31 Functional and Burn-in Test Jig Fabrication Specifications

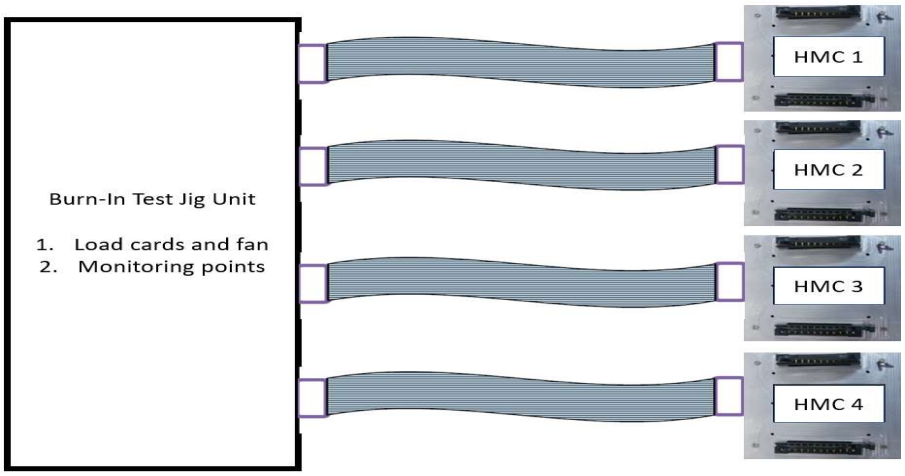
Specialized Functional and Burn–in jigs required for Screening of HMCs shall be realised / procured from ISRO approved vendors and evaluated prior to acceptance.

31.1 Functional Test Jig for 40W Triple Output DC DC Converter HMCs:

Functional Test Jig shall contain provision to test one HMC at a time. The test jig shall consist of socket assembly and test unit. Socket assembly shall consist of approved socket, supporting PCB, aluminium heat sink and D type connector for interfacing between HMC and test unit. The test jig shall cater to functional testing of HD4042T-HF.

31.2 Burn-In Test Jig for 40W Triple Output DC DC Converter HMCs

- Burn-in test jig should test four HMCs at a time. The test jig shall cater to Burn-In testing of HD4042T-HF.
- The jigs shall be used for conduct Burn in /ATC test for minimum of 4 HMCs at a time with external power supply. Dedicated test jigs shall be realised for Burn-in and ATC test.
- Test jig shall consist of Aluminum heat sink to mount HMC. Approved socket for I/O connections, polymide board and connector (Refer Images below). The required input signals are connected to corresponding inputs of the HMC through connector and PCB. During burn in test the load resistors are to be used and they shall be mounted on heat sink.



(a) Test jigs shall be realised as per guidelines "STATEMENT OF WORK TO FABRICATE FUNCTIONAL TEST/ BURN-IN TEST JIGS FOR TESTING HYBRID MICRO CIRCUITS & RC NETWORKS (DOC NO: INT: PMPD/SPES/HMC/GEN/13/REV-8)".

SOW40WJigRealisation.pdf

(b) Vendor shall generate detailed jig specification which shall include socket identification part number to suit to HMC package, mounting method with heat sink requirement, supporting PCB & connector for I/O connections from HMC to test jigs monitoring points, load resistors (if any), signal generation and harness details etc. which shall be approved by URSC prior to procurement.

(c) During phase of jig realization PCB layout design, Bill of materials used in realization of jigs, jig mechanical design & heat sink size shall be approved by URSC as specified in SOW document.

(d) One unit (Proto Test jig) shall be fabricated first and after evaluation and acceptance by URSC for the same, subsequent units shall be fabricated.

(e) Vendor shall plan to realize / procure jigs to meet the schedule as per RFP.

(f) The cost of these test jigs shall be separately billed and jigs shall be returned to URSC after the completion of all tests.

DOC NO: INT: PMPD/SPES/HMC/GEN/13/REV-8

STATEMENT OF WORK TO FABRICATE FUNCTIONAL TEST/ BURN-IN TEST JIGS FOR TESTING HYBRID MICRO CIRCUITS & RC NETWORKS

July 2019

HMC QUALITY CONTROL SECTION
COMPONENTS QUALITY CONTROL DIVISION
COMPONENTS MANAGEMENT GROUP
U R RAO SATELLITE CENTRE

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STATEMENT OF WORK TO REALIZE FUNCTIONAL TEST/ BURN-IN TEST JIGS FOR TESTING HYBRID MICRO CIRCUITS (RCNWs)

1.0. SCOPE: - This document gives the statement of work for realizing the Functional test jigs/ burn-in jigs used for testing and carrying out burn-in of flight Hybrid Micro Circuits (HMCs) & RCNWs.

