SYSTEMS

1.0 INTRODUCTION

The HAZMAT Weather Station, P/N 102647, is a portable Weather Station designed to be quickly deployed and operated in emergency response applications. It provides all the electronics necessary to transmit Wind Speed, Wind Direction, Temperature, Relative Humidity and optional Barometric Pressure over an RS232 Serial cable. The system outputs the data required for a CAMEO/ALOHA SAM station and is used with NOAA's CAMEO/ALOHA (including MARPLOT) Emergency Response software. The weather station is equipped with a flux gate compass for automatic alignment to magnetic north. Software is included in the sensor to allow the user to enter a declination angle to output true north, as required by the CAMEO/ALOHA software.

1.1 Specifications:

POWER REQUIREMENTS:
Input Power: 6 - 15 Vdc; 100 mA draw @ 12 Vdc (provided through AC/DC or car battery adapter)

ENVIRONMENTAL CHARACTERISTICS:
Operating Temp: -20° to 60°C (-4° to 140°F)
Storage Temp: -50° to 70°C (-58° to 158°F)
Humidity: 0 to 95% (non condensing)
Shock and Vibration: Withstands normal shipping and handling.

2.0 INSTALLATION

Install P/N 102607 Quick Mount on top of a 3/4 inch mast (1.05 inch O.D.). Tighten the set screws with a 1/8 inch Allen Key (See Figure 2).

Remove the sensor from the transit case and place it on top of the Quick Mount. Align the latches on the Quick Mount with the clips on the sensor. Rotate the sensor slightly until connector key and pins are aligned, lock into place with latches. If sensor does not align and latch on, rotate it 180°.

Plug sensor cable into Sensor Input (5-Pin connector) on Hazmat Serial Interface.

Please refer to Figure 2 for an installation diagram for the 102670 Hazmat Serial Interface and remote sensor.

3.0 INPUT/OUTPUT CONNECTIONS

Four connectors are provided on the Hazmat Serial Interface Assembly. One connector (5 pin) provides power to the sensor and receives the RS232 data through P/N 102607 Sensor mount on the top of the ¾ inch mast. The second connector is for the system power. An AC power adaptor and car cigarette lighter adaptor are provided to power the sensor. The third and fourth connectors are the RS232 serial outputs from the system. The CAMEO RS232 output is connected from the interface to the PC running the CAMEO/ALOHA software through the 9 Pin cable provided. The RS232 data rate on the interface has been factory preset to 1200 baud to comply with the CAMEO/ALOHA standard. The other RS232 cable carries the one second instantaneous data, 9600 baud, N, 8, 1, from the sensor and can be viewed using any terminal program or Climatronics WeatherView or HazView software. Examples of the two data formats are shown in Examples 1and 2.

4.0 THEORY OF OPERATION

P/N 102254 TACMET-II weather sensor provided with the system samples the meteorological parameters once per second. The microprocessor in the sensor stores these values and derives the 30-second running averages required by the CAMEO/ALOHA software. Please refer to Example 1 for details on the CAMEO/ALOHA output. In addition to the CAMEO/ALOHA output, the sensor also provides an instantaneous RS232 serial output on the Hazmat Serial Interface adaptor. This output can be connected to any Laptop PC or PDA using HyperTerminal or Climatronics HAZVIEW Display Software to check proper operation of the system. A null modem adaptor is required for the PDA, and provided in the base station radio kit. Please refer to Example 2 for details.

5.0 DECLINATION SETTING

5.1 Overview
The CAMEO/ALOHA software requires Wind Direction input relative to TRUE north. The flux compass in the TACMET-II Weather sensor provides Wind Direction to MAGNETIC north. Software resident in the sensor allows the setting of a declination angle to correct the Wind Direction

output to TRUE north. It is recommended that this procedure be done in the lab, but can be done in the field as well. Once the declination angle is set in the sensor, it is stored in non-volatile memory, and does not have to be reset each time the sensor is fielded. The declination angle must be reset only if the sensor is used in a different geographical location separated by many miles from the location where the declination was originally set.

It is suggested that the magnetic declination be determined before performing this calibration. Visit the following web site for help in determining the correct declination for your site:

www.ngdc.noaa.gov/seg/geomag/declination.shtml

Enter your zip code and click "Get Location". On the next page, click "Compute!" At the bottom of the page, Field "D" is declination in degrees and minutes. Divide minutes value by 60 to get decimal remainder of degrees (I.E. 50 minutes = 0.8 degrees). If the declination needs to be adjusted, please follow the steps in Section 5.2.

5.2 Equipment Required
Desktop PC or Laptop with MS HyperTerminal software.

Serial RS232 cable, 9 pin Male to 9 pin Female (provided).

5.2.1 Set up the Hazmat system as noted in Section 2.0 and Figure 2. Do not apply power to the Hazmat Serial Interface.

5.2.2 Start HyperTerminal on the PC or Laptop and configure it for the COM port connected to the CAMEO port on the Hazmat Serial Interface, 1200 baud, N, 8, 1. To find HyperTerminal click Start, Programs, Accessories, Communications, HyperTerminal.

5.2.3 Apply power to the Hazmat Serial Interface and observe the screen on the PC. The declination software tells you the current setting for the declination, and gives you 10 seconds to type CTRL-C (hold the CTRL key down then hit the C key), please refer to Figure 1. This is a screen capture of the declination setting procedure. Once the procedure is completed, the Weather Station will start to output the SAM station data. The declination calibration is complete and the station may be set up in the field. Be sure to remove the power from the Hazmat Serial Interface before moving the station to the field or storing it in the transit case.
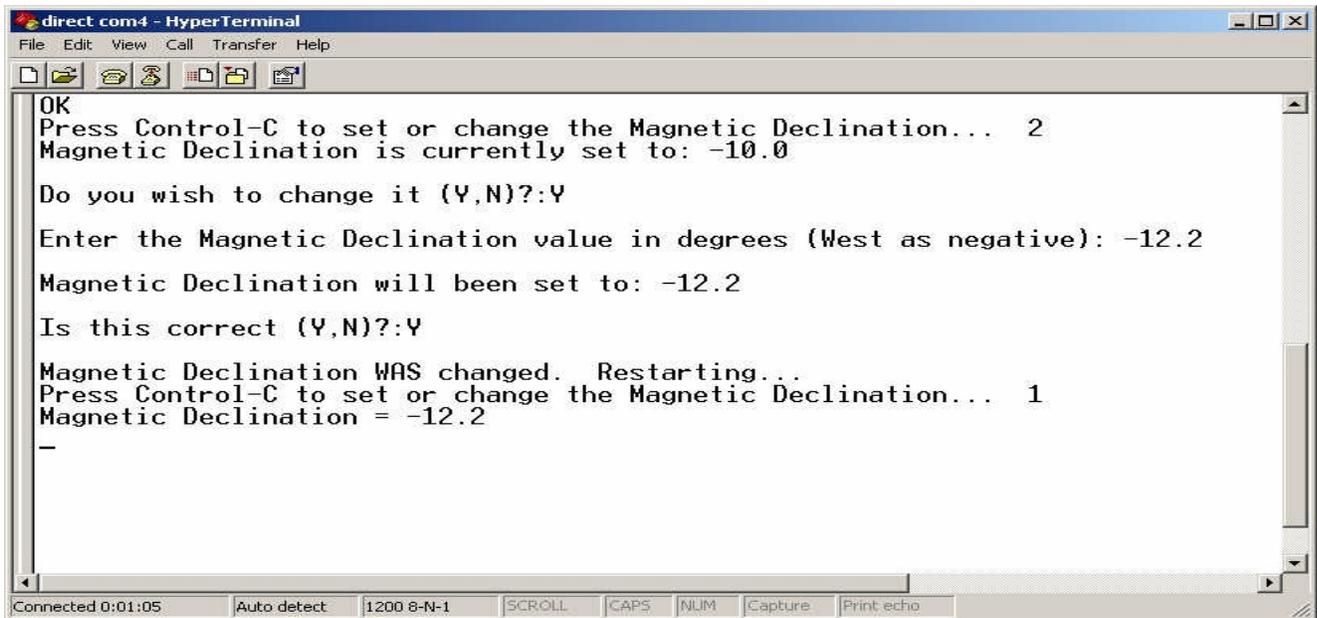


```
direct com4 - HyperTerminal
File  Edit  View  Call  Transfer  Help

OK
Press Control-C to set or change the Magnetic Declination...  2
Magnetic Declination is currently set to: -10.0

Do you wish to change it (Y,N)?:Y

Enter the Magnetic Declination value in degrees (West as negative): -12.2

Magnetic Declination will been set to: -12.2

Is this correct (Y,N)?:Y

Magnetic Declination WAS changed.  Restarting...
Press Control-C to set or change the Magnetic Declination...  1
Magnetic Declination = -12.2
_

Connected 0:01:05    Auto detect    1200 8-N-1    SCROLL    CAPS    NUM    Capture    Print echo
```
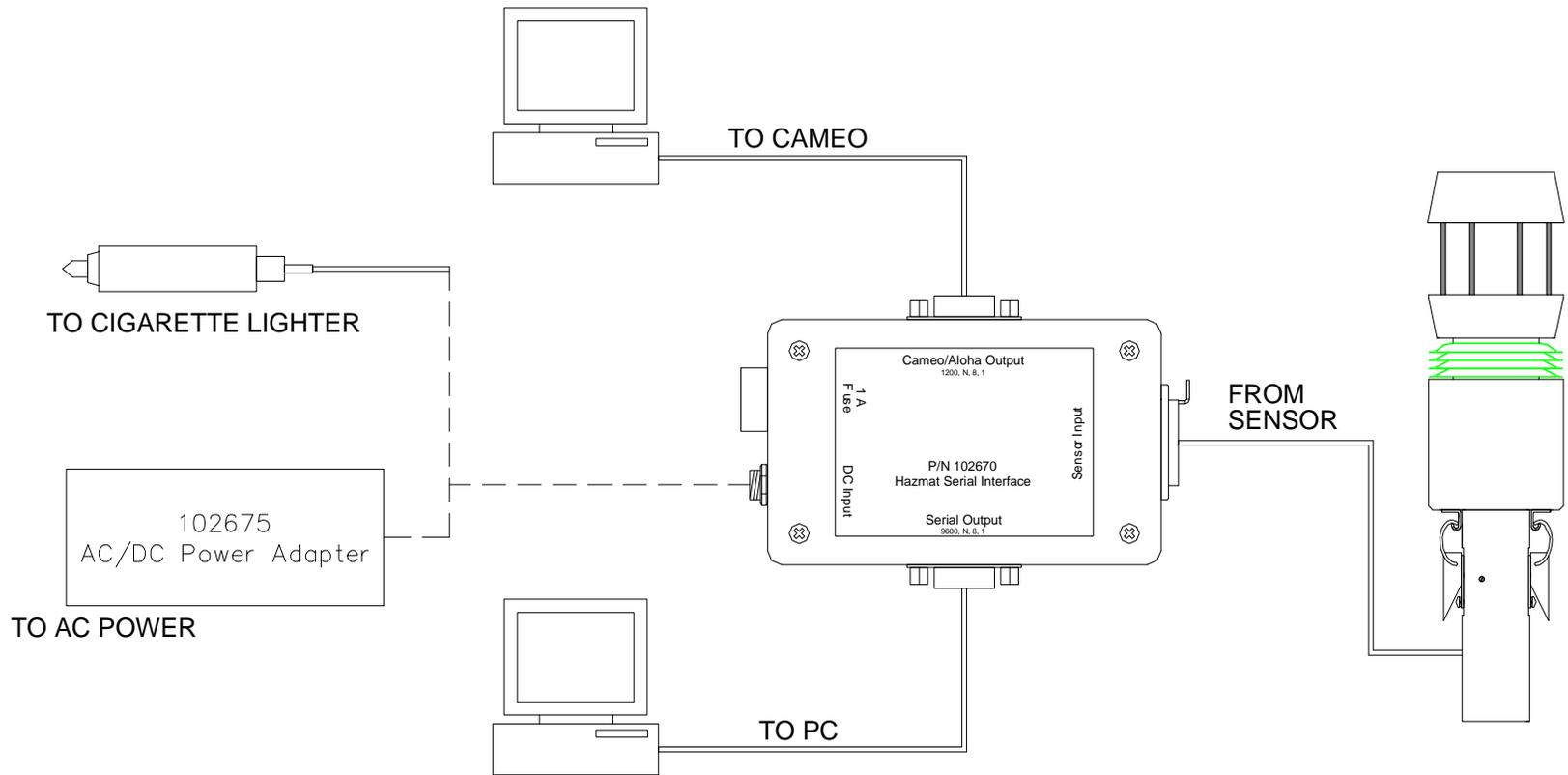
Figure 1

TO CAMEO

TO CIGARETTE LIGHTER

FROM SENSOR

Cameo/Aloha Output
1200, N, 8, 1

1 A Fuse

Sensor Input

DC Input

P/N 102670
Hazmat Serial Interface

Serial Output
9600, N, 8, 1

102675
AC/DC Power Adapter

TO AC POWER

TO PC

Figure 2

Example 1

CAMEO/ALOHA output of Hazmat Serial Interface:

The SAM data format for ALOHA is formatted as follows:

\<cr\>\<lf\>ID,VS,WD,SD,TA,SP,DI,TI,B,CHK, where

\<cr\> = a carriage return (ASCII character code 13),

\<lf\> = a line feed (ASCII character code 10),

ID = the station identification number,

VS = the vector mean wind speed, averaged over 5 minutes (in meters per second),

WD = the vector mean wind direction, averaged over 5 minutes (in degrees true),

SD = the standard deviation of the wind direction (in degrees),

TA = the mean air temperature, averaged over 5 minutes (in °C),

SP = the instantaneous wind speed (in meters per second),

DI = the instantaneous wind direction (in degrees true),

TI = the instantaneous air temperature (in °C),

B = instantaneous SAM battery voltage (in volts),

CHK = a checksum, computed by summing the ASCII values of all preceding characters in the data line, including the carriage return and line feed characters.

