**Requirement Specification of Rigid Hull Inflatable Boat with outboard engines (RHIB)**

1. **Requirements**

**1.1. Description of the requirement**

The Danish Defence shall acquire one Rigid Hull Inflatable Boat according to – Navy 740 (RHIB-SVN740APS).

The RHIB in this specification will only be purchased in connection with the disposal of RHIB-SVN740APS.

RHIB is considered an all-weather vessel that can operate globally irrespective of climatic conditions. The Navy will use RHIB in a wide variety of tasks. The most general tasks for RHIB is providing help for minor incidents involving disabled vessels, SAR and passenger transport ship to ship and ship to land.

The RHIB is based on a mother vessel and the RHIB is usually handled by crane or davit-system onshore.

The RHIB shall be used all around the world under all climatic and meteorological conditions. Accordingly, due account must be taken to the vessel's operational use as described in the below specification requirements. The RHIB is also intended to be used for operational preparedness, and for this reason, the RHIB must be of high quality and manufactured in approved modern materials and moulding techniques in order to maximize the interval between repairs. Approved materials shall be used and optimised with regard to strength and weight, taking into account RHIB’s operational use. Furthermore, the RHIB shall have good seaworthiness and good manoeuvring capabilities, including when reversing, as the RHIB will operate under particularly difficult wind and weather conditions.

**1.2. Description and definitions**

The requirement specification, cf. section 1.4, describes all the requirements for the acquisition and consists of six columns with the following information:

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| --- | --- |
| "#" | ID number |
| "Requirement" | Requirement description |
| "Classification" | The classification of the requirement as further described in section 1.3 |
| "DALO remarks" | Further information regarding the requirement |
| "Requirement compliance" | The tenderer's indication of compliance (YES or NO) |
| "Tender description" | Requirements regarding the tenderer's compliance description |

**1.3. Classification**

All requirements are mandatory requirements (SHALL) and shall be fulfilled by the tenderer. If just one of the mandatory requirements is not fulfilled, the tenderer's tender will not be taken into further consideration.

