777 Aviation Dr
Camarillo, Ca 93010
USA

March 5th, 2026
Revision F

Maintenance Support Document

ETM1000 - AS350 - ICA

Instructions for Continued Airworthiness;

Installation of an AKV, Inc Exceedence and Trend Monitoring System Kit P/N ETM1000 in the AS350 with the Arriel 1 or LTS101 engines

STC Number: SR02413LA

S/N _____

REVISIONS INTRODUCTION

The latest revision of this document is indicated by the highest revision letter as listed below in the Revision History and List of Effective Pages. Changes to the current revision will be indicated within the document by change bars. (Reference Section 1.) The entire document will be reprinted to reflect the current revision level.

REVISION HISTORY

Instructions for Continued Airworthiness; AKV Inc Exceedence and Trend Monitoring System ETM1000			**ETM1000-ICA**
Rev.	Date	Revision Description	Approval
NC	January 11th, 2012	Initial Release	PREPARED J. Gunn CHECKED J. Gunn APPROVED
A	April 5th, 2013	Added Appendix A Data	PREPARED J. Gunn CHECKED J. Gunn APPROVED
B	June 6th, 2013	Changed Caution and Warning LED Cap Color to White and Blue	PREPARED J. Gunn CHECKED J. Gunn APPROVED
C	October 10th, 2014	Added -2 configuration without pushbutton / indicators and audio side-tone	PREPARED J. Gunn CHECKED J. Gunn APPROVED

Continued

Instructions for Continued Airworthiness; AKV Inc Exceedence and Trend Monitoring System ETM1000			**ETM1000-ICA**
Rev.	Date	Revision Description	Approval
D	September 22nd, 2018	- Added cycle counting option with remote display or 3rd party Flightcell DZMx. -Updated App. A data. Changed to refer to the User Manual - Adjusted Appendix list due to App. A change - Change ICA doc from ETM1000-ICA to ETM1000-AS350-ICA and added engine model applicability - Updated App. D Drawings to include change for remote display and Flightcell DZMx interface - Various changes throughout	PREPARED J. Gunn CHECKED J. Gunn APPROVED
E	November 5th, 2020	- Added new AA battery holder in place of coin cell and updated Appendix D drawings	PREPARED J. Gunn CHECKED J. Gunn APPROVED
F	March 5th, 2026	- Updated Appendix D drawings to MDL Rev R	PREPARED J. Gunn CHECKED J. Gunn APPROVED

LIST OF EFFECTIVE PAGES

All pages are revised when any page is changed so that all pages maintain the same revision level.

PAGE	REVISION	DATE
All	NC	January 11th, 2012
All	A	April 5th, 2013
9	B	June 6th, 2013
2, 3, 4, 9, 10, 11, 23, 27	C	October 10th, 2014
ALL	D	September 22nd, 2018
10 and Appendix D	E	November 5th, 2020
Appendix D	F	March 5th, 2026

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1. INTRODUCTION

This AKV, Inc maintenance support document provides instructions for the continued airworthiness of the AKV Exceedence and Trend Monitoring System ETM1000. The basis for this document is 14 CFR 27.1529 and Appendix A to Part 27.

1.1 Service Difficulties

Technical Assistance can be provided by:

AKV, Inc.
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1.2 Warnings, Cautions, and Notes

WARNING

FAILURE TO FOLLOW INSTRUCTIONS GIVEN IN A *WARNING* MAY RESULT IN PERSONAL INJURY OR DEATH.

CAUTION

FAILURE TO FOLLOW INSTRUCTIONS GIVEN IN A CAUTION MAY RESULT IN DAMAGE TO THE HELICOPTER

Note

A note includes supplemental data about the procedure, practice, condition, etc., for the maintenance task you are about to perform.

1.3 Language

This manual is written to the Simplified English (SE) specification. This International Aerospace Maintenance Language Specification is important to maintenance personnel whose first language is not English.

1.4 References

The use of parentheses throughout this document is for denoting or depicting a reference to other sections, items, details, etc., the intent of which is to further identify or clarify existing information.

1.5 Revision to ICA

Revisions to this document and the documents listed within it are distributed to the operators who have this modification installed on the subject aircraft, either in electronic or paper format. **Contact AKV for available revision changes**.

1.6 Abbreviations and Definitions

A&P	Airframe & Powerplant Mechanic
CFR	Code of Federal Regulations
RFM	Rotorcraft Flight Manual
RFMS	Rotorcraft Flight Manual Supplement
FAR	Federal Aviation Regulations

2. AIRWORTHINESS LIMITATIONS

This section is FAA approved and specifies the inspections, and other maintenance, which are required under 14 CFR 43.16 and 91.403, unless an alternative program has been FAA approved. There are “No airworthiness limitations associated with this type design change”.

3. DESCRIPTION

3.1 ETM1000 Configurations

The ETM1000 is available in two configurations, a -1 or -2 configuration. In either configuration the ETM1000 enclosure is mounted on the pilot side below the instrument panel. It is electrically spliced to the existing signal generators for Tq, MGT, N1, N2 and Nr behind the instrument panel and at the rear of each indicator. The system receives airspeed indication in the form of a calibrated 40kt airspeed switch connected via a “tee” fitting in the pitot line and mounted in the forward section of the instrument panel area. It provides a signal to the ETM1000 that the A/C is operating 40Kt or greater and is utilized for Tq exceedence criteria. An OAT probe is mounted on the belly and the ETM1000 LRU has a pressure altitude (PA) senser built-in. The OAT and PA sensor are used for the Delta Ng and power check recording.

As a -1 configuration, two (2) instrument panel mounted pushbutton / indicators (annunciators) and audio side-tone are provided for overall status and alert indication to the pilot. A flip guard is installed on the P-PWR/CHK (left side switch) to prevent inadvertent operation. The “P” in the P-PWR/CHK and P-MUTE white nomenclature indicates the pushbutton feature.

NOTE: Cycle counting is available as an option on the -1 configuration via the AKV remote display or displayed on the 3rd party Flightcell DZMx. The **LRU must be Rev P** or greater to allow for using the cycle AKV remote display and **software v72.0 or greater** must be installed for the cycle counting option.

As a -2 configuration, there are no pushbutton / indicators or audio side-tone supplied. **NOTE:** The cycle counting / remote display or Flightcell DZMx interface options are not available with the -2 configuration.

The system date and time is backed up with an externally mounted battery for easy access which is **replaced annually**. A Single power source via a 2 amp circuit breaker supplies power to the ETM1000.

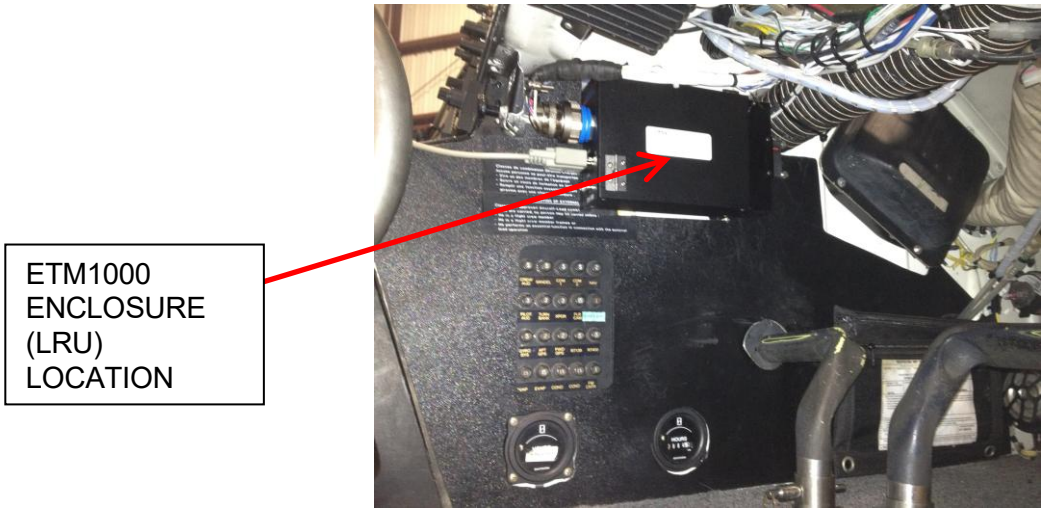


Figure 1 - Installed view of the ETM1000 LRU

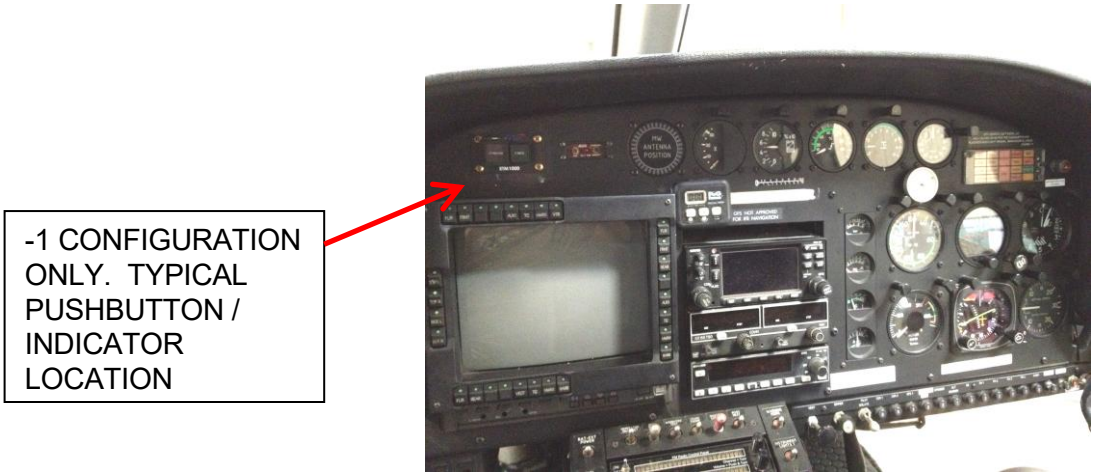


Figure 2 - Installed view of the ETM1000 pushbutton / anunciator

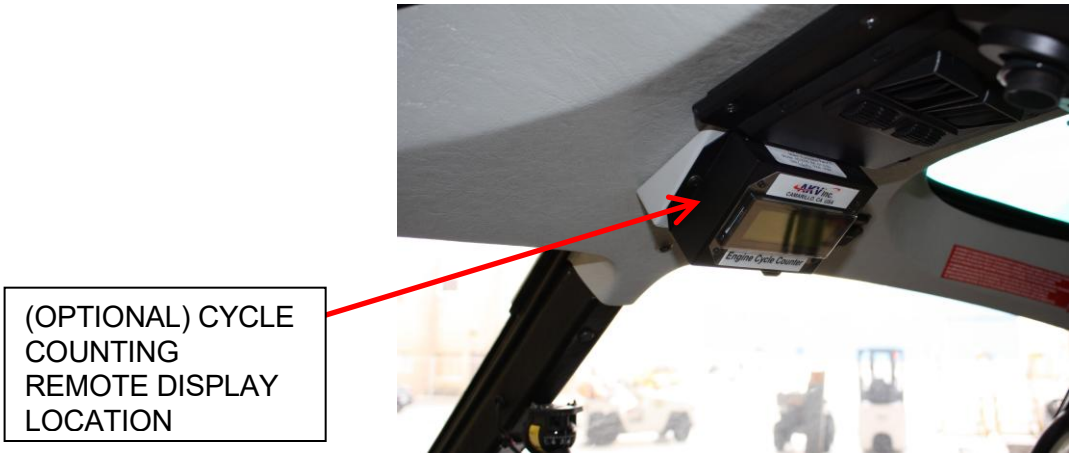


Figure 3 - Installed view of the (optional) cycle counting remote display

Figure 4 –(Optional) Flightcell DZMx with cycle counting display

3.2 ETM1000 Operation

The ETM1000 is designed to continuously monitor and record all engine and drive train parameters at 1Hz (1/sec). For values in excess of the airframe and engine operating limitations during an exceedance, it is recorded at 5hz (5/sec). The 1Hz data refered to as a Run Log (RL) is used during post flight for graphing normal flight operations. Exceedence data is also graphed.

As a -1 configuration system health and exceedence status indication via white caution and blue warning indicators is provided to the pilot via two (2) pushbutton / annunciators mounted on the instrument panel. An audible side tone for the pilot's headset is also provided for caution and warning indication. Audible muting and a power check recording feature is provided as part of the pushbuttons. In the -1 configuration **only**, the optional cycle count is available.

NOTE: When using the optional cycle counting feature with either the AKV remote display or Flightcell DZMx then refer to the **ETM1000 Arriel 1 or LTS101 Cycle Counting Operating Specification** document.

As a -2 configuration there is no pilot interface and the ETM1000 system is essentially a black box recorder.

All data is written to a removable 2GB SD Card. Exceedances are backed up in the ETM1000 flash memory in case the SD card is missing.

NOTE: For additional information, refer to the **ETM1000 User Manual**.

4. MAINTENANCE INSTRUCTIONS

4.1 Routine Cleaning & Maintenance

Routine Cleaning & Maintenance of the ETM1000 Routine maintenance may be required as the result of an inspection. Re-tighten loose fasteners to the standard torque values shown in Table 1 and Table 2. Perform routine cleaning to remove contaminants from the ETM1000. Remove grease, fungus, and ground-in dirt from equipment and mounting brackets using a clean, soft cloth dampened with mild soap and warm water; avoid damaging the coating.

4.2 Tools

The following tools will be necessary to maintain the AKV ETM1000 Installation:

- A Laptop PC utilizing Windows XP or later operating system
- RS-232 cable as supplied with the ETM1000 kit
- USB adaptor as supplied with the ETM1000 kit
- Pitot test set (user supplied)

4.3 Overhaul

There are no component overhaul requirements for this type design change. Under normal operating conditions, the ETM1000 will not require component overhaul. All parts and assemblies are designed to be replaced “On Condition”. Any maintenance needed to the ETM1000 or its installation beyond that described in this document requires that the components be removed and returned to AKV, Inc. The decision to return damaged components may be a subjective one and should be made by a qualified A & P Mechanic.

4.4 Component Retirement/Retirement Life

The ETM1000 has been designed with components that have a virtually unlimited life span. However, it is anticipated that some components may require replacement at some time during the service life of the helicopter. The decision to replace these parts is a subjective one and should be made by the operator or an A & P Mechanic.

	Bolts -- Steel Tension		Bolts -- Steel Tension		Bolts -- Aluminum	
	AN 3 – AN 20		MS 20004 – MS 20024		AN 3DD – AN 20DD	
	AN 42 – AN 49		NAS 144 – NAS 158		AN 173DD – AN 186DD	
	AN 73 – AN 81		NAS 583 – NAS 590		AN 509DD	
	AN 173 – AN 186		NAS 144 – NAS 158		AN 525D	
	MS 20033 – MS 20046		NAS 144624 – NAS 644		MS 27039D	
	MS 20073		NAS 1303 – NAS 1320		MS 24694DD	
	MS 20074		NAS 172		--------	
	AN 509 NK9		NAS 174		--------	
	MS 24694		NAS 517		--------	
	AN 525 NK525		--------		--------	
	MS 27030		--------		--------	
				Steel Shear Bolt		
				NAS 464		
	Nuts		Nuts		Nuts	
	Steel Tension	Steel Shear	Steel Tension	Steel Shear	Aluminum Tension	Aluminum Shear
	AN 310	AN 320	AN 310	AN 320	AN 365D	AN320D
	AN 315	AN 364	AN 315	AN 364	AN 310D	AN 364D
	AN 363	NAS 1022	AN 363	NAS 1022	NAS 1021D	NAS 1022D
	AN 365	MS 17826	AN 365	MS 17826	--------	--------
	NAS 1021	MA 20364	MS 17825	MS 20364	--------	--------
	MS 17825	--------	MS 20365	--------	--------	--------
	MS 21045	--------	MS 21045	--------	--------	--------
	MS 20365	--------	NAS 1021	--------	--------	--------
	MS 20500	--------	NAS 679	--------	--------	--------
	NAS 679	--------	NAS 1291	--------	--------	--------

FINE THREAD SERIES[1]

Nut-Bolt Size	Torque Limits In-lbs.		Torque Limits In-lbs.		Torque Limits In-lbs.		Torque Limits In-lbs.		Torque Limits In-lbs.		Torque Limits In-lbs.	
	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max
8 - 36	12	15	7	9	------	------	------	------	5	10	3	6
10 - 32	20	25	12	15	25	30	15	20	10	15	5	10
1/4 - 28	50	70	30	40	80	100	50	60	30	45	15	30
5/16 - 24	100	140	60	85	120	145	70	90	40	65	25	40
3/8 - 24	160	190	95	110	200	250	120	150	75	110	45	70
7/16 - 20	450	550	270	300	520	630	300	400	180	280	110	170
1/2 - 20	480	690	290	410	770	950	450	550	280	410	160	260
9/16 - 18	800	1000	480	600	1100	1300	650	800	380	580	230	360
5/8 - 18	1100	1300	660	780	1250	1550	750	950	550	670	270	420
3/4 - 16	2300	2500	1300	1500	2650	3200	1600	1900	950	1250	5560	880
7/8 - 14	2500	3000	1500	1800	3550	4350	2100	2600	1250	1900	750	1200
1 - 14	3700	4500	2200	3300	4500	5500	2700	3300	1600	2400	950	1500
1 1/8 - 12	5000	7000	3000	4200	6000	7300	3600	4400	2100	3200	1250	2000
1 1/4 - 12	9000	11000	5400	6600	11000	13400	6600	8000	3900	5600	2300	3650

Table 1: Recommended torque values for nut-bolt combinations: Fine Thread Series

1 Torque values without lubrication

	Bolts -- Steel Tension		Bolts -- Steel Tension		Bolts -- Aluminum	
	AN 3 – AN 20		MS 20004 – MS 20024		AN 3DD – AN 20DD	
	AN 42 – AN 49		NAS 144 – NAS 158		AN 173DD – AN 186DD	
	AN 73 – AN 81		NAS 583 – NAS 590		AN 509DD	
	AN 173 – AN 186		NAS 144 – NAS 158		AN 525D	
	MS 20033 – MS 20046		NAS 144624 – NAS 644		MS 27039D	
	MS 20073		NAS 1303 – NAS 1320		MS 24694DD	
	MS 20074		NAS 172		--------	
	AN 509 NK9		NAS 174		--------	
	MS 24694		NAS 517		--------	
	AN 525 NK525		--------		--------	
	MS 27030		--------		--------	
				Steel Shear Bolt		
				NAS 464		
	Nuts		Nuts		Nuts	
	Steel Tension	Steel Shear	Steel Tension	Steel Shear	Aluminum Tension	Aluminum Shear
	AN 310	AN 320	AN 310	AN 320	AN 365D	AN320D
	AN 315	AN 364	AN 315	AN 364	AN 310D	AN 364D
	AN 363	NAS 1022	AN 363	NAS 1022	NAS 1021D	NAS 1022D
	AN 365	MS 17826	AN 365	MS 17826	--------	--------
	NAS 1021	MA 20364	MS 17825	MS 20364	--------	--------
	MS 17825	--------	MS 20365	--------	--------	--------
	MS 21045	--------	MS 21045	--------	--------	--------
	MS 20365	--------	NAS 1021	--------	--------	--------
	MS 20500	--------	NAS 679	--------	--------	--------
	NAS 679	--------	NAS 1291	--------	--------	--------

COARSE THREAD SERIES[2]

Nut-Bolt Size	Torque Limits In-lbs.		Torque Limits In-lbs.		Torque Limits In-lbs.		Torque Limits In-lbs.		Torque Limits In-lbs.		Torque Limits In-lbs.	
	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max
8 - 32	12	15	7	9	------	------	------	------	------	------	------	------
10 - 24	20	25	12	15	------	------	------	------	------	------	------	------
1/4 - 20	40	50	25	30	------	------	------	------	------	------	------	------
5/16 - 18	80	90	48	55	------	------	------	------	------	------	------	------
3/8 - 16	160	185	95	110	------	------	------	------	------	------	------	------
7/16 - 14	235	255	140	155	------	------	------	------	------	------	------	------
1/2 - 13	400	480	240	290	------	------	------	------	------	------	------	------
9/16 - 12	500	700	300	420	------	------	------	------	------	------	------	------
5/8 - 11	700	900	420	540	------	------	------	------	------	------	------	------
3/4 - 10	1150	1600	700	950	------	------	------	------	------	------	------	------
7/8 - 9	2200	3000	1300	1800	------	------	------	------	------	------	------	------
1 - 8	3700	5000	2200	3000	------	------	------	------	------	------	------	------
1 1/8 - 8	5500	6500	3300	4000	------	------	------	------	------	------	------	------
1 1/4 - 8	6500	8000	4000	5000	------	------	------	------	------	------	------	------

Table 2: Recommended torque values for nut-bolt combinations: Coarse Thread Series

2 Torque values without lubrication

5. REQUIRED INSPECTIONS

5.1 Cycle Counting Daily Coherence Check (Installed as an option)

The following procedure applies to either use of the AKV remote display or 3rd party Flightcell DZMx display and provides an approved method for conforming with the SAFRAN "coherence check" as specified in the SAFRAN maintenance manual or with reference to SAFRAN / Turbomeca General Service Letter No. 2283/04 5th issue. It will provide a means to determine that the cycle counting function is recording cycles within your normal mission range.

Procedure: To understand your normal mission range, determine what the total manual count was for the last 10 flights. Add all 10 flights together and then divide by 10. The result is the average consumed cycles to which your normal range is determined by adding +/- 10%. Perform this function separately for Ng and Np.

After the last flight of the day, compare the recorded cycles from the cycle counter display with your normal mission range values. This method will insure that there is no significant discrepancy which would be evident with either a digital display of zero "flt" cycles or "flt" cycles that are in excess of what is the normal mission range. In the event that either of these situations is observed, then perform the Annual Inspection of the cycle counter as described below.

5.2 Annual Inspection

This section contains the time limit intervals and requirements for the scheduled and conditional inspections for the ETM1000 Installation. The inspection items are determined through experience, tests, and the judgment of mechanics and engineers. Every calendar and daily inspection is a visual and thorough inspection to determine the airworthiness of the ETM1000. Qualified persons must perform the inspections in accordance with standard aircraft practices and the applicable maintenance manuals.

An Annual inspection using this **ETM1000-ICA** document (Instructions for Continued Airworthiness), is required. When using **ETM1000-ICA** to perform the required inspections, use the "Inspection Task Description" forms below to record the appropriate data.

Any reference data needed to perform this inspection, other than this document, will be listed in the "Data Reference" column of the inspection forms.

The inspection task to be completed is described in the "Inspection Task Description" column of the inspection form.

When each task is satisfactorily completed, the mechanic performing the inspection task signs the "Mechanic" column for that task.

If the inspection task fails the inspection, the reason for the failure must be determined and remedial action taken before the “Mechanic” block can be signed off. Remedial action may involve cleaning, verifying correct operation, adjusting the tightness of fasteners and hardware, sending the assembly to the manufacturer for overhaul or replacement, etc. Once the appropriate remedial action has been taken and the inspection task has been satisfactorily performed, the mechanic may sign off the “Mechanic” block.

Once all tasks are signed off in the “Mechanic” Column, the inspection form may be signed off at the top of the form and the inspection has then been completed.

5.3 Special Inspection

In the event of a hard landing, perform the “Annual Inspection” tasks prior to returning the aircraft to service.

Helicopter S/N:_____ Registration:_____

Facility:_____ W.O.: _____

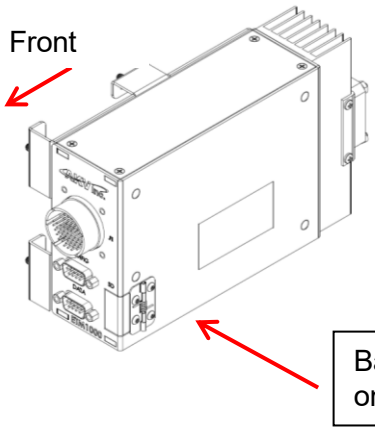
A/F Total time: _____ Rin:_____

Engine Total time: _____ Cycle:_____

Date started: _____ Date completed:_____

Signature: _____ License number: _____

Annual Inspection

Data Reference	Inspection Task Description	Mechanic
ETM1000 User Manual v7.0 or later	**Replacement of the Lithium Backup AA battery for Rev Q LRU's** The new 3.6V AA Lithium "button top" style battery should be replaced bi-annually in order to provide continued retention of the date / time clock. The 3.6V AA Lithium battery is a standard industry lithium battery that can be purchased from AKV, Inc. **Caution:** Do not use a standard AA battery which has insufficient voltage of 1.5V With the A/C battery switch "OFF", remove the battery holder cap by twisting counter clockwise. After the new battery has been installed, make sure the cap installaed and is **fully tighted**. You will now need to reset the date and time. Locate and connect the supplied RS232 cable to the "config" port just below the J1 connector. Connect the cable to a PC running Microsoft XP, 2000, Vista or Windows 7 or 10 using the 9 pin serial port. If a 9 pin serial port is not available then use the supplied USB / Serial adapter.  **Replace with a new battery making sure the "+" side of the battery is down.**	

Data Reference	Inspection Task Description	Mechanic
ETM1000 User Manual v7.0 or later	**Operational Check** The PC you will use must have been set up for communication via “HyperTerminal” prior to using the following procedure. Perform the following steps to verify proper operation of the ETM1000. 1. Use a PC running Windows XP, 2000, Vista or Windows 7/8 and connect to the “Config” port using the AKV supplied RS232 9-pin serial cable. Use the AKV supplied USB/Serial adaptor if your PC does not have a 9 pin serial port available. **<u>If you have a -2 configuration without the pushbutton / indicators and audio side-tone, goto step 7</u>** 2. If the indicators are known to be activated from within the configuration settings of Hyperterminal, turn the A/C battery switch “ON” and observe that the annunciator lights are illuminated as follows during system BIT self-check:  3. **NOTE:** If the **<u>WARNING</u>** light stays illuminated then there has been a prior exceedence that has not been acknowledge and cleared by maintenance. Remove the SD card to confirm what has been exceeded, verify corrective action then reset the light. 4. If the **<u>SD</u>** light stays illuminated then check the SD card is inserted. If it is flashing then the SD card nearly full and data must be removed. If the SD card is bad then replace it. 5. If the **<u>ERR</u>** light stays illuminated then there is a faulty connection with one of the signals to the ETM1000. Use HyperTerminal to determine which signal is faulty. *** Ref. Appendix D for the Wiring Diagrams.** 6. If the audio is known to be activated from within the configuration settings of Hyperterminal and with the headset on your head, check that the audio side tone is heard by cycling the ETM circuit breaker. If it is weak or load, adjust the audio control head unit for a comforatbel level. It is not adjustable within the ETM1000. 7. Check the cooling fan on the rear of the ETM1000 enclosure below the instrument panel for positive airflow by placing your hand next to the fan. 8. Check the fan bearings are not noisy and the fan is clean and provides airflow by placing your hand over the rear of the ETM1000 enclosure.	

Data Reference	Inspection Task Description	Mechanic
ETM1000 User Manual v7.0 or later	9. On your PC, locate and run the Windows native program called "HyperTerminal" 10. Check that the Date and Time are correct. If not, then enter "S" for settings, enter your password and change the appropriate field as required. 11. Check that the Collective Time, Engine Run Time and Engine Starts are correct, If not then enter "S" for settings, enter the password and change the appropriate field as required. 12. Check that the OAT value in "HyperTerminal" is with 5 deg C of the A/C OAT probe. Keep in mind that the ETM1000 OAT probe is mounted on the belly of the A/C and could be receiving additional heat form the ground when compared to the A/C OAT probe mounted above the canopy. **NOTE:** If the cycle counting option is installed, then include the **cycle Counting functional check** described on the next page along with item 13, 14 & 15 below. 13. Start the A/C and run at ground idle. 14. Check that the engine parameters for Tq, MGT, N1, N2 and Nr values in "HyperTerminal" correspond with the indicators on the instrument panel. **NOTE:** During startup it is normal to sometimes see the **ERR** light flash on for 1-2 secs. This can vary between different A/C. 15. Run the A/C at flight speed and again, check the engine parameters for accuracy. 16. Return to ground idle and shutdown the engine. 17. Set the altimeter to 29.92 and verify the Pressure Altitude in "HyperTerminal" is within approximately 300ft. 18. Connect a pitot test set to the A/C pitot tube and while monitoring "HyperTerminal" check that the "Air speed Switch" goes from "0" (OFF) to a "1" (ON) when the test set is adjusted to 40Kt or greater. Tolerances - Activation +0 / -5 MPH and Deactivation -2 / -6 MPH *** Ref. Appendix D for the Wiring Diagrams.** **Coninued next page**	

Data Reference	Inspection Task Description	Mechanic
ETM1000 Arriel 1 or LTS101 Cycle Counting Operating Specification	**Cycle Counting Functional Check (installed as an option)** The ETM1000 cycle counting option utilizes the same methodology as the SAFRAN validated stand-alone AKV cycle counter P/N 350NGTEC software called "Linear Ver Rev 1" or later approved revisions. The "Linear " version" software records a K1 penalty for each 0.1% of speed increase due to the higher resolution capability of the ETM1000 cycle count system. **NOTE:** Cycle counting is available as an option only on the -1 configuration via the AKV remote display or displayed on the 3rd party Flightcell DZMx as shown in Fig. 3 & 4 above. In either case, the ETM1000 is the source for the cycle counting data. When using the AKV remote display the ETM1000 **LRU must be Rev P** or greater. 1. Perform a ground run of the A/C and observe the first data screen for the Ng and Np speeds. These values are compared to the instrument panel indicators and should be within +/- 0.5%. **Note**: Ground runs of the A/C do not require cycle penalties to be recorded with the Arrile 1. A flight must be initiated in order to observe cycle penalties next to the "Flt" indication on the remote display. 2. Perform a normal departure, cruise and landing. Note the Max Ng (K1) to the nearest 0.1% during takeoff and the min Ng speed (K2) during power reduction as well as how many times Ng was > 85% then < 85% then > 85%. After shutdown, compare your estimated cycle count using the Arriel Operating Specification document examples starting on Pg 11 for both Ng and Np. Make sure there is no significant discrepancy between the estimated values and recorded values shown on the cycle counter. If a discrepancy exists, refer to the troubleshooting sect. 7 or contact AKV for further assistance. In place of the ETM1000 cycle counter system which includes the ETM1000 LRU and possibly the remote display (if bad), continue operating the A/C using the SAFRAN pilot "manual cycle counting" procedure during removal and repair. After the ETM1000 LRU / remote display is repaired, repeat this "Annual Inspection" procedure to verify correct operation. Use the ETM1000 programming interface to update the cycle counting function with any new totals. **END OF PROCEDURE**	

6. REMOVING PARTS

Removal instructions for the AKV ETM1000 and cycle counter remote display are listed below.

6.1 To Remove the ETM1000 LRU

Note: The ETM1000 Enclosure is secured to the mounting plate with four (4) ball studs that allow for a quick-release.

a) Disconnect the airframe P1 electrical connector from the J1 ETM1000 enclosure electrical connector
b) Place your hands on the front and rear of the enclosure
c) Pull the enclosure directly towards you and away from the mounting bracket

6.2 To Remove the Airspeed Switch

See Appendix B for the Airspeed Switch Installation Instructions.

6.3 To Remove the Pushbutton Switches

See Appendix C for the Pushbutton Indicator Removal / Installation Instructions.

6.4 To Remove the (optional) Cycle Counting Remote Display

d) Disconnect the airframe electrical connector from the cycle counter enclosure
e) Remove the 2 mounting screws holding the cycle counter to the bracket
f) Install a plastic bag over the airframe connector and secure with zip ties.

NOTE: To Remove the 3rd Party Flightcell DZMx, refer to the OEM Flightcell DZMx manual

7. TROUBLESHOOTING

The troubleshooting table provides the mechanic with guidance for diagnosing malfunctions and the recommended course of action to remedy the fault. Additional help can be found in the Inspection Task (operational task) starting on Pg. 10 or by contacting AKV. See Page 1 for support contact information.

ETM1000

Fault	Probable Cause	Action
No power to unit when aircraft battery power applied	1. Check Circuit breaker 2. Check J1 Connector	1. Reset the Circuit breaker 2. Turn off aircraft battery power and check connector with reference to Appendix D Drawings
Minimal or no airflow from cooling fan.	Cooling fan inoperative.	Check for obstruction and with the power off, check that the fan moves freely and is clean of dust.
Loss of date and time clock indicated by flashing ERR and confirmation with Hyperterminal connected	1. Battery hold cap loose 2. Battery is weak. Min 2.9V	1. Tighten cap 2. Replace battery with a new one

Cycle Counting (installed as an option)

Fault	Probable Cause	Action
No power to the remote display when aircraft battery power applied	1. Check ETM1000 Circuit breaker 2. Check J1 Connector	1. Reset the Circuit breaker 2. Turn off aircraft battery power and check connector with reference to Appendix D Drawings
High Ng and or Np cycles	Engine Signal Generator(s) noisy	Verify electrical connector at Signal Generator is clean and secure. ** **Perform signal quality check below.**
Blinking cursor in the top left corner of the remote display or no display at all	Electro-static discharge has damaged the LCD	Confirm that a ground bonding strap from the enclosure to airframe ground is present, secure and has < 3 milliohm resistance. **Remote Display will need to be returned to AKV for repair.** See Sect. 6 - Remove Parts

NOTE: If the above actions do not resolve the issue, contact AKV for additional assistance or to arrange for the unit to be returned for repair.

Signal quality check

1. Connect an oscilloscope to the ETM1000 airframe wire harness at the wiring splice point for Ng or Np behind the indictaors for whichever signal is of concern.

