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No : 1405/Directives/DGAQA/Tech Cord

10 Feb, 2015

To,

DDG(SZ)
DDG(N&CZ)
DDG(Nasik)
DDG(Koraput)

Release of AQA Directive 02/01/2015 on
"Guidelines for Qualification Test Procedure & Acceptance Test Procedure of Ground Equipments / Jigs for Airborne Items (Electrical & Electronic)"

It has been decided by this Head Quarter to issue the Aeronautical Quality Assurance Directives (AQAD) on the subjects essential for Quality Assurance (QA) in Military Aviation. The aim of issuing such AQA Directives is to have continual improvements in Quality Management System in Indian Military aviation as well as to set clear-cut guidelines/ requirements which need to be adhered / ensured during discharging the respective duties of stake holders.

2. Accordingly, in the series of issuing such AQADs, second AQA Directive is hereby issued which is to be implemented with immediate effects. This AQAD will supersede the document "DGAQA Guidelines for Qualification Test Procedure & Acceptance Test Procedure of Ground Equipment/Test Jigs for Airborne Items (Electrical & Electronic)" Revision No. 01 Dated 30th June 2011.

3. It is suggested to give wide publicity of the document within our organization as well as all stake holders for awareness & compliance. To facilitate this, a soft copy of the document is uploaded on DGAQA website and can be accessed from website www.dgaeroqa.gov.in through Technical (Main Menu) and Role & Functions (Sub Menu).

(A Dhanabalan)
Addl. Director General
For Director General, AQA

Encl: As stated

Copy:
All Field Establishment: For kind information & needful action as stated in text above.

Internal Copy:
1. PPS to DG, AQA: For kind information please.
2. All Technical Directorates: For kind information & needful action as stated in the text above.
At HQrs
3. IT Section: With a request to upload the document on DGAQA website.

GUIDELINES FOR QUALIFICATION TEST PROCEDURE & ACCEPTANCE TEST PROCEDURE OF GROUND EQUIPMENTS/TEST EQUIPMENTS (JIGS) FOR AIRBORNE ITEMS (ELECTRICAL & ELECTRONIC)

(ISSUE 02 –January 2015)

Directorate General of
Aeronautical Quality Assurance,
Ministry of Defence, `H' Block,
DHQ Post Office, New Delhi - 110011

C O N T E N T S

1. SCOPE

1.1 Most of the Qualification and Acceptance procedures being followed by various agencies during Development, Qualification and Acceptance of Airborne / Ground equipment have been adequately defined in documents like DDPMAS, DDPIL, JSS, JSG, MIL standards etc. These procedures envisage a definite role for different organizations with regard to Design, Qualification, Manufacture, Clearance and Acceptance of Electronic / Electrical equipments. However a need was felt to form a single document of self explanatory nature for the Guidelines for Qualification & Acceptance of ground equipments / test equipments (Jigs) for airborne items (Electrical & Electronic)

1.2 These guidelines describe the procedures and conditions for carrying out the qualification/ acceptance testing of ground equipment/ test equipments (Jigs) for airborne items (Electrical & Electronic). This document is open to changes / modifications on as and when necessary basis, due to rapidly changing technologies in the industry and customer requirements.

1.3 Suggestions, if any, may please be forwarded to:

Director General,
Aeronautical Quality Assurance,
Ministry of Defence, `H' Block,
DHQ Post Office, New Delhi-110 011

2. OBJECTIVE

2.1 It is necessary to ensure that the equipment conforms to the QRs/ Specifications as per the Supply Order/ Contract/ Mandatory requirements of Ministry of Defence during Acceptance Testing. This document describes Planning, Test Activity, Documentation andGuidelines for conducting Qualification Testing/ Acceptance Test Procedures.

2.2 The objective of Qualification & Acceptance Testing is to ascertain the system meeting the desired specifications, thereby mitigating the risk of defects or other inadequacies throughout the operational life of Project / Equipment. The intention of this guideline is set uniform procedure, based on the most professional yet pragmatic approach. This guideline should however be read in conjunction with General requirements for Electrical & Electronic Test equipment (JSS 6625 -01).

3. INTRODUCTION

3.1 Earlier version of subject guidelines was issued vide revision 01 dated 30-06-2011 and based on experience gained & feedback received from field establishments, the current issue has been refined to make the document more useful and worthiness.

3.2 Since the time and resources allocated to acceptance testing are often limited, therefore the procedure needs to be efficient, repeatable and authoritative. This section details the recommended Qualification Test / Acceptance Test Procedures, which consist of the following three stages:

3.3 Planning: Planning identifies the aspects of the equipment to be tested, the level of manning required to operate the Test stations and the anticipated duration of testing. Often a simple approach is taken, where testing of all Functionality related to the equipment is proposed. QA agency & the Vendor must agree on data, including Test equipment types and the location of equipment, including data classification and compatibility, must also be considered.

3.4 Given that the equipment under acceptance shares connectivity with other components of the main stream, it is desirable to perform simulation tests following preliminary acceptance of the stand-alone equipment. Otherwise, the results of the testing may be influenced by defects present in the stand-alone equipment.

