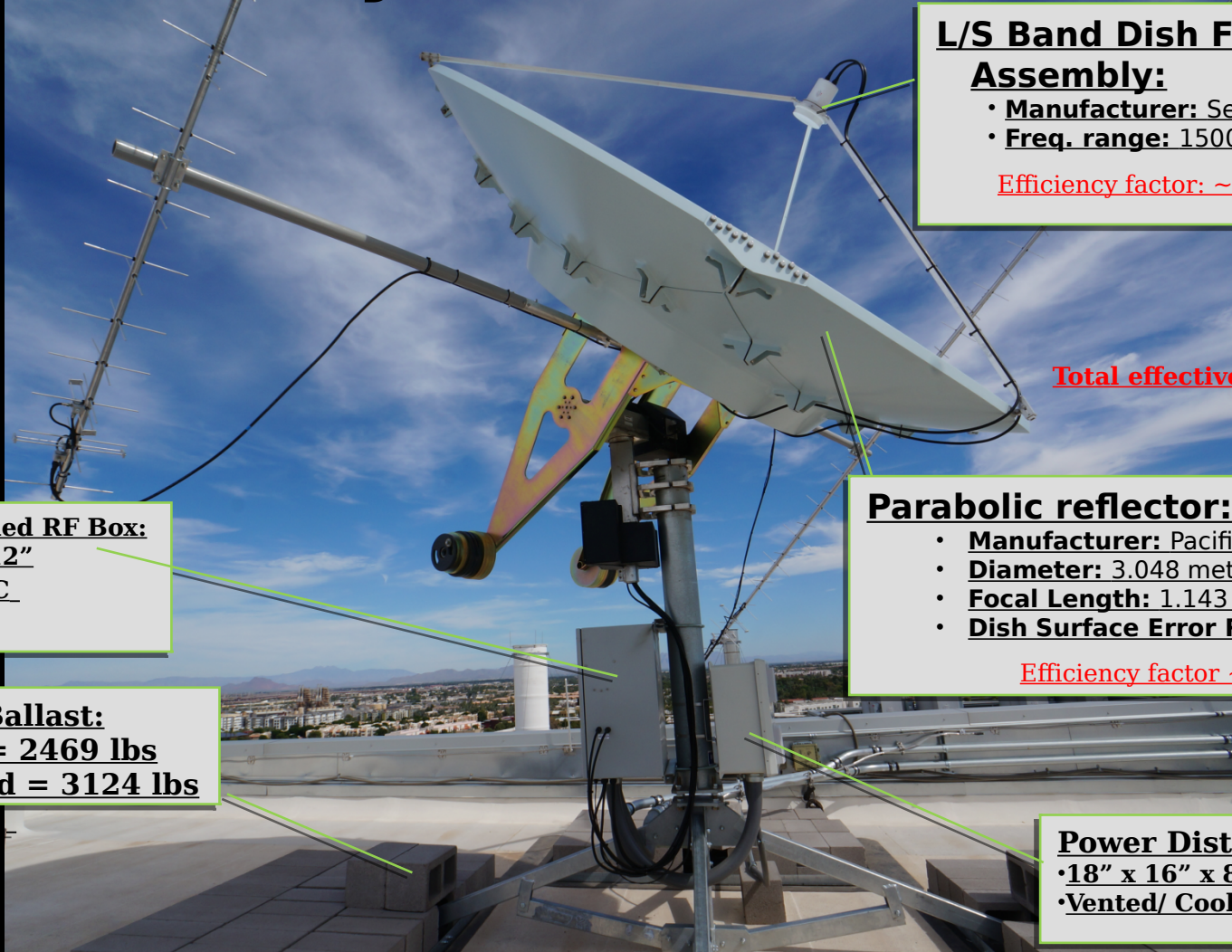


# Antenna System - Dish/Structure



## L/S Band Dish Feed

### Assembly:

- **Manufacturer:** Seavey Engineering Inc.
- **Freq. range:** 1500 - 2500 MHz

Efficiency factor: ~65 - 70%

Total effective efficiency: ~65%

### Air Conditioned RF Box:

- 24" x 24" x 12"
- 2000 BTU AC

### Required Ballast:

- Tethered = 2469 lbs
- Untethered = 3124 lbs

## Parabolic reflector:

- **Manufacturer:** Pacific Radomes, Inc.
- **Diameter:** 3.048 meters (10ft)
- **Focal Length:** 1.143 meters ( $f/D = .375$ )
- **Dish Surface Error RMS:**  $< .015$