2.0. INTRODUCTION: - As large number of HMCs/RCNWs are being used on board satellites, the need for fabricating more and more jigs also increased. This document gives the total work involved in realizing the jigs and the identification of responsibilities in detail. The definition of Functional Test Jig, Burn-in Jig and serialization of jigs are given in Appendix –1.

3.0. DESCRIPTION OF THE WORK: - The vendor shall be responsible for realization of Functional test/ burn-in jig as per the requirements spelt out in Appendix 2 and Appendix 3. After the fabrication and assembly, the jig shall be offered to HQCS for approval along with vendor's QC Inspection Report. The format for QC Inspection Report is given in Appendix-4. The fabricated and tested Functional test jig/ Burn-in jig shall be delivered to URSC, along with the associated documents. The documents shall contain the details as per the checklists provided in Appendix 5 and Appendix 6.

4.0. RESPONSIBILITY DEFINITION

4.1. RESPONSIBILITY OF URSC: -

- Description of HMC/RCNW to the vendor for the purpose of realising the document.
- To provide the approved Electrical Test Specifications (to realise Functional test jig). Also to provide the approved burn-in configuration, approved burn-in test specifications (to realise Burn -in test jig).
- To provide the Burn-in configuration of HMC/RCNW to Vendor.

To provide the requirements of powering, monitoring and measurement of Functional test jig / Burn-in test jig.

Respective Subsystem is required to approve the electrical design of test jig/Burn-In Jig to carry out the Functional test/Burn-In test of HMC/RCNW for their adequacy and accuracy to meet the test specifications.

To approve the bill of materials as per the formats given in Tables 4, 5 and 6 and check the certificate of conformance for all materials.

- To arrange training for two people from each vendor for 2, 3 days for general aspects of fabrication including conformal coating of burn-in boards. -- HQCS
- To provide necessary clarification as and when required.
- Check whether the QC Inspection report, documents are submitted along with the Jig for evaluation.
- To ensure that all the documentation in the suggested formats is supplied with the Jigs and is as per the requirements / specifications.

- The vendor shall test the jig for its complete specifications in the presence of concerned subsystem engineer & HQCS engineer. In case of burn-in jig it is mandatory to check all the slots with master HMC/RCNW.
- The subsystem and HQCS engineer shall accept the jig jointly.

4.2. RESPONSIBILITY OF VENDOR: -

- To provide the design for realising the Functional test jig as per specifications and to get the approval from subsystem. The mechanical design of the functional jig should be approved by both subsystem and HQCS.
- To provide the design for realising the burn-in test jig as per the burn-in configuration and burn-in test specifications and to get the approval from subsystem. The mechanical design of the burn-in jig should be approved by both subsystem and HQCS.
- To procure the required material as per specifications listed in Table-3 and use the material as per the requirements given in Table-1 and Table-2. To provide the Bill of Materials (BOM) for subsystem approval and provide the approved BOM in the document along with the deliverables.

- Vendor QC shall make sure that the approved design and correct values of components are only used for the fabrication of jigs.
- To carryout the fabrication and assembly work only by the trained and qualified operators. Only one unit shall be fabricated at first. The proto Jig shall be evaluated thoroughly by URSC team (Subsystem + HQCS) and one-week ambient burn-in should be performed on proto unit. After getting approval for proto Jig, the fabrication of production units must be initiated. At least one day ambient burn-in shall be performed on all production BIJs and the results of all BIJs shall be enclosed in all BOJ manuals.
- To prepare and submit the documents as per the checklists given in Appendix 4 & 5.
- To give the conformal coating to the burn-in board as per the guidelines given in Appendix-3.

5. FACILITY & PERSONNEL REQUIREMENTS FOR CARRYING OUT FUNCTIONAL/ BURN-IN JIG FABRICATION:

a) The facility shall have necessary features like

- Sufficient PWB Assy. area with ESD schemes
- PWB testing facility with all the required equipment.
- Fabrication tools -- as listed in document “QC Guidelines For Fabrication of Ground Support Equipment.
  Doc. No. URSC – 32-93-08-05-06.”
- Vendors shall identify the jobs that are subcontracted by them with all necessary details.

b) The vendor shall give details of technical manpower, availability of lab facilities and previous experience along with the proposal. The operators shall be well trained and must be qualified (at least two) by HQCS. The vendor shall employ personnel with a qualification of at least a diploma in Electronics for testing purposes.

