

From the top of Mt. Everest to the oil fields of West Texas...FreeWave Technologies gives you...

The Signal

Your quarterly **FREEWAVE** newsletter

Summer!

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A look at a
new **FreeWave** 
Lease Program

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OneOk replaces Satellite system using **FreeWave** By Bob Halford

OneOk Gas Transportation and its affiliates in Tulsa, Instrument Specialist, who related to Earl that he Oklahoma had the challenge to find a way to get real time gas data back to Tulsa every five minutes and to give the field personnel access to the installing in Oklahoma. Earl contacted the FreeWave representative in Texas and requested a proposal for the Buffalo Wallow area that is East of Pampa, Texas. After the FreeWave representative received coordinates for the Electronic Flow Meters, a path study was completed to determine if a FreeWave system could be installed.

**"We've all been impressed by
the ease and dependability"**

**-Earl Blackford on
FreeWave products**

Earl Blackford, OneOk SCADA Systems Administrator, was given the task of coming up with a plan. Earl spoke with Walt Hawkins, OneOk

representative in Texas and requested a proposal for the Buffalo Wallow area that is East of Pampa, Texas. After the FreeWave representative received coordinates for the Electronic Flow Meters, a path

Please see **OneOk** on page 4...

-FreeWave Lease / Purchase Program-

FreeWave Technologies offers a very flexible and competitive lease / purchase program. There are many advantages to using a FreeWave lease program for your project:

Flexible terms (12 to 36 months)
Flexible payment schedules
Fixed – rate financing
Paid for out of operating budget instead of capital

**With a FreeWave lease monthly per site costs can be a very attractive option!
Contact FreeWave today for more information.**

Can You Top This ?

We hear some amazing stories from customers about FreeWave radios such as links through multiple buildings in major metropolitan areas, links through mountains with no line of site, and links over amazing distances. This month's entry into the FreeWave "Can You Top This" story is from Yellow Pine Communications in Wyoming.

Yellow Pine Communication, a FreeWave reseller, recently installed a pilot project for Western Gas Resources in Green River, Wyoming. Technicians from Western Gas wanted a 66-mile radio link from the Western Gas repeater site on Hogsback ridge to the Western Gas office in Green River. Yellow Pine contacted FreeWave for a path study of the link. The path study determined it was a clear shot from Hogsback at 9500 feet and the office at 5500 feet with nothing in between. Yellow Pine and Western Gas were able to achieve a successful link by using 10 dB yagi directional antennas at each end.

Please send your "Can You Top This?" radio stories to FreeWave at moreinfo@freewave.com.



Saving *time* and *money*

Waste Water Treatment Plant Host Computer Re-location -By David Savells

How do you move your HMI computer to the opposite end of your plant with the least amount of work and grief? There are not too many ways to do it! In-plant radio applications can save thousands of dollars and huge amounts of time in this type of application.

Overcoming a bad experience with a licensed radio system was our first obstacle in working with this customer. Prior to the introduction of **FreeWave** radios, the city had used Motorola Entrac radios for plant telemetry. The obsolescence of the Entrac product and expensive tech support had dulled the customer's interest in ever using radios for anything other than voice communication at their plants.

An addition of personnel requiring office space at the plant required the city to relocate their master control room from the administration building to a maintenance building on the other side of the plant (approximately ¼ Mile). The original plant SCADA system is a hard wired system with installed I/O Racks scattered all over the plant. The remote units are all tied back to the master RTU in a cabinet located at the

administration building. Re-wiring the entire plant was looking like an ugly option.

I was asked by the plant manager for a recommendation on how to relocate their HMI computer and get all of the plant I/O to the new location. **FreeWave** seemed like a natural in this application. Licensed free operation, secure data and easy configuration were the chief points in selling the system. We took the sales call one step further and arranged a demonstration at the administration building by inserting a pair of **FreeWave's** and a couple of RS-232C to RS485 serial converters between the Master RTU and the HMI computer to demonstrate that the technology would work. Within 30 minutes, we had all of the I/O from the master going into the HMI computer wireless!

FreeWave products show durability and quality in North Dakota

Amerada Hess Corporation - North Dakota Operations

By Alan Hartwell

The hilly terrain of North Dakota makes getting a line-of-sight radio communications path for our SCADA systems a real challenge. In our operating area we have numerous installations visible to each other, but no feasible place to install typical repeaters. **FreeWave's** outstanding ability to have unlimited repeating plus slave operation in the same radio got us out of a real bind. All we have to do is point the antenna toward the nearest location to thread our way through the hills and buttes. The **FreeWave** unlicensed spread spectrum technology allows us to install our SCADA systems without the expense and delay

involved in the licensing process. Plus, being near the Canadian border, it is virtually impossible to obtain a licensed frequency due to international frequency coordination problems. **FreeWave** radios on four SCADA systems, and expect to install many more. Communications is rock-solid, with virtually 100% statistics, whether it's 30 degrees below zero or 100 degrees above.

We have installed a total of around 100



FreeWave products were used in North Dakota by the Amerada Hess Corp. The radios operated in the harshest and most severe conditions.

Within 72 hours of receipt of their order, they had the system installed and operating! Since then, we have furnished another pair of **FreeWave** radios and accessories to remote the operator interface on a PLC from one building to another. There are plans to add two more **FreeWave** networks to their system, one to monitor a remote outfall site 4 miles from the plant and another to connect the SCADA system from one plant to another 8 ½ miles away.





goes to space!!!

**A 'thank you'
from the
Civilian
Space
eXploration
Team**



A message from Program Manager, Jerry Larson to FreeWave President and CEO, Steve Wulchin...

Steve,

We've finally been cleared to launch. I would like to thank you and **FreeWave Technologies** for taking an interest in our endeavor and donating the transceivers for our rocket launcher alignment system. This system is bolted to the rocket launcher and will be used during the final countdown minutes to point the rocket along the firing solution. The equipment you sent is easy to use and works every single time I turn it on. It is one subsystem I don't worry about.

Thank you and take care.

- Jerry

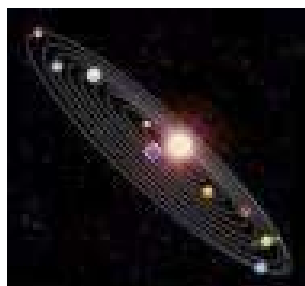
Space Launch Announcement

Ky Michaelson's Civilian Space eXploration Team (CSXT) has received official clearance from the FAA to conduct the space launch of the PRIMERA rocket in June

2002.

The single stage PRIMERA rocket is complete and ready to fly. Weighing 550 pounds at liftoff, the vehicle stands 17 feet tall, 9 inches in diameter and is expected to reach a peak altitude of 62 nautical miles. The 2 ½ minute flight into space will make history as the first civilian amateur launch to exceed 50 nautical miles (NASA's definition of space). The entire event will air on national television as episode 2 of the two part series. Editing of episode 1 titled "50 MILES UP: SPACE" is nearing completion and will highlight the space flight attempt of September 29th 2000.

We would like to thank you for sponsoring this historic event.
Jerry Larson
Program Manager
Civilian Space eXploration Team (CSXT)



FreeWave helped make history in June of 2002 as one of their transceivers (shown above) was used in space exploration.

Entergy replaces 13.6 miles of metallic pilot wire with FreeWave

Entergy's 69 kv building. That turned out transmission system in not to be a problem for the Monroe, LA used HCB FreeWave radios whose pilot wire relaying for signal got through on the primary protection. 4.26 mile line just fine and Maintaining the metallic has been in service for pilot wire was labor over a year.

intensive and very expensive. We had been Tom Dideum from looking for a protection FreeWave came to West scheme for several years Monroe and assisted us in to replace this system. optimizing the system. We Power Connections suggested that we use the FreeWave radios with the SEL 311C relays as a replacement. We went to our sending the information to design group and got their FreeWave for permission to go ahead performance evaluation. with the project. After receiving the equipment, This project was a big task we started installing the to undertake and we think antennas. We noticed that it will be well worth the one antenna was pointing time and effort. through the old

*By John Sistrunk
Monroe Power Plant*



Engineers for Entergy install **FreeWave** products in West Monroe, LA.