Efficiency factor ~98%

### Power Distribution Box:

- 18" x 16" x 8"
- Vented/ Cooling Fans

# Air Conditioned RF Box

UHF Safety Load

UHF LNA: ZRL-700+  
Gain: 30-31 dB  
Freq. range: 250 - 700 MHz

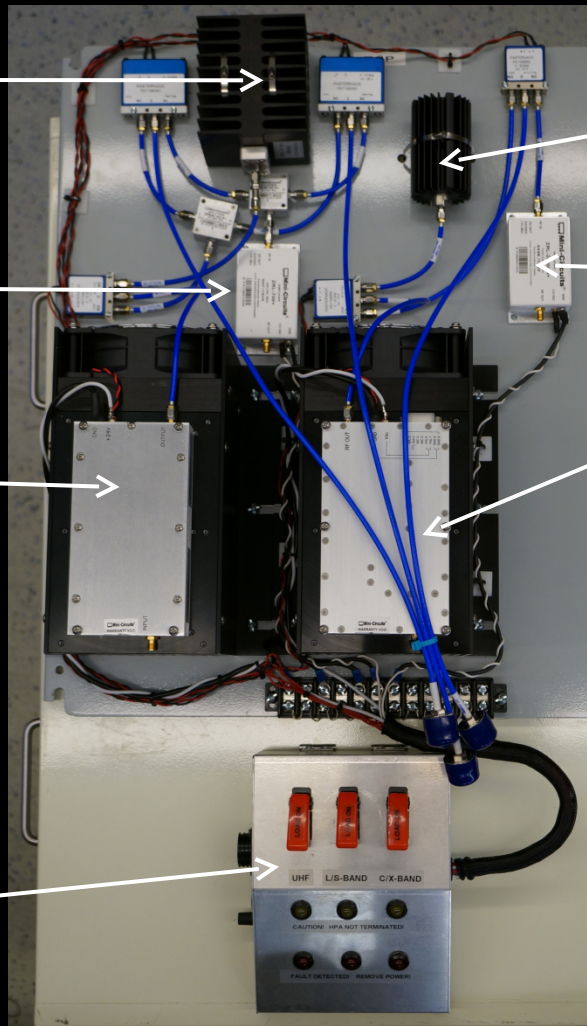
UHF HPA: ZHL-50W-52+  
Gain: 50 dB  
Freq. range: 50 - 500 MHz

Amplifier protection and fault indication circuit designed by Chris Marrs

S-Band Safety Load

L/S-Band LNA: ZRL-2400LN+  
Gain: 28-32 dB  
Freq. range: 1000 - 2400 MHz

L/S-Band: ZHL-30W-252+  
Gain: 50 dB  
Freq. range: 700 - 2500 MHz



# Major RF Components

- Yagi antennas

Yagi 1: 430 - 438 MHz

Yagi 2: ??? MHz

- Amplifiers

UHF:

HPA: 50-500 MHz

LNA: 250-700 MHz

L/S-Band:

HPA: 1000-2400 MHz

LNA: 700-2500 MHz

- Dish feed

Current: 2200 - 2450 MHz

Future: Bands covering all ASU and DSN frequencies

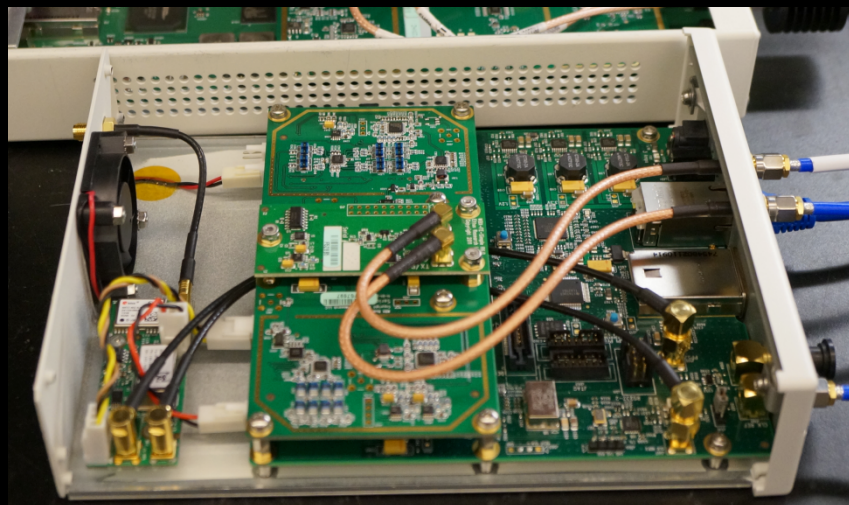
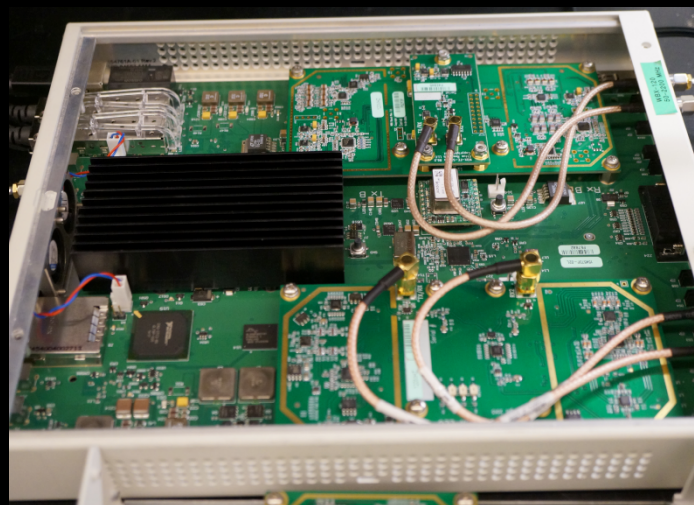
- USRP Daughter Boards

WBX-120: 50 - 2200 MHz (120 MHz Bandwidth)

CBX-120: 1200 - 6000 MHz (120

	<u>X310</u>	<u>N210</u>
		
Max ADC Sample Rate	200 MS/s	100 MS/s
ADC Resolution	14 bits	14 bits
Max DAC Sample Rate	800 MS/s	400 MS/s
DAC Resolution	16 bits	16 bits
Typical Noise Figure	8 dB	5 dB
Frequency Accuracy (w/ GPSDO)	0.02 ppm	0.01 ppm
Power Output	> 10dBm	15 dBm

# USRP Daughter-boards



Frequency Range

Bandwidth

WBX-120  
(only for x310 SDR)

50 - 2200 MHz

120 MHz

CBX-120  
(only for x310 SDR)

1200-6000 MHz

120 MHz

WBX-40

50-2200 MHz

40 MHz

CBX-40

1200-6000 MHz

40 MHz

# Generalized Antenna Beams