Note:

During the first 5 minutes of powering on the SAM station, not enough data samples are available for a valid 5 minute average. During that time the ID = 308 and VS=SP, WD-DI, SD= -1,and TA=TI. A change of ID to 121 indicates valid averages are being transmitted. Data is transmitted every 30 seconds @ 1200 Baud, No start bit, Eight data bits, One stop bit. Data Examples are shown below:

308,008.4,183.3,-01.0,009.8,006.7,189.5,009.8,11.37,2585
121,007.1,174.7,018.1,010.2,006.8,177.3,010.1,11.37,2557

Example 2

Serial Output of the HAZMAT Serial Interface:

The data format for the Diagnostic port is formatted as follows:

01+ID 02+SP 03+DI 04+TI 05+RH 06+BP 07+BV\<cr\>\<lf\>

\<cr\> = a carriage return (ASCII character code 13),

\<lf\> = a line feed (ASCII character code 10),

ID = the station identification number (sensor serial number),

SP = the instantaneous wind speed (in meters per second),

DI = the instantaneous wind direction (in degrees true),

TI = the instantaneous air temperature (in °C),

RH = the instantaneous relative humidity (in %),

BP = the instantaneous barometric pressure (in mB, optional parameter),

BV = instantaneous SAM battery voltage (in volts),

Data is transmitted every second @ 9600 Baud, No start bit, Eight data bits, One stop bit.
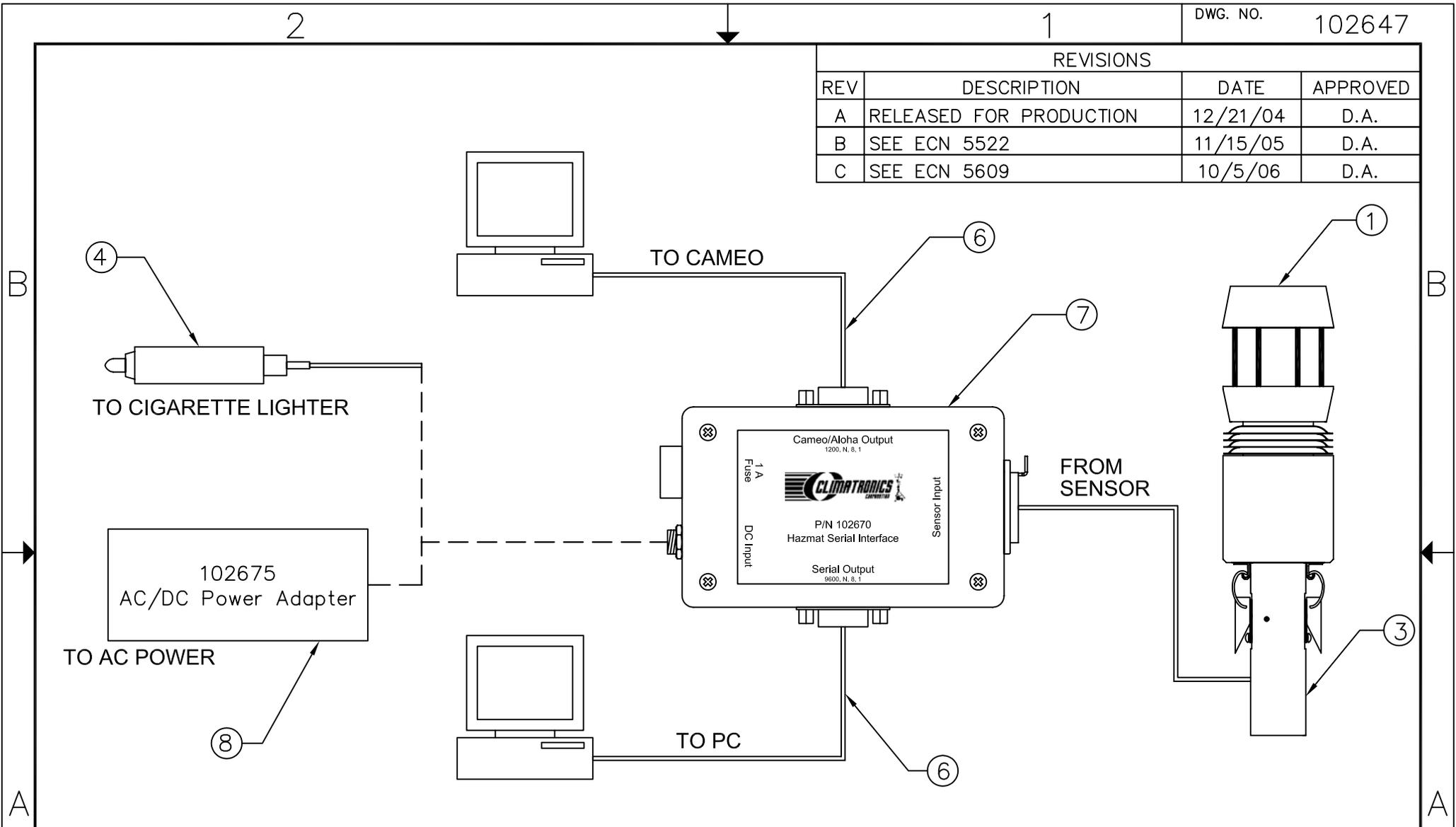
A data example is shown below:

01+I0957 02+000.2 03+136.0 04+023.1 05+051.4 06+0996.4 07+11.07

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Revision	Description	Date	Approved
-	**Released to Production**	**11/18/05**	**D.A.**
A	**See ECN 5609**	**10/5/06**	**D.A.**

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	RELEASED FOR PRODUCTION	12/21/04	D.A.
B	SEE ECN 5522	11/15/05	D.A.
C	SEE ECN 5609	10/5/06	D.A.

④

TO CIGARETTE LIGHTER

TO CAMEO

⑥

⑦

①

Cameo/Aloha Output
1200, N, 8, 1

CLIMATRONICS

1 A Fuse

P/N 102670
Hazmat Serial Interface

Sensor Input

DC Input

FROM SENSOR

Serial Output
9600, N, 8, 1

102675
AC/DC Power Adapter

③

TO AC POWER

⑧

TO PC

⑥

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± 1/64 .XX ± .010 ± 1° .XXX ± .005	CONTRACT NO.		CLIMATRONICS 140 Wilbur Place Airport International Plaza Bohemia, NY 11716 FAX (631)567-7585 Phone (631)567-7300			
	APPROVALS	DATE	CAMEO/ALOHA WEATHER SYSTEM			
MATERIAL NOT APPLICABLE	DRAWN C.HAPP	11/05				
	CHECKED D.ADAMS	11/05	SIZE A	FSCM NO. 52332	DWG. NO. 102647	REV. C
FINISH NOT APPLICABLE	ISSUED D.ADAMS	11/15/05				
NEXT ASSY USED ON	DO NOT SCALE DRAWING		SCALE: NONE	P:\Drawings\Assembly\102647C.dwg	SHEET 1 OF 2	
APPLICATION						

