

# Arinc 793 Fiber Schematic

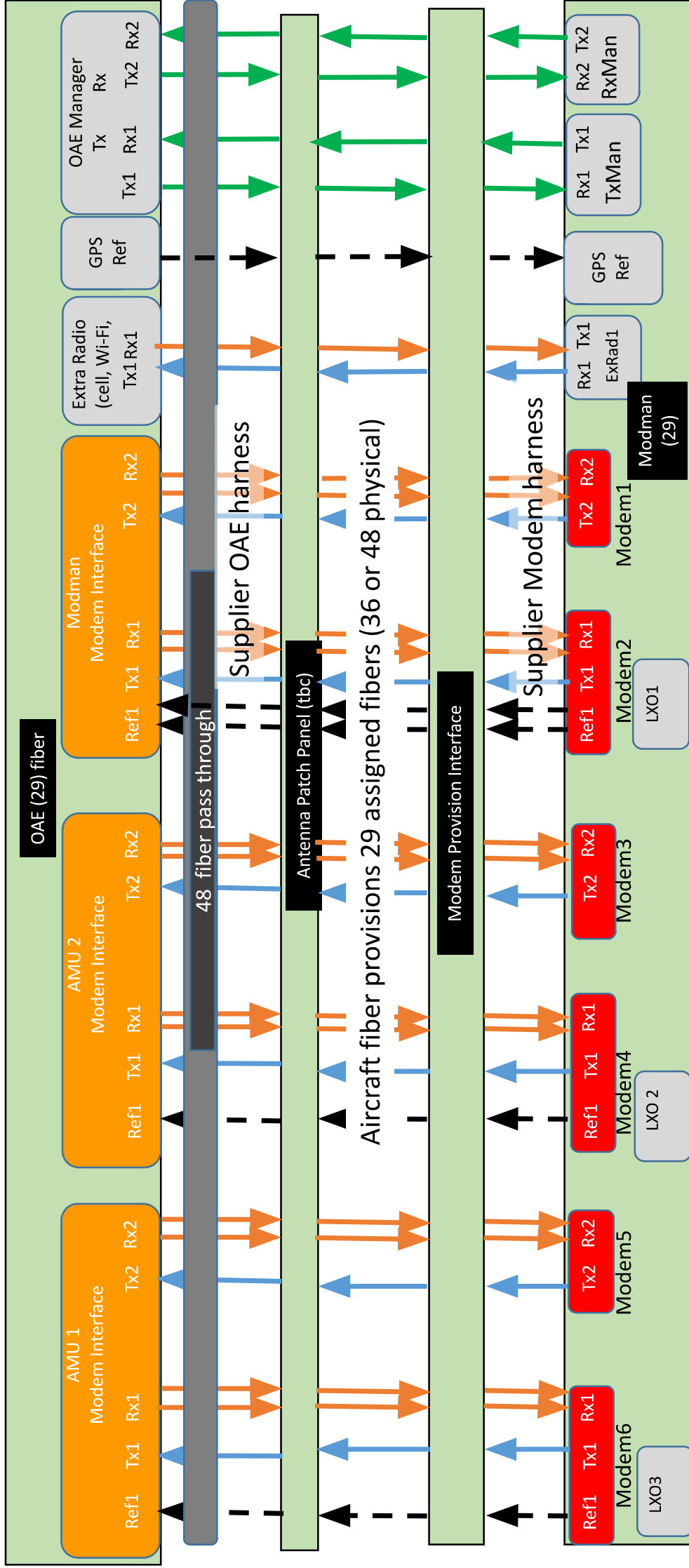
V18 – Arinc 793, Ref signal update, Pulse stream vs OCXO

V19 – Ref signal update, GPS Ref.