3.5 Test Activity: The test activity occurs at the Testing facility and often spans several days, depending on the amount of testing proposed in the planning stage. The black box testing methodology, which evaluates the functionality or performance of the system irrespective of internal implementation details, is sometimes employed. The functional requirements are examined, by stimulating the black box with input actions and witnessing the resulting output.

3.6 The test case is a fundamental concept in testing, which identifies the expected output from a specific input. A case is considered to pass if the output witnessed during the test execution matches the expected output, or is within the permitted tolerance range.

3.7 Documentation: Following a test activity, a document shall be produced that details the results of testing. The report can be styled as a formal report that introduces the equipment and describes the outcomes of the test activity.

3.8 The result of each test case should be highlighted by severity. Where a test case has failed, the potential impact on its implications should be explored, and the input action and witnessed output noted, to aid the supplier in resolving the fault. Ultimately the report should indicate whether the

equipment is compliant, and if it is not compliant, make recommendations for change. If significant faults are identified, the testing activity should be repeated to ensure that the supplier makes appropriate corrections. Observations noted can be categorized into the following:

Fault: Has potential to prevent interoperability with another equipment / LRU. Resolution is advised.

Issue: Does not comply with the standard, or lacks some functionality. However this is unlikely to prevent interoperability with another equipment / LRU. Resolution is desirable.

Action: The test data was insufficient to draw a firm conclusion. Further investigation is advised.

3.8 Review of Test Equipment: Test equipment is necessary to conduct acceptance testing, as the inputs/triggers/signals cannot be generated by hand. Test equipment falls into three broad categories: Loggers, Analyzers, and Generators. Loggers facilitate the testing process, by recording network data to disk and/or replaying the data back to the equipment. Instrumentation tools convert the output data into human interpretable form, and are necessary for analysis. Generators enable the user to easily create inputs and are necessary for testing.

3.9 It is important that the testing equipment is itself compliant to Standards, however this leads to the paradox of what equipment should be used to test the test equipment. It is therefore desirable to use equipment developed under good engineering practices (which can be inferred from the product's history, quality and accompanied documentation), and from different vendors, to ensure that testing is not performed solely against one interpretation of the equipment standards.

PART- I

4. QUALIFICATION TEST PROCEDURE

4.1 The following details shall be obtained and studied before carrying out Qualification Tests:

(i) RMS Order / Indent / Contract/ Supply Order, placed by Service Headquarters.
(ii) Technical Specifications as per 4.3.
(iii) Technical manual, giving detailed description of the equipment (If available).
(iv) Drawings.
(v) Bill of Materials (including MDI with issue number).
(vi) Software Verification.
(vii) Calibration Status of the Test and Measurement equipment.
(viii) Procedures for Integration Tests /Compatibility Tests/Aircraftchecks.
(ix) User Manual, if available.
(x) Environmental Tests, as specified in Technical Specifications and as per JSS 6625 along with JSS 55555.
(xi) Functional / Electrical test procedure of the Test Equipment including 4.3 (iii)
(xii) EMI / EMC test, as specified in Technical Specifications and in MIL 461 / JSG 261 & JSG 262.
(xiii) Performance to be tested/monitored during Environmental and EMI / EMC tests.
(xiv) Technical Specifications of the main equipment to be tested by the subject test equipment.
(xv) Compatibility checks (with main equipment to be tested by subject Equipment / Aircraft Interface)

4.2 RMS Order/Indent/Contract/Supply Order: The following should be ascertained for correctness and validity:

(i) Inspection Agency
(ii) Delivery Date
(iii) Item Part No./DS Cat Part No. & Quantity
(iv) Technical Specifications
(v) Requirement of Technical Manuals
(vi) Carried spares, etc.
(vii) Supplier reference
(viii) Type of Components (MIL/ QML/ COTS/ Industrial)
(ix) Warranty and Maintenance philosophy.

4.3 Technical Specification (Applicable for whole document): In Technical Specification, following should be checked:

(i) Equivalency of specifications in case of indigenous equipment with that of the original equipment.

(ii) All the details including the tolerances & limits for input parameter (s) of the test equipment (i.e. output (s) of the main equipment to be tested by the subject test equipment) and the details of all the output(s) / display(s)/ decision(s) preciously expected from the test equipment corresponding to its above input(s) along with other desired output(s) if any, shall be specified.

(iii) The detailed specifications mentioned at (ii) above shall be accurately derived from the specifications of the main equipment to be tested by the subject test equipment and shall be used to test the test equipment in the standalone mode without connecting to the main equipment. The generic standard /customized test equipments may be used for this standalone testing.

(iv) Inclusion of additional parameters/ design features, if envisaged, and if agreed by the User and Supplier.

(Note: Specifications of Test Rigs of airborne items are to be approved by CEMILAC, as explained in DDPMAS-2002(Section 3, Chap 1 Para 55). For Ground equipment and other Test equipment, specifications of similar equipment be studied and taken into consideration for approval by DGAQA. If the Technical Specifications are not as per the relevant standards or are not clearly specified including the requirement of Para 4.3 above, the same may be taken up for amendment/ incorporation of the desired/ correct specifications with the competent agency.)

