SMITHS AVIATION DIVISION

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MAINTENANCE MANUAL FOR SYNCHRO MULTITURN INDICATOR

FOR CODE NUMBERS OF UNITS COVERED BY THIS MANUAL, SEE PAGE 5

This manual complies with British Civil Airworthiness Requirements, Section A, Chapter A6-2
The technical accuracy of this manual has been verified and is certified as correct.

Signed K. Pearnside *Date* *October 1961*

A.R.B. Design Approval No. *AD/1017/39*

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SMITHS AVIATION DIVISION
MAINTENANCE MANUAL

MAINTENANCE MANUAL 77-10-08/51
(SYNCHRO MULTITURN INDICATOR)
LETTER OF TRANSMITTAL
FOR
REVISION NO. 1

Issued October 1961

by

Smiths Aviation Division

	Action	Reason
1.	Remove and destroy all pages which have been issued under the subject heading SYNCHRO MULTITURN INDICATOR, subject heading MA.8/51. Substitute the revised pages which are attached to this letter of transmittal.	To issue a new title page bearing the certification statement. To amend the text and illustrations where necessary.
2.	Retain this letter of transmittal.	This certifies compliance with Section A, Chapter A6-2 of British Civil Airworthiness Requirements.

NOTE: It is not necessary to record the incorporation of this revision under RECORD OF REVISIONS, this having been carried out by the originator at the time of printing.

This revision complies with British Civil Airworthiness Requirements, Section A, Chapter A6-2. The technical accuracy of this revision has been verified and is certified as correct.

Signed K. Teamside

Date October 1961

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ENGINE INDICATING

SYNCHRO MULTITURN INDICATOR

RECORD OF REVISIONS

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REV. NO.	INSERTION DATE	BY	REV. NO.	INSERTION DATE	BY	REV. NO.	INSERTION DATE	BY
1	Oct. 1961	SMITHS						

The introduction of any amendment or revision not certified in accordance with British Civil Airworthiness Requirements Section A, Chapter A6-2, will invalidate the statement of certification. Amendments or revisions embodied in this manual, which have been certified under an approved authorisation other than that applicable to the initial certification must be recorded on separate record sheets.

ENGINE INDICATING

SYNCHRO MULTITURN INDICATOR

List of Codes

This manual covers Synchro Multiturn Indicators bearing the following Code Numbers:

101 SSA/CP/1

102 SSA/CP/1

ENGINE INDICATING

SYNCHRO MULTITURN INDICATOR

List of Effective Pages

This subject consists of the following pages:

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1	Oct. 61
2	Oct. 61
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10	Oct. 61
11	Oct. 61
12	Oct. 61
13	Oct. 61

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SYNCHRO MULTITURN INDICATOR

DESCRIPTION, OPERATION AND DATA

1. DESCRIPTION

A. General

The synchro torque pressure system provides information on the pressure in the hydraulic torque meter system of the aircraft. Two components are required, a synchro torque pressure transmitter and a synchro multiturn indicator, selection being made from the codes listed in the following table, depending upon requirements.

Instrument	Code
Synchro Torque Pressure Transmitter	102 PTS/BR/1 *104 PTS/BR/1 107 PTS/BR/1 111 PTS/CP/1
Synchro Multiturn Indicator	101 SSA/CP/1 +102 SSA/CP/1

* Has integral pressure restrictor in inlet union.
\+ Fitted for integral lighting.

The torque pressure transmitter is mounted adjacent to the engine on a mounting approved by the engine manufacturer and is connected by flexible piping to the source of pressure. Designed for panel mounting, the multiturn indicator can be fitted wherever desired on the flight deck.

The system is energised from the 115V, 400 c/s, single phase a.c. aircraft supply, the electrical connections between the two components forming part of the aircraft wiring. Variations in pressure cause movement of the synchro transmitter rotor, and thus a corresponding alteration in the reading on the multiturn indicator, which registers pressure in pounds per square inch.

NOTE: For detailed description of the torque pressure transmitter see the appropriate maintenance manual, Smith's Publication 77-10-08/65 or 77-10-08/66.

B. Detailed Description

The synchro multiturn indicator is a panel mounted a.c. operated instrument designed to operate in conjunction with the synchro torque pressure transmitter and thus provide a remote indication of the pressure in the hydraulic torque meter system of an aircraft.

