

United States Of America
Department of Transportation - Federal Aviation Administration
Supplemental Type Certificate

Number SA01815LA

This Certificate issued to

**Sandel Avionics, Inc.
2401 Dogwood Way
Vista, California 92083**

*certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part *3 of the Civil Aviation Regulations.
(*Certification basis is set forth in Type Certificate Data Sheet A7CE)*

Original Product Type Certificate Number:

A7CE

Make:

Cessna Aircraft Company

Model:

421C Series

Description of Type Design Change: **Installation of Sandel Avionics SN3500 Electronic Horizontal Situation Indicator (EHSI) in accordance with FAA Approved Sandel Avionics Master Drawing List, Document No. ST11694LA-A-01, Revision "B", dated July 22, 2005. , or later FAA approved revision. FAA Approved Sandel Avionics Airplane Flight Manual Supplement, Supplement No. ST11694LA-A-10, Revision "Orig.", dated August 24, 2005, or later FAA approved revision.**

Limitations and Conditions: **This approval should not be incorporated in any aircraft unless it is determined that the interrelationship between this installation and any previous approved configuration will not introduce any adverse effect upon the airworthiness of the aircraft.**

If the holder agrees to permit another person to use this certificate to alter the product, the holder must give the other person written evidence of that permission.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator

Date of application: May 10, 2005

Date reissued:

Date of issuance: August 25, 2005

Date amended:



By direction of the Administrator

S. Larry Hashem
(Signature)

Manager, Systems & Equipment Branch, Los Angeles Aircraft Certification Office

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

SANDEL AVIONICS INC.
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Vista, CA 92081
Telephone: (760) 727-4900
Facsimile: (760) 727-4899

DOCUMENT NO. ST11694LA-A-01

Revision F

Project Numbers ST11694LA-A and SA13763LA-T

STC No. SA01815LA

MASTER DRAWING LIST

for
Make: CESSNA
Model: 421

with

Sandel Avionics SN3500 or SN4500
Primary Navigation Displays
with

Optional Reversionary Attitude Display

&

SG102 Attitude Heading Reference System

FAA APPROVED

JUN 04 2009

LOS ANGELES
AIRCRAFT CERTIFICATION OFFICE
INITIALS: *BT/figueroa*

PREPARED BY:

Dan Weisz

Dan Weisz, Project Eng.

Date

4/8/09

REVIEWED BY:

Gerry Block

Gerry Block, Dir. of Quality

Date

4.8.09

APPROVED BY:

Gerry Block

Gerry Block, Dir. Eng.

Date

4.8.09

PROPRIETARY DATA

SANDEL AVIONICS proprietary rights are included in the information disclosed herein. Recipient by accepting this document agrees that neither this document nor the information disclosed herein nor any part thereof shall be reproduced or transferred to other documents or used or disclosed to others for manufacturing or for any other purpose except as specifically authorized in writing by SANDEL AVIONICS.

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REV	DATE	PAGES	Description of Change
F	04/08/09	Title Hdr/Ftr 3 4 5 6	Updated project numbers, added STC number and Reversionary Attitude Mode. Updated for revision F. Updated for revision F. Format change. Updated note 1 for SG102 ICA and added note 5. Updated Drawing List revisions on Items 1 and 9. Added items 21, 22, and 23. Updated Reference Docs List revisions on Items 1, 2, 7, 8, 11, and 12. Added item 14.
E	01/30/08	Title 3 4 2,3,4	Added Primary Navigation Displays Added note 4 to include SG102 as primary heading source. Updated reference document list. Update footers.
D	06/08/06	3,4	Modified to include SN4500. Added items 12-20 to Drawing List. Added items 7-10 to Reference Docs.
C	11/18/05	3	Rev change to items 1,7,9 and 11 on drawing list. Reference docs added and Rev updates.
B	7/22/05	3	Moved doc #'s ST11694LA-A-12 and ST11694LA-A-13 from drawing list to reference documents. Changed item 9 on Drawing List table. Updated Ground Test Plan to be Ground Test Report in drawing list. Added Summary flight test report to referenced documents list. Ref doc. Pilots Guide revision B.
A	5/06/05	All	Initial Release

FAA APPROVED

JUN 04 2009

LOS ANGELES
AIRCRAFT CERTIFICATION OFFICE
INITIALS: *BT. H. Gaudin*

NOTES:

(1) The Maintenance Instructions for Continued Airworthiness are contained in Sandel Avionics documents No. ST11694LA-A-05 for the SN3500, ST11694LA-A-25 for the SN4500, and No. ST11694LA-A-45 for the SG102. The aircraft operator shall incorporate the changes and additions into respective aircraft Wiring Diagram, Illustrated Parts List (IPC) and Maintenance Manual.