**1.4. Requirement and response sheet**

|  |  |  |  |  |  |  |
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| **#** | **Requirement** | **Classification** | **DALO remarks** | **To be filled out be the tenderer** | | |
| **Requirement compliance**  **(tick a box)** | | **Tenderer's description** |
| **YES** | **NO** |
| **Operational and technical requirements** | | | | | | |
|  | **Regulatory basis**:  The RHIB shall fulfil the regulations in the SOLAS/LSA Code under the designation “rescue boat” in Chapter V.  The following deviations (remarks) from this regulation shall be made in order to comply with this requirement specification:   1. The human load shall be calculated using 125 kg per person for which the boat is designed. 2. The name, home port designations and call sign identifications are deleted and replaced by another FMT-determined identification system. 3. Shall not be fitted with self-righting bag. 4. Fixed seats located replaced by seats on the pontoons with foot ropes in the bottom which people can use to provide grip for their feet during sailing. 5. The colour is not high visible. | SHALL |  |  |  |  |
|  | **Certification:**  Certification in accordance with the required regulatory basis stated in ID No. 1 with specified deviations shall be carried out by one of the following independent competent bodies:   1. A “Notified Body” authorised in accordance with the EU Directive on the approval of marine equipment (MED). 2. A classification society authorised in accordance with the EU Directive on the approval of classification societies (Recognised Organisations).   Each individual RHIB shall be supplied with a certificate that confirms that the RHIB in question is of a type that fulfils the regulatory basis with the specified deviations. | SHALL |  |  |  |  |
|  | **Dimensions:**  Total length shall be maximum 7.60 meter | SHALL |  |  |  |  |
|  | Total width shall be maximum 3.00 meter with air in buoyancy tubes. | SHALL |  |  |  |  |
|  | Total width shall be maximum 2.40 meter without air in buoyancy tubes. | SHALL |  |  |  |  |
|  | Draught shall be maximum 0.50 cm from waterline to keel. | SHALL |  |  |  |  |
|  | Weight of the RHIB (excluding persons/crew) ready for sailing shall be maximum 1500 kg.  *(The weight of the RHIB ready for sailing shall be stated as a part of the tenderer’s response*) | SHALL |  |  |  |  |
|  | **Persons**  RHIB shall be able to carry a crew of at least 10 fully equipped persons (125 kg each – 10 persons ≈ 1250 kg). | SHALL |  |  |  |  |
|  | **Speed**  Fully loaded – crew/persons and total weight of the RHIB, cf. ID No. 7 and 8 – the RHIB shall be capable of sailing at a continuous speed of no less than 30+ knots exclusive of propeller safety guard in Sea State 2 according to the Beaufort scale. | SHALL |  |  |  |  |
|  | Fully loaded – crew/persons and total weight of the RHIB, cf. ID No. 7 and 8 – the RHIB shall be capable to sailing at a continuous speed of no less than 20 knots for at least 4 hours inclusive propeller safety guard in Sea State 1 according to the Beaufort scale. | SHALL |  |  |  |  |
|  | **Materials**  All metal components such as fittings, pipe constructions, bolts, nuts, etc., shall be of stainless steel EN 1.4401/AISI 316 or equivalent seawater-resistant material. | SHALL |  |  |  |  |
|  | The hydraulic and fuel systems shall be designed in accordance with the manufacturer’s instructions. | SHALL |  |  |  |  |
|  | No clamp ring or die ring fittings or self-tapping screws shall be used in connection with joints on the RHIB or its systems. | SHALL |  |  |  |  |
|  | There shall be no company logo or equivalent from the manufacturer on the RHIB. | SHALL |  |  |  |  |
|  | **Colour**  The complete RHIB, including pontoon, and control console, shall be finished in Orca Navy Grey (RAL 7011) or equivalent navy grey colour. | SHALL |  |  |  |  |
|  | **Hull design:**  Materials that are used in connection with the construction of RHIB shall meet the requirements set out in Stanag or equivalent 2895 M1 Marine Hot, M2 Marine Intermediate and M3 Marine Cold concerning air temperature, relative humidity and solar radiation. | SHALL |  |  |  |  |
|  | **Hull design**  The hull shall be designed as a full V-hull. | SHALL |  |  |  |  |
|  | Along the keel, the hull shall be reinforced with rubber, Trekollan or equivalent. | SHALL |  |  |  |  |
|  | The bow shall from the bottom of the pontoon to the waterline be protected with a rubber fender or equivalent material. | SHALL |  |  |  |  |
|  | Drainage screw(s) shall be fitted in the transom to drain the internal hull. | SHALL |  |  |  |  |
|  | The RHIB shall be designed with a closed transom. | SHALL |  |  |  |  |
