

**MODEL 26700  
PROGRAMMABLE TRANSLATOR**



**SEPTEMBER 2000**

**MANUAL PN 26700-90**

**R. M. YOUNG COMPANY**

2801 AERO PARK DRIVE, TRAVERSE CITY, MICHIGAN 49686, USA  
TEL: (231) 946-3980 FAX: (231) 946-4772

## WARRANTY AND ASSISTANCE

**R.M. YOUNG PRODUCTS** are warranted by CAMPBELL SCIENTIFIC (CANADA) CORP. ("CSC") to be free from defects in materials and workmanship under normal use and service for **twelve (12) months** from date of shipment unless specified otherwise. **\*\*\*\*\* Batteries are not warranted. \*\*\*\*\*** CSC's obligation under this warranty is limited to repairing or replacing (at CSC's option) defective products. The customer shall assume all costs of removing, reinstalling, and shipping defective products to CSC. CSC will return such products by surface carrier prepaid. This warranty shall not apply to any CSC products which have been subjected to modification, misuse, neglect, accidents of nature, or shipping damage. This warranty is in lieu of all other warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose. CSC is not liable for special, indirect, incidental, or consequential damages.

Products may not be returned without prior authorization. To obtain a Return Merchandise Authorization (RMA), contact CAMPBELL SCIENTIFIC (CANADA) CORP., at (780) 454-2505. An RMA number will be issued in order to facilitate Repair Personnel in identifying an instrument upon arrival. Please write this number clearly on the outside of the shipping container. Include description of symptoms and all pertinent details.

CAMPBELL SCIENTIFIC (CANADA) CORP. does not accept collect calls.

Non-warranty products returned for repair should be accompanied by a purchase order to cover repair costs.



**CAMPBELL SCIENTIFIC**  
CANADA CORP.

11564 - 149 street - edmonton - alberta - T5M 1W7  
tel 780.454.2505 fax 780.454.2655

[www.campbellsci.ca](http://www.campbellsci.ca)

# OPERATING INSTRUCTIONS

SEPTEMBER, 2000

## 26700 SERIES PROGRAMMABLE TRANSLATOR

### Contents

| SECTION         | DESCRIPTION                         | PAGE |
|-----------------|-------------------------------------|------|
| 1.0             | <b>INTRODUCTION</b>                 | 1    |
| 1.1             | Precautions                         | 1    |
| 1.2             | Operating Controls                  | 1    |
| 1.3             | Sensor Interface Modules            | 1    |
| 1.4             | Getting Started                     | 2    |
| 2.0             | <b>MENU SELECTION</b>               | 2    |
| 2.1             | Operate                             | 2    |
| 2.2             | Setup                               | 2    |
| 2.3             | Test                                | 4    |
| 3.0             | <b>PROGRAMMING</b>                  | 5    |
| 3.1             | Program Instructions                | 5    |
| 4.0             | <b>RECORDING DATA</b>               | 14   |
| 5.0             | <b>SERIAL COMMUNICATIONS</b>        | 15   |
| 6.0             | <b>ERROR MESSAGES</b>               | 15   |
| 7.0             | <b>INSTALLING PLUG-IN MODULES</b>   | 16   |
| 8.0             | <b>OPTION JUMPERS</b>               | 16   |
| 9.0             | <b>WARRANTY</b>                     | 17   |
| 10.0            | <b>CE COMPLIANCE</b>                | 17   |
| 11.0            | <b>REPLACING THE BACKUP BATTERY</b> | 17   |
| <b>APPENDIX</b> |                                     |      |
| A               | <b>SPECIFICATIONS</b>               | 18   |
| B               | <b>PROGRAM EXAMPLES</b>             | 19   |
| C               | <b>PROGRAM WORKSHEETS</b>           | 25   |
| D               | <b>MENU STRUCTURE</b>               | 30   |
| E               | <b>WIRING DIAGRAMS</b>              | 31   |





# 26700 SERIES PROGRAMMABLE TRANSLATOR / RECORDER



## 1.0 INTRODUCTION

The 26700 Series Translator is a programmable indicator and translator for use with a wide range of meteorological sensors.