   Refer to attached Appendix D drawings ETM350-003 for N1/Ng and N2/Np connections

2. Ground run the A/C at idle and observe the quality of the sine-wave signal is as shown in Fig 1.

3. Whilst observing the oscilloscope, slowly increase the FCL to the flight position and observe that the sine-wave remains as shown in Fig 1 thru the speed change.

NOTE: A bad sine-wave signal will look similar to figure 2. If this is observed, clean the signal generator connector and/or replace the signal generator and perform the test again to confirm the quality of the signal is displayed like Fig 1.

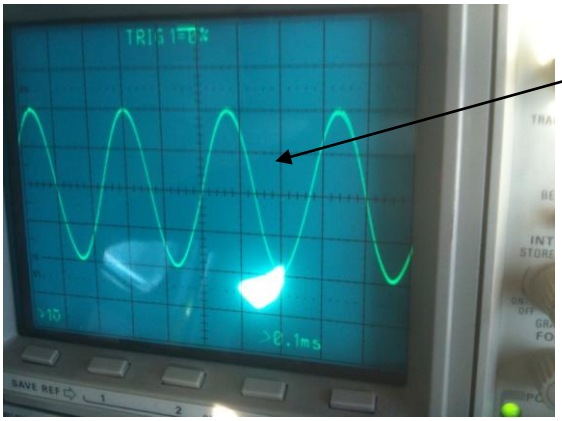


Fig. 1 **(good)**

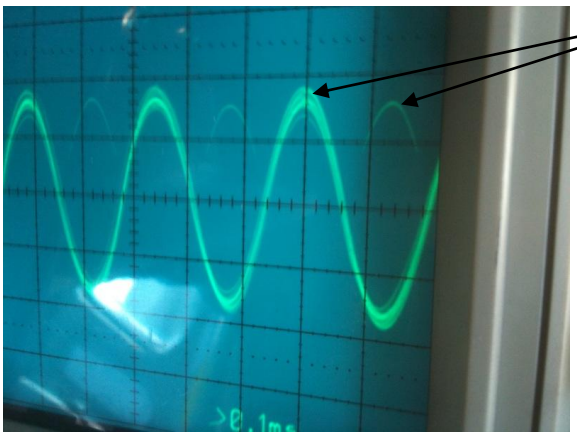


Fig. 2 **(bad)**

8. WEIGHT AND BALANCE CHANGES

In the event the ETM1000 has to be removed for maintenance, use the following table to adjust the aircraft weight and balance data.

Component	Weight
ETM1000 Enclosure P/N ETM350-006	1.25 Lbs 0.57 kg
Mounting Bracket P/N ETM350-007	0.25 Lbs 0.12 kg
(Optional) Cycle Counter Remote Display P/N ETMRD-004	0.25 Lbs 0.12 kg
(Optional) Cycle Counter Remote Display Bracket P/N AS350-ETMRD-001	0.75 Lbs 0.34 kg

Appendix A

A. CONFIGURING THE ETM1000

For Instructions on configuring the ETM1000 and optional cycle counting, refer to the ETM1000 User Manual v7.0 or later

Appendix B

B. AIRSPEED SWITCH INSTALLATION INSTRUCTIONS

Intended Use:
The intended use of the airspeed switch is to provide an airspeed signal at = > 40 Knots for torque exceedence criteria. **NOTE:** The Airspeed switch has an approved provision as noted in the App. D of drawing ETM350-003 Sht 12. Ref ⚠2⚠ under the notes section to be electrically disconnected.

System Description:
This airspeed switch utilizes the existing Pitot system to provide the needed pressures for switch actuation. A ground leg is connected through the airspeed switch and will supply a ground connection for the ETM when the airspeed is = > 40 Knots.

Note: This installation will have negligible effect on aircraft weight and balance.

WARNING: When performing pitot/static systems certification you must connect the vent nipple on the AS9300-603-A switch to the static source on the test box to prevent damage to the switch diaphragm. The vent nipple bleed hole must be sealed to prevent leakage during testing. Do not connect vent nipple to the ships static system except during testing. Do not remove sealant compound from around switch terminals or pressure nipple bleed hole. Removal will cause leakage when performing a pitot system check.

CHECKOUT PROCEDURES:

Required Equipment:
- Pitot test set.

Test:
1) Test the Pitot system in accordance with the aircraft manufacturer's instructions. If the manufacturer has not issued instructions for testing Pitot systems, utilize the procedures contained in AC 43.13-1A or later approved revision.
2) Apply power to the aircraft and observe that the circuit protective device (circuit breaker or fuse) does not "trip" or "blow". Repair wiring if necessary for proper circuit protective device operation.
3) After the Pitot system has been successfully leak tested, adjust Pitot test set to indicate zero knots.
4) Observe that the Airspeed is "OFF" via the laptop PC running "HyperTerminal". If the Airspeed is "ON," check for the proper airspeed switch electrical connections. Incorrect switch connections will cause the ETM to not function correctly when determining a torque exceedence in flight.
5) Adjust the airspeed to equal 40 Knots or greater and observe that the Airspeed is "ON". If the Airspeed does not turn "ON", check connections on airspeed switch or repair wiring as necessary.

NOTE: Tolerances are Activation +0 / -5 MPH and Deactivation -2 / -6 MPH

6) Disconnect the Pitot test equipment from the aircraft.

7) Make the appropriate entries in the aircraft log book indicating a Pitot system test, and the airspeed switch installation have been completed.

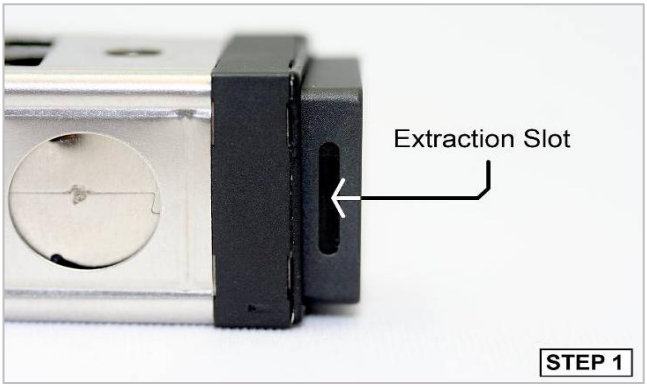
BLANK

Appendix C

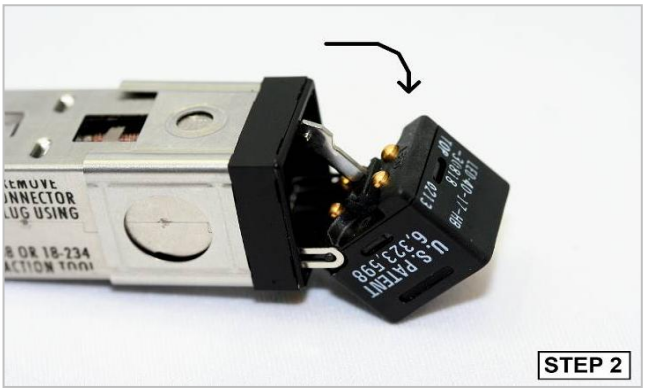
C. Pushbutton Indicator Removal/Installation Instructions

1) Examine the two sides of the switch cap to ensure the extraction slots are completely visible.

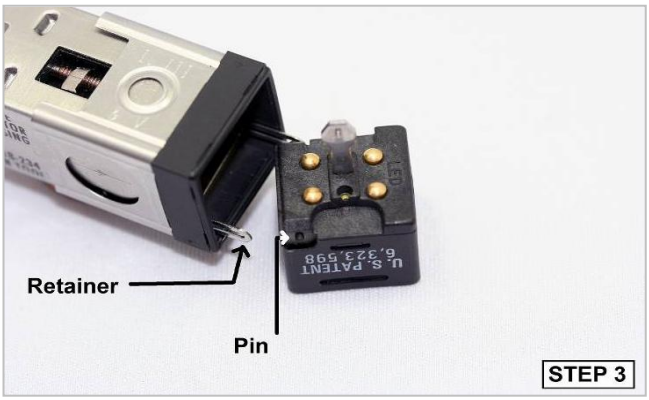
   Note: To release the switch cap from the actuated position, simply push in the switch cap and allow the cap to return to the released position.



2) Extract the switch cap by using the Cap Extractor Tool (Part Number: 17-150) or by applying finger pressure on two sides of the switch cap then pull the switch cap from the switch body.



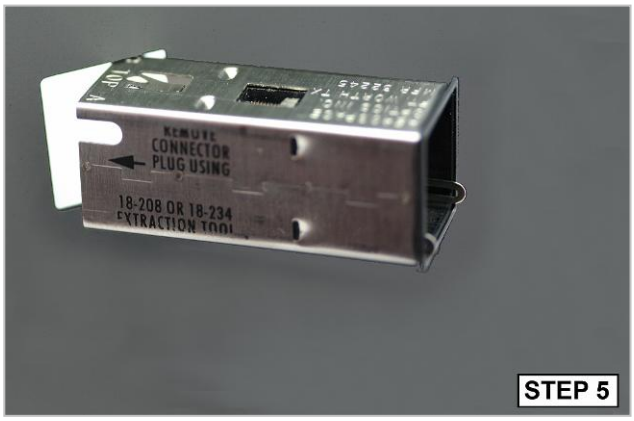
3) Remove switch cap from the switch body by gently removing the cap pins from the metallic retainer.



4) Remove the mounting sleeve by sliding the sleeve over the switch body from the back.

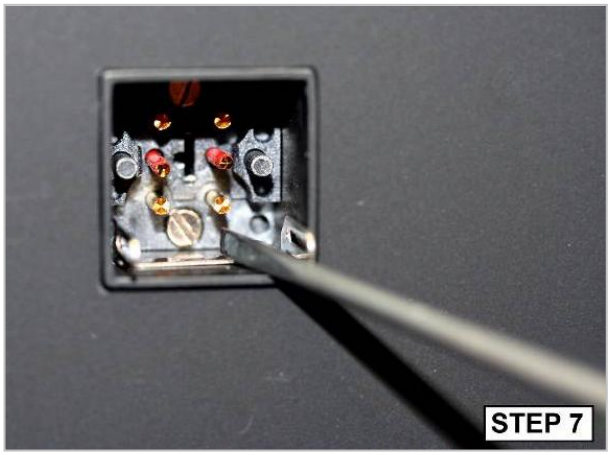
   Note: The optional spacer can also be removed by sliding it from the back of the switch body.

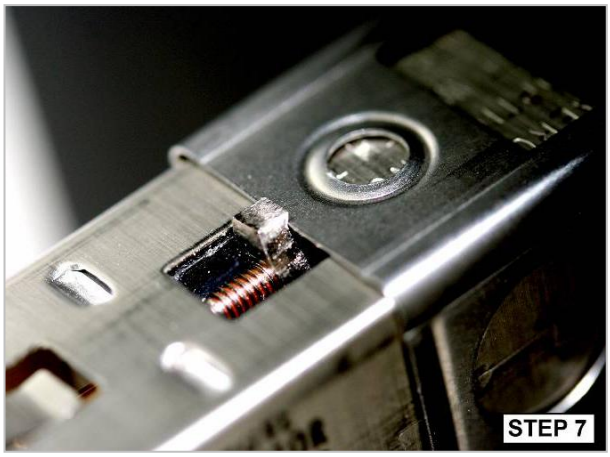
5) Insert the back of the switch body into the panel cutout and slide it through the panel from the front. Ensure the switch body label “TOP” is up.



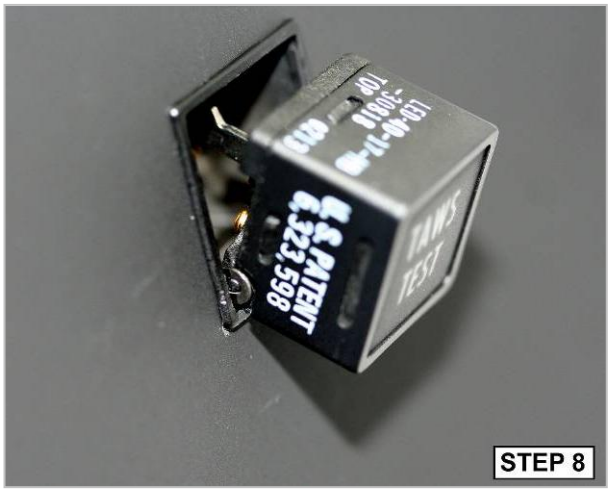
6) From behind the mounting panel, replace the mounting sleeve onto the switch body and slide it up to the back of the mounting panel.

7) From the front and inside of the switch body, tighten the two screws until the Integral Mounting Hardware pulls the mounting sleeve tight up against the mounting panel. Typical torque is 18 inch ounces.





8) Replace the switch cap in the switch body by inserting the cap pins into the metallic retainer and push the cap into the switch body.



Appendix D

D. WIRING DIAGRAMS

This chart is a list of all MDL Rev R drawings found within Appendix D, in order of appearance.

DRAWING#	LEVEL	TITLE	REV	DATE
ETM350-001 Sht 1	SYSTEM COMPONENTS	TOP ASSY	K	11/5/20
ETM350-001 Sht 2	SYSTEM COMPONENTS	-1 CONFIGURATION	J	11/5/20
ETM350-001 Sht 3	SYSTEM COMPONENTS	-2 CONFIGURATION	J	11/5/20
ETM350-001 Sht 4	SYSTEM COMPONENTS	CABLE ROUTING	I	10/10/14
ETM350-002 Sht 1	MECHANICAL INSTALL	LRU MOUNTING	H	11/5/20
ETM350-002 Sht 2	MECHANICAL INSTALL	AIRSPEED SWITCH	D	12/10/11
ETM350-002 Sht 3	MECHANICAL INSTALL	AIRSPEED SWITCH	D	12/10/11
ETM350-002 Sht 4	MECHANICAL INSTALL	AIRSPEED SWITCH	D	12/10/11
ETM350-002 Sht 5	MECHANICAL INSTALL	PUSHBUTTON / INDICATOR	I	10/10/14
ETM350-002 Sht 6	MECHANICAL INSTALL	OAT SENSOR	E	11/5/20
ETM350-003 Sht 1	WIRING INSTALLATION	POWER	NC	1/17/11
ETM350-003 Sht 2	WIRING INSTALLATION	ARRIEL 1 THERMOUCOUPLE	H	7/1/20
ETM350-003 Sht 3	WIRING INSTALLATION	LTS101 THERMOUCOUPLE	A	7/1/20
ETM350-003 Sht 4	WIRING INSTALLATION	ARRIEL 1 Tq	H	1/29/14
ETM350-003 Sht 5	WIRING INSTALLATION	LTS101 Tq	J	12/19/24
ETM350-003 Sht 6	WIRING INSTALLATION	ARRIEL 1 N1 / Ng	G	12/29/12
ETM350-003 Sht 7	WIRING INSTALLATION	LTS101 N1 / Ng	NC	1/17/11
ETM350-003 Sht 8	WIRING INSTALLATION	ARRIEL 1 N2 / Np	G	12/29/12
ETM350-003 Sht 9	WIRING INSTALLATION	LTS101 N2 / Np	NC	1/17/11
ETM350-003 Sht 10	WIRING INSTALLATION	ARRIEL 1 Nr	H	1/29/14
ETM350-003 Sht 11	WIRING INSTALLATION	LTS101 Nr	H	1/29/14
ETM350-003 Sht 12	WIRING INSTALLATION	AIRSPEED SWITCH	B	1/1/25
ETM350-003 Sht 13	WIRING INSTALLATION	COLLECTIVE SWITCH	A	7/24/17
ETM350-003 Sht 14	WIRING INSTALLATION	AUDIO PANEL INTERFACE	I	10/10/14
ETM350-003 Sht 15	WIRING INSTALLATION	OAT SENSOR	H	11/5/20
ETM350-003 Sht 16	WIRING INSTALLATION	PUSHBUTTON / INDICATOR	I	10/10/14
ETM350-003 Sht 17	WIRING INSTALLATION	LOAD WEIGHT (HOOK) INTERFACE	NC	1/1/25
ETM350-004 Sht 1	WIRING INSTALLATION	-1 WIRE HARNESS	K	1/1/25
ETM350-004 Sht 2	WIRING INSTALLATION	-2 WIRE HARNESS	K	1/1/25
ETM350-005 Sht 3	WIRING INSTALLATION	J1 PINOUT	J	1/1/25
ETM350-010 Sht 1	WIRING INSTALLATION	CONFIGURATION PORT	A	3/6/18
ETM350-011 Sht 1	WIRING INSTALLATION	DATA PORT	B	1/1/25
AS350-ETMRD-002 Sht 1	WIRING INSTALLATION	REMOTE DISPLAY INSTALLATION	NC	3/6/18
ETMRD-003 Sht 1	WIRING INSTALLATION	REMOTE DISPLAY WIRING	A	3/5/26
ETMRD-003 Sht 2	WIRING INSTALLATION	REMOTE DISPLAY WIRING	NC	3/5/26

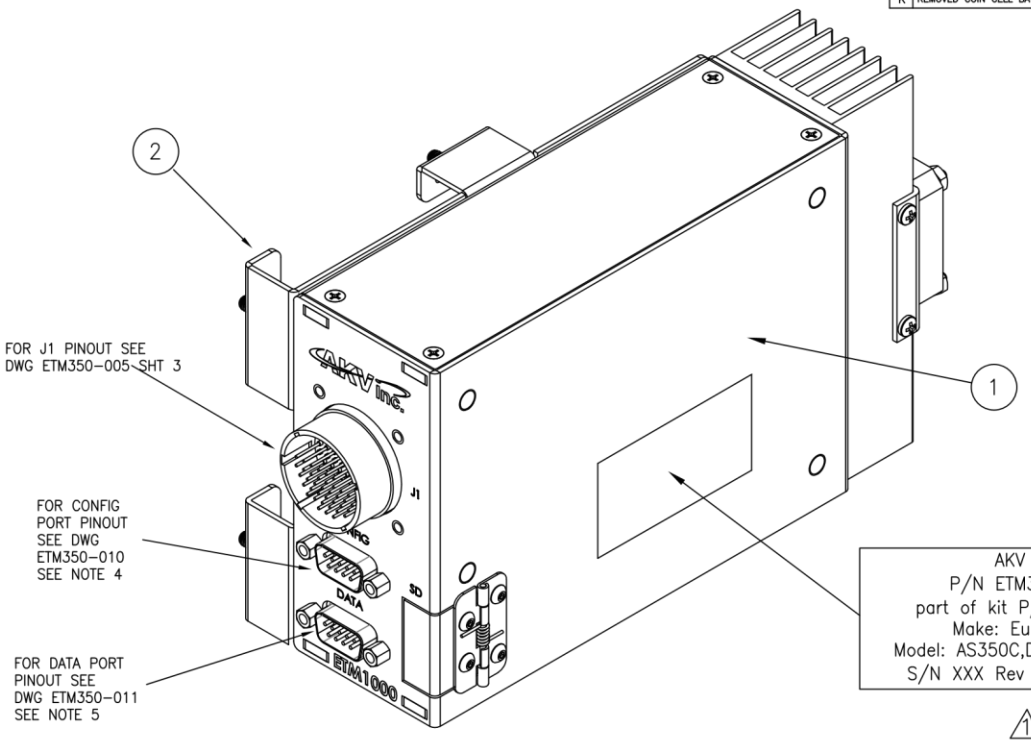
DWG NO ETM350-001 | SH 1 | REV K

REVISIONS				
REV	DESCRIPTION	PREPARED	DATE	APPROVED
NC	INITIAL RELEASE	JG	1/17/11	
I	ROLLED REV A–H ADDED SHT 3 FOR –2 CONFIG	JG	10/10/14	
J	ADDED NEW NOTE FOR REMOTE DISPLAY REV P REQUIREMENT FOR THE REMOTE DISPLAY OPTION	JG	3/6/18	
K	REMOVED COIN CELL BATTERY	JG	11/5/20	

TOP ASSEMBLY

AS350 WITH THE ARRIEL 1 OR LTS101 ENGINE INSTALLED. LRU SOFTWARE IS v71.0 OR GREATER.

SEE ⚠1 BELOW



AKV Inc
P/N ETM350–006
part of kit P/N ETM1000
Make: Eurocopter
Model: AS350C,D,D1,B,BA,B1,B2
S/N XXX Rev __ FAA/PMA

⚠1

NOTES:

1. POWER 28VDC 750mA CONSUMPTION.
2. WEIGHT 1.5Lb.
3. SEE ETM1000–MDL FOR COMPLETE DRAWING LIST.
4. THE RS232 CONFIGURATION "CONFIG" PORT IS USED FOR GROUND SUPPORT EQUIPMENT PURPOSES. SEE DWG ETM350–010.
5. THE RS232 "DATA" PORT IS A PROVISIONAL PORT FOR 3RD PART APPROVED SATELLITE TRACKING SYSTEMS. SEE DWG ETM350–011.

⚠1 TO ACCEPT THE CYCLE COUNTING REMOTE DISPLAY, THE FOLLOWING CONFIGURATION IS REQUIRED:
1. ETM1000 LRU MUST BE REV P OR GREATER
2. ETM1000 INSTALLED SOFTWARE MUST BE v72.0 OR GREATER. REF. DOCUMENT "ETM1000 CONFIGURATION AND GRAPH / TRENDING USER MANUAL v7.0" AND SECT. 5.0 TO CONFIRM INSTALLED SOFTWARE VERSION AND OPERATION.

QTY	QTY	ITEM	DESCRIPTION	PART NUMBER	VENDOR/MFGR
–2	–1		PARTS LIST		
1	1	2	MOUNTING BRACKETT	ETM350–007	AKV, INC
1	1	1	EXCEEDENCE & TREND MONITOR ETM1000	ETM350–006	AKV, INC

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UNLESS NOTED:
UNSHIELDED WIRE MIL–W–22759
SHIELDED WIRE MIL–C–M27500
COAX RG–400

RIVET CODE PER NAS523
DASH NO FOR DIA
BASIC CODE: M= MFD HEAD MS, F= MFD HEAD FS
DASH NO FOR LENGTH

BASIC CODES
BB= MS20426AD
BJ= MS20470AD
SEE NOTE:

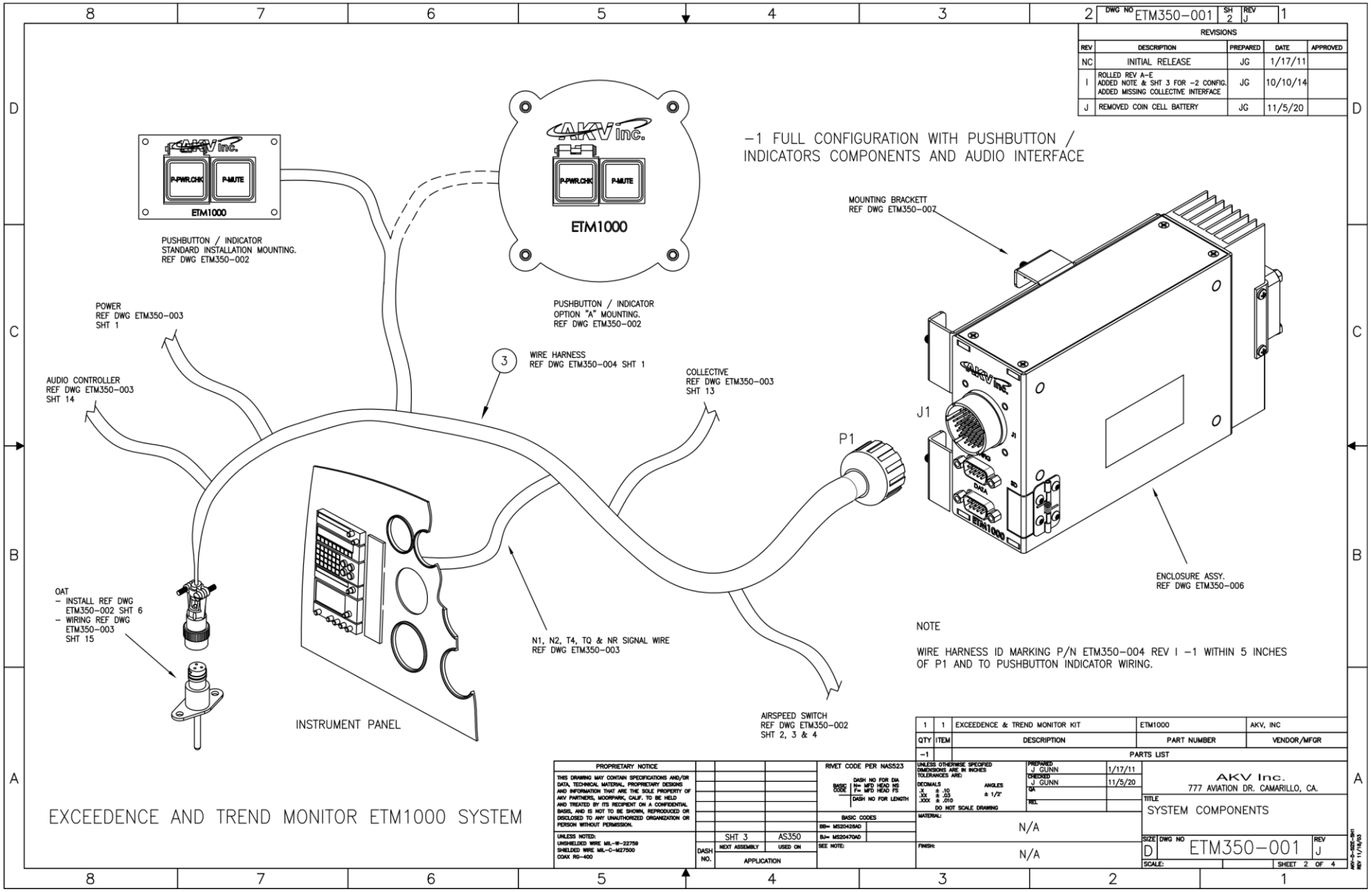
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMALS: .X ± .10, .XX ± .03, .XXX ± .010
ANGLES ± 1/2°
DO NOT SCALE DRAWING

PREPARED J GUNN 1/17/11
CHECKED J GUNN 11/5/20
QA
REL
MATERIAL: N/A
FINISH: N/A

AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
TITLE: SYSTEM COMPONENTS
SIZE D | DWG NO ETM350–001 | REV K
SCALE: | SHEET 1 OF 4

DASH NO.	NEXT ASSEMBLY	USED ON
	SHT 2	AS350
	APPLICATION	

AKV–D–SIZE–SH1 REV 11/16/03


DWG NO ETM350-001 SH 2 REV J
REVISIONS
REV | DESCRIPTION | PREPARED | DATE | APPROVED
NC | INITIAL RELEASE | JG | 1/17/11
I | ROLLED REV A-E ADDED NOTE & SHT 3 FOR -2 CONFIG. ADDED MISSING COLLECTIVE INTERFACE | JG | 10/10/14
J | REMOVED COIN CELL BATTERY | JG | 11/5/20
-1 FULL CONFIGURATION WITH PUSHBUTTON / INDICATORS COMPONENTS AND AUDIO INTERFACE
P-PWR.CHK
P-MUTE
ETM1000
PUSHBUTTON / INDICATOR STANDARD INSTALLATION MOUNTING. REF DWG ETM350-002
PUSHBUTTON / INDICATOR OPTION "A" MOUNTING. REF DWG ETM350-002
POWER REF DWG ETM350-003 SHT 1
AUDIO CONTROLLER REF DWG ETM350-003 SHT 14
3 WIRE HARNESS REF DWG ETM350-004 SHT 1
COLLECTIVE REF DWG ETM350-003 SHT 13
P1
J1
MOUNTING BRACKETT REF DWG ETM350-007
ENCLOSURE ASSY. REF DWG ETM350-006
OAT
- INSTALL REF DWG ETM350-002 SHT 6
- WIRING REF DWG ETM350-003 SHT 15
INSTRUMENT PANEL
N1, N2, T4, TQ & NR SIGNAL WIRE REF DWG ETM350-003
AIRSPEED SWITCH REF DWG ETM350-002 SHT 2, 3 & 4
NOTE
WIRE HARNESS ID MARKING P/N ETM350-004 REV I -1 WITHIN 5 INCHES OF P1 AND TO PUSHBUTTON INDICATOR WIRING.
QTY | ITEM | DESCRIPTION | PART NUMBER | VENDOR/MFGR
1 | 1 | EXCEEDENCE & TREND MONITOR KIT | ETM1000 | AKV, INC
-1
PARTS LIST
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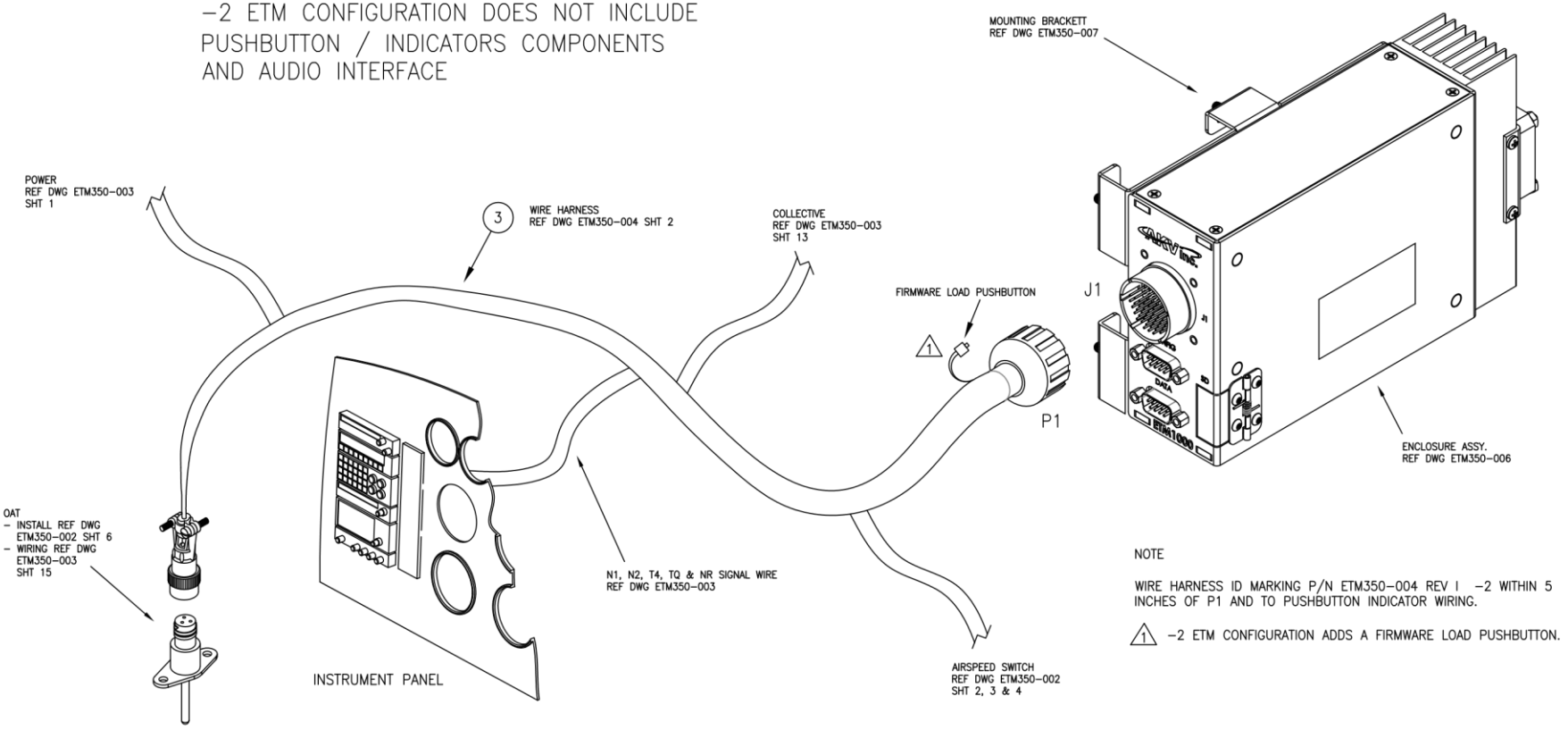
UNLESS NOTED:
UNSHIELDED WIRE MIL-W-22759
SHIELDED WIRE MIL-C-M27500
COAX RG-400
RIVET CODE PER NAS523
BASIC CODES
BB= MS20426AD
BJ= MS20470AD
SEE NOTE:
DASH NO. | SHT 3 | AS350
NEXT ASSEMBLY | USED ON
APPLICATION
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMALS .X ± .10 .XX ± .03 .XXX ± .010
ANGLES ± 1/2°
DO NOT SCALE DRAWING
PREPARED J GUNN 1/17/11
CHECKED J GUNN 11/5/20
QA
REL.
MATERIAL: N/A
FINISH: N/A
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
TITLE SYSTEM COMPONENTS
SIZE D DWG NO ETM350-001 REV J
SCALE: SHEET 2 OF 4
EXCEEDENCE AND TREND MONITOR ETM1000 SYSTEM

DWG NO ETM350-001 SH 3 REV J

REVISIONS				
REV	DESCRIPTION	PREPARED	DATE	APPROVED
I	INITIAL RELEASE ADDED SHT 3 FOR -2 CONFIG ADDED MISSING COLLECTIVE INTERFACE	JG	10/10/14	
J	REMOVED COIN CELL BATTERY	JG	11/5/20	

-2 ETM CONFIGURATION DOES NOT INCLUDE PUSHBUTTON / INDICATORS COMPONENTS AND AUDIO INTERFACE



NOTE

WIRE HARNESS ID MARKING P/N ETM350-004 REV I -2 WITHIN 5 INCHES OF P1 AND TO PUSHBUTTON INDICATOR WIRING.

1 -2 ETM CONFIGURATION ADDS A FIRMWARE LOAD PUSHBUTTON.