|  | The RHIB shall be designed with a self-baling engine well. | SHALL |  |  |  |  |
|  | Bolt penetrations for each of the two outboard engines shall be reinforced with bushings. | SHALL |  |  |  |  |
|  | Two bull-eyes shall be mounted on the transom so that a similar RHIB, fully loaded, can be towed at 5 knots using a crowfoot. | SHALL |  |  |  |  |
|  | The transom shall be strong enough to simultaneously support two outboard engines and permit towing on the crowfoot. | SHALL |  |  |  |  |
|  | Self-bails from the deck shall be installed of sufficient capacity; any bushings through the inner hull shall be pressure-tested for tightness by the supplier in connection to the production. | SHALL |  |  |  |  |
|  | 1 x bull-eye with a tensile strength of at least 5000 kg shall be fitted to the bow. | SHALL |  |  |  |  |
|  | A type approval plate shall be fitted to the transom. | SHALL |  |  |  |  |
|  | In a compartment in the hull near the bow shall be placed 80 kg removable ballast. | SHALL |  |  |  |  |
|  | In addition to the type approval plate, the transom shall be fitted with an identification plate with the following description:  FARTØJET TILHØRER DET DANSKE FORSVAR (THIS VESSEL BELONGS TO THE DANISH DEFENCE)  Type: RIGID HULL INFLATABLE BOAT  Serial number: RHIB- FKP (length) – (serial number/year)  NSN: 194022xxxxxxx  VED FUND: (IF FOUND:)  KONTAKT SPECIALOPERATIONSKOMMANDOEN  (CONTACT DEFENCE COMMAND NAVAL STAFF)  TELEFON +45 72857105 (ON TELEPHONE +45 72 85 71 05)  Dimensions: W = 16.5 cm \* H = 7.5 cm | SHALL |  |  |  |  |
|  | **Mooring clamp:**  One (1) strong mooring clamp shall be located in the bow of the RHIB for towing/mooring of a fully loaded RHIB, crew/persons and total weight of the RHIB, cf. ID No. 7 and 8. | SHALL |  |  |  |  |
|  | The clamp shall be sufficiently strong so the RHIB may be towed at 5 knots in Sea State 2. | SHALL |  |  |  |  |
|  | **Buoyancy tube (pontoon)**  The buoyancy tube shall be designed with at least 7 separate compartments. | SHALL |  |  |  |  |
|  | The buoyancy tube shall be made from Hypalon, 1670 dtx 1500 gr./m2, or equivalent material. | SHALL |  |  |  |  |
|  | The buoyancy tube shall be designed with a flat nose, and aft shall be of a length which means that the engines construction is cleared during turning. | SHALL |  |  |  |  |
|  | Each compartment shall be equipped with an inflation valve and a release valve of the Leafield C7 and A6 type, or equivalent. The valves shall be sunk flush in the buoyancy tube and be easily accessible for filling. | SHALL |  |  |  |  |
|  | It shall be possible to operate all valves on-board in the RHIB cockpit. | SHALL |  |  |  |  |
|  | For the rescue cradle, a wearing piece in the same material as the buoyancy tube shall be fitted to the buoyancy tube from the fender on the outside to the hull on the inside, width 800 mm, and 4 x D-rings (2 starboard and 2 port for the fitting of the rescue cradle) shall be fitted to the buoyancy tube.  *(These shall be positioned in agreement with DALO in connection with the execution of the agreement.)* | SHALL |  |  |  |  |
|  | A strong fender strip in black shall be fitted from starboard aft to port aft. | SHALL |  |  |  |  |
|  | Handlines shall be fitted internally starboard and port. | SHALL |  |  |  |  |
|  | Internal handlines shall be removable. | SHALL |  |  |  |  |
|  | Handlines shall be fitted externally starboard and port, excluded the wearing piece for the rescue cradle. | SHALL |  |  |  |  |
|  | The handlines exterior shall be designed as single sections, each fitted in its own D-ring on the buoyancy tube. | SHALL |  |  |  |  |
|  | On the top of the buoyancy tube, starboard and port, there shall be anti slippery path size 600/250 mm. Five pieces on each side. | SHALL |  |  |  |  |
|  | A rescue line with quoit shall be fitted aft starboard | SHALL |  |  |  |  |
|  | A buoyant knife shall be fitted aft internally starboard and port | SHALL |  |  |  |  |
|  | A clear sign stating the deadweight and total weight shall be fitted internally starboard. | SHALL |  |  |  |  |
|  | Four holders for 1500 mm wooden paddles shall be fitted starboard and port aft. | SHALL |  |  |  |  |
|  | Holders shall be fitted such that they do not inconvenience the passengers. | SHALL |  |  |  |  |
|  | 8 x D-rings shall be fitted for lashing cargo.  *(These shall be positioned in agreement with DALO in connection with the execution of the agreement)* | SHALL |  |  |  |  |
|  | **Construction**  The deck shall be completed as one whole flat section, where a natural step shall be designed in the stern. | SHALL |  |  |  |  |
|  | The edge of steps shall be protected with Hypalon or equivalent in the same colours as the deck. | SHALL |  |  |  |  |
