

SECTION 1 - REQUIREMENTS

1 GENERAL

1.1 This section contains the requirements for Helicopter Flight Training Devices

2 PRESENTATION

2.1 The requirements of JAR-STD 2H are presented in two columns on loose pages, each page being identified by the date of issue or the change number under which it is amended or reissued.

2.2 Subheadings are in italic typeface.

2.3 Explanatory notes not forming part of the requirements appear in smaller typeface.

2.4 New, amended and corrected text will be enclosed within heavy brackets until a subsequent "amendment" is issued.

INTENTIONALLY LEFT BLANK

INTENTIONALLY LEFT BLANK

SUBPART A - APPLICABILITY**JAR-STD 2H.001 Applicability**

JAR-STD 2H applies to those persons, organisations or enterprises (STD operators) seeking qualification of Flight Training Devices (FTD). STD users also shall gain approval to use the FTD as part of their approved training programmes despite the fact that the FTD has been previously qualified. Although this document provides guidance for STD users, precise details of such approvals are contained in JAR-OPS, JAR-FCL and other applicable documents.

INTENTIONALLY LEFT BLANK

INTENTIONALLY LEFT BLANK

INTENTIONALLY LEFT BLANK

SUBPART B - GENERAL

JAR-STD 2H.005 (continued)

JAR-STD 2H.005 Terminology

(See ACJ STD 2H.005)

Because of the technical complexity of STD qualification, it is essential that standard terminology is used throughout. The following principle terms and abbreviations shall be used in order to comply with JAR-STD.

(a) *Synthetic Training Device (STD)*. A training device which is either a Flight Simulator (FS), a Flight Training Device (FTD), a Flight & Navigation Procedures Trainer (FNPT) or a Basic Instrument Training Device (BITD).

(b) *Flight Simulator (FS)*. A full size replica of a specific type or make, model and series helicopter flight deck, including the assemblage of all equipment and computer programmes necessary to represent the helicopter in ground and flight operations, a visual system providing an out of the flight deck view, and a force cueing motion system. It is in compliance with the minimum standards for a specific FS Level of Qualification

(c) *Flight Training Device (FTD)*. A full size replica of a specific helicopter type's instruments, equipment, panels and controls in an open flight deck area or an enclosed helicopter flight deck, including the assemblage of equipment and computer software programmes necessary to represent the helicopter in ground and flight conditions to the extent of the systems installed in the device. It is in compliance with the minimum standards for a specific FTD Level of Qualification.

(d) *Flight and Navigation Procedures Trainer (FNPT)*. A training device which represents the flight deck/cockpit environment including the assemblage of equipment and computer programmes necessary to represent a helicopter in flight operations to the extent that the systems appear to function as in a helicopter. It is in compliance with the minimum standards for a specific FNPT Type of Qualification.

(e) *Basic Instrument Training Device (BITD)*. A ground based training device which represents the student pilot's station of a class of aeroplanes/group of helicopters. It may use screen based instrument panels and spring-loaded flight controls, providing a training platform for at least the procedural aspects of instrument flight.

(f) *Synthetic Training Device Approval (STD Approval)*. The extent to which an STD of a specified Qualification Level may be used by persons, organisations or enterprises as approved by the Authority. It takes account of helicopter to STD

differences and the operating and training ability of the organisation.

(g) *Synthetic Training Device Operator (STD Operator)*. That person, organisation or enterprise directly responsible to the Authority for requesting and maintaining the qualification of a particular STD.

(h) *Synthetic Training Device User (STD User)*. The person, organisation or enterprise requesting training, checking and testing credits through the use of an STD.

(i) *Synthetic Training Device Qualification (STD Qualification)*. The level of technical ability of an STD as defined in the compliance document.

(j) *Qualification Test Guide (QTG)*. A document designed to demonstrate that the performance and handling qualities of an STD agree within prescribed limits with those of the helicopter and that all applicable regulatory requirements have been met. The QTG includes both the helicopter and STD data used to support the validation.

JAR-STD 2H.010 Implementation

JAR-STD 2H will be implemented no later than 1 January 2004 where upon national arrangements, procedures and Qualification Certificates shall fully comply with JAR-STD 2H criteria.

INTENTIONALLY LEFT BLANK

INTENTIONALLY LEFT BLANK

SUBPART C - HELICOPTER FLIGHT TRAINING DEVICES

JAR-STD 2H.015 Application for FTD Qualification

(See ACJ No.1 to JAR-STD 2H.015)

(See ACJ No.2 to JAR-STD 2H.015)

(a) The operator of an FTD requiring evaluation of this FTD shall apply to the Authority giving 3 months notice.

(b) An FTD Qualification Certificate will be issued following satisfactory completion of an evaluation by the Authority.

(c) Exceptionally, for the initial evaluation of an FTD, the period of notice may be reduced to one month at the discretion of the Authority.

JAR-STD 2H.020 Validity of FTD Qualification

(a) An FTD Qualification is valid for 12 months unless otherwise specified by the Authority.

(b) An FTD evaluation for revalidation may take place at any time within the 60 days prior the expiry of the validity of the Qualification document. The new period of validity shall continue from the expiry date of the previous Qualification document.

(c) The Authority may refuse, revoke, suspend or vary an FTD qualification, if the provisions of JAR-STD 2H are not satisfied.

(d) The Authority may complete a special evaluation following major changes or when an FTD appears not to be performing at its initial Qualification Level.

JAR-STD 2H.025 Rules governing STD Operators

(See ACJ JAR-STD 2H.025)

The operator of an FTD shall demonstrate his capability to maintain the performance, functions and other characteristics specified for the FTD Qualification Level:

(a) *Quality system.*

(1) A Quality System shall be established and a Quality Manager designated to monitor compliance with, and the adequacy of, procedures required to ensure the maintenance of the Qualification Level of STDs. Compliance monitoring shall include a feed-back system to the

Accountable Manager to ensure corrective action as necessary.

(2) The Quality System shall include a Quality Assurance Programme that contains procedures designed to verify that the specified performance, functions and characteristics are being conducted in accordance with all applicable requirements, standards and procedures.

(3) The Quality System and the Quality Manager shall be acceptable to the Authority.

(4) The Quality System shall be described in relevant documentation.

(b) *Updating.* Maintain a link with manufacturers to incorporate important modifications, especially:

(1) *Helicopter modifications.* Helicopter modifications whether or not enforced by an airworthiness directive, and which are essential for training and checking shall be introduced into all affected Flight Training Devices.

(2) Modification of STD, including motion systems (if applicable):

(i) Where applicable and essential for training and checking, STD operators shall update their Flight Training Devices (for example in the light of data revisions). Modifications of the STD hardware and software which affect flight, ground handling and performance or any major modifications of the visual or addition/removal of a motion system (if applicable) shall be evaluated to determine the impact on the original qualification criteria if necessary. STD operators shall prepare amendments for any affected validation test. The STD operator shall test the STD to the new criteria.

(ii) The Authority shall be advised in advance of any major changes to determine whether or not a special evaluation of the STD may be necessary prior to returning it to training following the modification.

(c) *Installations.* Ensure that the FTD is located in a suitable environment, which supports safe and reliable operation.

(1) The STD operator shall ensure that the FTD and its installation comply with the local, country or state regulations for health and safety. However, as a minimum, the following shall be addressed:

JAR-STD 2H.025(c)(1) (continued)

(i) STD occupants and maintenance personnel shall receive adequate briefing on FTD safety.

(ii) Adequate fire/smoke detection, warning and suppression arrangements to ensure the safe passage of personnel from the FTD.

(iii) Adequate protection against electrical, mechanical, hydraulic and pneumatic hazards - including those arising from the control loading & motion systems (if applicable).

(iv) Other items:

(A) Emergency lighting.

(B) Escape exits & facilities.

(C) Danger area markings.

(D) Guard rails and gates.

(E) Control loading emergency stop controls (if applicable) accessible from either pilot and instructor seats.

(F) A manual or automatic electrical power isolation switch.

(2) The FTD safety features such as emergency stops and emergency lighting shall be checked regularly by the STD operator but in any case at least annually. These tests shall be recorded.

