TRAINING COURSE

Microwave Group (MWG) & Compressor Dehydrator

Primary Surveillance Radar Systems

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Warning of Confidentiality

Signature Sheet

	INDRA			
	Name	Signature	Date	Responsibility
Prepared	Jaime Herrero Gutiérrez			Systems Engineer
Revised	Carolina Rincón Gila			Systems Engineer
Approved	Crisanto Molina Blesa			Systems Engineer
Authorized	Crisanto Molina Blesa			Systems Engineer

Changes Record

DOCUMENT CHANGES RECORD				
EDITION	*REVISION*	*DATE*	*CHAPTER*	*REASON OF THE CHANGES*
A	0	18/04/2017	All	Content Review
A	1	09/03/2020	All	Updates

Acronyms

APG	Antenna and Pedestal Group
Att	Attenuation
BITE	Built-in test Equipment
cm	centimeter
CMS	Control and Monitor System
CRCH	Coaxial Receiver Channel
DC	Directional Coupler
dB	Decibel
dBc	Decibel (relative to carrier)
dBm	Decibel (relative to milliwatt)
FLU	Filter and LNA Unit
FWD	Forward
GHz	GigaHertz
GRPG	Generator, Receiver and Processor Group
h	Hour
HB	Hi Beam
Hz	Hertz
Kg	Kilogram
kPa	KiloPascal
kW	Kilowatt
LB	Low Beam

Acronyms

LNA	Low Noise Amplifier
LAN	Local Area Network
LRU	Line Replaceable Unit
MHz	MegaHertz
MWCG	MicroWave Control Group
MWCU	MicroWave Control Unit
MWG	Microwave Group
PSR	Primary Surveillance Radar
PSIG	Pound per square inch Gauge
REV	Reverse
RF	Radio Frequency
RH	Relative Humidity
RP	Receiver Protector
RX	Receiver
RFCSU	Radio Frequency Control Switching Unit
scfh	Standard Cubic Feet per Hour
scfm	Standard Cubic Feet per Minute
slpm	Standard Liters per Minute
STC	Sensitivity Time Control
SSA	Shelf Switch Assembly
SW	Switch

Acronyms

TGT	Target
TX	Transmission
TXG	Transmitter Group
VSWR	Video Standing Wave Ratio
w	watt
WCD	Waveguide Compressor Dehydrator
WGD	Waveguide Duplexer
WGS	Waveguide Switch
WPD	Waveguide Power Load
WRP	Waveguide Receiver Protector
WX	Weather
µs	microsecond

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Microwave Group Overview

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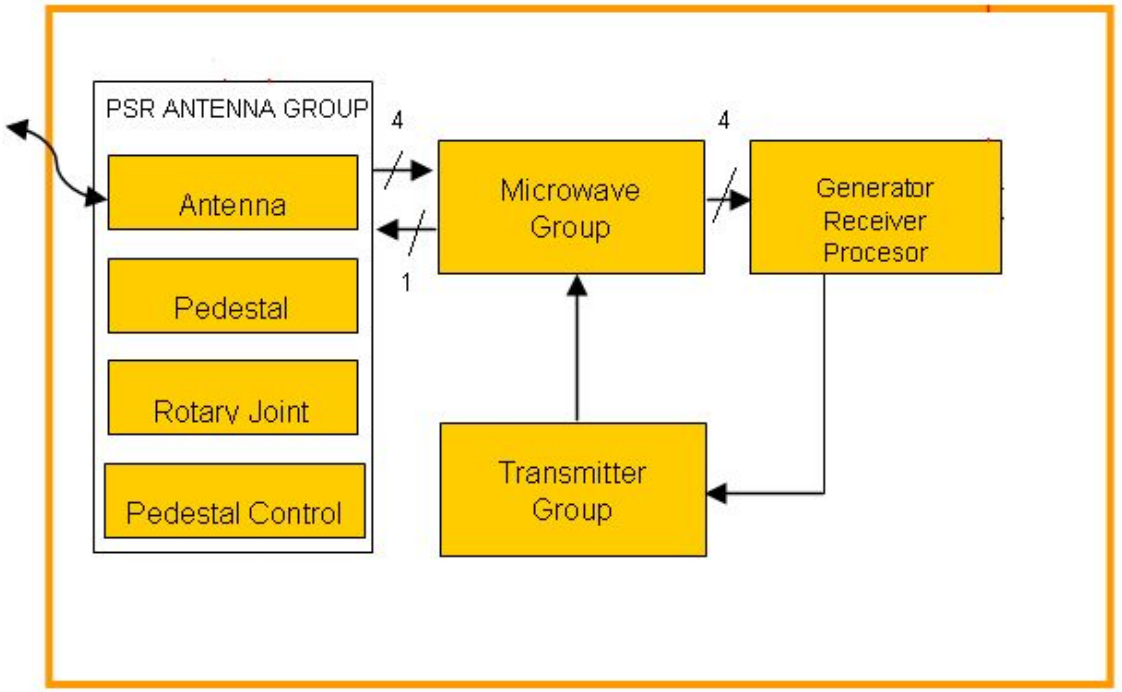
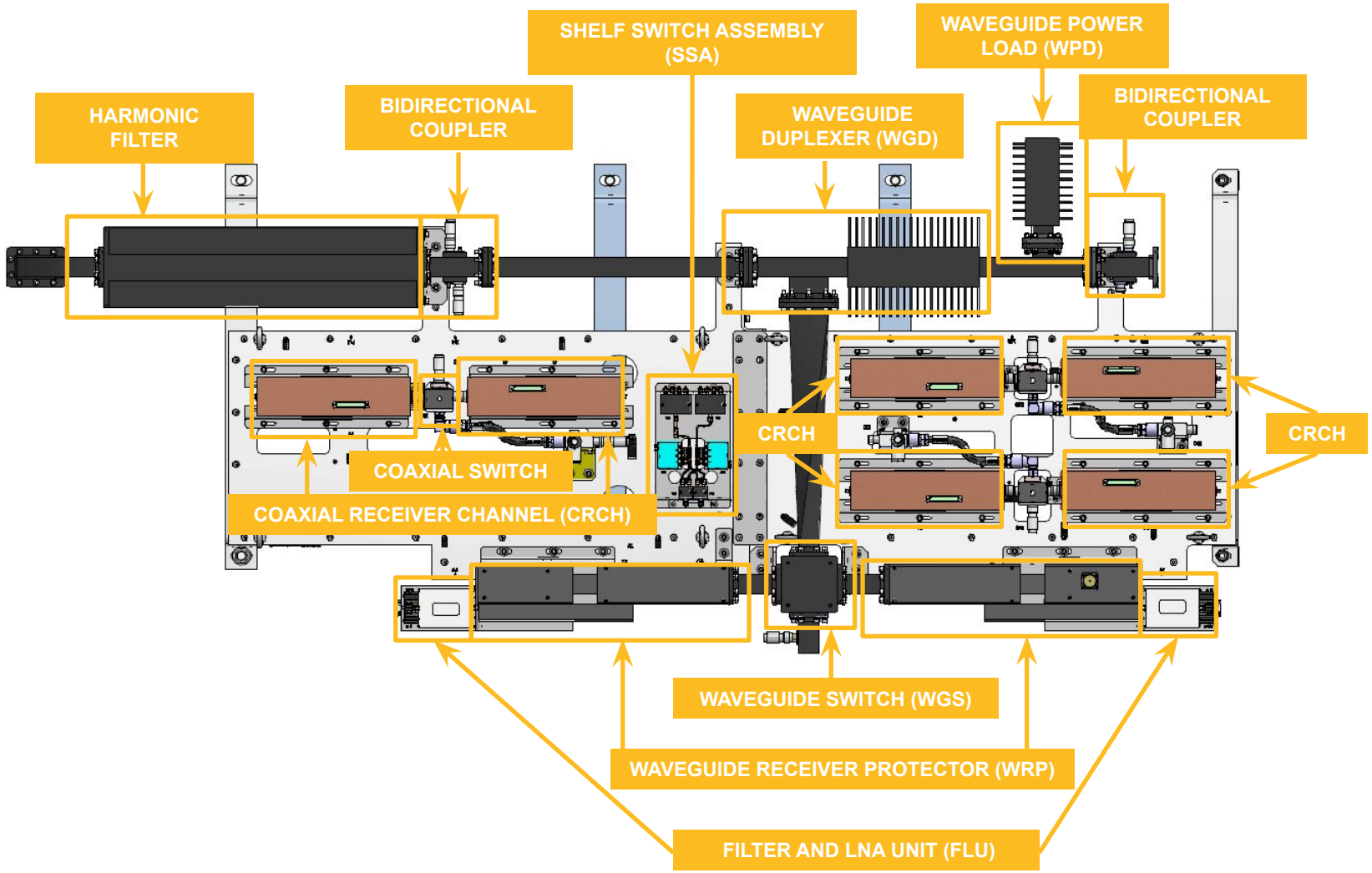
Microwave Group Overview



Microwave Group Overview

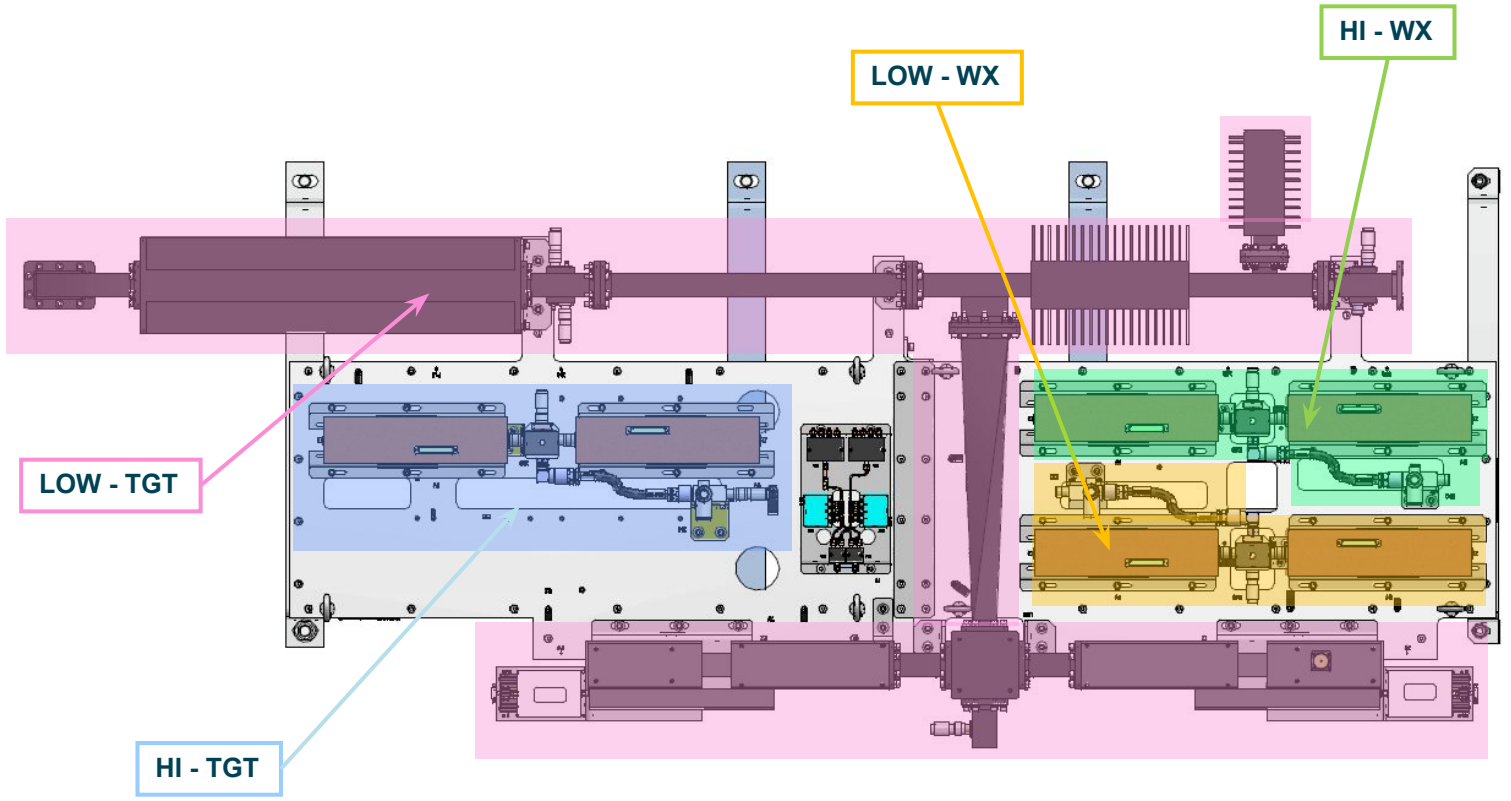


Physical Description

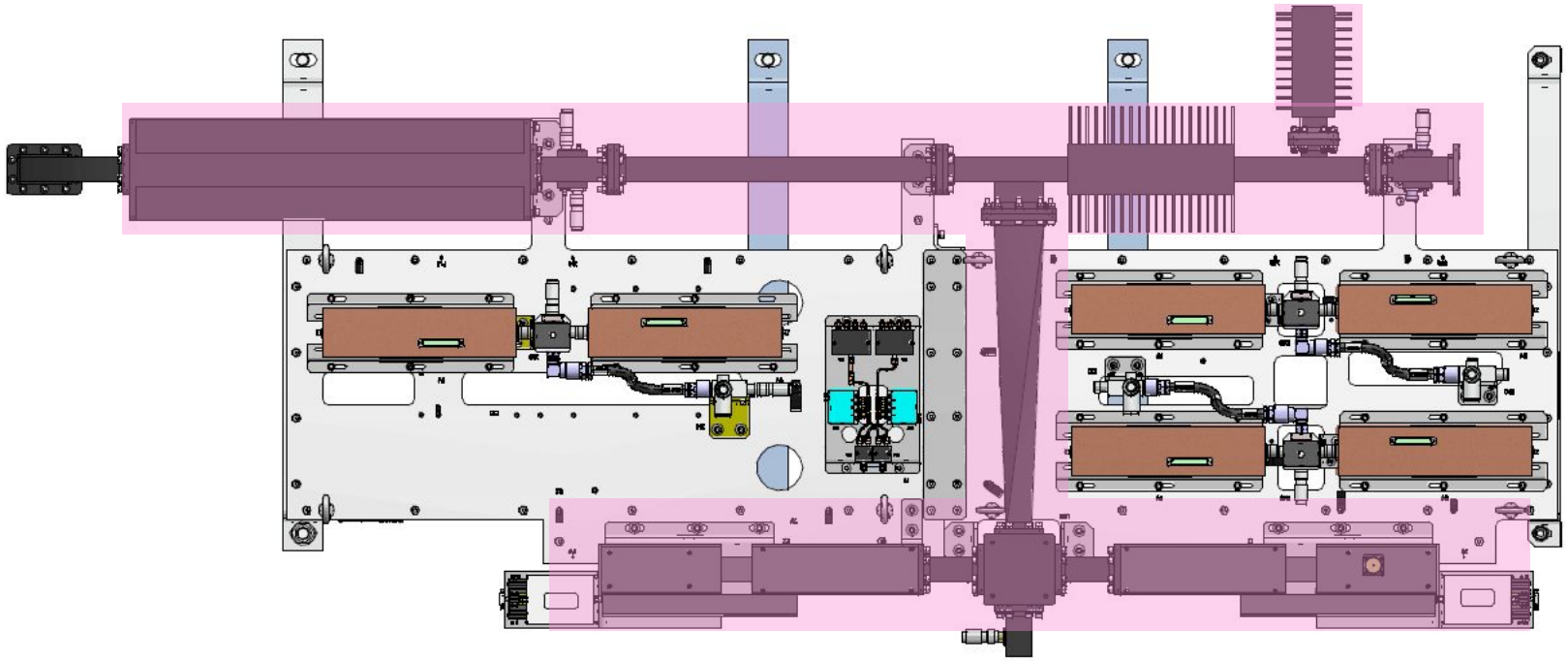
- Channel Distribution
- Transmission Channel
- Reception Channel
- Test Signals Distribution
- Summary

