Applications

- Point to Point medium haul, light density LAN extensions.
- Extending communications service, including local area network and PBX extensions in a single radio link.

MODEL 2351S (SYNTHESIZED)
21.2-23.6 GHz MILLIMETER WAVE RADIO LINK

10 Mbps: Ethernet, Ethernet plus 1 or 2 T1 or E1

Features & Benefits

- Flexible - Can be configured for ETHERNET only, ETHERNET+T1/E1, or ETHERNET+2T1/2E1.
- Operating frequency tunable at the Interface Unit with thumbwheel switches.
- Optional Output Power Control at the Interface Unit with thumbwheel switch.
- One year warranty - Low parts count, highly derated solid state devices make for extremely high MTBF.
- Easy installation - special mounts enable simplified, rapid installation.

Description

The 2351S series synthesized digital millimeter wave radio is a simple, low cost, 10 Mb/s, alternative to burying fiber.

For all your ETHERNET needs, the 2351S millimeter wave link affords a low cost full 10 Mb/s radio solution.

The 2351S digital radio, with its included switch selectable AUI/DB15 or UTP/RJ45 interface, will connect directly into your computer or 802.3 device such as a Router, Bridge, or Repeater, because the transceiver unit is built into the radio itself. The UTP interface facilitates full duplex operation. Optional separate T1/E1 capability (1T1, 1E1, 2T1, or 2E1) is available to add low cost voice service to the same radio link.

Three units make up the 2351S system:

- A weatherproof outdoor transmitter/receiver unit including integral 12" antennas.
- Also available in separate box for use with external antennas.
- An Indoor Interface unit containing power supplies, ETHERNET transceiver, and optional T1/E1 circuitry.

Technical Specifications

**TECHNICAL SUMMARY**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>21.2 to 23.6 GHz</td>
</tr>
<tr>
<td>Standard TX/RX spacing</td>
<td>1200 MHz</td>
</tr>
<tr>
<td>Allocated R.F. Channel Bandwidth</td>
<td>50 MHz</td>
</tr>
<tr>
<td>Occupied Bandwidth</td>
<td>28 MHz</td>
</tr>
<tr>
<td>Modulation type</td>
<td>2-level FSK (FM)</td>
</tr>
</tbody>
</table>

**STATUS AND DIAGNOSTICS**

- LED Status Indicators: Primary power, Link continuity
- LED Alarm indicators: AGC Alarm, Tx Alarm, Rx Alarm, Frequency command error
- Alignment Aids: Outdoor Unit: AGC Test Points, Indoor Unit: AGC Level Meter
TRANSMITTER CHARACTERISTICS

RF Source Oscillator/Multiplier/Amplifier Type
Guaranteed Power Output +17 dBm (minimum)
Power Control Option 7 steps down from max power out
Frequency Stability (-30° to +70° C) ± 0.001%
Tuning Range Covers full band with Two (2) sets of units
(One set covers upper half, one set covers lower half)
In response to interference, radios may be tuned in 5 MHz increments at the Control Unit.

RECEIVER CHARACTERISTICS

Type - Dual Conversion Superheterodyne 2500 & 70 MHz
Noise Figure (System) 5.5 dB (typical)
Sensitivity
For 10-6 BER operating point (LAN Only) -75 dBm
For 10-3 BER operating point (LAN+T1/E1) -78 dBm
Maximum receiver input -15 dBm
(Damage will occur at +5 dBm)

12" ANTENNA CHARACTERISTICS

Type Parabolic
Diameter 12.5 inches (31.8 cm)
Polarization Linear
Gain (22.4 GHz) 35 dB
Front to back ratio 42 dB
Beamwidth (3 dB) 3.2°

INTERFACE PARAMETERS

Ethernet Specification (direct) IEEE 802.3
Protocols passed IEEE 802.3

ENVIRONMENTAL CHARACTERISTICS

OUTDOOR UNIT INDOOR UNIT
Ambient temperature range -30° to +70° C 0° to +50° C
Storage & transportation -40° to +80° C -40° to +60° C
Humidity up to 100% up to 95% at +50° C
(non-condensing) (non-condensing)

INPUT VOLTAGE REQUIREMENTS

Power input 93 - 265 VAC
Brown-out voltage 90 VAC
Line frequency 50/60 Hz
A six foot long power cord with a 3-prong plug is provided with the indoor unit.

TRANSMISSION DATA

System Gain Guaranteed for 10^-6 BER operating point 92 dB (LAN Only)
Unfaded BER 10^-12

POWER CONSUMPTION

Total power required per Terminal 50 Watts Maximum
(100 Watts Maximum for both ends of the link)

FCC INFORMATION

FCC rules part number 101
Frequency range 21.2 - 23.6 GHz**
Emission Designator 42M0F7D
Frequency tolerance ± 0.001%
FCC Maximum power output 0.10 watts

SIZE AND WEIGHT

High 15" 12" 15" 15 lb.
Deep 10" 4.5" 8" 15 lb.
Wide

INTERCONNECT CABLES & CONNECTORS

Cabling Between RF Head and Interface Unit
0' to 1000' One single 50 Ohm coaxial cable (Belden 9913 or equivalent.)
Coaxial connectors Type N
Waveguide Flange UG 595/U (for connection to external antennas)
Ethernet conn RJ45 (UTP) or (switch selectable) DB15 (AUI)
T1 Connectors RJ45
E1 Connectors BNC

FREQUENCIES

The lower half of the band is covered by one pair of units and the upper half of the band is covered by a second pair of units. Therefore, to spare all possible frequencies would require four (4) different RF Heads.

Specifications are subject to change without notice.