the next mobile station power-up or until it has received an *Unlock Order*. This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*.

   12. *Long Code Transition Request Order:* If the *Long Code Transition Request Order* requests a private long code transition, the mobile station is able to generate the private long code (see 6.3.12.3), and the mobile station accepts the request, the

mobile station shall send a *Long Code Transition Response Order* (ORDQ = '00000011') within T_{56m} seconds. The mobile station shall use the private long code on both the Forward Traffic Channel and the Reverse Traffic Channel. If USE_TIME equals '0', the mobile station shall begin using the private long code at the first 80 ms boundary (relative to the start of System Time) after N_{4m} frames from the end of the response transmission. The mobile station should turn on the voice privacy indicator. If the *Long Code Transition Request Order* requests a private long code transition, and the mobile station is not able to generate the private long code or the mobile station does not accept the request, the mobile station shall send a *Long Code Transition Response Order* (ORDQ = '00000010') within T_{56m} seconds.

If the *Long Code Transition Request Order* requests a public long code transition and the mobile station accepts the request, the mobile station shall send a *Long Code Transition Response Order* (ORDQ = '00000010') within T_{56m} seconds. The mobile station should turn off the voice privacy indicator. If the *Long Code Transition Request Order* requests a public long code transition, and the mobile station does not accept the request, the mobile station shall send a *Long Code Transition Response Order* (ORDQ = '00000011') within T_{56m} seconds.

13. *Maintenance Order:* The mobile station shall reset the substate timer for T_{53m} seconds.

14. *Message Encryption Mode Order:* The mobile station shall process the message as specified in 6.3.12.2.

15. *Message Waiting Order:* No requirements.

16. *Mobile Station Registered Message:* The mobile station shall process the message as specified in 6.6.5.6.4.3.

17. *Neighbor List Update Message:* The mobile station shall process the message as specified in 6.6.6.2.6.3.

18. *Pilot Measurement Request Order:* The mobile station shall process the order as specified in 6.6.6.2.5.1.

19. *Power Control Parameters Message:* The mobile station shall process the message as specified in 6.6.4.1.1.2.

20. *Release Order:* The mobile station shall enter the *Release Substate* with a base station release indication (see 6.6.4.5).

21. *Retrieve Parameters Message:* If the mobile station can supply values for all of the parameters specified by the PARAMETER_ID fields in the message, the mobile station shall send, within T_{56m} seconds, a *Parameters Response Message*; otherwise, the mobile station shall send, within T_{56m} seconds, a *Mobile Station Reject Order.*

22. *Service Option Control Order:* The mobile station shall transfer the *Service Option Control Order* to the primary traffic service option application.

23. *Service Option Request Order:* The mobile station shall process the message as specified in 6.6.4.1.2.2.1.

24. *Service Option Response Order:* The mobile station shall process the message as specified in 6.6.4.1.2.2.2.

25. *Set Parameters Message:* If the mobile station can set all of the parameters specified by the PARAMETER_ID fields in the message, the mobile station shall set them; otherwise, the mobile station shall send, within T_{56m} seconds, a *Mobile Station Reject Order*.

26. *SSD Update Message:* The mobile station shall process the message and respond with a *Base Station Challenge Order* as specified in 6.3.12.1.9 within T_{32m} seconds.

27. *Status Request Order:* The mobile station shall send, within T_{56m} seconds, a *Status Message*.

- If the mobile station receives a message which is included in the above list and any message field value is not within its permissible range, the mobile station shall discard the message and send a *Mobile Station Reject Order* (ORDQ = '00000100') within T_{56m} seconds.

- If the mobile station receives a message which is not included in the above list, the mobile station shall send the *Mobile Station Reject Order* (ORDQ = '00000010') within T_{56m} seconds.

6.6.4.4 Conversation Substate

In this substate, the mobile station's primary traffic service option application exchanges primary traffic packets with the base station.

While in the *Conversation Substate*, the mobile station shall perform the following:

- The mobile station shall perform Forward Traffic Channel supervision as specified in 6.4.4. If a loss of the Forward Traffic Channel is declared, the mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State.*

- The mobile station shall adjust its transmit power as specified in 6.1.2.3.2.

- The mobile station shall perform Forward Traffic Channel power control as specified in 6.6.4.1.1.

- The mobile station shall perform handoff processing as specified in 6.6.6.

- The mobile station shall transfer the received primary traffic packets to the primary traffic service option application.

- The mobile station shall transmit primary traffic packets from the primary traffic service option application.

- The mobile station shall perform registration timer maintenance as specified in 6.6.5.6.4.2.

- If the mobile station originated the call and did not send all the dialed digits in the *Origination Message*, the mobile station shall send the remaining dialed digits to the base station in the *Origination Continuation Message*. The mobile station shall send the *Origination Continuation Message* as a message requiring acknowledgement within T_{54m} seconds after entering the *Conversation Substate*.

- If the mobile station is directed by the user to transmit a message, the mobile station shall send a *Data Burst Message*.

- If the mobile station is directed by the user to request a service option, the mobile station shall perform service option request initialization as specified in 6.6.4.1.2.2.3, and shall send a *Service Option Request Order* (ORDQ = requested service option number).

- If the mobile station is directed by the user to request a private long code transition and has the long code mask (see 6.3.12.3), the mobile station shall send a *Long Code Transition Request Order* (ORDQ = '00000001') as a message requiring acknowledgement.

- If the mobile station is directed by the user to request a public long code transition, the mobile station shall send a *Long Code Transition Request Order* (ORDQ = '00000000') as a message requiring acknowledgement.

- If the mobile station is directed by the user to issue a flash, the mobile station shall build a *Flash With Information Message* with the collected digits and send the message to the base station as a message requiring acknowledgement.

- If the mobile station is directed by the user to send burst DTMF digits, the mobile station shall build the *Send Burst DTMF Message* with the dialed digits and send the message as a message requiring acknowledgement.

- If the mobile station is directed by the user to send a continuous DTMF digit, the mobile station shall build the *Continuous DTMF Tone Order* with the dialed digit and send the order as a message requiring acknowledgement. When the mobile station is directed by the user to cease sending the continuous DTMF digit, the mobile station shall send the *Continuous DTMF Tone Order* (ORDQ = '11111111') as a message requiring acknowledgement.

- If the mobile station is directed by the user to operate in analog mode, the mobile station shall send the *Request Analog Service Order* as a message requiring acknowledgement.

- If the mobile station is directed by the user to disconnect the call, the mobile station shall enter the *Release Substate* with a mobile station release indication (see 6.6.4.5).

- If the mobile station is directed by the user to power down, the mobile station shall enter the *Release Substate* with a power-down indication (see 6.6.4.5).

- The mobile station shall perform the acknowledgement procedures as specified in 6.6.4.1.3. If an acknowledgement failure is declared, the mobile station shall disable its transmitter and enter the *System Determination Substate* of the *Mobile Station Initialization State.*

- If the mobile station receives a message which is included in the following list and every message field value is within its permissible range, the mobile station shall process the message as described below and in accordance with the message's action time (see 6.6.4.1.5).

  1. *Alert With Information Message:* If the message contains a signal information record with the SIGNAL_TYPE field set to '01' or '10', the mobile station shall enter the *Waiting For Mobile Station Answer Substate.*

  2. *Analog Handoff Direction Message:* The mobile station shall process the message as specified in 6.6.6.2.9 and enter the Conversation Task (see 2.6.4.4) with a handoff from CDMA indication.

  3. *Authentication Challenge Message:* The mobile station shall process the message and respond as specified in 6.3.12.1.5 within T_{32m} seconds.

  4. *Base Station Acknowledgement Order:* No requirements.

  5. *Base Station Challenge Confirmation Order:* The mobile station shall process the message and respond with an *SSD Update Confirmation Order* or *SSD Update Rejection Order* as specified in 6.3.12.1.9 within T_{32m} seconds.

  6. *Continuous DTMF Tone Order:* No requirements.

  7. *Data Burst Message:* No requirements.

  8. *Flash with Information Message:* No requirements.

  9. *Handoff Direction Message:* The mobile station shall process the message as specified in 6.6.6.2.5.1.

  10. *In-Traffic System Parameters Message:* The mobile station shall process the message as specified in 6.6.4.1.4.

  11. *Local Control Order:* No requirements.

  12. *Lock Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Order* in the mobile station's semi-permanent memory (LCKRSN$_{s-p}$ = ORDQ$_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until it has received an *Unlock Order*. This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State.*

  13. *Lock Until Power-Cycled Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Until Power-Cycled Order* in the mobile station's semi-permanent memory (LCKRSN_P$_{s-p}$ = ORDQ$_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until after the next mobile station power-up or until it has received an *Unlock Order*. This requirement shall take

precedence over any other mobile station requirement specifying entry to the *System Access State.*

14. *Long Code Transition Request Order:* If the *Long Code Transition Request Order* requests a private long code transition, the mobile station is able to generate the private long code (see 6.3.12.3), and the mobile station accepts the request, the mobile station shall send a *Long Code Transition Response Order* (ORDQ = '00000011') within T_{56m} seconds. The mobile station shall use the private long code on both the Forward Traffic Channel and the Reverse Traffic Channel. If USE_TIME equals '0', the mobile station shall begin using the private long code at the first 80 ms boundary (relative to the start of System Time) after N_{4m} frames from the end of the response transmission. The mobile station should turn on the voice privacy indicator. If the *Long Code Transition Request Order* requests a private long code transition, and the mobile station is not able to generate the private long code or the mobile station does not accept the request, the mobile station shall send a *Long Code Transition Response Order* (ORDQ = '00000010') within T_{56m} seconds.

If the *Long Code Transition Request Order* requests a public long code transition and the mobile station accepts the request, the mobile station shall send a *Long Code Transition Response Order* (ORDQ = '00000010') within T_{56m} seconds. The mobile station should turn off the voice privacy indicator. If the *Long Code Transition Request Order* requests a public long code transition, and the mobile station does not accept the request, the mobile station shall send a *Long Code Transition Response Order* (ORDQ = '00000011') within T_{56m} seconds.

15. *Maintenance Order:* The mobile station shall enter the *Waiting for Mobile Station Answer Substate.*

16. *Message Encryption Mode Order:* The mobile station shall process the message as specified in 6.3.12.2.

17. *Message Waiting Order:* No requirements.

18. *Mobile Station Registered Message:* The mobile station shall process the message as specified in 6.6.5.6.4.3.

19. *Neighbor List Update Message:* The mobile station shall process the message as specified in 6.6.6.2.6.3.

20. *Pilot Measurement Request Order:* The mobile station shall process the order as specified in 6.6.6.2.5.1.

21. *Power Control Parameters Message:* The mobile station shall process the message as specified in 6.6.4.1.1.2.

22. *Release Order:* The mobile station shall enter the *Release Substate* with a base station release indication (see 6.6.4.5).

23. *Retrieve Parameters Message:* If the mobile station can supply values for all of the parameters specified by the PARAMETER_ID fields in the message, the mobile station shall send, within T_{56m} seconds, a *Parameters Response*

Message; otherwise, the mobile station shall send, within T_{56m} seconds, a *Mobile Station Reject Order*.

24. *Send Burst DTMF Message:* No requirements.

25. *Service Option Control Order:* The mobile station shall transfer the *Service Option Control Order* to the primary traffic service option application.

26. *Service Option Request Order:* The mobile station shall process the message as specified in 6.6.4.1.2.2.1.

27. *Service Option Response Order:* The mobile station shall process the message as specified in 6.6.4.1.2.2.2.

28. *Set Parameters Message:* If the mobile station can set all of the parameters specified by the PARAMETER_ID fields in the message, the mobile station shall set them; otherwise, the mobile station shall send, within T_{56m} seconds, a *Mobile Station Reject Order*.

29. *SSD Update Message:* The mobile station shall process the message and respond with a *Base Station Challenge Order* as specified in 6.3.12.1.9 within T_{32m} seconds.

30. *Status Request Order:* The mobile station shall send, within T_{56m} seconds, a *Status Message*.

- If the mobile station receives a message which is included in the above list and any message field value is not within its permissible range, the mobile station shall discard the message and send a *Mobile Station Reject Order* (ORDQ = '00000100') within T_{56m} seconds.

- If the mobile station receives a message which is not included in the above list, the mobile station shall send the *Mobile Station Reject Order* (ORDQ = '00000010') within T_{56m} seconds.

6.6.4.5 Release Substate

In this substate, the mobile station confirms the call disconnect.

Upon entering the *Release Substate*, the mobile station shall perform the following:

- The mobile station shall set the substate timer for T_{55m} seconds.

- If the mobile station enters the *Release Substate* with a power-down indication, the mobile station shall send a *Release Order* (ORDQ = '00000001'), and perform registration power-down (see 6.6.5.6.4.3).

- If the mobile station enters the *Release Substate* with a mobile station release indication, the mobile station shall send a *Release Order* (ORDQ = '00000000').

- If the mobile station enters the *Release Substate* with a base station release indication, the mobile station shall send a *Release Order* (ORDQ = '00000000'). The mobile station shall disable its transmitter and enter the *System Determination Substate* of the *Mobile Station Initialization State*.

While in the *Release Substate*, the mobile station shall perform the following:

- If the substate timer expires, the mobile station shall disable its transmitter and enter the *System Determination Substate* of the *Mobile Station Initialization State.*

- The mobile station shall perform Forward Traffic Channel supervision as specified in 6.4.4. If a loss of the Forward Traffic Channel is declared, the mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State.*

- The mobile station shall adjust its transmit power as specified in 6.1.2.3.2.

- The mobile station shall perform Forward Traffic Channel power control as specified in 6.6.4.1.1.

- The mobile station shall perform handoff processing as specified in 6.6.6.

- The mobile station shall transmit null Traffic Channel data on the Reverse Traffic Channel (see 6.1.3.3.10.4).

- The mobile station shall perform registration timer maintenance as specified in 6.6.5.6.4.2.

- The mobile station shall perform the acknowledgement procedures as specified in 6.6.4.1.3. If an acknowledgement failure is declared, the mobile station shall disable its transmitter and enter the *System Determination Substate* of the *Mobile Station Initialization State.*

- If the mobile station receives a message which is included in the following list and every message field value is within its permissible range, the mobile station shall process the message as described below and in accordance with the message's action time (see 6.6.4.1.5).

  1. *Alert With Information Message:* The mobile shall enter the *Waiting for Mobile Station Answer Substate.*

  2. *Base Station Acknowledgement Order:* No requirements.

  3. *Data Burst Message:* No requirements.

  4. *Handoff Direction Message:* The mobile station shall process the message as specified in 6.6.6.2.5.1.

  5. *In-Traffic System Parameters Message:* The mobile station shall process the message as specified in 6.6.4.1.4.

  6. *Local Control Order:* No requirements.

  7. *Lock Order:* The mobile station shall disable its transmitter and record the reason for the Lock Order in the mobile station's semi-permanent memory ($LCKRSN_{s-p} = ORDQ_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until it has received an *Unlock Order.* This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State.*

8. *Lock Until Power-Cycled Order:* The mobile station shall disable its transmitter and record the reason for the *Lock Until Power-Cycled Order* in the mobile station's semi-permanent memory (LCKRSN_$P_{s\text{-}p}$ = ORDQ$_r$). The mobile station should notify the user of the locked condition. The mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*, and shall not enter the *System Access State* again until after the next mobile station power-up or until it has received an *Unlock Order*. This requirement shall take precedence over any other mobile station requirement specifying entry to the *System Access State*.

9. *Message Waiting Order:* No requirements.

10. *Mobile Station Registered Message:* The mobile station shall process the message as specified in 6.6.5.6.4.3.

11. *Neighbor List Update Message:* The mobile station shall process the message as specified in 6.6.6.2.6.3.

12. *Power Control Parameters Message*: The mobile station shall process the message as specified in 6.6.4.1.1.2.

13. *Release Order*: The mobile station shall disable its transmitter. If the mobile station enters the *Release Substate* with a power-down indication, the mobile station may power down; otherwise, the mobile station shall enter the *System Determination Substate* of the *Mobile Station Initialization State*.

14. *Retrieve Parameters Message:* If the mobile station can supply values for all of the parameters specified by the PARAMETER_ID fields in the message, the mobile station shall send, within T_{56m} seconds, a *Parameters Response Message*; otherwise, the mobile station shall send, within T_{56m} seconds, a *Mobile Station Reject Order*.

• If the mobile station receives a message which is included in the above list and any message field value is not within its permissible range, the mobile station shall discard the message and send a *Mobile Station Reject Order* (ORDQ = '00000100') within T_{56m} seconds.

• If the mobile station receives a message which is not included in the above list, the mobile station shall send the *Mobile Station Reject Order* (ORDQ = '00000010') within T_{56m} seconds.

6.6.5 Registration

6.6.5.1 Forms of Registration

Registration is the process by which the mobile station notifies the base station of its location, status, identification, slot cycle, station class, and other characteristics. The mobile station informs the base station of its location and status so that the base station can efficiently page the mobile station when establishing a mobile terminated call. The mobile station supplies the base station with the set of MINs that are active. This allows the base station to know which mobile station to contact when handling a mobile

terminated call.   If operating in the slotted mode, the mobile station supplies the SLOT_CYCLE_INDEX parameter so that the base station knows which slots the mobile station is monitoring. The mobile station supplies the station class mark and CAI revision number so that the base station knows the capabilities of the mobile station.

The CDMA system supports nine different forms of registration:

1.   Power-up registration. The mobile station registers when it powers on, switches from using the alternate serving system, or switches from using the analog system.

2.   Power-down registration. The mobile station registers when it powers off if previously registered in the current serving system.

3.   Timer-based registration. The mobile station registers when a timer expires.

4.   Distance-based registration. The mobile station registers when the distance between the current base station and the base station in which it last registered exceeds a threshold.

5.   Zone-based registration. The mobile station registers when it enters a new zone.

6.   Parameter-change registration. The mobile station registers when certain of its stored parameters change.

7.   Ordered registration. The mobile station registers when the base station requests it.

8.   Implicit registration. When a mobile station successfully uses the Access Channel, the base station can infer the mobile station's location, causing an implicit registration.

9.   Traffic Channel registration. Whenever the base station has registration information for a mobile station that has been assigned to a Traffic Channel, the base station can notify the mobile station that it is registered.

The first six forms are called autonomous registrations since the mobile station initiates the registration in response to an event, (i.e., without being explicitly directed to register by the base station). The first five forms of registration, as a group, are called class C registration and are enabled by roaming status for any MIN (see 6.6.5.3). Autonomous parameter-change registration is independent of MIN roaming status. Ordered registration is initiated by the base station through an *Order Message*. Implicit registration does not involve the exchange of any registration messages between the base station and the mobile station. While a mobile station is assigned a Traffic Channel, the base station can obtain registration information by using the *Status Request Order* to obtain *Status Messages* from the mobile station. The mobile station can be notified that it is registered through the *Mobile Station Registered Message*.

Any of the various forms of autonomous registration can be enabled or disabled. The forms of registration that are enabled and the corresponding registration parameters are communicated in the *System Parameters Message*.

In addition, the mobile station may enable or disable class C registration for each MIN for each type of roaming described in 6.6.5.3.

1   6.6.5.1.1 Power-Up Registration

2   Power-up registration is performed when the mobile station is turned on. So that a mobile
3   station is not continually registering when power is quickly turned on and off, the mobile
4   station delays T_{57m} seconds before registering after entering the *Mobile Station Idle State*.

5   The mobile station shall maintain a power-up/initialization timer. While the power-
6   up/initialization timer is active, the mobile station shall not make registration access
7   attempts.

8   When power-up registration is performed, the mobile station shall perform an initial
9   registration (see 6.6.5.4).

10   6.6.5.1.2 Power-Down Registration

11   Power-down registration is performed when the user directs the mobile station to power off.
12   If power-down registration is performed, the mobile station does not power down until after
13   completing the registration attempt.

14   The mobile station shall not perform power-down registration if it has not previously
15   registered with the current base station.

16   When power-down registration is performed, the mobile station shall perform a registration
17   update (see 6.6.5.4). The *Registration Update Message* shall not contain any added or
18   deleted MINs.

19   6.6.5.1.3 Timer-Based Registration

20   Timer-based registration causes the mobile station to register at regular intervals. Its use
21   also allows the system to automatically deregister mobile stations that did not perform a
22   successful power-down registration. Timer-based registration uses a Paging Channel slot
23   counter (equivalent to a timer with time increments of 200 ms). Timer-based registration is
24   performed when the counter reaches a maximum value (REG_COUNT_MAX$_S$) that is
25   controlled by the base station via the REG_PRD field of the *System Parameters Message*.
26   The base station disables timer-based registration by setting REG_PRD to zero.

27   The counter is reset on power-up and when switching from analog or alternate serving
28   systems.   The counter is also reset after each successful system access (implicit
29   registration).

30   The mobile station shall maintain a timer-based registration counter (REG_COUNT$_S$). The
31   mobile station shall compute and store the timer expiration count (REG_COUNT_MAX$_S$) as

32   $$REG\_COUNT\_MAX_S = \lfloor 2^{REG\_PRD/4} \rfloor.$$

33   The mobile station shall maintain an indicator of timer-based registration timer enable
34   status (COUNTER_ENABLED$_S$).

35   Whenever the mobile station changes COUNTER_ENABLED$_S$ from NO to YES, it shall set
36   REG_COUNT$_S$ to a pseudorandom value between 0 and REG_COUNT_MAX$_S$-1, using the
37   pseudorandom number generator specified in 6.6.7.2.

38   If the mobile station is operating in the non-slotted mode, it shall increment the timer-
39   based registration counter once per 200 ms whenever COUNTER_ENABLED$_S$ equals YES.

