

MSP-US/EU-TRF6901 EVM Quick Start Guide



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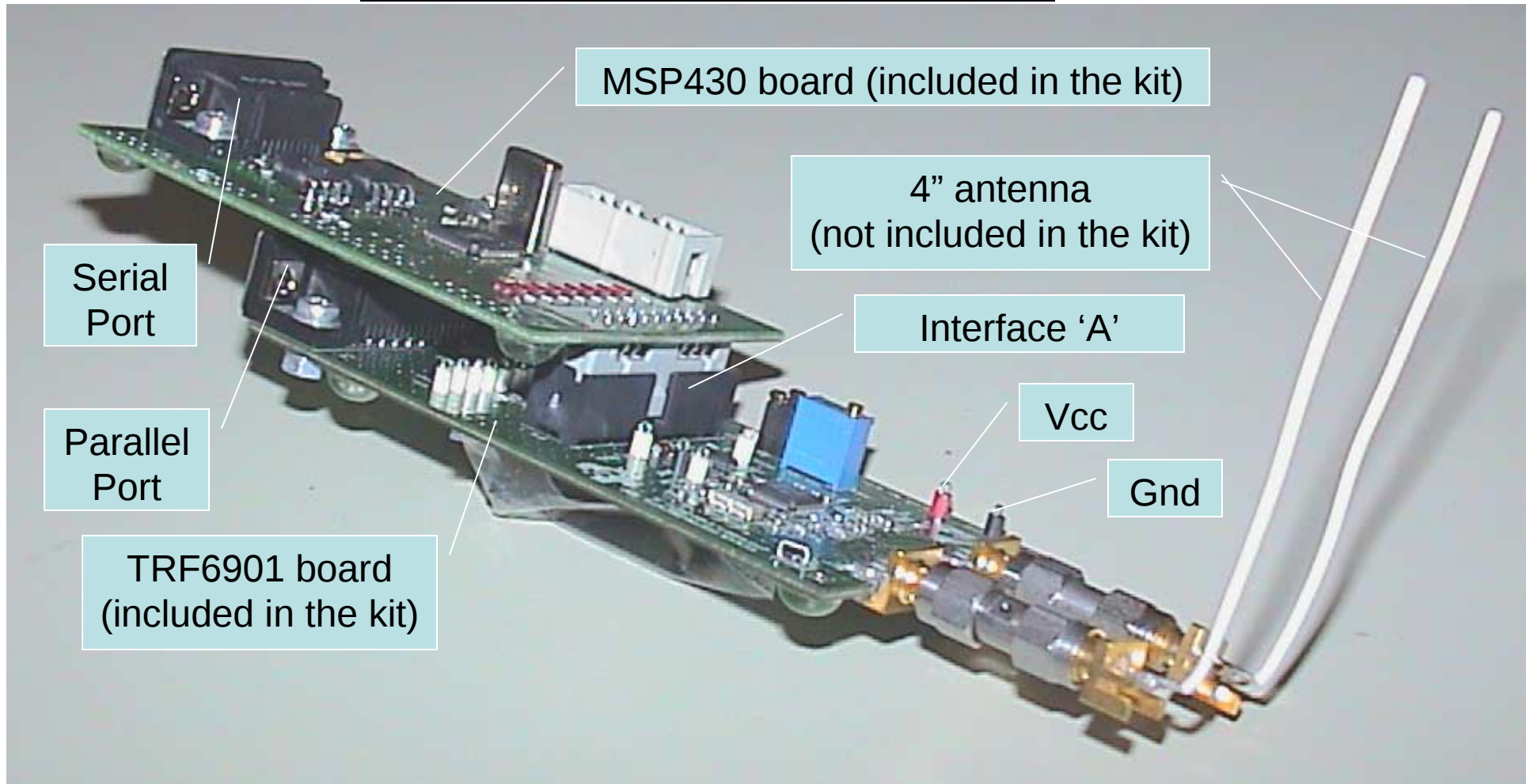
Introduction

