APPENDIX 6

COMMAND DOWNLINK & MODULATION

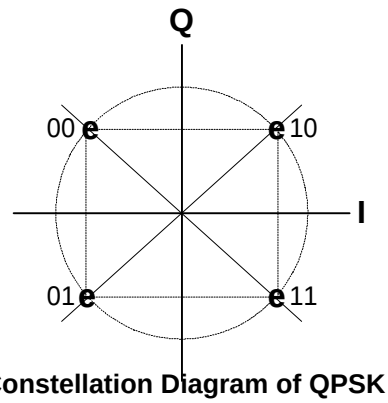
Command Downlink

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+α) $\times$ 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.



Constellation Diagram of QPSK showing combinations of 2 bits
Figure 1