### FEATURES:

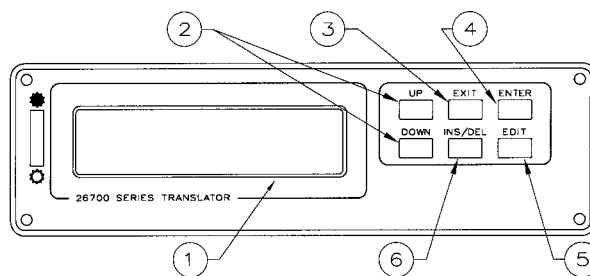
- Modular design
- Multiple sensor inputs
- Expandable using up to 5 plug-in modules
- Illuminated, alpha-numeric display
- 10 available display screens
- Voltage outputs
- Alarm relays
- Current loop outputs
- Printer connection
- 24,000 data point memory
- RS-232 interface
- Battery backed up memory
- Easy, on-screen and remote programming
- Statistical, trigonometric, max, min and many other functions

### 1.1 PRECAUTIONS

- This device is intended for indoor use only unless operated in a suitable enclosure.
- Always connect ground terminal of 26700 to suitable earth ground.
- Switch power OFF before connecting sensor wires.
- Disconnect power before servicing unit.
- Terminal block openings are deep; make sure wire is fully inserted before tightening. Do not overtighten.
- Operating range is 0°C to 50°C, 0 to 95% RH
- Some sensors may require connection to a proper earth ground to prevent possible sensor damage or malfunction due to static discharge. Follow instructions provided with sensor.

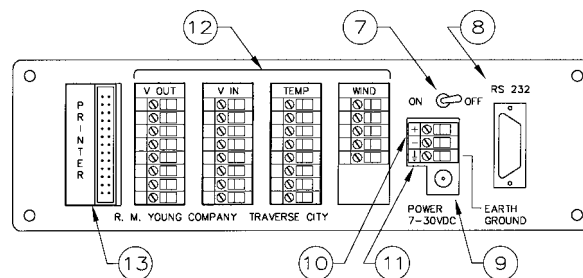
## 1.2 OPERATING CONTROLS

### FRONT PANEL



- |                   |   |
|-------------------|---|
| 1. Screen display | 2 rows x 16 columns   |
| 2. UP, DOWN keys  | Select screen for viewing, Change menu and editable items.                  |
| 3. EXIT key       | Exit OPERATE mode or current menu.  |
| 4. ENTER key      | Select menu item displayed or accept character at cursor when in edit mode. |
| 5. EDIT key       | Activates edit mode where possible.   |
| 6. INS/DEL key    | INSERT or DELETE a program instruction (Programming Only)                   |

### BACK PANEL



- |                               |  |
|-------------------------------|--|
| 7. ON/OFF switch              | Main power switch  |
| 8. RS-232 connector           | Serial data interface.   |
| 9. Power supply jack          | Connector for AC wall adapter.   |
| 10. Auxiliary Power Terminals | For powering the unit without AC adapter   |
| 11. Earth ground connection   | Connect to earth ground prior to use.  |
| 12. Cable connections         | For connection of meteorological sensors, voltage outputs, accessories. Actual configuration may vary. |
| 13. Printer port              | Parallel connector for printer. (26731 Printer Interface only)   |

## 1.3 SENSOR INTERFACE MODULES

Sensors and accessories are connected to the 26700 Translator through interface modules. Each module is identified by name (WIND, TEMP, V IN, etc...) and by module number (0,1,2,3). The module number is designated by the first digit appearing at the terminal. For example, a terminal labeled 02 indicates module 0, channel 2; 21 indicates module 2, channel 1; and so on. If more than one of the same type of module are used in one translator unit, each module must be assigned a different module number. New modules can be added at any time; refer to Appendix A for a complete listing of specifications.



SET HEADER 1 shows the first line of a header that is sent when recorded data is retrieved. The header is transmitted as a single string of 32 characters even though it is shown on the 26700 display as two lines of 16 characters.

SET HEADER 2 shows the second 32 character header line that is sent when recorded data is retrieved.

FIELDS/REC sets the number of data fields per record. The value must be from 1 to 25 and the FIELDS/REC multiplied by the number of RECORDS must be less than or equal to 24,000.

