

Fibers from RX-Cabin
 W1: 10 GbE Tx/Rx Spectrometer @ Spectrometer PC
 W2: SFP+ (at CTL) and (RX at R3-Cabin)
 W3: GBE COMM (TX at CTL) and (RX at R3-Cabin)
 W4: No used Cable into (Left)
 W5: 10 GbE Tx/Rx SFP+ to Maser House Block-2
 W6: 10 GbE Tx/Rx SFP+ to Maser House Block-2
 W7: 10 GbE Tx/Rx SFP+ to Maser House Block-2
 W8: 10 GbE Tx/Rx SFP+ to Maser House Block-2
 W9: 10 GbE Tx/Rx SFP+ to Maser House Block-2
 W10: 10 GbE Tx/Rx SFP+ to Maser House Block-2
 W11: 10 GbE Tx/Rx SFP+ to Maser House Block-2
 W12: 10 GbE Tx/Rx SFP+ to Maser House Block-2

Fibers from LSC
 W7: SFP+ (at CTL) and (RX at R3-Cabin)
 W8: GBE COMM (TX at CTL) and (RX at R3-Cabin)

Fibers from RSC
 W9: SFP+ (at CTL) and (RX at R3-Cabin)
 W10: GBE COMM (TX at CTL) and (RX at R3-Cabin)

Fibers From Rx-Cabin (through Az-Wrap)
 W11: SFP+ (at CTL) and (RX at R3-Cabin)
 W12: GBE COMM (TX at CTL) and (RX at R3-Cabin)

Legend:
 LHP Signal
 RHP Signal
 LO Reference, Low Freq
 LO Reference, High Freq
 Monitor/Control Network
 Singlemode Fiber

Missing Hardware (White box)
Completed/Received (Green box)

Legend:
 1GHz
 Up to 10GHz
 Up to 10GHz
 SC/APC
 LC

ACADEMIA SINICA
 Institute of Astronomy and Astrophysics
 Electronics System Block Diagram,
 Control Containers

Contract: D. Kubo, C.C. Hsu
 The GLT System Block Diagram is a joint effort by the GLT Project Team

100 0200 0000
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Instrument List

Assembly A# (Antenna) Grouping:

- A1 to A100 → Electronics
- A101 to A200 → Around DEWAR
- A201 to A300 → Outside of Rx-cabin

CAB #	Description
A1	Signal Test source Reference
A2	UPS - Eaton_9130
A3	Photonics Receiver
A4	EHT-BDC for USB
A5	EHT-BDC for LSB
A6	R2DBE (VLBI)
A7	R2DBE (VLBI)
A8	R2DBE (VLBI)
A9	R2DBE (VLBI)
A10	Backend Reference
A11	Continuum Detector & Phase monitor
A12	Vector VoltMeter (VVM)
A13	VLAN HUB
A14	RF switch matrix #1
A15	Power Meter #1
A16	Power Meter #2
A17	RF switch matrix #2
A18	Power Meter #3
A19	Power Meter #4
A20	Spectrum Analyzer
A21	48 PORT 1GbE Switch (with PoE)
A22	Receiver Control PC
A23	IP Phone (Ext-109)
A24	1-PPS distributor
A25	Vacuum Valve (Manual)
A26	10MHz distribution
A27	USB to CANbus converter (NI)
A28	VVM monitor (GPIB_to_LAN)
A29	Vacuum Meter (6-channel)
A30	UPS - APC_SRT3000_XLA
A31	PCAN converter
A32	DC supply for PCAN
A33	Fusion Splice chassis (host W4, W5, W6, W12)
A34	Fusion Splice chassis (host W1, W2, W3)
A35	10GbE Switch
A36	O-scope picoScope
A37	Sumitomo Coldhead
A38	6 port USB3 Hub
A39	Lakeshore 218 (temperature meter)
A40	Mini PC for Rx Control (Win 10)
A41	Vacuum Gauge on Dewar
A42	Lakeshore 218 monitor (GPIB_to_LAN)
A43	Pfeiffer Pump Station
A44	EHT-BDC extension for USB (with Baseband dist.)
A45	EHT-BDC extension for LSB (with baseband dist.)
A46	Power Meter #5
A47	QWP for 221.1 OR 260GHz receiver
A48	Holography Down Converter
A49	Spectrometer (was A6-A)
A50	Spectrometer (was A7-A)
A51	Spectrometer (was A8-A)
A52	Spectrometer (was A9-A)
A53	Solenoid Valve (pump)
A54	86GHz-RU channel coupler to A48(HDC)
A55	Mini-Circuit 1-750MHz Splitter (ZFSC-2-1W)
A56	CAB-A1-SW1-ch1 10dB coupler to A48(HDC)
A57	Vacuum Pump remote control (RS485 to LAN)
A58	Security Camera #9
A101	230GHz Receiver (Rx2 CCA)
A102	Rx2 WCA
A103	345GHz Receiver (Rx3 CCA)
A104	Rx3 WCA
A105	86GHz Receiver (Rx1 CCA)
A106	Rx1 WCA
A107	86G Tone source (WM mixer)
A108	230G Tone source (YM mixer)
A109	345G Tone source (HM mixer)
A110	Rx bias and CAN-Bus control
A111	PA for 345G Tone source
A112	Rotation stage controller
A113	Ambient load
A114	Rotation stage controller monitor (RS232_to_LAN)
A115	QWP for 345GHz receiver
A116	DC supply for Ext.FAN of WCA
A117	DC supply for Tone_345G Power Amplifier
A201	Optical Telescope
A202	Optical Telescope monitor (USB to CAT5E)
A203	Holography Ref receiver