ITEM	SYM.NO	QTY	PART NO.	DESCRIPTION

Notes: ITEM 5 NOT USED

ITEM	SYM.NO	QTY	PART NO.	DESCRIPTION
1		1.0	102254-A8D6FXXM	TACMET II STD WEATHER STATION
2		1.0	102617	SONIC AUX RS232 OUTPUT OPTION
3		1.0	102607-G2-25	MOUNT, TACMET, QUICK RELEASE
4		1.0	102723	AUTO ADAPTER W/LOCKING PLUG
6		2.0	10873	COMPUTER SERIAL CABLE
7		1.0	102670	HAZMAT SERIAL ADAPTOR
8		1.0	102675	HAZMAT POWER ADAPTER
9		1.0	501651	HAZMAT CASE, MODIFIED

1.0 INTRODUCTION

Climatronics' TACMET II weather station is designed as a stand-alone weather station to provide accurate measurements of wind speed, wind direction, temperature and relative humidity. A barometric pressure sensor and an internal fluxgate compass are available as options. The unit has no moving parts and is ideally suited for use wherever reliable, maintenance free operation over a wide operating range under adverse operating conditions is required.

Please see the configuration table on the last page of this manual. Compare it to the serial label on your sensor for your exact configuration.

1.1 SPECIFICATIONS

PERFORMANCE:

WS Range:	0-145 mph (0-65 m/s)
Accuracy:	**WS** 1.1 mph (0.5 m/s) or $\pm$ 5%
	WD $\pm$ 5° @ wind speeds > 5 mph (2.2 m/s)
Resolution:	.22 mph (0.1 m/s)
Temperature:	
Range:	-22 to 131°F (-30 to +55°C)
Accuracy:	$\pm$ 0.9°F ($\pm$ 0.5°C) (sensor element)
Relative Humidity:	
Range:	0 to 100%
Accuracy:	$\pm$ 3%
MTBF:	80,000 hours

ELECTRICAL:

Measurement Format: Two orthogonal axis North-South and East-West

Measurement Rate: Approx. 2 Hz each axis

Operating Frequency: 40 kHz

Signal Output: RS232C or RS422/485 @19.2 K baud (see section 5.0)

Power Requirements: 6 - 15 Vdc: 100 mA draw@ 12 Vdc

PHYSICAL:

Size:	12 inches (30.5 cm) X 4 inches (10.15 cm) dia.
Weight:	1.8 lb. (0.82 kg.)
Mounting:	MS3106F18-1S Connector

2.0 INSTALLATION

Be sure to mount the sensor in a clear, open area to minimize any turbulent effects caused by local obstructions (e.g., trees, buildings, etc.). The sensor is typically installed on Climatronics P/N 102286, P/N 102621 or P/N 102564 pre-wired sensor mounts. The keyway in the connector on the base of the sensor is matched to the keyway on either mount.

Attach the sensor to the 102286 mount by inserting the sensor into the mating connector on the mount and screwing the collar onto the sensor connector. Attach the sensor to the 102621 QuickMount or 102564 Handle Mount by inserting the sensor into the top of the mount, attaching the latch springs to the clips on the bottom of the sensor and snapping them down to lock the sensor in place. You may need to rotate the sensor 180° to allow the keyway to seat properly.

If your sensor is not equipped with a fluxgate compass you will need to align the posts with the black marks towards either True North or Magnetic North depending on your application. (All hand-held sensors are provided with a compass.)

On the 102286 mount, loosen the set screws in the end of the Nu-Rail fitting that secures the pipe that the sensor is mounted on, rotate the sensor to North, then retighten the set screws.

On the 102621 mount, loosen the set screws in the bottom of the mount that attach it to your vertical ¾ inch pipe, rotate the sensor to North, then retighten the set screws.

The connector keyways assure correct alignment if the sensor is removed and re-installed at any time.

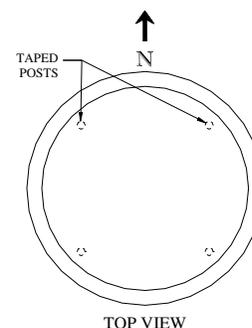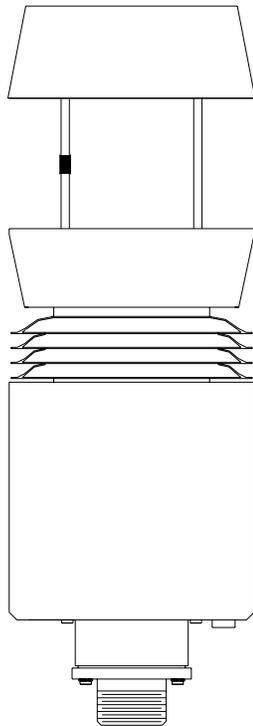Please refer to Figures 1 and 2 for reference.

Figure 1

SIDE VIEW
ROTATED 90°

Figure 2

3.0 INPUT/OUTPUT CONNECTIONS

The sensors' pin designations are as follows:

PIN	FUNCTION
A	Power Ground
B	6.0 - 15 Vdc
C	N/C
D	N/C
E	N/C
F	N/C
G	Receive Data RS232C (RS422/485)
H	Transmit Data RS232C (RS422/485)
I	N/C
J	N/C

4.0 USER DEFINED OPTIONS

Barometric Pressure
Four barometric pressure sensors are available:

Sensor	Accuracy
Analog Pressure 1	± 2.75 mbar (.08 inHg)
Analog Pressure 2	± 1.5 mbar (.04 inHg)
Digital Pressure	± 0.65 mbar (.02 inHg)
Digital Pressure	± 0.40 mbar (.01 inHg)

Fluxgate Compass
An internal fluxgate compass is available with the TACMET II Weather Station.

Note: *The wind direction output will be relative to magnetic north if the fluxgate compass is selected.*

5.0 USER INTERFACE

The output of the TACMET II is a serial data stream. Typically the output is set for 19.2k baud (N/8/1) and outputs the data string approximately once per second. The data is easily viewed and can be displayed and captured using Climatronics WeatherView Software or Windows HyperTerminal that is supplied on most Windows operating systems. To find HyperTerminal click Start, Programs, Accessories, Communications, HyperTerminal. An *example* of the output format is shown below:

01+E0012 02+006.8 03+063.2 04+022.2 05+015.1 06+30.26CR/LF

The first parameter is the serial number of the sensor (E0012), the second parameter is the wind speed, the third parameter is the wind direction, the fourth parameter is the temperature, the fifth parameter is the relative humidity and the sixth parameter is the optional barometric pressure.

Note: The optional wind tracker output is a special hex data string that cannot be viewed as shown in the above example.

Please refer to your specific sensor configuration for output ranges.

