



Double Hop Test Results



Bob Bruninga, WB4APR
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Packet Ideas For ARISS

by WB4APR

With ISS packet radio system (PRS) on line, we should consider the following operating scenarios for best fit with today's amateur satellite and packet radio users

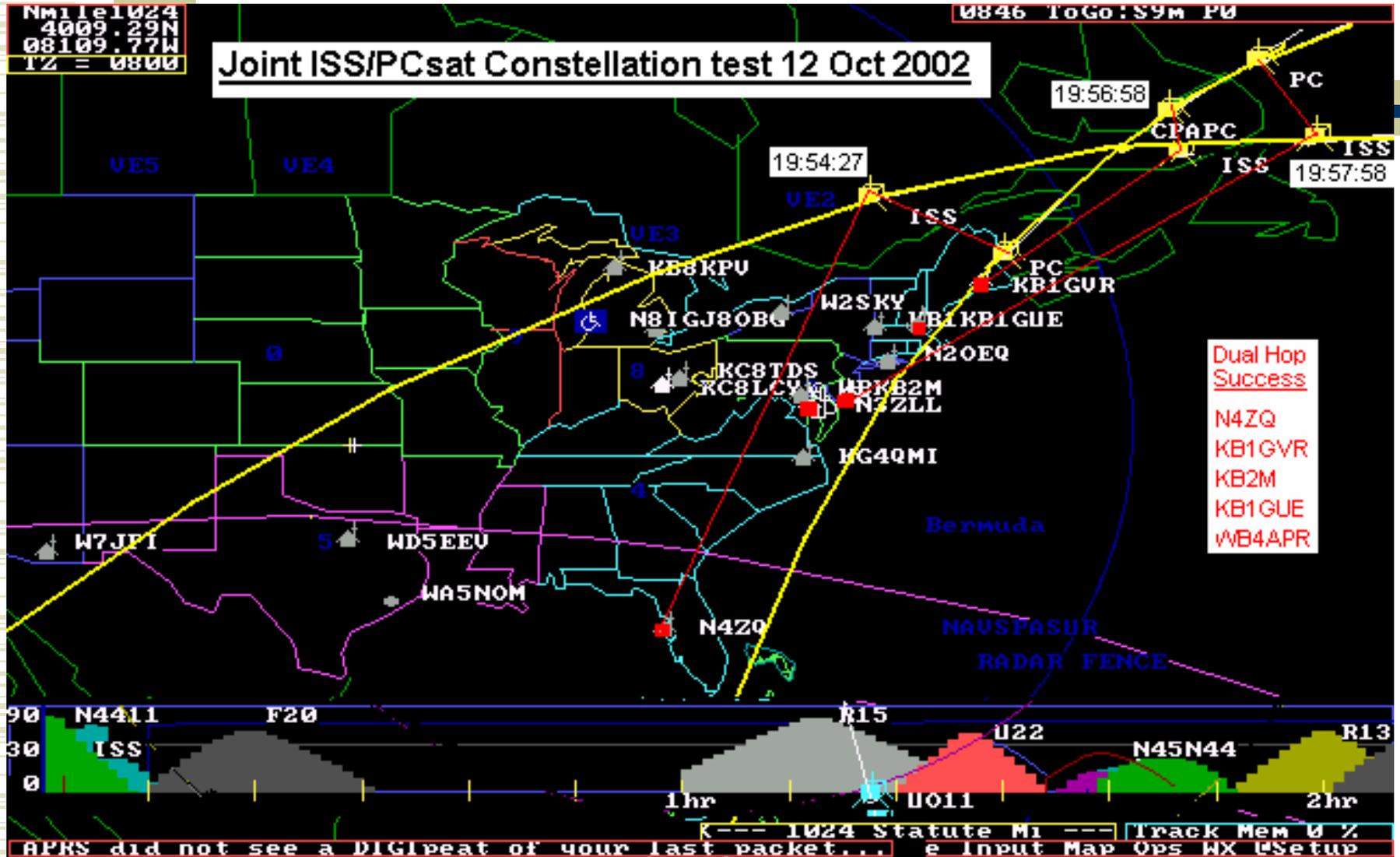
- Experiment #1: **Add ARISS Alias** on PCsat (done)
- Experiment #2,3: **Add APRSAT, RELAY and WIDE aliases** on ISS
- Experiment #4: **QSY ISS to 145.825 for a Dual Satellite Test**
- Experiment #5: **Dual-hop Packet Test**
- Experiment #6: **Move Old Packet System To Dedicated Antenna**
- Experiment #7: **ARISS Bulletins From ISS LT buffers**
- Experiment #9: **Originate ARISS Bulletins on The Ground**