|  | On the top of the steps there shall be anti slippery path. | SHALL |  |  |  |  |
|  | The RHIB shall be equipped with a combined fixed control console, windscreen in a tubular frame with padded grab-handle, and 2 shock mitigations seats. | SHALL |  |  |  |  |
|  | The control console shall be placed, so that the 2 shock mitigation seats can be located in the aft of the console. | SHALL |  |  |  |  |
|  | The deck shall have an anti-slip coating. | SHALL |  |  |  |  |
|  | The deck shall be protected with shock absorbing rubber mats that are secured so they do not slip. | SHALL |  |  |  |  |
|  | A lifting tower with Henriksen 5-tonne releasing gear, or equivalent gear, and Cone for docking head PAPH-700 from the supplier West Davit, shall be fitted and located 3250 mm in front of the aft edge of the pontoon.  The lifting device shall be located so that the RHIB is in almost horizontal or slightly aft trim max. 3°trim (equipped and with a full tank). | SHALL |  |  |  |  |
|  | Two Neoprene-coated grab-handles shall be fitted to the lifting tower. | SHALL |  |  |  |  |
|  | The lifting device can be an integral component of the control console, but it shall always have multiple legs for the sake of RHIB stability. | SHALL |  |  |  |  |
|  | A multi-legged lifting device that is not integrated into the console shall be capable of accommodating equipment beneath of dimensions L=555 W=470 H=540. | SHALL |  |  |  |  |
|  | The tower shall be designed as high as possibly, but not higher than the windscreen. | SHALL |  |  |  |  |
|  | Four lifting-point shall be fitted for lifting-sling. | SHALL |  |  |  |  |
|  | The lifting device shall be load tested and approved to a Safe Working Load (SWL) of 5 tons | SHALL |  |  |  |  |
|  | Foot ropes (wire protected with rubber or plastic pipe) shall be installed on both sides from the front legs on the lifting tower to aft on the step in front of the RHIB.  The foot ropes shall be load tested with 500 kg.  *(These shall be positioned in agreement with DALO in connection with the execution of the agreement)* | SHALL |  |  |  |  |
|  | The inner hull shall be capable of being emptied using a manual pump. | SHALL |  |  |  |  |
|  | A Targa bracket shall be installed aft. The bracket shall be designed as a pipe construction angled to not come in contact with another RHIB vessel/jetty if it rolls up to 30º. | SHALL |  |  |  |  |
|  | The targa bracket shall be fitted with lanterns, 2 working lights. One of the working lights shall have a circuit breaker, active radar reflector and relevant antennas. | SHALL |  |  |  |  |
|  | A roll of anchor tape (35 m) shall be fitted on the starboard side. | SHALL |  |  |  |  |
|  | A membrane pump shall be installed on the targa bracket hoop on the port side for bailing the inner hull. | SHALL |  |  |  |  |
|  | The transom/targa bracket shall be equipped with a holder for a stainless anchor (anchor weight of 8-15 kg) | SHALL |  |  |  |  |
|  | **Control console:**  The control console shall be as wide as possible so that there is a minimum of 125 mm from the buoyancy tubes to the control console. | SHALL |  |  |  |  |
|  | The edges of the control console shall be protected with Hypalon or equivalent in the same colour as the control console. | SHALL |  |  |  |  |
|  | Hatches that are fitted in the control console or hull shall be watertight and impact-resistant. | SHALL |  |  |  |  |
|  | The console shall have an integrated windscreen in or protected by a tubular frame with grab-handle. | SHALL |  |  |  |  |
|  | The windscreen shall be tilted at the top so as to provide maximum protection for the driver and navigator. | SHALL |  |  |  |  |
|  | Stainless steel tubes shall be fitted on the aft edge of the control console 10 cm above the deck to support instep. | SHALL |  |  |  |  |
|  | The aft edge of the control console shall be waterproof with USB connector for charging mobile phones, EA 2. | SHALL |  |  |  |  |
|  | The front of the control console shall be fitted with a horn and handheld searchlight with visibility at a distance up to at least 300 metres in clear daylight. | SHALL |  |  |  |  |
|  | The control console shall as a minimum contain/house the following:   * xx-amp storage batteries for starting the outboard engines and supply. The batteries are to be installed in a fixed tray, secured to the hull/bottom by a seawater-resistant bracket. * Batteri charcer with connection * Emergency batteri for VHF-radio * Steering wheel with pump * Instrument for engines * Gear/gas box with dead man’s switch * Contacts for electric/electronic components * Chart plotter and VHF radio on control console * Compass with light * Horn * A socket for a 12V handheld searchlight, a socket for a charger and the main switch for the storage batteries shall be mounted flush. | SHALL |  |  |  |  |
