

Stakeholder's meeting on NASRDA strategic Vision for
Communications Satellite in Nigeria & Africa
Abuja, 08 March 2011

Case Study



All the space you need



Introduction

The document is the property of Astrium. It shall not be communicated to third parties without prior written agreement. Its content shall not be disclosed.

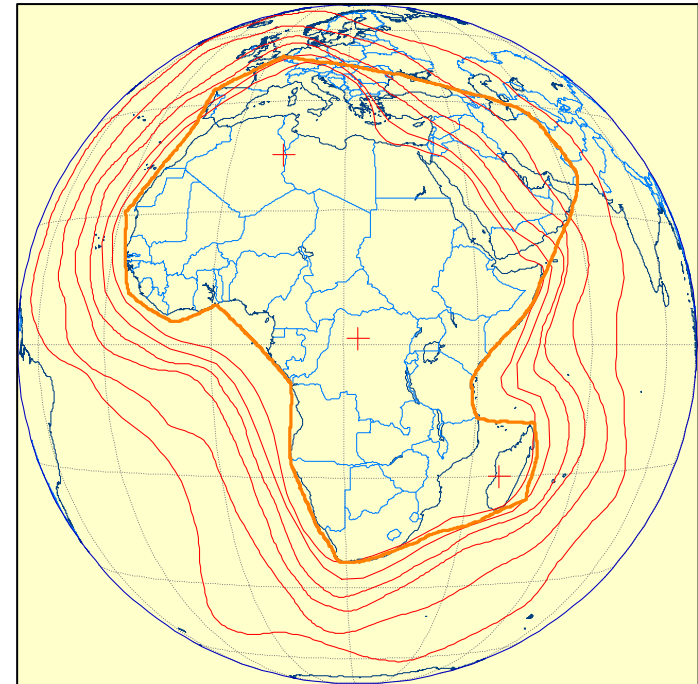
NigComSat-2/3 Spacecraft Overview

- **2 cases studied, using available ITU filings from Nigeria.**
 - at 22.0 East, a C/Ku mission (NigComSat-2)
 - at 19.2 West, a Ku/Ka mission, with possibly Navigation in L-band (NigComSat-3)
- **Further cases can be studied at 42.5 East, should it be deemed necessary to back-up / augment the capacity provided by NigComSat-1 Spacecraft.**
- **Platform considered for the cases studied is the small version of Eurostar E3000 Platform which can be tailored to meet actual mission needs.**

NigComSat-2 at 22° East

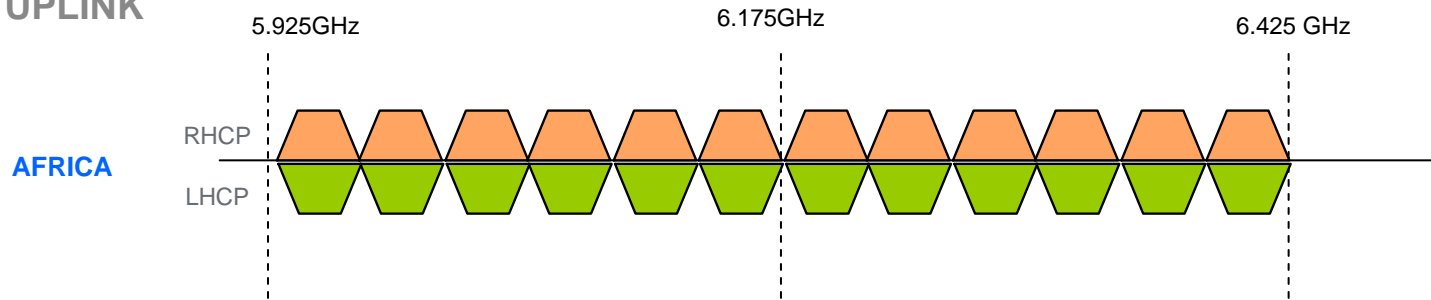
NigComSat-2 at 22.0E: C-band Payload

- **A unique coverage area for C-band mission:**
 - Over full Africa, including Southern of Europe
- **24 Transponders at 120W (EOL)**
- **36 MHz channels**
- **30 TWT installed (6 redundant)**
- **EIRP: 40 to 41 dBW EOC**
- **Applications: TV Broadcasting, Trunking, VSat**



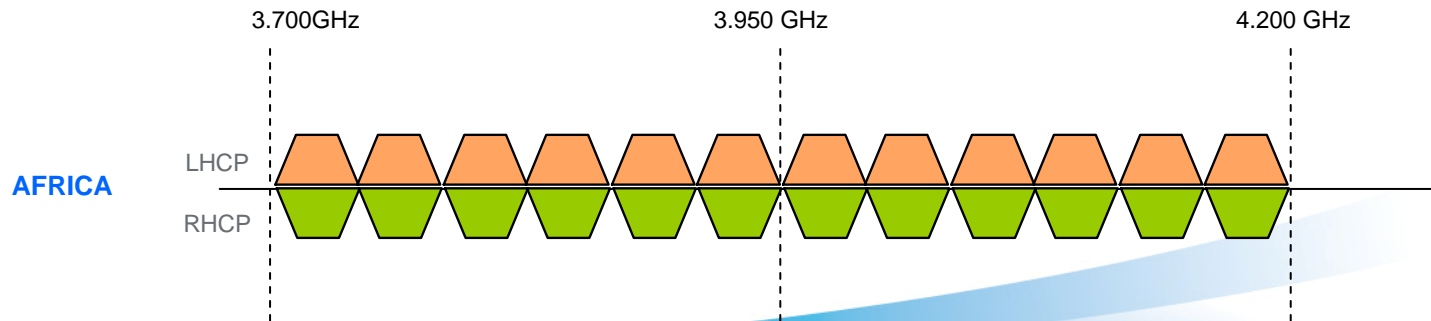
NigComSat-2 at 22.0E: C-band Frequency Plan