Color code:

- New Release (TBD.)
- Assigned / changed
- Missing / Not Installed Yet

LSC #	Description
A1	OPT / Continuum Detector PC
A2	24 port 1GbE Switch
A3	Menerga HVAC Controller
A4	CNS Clock II GPS (Position GPS)
A5	USB to RJ45 converter (for GPS)
A6	IP Phone (Ext-108)
A7	ESAN LSC Servo PLC
A8	USB to RJ45 converter (for OT)
A9	Patch Panel (2U Rack Mount)
A10	Fusion Splice
A11	ESAN Power Meter (for panel 1,2,3)
A12	Sumitomo compressor
A13	VVM
A14	Security Cam#10
A15	VVM Monitor (GPIB_to_LAN)
A16	Holography Rx power supply & Telemetry
A17	De-Ice Control Unit
A18	New Released (TBD.)
A19	Antenna for Position GPS
A20	HVAC PLC remote control laptop
A21	Compressor Remote Box

RSC #	Description
A1	Vertex Drive
A2	Antenna Control Unit (ACU)
A3	Hexapod Control Unit (HCU)
A4	24 port 1GbE Switch
A5	IP Phone (Ext-107)
A6	IRIG-B Dist (12 port)
A7	1-PPS Dist (12 port)
A8	1-PPS-B Receiver
A9	IRIG-B Receiver
A10	Fusion Splice
A11	Patch Panel (2U Rack Mount)
A12	Collision Switch Readout Box (CSRB)
A13	ESAN RSC Servo PLC
A14	ESAN PowerMeter (for panel 4,5)
A15	Security Camera #11
A16	New Released (TBD.)
A17	Security Camera #12
A18	ADS Windows laptop for HCU and CSRB

Assembly B# (Base) Grouping:

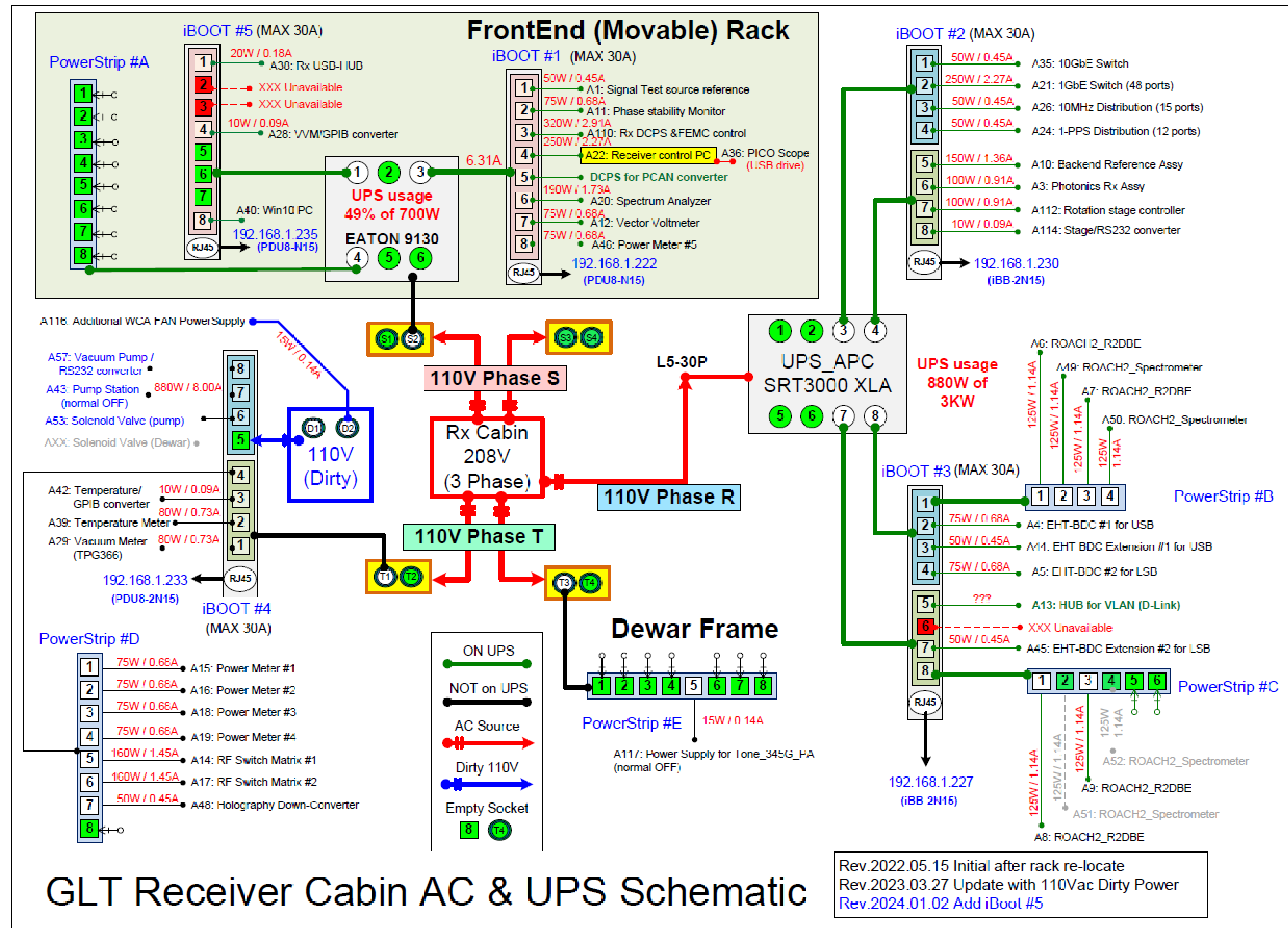
- B 1 to B 60 → Maser House
- B 61 to B100 → VLBI Electronics
- B101 to B200 → Control Room
- B201 to B.. → Others

Maser House	Description
B1	T4Science iMaser 3000
B2	iMaser UPS
B3	Agilent 8257D
B4	Photonic Transmitter Assembly
B5	VVM (Agilent 8508A)
B6	VVM monitor (GPIB_to_LAN)
B7	UPS - APC_SUA750RM1U
B8	Symmetricom TSC 5120A-01
B9	IRIG-B Dist.
B10	Oscilloquartz 10MHz OCXO
B11	CNS Clock II GPS (Timing GPS)
B12	Laptop PC (ASUS)
B13	24 ports 1 GbE Switch (with PoE)
B14	1-PPS Dist. (12 ports)
B15	HP 53131A Counter
B16	UPS-SRT1000
B17	1-PPS Transmitter
B18	IRIG-B Transmitter
B19	Fusion Splice Chassis (1U)
B20	IP Phone (Ext-110)
B21	Antenna for Timing GPS
B22	NTI Temp & Hum. Sensor
B23	Raspberry pi
B24	Security Camera #7
B25	Security Camera #8