(2) All electrical and mechanical system work shall be in accordance with AC43.13-() Latest Revision.

(3) The SN3500 and SN4500 are functionally and operationally equivalent. The SN3500 and SN4500 may be installed with a Sandel SG102 Attitude Heading Reference System (AHRS) for display of primary heading.

(4) The SG102 may be installed using ARINC 429, ARINC 407 interface data formats or as a replacement for a Bendix King KG102 heading gyro in accordance with the appropriate SN3500 or SN4500 and SG102 Installation Manuals. See reference document list herein.

(5) FAA project number SA13763LA-T amended STC SA01815LA approving the installation of Sandel SN3500 or SN4500 Primary Navigation Display with Reversionary Attitude Mode using the Sandel SG102 AHRS as a primary heading source and/or reversionary attitude source for roll, pitch and lateral acceleration (slip/skid).

DRAWING LIST:

Item No.	Doc/Drawing #	Rev	Title
1	ST11694LA-A-01	F	Master Drawing List
SN3500 EHSI Applicable Drawings			
2	ST11694LA-A-02	B	Ground Test Plan/Report
3	ST11694LA-A-03	A	Flight Test Plan
4	ST11694LA-A-04	A	Structural Analysis Report
5	ST11694LA-A-05	A	Instructions for Continued Airworthiness
6	ST11694LA-A-06	A	Electrical Load Analysis
7	ST11694LA-A-07	B	Wiring Diagram, Sandel SN3500 on Cessna 421
8	ST11694LA-A-08	A	Installation, SN3500 on Cessna 421
9	82005-0125	E	Functional Hazard Assessment, System Level ¹ (SN3500 with Reversionary Attitude Display)
10	ST11694LA-A-10	A	Airplane Flight Manual Supplement
11	ST11694LA-A-15	A	Supplemental Electrical Load Chart
SN4500 EHSI Applicable Drawings			
12	ST11694LA-A-22	A	Ground Test Plan/Report
13	ST11694LA-A-23	A	Flight Test Plan
14	ST11694LA-A-24	A	Structural Analysis Report
15	ST11694LA-A-25	A	Instructions for Continued Airworthiness
16	ST11694LA-A-26	A	Electrical Load Analysis
17	ST11694LA-A-27	A	Wiring Diagram - Cessna 421 SN4500 EHSI 1 - Pilot
18	ST11694LA-A-28	A	Installation - SN4500 EHSI System Cessna 421
19	82009-0125	A	Functional Hazard Assessment, System Level ¹
20	ST11694LA-A-30	-	Airplane Flight Manual Supplement
21	ST12361LA-T-31	B	Functional Hazard Assessment, System Level (SN4500 with Reversionary Attitude Display)
SG102 AHRS Applicable Drawings			
22	ST11694LA-A-45	A	SG102 AHRS Instructions for Continued Airworthiness STC SA01815LA
23	ST11694LA-A-47	A	Wiring Diagram SG102 AHRS to SN3500/SN4500 for Primary Heading and Reversionary Attitude Mode

¹ The selected DER for evaluation of SSA has found that the complexity of this installation, per A.C. 23.1309xxx, does not rise to the level associated to an SSA being required. An FHA has been incorporated to replace the requirement for the safety acknowledgement portion of the PSCP.

REFERENCE DOCUMENTS:

Item	Doc #	Rev.	Title
1	82005-PG	J or later	SN3500 Pilots Guide
2	82005-IM	G or later	SN3500 Installation Manual
3	ST11694LA-A-12	A	Weight and Balance Report
4	ST11694LA-A-13	A	Flammability Analysis Report
5	82005-0139	July 12, 2005	Summary Flight Test Report
6	82005-0143	B	SN3500 EHSI Data Link Weather Flight Test Plan / Report
7	82009-PG	D or later	SN4500 Pilots Guide
8	82009-IM	D1 or later	SN4500 Installation Manual
9	ST11694LA-A-32	A	Weight and Balance Report (SN4500)
10	ST11694LA-A-33	A	Flammability Analysis Report (SN4500)
11	82011-PG	D or later	SG102 Pilots Guide
12	82011-IM	E or later	SG102 Installation Manual
13	82011-CFT-02	A	Sandel Avionics Company Flight Test Plan/Report
14	ST12361LA-T-43	B	Flight Test Plan / Report for Make Cessna Model Citation S550 with Sandel Avionics SN4500 with Reversionary Attitude Mode and Sandel SG102 AHRS