

# Wireless Networks Falcon Packet Radio

Installation & Operating Instructions

Rev 2.0

December 7, 2000

## 1.0 Introduction

This document summarizes the installation and operating instructions for the Wireless Networks Falcon Packet Radio.

**This device complies with Part 15 of the FCC Rules, operation is subject to the following two conditions:**

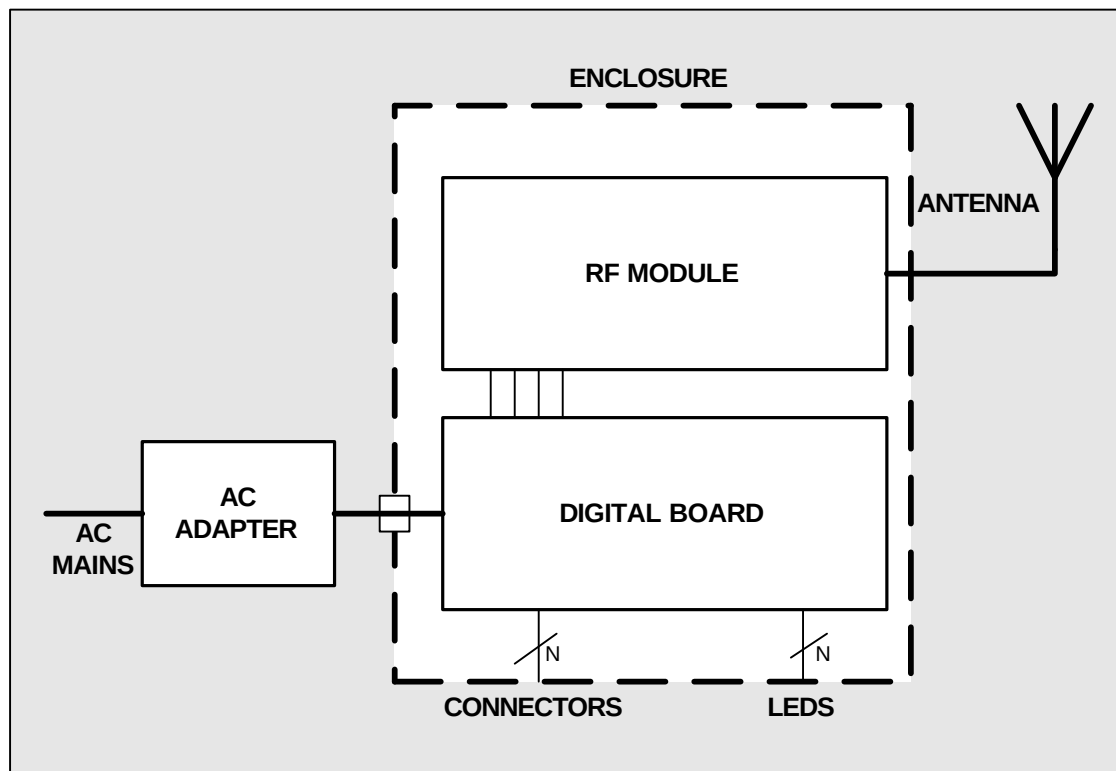
- 1) this device may not cause harmful interference, and**
- 2) this device must accept any interference received, including interference that may cause undesired operation.**

**FCC ID: 08J-FPR-U20**

**Models: Falcon FPR-U20-110, Falcon FPR-U20-120**

## 2.0 Overview

The block diagram shown below illustrates the major blocks of the system:



### 3.0 System Description

The Wireless Networks Falcon Packet Radio is used in a wireless local area network, operating in the 450 - 470 MHz frequency band. The installed radio consists of a stand-alone countertop radio, cables to access Ethernet and data lines, AC wall transformer, antenna, and coax cable to the antenna. The unit is powered by an AC wall transformer, which converts AC mains (90 – 240 VAC) to DC voltage to power the radio. Data transmission capability is 19.2 kbps. Radio is operated in half-duplex mode, and data is transmitted in packets. Front panel contains connectors to AC transformer, Ethernet, data lines; front panel also contains indicator lights (LEDs). Rear panel contains connector to antenna. This radio is licensed by the FCC under parts 2 and 90, and meets FCC part 15.

There are two main physical/functional blocks, an RF module and a digital board. The RF module is an off the shelf half duplex UHF RF link, capable of 2W of output power. The digital board is a printed circuit board that provides the remainder of the hardware functionality (CPU, peripherals, internal power supplies, etc.). Both the digital board and RF module reside in a metallic enclosure, to provide electromagnetic compatibility. With the exception of the antenna connector, the digital board provides all other connections to the outside of the enclosure.

The Falcon Packet Radio operates in the 450 – 470 MHz frequency band and is used within a local area wireless network. Synthesized RF Channels are selectable in the field, and can be changed by instructions generated within the network. RF power output is fixed. The network consists of individual user sites and a hub which gathers all transmitted information, monitors activity, and generates instructions. Both of these functions utilize the same hardware.