#4: QSY to 145.825 for a Dual Satellite Test

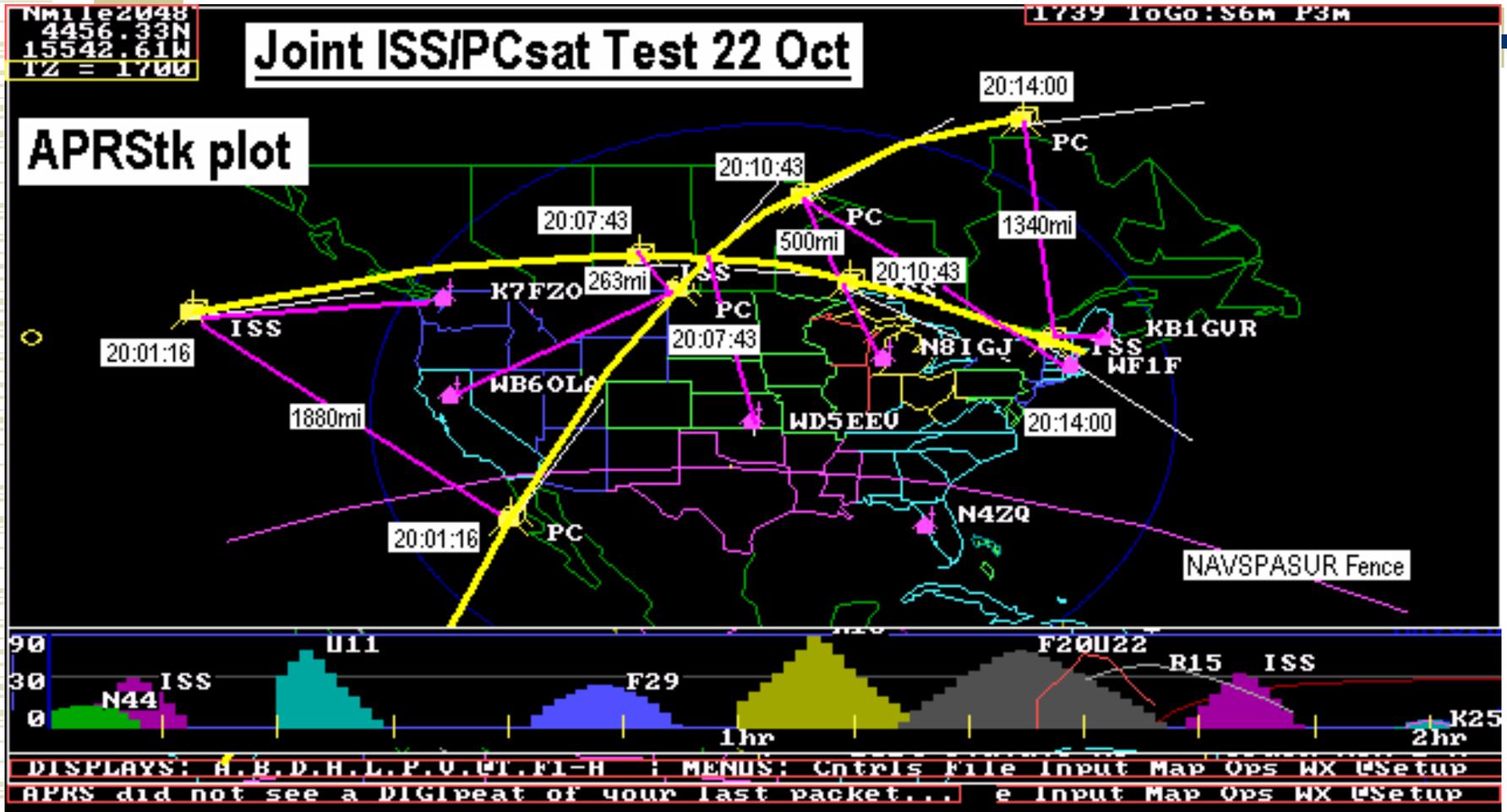


- ◆ 145.825 UI packet channel: PCsat, ANDE, PCsat2, SAFIR, Cubesats
- ◆ ISS QSY test on 145.825 temporarily for a 2 satellite demonstration
- ◆ With same ALIASES, and same FREQUENCY:
 - Operate identically and mutually supportive to all users...
 - 12 passes per day with PCsat (average every 2 hours all day)
 - Dual-hop Opportunities for DX
- ◆ Downlink captured by worldwide internet linked APRS ground stations

Joint ISS – PCsat Operations Test



Joint ISS – PCsat Operations Test



Experiment #7: ARISS Bulletins From ISS

Load bulletins into LT1, LT2, LT3 and LT4 buffers.

- ◆ The APRS formats for all Display software & radios are:
 - LT :BLN0ISS :this is the first bulletin line from ISS
 - L1 :BLN1ISS :this is the second bulletin line available
 - L2 :BLN2ISS :this is the 3rd line
 - L3 :BLN3ISS :this is the 4th such line available
- ◆ Setting these to about once every 3 mins is about right to guarantee every HT captures them.