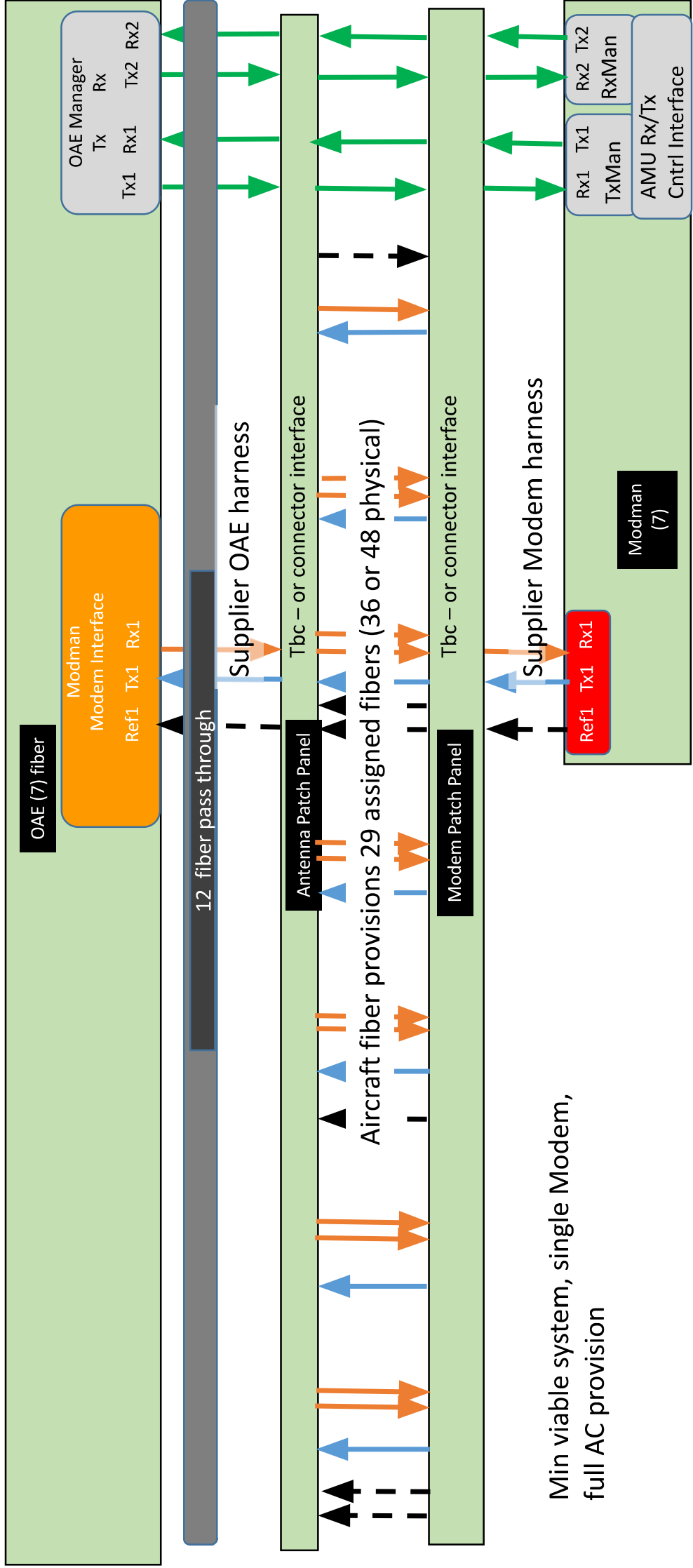
V20 – EFn-Modman, all AMUs gone, Cleanup

13.Oct.2023

Edits V20 were made in Google Presentation and converted to ppt.



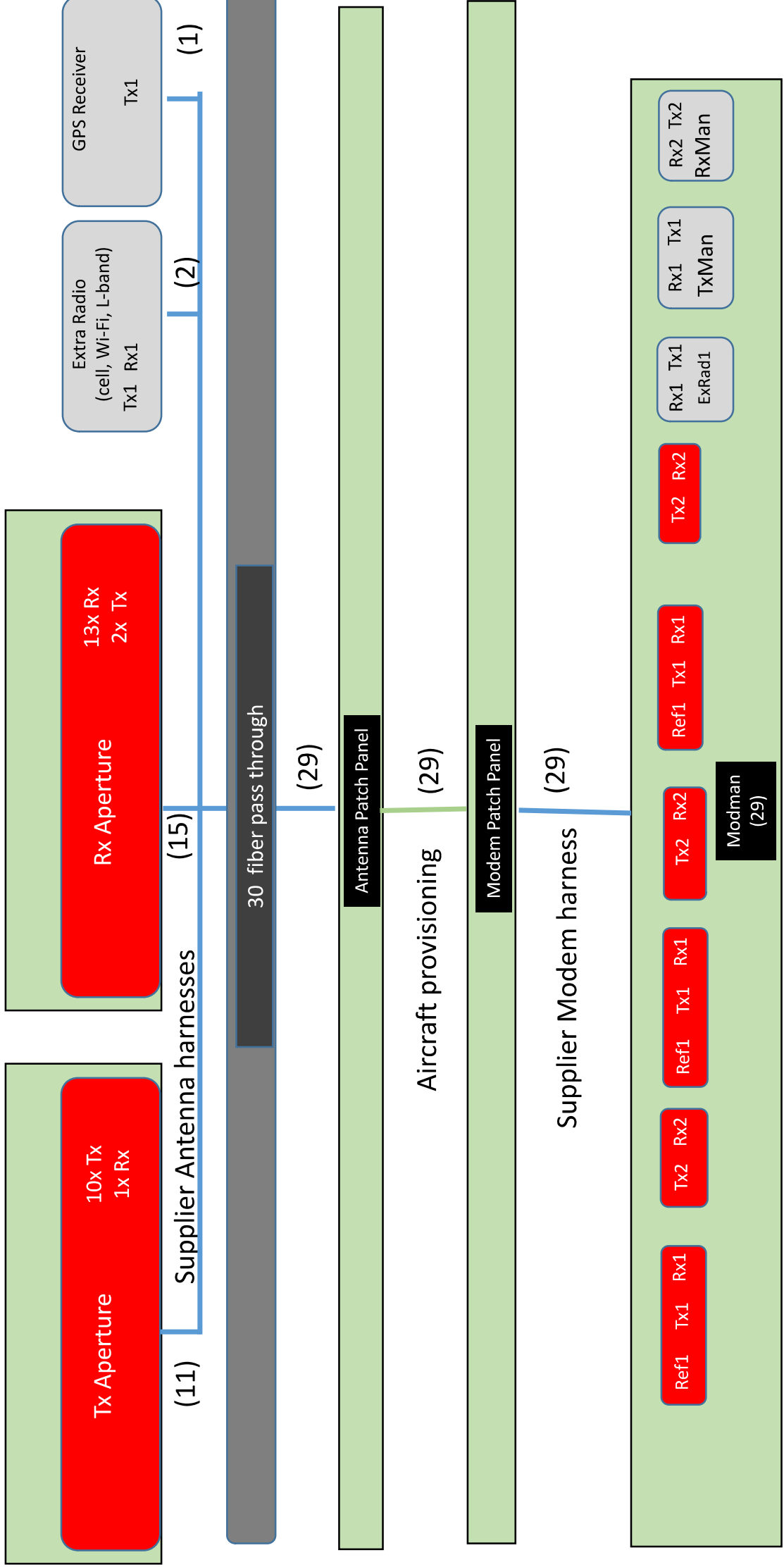
Note: There is no required assignment of LXO to Modems, LXO1 is shown under Modem 2 because it was the easier edit.



