

## 1072. TEST, INSPECTION AND PRODUCTION EQUIPMENT

1072. 1. Test, calibration or alignment equipment specially designed for equipment embargoed by 1071., except equipment for Maintenance Level I or Maintenance Level II;

### Technical Notes:

#### 1. Maintenance Level I

The failure of an inertial navigation unit is detected on the aircraft by indications from the control and display unit (CDU) or by the status message from the corresponding sub-system. By following the manufacturer's manual, the cause of the failure may be localised at the level of the malfunctioning line replaceable unit (LRU). The operator then removes the LRU and replaces it with a spare.

#### 2. Maintenance Level II

The defective LRU is sent to the maintenance workshop (the manufacturer's or that of the operator responsible for level II maintenance). At the maintenance workshop, the malfunctioning LRU is tested by various appropriate means to verify and localise the defective shop replaceable assembly (SRA) module responsible for the failure. This SRA is removed and replaced by an operative spare. The defective SRA (or possibly the complete LRU) is then shipped to the manufacturer.

### N.B.:

Maintenance Level II does not include the removal of embargoed accelerometers or gyro sensors from the SRA.

1072. 2. Equipment, as follows, specially designed to characterize mirrors for ring "laser" gyros:
- Scatterometers having a measurement accuracy of 10 ppm or less (better);
  - Profilometers having a measurement accuracy of 0.5 nm (5 angstrom) or less (better);
1072. 3. Equipment specially designed for the production of equipment embargoed by 1071., including:
- Gyro tuning test stations;
  - Gyro dynamic balance stations;
  - Gyro run-in/motor test stations;
  - Gyro evacuation and fill stations;
  - Centrifuge fixtures for gyro bearings;
  - Accelerometer axis align stations.

## 1073. MATERIALS

None

## 1074. SOFTWARE

1074. 1. "Software" specially designed or modified for the "development" or "production" of equipment embargoed by 1071. or 1072.;

1074. 2. "Source code" for the "use" of any inertial navigation equipment or Attitude Heading Reference Systems (AHRS) (except gimballed AHRS) including inertial equipment not embargoed by 1071.3. or 1071.4.;

### Technical Note:

AHRS generally differ from inertial navigation systems (INS) in that an AHRS provides attitude heading information and normally does not provide the acceleration, velocity and position information associated with an INS.

1074. 3. Other "software", as follows:
- "Software" specially designed or modified to improve the operational performance or reduce the navigational error of systems to the levels specified in 1071.3. or 1071.4.;
  - "Source code" for hybrid integrated systems which improves the operational performance or reduces the navigational error of systems to the level specified in 1071.3. by continuously combining inertial data with any of the following navigation data:
    - Doppler radar velocity;
    - Global Positioning Satellite (GPS) references; or
    - Terrain data base;
  - "Source code" for integrated avionics or mission systems which combine sensor data and employ knowledge-based expert systems;
  - "Source code" for the "development" of:
    - Digital flight management systems for flight path optimization;
    - Integrated propulsion and flight control systems;

- Fly-by-wire or fly-by-light control systems;
- Fault-tolerant or self-reconfiguring "active flight control systems";
- Airborne automatic direction finding equipment;
- Air data systems based on surface static data;
- Raster-type head-up displays or three dimensional displays.

## 1075. TECHNOLOGY

1075. 1. Technology according to the General Technology Note for the "development" of equipment or "software" embargoed by 1071., 1072. or 1074.;
2. Technology according to the General Technology Note for the "production" of equipment embargoed by 1071. or 1072.;
3. Technology according to the General Technology Note for the repair, refurbishing or overhaul of equipment embargoed by 1071.1. to 1071.4., except for maintenance technology directly associated with calibration, removal or replacement of damaged or unserviceable LRUs and SRAs of a "civil aircraft" as described in Maintenance Level I or Maintenance Level II. (see Technical Notes to 1072.1.)
4. Other technology, as follows:
- Technology for the "development" or "production" of:
    - Airborne automatic direction finding equipment operating at frequencies exceeding 5 MHz;
    - Air data systems based on surface static data only, i.e., which dispense with conventional air data probes;
    - Raster-type head-up displays or three dimensional displays for "aircraft";
    - Inertial navigation systems or gyro-astro compasses containing accelerometers or gyros embargoed by 1071.1. or 1071.2.;
  - "Development" technology, as follows, for "active flight control systems" (including fly-by-wire or fly-by-light):
    - Configuration design for interconnecting multiple microelectronic processing elements (on-board computers) to achieve "real time processing" for control law implementation;
    - Control law compensation for sensor location or dynamic airframe loads, i.e., compensation for sensor vibration environment or for variation of sensor location from the centre of gravity;
    - Electronic management of data redundancy or systems redundancy for fault detection, fault tolerance, fault isolation or reconfiguration;

### NOTE:

1075.4.b.3. does not embargo technology for the design of physical redundancy.

- Flight controls which permit in flight reconfiguration of force and moment controls for real time autonomous air vehicle control;
  - Integration of digital flight control, navigation and propulsion control data into a digital flight management system for flight path optimization, except "development" technology for aircraft flight instrument systems integrated solely for VOR, DME, ILS or MLS navigation or approaches;
  - Full authority digital flight control or multi sensor mission management systems incorporating knowledge-based expert systems;  
(For technology for Full Authority Digital Engine Control (FADEC), see 1095.3.a.10.)
- c. Technology for the "development" of helicopter systems, as follows:
- Multi-axis fly-by-wire or fly-by-light controllers which combine the functions of at least two of the following into one controlling element:
    - Collective controls;
    - Cyclic controls;
    - Yaw controls;
  - "Circulation-controlled anti-torque or circulation-controlled directional control systems";
  - Rotor blades incorporating "variable geometry airfoils" for use in systems using individual blade control.

### NOTES:

- Governments may permit, as administrative exceptions, the shipment to the Czech Republic, Poland, and Slovak Republic of everything embargoed by this Category, except: