



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 2-4 provide R2 signaling information based on ITU Q.441 as it applies specifically to the New Zealand 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	Reserved
12	G-I-12	1500 + 1980 Hz	Reserved
13	G-I-13	1620 + 1980 Hz	Reserved
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	Ordinary subscriber
2	G-II-2	1380 + 1620 Hz	Priority subscriber
3	G-II-3	1500 + 1620 Hz	Maintenance equipment
4	G-II-4	1380 + 1740 Hz	Coin telephone
5	G-II-5	1500 + 1740 Hz	Operator
6	G-II-6	1620 + 1740 Hz	Data subscriber
7	G-II-7	1380 + 1860 Hz	Barred message rate ¹
8	G-II-8	1500 + 1860 Hz	Step original call
9	G-II-9	1620 + 1860 Hz	Step ICF on Trunk Link Frame (TLF) at Tandem (Do not re-route)
10	G-II-10	1740 + 1860 Hz	Reserved
11	G-II-11	1380 + 1980 Hz	Price required subscriber (PPR)
12	G-II-12	1500 + 1980 Hz	Operator number identification (ONI)
13	G-II-13	1620 + 1980 Hz	Hotel service subscriber (HTL)
14	G-II-14	1740 + 1980 Hz	Expansion identification service (EIS)
15	G-II-15	1860 + 1980 Hz	Trunk offer

1. Step subscribers only.

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	Send last but one digit ($n - 1$) ¹
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	Send calling category first (first A-5) Calling subscriber's identity (successive A-5s) ²
6	A-6	900 + 780 Hz	Set up speech conditions
7	A-7	1140 + 660 Hz	Send last but two digit ($n - 2$) ¹
8	A-8	1020 + 660 Hz	Send last but three digit ($n - 3$) ¹
9	A-9	900 + 660 Hz	Send real category ³
10	A-10	780 + 660 Hz	Send last digit (n) ¹
11	A-11	1140 + 540 Hz	Reserved
12	A-12	1020 + 540 Hz	Reserved

Table 2-3 R2 Signaling Group A Backward Signals (continued)

Token Data Field	Designation	Frequencies	Meaning
13	A-13	900 + 540 Hz	Reserved
14	A-14	780 + 540 Hz	Reserved
15	A-15	660 + 540 Hz	Reserved

1. If the digit referred to is preceded by the trunk prefix 0 or 013, dialing begins back at the first digit of the dialing prefix.
2. The first A-5 is an instruction to send G-11 signal. Second and successive A-5s are to send the calling identity as G-I signals.
3. A-9 is an instruction to send a true G-II signal. It is followed by successive A-5s requesting calling party identity.

Table 2-4 R2 Signaling Group B Backward Signals

Token Data Field	Designation	Frequencies	Meaning
1	B-1	1140 + 1020 Hz	Malicious
2	B-2	1140 + 900 Hz	Subscriber transferred (changed number)
3	B-3	1020 + 900 Hz	Busy
4	B-4	1140 + 780 Hz	Congestion (when encountered after A-3)
5	B-5	1020 + 780 Hz	Not allotted and barred
6	B-6	900 + 780 Hz	Subscriber free with charging
7	B-7	1140 + 660 Hz	INward Wide Area Telephone Service (IN-WATS) (no charging to A subscriber)
8	B-8	1020 + 660 Hz	Line out of order
9	B-9	900 + 660 Hz	Common Carrier Bureau (CCB)
10	B-10	780 + 660 Hz	Malicious and INward Wide Area Telephone Service (IN-WATS)
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

Pulse Code Modulation Line Signaling

Table 2-5 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 2-5 R2 Pulse Code Modulation Line Signaling

Signal	Exchange Signaling			
	Forward		Backward	
	<i>Af</i>	<i>Bf</i>	<i>Ab</i>	<i>Bb</i>
Idle	1	0	1	0
Seize	0	0	1	0
Seize acknowledge	0	0	1	1
Answer	0	0	0	1
Flash (for 600 ms)	1	0	0	1
Called party clear	0	0	1	1
Called party reanswer (before timeout)	0	0	0	1
Calling party clear (before called party)	1	0	0	1
Calling party clear (after called party)	1	0	1	1
Release guard	1	0	1	0
Blocking	1	1	1	0