FLIGHT MANUAL SUPPLEMENT
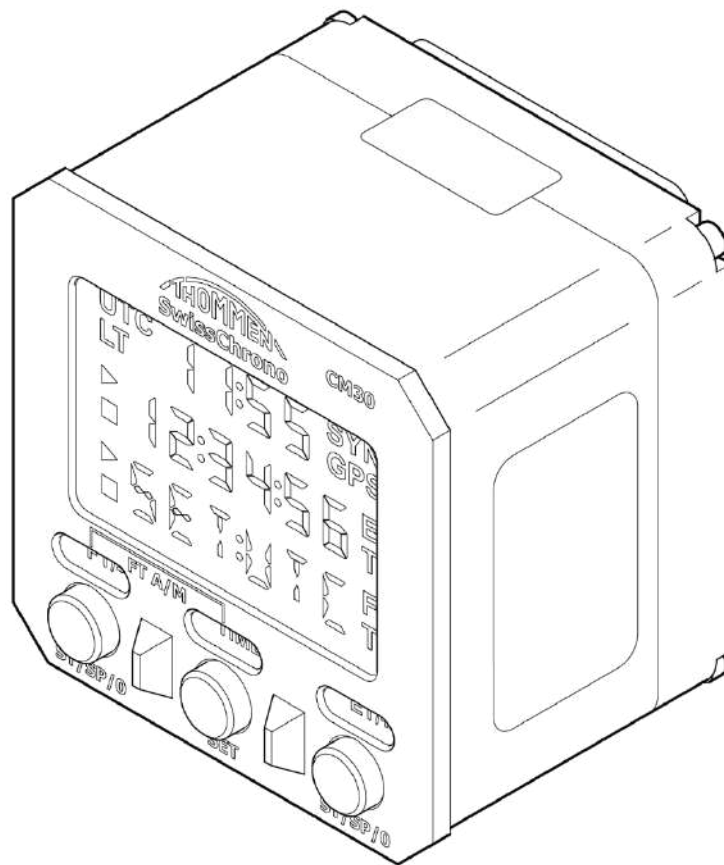
CM30 DIGITAL CHRONOMETER

ATA 31-22-21

Revision: 1.1

29/04/2022

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THOMMEN
AIRCRAFT EQUIPMENT

RECORD OF REVISIONS

Rev.	Date	Reason for Revision	Prepared	Checked	Approved
1.0	MAR 20/2013	Initial Release	T. Balazs	-	R. Freimuth
1.1	APR 29/2022	Document reformatted with updated logo and company address. Removal of MID number (S/N 2455). References to SynxT adapter and GPS deleted. General corrections and improvements.	J. Garrett	G. Schaffner	A. Savin

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<u>**SERVICE BULLETIN LIST**</u>

SB No.	Subject	Rev.	Date

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INTRODUCTION

1. Proprietary Notice

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2. Purpose of this Manual

    The information contained in this Flight Manual Supplement is for operator reference use only.

    For information concerning the installation and configuration of the CM30 Digital Chronometer, refer to the Installation and Operating Manual (CM30-INSOP), ATA 31-22-20.

    For repair procedures, refer to the Component Maintenance Manual (CM30-CMM), ATA 31-22-20.

3. Manual Description

    The page blocks in this manual comply with the Air Transport Association of America (ATA) specification i2200.

4. Revisions

    Thommen Aircraft Equipment AG (TAE) gives the customers (that have a product guarantee) a complete revised manual when a change is included in a manual. The Record of Revisions section gives the reason for the changes done in the current revision.

    A documentation revision service (with a customer portal) is also available for customers that have instruments/devices no longer covered by a product guarantee. This can be useful when an upgrade to the instrument/device can improve the operational life and/or reliability of older products.

    The documentation revision service also includes the necessary Service Bulletins that upgrade/modify the device.

5. Warnings, Cautions and Notes

   5.1 Warnings

   WARNING: WARNINGS ARE GIVEN IN THE RELEVANT PAGE BLOCKS TO TELL PERSONNEL ABOUT SOMETHING THAT CAN CAUSE INJURY TO THEM. WARNINGS ARE GIVEN IMMEDIATELY BEFORE THE APPLICABLE TEXT TO WHICH THEY REFER.