- The EVM kit used for the TRF6901 transceiver has multiple uses depending on what you want to achieve. It can be used for **link demonstration**, **code development**, or **stand-alone RF evaluation**.
 - **Link demonstration.** 2 EVM kits can be used together to demonstrate a bi-directional half-duplex link using 2 PCs (so called “system mode”) **Starts on page 4.**
 - **Code development.** The EVM kit can be used in conjunction with the MSP430 development tool and 1 PC to develop and implement code. **Starts on page 7.**
 - **RF evaluation.** 1 EVM kit using 1 PC and RF test equipment can be used to evaluate the TRF6901 with the objective of looking at the RF reception and transmission. **Starts on page 9.**
- The EVM kit is offered in 2 versions:
 - **MSP-US-TRF6901.** MSP430 pre-programmed with the European ISM band
 - **MSP-EU-TRF6901.** MSP430 pre-programmed with the US ISM band
- **The OBJECTIVE of this document is to get you started using the EVM kit. Other documentation provided more detailed information of how to use this tool.** To download the EVM kit User’s guide, go to:
 - Europe version:
<http://focus.ti.com/docs/apps/catalog/resources/appnoteabstract.jhtml?abstractName=swru006a>
 - US version:
<http://focus.ti.com/docs/apps/catalog/resources/appnoteabstract.jhtml?abstractName=swru005a>

Link demonstration

- This section describes the steps required to set up a quick demonstration that will enable you to send text from one PC to another PC using a wireless link at 32 kbps.
- Hardware required:
 - 2 MSP-US-TRF6901 (or MSP-EU-TRF6901) EVM kits
 - 4 antennas (**See pg. 13 for how to choose an antenna**)
 - 2 PCs each equipped with 1 serial port
 - 2 Power Supplies
- Setup Hardware:
 - Setup the 2 PCs wherever you want to demonstrate the RF link.
 - Assemble each 'station' according to the figure on **page 5**
 - **Review proper hardware and jumper setups in the EVM User's Guide section 6.2.2.**
- Setup Software:
 - Download the file TRF6900 Demo_1_16.exe from the CD provided with the EVM kit located under the following directory:
 \MS-RF Chipset\Tools_Software\Setup_TRF6900 demo 1_16_Master
 - Install the software on each PC. See a snap-shot on **page 6**
- Establish a bi-directional link:
 - See **page 6** to start-up the software
 - See section 7.7.5 of the EVM User's guide for more information on how to run the software

Demonstration setup for each 'station'



1. Plug the MSP430 board into the TRF6901 board using interface 'A' (per the illustration)
2. Screw the pair of antennas to the Rx and Tx ports to the SMA connectors
3. Connect the serial port cable to the EVM and the PC
4. Connect a 6 to 8 V power supply to the Vcc and Gnd pins
5. Repeat the same procedure for the other EVM setup

Link demonstration software start-up screen

1

Make sure that you choose the correct serial port

Press the 'Connect to serial port' button to start the demo after connecting the EVM to the PC using the serial port