## 4.0 Specifications

### 4.1 General

|                   |                                                              |
|-------------------|--------------------------------------------------------------|
| Frequency Band    | 450 – 470 MHz                                                |
| Regulations       | Licensed under FCC parts 2 & 90<br>Complies with FCC part 15 |
| Capacity          | 19.2kbps (9600 baud)                                         |
| Modulation        | 4-level FSK                                                  |
| Channel Bandwidth | 12.5 kHz                                                     |
| Operation Mode    | Half Duplex                                                  |

### 4.2 Interfaces

|                  |                                       |
|------------------|---------------------------------------|
| Type<br>Physical | 4 serial ports, RS-232/RS-485<br>RJ11 |
| Type<br>Physical | Ethernet, 10BASE-T compatible<br>RJ45 |
| Type<br>Physical | Coax connection<br>BNC-female         |
| Type<br>Physical | Power plug<br>2.5 mm jack             |

### 4.3 RF Transmitter and Receiver

|                    |                                      |
|--------------------|--------------------------------------|
| Frequency Band     | 450 – 470 MHz                        |
| Output Power (max) | 2 watts                              |
| Frequency Control  | Synthesized, $\pm 1.5$ ppm stability |

### 4.4 Antenna

|                 |               |
|-----------------|---------------|
| Frequency Range | 430 – 470 MHz |
| Input           | BNC-male      |
| Gain            | 3.2 dBi       |
| Length          | 17 inches     |

### 4.5 Power Requirements

|                  |                           |
|------------------|---------------------------|
| Input AC Voltage | 90 to 264 VAC, 47 – 63 Hz |
|------------------|---------------------------|

|               |                |
|---------------|----------------|
| Input Current | 0.5 A @ 115VAC |
|               | 0.3 A @ 230VAC |

|                     |                 |
|---------------------|-----------------|
| Output DC Voltage   | 12 VCD          |
| Output Current      | 1500 mA         |
| Output Ripple/Noise | 100 mV p-p max. |
| Output Connector    | 2.5 mm plug     |

#### 4.6 Environmental Specifications

|                     |                          |
|---------------------|--------------------------|
| Ambient Temperature | 0 to 70 degrees C        |
| Storage Temperature | -40 to +85 degrees C     |
| Relative Humidity   | 5% to 95% non-condensing |

#### 4.7 Mechanical

|                  |                           |
|------------------|---------------------------|
| Enclosure Size   | 5.38 x 5.28 x 1.12 inches |
| Enclosure Weight | tbd lbs                   |



## 5.0 Interfaces

| Function (enclosure text) | Connector Type |
|---------------------------|----------------|
| AC ADAPTER INPUT (DC)     | 2.5 mm jack    |
| ETHERNET (ETHERNET)       | RJ45           |
| TERMINAL 1 (A)            | RJ11           |
| TERMINAL 2 (B)            | RJ11           |
| TERMINAL 3 (C)            | RJ11           |
| TERMINAL 4 (D)            | RJ11           |
| ANTENNA                   | BNC - female   |

## 6.0 Display Indicators

| Function (enclosure text) | Description                                                                     | Type      |
|---------------------------|---------------------------------------------------------------------------------|-----------|
| POWER (PWR)               | Indicates that power from an external AC adapter is connected.                  | Green LED |
| ONLINE (ONLINE)           | Indicates that the CPU is active, and that it has a link with the Access Point. | Green LED |
| RF PACKET RECEIVE (RX)    | System is currently receiving a packet.                                         | Green LED |
| RF PACKET TRANSMIT (TX)   | System is currently transmitting a packet.                                      | Green LED |
| ETHERNET LINK (LINK)      | Ethernet link has been established.                                             | Green LED |
| ETHERNET ACT (ACT)        | Flashes with Ethernet activity.                                                 | Green LED |

## 7.0 Installation

**IMPORTANT!! For FCC RF exposure compliance, the antenna must be installed with a minimum distance of 20 cm away from all nearby persons.**

Installation of the Falcon Packet Radio should be near an AC outlet with enough distance to use provided AC wall transformer. When utilizing the Ethernet capability, the unit should be close enough to Ethernet data port for easy cabling. Installation is not permanent – this is a countertop unit that is easy to relocate. No tools are required for installation.

Antenna is to be connected by a 22-foot coax cable from the rear panel of the Falcon Packet Radio.

Connect AC wall transformer to DC input of radio making sure that jack seats fully in mating connector; connect other end to AC wall outlet. Connect BNC cable connector from antenna to BNC connector on rear panel, making sure that connector locks into place. When connecting serial ports (RJ11) or Ethernet port (RJ45) be sure that connector clicks into place.

Upon power-up, unit will perform self-tests.

This unit to be installed only by properly trained professionals, in accordance with FCC rules and regulations.

## 8.0 Warranty

Wireless Networks Falcon Packet Radio product is not sold to the general public. This product is used as a wireless access device in the wireless networks deployed and operated by Wireless Networks, Inc. or its subsidiaries. Consequently the product carries no limited warranty. The product is manufactured and tested to meet all FCC and safety requirements. All repairs and maintenance are carried out by Wireless Networks, Inc. trained and certified depot sites to ensure compliance with all FCC and safety requirements.