4.4 Technical Manual: It shall contain:-

(i) Description of equipment/ test rig
(ii) Introduction
(iii) Block diagram description
(iv) GA/ Schematic diagrams and description
(v) Cautions, Precautions and Warnings
(vi) PCB drawings
(vii) Bill of Material
(viii) Maintenance procedures
(ix) Repair & Troubleshooting procedures

(Note: Technical manual to be prepared in accordance with JSG-0251)

4.5 Drawings: The following Authentic & Approved Drawings should be provided by the Design Agency. The Inspecting Officer should verify that the Drawing has been duly standardized:

(i) Main assembly/ Equipment drawing
(ii) Sub- assembly/ PCB drawings
(iii) Mechanical drawings

(iv) System Layout
(v) Wiring details/ drawings
(vi) Schematic drawings
(vii) Inter connection detail (ICD) with other LRUs

4.6 Bill of Material (BOM)/ Standard of Preparation (SOP): Bill of material shall have the following details in respect of each component/module:

(i) Description
(ii) Part Number/ Type number
(iii) Master Drawing Index (MDI)
(iv) PCB layout (both sides) & including component location and other feasible details for circuit reference
(v) Quantity
(vi) Supplier/ Manufacturer (Approval Status)
(vii) Approval status of components (MIL/QML/COTS/LCSO). It should be ensured that Non MIL/Non QML components/Modules shall be screened as per JSS 50115/JSG 0667.
(viii) Alternate sources if any

(Note: Bill of Material should be prepared by the appropriate Authority in the Design Agency and approved by DGAQA. The BOM shall be given a document no, issue no & date. The Inspecting Officer should verify that the BOM has been duly standardized).

4.6.1 Physical Inspection of the items should incorporate the following aspects (As per JSS 6625-01):

a) Safety features like Personnel safety, Grounding, Thermal hazards, Equipment safety, Electrical safety, etc.,
b) Good manufacturing practices in respect of Components, Parts, Connectors and other Materials.
c) Design and Construction should be as per class, performance, usage and other requirements mentioned in the detailed specifications of the equipment.

4.7 Software Verification: It shall contain the following:

(i) Software Requirement Specification (SRS)
(ii) Software Design Documents (SDD)
(iii) Software Test Plan (STP)
(iv) Software Test Design (STD)
(v) Software Test Report (STR)
(vi) Version Definition Document (VDD): It shall contain:
  a) CSCI (Computer Software Configuration Items)
  b) Software Version Number.
  c) File size or date of completion.

d) Check sum details.

Software should be cleared by IV&V team. The team should have independent and autonomous status (Preferably not under the control of the Designer).

(Note: Role of DGAQA in acceptance/testing of software Test Jigs of Airborne items shall be governed by DDPMAS-2002 Vol-II for Software Development & Certification)

4.8 Calibration Status: Following Calibration details (with maintained validity) of the Test and Measurement equipment should be ascertained before carrying out the Testing activity:

(i) Date of calibration.
(ii) Due date for calibration.
(iii) Signature of authorized personnel on the tag.
(iv) Calibration chart, mentioning periodicity and other details.
(v) Calibration Traceability to National/International Standards.

4.9 Integration Tests/ Compatibility Tests/ Aircraft checks and procedures: The following should be forwarded to QA authority by the manufacturer:

(i) Test procedure for Integration tests
(ii) Test procedure for Aircraft checks
(iii) Built-in-test/ Self test procedures
(iv) Black box testing procedure, if required

4.10 User Manual:User Manual shall contain:

(i) Unpacking and Installation Procedures
(ii) Detailed Operation procedures
(iii) Brief description with block diagram of Main & Sub- assemblies
(iv) Cautions, Precautions and Warnings
(v) Layout diagram
(vi) Maintenance procedures
(vii) Trouble shooting procedures with flow charts/ Fault Diagnosis chart, mentioning detection and remedial guidelines for failure monitoring.

(Note: Document preparation should be as per JSG-0251)

4.11 Environmental Tests: The following environmental tests have been recommended

based on the JSS 6625 along with JSS 55555 standards. Sequence of the Tests should be as per the JSS 55555.

