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| Title: | Product Breakdown Structure | Owner: Kusel |
| Revision: | B | Date: 2022-07-25 |
| Doc. #: | 020.10.20.00.00-0004-DSN | |




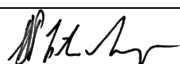
Product Breakdown Structure (PBS)


020.10.20.00.00-0004-DSN

Status: Released

| PREPARED BY | ORGANIZATION |
|-------------|--------------|
| T. Kusel | NRAO |

| APPROVALS | ORGANIZATION |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| T. Kusel, Systems Engineer  Thomas Kusel (Jul 26, 2022 16:58 EDT) | ngVLA, NRAO |
| R. Selina, Project Engineer  R. Selina (Jul 26, 2022 15:02 MDT) | ngVLA, NRAO |
| W. Hojnowski, Project Manager  William Hojnowski (Jul 26, 2022 15:04 MDT) | ngVLA, NRAO |
| W. Esterhuyse, Project Manager  | ngVLA, NRAO |

| RELEASED BY | ORGANIZATION |
|-----------------------------------------------------------------------------------------------------------------------|--------------|
| W. Esterhuyse, Project Manager  | ngVLA, NRAO |

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|-----------------------------------------------------------------------------------|------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Title: | Product Breakdown Structure | Owner: Kusel |
| | Revision: | B | Date: 2022-07-25 |
| | Doc. #: | 020.10.20.00.00-0004-DSN | |
| Revision | Date | Change By | Comments |
| 1 | 2021-04-13 | T. Kusel | Initial Draft, following review by all IPTs. |
| 2 | 2021-05-21 | T. Kusel | Added:WVR enclosure; Glycol Pipes |
| 3 | 2021-06-28 | T. Kusel | Updated the CSP breakdown and DBE description based in input from Omar |
| 4 | 2021-08-28 | T. Kusel | Updated Cryo breakdown based on inputs from Denis |
| 5 | 2021-11-12 | T. Kusel | Updated ATF section based on updated AE Block Diagrams |
| 6 | 2021-12-10 | T. Kusel | Updated AE section to align with latest AE Block Diagrams |
| 7 | 2022-01-10 | T. Kusel | Updated HIL section to synchronize product numbers with HIL product tree |
| 8 | 2022-01-28 | T. Kusel | Added Column S to indicate which parts of the structure are to be baselined for CDR |
| 9 | 2022-02-17 | T. Kusel | Updated BMR part of the structure |
| 10 | 2022-03-30 | T. Kusel | Updated time and frequency reference parts of the structure based on inputs from B.Shillue Added item classifications Added location classifications |
| A | 2022-04-22 | T. Kusel | Update based on the RIDS of the internal pre-CDR review. First released version. |
| A.1 | 2022-07-25 | T. Kusel | Changes incorporating feedback from CDR and CM system implementation. Changes from Rev A to B indicated in Columns U&V |
| B | 2022-07-25 | T. Kusel | Prepared for release |