(d) *Additional Equipment.* Where additional equipment including motion or visual system has been added by the STD operator to an FTD, even though not required for qualification, it will be assessed to ensure that it does not adversely affect the quality of training. Therefore any subsequent modification, removal or unserviceability could affect the qualification of the device.

JAR-STD 2H.030 Requirements for FTD qualified on or after 1 January 2004

(See Appendices 1 & 2 to JAR-STD 2H.030)

(See ACJ No.1 to JAR-STD 2H.030)

(See ACJ No.2 to JAR-STD 2H.030)

(a) Any FTD submitted for initial evaluation on or after 1 January 2004, will be evaluated against JAR-STD 2H criteria for Qualification Levels 1, 2 or 3.

JAR-STD 2H.030 (continued)

(b) An FTD shall be assessed in those areas which are essential to completing the flight crew member training and checking process, (where applicable) including:

(1) longitudinal, lateral and directional handling qualities,

(2) performance on the surface and in the air,

(3) specific operations where applicable,

(4) flight deck configuration,

(5) functioning during normal, abnormal and emergency operations,

(6) instructor station function and FTD control, and

(7) additional requirements depending on the Qualification Level and the installed equipment.

(c) The FTD shall be subjected to:

(1) Validation tests, and

(2) Functions & subjective tests as found in the Qualification Test Guide (QTG).

(d) Data which are used to ensure the fidelity of an FTD shall be of a standard that satisfies the Authority, before the FTD can gain a Qualification Level.

(e) The STD operator shall submit a QTG in a form and manner, which is acceptable to the Authority.

(f) The QTG will only be approved after completion of an initial or upgrade evaluation, and when all the discrepancies in the QTG have been addressed to the satisfaction of the Authority. After inclusion of the results of the tests witnessed by the Authority, the approved QTG becomes the Master QTG (MQTG), which is the basis for the FTD qualification and subsequent recurrent FTD evaluations.

(g) The STD operator shall:

(1) Run the complete MQTG progressively between each annual evaluation by the Authority. Results shall be dated and retained in order to satisfy both the STD operator and the Authority that FTD standards are being maintained and,

(2) Establish a Configuration Control System (CCS) to ensure the continued integrity of the hardware and software qualified.

JAR-STD 2H.035 Intentionally blank

JAR-STD 2H.040 Changes to qualified FTD

(a) *Requirement to notify major changes to an FTD.* The operator of a qualified FTD shall inform the Authority of proposed major changes such as:

- (1) Helicopter modifications, which could affect FTD qualification;
- (2) FTD hardware and/or software modifications, which could affect the handling qualities, performances or system representations;
- (3) relocation of the FTD, and
- (4) any deactivation of the FTD.

(b) *Upgrade of an FTD.* An FTD may be upgraded to a higher Qualification Level. Special evaluation is required before the issue of a higher level of qualification.

(1) If an upgrade is proposed the STD operator shall seek the advice of the Authority and give full details of the modifications. If the upgrade evaluation does not fall upon the anniversary of the original qualification date, a special evaluation is required to permit the FTD to continue to qualify even at the previous level.

(2) In the case of an FTD upgrade, an STD operator shall run all validation tests for the requested Qualification Level. Validation test results offered in a test guide for previous initial or upgrade evaluation shall not be used to validate FTD performance in a test guide offered for a current upgrade.

(c) *Relocation of an FTD.*

(1) In instances where an FTD is moved to a new location, the Authority shall be advised before the planned activity along with a schedule of events related thereto.

(2) Prior to returning the FTD to service at the new location the STD operator shall perform at least one third of the validation tests and all functions and subjective tests to ensure that the FTD performance meets its original qualification standard. A copy of the test documentation shall be retained together with the FTD records for review by the Authority.

(3) At the discretion of the Authority, the FTD shall be subject to an evaluation in accordance with its original JAA qualification criteria.

(d) *Deactivation of a currently qualified FTD.*

(1) In the event an STD operator plans to remove an FTD from active status for prolonged periods, the Authority shall be notified and suitable

JAR-STD 2H.040(d)(1) (continued)

controls established for the period the FTD is inactive.

(2) The STD operator shall arrange an understanding with the Authority to ensure that the FTD can be restored to active status at its original Qualification Level.