1 If the mobile station is operating in slotted mode, it may increment the timer-based
2 registration counter when it begins to monitor the Paging Channel (see 6.6.2.1.1.3). A
3 mobile station operating in the slotted mode shall increment the counter by the same
4 amount that the counter would have been incremented if the mobile station had been
5 operating in the non-slotted mode.[23]

6 ### 6.6.5.1.4 Distance-Based Registration

7 Distance-based registration causes a mobile station to register when the distance between
8 the current base station and the base station in which it last registered exceeds a
9 threshold. The mobile station determines that it has moved a certain distance by
10 computing a distance measure based on the difference in latitude and longitude between
11 the current base station and the base station where the mobile station last registered. If
12 this distance measure exceeds the threshold value, the mobile station registers.

13 The mobile station stores the base station latitude ($BASE\_LAT\_REG_{s-p}$), the base station
14 longitude ($BASE\_LONG\_REG_{s-p}$) and the registration distance ($REG\_DIST\_REG_{s-p}$), of the
15 base station whose Access Channel was used for the mobile station's last registration (see
16 6.3.4). The mobile station shall compute the current base station's distance from the last
17 registration point (DISTANCE) as:

$$DISTANCE = \left\lfloor \frac{\sqrt{(\Delta lat)^2 + (\Delta long)^2}}{16} \right\rfloor,$$

19 where

$$\Delta lat = BASE\_LAT_s - BASE\_LAT\_REG_{s-p}$$

$$\Delta long = (BASE\_LONG_s - BASE\_LONG\_REG_{s-p}) \times \cos(\pi/180 \times BASE\_LAT\_REG_{s-p}/14400).$$

22 The mobile station shall compute DISTANCE with an error of no more than ±5% of its true
23 value when $|BASE\_LAT\_REG_{s-p}/14400|$ is less than 60 and with an error of no more than
24 ±7% of its true value when $|BASE\_LAT\_REG_{s-p}/14400|$ is between 60 and 70.[24]

25 ### 6.6.5.1.5 Zone-Based Registration

26 Zones are groups of base stations within a given system and network. A base station's zone
27 assignment is identified by the REG_ZONE field of the *System Parameters Message*.

28 Zone-based registration causes a mobile station to register whenever it moves into a new
29 zone not on its internally stored list of visited registration zones. A zone is added to the list
30 whenever a registration (including implicit registration) occurs, and is deleted upon
31 expiration of a timer. After a system access, timers are enabled for every zone except one
32 that was successfully registered by the access. Timers are also enabled at the start of a
33 call.

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[23]For example, if the mobile station uses a 2 second slot cycle, then it may increment the counter by 10 every time it becomes active.

[24]BASE_LAT and BASE_LONG are given in units of 1/4 seconds. BASE_LAT/14400 and BASE_LONG/14400 are in units of degrees. There are several simple methods that provide the required accuracy and avoid explicitly taking the cosine and the square root.

A mobile station can be registered in more than one zone. Zones are uniquely identified by a zone number (REG_ZONE) plus the SID and NID of the zone.

The mobile station shall store a list of the zones in which the mobile station has registered ($ZONE\_LIST_s$). Each entry in $ZONE\_LIST_s$ shall include the zone number (REG_ZONE) and the (SID, NID) pair for the zone. The mobile station shall be capable of storing at least N_{9m} entries in $ZONE\_LIST_s$. A base station shall be considered to be in $ZONE\_LIST_s$ only if the base station's REG_ZONE, SID and NID are found in an entry in $ZONE\_LIST_s$. The mobile station provides storage for one entry of $ZONE\_LIST_s$ in semi-permanent memory, $ZONE\_LIST_{s-p}$ (see 6.3.4).

The mobile station shall maintain a zone list entry timer for each entry in $ZONE\_LIST_s$. When an entry in $ZONE\_LIST_s$ is removed from the list, the corresponding zone list entry timer shall be disabled. The timer duration shall be as determined from the stored value of $ZONE\_TIMER_s$ using Table 7.7.2.3.2.1-1. The mobile station shall provide a means to examine each timer's value while the timer is active, so that the age of list entries can be compared.

The base station controls the maximum number of zones in which a mobile station may be considered registered, by means of the TOTAL_ZONES field of the *System Parameters Message*. When an entry is added to the zone list, or if TOTAL_ZONES is decreased, the mobile station removes entries from the zone list if there are more entries than allowed by the setting of TOTAL_ZONES.

Whenever $ZONE\_LIST_s$ contains more than $TOTAL\_ZONES_s$ entries, the mobile station shall delete the excess entries according to the following rules:

- If $TOTAL\_ZONES_s$ is equal to zero, the mobile station shall delete all entries.

- If $TOTAL\_ZONES_s$ is not equal to zero, the mobile station shall delete those entries having active zone list entry timers (excluding any such entry selected to be retained), starting with the oldest entry, as determined by the timer values, and continuing in order of decreasing age until no more than $TOTAL\_ZONES_s$ entries remain.

The mobile station shall store a list of the systems/networks in which the mobile station has registered ($SID\_NID\_LIST_s$). Each entry in $SID\_NID\_LIST_s$ shall include the (SID, NID) pair for the system/network. The mobile station shall be capable of storing at least N_{10m} entries in $SID\_NID\_LIST_s$. A base station shall be considered to be in the $SID\_NID\_LIST_s$ only if the base station's SID and NID are found in an entry in $SID\_NID\_LIST_s$. The mobile station shall provide storage for one entry of $SID\_NID\_LIST_s$ in semi-permanent memory ($SID\_NID\_LIST_{s-p}$).

The mobile station shall maintain a SID/NID list entry timer for each entry in $SID\_NID\_LIST_s$. When an entry in $SID\_NID\_LIST_s$ is removed from the list, the corresponding SID/NID list entry timer shall be disabled. The timer duration shall be as determined from the stored value of $ZONE\_TIMER_s$ using Table 7.7.2.3.2.1-1. The mobile station shall provide a means to examine each timer's value while the timer is active, so that the age of list entries can be compared.

Whenever $SID\_NID\_LIST_s$ contains more than N_{10m} entries, the mobile station may delete the excess entries according to the following rule:

- The mobile station shall delete those entries having active SID/NID list entry timers, starting with the oldest entry, as determined by the timer values, and continuing in order of decreasing age.

When zone-based registration is performed, the mobile station may perform a registration update (see 6.6.5.4) if SID_NID_LIST$_S$ contains an entry with the current base station's SID and NID (SID$_S$ and NID$_S$); otherwise, the mobile station shall perform an initial registration (see 6.6.5.4).

6.6.5.1.6 Parameter-Change Registration

Parameter-change registration is performed when a mobile station modifies any of the following stored parameters:

- The preferred slot cycle index

- The station class mark

- An active MIN's home SID

- The list of active MINs (adding or deleting a MIN)

Parameter-change registration is independent of the roaming status of any MINs associated with the mobile station.[25]

Whenever a parameter changes, the mobile station shall delete all entries from SID_NID_LIST$_S$. When parameter-change registration is performed, the mobile station shall perform an initial registration (see 6.6.5.4).

6.6.5.1.7 Ordered Registration

The base station can command the mobile station to register by sending a *Registration Request Order*. Ordered registration is performed in the *Mobile Station Order and Message Processing Operation* (6.6.2.4). Requirements are specified in 6.6.5.6.2.3.

6.6.5.1.8 Implicit Registration

Whenever an access is completed, the base station can infer the location of the mobile station. This is treated as an implicit registration. Requirements are specified in 6.6.5.6.3.

6.6.5.1.9 Traffic Channel Registration

While a mobile station is assigned a Traffic Channel, the mobile station is notified that it is registered through the *Mobile Station Registered Message*. Requirements are specified in 6.6.5.6.4.3.

6.6.5.2 Systems and Networks

A base station is a member of a cellular system and a network. A network is a subset of a system.

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[25]The indicator C_REG_ENABLED does not govern parameter-change registration.

1 Systems are labeled with an identification called the system identification or SID; networks
2 within a system are given a network identification or NID. A network is uniquely identified
3 by the pair (SID, NID). The NID number 0 is a reserved value indicating all base stations
4 that are not included in a specific network. The NID number 65535 (2^{16}-1) is a reserved
5 value the mobile station may use for roaming status determination (see 6.6.5.3) to indicate
6 that the mobile station considers the entire SID (regardless of NID) as home.

7 Figure 6.6.5.2-1 shows an example of systems and networks. SID i contains three
8 networks labeled t, u, and v. A base station in system i that is not in one of these three
9 networks is in NID 0.

10
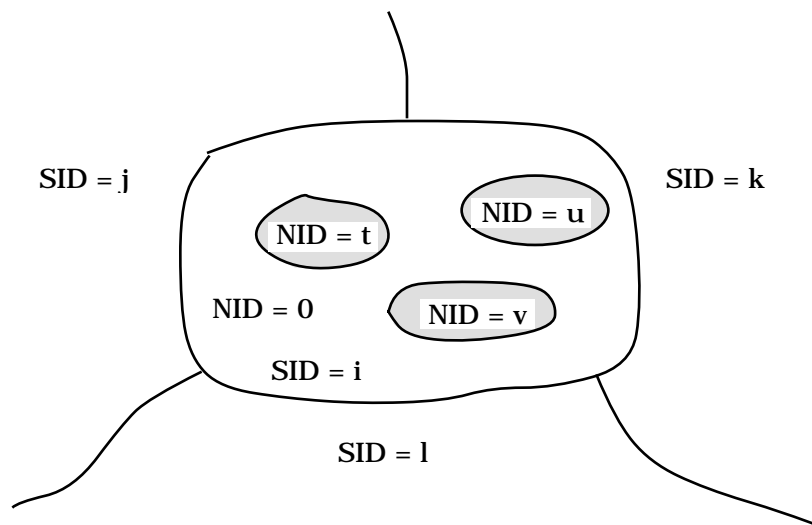
Figure 6.6.5.2-1. Systems and Networks Example

13

14 6.6.5.3 Roaming MINs

15 The concept of roaming applies individually to each mobile station identification number
16 (MIN) that is active in a mobile station. The mobile station, identified by the electronic
17 serial number (ESN), may have one or more MINs associated with it. In addition, the same
18 MIN can be entered into multiple mobile stations.[26] The mobile station informs the base
19 station of these MINs during the registration process. Since neither the ESN nor the MIN
20 directly provide a MIN's home system, a means is provided for identifying the home SID,
21 where basic parameters for a particular MIN can be obtained.[27] This SID is given by the
22 HOME_SID parameter, which is transmitted in the *Initial Registration Message* and the
23 *Registration Update Message.*

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[26]Individual systems may or may not allow these capabilities. The management of these capabilities
is a function of the base station and system operator.

[27]This system is where the Home Location Register (HLR) for this MIN is located.

For each MIN associated with the mobile station, the mobile station has a list of one or more home (SID, NID) pairs. A MIN is roaming if the stored (SID_s, NID_s) pair (received in the *System Parameters Message*) does not match one of the MIN's home (SID, NID) pairs. Two types of roaming are defined: A MIN is a foreign NID roamer if the MIN is roaming and there is some (SID, NID) pair in the MIN's (SID, NID) list for which SID is equal to SID_s. A MIN is a foreign SID roamer if there is no (SID, NID) pair in the MIN's (SID, NID) list for which SID is equal to SID_s.[28] The mobile station may use the special NID value 65535 to indicate that the mobile station considers all NIDs within a SID to be home (i.e., that the mobile station is not roaming when operating with any base station in that system).

For each MIN associated with the mobile station, the mobile station shall store three 1-bit parameters in its permanent memory (see 6.3.8). These parameters are MOB_TERM-_HOME$_p$, MOB_TERM_FOR_SID$_p$, and MOB_TERM_FOR_NID$_p$. The mobile station shall set MOB_TERM_HOME$_p$ to '1' if the mobile station is configured to receive mobile station terminated calls when using a home (SID, NID) pair; otherwise MOB_TERM_HOME$_p$ shall be set to '0'. The mobile station shall set MOB_TERM_FOR_SID$_p$ to '1' if the mobile station is configured to receive mobile station terminated calls when it is a foreign SID roamer; otherwise MOB_TERM_FOR_SID$_p$ shall be set to '0'. The mobile station shall set MOB_TERM_FOR_NID$_p$ to '1' if the mobile station is configured to receive mobile station terminated calls when it is a foreign NID roamer; otherwise MOB_TERM_FOR_NID$_p$ shall be set to '0'.

The mobile station determines the registration status for each MIN using these parameters and the HOME_REG, FOR_NID_REG, and FOR_SID_REG fields of the *System Parameters Message*.

The mobile station shall store a mobile station call termination enabled indicator, MOB_TERM$_s$, for each active MIN. The mobile station shall set MOB_TERM$_s$ to YES if any of the following conditions is met for the MIN; otherwise MOB_TERM$_s$ shall be set to NO:

- The MIN is not roaming, and MOB_TERM_HOME$_p$ is equal to '1'; or

- The MIN is a foreign NID roamer and MOB_TERM_FOR_NID$_p$ is equal to '1'; or

- The MIN is a foreign SID roamer and MOB_TERM_FOR_SID$_p$ is equal to '1'.

The mobile station shall store a registration status indicator, MIN_REG_ENABLED$_s$, for each active MIN. The indicator MIN_REG_ENABLED$_s$ for a MIN shall be set to YES if any of the following conditions is met for the MIN; otherwise MIN_REG_ENABLED$_s$ shall be set to NO:

- The MIN is not roaming, and both HOME_REG$_s$ and MOB_TERM_HOME$_p$ are equal to '1'; or

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[28]For example, suppose a mobile station has the following SID, NID list (2, 3) (2, 0) (3, 1). If the base station (SID, NID) pair is (2, 3) then the mobile station is not roaming because the (SID, NID) pair is in the list. If the base station (SID, NID) pair is (2, 7) then the mobile station is a foreign NID roamer because the SID 2 is in the list, but the (SID, NID) pair (2, 7) is not in the list. If the base station (SID, NID) pair is (4, 0) then the mobile station is a foreign SID roamer because SID 4 is not in the list.

1 • The MIN is a foreign NID roamer and both FOR_NID_REG$_s$ and MOB_TERM_FOR-
2 _NID$_p$ are equal to '1'; or

3 • The MIN is a foreign SID roamer and both FOR_SID_REG$_s$ and MOB_TERM_FOR-
4 _SID$_p$ are equal to '1'.

5 The mobile station performs class C registrations if MIN_REG_ENABLED$_s$ is YES for any of
6 the mobile station's active MINs.

7 The mobile station shall store the indicator C_REG_ENABLED$_s$. The mobile station shall
8 set C_REG_ENABLED$_s$ to YES if MIN_REG_ENABLED$_s$ is YES for any active MIN.

9 6.6.5.4 Registration Messages

10 The mobile station sends two types of registration messages to the base station: the *Initial*
11 *Registration Message* and the *Registration Update Message*. The *Initial Registration Message*
12 is sent when performing an initial registration. An initial registration is performed
13 whenever it is necessary to inform the base station of the complete configuration of the
14 mobile station. Any registration that is not an initial registration is a registration update.
15 The *Registration Update Message* is sent for a registration update, such as when the mobile
16 station adds or deletes a MIN or registers without changing the list of MINs. The
17 *Registration Update Message* is also sent as a continuation of an initial registration when
18 the complete list of MINs does not fit into a single *Initial Registration Message*.

19 The first registration sent after power-up or after the serving system is changed shall be an
20 initial registration.

21 When the mobile station performs an initial registration, all active MINs shall be included in
22 the registration. The first registration message sent shall be an *Initial Registration Message*.
23 If the mobile station cannot fit the entire set of MINs into the *Initial Registration Message*, it
24 shall send the *Initial Registration Message*, followed by one or more *Registration Update*
25 *Messages* with the additional MINs. If an initial registration is incomplete (i.e., if not all
26 MINs are registered), the next registration performed by the mobile station, if not a power-
27 down registration, shall also be an initial registration

28 When the mobile station performs a registration update, it shall send a *Registration Update*
29 *Message*. If the mobile station adds or deletes multiple MINs and cannot fit the entire set of
30 MIN changes into one *Registration Update Message*, it shall send additional *Registration*
31 *Update Messages* as needed.

32 6.6.5.5 Registration Timers and Indicators

33 The mobile station shall provide the following registration timers:

34 • Power-up/initialization timer (see 6.6.5.1.1).

35 • Timer-based registration timer (see 6.6.5.1.3).

36 • Zone list entry timers (see 6.6.5.1.5).

37 • SID/NID list entry timers (see 6.6.5.1.5).

The mobile station shall provide a means of enabling and disabling each timer. When a timer is disabled, it shall not be considered expired. A timer that has been enabled is referred to as active.

6.6.5.6 Registration Procedures

6.6.5.6.1 Actions in the *Mobile Station Initialization State*

6.6.5.6.1.1 Power-up or Serving System Change

Upon power-up, the mobile station shall perform the following actions:

- Delete all entries of ZONE_LIST$_s$.

- If ZONE_LIST$_{s-p}$ contains an entry, copy the entry to ZONE_LIST$_s$ and disable the corresponding entry timer.

- Delete all entries of SID_NID_LIST$_s$.

- If SID_NID_LIST$_{s-p}$ contains an entry, copy the entry to SID_NID_LIST$_s$ and disable the corresponding entry timer.

Upon power-up or after switching from analog or the alternate CDMA serving system, the mobile station shall perform the following actions:

- Set timer-based registration enable status (COUNTER_ENABLED$_s$) to NO.

- Set class C registration enable status (C_REG_ENABLED$_s$) to NO.

- Disable all registration timers (see 6.6.5.5).

6.6.5.6.1.2 Timer Maintenance

While in the *Mobile Station Initialization State*, the mobile station shall update all active registration timers (see 6.6.5.5). If any timer expires while in this state, the mobile station shall preserve the expiration status so that further action can be taken in the *Mobile Station Idle State*.

6.6.5.6.1.3 Entering the *Mobile Station Idle State*

Before entering the *Mobile Station Idle State*, the mobile station shall perform the following actions:

- Set the stored message sequence numbers CONFIG_MSG_SEQ$_S$, SYS_PAR_MSG-_SEQ$_S$, NGHBR_LST_MSG_SEQ$_S$, CHAN_LST_MSG_SEQ$_S$, and ACC_MSG_SEQ$_S$ variables to NULL (see 6.6.2.2).

- If SID_NID_LIST$_s$ is empty, enable the power-up/initialization timer with an expiration time of T$_{57m}$ seconds (see 6.6.5.1.1).

6.6.5.6.2 Actions in the *Mobile Station Idle State*

Requirements in this section and its subsections apply only when the mobile station is in the *Mobile Station Idle State.*

1 6.6.5.6.2.1 Idle Registration Procedures

2 These procedures are performed whenever the mobile station is in the *Mobile Station Idle*
3 *State* (see 6.6.2.1.3).

4 While in the *Mobile Station Idle State*, the mobile station shall update all active registration
5 timers (see 6.6.5.5).

6 If the power-up/initialization timer has expired or is disabled, the mobile station shall
7 perform the following actions in the order given; except that if any action causes a
8 registration to be performed, the remaining actions, if any, shall not be performed and the
9 mobile station shall enter the *Update Overhead Information Substate* of the *System Access*
10 *State* (see 6.6.3) with a registration indication.

11   1.   The timer-based registration timer shall be enabled (COUNTER_ENABLED$_S$=YES)
12   and the timer count (REG_COUNT$_S$) shall be set to a pseudorandom number as
13   specified in 6.6.5.1.3, if the following conditions are met:

14   a.   COUNTER_ENABLED$_S$ is equal to NO; and

15   b.   The stored configuration parameters are current (see 6.6.2.2); and

16   c.   C_REG_ENABLED$_S$ is equal to YES; and

17   d.   REG_PRD$_S$ is not equal to zero.

18   2.   If any zone list entry timer (see 6.6.5.1.5) has expired, the mobile station shall
19   delete the corresponding entry from ZONE_LIST$_S$.

20   3.   If any SID/NID list entry timer (see 6.6.5.1.5) has expired, the mobile station shall
21   delete the corresponding entry from SID_NID_LIST$_S$.

22   4.   The mobile station shall perform power-up registration, as specified in 6.6.5.1.1, if
23   all the following conditions are met:

24   a.   POWER_UP_REG$_S$ is equal to '1'; and

25   b.   The stored configuration parameters are current (see 6.6.2.2); and

26   c.   SID_NID_LIST$_S$ is empty; and

27   d.   C_REG_ENABLED$_S$ is equal to YES.

28   5.   The mobile station shall perform parameter-change registration (see 6.6.5.1.6) if all
29   the following conditions are met:

30   a.   PARAMETER_REG$_S$ is equal to '1'; and

31   b.   The stored configuration parameters are current (see 6.6.2.2); and

32   c.   There is no entry of SID_NID_LIST$_S$ whose SID and NID fields match the stored
33   SID$_S$ and NID$_S$.

34   6.   The mobile station shall perform timer-based registration (see 6.6.5.1.3) if all the
35   following conditions are met:

36   a.   COUNTER_ENABLED$_S$ is equal to YES; and

b. The stored configuration parameters are current (see 6.6.2.2); and

c. $C\_REG\_ENABLED_S$ is equal to YES; and

d. REG_COUNT_S is greater than or equal to $REG\_COUNT\_MAX_S$.

7. The mobile station shall perform distance-based registration (see 6.6.5.1.4) if all the following conditions are met:

a. REG_DIST_S is not equal to zero; and

b. The stored configuration parameters are current (see 6.6.2.2); and

c. $C\_REG\_ENABLED_S$ is equal to YES; and

d. The current base station's distance from the base station in which the mobile station last registered (see 6.6.5.1.4) is greater than or equal to $REG\_DIST\_REG_{S-p}$.

8. The mobile station shall perform zone-based registration (see 6.6.5.1.5) if all the following conditions are met:

a. $TOTAL\_ZONES_S$ is not equal to zero; and

b. The stored configuration parameters are current (see 6.6.2.2); and

c. $C\_REG\_ENABLED_S$ is equal to YES; and

d. There is no entry of $ZONE\_LIST_S$ whose SID, NID and REG_ZONE fields match the stored SID_S, NID_S and REG_ZONE_S.