6.0. WORKING MODALITY: - Vendor shall identify a senior employee as a focal point who shall interact with URSC for all related matters. Indentor shall be the focal point from URSC.

7.0. DELIVERABLES: -

1.Jig
2.Document
3.QC Inspection Report
4.Bill of Materials (in the specified formats) along with **Certificate of Conformance**
5.Warranty Certificate
6. i) Approved PCB Layouts of all PCBs, Gerber files for all layers like Component Marking, PTH marking, drilling details prints
ii) Approved PCB Film
iii) Unit Interconnection Details

The details mentioned in (6) above shall be submitted in hard copy and soft copy in DVD.

8.0. ACCEPTANCE CRITERIA: -

Vendor shall obtain the inspection and acceptance for the following details:

i) Inspection/ Audit by HQCS, URSC (Vendor shall provide internal QC Inspection Report)
ii) Electrical Functionality check
iii) Burn-In tests/Evaluation tests on jigs at the vendor site.
iv) Documentation + Fabrication Folder
v) Conformal Coating (in case of burn-in board)
vi) Serialization

In addition to the above the vendor shall obtain approvals as per the flowcharts given in Appendix-2 & 3. The fabrication folder shall consist of the measured values of all components (along with their ratings as per the format given in Table-7) and all rework/repair details.

The unit as a whole along with burn-in PCB, test unit and interface harness will be accepted after testing in detail at Vendor's premises and certified by indenter in the presence of concerned subsystem and HQCS engineers. Only after evaluating and accepting one burn-in jig, the remaining quantity (in purchase order) of burn-in jigs shall be fabricated.

9.0. REJECTION CRITERIA: -

The layout design or PCB or the unit as a whole shall be rejected if it does not confirm to the required specifications as provided in the indent. In case of any deviations the card or unit to be replaced free of cost by the vendor and replacement of unit/card should meet the specifications.

10.0. SECRECY: -

Vendor shall not disclose or give details of the specifications in any form to any one without the explicit permission from URSC. To this extent vendor has to execute a non-disclosure/secrecy agreement.

11.0. WARRANTY : -

All the items supplied to be warranted for a period of one year from the date of acceptance and any defective parts/systems are to be replaced free of cost during warranty period.

12.0. APPLICABLE DOCUMENTS: -

QC Guidelines For Fabrication of Ground Support Equipment
Doc. No. URSC – 32-93-08-05-06

13.0. Quotation should include following details:

a) Material Cost: Should include the split up for each item.
b) Fabrication Cost: Should include the split up for each activity.
c) Testing and Validation Charges.
d) Non Recurring Engineering Cost: Should include the split up for each activity.
e) Any other.

APPENDIX –1

Definition of Functional Test Jig: - It consists of signal generation, monitoring and load circuitry assembled in a box with a suitable (ZIF/Azimuth/Yamaichi) socket. At a time one HMC/RCNW can be tested for its functionality.

Definition of Burn- In Jig: - It consists of Burn-In Unit, Burn-In Board/s and Harnesses (with connectors on either side) to have the connectivity between Burn-In unit and Burn-In Boards.

Burn-In Unit: - It consists of signal generation circuitry, monitoring circuitry and load cards etc. assembled in a box. The front and or back panel of the box contain the connectors. In case of few circuits like relay drivers the signal generator circuitry and load circuitry are also stacked and separate units are made. Therefore, in such cases the Burn-In unit is divided into Signal Generation unit and Load unit.

Burn-In Board/s: - Usually jigs will have one or two burn-in boards. In very few circuits like relay drivers, the burn-in boards are stacked and are referred as stacked burn-in boards.

Serialization of Jigs: - The serial number shall be engraved on the Functional test jig, burn-in unit as well as on the burn-in boards as per the guidelines given below.

It is a 13 digit code for Functional test jig and Burn-in unit where as it is a 14-digit code for burn-in boards.

.

XXXXX XX XXX XXX/X

First 5 digits specify the **HMC/RCNW** type. Eg: **222DM**

Digits 6 & 7 specify the **year of accepting** the jig. Eg: **03**

Digits 8,9 & 10 specify the **type of jig**.

If it is Functional test jig, it shall be mentioned as **FTJ**

If it is burn-in jig, it shall be mentioned as **BIJ**

Digits 11, 12 & 13 specify the **serial number of the jig**.
Eg: **001** or **090**.
Digit 14 specifies the **serial number of the board** attached to that particular jig. Eg: **1, 2 or n (n is the no. of boards in a stack)**.