UPLINK



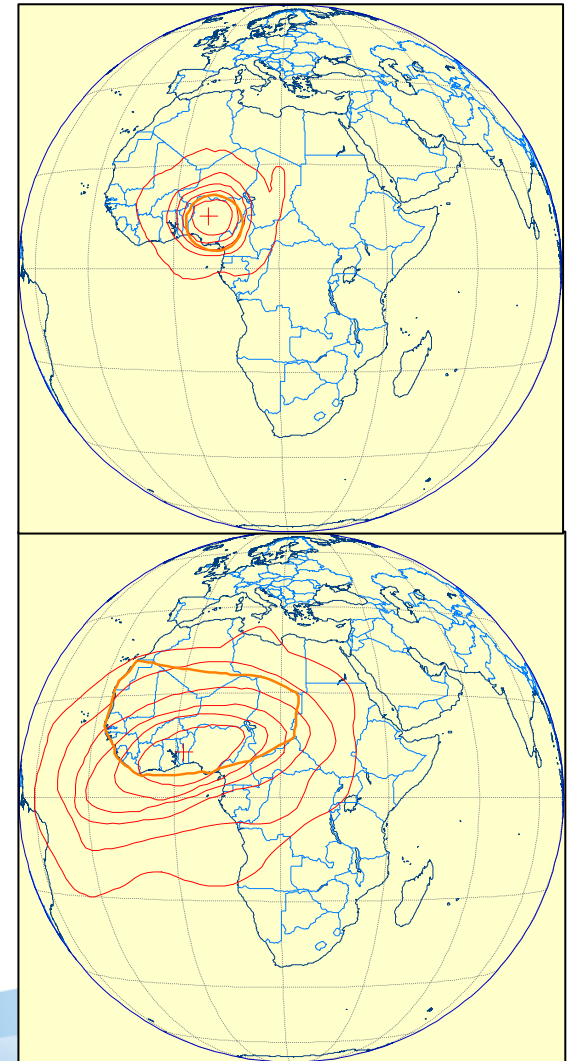
2.225 GHz

DOWNLINK



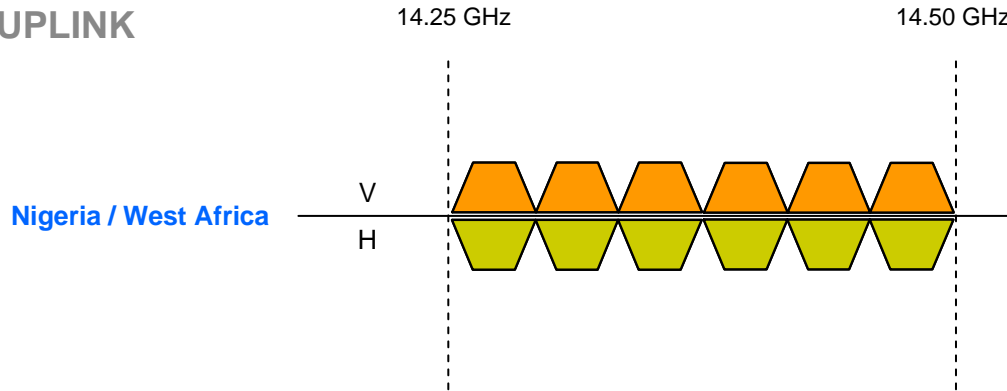
NigComSat-2 at 22.0E: Ku-band Payload

- **A unique coverage area for Ku-band:**
 - either over Nigeria or
 - over West Equatorial Africa according to coordination reached
- **12 Transponders at 150W (EOL)**
- **36 MHz channels**
- **15 TWT installed (3 redundant)**
- **EIRP:**
 - W-Africa: 48 dBW EOC
 - Nigeria: 57 dBW EOC
- **Applications: TV Broadcasting, Trunking, Fixed Service, Tele-Education / Medicine, etc...**



