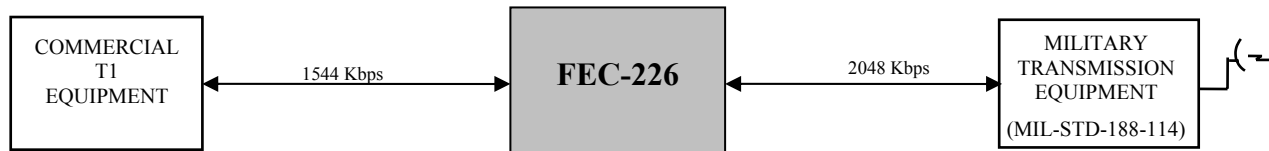


TELEGRID's Tactical T1 Interface Adapter (TTIA) Model FEC-226, implements rate conversion between commercial T1 and military 2048 Kbps while adding Forward Error Correction (FEC) and interleaving to improve link Bit Error Rate (BER) performance. The TTIA was developed for the US Army to enable Mobile Subscriber Equipment (MSE) AN/GRC-226 (V) radios to support T1 circuits in commercial applications such as Asynchronous Transfer Mode (ATM) transmission and Personal Communications Service (PCS) base station backhaul links. The Reed Solomon FEC method used in the TTIA improves the RF link BER performance from  $10^{-3}$  to better than  $10^{-8}$ . The bit stream interleaving method used in the TTIA provides protection from link fades. Together, the combination of FEC and interleaving results in a level of performance comparable to fiber optic.



**FEATURES**

- Adapts commercial T1 (DS1) circuits to military MIL-STD-188-114 interfaces.
- Utilizes an advanced Forward Error Correction (FEC) algorithm for superior BER performance.
- Provides bit stream interleaving.
- Provides jamming indicator.
- Housed in a 1U rack space enclosure.
- Operates from 115 VAC or 9-36 VDC.
- Front panel diagnostics switches and alarm/status indicators.
- Software reprogrammable.

**BENEFITS**

- Allows use of military legacy LOS Radios as range extension for COTS equipment.
- Provides BER performance comparable to or better than fiber optic.
- Protects against radio link fades.
- Indicates when radio link is being jammed.
- Can be easily installed in existing assemblage racks above or below legacy radios.
- Uses same AC and DC power sources as radios.
- Easy access to diagnostics functions and alarms.
- Allows future changes of platform characteristics.

# TACTICAL T1 INTERFACE ADAPTER (TTIA) MODEL FEC-226

## SPECIFICATIONS

### MIL-STD-188-114 INTERFACE

**Data Rate** 2048 Kbps  $\pm$  130 ppm  
**Electrical** Balanced NRZ (DTE)  
78 ohm impedance  
Unrestricted pulse rate  
**Mechanical** Female DB-25

### T1 INTERFACE

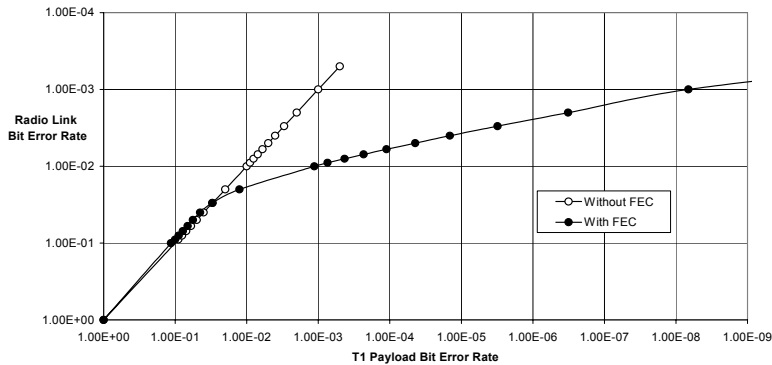
**Data Rate** 1.544 Mbps  $\pm$  130 ppm  
**Electrical** DS1 bipolar (NT)  
100 ohm impedance  
**Format** ESF, D3/D4 and SLC-96  
**Line Coding** B8ZS or AMI  
**Mechanical** Female RJ-45

### GENERAL

**Operating Mode:** Full Duplex  
**Master Timing:** Provided by T1 interface, MIL-STD-188-114 interface or internally  
**TED Interface:** Out-of-sync indication  
**Diagnostics:** T1 loopback, MIL-STD-188 loopback, Remote loopback  
**Indicators:** PWR, LOC, LOFS, BPV, YEL ALM, RST  
**Primary Power:** 115VAC @ 50-60 Hz, 9-36 VDC

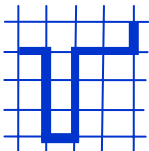
**Operating Temp:** 0 to 40 degrees C, ambient  
**Relative Humidity:** 0 to 90% non-condensing

### TTIA BIT ERROR RATE (BER) PERFORMANCE



### PCS BACKHAUL APPLICATION

The TTIA was developed for the US Army CECOM to enable use of Mobile Subscriber Equipment (MSE) trunks as backhaul for commercial Personal Communications Service (PCS) systems. In commercial PCS systems the backhaul connections between base stations and the Mobile Telephone Switching Office (MTSO) are normally fiber-based, low Bit Error Rate (BER) T1 circuits. MSE trunks, however, do not support T1 rate and provide only a poor BER performance in the order of  $10^{-3}$ . This is where the TTIA became essential. It not only provided a T1 interface for the MSE but also, through the addition of Forward Error Correction (FEC) and interleaving, improved the link performance to better than  $10^{-8}$  thus supporting above standard PCS performance. The success of the TTIA in the PCS system resulted in its use in other Army applications such as the transmission of ATM traffic on the battlefield.



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