
SERVICE BULLETIN

N° **139-748**

OPTIONAL

DATE: September 20, 2024

REV.: /

TITLE

ATA 23 - RADIO P25 INSTALLATION

REVISION LOG

First Issue

1. PLANNING INFORMATION

A. EFFECTIVITY

All AW139 helicopters from S/N 41801 to S/N 41806.

B. COMPLIANCE

At Customer's option.

C. CONCURRENT REQUIREMENTS

N.A.

D. REASON

This Service Bulletin is issued in order to provide the necessary instruction on how to perform the installation of the Kit Radio P25 P/N 4G2310F08411 and the ARC-210 Variant P/N 3G2310P04711.

LH issued this SB for the following reason:

Helicopter Reliability/Maintainability	
Product Improvement	
Obsolescence	
Customization	✓
Product/Capability Enhancement	

E. DESCRIPTION

Part I of this Service Bulletin gives instruction to perform the RT7000 RMR single APX module complete provision P/N 3G2310A31111, which consists in:

- the avionic bay liner retro mod P/N 3G2580P37511, for the replacement of a liner in the baggage compartment;
- the panel avionic bay installation P/N 3G5311A72511, for introduction of the avionic shelf required for the radio transceiver installation;
- the structural provision P/N 3G5311A72411 and electrical provision P/N 3G2310A31211 required for the kit;
- the ARC-210 variant P/N 3G2310P04711;
- the installation of the new NVIS auxiliary breaker panel P/N 3G2490L06462 and all the associated electrical installation;

Part II of this Service Bulletin gives instruction to perform the RT7000 RMR single APX module equipment installation P/N 3G2310A31311, which consists in the installation of the antenna VHF/UHF, the control panel and the radio transceiver.

F. APPROVAL

The technical content of this Service Bulletin is approved under the authority of DOA nr. EASA.21.J.005. For helicopters registered under other Aviation Authorities, before applying the Service Bulletin, applicable Aviation Authority approval must be checked within Leonardo Helicopters customer portal.

EASA states mandatory compliance with inspections, modifications or technical directives and related time of compliance by means of relevant Airworthiness Directives.

If an aircraft listed in the effectivity embodies a modification or repair not LHD certified and affecting the content of this Service Bulletin, it is responsibility of the Owner/Operator to obtain a formal approval by Aviation Authority having jurisdiction on the aircraft, for any adaptation necessary before incorporation of the present Service Bulletin.

G. MANPOWER

To comply with this Service Bulletin the following MMH are deemed necessary.

Part I: approximately three hundred (300);

Part II: approximately one hundred (100).

MMH are based on hands-on time and can change with helicopter configuration, personnel and facilities available. MMH are not comprehensive of the overall hours necessary to get access to work areas and to remove all the equipment that interferes with the application of the prescribed instructions.

H. WEIGHT AND BALANCE

PART I

WEIGHT (kg)	ARM (mm)	MOMENT (kg-mm)
		4,5
LONGITUDINAL BALANCE	6546	29130
LATERAL BALANCE	438	1948

PART II

WEIGHT (kg)	ARM (mm)	MOMENT (kg-mm)
		3,1
LONGITUDINAL BALANCE	6413	19880
LATERAL BALANCE	103	319

I. REFERENCES

I.1 PUBLICATIONS

Following Data Modules refer to AMP:

<u>DATA MODULE</u>	<u>DESCRIPTION</u>	<u>PART</u>
DM01 39-A-00-20-00-00A-120A-A	Helicopter safety – Pre-operation.	I, II
DM02 39-A-06-41-00-00A-010A-A	Access doors and panels - General data.	I, II
DM03 39-A-11-00-01-00A-720A-A	Decal - Install procedure	I, II

Following Data Modules refer to CSPP:

<u>DATA MODULE</u>	<u>DESCRIPTION</u>	<u>PART</u>
DM04 CSPP-A-20-10-13-00A-622A-D	Electrical contacts - Crimp	I
DM05 CSPP-A-20-10-02-00A-622A-D	Terminal lug - Crimp	I
DM06 CSPP-A-20-40-00-02A-711A-D	Threaded fasteners - Tighten procedure	II

I.2 ACRONYMS & ABBREVIATIONS

AMD	Aircraft Material Data Information
AMP	Aircraft Maintenance Publication
AR	As Required
C/A	Cable Assy
CB	Circuit Breaker
CSPP	Common Standard Practices Publication
DM	Data Module
DOA	Design Organization Approval
EASA	European Aviation Safety Agency
IPD	Illustrated Parts Data
ITEP	Illustrated Tool and Equipment Publication
LH	Leonardo Helicopters
MMH	Maintenance Man Hours
N.A.	Not Applicable
NVG	Night Vision Goggle
NVIS	Night Vision Imaging System
P/N	Part Number
RCDU	Remote Control Display Unit
S/N	Serial Number

SB Service Bulletin
UHF Ultra High Frequency
VHF Very High Frequency

I.3 ANNEX

Annex A RT-7000RMR 1APX P25 Acceptance Test Procedure
Annex B RT-7000RMR 1APX P25 Configuration Management Index

J. PUBLICATIONS AFFECTED

N.A.

K. SOFTWARE ACCOMPLISHMENT SUMMARY

N.A.

2. MATERIAL INFORMATION

A. REQUIRED MATERIALS

A.1 PARTS

PART I

#	P/N	ALTERNATIVE P/N	DESCRIPTION	Q.TY	LVL	NOTE	LOG P/N
1	4G2310F08411		KIT RT7000 RMR SINGLE APX MODULE	REF	.		
2	3G2310A31111		RT7000 RMR SINGLE APX MODULE COMPLETE PROVISION	REF	..		
3	3G5311A72411		RT7000 RMR SINGLE APX MODULE STRUCTURAL PROVISION	REF	...		
4	3G2580P37511		AVIONIC BAY LINER RETRO MOD	REF	....	
5	3G2580P37631		Baggage liner lateral RH upper rework	REF	.....	(1)	
6	3G2580P37731		Baggage liner lateral RH lower rework	REF	.....	(1)	
7	3G5311A72511		PANEL AVIONIC BAY INSTALLATION	1	....	
8	3G5315A64931		Angle assy	2	.....	
9	3G5315A67452		Support FWD RH	1	.....	
10	3G5318A79431		Panel assy	1	.....	
11	3G5318A79831		Right cross beam assy	1	.....	
12	3G5318A79951		Support	1	.....	
13	3G5318A80051		Support RHS	1	.....	
14	3G5318A80851		Internal plate	1	.....	
15	AN3-12A		Bolt	12	.....	
16	AW011TY001FB02 A		Washer	1	.....	
17	MS20426AD3-4		Rivet	0.1 kg	.....	
18	MS20426AD4-4		Rivet	0.1 kg	.....	
19	MS20470AD3-4		Rivet	0.1 kg	.....	
20	A297A04TW02		Rivet	0.1 kg	.....	
21	AGS2067-306		Rivet	0.1 kg	.....	
22	MS21043-3		Nut	9	.....	
23	MS21075L3N		Nut plate	1	.....	
24	MS27039-1-04		Screw	2	.....	
25	MS27039-1-07		Screw	4	.....	
26	NAS1149D0316K		Washer	11	.....	
27	NAS1149D0332K		Washer	6	.....	
28	NAS1832-3-4M		Insert	4	.....	
29	3G5317A63131		Cover plate assy	1	....	
30	3G5318A90351		Adapter plate	1	....	
31	3G5318A90451		Adapter plate	1	....	
32	3G5318A89451		Shim	1	....	
33	3G5318A89452		Shim	1	....	
34	999-7000-07-104		Terminal	1	....	
35	NAS9302-4-03		Rivet	0.1 kg	....	
36	A407A08C1P		Anchor nut	4	....	
37	AN525-10R9		Screw	5	....	
38	AN525-832R9		Screw	2	....	
39	AW007TE-30-212		Insert	4	....	

#	P/N	ALTERNATIVE P/N	DESCRIPTION	Q.TY	LVL	NOTE	LOG P/N
40	MS20426AD3-4		Rivet	0.1 kg	....	
41	MS20426AD5-4		Rivet	0.1 kg	....	
42	MS21069L3		Nut plate	6	....	
43	MS27039-0809		Screw	4	....	
44	MS27039-1-07		Screw	6	....	
45	NAS1149D0332K		Washer	6	....	
46	NAS1149DN832K		Washer	4	....	
47	3G2310A31211		RT7000 RMR SINGLE APX MODULE ELECTRICAL PROVISION	REF	...		
48	3G9A01A79101		Radio RT 7000RMR C/A (A1A791)	1	....	
49	3G9A01B73601		Radio RT 7000RMR C/A (A1B736)	1	....	
50	3G9A02B69601	3G2310A31211A1R	Radio RT 7000RMR C/A (A2B696)	1	....	
51	3G9B01R21601		Radio RT 7000RMR C/A (B1R216)	1	....	
52	3G9B01R21701	3G2310A31211A2R	Radio RT 7000RMR C/A (B1R217)	1	....	
53	3G9B02B86901		Radio RT 7000RMR C/A (B2B869)	1	....	
54	3G9C01B44001		Radio RT 7000RMR C/A (C1B440)	1	....	
55	3G9C02B49301	3G2310A31211A3R	Radio RT 7000RMR C/A (C2B493)	1	....	
56	3G9C03B36701		Radio RT 7000RMR C/A (C3B367)	1	....	
57	630B022B10BP		Adapter	1	....	
58	A10099		Metallic band	1	....	
59	A363A01		Terminal stud assy	1	....	
60	A366A3E12C		Stud	1	....	
61	A388A3E06C		Standoff	3	....	
62	A388A3E06C75		Standoff	1	....	
63	A631A02A		Spacer for cable bundles	1	....	
64	AW001CB03H		Clamp	4	....	
65	AW001CB05H		Clamp	9	....	
66	AW002FT109		Grommet	1	....	
67	ED300GS3012		Decal	1	....	
68	M85049/93-10		Support ring	1	....	
69	MS25036-102		Terminal lug	1	....	
70	MS35489-20		Grommet	2	....	
71	NAS1149D0332J		Washer	6	....	
72	NAS1190E3P12AK		Screw	3	....	
73	NAS1190E3P6AK		Screw	1	....	
74	NAS1190E3P7AK		Screw	1	....	
75	NAS1802-3-9		Screw	1	....	
76	NAS43DD3-27N		Spacer	3	....	
77	AW001CL001-N6		Support	6	....	
78	AW001TL3A06		Anchor nut	1	....	
79	AW001CL509-N6		Support	1	....	
80	M85049/95-25A-A		Retaining plate	1	....	
81	MS35206-228		Screw	4	....	
82	NAS1149DN616J		Washer	4	....	
83	ED300J138		Decal	1	....	
84	D38999/26JJ35PB		Electrical connector	1	....	
85	D38999/20JJ35SB		Electrical connector	1	....	
86	A529A400-2502C		Backshell	2	....	

#	P/N	ALTERNATIVE P/N	DESCRIPTION	Q.TY	LVL	NOTE	LOG P/N
87	MS3320-3		Circuit breaker	1	....	
88	MS3320-10		Circuit breaker	1	....	
89	ED300CB817		Decal	1	....	
90	ED300CB818		Decal	1	....	
91	AW001YC01RED		Locking ring	2	....	
92	AS44417-B12		Plug	6	....	
93	A556A-T20		Electrical wire	3 m	....	(2)	
94	A556A-T16		Electrical wire	4 m	....	(3)	
95	A556A-T12		Electrical wire	1 m	....	(4)	
96	MS25036-149		Electrical contact	1	....	
97	MS25036-153		Electrical contact	3	....	
98	MS25036-156		Electrical contact	2	....	
99	M39029/56-352		Electrical contact	1	....	
100	A523A-A05		Electrical contact	4	....	
101	M39029/56-348		Electrical contact	37	....	
102	M39029/56-351		Electrical contact	16	....	
103	M39029/58-360		Electrical contact	21	....	
104	M39029/58-363		Electrical contact	13	....	
105	M39029/58-364		Electrical contact	3	....	
106	031-1147-002		Electrical contact	2	....	
107	3G2490L06462		Illuminated NVIS panel AUX breaker (NVG)	1	.		
108	MS25036-108		Terminal lug	1	.		
109	3G9A01B73801	3G2310P04711A1R	ARC-210 variant C/A (A1B738)	1	..		
110	3G9A02B70201		ARC-210 variant C/A (A2B702)	1	..		
111	3G9B02B87301		ARC-210 variant C/A (B2B873)	1	..		
112	3G9C02B49901	3G2310P04711A2R	ARC-210 variant C/A (C2B499)	1	..		
113	3G9C02B50001		ARC-210 variant C/A (C2B500)	1	..		
114	3G5310A89111		INLET BARRIER FILTER STRUCTURAL PROVISION	REF	.		
115	A414A04C238A1		Support	1	..		
116	NAS1720H5L2A		Rivet	0.1 kg	..		
117	NAS1802-3-5		Screw	4	.		
118	NAS1149D0332J		Washer	4	.		

PART II

#	P/N	ALTERNATIVE P/N	DESCRIPTION	Q.TY	LVL	NOTE	LOG P/N
119	4G2310F08411		KIT RT7000 RMR SINGLE APX MODULE	REF	.		
120	3G2310A31311		RT7000 RMR SINGLE APX MODULE EQUIPMENT INSTALLATION	REF	..		
121	300-072411-01		Single mounting tray	1	...		
122	3G2310I01331		RT-7000 RMR (1APX) VCD	1	...		
123	AW001GH048A		Conductive gasket	1	...		
124	CI 295-300-4		Antenna VHF/UHF (black)	1	...		
125	ED300A895		Decal	1	...		
126	ED300E234		Decal	1	...		
127	ED300PL260		Decal	1	...		
128	MS20995C15		Lock wire	0.45 kg	...		
129	MS24694-S54		Screw	6	...		
130	NAS1802-3-6		Screw	4	...		

#	P/N	ALTERNATIVE P/N	DESCRIPTION	Q.TY	LVL	NOTE	LOG P/N
131	RCDU-7000-002-002		Remote control display unit	1	...		

Refer also to IPD for the spares materials required to comply with the AMP DMs referenced in the accomplishment instructions.

A.2 CONSUMABLES

The following consumable materials, or equivalent, are necessary to accomplish this Service Bulletin:

#	SPEC./LHD CODE NUMBER	DESCRIPTION	Q.TY	NOTE	PART
132	199-05-002, Ty I, CI 2	Adhesive EA9309.3NA (C021)	AR	(5)	I
133	199-05-002, Ty II, CI 2	Adhesive EA934NA (C397)	AR	(5)	I
134	-	Adhesive CB200-40 (C356)	AR	(5)	I
135	A236A02AB	Edging	AR	(5) (6)	I
136	EN6049-006-05-5	Nomex	AR	(5)	I
137	EN6049-006-08-5	Nomex	AR	(5)	I
138	EN6049-006-13-5	Nomex	AR	(5)	I
139	EN6049-006-19-5	Nomex	AR	(5)	I
140	EN6049-006-25-5	Nomex	AR	(5)	I
141	AW002XM002B	Tubular braid	AR	(5)	I
142	AW002XM005B	Tubular braid	AR	(5)	I
143	AW002XM101B	Tubular braid	AR	(5)	I
144	AW002XM102B	Tubular braid	AR	(5)	I
145	AW001XM01	Metal braid	AR	(5)	I
146	M23053/8-004-C	Insulation sleeving	AR	(5)	I
147	Commercial	Conductive adhesive CHO-BOND 584-29	AR	(5)(7)	I
148	AW001CK03LC	Lacing cord	AR	(5)	I, II
149	AWMS05-001, Ty I, CI B, Gr 2 N. 99999999000015245	Sealant MC780 B2 (C465)	AR	(5)	II
150	EE267-02-075B	Silicone Tape	AR	(5)	II
151	AD89503FR-01-36 N. 99999999000008091	StretchSeal tape	AR	(5)	II

Refer also to AMDI for the consumable materials required to comply with the AMP DM referenced in the accomplishment instructions.

A.3 LOGISTIC MATRIX

N.A.

NOTES

- (1) This item is obtained from the rework of the existing right upper liner bonded assy P/N 3G2580A40332.
- (2) To be marked as connection 846-20.
- (3) 3 m to be marked as connection 848-16 and 1 m to be marked as connection 890-16.
- (4) To be marked as connection 847-12.
- (5) Item to be procured as local supply.

(6) Indicated P/N refer to a specific size. The last digits can be different based on the actual required installation.

(7) Alternatively you can order adhesive Raychem S1184 (C327).

B. SPECIAL TOOLS

The following special tools, or equivalent, are necessary to accomplish this Service Bulletin:

#	P/N	DESCRIPTION	Q.TY	NOTE	PART
152	Commercial	Bondimeter	1	(B1)	I

Refer also to ITEP for the special tools required to comply with the AMP DM referenced in the accomplishment instructions.

Refer also to Annex A and Annex B for the special tools required to comply with this Service Bulletin.

SPECIAL TOOLS NOTES

(B1) Item to be procured as local supply.

C. INDUSTRY SUPPORT INFORMATION

Customization.

3. ACCOMPLISHMENT INSTRUCTIONS

GENERAL NOTES

- a) Place an identification tag on all components that are re-usable, including the attaching hardware that has been removed to gain access to the modification area and adequately protect them until their later re-use.
- b) Shape the cables in order to prevent interference with the structure and the other existing installations, using where necessary suitable lacing cords and plastic cable tiedown.
- c) Exercise extreme care during drilling operations to prevent instruments, cables and hoses damage.
- d) After drilling, remove all swarf and sharp edges. Apply on bare metal a light film of primer unless the hole is used for ground connection.
- e) During the installation of bonding braids or components requiring grounding, clean the surface structure in order to obtain a good ground contact.
- f) Let adhesive cure at room temperature for at least 24 hours unless otherwise specified.
- g) Exposed thread surface and nut must be protected using a layer of tectyl according to MIL-C-16173 grade I.
- h) All lengths are in mm.

PART I

1. In accordance with AMP DM 39-A-00-20-00-00A-120A-A, prepare the helicopter on ground for a safe maintenance. Disconnect the battery, all electrical power sources and/or the external power supply.
2. In accordance with AMP DM 39-A-06-41-00-00A-010A-A and with reference to Figures 10 and 29, remove all external panels, internal panels and internal liners as required to gain access to the area affected by the installation and perform the inlet barrier filter structural provision P/N 3G5310A89111 as described in the following procedure:
 - 2.1 With reference to Figure 29, in order to get access for riveting it is possible to remove the bracket P/N 3P5315A12331.

- 2.2 With reference to Figure 29 Section A-A and Section B-B, temporarily locate the bracket P/N A414A04C238A1 on the bracket P/N 3P5315A12331 and countermark n°3 holes-positions in accordance with the dimensions shown.
 - 2.3 With reference to Figure 29 Section A-A and Section B-B, drill n°3 rivet-holes thru the bracket P/N 3P5315A12331 previously countermarked.
 - 2.4 With reference to Figure 29 Section B-B, prepare the indicated surface on the bracket by removing soluble or non-soluble treatments and/or by cleaning the chromed surfaces to assure correct electrical bonding.
 - 2.5 With reference to Figure 29 Section A-A and Section B-B, install the bracket P/N A414A04C238A1 on the bracket P/N 3P5315A12331 by means of n°3 rivets P/N NAS1720H5L2A.
 - 2.6 If previously removed, re-install the bracket P/N 3P5315A12331 by means of n°4 washers P/N NAS1149D0332J and n°4 screws P/N NAS1802-3-5.
3. In accordance with AMP DM 39-A-06-41-00-00A-010A-A and with reference to Figures 1 thru 21, 27, 28 and 30 thru 40, remove all external panels, internal panels and internal liners as required to gain access to the area affected by the installation of the kit RT7000 RMR single APX module P/N 4G2310F08411 and perform the RT7000 RMR single APX module complete provision P/N 3G2310A31111 as described in the following procedure:
 - 3.1 With reference to Figures 1 thru 7, 27 and 28, perform the RT7000 RMR single APX module structural provision P/N 3G5311A72411 as described in the following procedure:
 - 3.1.1 With reference to Figure 4, remove the right upper liner bonded assy P/N 3G2580A40332 and retain the fixing hardware for later reuse.
 - 3.1.2 With reference to Figure 27, perform the baggage liner lateral RH lower rework P/N 3G2580P37731 as described in the following procedure:
 - 3.1.2.1 With reference to Figure 27, perform the indicated cut-out of the right upper liner bonded assy P/N 3G2580A40332 in accordance with the dimensions shown.
 - 3.1.2.2 With reference to Figure 27 Section A-A, apply the adhesive EA934NA (C397) around the edges of the right upper liner bonded assy P/N 3G2580A40332.
 - 3.1.2.3 With reference to Figure 27, remark the right upper liner bonded assy P/N 3G2580A40332 as the baggage liner lateral RH lower rework P/N 3G2580P37731.
 - 3.1.3 With reference to Figure 28, perform the baggage liner lateral RH upper rework P/N 3G2580P37631 as described in the following procedure:

- 3.1.3.1 With reference to Figure 28, perform the indicated cut-out of the right upper liner bonded assy P/N 3G2580A40332 in accordance with the dimensions shown.
- 3.1.3.2 With reference to Figure 28 Section A-A, apply the adhesive EA934NA (C397) around the edges of the right upper liner bonded assy P/N 3G2580A40332.
- 3.1.3.3 With reference to Figure 28, remark the right upper liner bonded assy P/N 3G2580A40332 as the baggage liner lateral RH upper rework P/N 3G2580P37631.
- 3.1.4 With reference to Figures 5 thru 7, perform the panel avionic bay installation P/N 3G5311A72511 as described in the following procedure:
 - 3.1.4.1 With reference to Figure 5 View A, prepare the indicated surface on the panel assy P/N 3G5318A79431 by removing soluble or non-soluble treatments and/or by cleaning the chromed surfaces to assure correct electrical bonding in accordance with the dimensions shown
 - 3.1.4.2 With reference to Figure 6 View D, prepare the indicated surface by removing soluble or non-soluble treatments and/or by cleaning the chromed surfaces to assure correct electrical bonding in accordance with the dimension shown.
 - 3.1.4.3 With reference to Figure 5 View A and Figure 6 View D, temporarily locate the right cross beam assy P/N 3G5318A79831 and the panel assy P/N 3G5318A79431 on the lower right beam in accordance with the dimensions shown. Countermark n°3 hole-positions on the lower right beam.
 - 3.1.4.4 With reference to Figure 6 View D, drill n°3 holes Ø5.25÷5.50 previously countermarked thru the lower right beam (coordinate with the panel assy P/N 3G5318A79431 and the right cross beam assy P/N 3G5318A79831).
 - 3.1.4.5 With reference to Figure 6 View D, temporarily locate the right cross beam assy P/N 3G5318A79831 on the lower right beam in accordance with the dimensions shown. Countermark n°10 positions on the lower right beam.
 - 3.1.4.6 With reference to Figure 6 View D, drill n°10 rivet holes thru the lower right beam in accordance with the rivets to be installed.

- 3.1.4.7 With reference to Figure 5 View B and Figure 6 View D, install the right cross beam assy P/N 3G5318A79831 on the lower right beam by means of n°10 rivets P/N MS20426AD4-4.
- 3.1.4.8 With reference to Figure 5 View B and Figure 6 View D, install the panel assy P/N 3G5318A79431 and fix on the lower right beam by means of n°3 bolts P/N AN3-12A and n°3 washers P/N NAS1149D0316K.
- 3.1.4.9 With reference to Figure 7 View G, remove n°2 rivets P/N A297A04TW01 from the support FWD RH P/N 3G5315A67452.
- 3.1.4.10 With reference to Figure 5 View A and Figure 7, temporarily locate the support FWD RH P/N 3G5315A67452 and the support RHS P/N 3G5318A80051 on the frame STA 8150 RH, on the panel assy P/N 3G5318A79431 and on the right cross beam assy P/N 3G5318A79831. Countermark the following positions:
- n°11 positions in accordance with the dimensions shown;
 - n°4 positions from the panel assy P/N 3G5318A79431 to the support RHS P/N 3G5318A80051.
- 3.1.4.11 With reference to Figure 5 View A and Figure 6 Section E-E, drill n°4 holes $\varnothing 5.25 \div 5.50$ previously countermarked thru the support RHS P/N 3G5318A80051.
- 3.1.4.12 With reference to Figure 7 Section L-L and Section M-M, drill n°6 rivet-holes previously countermarked thru the support FWD RH P/N 3G5315A67452, the support RHS P/N 3G5318A80051 and the frame STA 8150 RH in accordance with the rivets to be installed.
- 3.1.4.13 With reference to Figure 7 Section L-L and Section M-M, drill n°3 rivet-holes previously countermarked thru the support FWD RH P/N 3G5315A67452 and the right cross beam assy P/N 3G5318A79831 in accordance with the rivets to be installed.
- 3.1.4.14 With reference to Figure 7 View G and Section M-M, drill n°2 rivet-holes previously countermarked thru the support FWD RH P/N 3G5315A67452 and frame STA 8150 RH in accordance with the rivets to be installed.
- 3.1.4.15 With reference to Figure 7 Section L-L, drill the hole $\varnothing 5.74 - 5.87$ thru the support FWD RH P/N 3G5315A67452 and the support RHS P/N 3G5318A80051.

- 3.1.4.16 With reference to Figure 7 View G, prepare the indicated surface between the frame STA 8150 RH and the support RHS P/N 3G5318A80051 by removing soluble or non-soluble treatments and/or by cleaning the chromed surfaces to assure correct electrical bonding.
- 3.1.4.17 With reference to Figures 5 View B, install the support FWD RH P/N 3G5315A67452 and the support RHS P/N 3G5318A80051 by means of:
- n°4 rivets P/N A297A04TW02 to fix the frame STA 8150 RH and the P/N 3G5315A67452 (refer to Figure 7 View G and Section M-M);
 - n°6 rivets P/N MS20470AD3-4 to fix the P/N 3G5318A80051, the frame STA 8150 RH and the P/N 3G5315A67452 (refer to Figure 7 Section L-L and Section M-M);
 - n°3 rivets MS20426AD3-4 to fix the P/N 3G5318A79831 and the P/N 3G5315A67452 (refer to Figure 7 Section L-L and Section M-M);
 - n°4 bolts P/N AN3-12A, n°4 nuts P/N MS21043-3, n°3 washers P/N NAS1149D0316K and the washer P/NAW011TY001FB02A to fix the P/N 3G5318A80051 to the panel assy P/N 3G5318A79431 (refer to Figure 5 View A and Figure 6 Section E-E).
- 3.1.4.18 With reference to Figure 7 section L-L, install the nut plate P/N MS21075L3N on the support FWD RH P/N 3G5315A67452 by means of n°2 rivets P/N AGS2067-306.
- 3.1.4.19 With reference to Figure 5 View B and Figure 6 Section F-F, temporarily locate the internal plate P/N 3G5318A80851 and the support P/N 3G5318A79951 on the right bonded panel assy and on the panel assy P/N 3G5318A79431. Countermark the following positions:
- n°4 hole-positions from the support P/N 3G5318A79951 to the right bonded panel assy;
 - n°5 hole-positions from the panel assy P/N 3G5318A79431 to the support P/N 3G5318A79951.
- 3.1.4.20 With reference to Figure 6 Section F-F, drill n°5 holes $\varnothing 5.25 \div 5.50$ previously countermarked thru the support P/N 3G5318A79951.

- 3.1.4.21 With reference to Figure 6 Section F-F, drill n°4 holes $\varnothing 14.25 \div 14.38$ previously countermarked thru the right bonded panel assy (internal skin and honeycomb core).
- 3.1.4.22 With reference to Figure 6 Section F-F, install n°4 inserts P/N NAS1832-3-4M on the right bonded panel assy by means of adhesive EA934NA (C397).
- 3.1.4.23 With reference to Figure 5 View B, install the internal plate P/N 3G5318A80851 on the right bonded panel assy by means of adhesive EA 9309.3NA (C021).
- 3.1.4.24 With reference to Figure 5 View B and Figure 6 Section F-F, install the support P/N 3G5318A79951 and fix one end to the internal plate P/N 3G5318A80851 by means of n°4 screws P/N MS27039-1-07 and n°4 washers P/N NAS1149D0332K and the other end to the panel assy P/N 3G5318A79431 by means of n°5 bolts P/N AN3-12A, n°5 washers P/N NAS1149D0316K and n°5 nuts P/N MS21043-3.
- 3.1.4.25 With reference to Figure 5 View A and View B, install n°2 angles assy P/N 3G5315A64931 on the panel assy P/N 3G5318A79431 by means of n°2 screws P/N MS27039-1-04 and n°2 washers P/N NAS1149D0332K.
- 3.1.5 With reference to Figure 1 Detail A, countermark n°2 hole-positions from the two angles assy P/N 3G5315A64931 to the baggage liner lateral RH upper rework P/N 3G2580P37631.
- 3.1.6 With reference to Figure 1 Detail A, drill n°2 holes $\varnothing 5.16 \div 5.28$ previously countermarked thru the baggage liner lateral RH upper rework P/N 3G2580P37631.
- 3.1.7 With reference to Figure 1 Detail A, countermark n°5 hole-positions from the right cross beam assy P/N 3G5318A79831 to the baggage liner lateral RH lower rework P/N 3G2580P37731.
- 3.1.8 With reference to Figure 1 Detail A, drill n°5 holes $\varnothing 4.90 \div 5.03$ previously countermarked thru the baggage liner lateral RH lower rework P/N 3G2580P37731.
- 3.1.9 With reference to Figures 1 and 4, perform the avionic bay liner retro mod P/N 3G2580P37511 as described in the following procedure:
 - 3.1.9.1 With reference to Figure 1 Detail A and Figure 4, install the baggage liner lateral RH upper rework P/N 3G2580P37631 by

- means of n°2 screws P/N AN525-832R9 and existing hardware previously removed.
- 3.1.9.2 With reference to Figure 1 Detail A and Figure 4, install the baggage liner lateral RH lower rework P/N 3G2580P37731 by means of n°5 screws P/N AN525-10R9 and existing hardware previously removed.
- 3.1.10 With reference to Figure 1 Detail A and Figure 2 Section B-B and View K, temporarily locate the adapter plate P/N 3G5318A90451 and the adapter plate P/N 3G5318A90351 on the baggage liner lateral RH upper rework P/N 3G2580P37631 and countermark the cut-out profile and n°4 hole-positions on the liner in accordance with the dimensions shown.
- 3.1.11 With reference to Figure 2 Section B-B, drill n°4 holes $\varnothing 5.69 \div 5.82$ previously countermarked thru the baggage liner lateral RH upper rework P/N 3G2580P37631.
- 3.1.12 With reference to Figure 2 View K, perform the indicate cut-out previously countermarked thru the baggage liner lateral RH upper rework P/N 3G2580P37631.
- 3.1.13 With reference to Figure 2 View K, fill all around the cut-out profile with adhesive EA934NA (C397).
- 3.1.14 With reference to Figure 2 Section B-B, install n°4 anchor nuts P/N A407A08C1P on the baggage liner lateral RH upper rework P/N 3G2580P37631 by means of adhesive EA 9309.3NA (C021).
- 3.1.15 With reference to Figure 1 Detail A and Figure 2 Section B-B, install the adapter plate P/N 3G5318A90451 on the baggage liner lateral RH upper rework P/N 3G2580P37631 by means of n°2 screws P/N MS27039-0809 and n°2 washers P/N NAS1149DN832K.
- 3.1.16 With reference to Figure 1 Detail A and Figure 2 Section B-B, install the adapter plate P/N 3G5318A90351 on the baggage liner lateral RH upper rework P/N 3G2580P37631 by means of n°2 screws P/N MS27039-0809 and n°2 washers P/N NAS1149DN832K.
- 3.1.17 With reference to Figure 2 View G and Section J-J, drill n°4 holes $\varnothing 9.60 \div 9.50$ thru the panel assy P/N 3G5318A79431 in accordance with the dimensions shown.
- 3.1.18 With reference to Figure 2 View G, temporally locate the shim P/N 3G5318A89452 and the shim P/N 3G5318A89451 on the panel assy P/N 3G5318A79431 and countermark n°8 holes-positions on the shims in accordance with the dimensions shown.

NOTE

Coordinate according to insert holes previously performed.

- 3.1.19 With reference to Figure 2 View G, drill n°4 holes \varnothing 4.82 4.88 previously countermarked thru the shim P/N 3G5318A89452 and shim P/N 3G5318A89451.
- 3.1.20 With reference to Figure 2 View G, drill n°4 rivet-holes previously countermarked thru the shims and the panel assy P/N 3G5318A79431 in accordance with the dimensions shown.
- 3.1.21 With reference to Figure 2 View G, install the shim P/N 3G5318A89452 and the shim P/N 3G5318A89451 on the panel assy P/N 3G5318A79431 by means n°4 rivets P/N NAS9302-4-03. Bond with adhesive Raychem S1184 (C327).
- 3.1.22 With reference to Figure 2 Section J-J, install n°4 inserts P/N AW007TE-30-212 on the panel assy P/N 3G5318A79431 by means of adhesive EA934NA (C397).
- 3.1.23 With reference to Figure 3 View C and Detail F, temporarily locate the cover plate assy P/N 3G5317A63131 on the lower bonded panel assy P/N 3P5340A01732 and countermark n°6 hole-positions on the panel in accordance with the dimensions shown.
- 3.1.24 With reference to Figure 3 Detail F, drill n°6 holes \varnothing 5.15÷5.28 previously countermarked thru the lower bonded panel assy P/N 3P5340A01732 and the doubler P/N 3P5340A01751.
- 3.1.25 With reference to Figure 3 Detail F, drill the rivet-hole in accordance with the dimensions shown.
- 3.1.26 With reference to Figure 3 View C and Detail F, perform the indicated cut-out (\varnothing 26.0) in accordance with the dimensions shown thru the lower bonded panel assy P/N 3P5340A01732 and the doubler P/N 3P5340A01751.
- 3.1.27 With reference to Figure 3 View D, prepare the indicated surface of the doubler P/N 3P5340A01751 to assure ground contact in accordance with the dimensions shown.
- 3.1.28 With reference to Figure 3 Detail F, install n°6 nut plates P/N MS21069L3 on the doubler P/N 3P5340A01751 by means of n°12 rivets P/N MS20426AD3-4.
- 3.1.29 With reference to Figure 3 Detail F, install the terminal P/N 999-7000-07-104 by means of the rivet P/N MS20426AD5-4.

NOTE

Perform step 3.1.30 only if Part II is not intended to be embodied consequently to Part I.

- 3.1.30 With reference to Figure 3 Section E-E, install the cover plate assy P/N 3G5317A63131 on the lower bonded panel assy P/N 3P5340A01732 by means of n°6 screws P/N MS27039-1-07 and n°6 washers P/N NAS1149D0332K.
- 3.2 With reference to Figures 8 thru 16 and 30 thru 33, perform the RT7000 RMR single APX module electrical provision P/N 3G2310A31211 as described in the following procedure:
 - 3.2.1 With reference to Figure 10 View B, install n°2 supports P/N AW001CL001-N6 (locations n°1 and n°2) in accordance with the dimensions reported in the table by means of adhesive CB200-40 (C356).
 - 3.2.2 With reference to Figure 13 “View Looking Rear”, install the standoff P/N A388A3E06C75 (location n°1) in accordance with the dimensions reported in the table by means of adhesive CB200-40 (C356).
 - 3.2.3 With reference to Figure 13 “View Looking Rear”, install the terminal stud assy P/N A363A01 (GS3012) (location n°2) in accordance with the dimensions reported in the table.
 - 3.2.4 With reference to Figure 13 “View Looking Rear”, install the anchor nut P/N AW001TL3A06 (location n°3) in accordance with the dimensions reported in the table by means of adhesive CB200-40 (C356).
 - 3.2.5 With reference to Figure 13 “View Looking Rear”, install the stud P/N A366A3E12C (location n°4) in accordance with the dimensions reported in the table by means of adhesive CB200-40 (C356).
 - 3.2.6 With reference to Figure 14 View G, install n°4 supports P/N AW001CL001-N6 (locations n°1, n°2, n°3 and n°4) in accordance with the dimensions reported in the table by means of adhesive CB200-40 (C356).
 - 3.2.7 With reference to Figure 15 “View Looking Rear”, install the support P/N AW001CL509-N6 (location n°1) in accordance with the dimensions reported in the table by means of adhesive CB200-40 (C356).
 - 3.2.8 With reference to Figure 15 “View Looking Rear”, install n°3 standoffs P/N A388A3E06C (locations n°2, n°3 and n°4) in accordance with the dimensions reported in the table by means of adhesive CB200-40 (C356).

- 3.2.9 With reference to Figure 10 Detail P and Figure 33 Wiring Diagram, assemble the connector J138 by means of the electrical connector P/N D38999/20JJ35SB and the backshell P/N A529A400-2502C.
- 3.2.10 With reference to Figure 10 Detail P, install the connector J138 on the bracket P/N A414A04C238A1 by means of the retaining plate P/N M85049/95-25A-A, n°4 screws P/N MS35206-228 and n°4 washers P/N NAS1149DN616J.
- 3.2.11 In accordance with AMP DM 39-A-11-00-01-00A-720A-A and with reference to Figure 10 Detail P, install the decal P/N ED300J138 near the connector J138.
- 3.2.12 With reference to Figure 10 Detail P and Figure 33 Wiring Diagram, assemble the connector P138 by means of the electrical connector P/N D38999/26JJ35PB and the backshell P/N A529A400-2502C.
- 3.2.13 With reference to Figure 10 Detail P, install the connector P138 on the bracket P/N A414A04C238A1 and perform the electrical connection of the connector P138 to the connector J138 previously installed.

NOTE

Use the edging P/N A236A on edges which are liable to cause damage to cable assemblies or where abrasion may occur.

NOTE

Install the tubing braided P/N A582A where protection against chafing and prevention of contact with structure may occur, but the tubing protection is not substitute for good routing practice.

NOTE

When necessary, replace existing clamp with suitable clamp.

NOTE

To ensure a proper installation, it is allowed to use:

- wires/harnesses clamps (diameter only) two dash greater or lesser than the nominal one;
- bolts (length only) two dash shorter or longer than the nominal one;

- screws (length only) two dash shorter or longer than the nominal one;
- washers (thickness only) two dash greater or lesser than the nominal one;
- spacers (length only) two dash shorter or longer than the nominal one.

3.2.14 With reference to Figures 8 thru 16 and Figures 31 thru 33 Wiring Diagram, lay down the following cable assemblies on the existing routes unless otherwise indicated on the figures:

- 3G9A01A79101 radio RT 7000RMR C/A (A1A791);
- 3G9A01B73601 radio RT 7000RMR C/A (A1B736);
- 3G9A02B69601 radio RT 7000RMR C/A (A2B696);
- 3G9B01R21601 radio RT 7000RMR C/A (B1R216);
- 3G9B01R21701 radio RT 7000RMR C/A (B1R217);
- 3G9B02B86901 radio RT 7000RMR C/A (B2B869);
- 3G9C01B44001 radio RT 7000RMR C/A (C1B440);
- 3G9C02B49301 radio RT 7000RMR C/A (C2B493);
- 3G9C03B36701 radio RT 7000RMR C/A (C3B367).

3.2.15 With reference to Figures 8 thru 16, secure the cable assemblies laid down at the previous step by means of existing hardware and lacing cords.

3.2.16 With reference to Figure 14 View G and Detail L, install the adapter P/N 630B022B10BP on the C/A C1B440, C/A C2B493 and the C/A C3B367.

3.2.17 With reference to Figure 15 Detail M, install the support ring P/N M85049/93-10 on the C/A C3B367 by means of the metallic band P/N A10099.

3.2.18 With reference to Figure 14 Detail L and Figure 15 Detail M, cover the cable assemblies using the following items of adequate length (in accordance with the dimensions shown):

- Metal braid P/N AW002XM005B and nomex P/N EN6049-006-19-5 (on C/A C1B440, C/A C2B493 and the C/A C3B367);
- Metal braid P/N AW002XM101B and nomex P/N EN6049-006-08-5 (on C/A C3B367);
- Metal braid P/N AW002XM002B and nomex P/N EN6049-006-05-5 (on C/A C1B440);

- Metal braid P/N AW002XM102B and nomex P/N EN6049-006-13-5 (on C/A C2B493);
 - Metal braid P/N AW002XM005B and nomex P/N EN6049-006-19-5 (on C/A C3B367);
 - Metal braid P/N AW001XM01 (on C/A C3B367);
- 3.2.19 In accordance with CSPP DM CSPP-A-20-10-02-00A-622A-D and with reference to Figure 15 Detail M, crimp on the wire the terminal lug P/N MS25036-102.
- 3.2.20 With reference to Figure 13 “View Looking Upper Deck”, install the spacer for cable bundles P/N A631A02A between the C/A C2B493 and the C/A C1B440.
- 3.2.21 With reference to Figure 13 “View Looking Rear”, install the clamp P/N AW001CB05H on the C/A C3B367 by means of the screw P/N NAS1190E3P7AK and the washer P/N NAS1149D0332J.
- 3.2.22 With reference to Figure 13 “View Looking Rear”, remove existing clamp and install the new clamp P/N AW001CB05H on the C/A C3B367 by means of existing hardware. Refer to the relative Detail on Figure 16.
- 3.2.23 With reference to Figure 13 “View Looking Rear”, install the clamp P/N AW001CB03H on the existing C/A C3B4 by means of the screw P/N NAS1802-3-9 and the washer P/N NAS1149D0332J. Refer to the relative Detail on Figure 16.
- 3.2.24 With reference to Figure 13 “View Looking Rear”, install the grommet P/N MS35489-20 on the existing C/A C3B4 inside the hole indicated.
- 3.2.25 With reference to Figure 13 “View Looking Rear”, rotate the existing basic clamp 180° and re-install on the existing C/A C3B4 then install the clamp P/N AW001CB03H on the C/A C1B440 and the clamp P/N AW001CB05H on the C/A C2B493 by means of the existing hardware. Refer to the relative Detail on Figure 16.
- 3.2.26 With reference to Figure 13 “View Looking Rear”, rotate the existing basic clamp 180° and re-install on the existing C/A C3B4 then install the clamp P/N AW001CB03H on the C/A C1B440 and the clamp P/N AW001CB05H on the C/A C2B493 by means of the existing hardware. Refer to the relative Detail on Figure 16.
- 3.2.27 With reference to Figure 13 “View Looking Rear”, install the clamp P/N AW001CB03H on the C/A C1B440 and the clamp P/N AW001CB05H on the C/A C2B493 by means of the screw

P/N NAS1190E3P6AK and the washer P/N NAS1149D0332J. Refer to the relative Detail on Figure 16.

