PART 2

SECTION 1 — MANAGEMENT OF THE WEAPONS SYSTEM

CHAPTER 6 — WEAPONS SYSTEM CHECKS AND PROCEDURES

Contents

EXTERNAL CHECKS

General

1. Carry out the following checks:

   a. Check that external power is not connected to the aircraft.

   b. Check that the MASB is at SAFE.

   c. Check that the aircraft is pointing in a safe direction when live weapons are loaded.

Radar

2. Check the radar bullet for security, burns and holes, and check the integrity of the bursting discs.

Red Top

3. Carry out the following checks of Red Top:

   a. Confirm that the rounds fitted are the same as those specified in the Form 700.

   b. Remove the missile protective covers and inspect the glass nose and fuze windows for cracks, scratches, cleanliness of the glass and freedom from condensation. Bubbles, chips or cloudy patches on the glass may be ignored.

   c. Check that the wings are securely fitted and the leading edge contact fuzes are not damaged.

   d. Ensure that the fins are locked.

   e. Check the body section of the missile for distortion at the joint rings.

   f. Ensure that the safety plug is fitted in acquisition missiles, or that the firing link is fitted in live missiles.

   g. On operational missiles, check that the missile air priming screw is flush with the outer casing.

   h. If live rounds are carried, ensure that safety plugs are available in the weapon pack in case the aircraft is diverted.

   i. Check that the mis-fire indicators in the weapon pack have been reset.

   j. Check the security of the air bottle and link stowage panels in the pack.

   k. Check the weapon pack for hydraulic leaks.

Firestreak

4. Carry out the following checks of Firestreak:

   a. Confirm that the rounds fitted are the same as those specified in the Form 700.

   b. Remove the missile nose cover and inspect the glass for cracks, scratches, and separation between the glass panels.

   c. Check that the IR telescope is in an uncaged position; if the telescope is pointing dead ahead, the ground caging control may not have been disengaged.

   d. Remove the cover from the fuze windows and inspect the glass for damage.

   e. Check the wings are securely fitted and that the leading edge contact fuzes are not damaged.

   f. Ensure the fins are locked.

   g. Check the integrity of the joints and seals on the body of the missile.

   h. Check that the ammonia bottle is securely fitted and that there are no leaks; these are easy to detect since ammonia fumes are very pungent.

   i. Check that the accumulator pressure gauge indicates a minimum of 2600 PSI if one round (live or acquisition) is carried; if two rounds (live or acquisition) are carried, the minimum pressure should be 3300 PSI.

   j. Ensure that the safety plug is fitted in acquisition missiles, or that the firing link is fitted in live missiles.

   k. If live rounds are carried, ensure that safety plugs are available in the weapon pack in case the aircraft is diverted.

   l. Check that the mis-fire indicators in the weapon pack have been reset.

   m. Check the weapon pack for hydraulic leaks.

Guns

5. a. Check the security of the gun pack access panels.

   b. Check that the purging scoop is closed.

PRE-START CHECKS

General

6. Before entering the cockpit, check that:

   a. The trigger safety catch is at SAFE.

   b. The undercarriage lever is DOWN.

   c. The ARM/SAFE switch is at SAFE.

   d. The MAS is at OFF.

   e. The CAMERA MASTER is at ON.

Radar

7. When seated in the cockpit, check that:

a. *Hand Controller.*

(1) Reject lever ...	Rear (to ensure full AI23D operation)
(2) Transmitter ...	Off
(3) Ground test switch	Down (warm-up)
(4) Main radar switch	Inboard (ON)
(5) 80/40 NM scale switch	Down (40 NM scale)
(6) PRF switch ...	Down (high PRF)
(7) Vis-ident switch ...	Off

b. *Indicator.* Select the computer switch to the intended attack mode (if known) and turn the polaroid screen control fully clockwise for day flying. The filter should be turned through $\frac{1}{3}$ to $\frac{1}{2}$ its travel for night flying. It is necessary to check this setting after a picture has appeared on the B-scope. Check that the azimuth and scanner elevation scale lights illuminate after external power has been applied.

LFS

8. Carry out the following checks on the LFS after external power has been applied:

a. Select LFS on the LFS/CRT switch.

b. Ensure the LFS sight glass is fully raised.

c. Select the MAS to GW — check the illumination of the aiming mark.

d. Select the MAS to GUNS — check that the aiming mark depresses.

e. Select the LFS/CRT switch back to CRT.

f. Select the MAS to OFF.

Red Top

9. Check the pure air pressure gauge. For two missiles the gauge should read 4500 PSI at 20°C, varying by 15 PSI per °C (eg at 0°C the gauge should indicate 4200 PSI).

Firestreak

10. Check that the armed time indicator is set to zero.

Guns

11. No additional pre-start checks are specifically necessary for guns. However, before entering the cockpit pay special attention to:

(1) MAS at OFF.

