The Aquarius/SAC-D Satellite, Explained Transcription

This leads me into trying to give you a view of the Aquarius/SAC-D observatory. What does one of our earth observing satellites look like? A typical earth observing satellite has a number of instruments on. Maybe a couple of them are the star attraction. For the Aquarius/SAC-D satellite, the bottom part of this shows the SAC-D observatory, it's the scientific application satellite for Argentina with sensors on it for measuring fires over the Pampas, the MWR, the microwave sensor for measuring temperature in the coastal waters. But the star attraction for us was the Aquarius instrument which we put on and launched this satellite for the Argentinians. You'll get a picture of the size of it in a few minutes. Just this antenna which is an Aquarius reflector is 2 m. across. It seems more like a small bus than a car size thing. You can [?3] radiometer [?] on Aquarius. Aquarius is a microwave radiometer, but it is actually 3 radiometers that cut out a swath across the earth as it moves along.

There's a few more photos here of Aquarius in the clean room. Now you see it here with a person working on the sun shade. The sun is a big radiator of the kind of l-band microwave radiation that we're trying to sense. The Aquarius instrument actually looks at the dark side of the earth while it's around the terminator that separates the light and dark side of the [earth], and goes across the equator at 6am and 6pm looking at the dark side. It shields itself from the sun with this reflector.

We can see the whole observatory here in Argentina just as it was being completed. You can see the mammoth size of this instrument, if you want to call such a large thing an instrument. Its many instruments on an observatory as we call them. You see the gold foil and other things that we use to control the temperature. The Aquarius radiometer is a great piece of technological wizardry, more temperature controlled than any sensor that's been put on orbit. We need to know the temperature of the whole instrument to a tenth of a degree, and try to control to a tenth of a degree.

Before a satellite goes onto a rocket to be launched, it has to through environmental testing. They have a big enough environmental testing chamber in Brazil. The Aquarius instrument made[? its way path]. It was built at Goddard, assembled at JPL in California, assembled with the satellite in Argentina, and then sent to Brazil for environmental testing before finally making its way to Vandenberg Air Force Base for its launch. Here again you can see the sensors on the platform and in the environmental test chamber.

Here are some of the happy crew of scientists and engineers admiring the instrument on the launch pad. It's installed on top of a rocket. It's enclosed until the very last minute. It's quite a wondrous sight to get close up and on top of the watch platform.

Here's a movie of the Aquarius launch from Vandenberg Air Force Base in California. It launches out over the Santa Barbara Channel south towards Antarctica. That way it has a full good range of ocean to crash into if the launch fails. It won't go over any land. The satellite after launch gets to a certain point and the lower stages separate. First it has solid rocket boosters that separate within 2 minutes, and those are picked up in the Santa Barbara Channel. They come down. Further separations occur over the

southern ocean, and then after it crosses Antarctica it comes north through Africa and makes its first communication with the ground.

This is a little movie which all the NASA people love. We put a camera on the rocket so we can see the separation of the spacecraft from the rocket. On some satellites we're actually able to see the solar panels deploy. That always gives great heart and enthusiasm to the engineers to see all their parts work and come together.