UX Design for NASA's Deep Space Network

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Once I thought I knew a lot.

Then I was sure I knew a little.

Now, I know that I know **nothing**.

-Private Dowding

Setting the scene

What is the DSN?

WHO is the DSN?

Change is coming

Designing for change: What didn't work

Designing for change: What worked

What we're planning

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DEEP SPACE NETWORK *NOW*

LAST UPDATED: APR 7 4:47 PM (UTC)

DSN home

MADRID

APR 7
6:47 PM

M01O MVN MSL MEX | SOHO | MRO

63 | 65 | 54 | 55

GOLDSTONE

APR 7
9:47 AM

STA | DAWN | ACE | DSN | ORX

14 | 15 | 24 | 25 | 26

CANBERRA

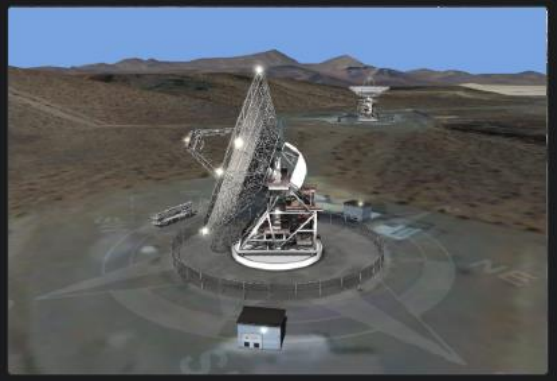
APR 8
2:47 AM

NHPC | JNO | CAS | MMS4

43 | 34 | 35 | 36

TARGET

OSIRIS-REX



VIEW ANTENNA | VIEW SPACECRAFT | VIEW WORLD MAP

ORX

SPACECRAFT

NAME
OSIRIS-REx

RANGE
-

ROUND-TRIP LIGHT TIME
-

ANTENNA

NAME
DSS 26

AZIMUTH
211.09 deg

ELEVATION
28.25 deg

WIND SPEED
22.84 km/hr

+ more detail

credits contact us

An intriguing design challenge

Old and new technologies combined

60 years of history

Designs need to last 20 years

40 years of human habit

Getting on with it

What is the DSN?