Eg. Of 13 digit code: **222DM 03 FTJ 005.**
Eg. Of 14 digit code: **222DM 03 BIJ 005/2**

The bunch of harnesses must be labelled with serial No. of the Burn-In Jig.

APPENDIX –2

REQUIREMENT SPECIFICATION FOR REALISING FUNCTIONAL TEST JIG

Sequence of operations for realising the Functional Test Jig:

1. Vendor shall get the complete requirements like HMC/RCNW circuit description, HMC/RCNW pin configuration, Functional test specifications from subsystem for making the Functional test jig.

2. Vendor shall make the design for realising the Functional test jig as per the test specifications and get the approval from subsystem engineer (when the design is done by vendor). The design includes generation of input signals, clock and or address signals, and monitoring and load circuitry.

3. Vendor shall procure the material as per the specifications given in Table-3. Make sure that only the material specified in Table-1 is used. Vendor shall submit the bill of materials to the subsystem. The subsystem shall ensure that the materials procured are of required quality and are as per the subsystem-approved design (in step2).

4. Vendor shall make the layout design as per the document “QC Guidelines For Fabrication of Ground Support Equipment.
Doc. No. URSC – 32-93-08-05-06”. The subsystem shall mention the specific layout requirements (if any) in the indent.

5. Vendor shall submit the layout design for their internal QC approval. Vendor’s internal QC shall ensure that this design is as per the subsystem-approved design (in step2).

6. Subsystem shall make sure that the types and precise values of components specified are only used. Make sure that mechanical guide lines as given in Table-2 and as per the document “QC Guidelines For Fabrication of Ground Support Equipment. Doc. No. URSC – 32-93-08-05-06” are followed.

7. The Jig shall be inspected by the internal QC of the vendor and generate a report as per the format given in Appendix-4. Vendors shall obtain the approval of HQCS for fabrication completeness.

8. The Jig shall be tested for the test specifications without HMC/RCNW. After making sure that all signals are as specified, the Jig shall be tested with a master HMC/RCNW.

9. Vendor shall make the document as per the checklists given in Appendix 3 and 4.

10. With approved QC Inspection Report, the Jig shall be offered to URSC along with the associated document and with bill of materials for inspection and testing. HQCS and subsystem are jointly responsible for accepting the Jig".

11. All the tests shall be carried out at Vendor's site. Acceptance of Jig shall be done at URSC.

12. Guidelines for Handling and Transportation of jigs are given in document "Procedure For Realisation of New Functional and Burn-In Test Jigs. Doc No: PMPD/SPES/HMC/GEN/06 Rev-1".

APPENDIX –3

REQUIREMENT SPECIFICATION FOR REALISING BURN-IN TEST JIG

Sequence of operations in realising the Burn-In Jig:

1. Vendor shall get the complete requirements like the HMC/RCNW circuit description, HMC/RCNW pin configuration, Burn-in test specifications from subsystem for making the burn-in test jig.

2. Vendor shall make the design for realising the burn-in test jig as per the burn-in configuration and test specifications. The design includes generation of input signals, clock and or address signals, and monitoring circuitry and load circuitry. Vendor shall get the design approved from subsystem engineer.

3. Vendor shall procure the material as per the specifications given in Table-3. Make sure that only the material specified in Table-1 is used. Vendor shall submit the bill of materials to the subsystem. The subsystem shall ensure that the materials procured of required quality and are as per the subsystem-approved design (in step2).

4. Vendor shall make the layout design as per the document “QC Guidelines For Fabrication of Ground Support Equipment”
Doc. No. URSC – 32-93-08-05-06. The test pattern drawing for making test coupon (along with the burn-in PCB) is enclosed in figure 1. The burn-in card shall be realized only in double-sided PCB. HQCS shall provide the spool file for test coupon to the vendor. Subsystem shall mention the specific layout requirements (if any) in the indent.

5. Vendor shall submit the layout design for their internal QC approval. Vendor’s internal QC shall ensure that this design is as per the subsystem-approved design (in step2).

6. Vendor shall fabricate the burn-in jig. Subsystem shall make sure that the types and precise values of components specified are only used. Make sure

that mechanical guide lines as given in Table-2 and as per the document “QC Guidelines For Fabrication of Ground Support Equipment. Doc. No. URSC – 32-93-08-05-06.”