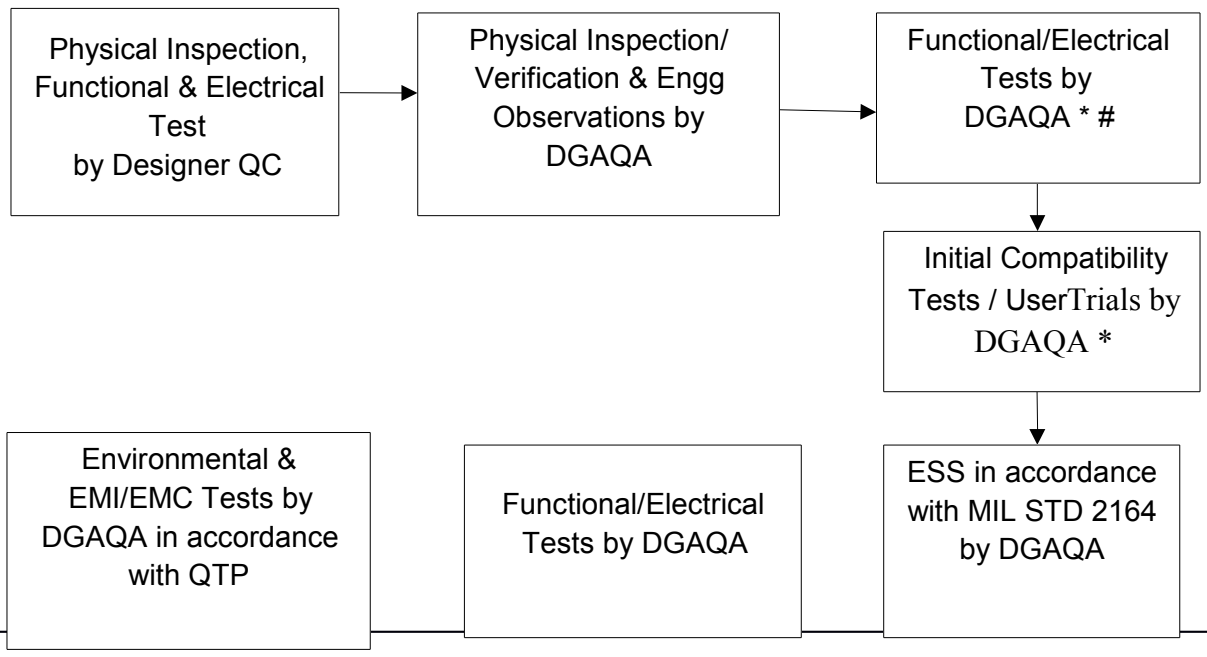
4.11.1 Recommended Environmental Tests for Qualification Testing as per JSS 55555

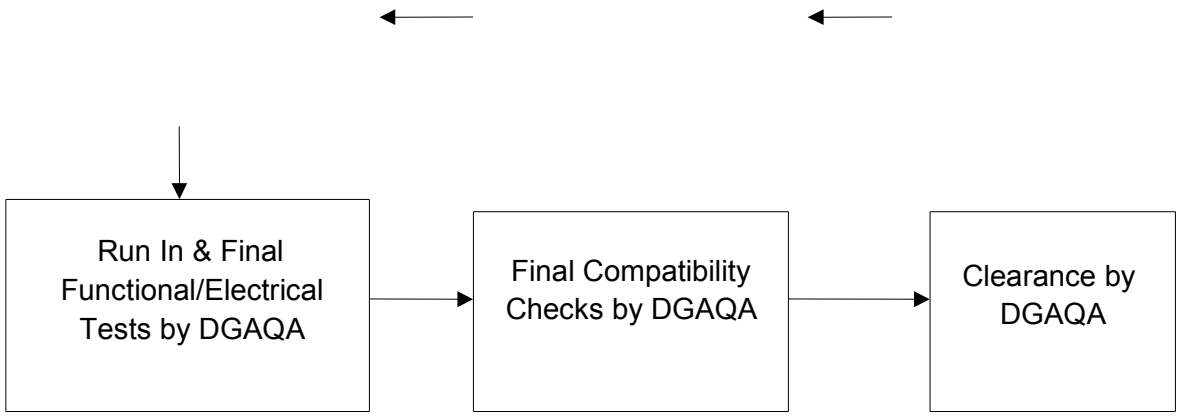
FULLY PROTECTED {Test (test No.)}	**PARTIALLY PROTECTED {Test (test No.)}**	**EXPOSED {Test (test No.)}**
Vibration (28)	Vibration (28)	Vibration (28)
High Temperature (17)	High Temperature (17)	High Temperature (17)
Damp Heat (10)	Damp Heat (10)	Solar Radiation (25)
Low Temperature (20)	Low Temperature (20)	Damp Heat (10)
Tropical Exposure (27)	Road Ability (29)	Low Temperature (20)
Toppling (26)	Rapid Temperature Cycling (22)	Altitude (3)
Bump (5)	Sealing (23)	Rapid Temperature Cycling(22)
	Dust (14)	Sealing (23)
	Tropical Exposure (27)	Driving Rain (12)
	Drop Test (13)	Immersion (19)
	Toppling(26)	Dust (14)
	Bump (5)	Tropical Exposure (27)
		Mould Growth (21)
		Corrosion (7,8,9)
		Drop (13)
		Toppling (26)
		Bump(5)
		Shock (24)

(Note: Requirements of these tests should be studied before finalizing the Qualification Tests)

4.11.2 Classification of the Environmental Conditions (as per JSS 6625-01) is further explained at Annexure-I.

4.12 Qualification Testing Procedure Flow Chart:





* Failures/ Deviations/ Errors noted at any stage (if any), should be corrected, before proceeding to the next stage. Such Failure should be investigated thoroughly by suitable DI Committee and remedial measures/improvements should be incorporated accordingly.

Comments during physical inspection and engineering observations by DGAQA are to be attended and replied before the electrical test by DGAQA.

