

## 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 PCM 2-bit signaling codes transmitted and received by E1 digital interface cards.

### Forward and Backward Signaling Tones

Table 2-1 through Table 2-4 provide R2 signaling information based on ITU-T Q.441 as it applies specifically to the Finnish telephone network.

*Table 2-1 R2 Signaling Group I Forward Signals*

Number	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	Centralized answering service address
12	G-I-12	1500 + 1980 Hz	Request not accepted
13	G-I-13	1620 + 1980 Hz	Address of test equipment
14	G-I-14	1749 + 1980 Hz	Spare for telecommunications administration
15	G-I-15	1860 + 1980 Hz	End of identification

**Table 2-2 R2 Signaling Group B Backward Signals**

Number	Designation	Frequencies	Digit Meaning
1	G-II-1	1380 + 1500 Hz	Ordinary subscriber (national)
2	G-II-2	1380 + 1620 Hz	Subscriber with priority (national)
3	G-II-3	1500 + 1620 Hz	Test equipment (national)
4	G-II-4	1380 + 1740 Hz	Payphone (national)
5	G-II-5	1500 + 1740 Hz	Operator (national)
6	G-II-6	1620 + 1740 Hz	Data subscriber (national)
7	G-II-7	1380 + 1860 Hz	Ordinary subscriber (international)
8	G-II-8	1500 + 1860 Hz	Data subscriber (international)
9	G-II-9	1620 + 1860 Hz	Subscriber with priority (international)
10	G-II-10	1740 + 1860 Hz	Operator with forward transfer facility (international)
11	G-II-11	1380 + 1980 Hz	Redirected call
12	G-II-12	1500 + 1980 Hz	Spare for national use
13	G-II-13	1620 + 1980 Hz	Digital connectivity required
14	G-II-14	1740 + 1980 Hz	Spare for national use
15	G-II-15	1860 + 1980 Hz	Spare for national use

**Table 2-3 R2 Signaling Group A Backward Signals**

Number	Designation	Frequencies	Meaning
1	A-1	1140 + 1020 Hz	Send next digit ( $n+1$ )
2	A-2	1140 + 900 Hz	Send last but 1 digit ( $n-1$ )
3	A-3	1020 + 900 Hz	Change over to reception of Group B signals
4	A-4	1140 + 780 Hz	Congestion in the national network
5	A-5	1020 + 780 Hz	Send category
6	A-6	900 + 780 Hz	Set up speech conditions
7	A-7	1140 + 660 Hz	Send last but 2 digits ( $n-2$ )
8	A-8	1020 + 660 Hz	Send last but 3 digits ( $n-3$ )
9	A-9	900 + 660 Hz	Send calling party's number
10	A-10	780 + 660 Hz	Spare for tele administrations use
11	A-11	1140 + 540 Hz	Not used in national network
12	A-12	1020 + 540 Hz	Not used in national network
13	A-13	900 + 540 Hz	Not used in national network
14	A-14	780 + 540 Hz	Not used in national network
15	A-15	660 + 540 Hz	Not used in national network

**Table 2-4 R2 Signaling Group B Backward Signals**

Number	Designation	Frequencies	Meaning
1	B-1	1140 + 1020 Hz	Subscriber line free, malicious call identification
2	B-2	1140 + 900 Hz	Send special information tone
3	B-3	1020 + 900 Hz	Subscriber line busy
4	B-4	1140 + 780 Hz	Congestion
5	B-5	1020 + 780 Hz	Unallocated number
6	B-6	900 + 780 Hz	Subscriber line free, charge
7	B-7	1140 + 660 Hz	Spare
8	B-8	1020 + 660 Hz	Subscriber line out of order
9	B-9	900 + 660 Hz	Route call to centralized answering service position in incoming numbering area
10	B-10	780 + 660 Hz	Subscriber number changed
11	B-11	1140 + 540 Hz	Not used in national network
12	B-12	1020 + 540 Hz	Not used in national network
13	B-13	900 + 540 Hz	Not used in national network
14	B-14	780 + 540 Hz	Not used in national network
15	B-15	660 + 540 Hz	Not used in national network

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

Forward		Backward		Meaning
Af	Bf	Ab	Bb	
1	0	1	0	Idle
0	0	1	0	Seizing
0	0	1	1	Seizing acknowledgment
0	0	0	1	Answer
0	0	1	0	Metering <sup>1</sup>
0	0	1	1	Clear back
0	0	0	0	Forced release
1	0	1	1	Clear forward
1	0	0	1	
1	0	0	0	
1	0	1	1	Blocking
0	1	1	1	Operator's signal <sup>2</sup>

1. Backward signals *Ab* and *Bb* Metering are 150 ms pulses.
2. The beginning state for signal *Bf* of Operator's signal is interpreted as a trunk-offering-start signal. The end state is interpreted as a trunk-offering-release signal. When connected to older equipment, channel 16 can also use trunk-offering signal in accordance with older requirements (i.e., 150 ms pulse on *Af*).