| ngVLA Product Breakdown Structure (PBS) | | | | | | | | Configuration Item Number 020_ | Code | Requirements level | Architecture layer | N*2 Interfacing Item | LRU SRU RR | Responsible Org | Location | Item Class | Item Type | CDR Baseline | | | | |
|-----------------------------------------------------------|---|---|---|---|---|---|---------------|--------------------------------|------|--------------------|--------------------|----------------------|------------|-----------------|-----------|------------------|------------|--------------|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | <-- PBS level | | | | | | | | | | | | | | | |
| ngVLA Observatory | | | | | | | | 00.00.00.00 | | 0 | 1 | | | | | | Facility | | . | | | |
| ngVLA Enabling Systems | | | | | | | | 02.00.00.00 | | | 2 | | | | | | System | | . | | | |
| Training System | | | | | | | | 02.05.00.00 | | | | | | | | | Component | | . | | | |
| Development systems, facilities, tools & equipment | | | | | | | | 02.10.00.00 | | | | | | | | | Component | | . | | | |
| Telescope system AIV equipment | | | | | | | | 02.11.00.00 | | | | | | | | | | | . | | | |
| Telescope system CSV equipment, facilities & tools | | | | | | | | 02.12.00.00 | | | | | | | | | | | . | | | |
| Antenna System test equipment | | | | | | | | 02.13.00.00 | | | | | | | | | | | . | | | |
| Main Antenna Prototype test equipment & infrastructure | | | | | | | | 02.14.00.00 | | | | | | | | | | | | . | | |
| Main Antenna Prototype Test Electronics (MSIP - specific) | | | | | | | | 02.14.10.00 | | | | | | | | | | | | . | | |
| Front End | | | | | | | | 02.14.15.00 | | | | | | ngV.AE | | | | | | . | | |
| X-band feed horn | | | | | | | | 02.14.15.01 | | | | | | ngV.AE | | | | | . | | | |
| Q-band feed horn | | | | | | | | 02.14.15.02 | | | | | | ngV.AE | | | | | . | | | |
| Environmental Control | | | | | | | | 02.14.20.00 | | | | | | ngV.AE | | | | | | . | | |
| Vacuum System | | | | | | | | 02.14.25.00 | | | | | | ngV.AE | | | | | . | | | |
| Helium System | | | | | | | | 02.14.30.00 | | | | | | ngV.AE | | | | | | . | | |
| Bins, Racks & Modules | | | | | | | | 02.14.35.00 | | | | | | ngV.AE | | | | | | . | | |
| Test Enclosure | | | | | | | | 02.14.36.00 | | | | | | ngV.AE | | | | | | . | | |
| DTS | | | | | | | | 02.14.40.00 | | | | | | | | | | | | . | | |
| Antenna Fibre Distribution | | | | | | | | 02.14.45.00 | | | | | | | | | | | | | . | |
| Main Antenna Prototype M&C Software | | | | | | | | 02.14.70.00 | | | | | | | | | | | | | . | |
| Main Antenna Prototype Infrastructure | | | | | | | | 02.14.80.00 | | | | | | | | | | | | | | . |
| SBA Antenna test equipment | | | | | | | | 02.15.00.00 | | | | | | | | | | | | . | | |
| Antenna Electronics test equipment | | | | | | | | 02.17.00.00 | | | | | | | | | | | | . | | |
| Computing & SW Development Support Subsystem | | | | | | | | 02.16.00.00 | DSS | | 3 | y | | ngV.CSW | | Subsystem | | . | | | | |
| ngVLA User Systems | | | | | | | | 03.00.00.00 | | | 2 | | | | | System | | . | | | | |
| Science User Systems | | | | | | | | 03.05.00.00 | | | | | | | | | Component | | . | | | |
| Community User Systems | | | | | | | | 03.10.00.00 | | | | | | | | | Component | | . | | | |
| Visitor centre outfit | | | | | | | | 03.11.00.00 | | | | | | | | | | | . | | | |
| Technical Operations and Support system | | | | | | | | 03.20.00.00 | | | | | | | | | Component | | . | | | |
| Telescope Operator Systems | | | | | | | | 03.21.00.00 | | | | | | | | | | | | . | | |
| Operations IT Systems | | | | | | | | 55.15.00.00 | | | | | | | | | Component | | . | | | |
| Safety and Security Systems | | | | | | | | 03.22.00.00 | | | | | | | | | | | | . | | |
| Medical response system | | | | | | | | | | | | | | | | | | | | . | | |
| Fire detection and response system | | | | | | | | | | | | | | | | | | | | . | | |
| Security surveillance system | | | | | | | | | | | | | | | | | | | | . | | |
| Maintenance & Support Systems | | | | | | | | 03.23.00.00 | | | | | | | | | Component | | . | | | |
| Maintenance & Support Software Subsystem | | | | | | | | 03.23.10.00 | MMS | 2 | 3 | y | | ngV.CSW | | Subsystem | | . | | | | |
| Maintenance & Support equipment | | | | | | | | 03.23.20.00 | | | | | | | | | | | . | | | |
| Maintenance Communication System | | | | | | | | 03.23.30.00 | | | | | | | | | | | . | | | |
| ngVLA Telescope (Prime Equipment) | | | | | | | | 01.00.00.00 | | 1 | 2 | | | | | System | | . | | | | |
| Main Antenna System | | | | | | | | 12.00.00.00 | 18AS | | 3 | | | ngV.SE | ANT.G | System | | . | | | | |
| Main Antenna | | | | | | | | 25.00.00.00 | ANT | 2 | 4 | y | | ngV.ANT | ANT.G | Subsystem | | . | | | | |
| ANT Pedestal | | | | | | | | 25.21100 | | | | | | ngV.ANT | ANT.PED.G | Component | Mechanical | . | | | | |
| Lower Pedestal | | | | | | | | 25.21110 | | | | | | ngV.ANT | ANT.PED.G | Component | Mechanical | . | | | | |
| Upper Pedestal | | | | | | | | 25.21130 | | | | | | ngV.ANT | ANT.PED.G | Component | Mechanical | . | | | | |
| Foundation Hardware & kit | | | | | | | | 25.21610 | | | | | | ngV.ANT | ANT.PED.G | Component | Mechanical | . | | | | |
| Azimuth Cable Wrap | | | | | | | | 25.23140 | | | | | | ngV.ANT | ANT.PED.G | Component | Mechanical | . | | | | |
| ANT Turnhead | | | | | | | | 25.21200 | | | | | | ngV.ANT | ANT.YOK.G | Component | Mechanical | . | | | | |
| Turnhead Structure | | | | | | | | 25.22210 | | | | | | ngV.ANT | ANT.YOK.G | Component | Mechanical | . | | | | |
| Azimuth Bearing | | | | | | | | 25.23110 | | | | | | ngV.ANT | ANT.YOK.G | Component | Mechanical | . | | | | |
| Azimuth Gearbox | | | | | | | | 25.23120 | | | | | | ngV.ANT | ANT.YOK.G | Component | Mechanical | . | | | | |
| EI Bearing | | | | | | | | 25.23210 | | | | | | ngV.ANT | ANT.YOK.G | Component | Mechanical | . | | | | |
| EI Gearbox | | | | | | | | 25.23220 | | | | | | ngV.ANT | ANT.YOK.G | Component | Mechanical | . | | | | |
| EI Cable Wrap | | | | | | | | 25.23240 | | | | | | ngV.ANT | ANT.YOK.G | Component | Mechanical | . | | | | |
| EI Buffers | | | | | | | | 25.23250 | | | | | | ngV.ANT | ANT.YOK.G | Component | Mechanical | . | | | | |
| EI Stow pins | | | | | | | | 25.23260 | | | | | | ngV.ANT | ANT.YOK.G | Component | Mechanical | . | | | | |
| Lubrication System | | | | | | | | 25.23270 | | | | | | ngV.ANT | ANT.YOK.G | Component | Mechanical | . | | | | |
| ANT EI Rotating Assembly (reflector) | | | | | | | | 25.21300 | | | | | | ngV.ANT | ANT.ELE.G | Component | Mechanical | . | | | | |
| Elevation Center Structure | | | | | | | | 25.21301 | | | | | | ngV.ANT | ANT.ELE.G | Component | Mechanical | . | | | | |
| Main Reflector Panels | | | | | | | | 25.22410 | | | | | | ngV.ANT | ANT.ELE.G | Component | Mechanical | . | | | | |
| Panel Adjusters | | | | | | | | 25.22415 | | | | | | ngV.ANT | ANT.ELE.G | Component | Mechanical | . | | | | |
| Back up structure (BUS) | | | | | | | | 25.22420 | | | | | | ngV.ANT | ANT.ELE.G | Component | Mechanical | . | | | | |
| Subreflector assembly | | | | | | | | 25.22450 | | | | | | ngV.ANT | ANT.ELE.G | Component | Mechanical | . | | | | |
| Boom arm | | | | | | | | 25.22460 | | | | | | ngV.ANT | ANT.ELE.G | Component | Mechanical | . | | | | |
| Feed Indexer System | | | | | | | | 25.22465 | | | | | | ngV.ANT | ANT.ELE.G | Component | Mechanical | . | | | | |
| WVR Mounting | | | | | | | | 25.22475 | | | | | | ngV.ANT | ANT.ELE.G | Component | Mechanical | . | | | | |
| Reflector Miscellaneous | | | | | | | | 25.24000 | | | | | | ngV.ANT | ANT.ELE.G | Component | Mechanical | . | | | | |
| ANT Electronics, Drives, Servo & Metrology | | | | | | | | 25.40000 | | | | | | ngV.ANT | ANT.G | Component | Functional | . | | | | |
| Main Antenna Electronics Drive Cabinet | | | | | | | | 25.41000 | | | | | | ngV.ANT | ANT.PED.G | Component | Mechanical | . | | | | |
| I/O System | | | | | | | | 25.42000 | | | | | | ngV.ANT | ANT.G | Component | Functional | . | | | | |
| Metrology | | | | | | | | 25.43050 | | | | | | ngV.ANT | ANT.G | Component | Functional | . | | | | |