Note 1: Functional/Electrical test shall also include the requirement of Para 4.3(iii)

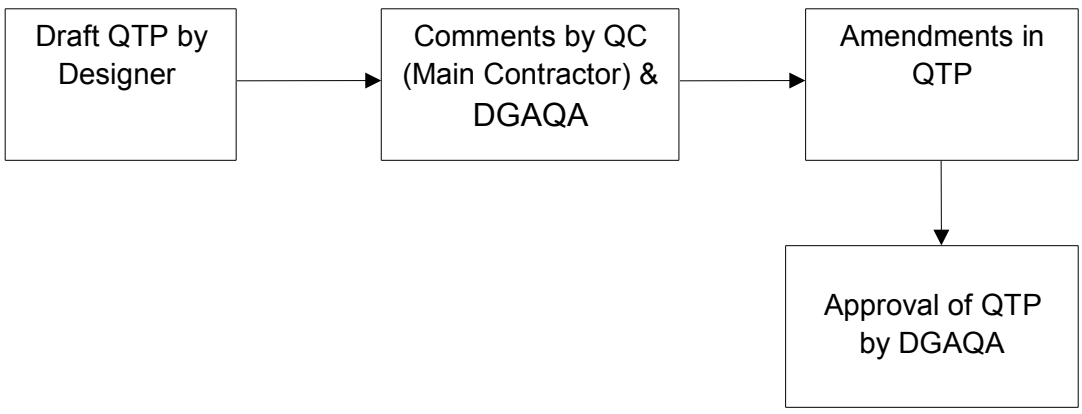
Note 2: If the modification is required at any stage(s), the tests of previous stage may be repeated as decided by DGAQA.

Note 3: During Environmental & EMI/EMC tests the equipment is to be switched on & the performance of the equipment is to be tested. This may be considered as specified against the requirement of JSS 55555.

PART II

5. QTP DOCUMENT

5.1 Flow Chart



5.2 QTP document should have the following details:-

(i) Brief Description of the equipment with Block Diagram
(ii) Technical Specifications as per para 4.3
(iii) MDI (with list of drawings)
(iv) Drawings
(v) Software VDD details (including CSCI)
(vi) Test Procedure
(vii) Test Reports
(viii) List of Qualification Tests
(ix) Test Severities
(x) Test Profiles / Graphs
(xi) Test set-up diagram
(xii) Equipment used for testing
(xiii) Compatibility checks (with main equipment to be tested by subject equipment/ Aircraft interface)
(xiv) Bill of Material as per 4.6
(xv) Performance to be tested/monitored during Environmental & EMI/EMC tests.
(xvi) Physical inspection (Dimensions, weight and overall workmanship of the LRUs)
(xvii) List of abbreviations used
(xviii) ESS requirement and procedure in accordance with MILSTD2164
(xix) Reference documents
(xx) Test report format/ template
(xxi) Procedure for software loading/ initial settings, as applicable
(xxii) Environmental Tests, Specifications as specified in Technical Specifications and as per JSS 6625 along with JSS 55555.
(xxiii) EMI/EMC test, as specified in Technical Specifications and/or in MIL 461/JSG 261& JSG 262.
(xxiv) Technical Specifications of the main equipment to be tested by subject test equipment.
(xxv) Functional/ Electrical test procedure of Test Equipment including 4.3(iii)

Note: Qualification Test Procedure document should be prepared as per Para 4.12 against the Environmental Test Specifications (xxii) & EMI/EMC Specifications (xxiii) and is to be approved by DGAQA.