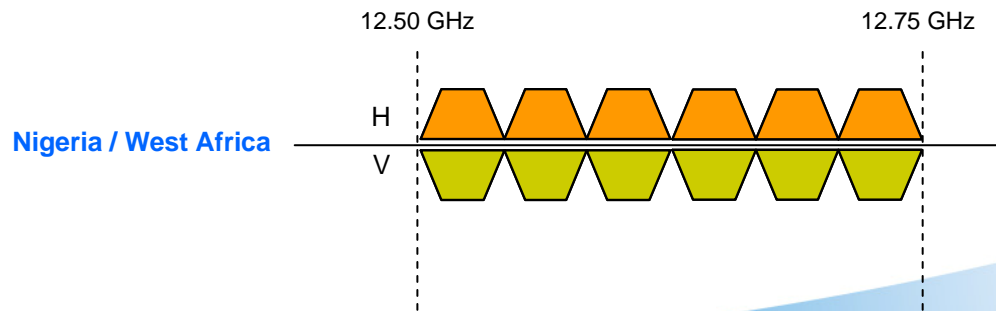
NigComSat-2 at 22.0E: Ku-band Frequency Plan

UPLINK

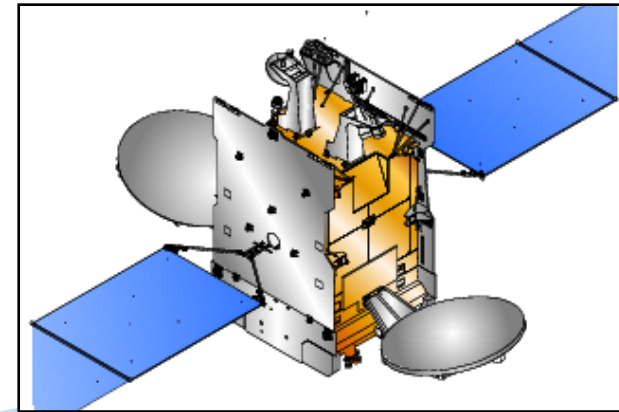
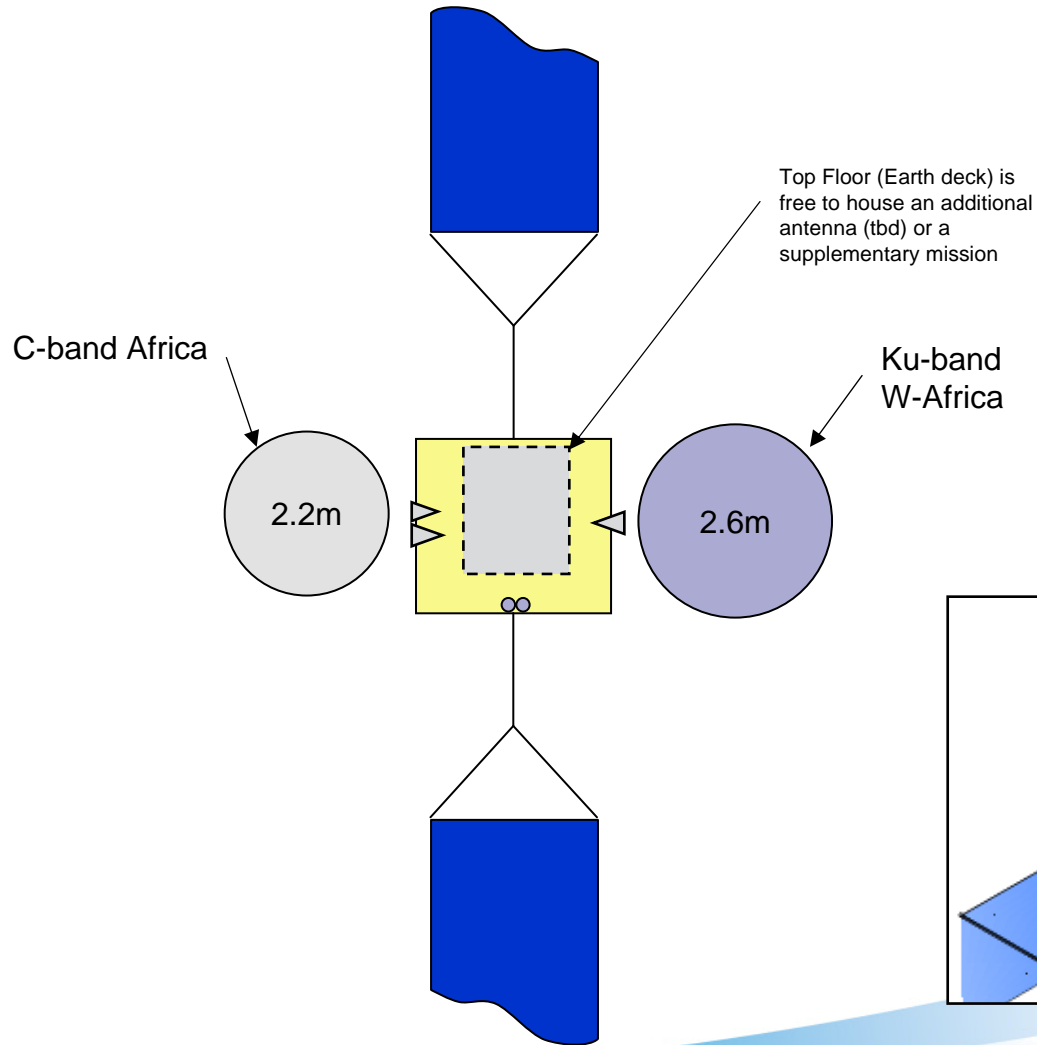