6.0 THEORY OF OPERATION
6.1 Winds

Climatronics' sonic anemometer operates on the principal that the speed of the wind effects the time it takes for sound to travel from one point to a second point. If the sound is traveling in the direction of the wind then the transit time is decreased. If the sound is traveling in a direction opposite the wind then the transit time is increased. This principal is well known and is the basis of most sonic anemometers. In mathematical terms:

$$t_1 = d / (c + u)$$
$$t_2 = d / (c - u)$$

where t_1= transit time from 1 to 2
t_2= transit time from 2 to 1
d= distance between 1 and 2
c= speed of sound
u= wind speed

If the equations are solved for $c+u$ and $c-u$ and the difference taken:

$$c+u-(c-u)=d/t_1-d/t_2$$
$$u=d/2*(1/t_1-1/t_2)$$

There are many ways to implement a sonic anemometer based on this equation and in fact most, if not all sonic anemometers operate according to this principal. It is important to note that the equation for wind speed is independent of the speed of sound. This is important because the speed of sound is not a constant but is very dependent upon air temperature, changing from 360 m/s at +50 °C to 300 m/s at -50 °C. Note that this change of 60 m/s is as great as the range of most sonic anemometers. The speed of sound is also affected by humidity and pressure, however their effect is small compared to the effect of temperature. It is interesting to note in passing that the equations can also be solved for the speed of sound and the air temperature can be determined from the speed of sound.
The relationship between the speed of sound in air and the air temperature can be described by the following equation:

$$c = 20.06\sqrt{T + 273} \qquad T=\text{temp °C}$$

The equation for u above does not account for delays in the electronics nor for any effect temperature might have on these delays. Because of this the path length d is generally made on the order of 10 cm or more. The longer the path length the less significant the other time delays. These design considerations and others lead to the sonic anemometers with which we are all familiar. Transducers are supported on long thin arms in an array to measure the components of the wind. The supports and the transducers are as slender as possible to minimize their effects on the wind field. These traditional sonic anemometers can be designed to measure one, two or three components of the wind.

Sonic anemometers of this type are generally accurate, exhibit high resolution, output temperature as well as wind speed and direction and are very responsive. They also are usually delicate, require extensive software to correct for transducer shadowing, and are expensive. Sonic anemometers of this type are generally used for research.

Climatronics' goal in developing a sonic anemometer was to design a unit that could replace cup and vane and propeller anemometers in terms of cost and accuracy and at the same time be more rugged. Size was determined in part because it was desirable that it have the same overall dimensions as Climatronics' original TACMET sensor for purposes of interchangeability. All of these considerations dictate that the transducers will be close together resulting in a short path length. The short path length requires that all system delays be accounted for.

If the equations for the transit time above are rewritten to include the delays in the system then we have:

$$t_1 = d\,/\,(c+u) + t_1{'}$$

$$t_2 = d\,/\,(c-u) + t_2{'}$$

$t_1{'}$= delays due to transducers and electronics
$t_2{'}$= delays due to transducers and electronics

$$t_1\text{-}t_2 = d/(c+u)+t_1{'}\text{-}d/(c-u)\text{-}t_2{'}$$

$$\text{if } t_1{'}= t_2{'}$$

$$t_1\text{-}t_2 = d/(c+u)\text{-}d/(c-u)$$

rearranging terms

$$u = -(t_1\text{-}t_2)*(c^2\text{-}u^2)/2d$$

At first this expression looks difficult to evaluate. It is required to measure the temperature to assign a value to c and the expression c^2-u^2 contains the variable we are trying to solve for. The advantage is that it is possible to measure (t_1-t_2) with greater accuracy then it is to measure either t_1 or t_2. The correction required due to the variation of the speed of sound with temperature is also readily accomplished. Note that the term (c^2-u^2) varies by ± 20% over the range of 0 to 50 m/s and -50 to +50 °C. Note also that if c is corrected for temperature and u is set equal to zero then the term c^2-u^2 is in error by less then 3% from 0 to 50 m/s.

Where the greatest accuracy is required the equation can be solved for *u* and then this value of *u* can be substituted back into the equation to solve for a more accurate value of *u*. The design that has evolved consists of two tapered cylinders separated from each other by approximately 10 cm. All of the transducers are mounted in the upper cylinder pointing down. Sound is transmitted toward the lower cylinder and reflected back towards the upper cylinder as shown:
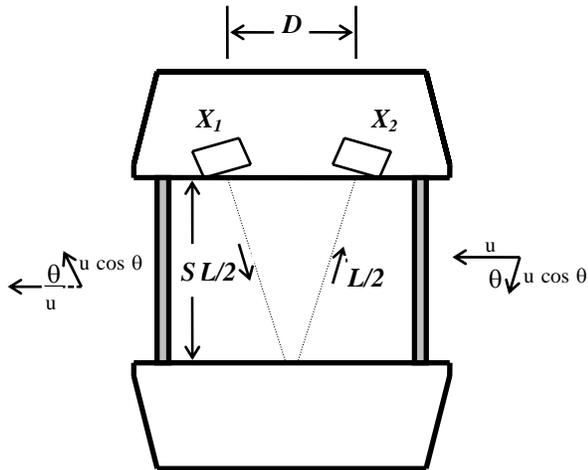

Figure 3

The transmission time is affected only by the horizontal component of the wind. Transducers are used as both transmitters and receivers. In this way the close match required for $t_1' = t_2'$ is achieved. Temperature is also measured but is not corrected for solar radiation errors. This temperature measurement is suitable for speed of sound corrections but not for most meteorological purposes. When more accurate temperature information is required a multi-plate shield is added to the unit.

Wind tunnel tests have shown that the airflow between the upper and lower housing is not greatly affected by the housings themselves through tilt angles in excess of $\pm$ 20 degrees. In this sense the sensor has an almost cosine response similar to a propeller anemometers.

6.2 Temperature/Humidity

The temperature sensor in the P/N 102254 TACMET II uses a precision single-element Thermistor. This provides a highly accurate and stable temperature reading. The resistance value is 10K ohms at 25°C.

This allows the TACMET II to directly interface with the temperature sensor without additional electronics; sensor compensation is handled through software.

The relative humidity sensor is a capacitive element sensor. It has a linear voltage output, which allows it to be connected directly to the TACMET II microprocessor. The humidity sensor element's construction provides excellent resistance to wetting, dust, dirt, oils, and common environmental chemicals. A heavy contaminant layer of dirt will slow down the sensor's response time because it will take longer for water vapor to equilibrate in the sensor.

6.3 Barometric Pressure

There are four barometers available for use in the P/N 102254 TACMET II. This section describes each one briefly. The part number configuration should be checked to verify which barometer is included with the TACMET II being used.

The P/N 102297 used in the TACMET II-is a state–of–the–art, monolithic, signal conditioned, piezoresistive silicon pressure sensor. This sensor provides an accurate, high level analog output signal that is proportional to applied pressure. The basic accuracy of the P/N 102297G0 barometer is $\pm$2.75 hPa (0.08 inHg). The P/N 102297G1 version includes a software temperature correction to improve the overall barometer accuracy to $\pm$1.5 hPa (0.04 inHg).

The P/N 102298 barometer consists of a resonator and pressure sensitive diaphragm micro-machined from single-crystal silicon, thus achieving the highest level of performance stability. The sensor has a serial output that is read by the TACMET II microprocessor. The accuracy of the sensor is $\pm$0.65 hPa (0.02 inHg).