QTY	ITEM	DESCRIPTION	PART NUMBER	VENDOR/MFGR
1	1	EXCEEDENCE & TREND MONITOR KIT	ETM1000	AKV, INC
-2		PARTS LIST		

EXCEEDENCE AND TREND MONITOR ETM1000 SYSTEM

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UNLESS NOTED:
UNSHIELDED WIRE MIL-W-22759
SHIELDED WIRE MIL-C-M27500
COAX RG-400

RIVET CODE PER NAS523
BASIC CODE: DASH NO FOR DIA; M= MFD HEAD MS; F= MFD HEAD FS; DASH NO FOR LENGTH

BASIC CODES
BB= MS20426AD
BJ= MS20470AD
SEE NOTE:

DASH NO.	NEXT ASSEMBLY	USED ON
	SHT 4	AS350
	APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMALS .X ± .10, .XX ± .03, .XXX ± .010
ANGLES ± 1/2°
DO NOT SCALE DRAWING

PREPARED J GUNN 1/17/11
CHECKED J GUNN 11/5/20
QA
REL

MATERIAL: N/A
FINISH: N/A

AKV Inc.
777 AVIATION DR. CAMARILLO, CA.

TITLE
SYSTEM COMPONENTS

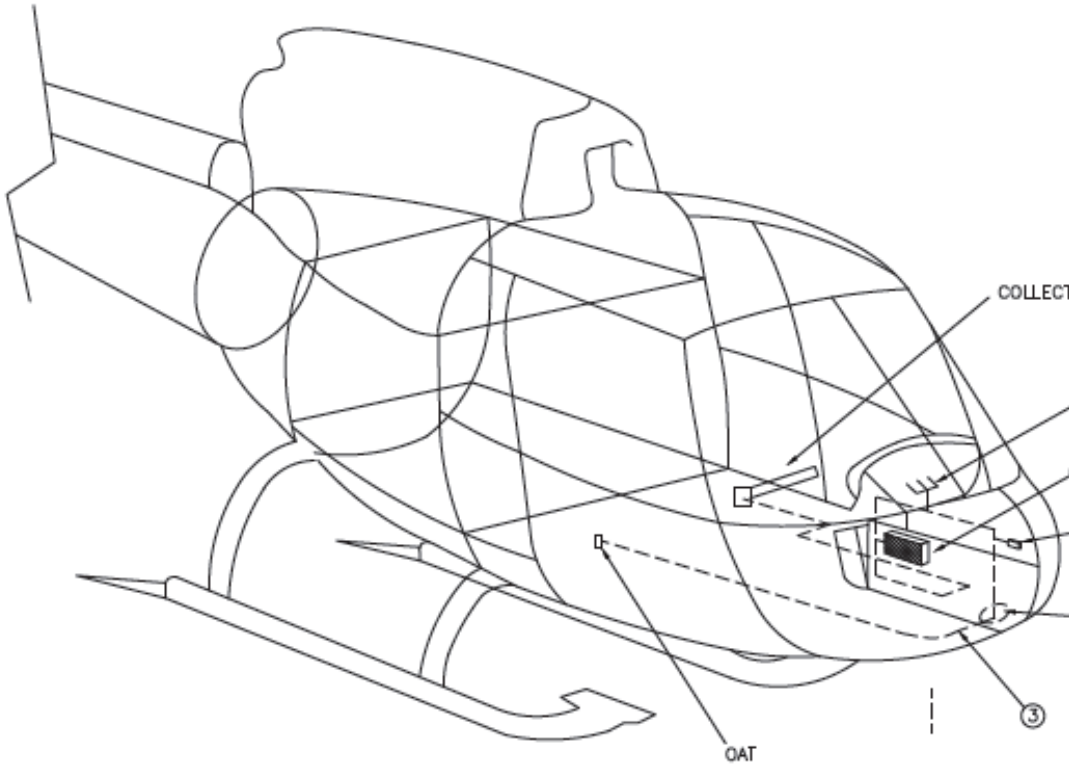
SIZE D DWG NO ETM350-001 REV J
SCALE: SHEET 3 OF 4

AKV-D-SIZE-SH1 REV 11/18/03

REVISIONS				
REV	DESCRIPTION	PREPARED	DATE	APPROVED
NC	INITIAL RELEASE	JG	1/17/11	
A–H	NO CHANGES MADE TO THIS DWG			
I	CHANGED FROM SAT 3 TO SAT 4	JG	10/10/14	

NOTES:

1. ROUTE / SECURE WIRING PER AC43.13–1B CHG 1. CHAPT. 11 SECT 8 PARA 11–105 THRU 11–121.



CABLE ROUTING

QTY	ITEM	DESCRIPTION	PART NUMBER	VENDOR/MFGR
1	3	WIRE HARNESS	ETM350–004	AKV, INC
1	2	MOUNTING BRACKETT	ETM350–007	AKV, INC
1	1	EXCEEDENCE & TREND MONITOR ETM1000	ETM350–008	AKV, INC

PARTS LIST

PROPRIETARY NOTICE

J GUINN 1/17/11
J GUINN 10/10/14

N/A
N/A

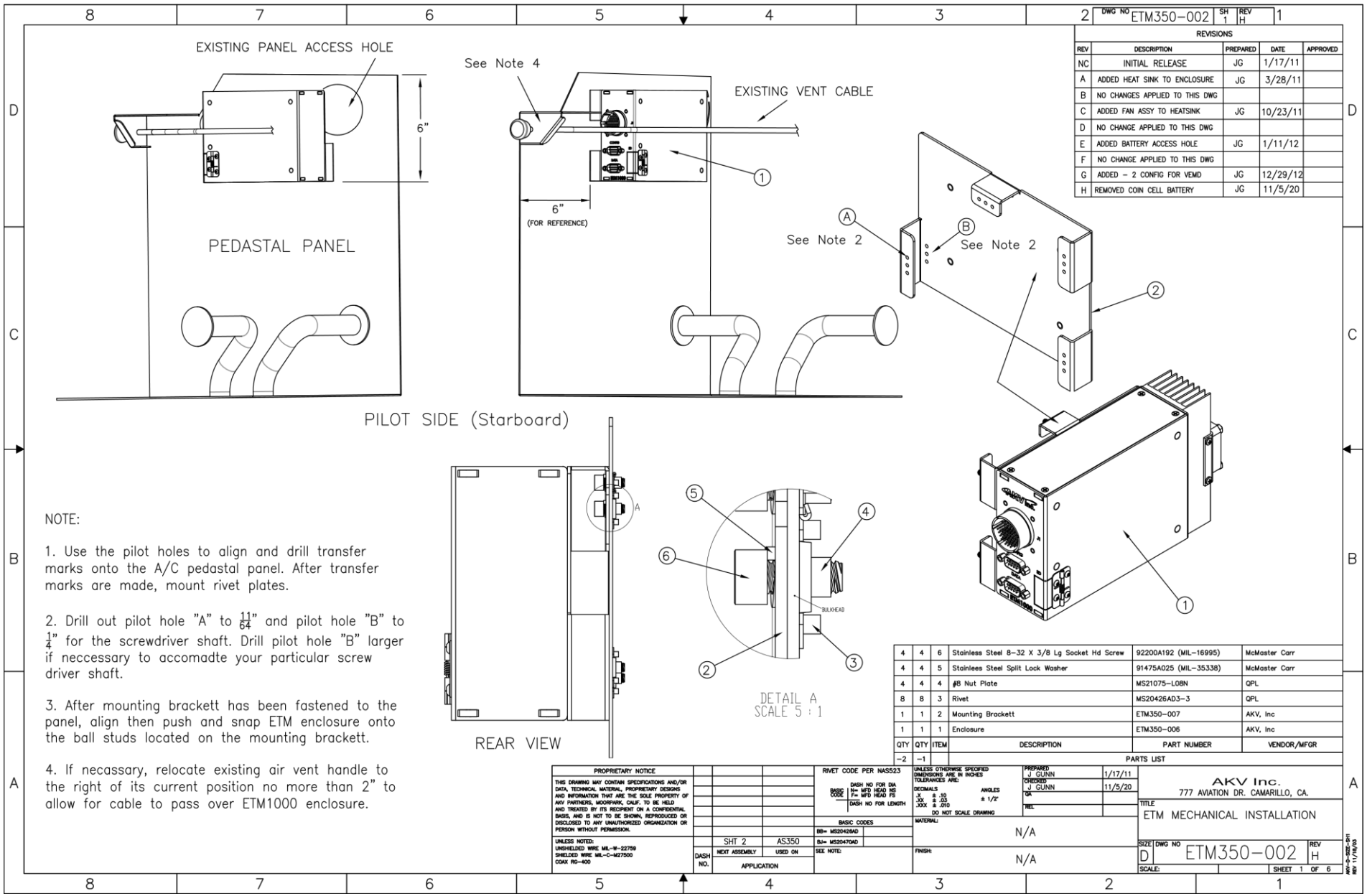
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.

TITLE: SYSTEM COMPONENTS

SIZE D | DWG NO ETM350–001 | REV I

SCALE | SHEET 4 OF 4

ETM350–003 AS350



NOTE:

1. Use the pilot holes to align and drill transfer marks onto the A/C pedastal panel. After transfer marks are made, mount rivet plates.

2. Drill out pilot hole "A" to $\frac{11}{64}$" and pilot hole "B" to $\frac{1}{4}$" for the screwdriver shaft. Drill pilot hole "B" larger if neccessary to accomadte your particular screw driver shaft.

3. After mounting brackett has been fastened to the panel, align then push and snap ETM enclosure onto the ball studs located on the mounting brackett.

4. If necassary, relocate existing air vent handle to the right of its current position no more than 2" to allow for cable to pass over ETM1000 enclosure.

DWG NO ETM350-002 | SH 1 | REV H

REVISIONS

REV	DESCRIPTION	PREPARED	DATE	APPROVED
NC	INITIAL RELEASE	JG	1/17/11	
A	ADDED HEAT SINK TO ENCLOSURE	JG	3/28/11	
B	NO CHANGES APPLIED TO THIS DWG			
C	ADDED FAN ASSY TO HEATSINK	JG	10/23/11	
D	NO CHANGE APPLIED TO THIS DWG			
E	ADDED BATTERY ACCESS HOLE	JG	1/11/12	
F	NO CHANGE APPLIED TO THIS DWG			
G	ADDED – 2 CONFIG FOR VEMD	JG	12/29/12	
H	REMOVED COIN CELL BATTERY	JG	11/5/20	

PARTS LIST

QTY	QTY	ITEM	DESCRIPTION	PART NUMBER	VENDOR/MFGR
-2	-1				
4	4	6	Stainless Steel 8-32 X 3/8 Lg Socket Hd Screw	92200A192 (MIL-16995)	McMaster Carr
4	4	5	Stainless Steel Split Lock Washer	91475A025 (MIL-35338)	McMaster Carr
4	4	4	#8 Nut Plate	MS21075-L08N	QPL
8	8	3	Rivet	MS20426AD3-3	QPL
1	1	2	Mounting Brackett	ETM350-007	AKV, Inc
1	1	1	Enclosure	ETM350-006	AKV, Inc

UNLESS NOTED:
UNSHIELDED WIRE MIL-W-22759
SHIELDED WIRE MIL-C-M27500
COAX RG-400

RIVET CODE PER NAS523
BASIC CODE: B= MFD HEAD NS, F= MFD HEAD FS
DASH NO FOR DIA
DASH NO FOR LENGTH

BASIC CODES
BB= MS20426AD
BJ= MS20470AD
SEE NOTE:

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMALS: .X ± .10, .XX ± .03, .XXX ± .010
ANGLES ± 1/2°
DO NOT SCALE DRAWING

MATERIAL: N/A
FINISH: N/A

DASH NO.	NEXT ASSEMBLY	USED ON
	SHT 2	AS350
	APPLICATION	

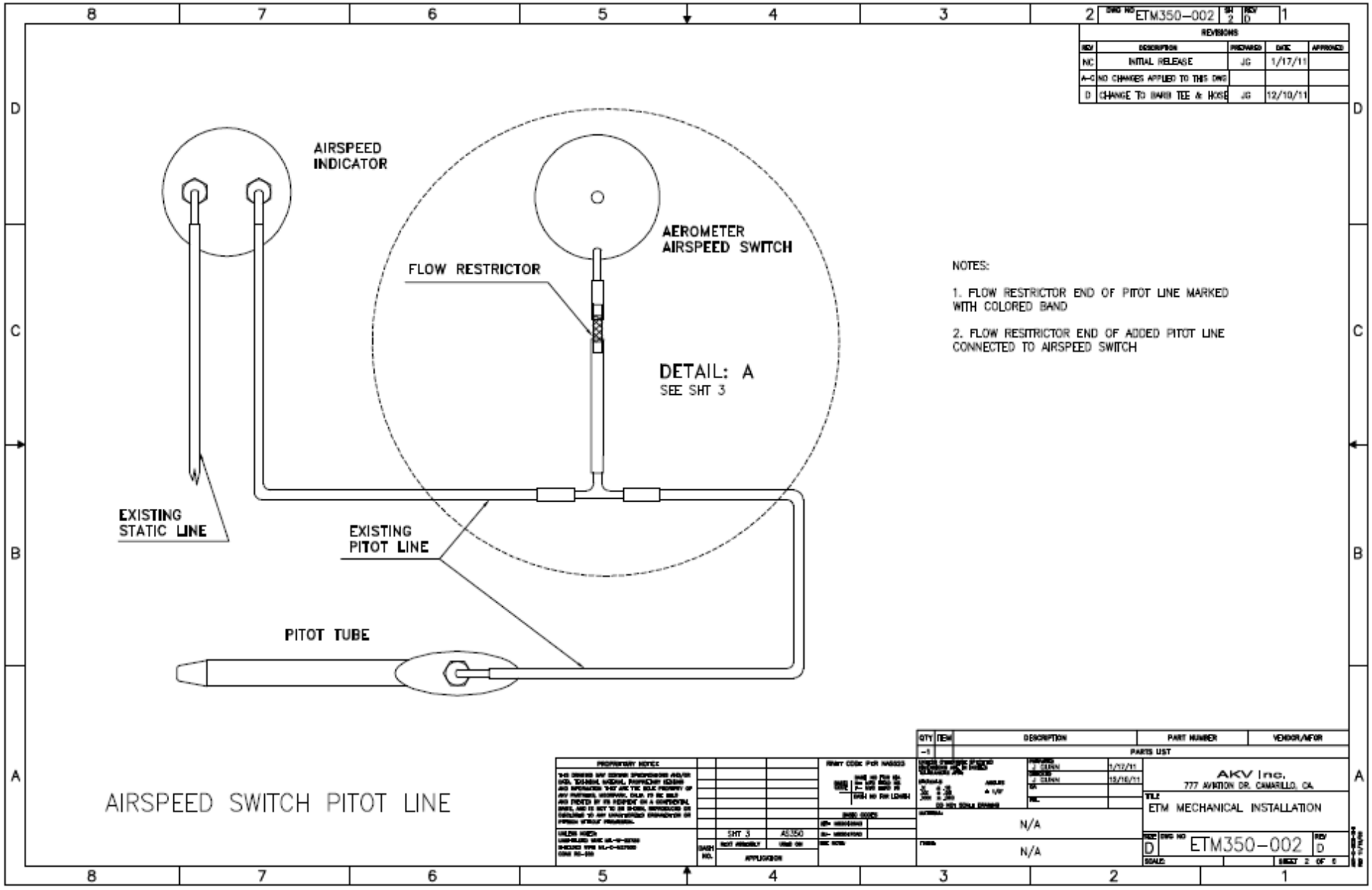
PREPARED J GUNN 1/17/11
CHECKED J GUNN 11/5/20
QA
REL

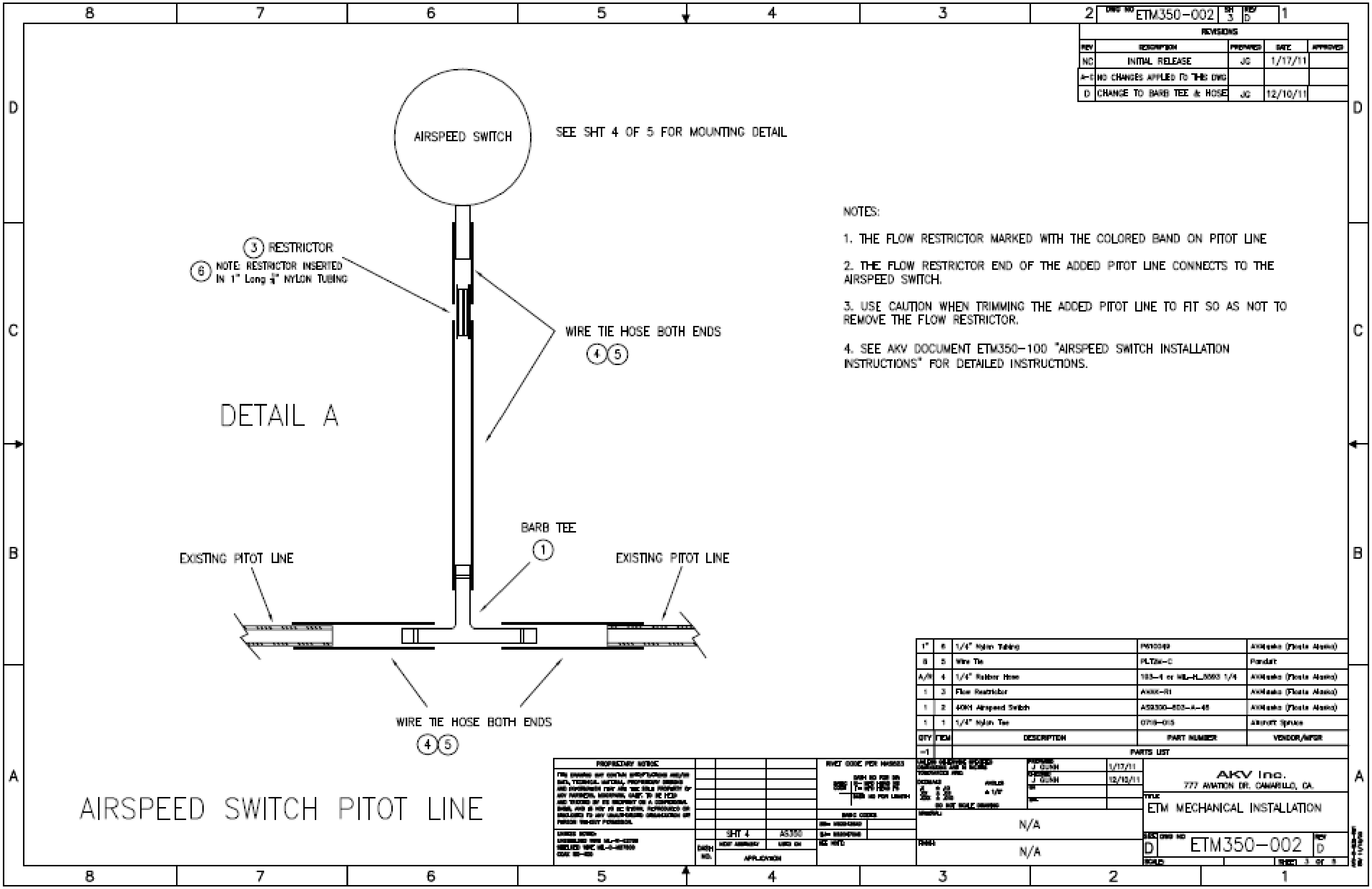
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.

TITLE
ETM MECHANICAL INSTALLATION

SIZE D | DWG NO ETM350-002 | REV H
SCALE: | SHEET 1 OF 6

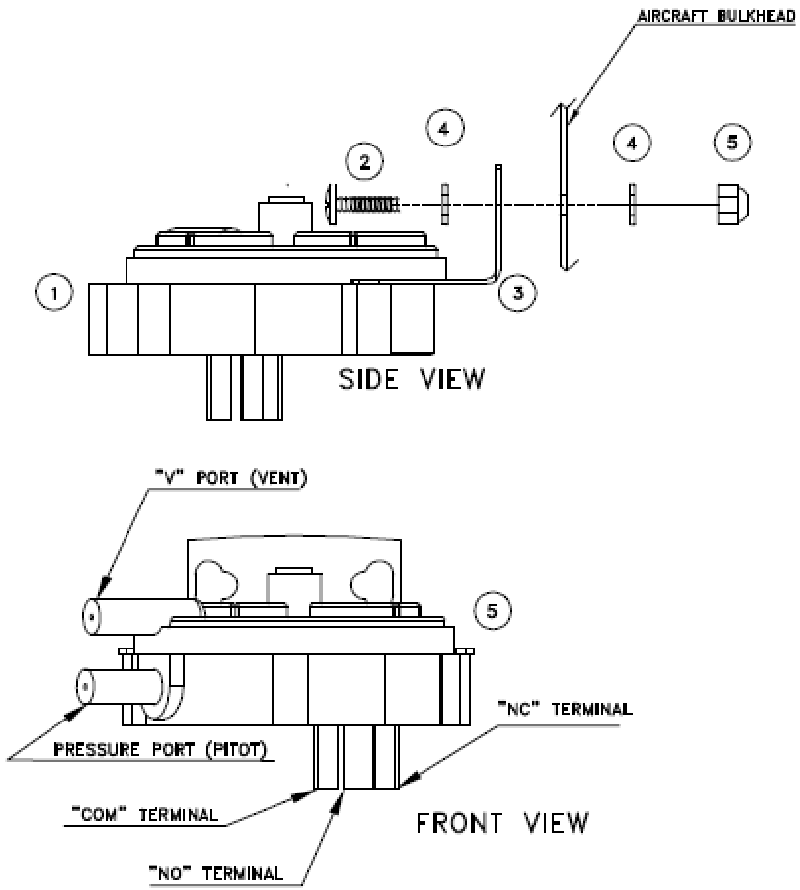
AKV-D-SIZE-SH1
REV 11/18/03


AIRSPEED INDICATOR
AEROMETER AIRSPEED SWITCH
FLOW RESTRICTOR
DETAIL: A
SEE SHT 3
EXISTING STATIC LINE
EXISTING PITOT LINE
PITOT TUBE
NOTES:
1. FLOW RESTRICTOR END OF PITOT LINE MARKED WITH COLORED BAND
2. FLOW RESTRICTOR END OF ADDED PITOT LINE CONNECTED TO AIRSPEED SWITCH
AIRSPEED SWITCH PITOT LINE
AKV Inc.
777 AVIATION DR. CAMARILLO, CA
ETM MECHANICAL INSTALLATION
ETM350-002


ETM350-002
REVISIONS
NC INITIAL RELEASE JG 1/17/11
NO CHANGES APPLIED TO THIS DWG
D CHANGE TO BARB TEE & HOSE JG 12/10/11
AIRSPEED SWITCH
SEE SHT 4 OF 5 FOR MOUNTING DETAIL
3 RESTRICTOR
6 NOTE: RESTRICTOR INSERTED IN 1" Long ¼" NYLON TUBING
WIRE TIE HOSE BOTH ENDS
4 5
DETAIL A
BARB TEE
1
EXISTING PITOT LINE
EXISTING PITOT LINE
WIRE TIE HOSE BOTH ENDS
4 5
AIRSPEED SWITCH PITOT LINE
NOTES:
1. THE FLOW RESTRICTOR MARKED WITH THE COLORED BAND ON PITOT LINE
2. THE FLOW RESTRICTOR END OF THE ADDED PITOT LINE CONNECTS TO THE AIRSPEED SWITCH.
3. USE CAUTION WHEN TRIMMING THE ADDED PITOT LINE TO FIT SO AS NOT TO REMOVE THE FLOW RESTRICTOR.
4. SEE AKV DOCUMENT ETM350-100 "AIRSPEED SWITCH INSTALLATION INSTRUCTIONS" FOR DETAILED INSTRUCTIONS.
1/4" Nylon Tubing
Wire Tie
1/4" Rubber Hose
Flow Restrictor
Airspeed Switch
1/4" Nylon Tee
QTY ITEM DESCRIPTION PART NUMBER VENDOR/MFGR
PARTS LIST
SHT 4 AS350
APPLICATION
J GUNN 1/17/11
J GUNN 12/10/11
N/A
N/A
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
ETM MECHANICAL INSTALLATION
D ETM350-002 D

DWG NO ETM350-002 SH 4 REV D

REVISIONS				
REV	DESCRIPTION	PREPARED	DATE	APPROVED
NC	INITIAL RELEASE	JG	1/17/11	
A-C	NO CHANGES APPLIED TO THIS DWG			
D	UPDATED PARTS LIST ITEM NO.	JG	12/10/11	



NOTES:

1. MOUNT THE BRACKETT ON THE INSIDE OF THE PEDASTAL PANEL OPPOSITE SIDE OF THE ETM MOUNTING LOCATION PANEL. REF SHT 1

2. FOR ELECTRICAL CONNECTION DETAIL SEE DWG ETM350-003 SHT 12

QTY	ITEM	DESCRIPTION	PART NUMBER	VENDOR/MFGR
2	5	Nut	MS21045-3	QPL
4	4	Washer	AN960-10	QPL
1	3	Switch Bracket (Part of Item 1)	[illegible]	[illegible]
2	2	Screw	MS35207-263	QPL
1	1	Airspeed Switch	[illegible]	[illegible]
-1		PARTS LIST		

AIRSPEED SWITCH MOUNTING

AKV Inc.
777 AVIATION DR. CAMARILLO, CA.

TITLE: ETM MECHANICAL INSTALLATION

DRAWN: J. GUNN 1/17/11
CHECKED: J. GUNN 12/10/11

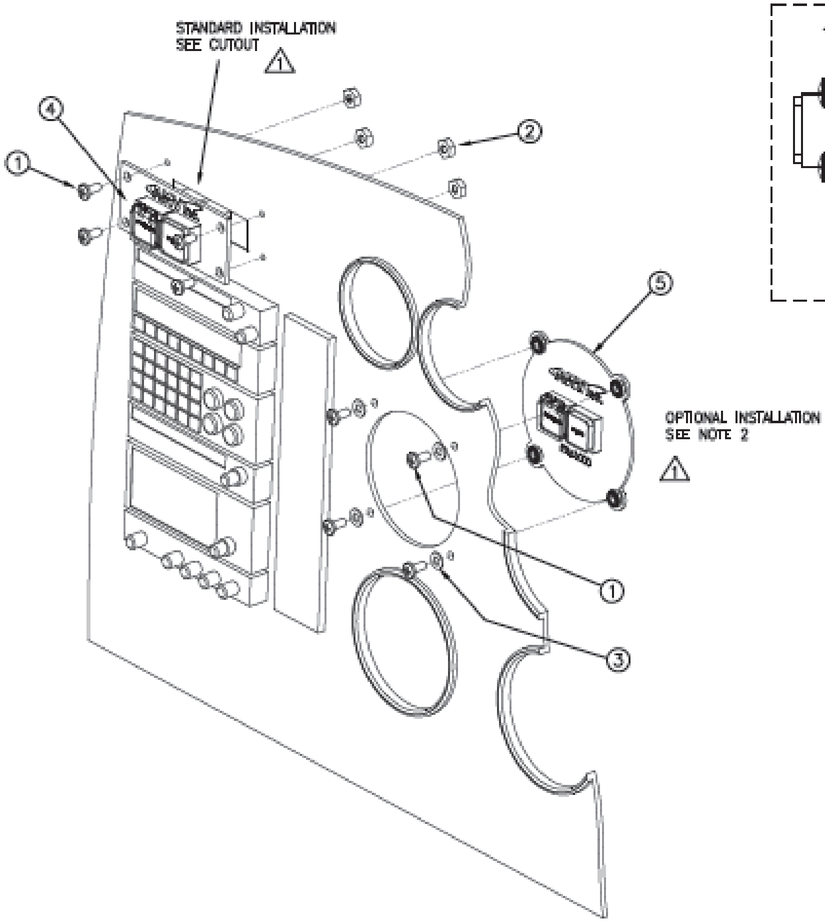
SHT 5 | AS350
NEXT ASSEMBLY | USED ON
APPLICATION

N/A
N/A

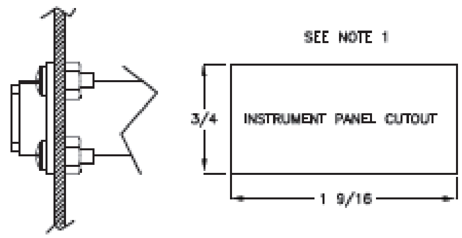
SIZE D DWG NO ETM350-002 REV D
SHEET 4 OF 6

DWG NO ETM350-002 SH 5 REV I

REVISIONS				
REV	DESCRIPTION	PREPARED	DATE	APPROVED
NC	INITIAL RELEASE	JG	1/17/11	
A	ADDED GAURD TO P-PWR.CHK PUSHBUTTON	JG	3/28/11	
B-H	NO CHANGES MADE TO THIS DWG			
I	ADDED -2 CONFIGURATION	JG	10/10/14	



PUSHBUTTON / INDICATOR



CUTOUT

NOTES:

1. LOCATE THE STANDARD INSTALLATION IN A SUITABLE AREA ON THE INSTRUMENT PANEL FREE FROM ANY INTERFERENCE WITH OTHER INSTALLED ITEMS. AFTER CUTOUT IS MADE, TRANSFER MATCH DRILL 4 EA. MOUNTING HOLES USING A 9/64 DRILL BIT. USE HARDWARE ITEMS 1 & 2 TO MOUNT.

2. OPTIONAL MOUNTING CAN BE PURCHASED FROM AKV SEPERATLEY AND USED WHEN A SPARE INSTRUMENT INDICATOR CUTOUT IS AVAILABLE. TO TRANSFER THE SWITCHES TO THE OPTIONAL PLATE, REF AKV DOCUMENT ETM350-012 "INSTALLATION PROCEDURE FOR LED SERIES SWITCH.

3. WHEN MOUNTING INSTALLATION OF SWITCHES IS COMPLETE, PRESS CORRESPONDING (INDENTIFIED) WIRE HARNESS QUIK CONNECT PLUG INTO THE BACK OF THE SWITCH. VERFIY ORIENTATION PRIOR TO INSTALLING PLUG. REF DWG ETM350-003 SHT 16 FOR WIRING DETAIL.

4. ITEM 3 QUICK CONNECT PLUG REMOVAL TOOL AEROSPACE OPTICS P/N 18-234

5. INDICATOR CAP REMOVAL TOOL AEROSPACE OPTICS P/N 17-150.

6. USE ASTRO TOOL CRIMPER P/N M22520/2-01 AND TURRET P/N M22520/2-07 FOR ITEM 4 SOCKET PINS.

7. USE WIRE INSERTION/EXTRACTION TOOL P/N M81969/14-11 (RED/WHITE) FOR PIN REMOVAL.

8. STANDARD INDICATOR CAP IS NON-NVIS. FOR NVIS CAPATABLE CAP CONTACT AKV.

⚠1 -2 ETM INSTALLATION CONFIGURATION DOES NOT INCLUDE THE INDICATOR PANEL COMPONENTS IDENTIFIED IN THE PARTS LIST

QTY	ITEM	DESCRIPTION	PART NUMBER	VENDOR/MFGR
1	5	OPTIONAL MOUNTING PLATE	ETM350-009	AKV, INC
1	4	STANDARD MOUNTING PLATE	ETM350-008	AKV, INC
4	3	#8 LOCK WASHER	MS35333-37	QPL
4	2	6/32 NYLON SHORT LOCK NUT	MS21083	QPL
4	1	6-32 3/8" PANHEAD SCREW BLK OXIDE	MS35214-25	QPL
-1		PARTS LIST		

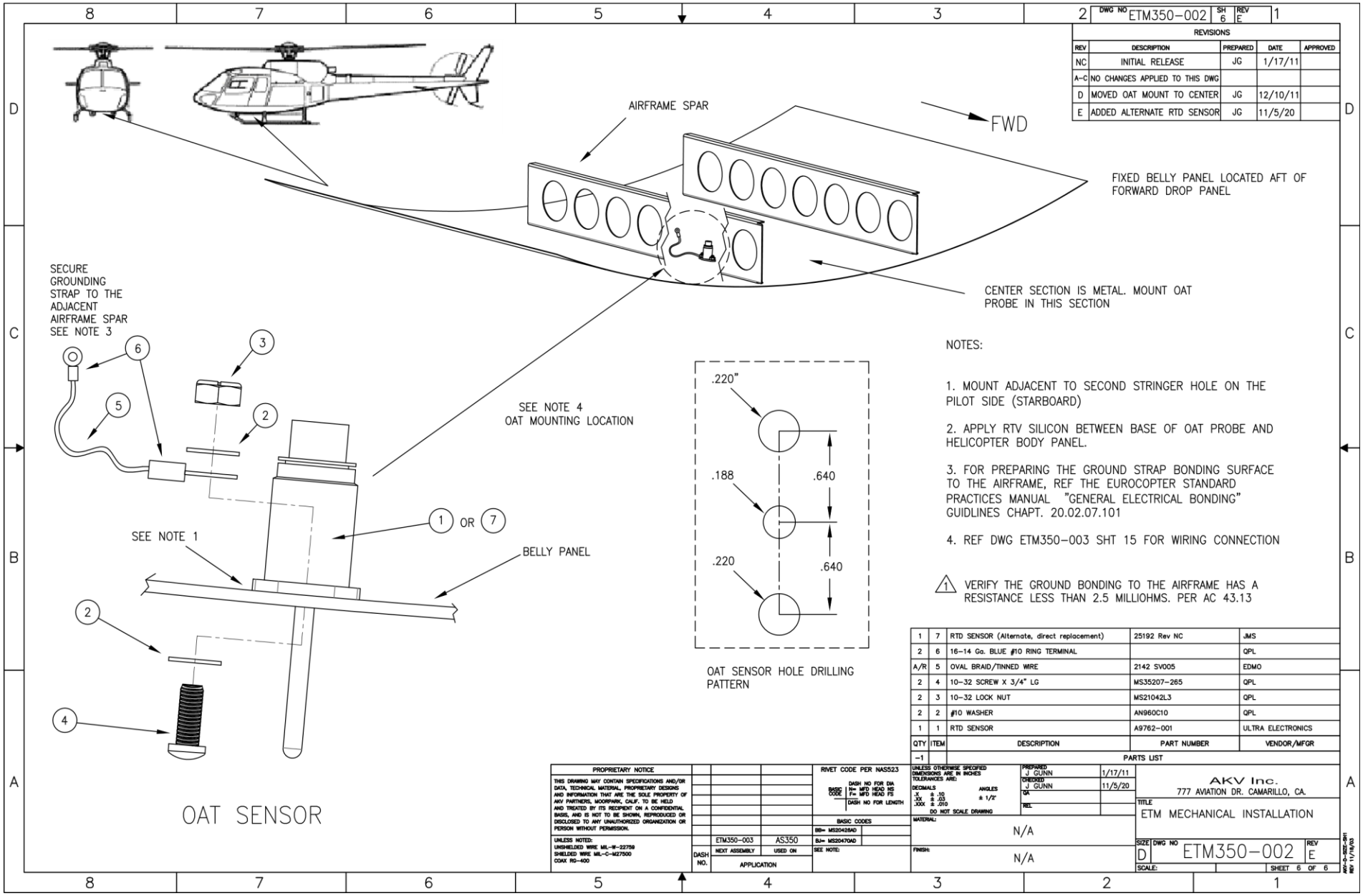
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.