6.6.5.6.2.2 Processing the Registration Fields of the *System Parameters Message*

When the mobile station processes the *System Parameters Message*, it shall perform the following actions:

1. If REG_PRD_S is equal to zero, the mobile station shall set $COUNTER\_ENABLED_S$ to NO.

2. If REG_PRD_S is not equal to zero, the mobile station shall set $REG\_COUNT\_MAX_S$ as specified in 6.6.5.1.3.

3. The mobile station shall update MIN roaming status and set $C\_REG\_ENABLED_S$ as specified in 6.6.5.3.

4. If $ZONE\_LIST_S$ contains more than $TOTAL\_ZONES_S$ entries, the mobile station shall delete the excess entries according to the rules specified in 6.6.5.1.5.

6.6.5.6.2.3 Ordered Registration

Ordered registration is performed after receiving a *Registration Request Order* while in the *Mobile Station Order and Message Processing Operation* (see 6.6.2.4).

If the ORDQ field is '00000001', then the mobile station shall perform an initial registration (see 6.6.5.4). If the ORDQ field is '00000010', then the mobile station shall perform a registration update (see 6.6.5.4). The mobile station shall enter the *Update Overhead*

1   *Information Substate* of the *System Access State* with a registration indication within T_{33m}
2   seconds after the *Registration Request Order* is received.

3   6.6.5.6.2.4 Power Down

4   These procedures are performed when the mobile station is directed by the user to power
5   down.

6   If $POWER\_UP\_REG_S$ is equal to '0', the mobile station shall perform the following actions:

7   • If an entry of $ZONE\_LIST_S$ does not have an active timer, copy that entry to
8      $ZONE\_LIST_{s-p}$; otherwise, delete any entry in $ZONE\_LIST_{s-p}$.

9   • If an entry of $SID\_NID\_LIST_S$ does not have an active timer, copy that entry to
10      $SID\_NID\_LIST_{s-p}$; otherwise, delete any entry in $SID\_NID\_LIST_{s-p}$.

11   If $POWER\_UP\_REG_S$ is equal to '1', the mobile station shall delete all entries from
12    $ZONE\_LIST_{s-p}$ and $SID\_NID\_LIST_{s-p}$.

13   The mobile station shall perform power-down registration, as specified in 6.6.5.1.2, if all the
14   following conditions are met:

15   • $C\_REG\_ENABLED_S$ equals YES; and

16   • $POWER\_DOWN\_REG_S$ equals '1'; and

17   • There is an entry of $SID\_NID\_LIST_S$ for which the SID and NID fields are equal to
18   SID_S and NID_S; and

19   • The power-up/initialization timer (see 6.6.5.1.1) is disabled or has expired.

20   6.6.5.6.3 Actions in the *System Access State*

21   Requirements in this section and its subsections apply only when the mobile station is in
22   the *System Access State.*

23   6.6.5.6.3.1 Successful Access

24   These procedures are performed after the mobile station receives an acknowledgement for a
25   probe sent on the Access Channel (see 6.6.3.1.2).

26   The mobile station shall perform the following actions:

27   • Disable the power-up/initialization timer (see 6.6.5.1.1).

28   • Set the First-Idle ID status to enabled (see 2.6.1.1).

29   • Set REG_COUNT_S to zero.

30   • Add REG_ZONE_S, SID_S, and NID_S to $ZONE\_LIST_S$ if not already in the list.

31   • Disable the zone list entry timer for the entry of $ZONE\_LIST_S$ containing REG_ZONE_S,
32   SID_S, and NID_S. For any other entry of $ZONE\_LIST_S$ whose entry timer is not active,
33   enable the entry timer with the duration specified by $ZONE\_TIMER_S$ (see 6.6.5.1.5).

34   • If $ZONE\_LIST_S$ contains more than $TOTAL\_ZONES_S$ entries, delete the excess entries
35   according to the rules specified in 6.6.5.1.5.

1 • Add SID_s and NID_s to $SID\_NID\_LIST_s$ if not already in the list.

2 • Disable the SID/NID list entry timer for the entry of $SID\_NID\_LIST_s$ containing SID_s,
3   and NID_s. For any other entry of $SID\_NID\_LIST_s$ whose entry timer is not active,
4   enable the entry timer with the duration specified in 6.6.5.1.5.

5 • If $SID\_NID\_LIST_s$ contains more than N_{10m} entries, the mobile station may delete the
6   excess entries according to the rules specified in 6.6.5.1.5.

7 • Set the stored location of last registration ($BASE\_LAT\_REG_{s-p}$ and BASE_LONG-
8    $\_REG_{s-p}$) to the current base station's location ($BASE\_LAT_s$ and $BASE\_LONG_s$). Set
9   the stored registration distance ($REG\_DIST\_REG_{s-p}$) to the current base station's
10   registration distance (REG_DIST_s).

11 • Update MIN roaming status and set $C\_REG\_ENABLED_s$ and MOB_TERM_s as
12   specified in 6.6.5.3.

13 6.6.5.6.3.2 Unsuccessful Access

14 These procedures are performed when an access attempt fails.

15 The mobile station shall perform the following actions:

16 • If there is an entry of $ZONE\_LIST_s$ whose entry timer is not active, enable the entry
17   timer with the duration specified by $ZONE\_TIMER_s$ (see 6.6.5.1.5).

18 • If there is an entry of $SID\_NID\_LIST_s$ whose entry timer is not active, enable the entry
19   timer with the duration specified in 6.6.5.1.5.

20 6.6.5.6.3.3 Power Down

21 These procedures are performed when the mobile station is directed by the user to power
22 down.

23 If $POWER\_UP\_REG_s$ is equal to '0', the mobile station shall perform the following actions:

24 • If an entry of $ZONE\_LIST_s$ does not have an active timer, copy that entry to
25   $ZONE\_LIST_{s-p}$; otherwise, delete any entry in $ZONE\_LIST_{s-p}$.

26 • If an entry of $SID\_NID\_LIST_s$ does not have an active timer, copy that entry to
27   $SID\_NID\_LIST_{s-p}$; otherwise, delete any entry in $SID\_NID\_LIST_{s-p}$.

28 If $POWER\_UP\_REG_s$ is equal to '1', the mobile station shall delete all entries from
29 $ZONE\_LIST_{s-p}$ and $SID\_NID\_LIST_{s-p}$.

30 6.6.5.6.4 Actions in the *Mobile Station Control on the Traffic Channel State*

31 Requirements in this section and its subsections apply only when the mobile station is in
32 the *Mobile Station Control on the Traffic Channel State.*

33 6.6.5.6.4.1 Call Initiation

34 Upon entering the *Mobile Station Control on the Traffic Channel State*, the mobile station
35 shall set $COUNTER\_ENABLED_s$ to NO.

1   6.6.5.6.4.2 Timer Maintenance

2   While in the *Mobile Station Control on the Traffic Channel State*, the mobile station shall
3   update all active registration timers.

4   If a zone list entry timer expires, the mobile station shall delete the corresponding entry
5   from $ZONE\_LIST_s$. If a SID/NID list entry timer expires, the mobile station shall delete the
6   corresponding entry from $SID\_NID\_LIST_s$.

7   6.6.5.6.4.3 Processing the *Mobile Station Registered Message*

8   The mobile station receives the *Mobile Station Registered Message* on the Forward Traffic
9   Channel when the mobile station is considered registered for the base station whose
10 location and other parameters are included in the message.

11 The mobile station shall store the following parameters:

12   • System identification ($SID_s=SID_r$)

13   • Network identification ($NID_s=NID_r$)

14   • Registration zone ($REG\_ZONE_s=REG\_ZONE_r$)

15   • Number of registration zones to be retained ($TOTAL\_ZONES_s=TOTAL\_ZONES_r$)

16   • Zone timer length ($ZONE\_TIMER_s=ZONE\_TIMER_r$)

17   • Base station latitude ($BASE\_LAT_s=BASE\_LAT_r$)

18   • Base station longitude ($BASE\_LONG_s=BASE\_LONG_r$)

19   • Registration distance ($REG\_DIST_s=REG\_DIST_r$)

20 The mobile station shall perform the following actions:

21   • Set the First-Idle ID status to enabled (see 2.6.2.1).

22   • Add REG_ZONE_s, SID_s, and NID_s to $ZONE\_LIST_s$ if not already in the list.

23   • Disable the zone list entry timer for the entry of $ZONE\_LIST_s$ containing REG_ZONE_s,
24   SID_s, and NID_s. For any other entry of $ZONE\_LIST_s$ whose entry timer is not active,
25   enable the entry timer with the duration specified by $ZONE\_TIMER_s$ (see 6.6.5.1.5).

26   • If $ZONE\_LIST_s$ contains more than $TOTAL\_ZONES_s$ entries, delete the excess entries
27   according to the rules specified in 6.6.5.1.5.

28   • Add SID_s and NID_s to $SID\_NID\_LIST_s$ if not already in the list.

29   • Disable the SID/NID list entry timer for the entry of $SID\_NID\_LIST_s$ containing SID_s,
30   and NID_s. For any other entry of $SID\_NID\_LIST_s$ whose entry timer is not active,
31   enable the entry timer with the duration specified in 6.6.5.1.5.

32   • If $SID\_NID\_LIST_s$ contains more than N_{10m} entries, the mobile station may delete the
33   excess entries according to the rules specified in 6.6.5.1.5.

- Set the stored location of last registration (BASE_LAT_REG$_{s-p}$ and BASE_LONG-_REG$_{s-p}$) to the base station's location (BASE_LAT$_s$ and BASE_LONG$_s$). Set the stored registration distance (REG_DIST_REG$_{s-p}$) to the base station's registration distance (REG_DIST$_s$).

- Update MIN roaming status and set MOB_TERM$_s$ as specified in 6.6.5.3.

6.6.5.6.4.4 Power Down

These procedures are performed when the mobile station is directed by the user to power down.

If POWER_UP_REG$_s$ is equal to '0', the mobile station shall perform the following actions:

- If an entry of ZONE_LIST$_s$ does not have an active timer, copy that entry to ZONE_LIST$_{s-p}$; otherwise, delete any entry in ZONE_LIST$_{s-p}$.

- If an entry of SID_NID_LIST$_s$ does not have an active timer, copy that entry to SID_NID_LIST$_{s-p}$; otherwise, delete any entry in SID_NID_LIST$_{s-p}$.

If POWER_UP_REG$_s$is equal to '1', the mobile station shall delete all entries from ZONE_LIST$_{s-p}$ and SID_NID_LIST$_{s-p}$.

6.6.6 Handoff Procedures

This section presents an overview and mobile station requirements for handoffs occurring while the mobile station is in the *Mobile Station Control on the Traffic Channel State* (see 6.6.4). Mobile station requirements for handoffs occurring while the mobile station is in the *Mobile Station Idle State* are specified in 6.6.2.1.4.

6.6.6.1 Overview

6.6.6.1.1 Types of Handoff

The mobile station supports the following three handoff procedures while in the *Mobile Station Control on the Traffic Channel State*:

- *Soft Handoff:* A handoff in which the mobile station commences communications with a new base station without interrupting communications with the old base station. Soft handoff can only be used between CDMA Channels having identical frequency assignments. Soft handoff provides diversity of Forward Traffic Channels and Reverse Traffic Channel paths on the boundaries between base stations.

- *CDMA to CDMA Hard Handoff:* A handoff in which the mobile station is transitioned between disjoint sets of base stations, different frequency assignments, or different frame offsets.

- *CDMA to Analog Handoff:* A handoff in which the mobile station is directed from a Forward Traffic Channel to an analog voice channel.

1   6.6.6.1.2 Pilot Sets

2   In the following, the term pilot refers to a Pilot Channel identified by a pilot sequence offset
3   (see 7.1.3.2.1) and a frequency assignment (see 7.1.1.1). A pilot is associated with the
4   Forward Traffic Channels in the same Forward CDMA Channel.

5   Soft handoffs and CDMA to CDMA hard handoffs using the same frequency assignment are
6   typically initiated by the mobile station. The mobile station searches for pilots to detect the
7   presence of CDMA Channels and to measure their strengths. When the mobile station
8   detects a pilot of sufficient strength that is not associated with any of the Forward Traffic
9   Channels assigned to it, it sends a *Pilot Strength Measurement Message* to the base station.
10   The base station can then assign a Forward Traffic Channel associated with that pilot to the
11   mobile station and direct the mobile station to perform a handoff.

12   The pilot search parameters and the rules for *Pilot Strength Measurement Message*
13   transmission are expressed in terms of the following sets of pilots:

14   • *Active Set:* The pilots associated with the Forward Traffic Channels assigned to the
15   mobile station.

16   • *Candidate Set:* The pilots that are not currently in the Active Set but have been
17   received by the mobile station with sufficient strength to indicate that the associated
18   Forward Traffic Channels could be successfully demodulated.

19   • *Neighbor Set:* The pilots that are not currently in the Active Set or the Candidate Set
20   but are likely candidates for handoff.

21   • *Remaining Set:* The set of all possible pilots in the current system on the current
22   CDMA frequency assignment, excluding the pilots in the Neighbor Set, the Candidate
23   Set, and the Active Set.

24   6.6.6.2 Requirements

25   6.6.6.2.1 Pilot Search

26   The base station specifies for each of the above pilot sets the search window (range of PN
27   offsets) in which the mobile station is to search for usable multipath components (i.e.,
28   multipath components that the mobile station can use for demodulation of the associated
29   Forward Traffic Channel) of the pilots in the set.

30   Search performance criteria are defined in the "Recommended Minimum Performance
31   Standards for 800 MHz Wideband Spread Spectrum Dual-Mode Mobile Stations."

1　This search shall be governed by the following:

2　• Active Set and Candidate Set: The search procedures for pilots in the Active Set and
3　　Candidate Set shall be identical. The search window size[29] for each pilot in the
4　　Active Set and Candidate Set shall be the number of PN chips specified in Table
5　　6.6.6.2.1-1 corresponding to SRCH_WIN_A$_S$. The mobile station should center the
6　　search window for each pilot of the Active Set and Candidate Set around the earliest
7　　arriving usable multipath component of the pilot.

8

9　**Table 6.6.6.2.1-1. Searcher Window Sizes**

SRCH_WIN_A SRCH_WIN_N SRCH_WIN_R	Window Size (PN chips)	SRCH_WIN_A SRCH_WIN_N SRCH_WIN_R	Window Size (PN chips)
0	2	8	40
1	4	9	56
2	6	10	80
3	8	11	114
4	10	12	160
5	14	13	226
6	20	14	320
7	28	15	452

10

11　• Neighbor Set: The search window size for each pilot in the Neighbor Set shall be the
12　　number of PN chips specified in Table 6.6.6.2.1-1 corresponding to SRCH_WIN_N$_S$.
13　　The mobile station should center the search window for each pilot in the Neighbor
14　　Set around the pilot's PN sequence offset using timing defined by the mobile station's
15　　time reference (see 6.1.5.1).

16　• Remaining Set: The search window size for each pilot in the Remaining Set shall be
17　　the number of PN chips specified in Table 6.6.6.2.1-1 corresponding to
18　　SRCH_WIN_R$_S$. The mobile station should center the search window for each pilot in
19　　the Remaining Set around the pilot's PN sequence offset using timing defined by the
20　　mobile station's time reference (see 6.1.5.1).

[29]The table defines the entire search range. For example, SRCH_WIN_A$_S$ = 7 corresponds to a 28 PN chip search window or ±14 PN chips around the search window center.

1   6.6.6.2.2 Pilot Strength Measurements

2   The mobile station assists the base station in the handoff process by measuring and
3   reporting the strengths of received pilots.

4   The mobile station shall compute the strength of a pilot by adding the ratios of received
5   pilot energy per chip, E_c, to total received spectral density (noise and signals), I_0, of at most
6   k usable multipath components, where k is the number of demodulating elements
7   supported by the mobile station.

8   6.6.6.2.3 Handoff Drop Timer

9   The mobile station shall maintain a handoff drop timer for each pilot in the Active Set and
10 Candidate Set. The mobile station shall start the timer whenever the strength of the
11 corresponding pilot becomes less than T_DROP_s. The mobile station shall reset and disable
12 the timer if the strength of the corresponding pilot exceeds T_DROP_s. If T_TDROP_s equals
13 zero, the mobile station shall consider the timer expired within 100 ms of enabling it.
14 Otherwise, the mobile station shall consider the timer expired within 10% of the timer
15 expiration value shown in Table 6.6.6.2.3.-1 corresponding to T_TDROP_s. If T_TDROP_s
16 changes, the mobile station shall begin using the new value within 100 ms.

17

18   **Table 6.6.6.2.3-1. Handoff Drop Timer Expiration Values**

T_TDROP	Timer Expiration (seconds)	T_TDROP	Timer Expiration (seconds)
0	0	8	27
1	1	9	39
2	2	10	55
3	4	11	79
4	6	12	112
5	9	13	159
6	13	14	225
7	19	15	319

19

6.6.6.2.4 Pilot PN Phase

The mobile station shall measure the arrival time, PILOT_ARRIVAL, for each pilot reported to the base station. The pilot arrival time shall be the time of occurrence, as measured at the mobile station antenna connector, of the earliest arriving usable multipath component of the pilot. The arrival time shall be measured relative to the mobile station's time reference (see 6.1.5.1) in units of PN chips. The mobile station shall compute the reported pilot PN phase, PILOT_PN_PHASE, as

$$\text{PILOT\_PN\_PHASE} = (\text{PILOT\_ARRIVAL} + (64 \times \text{PILOT\_PN})) \bmod 2^{15},$$

where PILOT_PN is the PN sequence offset index of the pilot (see 7.1.3.2.1).

6.6.6.2.5 Handoff Messages

6.6.6.2.5.1 Processing of Forward Traffic Channel Handoff Messages

If the mobile station receives any of the following messages, then the mobile station shall process the message as described.

1. *Pilot Measurement Request Order:* The mobile station shall send, within T_{56m} seconds, a *Pilot Strength Measurement Message*.

2. *Handoff Direction Message*: The message shall take effect at the following time:

   - If FRAME_OFFSET_r is not equal to FRAME_OFFSET_s and USE_TIME_r equals '0', then the mobile station shall process the message at the first 80 ms boundary (relative to System Time) occurring at least 80 ms after the end of the frame containing the last bit of the message.

   - Otherwise, the message shall take effect at the action time of the message as specified in 6.6.4.1.5.

   When the message takes effect, the mobile station shall perform the following:

   - Update the Active Set in accordance with the *Handoff Direction Message* (see 6.6.6.2.6.1).

   - Discontinue use of all Forward Traffic Channels associated with pilots not listed in the *Handoff Direction Message.*

   - If FRAME_OFFSET_r is not equal to FRAME_OFFSET_s, change the frame offset on both the Forward Traffic Channel and the Reverse Traffic Channel.

   - If the RESET_L2_r is equal to '1', reset the acknowledgement procedures as specified in 6.6.4.1.3.3, and reset the Forward Traffic Channel power control counters as specified in 6.6.4.1.1.1.

   - Use the long code mask specified by the PRIVATE_LCM_r (see 6.3.12.3).

   - Process the ENCRYPT_MODE field as specified in 6.3.12.2.

   - Store the following parameters from the *Handoff Direction Message*:

     - *Handoff Direction Message* sequence number ($\text{HDM\_SEQ}_s = \text{HDM\_SEQ}_r$)

1   •   Pilot detection threshold ($T\_ADD_s = T\_ADD_r$)

2   •   Pilot drop threshold ($T\_DROP_s = T\_DROP_r$)

3   •   Active Set versus Candidate Set comparison threshold ($T\_COMP_s = T\_COMP_r$)

4   •   Drop timer value ($T\_TDROP_s = T\_TDROP_r$)

5   •   Frame offset ($FRAME\_OFFSET_s = FRAME\_OFFSET_r$)

6   3.   *Analog Handoff Direction Message:*   The mobile station shall process the message as
7   specified in 6.6.6.2.9.

8   4.   *Neighbor List Update Message:*   The mobile station shall process the message as
9   specified in 6.6.6.2.6.3.

10 6.6.6.2.5.2 Processing of Reverse Traffic Channel Handoff Messages

11 The mobile station sends the following messages on the Reverse Traffic Channel in support
12 of handoff when its transmitter is enabled and following the receipt of the first *Base Station*
13 *Acknowledgement Order* on the Forward Traffic Channel:

14   1.   *Pilot Strength Measurement Message:*   The mobile station shall send an autonomous
15   *Pilot Strength Measurement Message* whenever any of the following events occur:

16   •   The strength of a Candidate Set, Neighbor Set, or Remaining Set pilot is found to
17   be above T_ADD_s and a *Pilot Strength Measurement Message* carrying this
18   information has not been sent since the last *Handoff Direction Message* was
19   received.

20   •   The strength of a Candidate Set pilot exceeds the strength of an Active Set pilot
21   by T_COMP_s dB and a *Pilot Strength Measurement Message* carrying this
22   information has not been sent since the last *Handoff Direction Message* was
23   received.

24   •   The handoff drop timer of an Active Set pilot has expired and a *Pilot Strength*
25   *Measurement Message* carrying this information has not been sent since the last
26   *Handoff Direction Message* was received.

27   2.   *Handoff Completion Message:*   The mobile station shall send the *Handoff*
28   *Completion Message* within T_{56m} seconds of the action time of a received *Handoff*
29   *Direction Message.*

30 6.6.6.2.6 Set Maintenance

31 6.6.6.2.6.1 Maintenance of the Active Set

32 The mobile station shall support an Active Set size of at least N_{6m} pilots.

33 When the mobile station is first assigned a Forward Traffic Channel, the mobile station
34 shall initialize the Active Set to contain only the pilot associated with the assigned Forward
35 Traffic Channel.   When the mobile station processes a *Handoff Direction Message* it shall
36 replace the Active Set with the pilots listed in the message.