| ngVLA Product Breakdown Structure (PBS) | | | | | | | Configuration Item Number 020_ | Code | Requirements level | Architecture layer | N*2 Interfacing Item | LRU SRU RR | Responsible Org | Location | Item Class | Item Type | CDR Baseline |
|-----------------------------------------|---|---|---|---|---|---|----------------------------------------------|------|--------------------|--------------------|----------------------|------------|-----------------|-----------|-----------------|-------------|--------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | <-- PBS level | | | | | | | | | | |
| | | | | | | | Pedestal Heat Exchanger | | | | | | ngV.ANT | ANT.PED.G | Component | Mechanical | |
| | | | | | | | Safe to Approach Cabinet | | | | | | ngV.ANT | ANT.SHE.G | Component | Mechanical | |
| | | | | | | | Software and Configurations | | | | | | ngV.ANT | VIR.G | Component | SW/FW | |
| | | | | | | | Ant Power Distribution | | | | | | ngV.ANT | ANT.G | Component | Electrical | |
| | | | | | | | Ant Fiber Distribution | | | | | | ngV.ANT | ANT.G | Component | Fibre Optic | |
| | | | | | | | Ant Cables | | | | | | ngV.ANT | ANT.G | Component | Cabling | |
| | | | | | | | ANT Miscellaneous | | | | | | ngV.ANT | ANT.G | Component | | |
| | | | | | | | Alignment Devices | | | | | | ngV.ANT | MOB.G | Component | | |
| | | | | | | | Special Transport Equipment | | | | | | ngV.ANT | MOB.G | Component | | |
| | | | | | | | Special Installation Equipment | | | | | | ngV.ANT | MOB.G | Component | | |
| | | | | | | | Antenna Electronics | | | | | | ngV.AE | ANT.G | Component | | |
| | | | | | | | Integrated FE assembly | | | | | LRU | ngV.AE | ANT.FED.G | Component | Mechanical | |
| | | | | | | | IFEA internal cabling | | | | | | ngV.AE | ANT.FED.G | Component | Cabling | |
| | | | | | | | SA501 Band 5-6 IRD/LO module | | | | | | ngV.AE | ANT.FED.G | Component | Mechanical | |
| | | | | | | | SA501 power & control module (HIL supplied) | | | | | | | | | | |
| | | | | | | | SA501 internal cabling | | | | | | ngV.AE | ANT.FED.G | Component | Cabling | |
| | | | | | | | SA501 cold plate (EEC supplied) | | | | | | | | | | |
| | | | | | | | SA501 voltage regulator board A | | | | | | ngV.AE | ANT.FED.G | Component | Electronic | |
| | | | | | | | SA501 voltage regulator board B | | | | | | ngV.AE | ANT.FED.G | Component | Electronic | |
| | | | | | | | SA502 Band 1-4 IRD/LO module | | | | | | ngV.AE | ANT.FED.G | Component | Mechanical | |
| | | | | | | | SA 502 power & control module (HIL supplied) | | | | | | | | | | |
| | | | | | | | SA 502 internal cabling | | | | | | ngV.AE | ANT.FED.G | Component | Cabling | |
| | | | | | | | SA 502 cold plate (EEC supplied) | | | | | | | | | | |
| | | | | | | | SA501 voltage regulator board A | | | | | | ngV.AE | ANT.FED.G | Component | Electronic | |
| | | | | | | | SA501 voltage regulator board B | | | | | | ngV.AE | ANT.FED.G | Component | Electronic | |
| | | | | | | | Integrated Aux enclosure | | | | | - | ngV.AE | ANT.AUX.G | Component | Mechanical | |
| | | | | | | | Integrated Back-end rack | | | | | - | ngV.AE | ANT.PED.G | Component | Mechanical | |
| | | | | | | | Front End | FED | 2 | 4 | y | | ngV.AE.FE | ANT.FED.G | Subsystem | | |
| | | | | | | | Band 1 Front End | | | | | SRU | ngV.AE.FE | ANT.FED.G | Component | Functional | |
| | | | | | | | F501 Band 1 Front End Receiver | | | | | | ngV.AE.FE | ANT.FED.G | Component | Mechatronic | |
| | | | | | | | F511 - B1 Noise diode module | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | Band 2 Front End | | | | | SRU | ngV.AE.FE | ANT.FED.G | Component | Functional | |
| | | | | | | | F502 - Band 2 Front End Cartridge | | | | | | ngV.AE.FE | ANT.FED.G | Component | Mechatronic | |
| | | | | | | | F512 - B2 Noise diode module | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | Band 3 Front End - F503 | | | | | SRU | ngV.AE.FE | ANT.FED.G | Component | Functional | |
| | | | | | | | F503 - Band3 Front End Cartridge | | | | | | ngV.AE.FE | ANT.FED.G | Component | Mechatronic | |
| | | | | | | | F513 - B3 Noise diode module | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | Band 4 Front End | | | | | SRU | ngV.AE.FE | ANT.FED.G | Component | Functional | |
| | | | | | | | F504 - Band 4 Front End Cartridge | | | | | | ngV.AE.FE | ANT.FED.G | Component | Mechatronic | |
| | | | | | | | F514 - B4 Noise diode module | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | Band 5 Front End | | | | | SRU | ngV.AE.FE | ANT.FED.G | Component | Functional | |
| | | | | | | | F505 - Band 5 Front End Cartridge | | | | | | ngV.AE.FE | ANT.FED.G | Component | Mechatronic | |
| | | | | | | | F515 - B5 Noise diode module | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | Band 6 Front End | | | | | SRU | ngV.AE.FE | ANT.FED.G | Component | Functional | |
| | | | | | | | F506 - Band 6 Front End Cartridge | | | | | | ngV.AE.FE | ANT.FED.G | Component | Mechatronic | |
| | | | | | | | F516 - B6 Noise diode module | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | Front End Support Electronics | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | B1 Front End Support Electronics | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | B2 Front End Support Electronics | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | B3 Front End Support Electronics | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | B4 Front End Support Electronics | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | B5 Front End Support Electronics | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | B6 Front End Support Electronics | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | Cryostat A Power & Interface module | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | Cryostat B Power & Interface module | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | Cryostat A - SA500A | | | | | SRU | ngV.AE.FE | ANT.FED.G | Component | Mechanical | |
| | | | | | | | Cryostat A cold stage sensors | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | Cryostat B - SA500B | | | | | SRU | ngV.AE.FE | ANT.FED.G | Component | Mechanical | |
| | | | | | | | Cryostat B cold stage sensors | | | | | | ngV.AE.FE | ANT.FED.G | Component | Electronic | |
| | | | | | | | Cryogenic System | CRY | 2 | 4 | y | | ngV.AE.CRY | ANT.G | Subsystem | | |
| | | | | | | | Cryocooler system | | | | | | ngV.AE.CRY | ANT.ELE.G | Component | Functional | |
| | | | | | | | Cryostat-A Refrigerator (Cold Head) | | | | | LRU | ngV.AE.CRY | ANT.FED.G | Part - procured | Mechanical | |
| | | | | | | | Cryostat-B Refrigerator (Cold Head) | | | | | LRU | ngV.AE.CRY | ANT.FED.G | Part - procured | Mechanical | |
| | | | | | | | F523 Cold head VFD Controller | | | | | LRU | ngV.AE.CRY | ANT.AUX.G | Part - procured | Electronic | |
| | | | | | | | F521 Cold head VFD Driver | | | | | LRU | ngV.AE.CRY | ANT.AUX.G | Part - procured | Electronic | |
| | | | | | | | Cryostat VFD Cabling | | | | | RR | ngV.AE.CRY | ANT.G | Component | Cabling | |
| | | | | | | | Cryostat A&B sensors | | | | | | ngV.AE.CRY | ANT.FED.G | Component | Electronic | |
| | | | | | | | Cold head sleeve Dewar A (TBC) | | | | | SRU | ngV.AE.CRY | ANT.FED.G | Part - procured | Mechanical | |
| | | | | | | | Cold head sleeve Dewar B (TBC) | | | | | SRU | ngV.AE.CRY | ANT.FED.G | Part - procured | Mechanical | |
| | | | | | | | Helium system | | | | | | ngV.AE.CRY | ANT.G | Component | Functional | |
| | | | | | | | Helium Compressor | | | | | LRU | ngV.AE.CRY | ANTYOK.G | Part - procured | Mechanical | |
| | | | | | | | Helium Pressure regulation assembly | | | | | LRU | ngV.AE.CRY | ANTYOK.G | Part - procured | Mechanical | |
| | | | | | | | Helium Pressure regulation cabling | | | | | | ngV.AE.CRY | ANTYOK.G | Component | Cabling | |