RECORDS determines the number of records to store. The RECORDS multiplied by the FIELDS/REC must be less than or equal to 24,000.

| R. M. YOUNG COMPANY 26700 SERIES |     |     |     |      | header 1 |
|----------------------------------|-----|-----|-----|------|----------|
| TOWER 2 DATA                     |     |     |     |      | header 2 |
| -----                            |     |     |     |      |          |
|                                  |     | WS  | WD  | TEMP | label 1  |
| hr                               | min | m/s | deg | C    | label 2  |
| -----                            |     |     |     |      |          |
| 19                               | 46  | 6.6 | 136 | 12.5 | records  |
| 19                               | 47  | 5.7 | 127 | 12.4 |          |
| 19                               | 48  | 6.2 | 128 | 12.4 |          |

Sample data showing 3 records with 5 fields.

**SET FIELDS** brings up the SET FIELDS MENU which consists of:

FIELD NUMBER is the field number of interest ranging from 1 to the value set in FIELDS/REC above. The sub-menu under FIELD NUMBER consists of:

WIDTH determines the width of the number retrieved from this field. Internally, data is always stored with maximum precision; the WIDTH value is used only when records are retrieved.

DECPT determines the number of decimal places for a number retrieved from this field. Internally, data is always stored with maximum precision; the DECPT value is used only when records are retrieved.

LABEL shows the two line label for this field that is sent as part of the header when records are retrieved. The label can only be as wide as the field WIDTH.

CLEAR RECORDS sets all internally stored records to a 0.0 value. A YES/NO prompt helps prevent accidental clearing.

**SET SCREEN TEXT** sets the text displayed on screens 0 through 9. To create or change screen text, follow these steps:

1. Use UP and DOWN to choose a screen number. Press ENTER to select it.
2. The screen text will appear.
3. Use the UP and DOWN keys to change the character at the cursor. Press ENTER to advance the cursor. Any message or text that fits can be displayed.
4. The "set screen text" menu will reappear when the last character is entered. Go to step 1 to edit other screens or press EXIT to return to the previous menu.

**SET SCROLL** brings up the SET SCROLL MENU which consists of:

SCROLL determines whether the auto-scroll feature is activated. When the unit is in OPERATE mode and SCROLL is activated, the display automatically changes from one screen to the next at a rate determined by the SCROLL INTERVAL. The last screen to be displayed is designated by the SCROLL END SCREEN value. Choices for the SCROLL parameter are YES and NO. When SCROLL is set to YES and the unit is in OPERATE mode, the screens cannot be selected manually with the UP/DOWN keys.

INTERVAL determines the rate at which the display changes from one screen to the next and is affected by the SAMPLE INTERVAL parameter (See SAMPLE INTERVAL). For example, with a SAMPLE INTERVAL of 1 second and a SCROLL INTERVAL of 3, the display would change screens every 3 seconds. If the SAMPLE INTERVAL were 2 seconds, the display would change screens every 6 seconds. Choices for INTERVAL are 1 to 99.

END SCREEN determines the last screen displayed in the scroll sequence before starting back at the beginning with screen 0. Choices are 0 to 9. This value also limits the range of screens which can be selected with the UP/DOWN keys when the SCROLL parameter is set to NO.

**SET COMM** brings up the SET COMM MENU which consists of:

BAUD RATE overrides the default baud rate set by the OPTION JUMPERS (see section 8.0). Changes made here only last while the unit is powered up and revert to the default value when power is re-applied. Use this parameter to test different baud rates then set the final value with the OPTION JUMPERS. Unless otherwise requested or used for NMEA applications, the unit is shipped with a default of 9600 baud. Choices for this parameter are 9600, 4800, 2400, 1200, 600, and 300.

DATA BITS determines the number of data bits in the serial output. Choices are 8 and 7.

PARITY determines the parity bit in the serial output. Choices are NONE, EVEN and ODD.

BUFFER LEN determines the length of the buffer used in sending serial data under program instruction control. The contents of this buffer are transmitted when the SERIAL BUFFER OUT instruction is used.

BUFFER END determines the character(s) sent at the end of the serial buffer output string when the SERIAL BUFFER OUT instruction is executed. Choices are NONE, CR, LF, and CRLF. See the information at the SERIAL BUFFER OUT and SERIAL BUFFER TXT instructions (Section 3.1).

ECHO determines whether incoming serial data is echoed (re-transmitted). ECHO is normally set to NO. When a 26700 is used as a slave indicator, receiving data serially, and both transmit and receive lines are connected between the units, ECHO in the slave unit must be set to NO.

LEAD 0s determines if numeric data in the serial output buffer will have leading zeros or not. This option is necessary when programming for serial communication protocols such as NMEA (marine applications). Choices are YES and NO.

INIT STR LEN determines the length of the initialization string. It is primarily used to initialize modems. If the string length is set to 0, no initialization string is sent. If the value is greater than 0, you are prompted to enter the hexadecimal values for the string. (See programming instructions PRN BUF TXT and SER BUF

TXT for an explanation of how to enter the hex codes.) You must know the initialization string values that are required by the device you are using. This string is sent out the port once before going into OPERATE mode.

**NUM ONLY INP** determines whether incoming serial data for the INP SERIAL instruction will be filtered for number-related characters. When set to YES, only number-related characters (+,-./0123456789) are accepted. This feature is useful for parsing incoming serial strings which may contain control codes or text that would confuse the INP SERIAL instruction. It is also useful for receiving data strings that start with CR-LF (rather than the more normal end-of-line position) since the CR-LF will be ignored. Note that when NUM ONLY INP is set to YES, the 26700 will NOT respond to control commands (like CNTL-R for retrieving records, etc.). The exception is CNTL-X which will continue to allow you to exit OPERATE mode remotely. When NUM ONLY INP is set to NO (this is the default setting), the 26700 will receive all incoming serial characters and all designated control codes will function normally (see section 5.0 Serial Communications). With the NO setting, each line of incoming serial data for the INP SERIAL instruction must end with CR. Use the NO setting for NMEA input also.

**MAX SER ERRS** sets the maximum number of consecutive INP SERIAL errors that can occur before responding to the error condition. The default setting is 10. See the INP SERIAL instruction for more information.

**SET PRINTER** brings up the SET PRINTER MENU which consists of:

**LINE LENGTH** determines the length of line printed under program instruction control. 250 characters max.

**PAGE LENGTH** determines the number of lines printed on each page under program instruction control.

**INIT STR LEN** determines the length of the initialization string. It is primarily used to initialize the printer for special modes of operation such as condensed characters. If the string length is set to 0, no initialization string is sent. If the value is greater than 0, you are prompted to enter the hexadecimal values for the string. (See programming instructions PRN BUF TXT and SER BUF TXT for an explanation of how to enter the hex codes.) You must know the initialization string values that are required by the printer you are using. This string is sent out to all printer ports once before going into OPERATE mode.

**SET AUTO-START** enables the 26700 to go directly to OPERATE mode on power up. Also see section 8.0, OPTION JUMPER.

**SET ERROR HANDLE** determines whether the 26700 stops to report errors during OPERATE mode or ignores them. Ordinarily, **SET ERROR HANDLE** is set to STOP ON ERROR during program development and turned off for normal operation.

**SET AUTO LBL CHG** automatically updates wind speed and temperature units when units are changed in the INP WIND SPD or INP TEMP instructions. For example, if wind speed units are changed from M/S to MPH in the INP WIND SPD instruction, the unit will scan all headers, text, labels. Wherever the text "M/S" appears it will be changed to "MPH". This feature only works with labels from the following group: M/S, MPH, KTS, KPH, °C, °F.

**SET LINE FREQ** sets the integration period for voltage and current input module measurements. The choices are 60 and 50 Hz (default 60). Setting the integration period to one cycle of the line frequency reduces AC line noise on the measured signal to an insignificant value.

**SET ACCESS LEVEL** determines the level of viewing and editing privileges. NONE prevents any SETUP or program parameter except this one to be viewed or changed. PARTIAL allows any SETUP or program parameter to be viewed or changed but no program instructions may be inserted or deleted. FULL allows full viewing and editing privileges in all areas. If the KEYSWITCH LOCKOUT OPTION JUMPER is installed (see section 8.0), all privileges are removed.

## 2.3 TEST

---

The TEST section is for checking and calibrating the 26700 and its modules. Some of the tests may require a working knowledge of modern signal conditioning and data acquisition equipment.

The following information describes each TEST. Press EXIT to return from each selection.

**TEST LCD** tests each dot in the dot-matrix by turning them all on. The result is a row of blocks. The UP/DOWN keys selects each of the 2 display rows.

**TEST RAM** performs a comprehensive non-destructive test of all RAM addresses. The test takes about 1 second and the results are displayed when it is finished. If an error is detected, contact your supplier.

**TEST ROM** performs a checksum calculation on all ROM addresses. The leftmost value must match the rightmost value. If they do not, contact your supplier. This test takes several seconds to complete.