2

Channel Distribution



Transmission Channel



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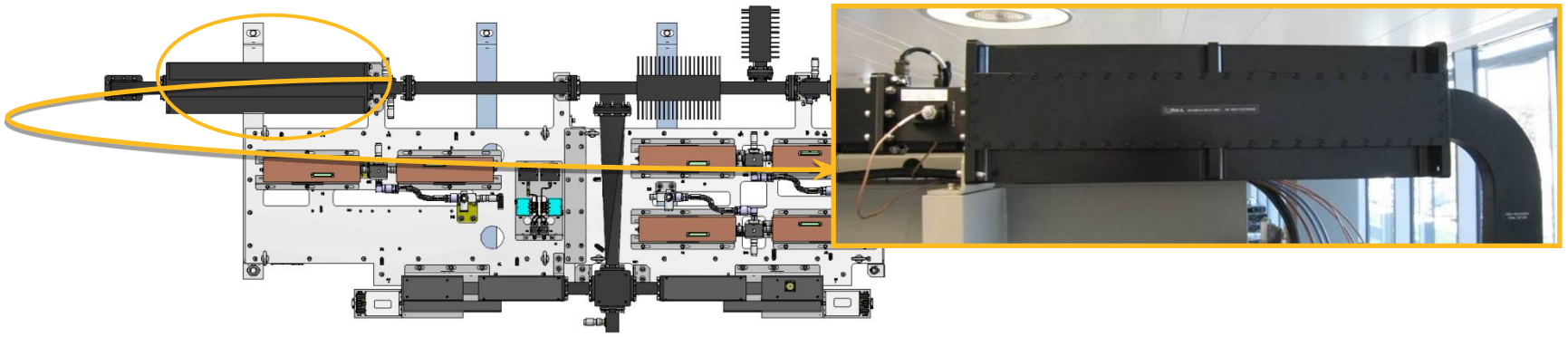

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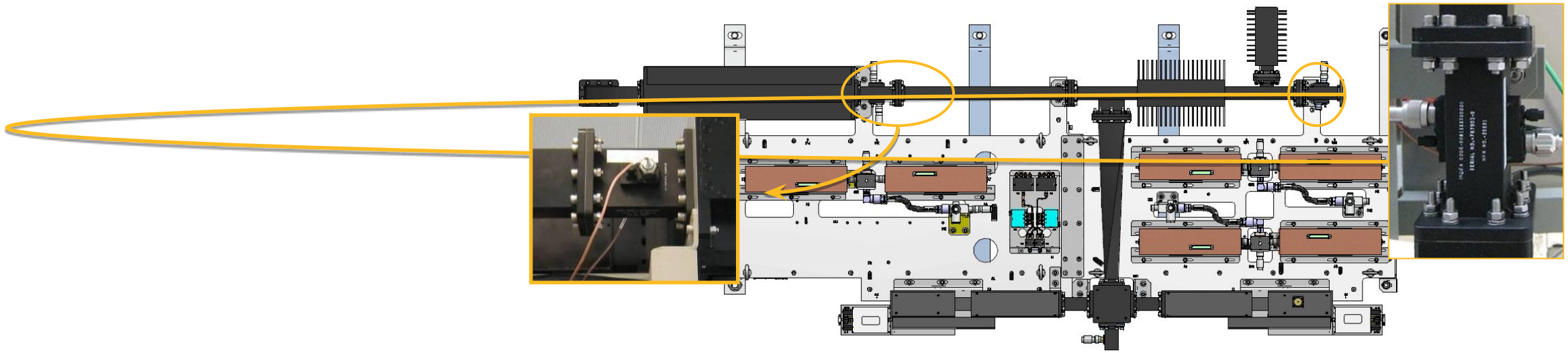

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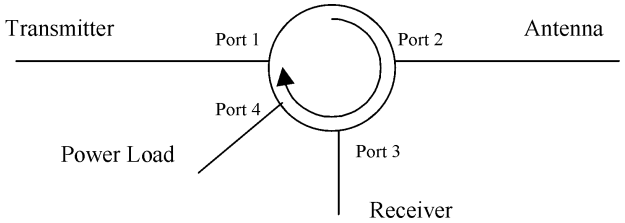

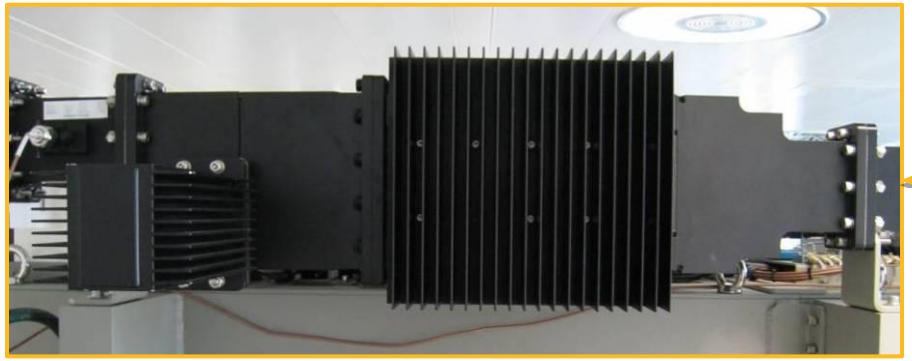

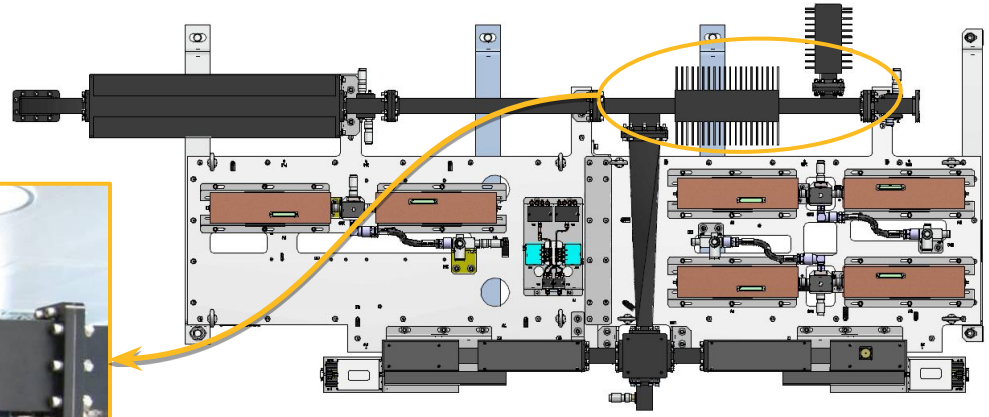

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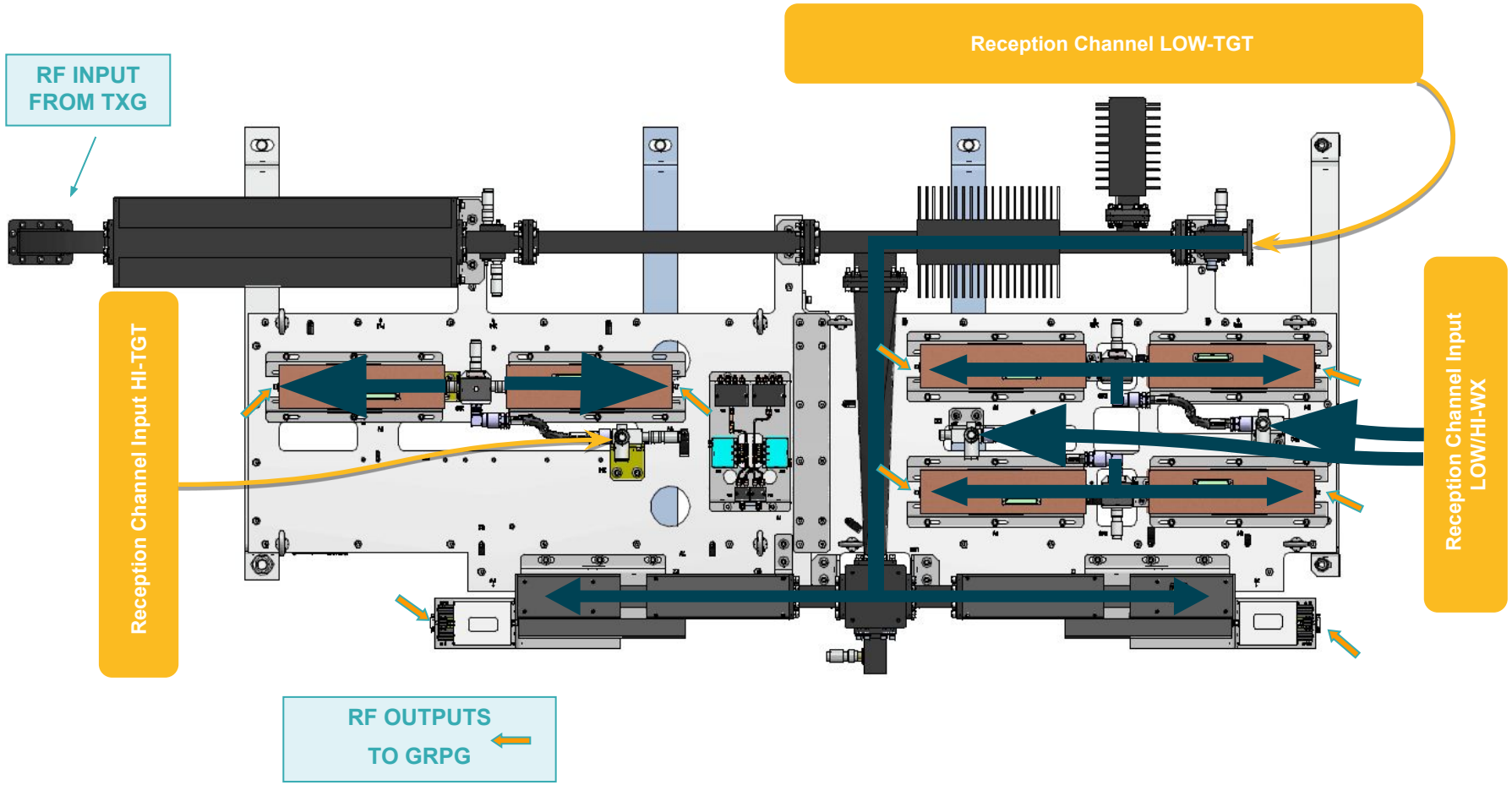

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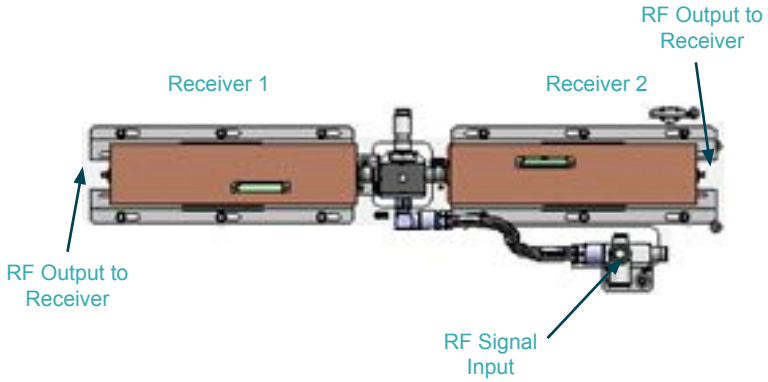
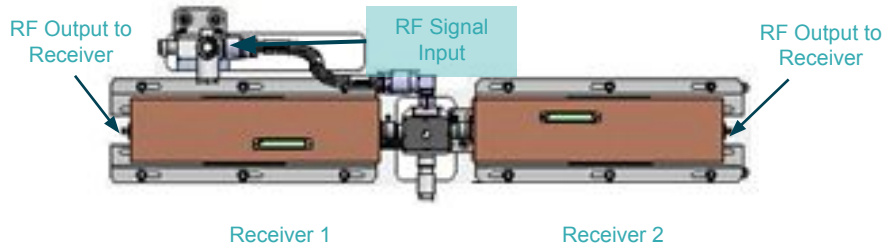
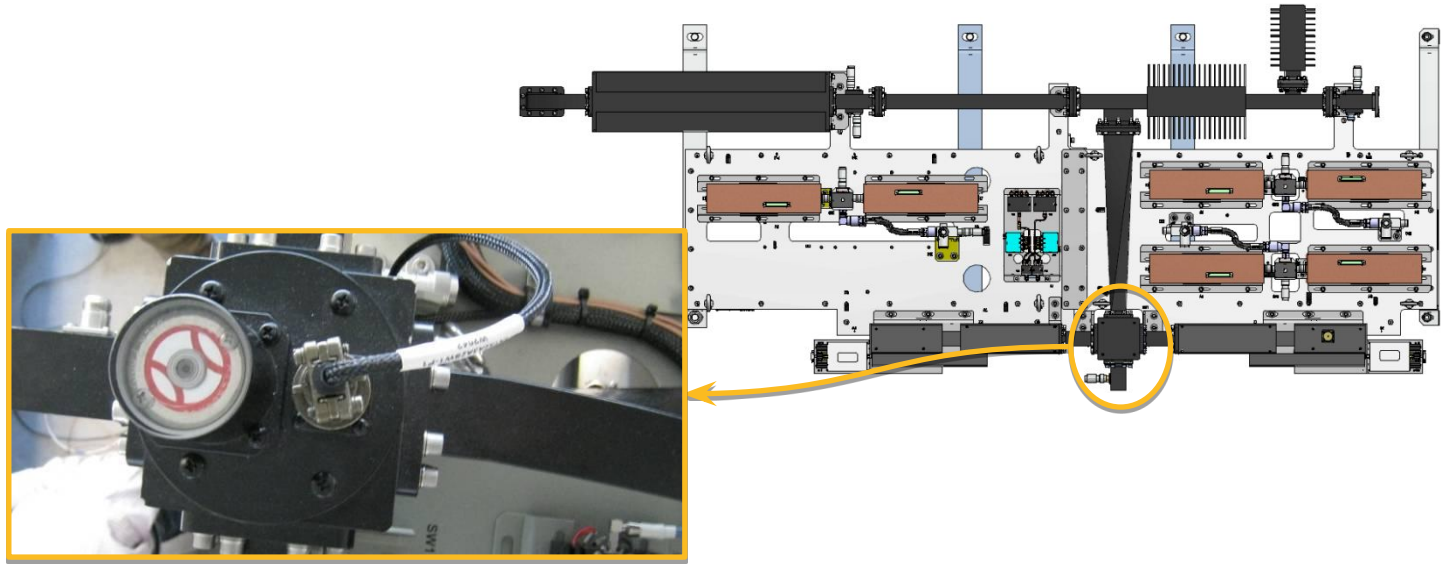