- 3.2.28 With reference to Figure 15 “View Looking Rear”, install the grommet P/N MS35489-20 on the C/A C3B367 inside the hole indicated.
- 3.2.29 With reference to Figure 15 “View Looking Rear”, install the clamp P/N AW001CB05H on the C/A C3B367 by means of the existing hardware. Refer to the relative Detail on Figure 16.
- 3.2.30 With reference to Figure 15 “View Looking Rear”, install n°3 clamps P/N AW001CB05H on the C/A C3B367 by means of n°3 screws P/N NAS1190E3P12AK, n°3 spacers P/N NAS43DD3-27N and n°3 washers P/N NAS1149D0332J. Refer to the relative Detail on Figure 16.
- 3.2.31 With reference to Figure 15 “View Looking Rear”, install the grommet P/N AW002FT109 on the C/A C3B367 and fix to the support previously installed.

NOTE

Refer to Figure 32 WD (For Reference Only) to identify the location of the splice SP10695.

NOTE

SP10536 should be installed on wire L1065A22 in connector PL2P1 pin M. SP10536 should be within 12 inches of connector PL2P1.

- 3.2.32 In accordance with CSPP DM CSPP-A-20-10-13-00A-622A-D and with reference to Figure 32 Wiring Diagram, perform the electrical connections of the C/A A1A791 to the connector PL260P1 and the splices SP10536 and SP10695.
- 3.2.33 In accordance with CSPP DM CSPP-A-20-10-13-00A-622A-D and with reference to Figures 30 and 32 Wiring Diagram, perform the electrical connections of the C/A A1B736 to the connectors P104 and TB132P1 and to the terminal boards TB140 and TB136/3.
- 3.2.34 In accordance with CSPP DM CSPP-A-20-10-13-00A-622A-D and with reference to Figures 30 and 33 Wiring Diagram, perform the electrical connections of the C/A A2B696 to the connectors P138, TB104P1 and TB130P1 and to the terminal board TB152. Apply insulation sleeving P/N M23053/8-004-C as required on the end of the electrical wires.

- 3.2.35 In accordance with CSPP DM CSPP-A-20-10-13-00A-622A-D and with reference to Figure 30 Wiring Diagram, perform the electrical connections of the C/A B1R216 to the connectors J104 and PL1P4.
- 3.2.36 In accordance with CSPP DM CSPP-A-20-10-13-00A-622A-D and with reference to Figure 31 Wiring Diagram, perform the electrical connections of the C/A B1R217 to the connectors J210 and PL1P8.
- 3.2.37 In accordance with CSPP DM CSPP-A-20-10-13-00A-622A-D and with reference to Figures 30 and 33 Wiring Diagram, perform the electrical connections of the C/A B2B869 to the connectors J138 and J216 and to the terminal board TB206. Apply insulation sleeving P/N M23053/8-004-C as required on the end of the electrical wires.
- 3.2.38 In accordance with CSPP DM CSPP-A-20-10-13-00A-622A-D and with reference to Figure 31 Wiring Diagram, perform the electrical connection of the C/A C1B440 to the connector P210.
- 3.2.39 In accordance with CSPP DM CSPP-A-20-10-02-00A-622A-D and with reference to Figure 31 Wiring Diagram, perform the electrical connection of the C/A C1B440 to the terminal stud assy GS3012.
- 3.2.40 In accordance with CSPP DM CSPP-A-20-10-13-00A-622A-D and with reference to Figure 31 Wiring Diagram, perform the electrical connections of the C/A C2B493 to the connector P216.
- 3.2.41 In accordance with AMP DM 39-A-11-00-01-00A-720A-A and with reference to Figure 13 “View Looking Rear”, install the decal P/N ED300GS3012 near the terminal stud assy GS3012.

NOTE

Perform steps from 3.2.42 to 3.2.45 only if Part II is not intended to be embodied consequently to Part I.

- 3.2.42 With reference to Figure 8 Detail C and Figure 10 View B, stow the connectors PL260P1 (C/A A1B736, C/A A1A791 and C/A A2B696) and PL260P2 (C/A A1B376) by means of plugs, nomex P/N EN6049-006-25-5 and lacing cords P/N AW001CK03LC.
- 3.2.43 With reference to Figure 8 Detail C and Figure 14 View G, stow the connectors A895P101 (C/A C2B493) and A895P105 (C/A C1B440) by means of plugs, nomex P/N EN6049-006-25-5 and lacing cords P/N AW001CK03LC.

- 3.2.44 With reference to Figure 8 Detail H and Figure 14 View G, stow the connectors A895P102 (C/A C3B367) by means of plugs, nomex P/N EN6049-006-25-5 and lacing cords P/N AW001CK03LC.
- 3.2.45 With reference to Figure 15 View N, stow the connector E234P1 (C/A C3B367) to the cover plate assy P/N 3G5317A63131 previously installed.

NOTE

Use the edging P/N A236A on edges which are liable to cause damage to cable assemblies or where abrasion may occur.

NOTE

Install the tubing braided P/N A582A where protection against chafing and prevention of contact with structure may occur, but the tubing protection is not substitute for good routing practice.

NOTE

To ensure a proper installation, it is allowed to use:

- wires/harnesses clamps (diameter only) two dash greater or lesser than the nominal one;
 - bolts (length only) two dash shorter or longer than the nominal one;
 - screws (length only) two dash shorter or longer than the nominal one;
 - washers (thickness only) two dash greater or lesser than the nominal one;
 - spacers (length only) two dash shorter or longer than the nominal one.
4. In accordance with AMP DM 39-A-06-41-00-00A-010A-A and with reference to Figures 17 thru 21 and 34 thru 40, remove all external panels, internal panels and internal liners as required to gain access to the area affected by the installation and perform the ARC-210 variant P/N 3G2310P04711 as described in the following procedure:
- 4.1 With reference to Figure 34 Wiring Diagram "Was", remove the wires indicated of existing C/A A1B605.
- 4.2 With reference to Figure 35 Wiring Diagram "Was", remove the wires indicated of existing C/A C2B385 and A1B605.

- 4.3 With reference to Figure 37 Wiring Diagram “Was”, remove the wires indicated of existing C/A A2B574, A1B605 and C2B385.
- 4.4 With reference to Figure 39 Wiring Diagram “Was”, remove the wires indicated of existing C/A C2B389.
- 4.5 With reference to Figure 40 Wiring Diagram “Was”, remove the wires indicated of existing C/A C2B385.
- 4.6 With reference to Figures 17 thru 21 and Figures 34 thru 40 Wiring Diagram, lay down the following cable assemblies on the existing routes unless otherwise indicated on the figures:
 - 3G9A01B73801 ARC-210 variant C/A (A1B738);
 - 3G9A02B70201 ARC-210 variant C/A (A2B702);
 - 3G9B02B87301 ARC-210 variant C/A (B2B873);
 - 3G9C02B49901 ARC-210 variant C/A (C2B499);
 - 3G9C02B50001 ARC-210 variant C/A (C2B500).
- 4.7 With reference to Figures 17 thru 21, secure the cable assemblies laid down at the previous step by means of existing hardware and lacing cords.
- 4.8 In accordance with CSPP DM CSPP-A-20-10-13-00A-622A-D and with reference to Figures 34, 36 and 38 Wiring Diagram, perform the electrical connections of the C/A A1B738 to the connectors P102 and PL210P1.
- 4.9 In accordance with CSPP DM CSPP-A-20-10-13-00A-622A-D and with reference to Figure 38 Wiring Diagram, perform the electrical connections of the C/A A2B702 to the connectors P110 and PL210P1. Apply insulation sleeving P/N M23053/8-004-C as required on the end of the electrical wires.
- 4.10 In accordance with CSPP DM CSPP-A-20-10-13-00A-622A-D and with reference to Figure 38 Wiring Diagram, perform the electrical connections of the C/A B2B873 to the connectors J110 and J208. Apply insulation sleeving P/N M23053/8-004-C as required on the end of the electrical wire.
- 4.11 In accordance with CSPP DM CSPP-A-20-10-13-00A-622A-D and with reference to Figures 36, 38 and 40 Wiring Diagram, perform the electrical connections of the C/A C2B499 to the connectors A637P2, A637P7, A639P2 and P208.
- 4.12 In accordance with CSPP DM CSPP-A-20-10-13-00A-622A-D and with reference to Figure 39 Wiring Diagram, perform the electrical connections of the C/A C2B500 to the connector TB3054P1. Apply insulation sleeving P/N M23053/8-004-C as required on the end of the electrical wire.
5. In accordance with AMP DM 39-A-06-41-00-00A-010A-A and with reference to Figures 22, 30 and 31, remove all external panels, internal panels and internal liners as required to gain access to the area affected by the installation and modify the auxiliary CB panel

on the overhead panel as described in the following procedure:

- 5.1 With reference to Figure 22 “View Looking Up O/H Panel”, loose the captive screws and remove the existing integrally-lighted panel from the auxiliary circuit-breaker panel. Retain the screws for later reuse.
- 5.2 Remove the fixing hardware and move the auxiliary circuit breaker-panel from the structure as far as the electrical cable will let. Retain hardware for later reuse.
- 5.3 With reference to Figure 22 Detail A, relocate CB346 as shown.
- 5.4 With reference to Figure 22 Detail A, install the circuit breaker (CB817) P/N MS3320-3 in the indicated position.
- 5.5 In accordance with AMP DM 39-A-11-00-01-00A-720A-A and with reference to Figure 22 Detail A, install the decal P/N ED300CB817 in an adjacent area the circuit breaker CB817.
- 5.6 With reference to Figure 22 Detail A, install the circuit breaker (CB818) P/N MS3320-10 in the indicated position.
- 5.7 In accordance with AMP DM 39-A-11-00-01-00A-720A-A and with reference to Figure 22 Detail A, install the decal P/N ED300CB818 in an adjacent area the circuit breaker CB818.
- 5.8 In accordance with CSPP DMs CSPP-A-20-10-13-00A-622A-D and CSPP-A-20-10-02-00A-622A-D and with reference to Figure 22 and Figure 30 Wiring Diagram, perform the electrical connection 846-20 by means of wire P/N A556A-T20, to be marked accordingly, between pin 2 of circuit breaker CB817 and pin X of connector PL1J4. Use the electrical contact P/N MS25036-149 for pin 2 of CB817 and the electrical contact P/N M39029/56-351 for pin X of PL1J4.
- 5.9 In accordance with CSPP DMs CSPP-A-20-10-13-00A-622A-D and CSPP-A-20-10-02-00A-622A-D and with reference to Figure 22 and Figure 31 Wiring Diagram, perform the electrical connection 848-16 by means of wire P/N A556A-T16, to be marked accordingly, between pin 2 of circuit breaker CB818 and pin D of connector PL1J8. Use the electrical contact P/N MS25036-153 for pin 2 of CB818 and the electrical contact P/N M39029/56-352 for pin D of PL1J8.
- 5.10 In accordance with CSPP DMs CSPP-A-20-10-13-00A-622A-D and CSPP-A-20-10-02-00A-622A-D, perform the electrical connection 847-12 by means of wire P/N A556A-T12, to be marked accordingly, between pin 1 of circuit breaker CB817 and pin 1 of circuit breaker CB818. Use the electrical contact P/N MS25036-156 for pin 1 of CB817 and the electrical contact P/N MS25036-156 for pin 1 of CB817.
- 5.11 In accordance with CSPP DMs CSPP-A-20-10-13-00A-622A-D and CSPP-A-20-10-02-00A-622A-D, perform the electrical connection 890-16 by

means of wire P/N A556A-T16, to be marked accordingly, between pin 1 of circuit breaker CB818 and pin 1 of circuit breaker CB346 (central display). Use the electrical contact P/N MS25036-153 for pin 1 of CB817 and the electrical contact P/N MS25036-153 for pin 1 of C346.

NOTE

Perform step from 5.12 only if Part II is not intended to be embodied consequently to Part I.

- 5.12 With reference to Figure 22 Detail D, install n°2 locking rings P/N AW001YC01RED: one on the circuit breaker CB817 and one on the circuit breaker CB818.

NOTE

If previously disconnected, perform the electrical connections of all the electrical wires/cables related to the existing switches and circuit breakers of the auxiliary CB panel.

- 5.13 With reference to Figure 22, re-install the auxiliary CB panel to the overhead structure by means of existing hardware previously removed.
- 5.14 With reference to Figure 22 “View Looking Up O/H Panel”, install the illuminated NVIS panel AUX breaker (NVG) P/N 3G2490L06462 on the auxiliary circuit-breaker panel by means of the captive screws previously removed.
- 5.15 With reference to Figure 22 “View Looking Up O/H Panel”, install n°6 plugs P/N AS44417-B12 in the indicated positions on the illuminated NVIS panel AUX breaker (NVG) P/N 3G2490L06462.
6. In accordance with AMP DM 39-A-06-41-00-00A-010A-A, re-install all external panels, internal panels and internal liners previously removed.
7. In accordance with weight and balance changes, update the Chart A (see Rotorcraft Flight Manual, Part II, section 6).
8. Return the helicopter to flight configuration and record for compliance with Part I of this Service Bulletin on the helicopter logbook.
9. Gain access to My Communications section on Leonardo WebPortal and compile the “Service Bulletin Application Communication”.

As an alternative, send the attached compliance form to the following mail box:

engineering.support.lhd@leonardo.com

and (for North, Central and South America) also to:

AWPC.Engineering.Support@leonardocompany.us

PART II

1. In accordance with AMP DM 39-A-00-20-00-00A-120A-A, prepare the helicopter on ground for a safe maintenance. Disconnect the battery, all electrical power sources and/or the external power supply.
2. In accordance with AMP DM 39-A-06-41-00-00A-010A-A and with reference to Figures 23 thru 26, remove all external panels, internal panels and internal liners as required to gain access to the area affected by the installation of the kit RT7000 RMR single APX module P/N 4G2310F08411 and perform the RT7000 RMR single APX module equipment installation P/N 3G2310A31311 as described in the following procedure:

NOTE

Perform steps from 2.1 to 2.5 only if Part II has NOT been embodied consequently to Part I.

- 2.1 With reference to Figure 23 Detail B and Figure 24 View D, free the connectors PL260P1 (C/A A1B736, C/A A1A791 and C/A A2B696) and PL260P2 (C/A A1B376) from their stowage.
- 2.2 With reference to Figure 23 Detail B and Figure 26 View E, free the connectors A895P105 (C/A C1B440) and A895P101 (C/A C2B493) from their stowage.
- 2.3 With reference to Figure 23 Detail C and Figure 26 View E, free the connector A895P102 (C/A C3B367) from its stowage.
- 2.4 With reference to Figure 25, disconnect the connector E234P1 (C/A C3B367) and remove the plate assy P/N 3G5317A63131 and fixing hardware (n°6 screws P/N MS27039-1-06 and n°6 washers P/N NAS1149D0332K).
- 2.5 With reference to Figure 23 View A, remove the two locking rings P/N AW001YC01RED: one from the circuit breaker CB817 and one from the circuit breaker CB818.

NOTE

If the control panel PL211 is not installed, remove the installed plate P/N 999-0500-85-255 instead.

- 2.6 With reference to Figure 24 "View Looking Interseat Console", remove the existing AN/ARC 210 control panel (PL211) from the interseat console and the relative decal P/N ED300PL211 installed near the PL211.
- 2.7 With reference to Figure 24 "View Looking Interseat Console" and "Top View Interseat Console", install the RCDU-7000 (PL260) P/N RCDU-7000-002-002 on the interseat console in the same position of the previously removed PL211.
- 2.8 With reference to Figure 24 View D, perform the electrical connections of the connector PL260P1 (C/A A1B736, C/A A1A791 and C/A A2B696) and the

connector PL260P2 (C/A A1B376) to the RCDU-7000 (PL260).

- 2.9 In accordance with AMP DM 39-A-11-00-01-00A-720A-A and with reference to Figure 24 “View Looking Interseat Console”, install the decal P/N ED300PL260 near the RCDU-7000 (PL260).

NOTE

The resistance measured must not exceed the value of
5.0 mOhm.

- 2.10 Perform the bonding test of the antenna RCDU-7000 (PL260) using the bondimeter tool.
- 2.11 With reference to Figure 25 “View Looking Outboard”, install the antenna VHF/UHF (E234) P/N CI 295-300-4 and the gasket P/N AW001GH048A by means of n°6 screws P/N MS24694-S54. Apply sealant MC780 B2 (C465) on the head of the six screws and on the mating edge between the antenna and the structure.
- 2.12 In accordance with CSPP DM CSPP-A-20-40-00-02A-711A-D, tighten the six screws P/N MS24694-S54 to the standard torque value.
- 2.13 With reference to Figure 25 “View Looking Back Rear”, perform the electrical connection of the connector E234P1 (C/A C3B367) to the antenna VHF/UHF (E234). Safety the connector using lock wire P/N MS20995C15 and connect the terminal P/N 999-7000-07-104 using existing hardware.

NOTE

Harness bundles and components that will come in contact with the connector sealing shall be free of dirt, oil, grease, and other contamination prior to installation.

- 2.14 Apply corrosion protection on the connector E234P1 as follows:

NOTE

Stretch the tape 25 to 50% to ensure good compression around the connector and coax cable.

- 2.14.1 Apply the StretchSeal Tape P/N AD89503FR-01-36 with a 50% overlap until the entire connector is covered.
- 2.14.2 Apply Silicone Tape P/N EE267-02-075B over the StretchSeal Tape.
- 2.14.3 Secure end of connector wrap with lacing cord P/N AW001CK03LC.
- 2.15 In accordance with AMP DM 39-A-11-00-01-00A-720A-A and with reference to Figure 25 “View Looking Outboard”, install the decal P/N ED300E234 near the antenna VHF/UHF (E234).

NOTE

The resistance measured must not exceed the value of
5.0 mOhm.

- 2.16 Perform the bonding test of the antenna VHF/UHF (E234) using the bondimeter tool.
- 2.17 With reference to Figure 26 “View Looking Rear Baggage Zone”, install the single mounting tray P/N 300-072411-01 by means of n°4 screws P/N NAS1802-3-6 and n°4 washers P/N NAS1149D0332J.
- 2.18 With reference to Figure 26 “View Looking Rear Baggage Zone”, install the RT-7000 RMR (1APX) VCD (A895) P/N 3G2310I01331 on the single mounting tray P/N 300-072411-01.
- 2.19 With reference to Figure 26 View E, perform the electrical connections of the connector A895P105 (C/A C1B440), the connector A895P101 (C/A C2B493) and the connector A895P102 (C/A C3B367) to the RT-7000 RMR (1APX) VCD (A895).
- 2.20 In accordance with AMP DM 39-A-11-00-01-00A-720A-A and with reference to Figure 26 “View Looking Rear Baggage Zone”, install the decal P/N ED300A895 near the RT-7000 RMR (1APX) VCD (A895).

NOTE

The resistance measured must not exceed the value of
5.0 mOhm.

- 2.21 Perform the bonding test of the RT-7000 RMR (1APX) VCD (A895) using the bondimeter tool.
3. In accordance with Annex A, perform the RT-7000 RMR 1APX P25 acceptance test procedure.
4. In accordance with AMP DM 39-A-06-41-00-00A-010A-A, re-install all external panels, internal panels and internal liners previously removed.
5. In accordance with weight and balance changes, update the Chart A (see Rotorcraft Flight Manual, Part II, section 6).
6. Return the helicopter to flight configuration and record for compliance with Part II of this Service Bulletin on the helicopter logbook.
7. Gain access to My Communications section on Leonardo WebPortal and compile the “Service Bulletin Application Communication”.

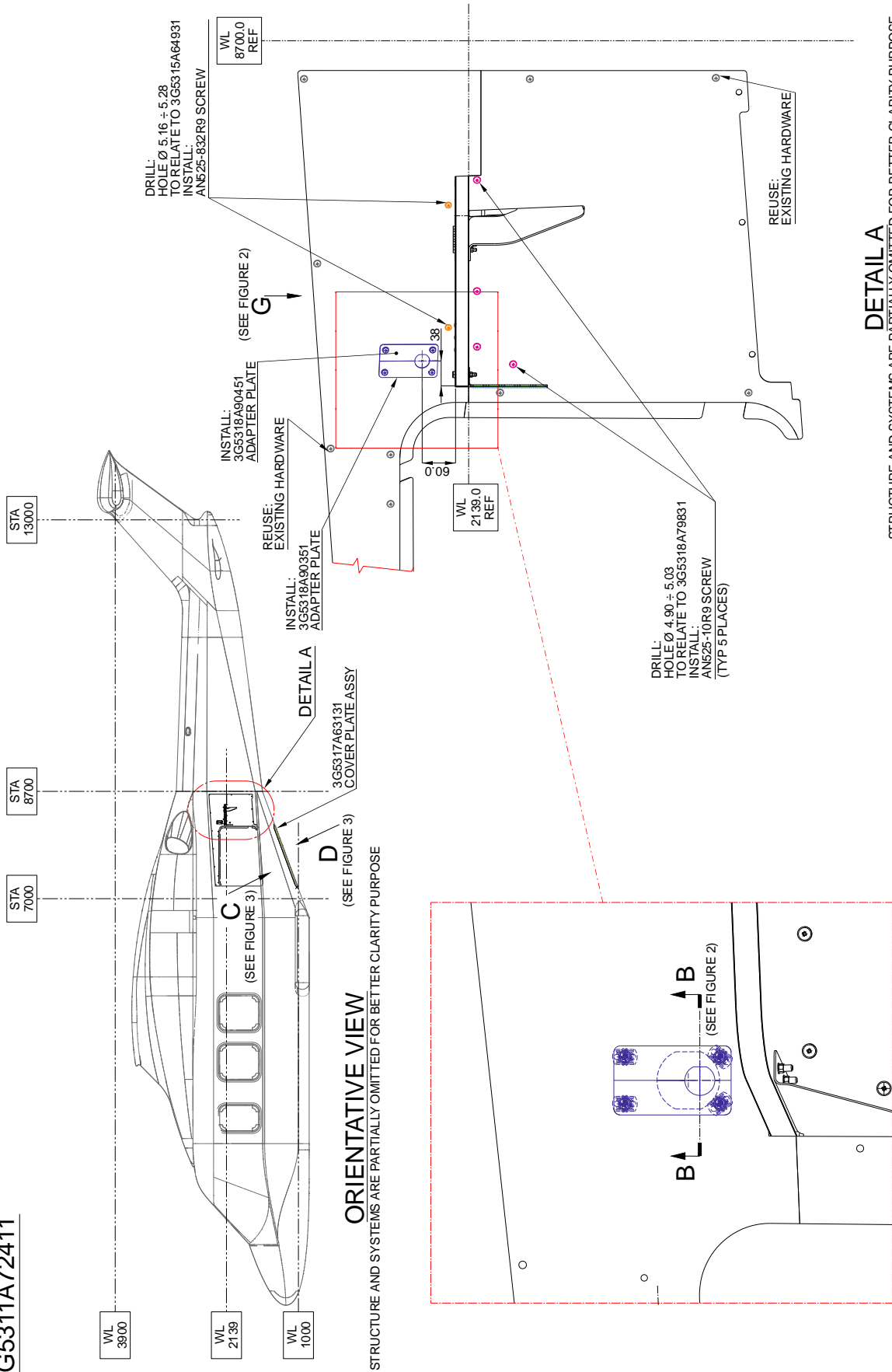
As an alternative, send the attached compliance form to the following mail box:

engineering.support.lhd@leonardo.com

and (for North, Central and South America) also to:

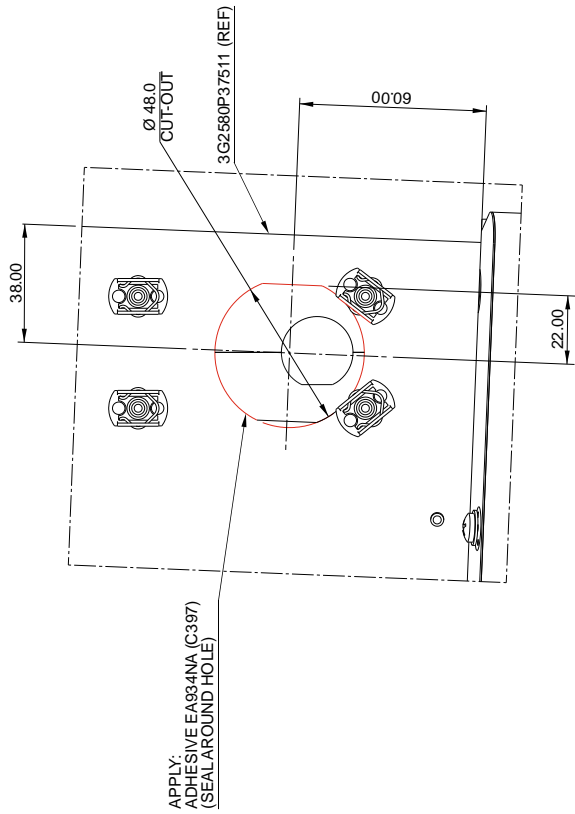
AWPC.Engineering.Support@leonardocompany.us

RT7000 RMR SINGLE APX MOD. STR. PROV.
3G5311A72411



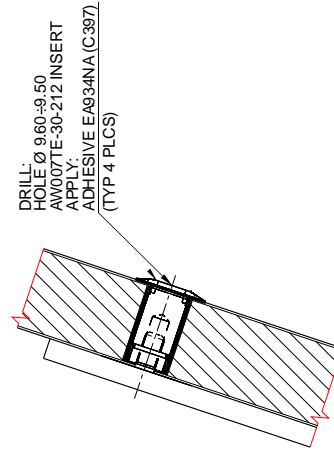
DETAIL A

Figure 1



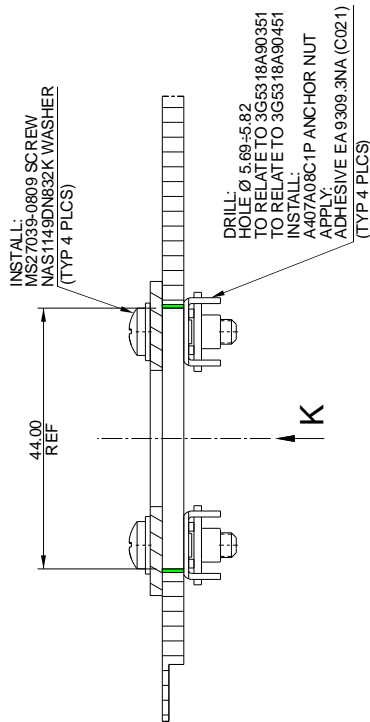
VIEW K

STRUCTURE AND SYSTEMS ARE PARTIALLY OMITTED FOR BETTER CLARITY PURPOSE



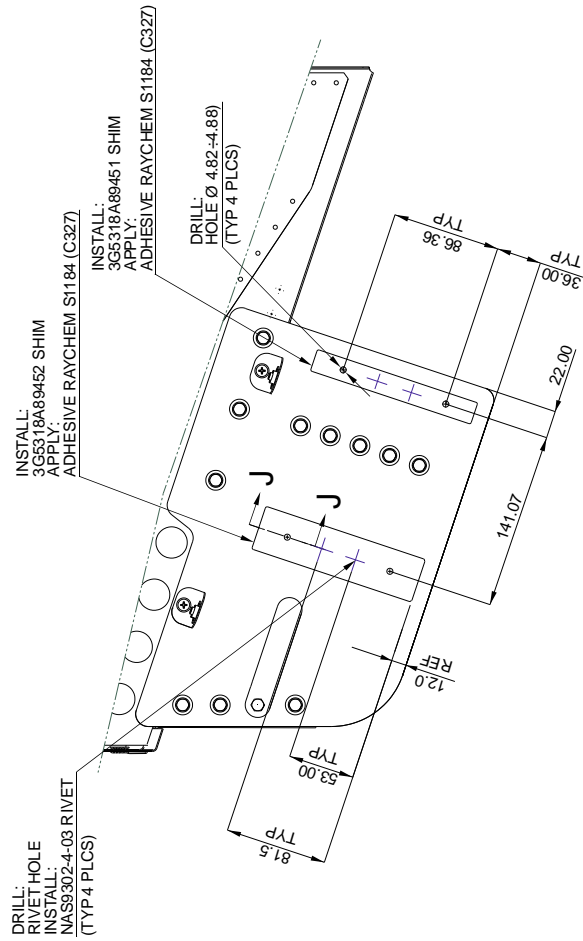
SECTION J-J

STRUCTURE AND SYSTEMS ARE PARTIALLY OMITTED FOR BETTER CLARITY PURPOSE



SECTION B-B

STRUCTURE AND SYSTEMS ARE PARTIALLY OMITTED FOR BETTER CLARITY PURPOSE (REFER TO FIGURE 1)



VIEW G

STRUCTURE AND SYSTEMS ARE PARTIALLY OMITTED FOR BETTER CLARITY PURPOSE (REFER TO FIGURE 1)