The P/N 102555 barometer uses proven silicon sensor technology with microprocessor-based signal compensation, eliminating the need to insulate or temperature-regulate the barometer. The P/N 102555 has a pressure range of 500 to 1200 hPa. The P/N 102555 has a TTL output that lowers the power consumption of the barometer to 33 mW. The accuracy of the sensor is $\pm$0.4 hPa (0.01 inHg).

6.4 Fluxgate Compass

The P/N 102294 internal compass is low power and compact, and is a complete compass or magnetic sensor module that integrates easily into the TACMET II. The internal compass uses two magneto-inductive sensors, which change inductance with different applied magnetic field strengths, to sense magnetic fields.

The TACMET II microprocessor measures the output of the internal compass and then corrects the wind direction data for the orientation of the sensor. The output of the TACMET II wind direction is relative to magnetic North when a compass has been specified.

7.0 CALIBRATION

The sensor requires a wind tunnel for calibration. Climatronics can provide NIST traceable calibration in our wind tunnel. A portable Zero Wind Test Fixture, P/N 501506 is available for purchase. Please contact the factory for further details.

8.0 MAINTENANCE

Because the sensor has no moving parts to wear out, periodic maintenance is not required. In extremely corrosive environments, the condition of the connector used to mount the sensor should be checked. There are no adjustments or user repairable parts located inside the sensor.
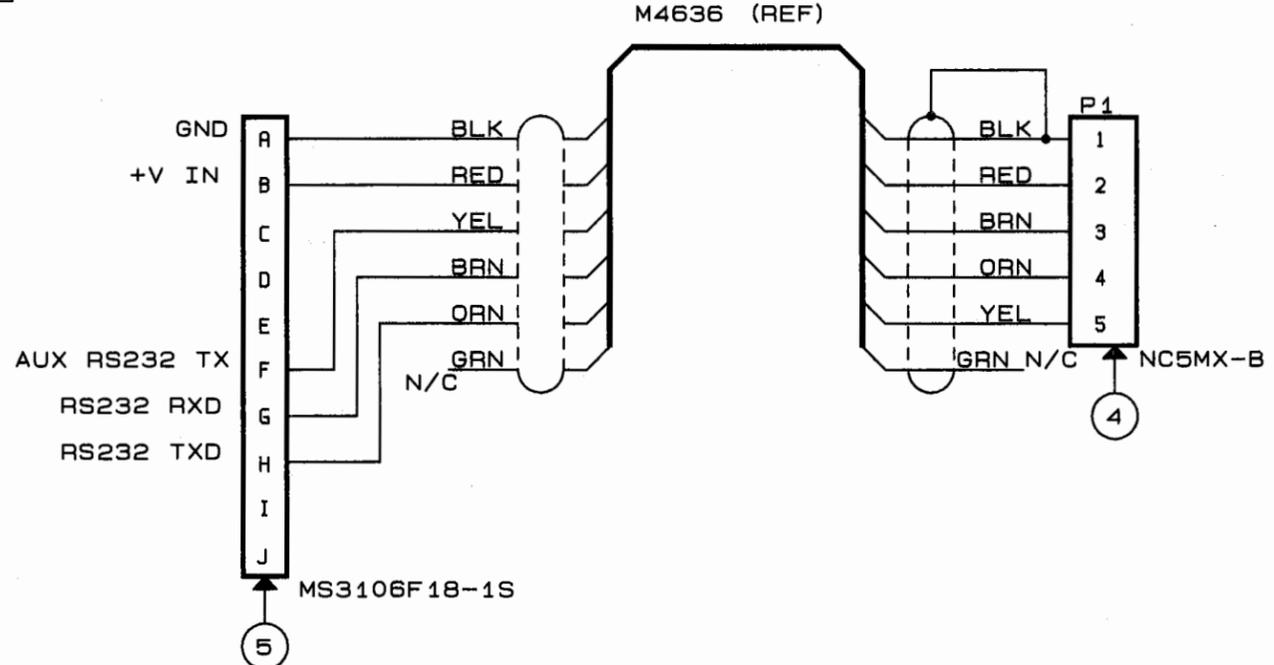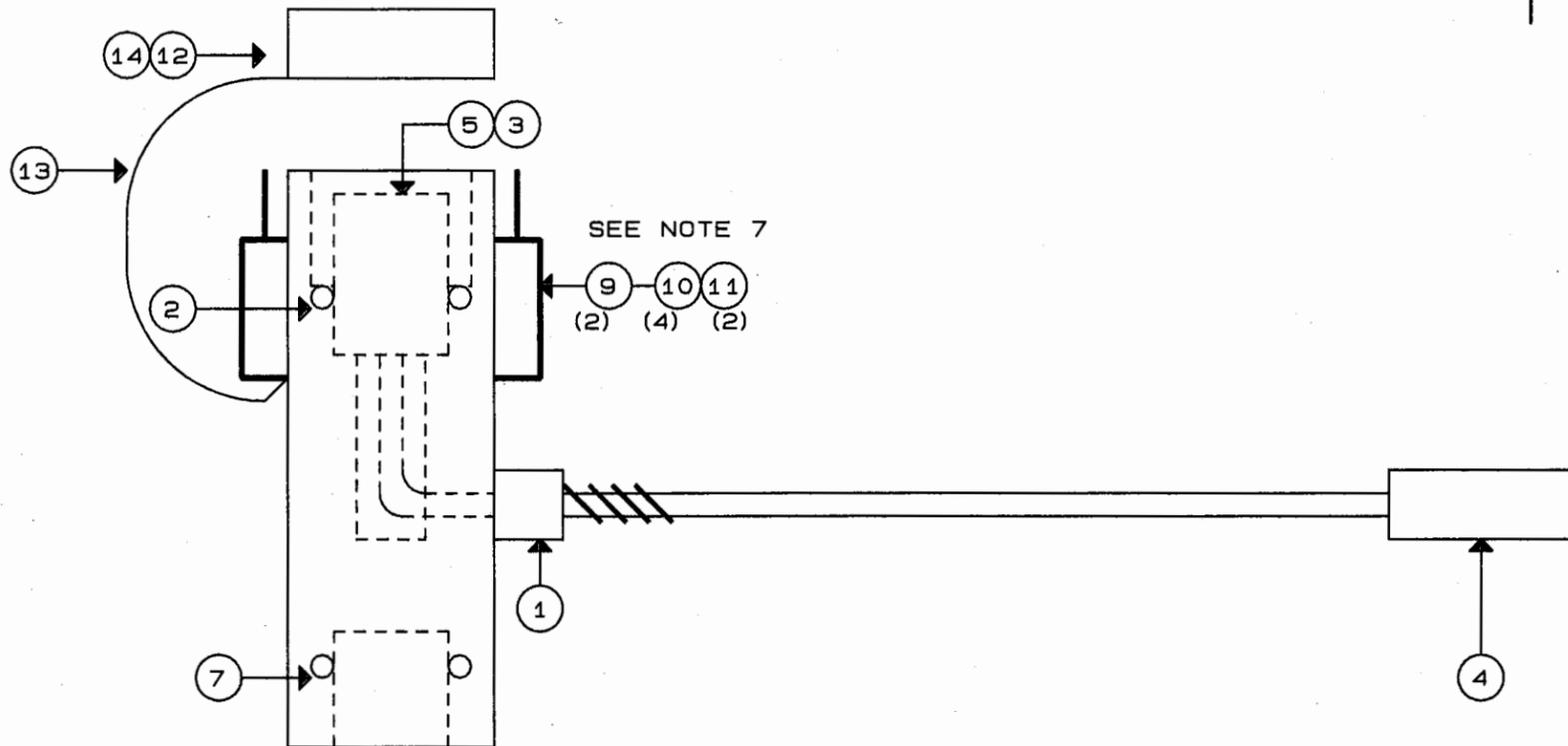
102254 TACMET II Options Configuration Guide