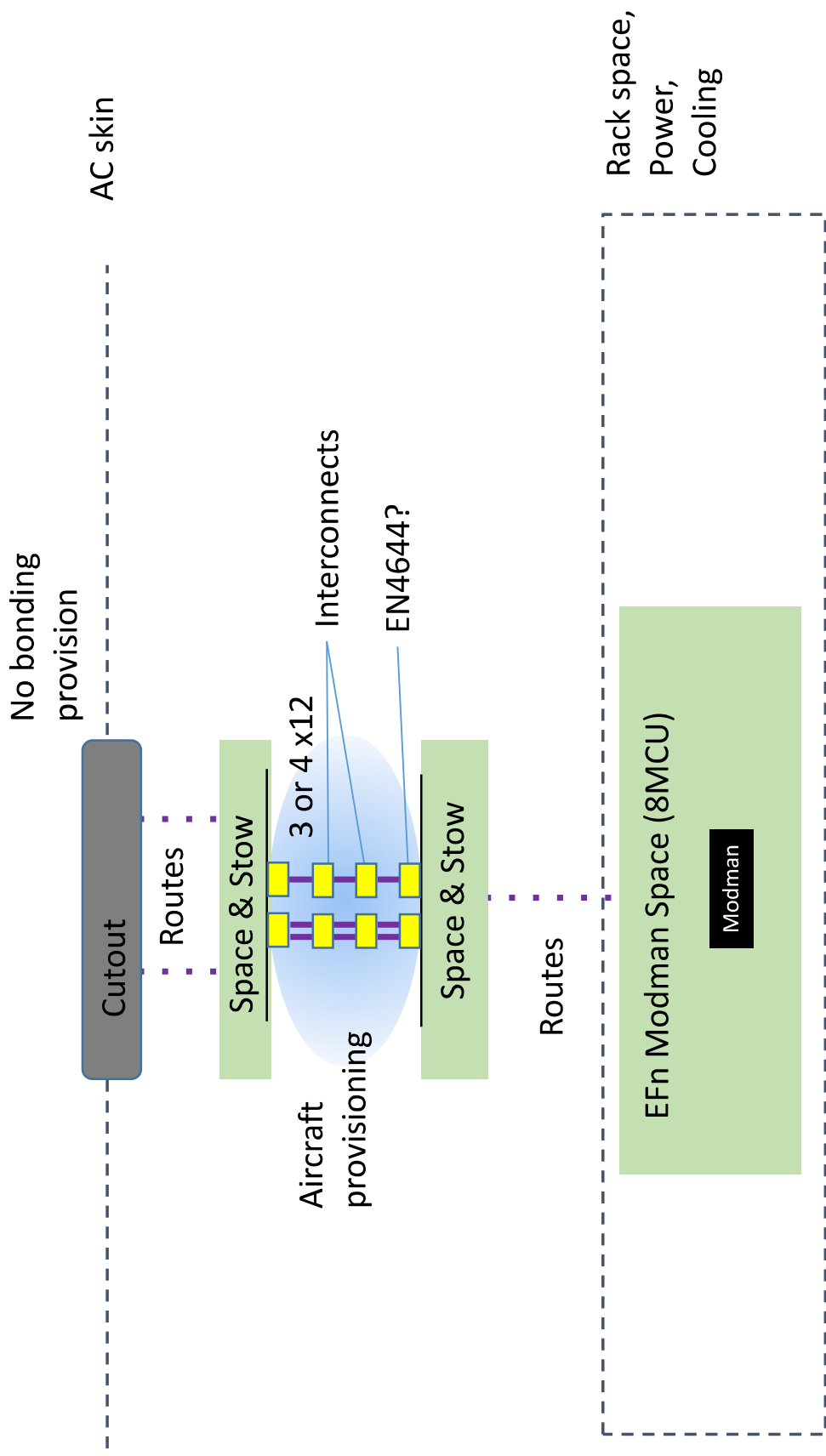
Min viable system, single Modem, full AC provision