Figure 2

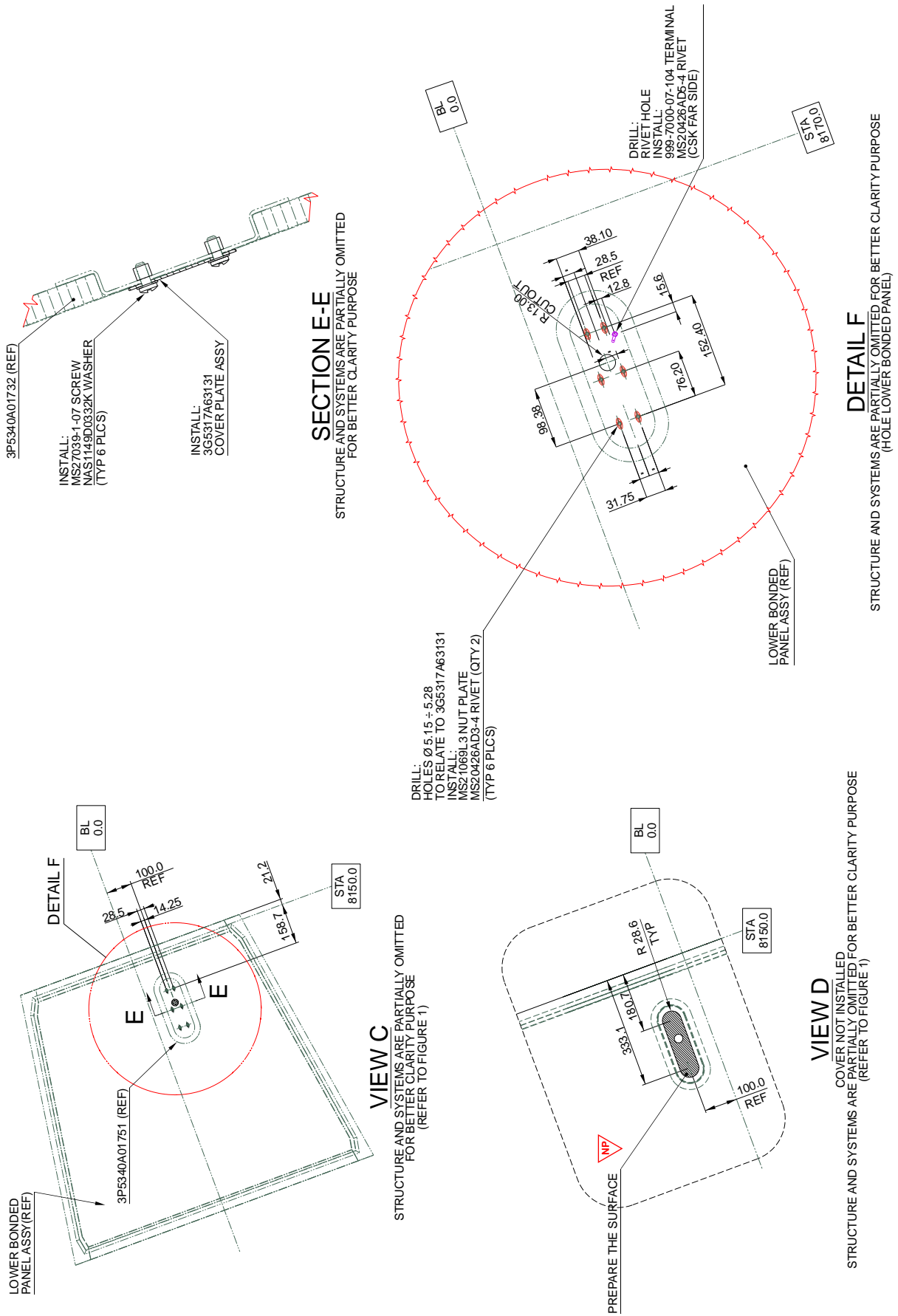


Figure 3

S.B. N°139-748 OPTIONAL
DATE: September 20, 2024
REVISION: /

AVIONIC BAY LINER RETRO MOD
3G2580P37511

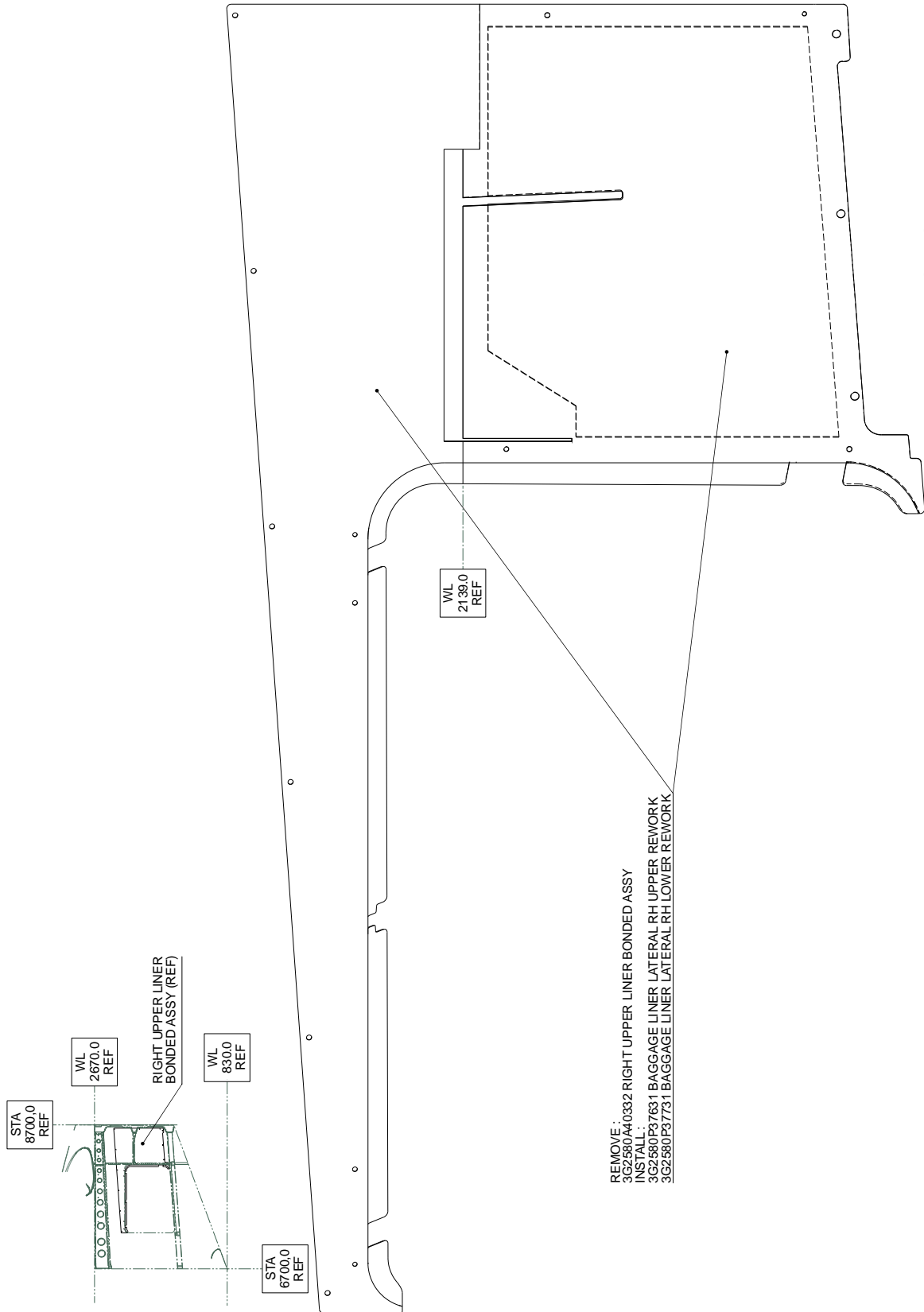


Figure 4

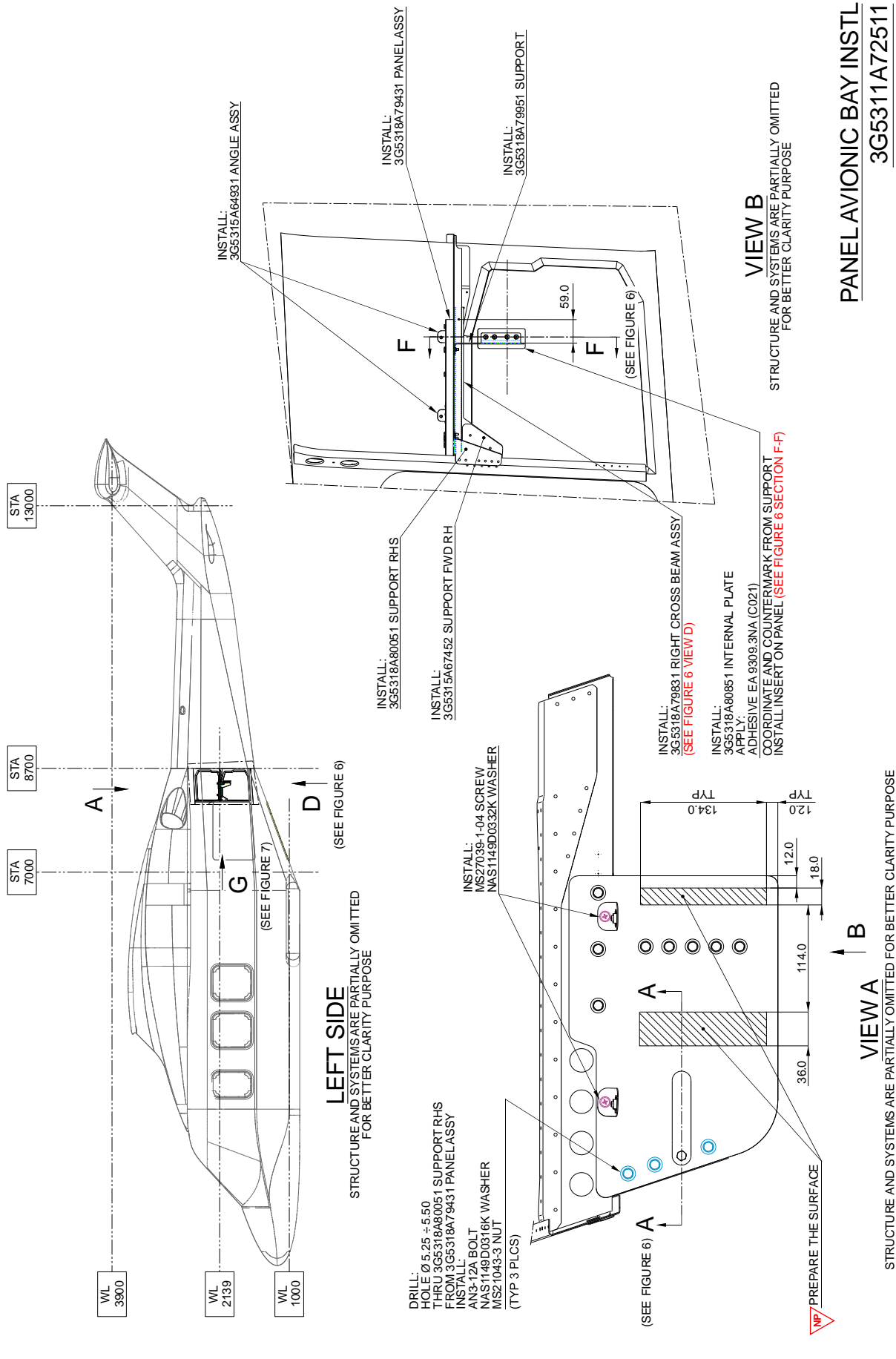


Figure 5

S.B. N°139-748 OPTIONAL
DATE: September 20, 2024
REVISION: /

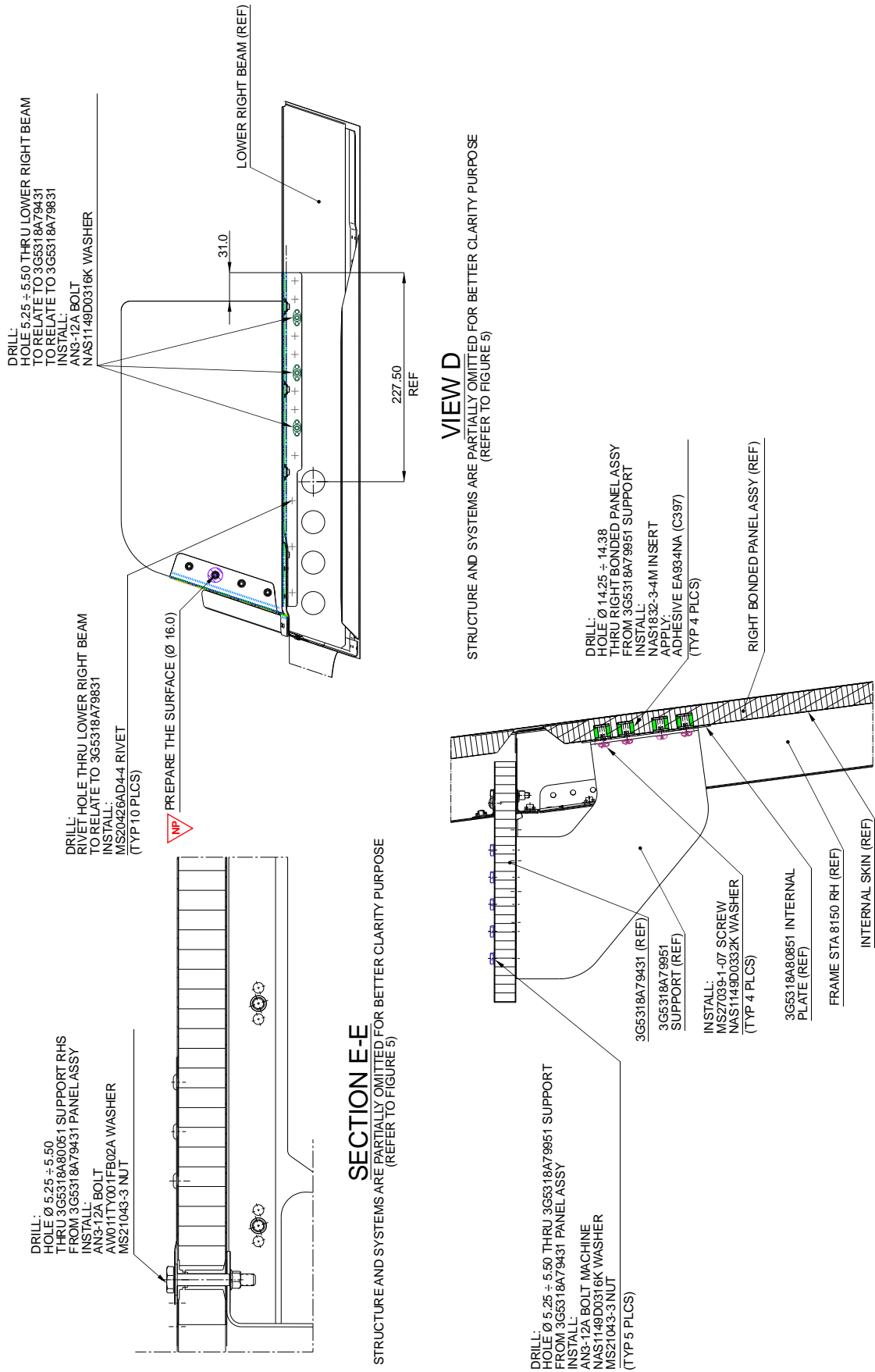


Figure 6

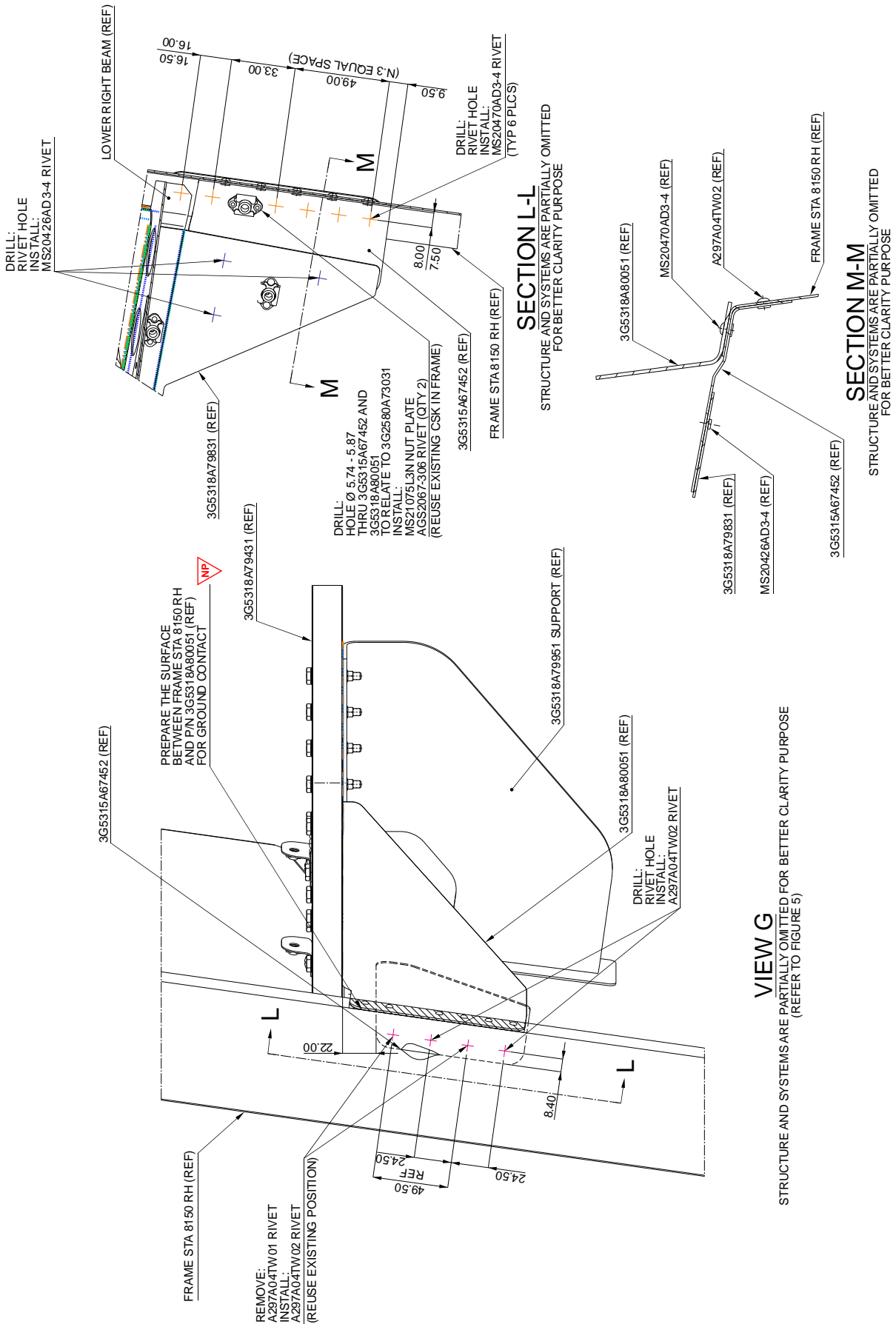


Figure 7

RT7000 RMR SINGLE APX MOD. ELECTRICAL INSTL
3G2310A31211

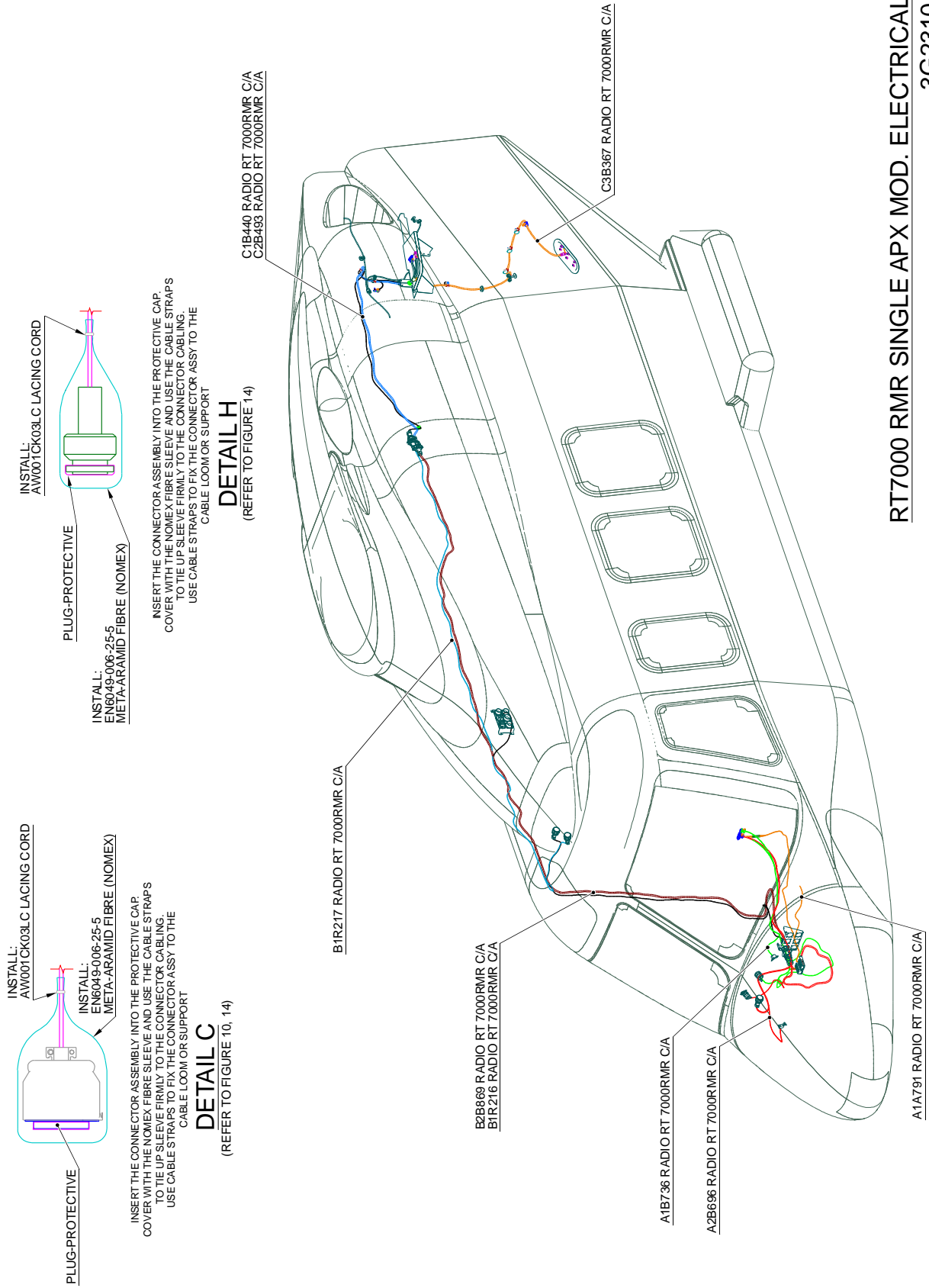


Figure 8

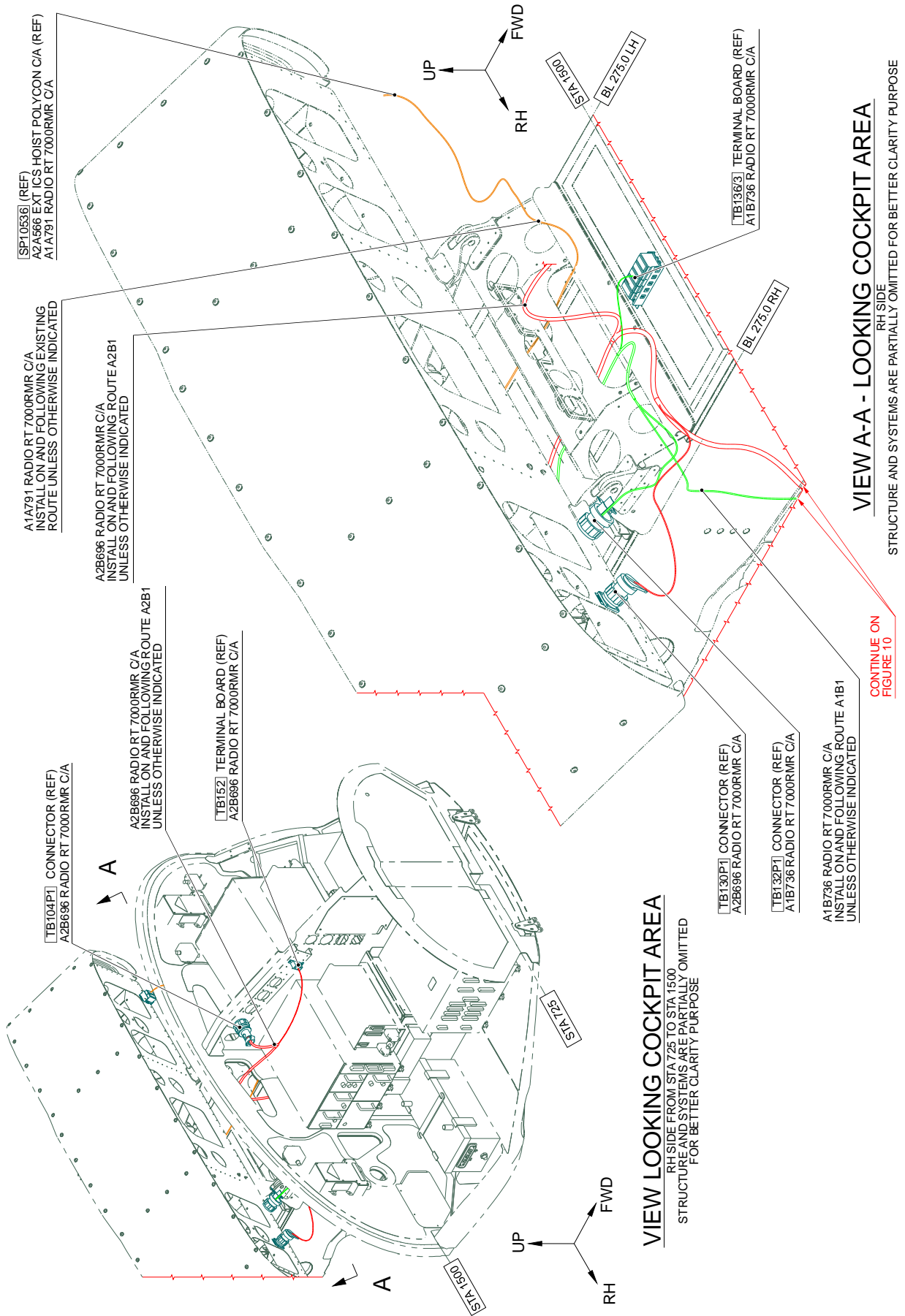


Figure 9

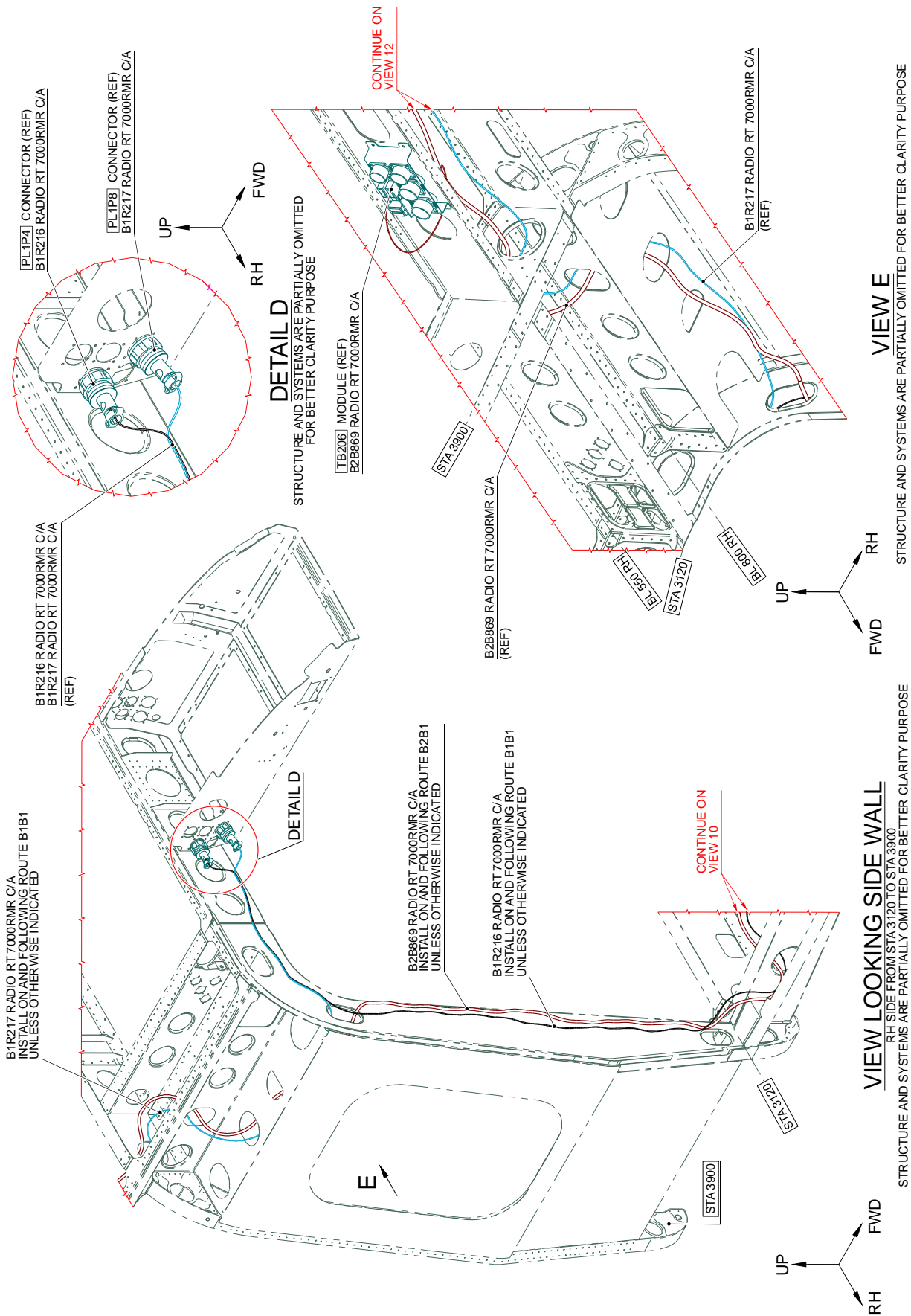


Figure 11

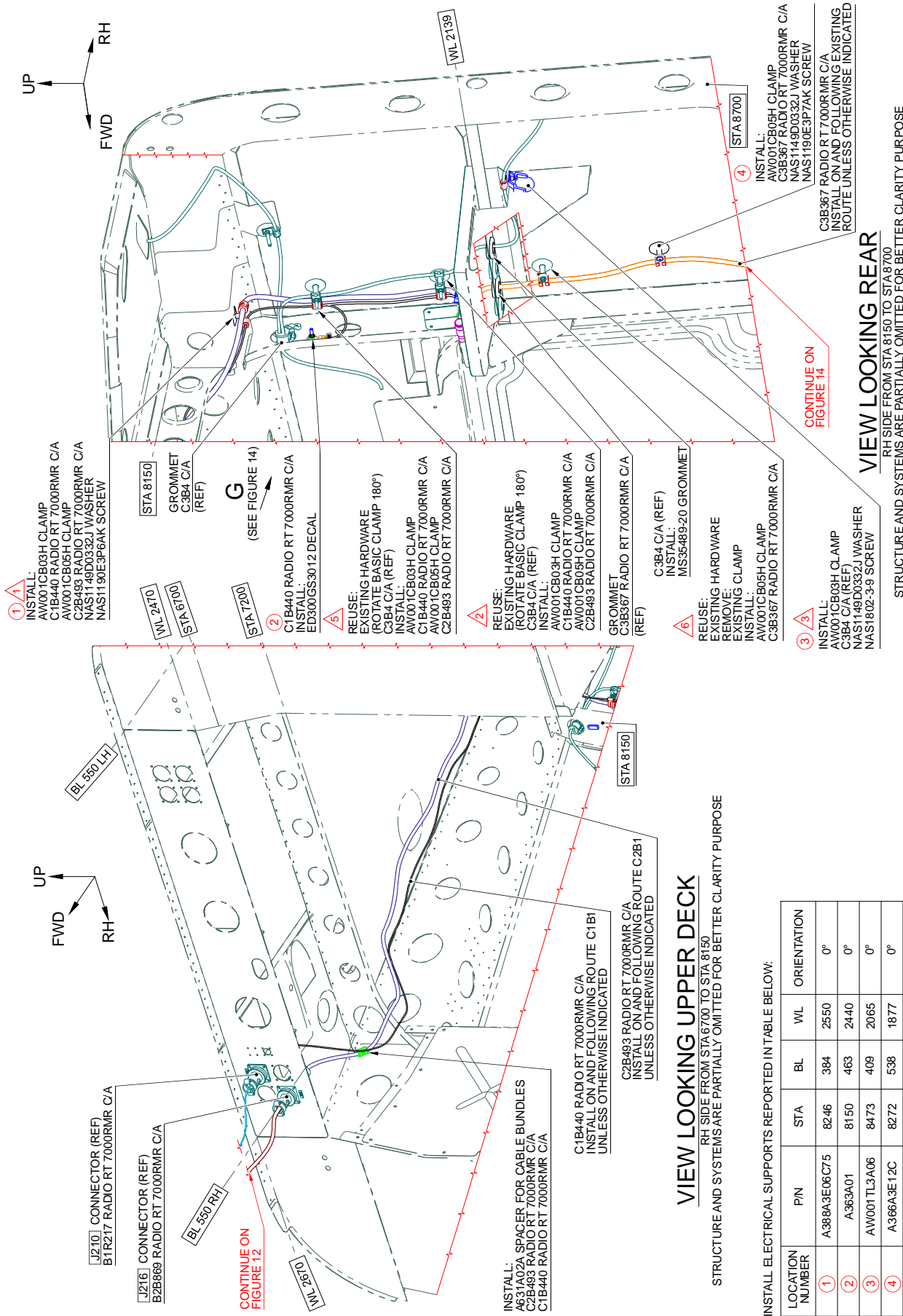


Figure 13

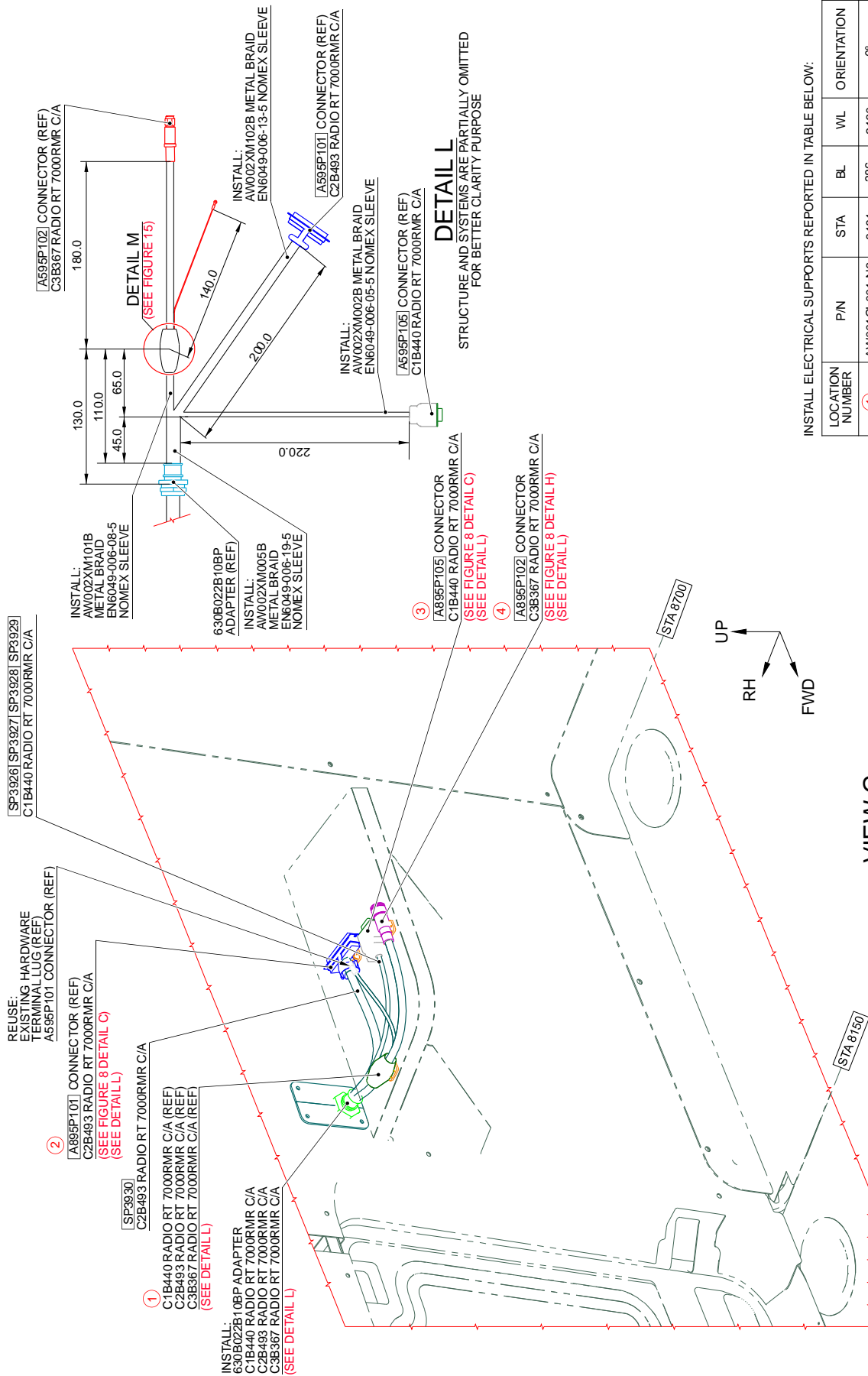


Figure 14

S.B. N°139-748 OPTIONAL
DATE: September 20, 2024
REVISION: /

INSTALL ELECTRICAL SUPPORTS REPORTED IN TABLE BELOW:

LOCATION NUMBER	P/N	STA	BL	WL	ORIENTATION
①	AW001CL001-N6	8181	386	2160	0°
②	AW001CL001-N6	8117	340	2160	0°
③	AW001CL001-N6	8285	295	2160	0°
④	AW001CL001-N6	8278	271	2160	0°

VIEW G

STRUCTURE AND SYSTEMS ARE PARTIALLY OMITTED FOR BETTER CLARITY PURPOSE
(REFER TO FIGURE 13)

DETAIL L
STRUCTURE AND SYSTEMS ARE PARTIALLY OMITTED
FOR BETTER CLARITY PURPOSE

③ A895P105 CONNECTOR
C1B440 RADIO RT 7000RMR C/A
(SEE FIGURE 8 DETAIL C)
(SEE DETAIL L)

④ A895P102 CONNECTOR
C3B367 RADIO RT 7000RMR C/A
(SEE FIGURE 8 DETAIL H)
(SEE DETAIL L)

INSTALL: A595P101 CONNECTOR (REF) C2B493 RADIO RT 7000RMR C/A

INSTALL: AW002XM002B METAL BRAID EN6049-006-13-5 NOMEX SLEEVE

INSTALL: AW002XM002B METAL BRAID EN6049-006-05-5 NOMEX SLEEVE

INSTALL: A595P105 CONNECTOR (REF) C1B440 RADIO RT 7000RMR C/A

INSTALL: AW002XM00101B METAL BRAID EN6049-006-08-5 NOMEX SLEEVE

630B022B10BP ADAPTER (REF)

INSTALL: AW002XM0005B METAL BRAID EN6049-006-19-5 NOMEX SLEEVE

REUSE EXISTING HARDWARE TERMINAL LUG (REF) A595P101 CONNECTOR (REF)

INSTALL: SP3926 | SP3927 | SP3928 | SP3929 C1B440 RADIO RT 7000RMR C/A

② A895P101 CONNECTOR (REF) C2B493 RADIO RT 7000RMR C/A
(SEE FIGURE 8 DETAIL C)
(SEE DETAIL L)

① C1B440 RADIO RT 7000RMR C/A (REF)
C2B493 RADIO RT 7000RMR C/A (REF)
C3B367 RADIO RT 7000RMR C/A (REF)
(SEE DETAIL L)

INSTALL: 630B022B10BP ADAPTER C1B440 RADIO RT 7000RMR C/A C2B493 RADIO RT 7000RMR C/A C3B367 RADIO RT 7000RMR C/A
(SEE DETAIL L)