Reception Channel

Summary

Reception Channel



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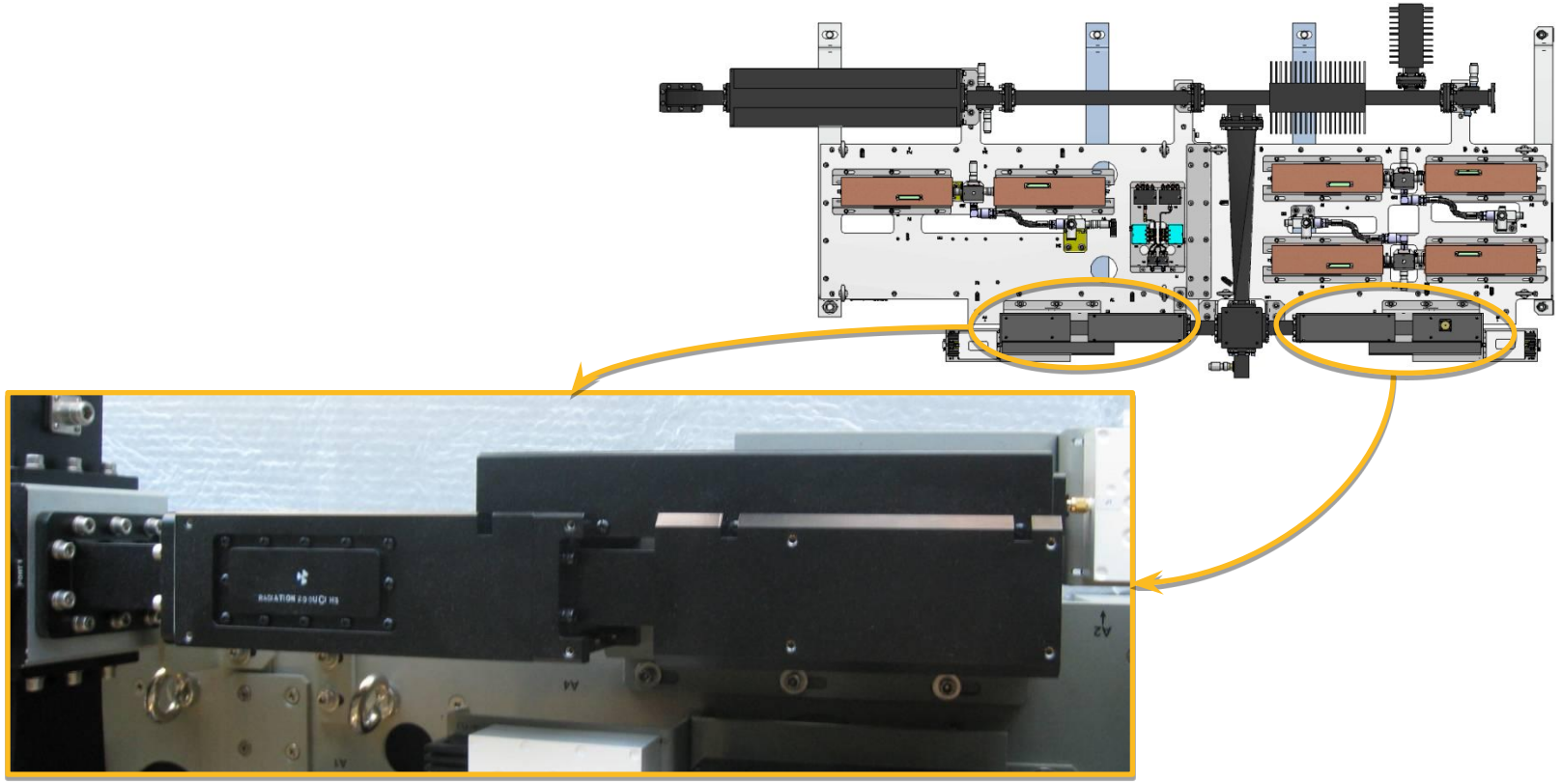

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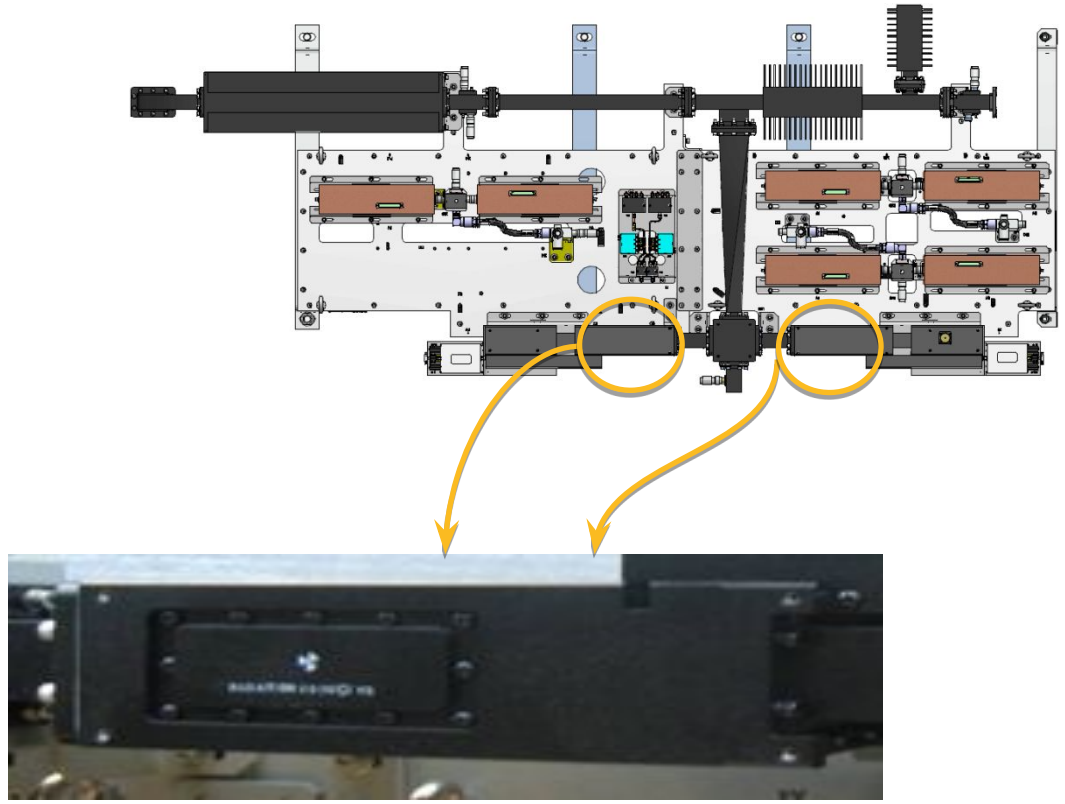

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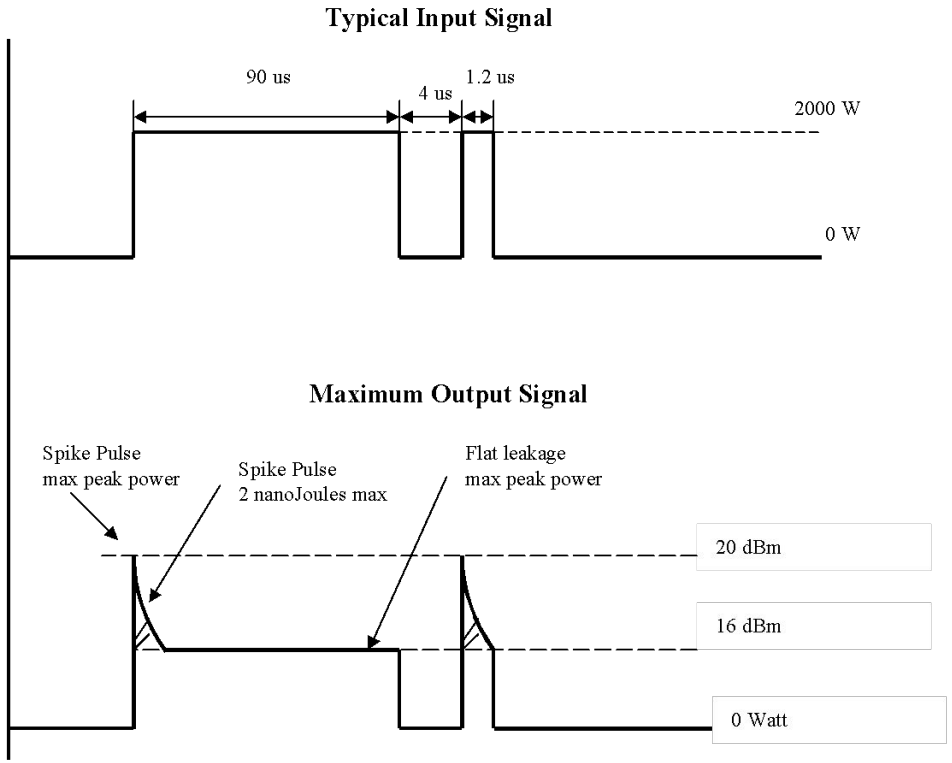

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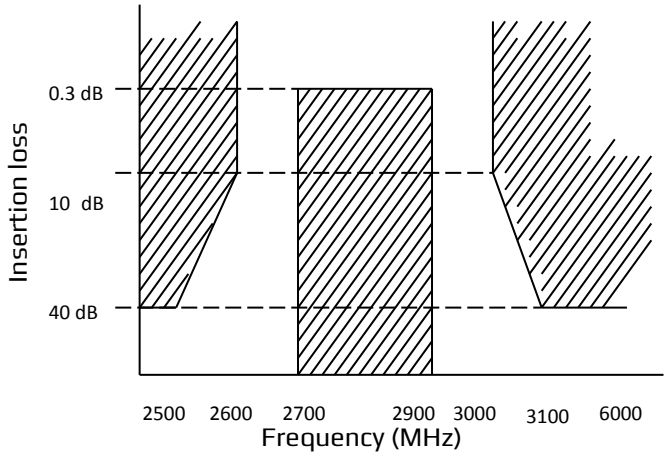

