



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 Venezuela 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	Not applicable
12	G-I-12	1500 + 1980 Hz	Request not accepted (exchange without ANUM)
13	G-I-13	1620 + 1980 Hz	Not applicable
14	G-I-14	1749 + 1980 Hz	Access to announcement
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	Subscriber without priority
2	G-II-2	1380 + 1620 Hz	Subscriber with priority
3	G-II-3	1500 + 1620 Hz	Test equipment
4	G-II-4	1380 + 1740 Hz	Coin box
5	G-II-5	1500 + 1740 Hz	Operator
6	G-II-6	1620 + 1740 Hz	Data transmission
7	G-II-7	1380 + 1860 Hz	Redirect call
8	G-II-8	1500 + 1860 Hz	Not applicable
9	G-II-9	1620 + 1860 Hz	Not applicable
10	G-II-10	1740 + 1860 Hz	Not applicable
11	G-II-11	1380 + 1980 Hz	Not applicable
12	G-II-12	1500 + 1980 Hz	Not applicable
13	G-II-13	1620 + 1980 Hz	Not applicable
14	G-II-14	1740 + 1980 Hz	Not applicable
15	G-II-15	1860 + 1980 Hz	Not applicable

Table 2-3 R2 Signaling Group A Backward Signals

Token Data Field	Designation	Frequencies	Meaning
1	A-1	1140 + 1020 Hz	Send next BNUM digit (n + 1)
2	A-2	1140 + 900 Hz	Send previous digit (n - 1)
3	A-3	1020 + 900 Hz	Number complete send category; change over to reception of Group B signals
4	A-4	1140 + 780 Hz	Network congestion
5	A-5	1020 + 780 Hz	Send category only
6	A-6	900 + 780 Hz	Number complete charge, set up voice path
7	A-7	1140 + 660 Hz	Send second previous digit (n - 2)
8	A-8	1020 + 660 Hz	Send third previous digit (n - 3)
9	A-9	900 + 660 Hz	Send next ANUM digit (n + 1)
10	A-10	780 + 660 Hz	Not applicable
11	A-11	1140 + 540 Hz	Not applicable
12	A-12	1020 + 540 Hz	Not applicable
13	A-13	900 + 540 Hz	Not applicable
14	A-14	780 + 540 Hz	Not applicable
15	A-15	660 + 540 Hz	Not applicable

Table 2-4 R2 Signaling Group B Backward Signals

Token Data Field	Designation	Frequencies	Meaning
1	B-1	1140 + 1020 Hz	Subscriber line free with charge
2	B-2	1140 + 900 Hz	Number changed
3	B-3	1020 + 900 Hz	Busy
4	B-4	1140 + 780 Hz	Congestion
5	B-5	1020 + 780 Hz	Unallocated number
6	B-6	900 + 780 Hz	Line free with charging
7	B-7	1140 + 660 Hz	Line free, no charge
8	B-8	1020 + 660 Hz	Line barred to incoming traffic
9	B-9	900 + 660 Hz	Subscriber line intercepted
10	B-10	780 + 660 Hz	Data transmission
11	B-11	1140 + 540 Hz	Not applicable
12	B-12	1020 + 540 Hz	Not applicable
13	B-13	900 + 540 Hz	Not applicable
14	B-14	780 + 540 Hz	Not applicable
15	B-15	660 + 540 Hz	Not applicable

Table 2-5 R2 Signaling Group C Backward Signals

Token Data Field	Designation	Frequencies	Meaning
1	C-1	1140 + 1020 Hz	Send next BNUM digit (n + 1)
2	C-2	1140 + 900 Hz	Send previous digit (n - 1)
3	C-3	1020 + 900 Hz	Number complete send category; change over to reception of Group B signals
4	C-4	1140 + 780 Hz	Network congestion
5	C-5	1020 + 780 Hz	Send category only
6	C-6	900 + 780 Hz	Number complete charge, set up voice path
7	C-7	1140 + 660 Hz	Send second previous digit (n - 1)
8	C-8	1020 + 660 Hz	Send third previous digit (n - 2)
9	C-9	900 + 660 Hz	Send next ANUM digit (n + 1)
10	C-10	780 + 660 Hz	Not applicable
11	C-11	1140 + 540 Hz	Not applicable
12	C-12	1020 + 540 Hz	Not applicable
13	C-13	900 + 540 Hz	Not applicable
14	C-14	780 + 540 Hz	Not applicable
15	C-15	660 + 540 Hz	Not applicable

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	Seizure	0	0	1	0
3	Seizure acknowledge	0	0	1	0
6a	Clear forward before answer	1	0	1	1
	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