JAR-STD 2H.045 Interim FTD Qualification

(See ACJ No.1 to JAR-STD 2H.045)

(See ACJ No.2 to JAR-STD 2H.045)

(a) In case of new helicopter programmes special arrangements shall be made to enable an interim Qualification Level to be achieved.

(b) Requirements, details relating to the issue, and the period of validity of an interim Qualification Level will be decided by the Authority.

JAR-STD 2H.050 Transferability of FTD Qualification

(a) When there is a change of STD operator, the new STD operator shall advise the Authority in advance in order to agree upon a plan of transfer of the FTD.

(b) At the discretion of the Authority, the FTD shall be subject to an evaluation in accordance with its original JAA qualification criteria.

(c) Provided that the FTD performs to its original standard, its original Qualification Level shall be restored.

INTENTIONALLY LEFT BLANK

INTENTIONALLY LEFT BLANK

Appendix 1 to JAR-STD 2H.030
Technical requirements

- (a) This Appendix describes the minimum technical requirements for qualifying FTD Levels 1, 2 and 3.
- (b) Each of these Qualification Levels carries an appropriate technical description.
- (c) Convertible FTD shall be qualified in each configuration.
- (d) Specific requirements for the use of the FTD are determined by the Authority. Specialised training courses require an adequate standard of simulation, which will be evaluated by the Authority. (See JAR-FCL and JAR-OPS).
- (e) Credits are granted in accordance with JAR-FCL and JAR-OPS.
- (f) Where additional equipment has been added to an FTD even though not required for qualification, it will be assessed to ensure that it does not adversely affect the qualification of a training device. Any subsequent removal or unserviceability could affect the qualification of the device.

Appendix 1 to JAR-STD 2H.030 (continued)

Table 1 - Minimum FTD requirements for qualifying JAA FTD level 1

Qualification Level	General Technical Requirements	Credits
1	<p>Type specific with at least one system fully represented to support the training task required.</p> <p>A cockpit/flight-deck, sufficiently closed off to exclude distractions.</p> <p>A full size panel of replicated system or systems with functional controls and switches.</p> <p>Lighting environment for panels and instruments sufficient for the operation being conducted.</p> <p>Flight-deck circuit breakers located as per the helicopter and functioning accurately for the system(s) represented.</p> <p>Aerodynamic and environment modelling sufficient to permit accurate systems operation and indication.</p> <p>Navigational data with corresponding approach facilities where replicated.</p> <p>Suitable seating arrangements for the instructor/examiner and Authority's inspector.</p> <p>Proper system(s) operation resulting from management by the flight crew independent from instructor control inputs.</p> <p>Instructor's controls to insert abnormal or emergency conditions into the helicopter systems.</p> <p>Independent freeze and reset facilities.</p> <p>Appropriate control forces and control travel.</p> <p>Appropriate flight deck sounds.</p>	<p>Could be considered suitable for:</p> <ul style="list-style-type: none"> - Selective system management credits (except for pilot manual control handling skills) as follows: <ul style="list-style-type: none"> • part of an approved conversion/transition course, • recurrent training/checking.

Appendix 1 to JAR-STD 2H.030 (continued)

Table 2 - Minimum FTD requirements for qualifying JAA FTD level 2

Qualification Level	General Technical Requirements	Credits
2	As for level 1 with the following additions or amendments: <ul style="list-style-type: none"> - All systems fully represented. - Lighting environment as per helicopter. - Representative / generic aerodynamic data tailored to the specific helicopter with the fidelity to meet the objective tests. - Adjustable crewmember seats. - Flight control characteristics representative of the helicopter. - A visual system (night/dusk and day) capable of providing a field-of-view of a minimum of 150 degrees horizontally from the middle eye point and 40 degrees vertically - A visual data base sufficient to support the training requirements - Significant flight deck sounds. - On board Instructor station with control of atmospheric conditions and freeze and reset. 	Could be considered suitable for: <ul style="list-style-type: none"> - Type training, including systems management, initial and recurrent training, - Instrument training and IR revalidation/renewal - Recency - CRM Training, as part of approved course. - LOFT (Route and area familiarisation) - MCC training

Table 3 - Minimum FTD requirements for qualifying JAA FTD level 3

Qualification Level	General Technical Requirements	Credits
3	As for level 2 with the following additions or amendments: <ul style="list-style-type: none"> - Validation flight test data as the basis for objective testing of flight, performance and systems characteristics - Visual system (night/dusk/day) capable of providing a field of view of a minimum of 150 degrees horizontally from the middle eye point and 60 degrees vertically. 	Could be considered suitable for: <ul style="list-style-type: none"> - Type training, testing and checking within an approved testing and checking programme.