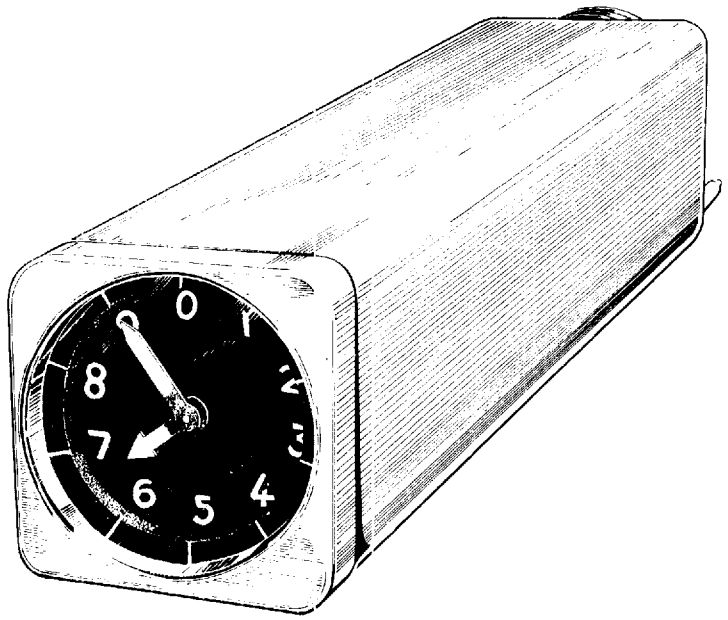

Fig. 1 General view.

The principal components of the indicator are a control transformer synchro, transistor amplifier, 2 phase servo motor, gearbox, and two-pointer presentation, all enclosed in a metal case approximately 2 in. square.

The transistor amplifier, which consists of two stages, each completely encapsulated, incorporates a circuit to attenuate a 3 c/s input signal from the synchro by a factor of at least 5 to 1. This 3 c/s signal is caused by the pulsations in the pressure medium line feeding the torque pressure transmitter. Provision is also made for electrical damping of the indicator to limit the number of overswings.

The presentation consists of two concentric pointers, the smaller rotating in step with the synchro, and the larger rotating ten times as fast. Both move over a dial graduated in ten main divisions.

Electrical connections to the instrument are made via a Cannon connector at the rear of the casing. The supply required is a nominal 115V single phase 400 c/s a. c.

1. OPERATION

The multiturn indicator is electrically connected to the torque pressure transmitter, as shown in fig. 2. When a variation in the pressure in the torque meter feed lines causes a movement of the rotor of the synchro CX in the torque pressure transmitter, there will be a change in the direction of flux in the synchro CT in the indicator, thus inducing a signal voltage in the synchro CT rotor. This is amplified by the two-stage

transistor amplifier and fed to the servo motor which, through the gearbox, drives the pointers and also the rotor of the synchro CT until the new null position is reached and the signal ceases.

3. DATA

A. Name, code number and weight

SYNCHRO MULTITURN INDICATOR		
Code No.	Installation Drawing No.	Weight
101 SSA/CP/1	C 1403/CP	1.53 lb (695g)
102 SSA/CP/1	C 1505/CP	1.64 lb (744g)

B. Power supplies

(1) Indicator (both codes)

115V ± 5%, single phase, 400 c/s ± 5%.

(3) Lighting (102 SSA/CP/1 only)

$5V \begin{smallmatrix} +\ 0.00V \\ -\ 0.25V \end{smallmatrix}$, 400 c/s, a.c.

C. Power consumption

55mA at 0.7 lagging p.f.

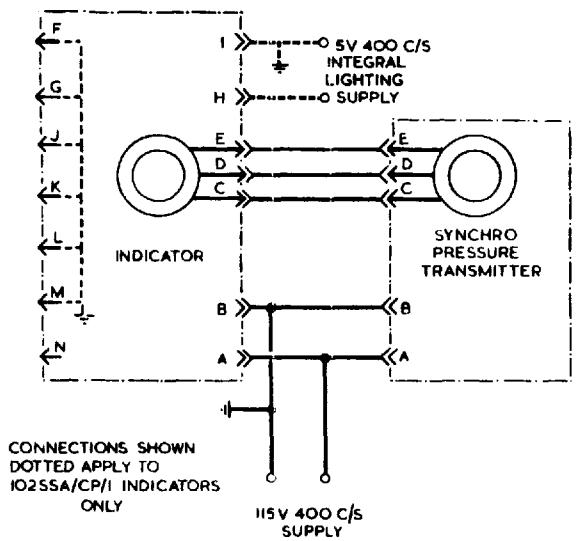

Fig. 2 Simplified system schematic diagram

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UNPACKING

1. GENERAL

A. The instrument is first wrapped in waxed paper and a strip label, impregnated with Vapour Phase Inhibitor and bearing a description and inspection record of the unit, is secured with adhesive tape to the package. The whole is then heat sealed in a polythene bag which is placed in a metal can and held in position by shock resistant moulds. A warning label and a label bearing a complete record of the instrument are secured to the outside of the can, and the lid sealed with adhesive tape. This is a storage pack only and is suitable for use in both temperate and tropical climates.