   5.2 Cautions

   CAUTION: CAUTIONS ARE GIVEN IN THE RELEVANT PAGE BLOCKS TO TELL PERSONNEL ABOUT SOMETHING THAT CAN CAUSE DAMAGE TO THE EQUIPMENT. CAUTIONS ARE GIVEN IMMEDIATELY BEFORE THE TEXT TO WHICH THEY REFER.

   5.3 Notes

   NOTE: Notes give helpful information to the personnel doing the task. Notes are included before or after the text to which they refer.

6. Technical Support

   Approved servicing facilities exist worldwide. Please contact Thommen Aircraft Equipment AG at the address given below for information regarding the facility nearest to your location.

   THOMMEN AIRCRAFT EQUIPMENT AG

   Hofackerstrasse 48
   CH-4132 Muttenz
   Switzerland

   Phone: +41 (0)61 965 22 22

   Email: tech-support@thommen.aero

   Internet: www.thommen.aero

7. Installer Responsibility

   The installer (and/or approved service facility) is responsible for the correct installation of the equipment. This includes the mechanical and electrical configuration and compatibility with the aircraft.

8. Document/Equipment Feedback

   The Document / Equipment Defect Report (on the next page) gives the customer and/or Approved Service Facility a way to inform Thommen Aircraft Equipment AG about any defects regarding the equipment or discrepancies in the technical documentation. This feedback will help Thommen Aircraft Equipment AG to make continued improvements to the equipment and/or the technical documentation.

DOCUMENT / EQUIPMENT DEFECT REPORT			
Aircraft Type	**Serial No.**	**Manual No.**	**Operator**

Date	**Reported By**	**Contact Details**

Document / Equipment:	
Description of Defect:	

Corrective action taken to continue operation:

Please send to:

THOMMEN AIRCRAFT EQUIPMENT AG
Hofackerstrasse 48
CH-4132 Muttenz
Switzerland

Telephone: +41 (0)61 965 22 22

Email: tech-support@thommen.aero

9. List of Abbreviations

Abbreviation	Description
ATA	Air Transport Association
BAT	Battery
CM30	Digital Chronometer, Type CM30
CMM	Component Maintenance Manual
DEF	Defect
ERR	Error
ET	Elapsed Time
FT	Flight Time
GPS	Global Positioning System
INSOP	Installation and Operating Manual
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LT	Local Time
MID	Master Identification Number
MTH	Maintenance Timer in Hours
NVIS	Night Vision Imaging System
REV	Revision
RTCA	Radio Technical Commission for Aeronautics
SB	Service Bulletin
SBIT	Start-up Built-In Test
ST/SP	Start/Stop
SynxT	Synchronized Timer
TAE	Thommen Aircraft Equipment
UTC	Universal Coordinated Time
WoW	Weight-on-Wheels

DESCRIPTION AND OPERATION

1. Description

    1.1 General

    The CM30 is a digital chronometer with Universal Coordinated Time (UTC), Local Time (LT), Flight Timer (FT), Elapsed Timer (ET) and Maintenance Timer in Hours (MTH) (remote mode only) functions.

    It has the purpose to provide clock and timer capabilities in aviation cockpit applications.

    1.2 Function Description

    The CM30 has a three-line negative image liquid crystal display (LCD). The top line shows the UTC or LT, the middle line shows the Elapsed Timer (ET) and the bottom line shows the Flight Timer (FT).

    Dual mode (day/night) LED backlighting allows the display to be clearly read under all lighting conditions.

    Located below the display, 3 push-buttons allow the user to easily switch between display modes or to start and stop the counter.