**TEST PGM CHKSUM** calculates a checksum for the internal user program. If a program does not change, its checksum does not change. Use this test to check the integrity of the user program over time.

**TEST SERIAL I/O** is used to test the serial link between the 26700 and another 26700 or a PC. In this test, serial data sent to the 26700 is echoed back to the source (ECHO must be set to YES in the SET COMM parameter). After a carriage return is received, the first 16 characters sent to the 26700 are displayed on the LCD screen. Baud rate and data format on the 26700 must be the same as the serial device it is connected to.

**TEST PRINTER** sends a constant stream of the character set to the printer until EXIT is pressed.

**TEST V OUT** tests the 26728 Voltage Output Module. Select a module number 0-3. If the module is not present, an error message will appear and the unit will beep until the EXIT key is pressed. If the module is present, the module number and millivolt (mV) output is displayed. Press EDIT to select a new mV value. The UP/DOWN keys change the value in  $\pm 200$  mV increments from -5000 to +4999 mV. Press ENTER to accept the mV value on the display and send it to all 4 voltage output channels.

---

Use TEST V OUT to exercise or calibrate external devices such as chart recorders or process control systems.

---

**TEST V IN** tests the 26727 Voltage Input Module. Select a module number 0-3. If the module is not present, an error message will appear and the unit will beep until the EXIT key is pressed. If the module is present, use the UP/DOWN keys to scroll through the input range menu (50, 500, and 5000 mV). Press ENTER to select the desired range. The display now shows the channel number and the raw value from the analog - to - digital convertor (ADC). The raw ADC values span  $\pm 4095$ . Use the UP/DOWN keys to change the channel number. Channels 0 - 3 represent the actual voltage input channels 0 - 3. Channels 4 - 7 represent the internal reference voltages.



**TEST I OUT** is identical to TEST V OUT except the output range is 0.00 to 24.00 mA with increments of 2.00 mA.

**TEST I IN** is identical to TEST V IN except the full scale input range is  $\pm 50$ mA.

**TEST WIND IN** tests the 26725 Wind Input Module. Select module 0-3. Select ADC (V input) or CTC (counter timer chip freq. input). The display will show the channel and raw value returned from the ADC or CTC, whichever was selected. Use the UP/DOWN keys to change channel number. When CTC input is selected, the displayed value represents the number of pulses counted during the SAMPLE INTERVAL period.

**TEST TEMP IN** tests the 26726 Temperature Input Module. Select a module 0-3. Select a sensor type, 100 or 1000 ohm RTD. The display will show the channel and raw ADC value. Use the UP/DOWN keys to change channel number. Channels 0 & 1 represent the two RTD inputs. Channels 2-4 represent internal references in the module.

**TEST RELAYS** tests the 26730 Alarm/Relay Module. Select a module 0-3. The display shows the module and channel. When a channel is selected, the relay switch closes.

---

**USE CAUTION IF THE RELAY CONTROLS OTHER EQUIPMENT WHEN PERFORMING THIS TEST! DISCONNECT THE EQUIPMENT BEING CONTROLLED IF NECESSARY!**

---

**TEST BEEP** turns on the piezo sound element as long as the ENTER key is pressed.

**RESET** initiates a FIRST-POWERUP sequence. All parameters are set to default values and all battery backed-up data storage and program memory are erased. The user program will be lost!

**TEST OPT BLOCK** examines the pattern of OPTION JUMPERS on the Power Supply Module.

### **3.0 PROGRAMMING**

---

The 26700 operates by executing a series of user program instructions that make measurements, display data, manipulate data, record data, test for conditions, and produce output. The instructions may be combined in any way for a broad range of applications.

The user program environment has three storage areas: one area for storing the program instructions; another area for storing temporary values; and an area for recording data. The program area holds 99 instructions, the temporary storage area holds 100 values, and the data record area holds 24,000 values (see RECORDING DATA, section 4.0, for more details on this area).

The programming area is accessed via the SETUP menu under the ENT/EDIT PROGRAM selection. Once in the program area, instructions and associated parameters may be viewed, edited, inserted, or deleted. (Some access restrictions may be in effect depending on the SET ACCESS LEVEL parameter. See section 2.2. Unless otherwise requested, all units are shipped with full access privileges.)

When developing your own programs, it is helpful to have the STOP ON ERROR feature turned on so the unit stops and identifies the source of error while in OPERATE mode. Once the program has been developed, you may turn that feature off. For more details, see SET ERROR HANDLE parameter in SETUP section 2.2.

