



R2 Signaling Tones and Pulse Code Modulation Line Signaling

This chapter describes the R2 signaling tones generated and detected by the MFCR2 transceiver cards, and the R2 pulse code modulation (PCM) 2-bit line signaling transmitted and received by E1 spans.

Forward and Backward R2 Signaling Tones

Table 2-1 through Table 2-5 provide R2 signaling information based on ITU Q.441 as it applies specifically to the Thailand telephone network.

Table 2-1 R2 Signaling Group I Forward Signals

Token Data Field	Designation	Frequencies	Digit Meaning
1	G-I-1	1380 + 1500 Hz	Digit 1
2	G-I-2	1380 + 1620 Hz	Digit 2
3	G-I-3	1500 + 1620 Hz	Digit 3
4	G-I-4	1380 + 1740 Hz	Digit 4
5	G-I-5	1500 + 1740 Hz	Digit 5
6	G-I-6	1620 + 1740 Hz	Digit 6
7	G-I-7	1380 + 1860 Hz	Digit 7
8	G-I-8	1500 + 1860 Hz	Digit 8
9	G-I-9	1620 + 1860 Hz	Digit 9
10	G-I-10	1740 + 1860 Hz	Digit 0
11	G-I-11	1380 + 1980 Hz	Operator
12	G-I-12	1500 + 1980 Hz	Reserved
13	G-I-13	1620 + 1980 Hz	Routine testing
14	G-I-14	1749 + 1980 Hz	Reserved
15	G-I-15	1860 + 1980 Hz	End of number

Table 2-2 R2 Signaling Group II Forward Signals

Token Data Field	Designation	Frequencies	Meaning
1	G-II-1	1380 + 1500 Hz	Operator
2	G-II-2	1380 + 1620 Hz	Ordinary subscriber without priority
3	G-II-3	1500 + 1620 Hz	Coin telephone
4	G-II-4	1380 + 1740 Hz	Reserved
5	G-II-5	1500 + 1740 Hz	Coin telephone
6	G-II-6	1620 + 1740 Hz	Test
7	G-II-7	1380 + 1860 Hz	Test with priority
8	G-II-8	1500 + 1860 Hz	Operator
9	G-II-9	1620 + 1860 Hz	Reserved
10	G-II-10	1740 + 1860 Hz	Reserved
11	G-II-11	1380 + 1980 Hz	Reserved
12	G-II-12	1500 + 1980 Hz	Reserved
13	G-II-13	1620 + 1980 Hz	Reserved
14	G-II-14	1740 + 1980 Hz	Reserved
15	G-II-15	1860 + 1980 Hz	Reserved

Table 2-3 R2 Signaling Group A Backward Signals

Token Data Field	Designation	Frequencies	Meaning
1	A-1	1140 + 1020 Hz	Send next digit ($n + 1$)
2	A-2	1140 + 900 Hz	Start from first digit
3	A-3	1020 + 900 Hz	Number complete, send category and change over to reception of Group B signals
4	A-4	1140 + 780 Hz	Network congestion
5	A-5	1020 + 780 Hz	Reserved
6	A-6	900 + 780 Hz	Send category and change to Group C signals
7	A-7	1140 + 660 Hz	Reserved
8	A-8	1020 + 660 Hz	Reserved
9	A-9	900 + 660 Hz	Reserved
10	A-10	780 + 660 Hz	Reserved
11	A-11	1140 + 540 Hz	Reserved
12	A-12	1020 + 540 Hz	Reserved
13	A-13	900 + 540 Hz	Reserved
14	A-14	780 + 540 Hz	Reserved
15	A-15	660 + 540 Hz	Reserved

Table 2-4 R2 Signaling Group B Backward Signals

Token Data Field	Designation	Frequencies	Meaning
1	B-1	1140 + 1020 Hz	Free with charging
2	B-2	1140 + 900 Hz	Busy
3	B-3	1020 + 900 Hz	Interception services
4	B-4	1140 + 780 Hz	Congestion
5	B-5	1020 + 780 Hz	Free without charging
6	B-6	900 + 780 Hz	Suspicious calls services
7	B-7	1140 + 660 Hz	Reserved
8	B-8	1020 + 660 Hz	Reserved
9	B-9	900 + 660 Hz	Reserved
10	B-10	780 + 660 Hz	Reserved
11	B-11	1140 + 540 Hz	Reserved
12	B-12	1020 + 540 Hz	Reserved
13	B-13	900 + 540 Hz	Reserved
14	B-14	780 + 540 Hz	Reserved
15	B-15	660 + 540 Hz	Reserved

Table 2-5 R2 Signaling Group C Backward Signals

Token Data Field	Designation	Frequencies	Meaning
1	C-1	1140 + 1020 Hz	Send next number of subscriber A
2	C-2	1140 + 900 Hz	Start from first digit of subscriber B
3	C-3	1020 + 900 Hz	Reserved
4	C-4	1140 + 780 Hz	Congestion
5	C-5	1020 + 780 Hz	Send next number of subscriber B
6	C-6	900 + 780 Hz	Reserved
7	C-7	1140 + 660 Hz	Reserved
8	C-8	1020 + 660 Hz	Reserved
9	C-9	900 + 660 Hz	Reserved
10	C-10	780 + 660 Hz	Reserved
11	C-11	1140 + 540 Hz	Reserved
12	C-12	1020 + 540 Hz	Reserved
13	C-13	900 + 540 Hz	Reserved
14	C-14	780 + 540 Hz	Reserved
15	C-15	660 + 540 Hz	Reserved

Pulse Code Modulation Line Signaling

Table 2-6 describes the 2-bit, channel-associated pulse code modulation (PCM) line signaling used by the VCO system equipped with E1 interface cards. Forward signals are used by originating or outgoing ports, while backward signals are generated by incoming ports. For more information on E1 cards, refer to the *Cisco VCO/4K Card Technical Descriptions*.

Table 2-6 R2 Pulse Code Modulation Line Signaling

Number	Signal	Exchange Signaling			
		Forward		Backward	
		<i>Af</i>	<i>Bf</i>	<i>Ab</i>	<i>Bb</i>
1	Idle	1	0	1	0
2	Seize	0	0	1	0
3	Seize acknowledge	0	0	1	0
6a	Clear forward before answer	1	0	1	1
6a	Release guard	1	0	1	0
4	Seize acknowledge	0	0	1	1
4	Answer	0	0	0	1
6b	Clear forward after answer	1	0	0	1
7b	Release guard	1	0	1	0
5	Clear back	0	0	1	1
6a	Clear forward after clear back	1	0	1	1
7	Release guard	1	0	1	0
8	Blocking	1	0	1	1
9	Unblocking	1	0	0	0