

LTV ELECTROSYSTEMS, INC.

P. O. BOX 1056 - GREENVILLE, TEXAS 75402

PHASE I

ENGINEERING STUDY REPORT on SP-2H MODIFICATION

REPORT NO. G-8853.01.02

1 April 1966

Revised 7 April 1966

Prepared by:

R O Baker

R. O. Baker
Systems Engineer

Approved by:

C. V. Slagle

C. V. Slagle
Project Engineer

Rev. "A"

Pages Affected: 17, 59, 68

Added: Appendices B & C

Rev. "A"

R O Baker

R. O. Baker

Rev. "A"

C. V. Slagle

C. V. Slagle

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3.2.4 GROUND MAPPING (GM)

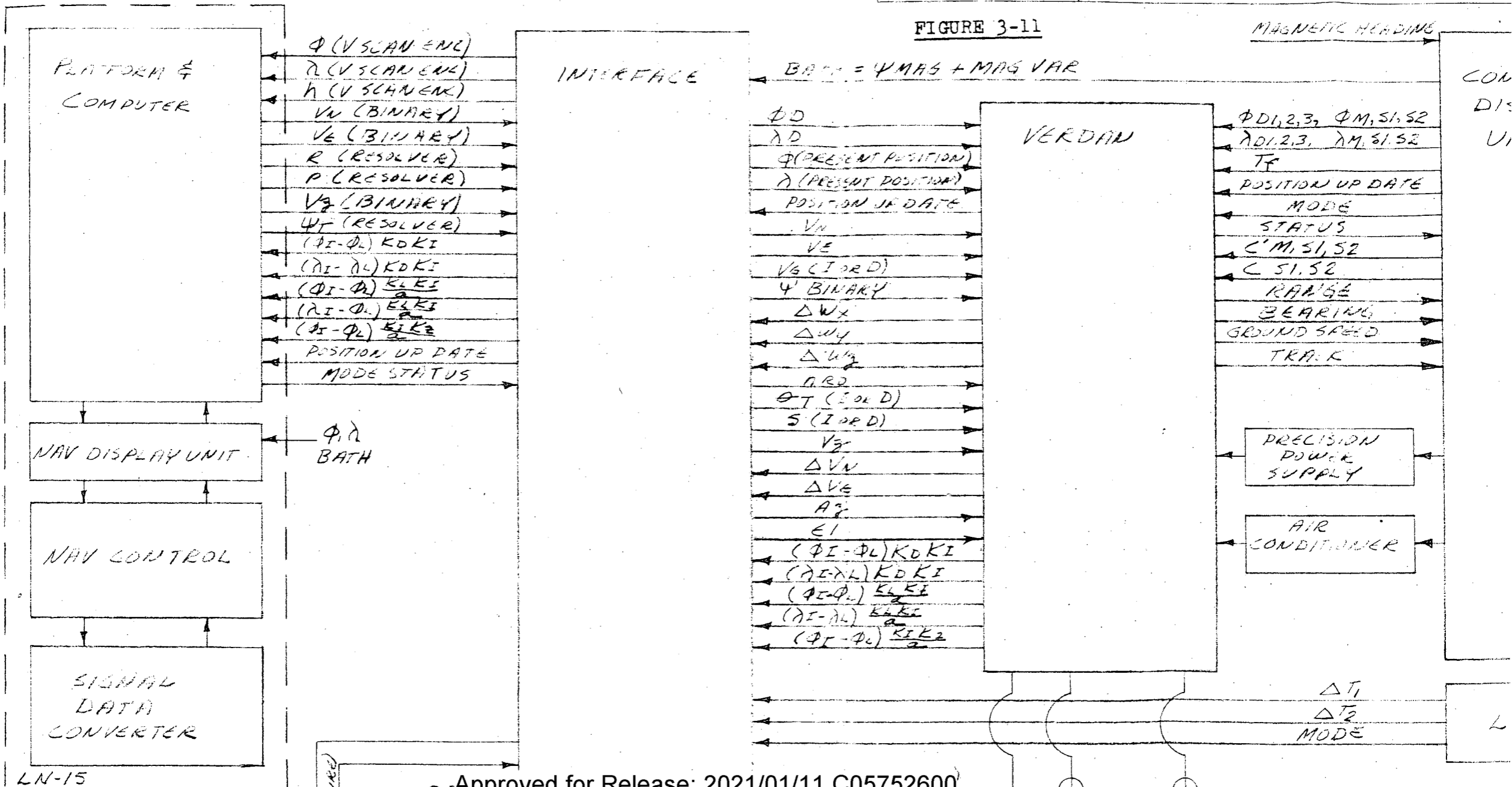
In the GM mode, lateral surveillance combined with an antenna tilt feature will provide a PPI display that may be used as a navigational aid for detecting water-land boundaries and other terrain characteristics. Ranges of 5, 10, and 15 miles may be selected.