| ngVLA Product Breakdown Structure (PBS) | | | | | | | Configuration Item Number 020_ | Code | Requirements level | Architecture layer | M*2 Interfacing/Item | LRU SRU RR | Responsible Org | Location | Item Class | Item Type | CDR Baseline |
|-----------------------------------------|---|---|---|---|---|-------------------------------------------------------------------|--------------------------------|------|--------------------|--------------------|----------------------|------------|-----------------|-----------|---------------------|------------|--------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | <-- PBS level | | | | | | | | | | |
| | | | | | | M506 Utility module (Aux Encl M&C/PSU) | 30.50.02.00 | | | | | LRU | ngV.AE.PSU | ANT.AUX.G | Component | Mechanical | . |
| | | | | | | M506 Utility Module PSU | 30.50.02.10 | | | | | | ngV.AE.PSU | ANT.AUX.G | Part - manufactured | Electrical | . |
| | | | | | | M&C module Aux enclosure (in HIL structure) | 30.45.56.00 | | | | | | | | | | . |
| | | | | | | AUX Cold Plate, M506 Utility Module (in EEC structure) | 30.60.60.70 | | | | | | | | | | . |
| | | | | | | AUX M506 Utility Module metalwork (in BMR structure) | 30.55.30.20 | | | | | | | | | | . |
| | | | | | | M505 Utility module (Cryo/ECC encl) | 30.50.03.00 | | | | | LRU | ngV.AE.PSU | ANT.YOK.G | Component | Mechanical | . |
| | | | | | | M505 Utility Module PSU | 30.50.03.10 | | | | | | ngV.AE.PSU | ANT.YOK.G | Part - manufactured | Electrical | . |
| | | | | | | M&C module Cryo Enclosure (in HIL structure) | 30.45.55.00 | | | | | | | | | | . |
| | | | | | | CRY Cold Plate, M505 Utility Module (in EEC structure) | 30.60.61.10 | | | | | | | | | | . |
| | | | | | | CRY M505 Utility Module metalwork (in BMR structure) | 30.55.30.30 | | | | | | | | | | . |
| | | | | | | M502 Utility module (Pedestal) | 30.50.04.00 | | | | | LRU | ngV.AE.PSU | ANT.PED.G | Component | Mechanical | . |
| | | | | | | M502 Utility Module PSU | 30.50.04.10 | | | | | | ngV.AE.PSU | ANT.PED.G | Part - manufactured | Electrical | . |
| | | | | | | M&C Module Pedestal Rack (in HIL structure) | 30.45.52.00 | | | | | | | | | | . |
| | | | | | | ELR M502 Utility Module metalwork (in BMR structure) | 30.55.30.43 | | | | | | | | | | . |
| | | | | | | M508 Utility Module (WVR) | 30.50.06.00 | | | | | LRU | ngV.AE.PSU | ANT.WVR.G | Component | Mechanical | . |
| | | | | | | M508 Utility Module PSU | 30.50.06.10 | | | | | | ngV.AE.PSU | ANT.WVR.G | Part - manufactured | Electrical | . |
| | | | | | | M&C module WVR (in HIL structure) | 30.45.58.00 | | | | | | | | | | . |
| | | | | | | WVR Cold Plate, M508 Utility Module (in EEC structure) | 30.60.61.40 | | | | | | | | | | . |
| | | | | | | WVR M508 Utility Module metalwork (in BMR structure) | 30.55.30.50 | | | | | | | | | | . |
| | | | | | | P500 -48VDC Power sub-system | 30.50.07.00 | | | | | LRU | ngV.AE.PSU | ANT.G | Component | Electrical | . |
| | | | | | | DC Power cabling | 30.50.08.00 | | | | | | ngV.AE.PSU | ANT.G | Component | Cabling | . |
| | | | | | | Pedestal Battery | 30.50.05.00 | | | | | LRU | ngV.AE.PSU | ANT.PED.G | Component | Electrical | . |
| | | | | | | Bins, Modules & Racks (BMR) | 30.55.00.00 | BMR | 2 | 4 | y | | ngV.AE.BMR | ANT.G | Subsystem | | . |
| | | | | | | Racks | 30.55.10.00 | | | | | | ngV.AE.BMR | | Component | | . |
| | | | | | | ELR Electronics Rack | 30.55.10.05 | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | Enclosures | 30.55.20.00 | | | | | | ngV.AE.BMR | | Component | | . |
| | | | | | | FEE Enclosure | 30.55.20.05 | | | | | | ngV.AE.BMR | ANT.FED.G | Component | Mechanical | . |
| | | | | | | FEE SA501 Band 5-6 IRD/LO Enclosure | 30.55.20.06 | | | | | | ngV.AE.BMR | ANT.FED.G | Component | Mechanical | . |
| | | | | | | AUX Enclosure | 30.55.20.10 | | | | | | ngV.AE.BMR | ANT.AUX.G | Component | Mechanical | . |
| | | | | | | CRY Enclosure | 30.55.20.20 | | | | | | ngV.AE.BMR | ANT.YOK.G | Component | Mechanical | . |
| | | | | | | WVR F507 Receiver Module Environmental Enclosure | 30.55.20.25 | | | | | | ngV.AE.BMR | ANT.WVR.G | Component | Mechanical | . |
| | | | | | | WVR F507 Receiver Module RFI Enclosure | 30.55.20.26 | | | | | | ngV.AE.BMR | ANT.WVR.G | Component | Mechanical | . |
| | | | | | | WVR M508 Utility Module Environmental Enclosure | 30.55.20.27 | | | | | | ngV.AE.BMR | ANT.WVR.G | Component | Mechanical | . |
| | | | | | | ARCS Modules | 30.55.30.00 | | | | | | ngV.AE.BMR | | Component | | . |