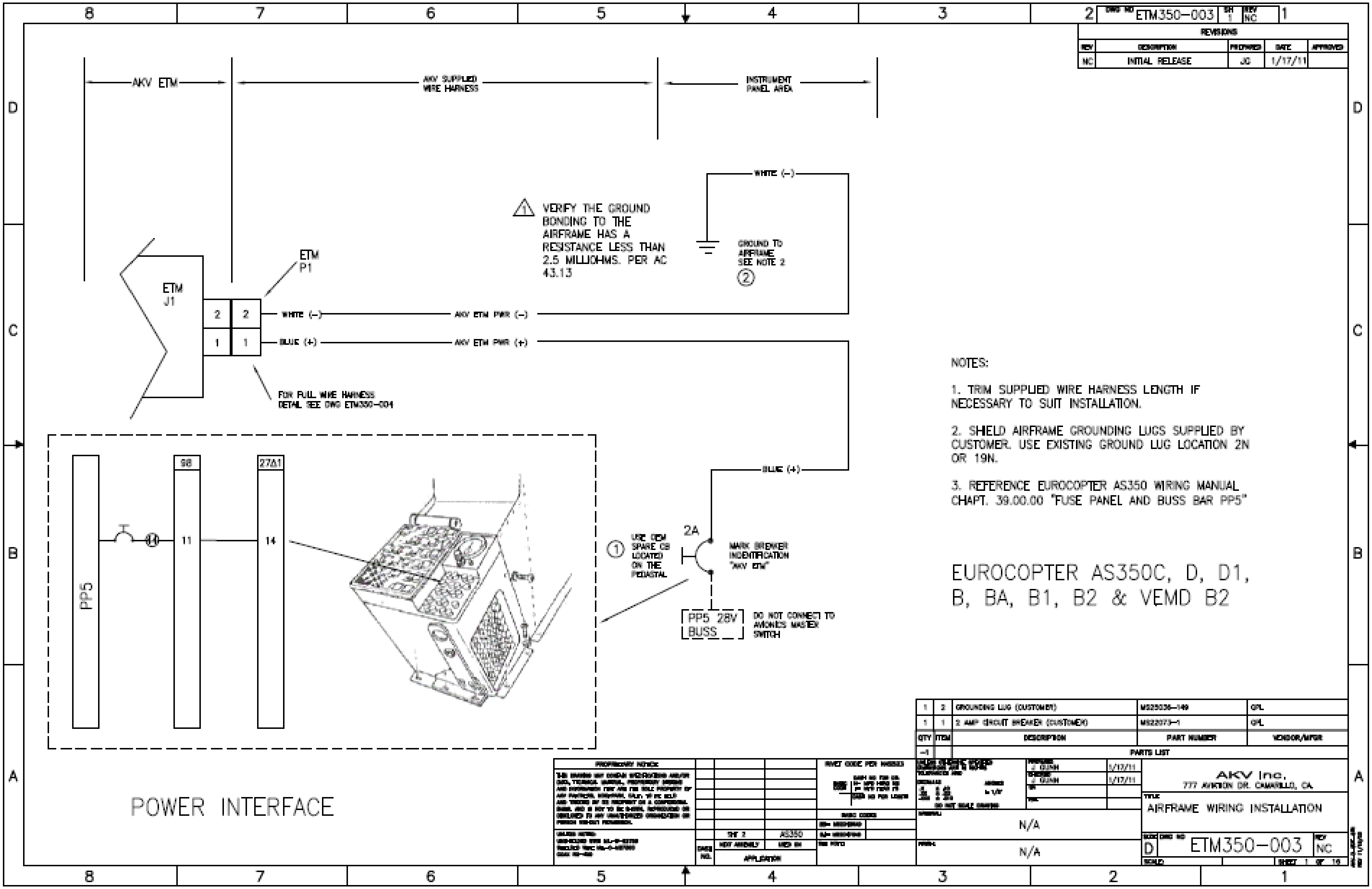
TITLE: ETM MECHANICAL INSTALLATION

DRAWN: J. GUNN 1/17/11
CHECKED: J. GUNN 10/10/14

MATERIAL: N/A
FINISH: N/A

SIZE D DWG NO ETM350-002 REV I
SHEET 5 OF 6

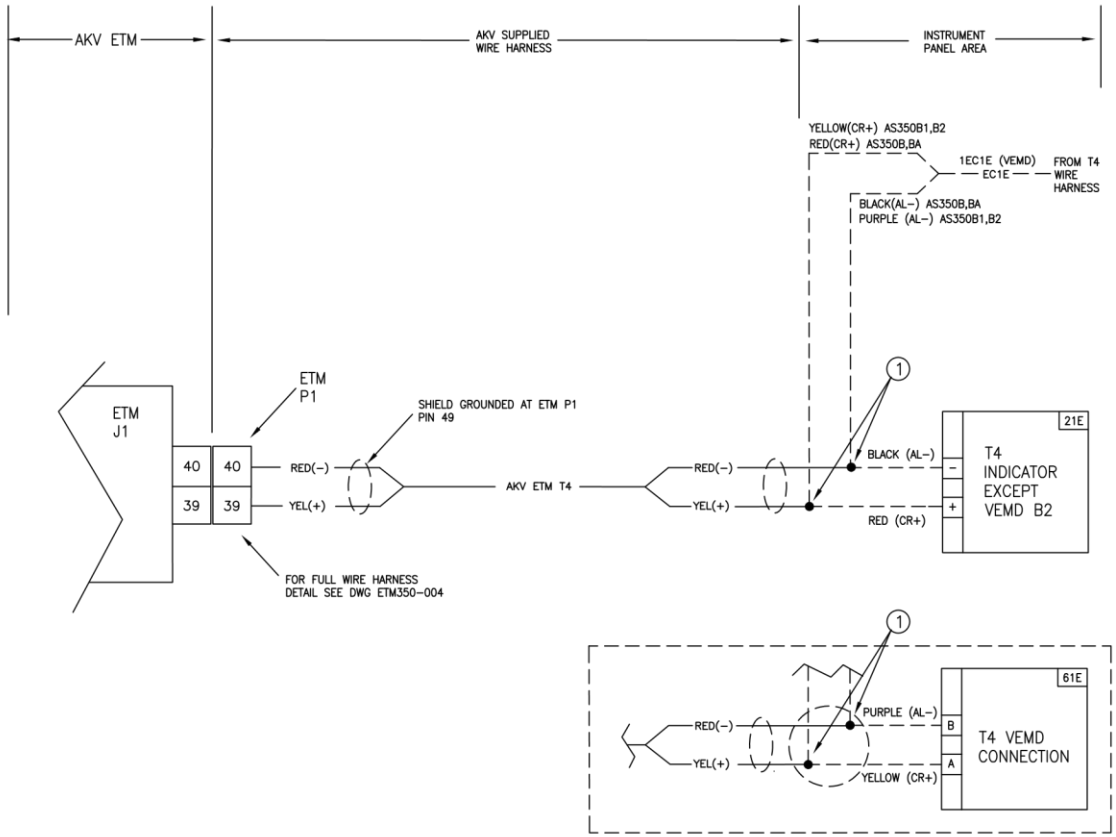

DWG NO ETM350-002 SH 6 REV E
REVISIONS
REV | DESCRIPTION | PREPARED | DATE | APPROVED
NC | INITIAL RELEASE | JG | 1/17/11
A-C | NO CHANGES APPLIED TO THIS DWG
D | MOVED OAT MOUNT TO CENTER | JG | 12/10/11
E | ADDED ALTERNATE RTD SENSOR | JG | 11/5/20
AIRFRAME SPAR
FWD
FIXED BELLY PANEL LOCATED AFT OF FORWARD DROP PANEL
CENTER SECTION IS METAL. MOUNT OAT PROBE IN THIS SECTION
SECURE GROUNDING STRAP TO THE ADJACENT AIRFRAME SPAR SEE NOTE 3
SEE NOTE 4 OAT MOUNTING LOCATION
SEE NOTE 1
1 OR 7
BELLY PANEL
OAT SENSOR
.220"
.188
.220
.640
.640
OAT SENSOR HOLE DRILLING PATTERN
NOTES:
1. MOUNT ADJACENT TO SECOND STRINGER HOLE ON THE PILOT SIDE (STARBOARD)
2. APPLY RTV SILICON BETWEEN BASE OF OAT PROBE AND HELICOPTER BODY PANEL.
3. FOR PREPARING THE GROUND STRAP BONDING SURFACE TO THE AIRFRAME, REF THE EUROCOPTER STANDARD PRACTICES MANUAL "GENERAL ELECTRICAL BONDING" GUIDLINES CHAPT. 20.02.07.101
4. REF DWG ETM350-003 SHT 15 FOR WIRING CONNECTION
1 VERIFY THE GROUND BONDING TO THE AIRFRAME HAS A RESISTANCE LESS THAN 2.5 MILLIOHMS. PER AC 43.13
1 | 7 | RTD SENSOR (Alternate, direct replacement) | 25192 Rev NC | JMS
2 | 6 | 16-14 Ga. BLUE #10 RING TERMINAL | | QPL
A/R | 5 | OVAL BRAID/TINNED WIRE | 2142 SV005 | EDMO
2 | 4 | 10-32 SCREW X 3/4" LG | MS35207-265 | QPL
2 | 3 | 10-32 LOCK NUT | MS21042L3 | QPL
2 | 2 | #10 WASHER | AN960C10 | QPL
1 | 1 | RTD SENSOR | A9762-001 | ULTRA ELECTRONICS
QTY | ITEM | DESCRIPTION | PART NUMBER | VENDOR/MFGR
-1 | PARTS LIST
PROPRIETARY NOTICE
THIS DRAWING MAY CONTAIN SPECIFICATIONS AND/OR DATA, TECHNICAL MATERIAL, PROPRIETARY DESIGNS AND INFORMATION THAT ARE THE SOLE PROPERTY OF AKV PARTNERS, MOORPARK, CALIF. TO BE HELD AND TREATED BY ITS RECIPIENT ON A CONFIDENTIAL BASIS, AND IS NOT TO BE SHOWN, REPRODUCED OR DISCLOSED TO ANY UNAUTHORIZED ORGANIZATION OR PERSON WITHOUT PERMISSION.
UNLESS NOTED:
UNSHIELDED WIRE MIL-W-22759
SHIELDED WIRE MIL-C-M27500
COAX RG-400
RIVET CODE PER NAS523
BASIC CODE | DASH NO FOR DIA | M= MFD HEAD MS | F= MFD HEAD FS | DASH NO FOR LENGTH
BASIC CODES
BB= MS20426AD
BJ= MS20470AD
SEE NOTE:
DASH NO. | ETM350-003 NEXT ASSEMBLY | AS350 USED ON
APPLICATION
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
DECIMALS X ± .10 XX ± .03 XXX ± .010
ANGLES ± 1/2°
DO NOT SCALE DRAWING
MATERIAL: N/A
FINISH: N/A
PREPARED J GUNN 1/17/11
CHECKED J GUNN 11/5/20
QA
REL
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
TITLE
ETM MECHANICAL INSTALLATION
SIZE D | DWG NO ETM350-002 | REV E
SCALE: | SHEET 6 OF 6


ETM350-003
REVISIONS
NC INITIAL RELEASE JG 1/17/11
AKV ETM
AKV SUPPLIED WIRE HARNESS
INSTRUMENT PANEL AREA
VERIFY THE GROUND BONDING TO THE AIRFRAME HAS A RESISTANCE LESS THAN 2.5 MILLIOHMS. PER AC 43.13
WHITE (–)
GROUND TO AIRFRAME SEE NOTE 2
ETM J1
ETM P1
WHITE (–)
AKV ETM PWR (–)
BLUE (+)
AKV ETM PWR (+)
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350-004
NOTES:
1. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATION.
2. SHIELD AIRFRAME GROUNDING LUGS SUPPLIED BY CUSTOMER. USE EXISTING GROUND LUG LOCATION 2N OR 19N.
3. REFERENCE EUROCOPTER AS350 WIRING MANUAL CHAPT. 39.00.00 "FUSE PANEL AND BUSS BAR PP5"
BLUE (+)
PP5
98
27Δ1
11
14
USE OEM SPARE CB LOCATED ON THE PEDASTAL
2A
MARK BREAKER INDENTIFICATION "AKV ETM"
PP5 28V BUSS
DO NOT CONNECT TO AVIONICS MASTER SWITCH
EUROCOPTER AS350C, D, D1, B, BA, B1, B2 & VEMD B2
1 2 GROUNDING LUG (CUSTOMER) MS25036-149 QPL
1 1 2 AMP CIRCUIT BREAKER (CUSTOMER) MS22073-1 QPL
QTY ITEM DESCRIPTION PART NUMBER VENDOR/MFGR
PARTS LIST
POWER INTERFACE
PROPRIETARY NOTICE
J. GUNN 1/17/11
AKV Inc.
777 AVIATION DR. CAMARILLO, CA
AIRFRAME WIRING INSTALLATION
N/A
N/A
D ETM350-003 NC

DWG NO ETM350-003 SH 2 REV H

REVISIONS

REV	DESCRIPTION	PREPARED	DATE	APPROVED
NC	INITIAL RELEASE	JG	1/17/11	
A–F	NO CHANGES APPLIED TO THIS DWG			
G	ADDED SECT A VEMD WIRE SPLICE	JG	12/29/12	
H	– ADDED NEW THERMOCOUPLE SPLICE ITEM 1 TO PARTS LIST – REMOVED DETAIL A & ITEM 2 FROM PARTS LIST	JG	7/1/20	



NOTES:

1. SPLICE ETM THERMOCOUPLE WIRE APPROX 2" FROM REAR OF GAUGE OR VEMD.

2. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATION.

3. PUT THE SENSOR AND INDICATOR WIRES IN THE SAME SIDE OF THE SPLICE.

4. REFERENCE EUROCOPTER AS350 WIRING MANUAL CHAPT. 77.00.00 "ENGINE ARRIEL MONITORING"

ARRIEL THERMOCOUPLE CONNECTION

EUROCOPTER AS350B, BA, B1, B2 & VEMD B2 WITH THE ARRIEL 1 ENGINE

QTY	ITEM	DESCRIPTION	PART NUMBER	VENDOR/MFGR
2	1	THERMOCOUPLE SPLICE	A132439–ND	AKV/DIGIKEY
–1		PARTS LIST		

PROPRIETARY NOTICE

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UNLESS NOTED:
UNSHIELDED WIRE MIL–W–22759
SHIELDED WIRE MIL–C–27500
COAX RG–400

RIVET CODE PER NAS523
BASIC CODE: DASH NO FOR DIA; H= MFD HEAD NS; F= MFD HEAD FS; DASH NO FOR LENGTH

BASIC CODES
BB= MS20426AD
BJ= MS20470AD
SEE NOTE:

DASH NO.	NEXT ASSEMBLY	USED ON
	SHT 3	AS350
	APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMALS .X ± .10, .XX ± .03, .XXX ± .010
ANGLES ± 1/2°
DO NOT SCALE DRAWING

PREPARED J GUNN 1/17/11
CHECKED J GUNN 7/1/20
QA
REL

MATERIAL: N/A
FINISH: N/A

AKV Inc.
777 AVIATION DR. CAMARILLO, CA.

TITLE: AIRFRAME WIRING INSTALLATION

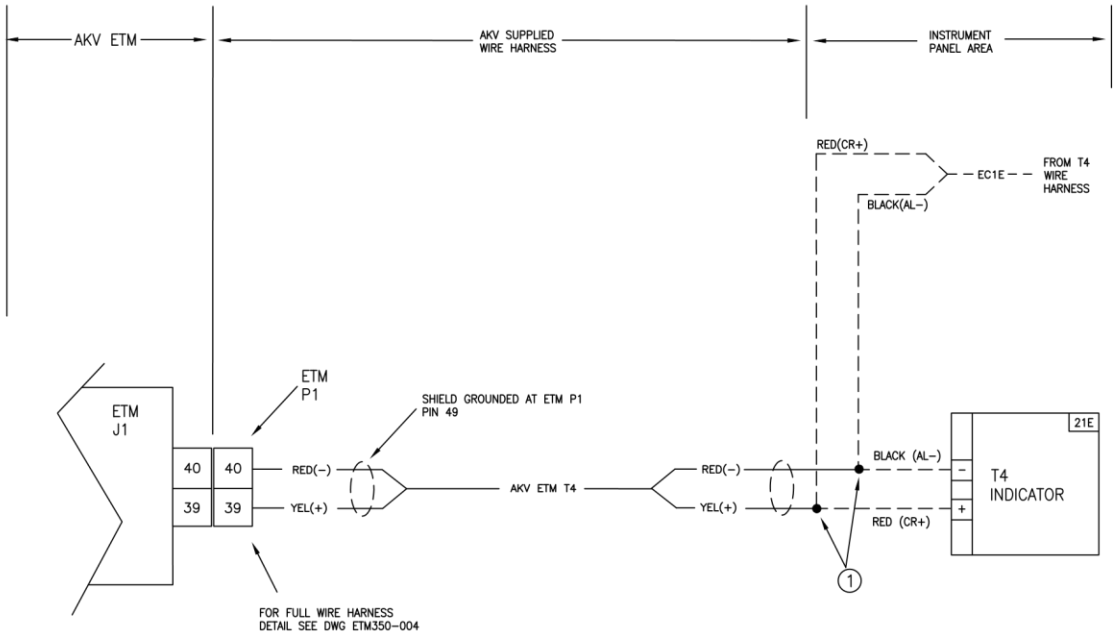
SIZE D DWG NO ETM350–003 REV H
SCALE: SHEET 2 OF 16

AKV–D–SIZE–SH1 REV 11/19/03

DWG NO ETM350-003 SH 3 REV A

REVISIONS

REV	DESCRIPTION	PREPARED	DATE	APPROVED
NC	INITIAL RELEASE	JG	1/17/11	
A	CHANGED PARTS LIST ITEM 1	JG	7/1/20	



NOTES:

1. IF WORKING WITH LTS101 CONVERTED AS350 MODIFIED WITH THE SOLOY OR HELILYNX LTS101 STC ENGINE CONVERSIONS, REFER TO THE RESPECTIVE CONVERSION DOCUMENTATION DRAWINGS FOR THE ASSIGNED WIRE AND INDICATOR TERMINAL NUMBER.

2. SPLICE ETM THERMOCOUPLE WIRE APPROX 2" FROM REAR OF GAUGE.

3. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATION.

4. PUT THE SENSOR AND INDICATOR WIRES IN THE SAME SIDE OF THE SPLICE.

5. REFERENCE EUROCOPTER AS350 WIRING MANUAL CHAPT. 77.00.00 "ENGINE LYCOMING MONITORING"

LTS101 THERMOCOUPLE CONNECTION

EUROCOPTER AS350C, D, D1 B, BA & B2 WITH THE LTS101 ENGINE

QTY	ITEM	DESCRIPTION	PART NUMBER	VENDOR/MFGR
1	1	THERMOCOUPLE SPLICE	A132439-ND	AKV/DIGIKEY

-1 PARTS LIST

PROPRIETARY NOTICE

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UNLESS NOTED:
UNSHIELDED WIRE MIL-W-22759
SHIELDED WIRE MIL-C-M27500
COAX RG-400

RIVET CODE PER NAS523
DASH NO FOR DIA
BASIC CODE | M= MFD HEAD NS | F= MFD HEAD FS
DASH NO FOR LENGTH

BASIC CODES
BB= MS20426AD
BJ= MS20470AD

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMALS .X ± .10 .XX ± .03 .XXX ± .010
ANGLES ± 1/2°
DO NOT SCALE DRAWING

MATERIAL: N/A

FINISH: N/A

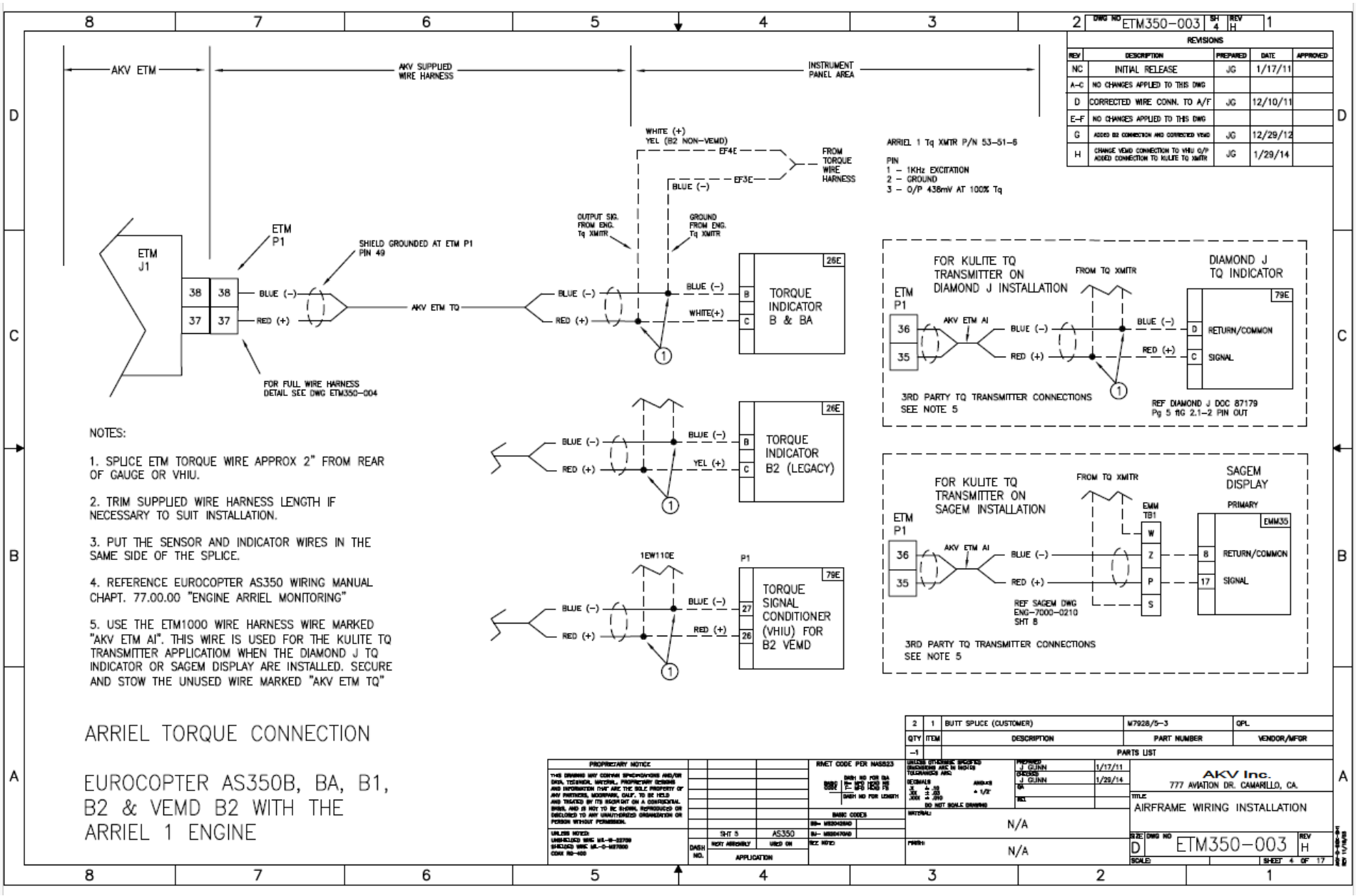
PREPARED		
J GUNN	1/17/11	
CHECKED		
J GUNN	7/1/20	
QA		
REL		

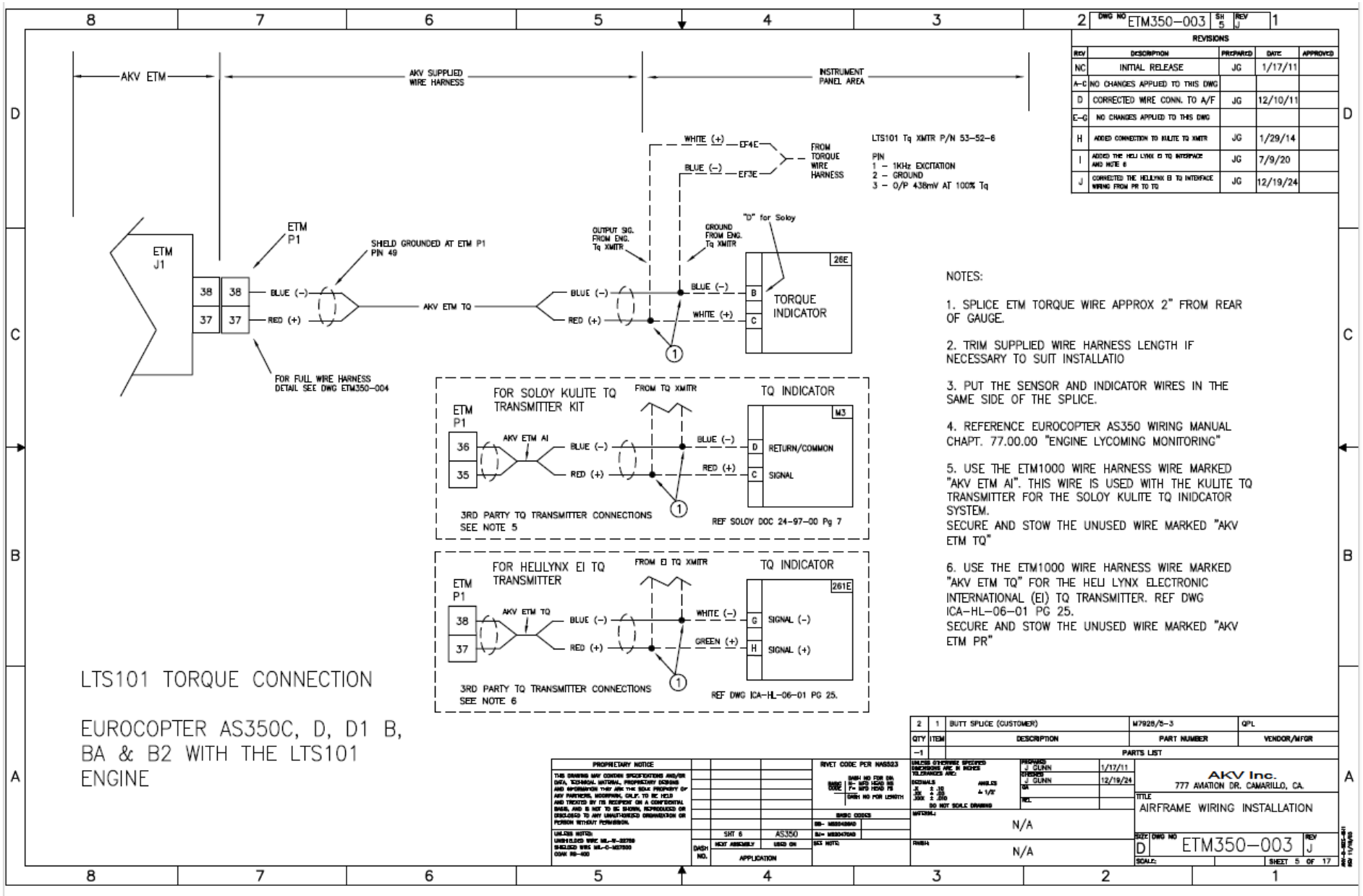
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.

