

SKYCAM 5" VDU COMPONENT MAINTENANCE MANUAL

BAW250-TP03

ISSUE A

**CABIN AVIONICS LTD,
BOURNEMOUTH, DORSET. BH1 2EF**

SKYCAM LETTER OF TRANSMITTAL

Insert this list in front of the normal log of pages.

This Component Maintenance Manual is a standalone document.

- 1) New Issue

Approval:



DATE: 25th September 2015

**DATE: 25-9-2014
ISSUE A**

LETTER OF TRANSMITTAL

PAGE 1 of 2

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LOG OF CHANGES

Insert in front of Component Maintenance Manual

| | | | | |
|--------------|--------------------------------------------------------------------------------------------------|----------------|-----------------|-------------------|
| ISSUE | <u>Changes:</u> | | | |
| | Initial Issue | | | |
| A | COMPILED | CHECKED | APPROVED | |
| | | | Avionics | Structures |
| | BRD | RMD | RMD | RMD |
| | The technical content of this document is approved under the authority of Cabin Avionics Limited | | | |
| | Signed:  | | Date: 25/9/2015 | |
| | Quality Manager | | | |

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COMPONENT MAINTENANCE MANUAL

SKYCAM 5" VDU



**Part number: BAW1134-501/1
 BAW1134-501/2
 BAW1134-501/3
 BAW1134-501/4**

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1. INTRODUCTION

The Skycam system comprises of a Dzus rail mounted 5" Colour TFT Video Display Unit with 4 selectable camera inputs¹. Each camera input is auto-focussing, auto contrast and auto low light operation. The integral power supply feeds all four cameras.

The 5" VDU is the latest Video Display Unit used for all new Skycam installations and is also a replacement/upgrade for the existing 4" VDU (BAC1134-101/*).

The Skycam system (mounted in the cockpit area) can be used to monitor the flight deck door area outside the cockpit, with one camera mounted in the ceiling panel looking aft, & two wall mounted cameras looking port & starboard across the galley. A fourth camera can be fitted further aft in the cabin ceiling looking forward towards the cockpit door; or an expansion pack (using the Selection Box) can be added to this position to allow four more cameras (expandable).

There are FIVE camera types used with the 5" VDU:

- 1) Wall mounted camera – 4 preset positions
- 2) Short universal camera – variable camera positions (48 to 90 degrees)
- 3) Roof mounted camera – preset camera position (35 degrees)
- 4) Universal Camera – variable camera position (30 to 90 degrees)
- 5) IR Wall Camera – set position (0.0 Lux capability – Cargo hold applications)

The wall mounted camera (1) is suitable for sidewall or ceiling applications.

The short universal camera (2) is suitable for sidewall or ceiling applications, but offers a greater choice of viewing angle.

The ceiling/roof mounted camera (3) has a low profile and is suitable for confined roof spaces.

The universal camera (4) is particularly suitable for viewing floor to ceiling due to its wide viewing angle.

The infra-red wall mounted camera (5) is ideal for viewing other dark areas such as Freight Holds.

All camera types are electrically interchangeable, with the same wiring harness connector. Small mounting changes are required if cameras are to be swapped.

The system is powered by a single 28VDC supply and consumes approximately 0.7Amps (20 Watts) when connected to 4 cameras.

The selection box is used as a camera expansion unit. It consists of an internal power supply, video selector switch and a status indicator. The selection box is powered by a single 28VDC supply and consumes approximately 0.6Amps when up to 4 additional cameras are installed and powered from the unit. The Selector box can also be used to power the Slave VDU (BAC1134-201) for remote VDU operation.

For information on the other Skycam System components, refer to the following associated document:

[SKYCAM COMPONENT MAINTENANCE MANUAL J134TP061 ISSUE F \(or later revision\).](#)

¹ Camera expansion packs are available. Please contact Cabin Avionics Ltd. +44 (0)1202 557670

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2. DESCRIPTION OF EQUIPMENT PART NUMBERS

| | |
|---------------|------------------------------------|
| BAW1134-501/1 | Skycam VDU – Light Grey Faceplate |
| BAW1134-501/2 | Skycam VDU – Light Brown Faceplate |
| BAW1134-501/3 | Skycam VDU – Black Faceplate |
| BAW1134-501/4 | Skycam VDU – Dark Grey Faceplate |