| | | | | | | ARCS Module Blank and Common parts | 30.55.30.05 | | | | | | ngV.AE.BMR | | Component | Mechanical | . |
| | | | | | | FEE SA502 Band 1-4 IRD/LO Module metalwork | 30.55.30.10 | | | | | | ngV.AE.BMR | ANT.FED.G | Component | Mechanical | . |
| | | | | | | FEE L501 LO Module metalwork | 30.55.30.11 | | | | | | ngV.AE.BMR | ANT.FED.G | Component | Mechanical | . |
| | | | | | | FEE M507 Utility Module metalwork | 30.55.30.12 | | | | | | ngV.AE.BMR | ANT.FED.G | Component | Mechanical | . |
| | | | | | | AUX M506 Utility Module metalwork | 30.55.30.20 | | | | | | ngV.AE.BMR | ANT.AUX.G | Component | Mechanical | . |
| | | | | | | AUX F523 Cold Head VFD Controller Module metalwork | 30.55.30.21 | | | | | | ngV.AE.BMR | ANT.AUX.G | Component | Mechanical | . |
| | | | | | | AUX F521 Cold Head VFD Driver Module metalwork | 30.55.30.22 | | | | | | ngV.AE.BMR | ANT.AUX.G | Component | Mechanical | . |
| | | | | | | AUX F522 Vacuum Pump Driver Module metalwork | 30.55.30.23 | | | | | | ngV.AE.BMR | ANT.AUX.G | Component | Mechanical | . |
| | | | | | | CRY M505 Utility Module metalwork | 30.55.30.30 | | | | | | ngV.AE.BMR | ANT.YOK.G | Component | Mechanical | . |
| | | | | | | CRY Helium Pressure Regulator Electronics Module metalwork | 30.55.30.31 | | | | | | ngV.AE.BMR | ANT.YOK.G | Component | Mechanical | . |
| | | | | | | ELR M502 Utility Module metalwork | 30.55.30.40 | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | ELR D501 DBE Module metalwork | 30.55.30.41 | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | ELR L503 Reference Receiver and Timing Module metalwork | 30.55.30.42 | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | ELR D502 WVR Back End Module metalwork | 30.55.30.43 | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | ELR M500 Antenna Supervisor Computer Module metalwork | 30.55.30.44 | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | ELR M501 Maintenance Computer Module metalwork | 30.55.30.45 | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | ELR M504 EEC Electronics Module metalwork | 30.55.30.46 | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | ELR *Data Backhaul Repeater Equipment - Multiple modules in c TBD | | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | ELR *L502 Reference Distribution Equipment - Multiple modules TBD | | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | WVR M508 Utility Module metalwork | 30.55.30.50 | | | | | | ngV.AE.BMR | ANT.WVR.G | Component | Mechanical | . |
| | | | | | | ARCS Bins | 30.55.40.00 | | | | | | ngV.AE.BMR | | Component | | . |
| | | | | | | ARCS Bin blank and common parts | 30.55.40.01 | | | | | | ngV.AE.BMR | | Component | Mechanical | . |
| | | | | | | FEE Bin | 30.55.40.05 | | | | | | ngV.AE.BMR | ANT.FED.G | Component | Mechanical | . |
| | | | | | | AUX Bin | 30.55.40.10 | | | | | | ngV.AE.BMR | ANT.AUX.G | Component | Mechanical | . |
| | | | | | | CRY Bin | 30.55.40.15 | | | | | | ngV.AE.BMR | ANT.YOK.G | Component | Mechanical | . |
| | | | | | | ELR Bin 1 | 30.55.40.20 | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | ELR Bin 2 | 30.55.40.21 | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | ELR Bin 3 | 30.55.40.22 | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | ELR Bin Data Backhaul Equipment | 30.55.40.23 | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | ELR Bin L502 Reference Distribution Equipment | 30.55.40.24 | | | | | | ngV.AE.BMR | ANT.PED.G | Component | Mechanical | . |
| | | | | | | Cable Carrier | 30.55.50.00 | | | | | | ngV.AE.BMR | | Component | | . |
| | | | | | | Front End Cable Carrier | 30.55.50.01 | | | | | | ngV.AE.BMR | | Part - manufactured | Mechanical | . |
| | | | | | | Electronics Environmental Control System (EEC) | 30.60.00.00 | EEC | 2 | 4 | y | | ngV.AE.EEC | | Subsystem | | . |
| | | | | | | Glycol Chiller Heater | 30.60.10.00 | | | | | RR | ngV.AE.EEC | ANT.SHE.G | Part - procured | Mechanical | . |
| | | | | | | ELR Electronics Rack Air Handler Unit | 30.60.20.00 | | | | | RR | ngV.AE.EEC | ANT.PED.G | Component | Mechanical | . |
| | | | | | | Glycol Pipes | 30.60.30.00 | | | | | RR | ngV.AE.EEC | | Component | Piping | . |
| | | | | | | FEE internal Glycol lines | 30.60.31.00 | | | | | | ngV.AE.EEC | ANT.FED.G | Component | Piping | . |
| | | | | | | AUX internal Glycol lines | 30.60.32.00 | | | | | | ngV.AE.EEC | ANT.AUX.G | Component | Piping | . |
| | | | | | | CRY internal Glycol lines | 30.60.33.00 | | | | | | ngV.AE.EEC | ANT.YOK.G | Component | Piping | . |