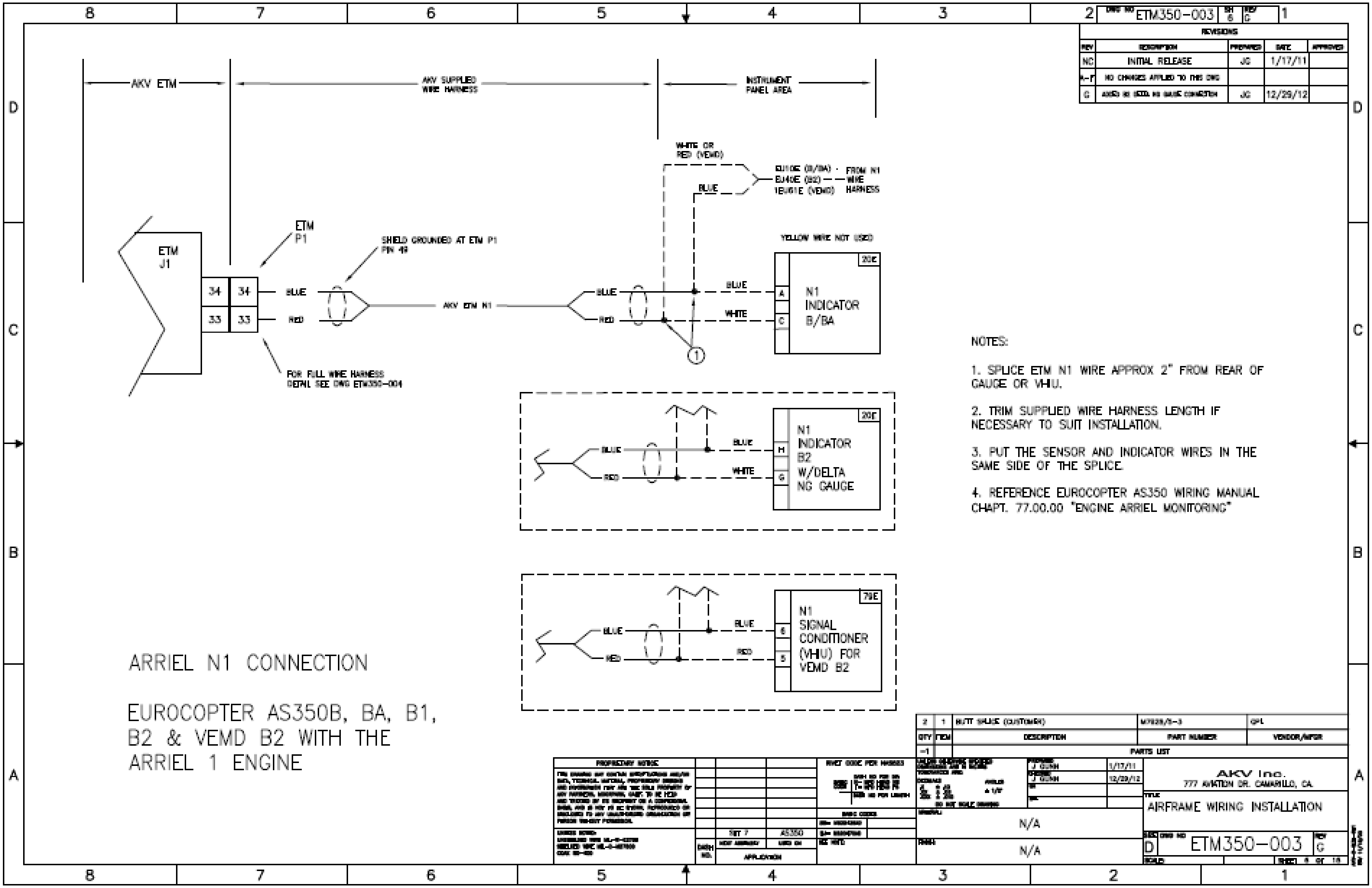
TITLE
AIRFRAME WIRING INSTALLATION

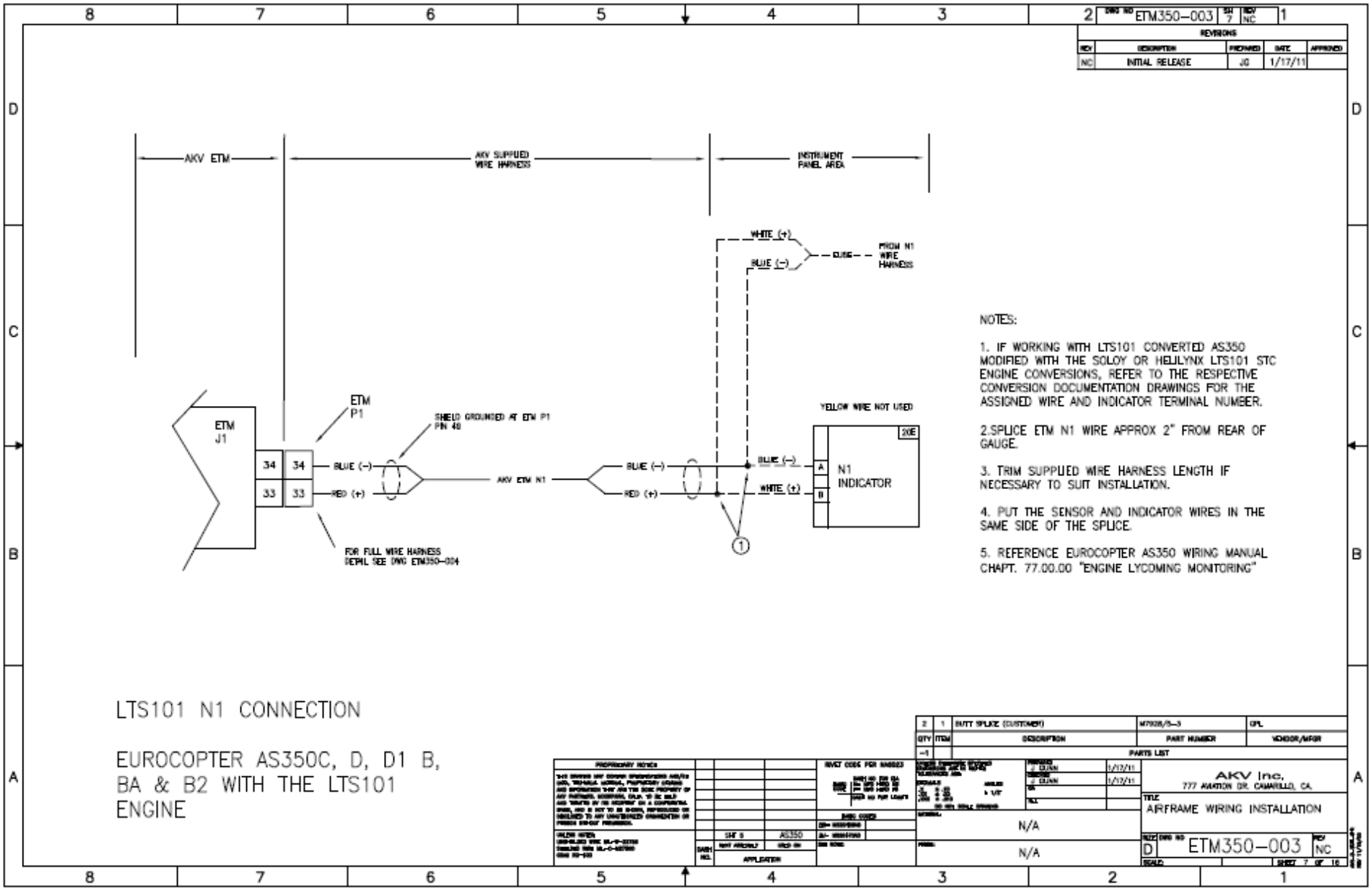
DASH NO.	SHT 4	AS350
	NEXT ASSEMBLY	USED ON
	APPLICATION	SEE NOTE:

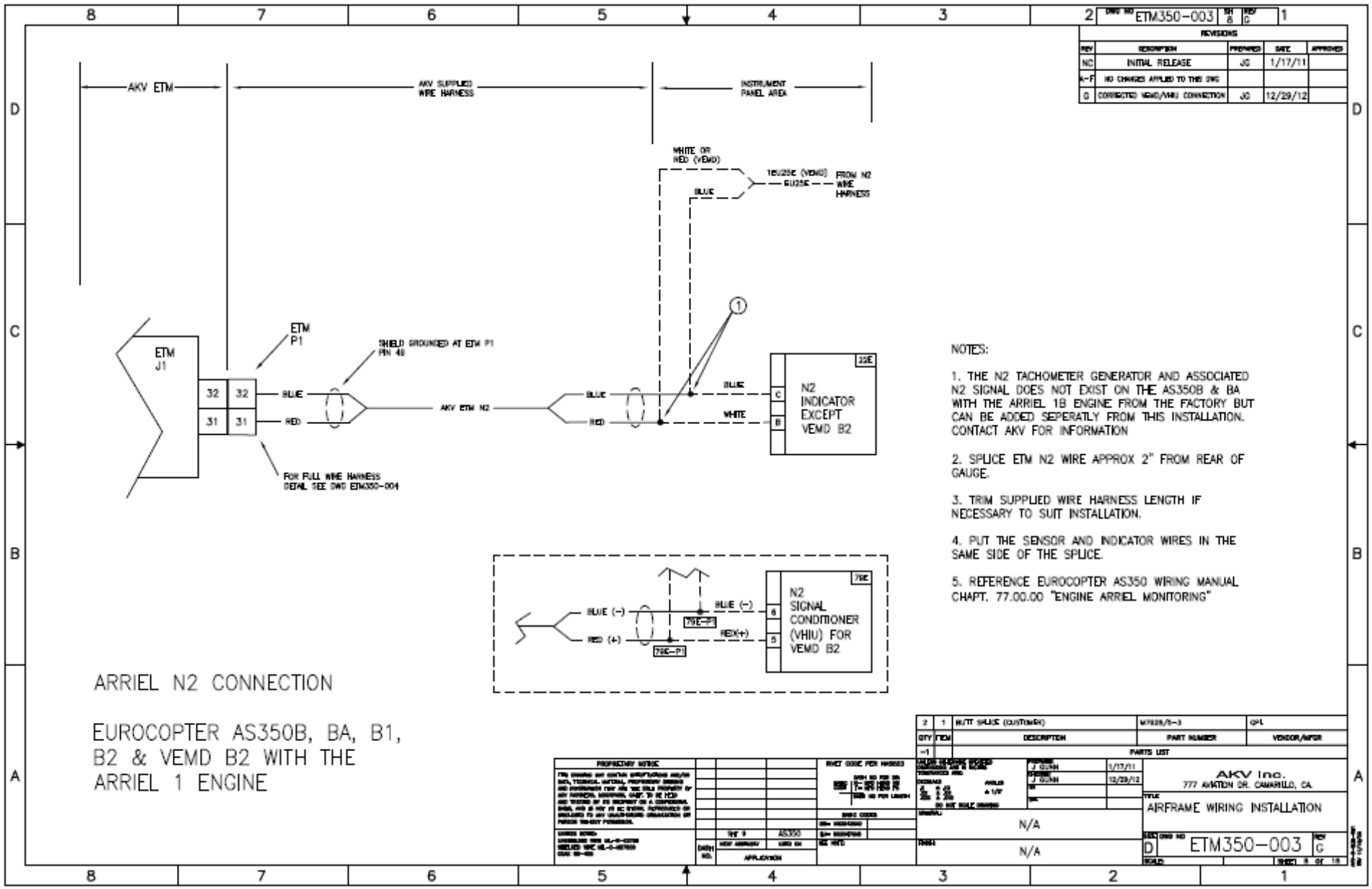
SIZE D DWG NO ETM350-003 REV A
SCALE: SHEET 3 OF 16

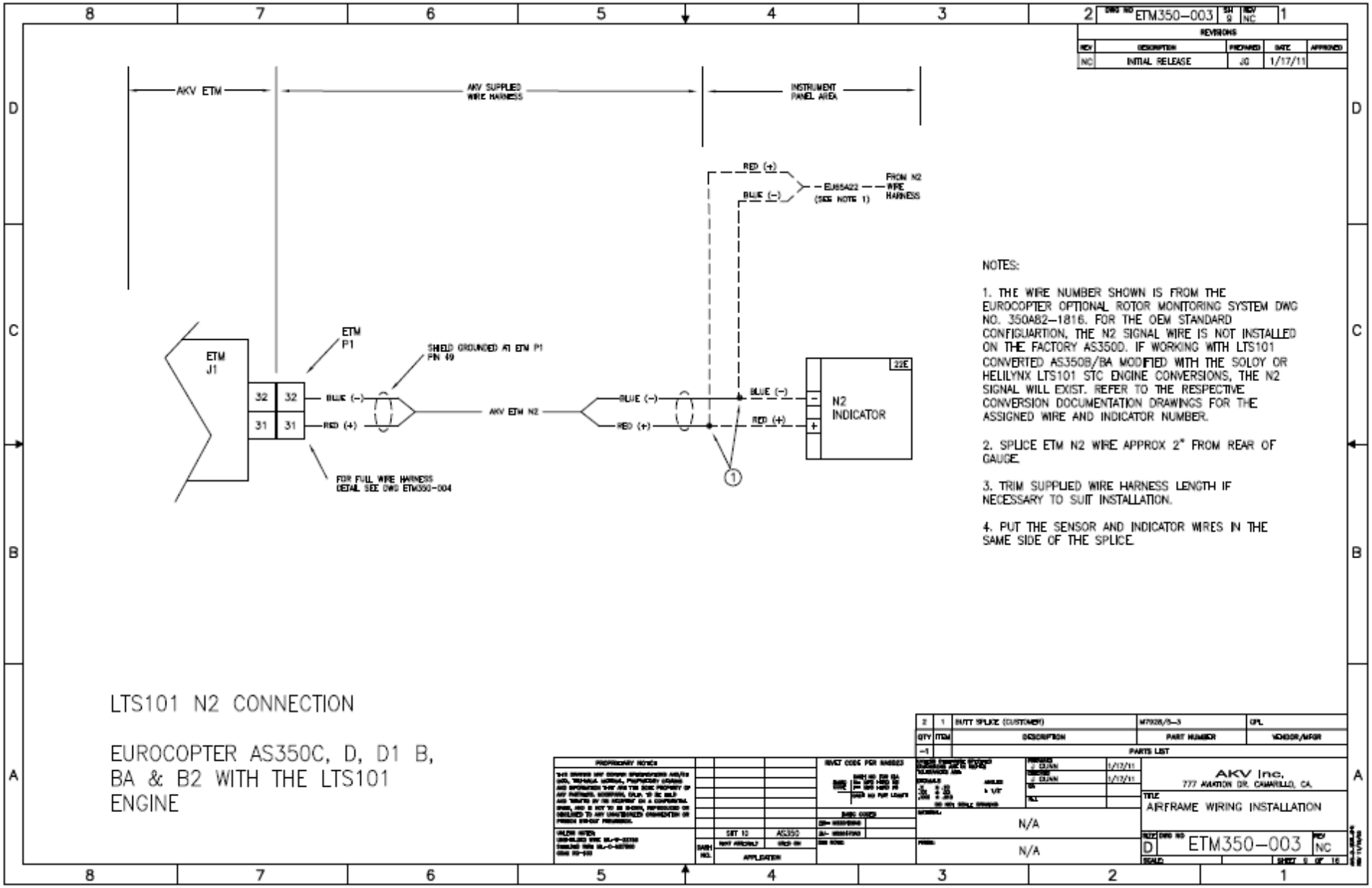

DWG NO ETM350-003 SH 4 REV H
REVISIONS
REV | DESCRIPTION | PREPARED | DATE | APPROVED
NC | INITIAL RELEASE | JC | 1/17/11
A-C | NO CHANGES APPLIED TO THIS DWG
D | CORRECTED WIRE CONN. TO A/F | JC | 12/10/11
E-F | NO CHANGES APPLIED TO THIS DWG
G | ADDED B2 CONNECTION AND CORRECTED VEMD | JC | 12/29/12
H | CHANGE VEMD CONNECTION TO VHIU O/P ADDED CONNECTION TO KULITE TQ XMTR | JC | 1/29/14
AKV ETM
AKV SUPPLIED WIRE HARNESS
INSTRUMENT PANEL AREA
ETM J1
ETM P1
38 38 BLUE (-)
37 37 RED (+)
SHIELD GROUNDED AT ETM P1 PIN 49
AKV ETM TQ
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350-004
WHITE (+) YEL (B2 NON-VEMD)
EF4E
EF3E
BLUE (-)
FROM TORQUE WIRE HARNESS
OUTPUT SIG. FROM ENG. Tq XMTR
GROUND FROM ENG. Tq XMTR
26E
TORQUE INDICATOR B & BA
TORQUE INDICATOR B2 (LEGACY)
1EW110E
P1
79E
TORQUE SIGNAL CONDITIONER (VHIU) FOR B2 VEMD
ARRIEL 1 Tq XMTR P/N 53-51-6
PIN
1 - 1KHz EXCITATION
2 - GROUND
3 - O/P 438mV AT 100% Tq
FOR KULITE TQ TRANSMITTER ON DIAMOND J INSTALLATION
FROM TQ XMTR
DIAMOND J TQ INDICATOR
AKV ETM AI
RETURN/COMMON
SIGNAL
3RD PARTY TQ TRANSMITTER CONNECTIONS SEE NOTE 5
REF DIAMOND J DOC 87179 Pg 5 fig 2.1-2 PIN OUT
FOR KULITE TQ TRANSMITTER ON SAGEM INSTALLATION
SAGEM DISPLAY
EMM TB1
PRIMARY
EMM35
REF SAGEM DWG ENG-7000-0210 SHT 8
NOTES:
1. SPLICE ETM TORQUE WIRE APPROX 2" FROM REAR OF GAUGE OR VHIU.
2. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATION.
3. PUT THE SENSOR AND INDICATOR WIRES IN THE SAME SIDE OF THE SPLICE.
4. REFERENCE EUROCOPTER AS350 WIRING MANUAL CHAPT. 77.00.00 "ENGINE ARRIEL MONITORING"
5. USE THE ETM1000 WIRE HARNESS WIRE MARKED "AKV ETM AI". THIS WIRE IS USED FOR THE KULITE TQ TRANSMITTER APPLICATIOM WHEN THE DIAMOND J TQ INDICATOR OR SAGEM DISPLAY ARE INSTALLED. SECURE AND STOW THE UNUSED WIRE MARKED "AKV ETM TQ"
ARRIEL TORQUE CONNECTION
EUROCOPTER AS350B, BA, B1, B2 & VEMD B2 WITH THE ARRIEL 1 ENGINE
QTY | ITEM | DESCRIPTION | PART NUMBER | VENDOR/MFGR
2 | 1 | BUTT SPLICE (CUSTOMER) | M7928/5-3 | QPL
-1
PARTS LIST
PROPRIETARY NOTICE
PREPARED J. GUNN 1/17/11
CHECKED J. GUNN 1/29/14
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
AIRFRAME WIRING INSTALLATION
MATERIAL: N/A
FINISH: N/A
SIZE D DWG NO ETM350-003 REV H
SCALE
SHEET 4 OF 17

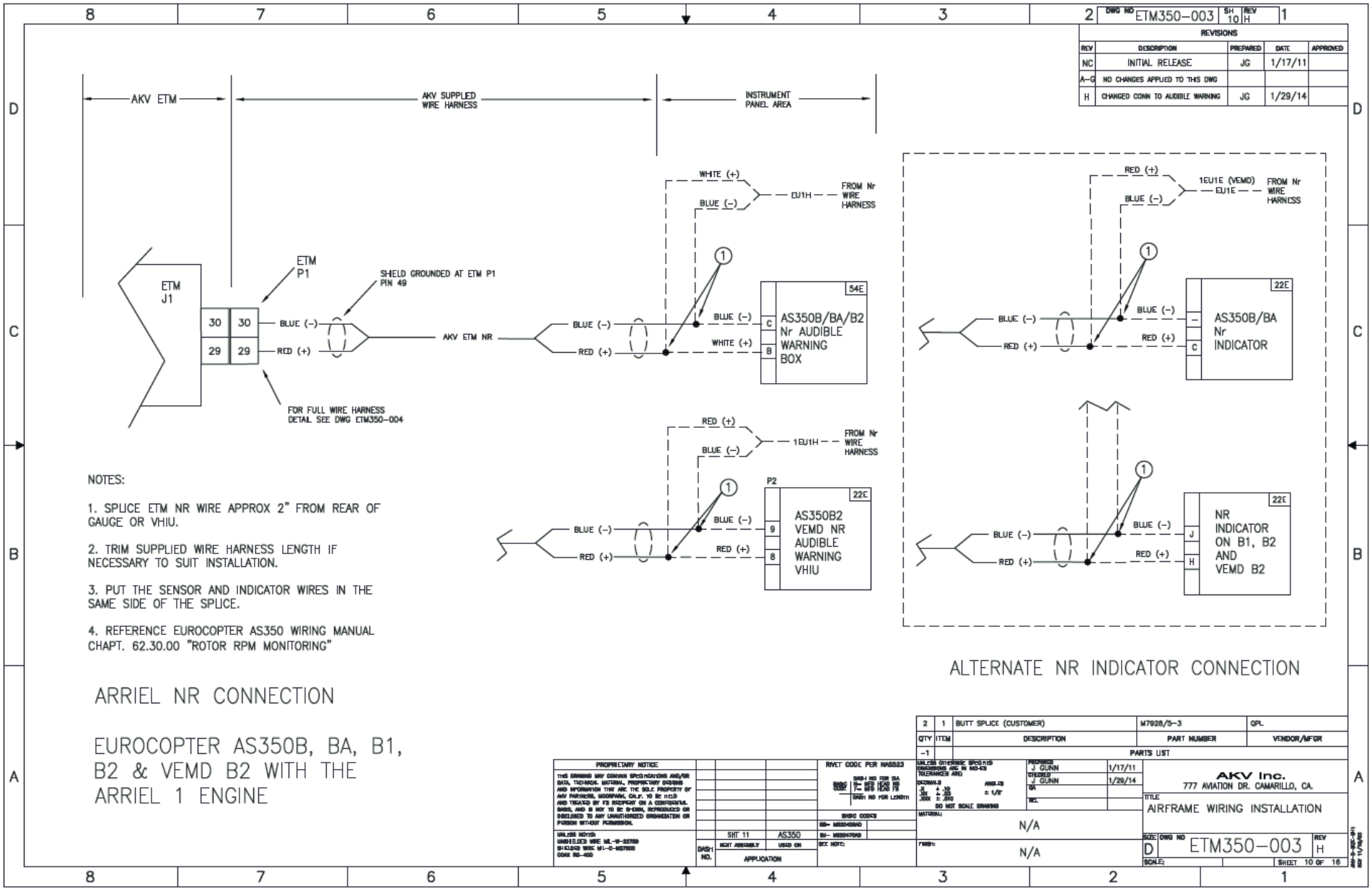

DWG NO ETM350-003 SH 5 REV J
REVISIONS
REV | DESCRIPTION | PREPARED | DATE | APPROVED
NC | INITIAL RELEASE | JG | 1/17/11
A-C | NO CHANGES APPLIED TO THIS DWG
D | CORRECTED WIRE CONN. TO A/F | JG | 12/10/11
E-G | NO CHANGES APPLIED TO THIS DWG
H | ADDED CONNECTION TO KULITE TQ XMTR | JG | 1/29/14
I | ADDED THE HELI LYNX EI TQ INTERFACE AND NOTE 6 | JG | 7/9/20
J | CORRECTED THE HELILYNX EI TQ INTERFACE WIRING FROM PR TO TQ | JG | 12/19/24
AKV ETM
AKV SUPPLIED WIRE HARNESS
INSTRUMENT PANEL AREA
WHITE (+) EF4E
BLUE (-) EF3E
FROM TORQUE WIRE HARNESS
LTS101 Tq XMTR P/N 53-52-6
PIN
1 - 1KHz EXCITATION
2 - GROUND
3 - O/P 438mV AT 100% Tq
ETM J1
ETM P1
SHIELD GROUNDED AT ETM P1 PIN 49
38 38 BLUE (-)
37 37 RED (+)
AKV ETM TQ
OUTPUT SIG. FROM ENG. Tq XMTR
GROUND FROM ENG. Tq XMTR
"D" for Soloy
26E
TORQUE INDICATOR
B
C
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350-004
FOR SOLOY KULITE TQ TRANSMITTER KIT
FROM TQ XMTR
TQ INDICATOR
M3
36
35
AKV ETM AI
RETURN/COMMON
SIGNAL
3RD PARTY TQ TRANSMITTER CONNECTIONS SEE NOTE 5
REF SOLOY DOC 24-97-00 Pg 7
FOR HELILYNX EI TQ TRANSMITTER
FROM EI TQ XMTR
261E
WHITE (-)
GREEN (+)
G SIGNAL (-)
H SIGNAL (+)
3RD PARTY TQ TRANSMITTER CONNECTIONS SEE NOTE 6
REF DWG ICA-HL-06-01 PG 25.
NOTES:
1. SPLICE ETM TORQUE WIRE APPROX 2" FROM REAR OF GAUGE.
2. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATIO
3. PUT THE SENSOR AND INDICATOR WIRES IN THE SAME SIDE OF THE SPLICE.
4. REFERENCE EUROCOPTER AS350 WIRING MANUAL CHAPT. 77.00.00 "ENGINE LYCOMING MONITORING"
5. USE THE ETM1000 WIRE HARNESS WIRE MARKED "AKV ETM AI". THIS WIRE IS USED WITH THE KULITE TQ TRANSMITTER FOR THE SOLOY KULITE TQ INIDCATOR SYSTEM.
SECURE AND STOW THE UNUSED WIRE MARKED "AKV ETM TQ"
6. USE THE ETM1000 WIRE HARNESS WIRE MARKED "AKV ETM TQ" FOR THE HELI LYNX ELECTRONIC INTERNATIONAL (EI) TQ TRANSMITTER. REF DWG ICA-HL-06-01 PG 25.
SECURE AND STOW THE UNUSED WIRE MARKED "AKV ETM PR"
LTS101 TORQUE CONNECTION
EUROCOPTER AS350C, D, D1 B, BA & B2 WITH THE LTS101 ENGINE
2 1 BUTT SPLICE (CUSTOMER) M7928/5-3
QTY ITEM DESCRIPTION PART NUMBER VENDOR/MFGR
-1 PARTS LIST
PROPRIETARY NOTICE
RIVET CODE PER NAS523
SHT 6 AS350
DASH NO. NEXT ASSEMBLY USED ON
APPLICATION
PREPARED J GUNN 1/17/11
STRESS J GUNN 12/19/24
DO NOT SCALE DRAWING
MATERIAL N/A
FINISH N/A
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
TITLE AIRFRAME WIRING INSTALLATION
SIZE D DWG NO ETM350-003 REV J
SCALE: SHEET 5 OF 17

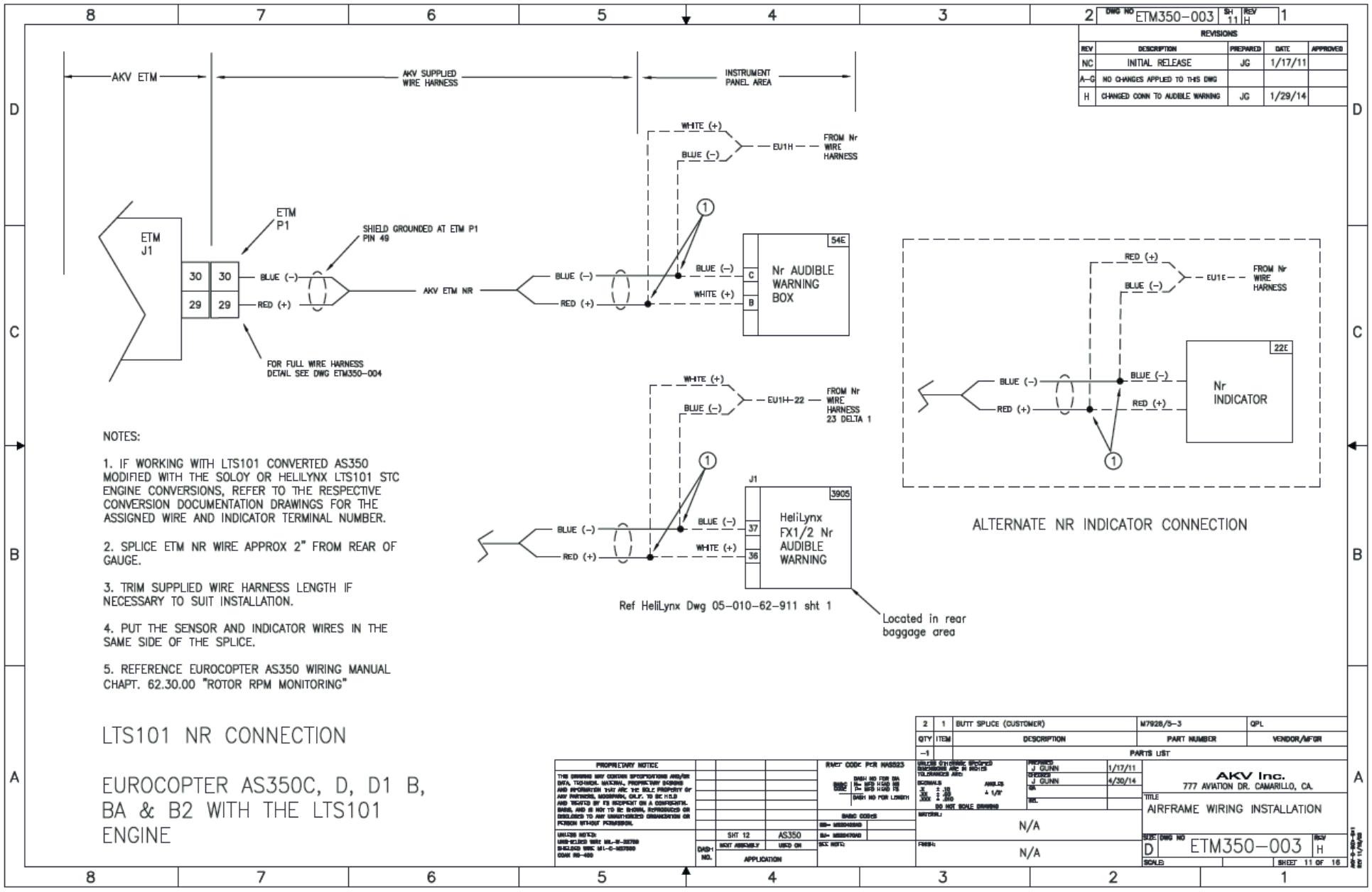

AKV ETM
AKV SUPPLIED WIRE HARNESS
INSTRUMENT PANEL AREA
ETM J1
ETM P1
SHIELD GROUNDED AT ETM P1
BLUE
RED
AKV ETM N1
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350-004
WHITE OR RED (VEMD)
FROM N1 WIRE HARNESS
YELLOW WIRE NOT USED
WHITE
N1 INDICATOR B/BA
N1 INDICATOR B2 W/DELTA NG GAUGE
N1 SIGNAL CONDITIONER (VHIU) FOR VEMD B2
ARRIEL N1 CONNECTION
EUROCOPTER AS350B, BA, B1, B2 & VEMD B2 WITH THE ARRIEL 1 ENGINE
NOTES:
1. SPLICE ETM N1 WIRE APPROX 2" FROM REAR OF GAUGE OR VHIU.
2. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATION.
3. PUT THE SENSOR AND INDICATOR WIRES IN THE SAME SIDE OF THE SPLICE.
4. REFERENCE EUROCOPTER AS350 WIRING MANUAL CHAPT. 77.00.00 "ENGINE ARRIEL MONITORING"
REVISIONS
NC INITIAL RELEASE JG 1/17/11
A-F NO CHANGES APPLIED TO THIS DWG
G JG 12/29/12
BUTT SPLICE (CUSTOMER)
PARTS LIST
AKV Inc.
777 AVIATION DR. CAMARILLO, CA
AIRFRAME WIRING INSTALLATION
N/A
ETM350-003
G

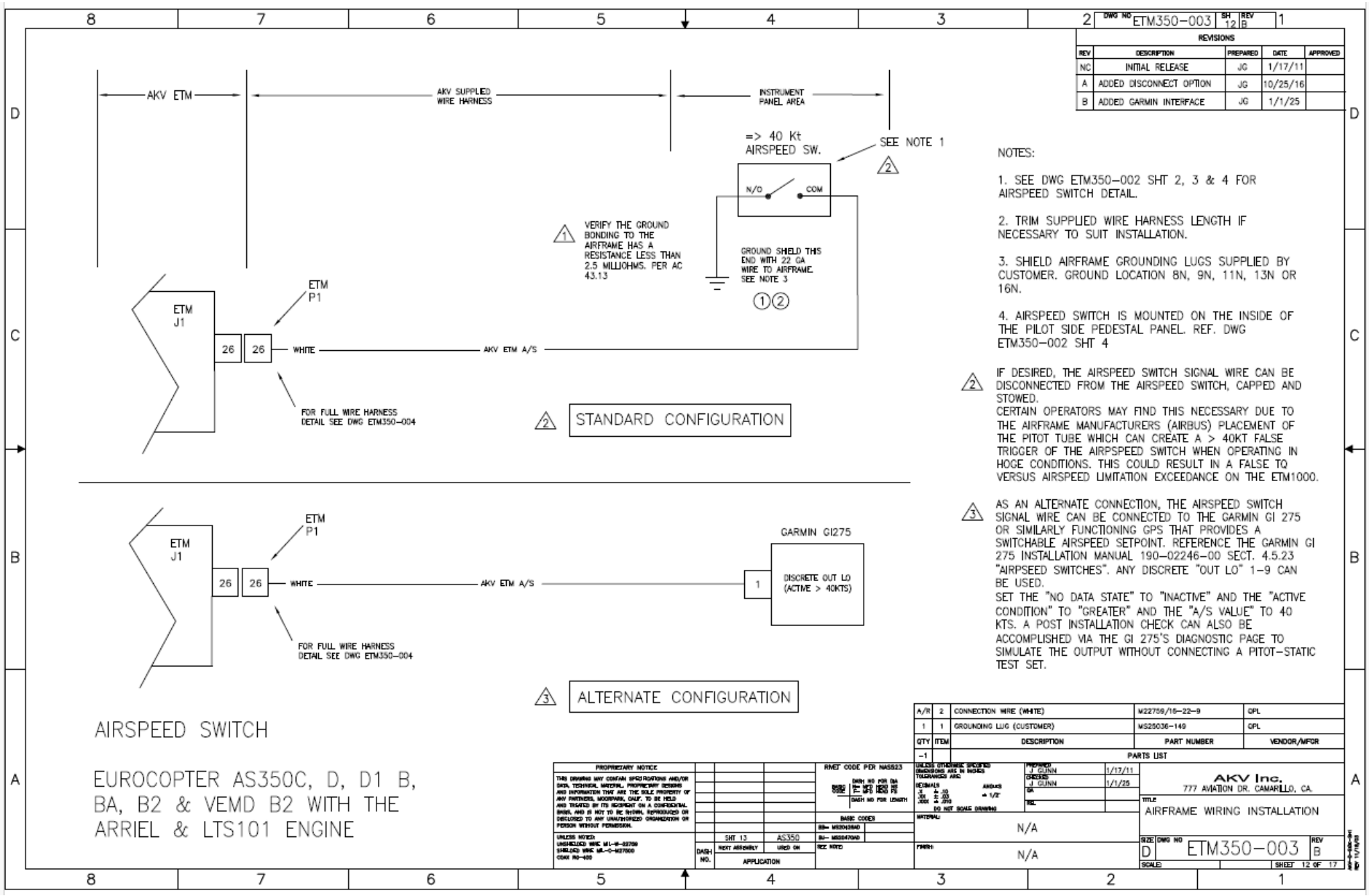

DWG NO ETM350–003
REV NC
REVISIONS
NC INITIAL RELEASE JG 1/17/11
AKV ETM
AKV SUPPLIED WIRE HARNESS
INSTRUMENT PANEL AREA
WHITE (+)
BLUE (–)
SPLICE
FROM N1 WIRE HARNESS
ETM J1
ETM P1
34
33
BLUE (–)
RED (+)
SHIELD GROUNDED AT ETM P1 PIN 48
AKV ETM N1
YELLOW WIRE NOT USED
N1 INDICATOR
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350–004
NOTES:
1. IF WORKING WITH LTS101 CONVERTED AS350 MODIFIED WITH THE SOLOY OR HELILYNX LTS101 STC ENGINE CONVERSIONS, REFER TO THE RESPECTIVE CONVERSION DOCUMENTATION DRAWINGS FOR THE ASSIGNED WIRE AND INDICATOR TERMINAL NUMBER.
2.SPLICE ETM N1 WIRE APPROX 2" FROM REAR OF GAUGE.
3. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATION.
4. PUT THE SENSOR AND INDICATOR WIRES IN THE SAME SIDE OF THE SPLICE.
5. REFERENCE EUROCOPTER AS350 WIRING MANUAL CHAPT. 77.00.00 "ENGINE LYCOMING MONITORING"
LTS101 N1 CONNECTION
EUROCOPTER AS350C, D, D1 B, BA & B2 WITH THE LTS101 ENGINE
PARTS LIST
QTY ITEM DESCRIPTION PART NUMBER VENDOR/MFGR
2 1 BUTT SPLICE (CUSTOMER) M7928/5–3 CPL
AKV Inc, 777 AVIATION DR. CAMARILLO, CA.
TITLE AIRFRAME WIRING INSTALLATION
SIZE D DWG NO ETM350–003 REV NC
SHEET 7 OF 10


AKV ETM
AKV SUPPLIED WIRE HARNESS
INSTRUMENT PANEL AREA
WHITE OR RED (VEMD)
BLUE
18U25E (VEMD)
6U25E
FROM N2 WIRE HARNESS
ETM J1
ETM P1
32
31
BLUE
RED
SHIELD GROUNDED AT ETM P1 PIN 49
AKV ETM N2
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350-004
22E
N2 INDICATOR EXCEPT VEMD B2
79E
N2 SIGNAL CONDITIONER (VHIU) FOR VEMD B2
79E-P6
79E-P5
ARRIEL N2 CONNECTION
EUROCOPTER AS350B, BA, B1, B2 & VEMD B2 WITH THE ARRIEL 1 ENGINE
NOTES:
1. THE N2 TACHOMETER GENERATOR AND ASSOCIATED N2 SIGNAL DOES NOT EXIST ON THE AS350B & BA WITH THE ARRIEL 1B ENGINE FROM THE FACTORY BUT CAN BE ADDED SEPERATLY FROM THIS INSTALLATION. CONTACT AKV FOR INFORMATION
2. SPLICE ETM N2 WIRE APPROX 2" FROM REAR OF GAUGE.
3. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATION.
4. PUT THE SENSOR AND INDICATOR WIRES IN THE SAME SIDE OF THE SPLICE.
5. REFERENCE EUROCOPTER AS350 WIRING MANUAL CHAPT. 77.00.00 "ENGINE ARRIEL MONITORING"
DWG NO ETM350-003
REVISIONS
NC INITIAL RELEASE JG 1/17/11
A-F NO CHANGES APPLIED TO THIS DWG
G CORRECTED VEMD/VHIU CONNECTION JG 12/29/12
AKV Inc.
777 AVIATION DR. CAMARILLO, CA
AIRFRAME WIRING INSTALLATION
ETM350-003