3. MODES OF OPERATION

The Skycam Display Unit operates as follows:

- **POWER** The power switch isolates the 28VDC supply from the unit. To switch the unit on, select the power switch 'on'. The unit takes approx 2 seconds to power up, therefore the unit may be left in the 'off' state when not required.
- **VIDEO SELECT** The video select switch will select up to 4 video cameras. A standard system only uses 3 cameras; however, camera 4 can be used to look forwards towards the cockpit door from a ceiling position or be used in conjunction with a camera expansion pack. With the Video Select switch turned to the left (1), the port side of the cockpit door/galley area is visible on the screen. With the Video Select switch turned to the centre (2), the area directly aft of the cockpit door is visible. With the Video Select switch turned to the right (3), the starboard side of the cockpit door/galley area is visible. With the Video Select switch turned to the far right (4), the front of the cockpit door/galley area is visible (if camera 4 is connected).
- **DAY/NIGHT** The Day/Night switch is used to vary the intensity of the screen. Hold then release in the 'Day' position, the screen intensity will brighten for normal daytime use. Hold then release in the 'Night' position, the screen intensity is reduced to enable 'softer' viewing during night operation.

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4. TECHNICAL SPECIFICATIONS

4.1. Overall Dimensions:

| | |
|--------------------|------------------------------------------------------------------------|
| Video Display Unit | Height: 4.50" (114.3 mm) |
| | Width: 5.75" (146.05 mm) |
| | Depth: 2.30" (58.42 mm) (Depth behind panel excl. connectors is 1.70") |
| | Note: Connectors protrudes 0.49" (12 mm) maximum from rear of unit. |

4.2. Weight:

| | |
|--------------------|-------------------|
| Video Display Unit | 1.43 lb (0.65 kg) |
|--------------------|-------------------|

4.3. Electrical supply requirements:

| | |
|--------------------------|-----------------------------------------------------|
| Video Display Unit (VDU) | 9 to 36VDC @ 0.24 Amps (With one camera powered) |
|--------------------------|-----------------------------------------------------|

Notes:

- 1) Add total current by 0.152A for each additional camera fitted, (e.g. 3 camera system = 0.54A)
- 2) Each camera assembly (Maximum of 4) is powered from the Video Display Unit.
- 3) Additional cameras (Max 4) are powered from the Selector box.
- 4) Internal Power Supply operates at 81% efficiency.
- 5) Aircraft 28VDC supply to VDU requires a 1 amp Circuit Breaker.
- 6) Aircraft 28VDC supply to Selector Box requires a 1 amp Circuit Breaker.
- 7) VDU has internal Over Voltage, Over Temperature and Short Circuit protection

4.4. Temperature:

Operating Temperature:

| | |
|---------------------|----------------|
| Video Display Unit: | -20°C to +40°C |
| Internal PSU: | -40°C to +85°C |

Storage Temperature:

| | |
|---------------------|-----------------|
| Video Display Unit: | -30°C to + 60°C |
| Internal PSU: | -55°C to +105°C |