| ngVLA Product Breakdown Structure (PBS) | | | | | | | Configuration Item Number 020_ | Code | Requirements level | Architecture layer | N°2 Interfacing Item | LRU SRU RR | Responsible Org | Location | Item Class | Item Type | CDR Baseline |
|-----------------------------------------|---|---|---|---|---|---|------------------------------------------------------------------------------------|------|--------------------|--------------------|----------------------|------------|-----------------|-----------|---------------------|-------------|--------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | <-- PBS level | | | | | | | | | | |
| | | | | | | | WVR internal Glycol lines | | | | | | ngV.AE.EEC | ANT.WVR.G | Component | Piping | |
| | | | | | | | GEN interconnecting Glycol Piping for all NRAO Equipment | | | | | | ngV.AE.EEC | ANT.G | Component | Piping | |
| | | | | | | | GEN interconnecting Glycol Pipe insulation | | | | | | ngV.AE.EEC | ANT.G | Component | Piping | |
| | | | | | | | GEN Valves for glycol lines | | | | | | ngV.AE.EEC | ANT.G | Component | Piping | |
| | | | | | | | Heat Exchangers | | | | | | ngV.AE.EEC | | Component | | |
| | | | | | | | FEE Fan for heat exchanger | | | | | | ngV.AE.EEC | ANT.FED.G | Component | Mechanical | |
| | | | | | | | FEE Liquid to air heat exchanger | | | | | | ngV.AE.EEC | ANT.FED.G | Component | Mechanical | |
| | | | | | | | AUX Fan for heat exchanger | | | | | | ngV.AE.EEC | ANT.AUX.G | Component | Mechanical | |
| | | | | | | | AUX Liquid to air heat exchanger | | | | | | ngV.AE.EEC | ANT.AUX.G | Component | Mechanical | |
| | | | | | | | Air flow management | | | | | | ngV.AE.EEC | | Component | Mechanical | |
| | | | | | | | ELR Rack air flow baffles | | | | | | ngV.AE.EEC | ANT.PED.G | Component | Mechanical | |
| | | | | | | | ELR Air ducting for Electronics Rack | | | | | | ngV.AE.EEC | ANT.PED.G | Component | Mechanical | |
| | | | | | | | Cold Plates | | | | | | ngV.AE.EEC | | Component | | |
| | | | | | | | GEN Cold Plate Common Parts | | | | | | ngV.AE.EEC | | Component | Mechanical | |
| | | | | | | | FEE Cold Plate, FE Enclosure | | | | | | ngV.AE.EEC | ANT.FED.G | Part - manufactured | Mechanical | |
| | | | | | | | FEE Cold Plate, SA-501 Custom IRD RF Enclosure | | | | | | ngV.AE.EEC | ANT.FED.G | Part - manufactured | Mechanical | |
| | | | | | | | FEE Cold Plate, SA-502 ARCS IRD/LO RF Enclosure | | | | | | ngV.AE.EEC | ANT.FED.G | Part - manufactured | Mechanical | |
| | | | | | | | FEE Cold Plate, L501 ARCS LO Module | | | | | | ngV.AE.EEC | ANT.FED.G | Part - manufactured | Mechanical | |
| | | | | | | | FEE Cold Plate, M507 Utility Module (PS + M&C) | | | | | | ngV.AE.EEC | ANT.FED.G | Part - manufactured | Mechanical | |
| | | | | | | | AUX Cold Plate, Aux Enclosure | | | | | | ngV.AE.EEC | ANT.AUX.G | Part - manufactured | Mechanical | |
| | | | | | | | AUX Cold Plate, M506 Utility Module (PS + M&C) | | | | | | ngV.AE.EEC | ANT.AUX.G | Part - manufactured | Mechanical | |
| | | | | | | | AUX Cold Plate, F523 VFD Control Module | | | | | | ngV.AE.EEC | ANT.AUX.G | Part - manufactured | Mechanical | |
| | | | | | | | AUX Cold Plate, F521 Cold Head VFD Driver | | | | | | ngV.AE.EEC | ANT.AUX.G | Part - manufactured | Mechanical | |
| | | | | | | | AUX Cold Plate, F524 Vacuum pump | | | | | | ngV.AE.EEC | ANT.AUX.G | Part - manufactured | Mechanical | |
| | | | | | | | CRY Cold Plate, M505 Utility Module (PS + M&C) | | | | | | ngV.AE.EEC | ANT.YOK.G | Part - manufactured | Mechanical | |
| | | | | | | | CRY Cold Plate Helium Compressor VFD | | | | | | ngV.AE.EEC | ANT.YOK.G | Part - manufactured | Mechanical | |
| | | | | | | | WVR Cold Plate, F507 RF Enclosure | | | | | | ngV.AE.EEC | ANT.WVR.G | Part - manufactured | Mechanical | |
| | | | | | | | WVR Cold Plate, M508 Utility Module | | | | | | ngV.AE.EEC | ANT.WVR.G | Part - manufactured | Mechanical | |
| | | | | | | | Dry Air System | | | | | | ngV.AE.EEC | ANT.G | Component | | |
| | | | | | | | Dry Air Unit | | | | | | ngV.AE.EEC | ANT.YOK.G | Part - procured | Mechanical | |
| | | | | | | | Dry Air piping | | | | | | ngV.AE.EEC | ANT.G | Component | Piping | |
| | | | | | | | Water Vapor Radiometer (WVR) | | WVR | 2 | 4 | y | ngV.AE.WVR | | Subsystem | | |
| | | | | | | | WVR Antenna Assembly | | | | | LRU | ngV.AE.WVR | ANT.WVR.G | Component | Mechanical | |