    A built-in battery prevents the loss of stored time settings if there is a power interruption.
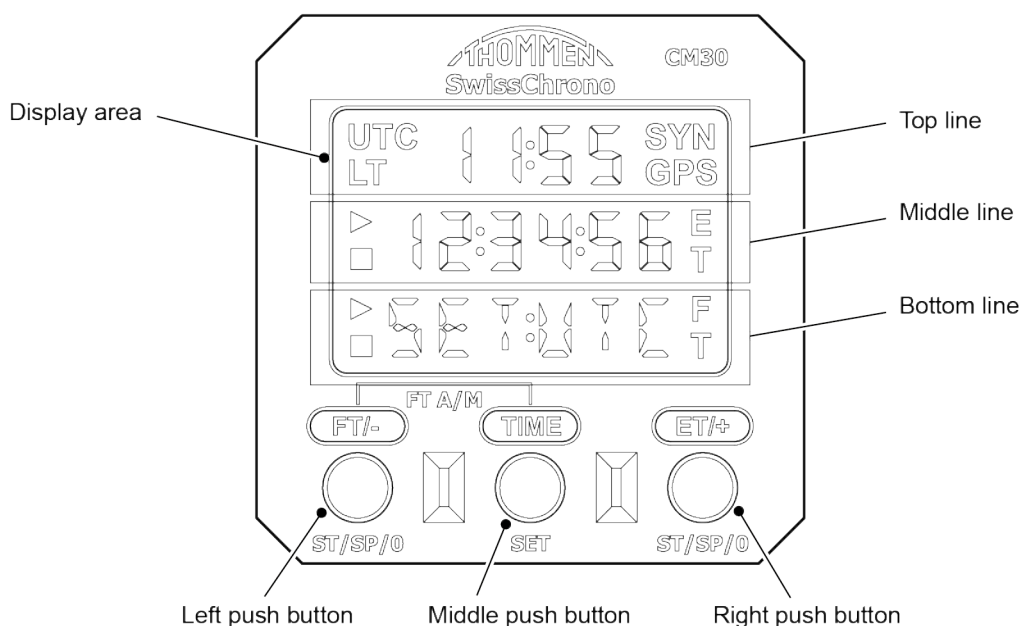

Figure 1 – CM30 Digital Chronometer, Front View

1.3 Limitations

The CM30 is vibration tested in accordance with category U2 of section 8.0 of RTCA/DO-160F, curves F and F1, without shock mounts.

The CM30 can therefore be installed in a helicopter or a fixed wing aircraft.

The CM30 can be operated within the following environmental limitations:

- Temperature: -45° C to +70° C (-49° F to +158°F)
- Altitude: Max. 55 000 ft (16 800 m)
- Humidity: 95% ±4% relative humidity

1.4 References

Refer to Installation and Operating Manual (CM30-INSOP) for installation and configuration instructions.

Refer to Component Maintenance Manual (CM30-CMM) for overhaul procedures.

1.5 Warnings and Cautions

WARNING: IF AN AIRCRAFT PILOT IS USING NVIS GOGGLES, AN UNINTENDED SWITCH OF THE CM30 TO DAY MODE CAN INCREASE THE DISPLAY LUMINANCE TO A LEVEL WHERE THE PILOT CAN BE TEMPORARILY BLINDED. IN THIS CONDITION, THE NVIS GOGGLES CAN UNEXPECTEDLY SHUT DOWN.

2. Operation

2.1 General

When electrical power is switched ON, the CM30 enters a Start-up Built-In Test (SBIT) routine. During this time, all display segments are turned on for about five seconds, as shown below.
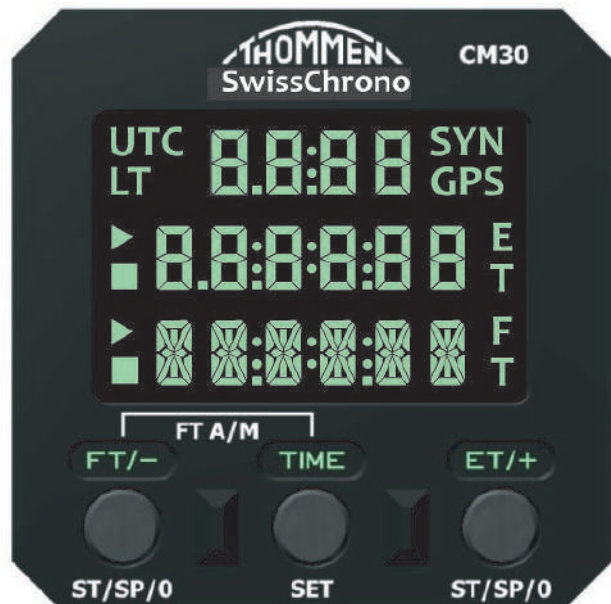

Figure 2 – During Five Second Start-up Built-In Test (SBIT)

When the SBIT is finished, the screen changes to show the pre-set coordinates, as shown below.

Figure 3 – After Five Second Start-up Built-In Test (SBIT)

2.2 Manually Setting the Universal Time Coordinated (UTC) Time

Do the following procedure to manually set the UTC time (Greenwich Mean Time). Refer to the figure below the procedure for item number references.