2

TRF6900 Demo - Version 1.16

Send Buffer
1 16 17 32
Clear Send

Sent Data
1 16 17 32 @
Clear

Connect to serial port

Received Data
1 16 17 32
Clear

COM Port
COM 1
COM 2

Statistics
0%
100%
0,00% Error Rate

Sent packages
0

Acknowledged packages
0

Lost packages
0

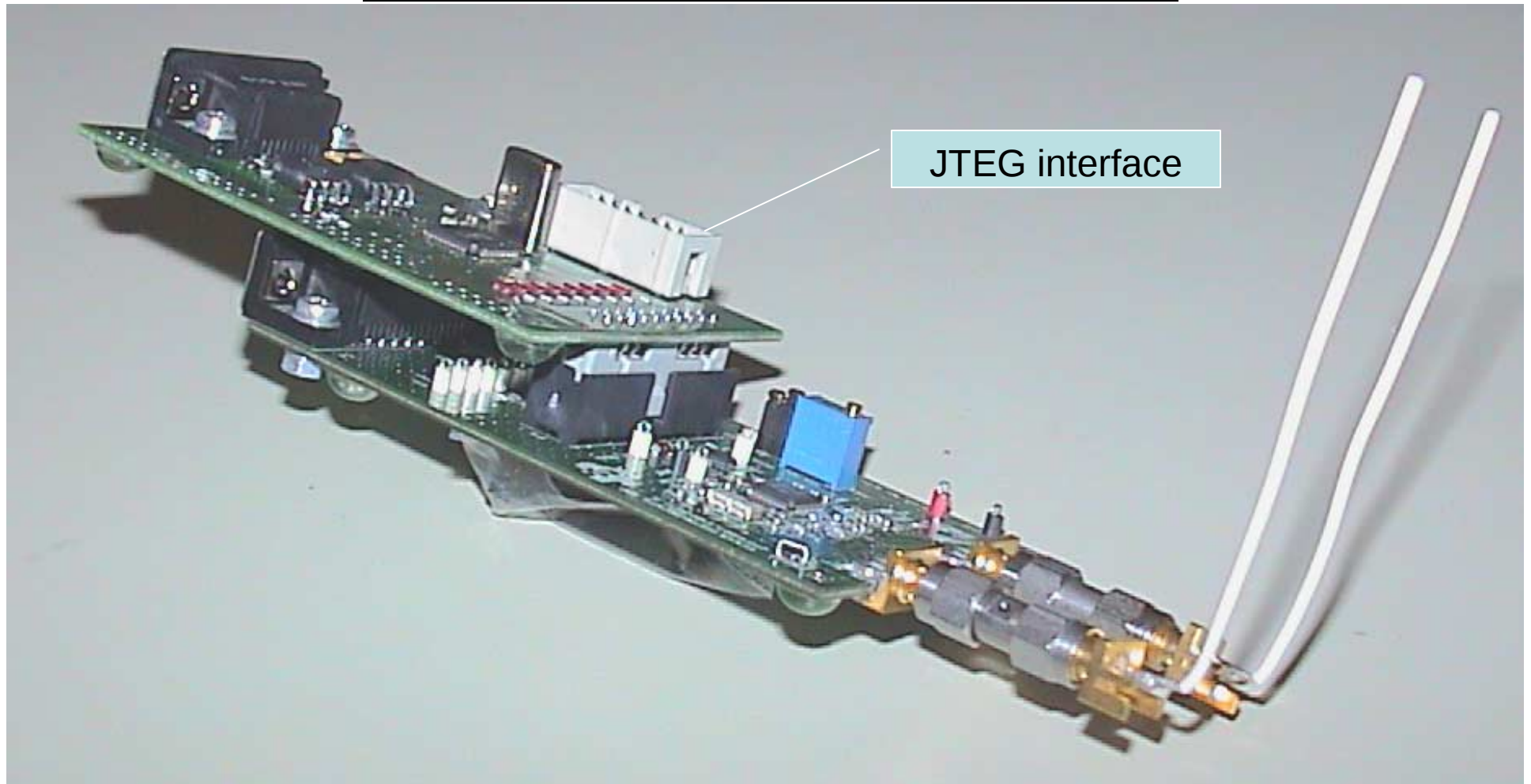
Received packages
0

TEXAS INSTRUMENTS EXIT

Code development

- This section describes the steps required to use the EVM as a code development tool and program the MSP430 uC.
- Hardware required:
 - 1 MSP-US-TRF6901 (or MSP-EU-TRF6901) EVM kit
 - 1 PC equipped with 1 serial port
 - 1 Power Supply
 - 1 MSP-FET430P140
- Setup Hardware:
 - Assemble the 'station' according to the figure on **page 5**
 - Plug the 'station' into the MSP-FET430P140 using the JTEG interface connector provided on the EVM board (**see page 8**)
- Setup Software:
 - Download the MSP430 FET (Flash Emulation Tool) called 'kickstart' at <http://focus.ti.com/docs/tool/toolfolder.jhtml?PartNumber=MSP430FREETOOLS>
 - **PLEASE KEEP IN MIND that to test your hardware you will need at least 2 stations to achieve a bi-directional link**
- Develop code for the MSP430
 - Develop code + FLASH the MSP430 according to the User manual included with the 'kickstart' tool set