6.6.6.2.6.2 Maintenance of the Candidate Set

The mobile station shall support a Candidate Set size of at least N_{7m} pilots.

When the mobile station is first assigned a Forward Traffic Channel, the mobile station shall initialize the Candidate Set to contain no pilots. The mobile station shall adjust the Candidate Set whenever any of the following events occur:

- If the mobile station detects that the strength of a Neighbor Set pilot or a Remaining Set pilot exceeds T_ADD_s, the mobile station shall add the pilot to the Candidate Set.

- If the mobile station processes a *Handoff Direction Message* which does not list a pilot in the current Active Set, and the handoff drop timer corresponding to that pilot has not expired, the mobile station shall add the pilot to the Candidate Set.

- If the mobile station processes a *Handoff Direction Message* which lists a pilot in the current Candidate Set, the mobile station shall delete the pilot from the Candidate Set.

- If the handoff drop timer corresponding to a Candidate Set pilot expires, the mobile station shall delete the pilot from the Candidate Set.

- If the mobile station adds a pilot to the Candidate Set and the resulting Candidate Set size exceeds the size supported by the mobile station, the mobile station shall delete from the Candidate Set the pilot whose handoff drop timer is closest to expiration. If more than one such pilot exists, the mobile station shall delete one such pilot that has the lowest strength. If no pilot in the Candidate Set has an enabled handoff drop timer, the mobile station shall delete from the Candidate Set one of the pilots that has the lowest strength.

6.6.6.2.6.3 Maintenance of the Neighbor Set

The mobile station shall support a Neighbor Set size of at least N_{8m} pilots.

When the mobile station is first assigned a Forward Traffic Channel, the mobile station shall initialize the Neighbor Set to contain the pilots specified in the most recently received *Neighbor List Message.*

The mobile station shall maintain a counter, AGE_s, for each pilot in the Neighbor Set. The mobile station shall initialize this counter to zero when it moves the pilot from the Active Set or the Candidate Set to the Neighbor Set. The mobile station shall initialize this counter to $NGHBR\_MAX\_AGE_s$ when it moves the pilot from the Remaining Set to the Neighbor Set. The mobile station shall increment AGE_s for each pilot in the Neighbor Set upon receipt of a *Neighbor List Update Message.*

The mobile station shall adjust the Neighbor Set whenever any of the following events occur:

- If the mobile station receives a *Neighbor List Update Message*, it shall perform the following:

    - Increment AGE_s for each pilot in the Neighbor Set.

    - Delete from the Neighbor Set all pilots whose AGE_s exceeds $NGHBR\_MAX\_AGE_s$.

- • Add to the Neighbor Set each pilot named in the message, if it is not already a pilot of the Candidate Set or Neighbor Set. If the mobile station can store in the Neighbor Set only k additional pilots and more than k new pilots were sent in the *Neighbor List Update Message*, the mobile station shall store the first k new pilots listed in the message.

- • If the handoff drop timer of a pilot in the Candidate Set expires, the mobile station shall add the pilot to the Neighbor Set.

- • If the mobile station processes a *Handoff Direction Message* in which a pilot in the Active Set is not listed and the handoff drop timer corresponding to the pilot has expired, the mobile station shall add the pilot to the Neighbor Set.

- • If the mobile station adds a pilot to the Candidate Set and the resulting Candidate Set size exceeds the size supported by the mobile station, the mobile station shall add the deleted Candidate Set pilot to the Neighbor Set (see 6.6.6.2.6.2).

- • If the mobile station detects that the strength of a Neighbor Set pilot exceeds T_ADD_S, the mobile station shall delete the pilot from the Neighbor Set.

- • If the mobile station processes a *Handoff Direction Message* which lists a pilot in the current Neighbor Set, the mobile station shall delete the pilot from the Neighbor Set.

- • If the mobile station adds a pilot to the Neighbor Set and the resulting Neighbor Set size exceeds the size supported by the mobile station, the mobile station shall delete from the Neighbor Set the pilot whose AGE_S is largest. If more than one such pilot exists, the mobile station shall delete one such pilot that has the lowest strength.

6.6.6.2.7 Soft Handoff

6.6.6.2.7.1 Forward Traffic Channel Processing

All Forward Traffic Channels associated with pilots in the Active Set of the mobile station carry identical modulation symbols with the exception of the power control subchannel (see 7.1.3.1.7 and 7.6.6.2.4.2).

When the Active Set contains more than one pilot, the mobile station should provide diversity combining of the associated Forward Traffic Channels. The mobile station shall provide for differential propagation delays from zero to at least 150 μs.

6.6.6.2.7.2 Reverse Traffic Channel Power Control During Soft Handoff

The *Handoff Direction Message* identifies sets of Forward Traffic Channels that carry identical closed loop power control subchannels.

In each power control group containing valid power control bits (see6.1.2.3.2), the mobile station should provide diversity combining of the identical closed loop power control subchannels and shall obtain at most one power control bit from each set of identical closed loop power control subchannels. If the power control bits obtained from all sets are equal to '0', the mobile station shall increase its power as specified in 6.1.2.3.2. If the power control bit obtained from any set is equal to '1', the mobile station shall decrease its power as specified in 6.1.2.3.2.

1   6.6.6.2.7.3 Timing During Soft Handoff

2   The mobile station shall comply with the requirements specified in 6.1.5.1 during soft
3   handoff.

4   6.6.6.2.8 CDMA to CDMA Hard Handoff

5   When the mobile station processes a *Handoff Direction Message* specifying a CDMA to
6   CDMA hard handoff, it shall disable its transmitter, reset the fade timer specified in 6.4.4,
7   and tune to the assigned Forward Traffic Channel. The mobile station shall not enable its
8   transmitter until it receives at least N_{3m} consecutive good frames on the assigned Forward
9   Traffic Channel.

10   If the *Handoff Direction Message* specifies a CDMA frequency assignment different from the
11   current CDMA frequency assignment and an Active Set containing pilots with pilot PN
12   sequence offsets identical to those of the pilots in the current Active Set, the mobile station
13   shall begin monitoring the assigned Forward Traffic Channel within T_{60m} seconds.

14   If the *Handoff Direction Message* specifies a CDMA frequency assignment different from the
15   current CDMA frequency assignment and an Active Set containing a pilot with pilot PN
16   sequence offset not equal to that of any pilot in the current Active Set, the mobile station
17   shall begin monitoring the assigned Forward Traffic Channel within T_{61m} seconds.

18   If the *Handoff Direction Message* specifies a CDMA to CDMA hard handoff using the current
19   CDMA frequency assignment, the mobile station shall begin monitoring the assigned
20   Forward Traffic Channel within T_{62m} seconds.

21   6.6.6.2.9 CDMA to Analog Handoff

22   The base station directs the mobile station to perform a CDMA to Analog handoff by
23   sending an *Analog Handoff Direction Message*.

24   The mobile station shall store the following parameters from the *Analog Handoff Direction*
25   *Message*:

26   • System identification ($SID_s = SID_r$)

27   • Voice mobile station attenuation code ($VMAC_s = VMAC_r$)

28   • Analog voice channel number ($ANALOG\_CHAN_s = ANALOG\_CHAN_r$)

29   • SAT color code ($SCC_s = SCC_r$)

30   • Message encryption mode indicator ($MEM_s = MEM_r$)

31   At the action time specified by the *Analog Handoff Direction Message* (see 6.6.4.1.5), the
32   mobile station shall disable its transmitter. The mobile station shall enable its transmitter
33   on the analog voice channel within T_{63m} seconds.

34   6.6.6.3 Examples

35   The following examples illustrate typical message exchanges between the mobile station
36   and the base station during handoff. Refer to Appendix B for examples of call processing
37   during handoff.

38   Figure 6.6.6.3-1 shows an example of the messages exchanged between the mobile station
39   and the base station during a typical handoff process.

1

2
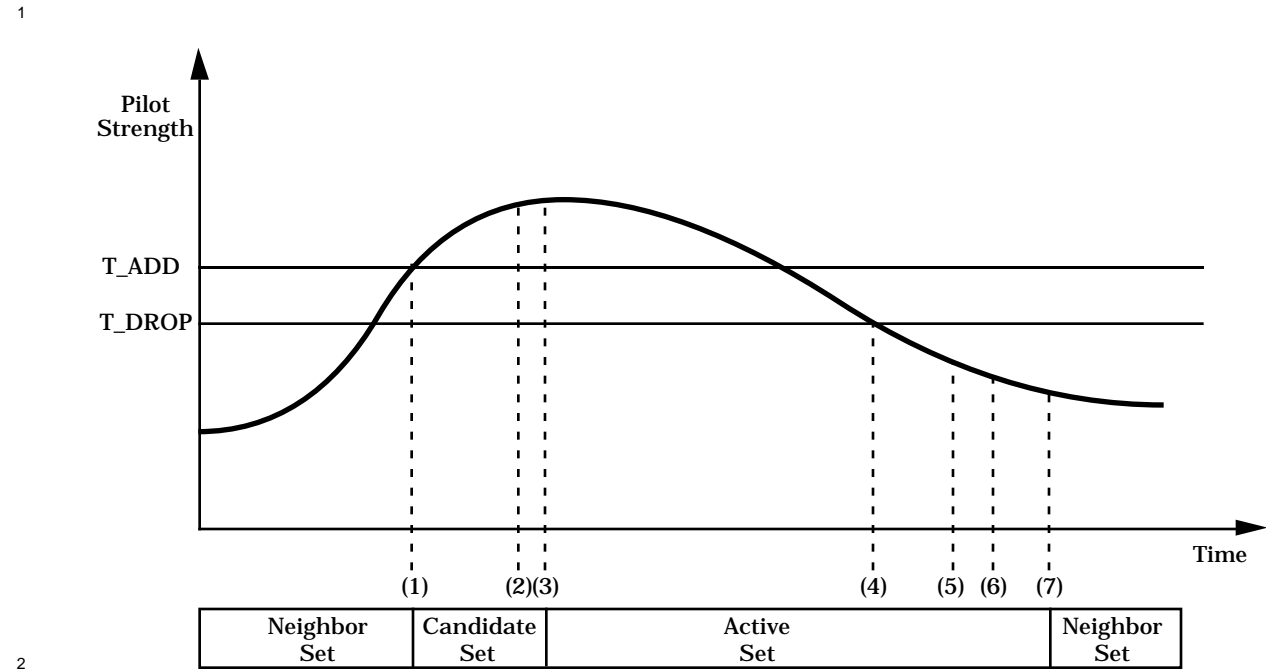
3   (1) Pilot strength exceeds T_ADD. Mobile station sends a *Pilot Strength*
4   *Measurement Message* and transfers pilot to the Candidate Set.

5   (2) Base station sends a *Handoff Direction Message.*

6   (3) Mobile station transfers pilot to the Active Set and sends a *Handoff*
7   *Completion Message.*

8   (4) Pilot strength drops below T_DROP. Mobile station starts the handoff
9   drop timer.

10 (5) Handoff drop timer expires. Mobile station sends a *Pilot Strength*
11   *Measurement Message.*

12 (6) Base station sends a *Handoff Direction Message.*

13 (7) Mobile station moves pilot from the Active Set to the Neighbor Set and
14   sends a *Handoff Completion Message.*

15   **Figure 6.6.6.3-1. Handoff Threshold Example**

Figure 6.6.6.3-2 illustrates the messaging triggered by a pilot of the Candidate Set as its strength gradually rises above the strength of each pilot of the Active Set. Note that the mobile station reports that a Candidate Set pilot is stronger than an Active Set pilot only if the difference between their respective strengths is at least T_COMP.
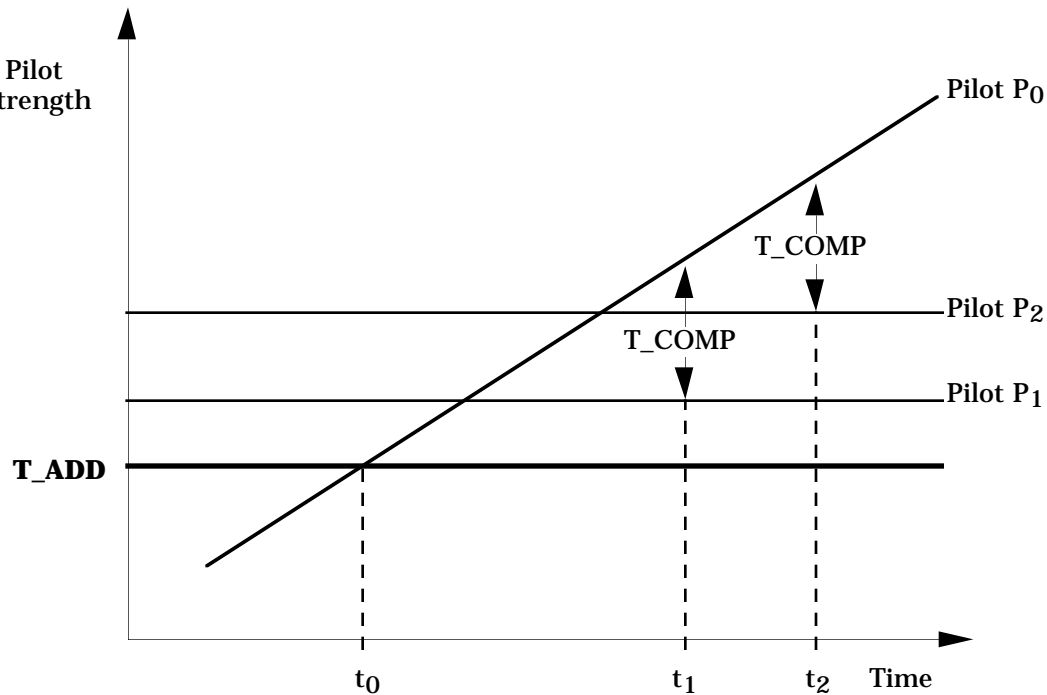
Candidate Set: Pilot P_0

Active Set: Pilots P_1, P_2

t_0 — *Pilot Strength Measurement Message* sent, $P_0 > $ T_ADD

t_1 — *Pilot Strength Measurement Message* sent, $P_0 > P_1 + $ T_COMP

t_2 — *Pilot Strength Measurement Message* sent, $P_0 > P_2 + $ T_COMP

Figure 6.6.6.3-2. Pilot Strength Measurements Triggered by a Candidate Pilot

6.6.7 Hash Functions and Randomization

6.6.7.1 Hash Function

Certain procedures require a uniform distribution of mobile stations among N resources. The following function returns an integer, using as arguments the mobile station's 32-bit ESN, the number of resources N, and a modifier DECORR. The modifier serves to decorrelate the values obtained for the various applications from the same ESN.

1   Define:

2   - Word L to be bits 0-15 of the ESN

3   - Word H to be bits 16-31 of the ESN

4   where bit 0 is the least significant bit of the ESN. The hash value is computed as follows:[30]

5    $$R = \lfloor N \times ((40503 \times (L \oplus H \oplus DECORR)) \bmod 2^{16}) / 2^{16} \rfloor.$$

6   The mobile station shall choose the range N and the 16-bit modifier DECORR according to
7   the application as shown in Table 6.6.7.1-1. In the table, ESN [0...11] denotes the 12 least
8   significant bits of the ESN.

9

10   **Table 6.6.7.1-1. Hash Function Modifier**

Application	N	DECORR	Return Value
CDMA Channel Number	Number of channels in last *CDMA Channel List Message* (up to 10)	0	R + 1
Paging Channel Number	$PAGE\_CHAN_s$ from *System Parameters Message* (up to 7)	$2 \times ESN$ [0...11]	R + 1
Paging Slot Number	640	$6 \times ESN$ [0...11]	R
Access Channel PN Randomization	$2^{PROBE\_PN\_RAN_s}$ where PROBE_PN_RAN is from *Access Parameters Message* (up to 512)	$14 \times ESN$ [0...11]	R

11

12   6.6.7.2 Pseudorandom Number Generator

13   Where pseudorandom numbers are needed in the CDMA cellular protocols, a linear
14   congruential generator shall be used. The mobile station shall implement the linear
15   congruential generator defined by:

16                        $$z_n = a \times z_{n-1} \bmod m$$

17   where $a = 7^5 = 16807$ and $m = 2^{31} - 1 = 2147483647$. z_n is the output of the generator.[31]

---

[30]This formula is adapted from Knuth, D. N., *Sorting and Searching*, vol. 3 of *The Art of Computer Programming*, 3 vols., (Reading, MA: Addison-Wesley, 1973), pp. 508-513.

[31]This generator has full period, ranging over all integers between 1 and m-1; the values 0 and m are never produced. Several suitable implementations can be found in Park, Stephen K. and Miller, Keith W., "Random Number Generators: Good Ones are Hard to Find," *Communications of the ACM*, vol. 31, no. 10, October 1988, pp. 1192-1201.

During the *Mobile Station Initialization State*, the mobile station shall seed its generator with

$$z_0 = (ESN \oplus RANDOM\_TIME) \bmod m$$

where RANDOM_TIME shall be the least-significant 32-bits of SYS_TIME_S stored from the *Sync Channel Message.* If the initial value so produced is found to be zero, it shall be replaced with one. The mobile station shall compute a new z_n for each subsequent use.

The mobile station shall use the value $u_n = z_n / m$ for those applications that require a binary fraction u_n, $0 < u_n < 1$.

The mobile station shall use the value $k_n = \lfloor N \times z_n / m \rfloor$ for those applications that require a small integer k_n, $0 \leq k_n \leq N-1$.

6.7 Signaling Formats

This section describes the messages sent by the mobile station.

Some bits in the following message formats are marked as RESERVED. These bits allow for extensions to the basic message for future features and capabilities. The mobile station sets all reserved bits to '0'.

All messages have a set of acknowledgement fields. These fields are ACK_SEQ, MSG_SEQ, ACK_REQ, and VALID_ACK for Access Channel messages and ACK_SEQ, MSG_SEQ, and ACK_REQ for Reverse Traffic Channel messages.

In any multi-bit field of a signaling message, the most significant bit shall be transmitted first.

6.7.1 Access Channel

This section describes the messages sent by the mobile station on the Access Channel (see 6.1.3.2).

6.7.1.1 Access Channel Structure

An Access Channel slot are (3 + MAX_CAP_SZ) + (1 + PAM_SZ) Access Channel frames in length. An Access Channel slot begins and ends on an Access Channel frame boundary. Access Channel slots begin at Access Channel frames in which

$$t \bmod (4 + \text{MAX\_CAP\_SZ} + \text{PAM\_SZ}) = 0,$$

where t is the System Time in frames. Note that all Access Channels associated with a particular Paging Channel have the same slot size and that all of the slots begin at the same time. Figure 6.7.1.1-1 shows an example of Access Channel slots. Figure 6.7.1.1-2 shows the Access Channel structure.

The Access Channel slot length may differ from base station to base station. A mobile station shall determine the beginning and length of the Access Channel slot prior to transmission.

An Access Channel transmission consists of the Access Channel preamble and the Access Channel message capsule. An Access Channel transmission shall be an integer number of Access Channel frames in length and shall not exceed 4+MAX_CAP_SZ + PAM_SZ Access Channel frames in length.

On each Access Channel transmission, the mobile station shall transmit a preamble consisting of continuous Walsh symbol zero starting at the beginning of the slot (plus PN randomization as specified in 6.6.3.1.1.2) and 1 + PAM_SZ Access Channel frames in length. The mobile station shall transmit an Access Channel message capsule immediately following the preamble.