7.The Jig shall be inspected by the internal QC of the vendor and generate a report as per the format given in Appendix-4. Vendors shall obtain the approval of HQCS for fabrication completeness.

8.The Jig shall be tested for the test specifications without HMC/RCNW. After making sure that all signals are as specified, all slots of the burn-in board shall be tested with master HMC/RCNW.

9. Vendor shall make the document as per the checklists given in Appendix 3 & 4.

11. The connectors of harnesses of burn-in jig must be potted (potting material- RTV3145) both sides. Before potting ensure that one to one electrical connections are made properly.

12. All the tests shall be carried out at Vendor’s site. Acceptance of Jig shall be done at URSC.

13. With approved QC Inspection Report, the Jig shall be offered to URSC along with the associated document and with bill of materials for inspection and testing. HQCS and subsystem are jointly responsible for accepting the jig.

14. Guidelines for Handling and Transportation of jigs are given in document “Procedure For Realisation of New Functional and Burn-In Test Jigs. Doc No: PMPD/SPES/HMC/GEN/06 Rev-1”.

UR RAO SATELLITE CENTRE
COMPONENTS QUALITY CONTROL DIVISION
HMC QUALITY CONTROL SECTION

INSPECTION REPORT

REF. NO. DATE:

PRODUCT: - BURN-IN BOARD/ BURN-IN JIG/ FUNCTIONAL TEST JIG/ CONNECTOR HARNESS

NOMENCLATURE:
SERIAL NUMBER:

SL. NO.	OPERATIONS	INSPECTION STATUS	REWORKS IF ANY	APPROVED	REMARKS
1	PCB LAYOUT				
2	PCB MASTER FILM				
3	BARE PCB				
4	COMPONENTS MOUNTING				
5	COMPONENTS SOLDERING				
6	HARNESS ROUTING				
7	HARNESS WIRE SOLDERING				
8	LACING				
9	CLEANING				
10	MECHANICAL ASSEMBLY				
11	DOCUMENT				
12	OTHERS				

THIS PRODUCT IS CHECKED AND CLEARED FOR INSPECTION TO URSC

APPROVED BY VENDOR QC

APPENDIX -4

CHECKLIST FOR FUNCTIONAL TEST JIG DOCUMENT

FUNCTIONAL TEST JIG DOCUMENT SHALL CONTAIN THE FOLLOWING DETAILS: -

SL. NO.	NAME OF THE DETAIL	PAGE NO.	REMARKS
1	INTRODUCTION		
2	DESCRIPTION OF HMC/RCNW		
3	HMC/RCNW PIN CONFIGURATION -MECHANICAL DIMENSIONS		
4	HMC/RCNW CIRCUIT DIAGRAM *It will be given to vendor @ URSC for inclusion in document.		
5	ELECTRICAL TEST SPECIFICATIONS		
6	ELECTRICAL TEST PROCEDURE		
7	FABRICATION DETAILS OF THE FOLLOWING A) FRONT PANEL B) BACK PANEL C) TOP PANEL		
8	INTERNAL VIEW OF THE JIG & BLOCK DIAGRAM OF TOTAL FTJ		
9	TOTAL CIRCUIT DIAGRAM OF FTJ (INCLUDING SIGNAL GENERATION & LOAD CIRCUITRY)		
10	INDIVIDUAL PCB CIRCUIT DIAGRAM WITH COMPONENT DETAILS		
11	LAYOUT DIAGRAMS OF INDIVIDUAL PCBs		
12	INTERNAL CONNECTION DETAILS BETWEEN PCBs		
13	INTERNAL CONNECTION DETAILS BETWEEN PCBs AND DIFFERENT (FRONT, BACK, TOP ETC.) PANELS		
14	BILL OF MATERIALS, **TEST RESULTS (along with all Input/Output waveforms) OF ONE HMC**/RCNW & FABRICATION FOLDER		
15	WARRANTY CERTIFICATE		