(2) Trigger safety catch at SAFE.

PRE-TAKE-OFF CHECKS

Radar

12. A functional check of the radar should be carried out prior to flight or before the aircraft is put 'on state'. After the starting cycle is complete, the MAS should be set to GW having first checked that the aircraft is pointing in a safe direction, that the trigger is set to SAFE, and the ARM/SAFE switch is set to SAFE. The checks given in the following paragraphs should be carried out:

13. *Search Phase.*

a. Check that the horizon bar is level and aligned with the engraved datum triangles.

b. Turn the gain control fully forward to the minimum position.

c. Adjust the brilliance. With the polaroid dimmer wound fully clockwise, the brilliance control should be adjusted until the sweep is barely visible. If the timebase is discernable as a bright line, the brilliance is too high. The brilliance control affects the complete B-scope display with the exception of the scale lights. However, it will have a more significant effect on the timebase and raw CRT display than the markers. To reduce the overall light level within the B-scope (eg at night), the polaroid dimmer must then be adjusted as required.

d. Turn up the gain until noise speckles are just visible on the display.

e. Set the scanner at 0° elevation.

f. Select 2- and 4-bar scans and check the operation.

g. Check that the picture fills the tube in range on all range scales.

h. Check that the scanner elevation moves through its full range of +27° to minus 8°.

i. Set the scanner to 2-bar scan.

14. *Acquisition Phase.*

a. Select acquisition phase; check that the elevation scan returns to single bar and that the

acquisition band covers 10°. Check the alignment of the acquisition circle and band.

b. Check the full range of movement of the acquisition circle on all range scales.

15. *Track Phase.*

a. Select track; check that the acquisition circle is sweeping and the gap in the time circle indicates 2400 knots (mode 1, 2 or 3 selected) or that there is no gap (modes 4, 5 and 6).

b. Check reject in and reject out on both 80 and 40 NM range scales.

c. Allow the acquisition circle to drift to minimum range and check that two reductions of the time circle occur, and that the breakaway cross is produced in sequence.

16. *Radar Ranging.*

a. Select LFS; check that the steering dot is not painted and that the scanner is at 0° azimuth.

b. Check the elevation marker; on level ground it should be approximately at:

(1) 0° for the Lightning F6.

(2) +2° for the Lightning F3 and T5.

c. Return to CRT, set +10° elevation and 2-bar scan for anti-collision search during the climb.

17. Switch the transmitter on when lining up on the runway (not, however, when in close proximity to ground objects or other aircraft in a formation take-off).

AIRBORNE CHECKS

Radar

18. Carry out regular anti-collision checks during the climb and at height.

19. a. *Lock-On Checks.* When tactically permissible, lock-on to an airborne or ground target, or to the altitude line and check that the automatic gain control operates and that the steering demands and range rate are sensible.

b. *Check of the Elevation Indicator Accuracy.* At the top of the climb, lower the scanner for anti-collision clearance and trim the aircraft in *straight* and *level* flight. Select LFS and note the indicated scanner elevation. The actual angle will equate to the aircraft incidence plus 2° above the MRG horizon. It will, therefore, vary depending on weight, speed and height. Average figures for an AUW of 33,000 to 37,000 lb are:

Height (ft)	*Speed*	*Scanner Elevation (Degrees)*
Sea level	350 knots	3·75° to 4°
25,000	·85M	4° to 4·25°
35,000	·9M	5·25° to 5·5°

Assess any error and apply it when setting the scanner at required angles or calculating target height difference.

Note: With experience, this check can be made during the sighter burst.

c. *Sighter Burst.* The aim of a sighter burst is to product a short film sequence which enables the image to be aligned correctly on the screen during assessment, as well as checking the accuracy of the visual recorder CRT in relation to the cockpit CRT. Before the first interception, a sighter burst should be taken on the visual recorder as follows:

(1) Select AI RECDR switch on.

(2) Select: 0 to 40 NM scale.
Acquisition band (more frames/second).
Scanner at 0° elevation in single-bar scan.

(3) Using the base of the acquisition circle, mark a range reference and then the altitude line by slowly moving the circle over 30° to 40° of azimuth.

Note: Use a reference range well away from the altitude line to avoid subsequent misalignment on the screen.

(4) Select LFS and check scanner elevation accuracy.

(5) Select: 0 to 10 NM scale.
Acquisition band.
Repeat item (3).

(6) Select AI RECDR switch off, and anti-collision search.

PRE-ATTACK CHECKS

General

20. a. Check trigger safety catch at SAFE; place to FIRE when required.

b. Select the MAS to GW or GUNS as required.

c. Select the LFS/CRT switch as required.

d. Select PAIRS or SINGLES as required.

e. CAMERA MASTER switch to ON.

f. AI RECDR switch on.

g. G90 camera IRIS, BRIGHT/DULL switch as required.

h. Telford Recorder Camera iris set.