**VIEWING THE PROGRAM:** From the SETUP MENU use the UP/DOWN keys to select ENT/EDIT PROGRAM. Press ENTER to display the first program instruction.

Example:

```
i01INP WIND SPD      instruction number and name
p1 chan = 01         parameter 1
```

The UP and DOWN keys will scroll through the program one parameter at a time. The ENTER key will scroll through the program one instruction at a time. The number of parameters will vary depending on the instruction.

**EDITING A PARAMETER:** Press the EDIT key. Use the UP and DOWN keys to change the value at the cursor and press ENTER to accept it. Edit mode is always designated by a cursor under the item being edited.

**INSERTING AN INSTRUCTION:** While viewing the program, press the INS/DEL key. The screen will prompt for INS OR DEL?. Press ENTER to select INSert. The screen will now prompt for -instruction?-- and the first available instruction from the list will appear. Use the UP/DOWN keys to scroll through the list and press ENTER to select the desired instruction. The display will then prompt for each parameter value for that instruction. Use the UP, DOWN and ENTER keys to set each parameter.

Example:

```
i13 INP WIND DIR
p1 chan = 01
```

**DELETING AN INSTRUCTION:** While viewing the program, use the UP/DOWN keys to go to the instruction to be deleted. Press INS/DEL and the display will prompt INS OR DEL? Press DOWN to select DEL then press ENTER to DELETE the current instruction.

**RETURN TO SETUP MENU:** Press EXIT.

Most instructions interact with the temporary storage locations in some way. Values are either placed in those locations or retrieved from them or both. The locations are numbered 0 through 99. A location may be considered a source (SLOC) or destination (DLOC) depending on the how it is used. When storing, a location is a destination. When retrieving, it is a source.

Blank worksheets for program instructions, temporary storage locations, and screen layouts are included in Appendix C. Copy and use them to plan the program.

When developing a new program, set the ERROR HANDLE under SETUP to STOP ON ERR (see section 2.2). This enables extensive error trapping that will catch most programming errors and reveal the source. Section 6.0, ERROR MESSAGES, addresses each type of error. Disable STOP ON ERROR after the program has been developed.

If a program does not generate any error messages and still does not produce the intended result, carefully review the sequence of instructions. The unit does only what it is instructed to do. For example, suppose you want to make a wind speed measurement and display it on the screen. You use the Inp Wind Speed instruction and store the result in LOCation 10. Then you retrieve the value from LOC 20 and display it. The program will execute without error yet no wind speed value will appear on the screen. In this example, the value in LOC 10 must be displayed, not LOC 20. Although this example is simplistic, it illustrates a common programming mistake. With more measurements, locations, and more display and processing instructions, it is easy to overlook something.

### 3.1 PROGRAM INSTRUCTIONS

Instruction names are in bold letters and listed alphabetically. Each instruction name is followed by a detailed description of the instruction and how it is used. The instruction parameters, if any, are also listed and described. A sample program appears in Appendix B.

**ALARM** activates one of the relays (MODEL 26730 ALARM MODULE required) and may be set to sound the internal beeper when the condition specified in this instruction is met.

SLOC= Location of value which could activate alarm  
COND: <, <=, >, >=, <>, =  
Condition sets the relationship between the value in SLOC and SETPT which activates the alarm.  
SETPT: Setpoint value for activating alarm  
DELAY: Number of samples which must meet the condition before alarm is activated (1-99).  
BEEP: Determines whether beeper sounds when alarm is activated (Yes/No).  
RELAY: Relay number. 1st digit is module number (0-3), 2nd digit is relay switch number (0-3).

**ALARM WD** is similar to the ALARM instruction but is designated for Wind Direction signals specifically. SETPT & SPAN determine the condition which activates the alarm. SETPT is at the mid-point of the SPAN value. For example, with a SPAN of 20 and a SETPT of 180, the alarm will be activated when the wind direction value is between 170 and 190.

SLOC= Location of wind direction value which could activate alarm  
SETPT: Setpoint value for activating alarm.  
SPAN: Span of wind direction values which activate alarm with setpoint value at the mid-point.  
DELAY: Number of samples which must meet the condition before alarm is activated (1-99)  
BEEP: Determines whether beeper sounds when alarm is activated (Yes/No).  
RELAY: Relay number. 1st digit is module number (0-3), 2nd digit is relay switch number (0-3).