FO Routing & harness layout (Net count)

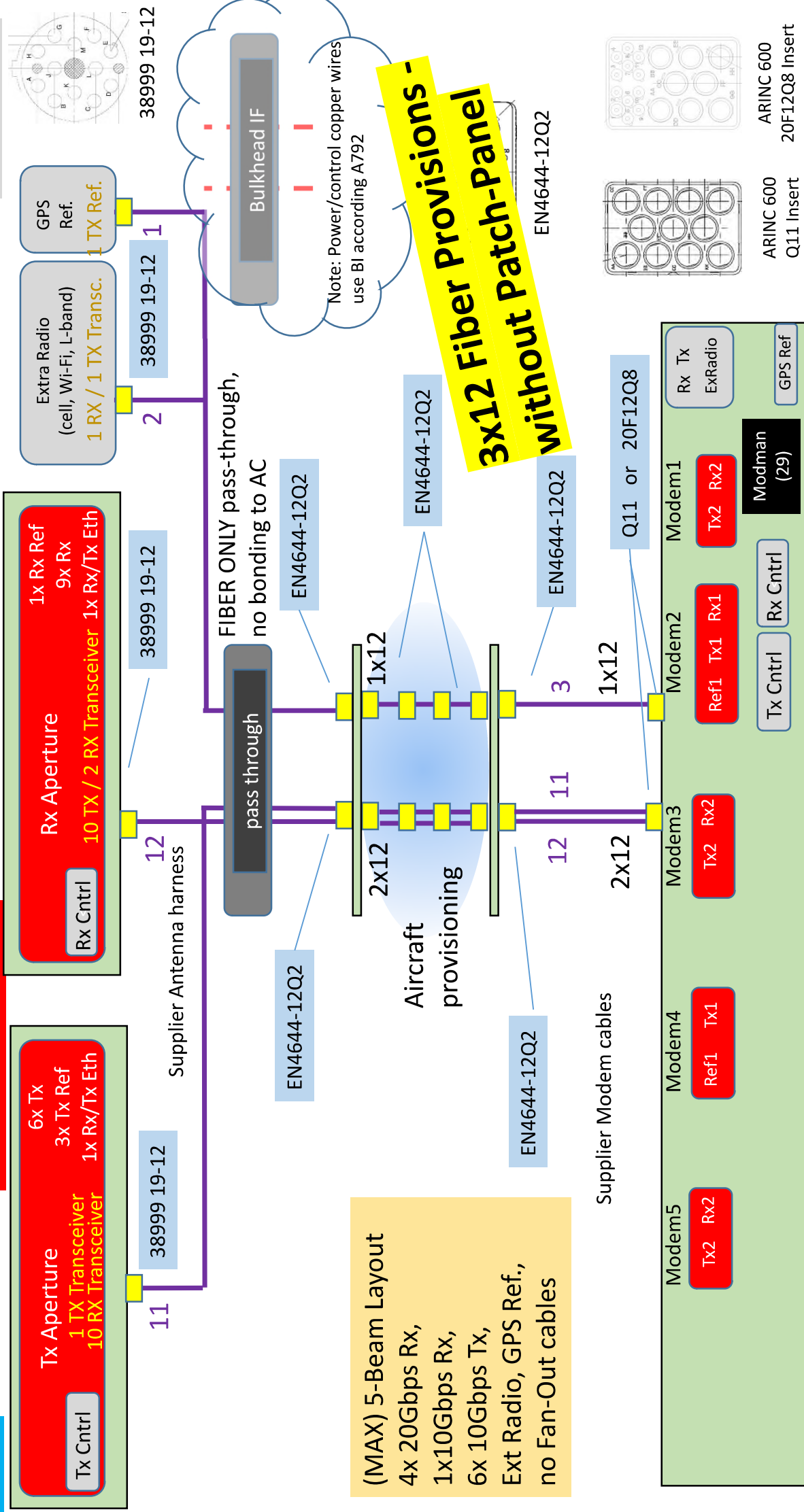
Tx and Rx: Ethernet

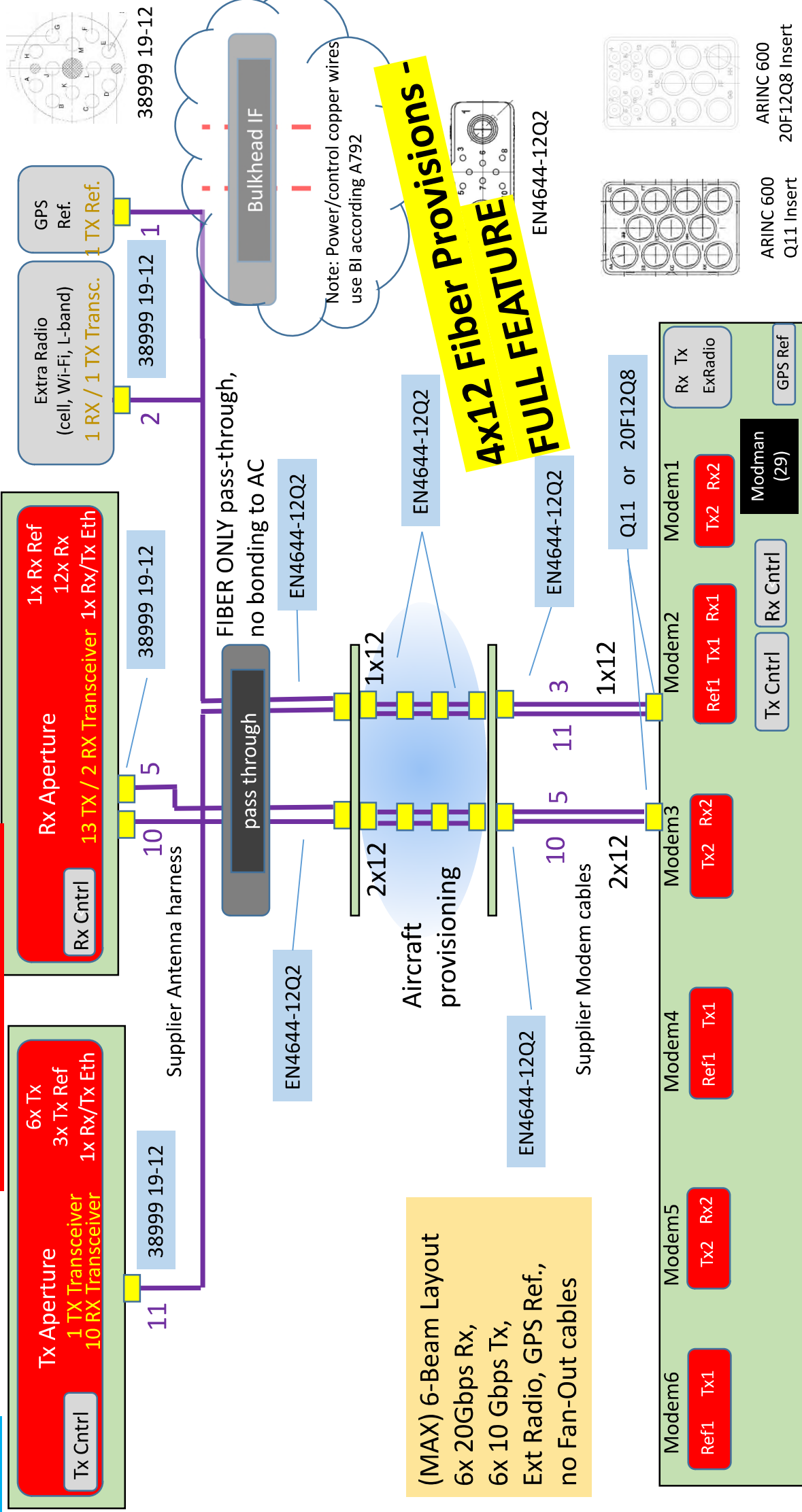


# Aircraft fiber & space related provisioning













Modman / AMU1 / AMU2 - Rack		Rx/TxConn.			MT Pin			Tx Aperture			Conn. MT Pin Rx/Tx Designation			Rx Aperture			Conn. MT Pin Rx/Tx Designation			Aux Radio			
Modem	Type	Rx	Tx	Conn.	MT	Pin	Conn.	MT	Pin	Rx/Tx Designation	Conn.	MT	Pin	Rx/Tx Designation	Conn.	MT	Pin	Rx/Tx Designation	Conn.	MT	Pin	Rx/Tx Designation	
MM Modem 1	Rec	Rx		J1	1	1					J1	1	1	Tx									
MM Modem 1	Rec2	Rx		J1	1	2					J1	1	2	Tx									
MM Modem 1	Ref-Out	Tx		J1	1	3					J1	1	3	Rx									