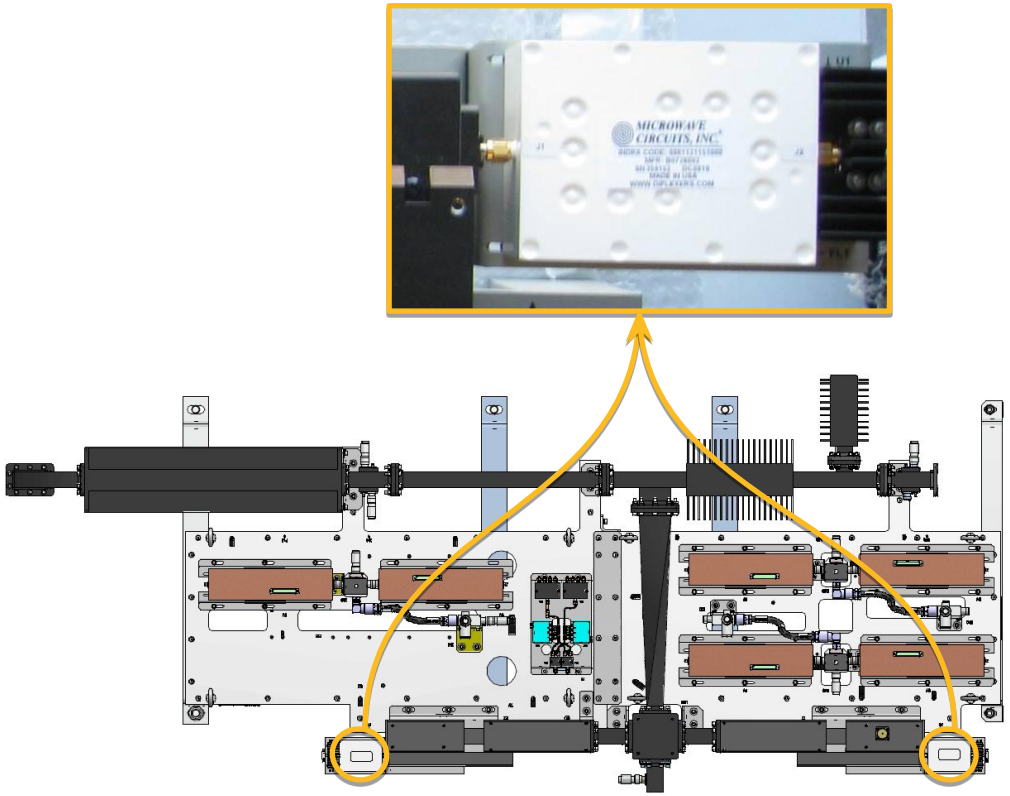

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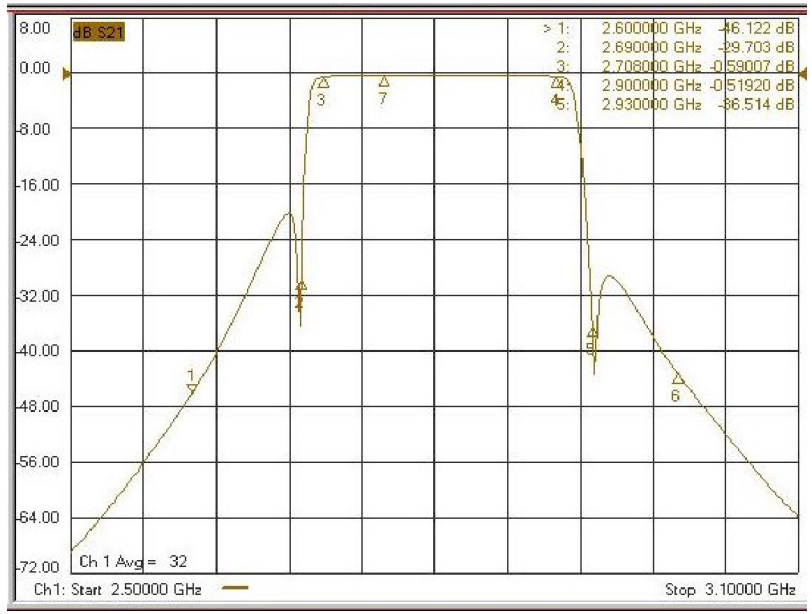
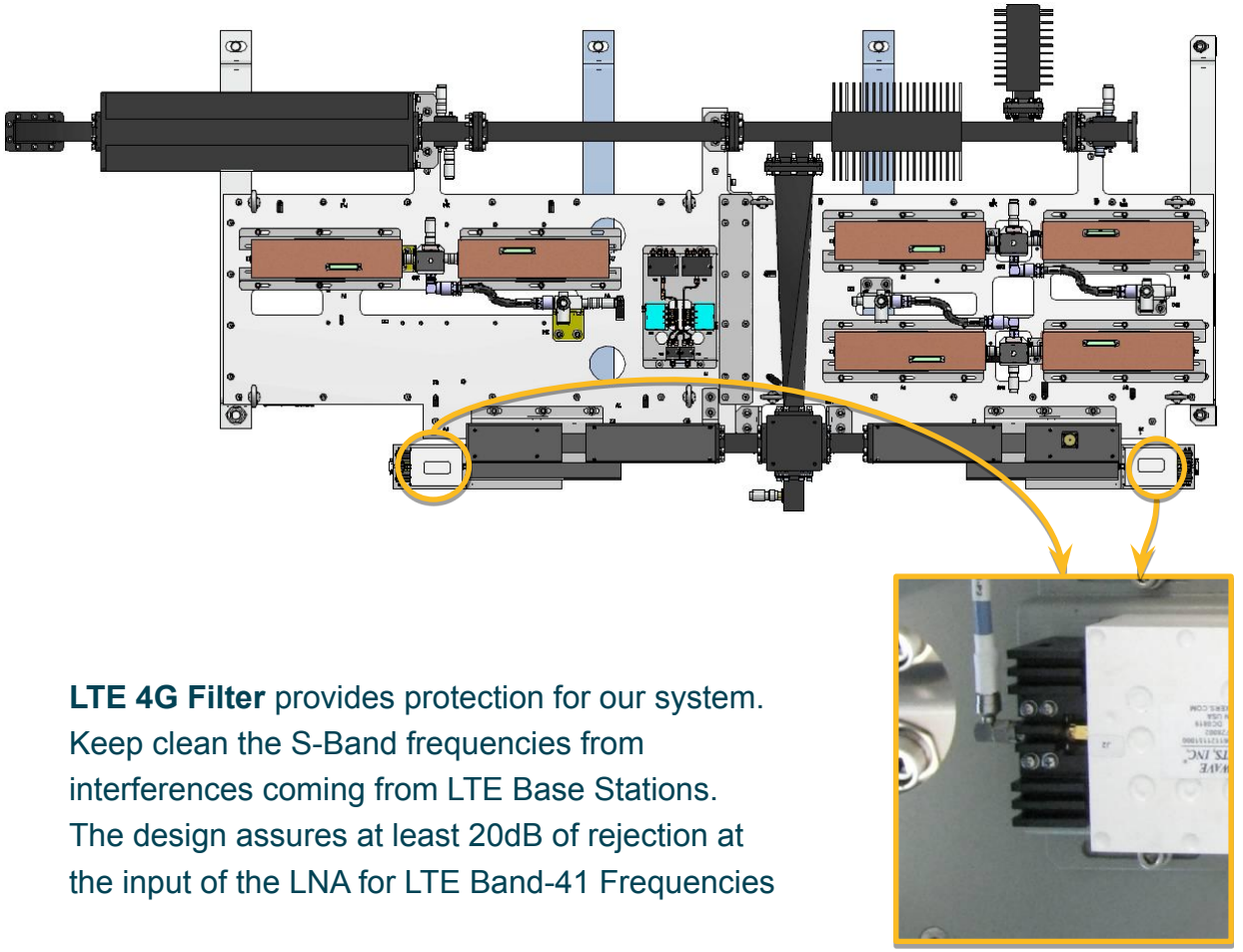
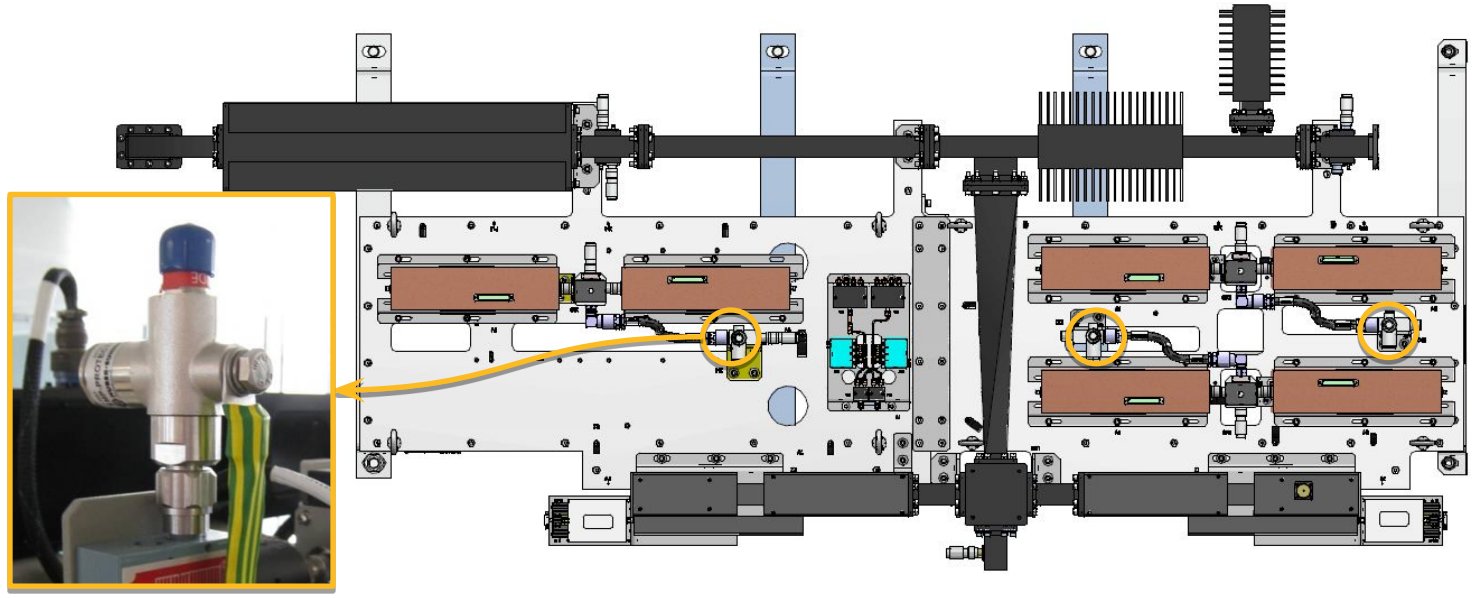




LTE 4G Filter provides protection for our system. Keep clean the S-Band frequencies from interferences coming from LTE Base Stations. The design assures at least 20dB of rejection at the input of the LNA for LTE Band-41 Frequencies

Reception Channel



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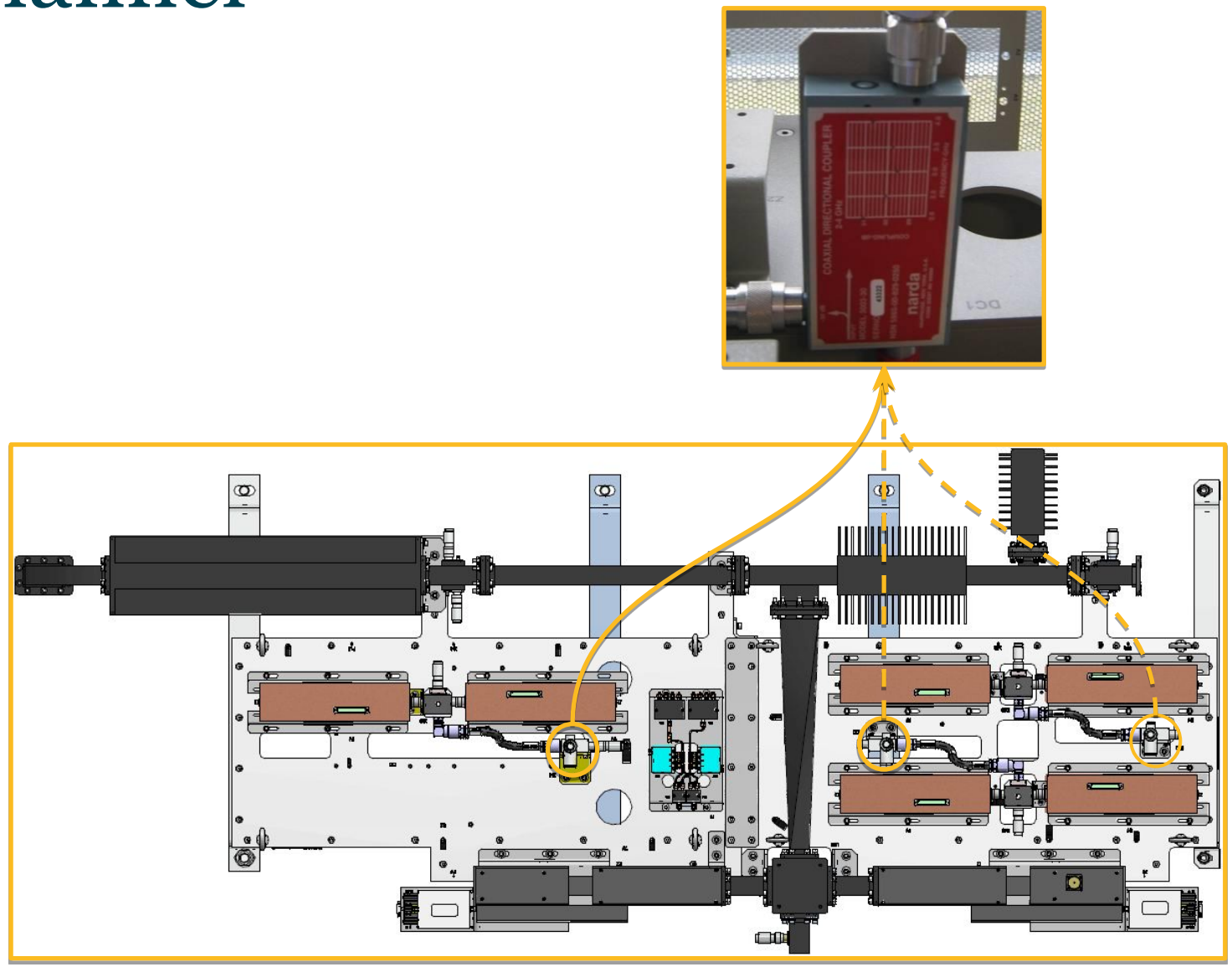

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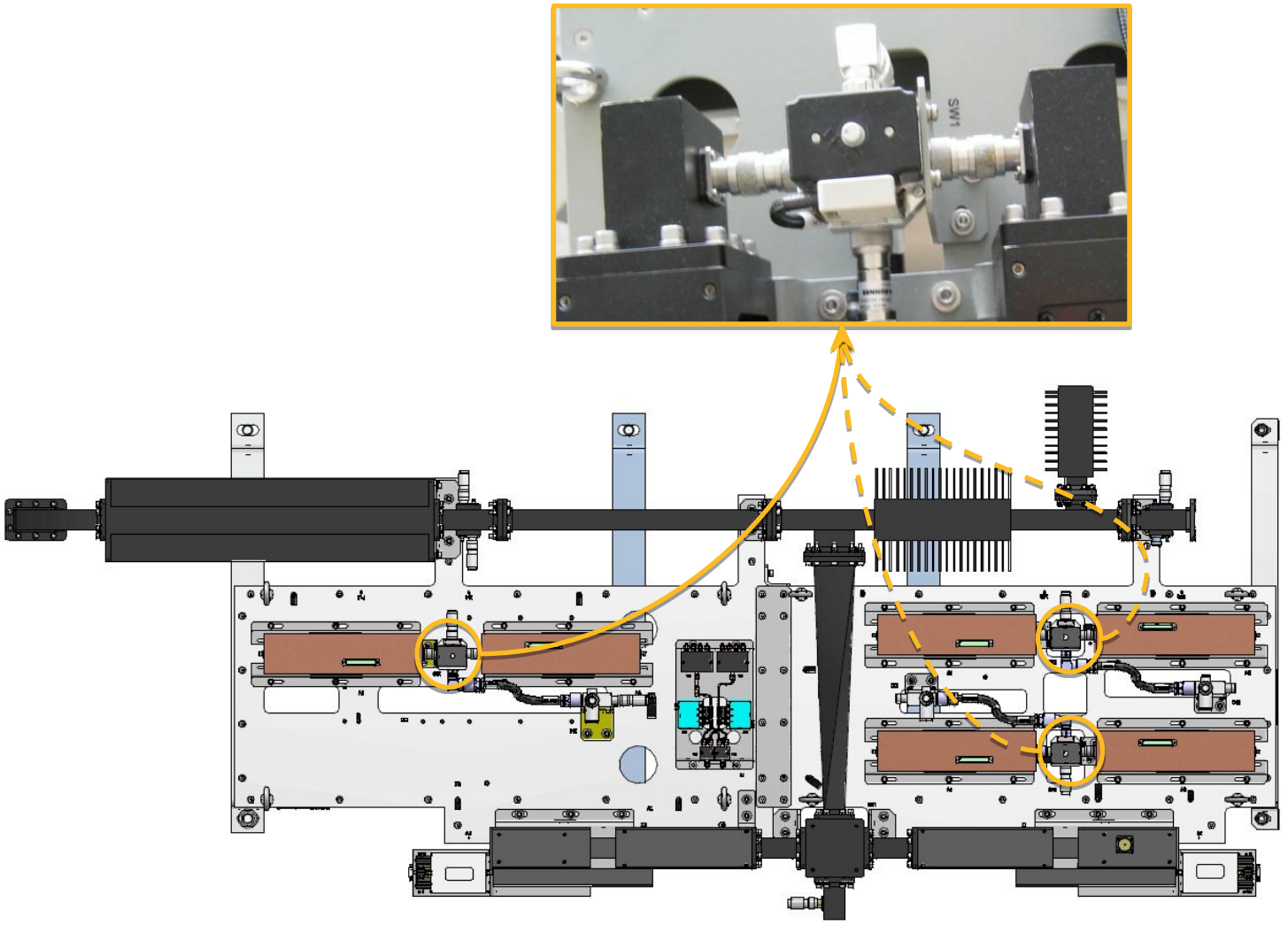