(1) Push the 'TIME' push-button (3) for three seconds. Make sure that the top row of digits is off, and the hour digits in the middle row (1) start to flash.

(2) Push the 'FT/-' push-button (4) or the 'ET/+' push-button (2) to decrease/increase the hour digits to the UTC time.

(3) Push the 'TIME' push-button (3) and make sure that the minute digits in the middle row (1) start to flash.

(4) Push the 'FT/-' push-button (4) or the 'ET/+' push-button (2) to decrease/increase the minute digits to the UTC time.

(5) Push the 'TIME' push-button (3) and make sure that the second digits in the middle row (1) start to flash.

(6) Push the 'FT/-' push-button (4) or the 'ET/+' push-button (2) to decrease/increase the second digits to the UTC time.

(7) Push the 'TIME' push-button (3) three times to set the UTC to the programed time. Make sure that the screen changes to show the actual UTC in the top row of digits.

(8) Make sure that the UTC that you set is the same as the actual UTC (Greenwich Mean Time).

(9) If a second CM30 Digital Chronometer is connected as a 'slave', make sure that it shows the same UTC.

Figure 4 – Manually Setting the Universal Time Coordinated (UTC) Time

2.3 Manually Setting the Local Time (LT)

Do the following procedure to manually set the LT time. Refer to the figure below the procedure for item number references.

(1) Make sure that the UTC is correctly set.

(2) Push the 'TIME' push-button (3) once and make sure that:

- 'UTC' and its value are shown in the top row of the display.

- The middle row (1) shows the current local time (with flashing hours).

- 'SET:LT' is shown in the bottom row of the display.

(3) Push the 'FT/-' push-button (4) or the 'ET/+' push-button (2) to decrease/increase the hour digits to the local time.

(4) Push the 'TIME' push-button (3) and make sure that the minute digits of the local time (1) start to flash.

(5) Push the 'FT/-' push-button (4) or the 'ET/+' push-button (2) to decrease/increase the minute digits to the local time.

NOTE: The minutes increase/decrease in 15-minute increments only.

(6) Push the 'TIME' push-button (3) and make sure that display goes back to the start page.

Figure 5 – Manually Setting the Local Time (LT)

2.4 Setting the Elapsed Timer (ET)

Do the following procedure to set the Elapsed Timer (ET). Refer to the figure below the procedure for item number references.

(1) Push the 'ET/+' push-button (2) for three seconds and make sure that the 'ET' row (1) is set to '00:00:00' and a square symbol is shown at the beginning of the zeros.

(2) Push the 'ET/+' push-button (2) once and make sure that the Elapsed Timer (ET) starts to count, and a triangle symbol is shown at the beginning of the counting digits.

(3) Push the 'ET/+' push-button (2) and make sure that the Elapsed Time (ET) stops counting and the triangle symbol is still shown at the beginning of the stopped digits.

NOTE: You can repeat the above two steps as many times as required.

(4) Push the 'ET/+' push-button (2) for three seconds and make sure that the 'ET' row (1) is set to '00:00:00' and a square symbol is shown at the beginning of the digits.
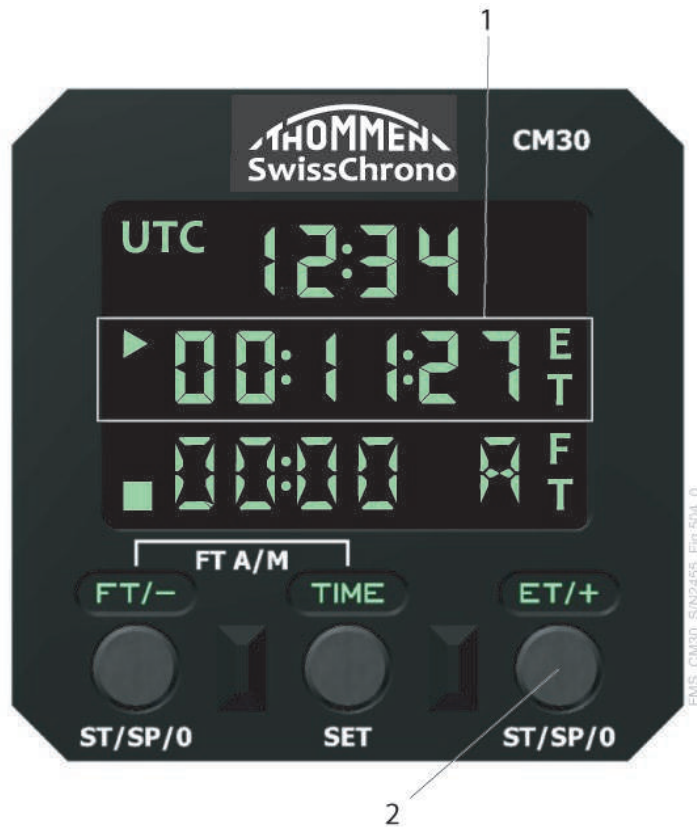