MM Modem 1	Trans	Tx		J1	2	1					J1	1	1	Rx									
MM Modem 1	Ref-Out	Tx		J1	2	2					J1	1	2	Rx									
MM Modem 2	Rec	Rx		J1	1	4																	
MM Modem 2	Rec2	Rx		J1	1	5																	
MM Modem 2	Trans	Tx		J1	2	3					J1	1	3	Rx									
MM Radio AUX	Rec	Rx		J1	3	1																	
MM Radio AUX	Trans	Tx		J1	3	2																	
MM ETH Tx	Eth	Rx		J1	2	4					J1	1	4	Tx									
MM ETH Tx	Eth	Tx		J1	2	5					J1	1	5	Rx									
MM ETH Rx	Eth	Rx		J1	1	6																	
MM ETH Rx	Eth	Tx		J1	1	7																	
MM GPS Ref 1	Ref-In	Rx		J1	3	3																	
MM Modem 3	Rec	Rx		J1	1	8																	
MM Modem 3	Rec2	Rx		J1	1	9																	
MM Modem 3	Trans	Tx		J1	2	6					J1	1	6	Rx									
MM Modem 3	Ref	Tx		J1	2	7					J1	1	7	Rx									
MM Modem 4	Rec	Rx		J1	1	10																	
MM Modem 4	Rec2	Rx		J1	1	11																	
MM Modem 4	Trans	Tx		J1	2	8					J1	1	8	Rx									
MM Modem 5	Rec	Rx		J1	1	12																	
MM Modem 5	Rec2	Rx		J1	3	1																	
MM Modem 5	Trans	Tx		J1	2	9					J1	1	9	Rx									
MM Modem 5	Ref	Tx		J1	2	10					J1	1	10	Rx									
MM Modem 6	Rec	Rx		J1	3	2																	
MM Modem 6	Rec2	Rx		J1	3	3																	
MM Modem 6	Trans	Tx		J1	2	11					J1	1	11	Rx									

Re-sorting for cots transceivers in case of 48 fiber provisions, 10xTx / 4Rx/4Tx possible, with min viable on 4+4 side.

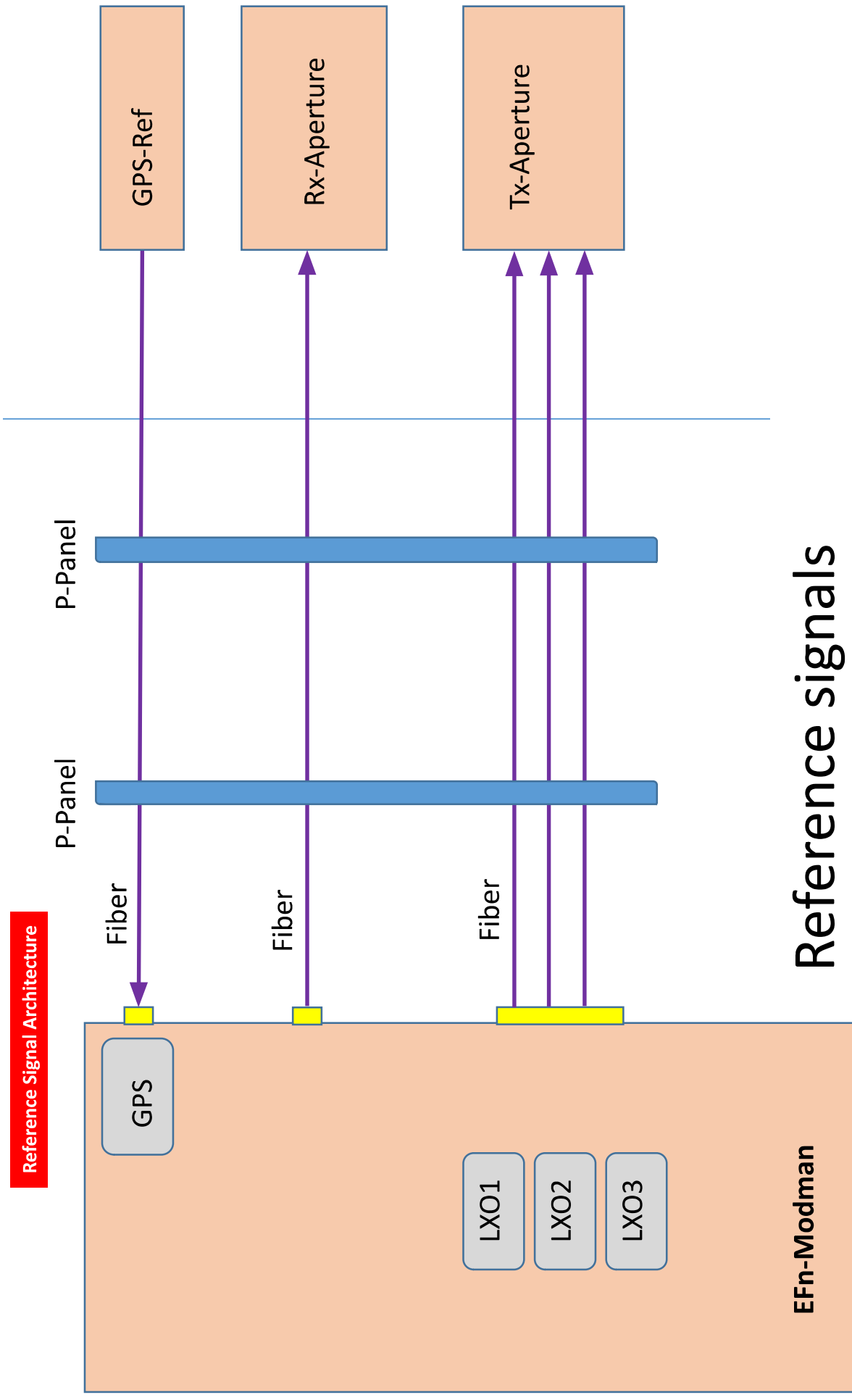
All REF signals are RFoF.