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Operator persona

Mostly male

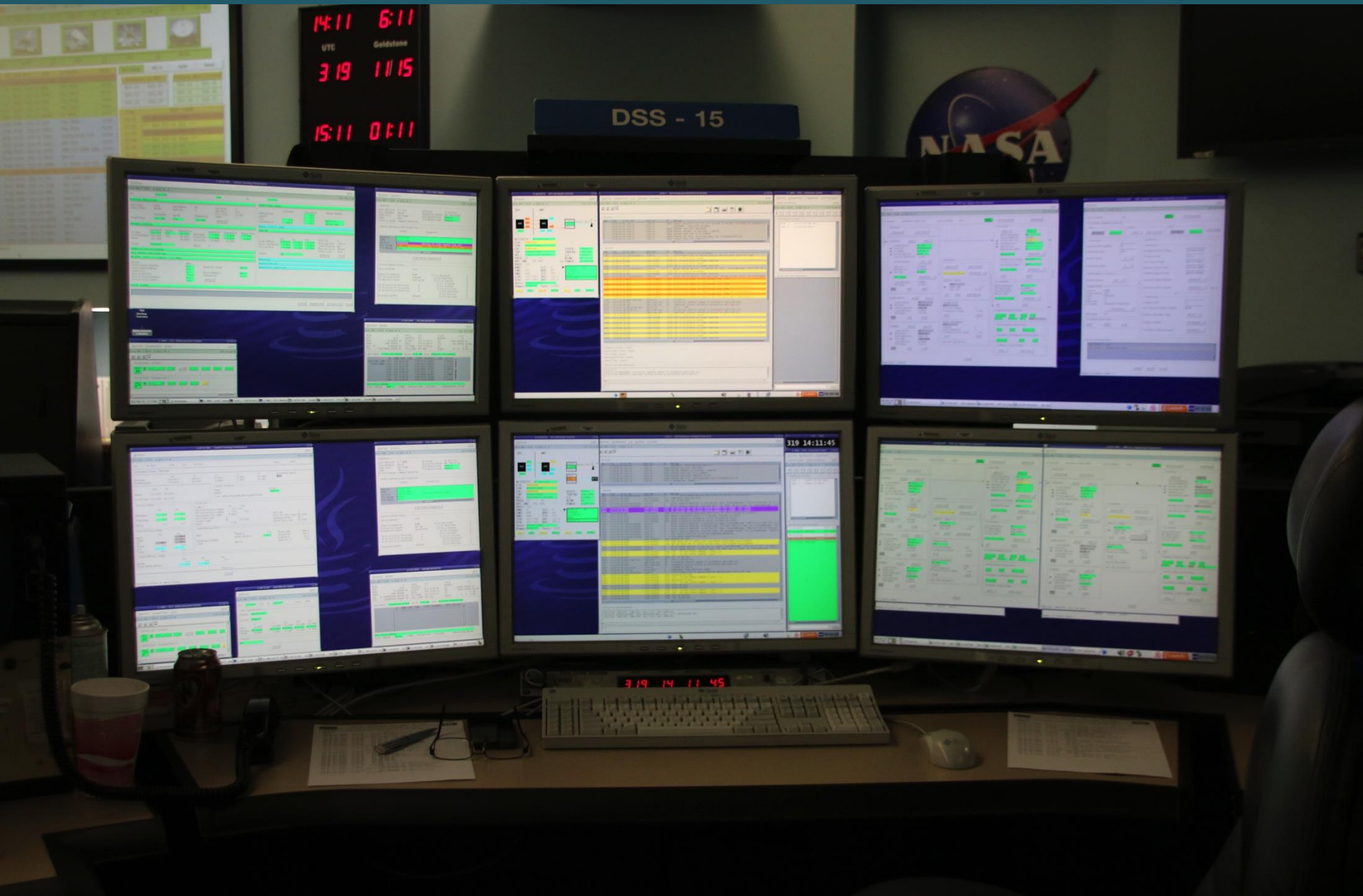
Mostly older

Highly technical – but not IT people

Highly educated – 40 years ago

Operators in their habitat

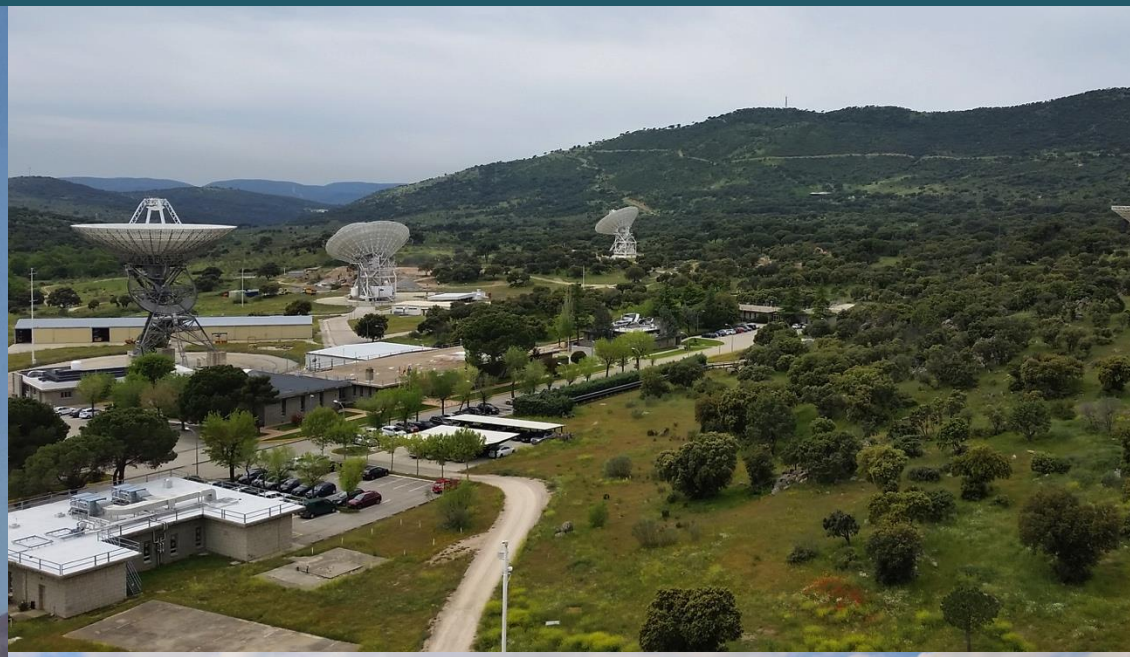
Situational awareness



The good old days

Photo credit: Alexandra Holloway

Three cultures



Dramatic music

What is the DSN?