240 Hour Test:

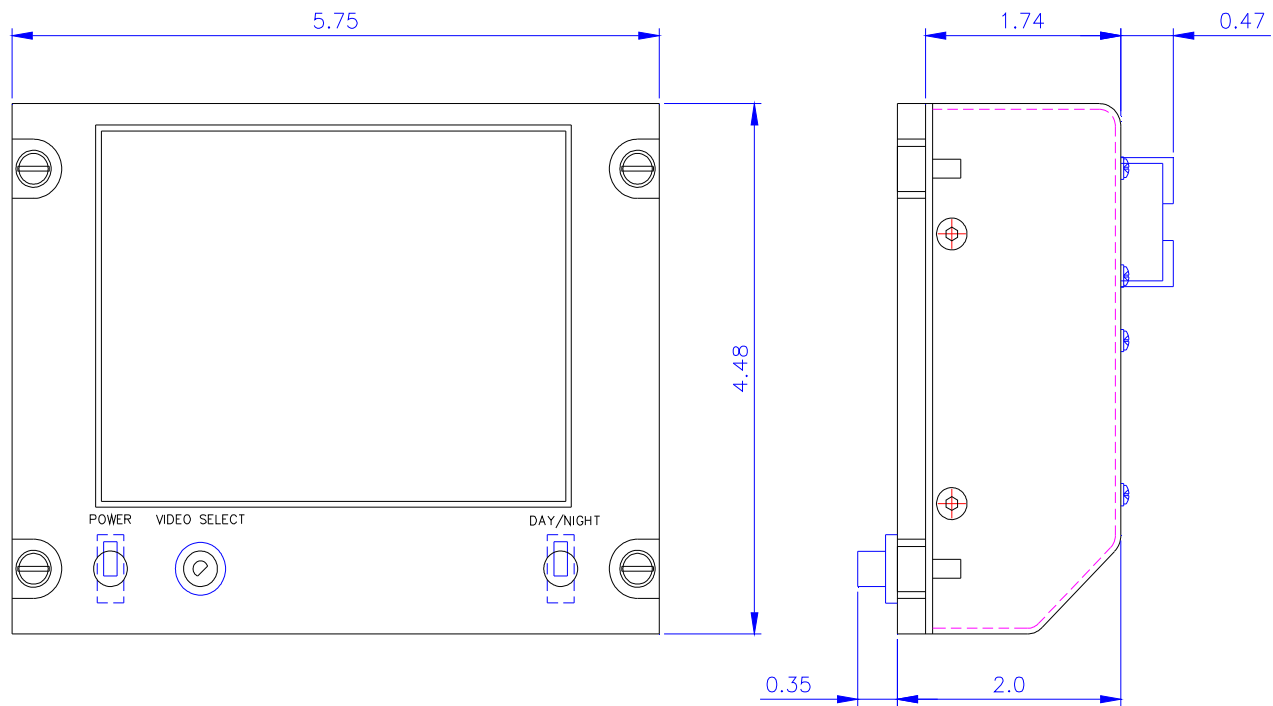
| | |
|---------------------|------------------|
| Video Display Unit: | + 60°C at 90% RH |
|---------------------|------------------|

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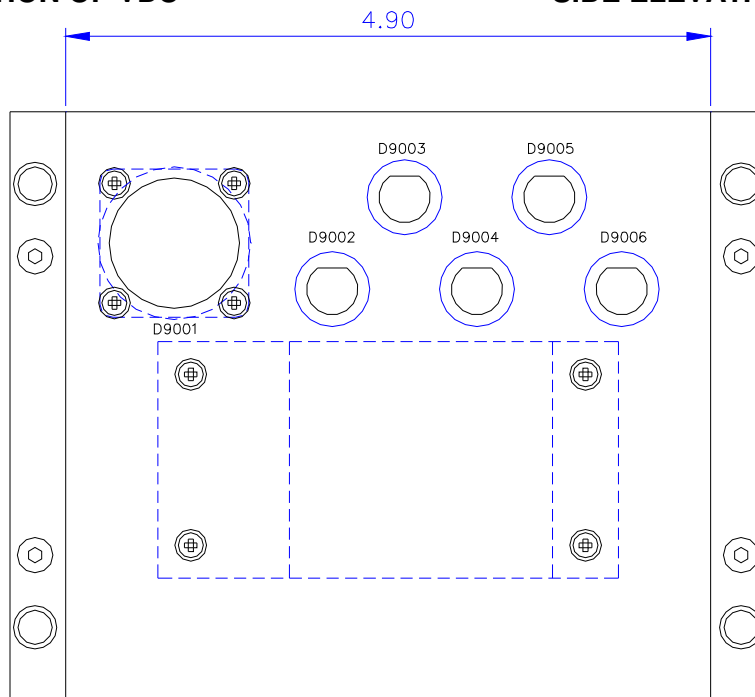
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FRONT ELEVATION OF VDU

SIDE ELEVATION OF VDU



REAR ELEVATION OF VDU (BAW1134-501 series)