VLBI Electronics	Description
B61	Fusion Splice Chassis (1U)
B62	Mark 6 VLBI (1A)
B63	Mark 6 VLBI (1B)
B64	Mark 6 VLBI (2A)
B65	Mark 6 VLBI (2B)
B66	24 port 1GbE Switch (with PoE)
B67	NTI Temp & Hum. Sensor
B68	Security Camera #6
B69	IP Phone (Ext-103)
B70	VLBI Backend PC
B71	16 port Switch for VLBI (VLAN#13)

Control Room	Description
B101	Fusion Splice Chassis (2U)
B102	48 ports 1 GbE Switch (with PoE)
B103	Weather Station
B104	IP Phone Switch server
B105	Cisco Router
B106	TP-Link WiFi AP
B107	Obscon PC (Desktop)
B108	GLTCU
B109	Windows PC
B110	Printer/Scanner/FAX(HP M125NW)
B111	Raspberry Pi
B112	Antenna Control Computer (ACC)
B113	Spectrometer PC
B114	Linux server for Monitor & Control
B115	Asustor NAS
B116	Gateway PC
B117	IP Phone (Ext-101)
B118	IP Phone (Ext-102)
B119	16 CH - PoE Switch
B120	Network Video Recorder (NVR)
B121	Monitor for NVR
B122	Weather sensors (Vaisala AWS310)
B123	Security Camera #4
B124	Radiometer
B125	Radiometer iBootbar
B126	IR sky monitor - Raspberry Pi
B127	Security Camera #5

Other Place	Description
Rx Trailer	B201 IP Phone (Ext-105)
Mechanical Shop	B202 IP Phone (Ext-104)
Container #5	B203 IP Phone
Container #6	B204 IP Phone
Power Trailer	B205 IP Phone (Ext-106)
Outside of Trailer	B206 Security Camera #1
Outside of Trailer	B207 Security Camera #2
Mechanical Shop	B208 Raspberry pi
Outside of Trailer	B209 Security Camera #3



Phone List & Security Camera

Phone	Location	IP
Ext-101	Control Trailer (Wall)	192.168.1.16
Ext-102	Control Trailer	192.168.1.17
Ext-103	VLBI Trailer (Wall)	192.168.1.51
Ext-104	Machine Shop Trailer	192.168.1.57
Ext-105	Receiver Trailer	192.168.1.61
Ext-106	Power Trailer	192.168.1.65
Ext-107	Antenna-RSC	192.168.1.102
Ext-108	Antenna-LSC	192.168.1.105
Ext-109	Antenna-RxCabin	192.168.1.231
Ext-110	MASER House	192.168.1.83

Camera	Location	Make	Model	IP
host	Control Trailer	Apple	Mac Mini,2021 M1	192.168.1.42
#1	Outdoor-1	GW Security	GW8171MMIC	192.168.1.34
#2	Outdoor-2	GW Security	GW8872IP	192.168.1.39
#3	Primary Reflector	GW Security	GW5050IP	192.168.1.44
#4	Control Trailer	GW Security	GW8872IP	192.168.1.35
#5	TV Weather Monitor	Aver	FV3028-RTM	192.168.1.119
#6	VLBI Trailer	GW Security	GW8872IP	192.168.1.36
#7	Maser House	GW Security	GW8872IP	192.168.1.40
#8	Maser House Rack	Aver	FV3028-RTM	192.168.1.168
#9	Receiver Cabin	GW Security	GW8171MMIC	192.168.1.38
#10	LeftSide Container	Aver	FV3028-RTM	192.168.1.118
#11	RightSide Container-1	GW Security	GW8171MMIC	192.168.1.37
#12	RightSide Container-2	Aver	FV3028-RTM	192.168.1.120
#13				
#14				
#15				
#16				

Revision History:

Revision Level	Date	Author	Affected Zone	Revision Description
Rev-0A	2013-Oct-29	D. Kubo		Initial release, Rev-0B (2014-May-1), Rev-0C, Rev-0D (2016-Oct-18), Rev-0E (2017-Mar-3), Rev-0F (2017-Apr-5),
Rev-0G	2017-Jul-10	D. Kubo, C.C. Han		Rev-0H (2017-Oct-25), Rev-0I (2017-Oct-30), Rev-0J(2018-Apr-9), Rev-0K (2018-Apr-23)
Rev-0L	2018-Apr-26	D. Kubo, C.C. Han	Sheet 1	CAB-A4, CAB-A5 IF Processor schematic, J#, and power level updates
				CAB-A44, CAB-A45 Baseband Distribution Assembly schematic updates
				CAB-A14, CAB-A17 Switch Matrix Assembly schematic updates
				CAB-A102, CAB-104, CAB-106 Warm Cartridge Assembly, remove YIG and FLOOG Test Points
			Sheet 1 & 2	Consolidate all single-mode fiber optic splice trays and I/O panels into integrated rackmount chassis units
			Sheet 1 & 2	Update legend, zone H8
			Sheet 2	Add power dissipation to equipment and instruments
			Sheet 1	J# corrections for CAB-102, CAB-104, CAB-106, CAB-14, CAB-17, CAB-A11
				Relocate indoor compressor to Left Side Container
				Add details for temperature recorder
				Modify cabling, zones C3, C4
			Sheet 3	Add sheet 3 Revision History
Rev-0M	2018-Oct-8	C.C. Han	Sheet 1	Add Power Meter 5 (CAB-A46), Add Single Channel Down converter for holography (CAB-A48)
				Holography wiring update (affect CAB-A106, A304, A302, and LSC-A1)
				Update RF Switch Matrix (CAB-A14, A17) input assignment
				Assign realIP address for equipment and make correction on 1 GHz Router, remove unused ROACH2 Ethernet
Rev-0N	2018-Oct-18	D. Kubo	Sheet 1- Zone H7	change Holograph Reference Receiver, A302, status to complete
			Sheet 1- Zone C5	update J#s for CAB-A3, add J7 100 MHz output
			Sheet 1- Zone A7, H7	Add Holography Reference Receiver DC Power Supply & Telemetry unit, LSC-A16, and associated cable
			Sheet 1 & 2	Change LO fiber from 45 to 46
			Sheet 1 & 2	Add 4-digit extension numbers to Kingtel phones in Control Container, VLBI Container, Maser House, Antenna Left Side and Right Side Containers
			Sheet 2- Zone F3, G3, H2	Update status to reflect no Kingtel phones in Receiver Trailer, Mechanical Shop Trailer, and Workshop Trailers
			Sheet 2- Zone E1	Remove switch SW1
			Sheet 2- Zone E3	Add HP 53131A counter, MAS-A45, and associated interconnect cables
			Sheet 2- Zone G5, C5	Move W5 fiber cable from Control Room to VLBI Electronics trailer
			Sheet 2- Zone C2	Update A42 UPS make and model, included units on backed up on UPS
			Sheet 2- Zone E3	Add A47 1-PPS Distribution unit
			Sheet 2- Zone E1	Remove SIIG 02-1750A USB to ethernet converter and replace with Asus laptop PC
Rev-0O	2019-Feb-13	C.C. Han	Sheet 1- Zone E4	Update the wiring to IF-processor input panel base on real connection from Rx1/2/3 (86/230/345GHz), the Receiver ID is same as control software
			Sheet 4	Add sheet 4 to present the current status (since 2019-Jan) inside the Rx Cabin that have EHT-BDC installed (IF-processor would need to be take out)
			Sheet 4- Zone H3, D5	Terminate unused I/O port of CAB-A10, CAB-A17
		D. Kubo	Sheet 4- Zone D4 through F4	Add "Manual Ctrl" label to VGAs
			Sheet 4- Zone D3 through F4	Gray out slope equalizers to indicated that they have been removed from EHT BDC units
	2019-Feb-14	C.C. Han	Sheet 4- Zone C8, H3, H5	Re-name the CAB-A14/A17 input signals due to IF processor (CAB-A4/A5) offline
			Sheet 4	Upgrade warm amplifier to 4-12 GHz for 230 GHz Rx (Zone-F8), and add the "waveguide transition" in 86 GHz CCA (Zone-G7) to fix the circular polarization issue