MSP-US/EU-TRF6901 MSP430 JTEG interface



RF Evaluation

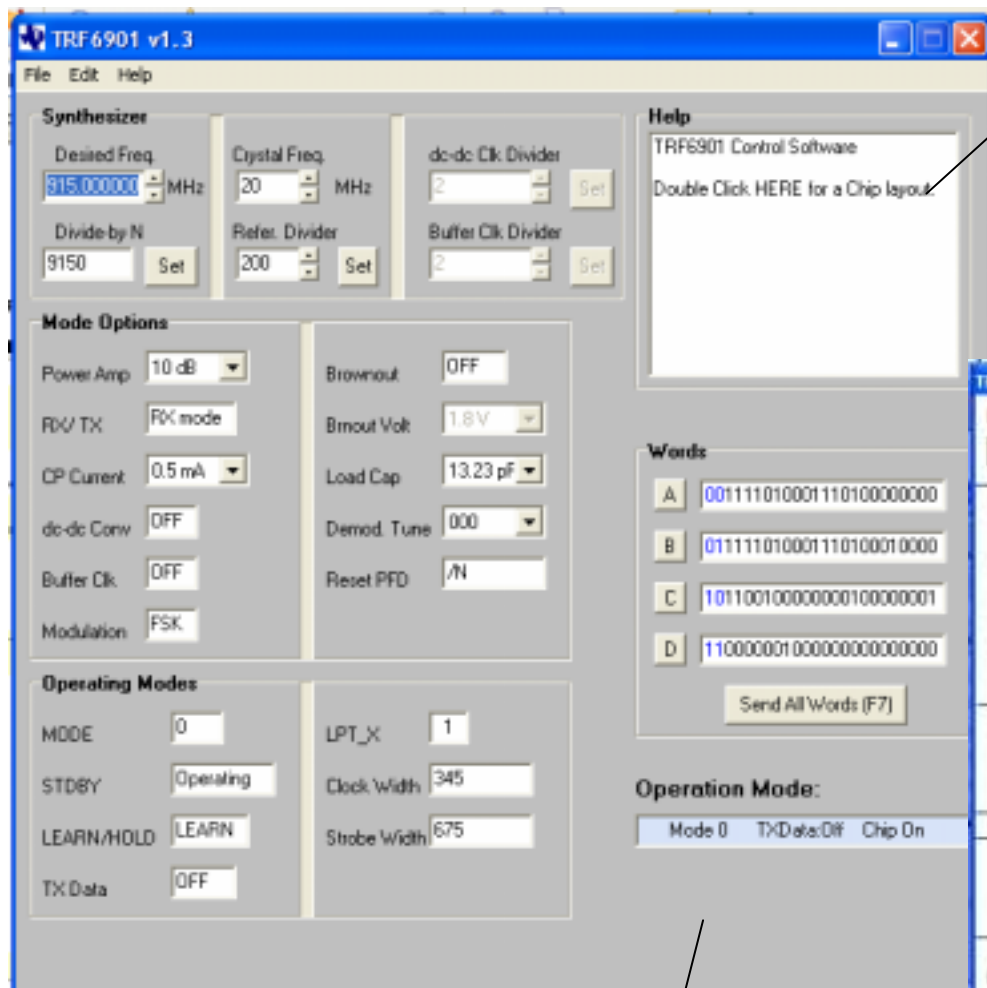
- This section describes the steps required to evaluate the TRF6901 device on a stand-alone .
- Hardware required:
 - 1 MSP-US-TRF6901 (or MSP-EU-TRF6901) EVM kit
 - 1 PCs equipped with 1 parallel port
 - 1 Spectrum Analyzer
 - 1 Signal generator (or another EVM)
 - 1 Oscilloscope
 - 1 Power Supply
- Setup Hardware:
 - Configure the EVM kit according to the figure on **page 5**
 - Assemble the test setup (more information on **page 10**)
 - **Review proper hardware and jumper setups in the EVM User's Guide section 2.8.1.**
- Setup Software:
 - Download the software from the internet at <http://www-s.ti.com/sc/techzip/slwc026.zip>
 - Install the software on the PC. Check out 2 screen snap-shots on **page 11**
 - More information available on how to install and run the software on the EVM User's Guide section 3

RF Evaluation Board Setup (Tx and Rx)



1. Connect the parallel port between the EVM and the PC
2. Connect a 6 to 8 V power supply to the Vcc and Gnd pins
3. Determine what kind of evaluation you want to work on:
 - **Testing of the transmitter.** A spectrum analyzer and pulse generator (for external modulation input) are required (connected to the Tx RF port). For more details go to section 3.7 of the EVM User's Guide.
 - **Testing of the receiver.** A spectrum analyzer, pulse generator, external modulation input signal generator or another EVM (connected to the Rx RF port), and oscilloscope are required. For more details go to section 3.8 of the EVM User's guide