1750MHz

DOWNLINK



NigComSat-2 at 22.0E: Antenna distribution

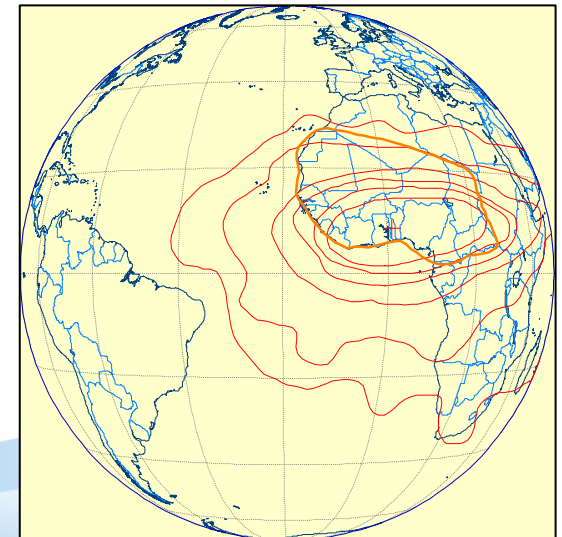
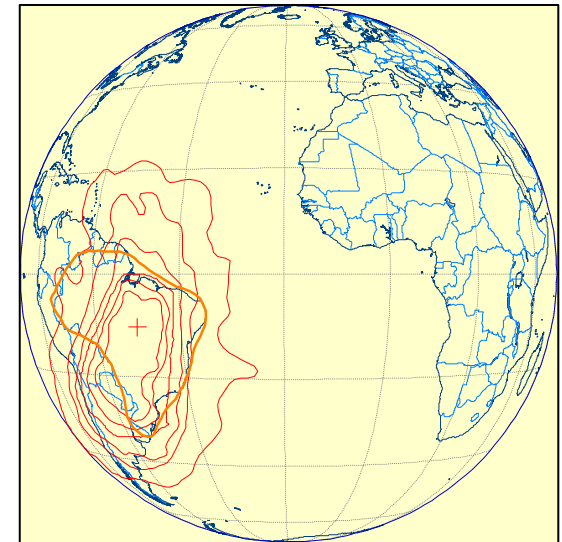


NigComSat-3 at 19.2° West

The document is the property of Astrium. It shall not be communicated to third parties without prior written agreement. Its content shall not be disclosed.

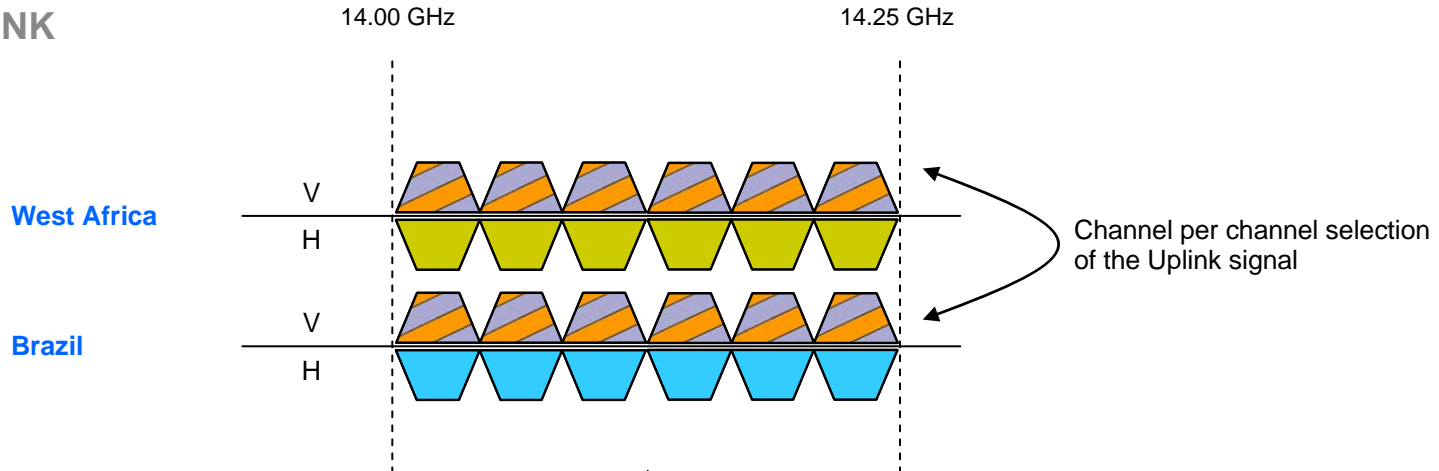
NigComSat-3 at 19.2W: Ku-band Payload

- **Two service areas for Ku-band:**
 - East Brazil
 - West Africa
- **24 Transponders at 150W (EOL) in total, 12 on each service areas.**
 - uplink selectable on 12 Transponders between one or the other coverage area for connectivity purpose between beams.
- **36 MHz channels**
- **30 TWT installed (6 redundant)**
- **EIRP : 48 to 50 dBW EOC**
- **Applications: TV Broadcasting, Trunking, Fixed Services, Tele-Education / Medicine. etc...**