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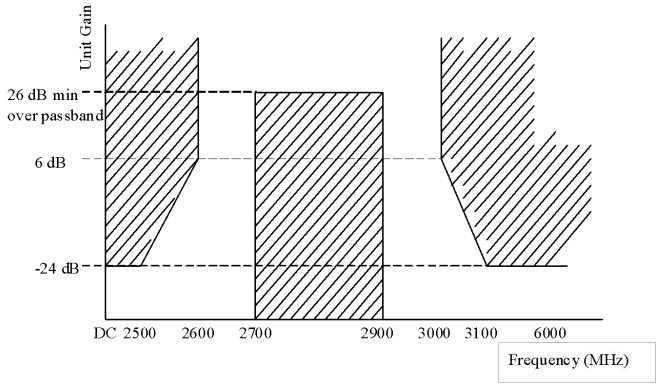

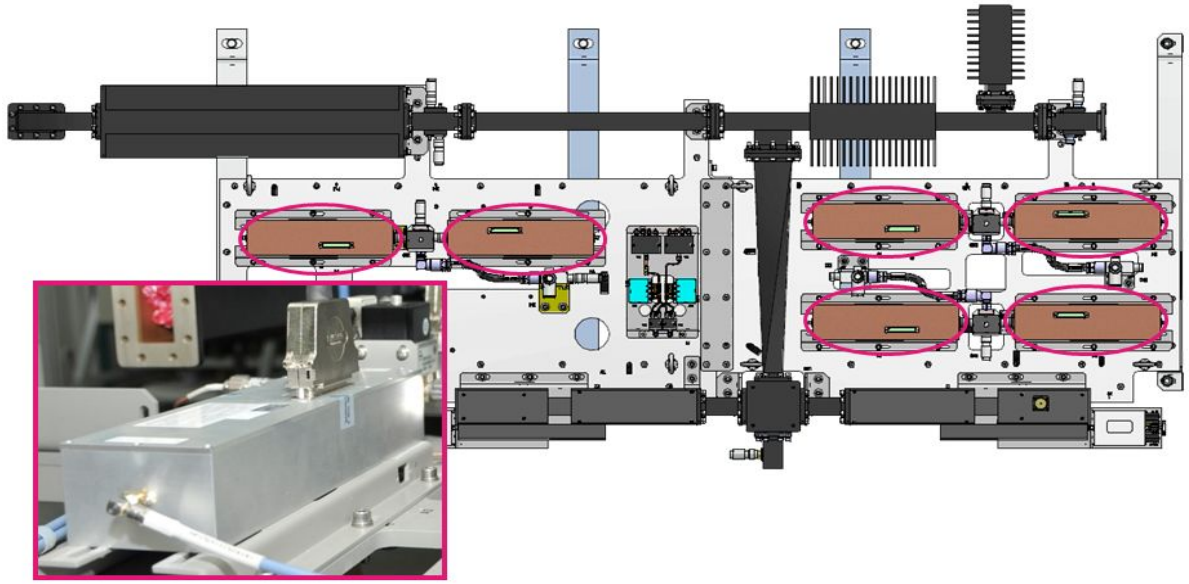

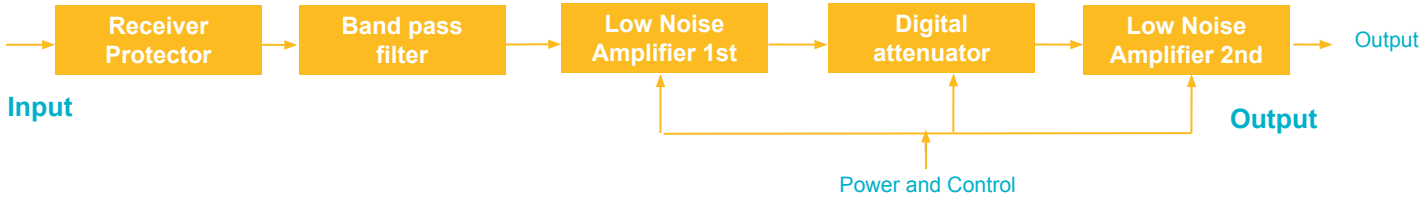

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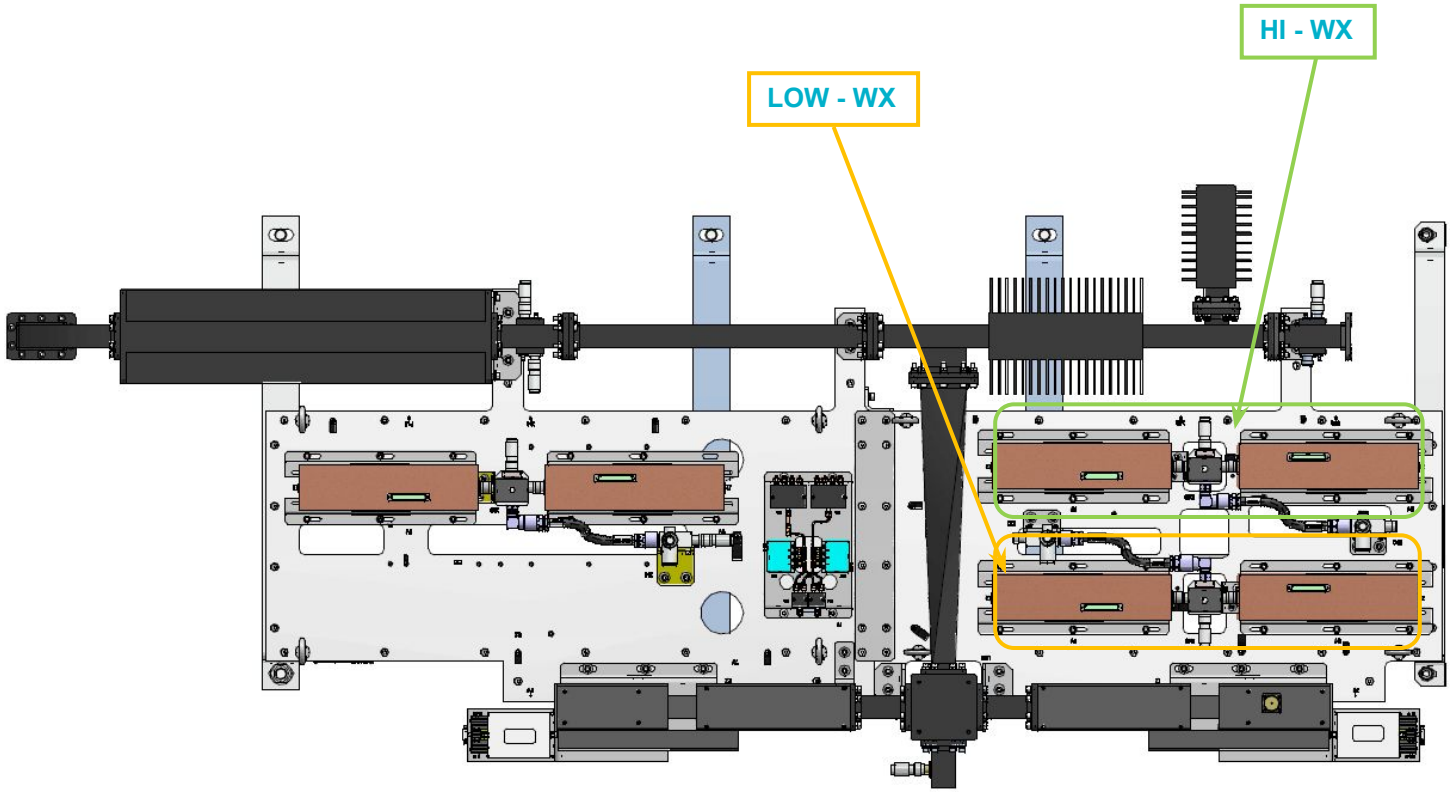
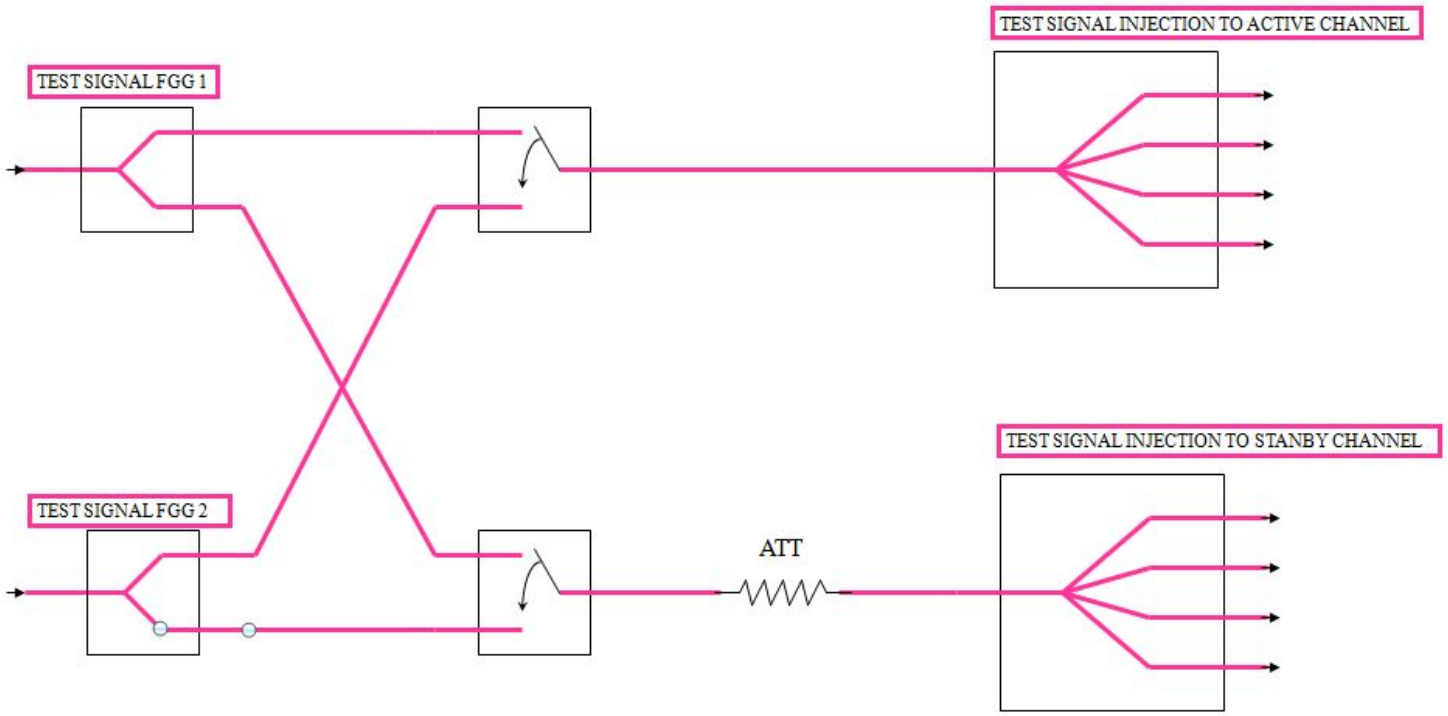


Test Signals Distribution

SSA



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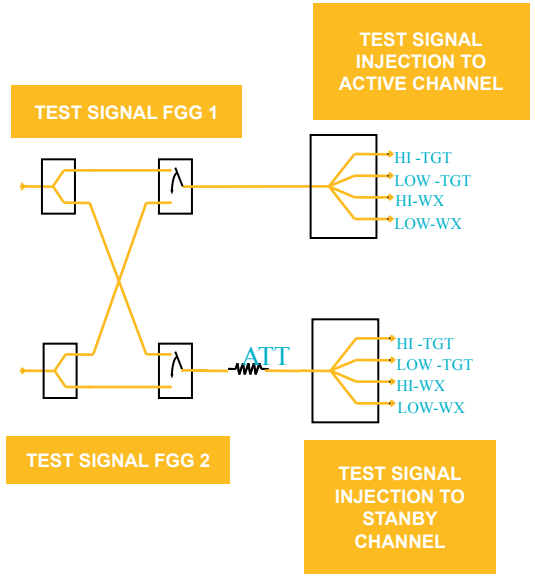

