

# 1 Introduction

## 1.1 Scope of Manual

The purpose of this manual is to provide planning and installation personnel with the appropriate procedures to plan and install the FT-512 Trailblazer Digital Microwave Radio. To avoid harm to persons or damage to the product please ensure that you have read through the safety, unpacking and installation sections before proceeding.

## 1.2 Functional Overview

The FT-512 provides a reliable, wireless voice and high-speed data connection up to a distance of 50 km. This radio is specifically designed for easy integration with our voice and data multiplexer cards, or any standard V.35 serial device. In addition, Carlson Wireless Technologies Inc. (CWT) also offers a multipoint card cage that will link together the serial data through our network interface card allowing up to 4 E1's/T1's connection into the public switched telephone network. CWT can provide excellent price/performance solutions for many of the worlds telecommunication needs both in a point to point or point to multipoint topologies.

The initial release is using a 2.4 GHz radio frequency band, however others are scheduled to follow in the 3.5 and 5.7 GHz radio bands in 1Q2003.

## 1.2.1 Main Features

**512 or 256 kb/s Synchronous Data Stream with Frame Sync** – Structured for high quality PCM voice use, V.35 serial data peripherals, or optionally an 10 MB/s Ethernet network port.

**Full configurable through a PC** – Simplify the setup using our Graphics User Interface application – Data speed, CDMA code, Clocking, Master/Slave and selection of the user frequency pool are configurable in minutes with a serial Com port.

**Repeater** – This product can act as a repeater by just connecting the serial data port back to back with another unit and setting the external clock to yes on the master side.

**Standard ISO 2593 V.35 DTE port** – plugs right in to most V.35 devices

**Low Power Draw** – The FT-512 uses between \_ to 2 watts of power and accepts any voltage between 12 and 48 VDC.

**Very Expandable-** You can start out with only one link and, utilizing a card cage, continue to add cards linking together the data and thus gain the features of a point to multipoint topology. Thus you can continue expanding without losing any of your original investment.

**Private and Secure** – Encrypted CDMA spread spectrum modulation, proprietary framing, structure and packet size assures complete privacy.

**Wire-line Quality Voice and Data** – Data speeds are selectable up to 512 kb/s. Designed to integrate seamlessly with our full bandwidth 64kb PCM POTS cards for high quality voice line/trunks.

**Optional 10 MB/s Ethernet port on-board** - For simultaneous LAN / IP data and PCM voice needs

**Affordable** – The “per pair” pricing of the FT-512 is comparable to the “single unit” of other data radios not designed for voice and PSTN integration.

## 1.3 Optional Add-on Boards

### 1.3.1 Point to point

The FT-512 is a powerful voice and/or data machine that can operate as a stand alone point to point microwave link. Optional voice and data plug-in cards are also available for your **current and future** growing needs:

#### **4, POTS lines voice plug-in card**

Four, full bandwidth 64kb PCM, POTS lines can be extended to one location, eliminating the need for external multiplexers.

#### **8, POTS lines voice plug-in card**

Eight, POTS lines can be extended to one location, eliminating the need for external multiplexers and can be configured as full bandwidth 64kb PCM or 32kb ADPCM to accommodate your data needs as well!

#### **1, 10BaseT, Ethernet bridge port**

With this unique option, line quality circuit switched voice can be used along with high-speed LAN data traffic, possibly eliminating the need of a router!

#### **4, port, shared V.35 data plug-in card**

Why set-up several individual data links when you can extend four data ports to one location and share the cost between customers?

### 1.3.2 Multipoint

#### **18 Slot Card Cage with 100 watt power supply**

You can have up to 15 villages, each served with up to 8, 64 kb PCM non blocking telephone lines/trunks integrated into one card cage along with an E1 or T1 direct digital connection. 1 or 2 time slots can be used for providing Internet.

#### **4 E1, V52, Network Interface Card**

With this optional Card Cage and 4 E1, Network Interface Card, you can provide up to 120 users with high quality voice and high speed Internet connectivity along with remote monitoring and diagnostics.

#### **4 T1, GR303, Network Interface Card**

With this optional Card Cage and 4 T1, Network Interface Card, you can provide up to 96 users with high quality voice and high speed Internet connectivity along with remote monitoring and diagnostics.

## **1.4 Application and System Design Considerations**

### **1.4.1 Point to Point Microwave Link**

Security Monitoring Cameras  
Public Safety Data Links  
Point to Point Commercial Data Links  
Cellular Backhaul Data Needs  
Permanent or Temporary Telephone Service  
Emergency and Disaster Relief  
Public Calling Phones  
Leased Line Emulation  
Islands and other Isolated Areas

### **1.4.2 Multipoint Microwave Link**

Internet Café and Telephone Calling Centers  
Wireless Digital Local Loop (Rural Telephone)

## 1.5 General Specifications

Note: More technical details are found in the Appendix of this manual

### Data Interfaces

Primary Serial Data Port	V.35 using a DB 25 Connector (RS-422/RS-232)
Data Rate and Type	256/512 kbps, Synchronous
Command Port	RS-232, 9600 bps, N,8,1
Latency	less than 5 ms.

### Power Requirements

Input Voltage	12 to 48 Vdc
Power Consumption	2 Watts in full operation (does not include add-on cards)

### RF Specifications

RF Frequency Band	2.400 to 2.4835 GHz 2.350 to 2.500 Optional for export only!
RF Channels	Programmable in 1 MHz steps
RF Signal Bandwidth	12 MHz (7 non overlapping channels)
PN Code Rate	11 M chip/sec
PN Code Length	16
Spreading codes	4 programmable non orthogonal codes
Processing Gain	12.04 dB
Modulation Type	BPSK (256) or QPSK (512kbs) DSSS
Transmitter Output Power	+17dBm, set to allow CDMA operation
Receiver Sensitivity ( $10^{-6}$ BER)	-93 dBm @ 256 kbps, -90 dBm @ 512 kbps

<b>Operating Temp</b>	-30 to +60 Degrees C with solar shielding
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### Mechanical

PCB dimensions	5 in. x 6 in. x 1 in.
PCB weight	0.5 lbs