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What we're planning

Follow the Sun

Photo credit: USGS

Three links per operator

1 operator + 1 antenna + 1 spacecraft
= HARD

1 operator + 2 antenna + 2 spacecraft
= MUCH HARDER

1 operator + 3 antenna + 3 spacecraft
= the wild, wild west

Charge boldly forward

What is the DSN?

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How to incite revolution

Big changes with no user research

Drastic changes without good reason

Changes with good reason that are too drastic.

“User Acceptance Testing”

Embrace the “slow blink”

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Designing for change: What worked

What we’re planning

Evolution, not revolution

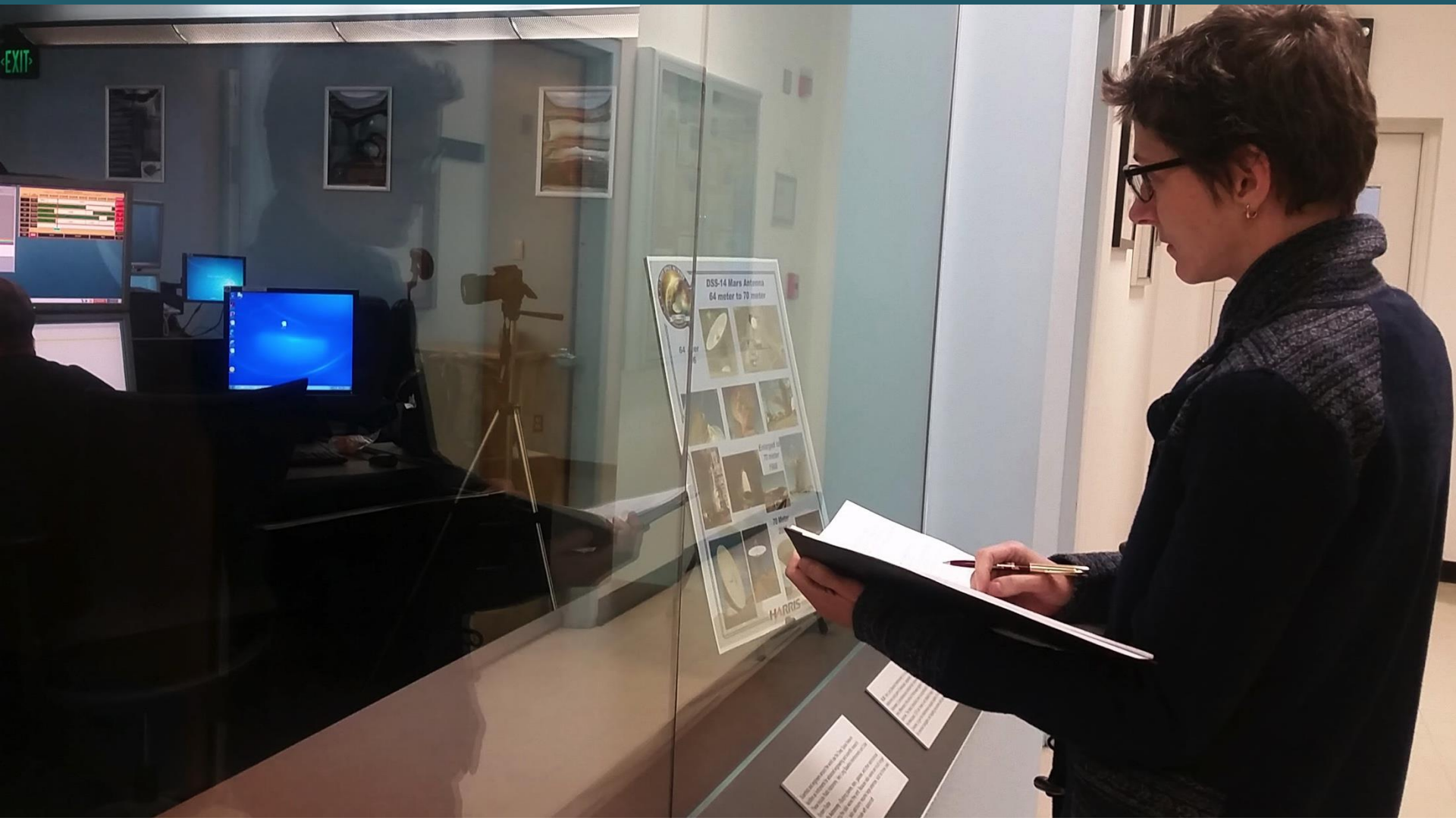
Involve early, involve often

Build trust

Iterations