ETM350-003
REVISIONS
NC INITIAL RELEASE JG 1/17/11
AKV ETM
AKV SUPPLIED WIRE HARNESS
INSTRUMENT PANEL AREA
RED (+)
BLUE (-)
EU65A22 (SEE NOTE 1)
FROM N2 WIRE HARNESS
ETM J1
ETM P1
SHIELD GROUNDED AT ETM P1 PIN 49
32 32 BLUE (-)
31 31 RED (+)
AKV ETM N2
BLUE (-)
RED (+)
22E
N2 INDICATOR
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350-004
NOTES:
1. THE WIRE NUMBER SHOWN IS FROM THE EUROCOPTER OPTIONAL ROTOR MONITORING SYSTEM DWG NO. 350A82-1816. FOR THE OEM STANDARD CONFIGUARTION, THE N2 SIGNAL WIRE IS NOT INSTALLED ON THE FACTORY AS350D. IF WORKING WITH LTS101 CONVERTED AS350B/BA MODIFIED WITH THE SOLOY OR HELILYNX LTS101 STC ENGINE CONVERSIONS, THE N2 SIGNAL WILL EXIST. REFER TO THE RESPECTIVE CONVERSION DOCUMENTATION DRAWINGS FOR THE ASSIGNED WIRE AND INDICATOR NUMBER.
2. SPLICE ETM N2 WIRE APPROX 2" FROM REAR OF GAUGE.
3. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATION.
4. PUT THE SENSOR AND INDICATOR WIRES IN THE SAME SIDE OF THE SPLICE.
LTS101 N2 CONNECTION
EUROCOPTER AS350C, D, D1 B, BA & B2 WITH THE LTS101 ENGINE
2 1 BUTT SPLICE (CUSTOMER) M7928/5-3
QTY ITEM DESCRIPTION PART NUMBER VENDOR/MFGR
PARTS LIST
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
TITLE
AIRFRAME WIRING INSTALLATION
N/A
N/A
D ETM350-003 NC
SIZE DWG NO REV
SHEET 9 OF 16

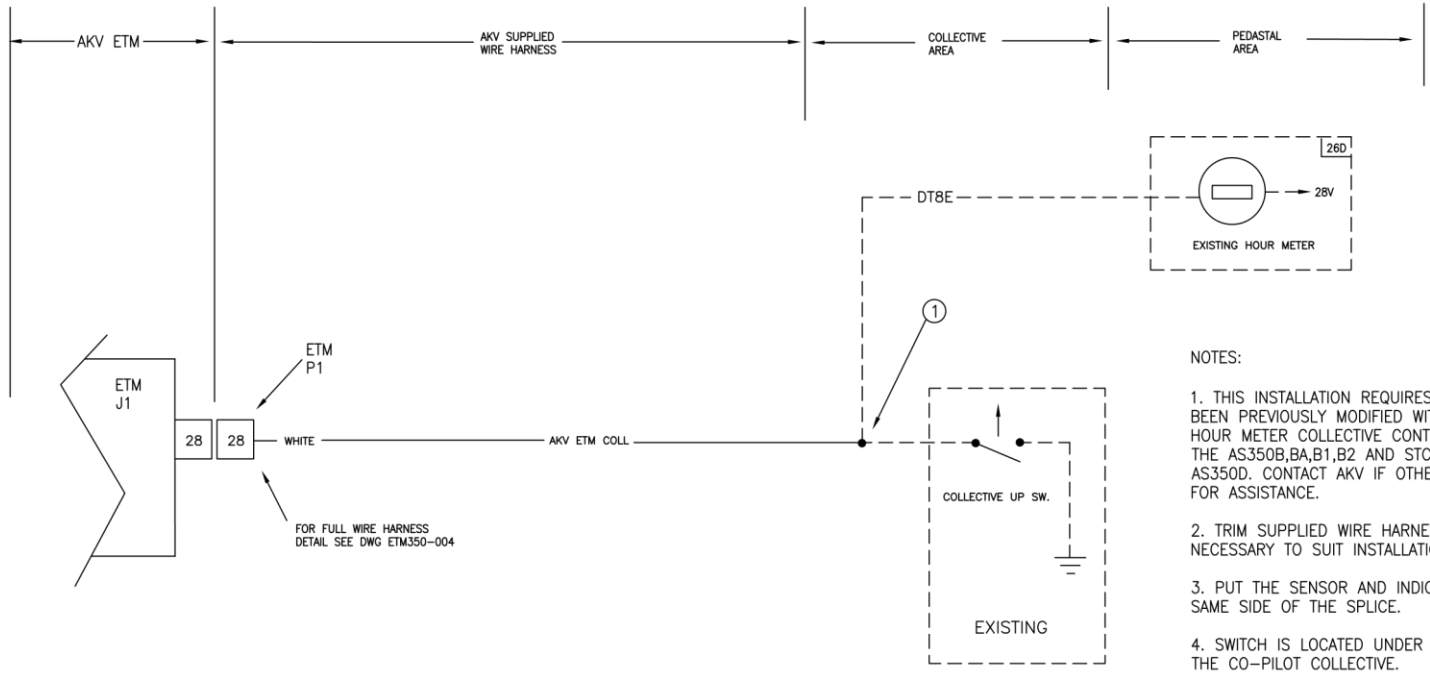

DWG NO ETM350-003 SH 10 REV H
REVISIONS
REV | DESCRIPTION | PREPARED | DATE | APPROVED
NC | INITIAL RELEASE | JG | 1/17/11
A-G | NO CHANGES APPLIED TO THIS DWG
H | CHANGED CONN TO AUDIBLE WARNING | JG | 1/29/14
AKV ETM
AKV SUPPLIED WIRE HARNESS
INSTRUMENT PANEL AREA
ETM J1
ETM P1
30 30 BLUE (-)
29 29 RED (+)
SHIELD GROUNDED AT ETM P1 PIN 49
AKV ETM NR
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350-004
WHITE (+)
BLUE (-)
EU1H
FROM Nr WIRE HARNESS
54E
C AS350B/BA/B2 Nr AUDIBLE WARNING BOX B
RED (+)
1EU1H
P2
22E
9 AS350B2 VEMD NR AUDIBLE WARNING VHIU 8
1EU1E (VEMD)
EU1E
22E
– AS350B/BA Nr INDICATOR C
J NR INDICATOR ON B1, B2 AND VEMD B2 H
NOTES:
1. SPLICE ETM NR WIRE APPROX 2" FROM REAR OF GAUGE OR VHIU.
2. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATION.
3. PUT THE SENSOR AND INDICATOR WIRES IN THE SAME SIDE OF THE SPLICE.
4. REFERENCE EUROCOPTER AS350 WIRING MANUAL CHAPT. 62.30.00 "ROTOR RPM MONITORING"
ARRIEL NR CONNECTION
EUROCOPTER AS350B, BA, B1, B2 & VEMD B2 WITH THE ARRIEL 1 ENGINE
ALTERNATE NR INDICATOR CONNECTION
2 1 BUTT SPLICE (CUSTOMER) M7928/5-3 QPL
QTY ITEM DESCRIPTION PART NUMBER VENDOR/MFGR
-1 PARTS LIST
PROPRIETARY NOTICE
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
TITLE AIRFRAME WIRING INSTALLATION
SIZE D DWG NO ETM350-003 REV H
SCALE: SHEET 10 OF 16


DWG NO ETM350-003 SH 11 REV H
REVISIONS
REV | DESCRIPTION | PREPARED | DATE | APPROVED
NC | INITIAL RELEASE | JG | 1/17/11
A–G | NO CHANGES APPLIED TO THIS DWG
H | CHANGED CONN TO AUDIBLE WARNING | JG | 1/29/14
AKV ETM
AKV SUPPLIED WIRE HARNESS
INSTRUMENT PANEL AREA
ETM J1
ETM P1
30 30 BLUE (–)
29 29 RED (+)
SHIELD GROUNDED AT ETM P1 PIN 49
AKV ETM NR
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350-004
WHITE (+)
BLUE (–)
EU1H
FROM Nr WIRE HARNESS
54E
Nr AUDIBLE WARNING BOX
C
B
WHITE (+)
BLUE (–)
EU1H-22
FROM Nr WIRE HARNESS 23 DELTA 1
J1
3905
HeliLynx FX1/2 Nr AUDIBLE WARNING
37
36
Ref HeliLynx Dwg 05-010-62-911 sht 1
Located in rear baggage area
RED (+)
BLUE (–)
EU1E
FROM Nr WIRE HARNESS
22E
Nr INDICATOR
ALTERNATE NR INDICATOR CONNECTION
NOTES:
1. IF WORKING WITH LTS101 CONVERTED AS350 MODIFIED WITH THE SOLOY OR HELILYNX LTS101 STC ENGINE CONVERSIONS, REFER TO THE RESPECTIVE CONVERSION DOCUMENTATION DRAWINGS FOR THE ASSIGNED WIRE AND INDICATOR TERMINAL NUMBER.
2. SPLICE ETM NR WIRE APPROX 2" FROM REAR OF GAUGE.
3. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATION.
4. PUT THE SENSOR AND INDICATOR WIRES IN THE SAME SIDE OF THE SPLICE.
5. REFERENCE EUROCOPTER AS350 WIRING MANUAL CHAPT. 62.30.00 "ROTOR RPM MONITORING"
LTS101 NR CONNECTION
EUROCOPTER AS350C, D, D1 B, BA & B2 WITH THE LTS101 ENGINE
2 1 BUTT SPLICE (CUSTOMER) M7928/5-3 QPL
QTY ITEM DESCRIPTION PART NUMBER VENDOR/MFGR
–1 PARTS LIST
PROPRIETARY NOTICE
SHT 12 AS350
DASH NO. NEXT ASSEMBLY USED ON
APPLICATION
DRAWN J GUNN 1/17/11
CHECKED J GUNN 4/30/14
DO NOT SCALE DRAWING
MATERIAL N/A
FINISH N/A
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
TITLE AIRFRAME WIRING INSTALLATION
SIZE D DWG NO ETM350-003 REV H
SCALE SHEET 11 OF 16


DWG NO ETM350-003 SH 12 REV B
REVISIONS
REV | DESCRIPTION | PREPARED | DATE | APPROVED
NC | INITIAL RELEASE | JG | 1/17/11
A | ADDED DISCONNECT OPTION | JG | 10/25/16
B | ADDED GARMIN INTERFACE | JG | 1/1/25
AKV ETM
AKV SUPPLIED WIRE HARNESS
INSTRUMENT PANEL AREA
=> 40 Kt AIRSPEED SW.
SEE NOTE 1
N/O
COM
VERIFY THE GROUND BONDING TO THE AIRFRAME HAS A RESISTANCE LESS THAN 2.5 MILLIOHMS. PER AC 43.13
GROUND SHIELD THIS END WITH 22 GA WIRE TO AIRFRAME. SEE NOTE 3
ETM J1
ETM P1
26
26
WHITE
AKV ETM A/S
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350-004
STANDARD CONFIGURATION
GARMIN GI275
DISCRETE OUT LO (ACTIVE > 40KTS)
ALTERNATE CONFIGURATION
AIRSPEED SWITCH
EUROCOPTER AS350C, D, D1 B, BA, B2 & VEMD B2 WITH THE ARRIEL & LTS101 ENGINE
NOTES:
1. SEE DWG ETM350-002 SHT 2, 3 & 4 FOR AIRSPEED SWITCH DETAIL.
2. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATION.
3. SHIELD AIRFRAME GROUNDING LUGS SUPPLIED BY CUSTOMER. GROUND LOCATION 8N, 9N, 11N, 13N OR 16N.
4. AIRSPEED SWITCH IS MOUNTED ON THE INSIDE OF THE PILOT SIDE PEDESTAL PANEL. REF. DWG ETM350-002 SHT 4
2 IF DESIRED, THE AIRSPEED SWITCH SIGNAL WIRE CAN BE DISCONNECTED FROM THE AIRSPEED SWITCH, CAPPED AND STOWED.
CERTAIN OPERATORS MAY FIND THIS NECESSARY DUE TO THE AIRFRAME MANUFACTURERS (AIRBUS) PLACEMENT OF THE PITOT TUBE WHICH CAN CREATE A > 40KT FALSE TRIGGER OF THE AIRPSPEED SWITCH WHEN OPERATING IN HOGE CONDITIONS. THIS COULD RESULT IN A FALSE TQ VERSUS AIRSPEED LIMITATION EXCEEDANCE ON THE ETM1000.
3 AS AN ALTERNATE CONNECTION, THE AIRSPEED SWITCH SIGNAL WIRE CAN BE CONNECTED TO THE GARMIN GI 275 OR SIMILARLY FUNCTIONING GPS THAT PROVIDES A SWITCHABLE AIRSPEED SETPOINT. REFERENCE THE GARMIN GI 275 INSTALLATION MANUAL 190-02246-00 SECT. 4.5.23 "AIRPSEED SWITCHES". ANY DISCRETE "OUT LO" 1-9 CAN BE USED.
SET THE "NO DATA STATE" TO "INACTIVE" AND THE "ACTIVE CONDITION" TO "GREATER" AND THE "A/S VALUE" TO 40 KTS. A POST INSTALLATION CHECK CAN ALSO BE ACCOMPLISHED VIA THE GI 275'S DIAGNOSTIC PAGE TO SIMULATE THE OUTPUT WITHOUT CONNECTING A PITOT-STATIC TEST SET.
A/R | 2 | CONNECTION WIRE (WHITE) | M22759/16-22-9 | OPL
1 | 1 | GROUNDING LUG (CUSTOMER) | MS25036-149 | OPL
QTY | ITEM | DESCRIPTION | PART NUMBER | VENDOR/MFGR
-1 PARTS LIST
PROPRIETARY NOTICE
RMET CODE PER NAS523
BASIC CODES
SHT 13 AS350
NEXT ASSEMBLY USED ON
APPLICATION
DASH NO.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
DECIMALS X ± .10 .XX ± .03 .XXX ± .010
ANGLES ± 1/2°
DO NOT SCALE DRAWING
PROGRAM J GUNN 1/17/11
CHECKED J GUNN 1/1/25
QA
ENG
MATERIAL N/A
FINISH N/A
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
TITLE AIRFRAME WIRING INSTALLATION
SIZE D DWG NO ETM350-003 REV B
SCALE SHEET 12 OF 17

DWG NO ETM350-003 SH 13 REV A

REVISIONS				
REV	DESCRIPTION	PREPARED	DATE	APPROVED
NC	INITIAL RELEASE	JG	1/17/11	
A	CORRECT WIRE NUMBER	JG	7/24/17	



NOTES:

1. THIS INSTALLATION REQUIRES THAT THE A/C HAS BEEN PREVIOUSLY MODIFIED WITH THE EUROCOPTER HOUR METER COLLECTIVE CONTROL STC SH4016SW FOR THE AS350B,BA,B1,B2 AND STC SH2866SW-D FOR THE AS350D. CONTACT AKV IF OTHER INSTALLATIONS EXIST FOR ASSISTANCE.

2. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATION.

3. PUT THE SENSOR AND INDICATOR WIRES IN THE SAME SIDE OF THE SPLICE.

4. SWITCH IS LOCATED UNDER THE FLOOR ADJACENT TO THE CO-PILOT COLLECTIVE.

COLLECTIVE SWITCH

EUROCOPTER AS350C, D, D1 B, BA, B2 & VEMD B2 WITH THE ARRIEL & LTS101 ENGINE

QTY	ITEM	DESCRIPTION	PART NUMBER	VENDOR/MFGR
1	1	BUTT SPLICE (CUSTOMER)	M7928/5-3	QPL
-1		PARTS LIST		

PROPRIETARY NOTICE

THIS DRAWING MAY CONTAIN SPECIFICATIONS AND/OR DATA, TECHNICAL MATERIAL, PROPRIETARY DESIGNS AND INFORMATION THAT ARE THE SOLE PROPERTY OF AKV PARTNERS, MOORPARK, CALIF. TO BE HELD AND TREATED BY ITS RECIPIENT ON A CONFIDENTIAL BASIS, AND IS NOT TO BE SHOWN, REPRODUCED OR DISCLOSED TO ANY UNAUTHORIZED ORGANIZATION OR PERSON WITHOUT PERMISSION.

UNLESS NOTED:
UNSHIELDED WIRE MIL-W-22759
SHIELDED WIRE MIL-C-M27500
COAX RG-400

RIVET CODE PER NAS523
BASIC CODE | DASH NO FOR DIA | W= MFD HEAD NS | F= MFD HEAD FS | DASH NO FOR LENGTH

BASIC CODES
BB= MS20426AD
BJ= MS20470AD
SEE NOTE:

DASH NO.	NEXT ASSEMBLY	USED ON
	SHT 14	AS350
	APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMALS .X ± .10 .XX ± .03 .XXX ± .010
ANGLES ± 1/2°
DO NOT SCALE DRAWING

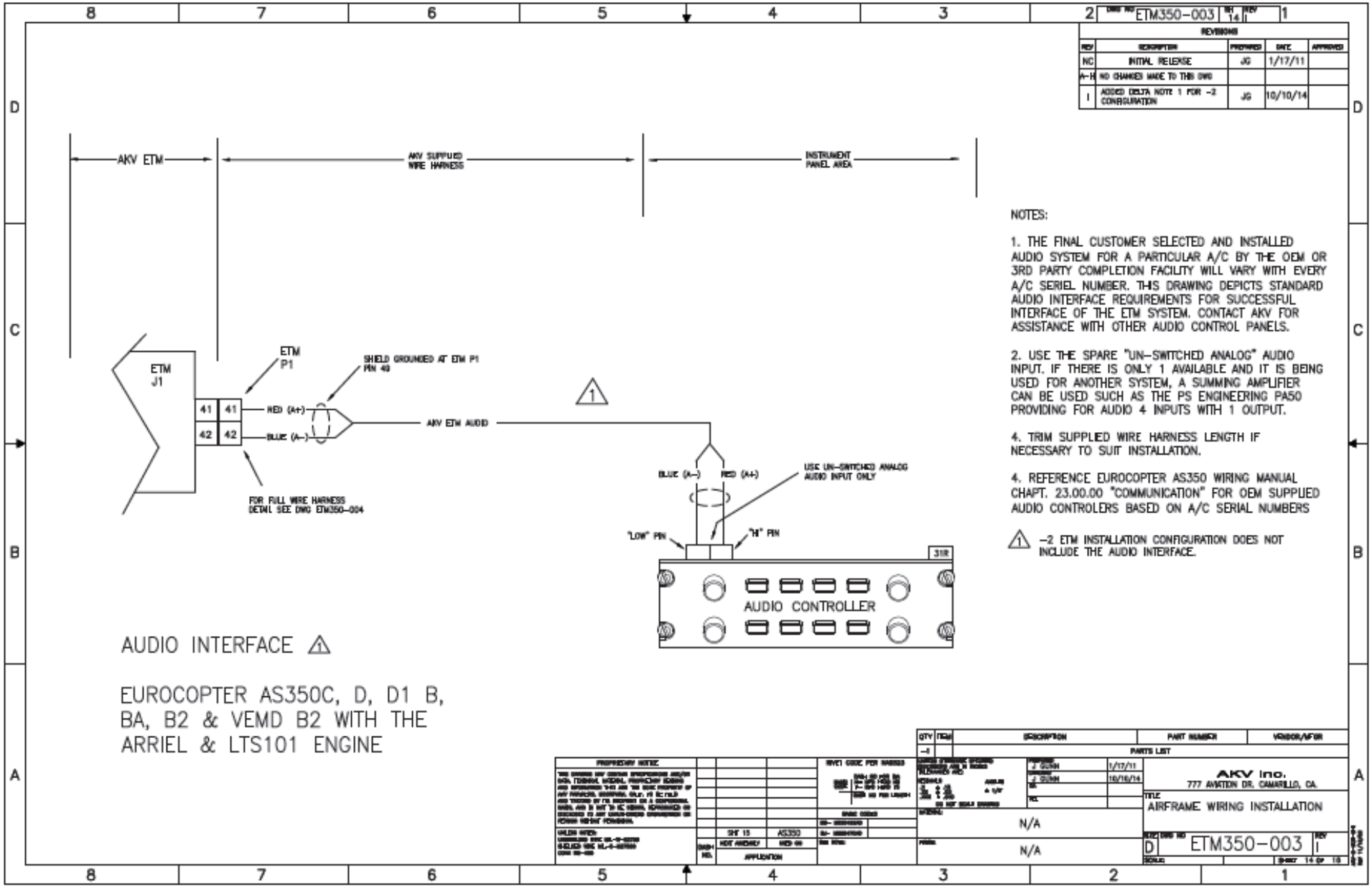
PREPARED J GUNN 1/17/11
CHECKED J GUNN 7/24/17
QA
REL

MATERIAL: N/A
FINISH: N/A

AKV Inc.
777 AVIATION DR. CAMARILLO, CA.

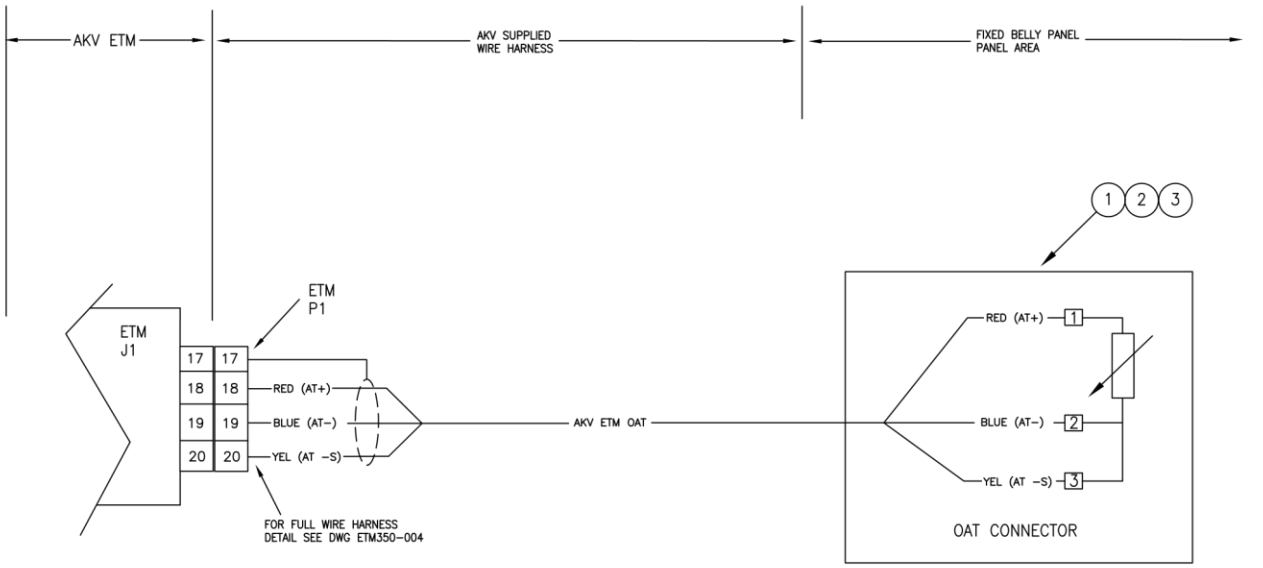
TITLE
AIRFRAME WIRING INSTALLATION

SIZE D | DWG NO ETM350-003 | REV A
SCALE: | SHEET 13 OF 16


ETM350-003
REVISIONS
REV DESCRIPTION PREPARED DATE APPROVED
NC INITIAL RELEASE JG 1/17/11
A-H NO CHANGES MADE TO THIS DWG
I ADDED DELTA NOTE 1 FOR -2 CONFIGURATION JG 10/10/14
AKV ETM
AKV SUPPLIED WIRE HARNESS
INSTRUMENT PANEL AREA
ETM J1
ETM P1
SHIELD GROUNDED AT ETM P1 PIN 49
41 41 RED (A+)
42 42 BLUE (A-)
AKV ETM AUDIO
1
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350-004
BLUE (A-) RED (A+)
USE UN-SWITCHED ANALOG AUDIO INPUT ONLY
"LOW" PIN
"H" PIN
AUDIO CONTROLLER
AUDIO INTERFACE 1
EUROCOPTER AS350C, D, D1 B, BA, B2 & VEMD B2 WITH THE ARRIEL & LTS101 ENGINE
NOTES:
1. THE FINAL CUSTOMER SELECTED AND INSTALLED AUDIO SYSTEM FOR A PARTICULAR A/C BY THE OEM OR 3RD PARTY COMPLETION FACILITY WILL VARY WITH EVERY A/C SERIEL NUMBER. THIS DRAWING DEPICTS STANDARD AUDIO INTERFACE REQUIREMENTS FOR SUCCESSFUL INTERFACE OF THE ETM SYSTEM. CONTACT AKV FOR ASSISTANCE WITH OTHER AUDIO CONTROL PANELS.
2. USE THE SPARE "UN-SWITCHED ANALOG" AUDIO INPUT. IF THERE IS ONLY 1 AVAILABLE AND IT IS BEING USED FOR ANOTHER SYSTEM, A SUMMING AMPLIFIER CAN BE USED SUCH AS THE PS ENGINEERING PA50 PROVIDING FOR AUDIO 4 INPUTS WITH 1 OUTPUT.
4. TRIM SUPPLIED WIRE HARNESS LENGTH IF NECESSARY TO SUIT INSTALLATION.
4. REFERENCE EUROCOPTER AS350 WIRING MANUAL CHAPT. 23.00.00 "COMMUNICATION" FOR OEM SUPPLIED AUDIO CONTROLERS BASED ON A/C SERIAL NUMBERS
1 -2 ETM INSTALLATION CONFIGURATION DOES NOT INCLUDE THE AUDIO INTERFACE.
PARTS LIST
QTY ITEM DESCRIPTION PART NUMBER VENDOR/MFGR
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
AIRFRAME WIRING INSTALLATION
N/A
N/A
D ETM350-003 I

DWG NO ETM350-003 SH 15 REV H

REVISIONS				
REV	DESCRIPTION	PREPARED	DATE	APPROVED
NC	INITIAL RELEASE	JG	1/17/11	
A–F	NO CHANGES APPLIED TO THIS DWG			
G	CORRECTED PIN DESIGNATION	JG	12/29/12	
H	CHANGED TO STRAIGHT BACKSHELL	JG	11/5/20	



NOTES:

1. REF DWG ETM350–002 SHT 6 FOR OAT MOUNTING DETAIL.
2. TRIM SUPPLIED WIRE LENGTH IF NECESSARY TO SUIT INSTALLATION.
3. FOR OAT CONNECTOR USE ASTRO TOOL CRIMPER P/N M22520/1–01 AND TURRET P/N M22520/1–02
4. FOR OAT CONNECTOR USE WIRE INSERT/EXTRACTION TOOL P/N M81969/1–02 (RED/WHITE)
5. STRIP INSULATION 1.5" FROM OAT END.

OAT CONNECTION

EUROCOPTER AS350C, D, D1 B, BA, B2 & VEMD B2 WITH THE ARRIEL & LTS101 ENGINE

QTY	ITEM	DESCRIPTION	PART NUMBER	VENDOR/MFGR
1	3	STRAIGHT BACKSHELL	M85049/52S8W	QPL
3	2	SOCKET PIN	M39029/5–115	QPL
1	1	PLUG	M83723/95W803N	QPL
–1		PARTS LIST		

PROPRIETARY NOTICE

THIS DRAWING MAY CONTAIN SPECIFICATIONS AND/OR DATA, TECHNICAL MATERIAL, PROPRIETARY DESIGNS AND INFORMATION THAT ARE THE SOLE PROPERTY OF AKV PARTNERS, MOORPARK, CALIF. TO BE HELD AND TREATED BY ITS RECIPIENT ON A CONFIDENTIAL BASIS, AND IS NOT TO BE SHOWN, REPRODUCED OR DISCLOSED TO ANY UNAUTHORIZED ORGANIZATION OR PERSON WITHOUT PERMISSION.

UNLESS NOTED:
UNSHIELDED WIRE MIL–W–22759
SHIELDED WIRE MIL–C–M27500
COAX RG–400

RIVET CODE PER NAS523

BASIC CODE | DASH NO FOR DIA | 1=E MFD HEAD NS | 2= MFD HEAD FS | DASH NO FOR LENGTH

BASIC CODES
BB= MS20426AD
BJ= MS20470AD
SEE NOTE:

DASH NO.	NEXT ASSEMBLY	USED ON
	SHT 16	AS350
	APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMALS: X ± .10, .XX ± .05, .XXX ± .010
ANGLES ± 1/2°
DO NOT SCALE DRAWING

PREPARED J GUNN 1/17/11
CHECKED J GUNN 11/5/20
QA
REL

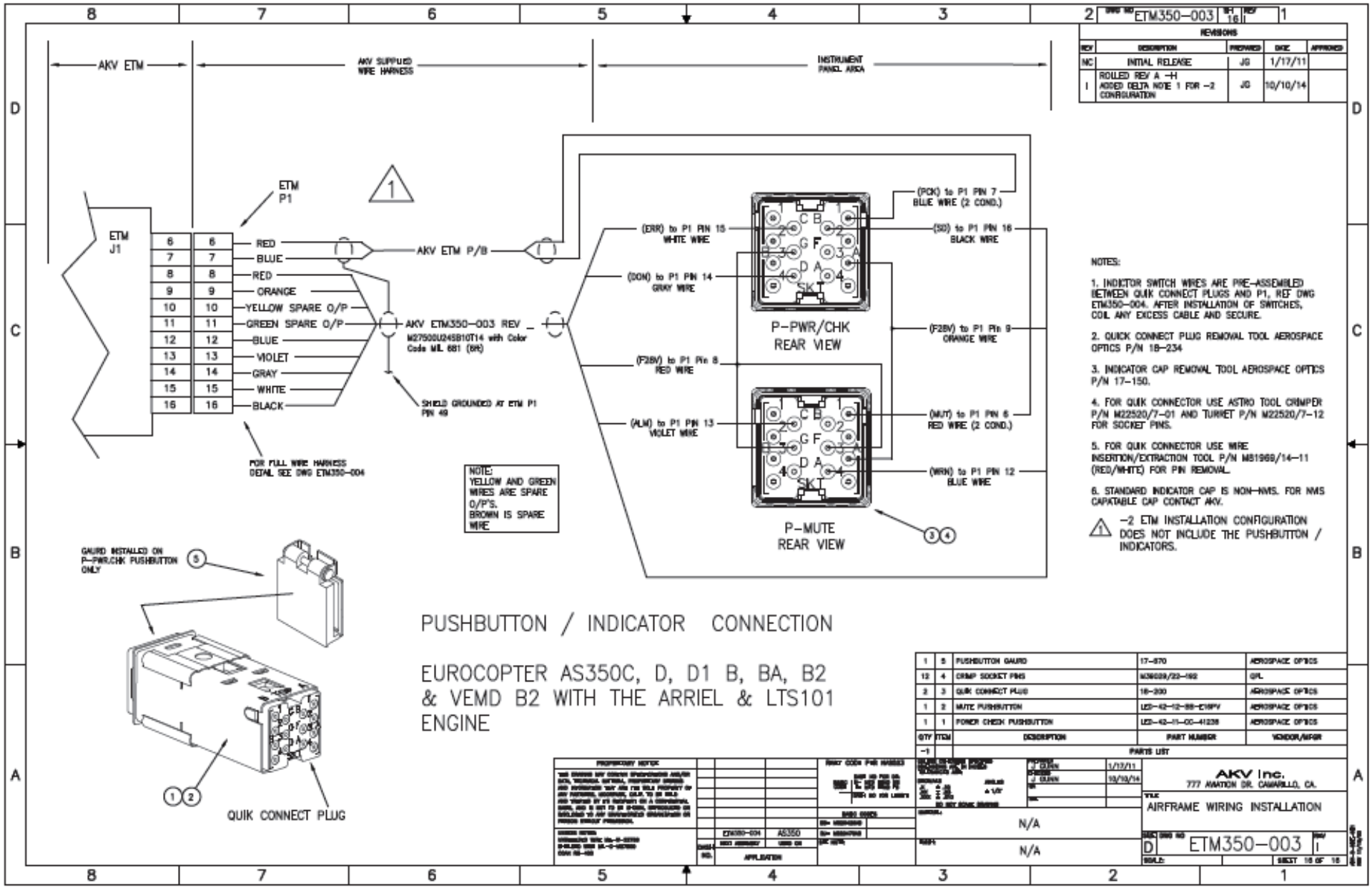
MATERIAL: N/A
FINISH: N/A

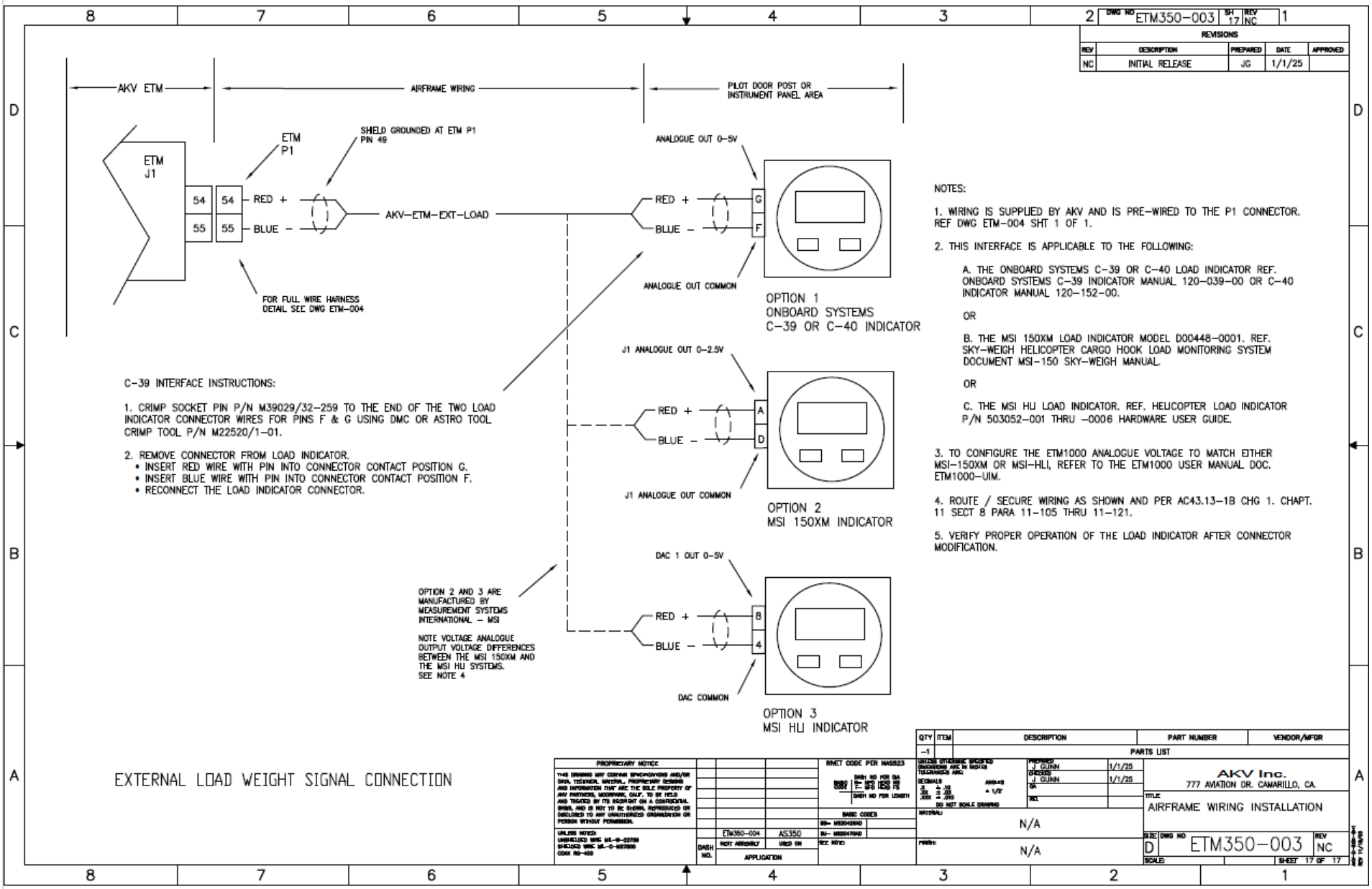
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.