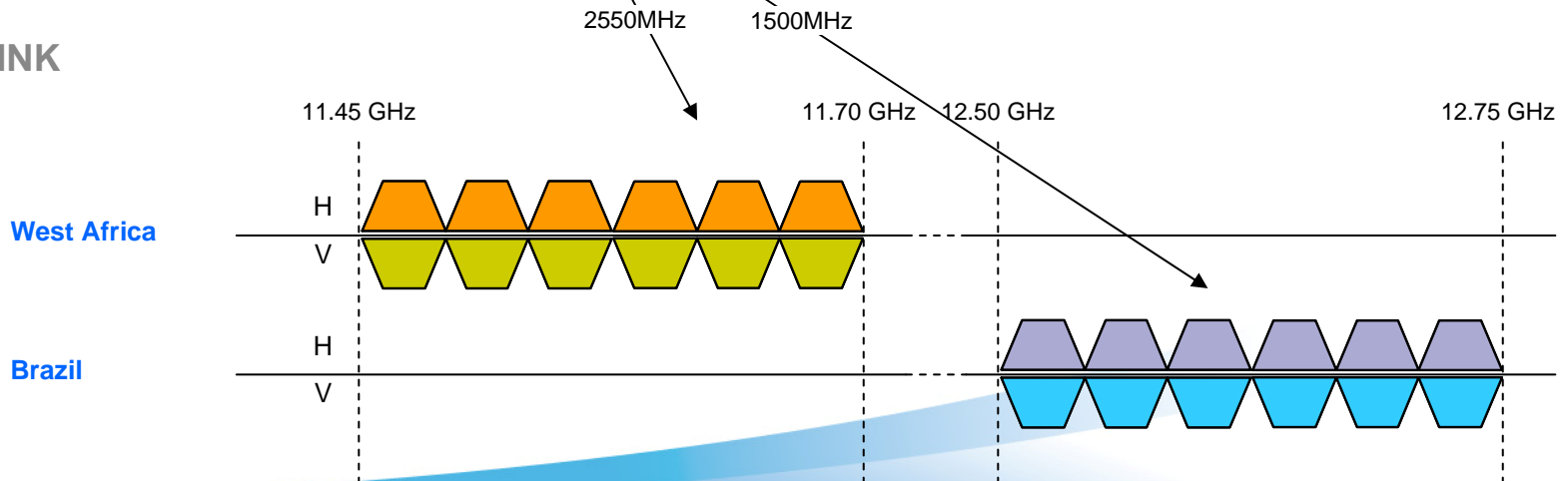


NigComSat-3 at 19.2W: Ku-band Frequency Plan

UPLINK



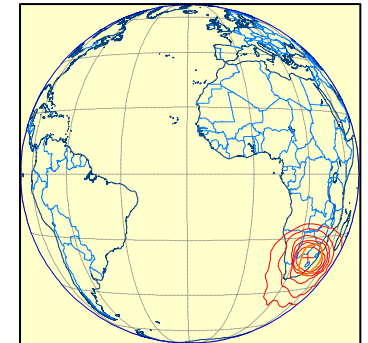
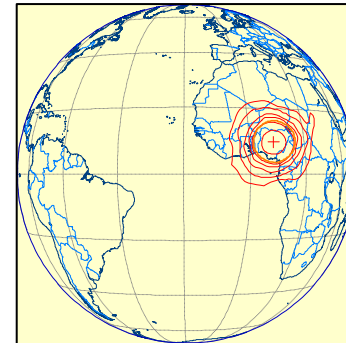
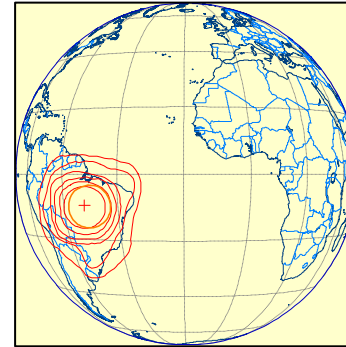
DOWNLINK



The document is the property of Astrium. It shall not be communicated to third parties without prior written agreement. Its content shall not be disclosed.

