PART 1

SECTION 5 — RECORDERS

CHAPTER 1 — G90 CAMERA AND AI VISUAL RECORDER

Contents

Introduction

1. A forward looking G90 camera is fitted in a compartment in the lower bullet strut in the air intake and a modified G90 camera is carried in the spine as part of the AI visual recorder.

Forward Looking G90 Camera

2. This camera uses 50 feet of 16 mm film and can operate at 8, 16 or 32 frames per second, the running speed being set before the camera is installed. The standard fit is a Vinten camera. A choice of lens is available: a 1·5 inch lens with a field of view of 15·5° in azimuth and 11° in elevation, or a Telescopic 3 inch lens, which has half the field of view of the 1·5 inch lens, but is more suitable at long range.

3. Camera power supplies are made available by the CAMERA MASTER switch on the starboard console (panel A1 on the T5). With the switch ON the camera can be operated and the IRIS, DULL-BRIGHT switch, adjacent to the master switch, is effective in adjusting the lens aperture to suit prevailing light conditions.

4. The camera runs in the following circumstances:

a. When Launch Warning is present in a GW radar attack, provided ARM is selected, and, in an automatic attack, continues until the breakaway signal supersedes the Launch Warning.

b. When the trigger is pressed (except in a GW radar attack) and ceases when the trigger is released.

c. When, and for as long as, the CAM button on the control column is pressed. This button enables the camera to be operated independent of weapon firing.

Note: An overrun facility allows the camera to continue running for 2 seconds after the trigger/CAMera button has been released, or the Launch Warning signal has been removed. A marker appears on the exposed film to indicate the overrun condition. This facility may be disconnected if not required.

5. *Interpretation of Film.*

a. The main purpose of the G90 camera is to record missile behaviour during the initial stages of its trajectory, and the strike accuracy of guns. To achieve accurate assessment from the film, the camera must be harmonised to determine the position of the optical axis of the camera relative to the aircraft axes.

b. (1) In a GW automatic attack, a breakaway signal is received about 2 seconds after the missile is launched. The camera, if the missile does not turn out of its field of view, only sees the first 2 seconds of the missile's flight but, from the missile's behaviour just after launch, its trajectory and strike accuracy can be determined. If impact information is required the attack must be continued after the breakaway signal with the camera operated by the CAM button on the control column.

(2) In the gun firing mode the target can be seen and so, by reference to harmonisation and true target position, the gun aiming and strike accuracies can be assessed.

Visual Recorder

6. The purpose of the visual recorder is to provide a permanent record of the B-scope display presented to the pilot by using a duplicate B-scope and cine-

camera. Also recorded are a watch face which shows elapsed time, and eight event lights.

7. *Display.* The cockpit B-scope display is repeated on the visual recorder B-scope with the exception of the scales, the engage (E), interrogate (I), and acquisition (W) markers. These are represented by lamps on the visual recorder numbered 1 to 6 as shown in Fig 1. Fig 1 also illustrates a typical track phase display. ▶◀

a. *Lamps No* 1 *and No* 2. These are wired to illuminate with lamps E and I respectively on the top of the B-scope. ▶◀ Lamp No 1 (and E) illuminates any time the trigger is pressed, Lamp No 2 (and I) illuminates, providing GW is selected on the MAS, whenever:

(1) The trigger is pressed with LFS selected.

(2) Launch Warning is generated in normal operation.

(3) Reject out is selected, or the GS CAGE button is pressed, in New Facility or when Kinematic Ranging is available, to generate synthetic Launch signals.

b. *Lamps No* 3 *and No* 4. Illuminate individually to indicate 40 NM and 10 NM scales selected respectively. They also illuminate simultaneously whenever the 80 NM scale or LFS is selected.

c. *Lamps No* 5 *and No* 6. Illuminate to indicate left and right missile acquisitions respectively.

d. *Lamp No* 7. Illuminates whenever Launch Warning is generated, regardless of the source of the signal.

e. *Lamp No* 8. Illuminates when the E/F-band homer is on and the autopilot is engaged.

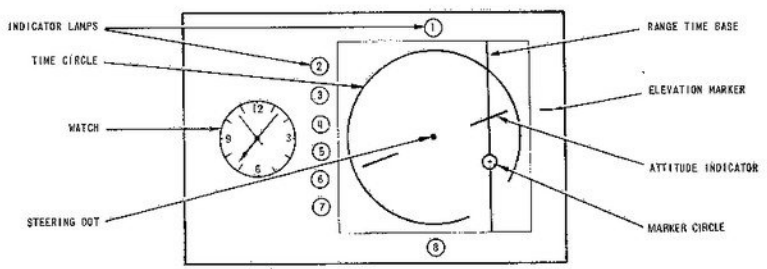
The electro-luminescent watch is not directly in line with the camera and its face is projected into the camera's view by a system of mirrors.

8. *Camera.*

a. The G90 camera used in the visual recorder is modified so that the shutter closes only when the film is moving. The film advance mechanism moves the film one frame on receipt of a signal pulse. During the search phase a pulse is received every alternate sweep of the scanner, ie once every 2·5 seconds, and a full film load has a running time of one hour at this rate. In all other radar phases the pulses occur at the rate of two per second (see also Part 2, Section 1, Chapter 5, para 13). A 50 feet length of film is carried in the magazine.

b. The camera is fitted with a pre-focussed lens. Two aperture values are available and the appropriate one, wide for search and narrow for other phases, is selected automatically. During acquisition, and track, the light output from the watch is increased to compensate for the smaller lens aperture.

9. *Visual Recorder Switching.* Power is made available for recorder operation by pulling the AI RECDR push/pull switch on the starboard console (AI RECORDER switch on panel AI on the T5). ▶◀ An amber lamp in the switch lights when the camera is recording.



1—5—1 Fig 1 Visual Recorder Display
◀ *(New Facility Updating)* ▶