CHECKLIST FOR BURN IN TEST JIG DOCUMENT

BURN IN TEST JIGDOCUMENT SHALL CONTAIN THE FOLLOWING DETAILS: -

Sl.No.	NAME OF THE DETAIL	PAGE NO.	REMARKS
1	INTRODUCTION		
2	DESCRIPTION OF HMC /RCNW		
3	HMC/RCNW PIN CONFIGURATION - -MECHANICAL DIMENSIONS		
4	HMC/RCNW CIRCUIT DIAGRAM *It will be given to vendor @ URSC for inclusion in document.		
5	BURN IN TEST SPECIFICATIONS		
6	BURN IN TEST PROCEDURE		
7	BURN IN CONFIGURATION DETAILS EACH HMC/RCNW PIN – CONNECTION DETAILS		
8	BLOCK SCHEMATIC OF TOTAL BURN-IN SYSTEM & TOTAL CIRCUIT DIAGRAM OF BIJ (INCLUDING SIGNAL GENERATION & LOAD CIRCUITRY)		
9	GENERATOR CARD LAYOUT, CIRCUIT AND COMPONENT DETAILS		
10	BURN IN CARD LAYOUT, CIRCUIT AND COMPONENT DETAILS		
11	DISPLAY OR OUTPUT MONITORING PART – FRONT PANEL AND/OR TOP PANEL DETAILS		
12	HARNESS AND CONNECTOR DETAILS		
13	INTER CONNECTION DETAILS OF THE FOLLOWING A) BETWEEN BURN IN CARD AND GENERATOR CARD B) BETWEEN BURN IN CARD AND LOAD CARD C) BETWEEN BURN IN CARD AND DISPLAY/ OUTPUT MONITORING CARD.		
14	BILL OF MATERIALS, **ONE WEEK BURN-IN TEST RESULTS (along with all Input/Output waveforms) & FABRICATION FOLDER**		
15	WARRANTY CERTIFICATE		

APPENDIX –6

WARRANTY CERTIFICATE

Name of the Vendor:

Name of the Indentor / subsystem:

Serial Number of the Jig:

Date of acceptance of Jig:

Warranty valid up to:

During warranty period, any defective parts or systems will be replaced free of cost.

(Vendor’s signature)

Note: - Warranty Certificate to be given by the vendor on vendor’s company letterhead.

APPENDIX – 7

TABLE –1. MATERIAL REQUIREMENTS

SL. NO	MATERIALS REQUIRED	FUNCTIO-NAL TEST JIG	BURN-IN JIG	REMARKS
1	PCB	Glass Epoxy Laminate	Polymide Laminate	Burn-In board should withstand continuous operation of 125^0C. PCB specifications are given separately.
2	Wires	PTFE (Teflon)	PTFE (Teflon)	Clear harness length should be minimum 3 meters for Burn-in jig. Wire Specifications are given separately.
3	Connector	FR022-grade	FR022-grade	Detailed connector specifications are given separately.
4	ZIF Socket	3M	3M	Part No. will be provided in Jig specifications
	Socket	Azimuth	Azimuth	Part No. will be provided in Jig specifications
	Socket	Yamaichi	Yamaichi	It's lid is to be milled to place RCNW without damage
5	Electronic Components	Industrial-grade	Mil-grade	Correct value & tolerance shall be used. Refer Appendix - 12
6	Sleeve	Shrinkable	Shrinkable	Recham Brand
7	Lacing Thread	Wax coated	Wax coated	Alpha Brand
8	Conformal coating	--	Polyurethane	Vendor need to get the material.
9	Solder Lead	5 core, SN63PB37	5 core, SN63PB37	Use 21 gauge RMA flux, with solder. **Flux shall not be used while doing soldering on Burn-In board.**

TABLE– 2 MECHANICAL SPECIFICATIONS.

SL. NO.	NAME OF MATERIAL	SPECIFICATIONS
1.	Sheet Metal	Thickness 1.2 to 1.5mm including powder coating. Box to be Powder coated
2.	Mechanical Design of the box	CAD package to be used
3.	Screws and Bolts	Stainless Steel

4.	Marking	Screen printable
5.	Size of the Box	Given in Appendix-9
6.	Color of the Box	Grey/Blue

Burn-in board Size: Maximum 1' X 1'

TABLE–3 PROCUREMENT SPECIFICATIONS

SL. NO	NAME OF MATERIAL	SPECIFICATIONS
1	PCB	Gloss Epoxy Laminate FR4/ 135^0 C T_g C1/C1; size – 18" X 24" IPC 4101 complaint, 62 mil thickness ***Vendors:Micropack***, ***Bangalore.***
		Polymide Laminate – Details are given in Appendix-8.
2	Wires	PTFE (Teflon) – 24/EE Wherever the requirement changes, the gauge is to be specified in the indent. For Communication Jigs, shielded cable shall be used in consultation with Subsystem, wherever required. Details are given in Appendix-8.
3	Connectors	Details are given in Appendix-8.
4	ZIF Socket	3M brand Details are given in Appendix-8.
	Yamaichi socket	Part No: IC51-0444-400
5	Electronic Components	Mil- grade; Value & tolerance shall be correct. The brand names are given in Table-8.
6	Sleeve	Shrinkable sleeve from RECHAM
7	Lacing Thread	Wax coated lacing thread from ***ALPHA***
8	Solder Lead	5 core, SN63PB37 with 21 gauge RMA flux.