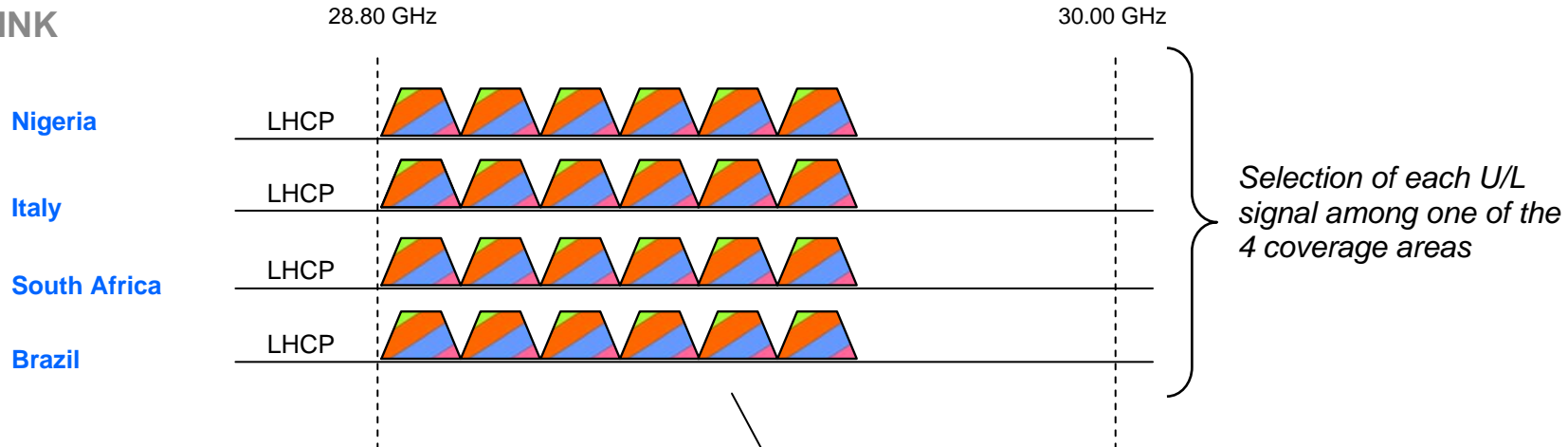
NigComSat-3 at 19.2W: Ka-band Payload

- **Four service areas for Ka-band:**
 - Brazil
 - Italy
 - Nigeria
 - South Africa
- **12 Transponders at 120W (EOL) in total**
 - can be configured to local/local or any beams interconnect.
- **54 MHz channels typically**
- **15 TWT installed (3 redundant)**
- **EIRP: 54 to 57 dBW EOC**
- **Applications: TV Broadcasting, Trunking, Broadband / Internet, Tele-Education / Medicine.**