PART III

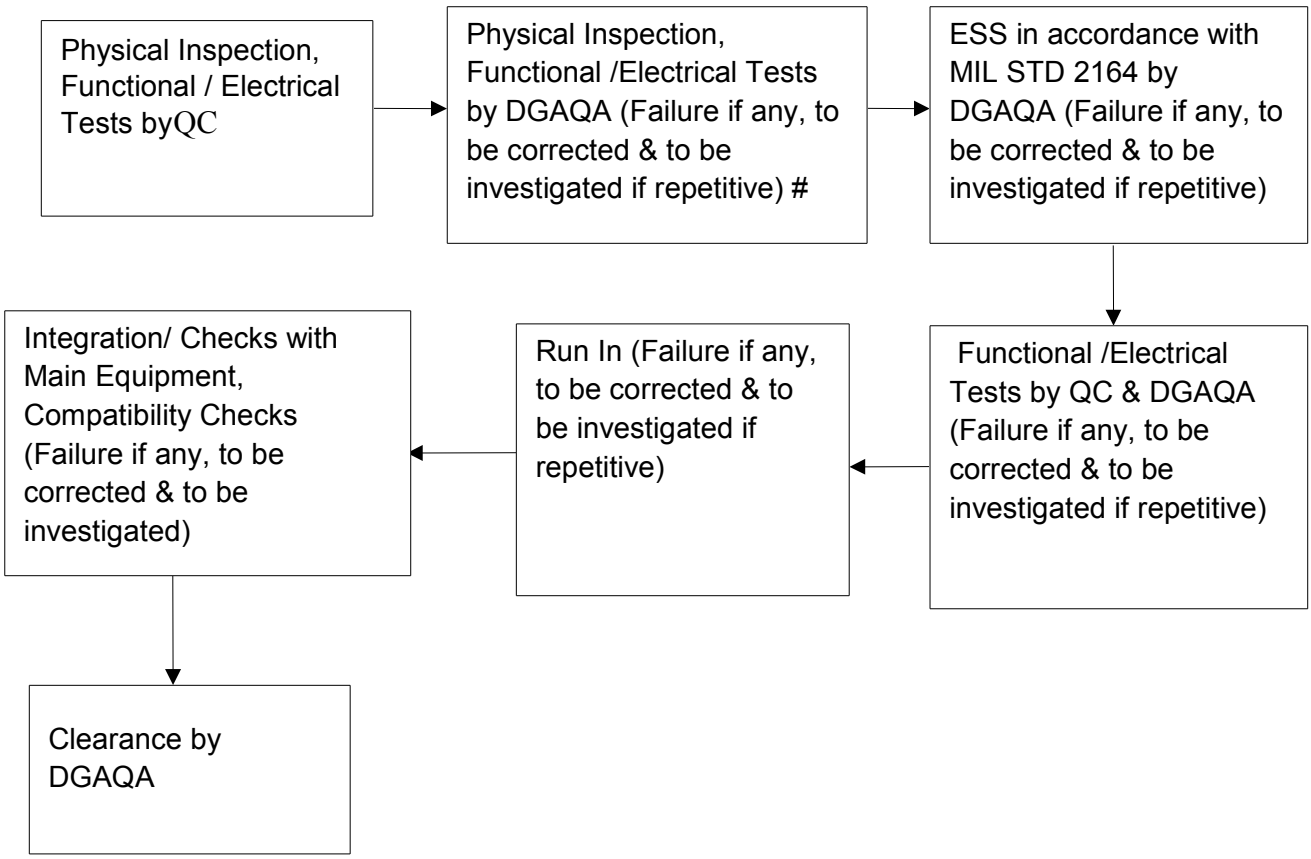
6. ACCEPTANCE TESTING PROCEDURE

6.1 The following details should be forwarded to the Inspecting Officer, for his Approval/ perusal:

(i) Brief Description of the equipment with block diagram
(ii) Technical Specifications as per 4.3
(iii) Draft Test Procedure including ESS in accordance with MIL STD 2164
(iv) Test Report Format
(v) Test set-up diagram
(vi) Equipment to be used for testing, with calibration details
(vii) Compatibility checks (with main equipment to be tested by subject equipment/ Aircraft interface)
(viii) Check List for Inspection Requirement for Quality Assurance (Annexure-II).
(ix) BOM, drawings, MDI with version No.
(x) QTR reports as applicable
(xi) Procedure for software loading/ initial settings, as applicable
(xii) Environmental Tests, as specified in Technical Specifications and as per JSS 6625 along with JSS 55555.

(xiii) EMI/EMC test, as specified in Technical Specifications and/or in MIL 461/JSG 261 & JSG 262.
(xiv) Technical Specifications of the main equipment to be tested by subject test equipment.
(xv) Functional / Electrical test procedure of the Test Equipment including 4.3 (iii)
(xvi) Performance to be tested/monitored during Environmental & EMI/EMC tests.
(xvii) QTP Document approved by DGAQA in accordance with Para 5.
(xviii) Software VDD details (including CSCI)

6.2 ATP Flow Chart



Comments during physical inspection and engineering observations by DGAQA are to be attended and replied before the electrical test by DGAQA.

Note 1: Functional/Electrical test shall also include the requirement of Para 4.3(iii)

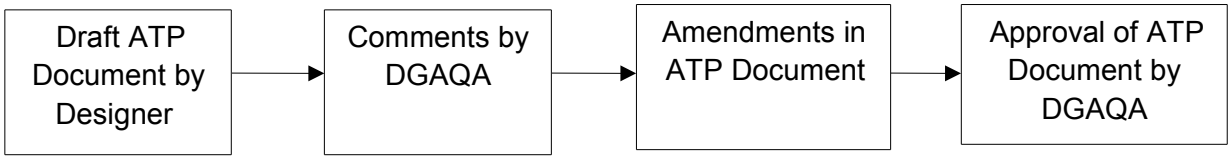
Note 2: If the modification is required at any stage(s), the tests of previous stage may

be repeated as decided by DGAQA.

PART-IV

7. ATP DOCUMENT:

7.1 Draft ATP should be studied and comments/ suggestions, if any, should be forwarded to the Manufacturer for consideration and incorporation. After finalisation, the document may be approved.



7.2 ATP document should have the following details:-

(i) Brief Description of the equipment with block diagram
(ii) Technical Specifications as per 4.3
(iii) Acceptance Test Procedure along with ESS as per MIL STD 2164 & Functional / Electrical test procedure of the Test Equipment including 4.3 (iii) & set-up diagram approved by DGAQA in accordance with Para 6.
(iv) Test Report
(v) Compatibility checks (with main equipment to be tested by subject equipment/ Aircraft Interface)
(vi) Other functional tests, if any
(vii) Physical inspection (Including the Dimension, weight and overall workmanship. Reference of BOM/SOP should be given)
(viii) Software VDD details (including CSCI)
(ix) Reference documents
(x) List of abbreviations used
(xi) Test report format/ template

7.3 CLEARANCE: After conducting ATP tests, the following should be ensured for necessary clearance:

(i) Completion of Acceptance Test Report (ATR) and related certifications, if any.
(ii) Calibration Instructions.
(iii) User Manual requirement.
(iv) Limitations/Deviations/Amendments are authenticated and documented.