Appendix 1 to JAR-STD 2H.030 (continued)

Table 4 - Minimum FTD Level 2/3 requirements for MCC

Level 2 and 3 FTD, meeting the following requirements, may seek accreditation for MCC training.

Device	General Technical Requirements	Credits
FTD Level 2/3 MCC	<p>For use in Multi-Crew Co-operation (MCC) training - as for Level 2 and 3 with the following additions or amendments:</p> <ol style="list-style-type: none"> 1. Multi engine and multi pilot helicopter. 2. Performance reserves, in case of an engine failure, to be in accordance with CAT . A criteria. 3. Retractable landing gear (where available). 4. Anti-icing or deicing systems (as appropriate). 5. Fire detection / suppression system. 6. Dual controls. 7. Autopilot with upper modes. 8. 2 VHF transceivers. 9. 2 VHF NAV receivers (VOR, ILS, DME). 10. 1 ADF receiver. 11. 1 Marker receiver. 12. 1 transponder. 13. Global Positioning System (GPS), (where applicable). 14. Weather radar (where applicable). <p>The following indicators shall be located in the same positions on the instrument panels of both pilots:</p> <ol style="list-style-type: none"> 1. Airspeed. 2. Flight attitude. 3. Altimeter and radio altimeter (if applicable) 4. HSI. 5. Vertical speed. 6. ADF. 7. VOR, ILS, DME. 8. Marker indication (as appropriate). 9. Stop watch (as appropriate). 	MCC Credits in accordance with the relevant JAR-FCL and JAR-OPS.

Appendix 2 to JAR-STD 2H.030

1. FTD standards

1.2 General

Tests and/or Statements of Compliance (SOC) shall demonstrate that the FTD standards below have been attained. These standards always refer to the type of helicopter being simulated.

FTD STANDARDS	FTD Level			COMPLIANCE
	1	2	3	
<p>a. A cockpit/flight deck, sufficiently closed off to exclude distractions.</p> <p>A full size panel of replicated system(s) with functional controls and switches. The use of electronically displayed images with physical overlay incorporating operable switches, knobs, buttons may be acceptable.</p>	✓	✓	✓	
<p>b. Lighting environment for panels and instruments shall be sufficient for the operation being conducted.</p> <p>Lighting environment shall be as per the helicopter.</p>	✓	✓	✓	
<p>c. Relevant flight deck circuit breakers shall be located as per the helicopter and shall function accurately when involved in operating procedures or malfunctions requiring or involving flight crew response.</p>	✓	✓	✓	
<p>d. Aerodynamic and environment modelling shall be sufficient to permit accurate systems operation and indication.</p> <p>Representative/generic aerodynamic data tailored to the specific helicopter with fidelity sufficient to meet the objective tests and sufficient to permit accurate system operation and indication.</p> <p>Validation flight test data shall be used as the basis for flight and performance and systems characteristics.</p> <p>Effect of aerodynamic changes for various combinations of airspeed and power normally encountered in flight, including the effect of change in helicopter attitude, side slip, altitude, temperature, initial mass, centre of gravity location, and configuration shall be provided.</p>	✓	✓	✓	Level 1 and 2 aerodynamic data can be representative/generic and need not necessarily be based on flight test data.
<p>e. Digital or analogue computing shall be sufficient to conduct complete operation of the device including its evaluation and testing.</p>	✓	✓	✓	Statement of Compliance required
<p>f. All relevant instrument indications involved in the simulation shall automatically respond to control input.</p>	✓	✓	✓	

Appendix 2 to JAR-STD 2H.030 (continued)