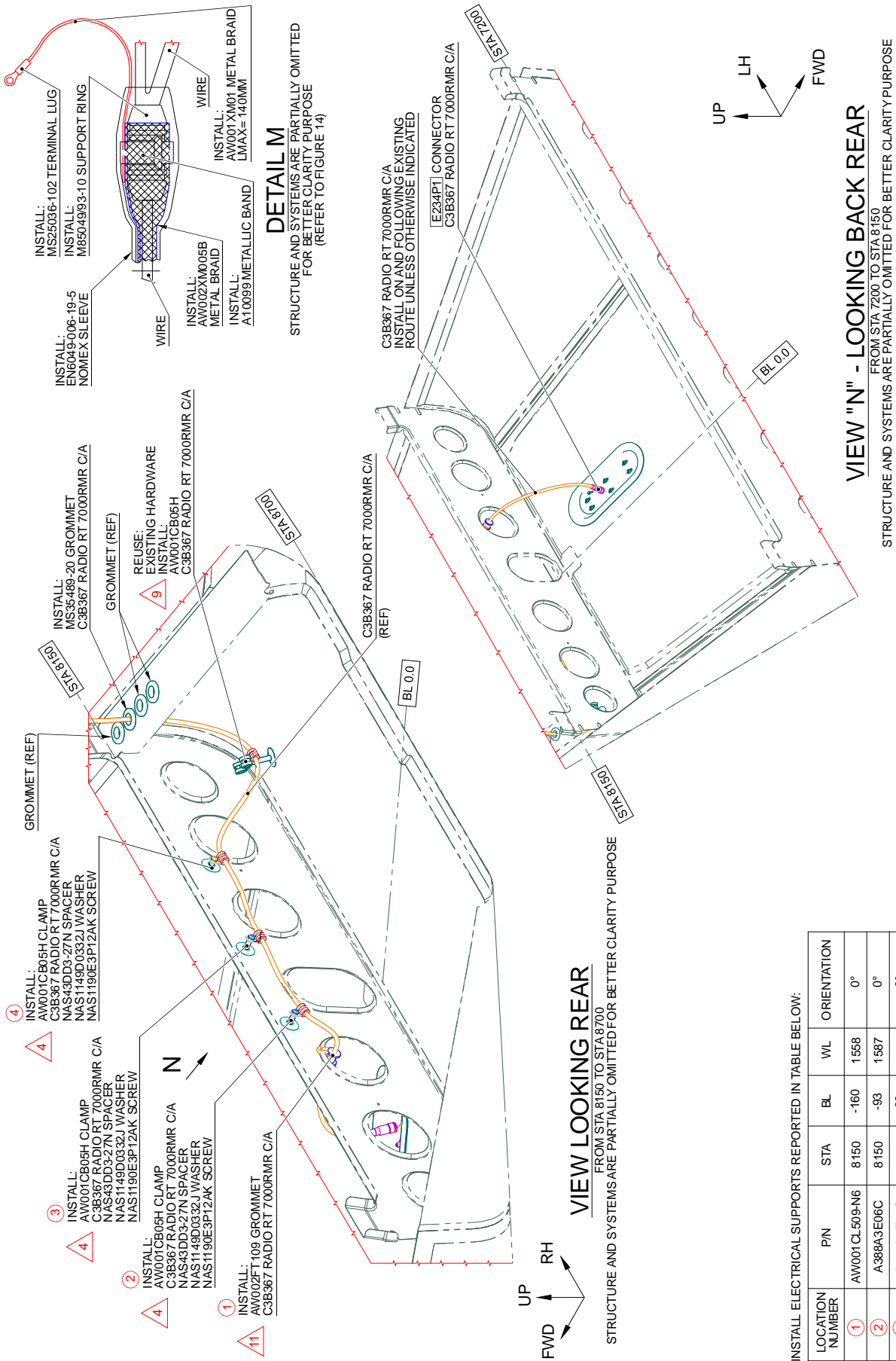


Figure 15

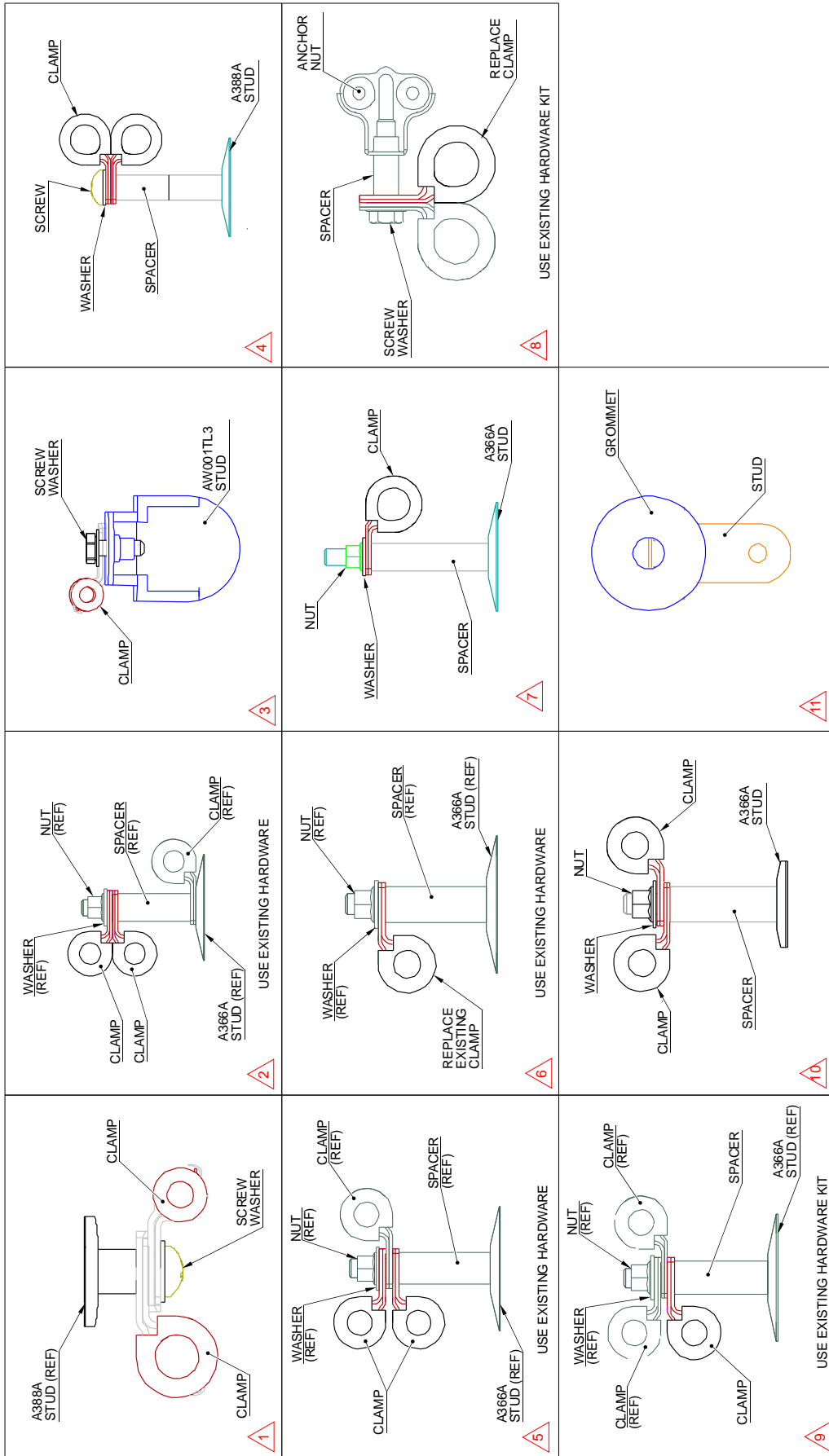


Figure 16

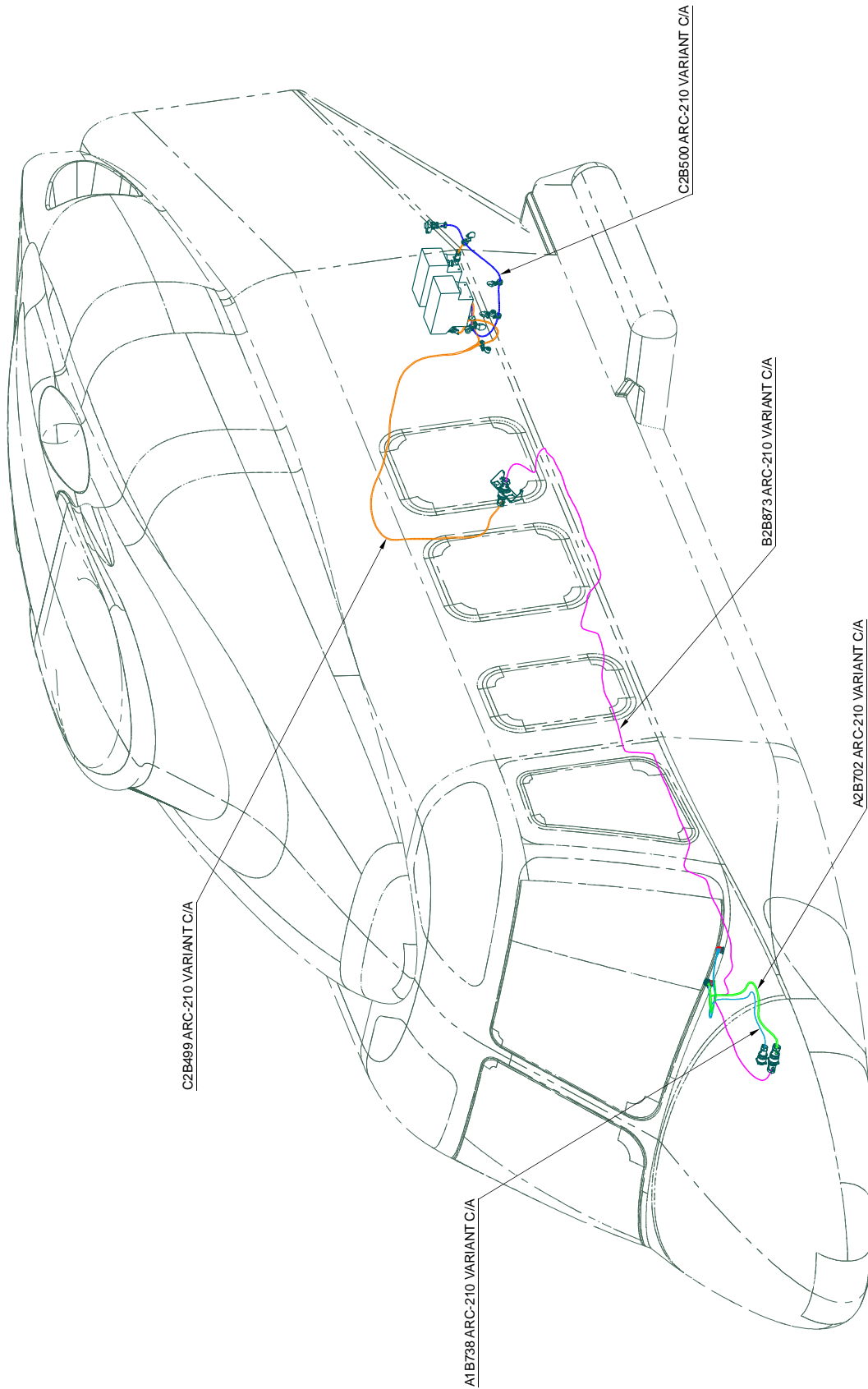


Figure 17

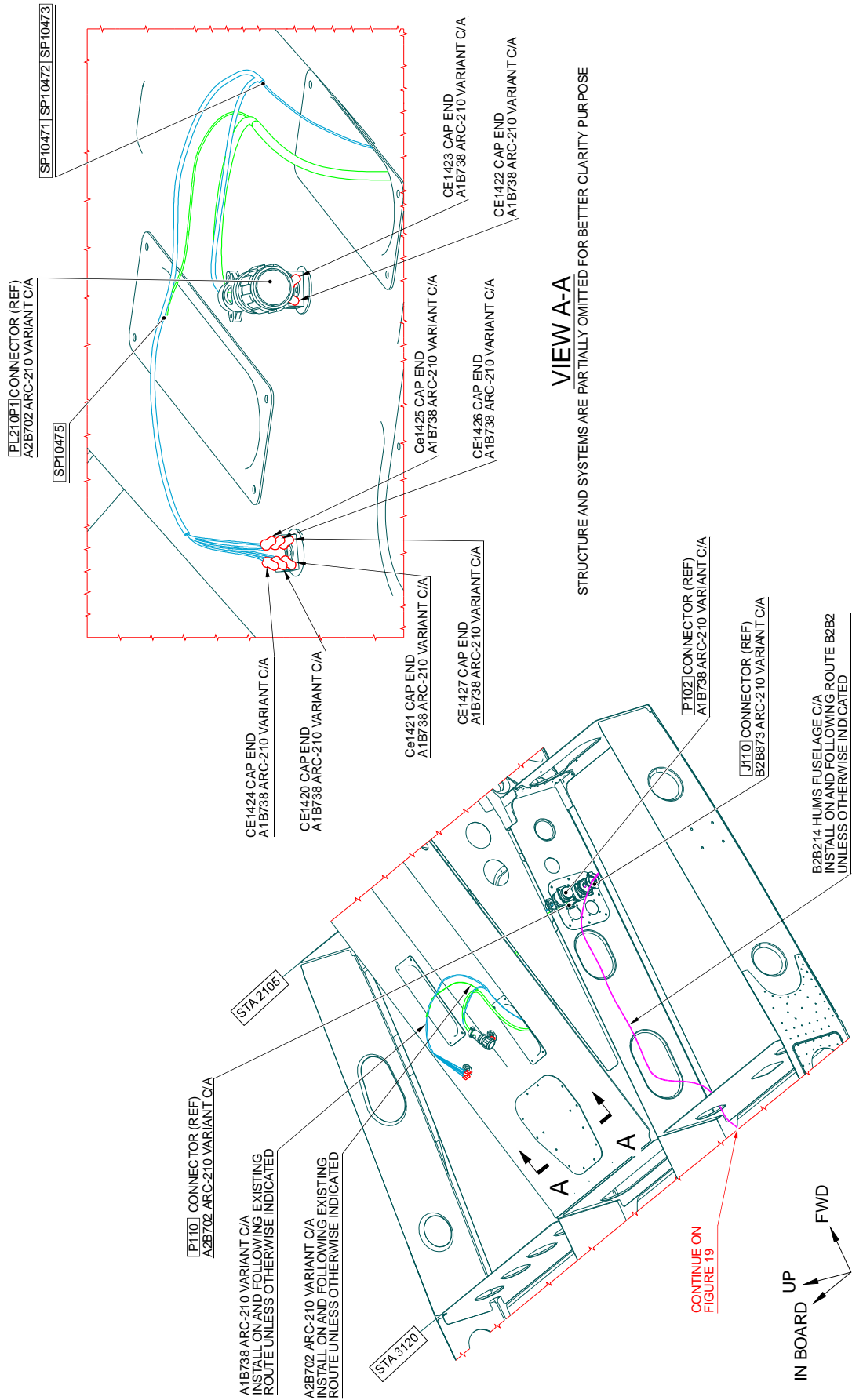
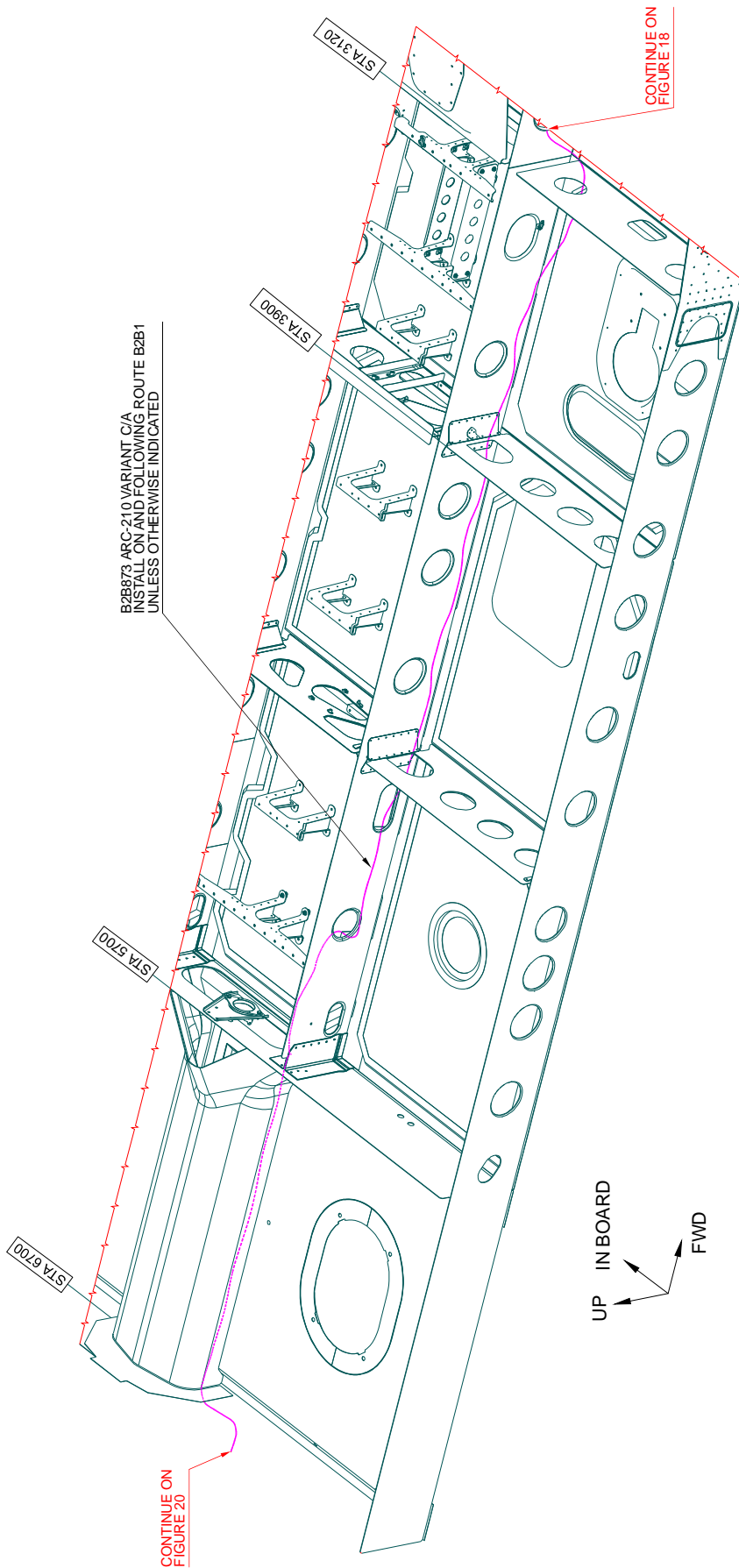


Figure 18



VIEW LOOKING FLOOR

FROM STA 3120 TO STA 6700
STRUCTURE AND SYSTEMS ARE PARTIALLY OMITTED FOR BETTER CLARITY PURPOSE

Figure 19

S.B. N°139-748 OPTIONAL
DATE: September 20, 2024
REVISION: /

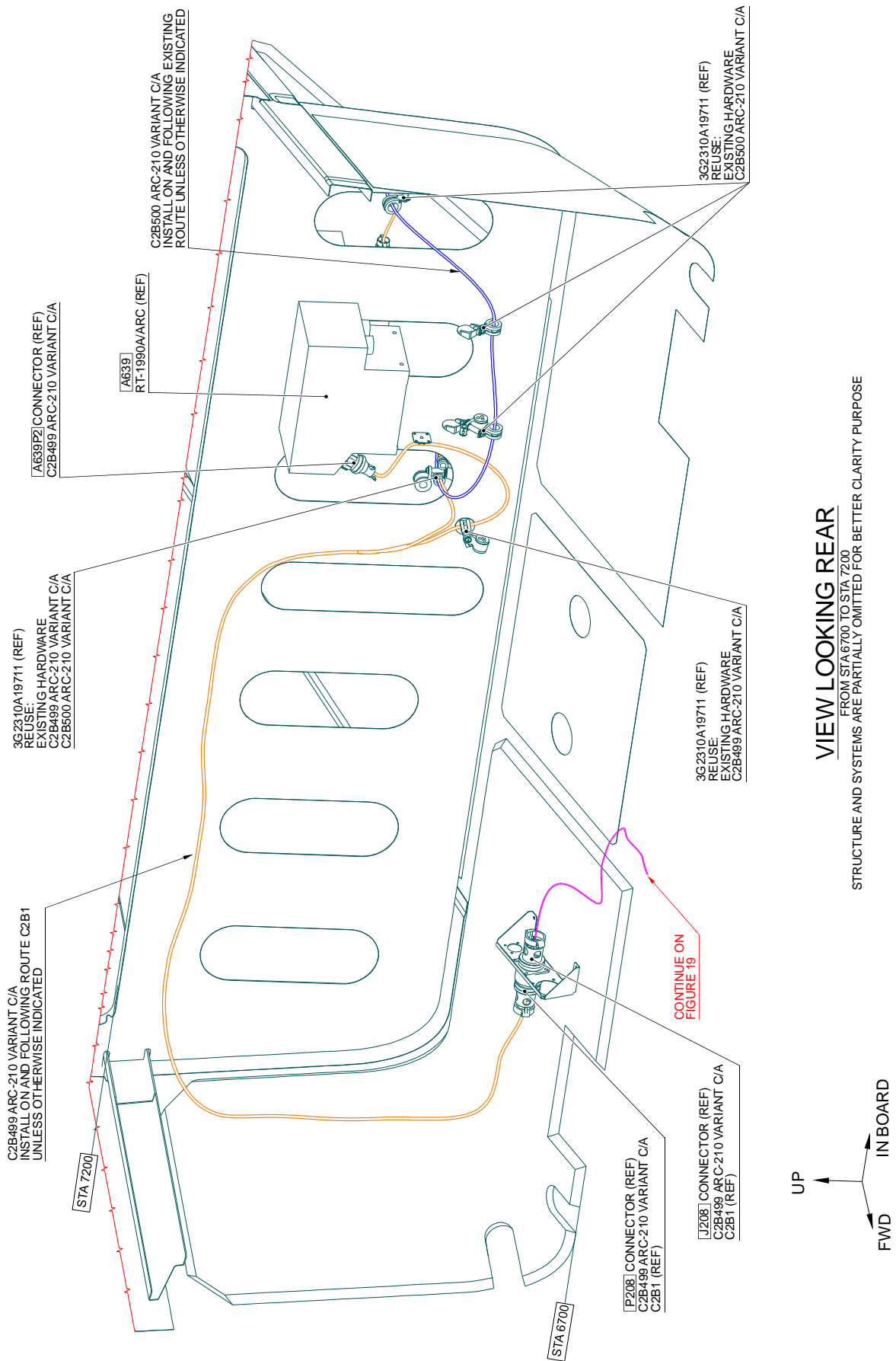
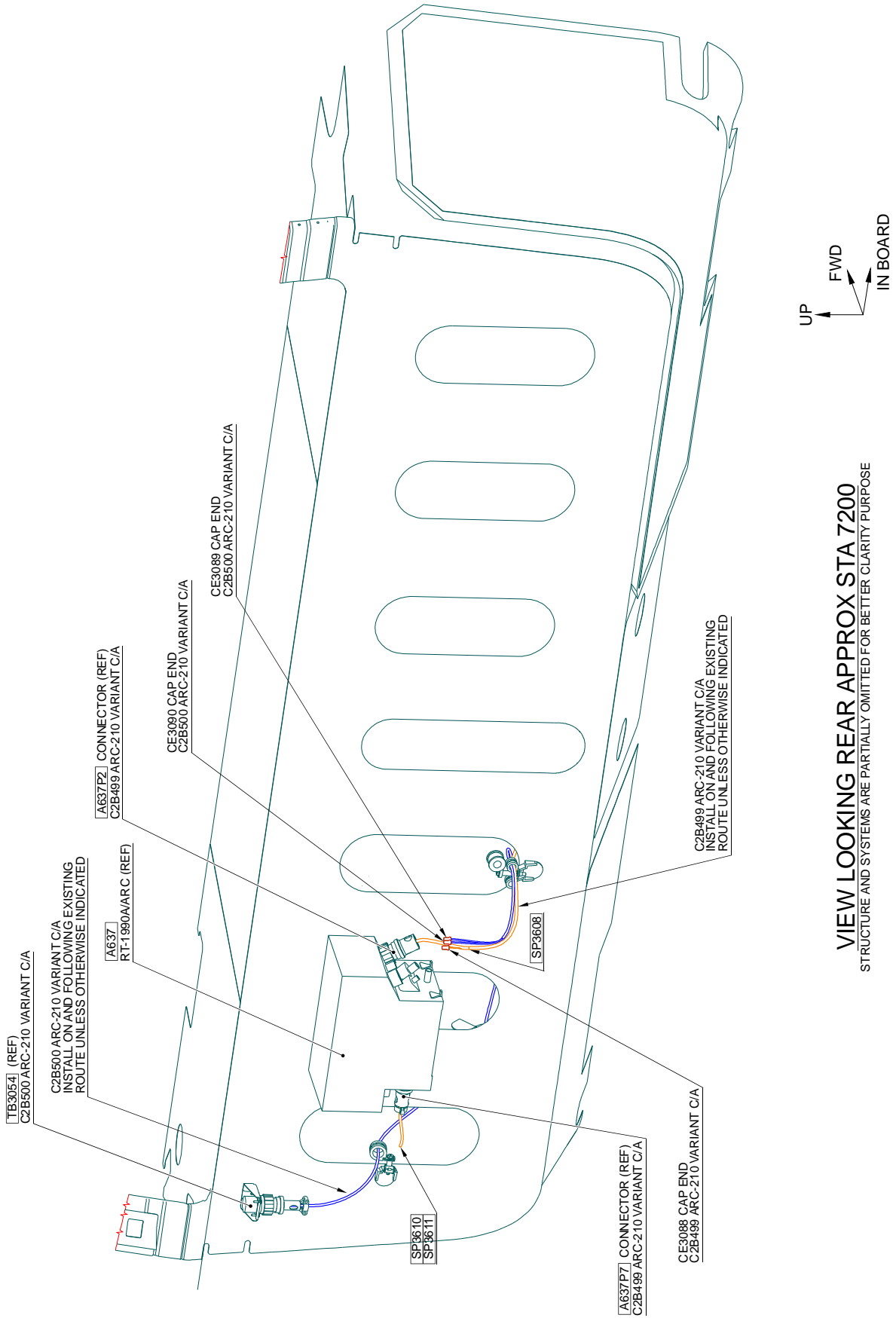


Figure 20



VIEW LOOKING REAR APPROX STA 7200
STRUCTURE AND SYSTEMS ARE PARTIALLY OMITTED FOR BETTER CLARITY PURPOSE

Figure 21

S.B. N°139-748 OPTIONAL
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REVISION: /

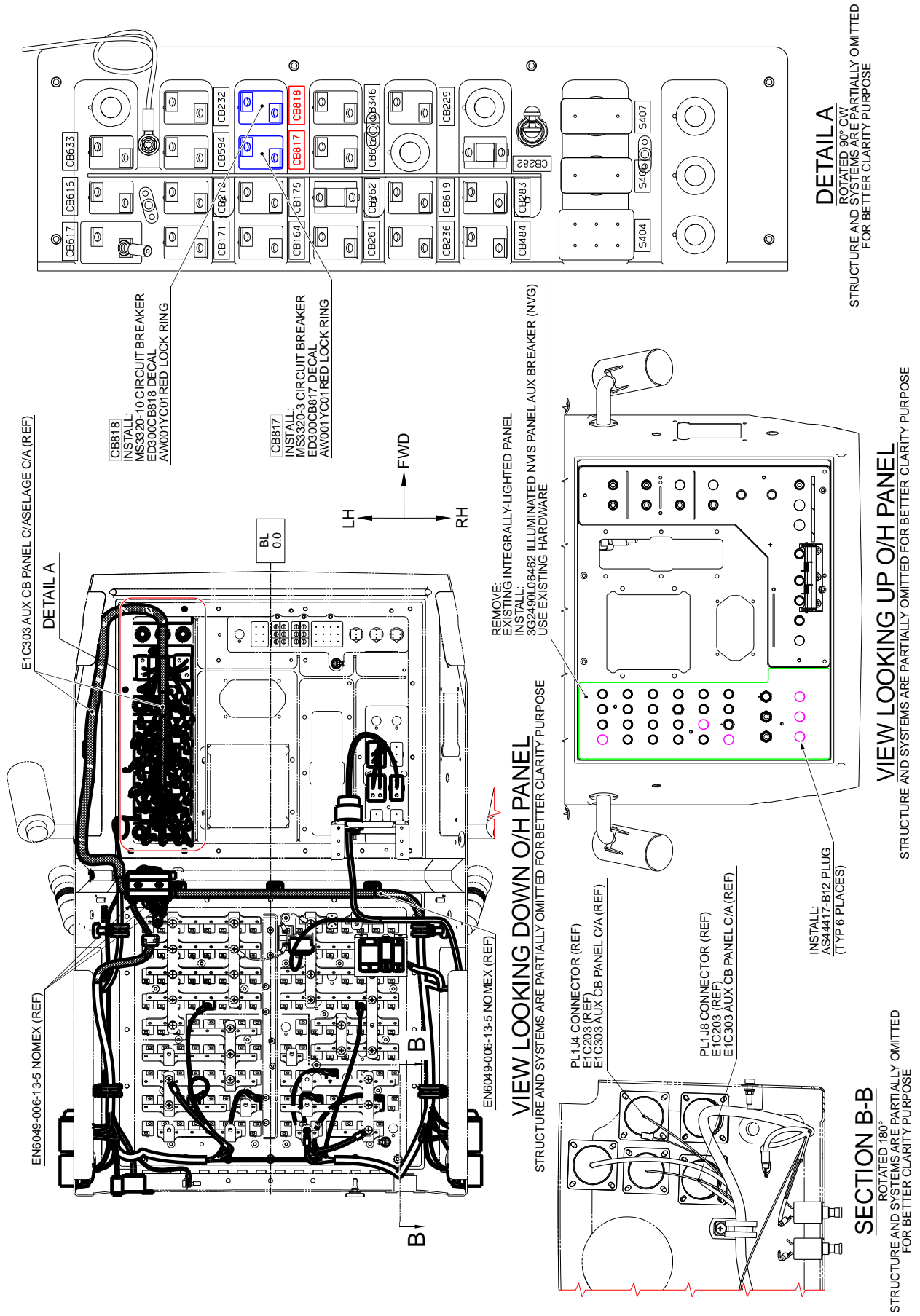


Figure 22

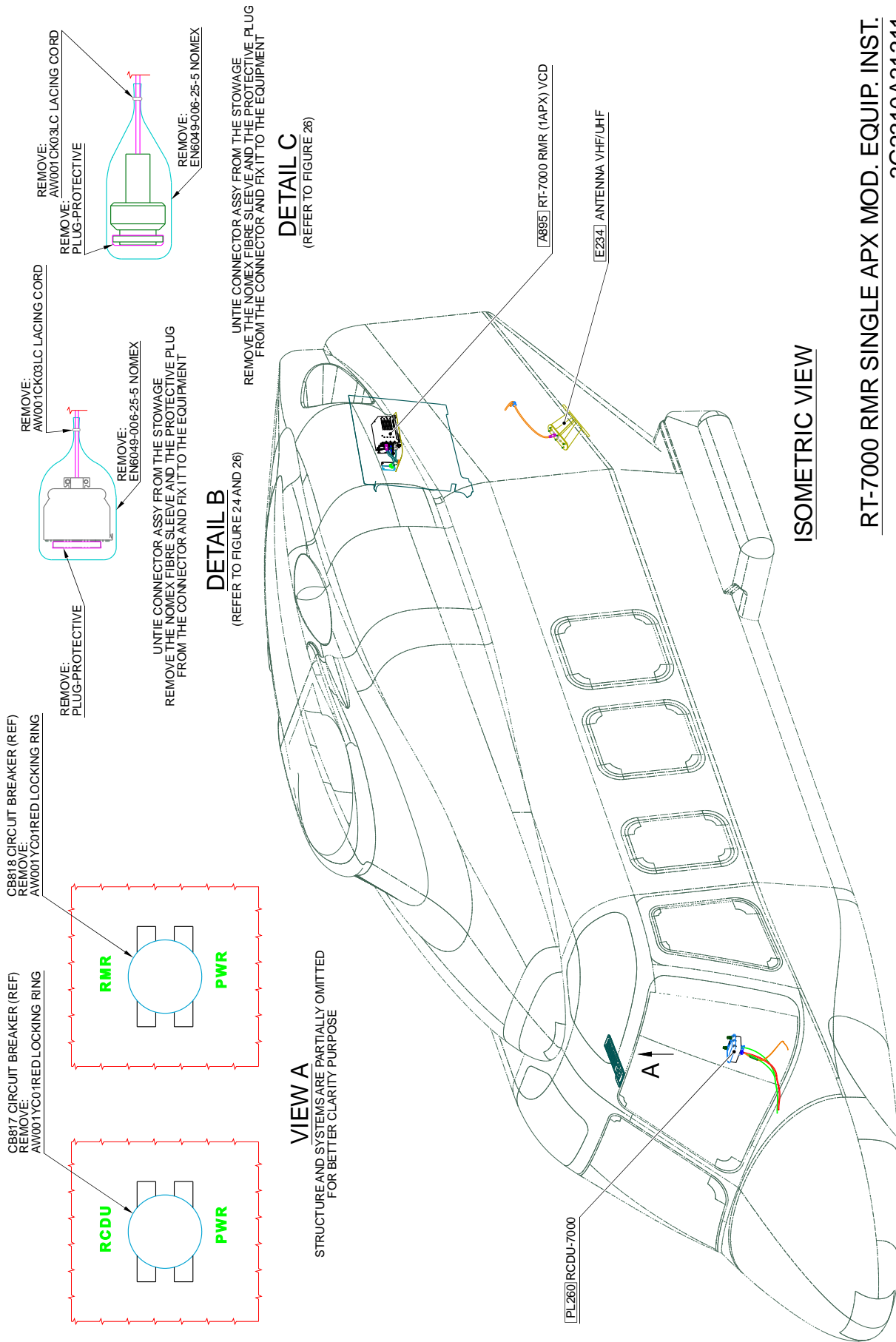


Figure 23

S.B. N°139-748 OPTIONAL
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REVISION: /

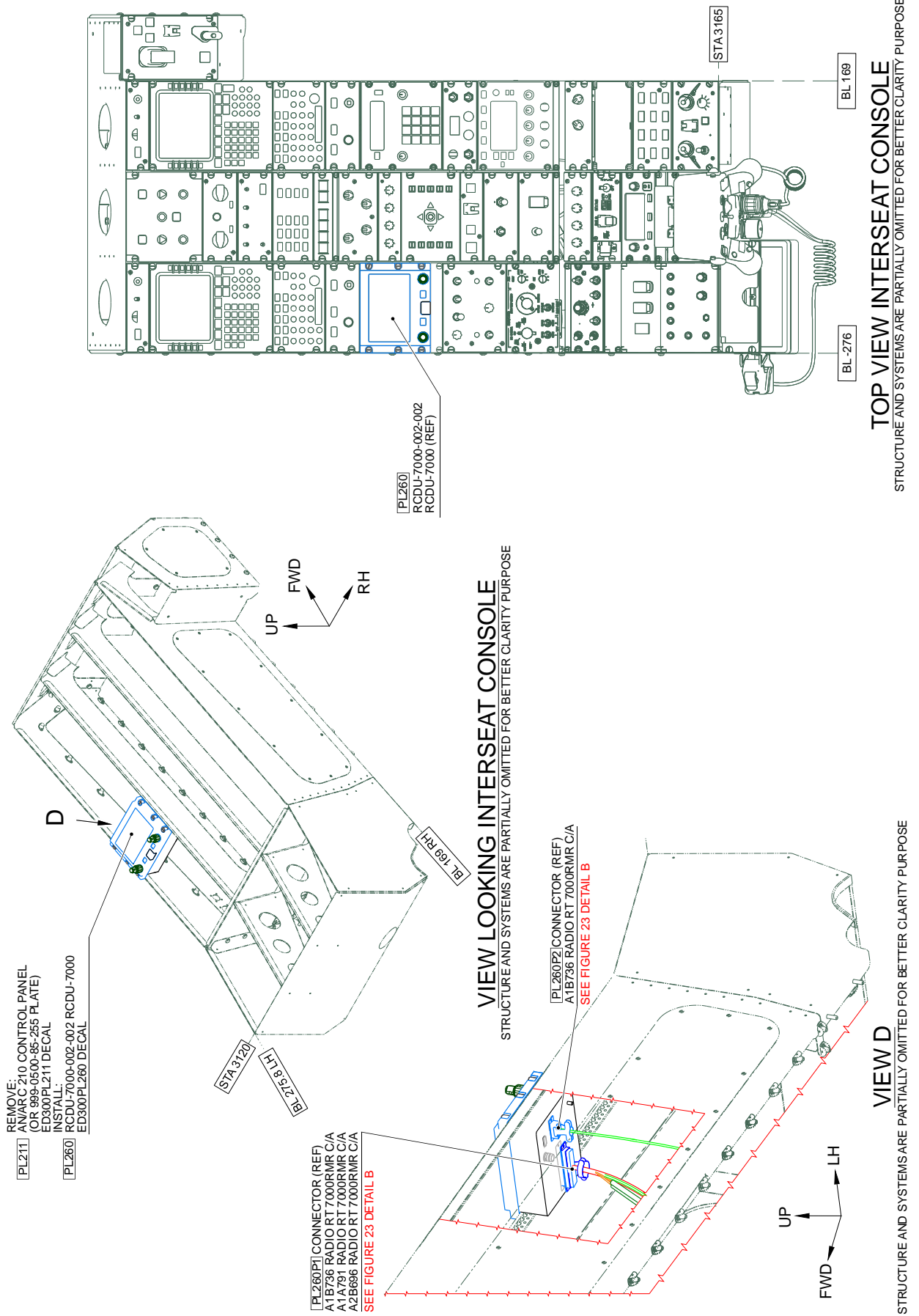


Figure 24

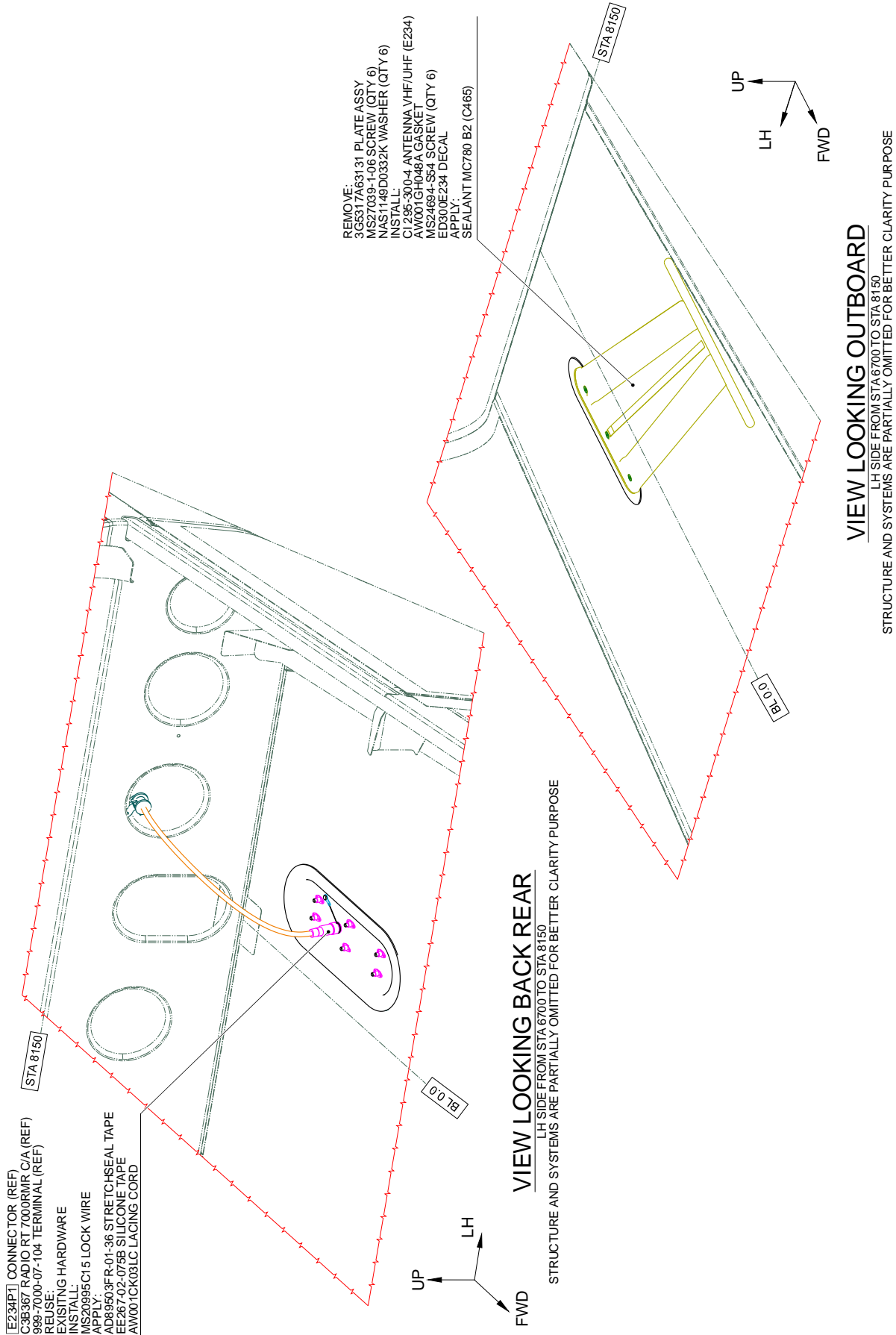


Figure 25

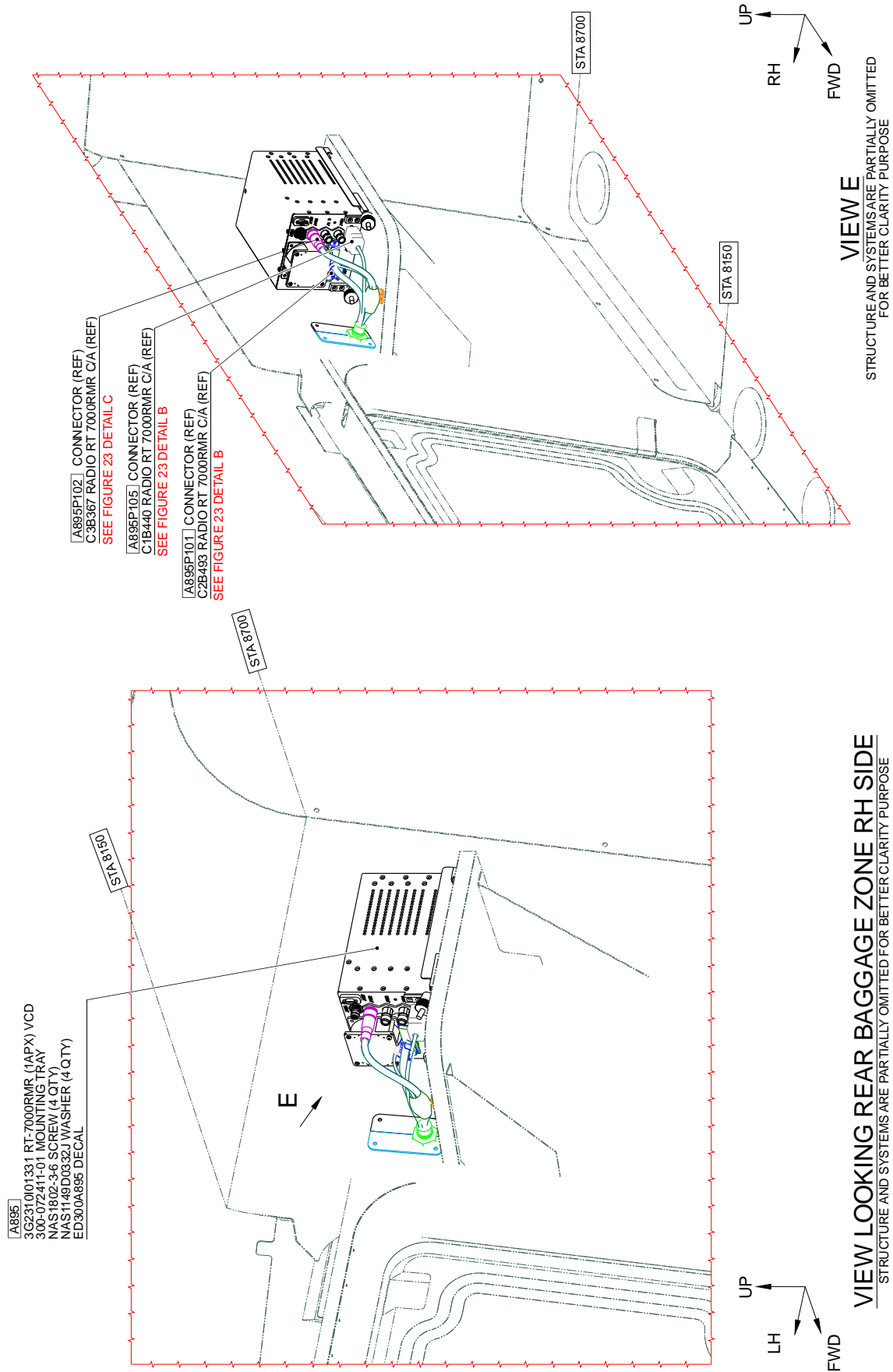
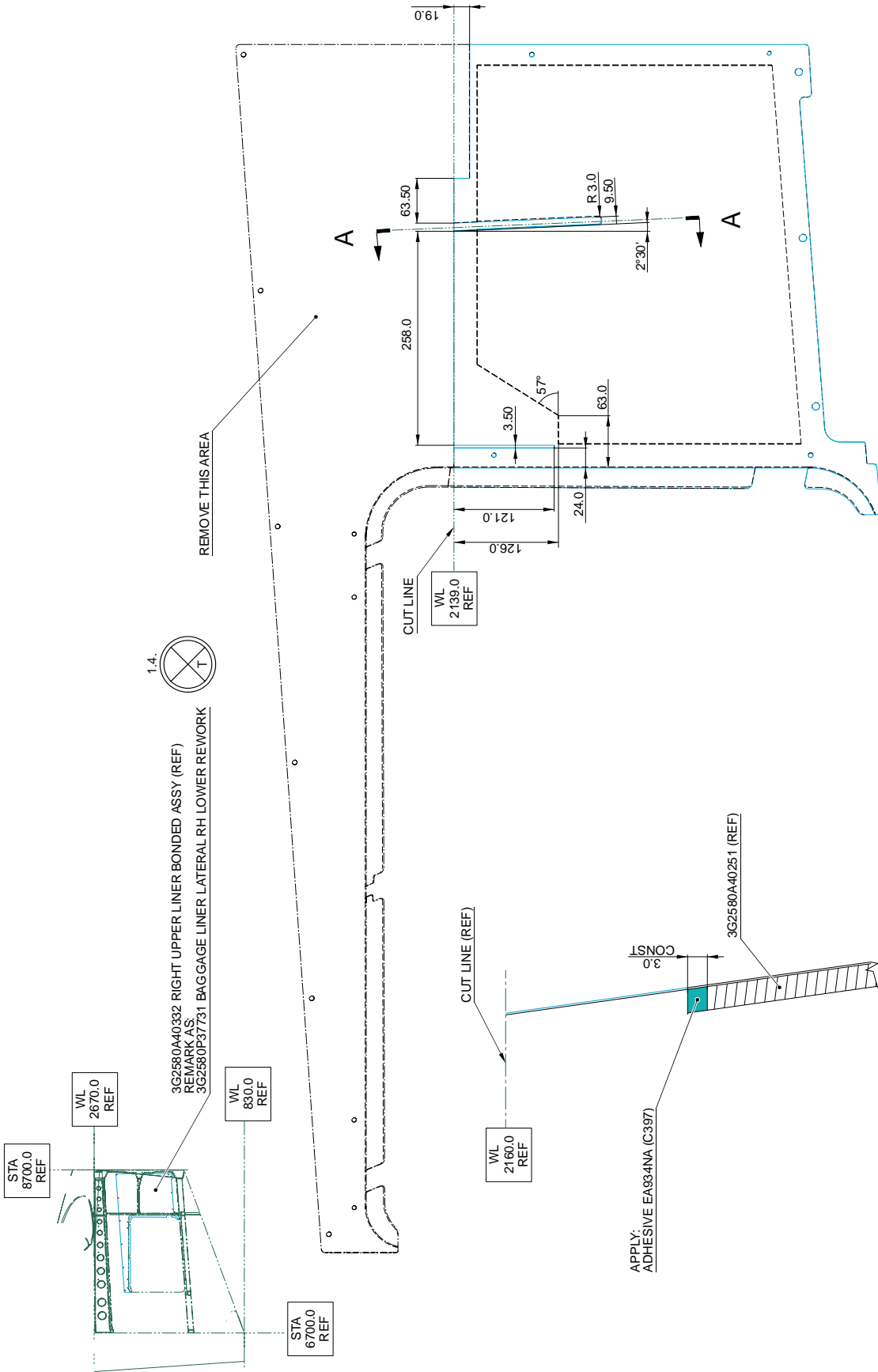


Figure 26

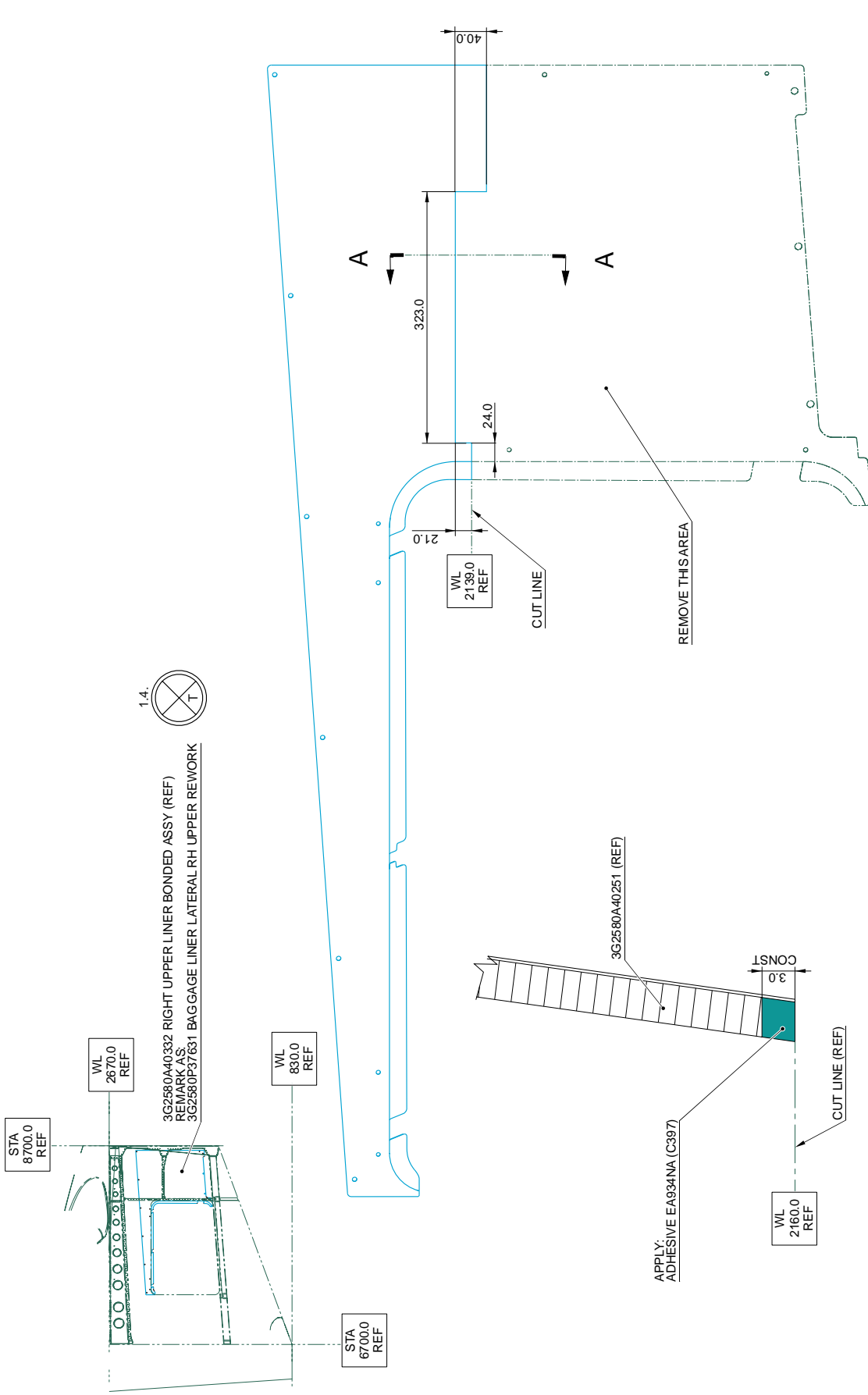


BAGGAGE LINER LATERAL RH LOWER REWORK
3G2580P037731

SECTION A-A
STRUCTURE AND SYSTEMS ARE PARTIALLY OMITTED
FOR BETTER CLARITY PURPOSE

Figure 27

S.B. N°139-748 OPTIONAL
DATE: September 20, 2024
REVISION: /



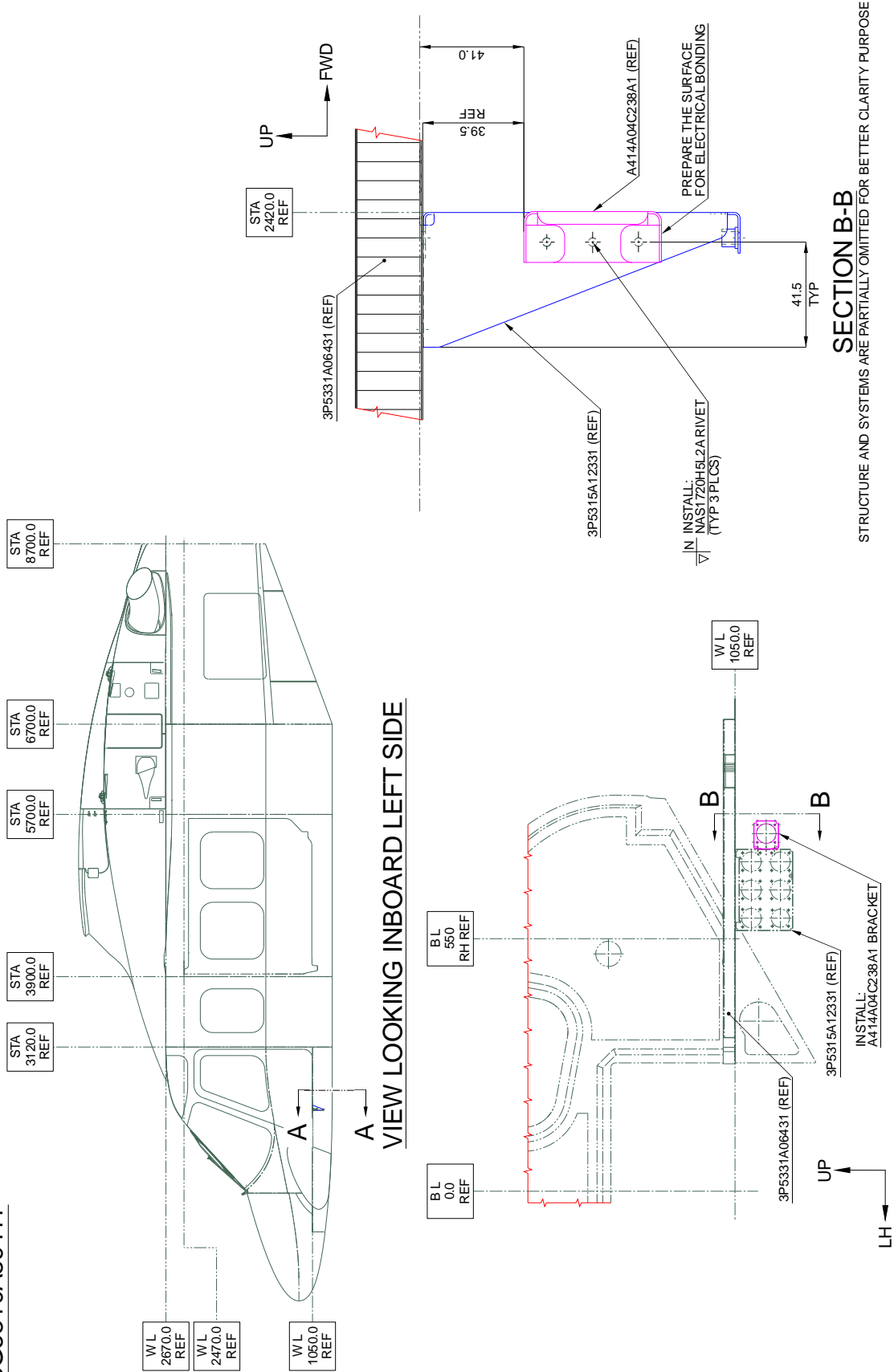
BAGGAGE LINER LATERAL RH UPPER REWORK
3G2580P037631