J1 1 1 Tx MM-AuxRec  
 X J1 1 2 Rx MM-AuxTrans

J1 1 3 Tx GPS Ref out

There is potential to add e.g. ETH to the ext. radios

Reference Signal Architecture



Reference signals  
(current EFn-MODMAN architecture)

### Rationales:

Rx data rate is calculated to require max 15Gbps, two parallel fibers with 10Gbps each selected for component and transceiver simplicity.

### Reference signals:

One Ref signal distributed from Modman and each AMU to the antenna, analog RF-over-fiber, range 10 to 100MHz. Ref. DIFI discussion.

Add one fiber dedicated to GPS from OAE to Modman

All com between Modman and AMU (References and AMIP/Control) is assumed on copper ethernet and not shown in the fiber architecture drawings.

### ASSUMPTIONS:

- EN4644 10Q2 Insert can be used to either connect to equipment or between harnesses
- ~~- Transceiver options are (4xRx + 4xTx) OR (12xRx) OR (12xTx)~~
- Transceivers can be fully utilized (12x per IMT), any combination of Rx and Tx

Cables:

Multi-fiber cable for MT terminus termination = ARINC 802 Cable, Appendix K, 12 fiber cable (50/125)  
 Single channel fiber cable = ARINC 802, Appendix I, but need to consider a double jacketed version (50/125)



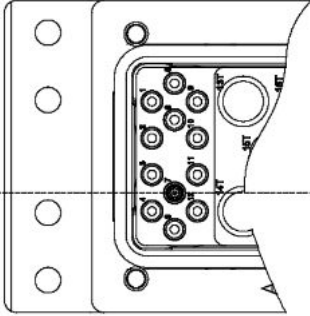
ARINC 802 Cable, Appendix K,  
12 Fibers, for MT



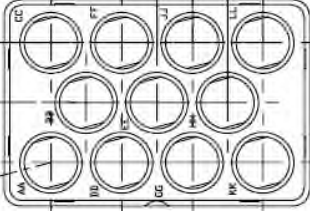
ARINC 802 Cable, Appendix I,  
Single Fiber, for ARINC 801

Connectors:

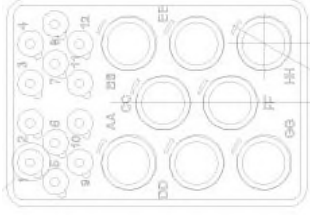
Rack mounted equipment = ARINC 600 type with inserts that accept quadrx contacts for ARINC 846 MT terminus or single channel fibers with ARINC 801 terminus. Disconnects between rack mounted equipment and antennas ARINC 801 single insert rectangular shell (EN4644) with 10Q2 insert for A846 MT termini or 1F12 for single channel fibers with ARINC 801 terminus