FTD STANDARDS	FTD Level			COMPLIANCE
	1	2	3	
g. Where navigation equipment is replicated, navigational data with the corresponding approach facilities shall be provided. All navigation aids shall be usable within range without restriction. Navigational data shall be capable of being updated.	✓	✓	✓	
h. Crewmember seats shall afford the capability for the occupants to be able to achieve the design eye reference position.	✓	✓	✓	
i. In addition to the flight crewmember stations, suitable seating arrangements for the instructor/examiner and Authority's inspector shall be provided, which shall permit adequate view of crew members' panel(s).	✓	✓	✓	
j. Any system represented shall be fully operative to the extent that normal, abnormal and emergency operating procedures can be accomplished at the appropriate FTD level. Once activated, proper system operation shall result from system management by the flight crew and not require input from instructor controls.	✓	✓	✓	
k. Instructor's controls shall enable the STD operator to control all required system variables and insert abnormal or emergency conditions into the helicopter systems, as specified in the helicopter Flight Manual. Independent freeze and reset facilities shall be provided. Instructor controls to vary atmospheric conditions shall be provided.	✓	✓	✓	
l. Representative control forces and control travel shall be provided.	✓	✓	✓	For FTD level 1 as appropriate for the system training required
m. Significant flight deck sounds shall be provided.	✓	✓	✓	For FTD level 1 as appropriate for the system training required
n. Ground handling and aerodynamic ground effects models should be provided to enable lift-off, hover, and touch down effects to be simulated and harmonised with the sound and visual system.		✓	✓	SOC
o. Relative response of the visual system and cockpit instruments should be coupled closely to provide integrated sensory cues. These systems should respond to abrupt pitch, roll, and yaw inputs at the pilot's position within the permissible delay.	✓	✓	✓	For Level 1 only instrument response is required.
p. A system allowing for timely continuous updating of FTD hardware and programming consistent with helicopter modifications.	✓	✓	✓	SOC

Appendix 2 to JAR-STD 2H.030 (continued)

FTD STANDARDS	FTD Level			COMPLIANCE
	1	2	3	
q. The STD operator shall submit a Qualification Test Guide in a form and manner acceptable to the Authority. A recording system shall be provided that will enable the FTD performance to be compared with QTG criteria.	✓	✓	✓	
r. A means of quickly and effectively testing FTD programming and hardware	✓	✓	✓	Statement of compliance required
s. FTD computer capacity and accuracy resolution and dynamic response sufficient for the Qualification Level sought.	✓	✓	✓	Statement of compliance required

1.3 Visual system

FTD STANDARDS	FTD Level			COMPLIANCE
	1	2	3	
a. Visual system capable of meeting all the standards of this paragraph and the respective paragraphs of validation tests as well as functions and subjective tests as applicable to the Level of Qualification requested by the STD operator.		✓	✓	
b. Continuous minimum visual field of view of 150 degrees horizontal and 40 degrees vertical available to both pilots. Continuous minimum visual field of view of 150 degrees horizontal and 60 degrees vertical available to both pilots.		✓	✓	A minimum of 75 degrees of horizontal field of view on either side of the zero degrees azimuth line relative to the helicopter fuselage is required. A minimum of 75 degrees horizontal field of view on either side of the zero degree azimuth line relative to the helicopter fuselage is required. This will allow an offset per side of the horizontal field of view if required for the training. Where training tasks, in accordance with JAR-FCL 2/JAR-OPS 3 subpart N, require extended fields of view beyond the 150 degrees x 60 degrees, then such extended fields of view should be provided.
c. A means of recording the visual response time for visual systems		✓	✓	

Appendix 2 to JAR-STD 2H.030 (continued)