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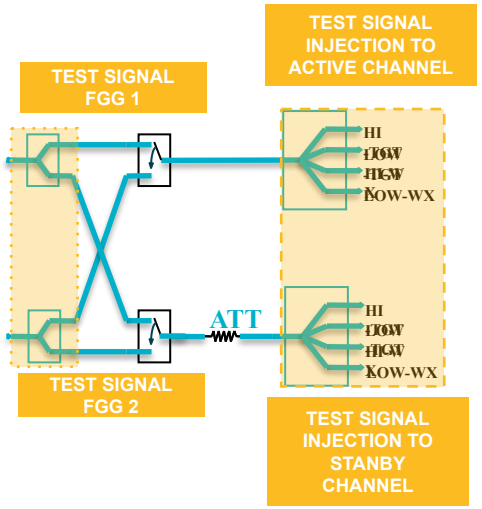
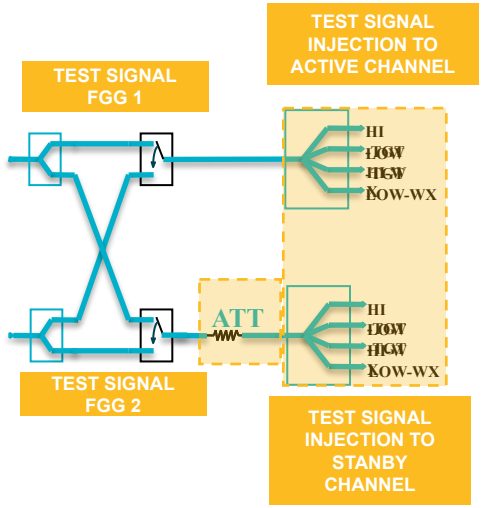
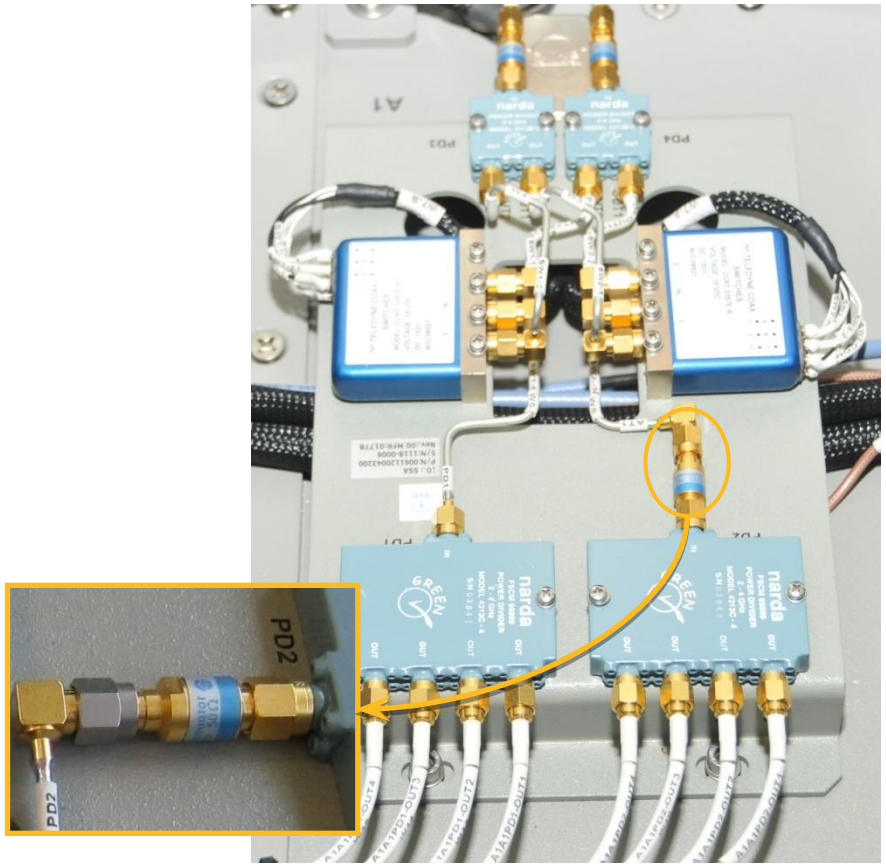


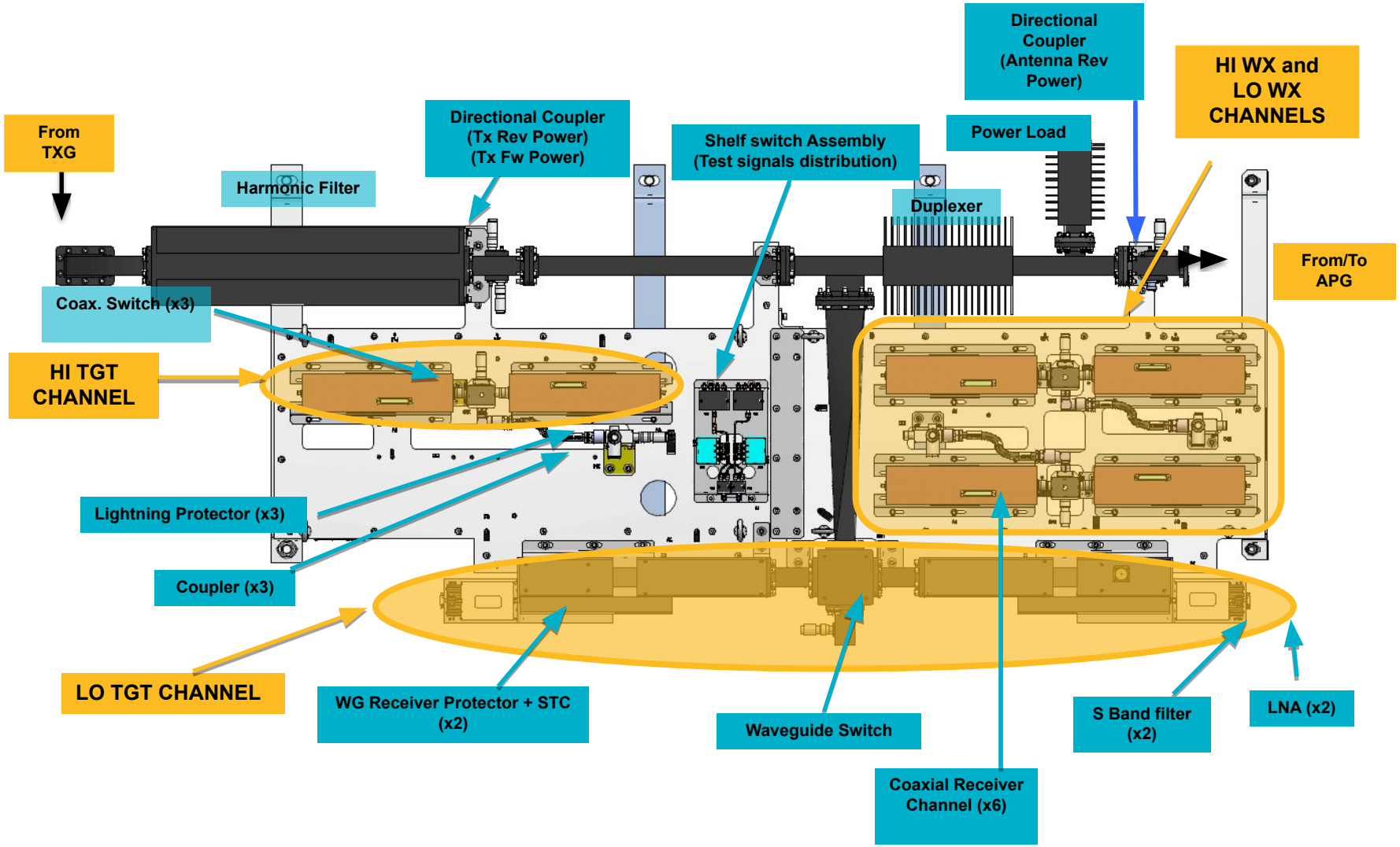
Test Signals Distribution

SSA





Summary

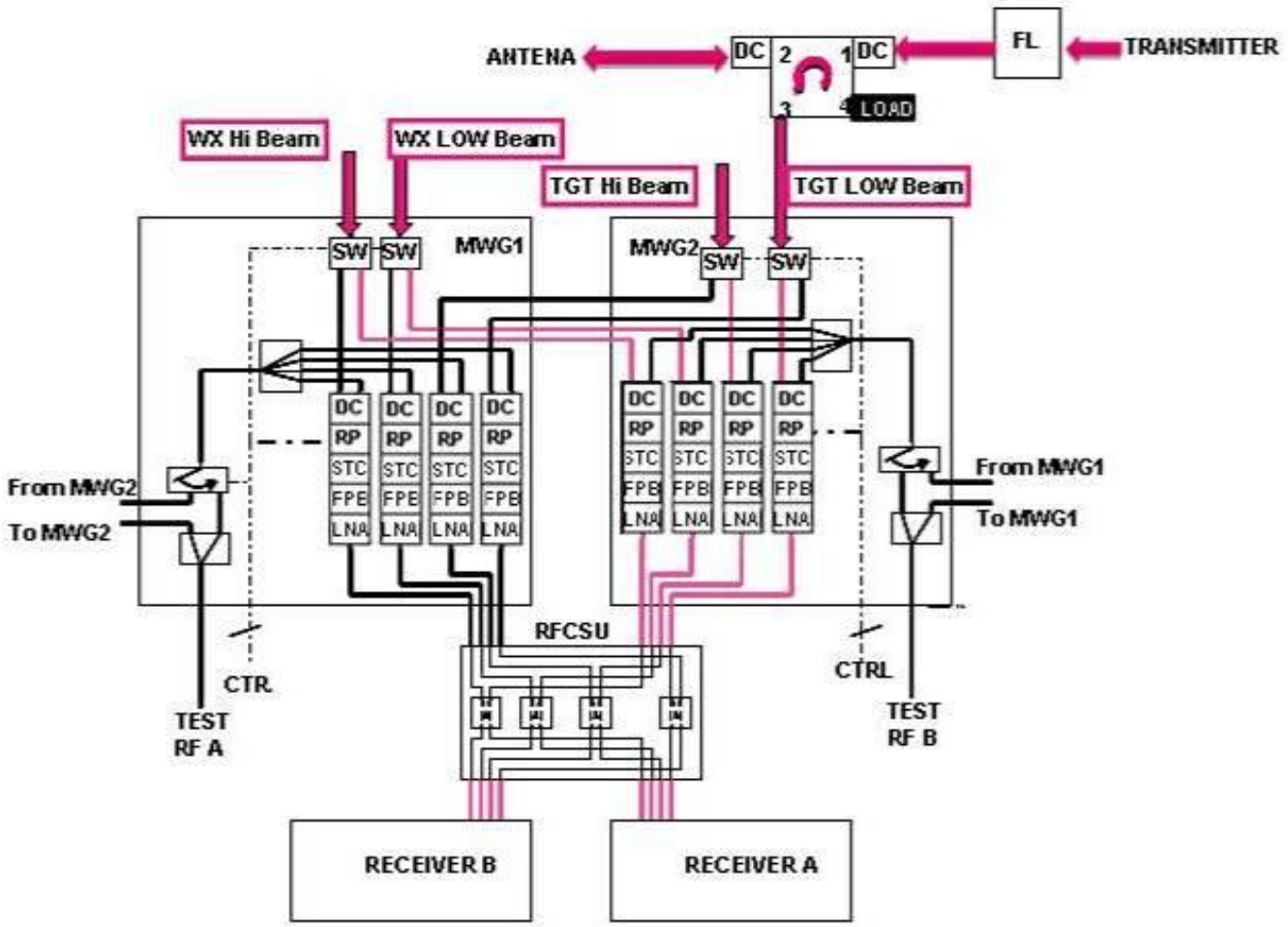

From TXG
Harmonic Filter
Directional Coupler (Tx Rev Power) (Tx Fw Power)
Shelf switch Assembly (Test signals distribution)
Directional Coupler (Antenna Rev Power)
Power Load
HI WX and LO WX CHANNELS
Duplexer
From/To APG
Coax. Switch (x3)
HI TGT CHANNEL
Lightning Protector (x3)
Coupler (x3)
LO TGT CHANNEL
WG Receiver Protector + STC (x2)
Waveguide Switch
Coaxial Receiver Channel (x6)
S Band filter (x2)
LNA (x2)

MWG Functional Description

- Signal Transmission and Reception
- STC
- Test Signal Distribution (SSA, Switches and Couplers)
- Redundancy

3

Signal Transmission and Reception



Signal Transmission and Reception

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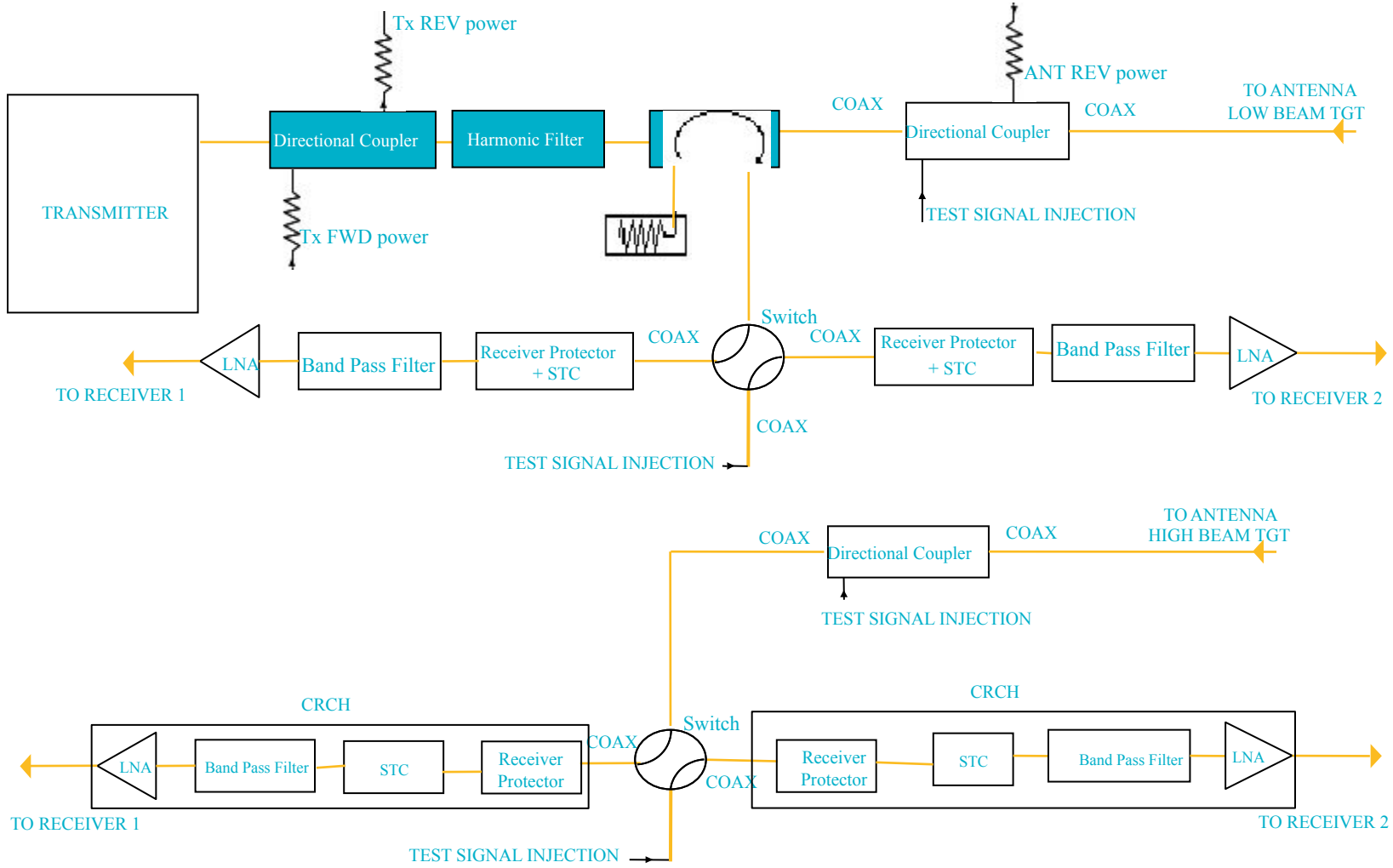