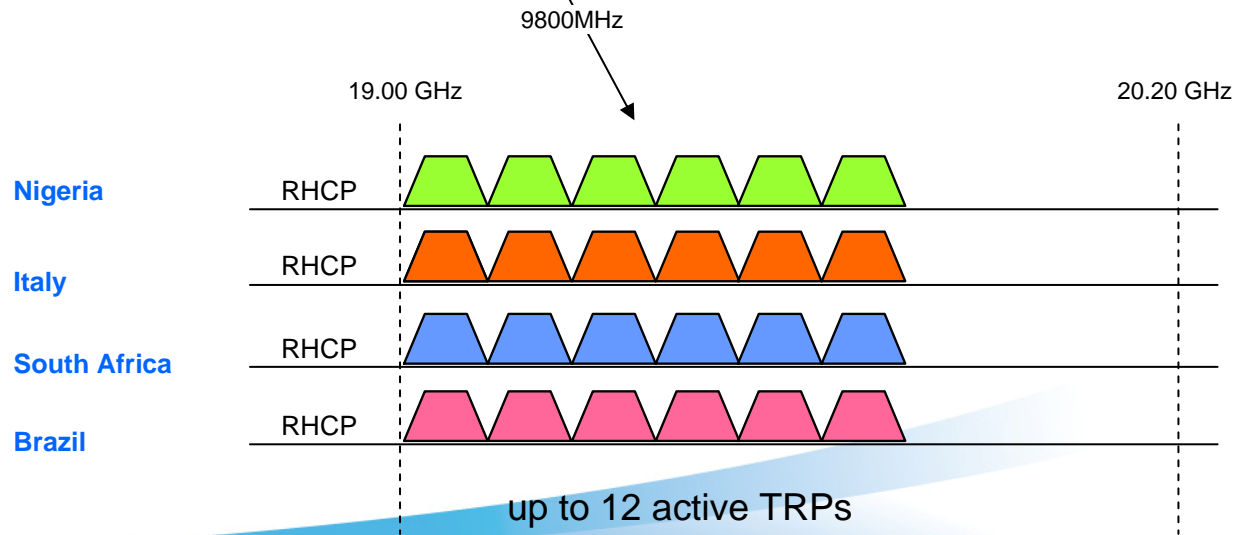


NigComSat-3 at 19.2W: Ka-band Frequency Plan

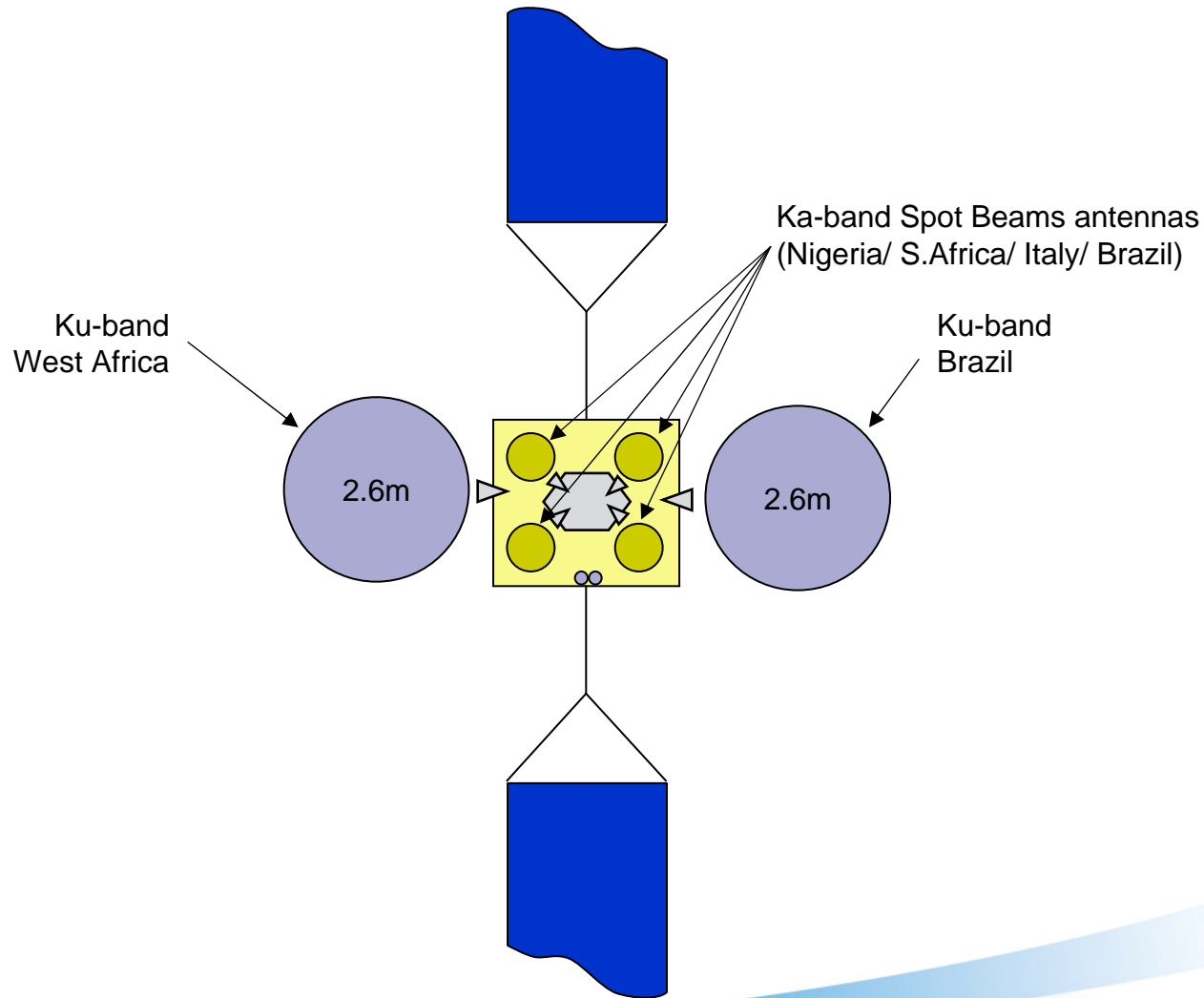
UPLINK



DOWNLINK

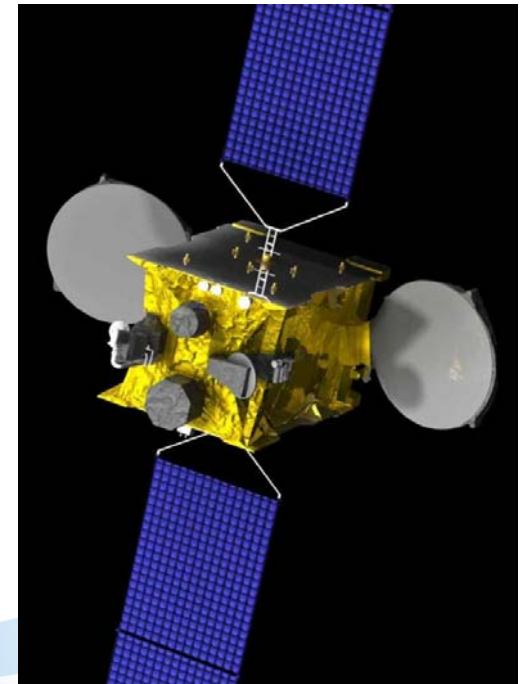
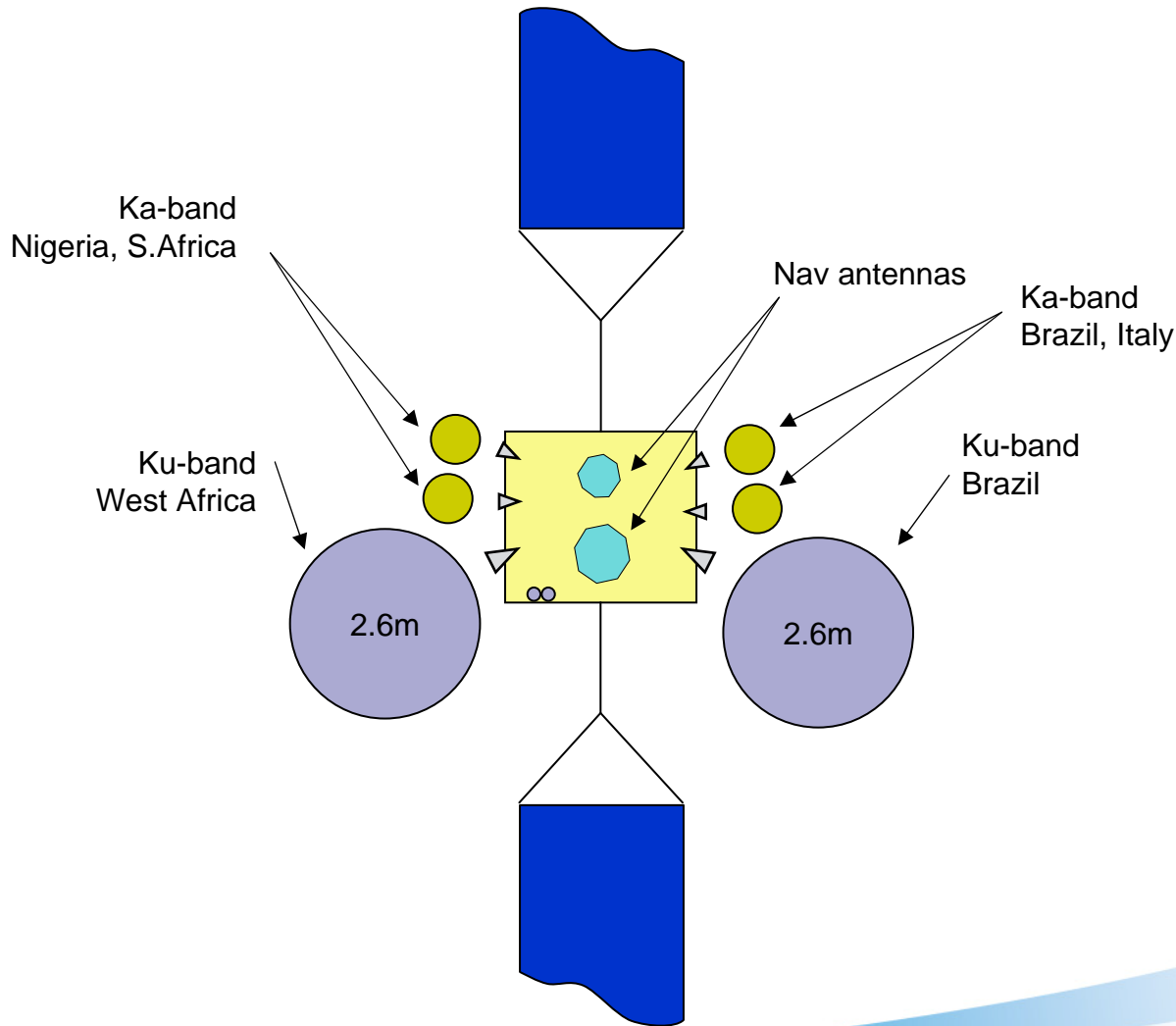


NigComSat-3 at 19.2W: Antenna distribution



The document is the property of Astrium. It shall not be communicated to third parties without prior written agreement. Its content shall not be disclosed.

NigComSat-3 at 19.2W: Antenna distribution with Navigation antennas



Anik F1R with NAV antennas fitted

The document is the property of Astrium. It shall not be communicated to third parties without prior written agreement. Its content shall not be disclosed.

NigComSat-2/3 : Satellite configuration summary

NigComSat-2/3 Payload and Satellite configuration

	NigComsat-2 @22E	NigComsat-3 @19.2W	
		no Nav P/L	with Nav P/L
C-band			
Number of TRP (active)	24		
Number of TWT installed	30		
Tube power (RF)	120 W		
Ku-band			
Number of TRP (active)	12	24	24