1

2

AS_n AS_{n+1} AS_{n+2}

Access transmission
max length

| Preamble | Max Capsule Size | Access channel slot of five 20 ms Access Channel frames |

Access
slot
boundary

20 ms Access
Channel frame

AS - Access Slot

Example parameters
MAX_CAP_SZ = 0
PAM_SZ = 1
Access transmission takes full slot

3
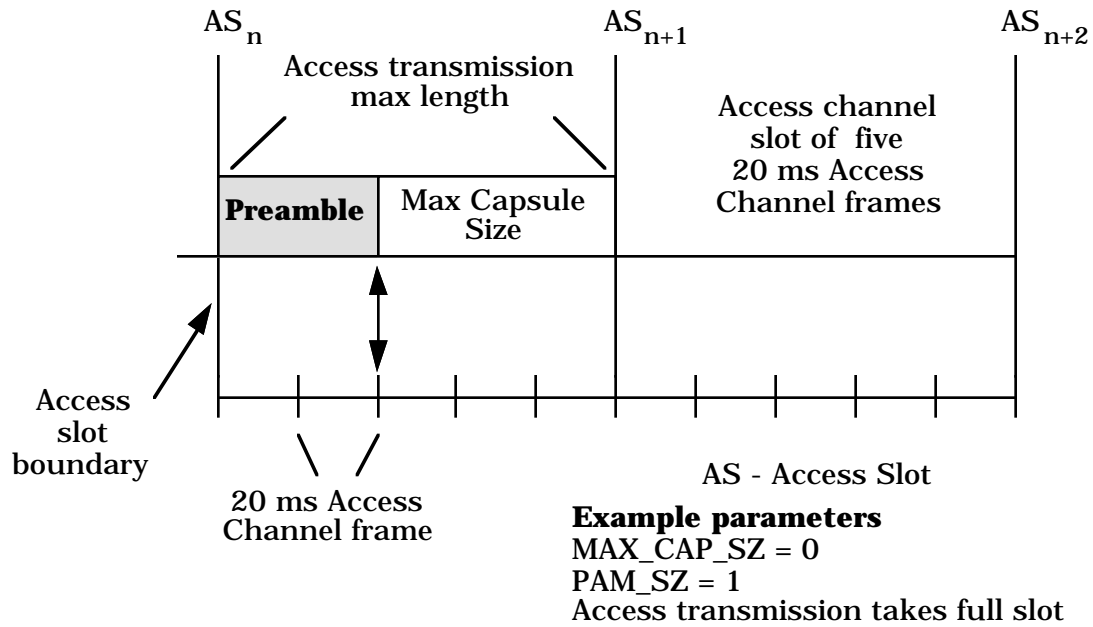
4   **Figure 6.7.1.1-1. Example of Access Channel Slot Structure**
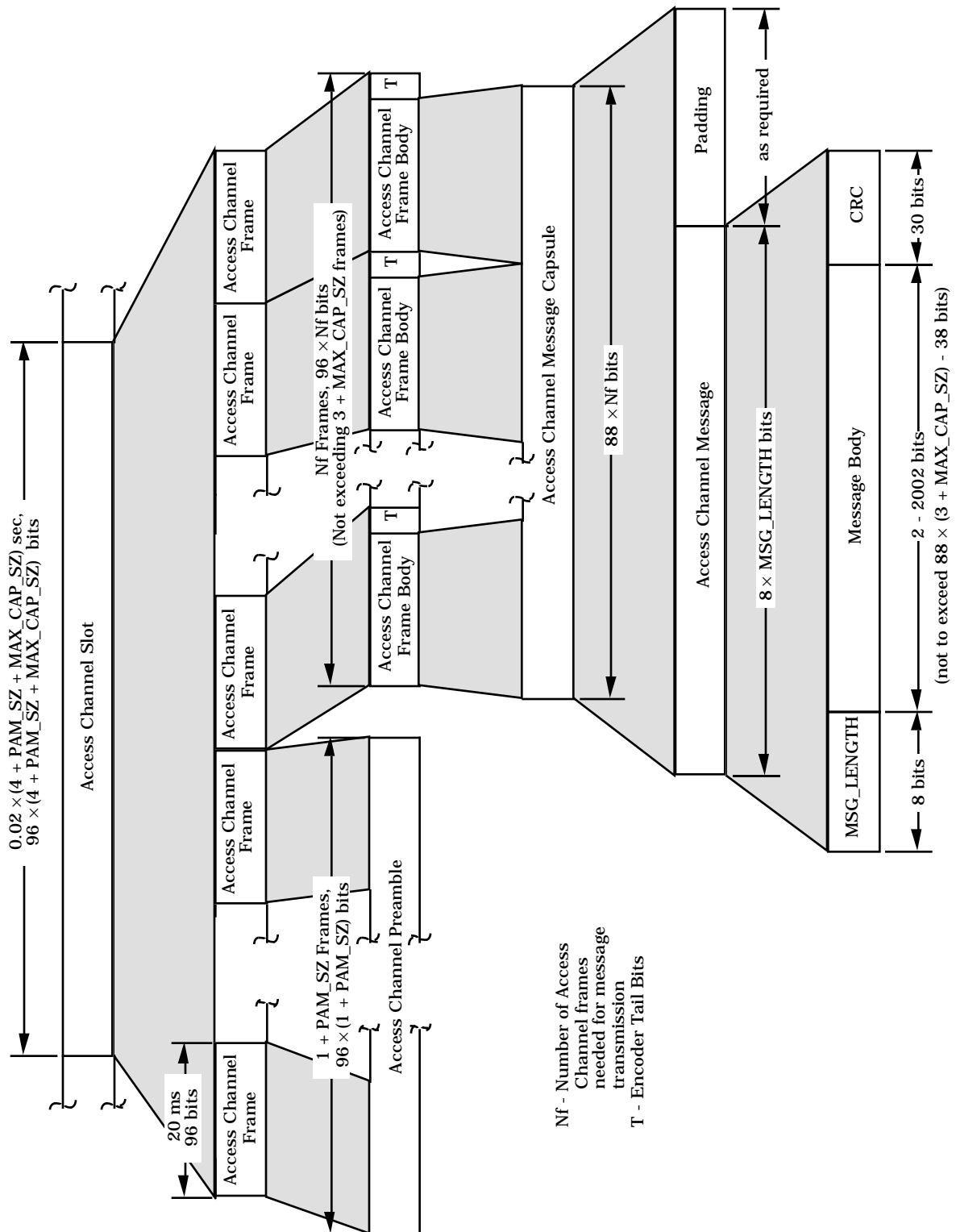
Figure 6.7.1.1-2. Access Channel Structure

1   6.7.1.2 Access Channel Message Structure

2   An Access Channel message capsule consists of an Access Channel message and padding,
3   as shown in Figure 6.7.1.2-1. The length of the Access Channel message capsule shall be
4   an integer number of Access Channel frames given by

5    $$\text{CAP\_SZ} = \left\lceil \frac{8 + \text{MessageBodyLength} + 30}{88} \right\rceil$$

6   where $\lceil x \rceil$ denotes smallest integer equal to or exceeding x.

7   Each Access Channel message shall consist of a length field, a message body, and a CRC,
8   in that order. The message body size shall be selected so that CAP_SZ does not exceed 3 +
9   MAX_CAP_SZ. The mobile station shall transmit the Access Channel message immediately
10   following the preamble.

11   The mobile station shall transmit padding consisting of zero or more '0' bits immediately
12   following the Access Channel message. The length of the padding shall be such that

13   $8 + \text{Message Body Length} + 30 + \text{Padding Length} = 88 \times \text{CAP\_SZ}.$

14
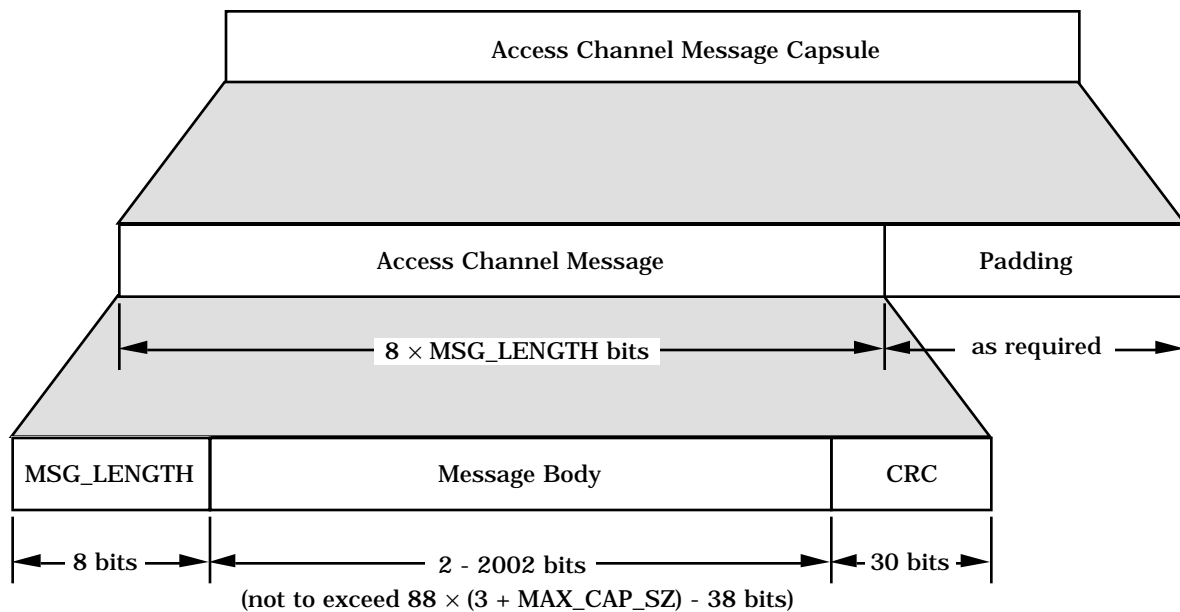
Figure 6.7.1.2-1. Access Channel Message Structure

1   6.7.1.2.1 Access Channel MSG_LENGTH Field

2   The mobile station shall set the MSG_LENGTH field of each Access Channel signaling
3   message to the length of the message in octets, including the MSG_LENGTH field, the
4   message body, and the CRC, but not including the preamble or the padding.   The
5   MSG_LENGTH field shall be 8 bits in length.   The maximum Access Channel message
6   length is therefore 255 octets, or 2040 bits.

7   6.7.1.2.2 Access Channel Message CRC

8   A 30-bit CRC shall be computed for each Access Channel signaling message.   The CRC
9   shall include the MSG_LENGTH field and the message body.   The generator polynomial for
10   the CRC shall be as follows:

11   $$g(x) = x^{30} + x^{29} + x^{21} + x^{20} + x^{15} + x^{13} + x^{12} + x^{11} + x^8 + x^7 + x^6 + x^2 + x + 1.$$

12   The CRC shall be the value computed by the following procedure and the logic shown in
13   Figure 6.7.1.2.2-1:

14   • All shift register elements shall be initialized to logical one.[32]

15   • The switches shall be set in the up position.

16   • The information bit count k shall be defined as 8 + message body length in bits.

17   • The register shall be clocked k times, with the length and message body of the
18   message as the k input bits.

19   • The switches shall be set in the down position.

20   • The register shall be clocked an additional 30 times.

21   • The 30 additional output bits shall be the check bits.

22   • The bits shall be transmitted in the order in which they are calculated.

---

[32]Initialization of the register to ones causes the CRC for all-zero data to be non-zero.

1

2

Figure 6.7.1.2.2-1. Access Channel CRC Calculation

3

4

5

1   6.7.1.3 Access Channel Message Body Format

2   The messages sent on the Access Channel are summarized in Table 6.7.1.3-1.

3

4   **Table 6.7.1.3-1. Access Channel Messages**

Message Name	Message Type (binary)
Initial Registration Message	00000001
Order Message	00000010
Data Burst Message	00000011
Origination Message	00000100
Page Response Message	00000101
Registration Update Message	00000110
Authentication Challenge Response Message	00000111

5

6   6.7.1.3.1 Common Fields

7   6.7.1.3.1.1 Common Fields

8   All Access Channel messages share the same first five fields:

9   ACK_SEQ   -   Acknowledgement sequence number.

10   The mobile station shall set this field to the value of the
11   MSG_SEQ field from the most recently received Paging
12   Channel message requiring acknowledgement. If no such
13   message has been received, the mobile station shall set this
14   field to '111'. See 6.6.2.1.2.

15   MSG_SEQ   -   Message sequence number.

16   The mobile station shall set this field to the message sequence
17   number for this message. See 6.6.3.1.2.

18   ACK_REQ   -   Acknowledgement required indicator. This field indicates
19   whether this message requires an acknowledgement. The
20   mobile station shall set this field to '1'.

21   VALID_ACK -   Valid acknowledgement indicator.

22   To acknowledge a Paging Channel message, the mobile station
23   shall set this field to '1'. Otherwise, the mobile station shall set
24   this field to '0'. See 6.6.2.1.2.

25   ESN   -   Mobile station's electronic serial number.

26   The mobile station shall set this field to its electronic serial
27   number. See 2.3.2.

1   6.7.1.3.1.2 Common Authentication Fields

2   Most Access Channel messages share the same four fields related to authentication:

3   AUTH_MODE   -   Authentication mode.

4   If authentication information is not available, or if the base
5   station has indicated that authentication is not required (by
6   setting the AUTH field in the *Access Parameters Message* to
7   '00'), the mobile station shall set this field to '00'.   If
8   authentication is required by the base station and
9   authentication information is available, the mobile station
10   shall set this field to '01'. All other values are reserved.

11 AUTHR   -   Authentication data.

12   If the AUTH_MODE field is set to '01', the mobile station shall
13   set this field as specified in 6.3.12.1. If the AUTH_MODE field
14   is set to any other value, the mobile station shall omit this
15   field.

16 RANDC   -   Random challenge value.

17   If the AUTH_MODE field is set to '01', the mobile station shall
18   set this field as specified in 6.3.12.1. If the AUTH_MODE field
19   is set to any other value, the mobile station shall omit this
20   field.

21 COUNT   -   Call history parameter.

22   If the AUTH_MODE field is set to '01', the mobile station shall
23   set this field to the current value of the $COUNT_{s-p}$ parameter.
24   If the AUTH_MODE field is set to any other value, the mobile
25   station shall omit this field.

26 6.7.1.3.2 Message Body Contents

27 The following sections specify the contents of the message body for each message that may
28 be sent on the Access Channel.

1   6.7.1.3.2.1 Initial Registration Message

2   When the mobile station sends an *Initial Registration Message*, it shall use the following
3   variable-length message format:

4

Field	Length (bits)
MSG_TYPE ('00000001')	8
ACK_SEQ	2
MSG_SEQ	2
ACK_REQ	1
VALID_ACK	1
ESN	32
AUTH_MODE	2
AUTHR	0 or 18
RANDC	0 or 8
COUNT	0 or 6
REG_TYPE	4
MORE_MINS	1
SLOT_CYCLE_INDEX	3
MOB_CAI_REV	8
SCM	8

One or more occurrences of the following record:

ADD_DEL	1
MIN1	24
MIN2	10
HOME_SID	15
MOB_TERM	1

RESERVED	0 - 7 (as needed)

5

6   MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00000001'.

8   ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.1.3.1.

MSG_SEQ   -   Message sequence number.

See 6.7.1.3.1.

ACK_REQ   -   Acknowledgement required indicator.

See 6.7.1.3.1.

VALID_ACK   -   Valid acknowledgement indicator.

See 6.7.1.3.1.

ESN   -   Mobile station's electronic serial number.

See 6.7.1.3.1.

AUTH_MODE   -   Authentication mode.

See 6.7.1.3.2.

AUTHR   -   Authentication data.

See 6.7.1.3.2.

RANDC   -   Random challenge value.

See 6.7.1.3.2.

COUNT   -   Call history parameter.

See 6.7.1.3.2.

REG_TYPE   -   Registration type.

This field indicates which type of event generated the registration attempt.

The mobile station shall set this field to the REG_TYPE value shown in Table 6.7.1.3.2.1-1 corresponding to the event that caused this registration to occur (see 6.6.5.1).

Table 6.7.1.3.2.1-1. Registration Type (REG_TYPE) Codes

REG_TYPE (binary)	Type of Registration
0000	Timer-based (see 6.6.5.1.3)
0001	Power-up (see 6.6.5.1.1)
0010	Zone-based (see 6.6.5.1.5)
0011	Power-down (see 6.6.5.1.2)
0100	Parameter-change (see 6.6.5.1.6)
0101	Ordered (see 6.6.5.1.7)
0110	Distance-based (see 6.6.5.1.4)
All other REG_TYPE values are reserved.	

MORE_MINS   -   More MINs to follow indicator.

This indicator specifies whether additional MINs are to be sent in later *Registration Update Messages*.

If all MINs actively supported by the mobile station are included in this message, the mobile station shall set this field to '0'. If not, the mobile station shall set this field to '1'.

SLOT_CYCLE_INDEX   -   Slot cycle mode.

If the mobile station is operating in non-slotted mode, it shall set this field to '000'. If the mobile station is operating in slotted mode, it shall set this field to the SLOT_CYCLE_INDEX value in use (see 6.6.2.1.1).

MOB_CAI_REV   -   CAI revision of the mobile station.

The mobile station shall set this field to '00000001'.

SCM   -   Station class mark.

The mobile station shall set this field to its station class mark. See 2.3.3.

The mobile station shall include one occurrence of the following five-field record for each MIN included in this message.

ADD_DEL   -   Add/Delete indicator.

This field indicates whether the MIN in this record is to be added to or deleted from the list of active MINs for this mobile station. In this message, all MINs are to be added to the list.

The mobile station shall set this field to '1'.

MIN1   -   First part of the mobile station identification number (MIN).

The mobile station shall set this field to the MIN1 value for the MIN specified by this record.

MIN2   -   Second part of the mobile station identification number (MIN).

The mobile station shall set this field to the MIN2 value for the MIN specified by this record.

HOME_SID   -   Home system identification.

The mobile station shall set this field to the SID of the home cellular system for the MIN specified by this record.

MOB_TERM   -   Mobile terminated calls accepted indicator.

If the MIN specified by this record is configured to accept mobile terminated calls while operating with the current roaming status (see 6.6.5.3), the mobile station shall set this bit to'1'. Otherwise, the mobile station shall set this bit to '0'.

RESERVED   -   Reserved bits.

The mobile station shall add reserved bits as needed in order to make the length of the entire message equal to an integer number of octets. The mobile station shall set these bits to '0'.

₁ 6.7.1.3.2.2 Order Message

₂ When the mobile station sends an *Order Message* on the Access Channel, it shall use the
₃ following variable-length message format:

₄

Field	Length (bits)
MSG_TYPE ('00000010')	8
ACK_SEQ	2
MSG_SEQ	2
ACK_REQ	1
VALID_ACK	1
ESN	32
RESERVED	2
ORDER	6
ADD_RECORD_LEN	3
order-specific fields (if used)	$8 \times$ ADD_RECORD_LEN
RESERVED	1

₅

₆　　　　MSG_TYPE　-　Message type.

₇　　　　　　　　　　　The mobile station shall set this field to '00000010'.

₈　　　　ACK_SEQ　-　Acknowledgement sequence number.

₉　　　　　　　　　　　See 6.7.1.3.1.

₁₀　　　　MSG_SEQ　-　Message sequence number.

₁₁　　　　　　　　　　　See 6.7.1.3.1.

₁₂　　　　ACK_REQ　-　Acknowledgement required indicator.

₁₃　　　　　　　　　　　See 6.7.1.3.1.

₁₄　　　VALID_ACK　-　Valid acknowledgement indicator.

₁₅　　　　　　　　　　　See 6.7.1.3.1.

₁₆　　　　　　　ESN　-　Mobile station's electronic serial number.

₁₇　　　　　　　　　　　See 6.7.1.3.1.

₁₈　　　RESERVED　-　Reserved bits.

₁₉　　　　　　　　　　　These bits take the place of the AUTH_MODE field.

₂₀　　　　　　　　　　　The mobile station shall set this field to '00'.

₂₁　　　　　ORDER　-　Order code.

₂₂　　　　　　　　　　　The mobile station shall set this field to the ORDER code
₂₃　　　　　　　　　　　(see6.7.3) for this type of order message.

1 ADD_RECORD_LEN   -   Additional record length.

2   The mobile station shall set this field to the number of octets
3   in the order-specific fields included in this message.

4   order-specific fields   -   Order-specific fields.

5   The mobile station shall include order-specific fields as
6   specified in 6.7.3.

7   RESERVED   -   Reserved bits.

8   The mobile station shall set this field to '0'.

1   6.7.1.3.2.3 Data Burst Message

2   When the mobile station sends a *Data Burst Message* on the Access Channel, it shall use
3   the following variable-length message format:

4

Field	Length (bits)
MSG_TYPE ('00000011')	8
ACK_SEQ	2
MSG_SEQ	2
ACK_REQ	1
VALID_ACK	1
ESN	32
AUTH_MODE	2
AUTHR	0 or 18
RANDC	0 or 8
COUNT	0 or 6
MSG_NUMBER	8
MIN1	24
MIN2	10
BURST_TYPE	6
NUM_MSGS	8
NUM_FIELDS	8

NUM_FIELDS occurrences of the following field:

CHARi	8

RESERVED	2

5

6   MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00000011'.

8   ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.1.3.1.

10   MSG_SEQ   -   Message sequence number.

11   See 6.7.1.3.1.

12   ACK_REQ   -   Acknowledgement required indicator.

13   See 6.7.1.3.1.

VALID_ACK   -   Valid acknowledgement indicator.

See 6.7.1.3.1.

ESN   -   Mobile station's electronic serial number.

See 6.7.1.3.1.

AUTH_MODE   -   Authentication mode.

See 6.7.1.3.2.

AUTHR   -   Authentication data.

See 6.7.1.3.2.

RANDC   -   Random challenge value.

See 6.7.1.3.2.

COUNT   -   Call history parameter.

See 6.7.1.3.2.

MSG_NUMBER   -   Message number within the data burst stream.

The mobile station shall set this field to the number of this message within the data burst stream.

MIN1   -   First part of the mobile station identification number (MIN).

The mobile station shall set this field to the MIN1 value for the MIN sending this message.

MIN2   -   Second part of the mobile station identification number (MIN).

The mobile station shall set this field to the MIN2 value for the MIN sending this message.

BURST_TYPE   -   Data burst type.

The mobile station shall set this field to the value shown in Table 6.7.1.3.2.3-1 for the type of this data burst.

Table 6.7.1.3.2.3-1. Burst Data Types

Value (binary)	Burst Data Type
000000	Unknown burst data type
All other burst data type codes are reserved.	

NUM_MSG   -   Number of messages in the data burst stream.

The mobile station shall set this field to the number of messages within this data burst stream.

NUM_FIELDS   -   Number of characters in this message.

The mobile station shall set this field to the number of CHARi fields included in this message.

CHARi   -   Character.

The mobile station shall include NUM_FIELDS occurrences of this field.   The mobile station shall set these fields to the corresponding octet of the data burst stream.

RESERVED   -   Reserved bits.

The mobile station shall set this field to '00'.

1　6.7.1.3.2.4 Origination Message

2　When the mobile station sends an *Origination Message*, it shall use the following variable-
3　length message format:

4

Field	Length (bits)
MSG_TYPE ('00000100')	8
ACK_SEQ	2
MSG_SEQ	2
ACK_REQ	1
VALID_ACK	1
ESN	32
AUTH_MODE	2
AUTHR	0 or 18
RANDC	0 or 8
COUNT	0 or 6
MIN1	24
MIN2	10
SCM	8
REQUEST_MODE	3
SPECIAL_MUX	1
MUX_OPTION	0 or 8
SPECIAL_SERVICE	1
SERVICE_OPTION	0 or 16
DIGIT_MODE	1
NUMBER_TYPE	0 or 3
NUMBER_PLAN	0 or 4
MORE_FIELDS	1
NUM_FIELDS	8

NUM_FIELDS occurrences of the following field:

CHARi	4 or 8

RESERVED	0 - 7 (as needed)

5

MSG_TYPE   -   Message type.

The mobile station shall set this field to '00000100'.

ACK_SEQ   -   Acknowledgement sequence number.

See 6.7.1.3.1.

MSG_SEQ   -   Message sequence number.

See 6.7.1.3.1.

ACK_REQ   -   Acknowledgement required indicator.