SECTION A-A
STRUCTURE AND SYSTEMS ARE PARTIALLY OMITTED
FOR BETTER CLARITY PURPOSE

Figure 28

INLET BARRIER FILTER STRUCTURAL PROVISION

3G5310A89111



SECTION B-B

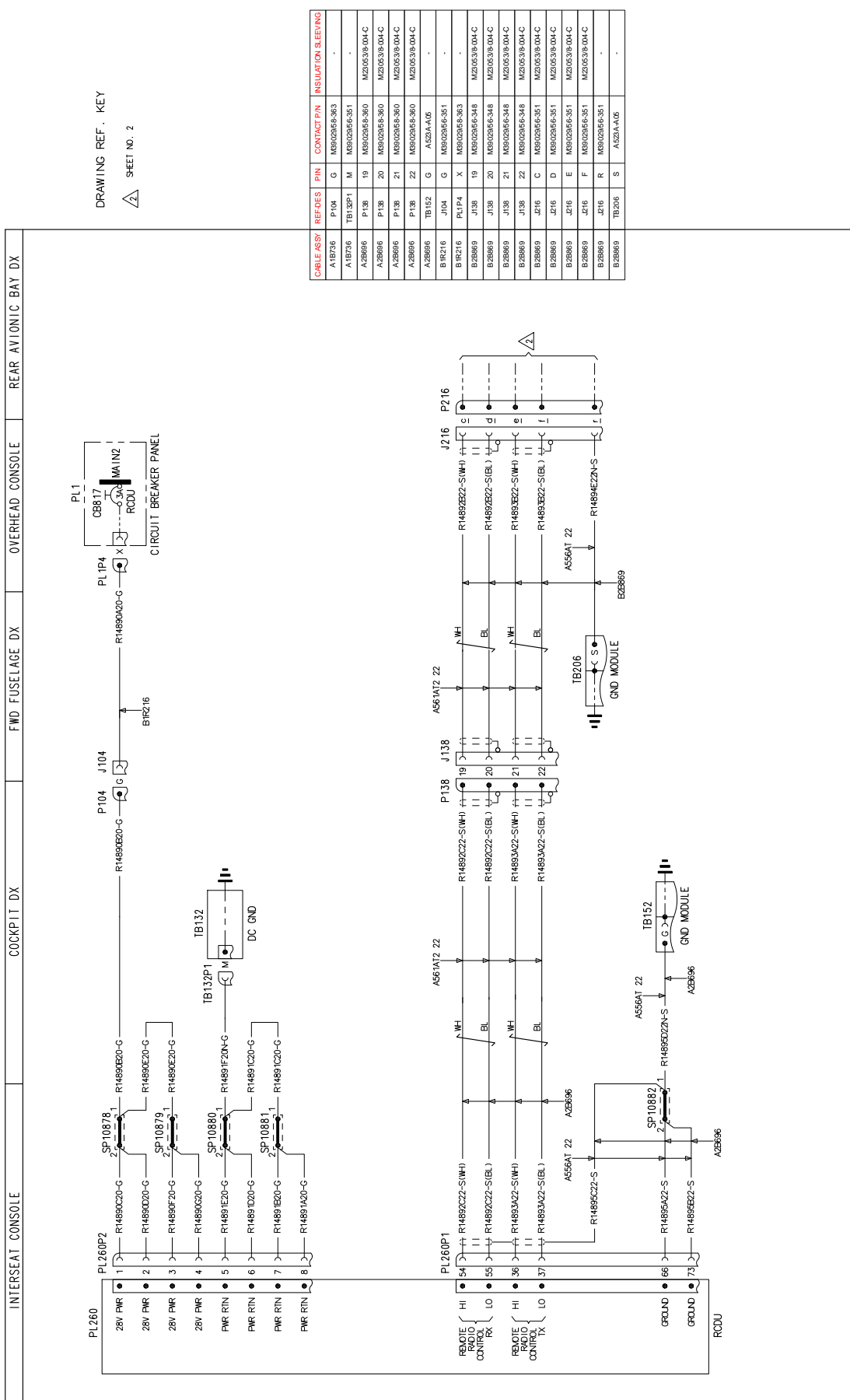
STRUCTURE AND SYSTEMS ARE PARTIALLY OMITTED FOR BETTER CLARITY PURPOSE

SECTION A-A

STRUCTURE AND SYSTEMS ARE PARTIALLY OMITTED FOR BETTER CLARITY PURPOSE

Figure 29

S.B. N°139-748 OPTIONAL
DATE: September 20, 2024
REVISION: /



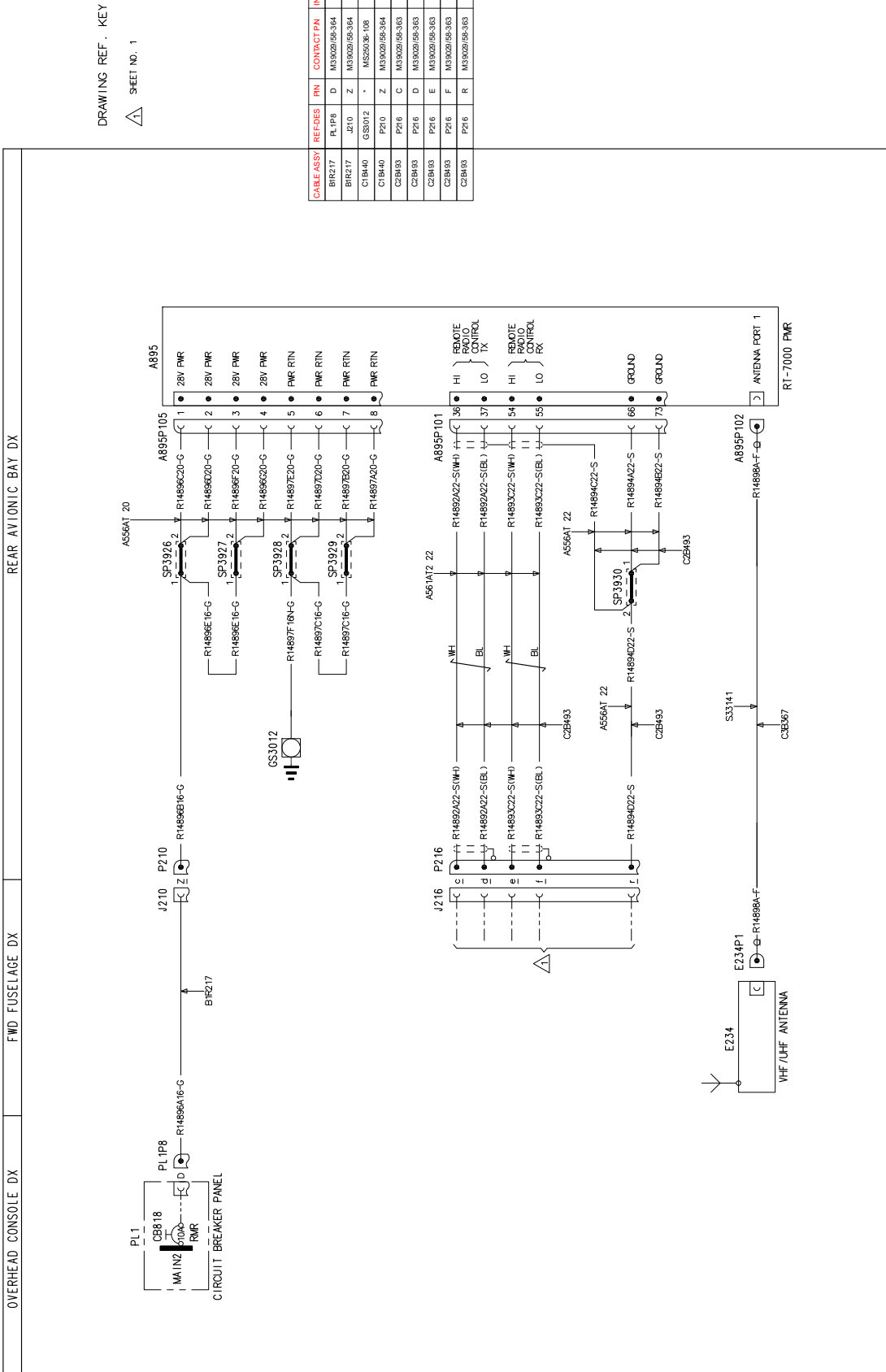
DRAWING REF. KEY
 SHEET NO. 2

CABLE ASSY	REF DES	PIN	CONTACT PIN	INSULATION SLEEVING
A1B736	P104	G	M8902B6-6-363	-
A1B736	TB132P1	M	M8902B6-6-351	-
A2B696	P138	19	M8902B6-6-360	M200539-04-C
A2B696	P138	20	M8902B6-6-360	M200539-04-C
A2B696	P138	21	M8902B6-6-360	M200539-04-C
A2B696	P138	22	M8902B6-6-360	M200539-04-C
A2B696	TB152	G	A32A-A-05	-
B1R216	J104	G	M8902B6-6-351	-
B1R216	P138	X	M8902B6-6-363	-
B2B669	J138	19	M8902B6-6-346	M200539-04-C
B2B669	J138	20	M8902B6-6-346	M200539-04-C
B2B669	J138	21	M8902B6-6-346	M200539-04-C
B2B669	J138	22	M8902B6-6-346	M200539-04-C
B2B669	J216	C	M8902B6-6-351	M200539-04-C
B2B669	J216	E	M8902B6-6-351	M200539-04-C
B2B669	J216	F	M8902B6-6-351	M200539-04-C
B2B669	J216	R	M8902B6-6-351	M200539-04-C
B2B669	TB206	S	A32A-A-05	-

3G2310W20011
WIRING DIAGRAM RADIO RT7000RMR
 SHEET 1 OF 4

FUNCTIONAL NOTES
 ALL CABLES ARE IN LOU A1B736 UNLESS SPECIFIED
 ALL CABLES ARE OF TYPE A556AT 20 UNLESS SPECIFIED

Figure 30



DRAWING REF. KEY
△ SHEET NO. 1

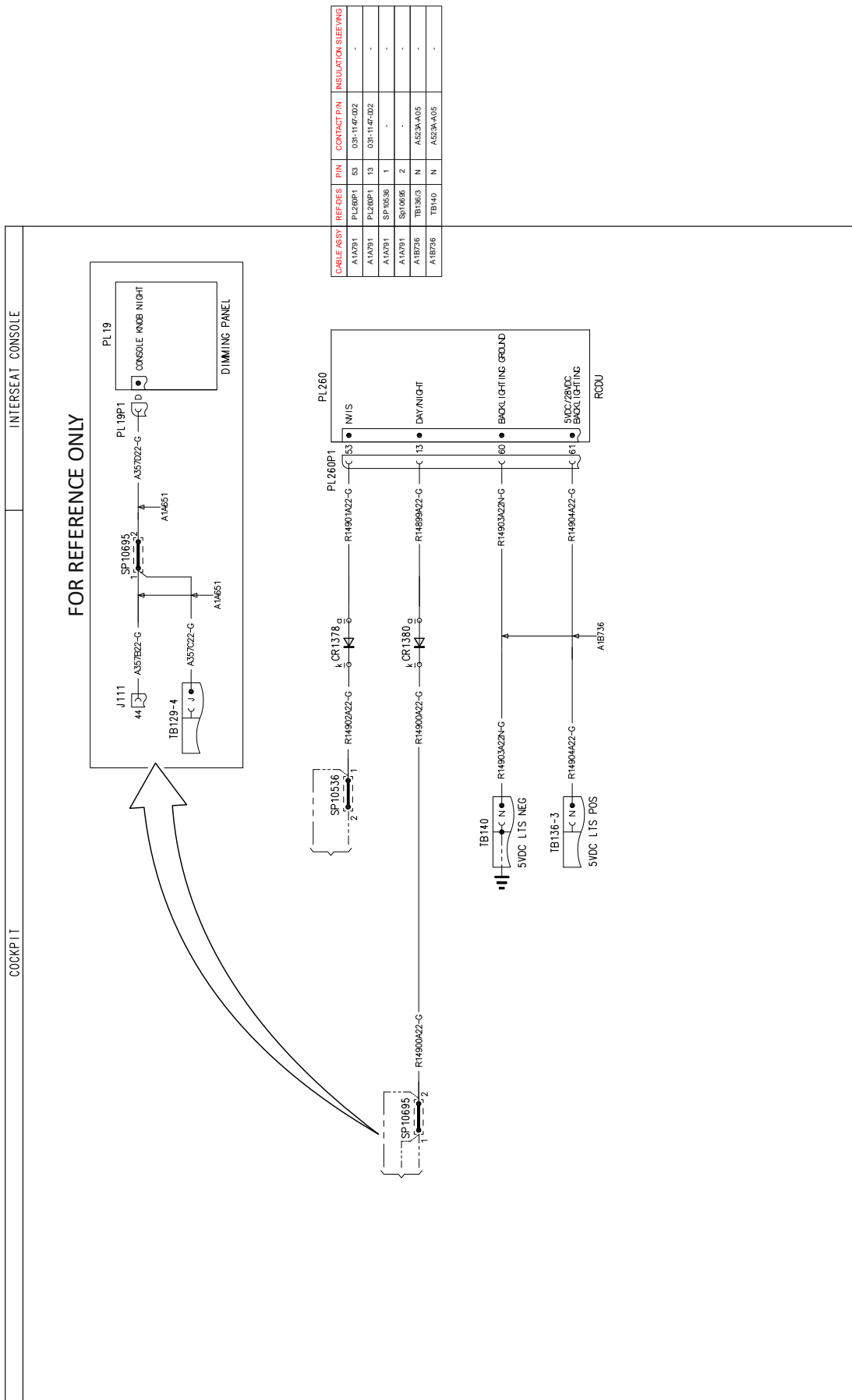
CABLE ASSY	REF DES	FN	CONTRACT FN	INSULATIONS LEEVING
BR217	PL1P8	D	M30029/05/3/64	-
BR217	JZ10	Z	M30029/05/3/64	-
CI8440	GS0012	-	MS2008-108	-
CI8440	P210	Z	M30029/05/3/64	-
C2B493	P216	C	M30029/05/3/63	M290598-004-C
C2B493	P216	D	M30029/05/3/63	M290598-004-C
C2B493	P216	E	M30029/05/3/63	M290598-004-C
C2B493	P216	F	M30029/05/3/63	M290598-004-C
C2B493	P216	R	M30029/05/3/63	-

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FUNCTIONAL NOTES
ALL CABLES ARE IN LOOM C18440 UNLESS SPECIFIED
ALL CABLES ARE OF TYPE A556AT 16 UNLESS SPECIFIED

Figure 31

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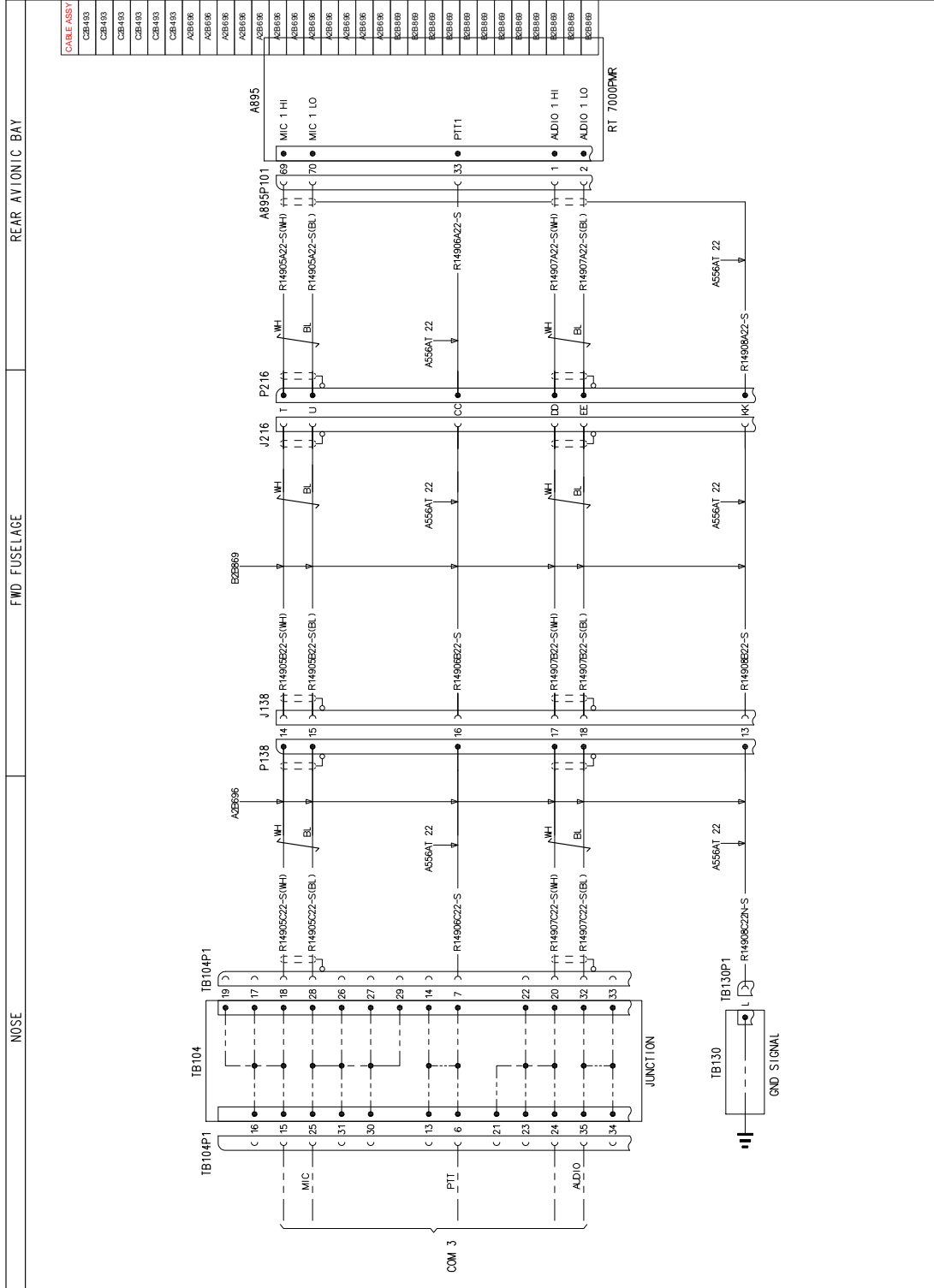
CABLE ASSY	REF ID	PIN	CONTACT PIN	INSULATION SLEEVING
A1A791	PL260P1	53	03F-114F-002	-
A1A791	PL260P1	13	03F-114F-002	-
A1A791	SP10536	1	-	-
A1A791	SP10695	2	-	-
A1B756	TB136/3	N	A523A-A05	-
A1B756	TB140	N	A523A-A05	-

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FUNCTIONAL NOTES

ALL CABLES ARE IN LOUW A1A791 UNLESS SPECIFIED.
ALL CABLES ARE OF TYPE A556A1 22 UNLESS SPECIFIED.

Figure 32



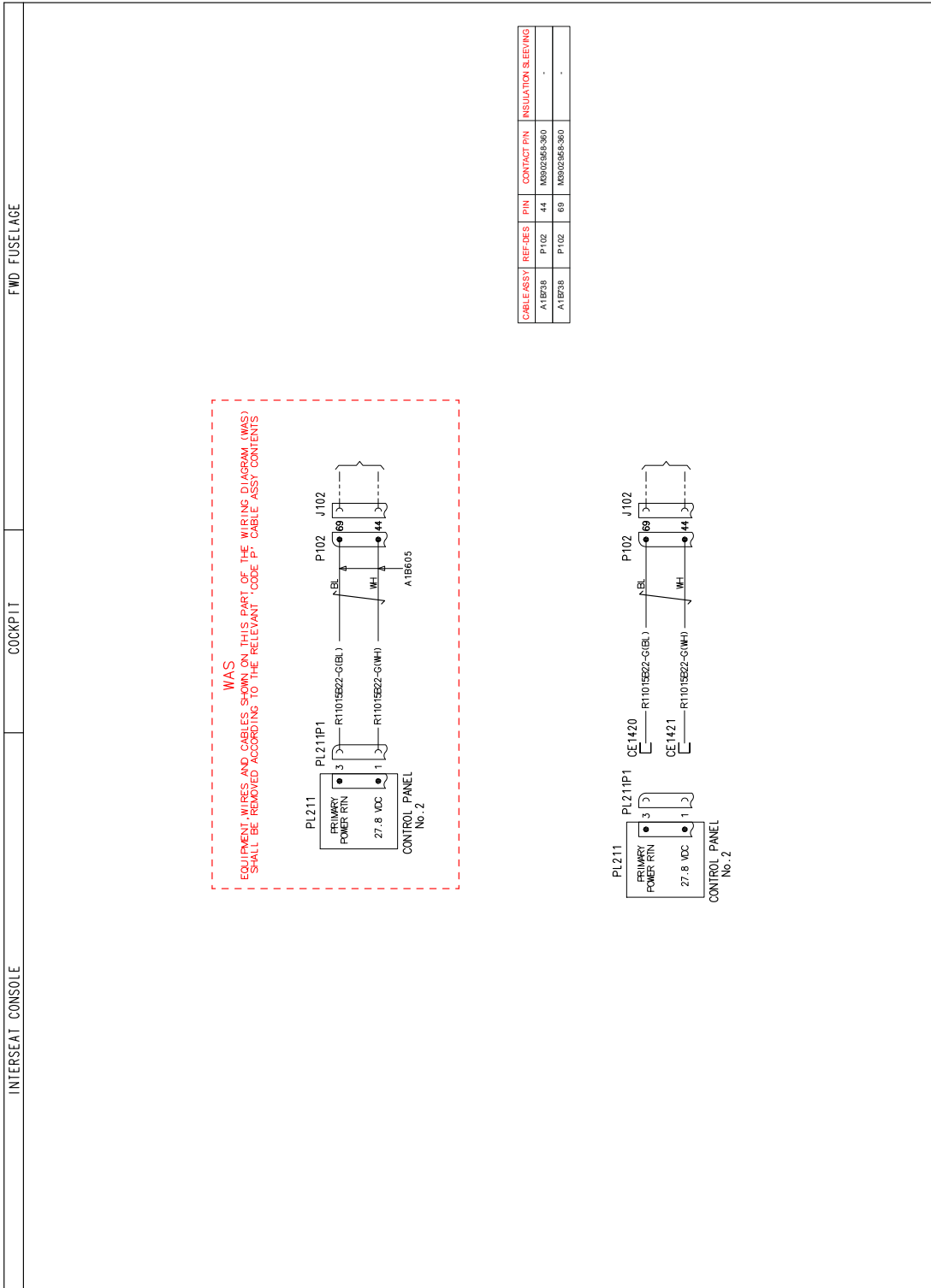
CABLE ASSY	REF DIS	FN	CONTACT FN	INSULATION SLEEVING
C2E1493	P216	T	M330201/56330	M230358/8-004-C
C2E1493	P216	U	M330201/56346	M230358/8-004-C
C2E1493	P216	CC	M330201/56308	-
C2E1493	P216	DD	M330201/56336	M230358/8-004-C
C2E1493	P216	EE	M330201/56308	M230358/8-004-C
C2E1493	P216	KK	M330201/56346	-
A2E1636	TB104P1	16	M330201/56346	M230358/8-004-C
A2E1636	P138	14	M330201/56330	M230358/8-004-C
A2E1636	TB104P1	26	M330201/56346	M230358/8-004-C
A2E1636	P138	15	M330201/56300	M230358/8-004-C
A2E1636	TB104P1	7	M330201/56346	-
A2E1636	P138	16	M330201/56300	-
A2E1636	TB104P1	20	M330201/56346	M230358/8-004-C
A2E1636	P138	17	M330201/56300	M230358/8-004-C
A2E1636	TB104P1	32	M330201/56346	M230358/8-004-C
A2E1636	P138	18	M330201/56300	M230358/8-004-C
A2E1636	TB104P1	L	M330201/56346	-
A2E1636	P138	13	M330201/56300	-
A2E1636	J138	14	M330201/56346	M230358/8-004-C
A2E1636	J216	T	M330201/56300	M230358/8-004-C
A2E1636	J138	15	M330201/56346	M230358/8-004-C
A2E1636	J216	U	M330201/56300	M230358/8-004-C
A2E1636	J138	16	M330201/56346	-
A2E1636	J216	CC	M330201/56346	-
A2E1636	J138	17	M330201/56300	M230358/8-004-C
A2E1636	J216	DD	M330201/56336	M230358/8-004-C
A2E1636	J138	18	M330201/56346	M230358/8-004-C
A2E1636	J216	EE	M330201/56300	M230358/8-004-C
A2E1636	J138	13	M330201/56346	-
A2E1636	J216	KK	M330201/56346	-

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FUNCTIONAL NOTES
ALL CABLES ARE IN LOOM C2B493 UNLESS SPECIFIED
ALL CABLES ARE OF TYPE A56M12 22 UNLESS SPECIFIED

Figure 33

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FUNCTIONAL NOTES

ALL CABLES ARE IN LOOM A8738 UNLESS SPECIFIED
ALL CABLES ARE OF TYPE A86A12 22 UNLESS SPECIFIED

Figure 34

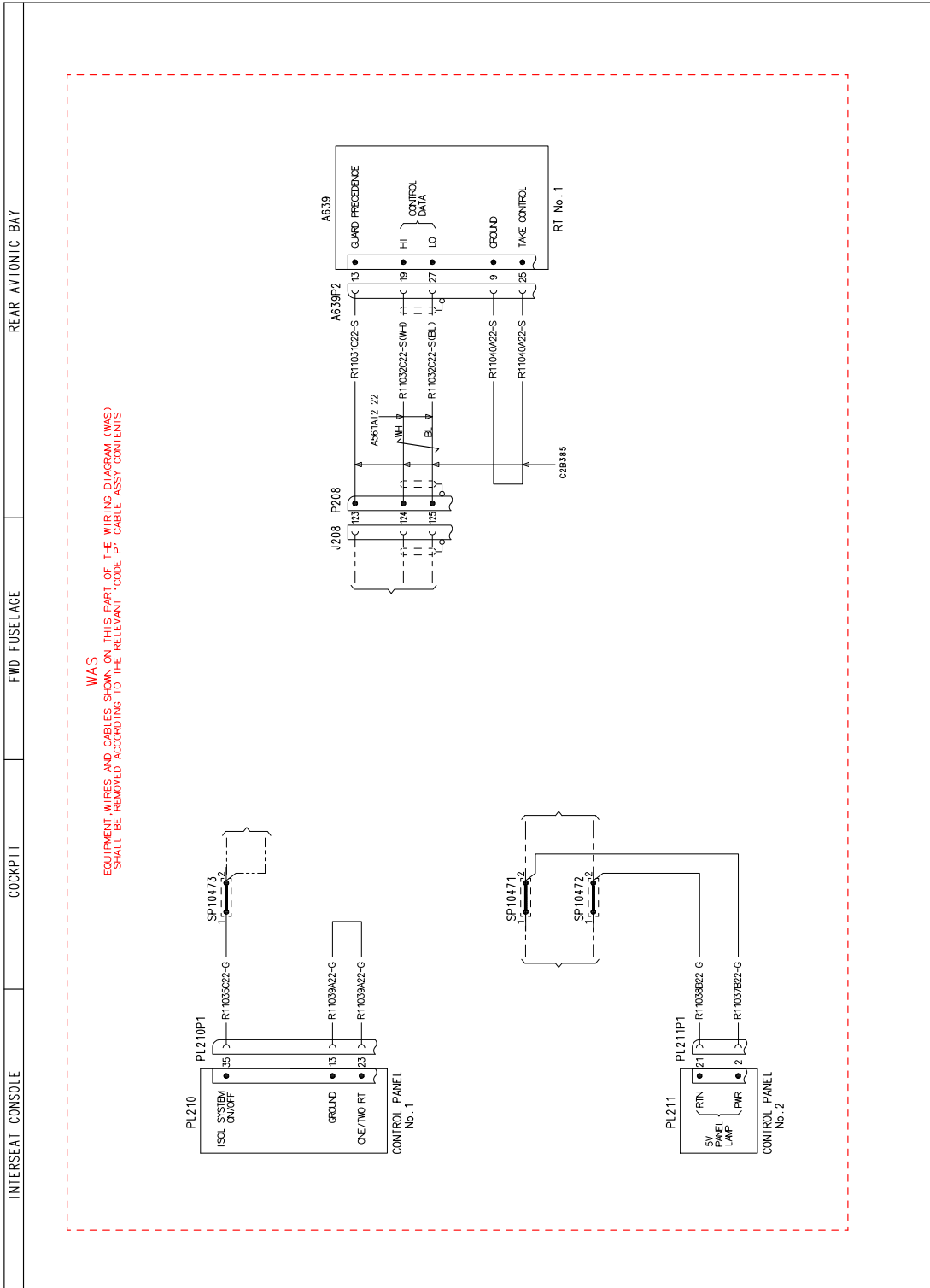
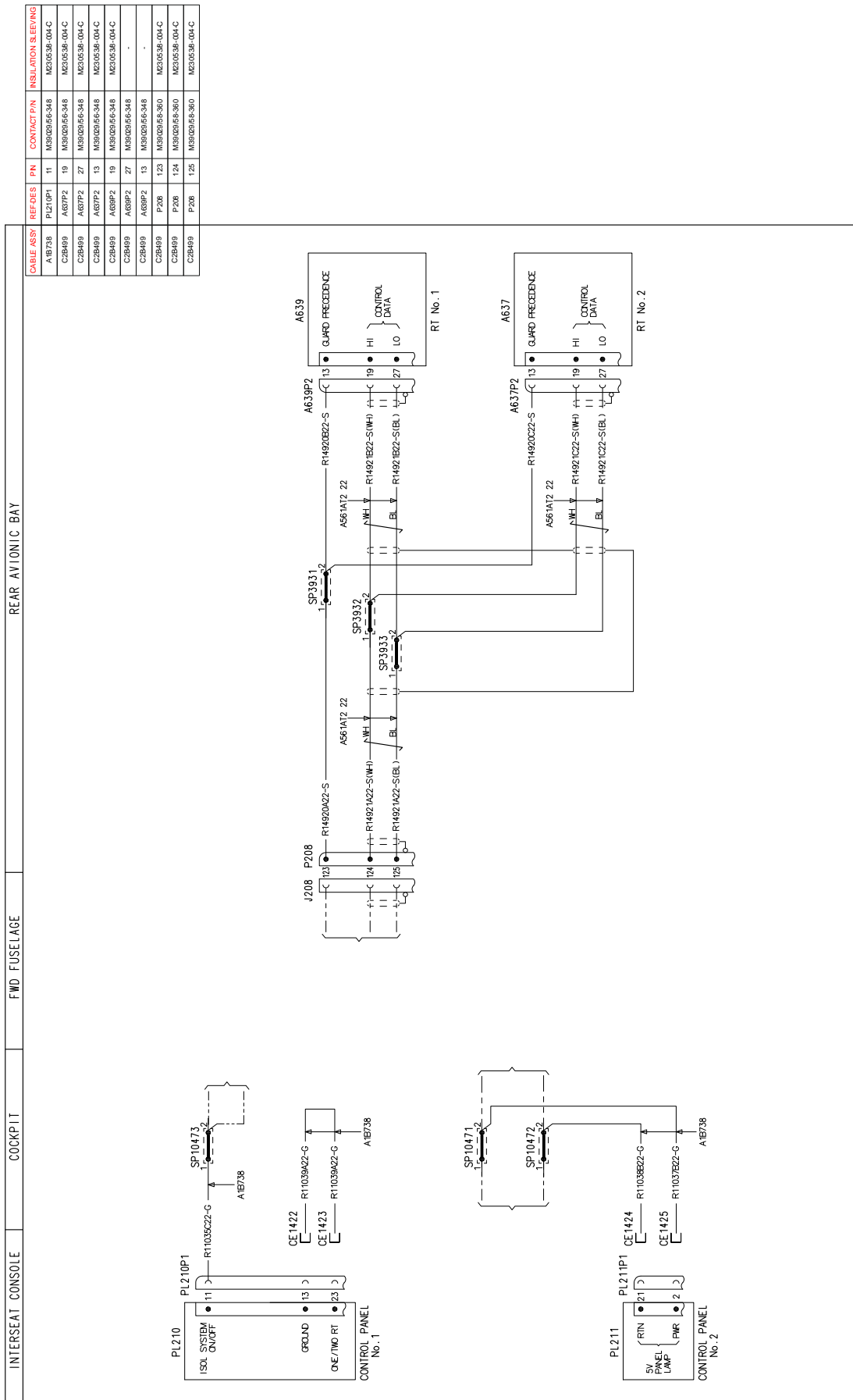


Figure 35

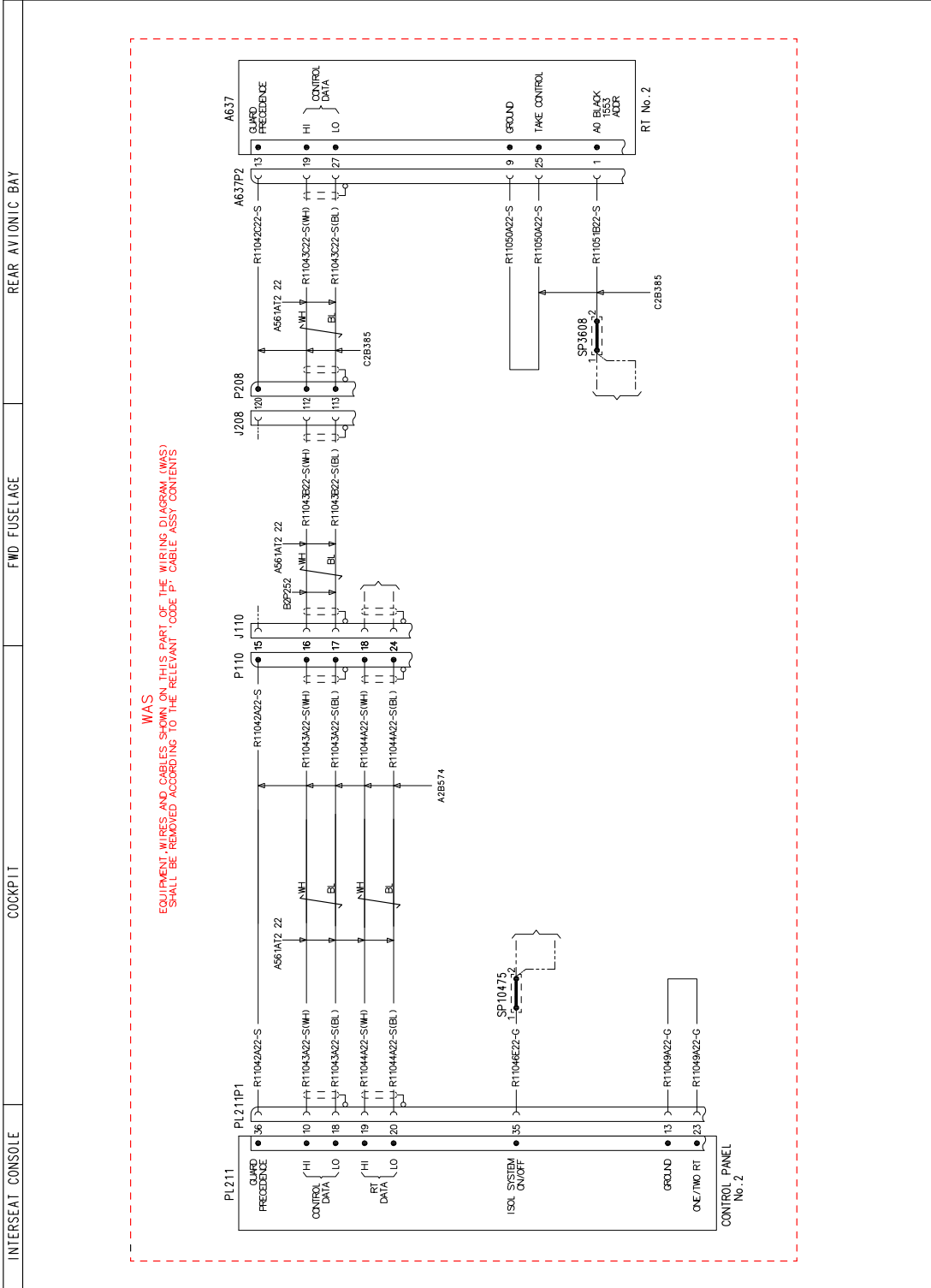
S.B. N°139-748 OPTIONAL
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REVISION: /



FUNCTIONAL NOTES

ALL CABLES ARE IN LOU C2B499 UNLESS SPECIFIED.
ALL CABLES ARE OF TYPE ASS8AT 22 UNLESS SPECIFIED

Figure 36

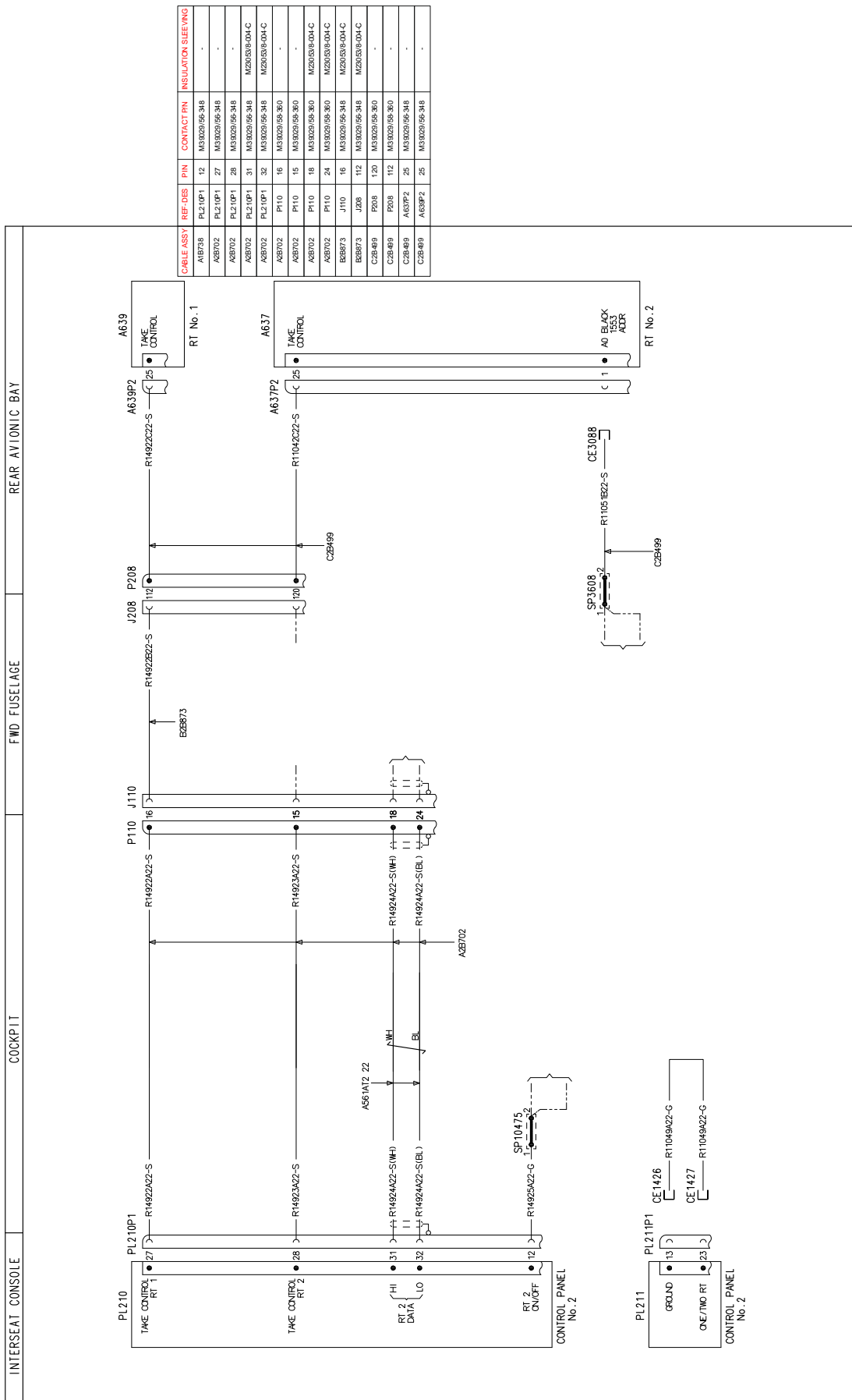


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WIRING DIAGRAM ARC-210 VARIANT
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FUNCTIONAL NOTES
ALL CABLES ARE IN LOOM A18605 UNLESS SPECIFIED
ALL CABLES ARE OF TYPE A556A1 22 UNLESS SPECIFIED

Figure 37

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REVISION: /



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WIRING DIAGRAM ARC-210 VARIANT
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FUNCTIONAL NOTES

ALL CABLES ARE IN LOU A6B702 UNLESS SPECIFIED.
ALL CABLES ARE OF TYPE ASS6AT 22 UNLESS SPECIFIED.