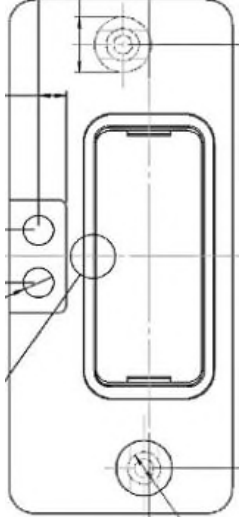
ARINC 600  
Connector



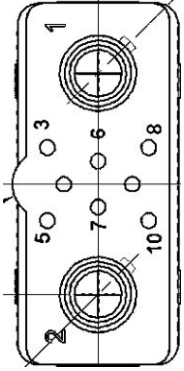
ARINC 600  
Q11 Insert



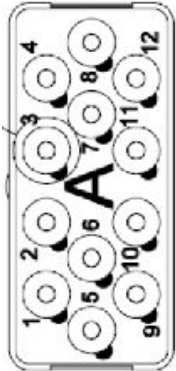
ARINC 600  
20F12Q8 Insert



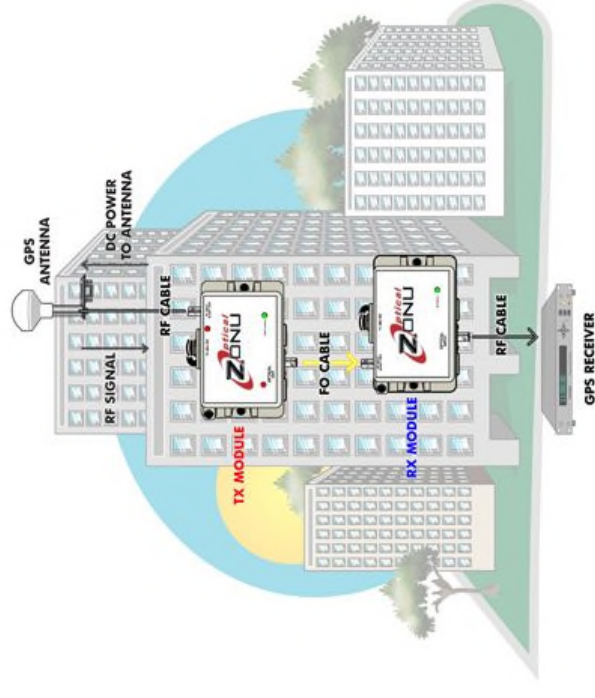
ARINC 801 (EN4644)  
Single Insert Connector



EN4644 10Q2 Insert



ARINC 801 12F12 Insert



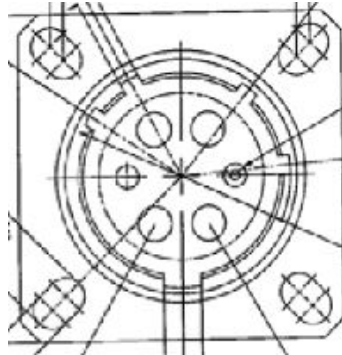
Shared in WS 11. Oct 23 Franklin WI

<https://rfoptic.com/Downloads/low-frequency/RFoF-2.5GHz-for-GPS.pdf>

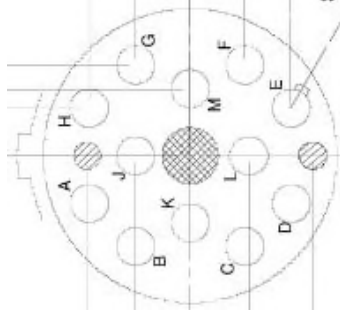
[https://www.opticalzону.com/solutions/link/](https://www.opticalzonu.com/solutions/link/)

Connectors (cont'd):

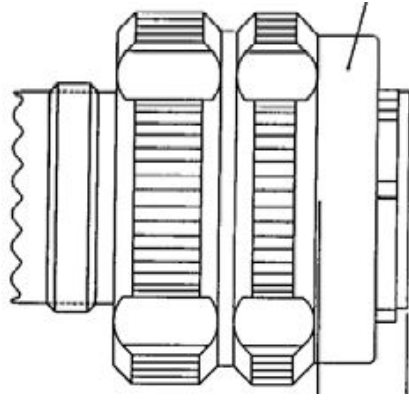
Antenna Equipment Harness = ARINC 801 circular (D38999 Type) that accepts single channel ARINC 801



ARINC 801 (D38999)  
Receptacle Shell Size 19



ARINC 801 (D38999)  
Arrangement 19-12



ARINC 801 (D38999) Plug  
Shell Size 19

Connectors (cont'd):

round fiber cables with 12 fibers (MT) is approx 3 to 4mm diameter

AWG 16 and 22 cables (according EN2267) are approx 1.8 and 1.1mm

Quadrax (4xAWG24) = 5mm dia.

Table 1

Code for nominal section	Nominal section mm <sup>2</sup>	AWG <sup>a</sup>	Linear resistance at 20 °C		External diameter		Mass kg/km max.
			Ω/km max.		mm min.	mm max.	
001	0,15	26	160,0		0,75	0,84	2,08
002	0,25	24	114,0		0,85	0,96	2,72
004	0,4	22	60,0		1,00	1,10	4,14
006	0,6	20	33,2		1,22	1,34	6,85
010	1	18	21,1		1,46	1,61	10,43
012	1,2	16	14,5		1,76	1,92	14,61
020	2	14	10,9		2,04	2,24	19,78
030	3	12	6,8		2,50	2,70	31,33
051	5	10	4,1		3,13	3,33	49,85
090	9	8	2,3		4,10	4,40	90,00
140	14	6	1,58		5,30	5,70	135,0
220	22	4	0,97		6,71	7,41	222,0
340	34	2	0,61		8,28	9,16	347,0

<sup>a</sup> AWG = closest American Wire Gage.



Connectors (cont'd):

Arinc 836A MiniMRP - not needed in case of 48 fiber provisions