See 6.7.1.3.1.

VALID_ACK   -   Valid acknowledgement indicator.

See 6.7.1.3.1.

ESN   -   Mobile station's electronic serial number.

See 6.7.1.3.1.

AUTH_MODE   -   Authentication mode.

See 6.7.1.3.2.

AUTHR   -   Authentication data.

See 6.7.1.3.2.

RANDC   -   Random challenge value.

See 6.7.1.3.2.

COUNT   -   Call history parameter.

See 6.7.1.3.2.

MIN1   -   First part of the mobile station identification number (MIN).

The mobile station shall set this field to the MIN1 value of the MIN originating the call.

MIN2   -   Second part of the mobile station identification number (MIN).

The mobile station shall set this field to the MIN2 value of the MIN originating the call.

SCM   -   Station class mark.

The mobile station shall set this field to the station class mark of the mobile station. See 2.3.3.

REQUEST_MODE   -   Requested mode code. The mobile station shall set this field to the value shown in Table 6.7.1.3.2.4-1 corresponding to its current configuration.

Table 6.7.1.3.2.4-1. REQUEST_MODE Codes

Value (binary)	Requested Mode
001	CDMA only
010	Analog only
011	Either CDMA or analog
All other REQUEST_MODE codes are reserved.	

SPECIAL_MUX   -   Special multiplex option indicator.

To request a special frame format or multiplex rule for this call, the mobile station shall set this field to '1'. To request the default multiplex option (Multiplex Option 1) for this call, the mobile station shall set this field to '0'.

MUX_OPTION   -   Multiplex option for this call.

If the SPECIAL_MUX field is set to '1', the mobile station shall set this field to the value shown in Table 6.7.1.3.2.4-2 corresponding to the requested multiplex option. If the SPECIAL_MUX field is set to '0', the mobile station shall omit this field.

Table 6.7.1.3.2.4-2. Multiplex Options

Value (binary)	Multiplex Option
00000001	Multiplex Option 1
All other Multiplex Option codes are reserved.	

SPECIAL_SERVICE   -   Special service option indicator.

To request a special service option, the mobile station shall set this field to '1'. To request the default service option (Service Option 1), the mobile station shall set this field to'0'.

SERVICE_OPTION   -   Requested service option for this call.

If the SPECIAL_SERVICE field is set to '1', the mobile station shall set this field to the value shown in Table A-1 corresponding to the requested service option. If the SPECIAL_SERVICE field is set to '0', the mobile station shall omit this field.

DIGIT_MODE   -   Digit mode indicator.

This field indicates whether the dialed digits are 4-bit DTMF codes using the Unknown numbering plan, or 8-bit ASCII codes using a specified numbering plan.

To originate the call using the binary representation of DTMF digits, the mobile station shall set this field to '0'. To originate the call using ASCII characters, the mobile station shall set this field to '1'.

NUMBER_TYPE   -   Type of number.

If the DIGIT_MODE field is set to '1', the mobile station shall set this field to the NUMBER_TYPE value shown in Table 6.7.1.3.2.4-3 corresponding to the type of the number as defined in ANSI T1.607 §4.5.9. If the DIGIT_MODE field is set to '0', the mobile station shall omit this field.

Table 6.7.1.3.2.4-3. Number Types

Description	NUMBER_TYPE (binary)
Unknown	000
International number	001
National number	010
Network-specific number	011
Subscriber number	100
Reserved	101
Abbreviated number	110
Reserved for extension	111

NUMBER_PLAN   -   Numbering plan.

If the DIGIT_MODE field is set to '1', the mobile station shall set this field to the NUMBER_PLAN value shown in Table 6.7.1.3.2.4-4 corresponding to the requested numbering plan. If the DIGIT_MODE field is set to '0', the mobile station shall omit this field.

Table 6.7.1.3.2.4-4. Numbering Plan Identification
(DIGIT_MODE= '1') (See ANSI T1.607 §4.5.9)

Description	NUMBER_PLAN (binary)
Unknown	0000
ISDN/Telephony numbering plan (CCITT E.164 and CCITT E.163)	0001
Data numbering plan (CCITT X.121)	0011
Telex numbering plan (CCITT F.69)	0100
Private numbering plan	1001
Reserved for extension	1111
All other NUMBER_PLAN codes are reserved.	

MORE_FIELDS - More dialed digits indicator.

This field indicates whether additional dialed digits will be sent in a later *Origination Continuation Message*.

If all dialed digits will fit in this message, the mobile station shall set this field to '0'. If not, the mobile station shall set this field to '1'.

NUM_FIELDS - Number of dialed digits in this message.

The mobile station shall set this field to the number of dialed digits included in this message.

CHARi - A dialed digit or character.

The mobile station shall include NUM_FIELDS occurrences of this field. If the DIGIT_MODE field is set to '0', the mobile station shall set each occurrence of this field to the code value shown in Table 6.7.1.3.2.4-5 corresponding to the dialed digit. If the DIGIT_MODE field is set to '1', the mobile station shall set each occurrence of this field to the ASCII representation corresponding to the dialed digit, as specified in ANSI X3.4, with the most significant bit set to '0'.

Table 6.7.1.3.2.4-5. Representation of DTMF Digits

Digit	Code (binary)	Digit	Code (binary)
1	0001	7	0111
2	0010	8	1000
3	0011	9	1001
4	0100	0	1010
5	0101	*	1011
6	0110	#	1100
All other codes are reserved.			

RESERVED   -   Reserved bits.

The mobile station shall add reserved bits as needed in order to make the length of the entire message equal to an integer number of octets. The mobile station shall set these bits to '0'.

1   6.7.1.3.2.5 Page Response Message

2   When the mobile station sends a *Page Response Message*, it shall use the following
3   variable-length message format:

4

Field	Length (bits)
MSG_TYPE ('00000101')	8
ACK_SEQ	2
MSG_SEQ	2
ACK_REQ	1
VALID_ACK	1
ESN	32
AUTH_MODE	2
AUTHR	0 or 18
RANDC	0 or 8
COUNT	0 or 6
MIN1	24
MIN2	10
SCM	8
REQUEST_MODE	3
RESERVED	5

5

6   MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00000101'.

8   ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.1.3.1.

10   MSG_SEQ   -   Message sequence number.

11   See 6.7.1.3.1.

12   ACK_REQ   -   Acknowledgement required indicator.

13   See 6.7.1.3.1.

14   VALID_ACK   -   Valid acknowledgement indicator.

15   See 6.7.1.3.1.

16   ESN   -   Mobile station's electronic serial number.

17   See 6.7.1.3.1.

1   AUTH_MODE   -   Authentication mode.

2   See 6.7.1.3.2.

3   AUTHR   -   Authentication data.

4   See 6.7.1.3.2.

5   RANDC   -   Random challenge value.

6   See 6.7.1.3.2.

7   COUNT   -   Call history parameter.

8   See 6.7.1.3.2.

9   MIN1   -   First part of the mobile station identification number (MIN).

10   The mobile station shall set this field to the MIN1 value from
11   the *Page Message* or *Slotted Page Message* to which this
12   message is a response.

13 MIN2   -   Second part of the mobile station identification number (MIN).

14   The mobile station shall set this field to the MIN2 value from
15   the *Page Message* or *Slotted Page Message* to which this
16   message is a response.

17 SCM   -   Station class mark.

18   The mobile station shall set this field to the station class mark
19   of the mobile station. See 2.3.3.

20 REQUEST_MODE - Requested mode code. The mobile station shall set this field
21   to the value shown in Table 6.7.1.3.2.4-1 corresponding to its
22   current configuration.

23 RESERVED   -   Reserved bits.

24   The mobile station shall set this field to '00000'.

1   6.7.1.3.2.6 Registration Update Message

2   When the mobile station sends a *Registration Update Message* on the Access Channel, it
3   shall use the following variable-length message format:

4

Field	Length (bits)
MSG_TYPE ('00000110')	8
ACK_SEQ	2
MSG_SEQ	2
ACK_REQ	1
VALID_ACK	1
ESN	32
AUTH_MODE	2
AUTHR	0 or 18
RANDC	0 or 8
COUNT	0 or 6
REG_TYPE	4
MORE_MINS	1
SCM	8
SLOT_CYCLE_INDEX	3

Zero or more occurrences of the following record:

ADD_DEL	1
MIN1	24
MIN2	10
HOME_SID	15
MOB_TERM	1

RESERVED	0-7 (as needed)

5

6   MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00000110'.

8   ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.1.3.1.

10   MSG_SEQ   -   Message sequence number.

11   See 6.7.1.3.1.

ACK_REQ	-	Acknowledgement required indicator.
		See 6.7.1.3.1.
VALID_ACK	-	Valid acknowledgement indicator.
		See 6.7.1.3.1.
ESN	-	Mobile station's electronic serial number.
		See 6.7.1.3.1.
AUTH_MODE	-	Authentication mode.
		See 6.7.1.3.2.
AUTHR	-	Authentication data.
		See 6.7.1.3.2.
RANDC	-	Random challenge value.
		See 6.7.1.3.2.
COUNT	-	Call history parameter.
		See 6.7.1.3.2.
REG_TYPE	-	Registration type.

This field indicates which type of event generated the registration attempt.

The mobile station shall set this field to the REG_TYPE value shown in Table 6.7.1.3.2.1-1 corresponding to the event which caused this registration to occur.

MORE_MINS	-	More MINs to follow indicator.

This indicator specifies whether additional MINs are to be sent in later *Registration Update Messages*.

If all MINs to be added or deleted will fit in this message, the mobile station shall set this field to '0'. If not, the mobile station shall set this field to '1'.

SCM	-	Station class mark.

The mobile station shall set this field to its station class mark. See 2.3.3.

SLOT_CYCLE_INDEX	-	Slot cycle mode.

If the mobile station is operating in non-slotted mode, it shall set this field to '000'. If the mobile station is operating in slotted mode, it shall set this field to the SLOT_CYCLE_INDEX value in use. See 6.6.2.1.1.

The mobile station shall include one occurrence of the following five-field record for each MIN included in this message.

ADD_DEL   -   Add/Delete indicator.

This field indicates whether the MIN in this record is to be added to or deleted from the list of active MINs for this mobile station.

To request that the MIN in this record be added to the list, the mobile station shall set this field to '1'. To request that the MIN in this record be deleted from the list, the mobile station shall set this field to '0'.

MIN1   -   First part of the mobile station identification number (MIN).

The mobile station shall set this field to the MIN1 value for the MIN specified by this record.

MIN2   -   Second part of the mobile station identification number (MIN).

The mobile station shall set this field to the MIN2 value for the MIN specified by this record.

HOME_SID   -   Home system identification.

The mobile station shall set this field to the SID of the home cellular system for the MIN specified by this record.

MOB_TERM   -   Mobile terminated calls accepted indicator.

If the MIN specified by this record is configured to accept mobile terminated calls while operating with the current roaming status (see 6.6.5.3), the mobile station shall set this bit to'1'. Otherwise, the mobile station shall set this bit to '0'.

RESERVED   -   Reserved bits.

The mobile station shall add reserved bits as needed in order to make the length of the entire message equal to an integer number of octets. The mobile station shall set these bits to'0'.

1   6.7.1.3.2.7 Authentication Challenge Response Message

2   When the mobile station sends an *Authentication Challenge Response Message* on the
3   Access Channel, it shall use the following fixed-length message format:

4

Field	Length (bits)
MSG_TYPE ('00000111')	8
ACK_SEQ	2
MSG_SEQ	2
ACK_REQ	1
VALID_ACK	1
ESN	32
RESERVED	2
AUTH_MIN1	24
AUTH_MIN2	10
AUTHU	0 or 18

RESERVED	6

5

6   MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00000111'.

8   ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.1.3.1.

10   MSG_SEQ   -   Message sequence number.

11   See 6.7.1.3.1.

12   ACK_REQ   -   Acknowledgement required indicator.

13   See 6.7.1.3.1.

14   VALID_ACK   -   Valid acknowledgement indicator.

15   See 6.7.1.3.1.

16   ESN   -   Mobile station's electronic serial number.

17   See 6.7.1.3.1.

18   RESERVED   -   Reserved bits.

19   These bits take the place of the AUTH_MODE field.

20   The mobile station shall set this field to '00'.

AUTH_MIN1   -   First part of the mobile station identification number (MIN).

The mobile station shall set this field to the value of the MIN1 field from the *Authentication Challenge Message* to which this message is a response.

AUTH_MIN2   -   Second part of the mobile station identification number (MIN).

The mobile station shall set this field to the value of the MIN2 field from the *Authentication Challenge Message* to which this message is a response.

AUTHU   -   Authentication challenge response.

The mobile station shall set this field as specified in 6.3.12.1.5.

RESERVED   -   Reserved bits.

The mobile station shall set this field to '000000'.

1　6.7.2 Reverse Traffic Channel

2　The Reverse Traffic Channel is used to send signaling information to the base station
3　during Traffic Channel operation.

4　6.7.2.1 Reverse Traffic Channel Structure

5　When sending a message on the Reverse Traffic Channel, the mobile station may use any
6　combination of blank-and-burst and dim-and-burst information bit structures
7　(see6.1.3.3.11) that allocates enough signaling traffic bits to contain the message. If the
8　number of allocated bits exceeds the number of bits in the message, the mobile station
9　shall transmit the message beginning with the first allocated bit. In the remaining allocated
10　bits, the mobile station shall transmit padding bits. The mobile station shall set the
11　padding bits to '0'.

12　6.7.2.2 Reverse Traffic Channel Message Structure

13　A Reverse Traffic Channel message capsule consists of a Reverse Traffic Channel message
14　and padding, as shown in Figure 6.7.2.2-1.

15　Each Traffic Channel message shall consist of a length field (MSG_LENGTH), a message
16　body, and a CRC, in that order.

17
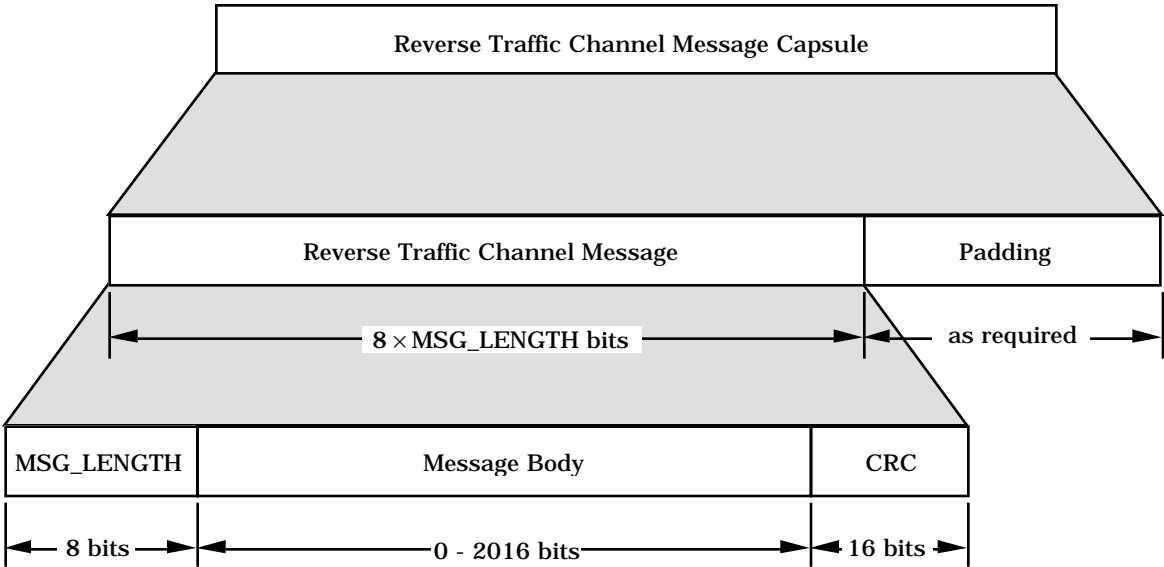
19　**Figure 6.7.2.2-1. Reverse Traffic Channel Message Structure**

20

6.7.2.2.1 Reverse Traffic Channel MSG_LENGTH Field

The mobile station shall set the MSG_LENGTH field of each Reverse Traffic Channel signaling message to the length of the message in octets, including the MSG_LENGTH field, the message body, and the CRC. The MSG_LENGTH field shall be 8 bits in length.

6.7.2.2.2 Reverse Traffic Channel Signaling Message CRC

A 16-bit CRC shall be computed for each Reverse Traffic Channel signaling message. The CRC shall include the MSG_LENGTH field and the message body. The generator polynomial for the CRC shall be the standard CRC-CCITT polynomial:

$$g(x) = x^{16} + x^{12} + x^5 + 1.$$

The CRC shall be the value computed by the following procedure and the logic shown in Figure 6.7.2.2-1:

- All shift register elements shall be initialized to logical one.[33]

- The switches shall be set in the up position.

- The information bit count k shall be defined as 8 + message body length in bits.

- The register shall be clocked k times, with the length and message body of the message as the k input bits.

- The switches shall be set in the down position.

- The register shall be clocked an additional 16 times.

- The 16 additional output bits shall be the check bits.

- The bits shall be transmitted in the order in which they are calculated.

---

[33]Initialization of the register to ones causes the CRC for all-zero data to be non-zero.

1

2
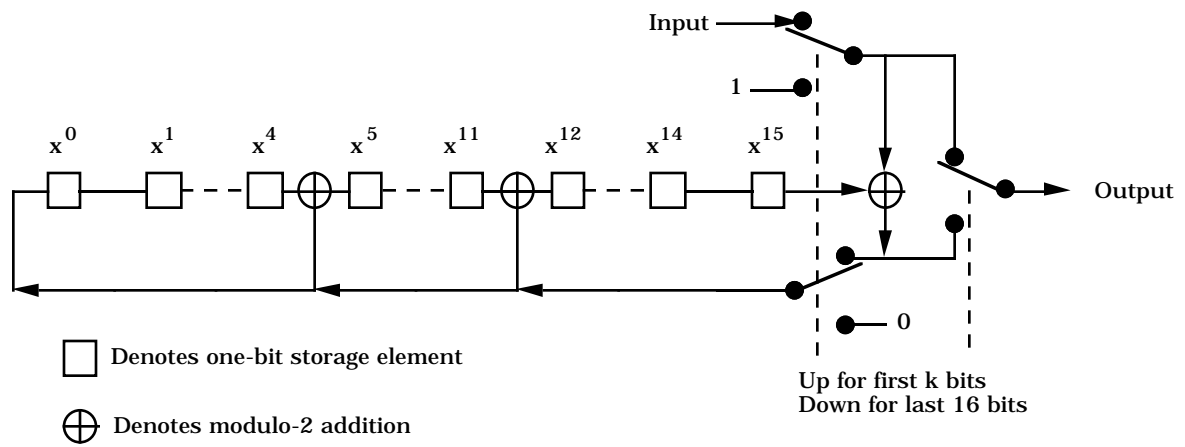
Figure 6.7.2.2.2-1. Reverse Traffic Channel Signaling CRC Calculation

1   6.7.2.3 Reverse Traffic Channel Message Body Format

2   The Reverse Traffic Channel messages are summarized in Table 6.7.2.3-1.

3

4   **Table 6.7.2.3-1. Reverse Traffic Channel Messages**

Message Name	Message Type (binary)
Order Message	00000001
Authentication Challenge Response Message	00000010
Flash With Information Message	00000011
Data Burst Message	00000100
Pilot Strength Measurement Message	00000101
Power Measurement Report Message	00000110
Send Burst DTMF Message	00000111
Status Message	00001000
Origination Continuation Message	00001001
Handoff Completion Message	00001010
Parameters Response Message	00001011

5

6   6.7.2.3.1 Common Fields

7   6.7.2.3.1.1 Common Acknowledgement Fields

8   All Reverse Traffic Channel messages share the same three acknowledgement fields:

9   ACK_SEQ   -   Acknowledgement sequence number.

10   The mobile station shall set this field to the value of the
11   MSG_SEQ field from the most recently received Forward
12   Traffic Channel message requiring acknowledgement. If no
13   such message has been received, the mobile station shall set
14   this field to '111'. See6.6.4.1.3.

15   MSG_SEQ   -   Message sequence number.

16   The mobile station shall set this field to the message sequence
17   number for this message. See 6.6.4.1.3.

ACK_REQ   -   Acknowledgement required indicator.

This field indicates whether this message requires an acknowledgement.

To indicate that this message requires acknowledgement, the mobile station shall set this field to '1'. To indicate that this message does not require acknowledgement, the mobile station shall set this field to '0'.

6.7.2.3.1.2 Common Encryption Field

Many Reverse Traffic Channel messages contain the following field:

ENCRYPTED   -   Message encryption indicator.

If this message is encrypted, the mobile station shall set this field to '1'. If this message is not encrypted, the mobile station shall set this field to '0'. See 6.3.12.2.

6.7.2.3.2 Message Body Contents

The following sections specify the contents of the message body for each message that may be sent on the Reverse Traffic Channel.

1   6.7.2.3.2.1 Order Message

2   When the mobile station sends an *Order Message* on the Reverse Traffic Channel, it shall
3   use the following variable-length message format:

4

Field	Length (bits)
MSG_TYPE ('00000001')	8
ACK_SEQ	3
MSG_SEQ	3
ACK_REQ	1
ENCRYPTED	1
ORDER	6
ADD_RECORD_LEN	3
Order-specific fields (if used)	$8 \times$ ADD_RECORD_LEN
RESERVED	7

5

6   MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00000001'.

8   ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.2.3.1.1.

10   MSG_SEQ   -   Message sequence number.

11   See 6.7.2.3.1.1.

12   ACK_REQ   -   Acknowledgement required indicator.

13   See 6.7.2.3.1.1.

14   ENCRYPTED   -   Message encryption indicator.

15   See 6.7.2.3.1.2. The mobile station shall set this field to '0'
16   unless encryption is required for this type of order.