The items should be cleared after ensuring that the Delivery Set List, Packing List and Transportable boxes have been catered for. Production permit/ clearance by competent authority and validity of delivery date to be checked.

Annexure-I

PERFORMANCE REQUIREMENT- ENVIRONMENTAL CONDITIONS
(Severities are indicative, and, therefore should be determined in light of the Governing specifications)

1. CLASSIFICATION:

(i) Class 1: Test equipment designed to withstand the severest environmental conditions. (Refer Table 1).
(ii) Class 2: Test equipment for use in the vicinity of aircraft, in tracked and wheeled vehicles, or for permanent top side installation on board ship (Refer table 1)
(iii) Class 3: Test equipment partially protected (Refer Table 2)
(iv)Class 4: Test equipment for use in light building (structures and vehicle where it is protected from direct rain sun etc. (Refer Table 3)
(v) Class 5: Test Equipment for use in permanent building (Refer Table 4).

1.1 The equipment shall be capable of meeting the following requirements as per JSS 55555.

1.2 Table 1

Environment Condition	Class	
	1	2
(a) Vibration limits	As per test No 28 (Severity of test to be determined as given in Table 4.28.2	As per test No 28 (Table 4.28.2, Sl.No.3 (a) or (b)
(b) Temp. (Non -operating)	-40º C to 85º C	-55º C to 70º C
(c) Temperature operating	-40º C to 70º C	-40º C to 70º C
(d) Altitude non–operating	15200m (A4)	15200m (A4)
(e) Altitude Operating	3000m(A1)	3000m(A1)
(f) Shock	As per test No 24, Procedure 2 Test Method C	As per test No 24, Procedure 2 Test Method A

(g) Tropical Exposure	As per test No 27, Test Condition C	As per test No 27, Test Condition C
(h) Mould Growth	As per test No 21	As per test No 21
(i) Corrosion Salt	As per test No 9, Test Procedure 1	As per test No 9, Test Procedure 1
(k) Dust	As per test No 14	As per test No 14
(l) Damp Heat	40º C, 95% RH	40º C, 95% RH
(m) Bump Test	As per Test No 5	As per Test No 5

Note: Road ability test may be decided on as required/ applicability basis.

1.3 Table 2

For Partially Protected:

Environment Condition	Class 3
(a) Vibration	As per test No 28 [As per Test No. 28, Table 4, 28.2 Sl.No.3 (a)]
(b) Temp. (Non -operating)	-40º C to 70º C
(c) Temperature operating	-20º C to 55º C
(d) Damp Heat	40º C, 95% RH 16 Hrs
(e) Altitude Operating	3000m(A1)*
(f) Dust	As per test No 14 (As required)
(g) Tropical Exposure	As per test No 27,Clause 3.2.7 Test Condition 'C'
(h) Mould Growth	As per test No 21(As required)
(j) Corrosion Salt	As per test No 9 (As required)
(k) Drop	As per test no 13, Clause 3.2.3 Test Condition 'D'*
(l) Toppling	As per test No 26
(m) Bump Test	As per Test No 5 (1000 bumps at 400 m/s2 or 40g, 6mS(see Note 1)

*Or as specified in the relevant equipment specifications

Note 1: To be carried out in transit carrying case.

Note 2: Road ability test may be decided on as required/ applicability basis.

1.4 Table 3

For use in light building, structures and vehicles where it is protected from direct rain, sun etc.

Environment Condition	Class 4
(a) Vibration limits	As per test No 28, Table 4, 28.2 Sl.No.3 (a)
(b) Temp. (Non -operating)	-40º C to 70º C
(c) Temperature operating	-20º C to 55º C
(d) Damp Heat	40º C, 95% RH , 16 Hrs
(e) Altitude	3000m(A1)*
(f) Toppling Test	As per test No 26

(g) Bump Test	As per Test No 5 (1000 bumps at 400 m/s2 or 40g, 6mS(see Note 1)
(h) Drop	As per test no 13 Clause 3.2.3 Test Condition 'D'*

*Or as specified in the relevant equipment specifications
Note 1: To be carried out in transit carrying case.
Note 2: Road ability test may be decided on as required/ applicability basis.

1.5 Table 4

For use in permanent buildings:

Environment Condition	Class 5
(a) Vibration limits	As per test No 28, Table 4, 28.2 Sl.No.3 (a)
(b) Temp. (Non -operating)	-20º C to 55º C
(c) Temperature operating	0º C to 50º C
(d) Damp Heat	40º C, 95% RH
(f) Toppling Test	As per test No 26
(g) Bump Test	As per Test No 5 (1000 bumps at 400 m/s2 or 40g, 6ms (see Note 1)
(h) Drop	As per test no 13, Clause 3.2.3 Test Condition 'D'*

*Or as specified in the relevant equipment specifications
Note 1: To be carried out in transit carrying case.
Note 2: Road ability test may be decided on as required/ applicability basis.