Figure 1

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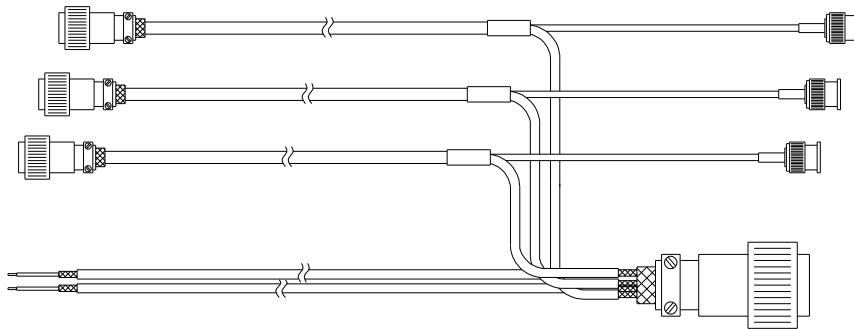
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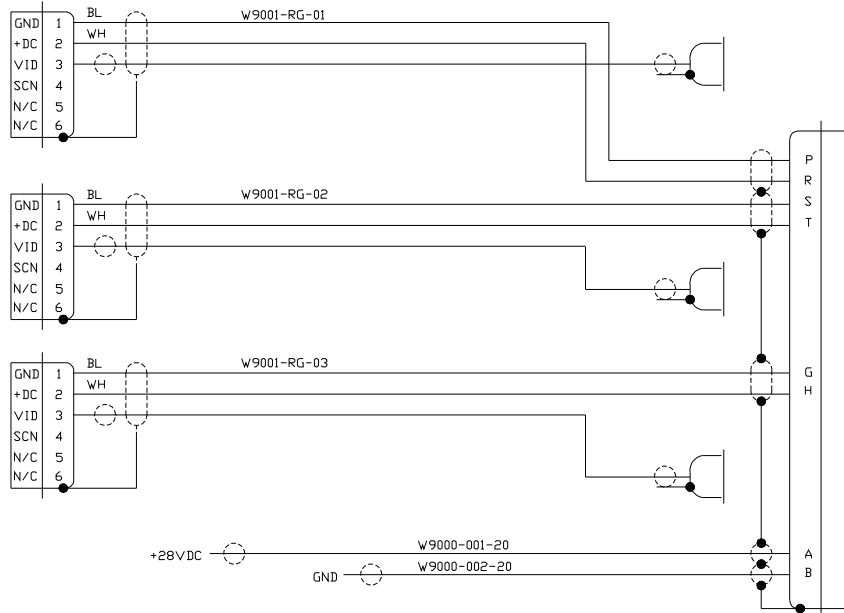
SKYCAM WIRING HARNESS

The Skycam system is to be installed in the aircraft using wiring harness BAC1134-31, or alternative wiring harness as called up in the associated installation modification.

A typical harness used with the 5" VDU is made up for a standard 3 camera system using the 19 way connector (as shown) in fig 9:



TYPICAL 3 CAMERA WIRING HARNESS ASSEMBLY - 19 WAY (BAC1134-31/1)
Figure 2



STANDARD 3 CAMERA HARNESS WIRING DIAGRAM
Figure 3






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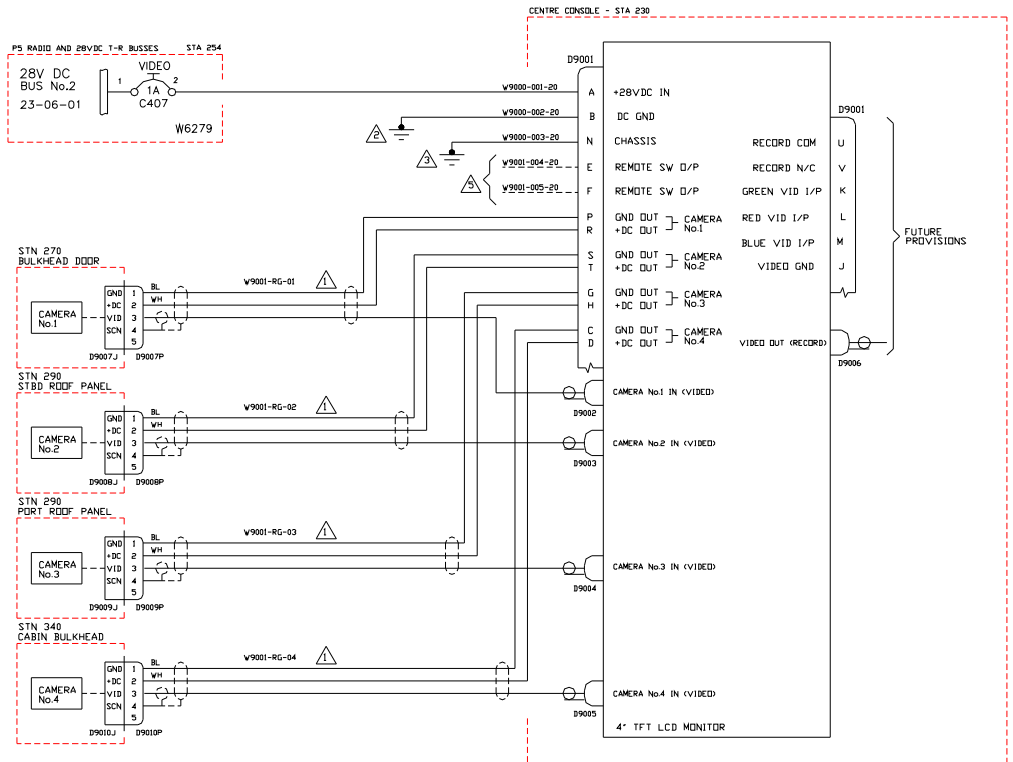
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NOTES:

-  COMPOSITE VIDEO CABLE PT. No. 452003
-  LOCAL DC GND
-  LOCAL CHASSIS GND
-  SCREENS CONNECTED AT BOTH ENDS
-  INTERFACE WITH ARMORED DOOR LATCH



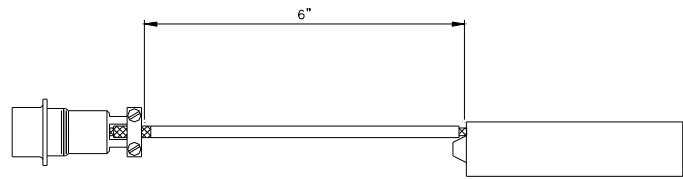
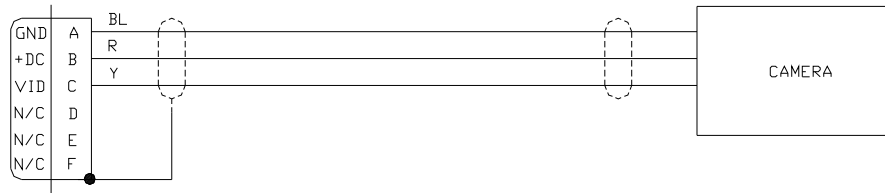
TYPICAL 4 CAMERA SYSTEM AIRCRAFT WIRING DIAGRAM
Figure 4

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TYPICAL WALL OR ROOF CAMERA WIRING

Figure 5

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4.5. CONNECTOR DETAILS:

VDU Connector D9001 (VDU Type BAW1134-501/*)

Part No. MS3122E14-19P

(Mates with 19 way Free Connector MS3476L14-19S plus M85049/52-1-14N Back shell)

| | | | |
|---|-----------------------|---|-----------------------|
| A | +28VDC | L | Video I/P (Red) |
| B | DC Ground | M | Video I/P (Blue) |
| C | Ground Out (Camera 1) | N | Chassis Gnd |
| D | DC Out (Camera 1) | P | Ground Out (Camera 1) |
| E | N/C | R | DC Out (Camera 1) |
| F | N/C | S | Ground Out (Camera 2) |
| G | Ground Out (Camera 2) | T | DC Out (Camera 2) |
| H | DC Out (Camera 3) | U | Record Switch (Com) |
| J | Video Ground | V | Record (N/C) |
| K | Video I/P (Green) | | |

VDU Connector D9002 to D9006 (VDU Type BAW1134-501/*)

RS 405-039 BNC Bulkhead Socket

(Mates with BNC Free Connector UPL220-009)

| | |
|-------|---------------|
| Pin 1 | Video Signal |
| Pin 2 | Ground/Shield |

Wiring Harness Camera Connector PL1 (camera end). Reference Only.