Rev-0P	2019-Mar-4	C.C. Han	Sheet 1- Zone F3 & D3,	Update the BPF spec of EHT-BDC, and combine the manual switch together of single EHT-BDC extension
Rev-0Q	2019-Sep-6	D. Kubo	Sheet 1- Zone D4 through F4	Update EHT BDC Ext-1 and Ext-2 Plates with IP addresses and Reference Designators CAB-A4-A and A5-A
	2019-Sep-6	D. Kubo	Sheet 1- Zone D3 through F3	Add Reference Designators CAB-A4 and A5 to EHT BDC units (formerly IF Processor units)
	2019-Sep-9	D. Kubo	Sheet 1- Zone C5	Update Photonics Receiver Assembly, CAB-A5
	2019-Sep-10	D. Kubo	Sheet 2- Zone C3 through E2	Update Photonics Transmitter Assembly, MAS-A4
	2019-Sep-10	D. Kubo	Sheet 1	Sheet 1 - General, add "Left" or "Right" rack location designations for equipment, where applicable
	2019-Sep-10	D. Kubo	Sheet 1- Zone G8, H8	Updated LO reference signals to holography reference receiver
	2019-Sep-10	D. Kubo	Sheet 1- Zone D6	Updated new Holography Down Converter Plate, CAB-A48
Rev-0R	2020-Nov-26	C.C. Han	Sheet 1- Zone F2 through D3	Add LO couple out monitor of the EHT-BDC (A4, A5), integrate the baseband distribution into EHT-BDC extension and rename to A44n, A45n
			Sheet 1- Zone E2	Remove the DC supply for baseband distribution, Remove the input 12dB pad at baseband distribution
			Sheet 1- Zone H3	Update the EHT-LO couple monitor port at A17-J12, A17-J11
			Sheet 1- Zone G7 through E8	Update the CCA and WCA for 86GHz receiver and 230GHz receiver, and add QWP for Rx-3 (345GHz Receiver)
	2020-DEC-03	C.C. Han	Sheet 1- Zone D2	Gray out uninstalled ROACH2
			Sheet 1- Zone H7	Add PA (A111) for 345GHz tone source
			Sheet 1- Zone C6	Remove A27 (10MHz dist.) module
			Sheet 4	Add new sheet 4 for instrument list (include in the UPS hook-up plan)
			Sheet (Revision History)	Use excel file to organize the revise history
	2020-DEC-07	C.C. Han	Sheet 1- Zone C3	Remove rack-patch panel
			Sheet 1- Zone F4 through D8	Re-draw wires from Rxs to A44/A45
			Sheet 1- D8	Add UPS
			Sheet 1- D6	Holography down converter wiring update
Rev-0S	2020-Dec-10	C.C. Han	Sheet (Antenna)	Rework on RSC, LSC, and Rx-cabin for fiber routing
			Sheet (Control Container)	Rework for fiber routing
			Sheet (Antenna)	Rework on holography input/output signal routing
Rev-0T	2020-Dec-23	C.C. Han	Sheet (Antenna)	Rework on RSC wiring, especially on HCU, CSR, IP-cam of servo, and cables to Hexapod
			Sheet (Control Container)	Rework on Maser house, control trailer, VLBI trailer
			Sheet (Antenna) - Zone B4	Modify cabling for CSR, HCU
	2021-Jan-07	C.C. Han	Sheet Antenna & Sheet Control	Rework on GPS antenna
Rev-0U	2022-Jul-22	C.C. Han	Sheet (Antenna) (Instrument List)	Update R2DBE system, add VLAN hub, redefine CAB-A14/A17 junctions. Add PCAN, rewire coupler for holography downconverter, add compressor remote box
	2022-Jul-26	D. Kubo	Sheet 2 (Maser House)	Add second UPS and update items on backup, update network switch model number, add B4 Photonics Transmitter status and control bits
	2022-Jul-29	C.C. Han	All	Rework on ethernet wires for all 1G switch router (update VLAN configuration), Move radiometer host and iBoot into control room
	2022-Aug-3	C.C. Han	All	Security Camera assignment
Rev-0V	2024-Jan-4	C.C. Han	Sheet (Antenna) - Zone E8 to G8	Update to the new (ASIAA) 230 GHz receiver, QWP
			Sheet (Antenna) - Zone H5, and E1	Add mini PC (WN 10) Rx control bench, update VLAN connection
			Sheet (Antenna)	Modify wiring regarding CAB-A1, A11 to match the new cabling and RF switch matrix (CAB-A14.A17) monitoring
			Sheet (Instrument List)	Update the 110V AC connection of RxCabin, add new iBoot#5 in the FrontEnd rack