Radar

21. a. Select Normal or New Facility as required.

b. Transmitter on.

c. Select search phase.

d. Select the required range scale.

e. Select high PRF.

f. Check vis-ident not selected.

g. Select single, 2- or 4-bar scan and scanner elevation as required.

LFS

22. Check the glass is fully up and the brilliance is adjusted.

Red Top

23. a. Select the ARM/SAFE switch to ARM and check that:

(1) The services pressure drops and then returns to normal.

(2) The pure air pressure drops momentarily and then builds up again.

(3) The ARMING light(s) illuminates.

(4) After approximately 2 minutes the ARMED light(s) illuminates.

b. Computer switch to mode 2, 3, 4, 5 or 6 as required.

c. MISSILE TELEMetry switch on if required.

Firestreak

24. a. Select the ARM/SAFE switch to ARM and check that:

(1) The services pressure drops and then returns to normal.

(2) The ARMING light(s) illuminates.

(3) The ARMED light(s) flickers momentarily and then goes out.

(4) After approximately 2 minutes, the ARMED light(s) illuminates.

b. Computer switch to mode 1.

Guns

25. a. Select the LFS/CRT switch to:

(1) LFS for a visual attack.

(2) CRT for a Guns Pure Pursuit attack.

b. Select the MAS to GUNS and check that the EVENT 1 and EVENT 2 captions illuminate on the Armament Indication panel.

POST-ATTACK CHECKS

A breakaway manoeuvre must be made immediately following missile launch. When clear, carry out the **Post-Attack Checks:**

General

26. a. Trigger safety catch to SAFE.

b. AI RECDR switch to off.

Radar

27. a. Select Normal.

b. Select the LFS/CRT switch to CRT.

c. Check that the radar is in the search mode.

Red Top

28. a. Check P GONE/S GONE light(s) illuminated.

b. Select the ARM/SAFE switch to SAFE after a live firing attempt or if there is no requirement for the missile(s) to remain armed.

c. *Resetting an Acquisition Round — System Remaining Armed.* Press the RESET FIRE CONTROL button.

d. *Resetting an Acquisition Round — System De-Armed after Firing.* Press the RESET FIRE CONTROL button before re-arming the system.

Firestreak

29. a. If one drill round and one acquisition round are carried, check that the associated EVENT light goes out followed by momentary illumination of the other EVENT light (1·05 seconds), simulating time to missile motor firing.

b. Select the ARM/SAFE switch to SAFE after a live firing attempt or if there is no requirement for the missile(s) to remain armed.

Guns

30. a. Select the MAS to GW or OFF.

b. Carry out a camera clearing burst using the CAMera button as required.

RECOVERY AND CLOSE FORMATION PRE-JOIN CHECKS

31. Carry out regular anti-collision and ground mapping checks during recovery.

32. Prior to joining in close formation with another aircraft:

a. Select the transmitter off (to prevent burning out the receiver crystals).

b. Select either the LFS/CRT switch to LFS, the MAS to OFF, or the AI into search mode (to prevent burning out the scanner drive motors).

PRE-LANDING CHECKS

33. Carry out the following pre-landing checks:

a. Check that the trigger safety catch is at SAFE.

b. Check the ARM/SAFE switch is at SAFE.

c. Select the MAS to OFF.

d. Select the AI transmitter to off.

AFTER LANDING CHECKS

34. a. Select the main radar switch off.

b. Select CAMERA MASTER to off.

MALFUNCTIONS

Red Top/Firestreak Mis-fire

35. In the event of a mis-fire, take action as follows:

a. Keep the aircraft pointing in a safe direction.

b. Trigger safety catch to SAFE.

c. ARM/SAFE switch to SAFE.

d. MAS to OFF.

e. Inform ATC.

f. Land as soon as possible, using minimum g practical for the recovery.

g. After landing, park in the missile safe area as directed by ATC and have the MASB made safe.

Guns

36. *Stoppage.* Attempt to fire again to confirm stoppage. If confirmed, set the trigger safety catch to SAFE and continue in accordance with Operational or Range Orders.

37. *Runaway Gun.*

a. Break off the attack and continue in a safe direction until the gun stops.

b. Whilst pointing in a safe direction pull the trigger again to ensure all rounds spent.

c. Set the trigger safety catch to SAFE.

d. Set the MAS to OFF.

e. Return to base avoiding populated areas.

f. Inform ATC and have the weapons made safe on the ORP after landing.

PRE-AEROBATIC CHECKS

38. To prevent damage to the scanner drive circuits during aerobatic manoeuvres it is essential that:

a. The main radar switch is ON.

b. Either LFS is selected or the MAS is at OFF.