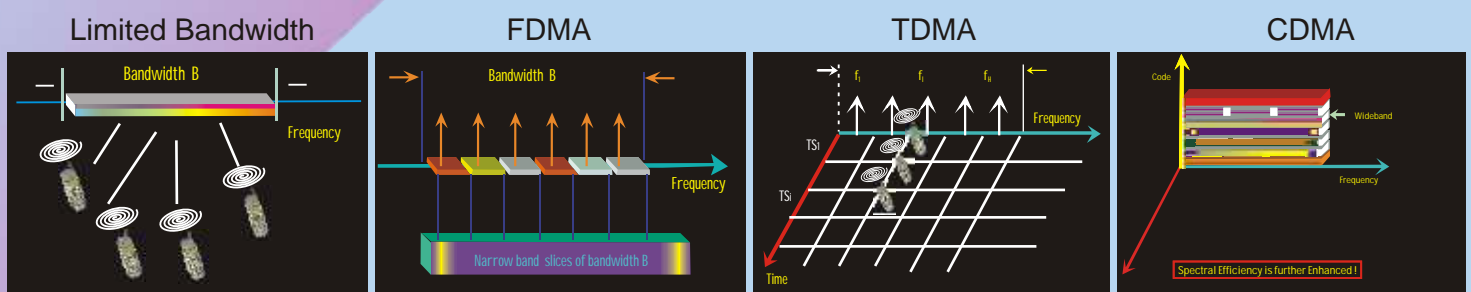# CDMA-DIRECT SEQUENCE
SPREAD SPECTRUM (DSSS) TRAINER ST2131

CDMA has gained widespread international acceptance by Cellular Radio System operators as an upgrade that will increase both their system capacity and the service quality.

This trainer provides a basic understanding of the concepts behind CDMA, and various issues that need to be considered in the design of a CDMA system.

A new commercial marketplace has been emerging. Called spread spectrum, this field covers the art of Secure Digital Communications that is now being exploited for commercial and industrial purposes. In the next several years hardly anyone will escape being involved in some way with spread spectrum communications. Applications for commercial Spread Spectrum ranges from "Wireless" LAN's (computer to computer local area networks), to Integrated Barcode Scanner/ Palmtop Computer/ Radio Modem devices for warehousing, to Digital Dispatch, to Digital Cellular Telephone Communications, to "information society" city/area/state or country wide networks for passing Faxes, Computer data, Email, or Multimedia data.

Limited Bandwidth	FDMA	TDMA	CDMA

CDMA-DIRECT SEQUENCE
SPREAD SPECTRUM (DSSS) TRAINER
ST2131

TECHNICAL SPECIFICATIONS
- Direct Sequence Spread- Spectrum (DS-SS) Modulator, Demodulator.
- Programmable chip rates upto 10 Mchip/s.
- Spreading codes:
- Gold sequences (up to 2^{23}-1 chips)
- Maximal length sequences, (max length 2^{23}-1 chips)
- Barker codes (length 11, 13)
- Code modulation: BPSK/QPSK/OQPSK with output spectral shaping filter:
- raised cosine square root filter with 20%, 25%, or 40% rolloff.
- Internal generation of pseudo-random bit stream and unmodulated carrier for test purposes.
- Built-in channel impairments generation:
- Additive White Gaussian Noise
- Frequency offset (Doppler)
- Sequential code search.
- 4-bit soft-quantized demodulated bits.
- Extensive monitoring:
- Receiver lock
- Carrier frequency error

Included Accessories:
Software CD-Rom, Theory manual, Programming software, Operating & applications manual Faq's, Serial interface cable.


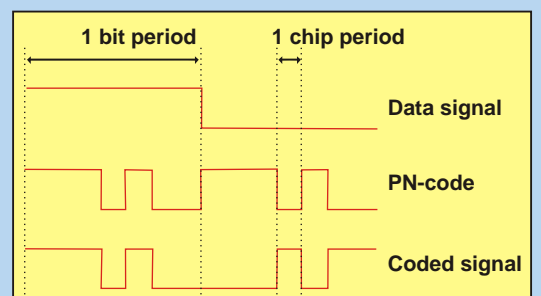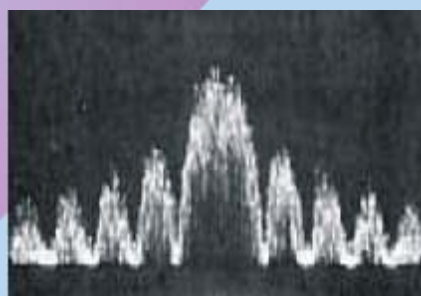Following **EXPERIMENTS & ASSIGNMENTS** can be performed with this trainer:-
1. To study theory of Direct Sequence Spread Spectrum Modulation and Demodulation (DS-SS).
2. Selection and study of various PN codes (MLS, GOLD, BARKER)
3. Generate (spreading) DS-SS modulated signal.
4. To demodulate (despreading) DS-SS modulated signal
5. Selection & comparative study of various code modulation techniques: BPSK/QPSK/OQPSK..
6. Modulation and Demodulation using internal generation of 2047 bit PN sequence as modulator Input and unmodulated carrier.
7. Spreading and Despreading using additive white Gaussian Noise Generator and frequency offset.
8. To perform spreading and despreading using extensive monitoring at the receiver for code lock, carrier lock, carrier frequency offset and code acquisition.
9. To study the effect of Synchronization. Sequential, code search in Despreading.
10. Voice Communication using DSSS concept ....

APPLICATIONS: This trainer can be used in:
- Satellite Communication & Broadcasting lab.
- Cellular Mobile Communication lab.
- Advanced Communication lab.
- Broadband Communication lab.
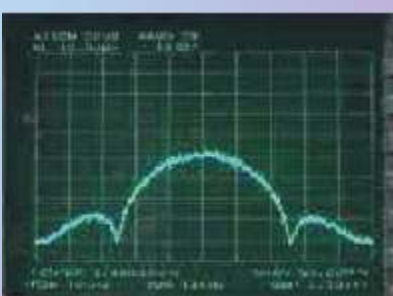
SPECTRUM OF DSSS SIGNAL

Direct-sequence spreading