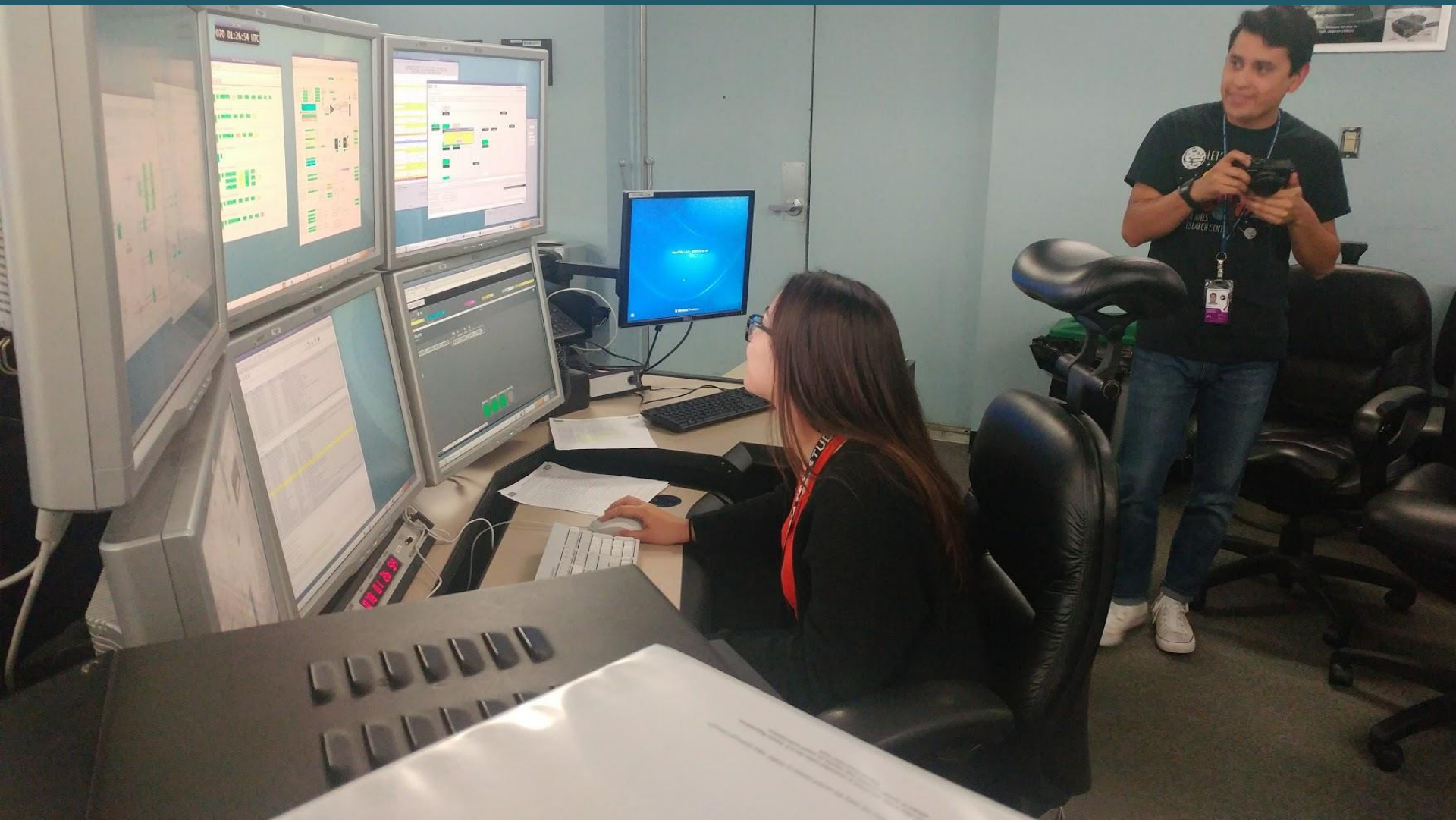
Slow and steady wins the race

Techniques



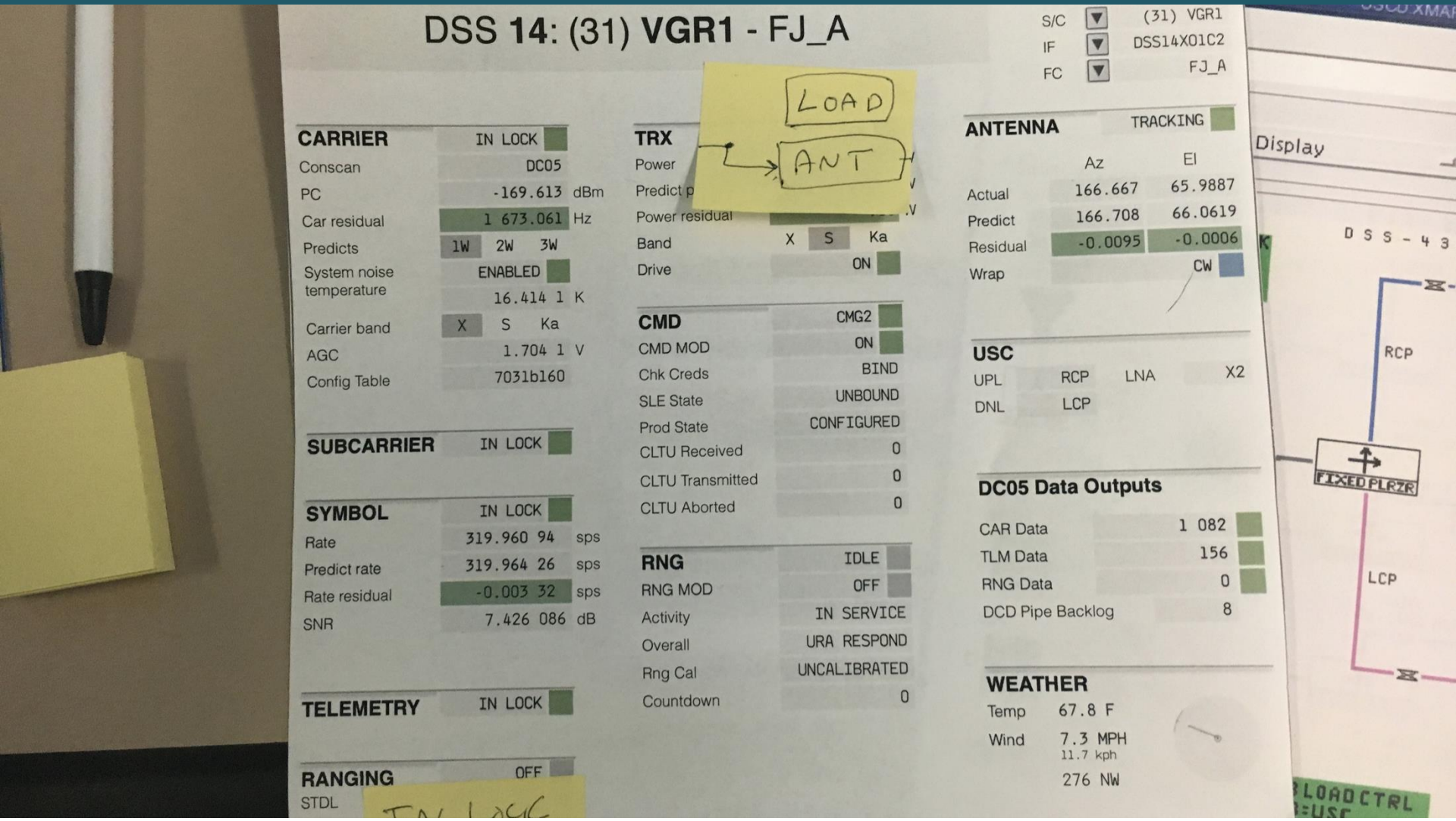
Observations

Techniques



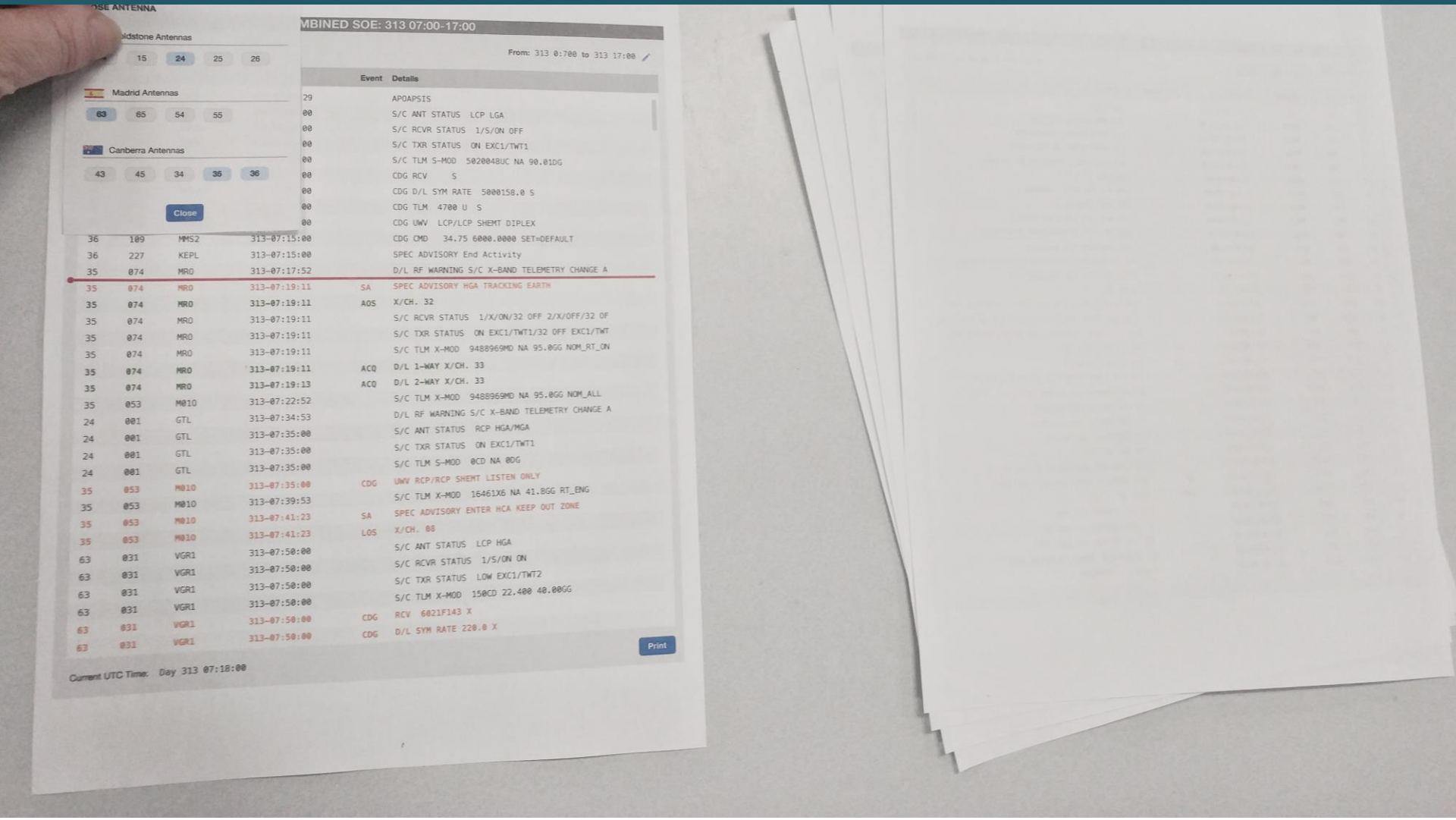
Experiental Research

Techniques



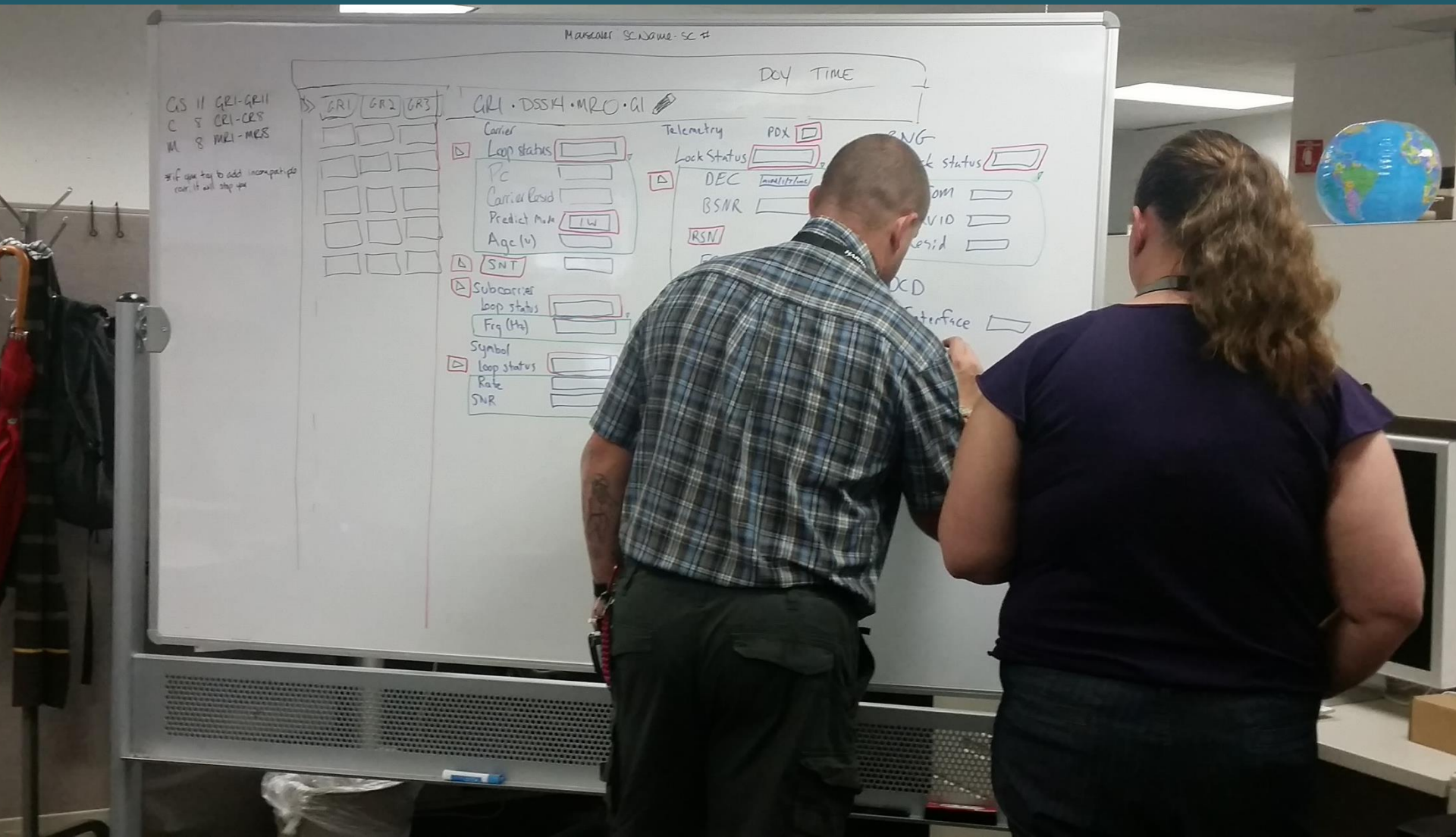
Paper Prototypes

Techniques



