DCME Analyzer - E1 Only
(Digital Circuit Multiplication Equipment)
Typical Application

- DCME
- E1
- 8 E1’s
- Cellular / Radio / Satellite
- Voice
- Fax
- Compression
- USB E1 Analyzer
- 1x E1
Features

- DCME analyzer uses GL’s Dual port USB E1 unit to provide the capability to test and analyze DCME signals
- Supports IESS-501 Rev 3 Specifications and equipment such as DTX 360 of ECTel
- Connects non-intrusively to the bearer side of DCME equipment
- Captures the entire DCME bearer signal to the PC’s hard disk
- Real-time and post processing of the DCME bearer signal
- Verification of channel mapping and implementation timing of the DCME protocol Golay and BCH error correction
- Bit level analysis and verification of facsimile data sub-multiplexing on DCME bearer
The figure shows a simplified block diagram of the use of this hardware and software as a Test Bed for end-to-end testing of DCMEs.
DCME Test and Analysis Tool Kit

Test Bed – Overview

• On the trunk sides, the DCMEs are loaded with PCM sources consisting of voice, data and fax signals.

• The loaded PCM signals are analyzed after having passed through DCME processing, together with, if required, injected satellite delay and error.

• The assignment channel, bearer frame and multiframe, connectivity and bit rotation are analyzed using the DCME Test and Analysis System (DTAS).
DCME Test Analysis System (DTAS)

- The DTAS connects non-intrusively to the bearer side of the DCME.
- Consists of - Dual port USB E1 unit, One 16 bit A/D Card w/ Speakers, and DCME Test Analysis Software.
E1 Analyzer Software
DCME Functions

**Bearer Frame-by-Frame Analysis**

- Extraction and display of raw bearer data.
DCME Functions

**DCME Frame-by-Frame Analysis**

- Synchronizes to the DCME Frame and Multi-frame
- Assembly of the control channel messages
- Decodes and verifies BC and IT identification words
- Displays frame by frame DCME map connectivity
- Performs Control Channel Error Correction Coding
- Utilities for search and analysis of anomalies
BC / IT Connectivity

- Analysis on the following types of BC’s: 64 kbps, 40 kbps, Bit Banks, Fax Banks, 4/3 bit overload, 3/2 bit overload, and pre-assigned.
- Verification of connectivity and implementation delay.
- For each selected IT (overload or normal), extraction of the ADPCM words (whether 2, 3 or 4 bit) and decoding to PCM for comparison with the original PCM input.
DCME Functions

DCME Multiframe-by-Multiframe Analysis

- Analyze the bearer output of a DCME for async words.
- Async words contains information about IT circuit alarms, bearer backward alarms, DLC support messages, and other maintenance information.
Facsimile Frame-by-Frame Analysis

- Decodes Facsimile Control Channel (FCC) and displays messages.
- Displays raw fax bank data.
- Displays facsimile data and signaling bits for IT channels.
- Extraction of Facsimile data for viewing of image.
- Extraction and processing of signaling data.
Full Duplex Facsimile Protocol Analysis

- Decodes and displays FCC messages from 2 DCME’s (Tx and Rx) on a frame basis.
- Filtering of FCC messages on active or specific IT’s.
- Decodes T.30 HDLC frames.
Full Duplex Facsimile Protocol Analysis with T30 Signaling

- Displays T30 signaling messages exchanged between two DCMEs
- Gather Facsimile data for later viewing
ADPCM Extraction & Conversion

- Supports voice file extraction from captured data for later playback
- ADPCM encoded speech vary in word length (2-bit, 3-bit, and 4-bit mode)
- Audio playback of PCM for analysis
Error Correction Utilities

- Convenient tool for encoding and decoding Golay and BCH forward error correction (FEC) codes used between two DCMEs.
DCME Bearer & Full Duplex Capture

- Capture the output of the DCME for analysis using other programs.
Real-time Bearer Analysis

- Indicates synchronizing and bearer format
- Gathers real-time statistics (every 1 second)
- BC / IT connectivity maps
- Real-time IT filtering of FCC messages
Thank You