FTD STANDARDS	FTD Level			COMPLIANCE
	1	2	3	
<p>d. Verification of visual ground segment and visual scene content at a decision height on landing approach. The QTG shall contain appropriate calculations and a drawing showing the pertinent data used to establish the helicopter location and visual ground segment. Such data shall include, but are not limited to:</p> <p>(1) Aerodrome and runway used.</p> <p>(2) Glide slope transmitter location for the specified runway.</p> <p>(3) Position of the glide slope receiver antenna relative to the helicopter landing gear.</p> <p>(4) Approach and runway light intensity settings.</p> <p>(5) Helicopter attitude.</p> <p>The above parameters should be presented for the helicopter in the landing configuration and a landing gear height of 200ft (60m) above the touchdown zone. The visual ground segment and scene content should be determined for a runway visual range of 550m (1 805 ft).</p>		✓	✓	See the respective paragraph within the tables of validation tests as well as functions and subjective tests.
<p>e. Visual cues to assess rate of change of height and position during takeoff, low altitude/low airspeed manoeuvring, hover and landing.</p>		✓	✓	
<p>f. Test procedures to quickly confirm visual system color, RVR, focus, intensity, level horizon, and attitude as compared with the specified parameter.</p>		✓	✓	Statement of Compliance required. Tests required. See the respective paragraph within the tables of validation tests as well as functions and subjective tests.
<p>g. Night/Dusk/Day scene</p>		✓	✓	
<p>h. A minimum of 10 levels of occulting. This capability should be demonstrated by a visual model through each channel.</p>		✓	✓	Statement of Compliance required. Tests required. See the respective paragraph within the tables of validation tests as well as functions and subjective tests.
<p>i. Surface resolution will be demonstrated by a test pattern of objects shown to occupy a visual angle of 3 arc minutes in the visual scene from the pilot's eyepoint.</p>		✓	✓	Statement of compliance required to confirm that surface resolution has been measured at each pilot's eye position towards the middle of each channel. See the respective paragraph within the tables of validation tests as well as functions and subjective tests.

Appendix 2 to JAR-STD 2H.030 (continued)

FTD STANDARDS	FTD Level			COMPLIANCE
	1	2	3	
j. Light point size not greater than 6 arc minutes measured in a test pattern consisting of a single row of light points, separated by black points, reduced in length until modulation is just discernable. A row of 30 lights will form a 4 degree angle or less.		✓	✓	This is equivalent to a light point resolution of 3 arc minutes. See the respective paragraph within the tables of validation tests as well as functions and subjective tests.
k. A visual database sufficient to support the requirements, including (i) Specific areas within the database needing higher resolution to support landings, take-offs and ground cushion exercises and training away from a heliport. (ii) For cross-country flights sufficient scene details to allow for ground to map navigation over a sector length equal to 30 minutes at an average cruise speed. (iii) For offshore airborne radar approaches (ARA), harmonised visual/radar representations of installations. (iv) For training in the use of Night Vision Goggles (NVG) a visual display with the ability to represent various scenes with the required levels of ambient light/colour. Detailed high resolution visual data bases as required to support advanced training, including at least: - elevated heliports (including heli-decks), confined areas.		✓	✓	Generic database is acceptable. Where applicable Where applicable Where applicable Where applicable Where applicable
l. The visual system should be capable of producing, as a minimum, the following effects: (1) full colour presentations. Full colour texture should be used to enhance visual cue perception for illuminated landing surfaces. (2) scene content comparable in detail with that produced by 6 000 polygons for daylight and 1 000 light points for night and dusk scenes for the entire visual system, (3) 17 cd/m ² (5 ft-Lamberts) of light measured at the pilot's eye position (Highlight Brightness), (4) a display which is free of apparent quantization and other distracting visual effects.		✓	✓	Statement of Compliance required. Test required The ambient lighting should provide an even level of illumination which is not distracting to the pilot. See the respective paragraph within the tables of validation tests and functions and subjective tests.

Appendix 2 to JAR-STD 2H.030 (continued)

FTD STANDARDS	FTD Level			COMPLIANCE
	1	2	3	
m. Contrast Ratio. A raster drawn test pattern filling the entire visual scene (three or more channels) should consist of a central white square no larger than 10 degrees and no smaller than 5 degrees per channel. Minimum test contrast ratio is 8:1.		✓	✓	Measurement should be made on the center of the white square and the adjacent dark area for each channel using a 1 degree spot photometer. The contrast ratio is the value of the white square divided by the value of the dark area.
n. Highlight Brightness Test. The minimum highlight brightness is 5 ft-Lamberts.		✓	✓	Measure the brightness of the centre of a white square covering 10% of the surface of each channel using the 1 degree spot photometer.

1.4 Intentionally left blank

INTENTIONALLY LEFT BLANK