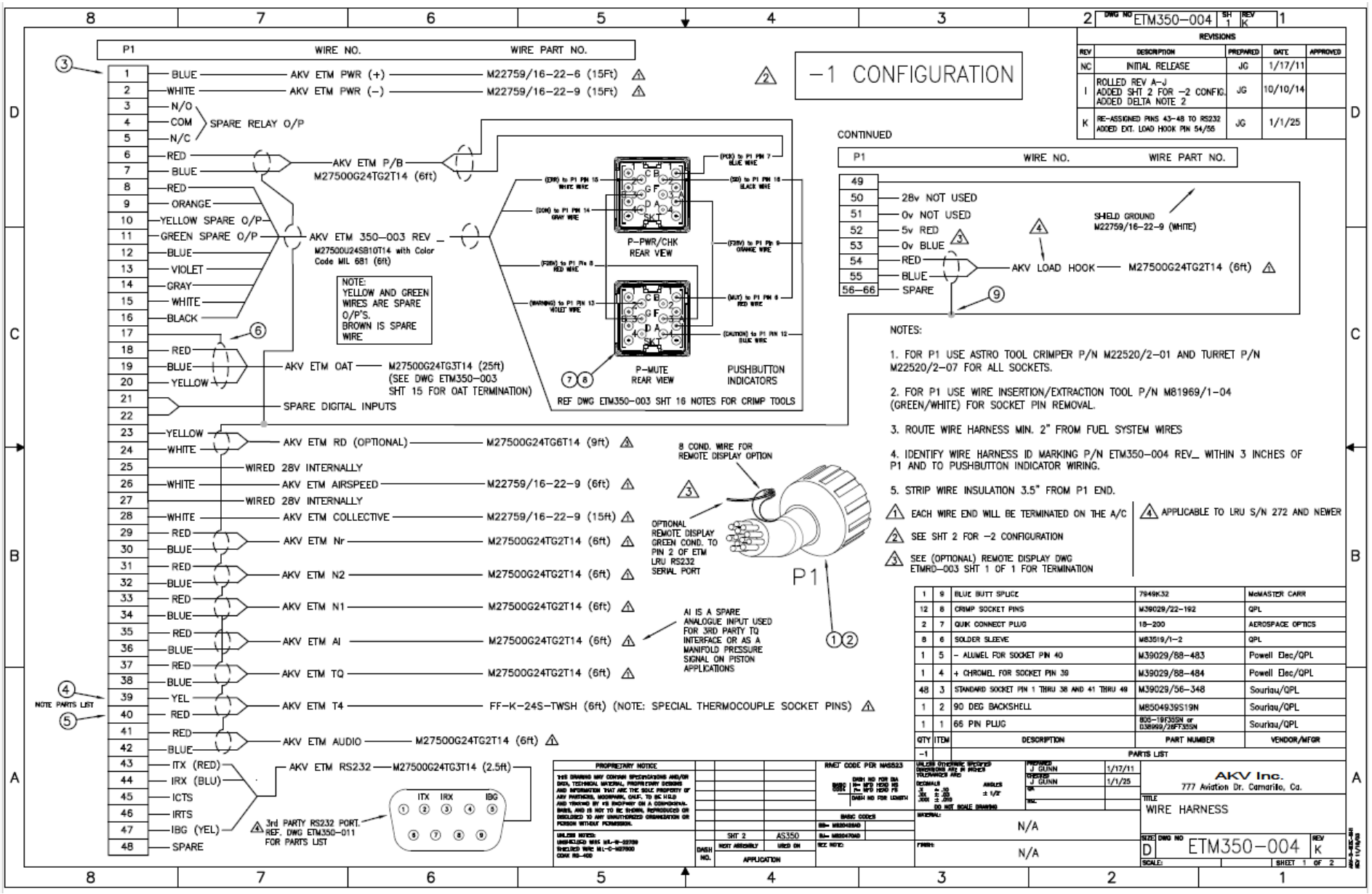
TITLE
AIRFRAME WIRING INSTALLATION

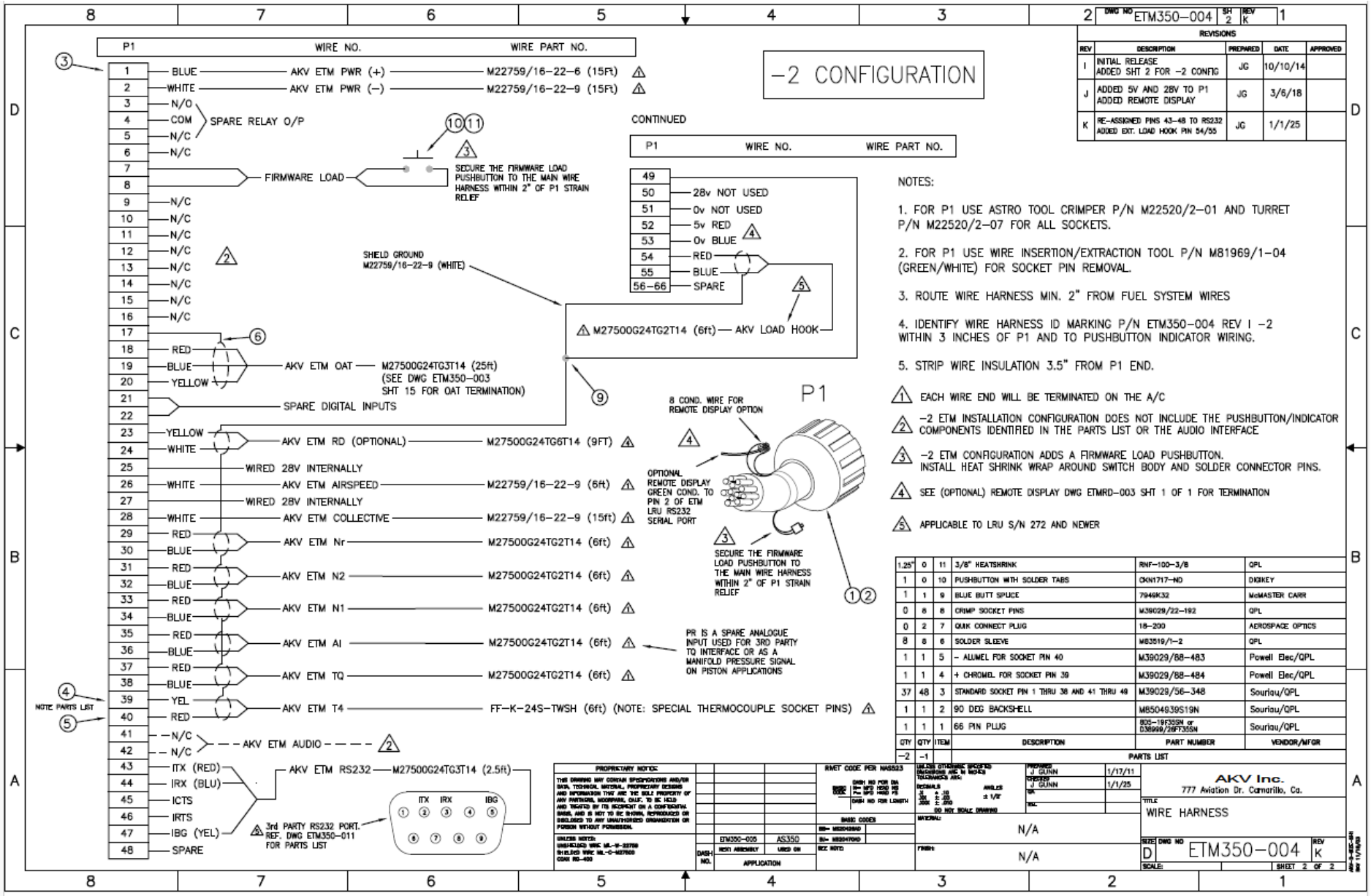
SIZE D | DWG NO ETM350–003 | REV H
SCALE: | SHEET 15 OF 16

AKV–D–SEC–001 REV 11/10/10


AKV ETM
AKV SUPPLIED WIRE HARNESS
INSTRUMENT PANEL AREA
ETM350-003
REVISIONS
REV | DESCRIPTION | PREPARED | DATE | APPROVED
NC | INITIAL RELEASE | JG | 1/17/11
I | ROLLED REV A -H ADDED DELTA NOTE 1 FOR -2 CONFIGURATION | JG | 10/10/14
ETM P1
ETM J1
6 RED
7 BLUE
8 RED
9 ORANGE
10 YELLOW SPARE O/P
11 GREEN SPARE O/P
12 BLUE
13 VIOLET
14 GRAY
15 WHITE
16 BLACK
AKV ETM P/B
AKV ETM350-003 REV _
M27500U24SB10T14 with Color Code MIL 681 (6H)
SHIELD GROUNDED AT ETM P1 PIN 49
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350-004
NOTE: YELLOW AND GREEN WIRES ARE SPARE O/P'S. BROWN IS SPARE WIRE
(PCK) to P1 PIN 7 BLUE WIRE (2 COND.)
(ERR) to P1 PIN 15 WHITE WIRE
(SG) to P1 PIN 16 BLACK WIRE
(DOM) to P1 PIN 14 GRAY WIRE
(F28V) to P1 Pin 9 ORANGE WIRE
(F28V) to P1 Pin 8 RED WIRE
(MUT) to P1 PIN 6 RED WIRE (2 COND.)
(ALM) to P1 PIN 13 VIOLET WIRE
(WRN) to P1 PIN 12 BLUE WIRE
P-PWR/CHK REAR VIEW
P-MUTE REAR VIEW
NOTES:
1. INDICTOR SWITCH WIRES ARE PRE-ASSEMBLED BETWEEN QUIK CONNECT PLUGS AND P1, REF DWG ETM350-004. AFTER INSTALLATION OF SWITCHES, COIL ANY EXCESS CABLE AND SECURE.
2. QUICK CONNECT PLUG REMOVAL TOOL AEROSPACE OPTICS P/N 18-234
3. INDICATOR CAP REMOVAL TOOL AEROSPACE OPTICS P/N 17-150.
4. FOR QUIK CONNECTOR USE ASTRO TOOL CRIMPER P/N M22520/7-01 AND TURRET P/N M22520/7-12 FOR SOCKET PINS.
5. FOR QUIK CONNECTOR USE WIRE INSERTION/EXTRACTION TOOL P/N M81969/14-11 (RED/WHITE) FOR PIN REMOVAL.
6. STANDARD INDICATOR CAP IS NON-NVIS. FOR NVIS CAPATABLE CAP CONTACT AKV.
-2 ETM INSTALLATION CONFIGURATION DOES NOT INCLUDE THE PUSHBUTTON / INDICATORS.
GAURD INSTALLED ON P-PWR/CHK PUSHBUTTON ONLY
QUIK CONNECT PLUG
PUSHBUTTON / INDICATOR CONNECTION
EUROCOPTER AS350C, D, D1 B, BA, B2 & VEMD B2 WITH THE ARRIEL & LTS101 ENGINE
1 5 PUSHBUTTON GAURD 17-870 AEROSPACE OPTICS
12 4 CRIMP SOCKET PINS M39029/22-192 GPL
2 3 QUIK CONNECT PLUG 18-200 AEROSPACE OPTICS
1 2 MUTE PUSHBUTTON LED-42-12-88-CWPV AEROSPACE OPTICS
1 1 POWER CHECK PUSHBUTTON LED-42-11-00-41238 AEROSPACE OPTICS
QTY ITEM DESCRIPTION PART NUMBER VENDOR/MFGR
-1 PARTS LIST
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
AIRFRAME WIRING INSTALLATION
D ETM350-003 I
SHEET 16 OF 16
N/A
N/A
AS350
APPLICATION


DWG NO ETM350-003 SH 17 REV NC
REVISIONS
REV | DESCRIPTION | PREPARED | DATE | APPROVED
NC | INITIAL RELEASE | JG | 1/1/25
AKV ETM
AIRFRAME WIRING
PILOT DOOR POST OR INSTRUMENT PANEL AREA
ETM J1
ETM P1
SHIELD GROUNDED AT ETM P1 PIN 49
54 54 RED +
55 55 BLUE –
AKV-ETM-EXT-LOAD
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM-004
ANALOGUE OUT 0-5V
RED + G
BLUE – F
ANALOGUE OUT COMMON
OPTION 1
ONBOARD SYSTEMS
C-39 OR C-40 INDICATOR
J1 ANALOGUE OUT 0-2.5V
RED + A
BLUE – D
J1 ANALOGUE OUT COMMON
OPTION 2
MSI 150XM INDICATOR
DAC 1 OUT 0-5V
RED + 8
BLUE – 4
DAC COMMON
OPTION 3
MSI HLI INDICATOR
C-39 INTERFACE INSTRUCTIONS:
1. CRIMP SOCKET PIN P/N M39029/32-259 TO THE END OF THE TWO LOAD INDICATOR CONNECTOR WIRES FOR PINS F & G USING DMC OR ASTRO TOOL CRIMP TOOL P/N M22520/1-01.
2. REMOVE CONNECTOR FROM LOAD INDICATOR.
• INSERT RED WIRE WITH PIN INTO CONNECTOR CONTACT POSITION G.
• INSERT BLUE WIRE WITH PIN INTO CONNECTOR CONTACT POSITION F.
• RECONNECT THE LOAD INDICATOR CONNECTOR.
OPTION 2 AND 3 ARE MANUFACTURED BY MEASUREMENT SYSTEMS INTERNATIONAL – MSI
NOTE VOLTAGE ANALOGUE OUTPUT VOLTAGE DIFFERENCES BETWEEN THE MSI 150XM AND THE MSI HLI SYSTEMS. SEE NOTE 4
NOTES:
1. WIRING IS SUPPLIED BY AKV AND IS PRE-WIRED TO THE P1 CONNECTOR. REF DWG ETM-004 SHT 1 OF 1.
2. THIS INTERFACE IS APPLICABLE TO THE FOLLOWING:
A. THE ONBOARD SYSTEMS C-39 OR C-40 LOAD INDICATOR REF. ONBOARD SYSTEMS C-39 INDICATOR MANUAL 120-039-00 OR C-40 INDICATOR MANUAL 120-152-00.
OR
B. THE MSI 150XM LOAD INDICATOR MODEL D00448-0001. REF. SKY-WEIGH HELICOPTER CARGO HOOK LOAD MONITORING SYSTEM DOCUMENT MSI-150 SKY-WEIGH MANUAL.
OR
C. THE MSI HLI LOAD INDICATOR. REF. HELICOPTER LOAD INDICATOR P/N 503052-001 THRU -0006 HARDWARE USER GUIDE.
3. TO CONFIGURE THE ETM1000 ANALOGUE VOLTAGE TO MATCH EITHER MSI-150XM OR MSI-HLI, REFER TO THE ETM1000 USER MANUAL DOC. ETM1000-UIM.
4. ROUTE / SECURE WIRING AS SHOWN AND PER AC43.13-1B CHG 1. CHAPT. 11 SECT 8 PARA 11-105 THRU 11-121.
5. VERIFY PROPER OPERATION OF THE LOAD INDICATOR AFTER CONNECTOR MODIFICATION.
EXTERNAL LOAD WEIGHT SIGNAL CONNECTION
PROPRIETARY NOTICE
RNET CODE PER NAS523
QTY | ITEM | DESCRIPTION | PART NUMBER | VENDOR/MFGR
PARTS LIST
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
AIRFRAME WIRING INSTALLATION
N/A
N/A
SIZE D DWG NO ETM350-003 REV NC
SCALE
SHEET 17 OF 17
ETM350-004 AS350
DASH NO. | NOT ASSEMBLY | USED ON | APPLICATION


DWG NO ETM350-004 SH 1 REV K
REVISIONS
REV | DESCRIPTION | PREPARED | DATE | APPROVED
NC | INITIAL RELEASE | JG | 1/17/11
I | ROLLED REV A-J ADDED SHT 2 FOR -2 CONFIG. ADDED DELTA NOTE 2 | JG | 10/10/14
K | RE-ASSIGNED PINS 43-48 TO RS232 ADDED EXT. LOAD HOOK PIN 54/55 | JG | 1/1/25
P1 WIRE NO. WIRE PART NO.
1 BLUE AKV ETM PWR (+) M22759/16-22-6 (15Ft)
2 WHITE AKV ETM PWR (-) M22759/16-22-9 (15Ft)
3 N/O
4 COM
5 N/C
SPARE RELAY O/P
6 RED
7 BLUE
AKV ETM P/B M27500G24TG2T14 (6ft)
8 RED
9 ORANGE
10 YELLOW SPARE O/P
11 GREEN SPARE O/P
AKV ETM 350-003 REV _ M27500U24SB10T14 with Color Code MIL 681 (6ft)
12 BLUE
13 VIOLET
14 GRAY
15 WHITE
16 BLACK
NOTE: YELLOW AND GREEN WIRES ARE SPARE O/P'S. BROWN IS SPARE WIRE
17
18 RED
19 BLUE
20 YELLOW
AKV ETM OAT M27500G24TG3T14 (25ft) (SEE DWG ETM350-003 SHT 15 FOR OAT TERMINATION)
21
22
SPARE DIGITAL INPUTS
23 YELLOW
24 WHITE
AKV ETM RD (OPTIONAL) M27500G24TG6T14 (9ft)
25
WIRED 28V INTERNALLY
26 WHITE
AKV ETM AIRSPEED M22759/16-22-9 (6ft)
27
WIRED 28V INTERNALLY
28 WHITE
AKV ETM COLLECTIVE M22759/16-22-9 (15ft)
29 RED
30 BLUE
AKV ETM Nr M27500G24TG2T14 (6ft)
31 RED
32 BLUE
AKV ETM N2 M27500G24TG2T14 (6ft)
33 RED
34 BLUE
AKV ETM N1 M27500G24TG2T14 (6ft)
35 RED
36 BLUE
AKV ETM AI M27500G24TG2T14 (6ft)
37 RED
38 BLUE
AKV ETM TQ M27500G24TG2T14 (6ft)
39 YEL
40 RED
AKV ETM T4 FF-K-24S-TWSH (6ft) (NOTE: SPECIAL THERMOCOUPLE SOCKET PINS)
41 RED
42 BLUE
AKV ETM AUDIO M27500G24TG2T14 (6ft)
43 ITX (RED)
44 IRX (BLU)
45 ICTS
46 IRTS
47 IBG (YEL)
48 SPARE
AKV ETM RS232 M27500G24TG3T14 (2.5ft)
3rd PARTY RS232 PORT. REF. DWG ETM350-011 FOR PARTS LIST
ITX IRX IBG
-1 CONFIGURATION
P-PWR/CHK REAR VIEW
P-MUTE REAR VIEW
PUSHBUTTON INDICATORS
REF DWG ETM350-003 SHT 16 NOTES FOR CRIMP TOOLS
CONTINUED
P1 WIRE NO. WIRE PART NO.
49
50 28v NOT USED
51 0v NOT USED
52 5v RED
53 0v BLUE
54 RED
55 BLUE
56-66 SPARE
AKV LOAD HOOK M27500G24TG2T14 (6ft)
SHIELD GROUND M22759/16-22-9 (WHITE)
NOTES:
1. FOR P1 USE ASTRO TOOL CRIMPER P/N M22520/2-01 AND TURRET P/N M22520/2-07 FOR ALL SOCKETS.
2. FOR P1 USE WIRE INSERTION/EXTRACTION TOOL P/N M81969/1-04 (GREEN/WHITE) FOR SOCKET PIN REMOVAL.
3. ROUTE WIRE HARNESS MIN. 2" FROM FUEL SYSTEM WIRES
4. IDENTIFY WIRE HARNESS ID MARKING P/N ETM350-004 REV_ WITHIN 3 INCHES OF P1 AND TO PUSHBUTTON INDICATOR WIRING.
5. STRIP WIRE INSULATION 3.5" FROM P1 END.
1 EACH WIRE END WILL BE TERMINATED ON THE A/C
2 SEE SHT 2 FOR -2 CONFIGURATION
3 SEE (OPTIONAL) REMOTE DISPLAY DWG ETMRD-003 SHT 1 OF 1 FOR TERMINATION
4 APPLICABLE TO LRU S/N 272 AND NEWER
8 COND. WIRE FOR REMOTE DISPLAY OPTION
OPTIONAL REMOTE DISPLAY GREEN COND. TO PIN 2 OF ETM LRU RS232 SERIAL PORT
AI IS A SPARE ANALOGUE INPUT USED FOR 3RD PARTY TQ INTERFACE OR AS A MANIFOLD PRESSURE SIGNAL ON PISTON APPLICATIONS
P1
NOTE PARTS LIST
QTY ITEM DESCRIPTION PART NUMBER VENDOR/MFGR
-1 PARTS LIST
1 9 BLUE BUTT SPLICE 7949K32 McMASTER CARR
12 8 CRIMP SOCKET PINS M39029/22-192 QPL
2 7 QUIK CONNECT PLUG 18-200 AEROSPACE OPTICS
8 6 SOLDER SLEEVE M83519/1-2 QPL
1 5 - ALUMEL FOR SOCKET PIN 40 M39029/88-483 Powell Elec/QPL
1 4 + CHROMEL FOR SOCKET PIN 39 M39029/88-484 Powell Elec/QPL
48 3 STANDARD SOCKET PIN 1 THRU 38 AND 41 THRU 49 M39029/56-348 Souriau/QPL
1 2 90 DEG BACKSHELL M85049/39S19N Souriau/QPL
1 1 66 PIN PLUG 80S-19J35SN or D38999/26FF35SN Souriau/QPL
PROPRIETARY NOTICE
RNET CODE PER MAS523
DASH NO. SHT 2 AS350
APPLICATION
PREPARED J GUNN 1/17/11
APPROVED J GUNN 1/1/25
MATERIAL: N/A
FINISH: N/A
AKV Inc. 777 Aviation Dr. Camarillo, Ca.
TITLE WIRE HARNESS
SIZE D DWG NO ETM350-004 REV K
SCALE: SHEET 1 OF 2


DWG NO ETM350-004 SH 2 REV K
-2 CONFIGURATION
REVISIONS
REV I INITIAL RELEASE ADDED SHT 2 FOR -2 CONFIG JG 10/10/14
REV J ADDED 5V AND 28V TO P1 ADDED REMOTE DISPLAY JG 3/6/18
REV K RE-ASSIGNED PINS 43-48 TO RS232 ADDED EXT. LOAD HOOK PIN 54/55 JG 1/1/25
P1 WIRE NO. WIRE PART NO.
1 BLUE AKV ETM PWR (+) M22759/16-22-6 (15Ft)
2 WHITE AKV ETM PWR (-) M22759/16-22-9 (15Ft)
3 N/O
4 COM
5 N/C
6 N/C
SPARE RELAY O/P
7
8 FIRMWARE LOAD
SECURE THE FIRMWARE LOAD PUSHBUTTON TO THE MAIN WIRE HARNESS WITHIN 2" OF P1 STRAIN RELIEF
9 N/C
10 N/C
11 N/C
12 N/C
13 N/C
14 N/C
15 N/C
16 N/C
17
18 RED
19 BLUE AKV ETM OAT M27500G24TG3T14 (25ft)
20 YELLOW (SEE DWG ETM350-003 SHT 15 FOR OAT TERMINATION)
21 SPARE DIGITAL INPUTS
22
23 YELLOW
24 WHITE AKV ETM RD (OPTIONAL) M27500G24TG6T14 (9FT)
25 WIRED 28V INTERNALLY
26 WHITE AKV ETM AIRSPEED M22759/16-22-9 (6ft)
27 WIRED 28V INTERNALLY
28 WHITE AKV ETM COLLECTIVE M22759/16-22-9 (15ft)
29 RED
30 BLUE AKV ETM Nr M27500G24TG2T14 (6ft)
31 RED
32 BLUE AKV ETM N2 M27500G24TG2T14 (6ft)
33 RED
34 BLUE AKV ETM N1 M27500G24TG2T14 (6ft)
35 RED
36 BLUE AKV ETM AI M27500G24TG2T14 (6ft)
37 RED
38 BLUE AKV ETM TQ M27500G24TG2T14 (6ft)
39 YEL
40 RED AKV ETM T4 FF-K-24S-TWSH (6ft) (NOTE: SPECIAL THERMOCOUPLE SOCKET PINS)
41 N/C
42 N/C AKV ETM AUDIO
43 ITX (RED)
44 IRX (BLU)
45 ICTS
46 IRTS
47 IBG (YEL)
48 SPARE
AKV ETM RS232 M27500G24TG3T14 (2.5ft)
3rd PARTY RS232 PORT. REF. DWG ETM350-011 FOR PARTS LIST
ITX IRX IBG
NOTE PARTS LIST
CONTINUED
P1 WIRE NO. WIRE PART NO.
49
50 28v NOT USED
51 0v NOT USED
52 5v RED
53 0v BLUE
54 RED
55 BLUE
56-66 SPARE
SHIELD GROUND M22759/16-22-9 (WHITE)
M27500G24TG2T14 (6ft) AKV LOAD HOOK
8 COND. WIRE FOR REMOTE DISPLAY OPTION
OPTIONAL REMOTE DISPLAY GREEN COND. TO PIN 2 OF ETM LRU RS232 SERIAL PORT
SECURE THE FIRMWARE LOAD PUSHBUTTON TO THE MAIN WIRE HARNESS WITHIN 2" OF P1 STRAIN RELIEF
P1
PR IS A SPARE ANALOGUE INPUT USED FOR 3RD PARTY TO INTERFACE OR AS A MANIFOLD PRESSURE SIGNAL ON PISTON APPLICATIONS
NOTES:
1. FOR P1 USE ASTRO TOOL CRIMPER P/N M22520/2-01 AND TURRET P/N M22520/2-07 FOR ALL SOCKETS.
2. FOR P1 USE WIRE INSERTION/EXTRACTION TOOL P/N M81969/1-04 (GREEN/WHITE) FOR SOCKET PIN REMOVAL.
3. ROUTE WIRE HARNESS MIN. 2" FROM FUEL SYSTEM WIRES
4. IDENTIFY WIRE HARNESS ID MARKING P/N ETM350-004 REV I -2 WITHIN 3 INCHES OF P1 AND TO PUSHBUTTON INDICATOR WIRING.
5. STRIP WIRE INSULATION 3.5" FROM P1 END.
1 EACH WIRE END WILL BE TERMINATED ON THE A/C
2 -2 ETM INSTALLATION CONFIGURATION DOES NOT INCLUDE THE PUSHBUTTON/INDICATOR COMPONENTS IDENTIFIED IN THE PARTS LIST OR THE AUDIO INTERFACE
3 -2 ETM CONFIGURATION ADDS A FIRMWARE LOAD PUSHBUTTON. INSTALL HEAT SHRINK WRAP AROUND SWITCH BODY AND SOLDER CONNECTOR PINS.
4 SEE (OPTIONAL) REMOTE DISPLAY DWG ETMRD-003 SHT 1 OF 1 FOR TERMINATION
5 APPLICABLE TO LRU S/N 272 AND NEWER
PARTS LIST
QTY -2 | QTY -1 | ITEM | DESCRIPTION | PART NUMBER | VENDOR/MFGR
1.25" 0 11 3/8" HEATSHRINK RNF-100-3/8 QPL
1 0 10 PUSHBUTTON WITH SOLDER TABS CKN1717-ND DIGIKEY
1 1 9 BLUE BUTT SPLICE 7949K32 McMASTER CARR
0 8 8 CRIMP SOCKET PINS M39029/22-192 QPL
0 2 7 QUIK CONNECT PLUG 18-200 AEROSPACE OPTICS
8 8 6 SOLDER SLEEVE M83519/1-2 QPL
1 1 5 - ALUMEL FOR SOCKET PIN 40 M39029/88-483 Powell Elec/QPL
1 1 4 + CHROMEL FOR SOCKET PIN 39 M39029/88-484 Powell Elec/QPL
37 48 3 STANDARD SOCKET PIN 1 THRU 38 AND 41 THRU 49 M39029/56-348 Souriau/QPL
1 1 2 90 DEG BACKSHELL M8504939S19N Souriau/QPL
1 1 1 66 PIN PLUG 805-19F35SN or D38999/26FF35SN Souriau/QPL
PROPRIETARY NOTICE
RWET CODE PER NAS523
DRAWN J GUNN 1/17/11
CHECKED J GUNN 1/1/25
AKV Inc. 777 Aviation Dr. Camarillo, Ca.
TITLE WIRE HARNESS
MATERIAL: N/A
FINISH: N/A
ETM350-005 AS350
DASH NO. NEXT ASSEMBLY USED ON
APPLICATION
SIZE D DWG NO ETM350-004 REV K
SCALE: SHEET 2 OF 2

DWG NO ETM350-005 SH 3 REV J

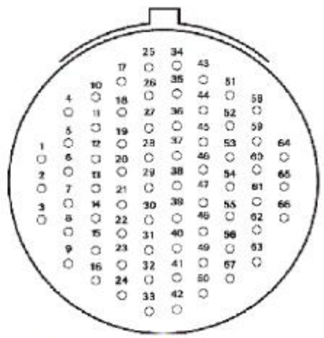
REVISIONS

REV	DESCRIPTION	PREPARED	DATE	APPROVED
NC	INITIAL RELEASE	JG	1/17/11	
J	ROLLED A-J RE-ASSIGNED PINS 43-48 TO RS232 ADDED EXT. LOAD HOOK PIN 54/55	JG	1/1/25	

J1 PIN OUT

AS350

PIN 1	28Vdc	Main Board Power 28V
PIN 2	GND	Main Board Ground 0V
PIN 3	N/O	Spare Relay Output
PIN 4	C	Spare Relay Output
PIN 5	N/C	Spare Relay Output
PIN 6	MUT	Mute
PIN 7	PCK	Power Check
PIN 8	F28V	Fused 28V
PIN 9	F28V	Fused 28V
PIN 10	SP2	Digital Output Spare
PIN 11	SP1	Digital Output Spare
PIN 12	CAU	Caution
PIN 13	WRN	Warning
PIN 14	DON	Done
PIN 15	ERR	Error
PIN 16	SD	SD Card
PIN 17	ATSH	OAT SHIELD
PIN 18	AT+	OAT
PIN 19	AT-	OAT
PIN 20	AT-S	OAT
PIN 21	D4+	Digital Input Spare
PIN 22	D4-	Digital Input Spare
PIN 23	D3+	Remote Display Reset
PIN 24	D3-	Remote Display 0v
PIN 25	D2+	Wired to 28V Internally N/C
PIN 26	D2-	Digital Input Airspeed Sw
PIN 27	D1+	Wired to 28V Internally N/C
PIN 28	D1-	Digital Input Collective Sw
PIN 29	NR+	Rotor
PIN 30	NR-	Rotor
PIN 31	N2+	Free Turbine
PIN 32	N2-	Free Turbine
PIN 33	N1+	Gas Producer
PIN 34	N1-	Gas Producer
PIN 35	TQ+ (AI)	Alt Tq
PIN 36	TQ- (AI)	Alt Tq
PIN 37	TQ+	Torque
PIN 38	TQ-	Torque