Figure 38

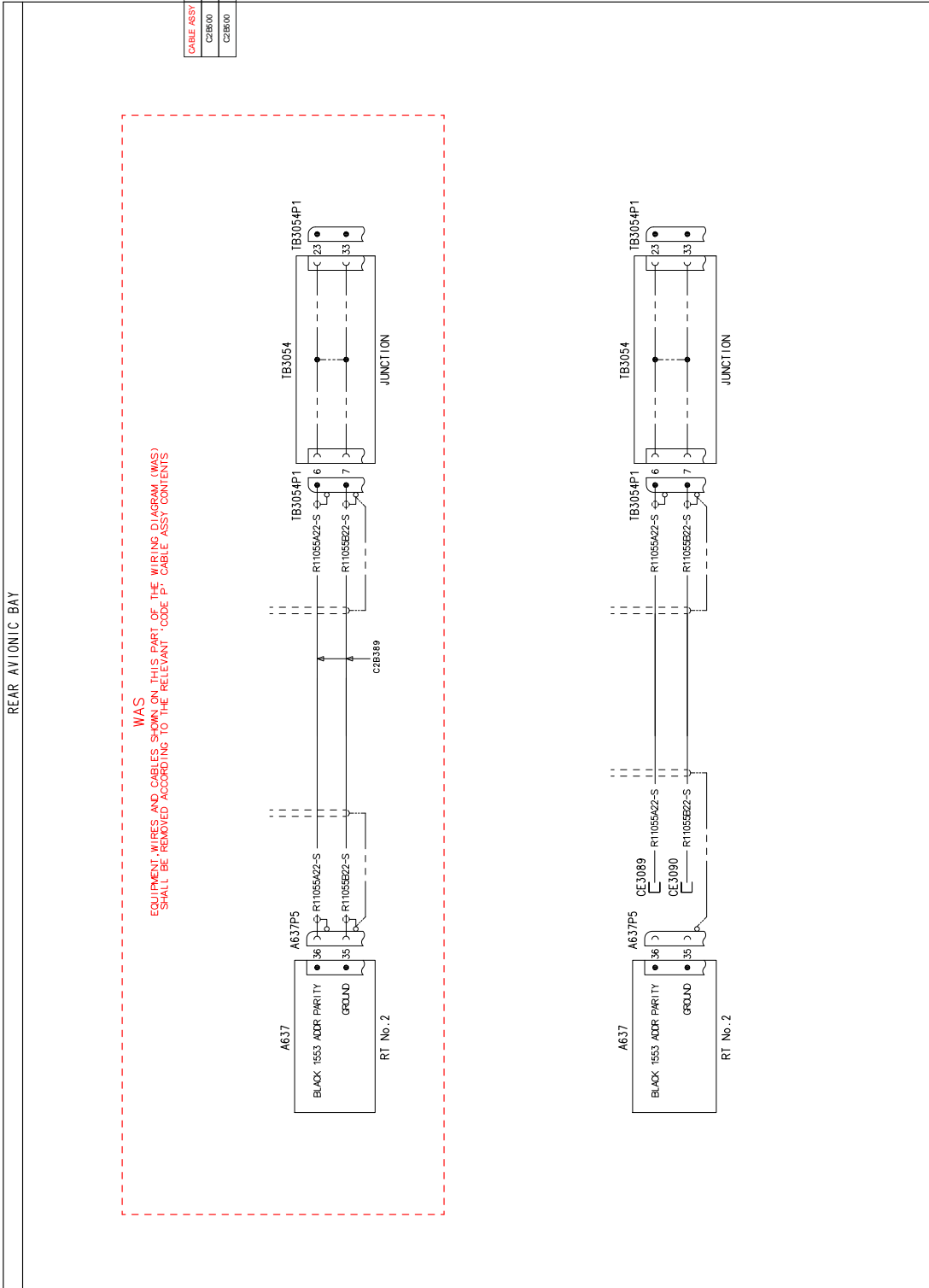


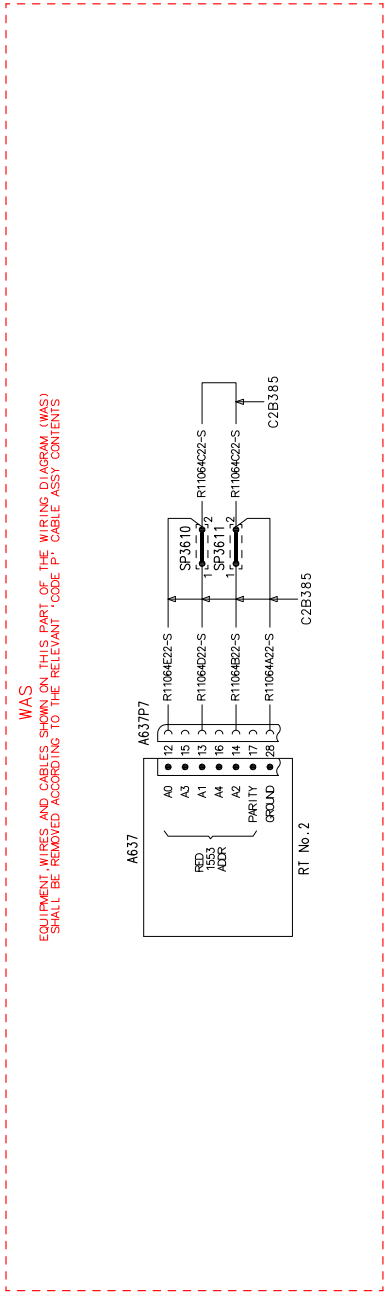
Figure 39

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REVISION: /

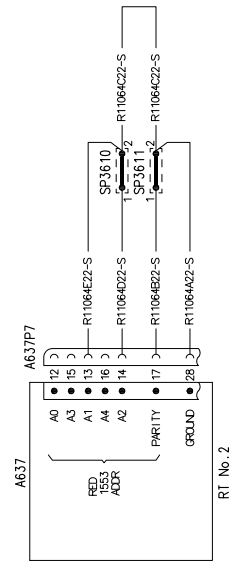
FUNCTIONAL NOTES

ALL CABLES ARE IN LOOM C2B500 UNLESS SPECIFIED
ALL CABLES ARE OF TYPE A561A11 22 UNLESS SPECIFIED

REAR AVIONIC BAY



CABLE ASSY	REF DES	PIN	CONTACT PIN	INSULATION SLEEVING
C2B499	A637P7	28	M38029/95-346	-
C2B499	A637P7	17	M38029/95-346	-
C2B499	A637P7	14	M38029/95-346	-
C2B499	A637P7	13	M38029/95-346	-



FUNCTIONAL NOTES

ALL CABLES ARE IN LOCK C2B499 UNLESS SPECIFIED.
ALL CABLES ARE OF TYPE ASSRAT 22 UNLESS SPECIFIED

3G2310W20611
WIRING DIAGRAM ARC-210 VARIANT
SHEET 7 OF 7

Figure 40

ANNEX A


RT-7000RMR 1APX P25 ACCEPTANCE TEST PROCEDURE


1 PRELIMINARY OPERATIONS


When not otherwise specified, a $\pm 5\%$ tolerance is implied for measured values w.r.t required values.

1.1 Safety provisions

The following safety provisions shall be observed when performing tests described in this section.

	WARNING
	The bonding cable shall be connected to the earth (ground) point before you connect it to the helicopter.
	Failure to comply to this instruction may cause injuries to persons and/or damage to the equipment.

	WARNING
	During all ATP Tests, disconnect (if installed) the wires from the Fire extinguishing bottles and stow them properly (E1- MTR1 & MTR2, E2- MTR1 & MTR2).
	If other Electro-Explosive Devices (EEDs) are fitted, ensure that these are electrically disconnected.
	Contact to pins and sockets under test must be achieved by means of the correct mating sockets and pins.
	No other form of probe must be used under any circumstances.
	Failure to comply to this instruction may cause injuries to persons and/or damage to the equipment.

	WARNING
	During ground testing, all START 1 and START 2 circuit breakers shall be in open state (off, pulled out) in order to prevent inadvertent actuation of engine starters. When the testing procedure specifically requires circuit breakers to be in closed state (on, pushed in), circuit breakers IGN 1 and IGN 2 shall be in open state (pulled out) in order to prevent inadvertent actuation of engine starters.
	Failure to comply to this instruction may cause injuries to persons and/or damage to the equipment.


	WARNING
	Do not handle or operate plug/receptacle connectors with voltage presence.
	Failure to comply to this instruction may cause injuries to persons and/or damage to the equipment.

Table 1-1 Safety Provisions

Item	Action	Check
1	Always make sure that all applicable general and local safety instructions and regulations are complied with. If in doubt, ask.	<input type="checkbox"/>
2	Connect the two ends of a bonding cable, in the specified order: <ul style="list-style-type: none"> • to an earth (ground) point; • to the ground receptacle on the helicopter. See also WARNING notice above.	<input type="checkbox"/>
3	On the EPGDS Control Panel, make sure that the following switches are set to OFF before starting the tests: <ul style="list-style-type: none"> • GEN 1; • GEN 2; 	<input type="checkbox"/>

Item	Action	Check
	<ul style="list-style-type: none"> • MAIN BATT; • BATT AUX; • EXT PWR. Do not change this setting during the tests, unless specifically required by the test procedure.	
4	Make sure that the following circuit breakers on CBP are pulled out and locked prior to starting the tests: <ul style="list-style-type: none"> • START 1 • START 2 • IGN 1 • IGN 2 Do not change this setting during the tests, unless specifically required by the test procedure. See also WARNING notice above.	<input type="checkbox"/>
5	Make sure that both the main battery and the auxiliary battery are disconnected at all times during performance of the procedures described in this document, unless specifically required by the test procedure.	<input type="checkbox"/>
6	Make sure that the fire extinguishing bottle connectors are disconnected at all times during performance of the procedures described in this document.	<input type="checkbox"/>
7	Make sure that any other EIED (e.g. rescue hoist cable cutter cartridge, cargo hook release cartridge, emergency float bottles) that is installed according to the specific helicopter configuration is disconnected at all times during performance of the procedures described in this document. Refer to the relevant system ATP for the applicable safety provisions.	<input type="checkbox"/>
8	Use ESD protection measures according to general and local instructions and training.	<input type="checkbox"/>

1.2 Test equipment

The following standard equipment is required in order to complete the tests described:

Table 1-2 Test equipment list

Item	Tool	Check
1.	DC External Power Bench (28VDC)	<input type="checkbox"/>
2.	Multimeter	<input type="checkbox"/>
3.	Low resistance ohmmeter	<input type="checkbox"/>
4.	Conductor pins and wire extensions for troubleshooting operation	<input type="checkbox"/>
5.	Cable and Antenna Analyzer S820D or equivalent	<input type="checkbox"/>
6.	N°2 Headsets David Clark H10-13 (or equivalent headsets).	<input type="checkbox"/>
7.	Hand-held Radio APX-7000/APX-8000 VHF–UHF GPS ANT or similar APX compatible hand-held radio or equivalent	<input type="checkbox"/>
8.	Wattmeter or equivalent instrument to measure RF Power and relevant termination caps (slugs).	<input type="checkbox"/>
9.	Cobham ICT software and relevant cable(s)	<input type="checkbox"/>
10.	Motorola CPS software and relevant cable(s)	<input type="checkbox"/>

When testing at pins and sockets of plug and receptacle connectors is required, contact shall be made by means of the correct mating socket or pin. Under no circumstances, any other form of probe must be used.

All instruments shall be duly calibrated according to the applicable procedures and shall provide a measurement uncertainty less than 2%.
The operator shall make sure that all instruments and tools are set up and operated according to the applicable operating instructions.

1.3 Test prerequisites

Make sure that the following actions have been performed:

Table 1-3 Test prerequisites

Item	CHECK
Verify the Primus Epic® Settings configuration from the MFD menus: select System > Sys Config ; verify that, in the APM Data field, the parameters relevant for the applicable XCVR configuration are enabled.	<input type="checkbox"/>
Before starting each test procedure, verify that the External Power Bench is operative and set to the appropriate voltage (28 VDC).	<input type="checkbox"/>

1.4 System configuration check

1.4.1 Circuit breakers

Check the circuit breaker ratings according to the following table:

Table 1-4 CB ratings (basic)

Item	Ref-des	Type	Rating	Check
1	CB818	CB	10 A	<input type="checkbox"/>
2	CB817	CB	3 A	<input type="checkbox"/>

1.5 Preliminary setup

The following subsection(s) describe actions that shall be completed before performing the functional tests, in order to prepare the helicopter for the execution of the tests.

1.5.1 Circuit breakers

Set the electrical power supply protection devices according to the following table:

Table 1-5 CB settings (basic)

Item	Type	Ref-des	Name	Setting	Check
1	CB	CB818	RMR	OUT	<input type="checkbox"/>
2	CB	CB817	RCDU	OUT	<input type="checkbox"/>
3	CB	CB107	ENGINE IGN 1	OUT	<input type="checkbox"/>
4	CB	CB108	ENGINE IGN 2	OUT	<input type="checkbox"/>
5	CB	CB103	ENGINE START 1	OUT	<input type="checkbox"/>
6	CB	CB104	ENGINE START 2	OUT	<input type="checkbox"/>

1.6 RT7000 RMR PN Registration

Note, in the following table, the P/N and Catalog P/N (see Figure 1-1 for PN location on the LRU) of the RT7000RMR.

Table 1-6 RT7000 RMR PN

PN (short PN)	Catalog PN (long PN)

COBHAM

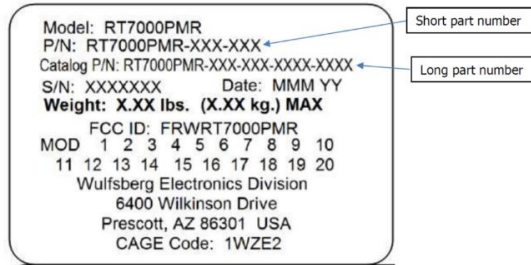


Figure 1-1 RT7000RMR Identification Label

2 PROVISION TESTS

2.1 Pin-to-pin

Perform a complete pin-to-pin continuity check of all the electrical connections made.

Table 2-1 pin-to-pin check

Item	Action	Requirement	Result	Check
1	Disconnect the following connectors from relevant equipment/LRUs:	A895P101, A895P102, A895P105	<input type="checkbox"/>	<input type="checkbox"/>
		E234P1	<input type="checkbox"/>	
		PL260P1, PL260P2	<input type="checkbox"/>	
2	Verify the grounding of the following pins:	A895P105 - 5	<input type="checkbox"/>	<input type="checkbox"/>
		A895P105 - 6	<input type="checkbox"/>	
		A895P105 - 7	<input type="checkbox"/>	
		A895P105 - 8	<input type="checkbox"/>	
		A895P101 - 66	<input type="checkbox"/>	
		A895P101 - 73	<input type="checkbox"/>	
		PL260P2 - 5	<input type="checkbox"/>	
		PL260P2 - 6	<input type="checkbox"/>	
		PL260P2 - 7	<input type="checkbox"/>	
		PL260P2 - 8	<input type="checkbox"/>	
		PL260P1 - 60	<input type="checkbox"/>	
		PL260P1 - 66	<input type="checkbox"/>	
		PL260P1 - 73	<input type="checkbox"/>	
		3	Verify the continuity among following couples of pins:	
A895P101 - 37 PL260P2 - 55	<input type="checkbox"/>			
A895P101 - 54 | PL260P2 - 36	<input type="checkbox"/>			
A895P101 - 55 | PL260P2 - 37	<input type="checkbox"/>			
4	Verify the continuity of the core of the coaxial RF cable between the A895P102 connector and the connector E234P1 .		<input type="checkbox"/>	<input type="checkbox"/>
5	Verify the isolation between core and shield of the coaxial RF cable between the A895P102 connector and the connector E234P1 .		<input type="checkbox"/>	<input type="checkbox"/>
6	Verify the continuity of the shield of the coaxial RF cable from connector shell to connector shell.			<input type="checkbox"/>

After completion of the pin-to-pin test, reconnect any connector that was disconnected during the test.

2.2 Radio Module – Antenna Cable Test

2.2.1 Instrument Calibration for RF Antenna Cable Testing

Table 2-2 Instrument Calibration for RF Antenna Cable Testing 1

Item	Action	Check
1	Using instrument number 5 in §1.2 or equivalent, select the VNA mode and set the RF limits as follows: Start frequency: 136 MHz; Stop frequency: 870 MHz.	<input type="checkbox"/>

Item	Action	Check
2	Perform Instrument calibration, if necessary.	<input type="checkbox"/>

2.2.2 Antenna Cable Line Attenuation

Table 2-3 Antenna Cable Line Attenuation

Item	Action	Requirement	Result	Check
1	Select the Cable loss – one port applicable measurement on the instrument number 5 in §1.2 or equivalent			<input type="checkbox"/>
2	Make sure that the following CBs are pulled OUT:	CB818 – OUT	<input type="checkbox"/>	<input type="checkbox"/>
		CB817 – OUT	<input type="checkbox"/>	
3	Disconnect the following connectors:	A895P102	<input type="checkbox"/>	<input type="checkbox"/>
		E234P1	<input type="checkbox"/>	
4	Connect the antenna plug A895P102 connector to the Cable&Antenna Analyzer S820D or equivalent.			<input type="checkbox"/>
5	Connect an enclosed precision “short” (of Calibration Tool) at the end of the RF coaxial transmission line (E234P1).			<input type="checkbox"/>
6	Perform the Cable Loss and record the maximum value, determined in the selected frequency range:	< 2.5 dB	ANTENNA Line Attenuation or Cable Loss Attenuation [dB]	<input type="checkbox"/>
7	Reconnect the following connectors:	A895P102	<input type="checkbox"/>	<input type="checkbox"/>
		E234P1	<input type="checkbox"/>	

2.3 Power supply checks

Table 2-4 Power supply checks 1/3

Item	Action	Requirement	Result	Check
1	Disconnect the following connectors:	A895P105	<input type="checkbox"/>	<input type="checkbox"/>
		PL260P1	<input type="checkbox"/>	
		PL260P2	<input type="checkbox"/>	
2	Connect the external DC power supply bench.			<input type="checkbox"/>
3	Power on the external power supply.			<input type="checkbox"/>
4	Check external power supply voltage.	28 ± 0.5 VDC		
5	Make sure that the following CB(s) are pulled OUT:	CB818 – OUT	<input type="checkbox"/>	<input type="checkbox"/>
		CB817 – OUT	<input type="checkbox"/>	
6	Use a multimeter to perform checks as detailed in Table 2-5	See Table 2-5	Record results in Table 2-5	<input type="checkbox"/>

Table 2-5 Power supply checks - Pins

Item	Eqpt./LRU	REF-DES	Conn.	Pin	Requirement	Check
A.	RT7000 RMR	A895	P105	1	0 VDC w.r.t. A895P105 - 5 (-)	<input type="checkbox"/>
B.	RT7000 RMR	A895	P105	2	0 VDC w.r.t. A895P105 - 5 (-)	<input type="checkbox"/>
C.	RT7000 RMR	A895	P105	3	0 VDC w.r.t. A895P105 - 5 (-)	<input type="checkbox"/>
D.	RT7000 RMR	A895	P105	4	0 VDC w.r.t. A895P105 - 5 (-)	<input type="checkbox"/>
E.	Push IN SB818					<input type="checkbox"/>
F.	RT7000 RMR	A895	P105	1	28 VDC w.r.t. A895P105 - 5 (-)	<input type="checkbox"/>
G.	RT7000 RMR	A895	P105	2	28 VDC w.r.t. A895P105 - 5 (-)	<input type="checkbox"/>
H.	RT7000 RMR	A895	P105	3	28 VDC w.r.t. A895P105 - 5 (-)	<input type="checkbox"/>
I.	RT7000 RMR	A895	P105	4	28 VDC w.r.t. A895P105 - 5 (-)	<input type="checkbox"/>

Table 2-6 Power supply checks 2/3

Item	Action	Requirement		Result	Check
7	Make sure that the following CB(s) are pulled OUT:	CB817 – OUT	<input type="checkbox"/>		<input type="checkbox"/>
		CB818 – OUT	<input type="checkbox"/>		
8	Use a multimeter to perform checks as detailed in Table 2-7	See Table 2-7	Record results in Table 2-7	<input type="checkbox"/>	

Table 2-7 Power supply checks - Pins

Item	Eqpt./LRU	REF-DES	Conn.	Pin	Requirement	Check
J.	RCDU	PL260	P2	1	0 VDC w.r.t. PL260P2 – 5 (-)	<input type="checkbox"/>
K.	RCDU	PL260	P2	2	0 VDC w.r.t. PL260P2 – 5 (-)	<input type="checkbox"/>
L.	RCDU	PL260	P2	3	0 VDC w.r.t. PL260P2 – 5 (-)	<input type="checkbox"/>
M.	RCDU	PL260	P2	4	0 VDC w.r.t. PL260P2 – 5 (-)	<input type="checkbox"/>
N.	Push IN SB817					<input type="checkbox"/>
O.	RCDU	PL260	P2	1	28 VDC w.r.t. PL260P2 – 5 (-)	<input type="checkbox"/>
P.	RCDU	PL260	P2	2	28 VDC w.r.t. PL260P2 – 5 (-)	<input type="checkbox"/>
Q.	RCDU	PL260	P2	3	28 VDC w.r.t. PL260P2 – 5 (-)	<input type="checkbox"/>
R.	RCDU	PL260	P2	4	28 VDC w.r.t. PL260P2 – 5 (-)	<input type="checkbox"/>

Table 2-8 Power supply checks 3/3

Item	Action	Requirement		Result	Check
9	Verify that, rotating the Cockpit Dimming Console Knob the Voltage between the following pins swings between 0 and 5 VDC	PL260P2 - 61 (+)	PL260P2 - 60 (-)	<input type="checkbox"/>	<input type="checkbox"/>
10	Connect the tester for Diode measurement with the <u>positive</u> clamp connected to pin A895P101 - 33 and the <u>negative</u> clamp connected with the nearest ground point.				<input type="checkbox"/>
11	With the helicopter electrically powered, select the COM3 Tx on the AV-900 Audio Control Panel as specified in the requirement column. Press the cyclic PTT button on applicable side, and verify the grounding of the pin mentioned in item 10.	Pilot AV900		<input type="checkbox"/>	<input type="checkbox"/>
		CoPilot AV900		<input type="checkbox"/>	
		3 rd AV900 (if installed)		<input type="checkbox"/>	
		4 th AV900 (if installed)		<input type="checkbox"/>	
		Others (if installed)		<input type="checkbox"/>	
12	With the helicopter electrically powered, connect the tester for Diode measurement with the <u>negative</u> clamp to pin PL260P1 - 13 and the <u>positive</u> clamp to the nearest ground point.			<input type="checkbox"/>	<input type="checkbox"/>
13	Select the H/C in NIGHT mode using the Cockpit Light Dimmer Panel Console knob.	Verify the diode presence and correct installation. Tester reading OL (Open Loop)		<input type="checkbox"/>	<input type="checkbox"/>
14	With the helicopter electrically powered, connect the tester for Diode measurement with the <u>positive</u> clamp to pin PL260P1 - 13 and the <u>negative</u> clamp to the nearest ground point.			<input type="checkbox"/>	<input type="checkbox"/>
15	Ensure the H/C in still in NIGHT mode checking the Cockpit Light Dimmer Panel Console knob.	Verify the diode presence and correct installation. Tester reading ≥ 0.5 VDC		<input type="checkbox"/>	<input type="checkbox"/>
16	Select the H/C in DAY mode using the Cockpit Light Dimmer Panel Console knob.	Tester reading OL (Open Loop)		<input type="checkbox"/>	<input type="checkbox"/>
17	With the helicopter electrically powered, connect the tester for Diode measurement with the <u>negative</u> clamp to pin PL260P1 - 53 and the <u>positive</u> clamp to the nearest ground point.			<input type="checkbox"/>	<input type="checkbox"/>

Item	Action	Requirement	Result	Check
18	Select the H/C in NVG mode using the relevant switch on the Light Control Panel.	Verify the diode presence and correct installation. Tester reading OL (Open Loop)	<input type="checkbox"/>	<input type="checkbox"/>
19	With the helicopter electrically powered, connect the tester for Diode measurement with the <u>positive</u> clamp to pin PL260P1 - 53 and the <u>negative</u> clamp to the nearest ground point.		<input type="checkbox"/>	<input type="checkbox"/>
20	Ensure the H/C is still in NVG mode checking the Cockpit Light Dimmer Panel Console knob.	Verify the diode presence and correct installation. Tester reading ≥ 0.5 VDC	<input type="checkbox"/>	<input type="checkbox"/>
21	Exit from NVG mode using the relevant switch on the Light Control Panel.	Tester reading OL (Open Loop)		

3 FUNCTIONAL TESTS

3.1 Preliminary setup

The following subsections describe actions that shall be completed before performing the functional tests, in order to prepare the helicopter for the execution of the tests.

3.1.1 Helicopter power up and preparation

Table 3-1 Helicopter power up and preparation – Functional Tests

Item	Action	Requirement	Result	Check
1	Install the WOW simulator box.			<input type="checkbox"/>
2	Set both switches on the WOW simulator box to ground condition.			<input type="checkbox"/>
3	Connect the external DC power supply.			<input type="checkbox"/>
4	Check external power supply voltage.	28 ± 0.5 VDC		<input type="checkbox"/>
5	Switch on external power: <ul style="list-style-type: none"> • GEN 1 – OFF • GEN 2 – OFF • MAIN BATT – OFF • BATT AUX – OFF • EXT PWR – ON 			<input type="checkbox"/>

3.1.2 Electrical power supply protection devices

Set the electrical power supply protection devices according to the following table:

Table 3-2 CB settings (basic)

Item	Type	Ref-des	Name	Setting	Check
1	CB	CB818	RMR	IN	<input type="checkbox"/>
2	CB	CB817	RCDU	IN	<input type="checkbox"/>
3	CB	CB107	ENGINE IGN 1	OUT	<input type="checkbox"/>
4	CB	CB108	ENGINE IGN 2	OUT	<input type="checkbox"/>
5	CB	CB103	ENGINE START 1	OUT	<input type="checkbox"/>
6	CB	CB104	ENGINE START 2	OUT	<input type="checkbox"/>

3.2 Test procedures

3.2.1 System Power ON

Table 3-3 System Power ON

S.	Item	Action	Requirement	Result	Check
1.		The helicopter external power port shall be connected to the External Power Bench set to 28 VDC output.			<input type="checkbox"/>
2.		Power up the External Power and the Helicopter.			

3.	Check that the following CBs are pushed IN:	CB818– IN	<input type="checkbox"/>	<input type="checkbox"/>
		CB817– IN	<input type="checkbox"/>	
4.	If on application of the aircraft power the RCDU doesn't power up automatically, press the ON/OFF button positioned on the left inner knob.			<input type="checkbox"/>
5.	After the boot screen verify that no error messages appear on the RCDU screen.			<input type="checkbox"/>
6.	If the system needs to be turned off, keep pressed the left inner knob until the panel turns off.			<input type="checkbox"/>

3.2.2 RT7000 RMR Programming

T.	Item	Action	Check
1.		Follow the procedure in Annex B to properly install the audio configuration and brightness control using ICT software.	<input type="checkbox"/>
2.		Configure the Motorola APX-8000 Transceiver according to the procedure in Annex B to install the correct CPS configuration file on the transceiver.	<input type="checkbox"/>

3.2.3 RT7000 RCDU Programming

U.	Item	Action	Check
1.		Follow the procedure in Annex B to properly install the audio configuration and brightness control using ICT software. The procedure is identical to the one applicable for RT7000RMR.	<input type="checkbox"/>

3.2.4 RT7000 RCDU Dimming Regulation

Table 3-4 RT7000 RCDU Dimming Regulation


V.	Item	Action	Requirement	Result	Check
1.		Rotate the outer LH knob on the RCDU. Verify that the panel brightness changes accordingly.			<input type="checkbox"/>
2.		Put the H/C in DAY mode using the Cabin Light Dimmer Panel Console knob.			<input type="checkbox"/>
3.		Put the H/C in NIGHT mode using the Cabin Light Dimmer Panel Console knob. Verify that the bezel brightness level decreases.			<input type="checkbox"/>

4.	Rotate the Cockpit Light Dimmer panel console knob and verify that the brightness of the bezel change accordingly.			<input type="checkbox"/>
5.	Enable NVG mode using the NVG switch on the LT Cabin Control Panel. Verify that both panel and bezel brightness level changes according to the NVG mode.			<input type="checkbox"/>
6.	Disable NVG mode using the NVG switch on the LT Cabin Control Panel and put the H/C in DAY mode.			<input type="checkbox"/>

3.2.5 Radio Module Power and VSWR Test

Be sure that transmitter output is always properly terminated when transmitting.

Table 1-5 Power and VSWR Test – Radio Module

Item	Action	Requirement	Result	Check
1	Connect the external DC power supply bench.			<input type="checkbox"/>
2	Power on the external power supply.			<input type="checkbox"/>
3	Make sure that the following CB(s) are pulled OUT:	CB818 – OUT	<input type="checkbox"/>	<input type="checkbox"/>
		CB817 – OUT	<input type="checkbox"/>	
4	Disconnect the A895P102 connector and insert the directional RF Power Meter inline. Note: the wattmeter must be installed inline as close as possible to the RT7000RMR radio transceiver.	The wattmeter element pointing toward the antenna for Direct Power and the wattmeter element pointing toward the RT7000RMR for Reflected Power.		<input type="checkbox"/>
5	Make sure that the following CB(s) are pushed IN:	CB818 – IN	<input type="checkbox"/>	<input type="checkbox"/>
		CB817 – IN	<input type="checkbox"/>	
6	If on application of the aircraft power the RT7000RMR and RCDU don't power up automatically, press the ON/OFF button positioned on the left inner knob of the RCDU.			<input type="checkbox"/>
7	After the boot screen verify that no error messages appear on the RCDU screen.			<input type="checkbox"/>
8	Verify that the RT1 is selected on the system dashboard.			<input type="checkbox"/>
9	Using the Right Hand knobs, change the standby channel according to the desired channel.	Three frequencies inside band 136 – 174 MHz	<input type="checkbox"/>	<input type="checkbox"/>
		Three frequencies inside band 380 – 520 MHz	<input type="checkbox"/>	
		Two frequencies inside band 764 – 870 MHz	<input type="checkbox"/>	
10	Press the  and use the selected frequency as active channel.			<input type="checkbox"/>
11	On the PLT or CPLT AV900 Audio Control Panel press the COM3 Tx button. Push and hold, on AV900, XCVR AUD button and set Radio volume to the MID range level. Press the PTT button to perform a transmission.			<input type="checkbox"/>

Item	Action	Requirement	Result	Check
12	<p>For each frequency listed in Table 3-6 perform the transmission and record the VSWR.</p> $VSWR = \frac{1 + \sqrt{\frac{P_{ref}}{P_{direct}}}}{1 - \sqrt{\frac{P_{ref}}{P_{direct}}}}$	VSWR < 3:1		<input type="checkbox"/>

Table 3-6 WBT POWER VSWR Test

FREQUENCY BAND	ID	FREQUENCY [MHz]	VSWR (PASSED IF < 3)
136 – 174	1	_____	
	2	_____	
	3	_____	
380 – 520	4	_____	
	5	_____	
	6	_____	
764 – 870	7	_____	
	8	_____	

3.2.6 Communication Test

The TX/RX tests shall be performed with a proper cooperating radio system. The on-ground test personnel shall remain on the helicopter platform as long as the test requires.

For audio quality refer to the following scale:

Table 3-7 Audio quality scale

- | |
|--|
| <ul style="list-style-type: none"> • 5/5 - Perfectly readable. • 4/5 - Readable. • 3/5 - Readable with difficulty. • 2/5 - Readable now and then (however not acceptable). • 1/5 - Unreadable (not acceptable). |
|--|

NOTE: The frequencies reported in the table below are only suggested frequencies. Depending on the cooperating radio, equivalent frequencies in the applicable bands can be used.

Table 3-8 Frequency-bands division for testing purpose

CHANNEL NAME	FREQUENCY [MHz]	Modulation	Channel Spacing [kHz]	Nominal TX Power [W]
MTM138S	138.125	P25	25	6
MTM155S	155.125	P25	25	6
MTM173S	173.975	P25	25	6
MTM400S	400.125	P25	25	5
MTM440S	440.975	P25	25	5
MTM500S	500.125	P25	25	5
MTM764S	764.125	P25	25	3
MTM856S	856.125	P25	25	3

Communication Control via RT7000RMR

The communication test using the RT7000RMR is intended to assess the performance of the transceivers on the whole operative frequency band.

Table 3-9 Communication Control via RT7000RMR


W.	Item	Action	Requirement	Result	Check
1.		Verify that the RT1 is selected on the system dashboard.			<input type="checkbox"/>
2.		Using the Right Hand knobs, change the standby channel according to the desired channel.	Three frequencies inside band 136 – 174 MHz	<input type="checkbox"/>	<input type="checkbox"/>
			Three frequencies inside band 380 – 520 MHz	<input type="checkbox"/>	
			Two frequencies inside band 764 – 870 MHz	<input type="checkbox"/>	
3.		Press the  use the selected frequency as active channel.			<input type="checkbox"/>
4.		Select the same frequency on the hand-held radio or ground-station used for TX/RX test.			<input type="checkbox"/>
5.		On the PLT or CPLT AV900 Audio Control Panel press the COM3 Tx and Audio buttons. Push and hold, on AV900, XCVR AUD button and set Radio volume to the MID range level.			<input type="checkbox"/>
6.		Press the PTT button and perform a communication with the receiving radio. Verify the correct transmission /reception of the audio. Assign a value of the audio and readability using the scale reported in Table 3-7 and record the values in Table 3-10 according to the type of transceiver installed as module # 1.	PASS if $\geq 3/5$		<input type="checkbox"/>

Table 3-10 Readability test

FREQUENCY BAND [MHz]	ID #	CHANNEL NAME(*)	FREQUENCY [MHz]	AUDIO READABILITY
136 – 174	1	MTMXXXS	___	___/5
	2	MTMXXXS	___	___/5
	3	MTMXXXS	___	___/5
380 – 520	4	MTMXXXS	___	___/5
	5	MTMXXXS	___	___/5
	6	MTMXXXS	___	___/5
764 – 870	7	MTMXXXS	___	___/5
	8	MTMXXXS	___	___/5

NOTE(*): XXX are the MHz value of the frequency; e.g. MTM136S for 136.000 MHz

ANNEX B

RT-7000RMR 1APX P25 CONFIGURATION MANAGEMENT INDEX



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1 REFERENCE MANUALS AND REQUIRED SOFTWARE AND CABLES

The following reference documentation can be retrieved from the vendor website.

Table 1-1: Reference Documents

Document number	Description
150-071724.W	RT7000PMR and RMR INSTALLATION MANUAL
150-071770.E	Operator Guide
150-075771.B	ICT Operator Manual

The following software are supplied as part of the RT-7000RMR P25 kit and are required to complete the configuration procedures described in this section:

Table 1-2: Programming Software

S/W P/N	Name	Description
Refer to chapter 4 and to applicable configuration	Installer Configuration Tool	Generates Installation Configuration Files that pertain to the operation and configuration of the RT7000PMR within the aircraft.
RVNXXX (*)	CPS Software	Generates configuration files for Motorola APX modules

(*) The “XX” digits represent the S/W version. Test have been executed with the following SW PNs:

- ICT: 320-175734-05 (ICT Version -0105);
- CPS: RVN5224 (Version R31.00.01).

The following programming cables are supplied as part of the RT-7000RMR P25 kit and are required to complete the configuration procedures described in this section:

Table 1-3: Programming Cables

P/N	Programming Cable Description
123-371761-01 or 123-371761-02	Micro-D to Motorola GCAI Interface – APX Programming Cable

<p>129-271601-01 (Motorola P/N PMKN4012B)</p>	<p>GCAI to USB – APX Programming Cable</p>
<p>129-271603-01 or 129-271603-02</p>	<p>Micro-D to RS-232 – ICT/MCT Programming Cable</p>
<p>UPOINT1130 (or equivalent)</p>	<p>MOXA UPOINT USB to SERIAL RS422 Cable or commercial RS-232 to USB adapter</p>



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2 INSTALLER CONFIGURATION TOOL

The Installer Configuration Tool or ICT pertains to the operation and configuration of the RT7000RMR within the aircraft, in particular is possible to:

- Route the audio paths and PTT paths of the transceivers;
- Adjust the lighting bus parameters, adjust the gain on various audio inputs/outputs;
- Configure the microphone mode of the RT7000RMR.

The ICT tool can be obtained from the CA website <https://www.canyonaeroconnect.com/>, once registering on the site for restricted access.

The ICT tool is a Windows application and can be used on compatible Windows 7, 8 or 10. The RT7000RMR may be connected to the PC either in the aircraft or on the bench to upload or download configuration data.

To connect the PC to the RT7000RMR it is necessary a Cobham/Canyon AeroConnect cable RS-232 serial data (P/N 129-271603-01 or 129-271603-02) as illustrate in the following figure and a RS-232 to USB adapter (e.g. MOXA UPORT USB to SERIAL RS422 Cable P/N UPORT1130).

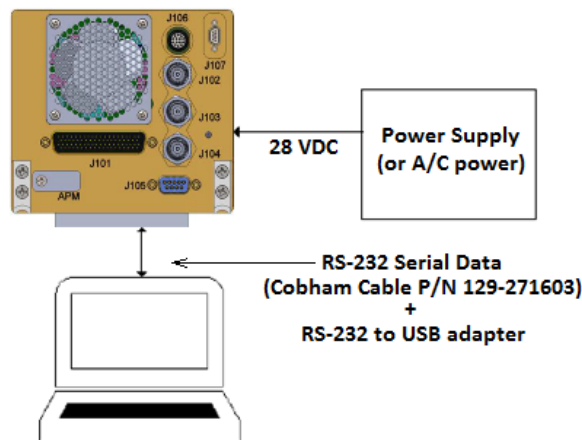


Figure 2-1: ICT Hardware Setup

For more details regarding the ICT Software operation refer to the installation manual.