Base Part Number		102254-							
Serial Output	RS232	A							
Options	102295 (RS422/485)	B							
	900 MHz Spread Spectrum RF	Q							
	2.4 GHz Spread Spectrum RF	R							
Baud / Output	1200		1						
Options	2400		2						
	4800		3						
	9600		4						
	19200		5						
	(requires option B) 485 Tracker		6						
	NMEA		7						
	CAMEO/ALOHA		8						
Averaging Options	Instantaneous			C					
	Running Avg			D					
Speed Units	MPH0 to 145				1				
	M/S0 to 65				2				
	Knots0 to 125				3				
	Kilometers/Hr0 to 234				4				
	MPH-A0 to 100				5				
	M/S-A0 to 50				6				
	Knots-A0 to 100				7				
Temperature Units	Degrees F-22 to +131					E			
	Degrees C-30 to +55					F			
Pressure Options	None						XX		
102297G0 Sensor (± 0.08 inHg, 17.71-32.45 In/Hg)	In/Hg Output						G1		
102297G0 Sensor (± 2.75 hPa, 600-1100 Millibars)	Millibar Output						G2		
102297G1 Sensor (± 0.04 inHg, 17.71-32.45 In/Hg)	In/Hg Output						H1		
102297G1 Sensor (± 1.50 hPa, 600-1100 Millibars)	Millibar Output						H2		
102298 Sensor (± 0.02 inHg, 17.71-32.45 In/Hg)	In/Hg Output						N1		
102298 Sensor (± 0.65 hPa, 600-1100 Millibars)	Millibar Output						N2		
102555 Sensor (± 0.01 inHg, 17.71-32.45 In/Hg)	In/Hg Output						P1		
102555 Sensor (± 0.4 hPa, 600-1100 Millibars)	Millibar Output						P2		
Compass Option	None							X	
	102294							M	

Table 1

Climatronics Corporation
140 Wilbur Place Bohemia, NY 11716 (631) 567-7300
www.climatronics.com

Revision	Description	Date	Approved
-	Released to Production	7/26/04	D.A.
A	See ECN 5388	2/01/05	D.A.
B	See ECN 5523	11/17/05	D.A.
C	See ECN 5550	3/9/06	D.A.

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED
A	ECN 5262	11-12-03	
B	ECN 5282	02-16-04	
C	ECN 5410	03-14-05	
D	ECN 5429	04-14-05	
E	ECN 5455	07-06-05	
F	ECN 5516	11-09-05	
G	ECN 5548	3-01-06	
H	ECN 5564	5-22-06	
J	ECN 5596	9-18-06	

SEE NOTE 7

M4636 (REF)

GND — A — BLK
+V IN — B — RED
— C — YEL
— D — BRN
— E — ORN
AUX RS232 TX — F — GRN
RS232 RXD — G — N/C
RS232 TXD — H

MS3106F18-1S

P1
1 — BLK
2 — RED
3 — BRN
4 — ORN
5 — YEL
GRN N/C — NC5MX-B

NOTE:

1. 102607-G0 IS PAINTED CARC GREEN 383

2. 102607-G1 IS PAINTED CARC TAN 686A

3. 102607-G2 IS CLEAR ANOZIDE COATING

4. 102607-G3 IS BLACK ANOZIDE COATING

5. M4636 IS SHOWN FOR REFERENCE. SEE
   CONFIGURED PART FOR CORRECT LENGTH.

6. 2 ea. 501598 INSTALLED ON TACMET
   OR SONIC SENSOR.

7. ONLY PUT LOCKWASHERS UNDER SCREWS
   ON BOTTOM OF LATCH. USE LOCTITE
   ON ITEM 10.

8. INSTALL LANYARD ON SIDE OF CAP WITH
   RIVET FROM THE OUTSIDE (INSIDE MUST
   BE FLAT). ATTACH LANYARD TO BOTTOM
   SCREW ON LATCH. RIVET MUST BE TIGHT!

106103

102607J.ASY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		CONTRACT NO.		CLIMATRONICS CORPORATION
FRACTIONS ±	DECIMALS .XX ± .XXX ±	ANGLES ±		QUICK MOUNT, TACMET HAZMAT CASE

		MATERIAL NOT APPLICABLE		APPROVALS	DATE
			DRAWN	D. ADAMS	11/03
	102603	FINISH NOT APPLICABLE	CHECKED	C. HAPP	11/03
NEXT ASSY	USED ON		ISSUED	TJS	11/03

