

APPENDIX 6

COMMAND DOWNLINK & MODULATION

Command Downlink

Parameters of the Command downlink are summarized below:

Access method:	Single command downlink channel on specified channel.
Data format:	QPSK with feed forward signal regeneration from pilot tones
Design Error rate:	10^{-6} BER
Pulse shaping:	Root-raised cosine at transmit and receive locations
Channel raw data rate:	10,000 bits/s
Sustained message throughput:	6365 bits/s (error corrected)
Symbol rate:	5,000 symbols/s on lower sub-band
Error detection/correction method:	FEC using a 16,11 block code
Error correction:	1 error in 16 bit block
Error detection:	2 errors in 16 bit block
Data bandwidth:	7500 Hz $[(1+\alpha) \times \text{data Nyquist limit}]$
Data band lower limit	-7872 Hz, relative to channel center
Data band centre:	-4122 Hz, relative to channel center
Data band upper limit:	-372 Hz, relative to channel center

Modulation

The modulation format used for the downlink transmission is QPSK. A constellation diagram of this format is shown in figure 1, where it may be noted that adjacent symbols differ by only one bit, thereby minimising potential error rate.