With the typical wiring harness fitted (aircraft installation), the following connector is used for each camera:

MS3475L10-6S 6 Way Free Connector and M85049/52-1-10N Backshell

(Mates with fixed camera connector MS34750L10-6P)

| | |
|-------|-------------------------|
| Pin A | Ground (Camera 1) |
| Pin B | +12VDC Out (Camera 1) |
| Pin C | Video Signal (Camera 1) |
| Pin D | Screen |
| Pin E | N/C |
| Pin F | N/C |

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SYSTEM INSTALLATION TEST²

TEST No.1 – Power On:

- 1) Select Power Switch on (up position)
- 2) Select Video Select to camera 1 (Knob fully anticlockwise)
- 3) Select Day/Night to 'Day' (to increase brightness if no image is visible)
- 4) Verify that the Video Display Unit is showing the image captured on the Starboard Camera (looking Port).
- 5) Verify that the display colour, contrast, brightness and resolution is to an acceptable level.

| Pass | Fail |
|------|------|
| | |

TEST No.2 – Day/Night

With the Video Display set up as per (1) above, monitor the Video Display Unit (VDU) display whilst selecting the Day/Night switch on the VDU.

- 1) Select and hold 'Day' Mode and verify screen display brightness increases i.a.w the brightness bar position displayed on the screen. Release 'Day' mode switch and selected brightness should remain at selected value.
- 2) Select and hold 'Night' Mode and verify screen display brightness reduces i.a.w the brightness bar position displayed on the screen. Release 'Night' mode switch and selected brightness should remain at selected value.

| Pass | Fail |
|------|------|
| | |

TEST No.3 – Video Select

With the Video Display set up as per (1) above, monitor the Video Display Unit (VDU) display whilst selecting camera 1,2,3 & 4 on the VDU.

- 1) Select Video Select to 'Camera 1' (Knob fully anticlockwise).
- 2) Verify that the Video Display Unit is show the image captured on the starboard camera (looking Port).
- 3) Select Video Select to 'Camera 2' (Knob moved one position to the right).
- 4) Verify that the Video Display Unit is show the image captured on the centre camera (looking aft).
- 5) Select Video Select to 'Camera 3' (Knob moved one more position to the right).
- 6) Verify that the Video Display Unit is show the image captured on the Port camera (looking Starboard).
- 7) Select Video Select to 'Camera 4' (Knob fully clockwise).
- 8) Verify that the Video Display Unit is showing a blank screen (IF CAMERA POSITION 4 IS NOT USED).

| Pass | Fail |
|------|------|
| | |

THIS CONCLUDES THE SKYCAM INSTALLATION TESTS

² For alternative test please see specific Aircraft Modification.

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5. MAINTENANCE REQUIREMENTS

Service and repair

Skycam components requiring service or repair should be sent to:

Oakenhurst Aircraft Services Ltd
Claydons Lane
Rayleigh
Essex, SS6 7UP
United Kingdom

Tel: 44 (0)1268 741622
Fax: 44 (0)1268 741650
Website: www.oakenhurst.com

5.1. SKYCAM VIDEO DISPLAY UNIT – BAC1134-501/*

5.1.a. Video Display Unit Ground Tests

The VDU is to be tested as part of the Skycam installation as above.

5.1.b. Removal and replacement:

Video Display Unit Removal:

- 5.1.b.i.** Loosen the four ¼-turn Dzus fasteners (located on front panel) that secure the VDU to the aircraft panel.
- 5.1.b.ii.** Gently pull VDU forward to expose rear connectors.
- 5.1.b.iii.** Disconnect VDU connectors, making careful note of connections.

Video Display Unit Reinstallation:

- 5.1.b.iv.** Reconnect connectors to rear of control panel.
- 5.1.b.v.** Carefully slide VDU into position and tighten the four ¼-turn Dzus fasteners to hold panel firmly in place.

5.1.c. Maintenance Procedures

In-Aircraft Adjustments:

There are no in-aircraft adjustments for the VDU. All alignment and adjustment must be done during workshop maintenance.

System Protection:

The VDU panel is externally protected by a one Ampere circuit breaker (Maximum five Amp permitted).

Lubrication:

There are no moving parts in the VDU panel, so lubrication is not required.

Cleaning:

After shop maintenance or storage, equipment exterior surfaces should be cleaned prior to installation. Use a lint-free cloth dampened with an approved cleaning agent such as denatured alcohol. The front fascia plate may be removed for cleaning both faces by loosening and removing the 4 off hex socket CSK screws, near each Dzus fastener. Re-assemble using the CSK screws applied with loctite or equivalent.