Figure 6 – Setting the Elapsed Timer (ET)

2.5 Manually Start/Stop the Flight Timer (FT)

Do the following procedure to manually start/stop the Flight Timer (FT). Refer to the figure below the procedure for item number references.

NOTE: In AUTOMATIC mode the flight timer starts and stops automatically when a Weight-on-Wheels (WoW) signal is available.

(1) Push the 'FT/-' push-button (2) for three seconds and make sure that the 'FT' row (1) is set to '00:00' and a square symbol is shown at the beginning of the digits.

(2) Push the 'FT/-' push-button (2) once and make sure that the 'FT' row (1) starts to count (visible after one minute) and a triangle symbol is shown at the beginning of the zeros.

NOTE: The colon between the hour and minute digits flashes on/off when the counter is running.

(3) Push the 'FT/-' push-button (2) once and make sure that the 'FT' row (1) stops counting and a square symbol is shown at the beginning of the digits.

(4) To reset, push the 'FT/-' push-button (2) for three seconds and make sure that the 'FT' row (1) is set to '00:00' and a square symbol is shown at the beginning of the zeros.

Figure 7 – Manually Start/Stop the Flight Timer (FT)

2.6 Changing between Manual and Automatic Flight Timer (FT)

Do the following procedure to change between manual and automatic Flight Timer (FT). Refer to the figure below the procedure for item number references.

NOTE: The flight timer cannot be changed from 'Manual' to 'Automatic', or from 'Automatic' to 'Manual', when the timer is running.

(1)   With the aircraft on the ground, push the 'FT/-' push-button (2) for three seconds to stop the flight timer counter (1).

(2)   To change from 'Manual' to 'Automatic', push both the 'FT/-' push-button (2) and the 'TIME' push-button (3) at the same time. Make sure that the 'FT' row (1) is set to '00:00' and a square symbol is shown at the beginning of the digits and an 'A' after the digits.

(3)   To change from 'Automatic' to 'Manual', push both the 'FT/-' push-button (2) and the 'TIME' push-button (3) at the same time. Make sure that the 'FT' row (1) is set to '00:00' and a square symbol is shown at the beginning of the digits and an 'M' after the digits.

Figure 8 - Changing between Manual and Automatic Flight Timer (FT)

DESCRIPTION AND OPERATION

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2.7 Changing between Universal Time Coordinated (UTC) and Local Time (LT)

Do the following procedure to change between Universal Time Coordinated (UTC) and Local Time (LT). Refer to the figure below the procedure for item number references.

(1) Push the 'TIME' push-button (2) to change from 'UTC' (1) to 'LT' (3).

Figure 9 - Changing between Universal Time Coordinated (UTC) and Local Time (LT)

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FAULT ISOLATION

1. General

This section gives the general fault isolation information to assist in locating and correcting any malfunctions with the CM30 Digital Chronometer.

1.1 Malfunctions

A warning appears when the built-in battery doesn't provide enough power for safe operational mode.

The bottom line displays a warning message for five seconds. After that, the CM30 continues to operate normally.

The message can be:

Message	Description
BAT:LOW	Battery capacity is low, replace soon
BAT:DEF	Battery capacity is too low, replace immediately

Table 101 – Warning Messages

1.2 Troubleshooting

If an unexpected error occurs during the operation of the CM30, the clock will be stopped.

The top and middle lines will statically display '--:--' and '--:--:--' respectively.

The bottom line will display 'ERR:<Code>'.

Make a note of the error code and inform the technical service about the error message.

Currently, the possible error codes displayed by the CM30 are:

Error Code	Description
001	Battery not detected

Table 102 - Error Codes

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