| | | | | | | | WVR Antenna | | | | | LRU | ngV.AE.WVR | ANT.WVR.G | Part - manufactured | Mechanical | |
| | | | | | | | WVR Antenna Mount | | | | | LRU | ngV.AE.WVR | ANT.WVR.G | Part - manufactured | Mechanical | |
| | | | | | | | WVR Feed heater | | | | | LRU | ngV.AE.WVR | ANT.WVR.G | Component | Mechanical | |
| | | | | | | | F507 WVR Receiver Assembly | | | | | LRU | ngV.AE.WVR | ANT.WVR.G | Component | Mechanical | |
| | | | | | | | F507 WVR Receiver Module RFI enclosure (in BMR structure) | | | | | SRU | | | | | |
| | | | | | | | F507 WVR Receiver Module ENV enclosure (in BMR structure) | | | | | SRU | | | | | |
| | | | | | | | F507 WVR RF front-end module | | | | | SRU | ngV.AE.WVR | ANT.WVR.G | Component | Electronic | |
| | | | | | | | L523 WVR LO & Timing | | | | | SRU | ngV.AE.WVR | ANT.WVR.G | Component | Electronic | |
| | | | | | | | F507 WVR Front End Voltage Regulator board | | | | | SRU | ngV.AE.WVR | ANT.WVR.G | Part - manufactured | Electronic | |
| | | | | | | | F507 WVR Control Board | | | | | | ngV.AE.WVR | ANT.WVR.G | Part - manufactured | Electronic | |
| | | | | | | | T504-E Band4 IRD | | | | | SRU | ngV.AE.WVR | ANT.WVR.G | Component | Electronic | |
| | | | | | | | T504-D Band4 IRD | | | | | SRU | ngV.AE.WVR | ANT.WVR.G | Component | Electronic | |
| | | | | | | | WVR Cold Plate, F507 RF Enclosure (EEC structure) | | | | | SRU | | | | | |
| | | | | | | | WVR Intermediate Coldplate (in EEC structure) | | | | | SRU | | | | | |
| | | | | | | | M508 WVR Utility Module Assembly | | | | | LRU | ngV.AE.WVR | ANT.WVR.G | Component | Mechanical | |
| | | | | | | | WVR feed heater control relay | | | | | | ngV.AE.WVR | ANT.WVR.G | Part - procured | Electronic | |
| | | | | | | | WVR M508 fibre management | | | | | | ngV.AE.WVR | ANT.WVR.G | Component | Fibre Optic | |
| | | | | | | | WVR M508 Utility Module Environmental Enclosure (in BMR structure) | | | | | | | | | | |
| | | | | | | | M508 WVR Utility Module (in PSU structure) | | | | | SRU | | | | | |
| | | | | | | | D502 WVR Back-end Assembly | | | | | LRU | ngV.AE.WVR | ANT.PED.G | Component | Mechanical | |
| | | | | | | | D502 WVR Back End Module (in BMR structure) | | | | | | | | | | |
| | | | | | | | D502 WVR DSP board | | | | | | ngV.AE.WVR | SBA.PED.G | Part - manufactured | Electronic | |
| | | | | | | | D502 WVR DSP board 2.. (TBD number of boards) | | | | | | ngV.AE.WVR | SBA.PED.G | Part - manufactured | Electronic | |
| | | | | | | | WVR Delay Calibration Software | | | | | LRU | ngV.AE.WVR | VIR.G | Component | SW/FW | |
| | | | | | | | WVR SBA Pedestal Assembly | | | | | LRU | ngV.AE.WVR | SBA.G | Component | Mechanical | |
| | | | | | | | WVR SBA Pedestal | | | | | | ngV.AE.WVR | SBA.G | Component | Mechanical | |
| | | | | | | | WVR SBA Tracking Mount | | | | | | ngV.AE.WVR | SBA.G | Component | Mechanical | |
| | | | | | | | Monitor and Control Hardware Interface Layer (HIL) | | HIL | 2 | 4 | y | ngV.AE.HIL | | Subsystem | | |
| | | | | | | | M500 Supervisor Computer (hardware only) | | | | | LRU | ngV.AE.HIL | ANT.PED.G | Part - procured | Computing | |
| | | | | | | | M501 Maintenance Computer (hardware only) | | | | | LRU | ngV.AE.HIL | ANT.PED.G | Part - procured | Computing | |
| | | | | | | | M&C Module Pedestal Rack (part of M502 Utility Module) | | | | | SRU | ngV.AE.HIL | ANT.PED.G | Part - manufactured | Electronic | |
| | | | | | | | M504 EEC M&C module | | | | | LRU | ngV.AE.HIL | ANT.YOK.G | Component | Electronic | |
| | | | | | | | M&C module Cryo Enclosure (part of M505 Utility Module) | | | | | SRU | ngV.AE.HIL | ANT.YOK.G | Part - manufactured | Electronic | |
| | | | | | | | M&C module Aux enclosure (part of M506 Utility Module) | | | | | SRU | ngV.AE.HIL | ANT.AUX.G | Part - manufactured | Electronic | |
| | | | | | | | M&C module FE Enclosure (part of M507 Utility Module) | | | | | SRU | ngV.AE.HIL | ANT.FED.G | Part - manufactured | Electronic | |
| | | | | | | | M&C module WVR (part of M508 Utility Module) | | | | | SRU | ngV.AE.HIL | ANT.WVR.G | Part - manufactured | Electronic | |
| | | | | | | | SA501 Power & Control Module | | | | | | ngV.AE.HIL | ANT.FED.G | Part - manufactured | Electronic | |
| | | | | | | | SA502 Power & Control Module | | | | | | ngV.AE.HIL | ANT.FED.G | Part - manufactured | Electronic | |
| | | | | | | | Antenna Fibre Optic System | | AFD | 2 | 4 | y | ngV.AE.AFD | ANT.G | Subsystem | | |