APPENDIX –8

SPECIFICATIONS OF CRITICAL PARTS AND MATERIALS

1. ZIF SOCKETS

MAKE: 3M

Distributor: M/s Pouyet Communication India Pvt Ltd,
138 Residency Road, Raheja Paramount
Bangalore-560 025.

Size of ZIF socket	No.of pins	3M Part No.
1 “X 1/2”	24	224A –6313-OUA-1902
1 “X 1/2”	34	234A –6313-OUA-1902
1 “X 1”	24	224B –6313-OUA-1902
1 “X 1”	44	244A –6313-OUA-1902
1 “X 11/2”	34	234–6317-OUA-1902
1 “X 11/2”	54	254–6317-OUA-1902

B. Yamaichi socket for 44 pin Jlead RCNW part no: Part No: IC51-0444-400
Note: It’s lid is to be milled to place RCNW without damage

2.POLYAMIDE BOARD

1) Manufacturer: MICRO PACK,
Plot.No.16, Jigani Industrial Area
Bangalore-562106
2) Material: NELCO make N 7000 –1
3) Board Size: 300mmx300mm
4) Type: DSB with PTH
5) Copper thickness: 70 microns

3.CONNECTORS

1) Make: Amphenol

Distributors: Amphenol Interconnect India Pvt Ltd
(Fromerly Amphetronix Pvt Ltd)
4931 High point IV, 45 Palace Road
Bangalore-560001

Connector Part Numbers – Amphenol

Sl No	Type	Description	Part number
1.	Standard Density Crimpable Connectors	9-pin plug	4110-2-1-9P-GNMB-GND
2.		15-pin plug	4110-2-1-15P-GNMB-GND
3.		25-pin plug	4110-2-1-25P-GNMB-GND
4.		37-pin plug	4110-2-1-37P-GNMB-GND
5.		50-pin plug	4110-2-1-50P-GNMB-GND
6.		9-pin socket	4110-2-1-9S-GNMB-GND
7.		15-pin socket	4110-2-1-15S-GNMB-GND
8.		25-pin socket	4110-2-1-25S-GNMB-GND
9.		37-pin socket	4110-2-1-37S-GNMB-GND
10.		50-pin socket	4110-2-1-50S-GNMB-GND
11.	High density crimpable connector	78-pin plug	4110-2-2-78P-GNMB-GND
12.		78-pin socket	4110-2-2-78S-GNMB-GND
13.	Standard density contacts	Pin contact	4110-5-1-P-GNMB-GND
14.		Socket contact	4110-5-1-S-GNMB-GND
15.	High density contacts	Pin contact	4110-5-2-P-GNMB-GND
		Socket contact	4110-5-2-S-GNMB-GND
16.	Standard Density 90 degree bent PCB mountable Connectors	9-pin plug	4110-1-1-9P-4-GNMB-GND
17.		15-pin plug	4110-1-1-15P-4-GNMB-GND
18.		25-pin plug	4110-1-1-25P-4-GNMB-GND
19.		37-pin plug	4110-1-1-37P-4-GNMB-GND
20.		50-pin plug	4110-1-1-50P-4-GNMB-GND
21.		9-pin socket	4110-1-1-9S-4-GNMB-GND
22.		15-pin socket	4110-1-1-15S-4-GNMB-GND
23.		25-pin socket	4110-1-1-25S-4-GNMB-GND
24.		37-pin socket	4110-1-1-37S-4-GNMB-GND
25.		50-pin socket	4110-1-1-50S-4-GNMB-GND
26.	High Density 90 degree bent PCB Mountable Connectors	78 –pin plug	4110-5-2-78P-GNMB-GND
27.		78-pin socket	4110-5-2-78S-GNMB-GND

4. SHIELDED CABLES:

Manufacturer's Address: Sanghvi Aerospace (p) Ltd.,
B/h Lalit Warehouse, Narol-Sarkhej Highway,
Narol, Ahmedabad – 382405, India

Mil Part No.	Sanghvi Part No.
Hybrid cable single core (M27500 26WC1S24)	75981A-26-1S24