Annexure-II

CHECK LIST FOR INSPECTION REQUIREMENT FOR QUALITY ASSURANCE

(To be submitted by the manufacturer to the appropriate authority before the bulk is offered for inspection).

Sl. No.	Description		Remarks (If any)
1	Has an independent suitable representative nominated to ensure implementation of quality control program?	Yes/No	
2	Is proper check of incoming raw materials components and sub-assemblies done and suitable documents maintained to ensure that only acceptable articles are used in manufacture/supply?	Yes/No	
3	Are the inward goods inspection test procedure used complete, correct and clear?	Yes/No	
4	Are correct documents maintained to indicate segregation of non-conforming items, inspection/ rejection and rectification activities? Does a procedure to prevent use of non-standard items exist?	Yes/No	
5	Are the test equipment and measuring devices provided are of required accuracy and calibrated within the stipulated period?	Yes/No	
6	Are the test equipments and measuring devices calibrated to standards which are traceable to National/Secondary Standards?	Yes/No	
7	Have all the necessary modification/improvements arising out of technical evaluation of prototype, user trials, maintenance evaluation been duly incorporate in the bulk?	Yes/No	
8	Will all the accessories/ carried spares as per the contract be supplied along with the main equipment?	Yes/No	
9	Are all the documents supplied at appropriate stages as per contract? If not given the reasons and probable date of supply?	Yes/No	

10	Whether system audit has been carried out	Yes/No	

GENERAL GUIDELINES FOR ISSUING PROVISIONAL ACCEPTANCE/ APPROVAL CERTIFICATE

The following amendments and guidelines are to be followed for granting of Provisional Clearance/Type Approval certificate of test jigs/ground equipments:

a) The jigs/ ground test equipments will be cleared under “Provisional Clearance “and “Type approval “category.

b) In the beginning, after satisfactory qualification testing of equipment, Provisional Clearance will be issued for one year. All associated Documents like MDI, BOM & Drawings will be approved by DGAQA. Technical specifications for Jig/Rig for airborne application are to be issued by RCMA. Technical specifications for jig & rig for ground application/equipment will be approved by concerned Field establishment head.

c) After satisfactory performance of equipments at user end, Type Approval may be accorded for 5 years period for same SOP as defined in Provisional Clearance.

d) There may be occasions where in due course of time technology might have been upgraded and supplier may be in position to offer better equipment. In such cases, Head of Field establish should satisfy himself that such up gradations can be permitted or not. Judicious decisions for conducting additional LQT tests or Qualification Tests review for such H/W & S/W changes should be taken by the Head of Field Establishment.

e) There should be a proper record of Issue of Provisional Clearance and Type Approval. Technical Coordination section of concerned field establishment should maintain a register of records of issue of such approvals. Only Head of Field Establishment should issue subject document by signing the document himself. A copy of issue of such approvals should be communicated to this Headquarter as well as to be indicated in Quarterly Progress Reports.

Format for issuing of provisional acceptance/approval certificate is as follows:

Certificate Sl . No……..

DIRECTORATE GENERAL OF AERONAUTICAL QUALITY ASSURANCE

MINISTRY OF DEFENCE

PROVISIONAL CLEARANCE / TYPE APPROVAL CERTIFICATE

NAME OF THE FIRM:……
ITEM DESCRIPTION:…… (PART NO……)

This is to certify that under mentioned item designed and developed by M/s…… ……has been tested & found satisfactory based on following documents referred in type record.

(i) Technical specifications of….. (Equipment Name) Doc No..…Issue No..…Dated…….
(ii) QTP Doc No. :…….…… …Issue No……...…..…Dated……..……
(iii) QTR Doc No. :……..……..…Issue No…….……..…Dated……..…..……
(iv) BOM/SOP/Master Drawing Index (MDI) Doc No.: ……Issue No.……Dated……..

The …….(name of the equipment) has been cleared by …….(concerned field establishment head) subjected to the following limitations detailed in the type record.

1. The purpose of ……...(name of unit) is to function as ……
2. The approval serial number quoted above must be reflected on all relevant drawings, contracts and release notes.
3. This Provisional Clearance/ Type Approval is contingent upon fulfillment of quality assurance aspects of DGAQA during bulk production acceptance.
4. Validity: (Indicate whichever is applicable)
   (a) Provisional Clearance: One year from the date of Issue
   (b) Type Approval: Five years from the date of issue
5. Special Conditions if any…….

File Reference No……..

Date:……..

Signature & Stamp
(Head of Field Establishment)

Related/ Reference Documents:

1. JSS 55555 Environmental Test Methods for Electronic &Electrical Equipment.
2. JSS 0283 Design & Manufacturing requirements for Service Electronic equipment/ systems.
3. JSS 6625-01 General requirements for Electrical & Electronic Test equipment.
4. MIL STD 461/ For EMI/ EMC requirements JSG 0261/JSG 0262.
5. MIL STD 2164 ESS process for Electronic Equipment.
6. DDPMAS-2002 Design, Development & Production of Military Aircraft & Airborne Stores.
7. DDPIL Design, Development, Production and Inspection of Electronic Equipment.
8. IS 2500 Sampling Procedure for Inspection by attributes.