2.1 ICT Software Installation Procedure

NOTE: *If the correct ICT version (that can be identified in the ICT Operator Manual) is not installed on the Laptop follow the procedure reported below. If a different version is already installed make sure that it is uninstalled before installing the correct version.*

ICT compatibility is defined as (use this table to properly apply the ICT configuration procedure):

Radio SW ID	ICT SW Version
716-070001-0101	320-171803-07
716-070001-0102	320-171803-07
716-070001-0103	320-171803-08
716-070001-0104	320-171803-08
716-070001-0105	320-171803-09
716-070001-0106	320-171803-11
716-070001-0107	320-171803-13
716-070001-0108	320-171803-13
716-075723-0104	320-175734-02
716-075723-0105	320-175734-03
716-075723-0108	320-175734-05

1.	If needed insert storage media (CD or USB flash drive) relevant to the ICT software on a laptop (it is necessary that user is logged in to the machine with local administrator rights).	<input type="checkbox"/>
2.	Install the ICT software .	<input type="checkbox"/>

2.2 ICT Configuration File Creation Procedure

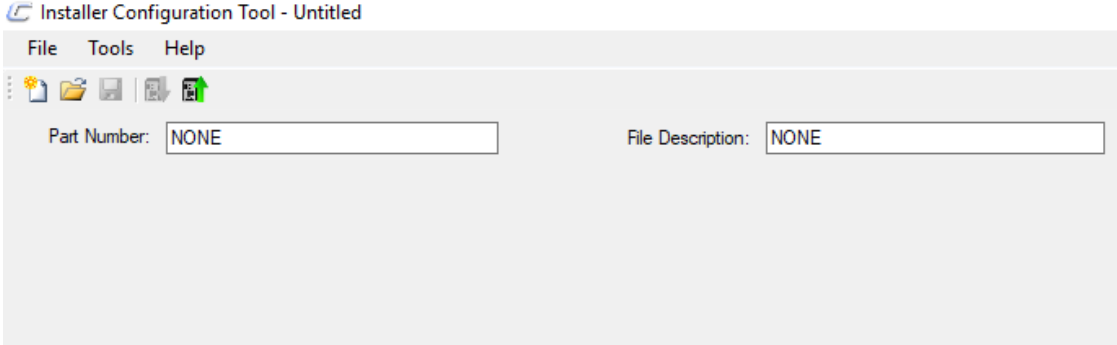

Execute only one of the following subsections based on the applicable ICT SW version.

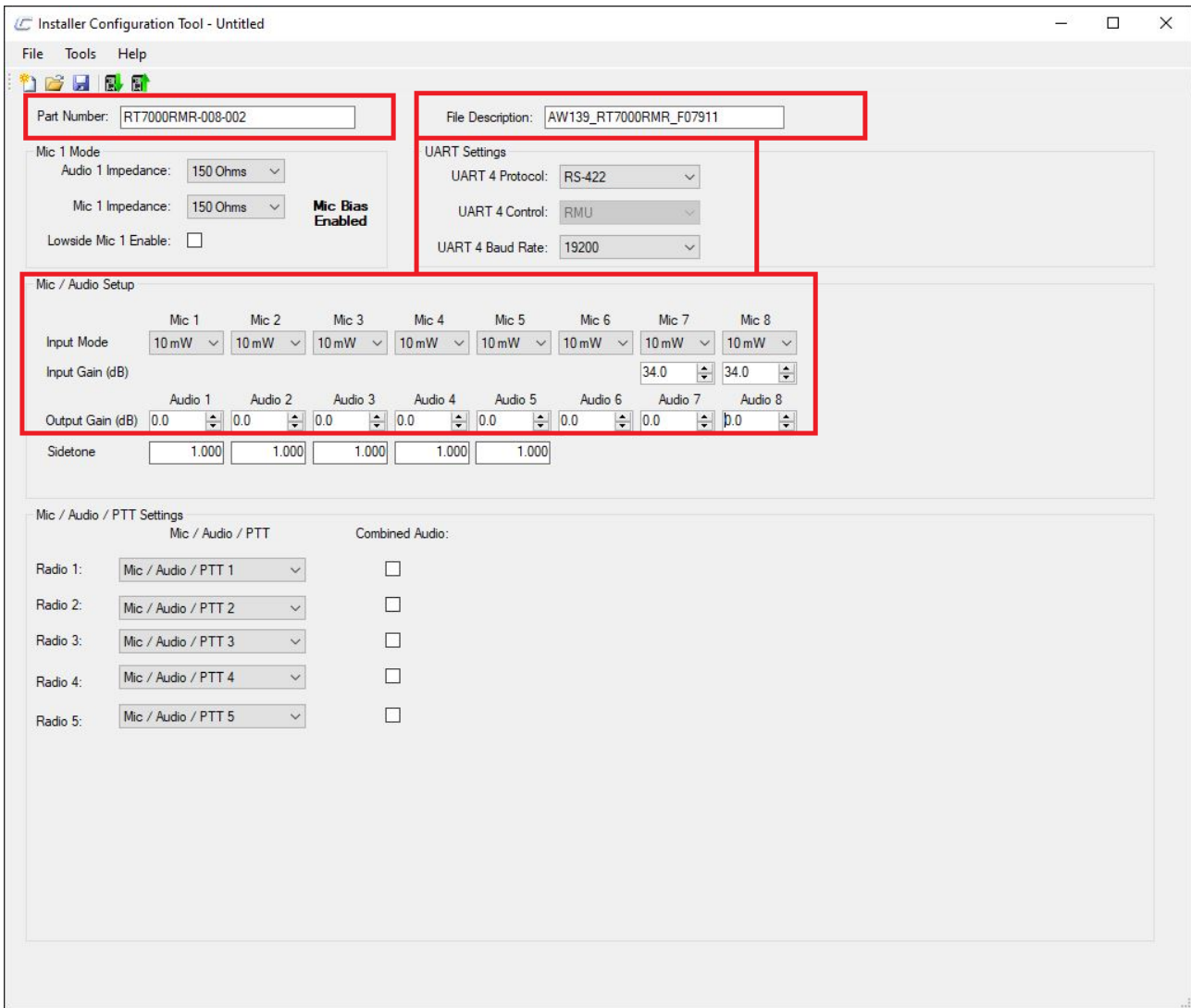
2.2.1 For ICT SW Versions 320-171803-xx

1.	Open the correct version of ICT file (in this example version 09 has been used).	<input type="checkbox"/>
----	--	--------------------------



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2.	<p>The main page should appear:</p>  <p>(Only for reference)</p>	<input type="checkbox"/>
3.	<p>Click on the “Create a new configuration” icon () and select the P/N of the unit to be configured and press OK.</p>	<input type="checkbox"/>
4.	<p>If the configuration file has to be installed on the RT7000, the configuration window will look like Figure 2-2.</p> <ul style="list-style-type: none">▪ The “Mic 1 Mode” fields should not be modified.▪ The “Mic / Audio Setup” fields should be modified only if the audio levels are deemed not acceptable.▪ The “Mic / Audio / PTT Settings” fields should not be modified. <p>If the configuration file has to be installed on the RCDU, the configuration window will look like Figure 2-3.</p> <p>Both in Figure 2-2 and in Figure 2-3, required fields are highlighted.</p> <p><u>All required fields shall be configured according to the applicable configuration, which can be retrieved in para. §4 of this Annex B.</u></p>	<input type="checkbox"/>
5.	<p>Click File and then save the configuration created.</p>	<input type="checkbox"/>

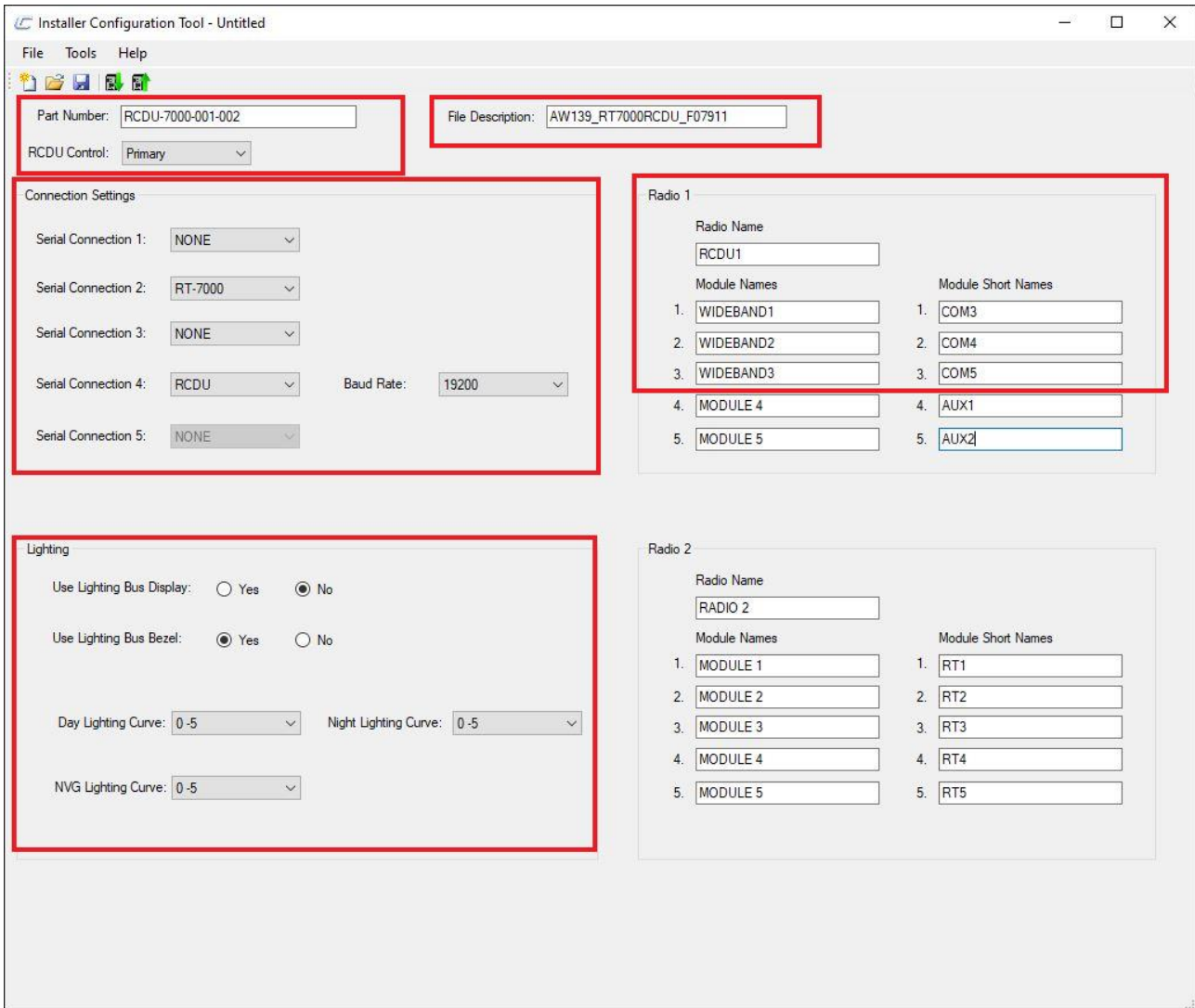


(Only for reference)

Figure 2-2: ICT software configuration for RT7000RMR (the appearance could change depending on the ICT software version)



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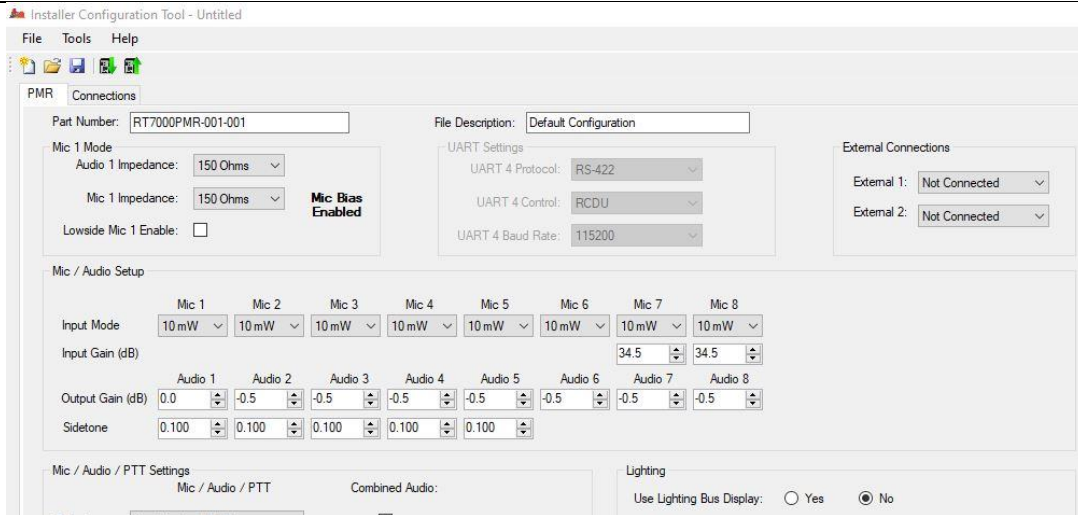


(Only for reference)

Figure 2-3: ICT software configuration for RCDU7000 (the appearance could change depending on the ICT software version)

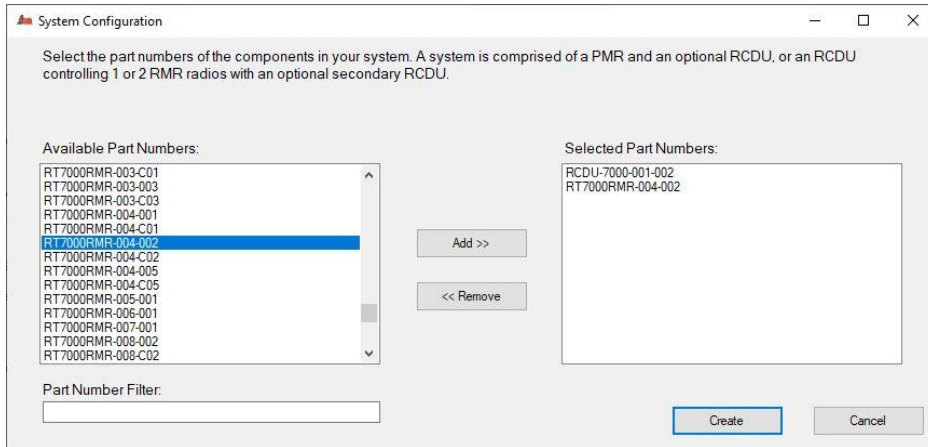
2.2.2 For ICT SW Versions 320-171803-xx

1.	Open the correct version of ICT file on the laptop used for the configuration.	<input type="checkbox"/>
2.	The main page should appear:	<input type="checkbox"/>



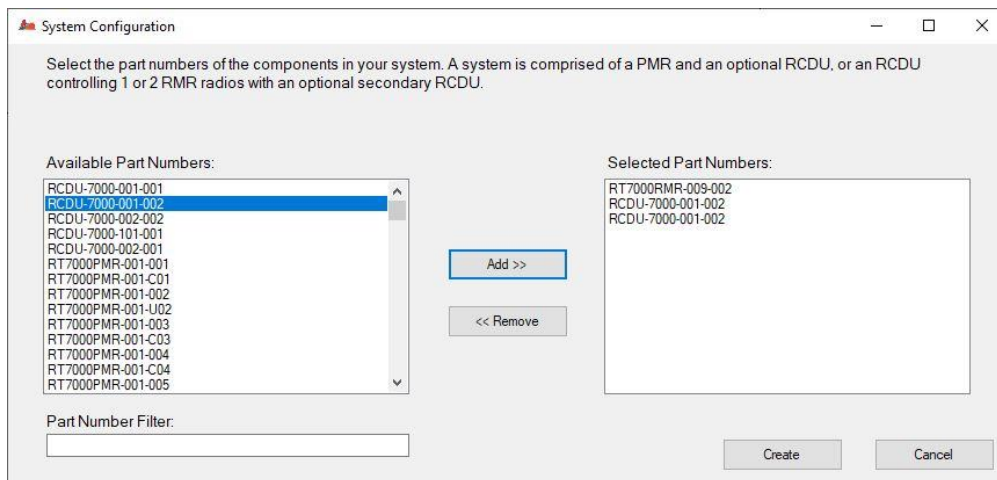
(Only for reference)

Click on 'Create' and select the PN's comprising the system (RMR and RCDU, plus optional secondary RCDU, if installed)



3.

NOTE: if secondary RCDU is installed, it shall be selected together with the respective RMR transceiver.

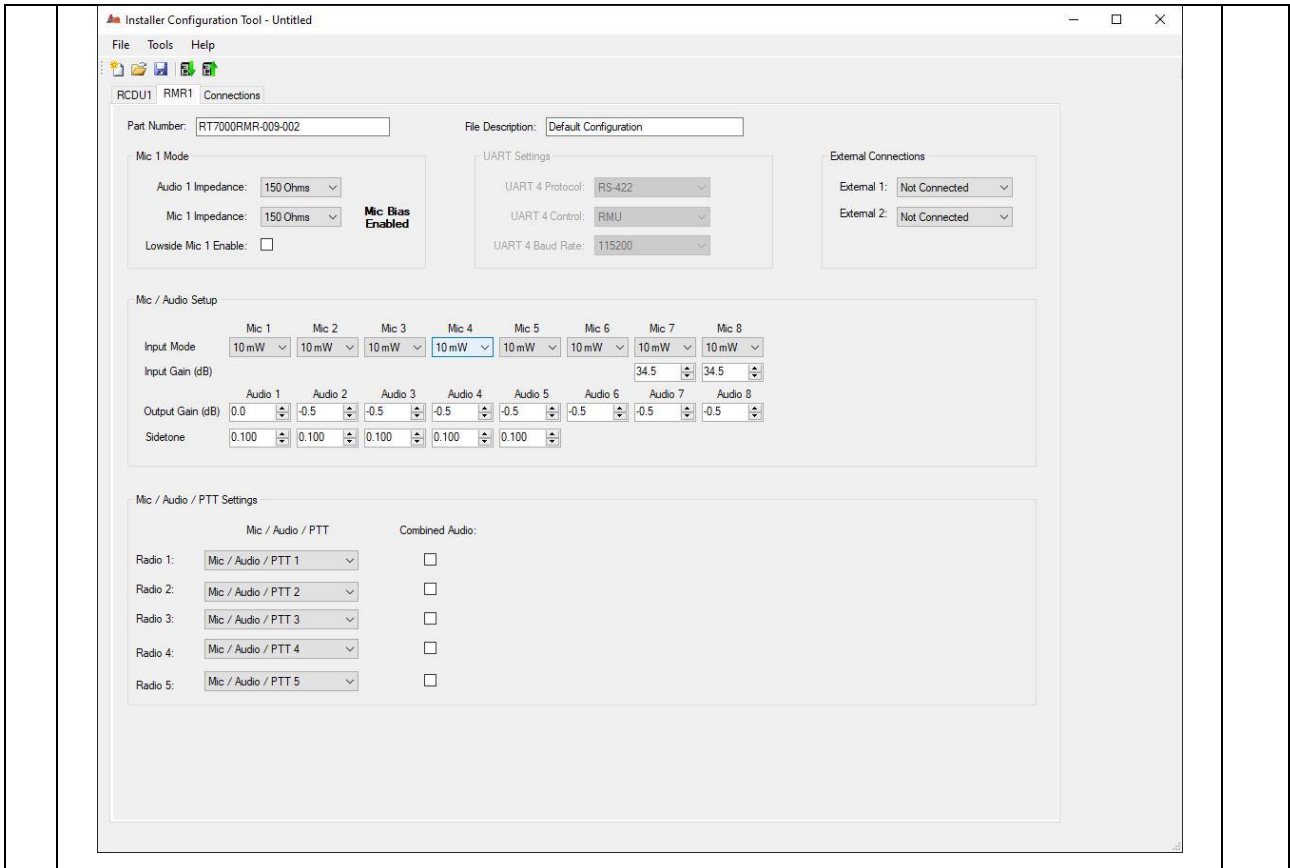


4. Click 'Create' button.

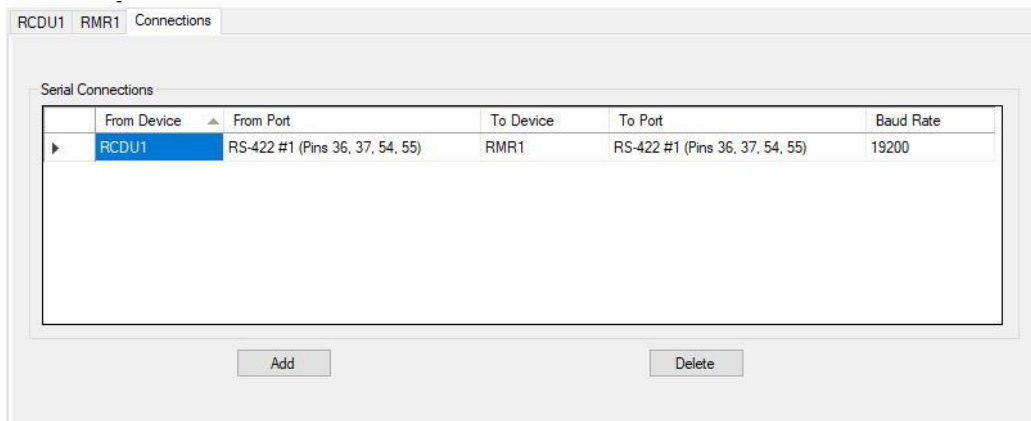


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5.	<p>Make sure to select the 'RCDU1' tab.</p> <p>The 'RCDU2' is not modifiable since it inherits the RCDU1 settings.</p> <p><u>All fields shall be configured depending on applicable configuration, which can be retrieved in para. §4.</u></p> <div style="border: 1px solid gray; padding: 10px; margin: 10px 0;"> </div>	
6.	<p>Make sure to select the 'RMR1' tab.</p> <ul style="list-style-type: none"> ▪ The "Mic 1 Mode" fields should not be modified. ▪ The "Mic / Audio Setup" fields should be modified only if the audio levels are deemed not acceptable. ▪ The "Mic / Audio / PTT Settings" fields should not be modified. <p><u>All fields shall be configured depending on applicable configuration, which can be retrieved in para. §4.</u></p>	



Select the 'Connections' tab and make sure to configure it as follows (double click on each column to select relevant drop down menu):



7.

This step has to be executed only if the RCDU2 is installed.

8. Select the 'Connections' tab and make sure to configure it as follows (double click on each column to select relevant drop down menu):



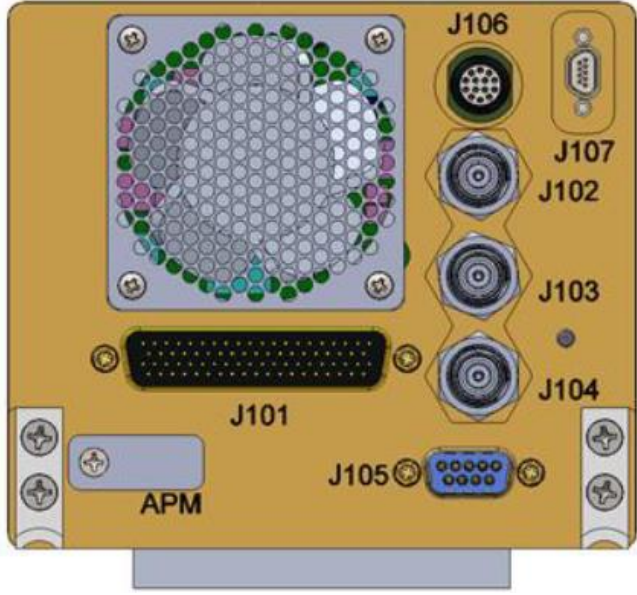
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	<p>RCDU1 RCDU2 RMR1 Connections</p> <p>Serial Connections</p> <table border="1"><thead><tr><th></th><th>From Device</th><th>From Port</th><th>To Device</th><th>To Port</th><th>Baud Rate</th></tr></thead><tbody><tr><td>▶</td><td>RCDU1</td><td>RS-422 #3 (Pins 15, 16, 19, 20)</td><td>RCDU2</td><td>RS-422 #3 (Pins 15, 16, 19, 20)</td><td>19200</td></tr><tr><td></td><td>RCDU1</td><td>RS-422 #1 (Pins 36, 37, 54, 55)</td><td>RMR1</td><td>RS-422 #1 (Pins 36, 37, 54, 55)</td><td>19200</td></tr></tbody></table> <p>Add Delete</p>		From Device	From Port	To Device	To Port	Baud Rate	▶	RCDU1	RS-422 #3 (Pins 15, 16, 19, 20)	RCDU2	RS-422 #3 (Pins 15, 16, 19, 20)	19200		RCDU1	RS-422 #1 (Pins 36, 37, 54, 55)	RMR1	RS-422 #1 (Pins 36, 37, 54, 55)	19200	
	From Device	From Port	To Device	To Port	Baud Rate															
▶	RCDU1	RS-422 #3 (Pins 15, 16, 19, 20)	RCDU2	RS-422 #3 (Pins 15, 16, 19, 20)	19200															
	RCDU1	RS-422 #1 (Pins 36, 37, 54, 55)	RMR1	RS-422 #1 (Pins 36, 37, 54, 55)	19200															
9.	Click File and then save the configuration created.	<input type="checkbox"/>																		

2.3 ICT Configuration File Upload Procedure


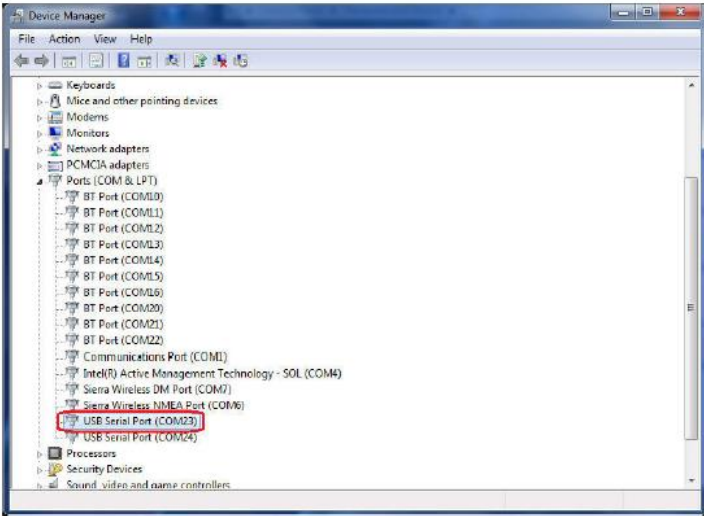

2.3.1 For ICT SW Versions 320-171803-xx

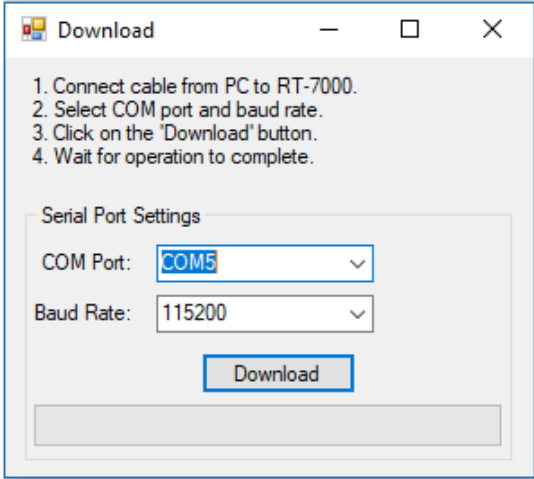
The following procedure has to be executed both for RT7000RMR and for the RCDU (see step 3 alternatives -1 and -2).

1.	If the RT7000RMR is ON, turn off the radio and the RCDU (or the secondary RCDU if the configuration file has to be installed on the second RCDU).	<input type="checkbox"/>
2.	Verify that the configuration file created in the previous steps is properly loaded on the ICT configuration file.	<input type="checkbox"/>
3.	<p>Use a RS-232 to USB adapter and the RS-232 serial data (P/N 129-271603-01 or 129-271603-02 and MOXA UPORT USB to SERIAL RS422 Cable P/N UPORT1130 or equivalent USB to RS-232 adapter) cable to connect:</p> <p>1- the RT7000RMR (via the J107 connector) to the personal computer (see the picture below as reference). Wait until the adapter device is correctly recognized by the operating system.</p> 	<input type="checkbox"/>



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	<p>2- the panel (the connector is just in the middle of the two knobs) to the personal computer (see the picture below as reference). Wait until the adapter device is correctly recognized by the operating system.</p> 	
4.	Turn on the RCDU pressing the inner left hand side knob.	<input type="checkbox"/>
5.	<p>From Windows START menu, open the Control Panel; click Hardware and Sound, then open Device Manager. Expand the Ports (COM & LPT) section and look for the first USB Serial Port device in the list and note the related identifier (e.g. COM23);</p> <p>This is usually the serial port used by the programming interface.</p>  <p style="text-align: center;">(only for reference)</p>	<input type="checkbox"/>
6.	<p>On the ICT screen, press the “Download configuration to RT-7000” button (). Select the COM port in which the USB cable is inserted.</p> <p>Insert the proper Baud Rate. 115200 value is suggested. It is a good compromise between speed and reliability. If data transfer is unreliable, the baud rate may be decreased)</p>	<input type="checkbox"/>

	 <p style="text-align: center;">(only for reference)</p>	
7.	<p>Select "Download" Icon to transfer configuration data from PC to the RT7000 or RCDU.</p> <p>NOTE: Before downloading configuration file to the RT7000, verify the field "UART 4 Protocol" is still set to "RS422".</p>	<input type="checkbox"/>
8.	<p>Disconnect the RS-232 Serial Data cable from the panel and the computer.</p>	<input type="checkbox"/>

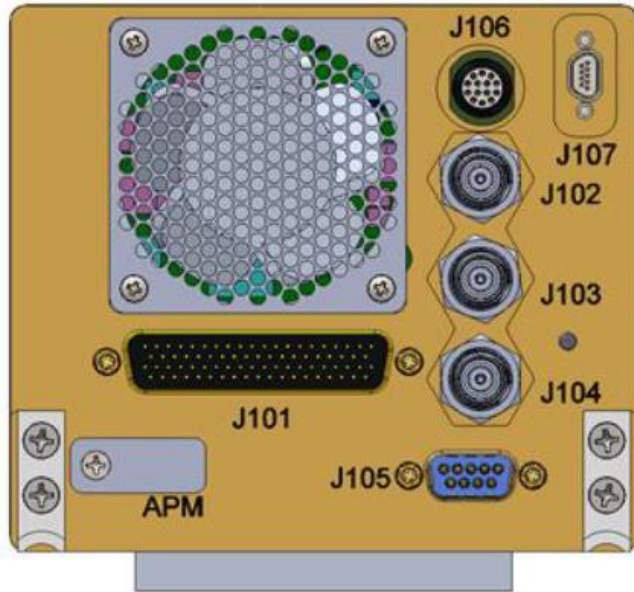
2.3.2 For ICT SW Versions 320-175734-xx

The following procedure has to be executed both for RT7000RMR and for the RCDU (see step 3 alternatives -1 and -2).

1.	<p>If the RT7000RMR is ON, turn off the radio and the RCDU (or the secondary RCDU if the configuration file has to be installed on the second RCDU).</p>	<input type="checkbox"/>
2.	<p>Verify that the configuration file created in the previous steps is properly loaded on the ICT configuration file.</p>	<input type="checkbox"/>
3.	<p>Use a RS-232 to USB adapter and the RS-232 serial data (P/N 129-271603-01 or 129-271603-02 and MOXA UPORT USB to SERIAL RS422 Cable P/N UPORT1130 or equivalent USB to RS-232 adapter) cable to connect:</p> <p>1- the RT7000RMR (via the J107 connector) to the personal computer (see the picture below as reference). Wait until the adapter device is correctly recognized by the operating system.</p>	<input type="checkbox"/>



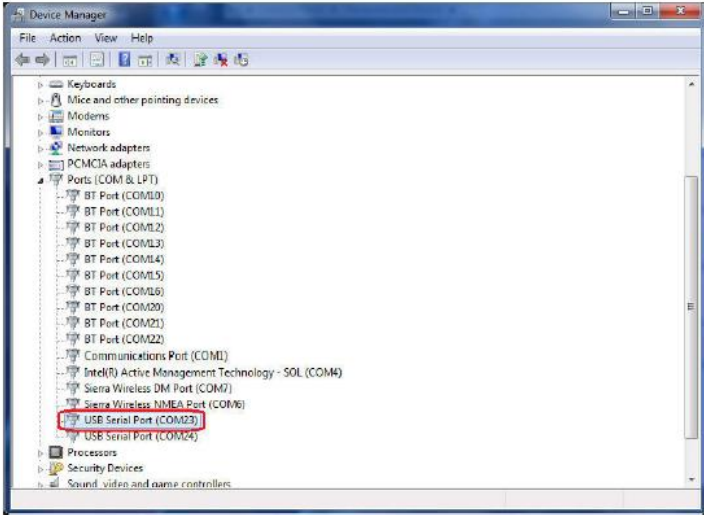


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- 2- the panel (the connector is just in the middle of the two knobs) to the personal computer (see the picture below as reference). Wait until the adapter device is correctly recognized by the operating system.



4.	Turn on the RT7000RMR pressing the inner left hand side knob on the RCDCU.	<input type="checkbox"/>
5.	From Windows START menu, open the Control Panel; click Hardware and Sound, then open Device Manager. Expand the Ports (COM & LPT) section and look for the first USB Serial Port device in the list and note the related identifier (e.g. COM23); This is usually the serial port used by the programming interface.	<input type="checkbox"/>

	 <p style="text-align: center;">(only for reference)</p>	
6.	<p>On the ICT screen, before downloading each configuration data, make sure to select 'RMR' tab or 'RCDU' for the device to be configured.</p>  <p>Press the "Download configuration to RT-7000" button (). Select the COM port in which the USB cable is inserted.</p>	☐
7.	Select "Download ¹ " Icon to transfer configuration data from PC to the RT7000RMR.	☐
8.	Disconnect the RS-232 Serial Data cable from the panel and the computer.	☐

¹ If the "Download" process fail, retry selecting the Download Icon a second time right after.



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3 CUSTOMER PROGRAMMING SOFTWARE

CPS (P/N RVNXXX) pertains to the operation and configuration of the APX module installed in the RT7000RMR device.

The CPS tool must be retrieved from Motorola directly and is a Windows application and can be installed on compatible Windows 7, 8 or 10. The RT7000RMR may be connected to the PC either in the aircraft or on the bench to upload or download configuration data.

To connect the PC to the RT7000RMR is necessary USB cable (Cobham/Canyon AeroConnect P/N 129-271601-01 or Motorola P/N PMKN4012B) that connects to the Cobham/Canyon AeroConnect cable P/N 123-371761-01 (or -02) as illustrated in the following figure.

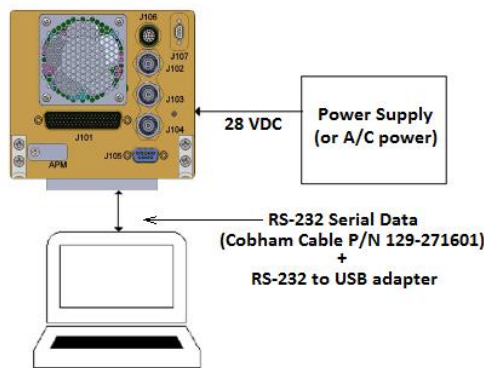


Figure 3-1: Motorola CPS Hardware setup



Figure 3-2: Cables used to install APX module(s) configuration file(s)

3.1 CPS Software Installation Procedure

NOTE: *Only if the CPS is not installed on the Laptop follow the procedure reported below. Do not install multiple versions of the CPS software into the same folder.*

NOTE: *This procedure refers to software version 2.7.19 and is reported for reference only. Refer to the Installation Manual for each specific version.*

1.	<p>Insert CPS software disc on a laptop (is necessary that user is logged in to the machine with local administrator rights) and verify that contains the following:</p> <ul style="list-style-type: none"> • ApxFamilyCPS.exe • Autorun.inf • CPS_Readme.txt • Installation Guide_RXXX.pdf 	<input type="checkbox"/>
2.	<p>Follow the procedure reported in the following pictures to install the Software.</p> <p>NOTE: pictures are taken as reference only from R17 version of the software, different releases may change.</p>	<input type="checkbox"/>



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Installation Guide for the Suite Installer (Customer Programming Software and Radio Management)

The APX CPS DVD includes the CPS and the Radio Management Components.

* Please allow all Windows updates to complete before installing

* Before upgrading to a new version of RM, make sure to backup your database. RM Server Utility -> Database Settings -> Database Backup

System Requirements:

Supported Operating Systems: (for installing ApxFamily CPS only)

- Windows 7 (SP 1 or higher)
- Windows 8
- Windows 8.1
- Windows 10

Supported Operating Systems: (for installing ApxFamily CPS with Radio Management Server and Radio Management Device Programmer)

- Windows 7 (SP 1 or higher)
- Windows Server 2008 R2 SP1
- Windows 8/8.1
- Windows 10
- Please see the "Additional Installation Instructions for Windows 8/8.1 & Windows 10" section before installing
- Windows Server 2012 R2

Recommended Hardware Requirements: (for Radio Management, please refer to RM Deployment Guide RM located at the root of the DVD)

- Processor: 2 GHz dual core or higher Pentium grade processor
- Memory: 6 GB RAM
- Aero capable graphics card with 128 MB graphics memory
- 15 GB free hard disk
- USB Port for iButton dongle
- USB Port for radio communication
- DVD-ROM drive for software installation

Note: This recommended configuration is required when working with large codeplugs.

Minimum Hardware Requirements:

- Processor: 1 GHz dual core or higher Pentium grade processor
- Memory: 4 GB RAM free memory, excluding onboard graphics card memory usage
- DirectX 9-class graphics card.
- 10 GB free hard disk space (for Standalone CPS) or 4GB for CPS with Radio Management Suite
- USB Port for iButton dongle
- USB Port for radio communication
- DVD-ROM drive for software installation

Minimum Software Requirements:

- Windows Internet Explorer 7 or later
- Microsoft Word 2003 SP3 or Microsoft Word 2007

Note:

- If the PC does not meet the recommended configuration the application performance may be degraded.

Installation Instructions:

1. The user is required to be logged in to the machine with local administration rights. For Windows 7 or higher, it is required to enable UAC instead.
2. Unplug any Motorola devices that are connected to the computer.
3. Exit all CPS and related programs running on the computer.
4. Insert the DVD into the DVD drive. If there is more than one DVD drive, the master DVD drive must be used.
5. Wait for the auto-install program to start and follow the instructions on the screen. If the auto-install program fails, navigate to Setup.exe on the DVD and double-click it.
6. If the Microsoft .Net Framework or other pre-requisites have not been installed on the hard drive, there will be a prompt to install it. Click 'Yes' or 'Install' to install the .Net Framework and the other prerequisites.
IMPORTANT NOTE: If prompted to re-start the machine during the installation process, please do so before proceeding with the install.
7. The first screen that appears is the language selection screen. The selected language will be used during the installation. Select the install language and click Next.

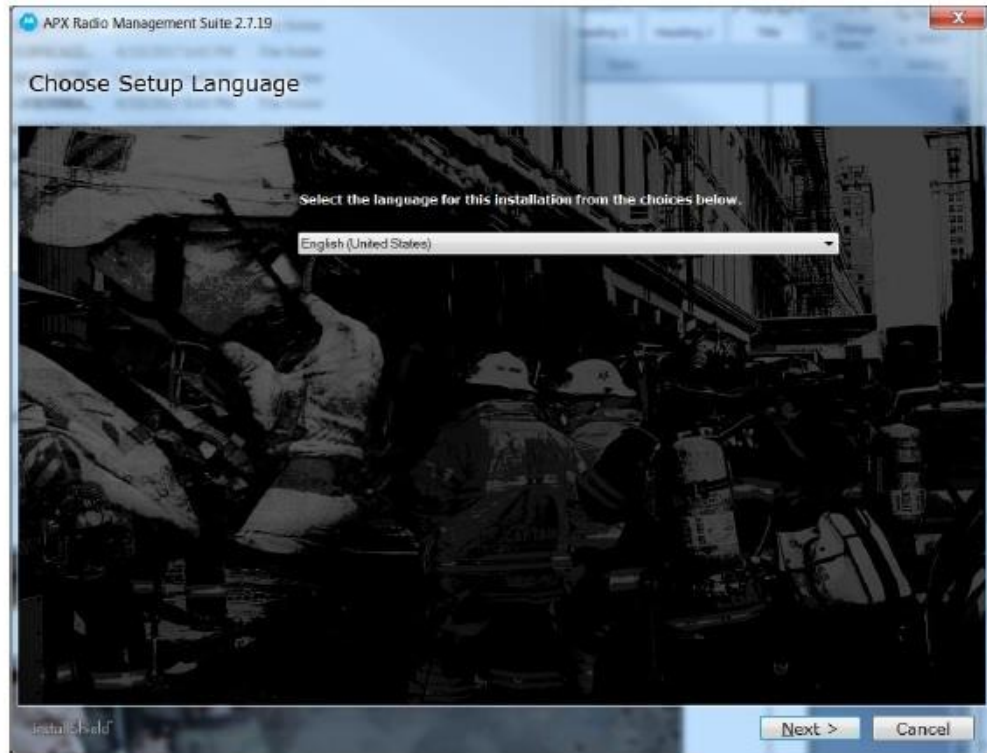


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8. The installation program will then proceed to the Welcome screen. Click Next.