Front View of Male Connector

J1 66 Male Pin Connector Mounted on ETM Enclosure

NOTES:

1. USE ASTRO TOOL CRIMPER P/N M22520/2-01 AND TURRET P/N M22520/2-09 FOR ALL PINS.

2. USE WIRE INSERTION/EXTRACTION TOOL P/N M81969/1-04 (GREEN/WHITE)

PIN 39	KT/C YEL + Chromel	T4 Thermocouple	NOTE: Pin P/N M39029/87-472 (Socket P/N M39029/88-484)
PIN 40	KT/C RED - Alumel	T4 Thermocouple	NOTE: Pin P/N M39029/87-471 (Socket P/N M39029/88-483)
PIN 41	A+	Audio Output	
PIN 42	A-	Audio Output	
PIN 43	ITX	Optional RS232 Interface	
PIN 44	IRX	Optional RS232 Interface	
PIN 45	ICTS	Optional RS232 Interface	
PIN 46	IRTS	Optional RS232 Interface	
PIN 47	IBG	Optional RS232 Interface	
PIN 48	SPARE		
PIN 49	SHIELD	Signal Wire Shield Ground	
PIN 50	28V	NOT USED ON AS350	
PIN 51	0V	NOT USED ON AS350	
PIN 52	5V	Remote LCD	
PIN 53	0V	Remote LCD	
PIN 54	LH+	Load Hook Interface	
PIN 55	LH-	Load Hook Interface	
PIN 56 THRU 66 SPARE			
For Pin 1 Thru 38 and 41 Thru 66 Use :			NOTE: Pin P/N M39029/58-360 (Socket P/N M39029/56-348)

QTY	ITEM	DESCRIPTION	PART NUMBER	VENDOR/MFGR
-1		PARTS LIST		

PROPRIETARY NOTICE

NEXT ASSEMBLY: ETM350-006 — USED ON: AS350 — APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. DO NOT SCALE DRAWING

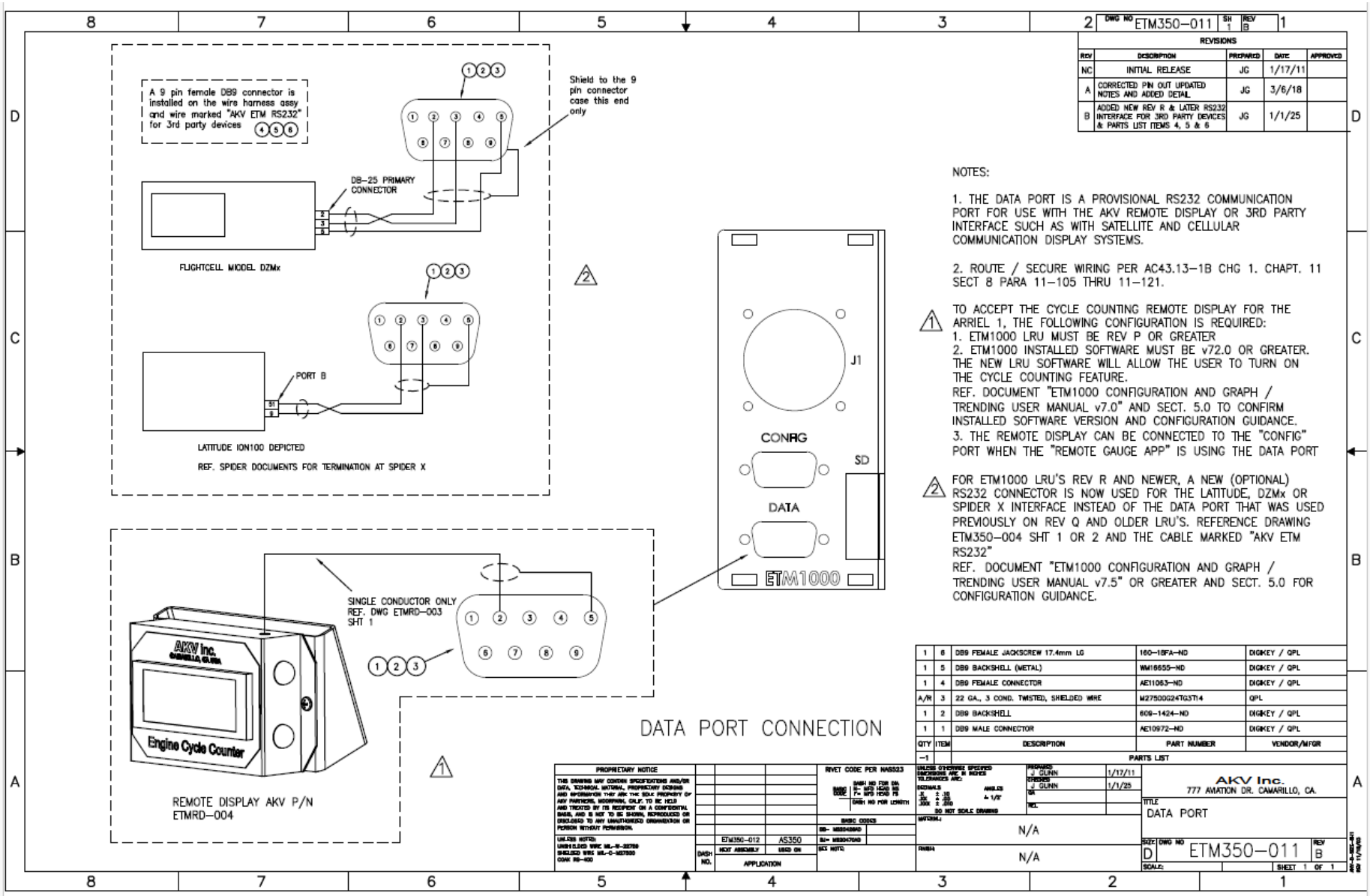
PREPARED: J GUNN 1/17/11
CHECKED: J GUNN 1/1/25

MATERIAL: N/A
FINISH: N/A

AKV Inc.
777 Aviation Dr, Camarillo, Ca.

TITLE: WIRING DIAGRAM

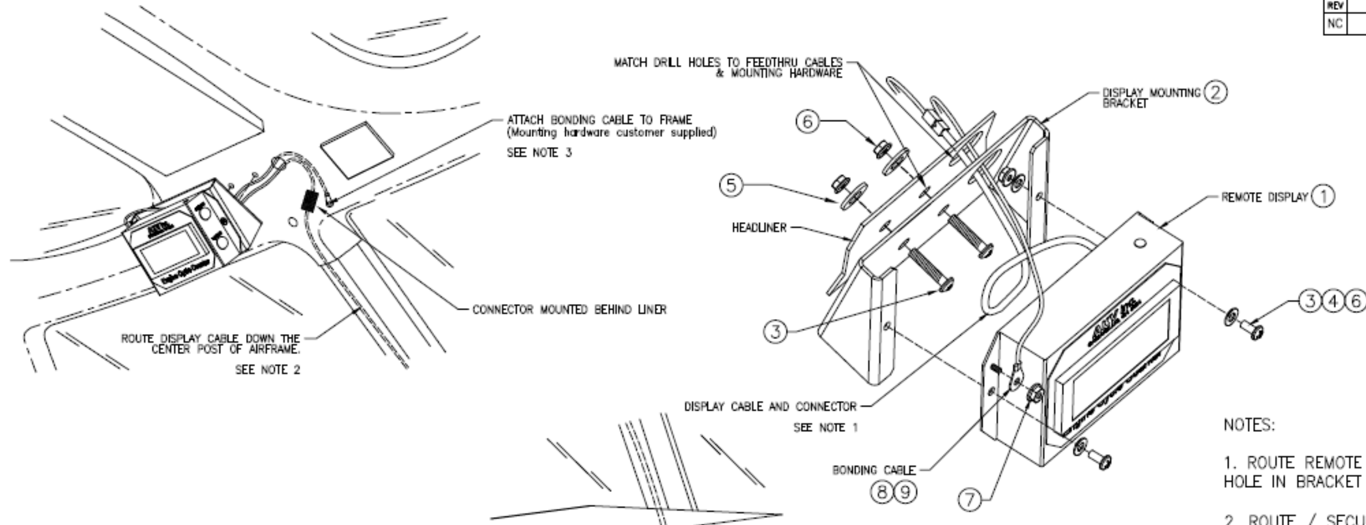
SIZE: D — DWG NO: ETM350-005 — REV: J
SCALE: — SHEET 3 OF 3


DWG NO ETM350-011 SH 1 REV B
REVISIONS
REV | DESCRIPTION | PREPARED | DATE | APPROVED
NC | INITIAL RELEASE | JG | 1/17/11
A | CORRECTED PIN OUT UPDATED NOTES AND ADDED DETAIL | JG | 3/6/18
B | ADDED NEW REV R & LATER RS232 INTERFACE FOR 3RD PARTY DEVICES & PARTS LIST ITEMS 4, 5 & 6 | JG | 1/1/25
A 9 pin female DB9 connector is installed on the wire harness assy and wire marked "AKV ETM RS232" for 3rd party devices
Shield to the 9 pin connector case this end only
DB-25 PRIMARY CONNECTOR
FLIGHTCELL MODEL DZMx
PORT B
LATITUDE ION100 DEPICTED
REF. SPIDER DOCUMENTS FOR TERMINATION AT SPIDER X
J1
CONFIG
SD
DATA
ETM1000
SINGLE CONDUCTOR ONLY
REF. DWG ETMRD-003
SHT 1
AKV Inc.
Engine Cycle Counter
REMOTE DISPLAY AKV P/N
ETMRD-004
DATA PORT CONNECTION
NOTES:
1. THE DATA PORT IS A PROVISIONAL RS232 COMMUNICATION PORT FOR USE WITH THE AKV REMOTE DISPLAY OR 3RD PARTY INTERFACE SUCH AS WITH SATELLITE AND CELLULAR COMMUNICATION DISPLAY SYSTEMS.
2. ROUTE / SECURE WIRING PER AC43.13-1B CHG 1. CHAPT. 11 SECT 8 PARA 11-105 THRU 11-121.
1 TO ACCEPT THE CYCLE COUNTING REMOTE DISPLAY FOR THE ARRIEL 1, THE FOLLOWING CONFIGURATION IS REQUIRED:
1. ETM1000 LRU MUST BE REV P OR GREATER
2. ETM1000 INSTALLED SOFTWARE MUST BE v72.0 OR GREATER. THE NEW LRU SOFTWARE WILL ALLOW THE USER TO TURN ON THE CYCLE COUNTING FEATURE.
REF. DOCUMENT "ETM1000 CONFIGURATION AND GRAPH / TRENDING USER MANUAL v7.0" AND SECT. 5.0 TO CONFIRM INSTALLED SOFTWARE VERSION AND CONFIGURATION GUIDANCE.
3. THE REMOTE DISPLAY CAN BE CONNECTED TO THE "CONFIG" PORT WHEN THE "REMOTE GAUGE APP" IS USING THE DATA PORT
2 FOR ETM1000 LRU'S REV R AND NEWER, A NEW (OPTIONAL) RS232 CONNECTOR IS NOW USED FOR THE LATITUDE, DZMx OR SPIDER X INTERFACE INSTEAD OF THE DATA PORT THAT WAS USED PREVIOUSLY ON REV Q AND OLDER LRU'S. REFERENCE DRAWING ETM350-004 SHT 1 OR 2 AND THE CABLE MARKED "AKV ETM RS232"
REF. DOCUMENT "ETM1000 CONFIGURATION AND GRAPH / TRENDING USER MANUAL v7.5" OR GREATER AND SECT. 5.0 FOR CONFIGURATION GUIDANCE.
QTY | ITEM | DESCRIPTION | PART NUMBER | VENDOR/MFGR
1 | 6 | DB9 FEMALE JACKSCREW 17.4mm LG | 160-18FA-ND | DIGIKEY / QPL
1 | 5 | DB9 BACKSHELL (METAL) | WM16555-ND | DIGIKEY / QPL
1 | 4 | DB9 FEMALE CONNECTOR | AE11063-ND | DIGIKEY / QPL
A/R | 3 | 22 GA., 3 COND. TWISTED, SHIELDED WIRE | M27500G24TG3T14 | QPL
1 | 2 | DB9 BACKSHELL | 609-1424-ND | DIGIKEY / QPL
1 | 1 | DB9 MALE CONNECTOR | AE10972-ND | DIGIKEY / QPL
-1 | PARTS LIST
PROPRIETARY NOTICE
DASH NO. ETM350-012 AS350
NEXT ASSEMBLY USED ON
APPLICATION
RIVET CODE PER NAS523
DRAWN J. GUNN 1/17/11
CHECKED J. GUNN 1/1/25
QA
ENG
DO NOT SCALE DRAWING
MATERIAL N/A
FINISH N/A
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
TITLE DATA PORT
SIZE D DWG NO ETM350-011 REV B
SCALE: SHEET 1 OF 1

DWG NO AS350-ETMRD-002 SH 1 REV NC

REVISIONS

REV	DESCRIPTION	PREPARED	DATE	APPROVED
NC	INITIAL RELEASE	JG	3/6/18	



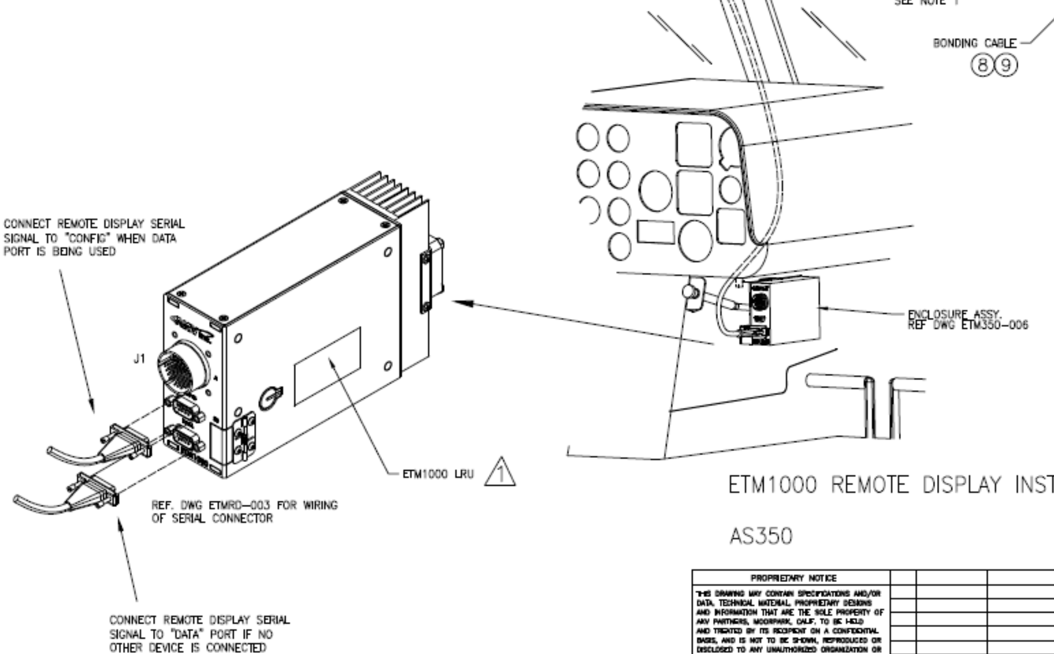
NOTES:

1. ROUTE REMOTE DISPLAY CABLE CONNECTOR THRU HOLE IN BRACKET AND HEADLINER.

2. ROUTE / SECURE WIRING PER AC43.13-1B CHG 1. CHAPT. 11 SECT 8 PARA 11-105 THRU 11-121.

3. FOR PREPARING THE GROUND STRAP BONDING SURFACE TO THE AIRFRAME, REF THE EUROCOPTER STANDARD PRACTICES MANUAL "GENERAL ELECTRICAL BONDING" GUIDLINES CHAPT. 20.02.07.101

⚠1 ETM1000 LRU MUST BE REV P OR GREATER TO ACCEPT REMOTE DISPLAY INTERFACE



ETM1000 REMOTE DISPLAY INSTALLATION

AS350

QTY	ITEM	DESCRIPTION	PART NUMBER	VENDOR/MFGR
12"	9	1/4" Oval Braided Wire Silver	2142 SV005	EDMO
2	8	#10 Ring Terminal	7113K241	McMaster Carr
1	7	8-32 Flange Nut	95307A300 or MS-21042-08	McMaster Carr / QPL
4	6	10-32 Nut	95307A400 or MS21042L3	McMaster Carr / QPL
2	5	#10 Surface Washer	90615A125 or MS/NASM-15795-8578	McMaster Carr / QPL
6	4	#10 Washer	98017A640 or AN960C10	McMaster Carr / QPL
4	3	Screw 10-32 x 0.5" Lg	96880A518 or MS35207-263	McMaster Carr / QPL
1	2	Remote Display Mounting bracket	AS350-ETMRD-001	AKV, Inc
1	1	Remote Display	ETMRD-004	AKV, Inc
-1		PARTS LIST		

UNLESS NOTED:
UNSHIELDED WIRE MIL-W-22759
SHIELDED WIRE MIL-C-M27500
COAX RG-400

DASH NO.	NEXT ASSEMBLY	USED ON
		AS350/BELL
APPLICATION		

RIVET CODE PER NAS523
BASIC CODE: DASH NO FOR DIA; N= MFD HEAD MS; F= MFD HEAD FS; DASH NO FOR LENGTH
BASIC CODES
BB= MS20426AD
BJ= MS20470AD
SEE NOTE:

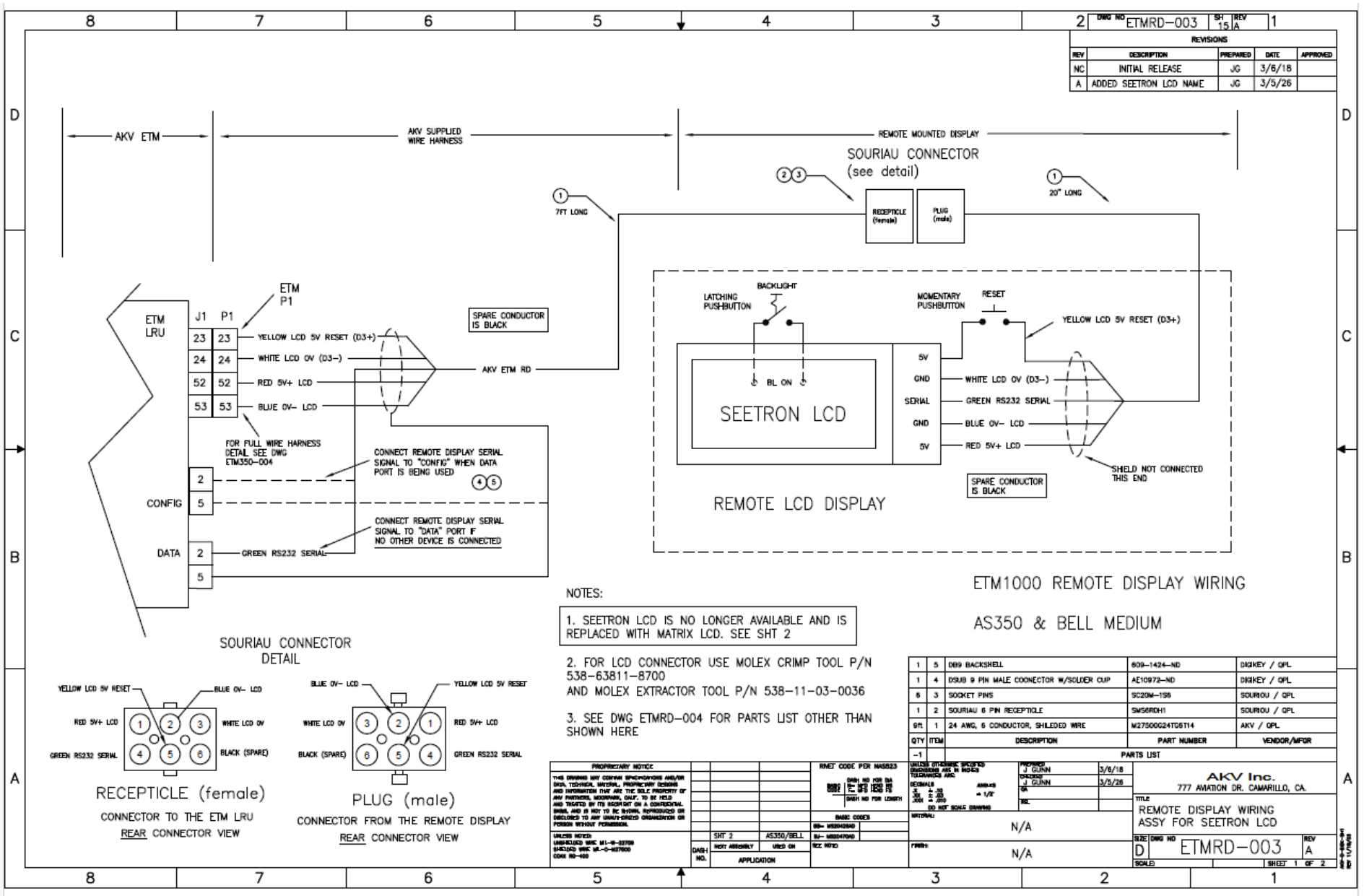
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMALS .X ± .10, .XX ± .03, .XXX ± .010
ANGLES ± 1/2°
DO NOT SCALE DRAWING
MATERIAL: N/A
FINISH: N/A

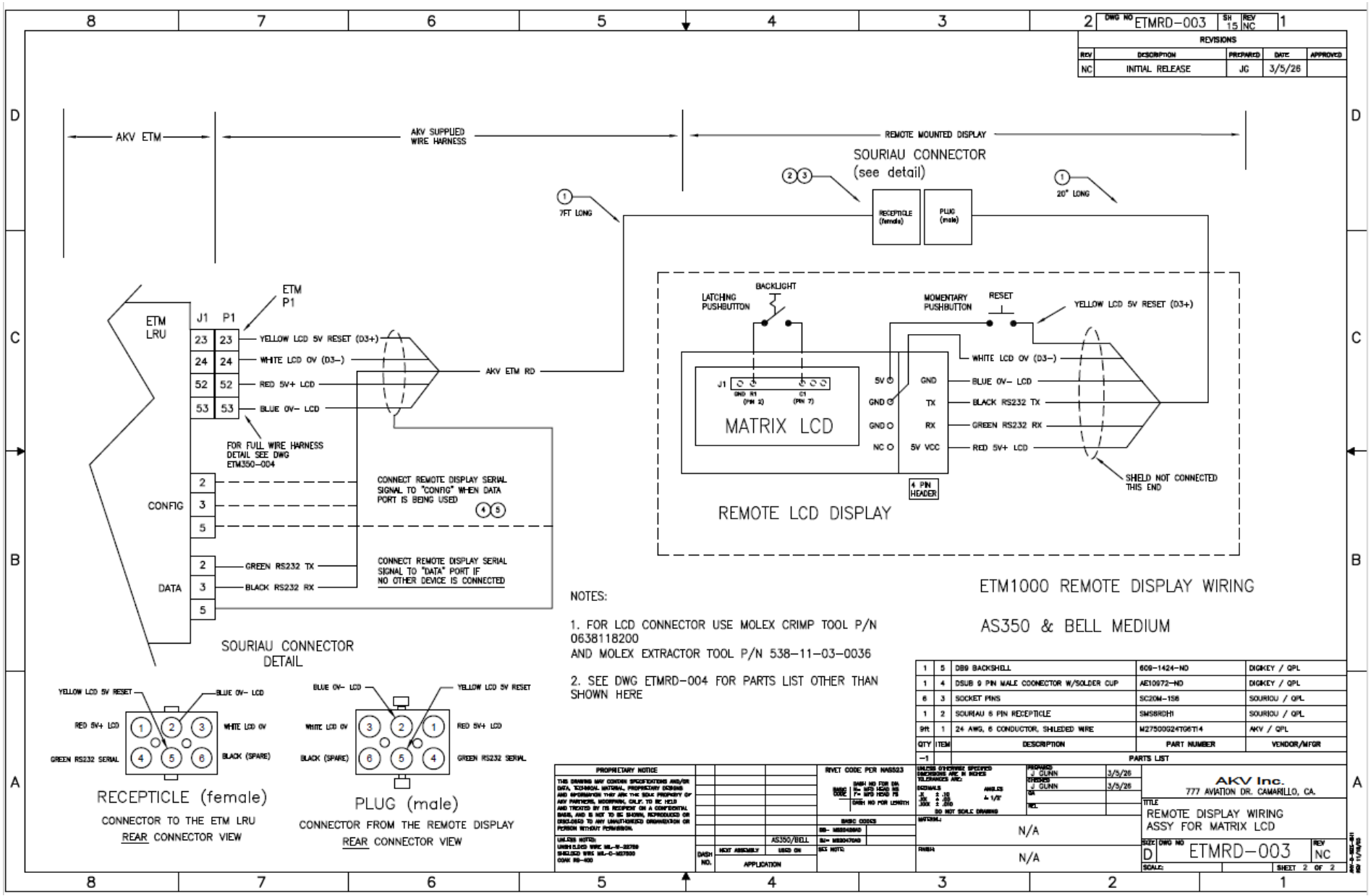
PREPARED	J GUNN	3/6/18
CHECKED	J GUNN	3/6/18
QA		
REL		

AKV Inc.
777 AVIATION DR. CAMARILLO, CA.

TITLE: AS350 REMOTE DISPLAY INSTALLATION

SIZE: D DWG NO: AS350-ETMRD-002 REV: NC
SCALE: SHEET 1 OF 1


DWG NO ETMRD-003 SH 15 REV A
REVISIONS
REV | DESCRIPTION | PREPARED | DATE | APPROVED
NC | INITIAL RELEASE | JG | 3/6/18
A | ADDED SEETRON LCD NAME | JG | 3/5/26
AKV ETM
AKV SUPPLIED WIRE HARNESS
REMOTE MOUNTED DISPLAY
SOURIAU CONNECTOR (see detail)
7FT LONG
20" LONG
RECEPTICLE (female)
PLUG (male)
ETM LRU
J1 P1
ETM P1
23 23 YELLOW LCD 5V RESET (D3+)
24 24 WHITE LCD 0V (D3-)
52 52 RED 5V+ LCD
53 53 BLUE 0V- LCD
SPARE CONDUCTOR IS BLACK
AKV ETM RD
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350-004
CONFIG 2 5
CONNECT REMOTE DISPLAY SERIAL SIGNAL TO "CONFIG" WHEN DATA PORT IS BEING USED
DATA 2 5 GREEN RS232 SERIAL
CONNECT REMOTE DISPLAY SERIAL SIGNAL TO "DATA" PORT IF NO OTHER DEVICE IS CONNECTED
LATCHING PUSHBUTTON
BACKLIGHT
BL ON
SEETRON LCD
MOMENTARY PUSHBUTTON
RESET
YELLOW LCD 5V RESET (D3+)
5V
GND
SERIAL
GND
5V
WHITE LCD 0V (D3-)
GREEN RS232 SERIAL
BLUE 0V- LCD
RED 5V+ LCD
SHIELD NOT CONNECTED THIS END
SPARE CONDUCTOR IS BLACK
REMOTE LCD DISPLAY
SOURIAU CONNECTOR DETAIL
YELLOW LCD 5V RESET
BLUE 0V- LCD
RED 5V+ LCD
WHITE LCD 0V
GREEN RS232 SERIAL
BLACK (SPARE)
RECEPTICLE (female)
CONNECTOR TO THE ETM LRU
REAR CONNECTOR VIEW
BLUE 0V- LCD
YELLOW LCD 5V RESET
WHITE LCD 0V
RED 5V+ LCD
BLACK (SPARE)
GREEN RS232 SERIAL
PLUG (male)
CONNECTOR FROM THE REMOTE DISPLAY
REAR CONNECTOR VIEW
NOTES:
1. SEETRON LCD IS NO LONGER AVAILABLE AND IS REPLACED WITH MATRIX LCD. SEE SHT 2
2. FOR LCD CONNECTOR USE MOLEX CRIMP TOOL P/N 538-63811-8700 AND MOLEX EXTRACTOR TOOL P/N 538-11-03-0036
3. SEE DWG ETMRD-004 FOR PARTS LIST OTHER THAN SHOWN HERE
ETM1000 REMOTE DISPLAY WIRING
AS350 & BELL MEDIUM
QTY | ITEM | DESCRIPTION | PART NUMBER | VENDOR/MFGR
-1 | PARTS LIST
1 | 5 | DB9 BACKSHELL | 609-1424-ND | DIGIKEY / QPL
1 | 4 | DSUB 9 PIN MALE COONECTOR W/SOLDER CUP | AE10972-ND | DIGIKEY / QPL
6 | 3 | SOCKET PINS | SC20M-19S | SOURIOU / QPL
1 | 2 | SOURIAU 6 PIN RECEPTICLE | SWS6RDH1 | SOURIOU / QPL
9ft | 1 | 24 AWG, 6 CONDUCTOR, SHIELDED WIRE | M27500G24T06T14 | AKV / QPL
PROPRIETARY NOTICE
RIVET CODE PER NAS523
DASH NO. SHT 2 NOT ASSEMBLY AS350/BELL USED ON APPLICATION
DRAWN J GUNN 3/6/18
CHECKED J GUNN 3/5/26
QA
ENG
MATERIAL N/A
FINISH N/A
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
TITLE REMOTE DISPLAY WIRING ASSY FOR SEETRON LCD
SIZE D DWG NO ETMRD-003 REV A
SCALE SHEET 1 OF 2


DWG NO ETMRD-003 SH 1 OF 2 REV NC
REVISIONS
REV NC DESCRIPTION INITIAL RELEASE PREPARED JG DATE 3/5/26
AKV ETM
AKV SUPPLIED WIRE HARNESS
REMOTE MOUNTED DISPLAY
SOURIAU CONNECTOR (see detail)
RECEPTICLE (female)
PLUG (male)
7FT LONG
20" LONG
ETM LRU
ETM P1
J1 P1
23 23 YELLOW LCD 5V RESET (D3+)
24 24 WHITE LCD 0V (D3-)
52 52 RED 5V+ LCD
53 53 BLUE 0V- LCD
AKV ETM RD
FOR FULL WIRE HARNESS DETAIL SEE DWG ETM350-004
CONFIG
2
3
5
CONNECT REMOTE DISPLAY SERIAL SIGNAL TO "CONFIG" WHEN DATA PORT IS BEING USED
4 5
DATA
2 GREEN RS232 TX
3 BLACK RS232 RX
5
CONNECT REMOTE DISPLAY SERIAL SIGNAL TO "DATA" PORT IF NO OTHER DEVICE IS CONNECTED
SOURIAU CONNECTOR DETAIL
YELLOW LCD 5V RESET
BLUE 0V- LCD
RED 5V+ LCD
WHITE LCD 0V
GREEN RS232 SERIAL
BLACK (SPARE)
RECEPTICLE (female)
CONNECTOR TO THE ETM LRU
REAR CONNECTOR VIEW
PLUG (male)
CONNECTOR FROM THE REMOTE DISPLAY
REAR CONNECTOR VIEW
LATCHING PUSHBUTTON
BACKLIGHT
MOMENTARY PUSHBUTTON
RESET
YELLOW LCD 5V RESET (D3+)
WHITE LCD 0V (D3-)
BLUE 0V- LCD
BLACK RS232 TX
GREEN RS232 RX
RED 5V+ LCD
SHIELD NOT CONNECTED THIS END
J1
GND R1 (PIN 2)
C1 (PIN 7)
MATRIX LCD
5V GND
GND TX
GND RX
NC 5V VCC
4 PIN HEADER
REMOTE LCD DISPLAY
NOTES:
1. FOR LCD CONNECTOR USE MOLEX CRIMP TOOL P/N 0638118200
AND MOLEX EXTRACTOR TOOL P/N 538-11-03-0036
2. SEE DWG ETMRD-004 FOR PARTS LIST OTHER THAN SHOWN HERE
ETM1000 REMOTE DISPLAY WIRING
AS350 & BELL MEDIUM
1 5 DB9 BACKSHELL 609-1424-ND DIGIKEY / QPL
1 4 DSUB 9 PIN MALE COONECTOR W/SOLDER CUP AE10972-ND DIGIKEY / QPL
6 3 SOCKET PINS SC20M-1S6 SOURIOU / QPL
1 2 SOURIAU 6 PIN RECEPTICLE SMS8RDH1 SOURIOU / QPL
9ft 1 24 AWG, 6 CONDUCTOR, SHILEDED WIRE M27500G24T06T14 AKV / QPL
QTY ITEM DESCRIPTION PART NUMBER VENDOR/MFGR
-1 PARTS LIST
PROPRIETARY NOTICE
RIVET CODE PER NAS523
AS350/BELL
DASH NO. NEXT ASSEMBLY USED ON
APPLICATION
PREPARED J GUNN 3/5/26
CHECKED J GUNN 3/5/26
QA
ENG
MATERIAL N/A
FINISH N/A
AKV Inc.
777 AVIATION DR. CAMARILLO, CA.
TITLE REMOTE DISPLAY WIRING ASSY FOR MATRIX LCD
SIZE D DWG NO ETMRD-003 REV NC
SCALE: SHEET 2 OF 2