SIZE **B** | FSCM NO. **52332** | DWG. NO. **102607** | REV. **J**

APPLICATION | DO NOT SCALE DRAWING | SCALE | SHEET 1 of 2

MOUNT, TACMET, QUICK RELEASE
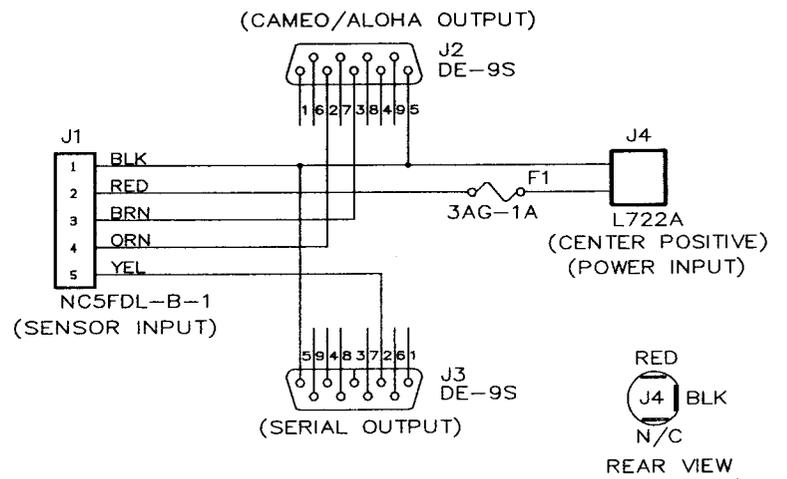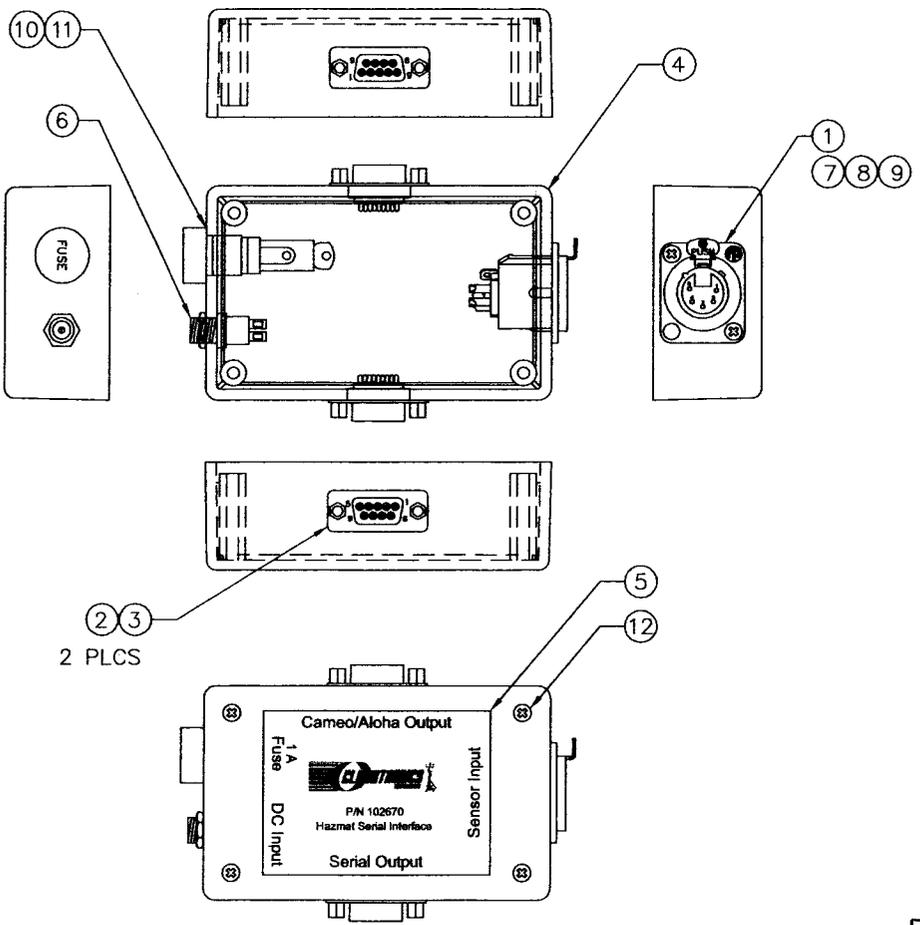P/N 102607 Rev J
PARTS LIST
Sheet 2 of 2

ITEM	SYM.NO	QTY	PART NO.	DESCRIPTION

Notes: 102607-G0 IS 501597-1 MOUNT, PAINTED CARC GREEN 383
102607-G1 IS 501597-2 MOUNT, PAINTED CARC TAN 686A
102607-G2 IS 501597-3 MOUNT, CLEAR ANODIZE
102607-G3 IS 501597-4 MOUNT, BLACK ANODIZE

M4636 CABLE IS SHOWN FOR REFERENCE.
SEE CONFIGURED PART FOR CORRECT CABLE LENGTH.

ITEM	QTY	PART NO.	DESCRIPTION
1	1.0	3240	CONNECTOR/LIQUID TYPE W/STRAIN
2	2.0	MS51023-51	SET SCREW 10-32 x 3/8
3	1.0	304-0145-000	FERRULE, #18
4	1.0	NC5MX-B	CONNECTOR, 5 PIN, M, CABLE MT
5	1.0	MS3106F18-1S	CONNECTOR, STRAIGHT PLUG
7	2.0	91745A539	THUMB SCREW 1/4-20 X 5/8 SS
8	2.0	501598	MODIFICATION, STRIKE PLATE
9	2.0	7882-7-SS	LATCH
10	4.0	MS51957-42	SCREW 8-32 x 5/16
11	2.0	MS35338-137	WASHER LOCK SPLIT #8
12	1.0	PQC-101	1-1/2 PIPE CAP
13	1.0	LL2-8	LANYARD
14	1.0	2014157	RIVET, 3/16 DIA X 1/8

2

1

B

A

10 11

6

4

1

7 8 9

FUSE

5

12

2 3

2 PLCS

(CAMEO/ALOHA OUTPUT)

J2
DE-9S

1 6 2 7 3 8 4 9 5

J1

1	BLK
2	RED
3	BRN
4	ORN
5	YEL

NC5FDL-B-1
(SENSOR INPUT)

F1

3AG-1A

J4

L722A
(CENTER POSITIVE)
(POWER INPUT)

5 9 4 8 3 7 2 6 1

J3
DE-9S

(SERIAL OUTPUT)

RED

J4 BLK

N/C

REAR VIEW

Cameo/Aloha Output

1A
Fuse

P/N 102670
Hazmat Serial Interface

Sensor Input

DC Input

Serial Output

NOTES:
1) ALL WIRE TO BE 22AWG.
2) MAKE SURE LABEL MATCHES THE
PROPER INPUTS AND OUTPUTS.

		CONTRACT NO.	APPROVALS		DATE
	102647		DRAWN C.HAPP		07/05
	102578	MATERIAL NOT APPLICABLE	CHECKED D.ADAMS		07/05
NEXT ASSY	USED ON	FINISH NOT APPLICABLE	ISSUED T.J.S.		07/05

UNLESS OTHERWISE SPECIFIED, DIMENSIONS
ARE IN INCHES, TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
± 1/64   .XX ± .010   ± 1°
          .XXX ± .005

APPLICATION

DO NOT SCALE DRAWING

SCALE: 1.5 : 1

ASSEMBLY, HAZMAT
SERIAL ADAPTER

SIZE B   FSCM NO. 52332   DWG. NO. 102670   REV. B

P\Drawings\Assembly\102670B.dwg

SHEET 1 OF 2

ITEM	SYM.NO	QTY	PART NO.	DESCRIPTION
1	J1	1.0	NC5FDL-B-1	CONNECTOR, 5 PIN, F, PANEL MT
2	J2,J3	2.0	DE-9S	CONNECTOR, 9 PIN FEMALE
3		2.0	D20418-2	SCREW LOCK ASSEMBLY FEMALE
4		1.0	501648	ENCLOSURE, HAZMAT SERIAL ADAPT
5		1.0	501650	LABEL, HAZMAT SERIAL INTERFACE
6	J4	1.0	L712A	DC POWER JACK, 2.5MM, FM, LONG
7		2.0	MS51959-17	SCREW 4-40 x 1/2 FH
8		2.0	MS35338-135	WASHER, LOCK SPLIT #4
9		2.0	MS35649-244	NUT HEX 4-40
10	XF1	1.0	HKP	FUSEHOLDER, 30 AMP 250V
11	F1	1.0	AGC-1	FUSE, 1 AMP
12		4.0	M3-16FH	SCREW M3 X 16MM FH SS