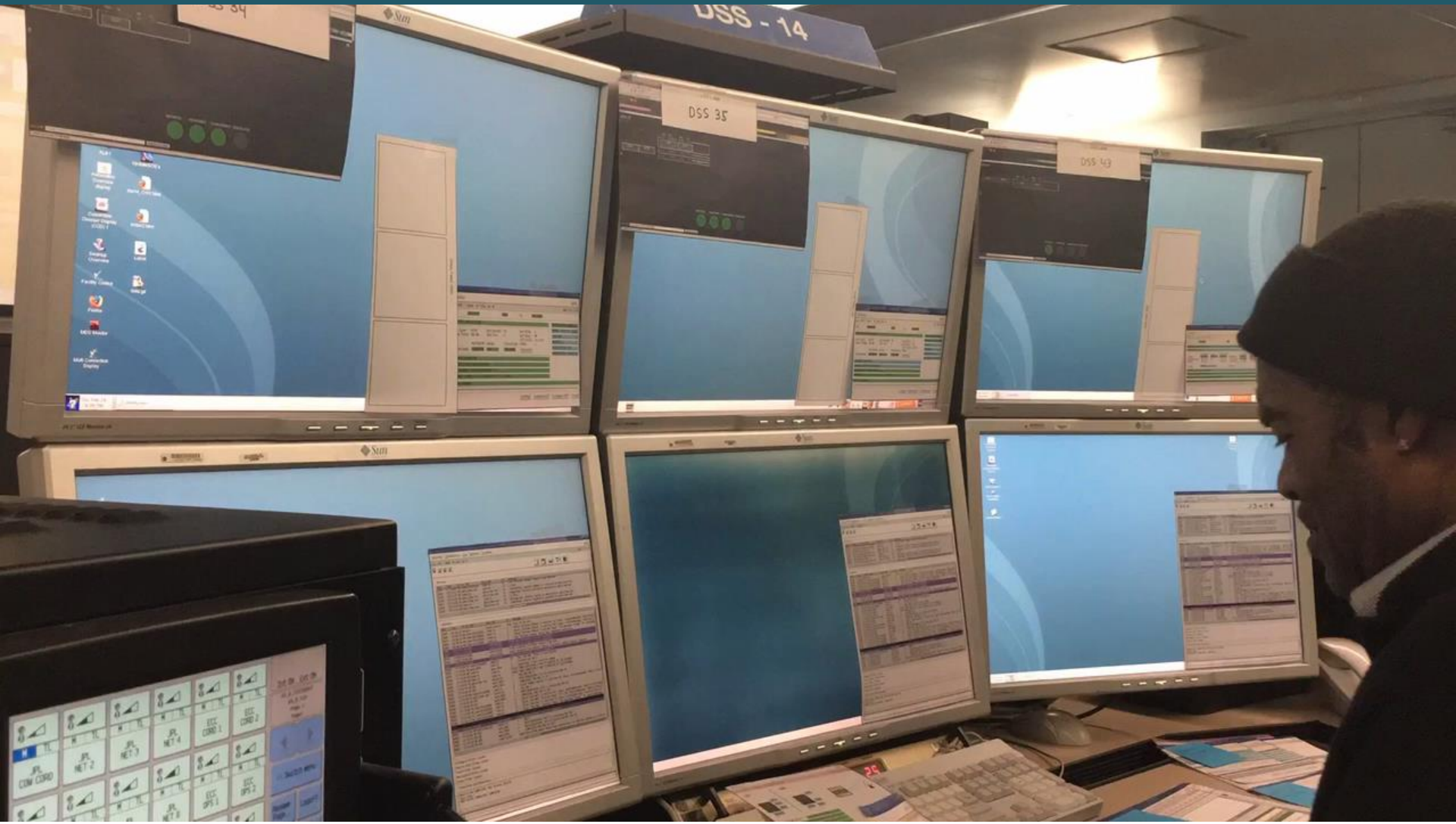
Paper Prototypes

Techniques



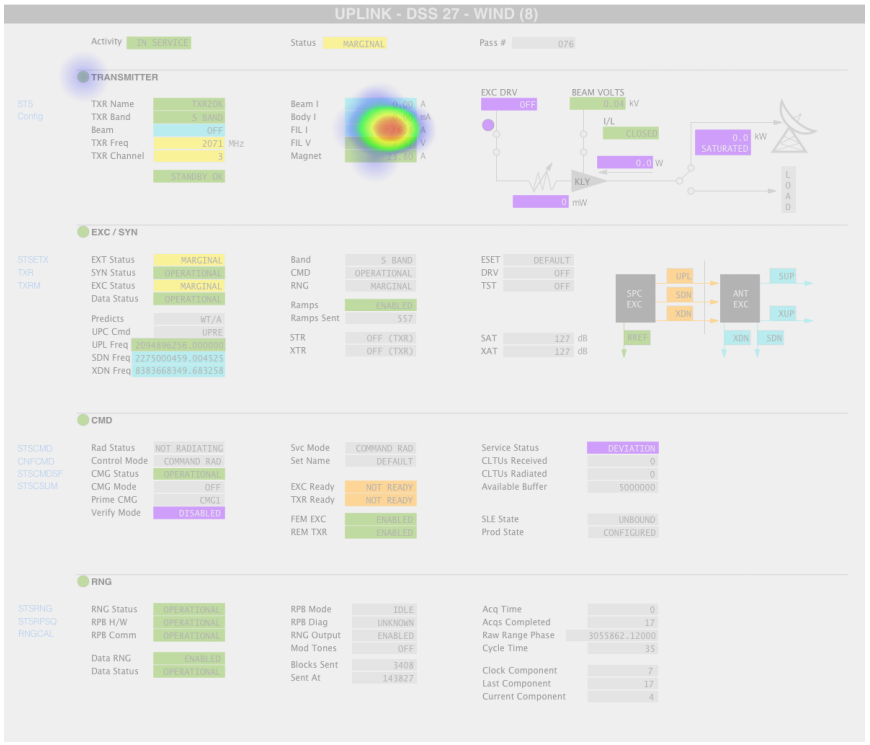
Participatory Design

Techniques



"Paper Dolls"

Techniques



"What Changed" tests

Techniques

Cultivating Ambassadors

Techniques

Banana bread

The future of Deep Space Operations

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What we're planning

How far can we evolve?

Modern technologies – but not too modern

Automation

PR and Goodwill

Training

Questions?

Thank you!

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