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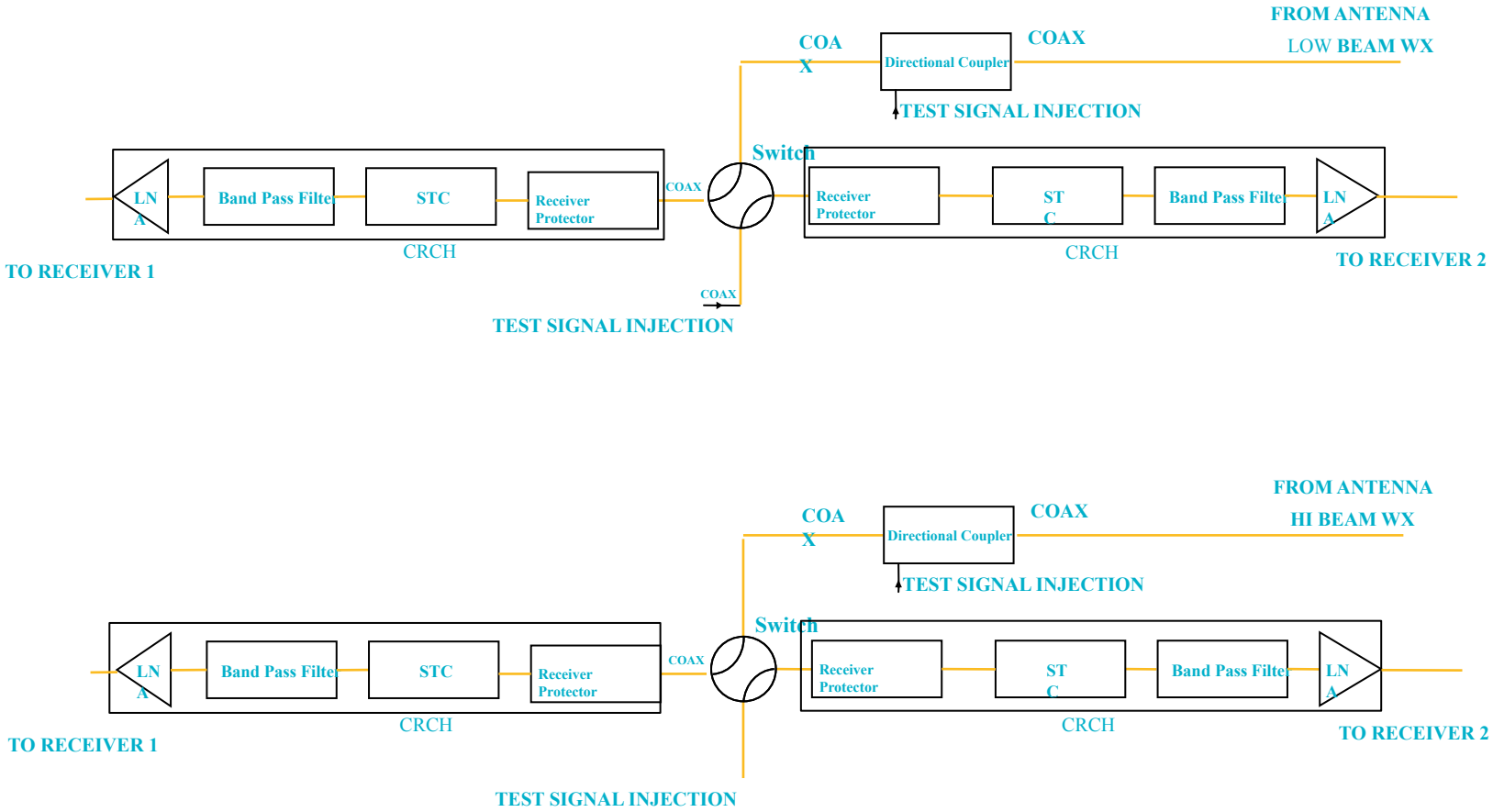
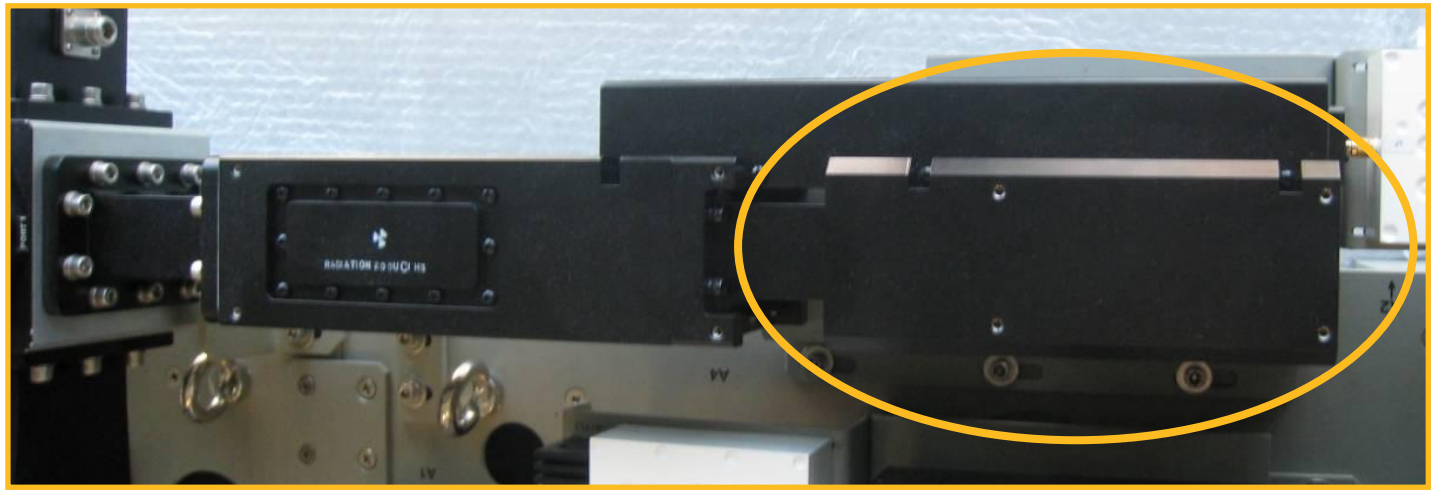
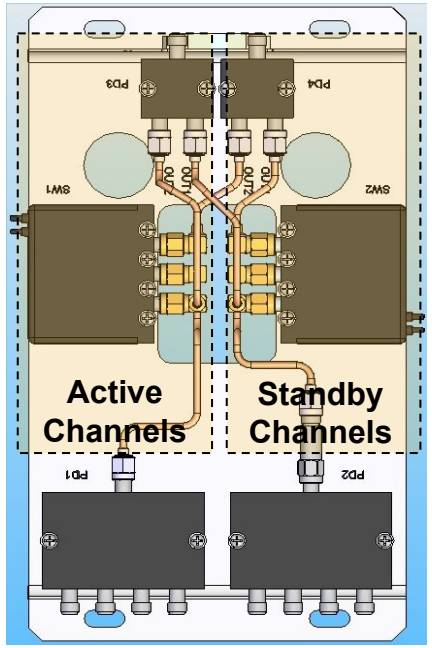


STC



Test Signal Distribution (SSA, Switches and Couplers)



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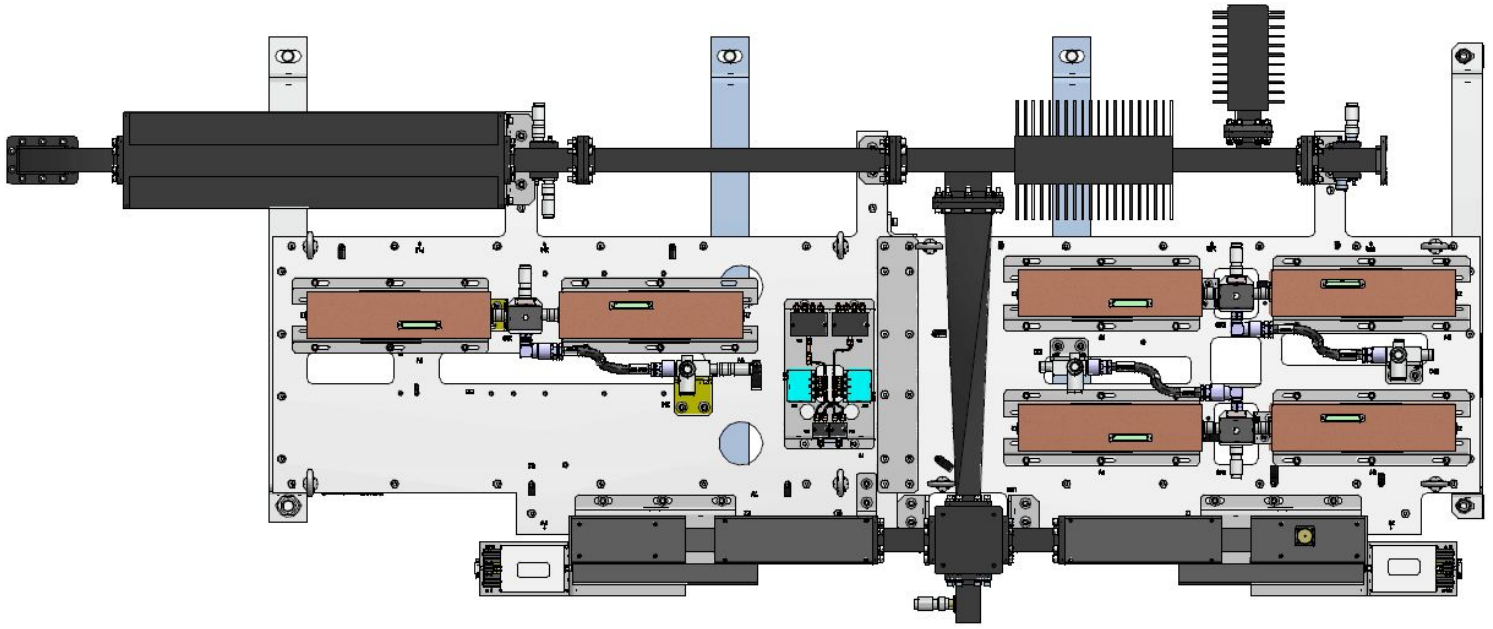