3.2.5 OPERATIONAL PARAMETERS

The AN/APQ-110 (modified for single-channel operation) is a K_u -band, vertically scanning, on-boresight elevation monopulse, pulsed radar. The system will provide pitch rate error commands to the pilot over the velocity

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NAVIGATION SYSTEM INTERCONNECTION BLOCK DIAGRAM	

FIGURE 3-11



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"A" 3.8.3.3

Compass

The N-1 Compass system was considered as a replacement for the MF-1. The performance of the two systems was compared and it was decided that the improvement in performance does not justify the schedule delay and cost incurred. This decision was based on the fact that it is used as a back-up heading reference in case of inertial failure. The decision was coordinated with the customer.

3.8.3.4

INTERFACE UNIT

The Interface Unit provides proper signal conditioning and signal format between the Loran, Inertial, Verdian Computer, and aircraft avionic systems. The major function of the Interface Unit is to convert outputs from sources external to the Verdian Computer into a format acceptable as an input to the Verdian Computer and to convert outputs from the Verdian Computer into a signal or format acceptable as an input to devices external to the Verdian Computer.

The types of signals which must be processed by the Interface Unit are shown in Figure 11. The Interface unit provides circuitry and mechanisms for converting analog (synchro, resolver, etc.) signals into digital format, buffering digital signals to provide proper signal characteristics (voltage level, current, etc.), converting digital signals into analog signals and servo drive signals along with the necessary logic

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APPENDIX BCONTRACTOR-FURNISHED EQUIPMENTREQ'D

1	AN/APN-153	R-T Unit
1	AN/APN-153	Control
1	AN/APN-153	Antenna
1	AN/APN-153	Radome
1	AN/ASN-25	Nav Computer
1	AN/ASN-25	Control
1	AN/ASN-25	Short Range/Indicator
1	LN-15	Inertial Nav Unit
1	LN-15	Control Signal Converter
1	LN-15	Control Unit
1	LN-15	Display
2	G 320	Air Conditioner
1	AN/ARN-78	Receiver
1	AN/ARN-78	Coupler
1	AN/ARN-78	Control
1	AN/ARN-78	Indicator
1	AN/APN-167	R-T Unit
2	AN/APN-167	Antenna
2	AN/APN-167	Indicator
1		Blower
1	AN/APQ-110	Antenna/Receiver Unit
2	AN/APQ-110	Indicator
1	AN/APQ-110	Control

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APPENDIX B (Continued)CONTRACTOR-FURNISHED EQUIPMENTREQ'D

1	AN/APQ-110	Synchronizer-Transmitter
1	AN/APQ-110	Power Supply
1	AN/APQ-110	Computer
2	ARU-11A	
5	G-159	Digital Clock
2	G-160A	Junction Box
1	G-190B	Programmer
1	G-261A	Power Supply
1	G-507	Power Supply
1	G-355	Control
1	G-495 ()	Serializer
1		Mission Event Cont. Panel
1	G-189 ()	Readout
1		Readout Selector
1		Nav Interface Unit
2	G-176J	Recorder
1	G-184C	Recorder Amplifier
1	G-700	Recorder Control
1	KA-51A	Camera
1	KA-51A	Control Assy.
1	KA-51A	Control Panel
1	KA 60	Camera
1	KA 60	Camera Control Assy