APPENDIX – 9

Mechanical BOX details of FTJ and BIJ

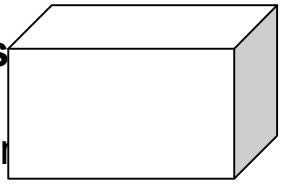
Shape of Box: -

1) Rectangular Box (only 2-piece design) with following dimensions:

From 12”(l) x 6”(w) x 6”(h) to 15”(l) x 9”(w) x 6”(h)

or

From 12” (l) x 9”(w) x 4”(h) to 15”(l) x 15”(w) x 9”(h)



Weight of Box: - Not more than **5kgs**

Thickness of the sheet metal (includi
coating) should be **1.2 mm to 1.5 mm.**

BILL OF MATERIALS – FTJ

Sl. No.	Component Type	Component ID	Quantity	Quality Level	Component Part No.	Value with voltage/ Wattage specification	Tolerance	Manufacturer

Prepared By:

(Vendor)

Approved by:

(Subsystem, URSC)

Table -4

BILL OF MATERIALS – BURN IN UNIT

Sl. No.	Component Type	Component ID	Quantity	Quality Level	Component Part No.	Value with voltage/ Wattage specification	Tolerance	Manufacturer

Prepared By:

(Vendor)

Approved by:

(Subsystem, URSC)

Table -5

BILL OF MATERIALS – BURN IN BOARD

Sl. No.	Component Type	Component ID	Quantity	Quality Level	Component Part No.	Value with voltage/ Wattage specification	Tolerance	Manufacturer

Prepared By:

(Vendor)

Approved by:

(Subsystem, URSC)

Table -6

MEASURED VALUES OF COMPONENTS WITH VOLTAGE/WATTAGE RATINGS

Sl. No.	Component ID	Measured Value	Voltage/Wattage rating	Remarks (Tolerance details etc.)

Prepared By:
(Vendor)

Reviewed By:
(QC Inspector)

Approved by:
(Subsystem, URSC)

TABLE-7

FUNCTIONAL TEST JIG APPROVAL FORMAT

1. Serial Number of FTJ:
2. Deliverables:

    a) Jig
    b) Document
    c) QC Inspection Report
    d) Approved Bill of Materials (as per the format given by HQCS)
    e) Warranty Certificate
    f) i) Approved PCB layouts of all PCBs, Spool files, Component Marking, PTH marking, Drilling details prints
    ii) Approved PCB film
    iii) Unit Interconnection Details

    The details mentioned in (f) above shall be submitted in hard copy in duplicate and soft copy in DVD form.

    g) Fabrication Folder & One HMC/RCNW test results
3. Electrical Functionality: Functioning in all respects: Yes/ No

Approved by: -
Subsystem Engineer with Date:
HQCS Engineer with Date:

APPENDIX-10

BURN-IN JIG APPROVAL FORMAT

1. Serial Number of Burn-In Unit
   Serial Number of Burn-In Boards
2. Deliverables:
   a. Jig (Burn-In unit, Burn-In boards, Harnesses – specify no.of boards and harnesses)
   b. Document
   c. QC Inspection Report
   d. Approved Bill of Materials (as per the format given by HQCS)
   e. Warranty Certificate
   f. i) Approved PCB layouts of all PCBs, Spool files, Component Marking, PTH marking, Drilling details prints
      ii) Approved PCB film
      iii) Burn-In Jig interconnection details (as per the format given in SOW document)

   The details mentioned in (f) above shall be submitted in hard copy in duplicate and soft copy in CD form.

   g) Fabrication Folder & One week burn-in test results with waveforms.
4. Electrical Functionality: Functioning in all respects: Yes/ No
5. Conformal Coating done: Yes/ No

Accepted By: -

Subsystem Engineer with Date:

HQCS Engineer with Date:

APPENDIX-11

Appendix –12

Component type	Quality level	Manufacturer
Resistor	Industrial	Watts, Keltron
Resistor	Mil grade	
Capacitor	Industrial	Philips, Keltron
Capacitor	Mil grade	Vishay
IC	Industrial	Philips/NS, FAIRCHILD
IC	Mil grade	
ZIF		3M
LED	Industrial	Watts, Liton
Banana Socket	Industrial	Elcom
PB Socket	Industrial	Elcom
Switch	Industrial	Elcom
Wires	Industrial- Teflon	Tanya Enterprises-Meerut
Shielded Cable		
Connectors		Amphenol
Toggle Switch	Industrial	Elcom
Terminal posts	Industrial	Elcom
Sockets	Industrial	Elcom
Binding post	Industrial	Elcom
Binding post	Mil grade	