Number of TWT installed	15	30	30
Tube power (RF)	150 W	150 W	150 W
Ka-band			
Number of TRP (active)		12	12
Number of TWT installed		15	15
Tube power (RF)		120 W	120 W
L-band			
Number of TRP (active)			2
Number of SSPA installed			4
SSPA power (RF)			40 W
Efficiency			33%
Total P/L DC Power	8,0 kW	8,7 kW	9,0 kW
Total P/L Mass	400 kg	400 kg	440 kg
P/F Mass	1 490 kg	1 490 kg	1 490 kg
S/L Dry mass (nominal)	1 888 kg	1 890 kg	1 930 kg
Margins (5%)	94 kg	95 kg	97 kg
Total S/L Dry mass (maximum)	2 000 kg	2 000 kg	2 040 kg
Total S/L Launch Mass (AR5, 16y)	4,5 tons	4,5 tons	4,6 tons
Propellant mass	2 500 kg	2 500 kg	2 560 kg
Platform configuration			
Batteries	Dual 11S6P	Dual 11S6P	Dual 11S6P
Solar Array	4S	4S	4S
CPS	2 630 kg	2 630 kg	2 630 kg
DHS	1*MPIU *8sTTI	1*MPIU *8sTTI	1*MPIU *8sTTI
CM Floor	1	1	1
E3000 Type	SX	SX	SX

The document is the property of Astrium. It shall not be communicated to third parties without prior written agreement. Its content shall not be disclosed.