| ngVLA Product Breakdown Structure (PBS) | | | | | | | Configuration Item Number 020_1 | Code | Requirements level | Architecture layer | N*2 Interfacing Item | LRU SRU RR | Responsible Org | Location | Item Class | Item Type | CDR Baseline |
|-----------------------------------------|-----|-------------------------------------------------------|---|---|---|---|---------------------------------|------|--------------------|--------------------|----------------------|------------|-----------------|-------------|------------------------|-------------|--------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | <-- PBS level | | | | | | | | | | |
| | | | | | | | | | | | | | ngV.AE.AFD | ANT.PED.G | Part - procured | Fibre Optic | . |
| | | | | | | | | | | | | | ngV.AE.AFD | ANT.PED.G | Part - procured | Fibre Optic | . |
| | | | | | | | | | | | | | ngV.AE.AFD | ANT.AUX.G | Part - procured | Fibre Optic | . |
| | | | | | | | | | | | | | ngV.AE.AFD | ANTYOK.G | Part - procured | Fibre Optic | . |
| | | | | | | | | | | | | | ngV.AE.AFD | ANT.PED.G | Part - procured | Fibre Optic | . |
| | | | | | | | | | | | | | ngV.AE.AFD | ANT.PED.G | Part - procured | Fibre Optic | . |
| | | | | | | | | | | | | RR | ngV.AE.AFD | ANT.G | Component | Cabling | . |
| | SBA | Antenna System | | | | | | 6AS | | 3 | | | ngV.SE | SBA.G | System | | . |
| | | Short Baseline Antenna | | | | | | SBA | 2 | 4 | y | | ngV.ANT | SBA.G | Subsystem | | . |
| | | SBA Electronics | | | | | | | | | | | ngV.AE | SBA.G | Component - Functional | | . |
| | | Product breakdown TBD | | | | | | | | | | | | | | | . |
| | | Total Power Antenna System | | | | | | | | | | | ngV.SE | TPA.G | System | | . |
| | | Total Power Antenna | | | | | | TPA | | | | | ngV.ANT | TPA.G | Subsystem | | . |
| | | TPA Electronics | | | | | | | | | | | ngV.AE | TPA.G | Component - Functional | | . |
| | | Product breakdown TBD | | | | | | | | | | | | | | | . |
| | | Environmental Monitoring & Characterization System | | | | | | MON | 2 | 3 | y | | ngV.AE.MON | | Subsystem | | . |
| | | Weather Stations | | | | | | | 3 | 4 | | | ngV.AE.MON | ENV.WTH.G | Component | Functional | . |
| | | Atmospheric Phase Monitor | | | | | | | 3 | 4 | | | ngV.AE.MON | ENV.ATM.G | Component | Functional | . |
| | | Cloud Monitor | | | | | | | 3 | 4 | | | ngV.AE.MON | ENV.CLD.G | Component | Functional | . |
| | | Lightning Monitor | | | | | | | 3 | 4 | | | ngV.AE.MON | ENV.LGH.G | Component | Functional | . |
| | | RFI Monitor | | | | | | | 3 | 4 | | | ngV.AE.MON | ENV.RFI.G | Component | Functional | . |
| | | Remote Site Monitor | | | | | | | 3 | 4 | | | ngV.AE.MON | STE.LBS.G | Component | Functional | . |
| | | Satellite Holography System | | | | | | | 3 | 4 | | | ngV.AE.MON | MOB.G | Component | Functional | . |
| | | Reference signals | | | | | | | | | | | ngV.CSPT | | System | | . |
| | | LO Reference & Timing - Generation (RTG) | | | | | | RTG | 2 | 3 | y | | ngV.CSPT.RTG | BLD.CEB | Subsystem | | . |
| | | Maser and GPS Sources | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Component | Functional | . |
| | | Hydrogen Maser | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Part - procured | Electronic | . |
| | | Phase and Timing Synchronization | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Component | Electronic | . |
| | | Timescale Receiver | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Component | Electronic | . |
| | | GNSS Receiver | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Component | Electronic | . |
| | | Frequency Transfer Fixed Sources | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Component | Functional | . |
| | | Narrow Linewidth Laser | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Component | Electronic | . |
| | | Fixed Microwave Source | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Component | Electronic | . |
| | | Frequency Transfer Offset Sources | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Component | Functional | . |
| | | Tunable Source | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Component | Electronic | . |
| | | Time Transfer Sources | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Component | Functional | . |
| | | Timing Laser | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Component | Electronic | . |
| | | Optical Modulator PSK | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Component | Electronic | . |
| | | PN Code-1 Modulator | | | | | | | | | | | ngV.CSPT.RTG | BLD.CEB | Component | Electronic | . |
| | | LBA antennas time and frequency reference system | | | | | | | | | | | ngV.CSPT.RTG | STE.LBS.G | Component | Functional | . |
| | | Hydrogen Maser (TBC) | | | | | | | | | | | ngV.CSPT.RTG | STE.LBS.G | Part - procured | Electronic | . |
| | | GPS receiver system (TBC) | | | | | | | | | | | ngV.CSPT.RTG | STE.LBS.G | Component | Electronic | . |
| | | Other parts are TBD | | | | | | | | | | | ngV.CSPT.RTG | STE.LBS.G | | | . |
| | | LO Reference & Timing - Distribution (RTD) | | | | | | RTD | 2 | 3 | y | | ngV.CSPT.RTD | | Subsystem | | . |
| | | Reference Distributor Rack | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Functional | . |
| | | NLL Distributor | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Functional | . |
| | | RF Distributor | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Functional | . |
| | | 1PPS Distributor | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Functional | . |
| | | Frequency Transmitter Rack | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Functional | . |
| | | Frequency Transmitter | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Functional | . |
| | | LO Reference | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Functional | . |
| | | Timing Transmitter Rack | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Functional | . |
| | | Time Transmitter | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Functional | . |
| | | Time transmitter optical assembly | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Functional | . |
| | | Time transmitetr electronic assembly | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Functional | . |
| | | Timing Controller | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Functional | . |
| | | RTD central infrastructure | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Functional | . |
| | | RTD fibre cabling - central processor building | | | | | | | | | | | ngV.CSPT.RTD | BLD.CEB | Component | Cabling | . |
| | | RTD long-haul repeater station equipment | | | | | | | | | | | ngV.CSPT.RTD | NET.REP.G | Component | Functional | . |
| | | RTD long-haul repeater station amplifiers (BiDi EDFA) | | | | | | | | | | | ngV.CSPT.RTD | NET.REP.G | Component | Electronic | . |
| | | RTD long-haul repeater station splice tray | | | | | | | | | | | ngV.CSPT.RTD | NET.REP.G | Component | Fibre Optic | . |
| | | RTD long-haul antenna repeater equipment | | | | | | | | | | | ngV.CSPT.RTD | ANT.PED.REP | Component | Functional | . |
| | | RTD long-haul antenna repeater (OEO Repeater) | | | | | | | | | | | ngV.CSPT.RTD | ANT.PED.REP | Component | Electronic | . |
| | | RTD long-haul antenna amplifier (BiDi EDFA) | | | | | | | | | | | ngV.CSPT.RTD | ANT.PED.REP | Component | Electronic | . |
| | | L503 Reference Receiver and Timing module | | | | | | | | | | | ngV.CSPT.RTD | ANT.PED.G | Component | Mechanical | . |
| | | L503 Frequency Receiver Assembly | | | | | | | | | | | ngV.CSPT.RTD | ANT.PED.G | Component | Electronic | . |
| | | L503 Timing Receiver Assembly | | | | | | | | | | | ngV.CSPT.RTD | ANT.PED.G | Component | Electronic | . |
| | | L503 Timing Relay Transmitter | | | | | | | | | | | ngV.CSPT.RTD | ANT.PED.G | Component | Electronic | . |
| | | Central Signal Processor (CSP) | | | | | | CSP | 2 | 2 | y | | ngV.CSPT | | Subsystem | | . |
| | | Subband Processor (SBP) | | | | | | SBP | 3 | 3 | | | ngV.CSPT.SBP | BLD.CEB | Component | Functional | . |
| | | SBP Line Type #1 (FSA-based) | | | | | | | | | | LRU | ngV.CSPT.SBP | BLD.CEB | | | . |
| | | SBP Line Type #2 (SCREAM's B&C) | | | | | | | | | | LRU | ngV.CSPT.SBP | BLD.CEB | | | . |
| | | SBP Line Type #3 (SCREAM's B&C) | | | | | | | | | | LRU | ngV.CSPT.SBP | BLD.CEB | | | . |











020.10.20.00.00-0004-DSN-B-ProductBreakdownStructure

Final Audit Report

2022-07-26

| | |
|-----------------|----------------------------------------------|
| Created: | 2022-07-26 |
| By: | Thomas Kusel (tkusel@nrao.edu) |
| Status: | Signed |
| Transaction ID: | CBJCHBCAABAA3sit_Jm2SSmQ7qULoYvMpvUniPYcngjG |


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