Experiment #8: Originate ISS Position Packets On The Ground

- GPS will not be interfaced any time soon.
- Although GPS could be plugged into TM-D700
- ISS posits can be originated on the ground and then digipeated by ISS
 - We have been doing this for a year from Maryland and California.
 - To users, it looks like ISS is moving...

ISS Position Packet on Mobile



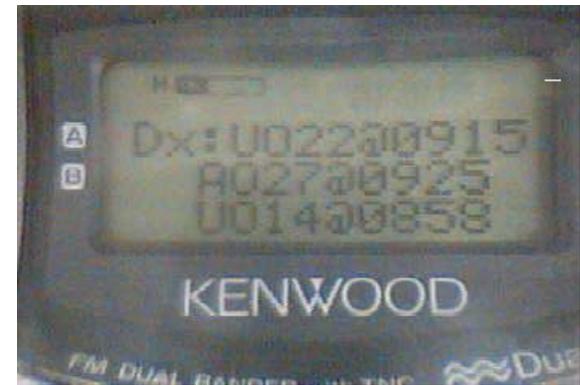
D-700 Front Panel Display of Satellite-in-view

Experiment #9: Originating ARISS Bulletins On The Ground

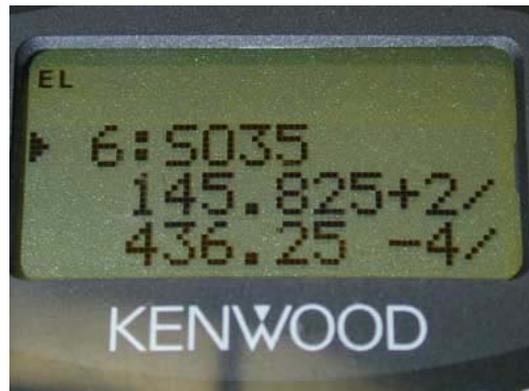
- ◆ One ground station in each footprint can originate the "daily" ISS bulletins in the same manner as the positions.
- ◆ Moves burden from the ISS crew to the -ground-
- ◆ On ground there is an ample supply of ARISS volunteers.
- ◆ Some advantages over the remote SYSOP process:
 - A connection is not required.
 - Bulletins can be customized for each footprint.

Satellite Objects on the D7

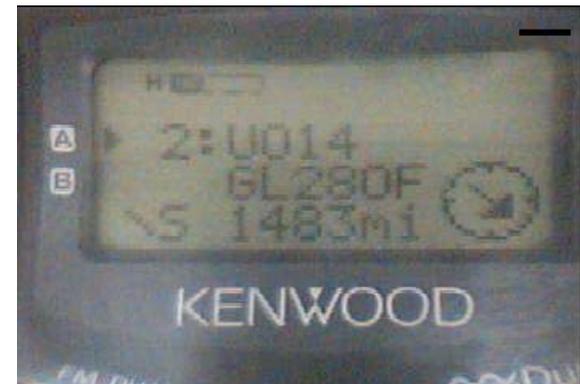
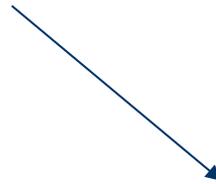
Satellite Schedule in DX list



Sat-in-view (pg 2 of 5)



Sat-in-view (pg 3 of 5)



Ground-origination method works

- **This ground-origination method works:**
 - The software exists
 - The ground stations are in place
 - The labor is available
 - On ISS the UI digipeater is "ON"
- **The end user with his HT, mobile, or other packet station will see:**
 - packets "from ARISS" as if they were originated on ISS
 - And Moving position reports from ISS

RESULT: real-time-ARISS bulletins about everything pertaining to ISS on -every- pass (with no crew nor remote SYSOP involvement).

Conclusion

- ◆ **All the world is going wireless.**
- ◆ **HAMS with HT's, Digital assistants, laptops or Kenwood packet radios have the ability to receive every packet from ISS when it is in view.**
- ◆ **We must exploit the ISS PACKET downlink to show HAM radio to kids and students in a living, daily updated manner.**
- ◆ **Packet works without crew involvement and is more reliable.**
- ◆ **Keep up the good work!**

Some WEB References

- ◆ PCsat WEB: <http://www.ew.usna.edu/~bruninga/pcsat.Html>
- ◆ ISS-APRS FAQ: <http://www.ew.usna.edu/~bruninga/iss-faq.Html>
- ◆ APRS SATELLITES: <http://www.ew.usna.edu/~bruninga/astars.Html>
- ◆ SAT-INFO displays: <http://www.ew.usna.edu/~bruninga/satinfo.Html>
- ◆ ANDE Satellite: <http://www.ew.usna.edu/~bruninga/ande.Html>
- ◆ PCsat2 Satellite: <http://www.ew.usna.edu/~bruninga/pcsat2.Html>