17   ORDER   -   Order code.

18   The mobile station shall set this field to the ORDER code.
19   See 6.7.3.

20   ADD_RECORD_LEN   -   Additional record length.

21   The mobile station shall set this field to the number of octets
22   in the order-specific fields included in this message.

23   Order-specific fields   -   Order-specific fields.

24   The mobile station shall include order-specific fields as
25   specified in 6.7.3.

RESERVED   -   Reserved bits.

The mobile station shall set this field to '0000000'.

1   6.7.2.3.2.2 Authentication Challenge Response Message

2   When the mobile station sends an *Authentication Challenge Response Message* on the
3   Reverse Traffic Channel, it shall use the following fixed-length message format:

4

Field	Length (bits)
MSG_TYPE ('00000010')	8
ACK_SEQ	3
MSG_SEQ	3
ACK_REQ	1
RESERVED	1
AUTHU	18
RESERVED	6

5

6   MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00000010'.

8   ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.2.3.1.1.

10 MSG_SEQ   -   Message sequence number.

11   See 6.7.2.3.1.1.

12 ACK_REQ   -   Acknowledgement required indicator.

13   See 6.7.2.3.1.1.

14 RESERVED   -   Reserved bit.

15   This field takes the place of the ENCRYPTED bit.

16   The mobile station shall set this field to '0'.

17 AUTHU   -   Authentication challenge response.

18   The mobile station shall set this field as specified in
19   6.3.12.1.5.

20 RESERVED   -   Reserved bits.

21   The mobile station shall set this field to '000000'.

1 6.7.2.3.2.3 Flash With Information Message

2 When the mobile station sends a *Flash With Information Message*, it shall use the following
3 variable-length message format:

4

Field	Length (bits)
MSG_TYPE ('00000011')	8
ACK_SEQ	3
MSG_SEQ	3
ACK_REQ	1
ENCRYPTED	1

One or more occurrences of the following record:

RECORD_TYPE	8
RECORD_LEN	6
Type-specific fields	$8 \times$ RECORD_LEN

RESERVED	0 - 7 (as needed)

5

6 MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00000011'.

8 ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.2.3.1.1.

10 MSG_SEQ   -   Message sequence number.

11   See 6.7.2.3.1.1.

12 ACK_REQ   -   Acknowledgement required indicator.

13   See 6.7.2.3.1.1.

14 ENCRYPTED   -   Message encryption indicator.

15   See 6.7.2.3.1.2.

16

17 The mobile station shall include one occurrence of the following record for each information
18 record to be included:

19 RECORD_TYPE -   Information record type.

20   The mobile station shall set this field to the record type code
21   shown in Table 6.7.4-1 corresponding to the type of this
22   information record.

1   RECORD_LEN   -   Information record length.

2   The mobile station shall set this field to the number of octets
3   in the type-specific fields of this record.

4   Type-specific fields   -   Type-specific fields.

5   The mobile station shall set these fields as specified in 6.7.4
6   for this type of information record.

7

8   RESERVED   -   Reserved bits.

9   The mobile station shall add reserved bits as needed in order
10   to make the length of the entire message equal to an integer
11   number of octets. The mobile station shall set these bits
12   to'0'.

1   6.7.2.3.2.4 Data Burst Message

2   When the mobile station sends a *Data Burst Message* on the Reverse Traffic Channel, it
3   shall use the following variable-length message format:

4

Field	Length (bits)
MSG_TYPE ('00000100')	8
ACK_SEQ	3
MSG_SEQ	3
ACK_REQ	1
ENCRYPTED	1
MSG_NUMBER	8
MIN1	24
MIN2	10
BURST_TYPE	6
NUM_MSGS	8
NUM_FIELDS	8

NUM_FIELDS occurrences of the following field:

CHARi	8

RESERVED	0

5

6   MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00000100'.

8   ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.2.3.1.1.

10   MSG_SEQ   -   Message sequence number.

11   See 6.7.2.3.1.1.

12   ACK_REQ   -   Acknowledgement required indicator.

13   See 6.7.2.3.1.1.

14   ENCRYPTED   -   Message encryption indicator.

15   See 6.7.2.3.1.2.

16   MSG_NUMBER   -   Message number within the data burst stream.

17   The mobile station shall set this field to the number of this
18   message within the data burst stream.

MIN1   -   First part of the mobile station identification number (MIN).

The mobile station shall set this field to the MIN1 value for the MIN sending this message.

MIN2   -   Second part of the mobile station identification number (MIN).

The mobile station shall set this field to the MIN2 value for the MIN sending this message.

BURST_TYPE   -   Data burst type.

The mobile station shall set this field to the value shown in Table 6.7.1.3.2.3-1 for the type of this data burst.

NUM_MSGS   -   Number of messages in the data burst stream.

The mobile station shall set this field to the number of messages within this data burst stream.

NUM_FIELDS   -   Number of characters in this message.

The mobile station shall set this field to the number of CHARi fields included in this message.

CHARi   -   Character.

The mobile station shall include NUM_FIELDS occurrences of this field. The mobile station shall set these fields to the corresponding octet of the data burst stream.

RESERVED   -   Reserved bits.

The mobile station shall omit this field.

1 6.7.2.3.2.5 Pilot Strength Measurement Message

2 When the mobile station sends a *Pilot Strength Measurement Message*, it shall use the
3 following variable-length message format:

4

Field	Length (bits)
MSG_TYPE ('00000101')	8
ACK_SEQ	3
MSG_SEQ	3
ACK_REQ	1
RESERVED	1
REF_PN	9
PILOT_STRENGTH	6

5 Zero or more occurrences of the following record:

PILOT_PN_PHASE	15
PILOT_STRENGTH	6
KEEP	1

RESERVED	0 - 7 as needed

6

7 MSG_TYPE - Message type.

8 The mobile station shall set this field to '00000101'.

9 ACK_SEQ - Acknowledgement sequence number.

10 See 6.7.2.3.1.1.

11 MSG_SEQ - Message sequence number.

12 See 6.7.2.3.1.1.

13 ACK_REQ - Acknowledgement required indicator.

14 See 6.7.2.3.1.1.

15 RESERVED - Reserved bit.

16 This field takes the place of the ENCRYPTED field.

17 The mobile station shall set this field to '0'.

18 REF_PN - Time reference PN sequence offset.

19 The mobile station shall set this field to the PN sequence offset
20 of the pilot used by the mobile station to derive its time
21 reference, relative to the zero offset pilot PN sequence in units
22 of 64 PN chips.

PILOT_STRENGTH   -   Pilot strength.

The mobile station shall set this field to

$$\lfloor - 2 \times 10 \times \log_{10} PS \rfloor,$$

where PS is the strength of the pilot used by the mobile station to derive its time reference (see 6.1.5.1), measured as specified in 6.6.6.2.2. If this value is less than 0, the mobile station shall set this field to 0. If this value is greater than 63, the mobile station shall set this field to 63.

The mobile station shall include one occurrence of the following three-field record for each pilot in the Active Set and for each pilot in the Candidate Set, other than the pilot identified by the REF_PN field.

PILOT_PN_PHASE   -   Pilot measured phase.

The mobile station shall set this field to the phase of the pilot PN sequence relative to the zero offset pilot PN sequence of this pilot, in units of one PN chip, as specified in 6.6.6.2.4.

PILOT_STRENGTH   -   Pilot strength.

The mobile station shall set this field to

$$\lfloor - 2 \times 10 \times \log_{10} PS \rfloor,$$

where PS is the strength of this pilot, measured as specified in 6.6.6.2.2. If this value is less than 0, the mobile station shall set this field to 0. If this value is greater than 63, the mobile station shall set this field to 63.

KEEP   -   Keep pilot indicator.

For pilots in the Active Set, this field indicates whether the mobile station recommends that this pilot be kept in the Active Set or not. For pilots in the Candidate Set, this field always indicates that the mobile station recommends adding this pilot to the Active Set.

If the strength of this pilot has exceeded T_DROP within the last interval specified by T_TDROP, as specified in 6.6.6.2.3, the mobile station shall set this field to '1'. Otherwise, the mobile station shall set this field to '0'.

RESERVED   -   Reserved bits.

The mobile station shall add reserved bits as needed in order to make the length of the entire message equal to an integer number of octets. The mobile station shall set these bits to'0'.

1   6.7.2.3.2.6 Power Measurement Report Message

2   When the mobile station sends a *Power Measurement Report Message*, it shall use the
3   following variable-length message format:

4

Field	Length (bits)
MSG_TYPE ('00000110')	8
ACK_SEQ	3
MSG_SEQ	3
ACK_REQ	1
RESERVED	1
ERRORS_DETECTED	5
PWR_MEAS_FRAMES	10
LAST_HDM_SEQ	2
NUM_PILOTS	4

NUM_PILOTS occurrences of the following field:

PILOT_STRENGTH	6

RESERVED	0 - 7 (as needed)

5

6   MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00000110'.

8   ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.2.3.1.1.

10 MSG_SEQ   -   Message sequence number.

11   See 6.7.2.3.1.1.

12 ACK_REQ   -   Acknowledgement required indicator.

13   See 6.7.2.3.1.1.

14 RESERVED   -   Reserved bit.

15   This field takes the place of the ENCRYPTED field.

16   The mobile station shall set this field to '0'.

17 ERRORS_DETECTED -   Number of frame errors detected.

18   If the number of bad frames (see 6.2.2.2) received in the
19   measurement period is less than or equal to 31, the mobile
20   station shall set this field to that number. If that number
21   exceeds 31, the mobile station shall set this field to '11111'.

PWR_MEAS_FRAMES   -   Number of ForwardTraffic Channelframesin the measurement period.

The mobile station shall set this field to the number of Forward Traffic Channel frames in the measurement period (see 6.6.4.1.1).

LAST_HDM_SEQ   -   *Handoff Direction Message* sequence number.

If a *Handoff Direction Message* has been received during this call, the mobile station shall set this field to the value of the HDM_SEQ field from the *Handoff Direction Message* that determined the current Active Set. If no *Handoff Direction Message* has been received during this call, the mobile station shall set this field to '11'.

NUM_PILOTS   -   Number of pilots reported.

The mobile station shall set this field to the number of pilots in the current Active Set.

PILOT_STRENGTH   -   Pilot strength.

The mobile station shall include one occurrence of this field for each pilot in the Active Set. If the Active Set contains more than one pilot, the mobile station shall include the pilot strengths in the same order as in the Handoff Direction Message that determined the current Active Set.

The mobile station shall set each occurrence of this field to

$$\lfloor -2 \times 10 \times \log_{10} PS \rfloor,$$

where PS is the strength of the pilot, measured as specified in 6.6.6.2.2. If this value is less than 0, the mobile station shall set this field to 0. If this value is greater than 63, the mobile station shall set this field to 63.

RESERVED   -   Reserved bits.

The mobile station shall add reserved bits as needed in order to make the length of the entire message equal to an integer number of octets. The mobile station shall set these bits to'0'.

1   6.7.2.3.2.7 Send Burst DTMF Message

2   When the mobile station sends a *Send Burst DTMF Message*, it shall use the following
3   variable-length message format:

4

Field	Length (bits)
MSG_TYPE ('00000111')	8
ACK_SEQ	3
MSG_SEQ	3
ACK_REQ	1
ENCRYPTED	1
NUM_DIGITS	8
DTMF_ON_LENGTH	3
DTMF_OFF_LENGTH	3

NUM_DIGITS occurrences of the following field:

DIGITi	4

RESERVED	0 - 7 (as needed)

5

6   MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00000111'.

8   ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.2.3.1.1.

10   MSG_SEQ   -   Message sequence number.

11   See 6.7.2.3.1.1.

12   ACK_REQ   -   Acknowledgement required indicator.

13   See 6.7.2.3.1.1.

14   ENCRYPTED   -   Message encryption indicator.

15   See 6.7.2.3.1.2.

16   NUM_DIGITS   -   Number of DTMF digits.

17   The mobile station shall set this field to the number of DTMF
18   digits included in this message.

1   DTMF_ON_LENGTH   -   DTMF pulse width code.

2   The mobile station shall set this field to the DTMF_-
3   ON_LENGTH value shown in Table 6.7.2.3.2.7-1
4   corresponding to the requested width of DTMF pulses to be
5   generated by the base station.

6

Table 6.7.2.3.2.7-1. Recommended DTMF Pulse Width

DTMF_ON_LENGTH Field (binary)	Recommended Pulse Width
000	95 ms
001	150 ms
010	200 ms
011	250 ms
100	300 ms
101	350 ms
All other DTMF_ON_LENGTH codes are reserved.	

8

9   DTMF_OFF_LENGTH   -   DTMF interdigit interval code.

10   The mobile station shall set this field to the
11   DTMF_OFF_LENGTH value shown in Table 6.7.2.3.2.7-2
12   corresponding to the requested minimum interval between
13   DTMF pulses to be generated by the base station.

14

Table 6.7.2.3.2.7-2. Recommended Minimum Interdigit Interval

DTMF_OFF_LENGTH Field (binary)	Recommended Minimum Interdigit Interval
000	60 ms
001	100 ms
010	150 ms
011	200 ms
All other DTMF_OFF_LENGTH codes are reserved.	

16

17   DIGITi   -   DTMF digit.

18   The mobile station shall include one occurrence of this field
19   for each DTMF digit to be generated by the base station. The
20   mobile station shall set each occurrence of this field to the
21   code value shown in Table 6.7.1.3.2.4-5 corresponding to the
22   dialed digit.

RESERVED   -   Reserved bits.

The mobile station shall add reserved bits as needed in order to make the length of the entire message equal to an integer number of octets. The mobile station shall set these bits to '0'.

1   6.7.2.3.2.8 Status Message

2   When the mobile station sends a *Status Message*, it shall use the following variable-length
3   message format:

4

Field	Length (bits)
MSG_TYPE ('00001000')	8
ACK_SEQ	3
MSG_SEQ	3
ACK_REQ	1
RESERVED	1

One or more occurrences of the following record:

RECORD_TYPE	8
RECORD_LEN	6
Type-specific fields	$8 \times$ RECORD_LEN

RESERVED	0 - 7 (as needed)

5

6   MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00001000'.

8   ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.2.3.1.1.

10   MSG_SEQ   -   Message sequence number.

11   See 6.7.2.3.1.1.

12   ACK_REQ   -   Acknowledgement required indicator.

13   See 6.7.2.3.1.1.

14   RESERVED   -   Reserved bit.

15   This field takes the place of the ENCRYPTED field.

16   The mobile station shall set this field to '0'.

17

18   The mobile station shall include one occurrence of the following record for each information
19   record to be included:

20   RECORD_TYPE -   Information record type.

21   The mobile station shall set this field to the record type value
22   shown in Table 6.7.4-1 corresponding to the type of this
23   information record.

RECORD_LEN - Information record length.

The mobile station shall set this field to the number of octets included in the type-specific fields of this information record.

Type-specific fields - Type-specific fields.

The mobile station shall set these fields as specified in 6.7.4 for this type of record.

RESERVED - Reserved bits.

The mobile station shall add reserved bits as needed in order to make the length of the entire message equal to an integer number of octets. The mobile station shall set these bits to '0'.

1 6.7.2.3.2.9 Origination Continuation Message

2 When the mobile station sends an *Origination Continuation Message*, it shall use the
3 following variable-length message format:

4

Field	Length (bits)
MSG_TYPE ('00001001')	8
ACK_SEQ	3
MSG_SEQ	3
ACK_REQ	1
ENCRYPTED	1
DIGIT_MODE	1
NUM_FIELDS	8

NUM_FIELDS occurrences of the following field:

CHARi	4 or 8

RESERVED	0 - 7 (as needed)

5

6 MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00001001'.

8 ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.2.3.1.1.

10 MSG_SEQ   -   Message sequence number.

11   See 6.7.2.3.1.1.

12 ACK_REQ   -   Acknowledgement required indicator.

13   See 6.7.2.3.1.1.

14 ENCRYPTED   -   Message encryption indicator.

15   See 6.7.2.3.1.2.

16 DIGIT_MODE   -   Digit mode indicator.

17   The mobile station shall set this field to the DIGIT_MODE
18   value from the Access Channel *Origination Message* for which
19   this message is a continuation.

20 NUM_FIELDS   -   Number of dialed digits in this message.

21   The mobile station shall set this field to the number of dialed
22   digits included in this message.

CHARi   -   A dialed digit or character.

The mobile station shall include NUM_FIELDS occurrences of this field. The mobile station shall include occurrences of this field for all dialed digits after those sent in the Access Channel *Origination Message* of which this message is a continuation. If the DIGIT_MODE field is set to '0', the mobile station shall set each occurrence of this field to the code value shown in Table 6.7.1.3.2.4-5 corresponding to the dialed digit. If the DIGIT_MODE field is set to '1', the mobile station shall set each occurrence of this field to the ASCII representation corresponding to the dialed digit, as specified in ANSI X3.4, with the most significant bit set to '0'.

RESERVED   -   Reserved bits.

The mobile station shall add reserved bits as needed in order to make the length of the entire message equal to an integer number of octets. The mobile station shall set these bits to'0'.

1 6.7.2.3.2.10 Handoff Completion Message

2 When the mobile station sends a *Handoff Completion Message*, it shall use the following
3 variable-length message format:

4

Field	Length (bits)
MSG_TYPE ('00001010')	8
ACK_SEQ	3
MSG_SEQ	3
ACK_REQ	1
RESERVED	1
LAST_HDM_SEQ	2
NUM_PILOTS	4
NUM_PILOTS occurrences of the following field:	
PILOT_PN	9

RESERVED	0 - 7 (as needed)

5

6 MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00001010'.

8 ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.2.3.1.1.

10 MSG_SEQ   -   Message sequence number.

11   See 6.7.2.3.1.1.

12 ACK_REQ   -   Acknowledgement required indicator.

13   See 6.7.2.3.1.1.

14 RESERVED   -   Reserved bit.

15   This field takes the place of the ENCRYPTED field.

16   The mobile station shall set this field to '0'.

17 LAST_HDM_SEQ   -   *Handoff Direction Message* sequence number.

18   The mobile station shall set this field to the value of the
19   HDM_SEQ field from the *Handoff Direction Message* that
20   determined the current Active Set.

21 NUM_PILOTS   -   Number of pilots reported.

22   The mobile station shall set this field to the number of pilots
23   in the current Active Set.

PILOT_PN   -   Pilot PN sequence offset.

The mobile station shall include one occurrence of this field for each pilot in the current Active Set. The mobile station shall set this field to the pilot PN sequence offset, relative to the zero offset pilot PN sequence in units of 64 PN chips, for this pilot.

RESERVED   -   Reserved bits.

The mobile station shall add reserved bits as needed in order to make the length of the entire message equal to an integer number of octets. The mobile station shall set these bits to'0'.

1   6.7.2.3.2.11 Parameters Response Message

2   When the mobile station sends a *Parameters Response Message*, it shall use the following
3   variable-length message format:

4

Field	Length (bits)
MSG_TYPE ('00001011')	8
ACK_SEQ	3
MSG_SEQ	3
ACK_REQ	1
ENCRYPTED	1

One or more occurrences of the following record:

PARAMETER_ID	16
PARAMETER_LEN	10
PARAMETER	PARAMETER_LEN + 1

RESERVED	0 - 7 (as needed)

5

6   MSG_TYPE   -   Message type.

7   The mobile station shall set this field to '00001011'.

8   ACK_SEQ   -   Acknowledgement sequence number.

9   See 6.7.2.3.1.1.

10   MSG_SEQ   -   Message sequence number.

11   See 6.7.2.3.1.1.

12   ACK_REQ   -   Acknowledgement required indicator.

13   See 6.7.2.3.1.1.

14   ENCRYPTED   -   Message encryption indicator.

15   See 6.7.2.3.1.2.

16

17   The mobile station shall include one occurrence of the following three-field record for each
18   occurrence of the PARAMETER_ID field in the Forward Traffic Channel *Retrieve Parameters*
19   *Message* to which this message is a response. See Appendix E.

20   PARAMETER_ID -   Parameter identification.

21   The mobile station shall set this field to the value of the
22   PARAMETER_ID field for this parameter from the *Retrieve*
23   *Parameters Message* to which this message is a response.

PARAMETER_LEN - Parameter length.

The mobile station shall set this field to the length shown in Table E-1 corresponding to this PARAMETER_ID.

PARAMETER - Parameter value.

The mobile station shall set this parameter as specified in Appendix E for this value of PARAMETER_ID.

RESERVED - Reserved bits.

The mobile station shall add reserved bits as needed in order to make the length of the entire message equal to an integer number of octets. The mobile station shall set these bits to'0'.

1 6.7.3 Orders

2 Order Messages are sent by the mobile station on the Access Channel and on the Reverse
3 Traffic Channel. The general format used on the Access Channel is defined in 6.7.1.3.2.2,
4 and the general format used on the Reverse Traffic Channel is defined in 6.7.2.3.2.1. There
5 are many specific types of *Order Message*, as shown in Table 6.7.3-1.

6 The mobile station may send on the Access Channel any type of order shown in
7 Table6.7.3-1 with a 'Y' in the first column, but shall not send on the Access Channel any
8 type of order with an 'N' in the first column. The mobile station may send on the Reverse
9 Traffic Channel any type of order shown in Table6.7.3-1 with a 'Y' in the second column,
10 but shall not send on the Reverse Traffic Channel any type of order with an 'N' in the
11 second column. The mobile station shall be capable of sending all types of orders shown in
12 Table 6.7.3-1 with a 'Y' in the sixth column.

13 An order consists of an order code and order-specific fields. The order-specific fields
14 consist of an order qualification code (ORDQ) and zero or more additional order-specific
15 fields. The mobile station shall set the ORDER field in the *Order Message* to the order code
16 shown in Table 6.7.3-1 corresponding to the type of order being sent.

17 If the order qualification code is '00000000' and there are no other additional fields as
18 shown in Table 6.7.3-1 by an 'N' in the fifth column, the mobile station shall include no
19 order-specific fields in the *Order Message*. The order qualification code of such a message
20 is implicitly '00000000'.