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APPENDIX B (Continued)

<u>REQ'D</u>	<u>CONTRACTOR-FURNISHED EQUIPMENT</u>	
1	KA 60	Control Panel
2	TRIM-7	R-T Unit
1	Vector/Sector	Receiver
4	X-Band	Antenna
8	S-Band	Antenna
1		Audio Monitor Panel
1	618T-2	R-T Unit
1	180L-3	Tuning Unit
2	714E-3	Control
1	618T	Selector
1		FLIR Interface System
1		Inertial Interface System
1		Loran Interface System
2	ARU-11A	Indicator
1	25623	Angle of Attack Sensor
1		Verdan Power Supply
1	G-304 (Mod)	Display and Control
1	G-305 (Mod)	AN/ASN-53 Nav Control
1	G-310 (Mod)	Display Electronics

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APPENDIX CGOVERNMENT-FURNISHED EQUIPMENTREQ'D

1	FLIR	Receiver
1	FLIR	Power Supply
3	FLIR	Display
1	FLIR	Electronics
1	FLIR	Control
1	500-Cycle	Converter
1		Heat Exchanger
1	FLIR	Receiver Mount
3	41968-501-61	Verdan D9A Computer
4	T.O.11G6-13-2-1	
4	T.O.11G6-13-2-2	
4	T.O.11G6-13-2-3	
4	T.O.11G6-13-2-4	
1	C2-97A-A	Computer Test Set
4	T.O.31X2-3-16-1	
4	T.O.31X2-3-16-2	
4	T.O.31X2-3-16-3	
4	T.O.31X2-3-16-4	
1	Set TEst Tapes Listed in T.O.31X2-3-16-1, Figure 2-1	
1	Set Test Equipment Listed in T.O.31X2-3-16-1, Figure 2-2	
1	LLTV Camera	
3	LLTV Display	
1	LLTV Camera Control	
1	LLTV Camera Mount	

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Appendix C (Continued)

GOVERNMENT-FURNISHED EQUIPMENT

REQ'D

- | | | |
|---|-----------------------------------|----------------|
| 1 | LLLTV Camera Electronics | |
| 1 | LLLTV Gimbal Electronics | |
| 1 | LLLTV Platform Control | |
| 1 | LLLTV Pilot's Platform Control | |
| 1 | D-5 Scanner Unit (R.H.Film Drive) | |
| 1 | D-5 Scanner Unit (L.H.Film Drive) | |
| 2 | D-5 Power Supply | |
| 2 | D-5 Electronics | |
| 2 | D-5 Control | |
| 2 | | Heat Exchanger |
| 1 | C1015/ARC-27 | UHF Control |
| 1 | CMA-21C | VHF Control |

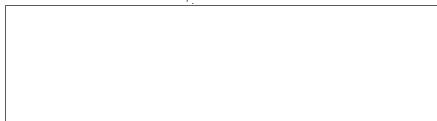
Post Office Box 490
Greenville, Texas

11 April 1966
In Reply Refer To:
8853-CADY-12

REGISTERED

SUBJECT : Phase II Technical Proposal for a
Specialized Multisensor SP2H Aircraft,
Supplementary Data for

TO :



(b)(3)

ATTENTION : Contracting Officer

REFERENCE : (a) Letter No. 8853-CADY-09 dated 5 April 1966
(b) Letter No. 8853-CADY-10 dated 5 April 1966

ENCLOSURES : (1) Appendices B and C for Engineering Report
No. G-8853.01.02.
(2) Revised Pages for Technical Proposal,
Phase II, Report No. G-4000.01.145.

In accordance with our various discussions, we are transmitting supplemental data for the Phase I Engineering Study Report and the Phase II Technical Proposal as enclosures hereto.