Reaching new heights
in wireless data solutions

OneOk looks to *FreeWave* for wireless solutions

...Continued from page 1
The path study proved that a **FreeWave** system could be installed at some 28 sites allowing the replacement of both satellite and dial up modems. A fiscal study was completed and determined that if this plan were successful, the savings would pay for the system within a year. The **FreeWave** system was installed in February 2001. On February 28, just one day after the last site was installed, the worst ice storm the area has seen in the last 20 years hit. A technician in the Tulsa control room contacted Earl to tell him the only area receiving data back to Tulsa was the newly installed **FreeWave** system at Buffalo Wallow. OneOk management was impressed and approval was given to move forward with other projects. Since that time OneOk has worked extensively with Bob Halford and PathTech, **FreeWave's** reseller out of Odessa Texas, to install **FreeWave** systems in El Paso and Loop Texas. New projects are currently under way in Texas, Oklahoma and Kansas.

TECH TIPS: from **FreeWave's** Tom Dideum ...

-using the Repeater Frequency feature to avoid interference from parallel repeaters-

Whenever two or more repeaters are linked into a common source,

either the Master radio or a common Repeater, the possibility exists that the signals from the repeaters will interfere with or cancel each other at any radio site that can hear from more than one of the repeaters. The following diagram shows two network examples, one where the repeaters are sequential and repeater interference is not a problem, and one where the repeaters are in parallel and where repeater interference is a possibility.

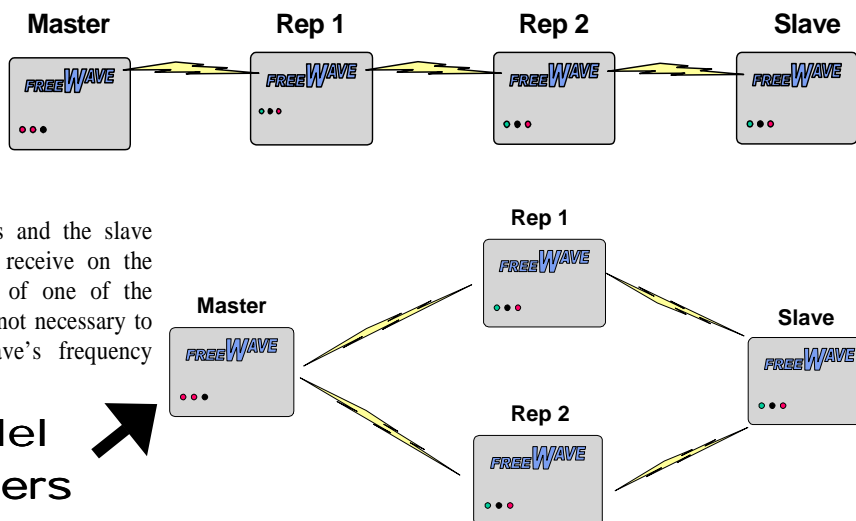
Repeater interference occurs because parallel repeaters retransmit data at the same time and on the same frequency. The repeated signals arrive out of phase with each other at any radio that can hear either repeater. The signals will tend to cancel each other reducing the overall received signal level. In extreme cases, the signals will completely cancel each other and the receiving radio will be unable to connect to the network.

key if subnet ID is used.

The repeater frequency function allows a repeater to link into the network on one frequency key, and transmit on a different frequency key. Enabling this function on Repeater 2 in the example network below and setting the frequency key on this repeater to some value other than the Master's setting will eliminate any repeater interference. The subnet ID function must be set on the repeaters and the slave must be set to receive on the transmit subnet of one of the repeaters. It is not necessary to change the Slave's frequency

procedure can be used. Simply chose additional frequency keys for each of the other parallel repeaters. For more information on this function refer to **FreeWave** application note 5425.

Sequential repeaters



Don't forget to reach us on the web at:

www..com

Tell us your best **FreeWave** stories!

If we use your story in our next newsletter we will send you a Garmin 12XL GPS Receiver.

Send your stories to moreinfo@freewave.com



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