9. Select the components to be installed. If no languages are selected, the CPS will default to English. Click Next.
 - Please be sure to install the APX CPS or APX Tuner application BEFORE attaching a radio to the PC via the USB cable. Failing to do this can prevent files that need to be updated from being updated, which will cause problems with communication between the radio and PC.
 - If installing both the CPS and the Tuner, install them to separate directories.
 - If installing Radio Management components, please see the section "Radio Management Installation" below.
 - If migrating from Radio Management in version R14.01.00 or lower, it is necessary to leave the RM Server services running (the Motorola RM Discovery Service, the Motorola RM Job Server, and the Motorola RM Server services). If these are not running during this installation, none of the data in the previous version will be migrated to this new version.

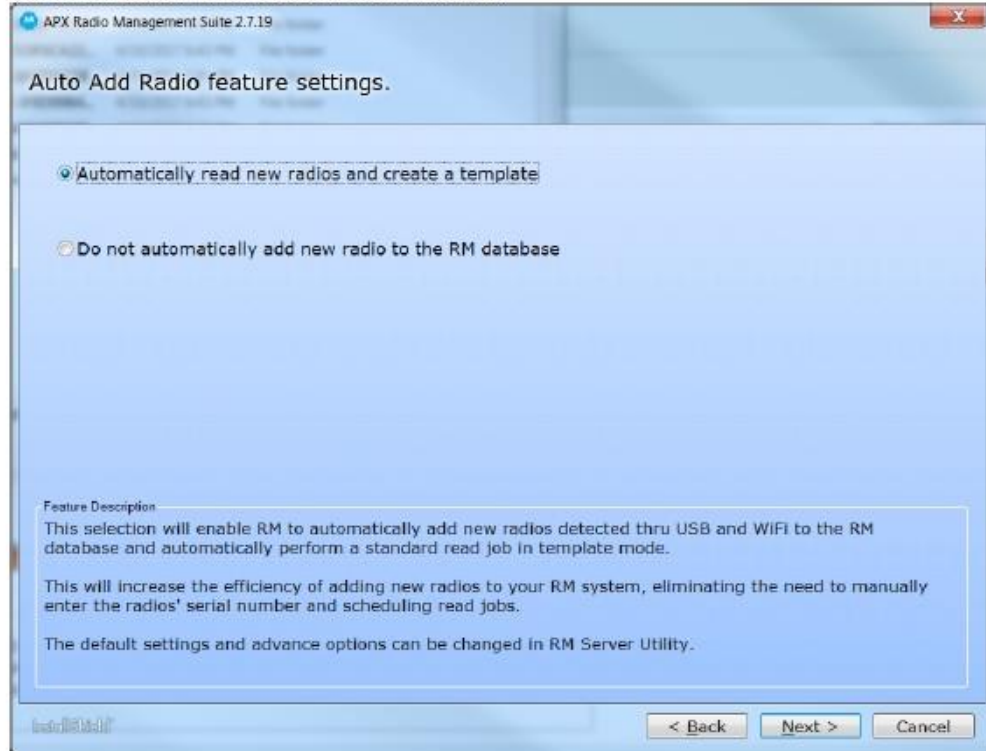


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10. Auto Add Radio feature – RM will automatically add new radios detected thru USB and Wi-Fi to the database ((more information can be found in the help)



11. On the Change Current Destination Folder screen, there are two options for setting the location of the Program Files and the Data Files. The first specifies where the executables and dynamic linked libraries are to be installed, and the other specifies where the user created content is to be stored. This user created content includes templates and xPBA files generated during read operations and write operations. If the repository for the existing database had been previously moved to an alternative location, the Data Files path may need to be updated. Please make sure that the database location points to the correct path.

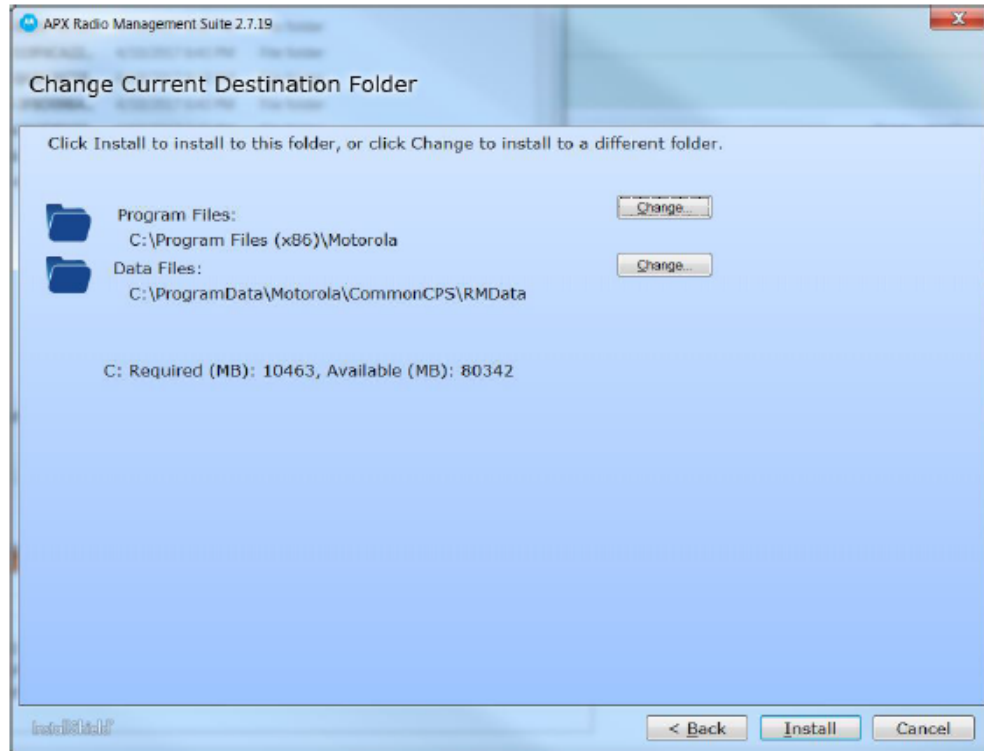


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12. Follow the instructions on the screen to complete the installation.
Note: If asked to restart, you must restart the machine for the install process to complete successfully.
13. At the end of the installation, click Finish and restart the computer.
14. If security related Windows 7 (or higher) messages come up during the install, click 'OK' to proceed. **Note:** If installing the CPS and/or Tuner on Windows 7 or higher, do not install any other applications that would communicate with the APX Radio, such as the Data Terminal Application.
15. ***** DATABASE MIGRATION PROCEDURE*****
If migrating from Radio Management in version R14.01.00 or lower, please follow these instructions, else, skip to step 19 below. After the install is complete, launch the CPS and click on the Radio Management button to start the data migration process. The RMC will display the Data Upgrade dialog, which has two choices: the first will discard the job history for all radios, while the second preserves the history.

Data Upgrade

A version 1.6.1 RM database was found. Radio Management needs to upgrade this data to the current version.

Upgrade RM data excluding each radio's individual job history.

Estimated time to complete: 2 Hour(s) 25 Minutes(s)
Estimated disk space required: 15901 MB

Upgrade RM data including each radio's individual job history.

Estimated time to complete: 4 Hour(s) 9 Minutes(s)
Estimated disk space required: 99137 MB

16. During the data migration procedure, a one-time upgrade read job will be scheduled by the data upgrade program. This read job does not require any radios to be connected; it is completed by reading the data from the old database and reprocessing it into the format used by the new database. It is very important that this process does not get interrupted.
17. At the end of the data migration process, there will be an option to delete the old data. This option is provided for those situations where disk space is limited. For those situations where there is sufficient disk space, it is highly recommended to preserve this data.
18. Once the migration is complete, the RMC radio view will be presented. The upgrade read job may take a significant amount of time depending on the size of the database. As these jobs are completed, the radio Status will be updated to the Completed. Radios can be modified once they are in the completed state.
19. If the PC has never had a 1-Wire USB device connected to it before, such as the USB dongle used for FLASHkeys or Advanced keys, plug in a 1-Wire USB device immediately after the CPS installation finishes in order to ensure that the 1-Wire USB drivers are properly installed. If the device is not recognized or if auto-detect cannot locate the USB device driver, point the New Hardware Wizard's Driver installer to the 1-Wire driver located in:
 - * C:\WINDOWS\system32\drivers for 32-bit operating systems
 - * C:\WINDOWS\syswow64\drivers for 64-bit operating systems
 The wizard should then find and install the driver automatically.
20. Multiple versions of the CPS are allowed to be installed on the same computer. Please note that when double-clicking on a codeplug file (.mc), the latest installed CPS will be launched to open the codeplug file (.mc).

IMPORTANT NOTE: DO NOT INSTALL MULTIPLE VERSIONS OF THE CPS INTO THE SAME FOLDER.

Radio Management Installation

Customers that are using the CPS Radio Management system in a distributed configuration are responsible to ensure that the distributed CPS Radio Management System computers have open IP connectivity between each other. This may involve configuring firewall and routers to allow connectivity for each computer's IP address and to open the ports used by the CPS Radio Management System. The default Radio Management Port is 8675.

The Radio Management Server installation installs SQL Server version 12.0.2000.8. If there is a later version of SQL Server installed, please uninstall the existing version before installing the Radio Management Server. If uninstalling the existing SQL Server is not a viable option, please contact the Motorola Solutions Customer Service in order to be able to complete the installation.

If you have a need to use a Microsoft SQL server system other than the MS SQL Server Express Edition provided in the Radio Management Installer, please contact Motorola Solutions Support.



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In rare instances during the installation of Radio Management components, the Windows Powershell screen (blue) is displayed for about 10 minutes with no progress status and the install ends displaying "install interrupted" message. Please re-start the install to complete the installation.

This version of the CPS will not be compatible with the previous versions of Radio Management Server. Please upgrade the Radio Management Server if already installed.

Additional Installation Instructions for Windows Identity Foundation:

If the Windows Update Service is not enabled on the Windows 7, Windows 8/8.1, or Windows 10 OS, the Radio Management Server installation may not be able to install the Windows Identity Foundation, which may cause the installation to fail.

To resolve the problem, exit the installation and follow the steps below:

1. Go to Control Panel->System and Security->Windows Update and choose one of the options other than "Never check for updates"
2. Go to the Microsoft page at <http://support.microsoft.com/kb/958043> and follow the steps to fully reenable Windows Update
3. Run the installation again

In some rare scenarios on Windows 7 32-bit computers, the Windows Identity Foundation which is a prerequisite for Radio Management Server may not get installed. In such cases please try turning on the Windows Update setting which can be found under Control Panel → System and Security → Windows Update and try again.

Note for Hardened Operating Systems:

Before installing Radio Management, please make sure that certain permissions are set on Hardened machines. Please follow these instructions to install on Hardened machines:

1. Give the user that will be running the installer the following privileges. These permissions are required to install Microsoft SQL Server, which the Radio Management Server requires to function. Also note that the user running the installer must be an administrator.

Local Policy Object Display Name	User Right
Backup files and directories	SeBackupPrivilege
Debug Programs	SeDebugPrivilege
Manage auditing and security log	SeSecurityPrivilege

2. Disable the FIPS setting on the machine:
 - Go to Start -> Control Panel -> System and Security -> Administrative Tools
 - Double click on Local Security Policy
 - In the left pane , double click on Local Policies. Click on Security Options, and towards the bottom of the right pane, look for the entry,
 - "System cryptography: Use FIPS compliant algorithms for encryption, hashing, and signing."
 - If this entry is enabled, please disable it.
3. Double check that FIPS is disabled in the following registry locations:
 - HKLM\System\CurrentControlSet\Control\Lsa\FIPSAlgorithmPolicy\Enabled
 - verify that the data value here is 0.

- HKLM\System\CurrentControlSet\Control\Lsa (don't click on FipsAlgorithmPolicy)
- In the list in the right pane, do you see FipsAlgorithmPolicy REG_DWORD with some data value? If so, make sure the data value is set to 0.
- 4. Install Radio Management using the directions in the *Radio Management Installation Instructions* section of this document.
- 5. Revert the permissions back to the secure settings that were applicable before step 1.

Additional Installation Instructions for Windows 8/8.1 & Windows 10:

There are certain components that need .NET 3.5 installed. If the computer has access to the Internet:

1. Go to the Desktop
2. Open Settings->Control Panel
3. Go to Programs->Uninstall a program
4. Choose "Turn Windows features on or off" from the left panel 5. Check ".NET Framework 3.5 (includes .NET 2.0 and 3.0)"
6. Click on the OK button.

If the computer does not have access to the Internet:

1. Insert the Windows DVD into the computer's DVD drive
2. Go to the Start screen
3. Right-click on the screen and choose "All apps"
4. Scroll to the right to Windows System->Command Prompt
5. Right-click on Command Prompt and choose "Run as Administrator"
6. Enter "DISM /Online /Enable-Feature /FeatureName:NetFx3 /All /LimitAccess /Source:<DVD_Drive>:\sources\sxs", where <DVD_Drive> is replaced with the drive that contains the Windows DVD, then press Enter
7. After the operation completes, close Command Prompt

For more information, please see the Microsoft page at <http://msdn.microsoft.com/en-us/library/hh506443.aspx>

Software Upgrades:

APX CPS Application - When upgrading to a minor CPS version, the current CPS installed will be overwritten by the new minor version. *For example:* if R10.00.00 CPS is installed, it can be upgraded to R10.01.00 (which is a minor upgrade) and the new CPS version will be R10.01.00. However, an upgrade from R10.00.00 to R11.00.00 will install R11.00.00 alongside R10.00.00.

Advanced Keys Administrator (AKA) – AKA does not support any upgrades. Multiple versions of the AKA application can be installed on the same machine without having to uninstall the older version.

ARS Administrator Application (ARS) – ARS application will always be upgraded to the latest version.

Tuner Application– Upgrades work the same as the CPS.

Migration Assistant Application – Upgrades work the same as the CPS.

Radio Management Server – The Radio Management Server is required to be upgraded for this release.



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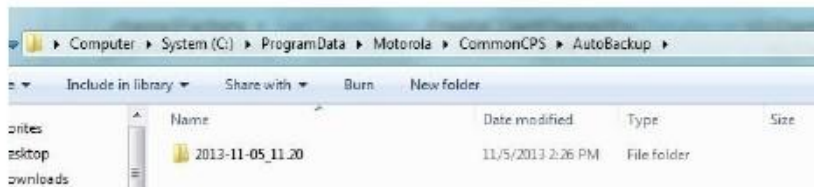
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Radio Management Device Programmer – The Radio Management Device Programmer is required to be upgraded for this release.

Radio Management Job Processor – The Radio Management Job Processor is required to be upgraded for this release.

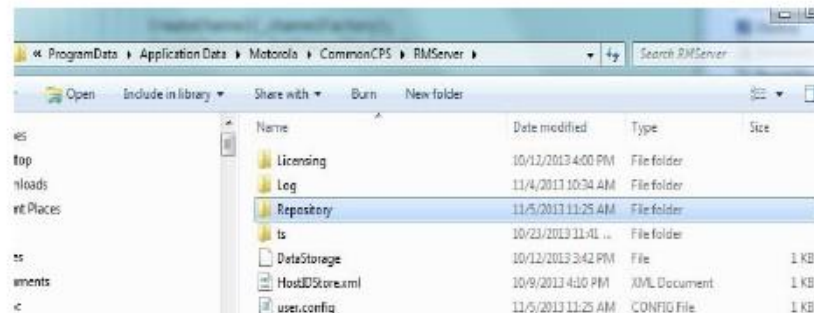
Important Note: For all the users that are currently using Radio Management version 1.1.3 or earlier, please make sure to uninstall Radio Management Server component before upgrading to this new version. PLEASE NOTE that the database will be upgraded by this new version, and no customer interaction required, but in case of any failures, please make sure to follow the steps below to manually restore the database back to its original state.

1. Find the auto-backup folder from the path mentioned below:



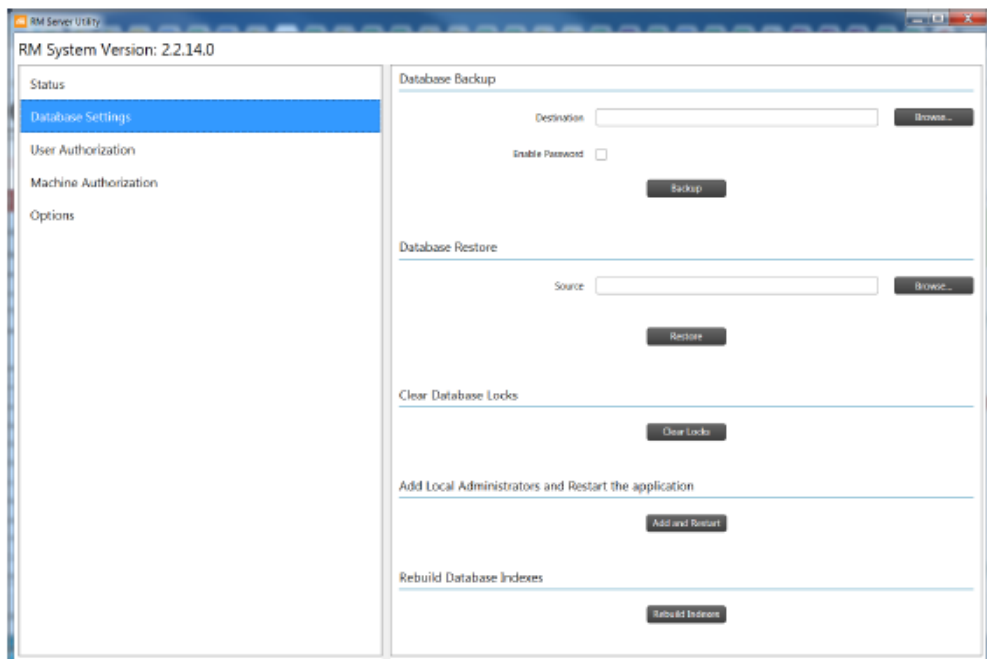
On Win7/Win8/Win8.1/Win10: C:\ProgramData\Motorola\CommonCPS\AutoBackup 2.

2. Find the "Repository" folder in RM Server's data folder:



On Win7/Win8/Win8.1/Win10: C:\ProgramData\Application Data\Motorola\CommonCPS\RMServer\Repository

3. Copy the "Repository" folder (including sub-folders) from RM Server's data folder, into the autobackup folder.
(For example, copy "Repository" folder into the auto-backup folder "2013-11-05_11.20")
4. Launch "RM Server Utility", select "Database Settings" tab and navigate to "Database Restore". Select auto-backup folder as the source path. Click "Restore" button to restore the data.



Note: Only backups on the same DB version as the current RM Server DB can be restored.

In order to downgrade to a previous version of RM, it will be necessary to uninstall the current version of RM and remove the current database from SQL. Removing the SQL database can be done via three different methods:

1. Completely uninstall SQL from the machine via the Add/Remove Programs list
2. Re-run the install for SQL, select modify, and delete/uninstall only the RM database
3. Launch the SQL Management Studio and delete the RM database from the list of databases

After removing the database, reinstalling the desired RM server will create a new blank database to restore to.

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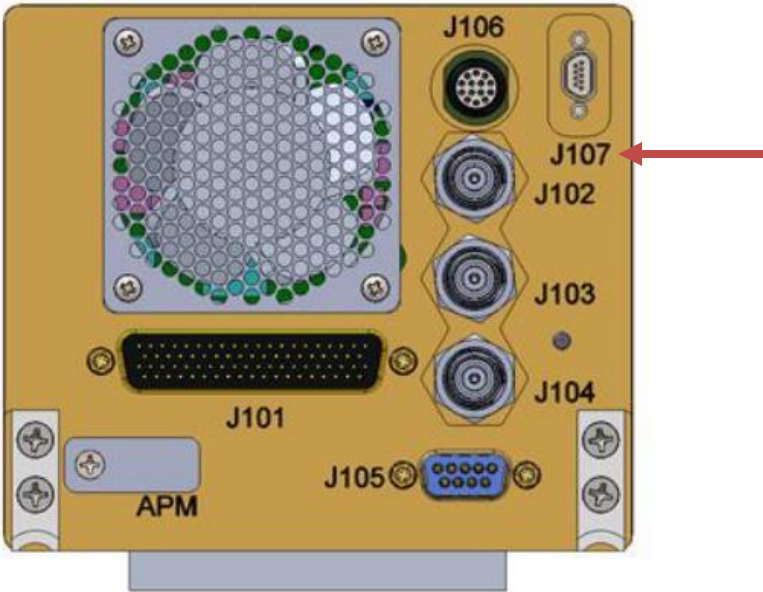

3.2 Basic APX Module Configuration Download Procedure




The following procedure provides the guidelines to correctly load preset channels into an APX module.



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Refer to para. §4 of this Annex B for the applicable configuration.

1.	<p>Run the CPS software click on the icon.</p> <div style="text-align: center;">  </div>	☐
2.	<p>Connect the two cables reported in Figure 3-2 (P/N 123-371761-01 or -02 and 129-271601-01 or PMKN4012B). Connect the cable P/N 129-271601-01 (or PMKN4012B) to the USB port of the Laptop and the cable P/N 123-371761-01 (or -02) to the RT7000RMR J107 connector.</p> <div style="text-align: center;">  </div>	☐
3.	<p>From the RCDU go to home page pressing the “Home” button in lower left of the front panel. Then pressing the “Menu” button to access in “Mode Select” page.</p> <div style="text-align: center;">  <p>(only for reference)</p> </div>	☐
4.	<p>Select “Configure” icon to access in the “Programming Mode” and then select “Transceiver” bring up the configuration transceiver page.</p>	☐

	 <p>(only for reference)</p>	
5.	<p>Select the APX module in which you want to upload the CPS file and then select “NEXT” bring up the configure Transceiver Action page.</p>  <p>(only for reference)</p> <p>The RT7000RMR is ready to transfer configuration data to or from CPS software. Click on the “START” icon.</p>	<input type="checkbox"/>
6.	<p>On computer, from CPS software, select “Device” and then “Read Device” (or Read a Radio on the bar of Left Hand side of the main menu) on the to import the default file configuration (called Codeplug) from the transceiver module.</p> <p>At the end of operation, return on the RCDU and select “STOP” icon. Then go to Home page selecting “Home” button many times.</p>	<input type="checkbox"/>
7.	<p>Press the Motorola  button on the top left corner and save the default codeplug.</p>	<input type="checkbox"/>
8.	<p>Disconnect the cable from the panel and the computer.</p>	<input type="checkbox"/>



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3.3 CPS Codeplug Configuration Creation Procedure

1.	Run CPS software. On the left hand side menu select “Browse for a Codeplug” and select the Codeplug previously saved. See Figure 3-3 for reference.	<input type="checkbox"/>
2.	<p>On the left hand side menu (Codeplug Configuration) select Conventional Configuration and then Conventional Personality (see Figure 3-4 and as reference). Right-click on Conventional Personality and press on Add to create a new set of channels. Click twice on the new field created.</p> <p>In General → Conventional Personality Name type the name of the configuration (e.g. Test Freq).</p> <p>In Frequency Options field click Add Record(s) button just above the channel list and add the desired channel(s).</p> <p>In Figure 3-4 required field are highlighted.</p> <p><u>The channels list can be found according to the applicable configuration, which can be retrieved in para. §4 of this Annex B.</u></p> <p>Input the Channel name, the Rx Frequency, the Tx Frequency and the Tx Deviation / Channel Spacing.</p> <p>NOTE: If a mistake is made (e.g. an incompatible frequency is inserted in the desired band) the field will become red and the file will not be saved.</p>	<input type="checkbox"/>
3.	<p>On the left hand side menu (Codeplug Configuration) select Zone Channel (see Figure 3-5 as reference). Right-click on Zone Channel Assignment and press on Add to create a new set of channels.</p> <p>Click twice on the new field created.</p> <p>In Zone → Zone Name type the Zone name (e.g. ZT).</p> <p>In the Channels field click Add Record(s) button just above the channel list and add the desired channel(s). Input the Channel Name, select from the Personality field the Conventional Personality module created in the previous point and select from the Conventional Frequency Option field the channel created inside the Conventional Personality module</p> <p>In Figure 3-5 required fields are highlighted.</p> <p><u>The channels list can be found according to the applicable configuration, which can be retrieved in para. §4 of this Annex B.</u></p> <p>NOTE: If a mistake is made (e.g. an incompatible frequency is inserted in the desired band) the field will become red and the file will not be saved.</p>	<input type="checkbox"/>
4.	Save the modified Codeplug	<input type="checkbox"/>



Figure 3-3: CPS software Main page (only for reference)



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APX CPS (Portable) - rt7000pmr nc31826 Test Configuration.mc

Codeplug View Device Tools Help

Navigation

Codeplug Configuration

DEFAULT CODEPLUG ASK

- Radio Information
- Radio Wide
- Factory Overrides
- Radio Ergonomics Configuration
- Secure Configuration
- Emergency Configuration
- Data Configuration
- Phone Wide
- Conventional Configuration
 - Conventional Wide
 - MPL Configuration
 - Conventional Alias Lists
 - Repeater ID List
 - ASTRO Talkgroup List
 - Conventional System
 - Conventional Personality
 - Test Freq
 - Trunking Configuration
 - Call List Configuration
 - Zone Channel Assignment
 - 1-ZT
 - Scan Configuration

Conventional Personality 1 of 1

General Rx Options Tx Options Frequency Options Signaling Non-ASTRO Call ASTRO Call ASTRO Talkgroup RAC Features Phone One Touch Secure Advanced

General

Conventional Personality Name Test Freq

Rx Options

Receive Only Personality

Rx Voice / Signal Type Non-ASTRO

Unmute / Mute Type UnMute, Or Mute

Rx Unmute Delay (ms) 0

Squelch (Fine Tune) 3

Busy LED

Rx De-Emphasis

HearClear Disabled

Tx Options

Tx Voice / Signal Type Non-ASTRO

Time Out Timer (sec) 60

Transmit Pre-Emphasis

Reverse Burst / Turn-Off Code

Transmit Power Level High

Adaptive Power

Frequency Options

Name	Rx / TA Frequency ()	Tx Frequency (MHz)	Direct / Talkaround	Direct Frequency ()	Tx Deviation / Chan	Rx / TA Network ID	Tx Network ID	Direct Network ID	ASTRO Talkgroup II	User Selectable PL	User Selectable PL	Rx / TA Squelch Typ	Rx / TA PL Freq
MTM VHF 138 S	138.12500	138.12500	<input checked="" type="checkbox"/>	450.00000	5 kHz / 25 kHz	659 - 293	659 - 293	659 - 293	TG 00002	<input type="checkbox"/>	Disabled	CSQ	67.0
MTM VHF 155 S	155.12500	155.12500	<input checked="" type="checkbox"/>	450.00000	5 kHz / 25 kHz	659 - 293	659 - 293	659 - 293	TG 00002	<input type="checkbox"/>	Disabled	CSQ	67.0
MTM VHF 173 S	173.97500	173.97500	<input checked="" type="checkbox"/>	450.00000	5 kHz / 25 kHz	659 - 293	659 - 293	659 - 293	TG 00002	<input type="checkbox"/>	Disabled	CSQ	67.0
MTM UHF 400 S	400.00000	400.00000	<input checked="" type="checkbox"/>	450.00000	5 kHz / 25 kHz	659 - 293	659 - 293	659 - 293	TG 00002	<input type="checkbox"/>	Disabled	CSQ	67.0
MTM UHF 470 S	470.00000	470.00000	<input checked="" type="checkbox"/>	450.00000	5 kHz / 25 kHz	659 - 293	659 - 293	659 - 293	TG 00002	<input type="checkbox"/>	Disabled	CSQ	67.0

Signaling

ASTRO

ASTRO System <None>

Digital Modulator Type C4FM

ASTRO Rx Unmute Rule Normal Squelch

Late Entry Fast Unmute

Non-ASTRO

Ready

Output Invalid Fields Report Drag and Drop Report Import/Export Report Comparator Report Fill Up/Fill Down Report Find Results System Key Report

H91TGD9PW6AN 579CTP0583

Figure 3-4: CPS software Conventional Personality page (only for reference)

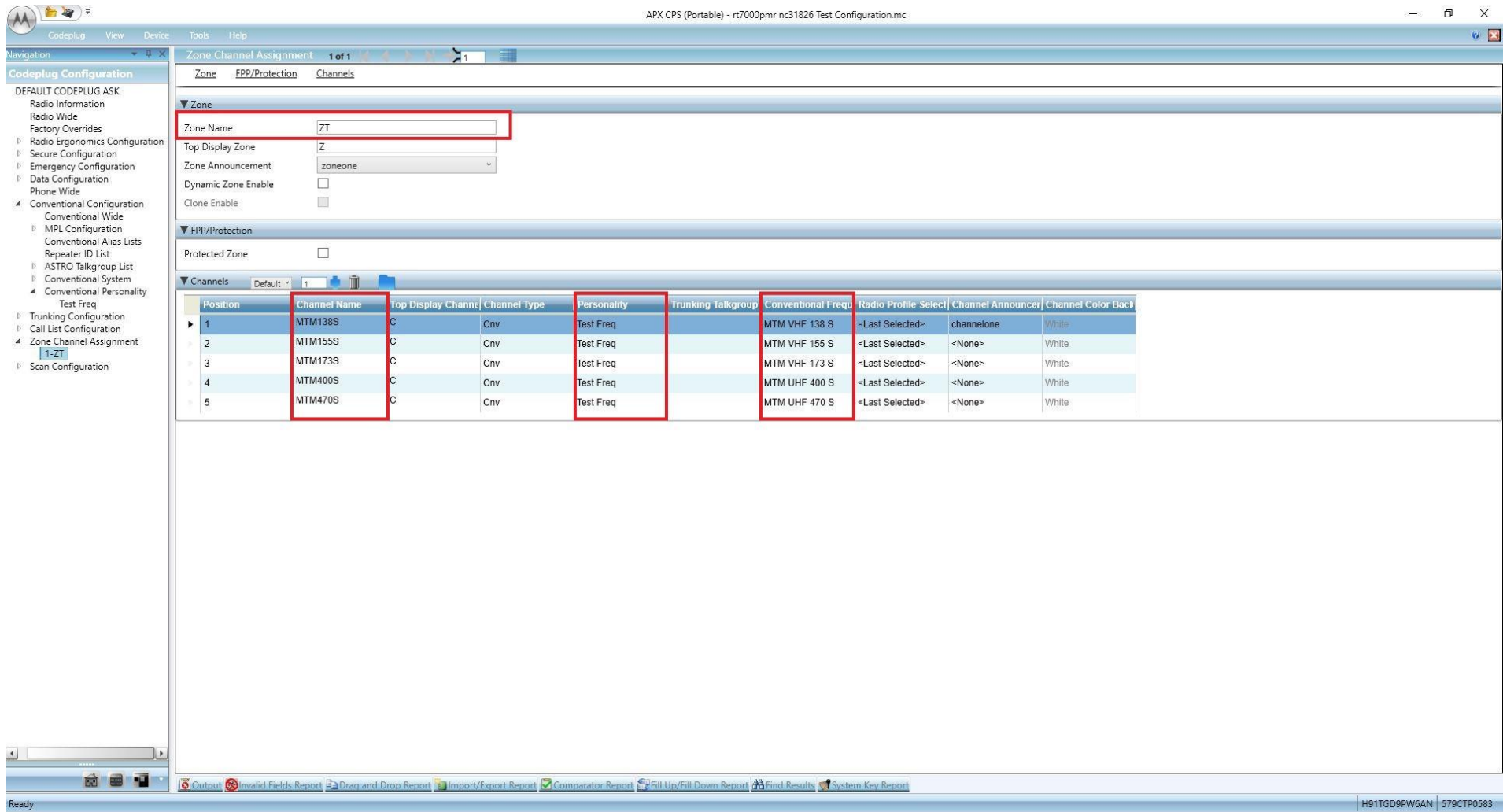


Figure 3-5: CPS software Zone Assignment page (only for reference)

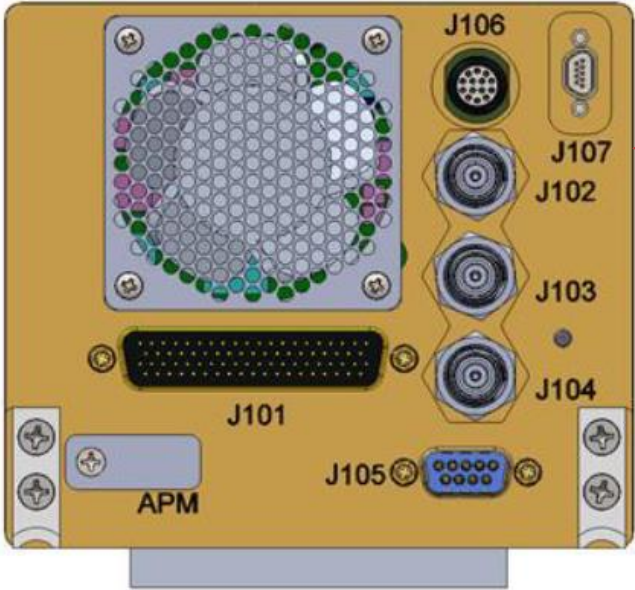





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3.4 CPS Codeplug Upload Procedure

1.	<p>Connect the two cables reported in Figure 3-2 (P/N 123-371761-01 or -02 and 129-271601-01 or PMKN4012B). Connect the cable P/N 129-271601-01 (or PMKN4012B) to the USB port of the Laptop and the cable P/N 123-371761-01 (or -02) to the RT7000RMR J107 connector.</p> 	<input type="checkbox"/>
2.	<p>From the RCDU go to home page pressing the “Home” button in lower left of the front panel. Then pressing the “Menu” button to access in “Mode Select” page.</p>  <p>(only for reference)</p>	<input type="checkbox"/>
3.	<p>Select “Configure” icon to access in the “Programming Mode” and then select “Transceiver” bring up the configuration transceiver page.</p>	<input type="checkbox"/>

	 <p>(only for reference)</p>	
4.	<p>Select the APX module in which you want to upload the CPS file and then select “NEXT” bring up the configure Transceiver Action page.</p>  <p>(only for reference)</p> <p>The RT7000RMR is ready to transfer configuration data to or from CPS software. Click on the “START” icon.</p>	<input type="checkbox"/>
5.	<p>On computer, from CPS software, select “Device” and then “Clone Radio” to import the default file configuration (called Codeplug) on the transceiver module.</p> <p>At the end of operation, return on the RT7000RMR panel and select “STOP” icon. Then go to Home page selecting “Home” button many times.</p> <p>NOTE: If the RT7000 does not restart automatically use the ON/OFF button to restart it and to visualize the installed channel configuration</p>	<input type="checkbox"/>
6.	<p>Disconnect the cable from the panel and the computer.</p>	<input type="checkbox"/>



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4 CONFIGURATION APPLICABILITY

This paragraph reports the configuration applicable in the previous procedures.

4.1 ICT Configuration

Refer to Figure 2-2 for the software graphic interface, the following table reports the parameters applicable to this configuration.

The following table is applicable for ICT SW PN 320-171803-XX

Part Number	RT7000RMR-005-001			File Description	AW139_RT7000RMR_F08411			
				UART Settings				
						UART 4 Protocol	RS-422	
						UART 4 Control	RMU	
						UART 4 Baud Rate	19200	
Mic/Audio Setup								
	Mic 1	Mic 2	Mic 3	Mic 4	Mic 5	Mic 6	Mic 7	Mic 8
Input Mode	10 mW	10 mW	10 mW	10 mW	10 mW	10 mW	10 mW	10 mW
Input Gain							34.0	34.0
	Audio 1	Audio 2	Audio 3	Audio 4	Audio 5	Audio 6	Audio 7	Audio 8
Output Gain	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SideTone	1.000	1.000	1.000	1.000	1.000			

The following table is applicable for ICT SW PN 320-175734-XX:

Part Number	RT7000RMR-009-002			File Description	AW139_RT7000RMR_F08011			
Mic/Audio Setup								
	Mic 1	Mic 2	Mic 3	Mic 4	Mic 5	Mic 6	Mic 7	Mic 8
Input Mode	10 mW	10 mW	10 mW	10 mW	10 mW	10 mW	10 mW	10 mW
Input Gain							34.0	34.0
	Audio 1	Audio 2	Audio 3	Audio 4	Audio 5	Audio 6	Audio 7	Audio 8
Output Gain	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SideTone	0.350	0.350	0.350	0.350	0.350			

Refer to Figure 2-3 for the software graphic interface, the following table reports the parameters applicable to this configuration.

The following table is applicable for ICT SW PN 320-171803-XX:

Part Number	RCDU-7000-002-002		File Description	AW139_RT7000RCDU_F08411		
RCDU Control	Primary					
Connection Settings						
Serial Connection 1	NONE			Radio 1		
Serial Connection 2	RT-7000				Radio Name	
Serial Connection 3	NONE				RCDU1	
Serial Connection 4	RCDU	Baud Rate	19200		Module Names	Module Short Names
Serial Connection 5	NONE			1	APX	1 COM3
				2	MODULE 2	2 AUX1
				3	MODULE 3	3 AUX2
				4	MODULE 4	4 AUX3
				5	MODULE 5	5 AUX4
Lighting						
	Use Lighting Bus Display:		No			
	Use Lighting Bus Bezel:	Yes				
	Day Lighting Curve	0-5	Night Lighting Curve	0-5		
	NVG Lighting Curve	0-5				

NOTE: the field “Module Short Names” accepts only 4 characters. Be sure to not insert unwanted spaces.



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The following table is applicable for ICT SW PN 320-175734-XX:

Part Number	RCDU-7000-001-002	File Description	AW139_RT7000RCDU_F08011			
RCDU Control	Primary					
		Radio 1				
			Radio Name			
			RCDU1			
			Module Names		Module Short Names	
		1	WIDEBAND1	1	COM3	
		2	WIDEBAND2	2	COM4	
		3	APX	3	COM5	
		4	MODULE 4	4	AUX1	
		5	MODULE 5	5	AUX2	
Lighting						
	Use Lighting Bus Display:		No			
	Use Lighting Bus Bezel:	Yes				
	Day Lighting Curve	0-5	Night Lighting Curve	0-5		
	NVG Lighting Curve	0-5				

NOTE: the field “Module Short Names” accepts only 4 characters. Be sure to not insert unwanted spaces.

4.2 CPS Configuration

Refer to Figure 3-4 for the software graphic interface, the following tables reports the parameters applicable to this configuration:

Conventional Personality Name		Test Freq	
Name	Rx/TA Frequency (*)	Tx Frequency	Tx Deviation / Channel
MTMXXXS With XXX being the MHz value of the frequency; e.g. MTM136S for 136.000 MHz	Set at least three frequencies for the following band: - 136 – 174 MHz Set at least three frequencies for the following band: - 380 – 520 MHz Set at least two frequencies for the following band: - 764 – 870 MHz	Set the same frequencies of the 'Rx/TA Frequency' column	5 kHz / 25 kHz

NOTE: If preconfigured cooperating radio are used for testing, mind to choose the correct frequency between RT7000PMR and cooperating radio.

Conventional Personality Name		EMCTestFreq	
Name	Rx/TA Frequency (*)	Tx Frequency	Tx Deviation / Channel
EMC_X With X being a progressive number	Set the same frequencies of the previous table	Set the same frequencies of the 'Rx/TA Frequency' column	5 kHz / 25 kHz

NOTE: If preconfigured cooperating radio are used for testing, mind to choose the correct frequency between RT7000PMR and cooperating radio.



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Refer to Figure 3-5 for the software graphic interface, the following table reports the parameters applicable to this configuration:

Zone Name		ZT	
Channel Name		Personality	Conventional Frequency
MTMXXXS With XXX being the frequency value set before		Test Freq	MTM VHF XXX S With XXX being the frequency value set before. VHF label has to be replaced by UHF if the frequency value is greater than 300 MHz

Zone Name		EMC	
Channel Name		Personality	Conventional Frequency
EMC_X With X being the same progressive number set before		EMC Test Freq	Same as 'Channel Name'

4.3 PRMUS EPIC XCVRs SETTINGS CONFIGURATION

Depending on the installed Primus EPIC Software release, the Primus EPIC Setting file may need to be updated in accordance with the applicable AMP DM “Processing and integrating - Options and setting file - Load software procedure”.

The following table reports the required settings:

APM DATA FIELD	STATUS	NOTE
XCVR A2 Audio Enable	Enabled	

Please send to the following address:		SERVICE BULLETIN COMPLIANCE FORM		Date:
LEONARDO S.p.A. CUSTOMER SUPPORT & SERVICES - ITALY PRODUCT SUPPORT ENGINEERING & LICENSES DEPT. Via Giovanni Agusta, 520 21017 Cascina Costa di Samarate (VA) - ITALY Tel.: +39 0331 225036 Fax: +39 0331 225988		Number:		
		Revision:		
Customer Name and Address:		Telephone:		
		Fax:		
		B.T. Compliance Date:		
Helicopter Model	S/N	Total Number	Total Hours	T.S.O.
Remarks:				
Information: We request your cooperation in filling this form, in order to keep out statistical data relevant to aircraft configuration up-to-date. The form should be filled in all its parts and sent to the above address or you can communicate the application also via Technical Bulletin Application Communication Section placed in Leonardo AW Customer Portal - MyCommunications Area. We thank you beforehand for the information given.				