|  | It shall be possible to operate all instruments and switches, that require operation, while wearing wet gloves. | SHALL |  |  |  |  |
|  | **Seats:**  EA 2 shock mitigation seats shall be supplied and fitted, cf. ID No. 50 and 51. | SHALL |  |  |  |  |
|  | The 2 shock mitigation seats shall meet the requirements of Directive 2002/44/EC of 25 June 2002 of the European Parliament and Council of the European Union. | SHALL |  |  |  |  |
|  | The seats shall be placed a minimum of 55 cm from centre to centre. | SHALL |  |  |  |  |
|  | It shall be possible to move the seats’ foundation on the rails, from 15 cm from the control console, with a minimum length of 65 cm from the steering wheel to backrest. | SHALL |  |  |  |  |
|  | It shall be possible to remove, fit and adjust seats without tools. | SHALL |  |  |  |  |
|  | **Communications equipment:**  The following is provided by DALO and is installed by the supplier:   * Sailor VHF radio 6222 with DCS * With hand microphone including bracket. * Antenna cable RG 214 * EA 1, Antenna, VHF MA160 149–164MHZ ground plane * EA 1, Mount, ratchet antenna, VHF MA160 * EA 2, Antenna fitting LW-1 for CXL3-1 ANT | SHALL |  |  |  |  |
|  | **Navigation:**  The following equipment shall be supplied and installed.   * Chart plotter with a minimum 10” split-screen. The chart plotter shall have a pushbutton function. * Depth Sounder * AIS of the class B transponder. It shall be possible to switch off the AIS via the control panel, so it does not actively transmit. | SHALL |  |  |  |  |
|  | **Outboard engine installation**  2 x 4-stroke Fxx hp Solas approval outboard engines including all necessary components (complete with propeller instrument and gear/gas box) shall be installed. | SHALL |  |  |  |  |
|  | Gear/gas box with powertrim and key switch shall be placed on the starboard side of the console. | SHALL |  |  |  |  |
|  | It shall be possible to read at least the following on an instrument panel: trim, RPM, tank level, oil alarm, coolant alarm and charger amps. | SHALL |  |  |  |  |
|  | Wires and cables from the gear/gas box shall be ducted in maintenance-friendly cable duct(s) from the engines/Targa bracket to the console. | SHALL |  |  |  |  |
|  | The installation shall be designed such that maintenance, trouble-shooting and necessary replacement of components is feasible at user level. | SHALL |  |  |  |  |
|  | **Tank installation**  1 x CE-approved petrol tank which fulfils previously established requirements shall be installed. The tank and associated system shall be approved in accordance with the following. | SHALL |  |  |  |  |
|  | The tank and associated systems shall be approved in accordance with the supplier’s instructions. | SHALL |  |  |  |  |
|  | The tank shall be equipped with venting, refuelling and cleaning covers. | SHALL |  |  |  |  |
|  | 2 water separation filters shall be fitted to the fuel system. | SHALL |  |  |  |  |
|  | The tanks shall be secured and supported so that they do not rupture. | SHALL |  |  |  |  |
|  | The fuel system shall comply with the outboard engine manufacturer’s instructions. | SHALL |  |  |  |  |
|  | **Electrical installations**  Storage batteries shall have sufficient output to enable both cold outboard engines to be started six (6) times in succession and to support electrical components for 4 hours. | SHALL |  |  |  |  |
|  | Via the main switches, it shall be possible to start the outboard engines on battery 1, battery 2 or both batteries simultaneously. | SHALL |  |  |  |  |
|  | It shall be possible to isolate batteries via a key main switch. | SHALL |  |  |  |  |
|  | A watertight contact panel for miscellaneous installations shall be placed appropriately on the control console. The contact panel shall be complete with circuit breakers and terminal blocks and connected to the following functions:   * Chart plotter (just terminal block) * VHF Sailor radio (just terminal block) * AIS * Horn * Navigation lights * Working lights * Search light * Instrument lighting and compass * At least 2 additional sockets   The contacts shall be adapted to the individual functions and marked unambiguously. Terminal blocks shall be marked in accordance with the circuit diagram. | SHALL |  |  |  |  |
|  | The charger arrangement is to be designed in accordance with the LSA Code.  The following equipment shall be used in connection with the installation:   * Life boat charger with the following plug and casing:   + Plug 216BAU1W ABB no. 2CMA166684R1000   + Casing GP216 ABB no. 2CMA164993R1000   10 amp fuses shall be used between storage batteries and the charger. | SHALL |  |  |  |  |