21 If the order qualification code is not '00000000' and there are no other additional fields as
22 shown in Table 6.7.3-1 by an 'N' in the fifth column, the mobile station shall include the
23 order qualification code as the only order-specific field in the *Order Message*.

24 If there are other additional fields as shown in Table 6.7.3-1 by a 'Y' in the fifth column, the
25 mobile station shall include order-specific fields as specified in the corresponding
26 subsection of this section.

Table 6.7.3-1. Order and Order Qualification Codes Used on the Reverse Traffic Channel and the Access Channel (Part 1 of 2)

Access Channel Order	Reverse Traffic Channel Order	Order Code, ORDER (binary)	Order Qualification Code, ORDQ (binary)	More Fields other than ORDQ	Support Req'd	Name/Function
Y	Y	000010	00000000	Y	Y	*Base Station Challenge Order*
Y	Y	000011	00000000	N	Y	*SSD Update Confirmation Order*
Y	Y	000011	00000001	N	Y	*SSD Update Rejection Order*
N	Y	001011	00000000	N	N	*Request Analog Service Order*
Y	Y	010000	00000000	N	Y	*Mobile Station Acknowledgement Order*
N	Y	010011	00000000	Y	N	*Service Option Request Order* (see 6.7.3.2)
N	Y	010100	00000000	Y	Y	*Service Option Response Order* (see 6.7.3.3)
N	Y	010101	00000000	N	Y	*Release Order* (normal release)
N	Y	010101	00000001	N	Y	*Release Order* (with power-down indication)
N	Y	010111	00000000	N	N	*Long Code Transition Request Order* (request public)
N	Y	010111	00000001	N	N	*Long Code Transitionn Request Order* (request private)
N	Y	010111	00000010	N	Y	*Long Code Transition Response Order* (use public)
N	Y	010111	00000011	N	N	*Long Code Transition Response Order* (use private)
N	Y	011000	00000000	N	Y	*Connect Order*
N	Y	011001	0000nnnn	N	Y	*Continuous DTMF Tone Order* (where 'nnnn' is the tone per Table 6.7.1.3.2.4-5).

Table 6.7.3-1. Order and Order Qualification Codes Used on the Reverse Traffic Channel and the Access Channel (Part 2 of 2)

Access Channel Order	Reverse Traffic Channel Order	Order Code, ORDER (binary)	Order Qualification Code, ORDQ (binary)	More Fields other than ORDQ	Support Req'd	Name/Function
N	Y	011001	11111111	N	Y	*Continuous DTMF Tone Order* (Stop continuous DTMF tone)
Y	Y	011110	nnnnnnnn	N	N	*Local Control Response Order* (specific response as designated by 'nnnnnnnn' as determined by each system)
Y	Y	011111	00000001	Y	Y	*Mobile Station Reject Order* (unspecified reason; see 6.7.3.4)
Y	Y	011111	00000010	Y	Y	*Mobile Station Reject Order* (message not accepted in this state; see 6.7.3.4)
Y	Y	011111	00000011	Y	Y	*Mobile Station Reject Order* (message structure not acceptable; see 6.7.3.4)
Y	Y	011111	00000100	Y	Y	*Mobile Station Reject Order* (message field not in valid range; see 6.7.3.4)
Y	Y	011111	00000101	Y	Y	*Mobile Station Reject Order* (message type or order code not understood; see 6.7.3.4)
Y	Y	011111	00000110	Y	Y	*Mobile Station Reject Order* (message requires a capability that is not supported by the mobile station; see 6.7.3.4)
Y	Y	011111	00000111	Y	Y	*Mobile Station Reject Order* (message cannot be handled by the current mobile station configuration; see 6.7.3.4)
All other codes are reserved.						

1   6.7.3.1 Base Station Challenge Order

2   When the mobile station sends a *Base Station Challenge Order*, it shall set the ENCRYPTED
3   field to '0' and shall not encrypt the contents of the message. The mobile station shall use
4   the following fixed-length format for the order-specific fields:

5

Order-Specific Field	Length (bits)
ORDQ	8
RANDBS	32

6

7   ORDQ   -   Order qualification code.

8   The mobile station shall set this field to '00000000'.

9   RANDBS -   Random challenge data.

10   The mobile station shall set this field as specified in
11   6.3.12.1.9.

1 6.7.3.2 Service Option Request Order

2 When the mobile station sends a *Service Option Request Order*, it shall use the following
3 fixed-length format for the order-specific fields:

4

Order-Specific Field	Length (bits)
ORDQ	8
SERVICE_OPTION	16

5

6   ORDQ   -   Order qualification code.

7   The mobile station shall set this field to '00000000'.

8   SERVICE_OPTION   -   Service option.

9   The mobile station shall set this field to the service option
10   code shown in Table A-1 corresponding to the requested or
11   alternative service option.

1 6.7.3.3 Service Option Response Order

2 When the mobile station sends a *Service Option Response Order*, it shall use the following
3 fixed-length format for the order-specific fields:

4

Order-Specific Field	Length (bits)
ORDQ	8
SERVICE_OPTION	16

5

6   ORDQ   -   Order qualification code.

7   The mobile station shall set this field to '00000000'.

8   SERVICE_OPTION   -   Service option.

9   The mobile station shall set this field to the service option
10   code shown in Table A-1 corresponding to the accepted service
11   option, or to '0000000000000000' to reject the proposed
12   service option. See 6.6.4.1.2.2.1.

1   6.7.3.4 Mobile Station Reject Order

2   The *Mobile Station Reject Order* can be sent on either the Access Channel or the Reverse
3   Traffic Channel. The mobile station shall use the following variable-length format for the
4   order-specific fields:

5

Order-Specific Field	Length (bits)
ORDQ	8
MSG_TYPE	8
ORDER	0 or 8
ORDQ	0 or 8

6

7   ORDQ   -   Order qualification code.

8   The mobile station shall set this field to the ORDQ value
9   shown in Table 6.7.3-1 corresponding for the reason for
10   rejecting the message.

11   MSG_TYPE   -   Message type of rejected message.

12   The mobile station shall set this field to the value of the
13   MSG_TYPE field of the message being rejected.

14   ORDER   -   Order type of rejected message.

15   If the rejected message was an order message, the mobile
16   station shall set this field to the value of the ORDER field in
17   the rejected message. If the rejected message was not an
18   order message, the mobile station shall omit this field.

19   ORDQ   -   Order qualification code of rejected message.

20   If the rejected message was an order message including an
21   ORDQ field, the mobile station shall set this field to the value
22   of the ORDQ field in the rejected message. If the rejected
23   message was an order message not including an ORDQ field,
24   the mobile station shall set this field to '00000000'. If the
25   rejected message was not an order message, the mobile
26   station shall omit this field.

1   6.7.4 Reverse Traffic Channel Information Records

2   On the Reverse Traffic Channel, information records may be included in the *Flash with*
3   *Information Message* or the *Status Message*. Table 6.7.4-1 lists the information record type
4   values that may be used with each message type. The following sections describe the
5   contents of each of the record types in detail.

6

7   **Table 6.7.4-1. Information Record Types**

Message Type	Information Record	Record Type (binary)
None	Reserved	00000001
Flash	Feature Indicator	00000010
Flash	Keypad Facility	00000011
Flash	Called Party Number	00000100
Flash	Calling Party Number	00000101
Status	Identification	00000110
Status	Call Mode	00000111
Status	Terminal Information	00001000
Status	MIN Information	00001001
Status	Security Status	00001010
Flash	Connected Number	00001011
All other record type values are reserved.		

1   6.7.4.1 Feature Indicator

2   This information record allows the user to invoke supplementary services and features. The
3   mobile station shall use the following fixed-length format for the type-specific fields:

4

Type-Specific Field	Length (bits)
FEATURE	4
RESERVED	4

5

6   FEATURE   -   Feature identifier.

7   This field identifies the supplementary service or feature to be
8   invoked. Definition of the values for this field is left to the
9   manufacturers and system operators.

10   The mobile station shall set this field to the feature identifier.

11   RESERVED   -   Reserved bits.

12   The mobile station shall set this field to '0000'.

1 6.7.4.2 Keypad Facility

2 This information record allows the user to send characters entered via a keyboard or other
3 such terminal. The mobile station shall use the following variable-length format for the
4 type-specific fields:

5

Type-Specific Field	Length (bits)
One or more occurrences of the following field:	
CHARi	8

RESERVED	0

6

7   CHARi   -   Character.

8   The mobile station shall include one occurrence of this field
9   for each character entered. The mobile station shall set each
10   occurrence of this field to the ASCII representation
11   corresponding to the character entered, as specified in ANSI
12   X3.4, with the most significant bit set to '0'.

13   RESERVED   -   Reserved bits.

14   The mobile station shall omit this field.

1 6.7.4.3 Called Party Number

2 This information record identifies the called party's number. The mobile station shall use
3 the following variable-length format for the type-specific fields:

4

Type-Specific Field	Length (bits)
NUMBER_TYPE	3
NUMBER_PLAN	4

Zero or more occurrences of the following field:

CHARi	8

RESERVED	1

5

6   NUMBER_TYPE   -   Type of number.

7   The mobile station shall set this field to the NUMBER_TYPE
8   value shown in Table 6.7.1.3.2.4-3 corresponding to the type
9   of the called number, as defined in ANSI T1.607 §4.5.9.

10 NUMBER_PLAN   -   Numbering plan.

11   The mobile station shall set this field to the NUMBER_PLAN
12   value shown in Table 6.7.1.3.2.4-4 corresponding to the
13   numbering plan used for the called number, as defined in
14   ANSI T1.607 §4.5.9.

15   CHARi   -   Character.

16   The mobile stations shall include one occurrence of this field
17   for each character in the called number. The mobile station
18   shall set each occurrence of this field to the ASCII
19   representation corresponding to the character, as specified in
20   ANSI X3.4, with the most significant bit set to '0'.

21   RESERVED   -   Reserved bits.

22   The mobile station shall set this field to '0'.

1   6.7.4.4 Calling Party Number

2   This information record identifies the calling party's number. The mobile station shall use
3   the following variable-length format for the type-specific fields:

4

Type-Specific Field	Length (bits)
NUMBER_TYPE	3
NUMBER_PLAN	4
PI	2
SI	2

Zero or more occurrences of the following field:

CHARi	8

RESERVED	5

5

6   NUMBER_TYPE   -   Type of number.

7   The mobile station shall set this field to the NUMBER_TYPE
8   value shown in Table 6.7.1.3.2.4-3 corresponding to the type
9   of the calling number as defined in ANSI T1.607 §4.5.9.

10   NUMBER_PLAN   -   Numbering plan.

11   The mobile station shall set this field to the NUMBER_PLAN
12   value shown in Table 6.7.1.3.2.4-4 corresponding to the
13   numbering plan used for the calling number, as defined in
14   ANSI T1.607 §4.5.9.

15   PI   -   Presentation indicator.

16   This field indicates whether or not the calling number should
17   be displayed.

18   The mobile station shall set this field to the PI value shown in
19   Table 6.7.4.4-1 corresponding to the presentation indicator as
20   defined in ANSI T1.607 §4.5.9.

21

Table 6.7.4.4-1. Presentation Indicators

Description	PI (binary)
Presentation allowed	00
Presentation restricted	01
Number not available	10
Reserved	11

SI - Screening indicator.

This field indicates how the calling number was screened.

The mobile station shall set this field to the SI value shown in Table 6.7.4.4-2 corresponding to the screening indicator value as defined in ANSI T1.607 §4.5.9.

Table 6.7.4.4-2. Screening Indicators

Description	SI (binary)
User-provided, not screened	00
User-provided, verified and passed	01
User-provided, verified and failed	10
Network-provided	11

CHARi - Character.

The mobile stations shall include one occurrence of this field for each character in the calling number. The mobile station shall set each occurrence of this field to the ASCII representation corresponding to the character, as specified in ANSI X3.4, with the most significant bit set to '0'.

RESERVED - Reserved bits.

The mobile station shall set this field to '00000'.

1   6.7.4.5 Identification

2   This information record can be included in a *Status Message* to return the mobile station's
3   ESN and MIN list. The mobile station shall use the following variable-length format for the
4   type-specific fields:

5

Type-Specific Field	Length (bits)
One or more occurrences of the following record:	
MIN1	24
MIN2	10
HOME_SID	15
MOB_TERM	1

RESERVED	0-7 (as needed)

6

7   The mobile station shall include one occurrence of the following two-field record for each
8   MIN it is actively supporting.

9   MIN1   -   First part of the mobile station identification number (MIN).

10   The mobile station shall set this field to the MIN1 value for the
11   MIN specified by this record.

12   MIN2   -   Second part of the mobile station identification number (MIN).

13   The mobile station shall set this field to the MIN2 value for the
14   MIN specified by this record.

15   HOME_SID   -   Home system identification.

16   The mobile station shall set this field to the SID of the home
17   cellular system for the MIN specified by this record.

18   MOB_TERM   -   Mobile terminated calls accepted indicator.

19   If the MIN specified by this record is configured to accept
20   mobile terminated calls while operating with the current
21   roaming status (see 6.6.5.3), the mobile station shall set this
22   bit to'1'. Otherwise, the mobile station shall set this bit to '0'.

23

24   RESERVED   -   Reserved bits.

25   The mobile station shall add reserved bits as needed in order
26   to make the length of the entire message equal to an integer
27   number of octets. The mobile station shall set these bits
28   to'0'.

1   6.7.4.6 Call Mode

2   This information record can be included in a *Status Message* to return the mobile station's
3   preferred call mode and call-related information. The mobile station shall use the following
4   fixed-length format for the type-specific fields:

5

Type-Specific Field	Length (bits)
ORIG_MODE	1
PRI_SERVICE	16
SEC_SERVICE	16
RESERVED	7

6

7   ORIG_MODE   -   Origination mode indicator.

8   If the current call is a mobile-originated call, the mobile
9   station shall set this field to '0'. If the current call is a mobile-
10   terminated call, the mobile station shall set this field to '1'.

11   PRI_SERVICE   -   Primary service option.

12   The mobile station shall set this field to the value shown in
13   Table A-1 corresponding to the current primary service option.
14   If no primary service option is active, the mobile station shall
15   set this field to '0000000000000000'.

16   SEC_SERVICE   -   Secondary service option.

17   The mobile station shall set this field to the value shown in
18   Table A-1 corresponding to the current secondary service
19   option. If no secondary service option is active, the mobile
20   station shall set this field to '0000000000000000'.

21   RESERVED   -   Reserved bits.

22   The mobile station shall set this field to '0000000'.

6.7.4.7 Terminal Information

This information record can be included in a *Status Message* to return configuration information about the mobile station. The mobile station shall use the following variable-length format for the type-specific fields:

Type-Specific Field	Length (bits)
MOB_CAI_REV	8
MOB_MFG_CODE	8
MOB_MODEL	8
MOB_FIRM_REV	16
SCM	8
LOCAL_CTRL	1
SLOT_CYCLE_INDEX	3

One or more occurrences of the following field:

SERVICE_OPTION	16

RESERVED	4

MOB_CAI_REV   -   CAI revision of the mobile station.

The mobile station shall set this field to '00000001'.

MOB_MFG_CODE   -   Manufacturer code.

This field identifies the manufacturer of the mobile station.

The mobile station shall set this field to the manufacturer code assigned to its manufacturer.

MOB_MODEL   -   Model number.

This number is assigned by the manufacturer for a particular model.

The mobile station shall set this field to the model number assigned by the manufacturer for this mobile station.

MOB_FIRM_REV   -   Firmware revision number.

This number is assigned by the manufacturer for a particular firmware version.

The mobile station shall set this field to the revision number assigned by the manufacturer for the firmware version running in this mobile station.

SCM   -   Station class mark.

The mobile station shall set this field to its station class mark. See 2.3.3.

LOCAL_CTRL   -   Local control indicator.

If local control is enabled, the mobile station shall set this field to '1'. If local control is disabled, the mobile station shall set this field to '0'.

SLOT_CYCLE_INDEX   -   Slot cycle mode.

If the mobile station is operating in non-slotted mode, it shall set this field to '000'. If the mobile station is operating in slotted mode, it shall set this field to the SLOT_CYCLE_INDEX value in use. See 6.6.2.1.1.

SERVICE_OPTION   -   Supported service option.

The mobile station shall include one occurrence of this field for each service option supported by the mobile station. The mobile station shall set this field to the value shown in TableA-1 corresponding to the supported service option.

RESERVED   -   Reserved bits.

The mobile station shall set this field to '0000'.

1   6.7.4.8 MIN Information

2   This information record can be included in a *Status Message* to return MIN-related
3   configuration information about the mobile station. Each record of this type returns
4   information for one MIN. The mobile station shall use the following variable-length format
5   for the type-specific fields:

6

Type-Specific Field	Length (bits)
MIN1	24
MIN2	10
ACCOLC	4
MOB_TERM_HOME	1
MOB_TERM_FOR_SID	1
MOB_TERM_FOR_NID	1
HOME_SID	15

Zero or more occurrences of the following record:

SID	15
NID	16

RESERVED	0-7 (as needed)

7

8   MIN1   -   First part of the mobile station identification number (MIN).

9   The mobile station shall set this field to the MIN1 value for the
10   MIN specified by this record.

11   MIN2   -   Second part of the mobile station identification number (MIN).

12   The mobile station shall set this field to the MIN2 value for the
13   MIN specified by this record.

14   ACCOLC   -   Overload class.

15   The mobile station shall set this field to the access overload
16   class assigned to the mobile station for this MIN.

17 MOB_TERM_HOME - Home registration enable indicator.

18   If the mobile station is configured to receive mobile station
19   terminated calls when using a home (SID,NID) pair, the
20   mobile station shall set this field to '1'. Otherwise, the mobile
21   station shall set this field to '0'. See 6.6.5.3.

MOB_TERM_FOR_SID   -   Foreign SID roaming registration enable indicator.

If the mobile is configured to receive mobile station terminated calls when it is a foreign SID roamer, the mobile station shall set this field to '1'. Otherwise, the mobile station shall set this field to '0'. See 6.6.5.3.

MOB_TERM_FOR_NID   -   Foreign NID roaming registration enable indicator.

If the mobile is configured to receive mobile station terminated calls when it is a foreign NID roamer, the mobile station shall set this field to '1'. Otherwise, the mobile station shall set this field to '0'. See 6.6.5.3.

HOME_SID   -   Home system identification.

The mobile station shall set this field to the SID of the home cellular system for the MIN specified by this record.

The mobile station shall include one occurrence of the following two-field record for each home (SID, NID) pair for this MIN:

SID   -   System identification.

The mobile station shall set this field to the SID value for this (SID, NID) pair.

NID   -   Network identification.

The mobile station shall set this field to the NID value for this (SID, NID) pair.

RESERVED   -   Reserved bits.

The mobile station shall add reserved bits as needed in order to make the length of the entire information record equal to an integer number of octets. The mobile station shall set these bits to'0'.

1   6.7.4.9 Security Status

2   This information record can be included in a *Status Message* to return the authentication,
3   encryption, and voice privacy modes of the mobile station. The mobile station shall use the
4   following fixed-length format for the type-specific fields:

5

Type-Specific Field	Length (bits)
AUTH_MODE	2
ENCRYPT_MODE	4
PRIVATE_LCM	1
RESERVED	1

6

7   AUTH_MODE   -   Authentication mode.

8   If the mobile station provided standard authentication
9   information at the initiation of this call, the mobile station
10   shall set this field to '01'. Otherwise, the mobile station shall
11   set this field to '00'. All other values are reserved.

12   ENCRYPT_MODE   -   Message encryption mode.

13   The mobile station shall set this field to the value shown in
14   Table 7.7.2.3.2.8-2 corresponding to the message encryption
15   mode currently in use for this call.

16   PRIVATE_LCM   -   Private long code mask indicator.

17   If the mobile station is using the private long code mask for
18   this call, the mobile station shall set this field to '1'. If the
19   mobile station is using the public long code mask for this call,
20   the mobile station shall set this field to '0'.

21   RESERVED   -   Reserved bits.

22   The mobile station shall set this field to '0'.

1 6.7.4.10 Connected Number

2 This information record identifies the responding party to a call. The mobile station shall
3 use the following variable-length format for the type-specific fields:

4

Type-Specific Field	Length (bits)
NUMBER_TYPE	3
NUMBER_PLAN	4
PI	2
SI	2

Zero or more occurrences of the following field:

CHARi	8

RESERVED	1

5

6 NUMBER_TYPE   -   Type of number.

7   The mobile station shall set this field to the NUMBER_TYPE
8   value shown in Table 6.7.1.3.2.4-3 corresponding to the type
9   of the connected number as defined in ANSI T1.607 §4.5.9.

10 NUMBER_PLAN   -   Numbering plan.

11   The mobile station shall set this field to the NUMBER_PLAN
12   value shown in Table 6.7.1.3.2.4-4 corresponding to the
13   numbering plan used for the connected number, as defined in
14   ANSI T1.607 §4.5.9.

15   PI   -   Presentation indicator.

16   This field indicates whether or not the connected number
17   should be displayed. The mobile station shall set this field to
18   the PI value shown in Table 6.7.4.4-1 corresponding to the
19   presentation indicator as defined in ANSI T1.607 §4.5.9.

20   SI   -   Screening indicator.

21   This field indicates how the connected number was screened.
22   The mobile station shall set this field to the SI value shown in
23   Table 6.7.4.4-2 corresponding to the screening indicator value
24   as defined in ANSI T1.607 §4.5.9.

25   CHARi   -   Character.

26   The mobile station shall include one occurrence of this field
27   for each character in the connected number. The mobile
28   station shall set each occurrence of this field to the ASCII
29   representation corresponding to the character, as specified in
30   ANSI X3.4, with the most significant bit set to '0'.

1   RESERVED   -   Reserved bits.

2   The mobile station shall set this field to '0'.

1

2

3   No text.

4