RF Evaluation Software Snap shots

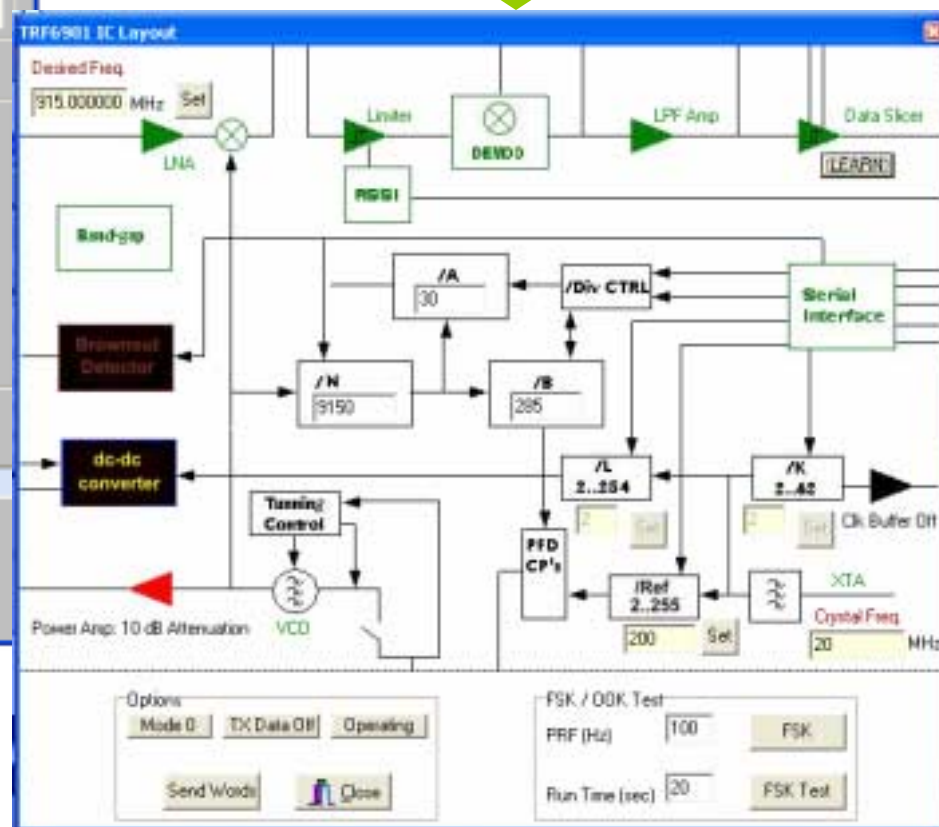


1

Start up screen

The software enables you to look at the block diagram (below) by double clicking on the white box

2



Additional Documentation

More information available
at www.ti.com/ismrf

You will find multiple sources of information to help you solve your inquiries, including data sheets, application notes, reference designs, development software utilities, and FAQs



Choosing an Antenna

- **Custom built:** a custom-built antenna can be used while the designer focuses on developing the system. For this case, a 4" wire can be soldered to a SMA connector.
- **Off-the-shelf:** a designer may opt to purchase a pre fabricated tuned antenna. For this case, the designer needs to consider what frequency band is going to be used. In the next page are a few web sites that offer US or European ISM band antennas. Most antenna information can be found at the following URL

http://www.rfcafe.com/vendors/components/antenna_links.htm

- **PCB antenna:** Another alternative is to use a printed circuit board with a Cu trace as an antenna. There are multiple designs for this and readily available in different publications.

Antenna Manufacturers

- <http://www.superpass.com/902-928M.html>
- <http://www.maxrad.com/>
- <http://www.mobilemark.com/>
- <http://www.cushcraft.com>
- http://www.hyperlinktech.com/web/antennas_900.php
- <http://www.antennaworld.com/>
- <http://www.aironet.com/>
- <http://www.lm-electronics.com/portable.htm>
- <http://www.antenex.com/>
- <http://www.galtronics.com/wdata.html>
- <http://www.antstar.com/>
- <http://www.aatinternational.com/default.htm>
- <http://www.antennafactor.com/adocs/main.html>
- <http://www.dbiplus.com/products.htm>
- <http://www.radiallarsen.com/products/index.html>
- <http://www.rangestar.com/>

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