For transit, the storage pack is packed in a cardboard container bearing a despatch label and a warning label.

NOTE: The package label is merely for identification purposes and the assessment of storage and overhaul periods of the instrument. The label does not confer release authority. The release certificate of the appropriate Airworthiness Authority is forwarded under separate cover.

B. Unless the storage pack shows signs of damage it is not recommended that the pack be opened until the unit is required for use.

2. PROCEDURE

A. Open the transit container and remove the storage pack. Do not unpack further unless the storage pack appears damaged. Retain the transit container and rubberised hair packing for further use.

B. When required, remove the storage pack and cut the polythene bag as near to the heat-seal as possible to allow sufficient material for further sealing.

C. Retain the storage container, shock resistant moulds and polythene bag for further use.

ACCEPTANCE CHECKS

Acceptance checks are not recommended unless the storage pack shows signs of damage. In this event carry out a thorough visual examination of the instrument for damage, corrosion or defects. If serviceability is suspect, subject the instrument to the procedure under TESTING in Overhaul Manual 77-10-08/51.

STORAGE INSTRUCTIONS

1. CONDITIONS

For storage the instrument must be correctly packed in the storage pack. Store the pack in a clean dry atmosphere away from any process which may set up damaging fumes. If practicable, retain the pack in the transit case for additional protection.

2. LIMITING PERIOD

Providing that the storage conditions are fulfilled, the storage limiting period is 24 months.

On the expiration of the limiting period return the instrument to either the manufacturer or an approved overhaul base.

CHECKS/TESTS BEFORE INSTALLATION

First examine the instrument visually for signs of damage, corrosion or defects. If the instrument appears serviceable, install it. Should serviceability be suspect, subject the instrument to the procedure under TESTING in Overhaul Manual 77-10-08/51.

INSTALLATION

Mount the indicator in the aircraft instrument panel, securing it by means of the panel mounting clamp.

Connect the indicator to the transmitter and to the 115V supply by inserting the plug of the aircraft cable in the Cannon receptacle on the rear of the indicator.

CHECKS/TESTS AFTER INSTALLATION

When both the torque pressure transmitter (see Smith's Pub. 77-10-08/65 or 77-10-08/66) and indicator have been installed, it is recommended that the system be tested for correct operation with the aircraft engine running (see Power Plant Manual).

OPERATING INSTRUCTIONS

Not applicable.

MAINTENANCE

1. SCHEDULE

Every 1500 hours	Carry out a thorough visual examination of the instrument in situ. Check for security of fixing, damage, corrosion or defects.

2. PROCEDURE

Not applicable.

TROUBLE SHOOTING

Not applicable.

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REMOVAL

1. Ensure that electrical power supply to the indicator is off.
2. Remove the Cannon connector from the receptacle at the rear of the indicator.
3. Release the clamping screws of the panel mounting clamp and withdraw the indicator.

BENCH CHECK

Subject the instrument to the procedure under TESTING in Overhaul Manual 77-10-08/51.

OVERHAUL PERIOD

NOTE: The Overhaul Period quoted in a recommendation only. If a variation in the period is sought, please refer to the manufacturer's Technical Services Department.

1. Remove the instrument for overhaul after the completion of 3,000 flying hours or 18 months installed time, whichever occurs first. The specified period of storage does not affect the installed time given, but unused storage time must not be added to the installed time.
2. Return the instrument to the manufacturer or an approved overhaul base.

RETURN TO MANUFACTURER OR BASE

Pack the instrument in the storage pack and transit container in the same manner as originally received. Include in the pack documentation giving a brief history of the unit in service, together with the reason for return. Type of information required is:

1. Code and serial number of instrument.
2. Date of removal from aircraft.
3. Date of last overhaul.
4. Note and date of any modification.
5. Number of flying hours completed.
6. Reason for return of instrument.