|  | Outside the console, cables and wires shall be ducted in maintenance-friendly cable ducts. On RHIB targa bracket and inside the console, they shall be screened/protected from overload. | SHALL |  |  |  |  |
|  | Cables and wires on the targa bracket shall be connected together using waterproof plugs so that the tower can be removed. | SHALL |  |  |  |  |
|  | For all specified systems, standard manufactured cables and wires shall be used with original plugs, a minimum of IP 57, or equivalent. | SHALL |  |  |  |  |
|  | Cables and wires, which are deemed to be non-standard, shall be made using halogen-free double-shielded marine cables. | SHALL |  |  |  |  |
|  | Excess length of the cables according to ID No. 101 and 102 shall be cut to size (in order to remove excess length) and fully fixated and secured. | SHALL |  |  |  |  |
|  | On non-standard cables, wiring concentrators and cable clamps/plugs, a watertight design shall be used, a minimum of IP 57, or equivalent. | SHALL |  |  |  |  |
|  | **Labelling.**  All circuit breakers and switches shall be labelled ON/OFF. | SHALL |  |  |  |  |
|  | All circuit breakers and switches shall be labelled with their function. | SHALL |  |  |  |  |
|  | All fuses shall be labelled with their function. | SHALL |  |  |  |  |
|  | All cables and wires shall be labelled at both ends, and on each side of a bushing with a Partex Marking System or equivalent.  *(Standardly manufactured cables clearly marked by the manufacturer in accordance with the diagram need not be externally marked)* | SHALL |  |  |  |  |
|  | All +cables shall be indicated by red heat-shrink, and others by black. | SHALL |  |  |  |  |
|  | **General.**  Wiring implemented as one-wire conductors by the manufacturer shall be wrapped in self-vulcanising tape. | SHALL |  |  |  |  |
|  | Wires that are separated for routing to the individual consumers shall again be wrapped in self-vulcanising tape. | SHALL |  |  |  |  |
|  | All open connection points shall be sealed for protection against corrosion. | SHALL |  |  |  |  |
|  | Cables and wires shall able to withstand the G-forces to which the RHIB is subject. | SHALL |  |  |  |  |
| **Logistics and other requirements** | | | | | | |
|  | **Loose equipment**  Unless stated otherwise in this specification, a delivery shall be deemed as being a shipyard delivery (delivery, assembly and testing).  The following equipment shall accompany each individual RHIB:   * EA 1 tarpaulin PVC fabric, 600 gr/m²covering control console in a pale grey colour, or equivalent material * EA 1 tarpaulin PVC fabric 600 gr/m2 covering the entire RHIB including outboard engines in a pale grey colour, or equivalent material * EA 1 approved 2 kg powder fire-extinguishers including brackets intended for maritime use shall be deployed on the starboard side fore. * EA 2 water separation filters of the approval type for the engines. * EA 1 Wire fore-hanger for the releasing gear, max. length 400 mm with painter, 500 mm, in fluorescent colour). * EA 1 4-point lifting-sling. * LED side (starboard/port) and masthead lights. * Hydraulic steering complete with wheel. * Wheel with metal spokes, Ø (diameter) 34 cm.   Compass, inbuilt with light, black | SHALL |  |  |  |  |
|  | **Documentation**  Original documentation is to be delivered in Danish or English. The following documentation is to be supplied:   * All drawings, both main and component drawings, are delivered using the electronic medium in auto-cad, version 2010 * Documentation supplied on CD/USB shall be in printer friendly format. * Information manual (supplied on CD/USB) including the following: * Original certificate, cf. ID No. 2, other relevant original certificates and original documentation of installed equipment, latest version. * Drawings, parts lists, descriptions and circuit diagrams considered essential in connection with troubleshooting and minor repairs. * All circuit diagrams are to be executed consistently for the entire electrical installation. * Copy of approval certificates. * Original documentation on installed equipment is to be supplied on CD/USB. * Documentation (supplied on USB stick) in Danish regarding user maintenance including the following:   + - Description with explanatory illustrations of the RHIB.     - Description with explanatory illustrations for functions. * Preparation description. * Package description. * Patch description. * Instructions regarding maintenance and replacing the inflation and release valve as well as external inflation/release system.   + - User maintenance, preferably on a daily, weekly and monthly basis, and before and after sailing. | SHALL |  |  |  |  |
|  | **Delivery time**  The delivery time shall be no more than 120 calendar days from submission of the purchase order. | SHALL |  |  |  |  |