Redundancy

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LRU List and Interfaces

4

LRU List and Interfaces

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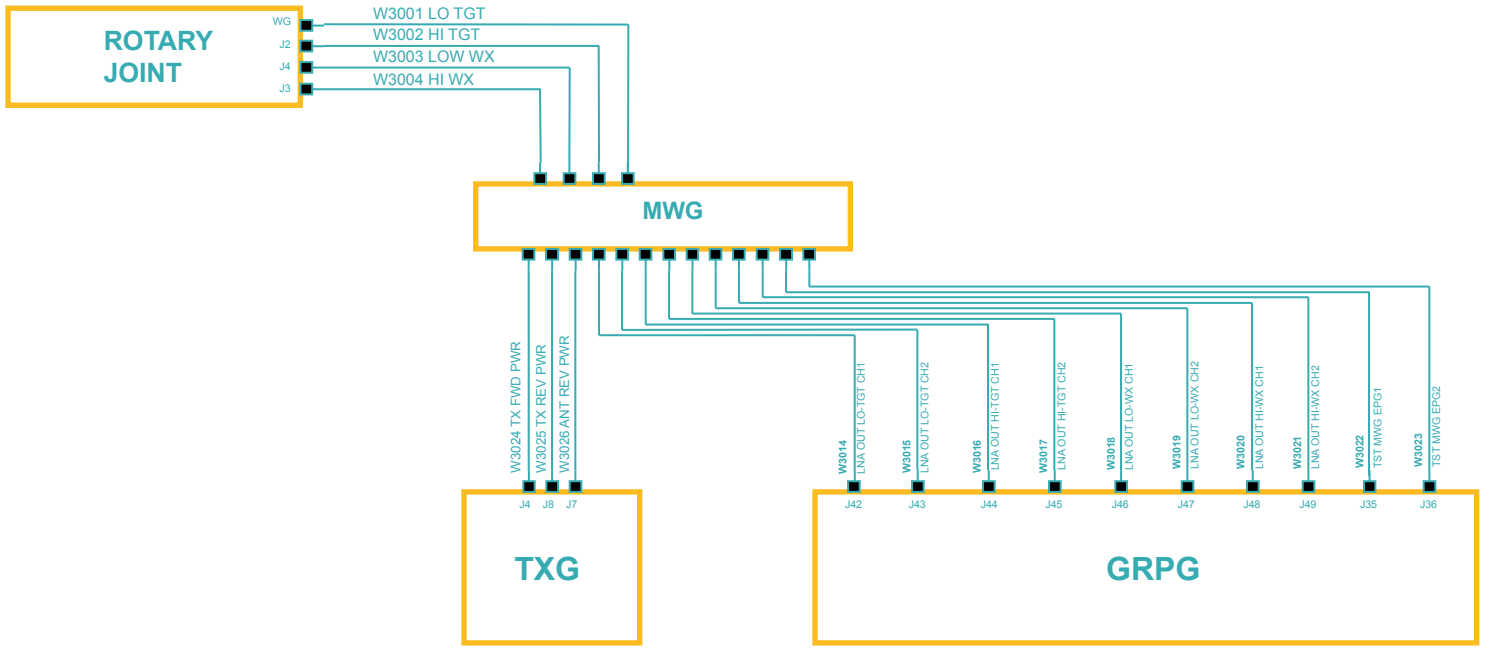
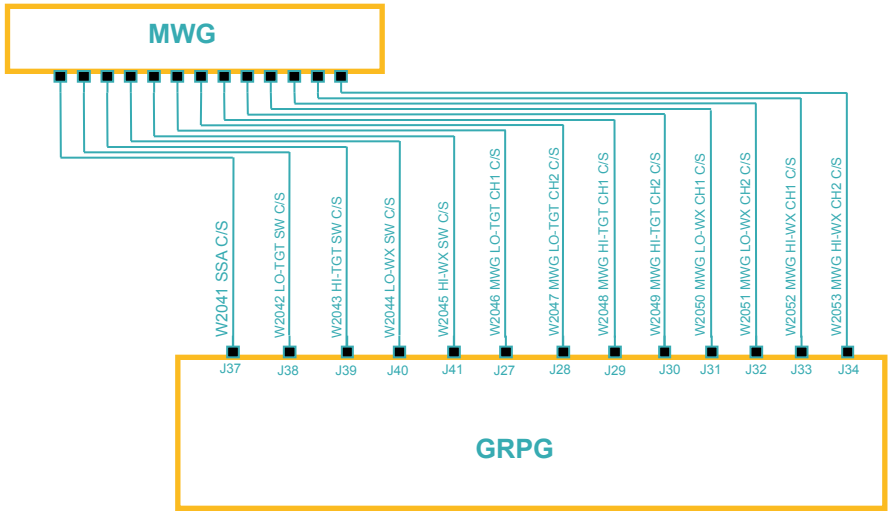
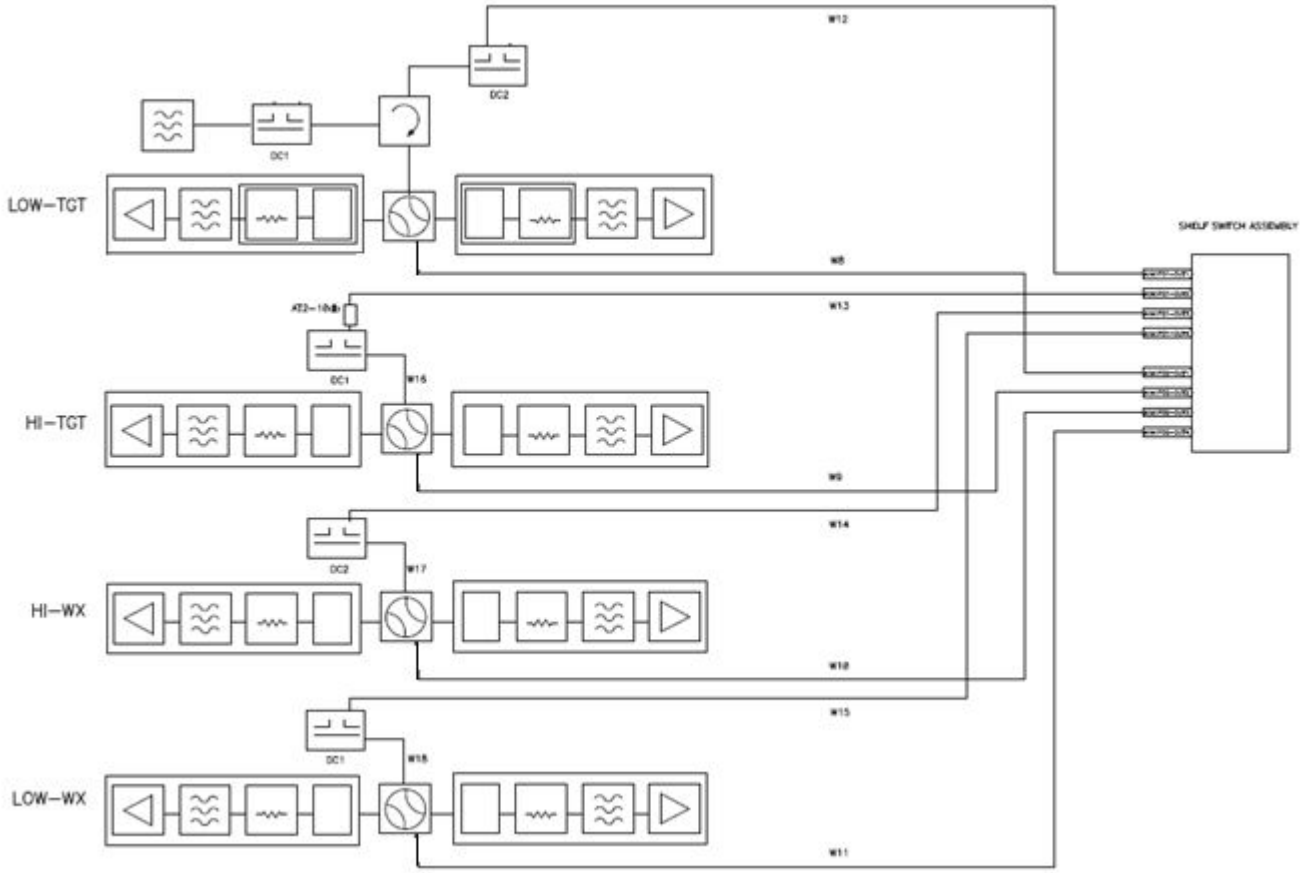


LRU List and Interfaces



LRU List and Interfaces



Compressor Dehydrator

- Main Features
- Physical Description
- Functional Description
- Operation
- Interface

5

Compressor Dehydrator

Main Features

COMPRESSOR FEATURES	
Controlled Output Pressure	2 to 6 PSIG
Output Capacity	7.2 SCFH (204 l/h) or 0.12 SCFM (3.4 l/min)
Output Dew Point	-50ºF (-45ºC)
Electrical Input	115/230 ±10% VAC, 50/60 Hz
Low Pressure Alarm	<1 PSIG
High Humidity Alarm	> 7.5% RH, factory set.
Excess Run Alarm Set Point	10 min, factory set.
Power Fail Alarm	Loss of input power
Net weight	16.1 kg
Monitoring and BITE alarms	Monitoring in CMS
External pressure regulator	0 to 2 PSIG
Output connector	3/8” polytube, compression

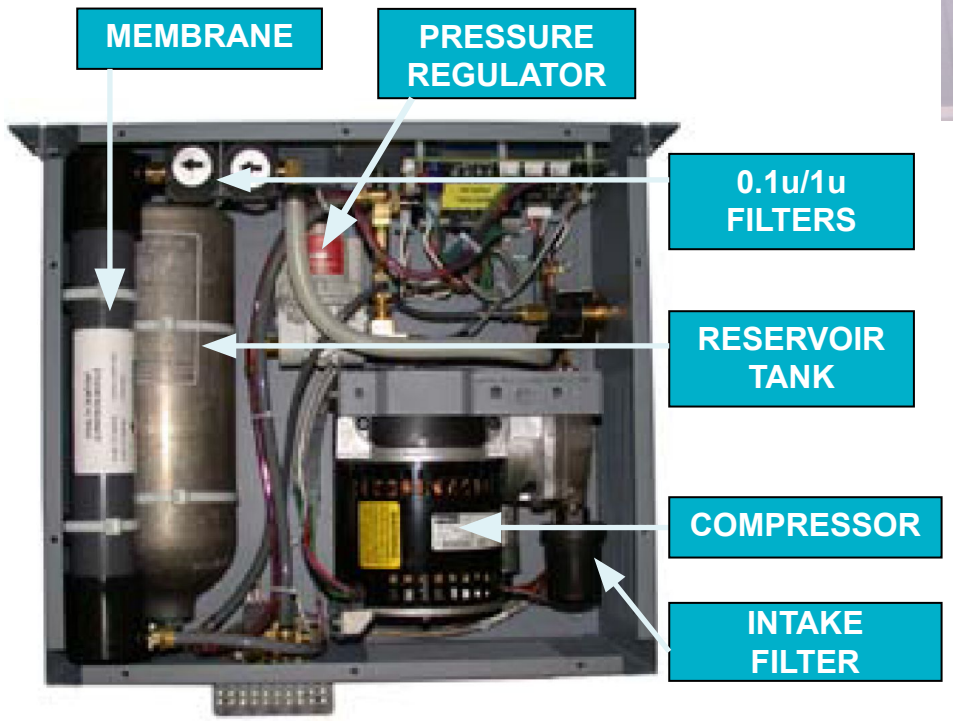
Physical Description

$$1PSIG = 1lb/in^2 = 14{,}22kg/cm^2 = 6894.75Pa$$

$$1.5PSIG \approx 21{,}3kg/cm^2 \approx 10kPa$$

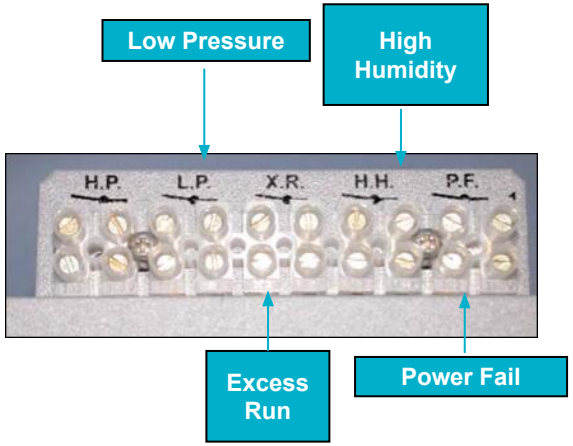
Physical Description

EXTERNAL VIEW



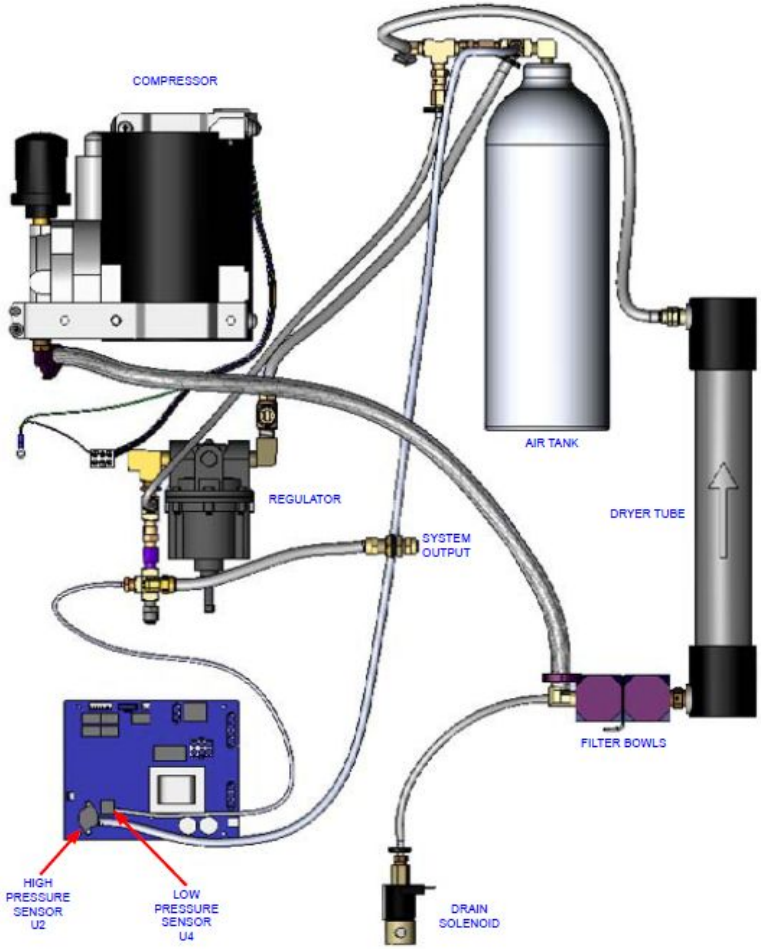
INTERNAL VIEW

Physical Description



Functional Description

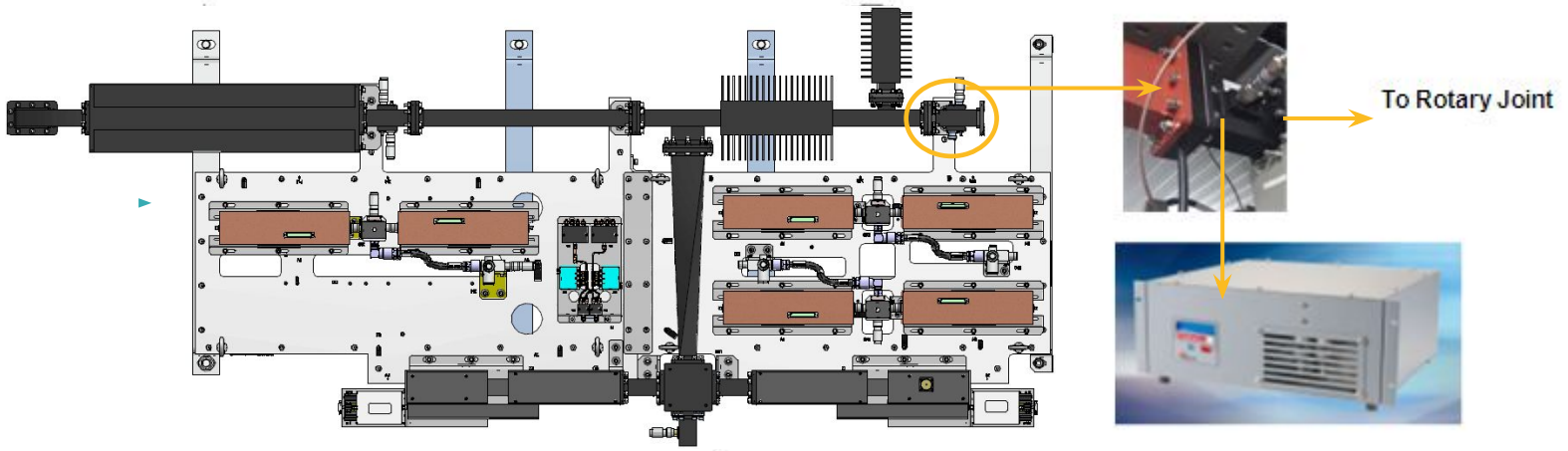
Functional Description



Functional Description

Operation

Interface




indra
At the core