Your efforts to insert the data sheets in the applicable reports submitted with References (a) and (b) will be appreciated.

C. F. Wilson
Contract Administrator

CFW:lw
encs.

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GROUP 1
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LTV ELECTROSYSTEMS, INC.

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PROPOSAL FOR PHASE II EFFORT

FOR . A

MULTISENSOR AIRCRAFT

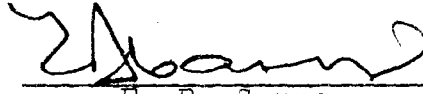
DEVELOPMENT PROGRAM

AEP-6A-611

REPORT NO. G-4000.01.145


1 April 1966

Revised 7 April 1966



E. B. Carne
Director of Engineering

REVISION "A" -



E. B. Carne
Director of Engineering

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3. Mission Equipment Installation (Continued)
- j. Modified Ordnance Delivery System
 - k. Digital Recorder System
 - l. Low Light Level Television System
 - m. SD-5 Infrared Sensor System
 - n. KA-51A Color Camera
 - o. KA-60 Panoramic Camera
 - p. Vector/Sector and TRIM-7 Radar Defensive System
 - q. 618T-2 HF Communication System
 - r. ~~ADD E L E T E D~~

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This program will be accomplished under the direction of a Program Manager who will be responsible for coordinating the activities of Engineering, Production, Purchasing, and Support Services. A Design Engineering Task Force will be established under the direction of a Project Engineer. A Systems Engineer will be assigned to the program and provide technical direction in regard to the Mission Equipment to assure subsystem interface compatibility and a fully coordinated technical approach in meeting the operational requirement.

The Phase II Flight Testing will be accomplished at Greenville, Texas. A total of six (6) flights is planned for this phase.

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3.1.2.3.18 Modification to Intercom System

Develop engineering for the modification, as required, of the installed interphone system to make it compatible with the overall systems installation.

3.1.2.3.19 Modification to Aircraft Interior Lighting

Develop engineering to modify existing aircraft interior lighting in accordance with requirements for new system installations.

3.1.2.3.20 Modification to Aircraft Electrical Power System


Develop engineering for the modification of existing aircraft electrical power system to supply required power to all installed systems.

3.1.2.3.21 Modification to Instrument Panels

Develop engineering for the modification of the Pilot's and Co-pilot's instrument panel to accommodate the displays for the Forward Looking Infrared System, the Terrain Following and Ground Mapping Radar and the Low Light Level TV System.

3.1.2.3.22 DELETED

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- 3.1.3.10 Fabricate and Install Ordnance Interface System
- 3.1.3.11 Fabricate and Install Digital Recorder System
- 3.1.3.12 Install Low Light Level TV System
- 3.1.3.13 Install SD-5 Infrared System
- 3.1.3.14 Install KA-51A Color Camera
- 3.1.3.15 Install KA-60 Panoramic Camera
- 3.1.3.16 Install Radar Warning and Defensive System
- 3.1.3.17 Modify and Install Communications System
- 3.1.3.18 Modify Interphone System
- 3.1.3.19 Modify Aircraft Interior Lighting
- 3.1.3.20 Modify Aircraft Electrical Power System
- 3.1.3.21 Fabricate and Install New Pilot and Co-pilot Instrument Panel
-
- 3.1.3.22 DELETED
- 3.1.3.23 Provide Support for EMI Testing
- 3.1.3.24 Provide Support for Systems Ground Testing
- 3.1.3.25 Provide Maintenance Support as Required for Flight Test Operations
-
- 3.1.3.26 Perform Aircraft Removals as Specified by Engineering Documents
-

"A"

3.2 BIDDING ASSUMPTIONS AND GUIDELINES

This section of the proposal outlines the major assumptions and guidelines on which LTV's price and schedule are predicated.

- 3.2.1 GFE and Associated Table 2020 data will be delivered in accordance with the schedule in Figure 4-1 of the proposal.