**AQ STATS** performs a number of statistical calculations specifically for air quality monitoring using the exact methods recommended by the U.S. EPA. Details on these methods appear in the EPA document "On-Site Meteorological Program Guidance For Regulatory Modeling Applications."

SLOC = Start of consecutive locations where raw horizontal wind speed and direction input values are stored.  
SLOC Horizontal wind speed  
SLOC+1 Horizontal wind direction  
DLOC = Start of consecutive locations where results are stored.  
DLOC Mean wind speed  
DLOC+1 Mean wind direction  
DLOC+2 Standard deviation of wind direction  
PER = 15-MIN or 60-MIN sampling period  
TYPE = SCALAR, VECTOR, OR UNIT VECTOR

#### IMPORTANT NOTES ABOUT AQ STATS:

1) Locations DLOC+3 through DLOC+10 are used by the AQ STATS instruction for internal calculations. The values in these locations *MUST NOT* be changed by any other instructions in the user program.

- 2) This instruction requires a SAMPLE INTERVAL of 1 second to comply with EPA recommendations. Intervals other than 1 second will cause AQ STATS to yield improper results.
- 3) Since the sampling period begins immediately, the user program must control the point in time at which this period (and its subsequent repetitions) begins. For example, with a sample period of 60-MIN and a start time of 1:07, AQ STATS will produce results at 2:07, 3:07, etc. If you want to start at a specific time, use the example shown in Appendix B for doing so.
- 4) When the 60-MIN sampling period is selected, the standard deviation of wind direction is based on the RMS value of the four preceding 15-minute values as recommended by the EPA. Also, the wind direction standard deviation is calculated using the Yamartino method as recommended.

**AVERAGE** calculates the average of a group of samples. When #SAMP is greater than 0, each execution of the instruction stores values from SLOC until #SAMP values have been collected then calculates the average and begins again.

In special applications it may be preferable to collect samples based on other events or times. For these applications #SAMP is set to 0.

When #SAMP = 0, each execution of the instruction stores values from SLOC until FLAG 0 is set (see FLAG instruction) then calculates the average and begins again. For wind direction average, use the AVERAGE WD instruction.

SLOC= Location of sample value  
DLOC= Location where resulting average is stored  
#SAMP= Number of samples to average (0-32767, note special case for 0).

**AVERAGE WD** is similar to the AVERAGE instruction except it calculates a unit vector average using 0-360° wind direction values. The mathematical method used is one of several recommended by the US EPA for use in Air Quality monitoring. When #SAMP is greater than 0, each execution of the instruction stores values from SLOC until #SAMP values have been collected then calculates the average and begins again.

In special applications it may be preferable to collect samples based on other events or times. For these applications #SAMP is set to 0.

When #SAMP=0, each execution of the instruction stores values from SLOC until FLAG 0 is set (see FLAG instruction) then calculates the average and begins again.

SLOC= Location of sample angle value (degrees)  
DLOC= Location where resulting angle average is stored  
#SAMP= Number of samples to average (0-32767, note special case for 0).

**AVG MOV** calculates a moving average of up to 99 samples. On each execution of the instruction, values from SLOC are stored and a new average is calculated using the last #SAMP values. Be aware that the number of Temporary Storage Locations used by this instruction equals #SAMP + 2. For wind direction moving average, use the AVG WD MOV instruction.

SLOC= Location of sample value  
DLOC= Location where resulting average is stored  
#SAMP= Number of samples to average (1-99 max).

To calculate the Temporary Storage Location needs:  
DLOC + 1 = Start of buffer  
DLOC + 1 + #SAMP = End of buffer

**AVG MOV WD** is similar to the AVG MOV instruction except it calculates a unit vector moving average using 0-360° angular values. The mathematical method used is one of several recommended by the US EPA for use in Air Quality monitoring. On each execution of the instruction, values from SLOC are stored and a new average is calculated using the last #SAMP values. Be aware that the number of Temporary Storage Locations used by this instruction equals #SAMP + 2.

SLOC= Location of sample angle value (degrees)  
 DLOC= Location where resulting average is stored  
 #SAMP= Number of samples to average (1-99).

To calculate the Temporary Storage Location needs:  
 DLOC + 1 = Start of buffer  
 DLOC + 1 + #SAMP = End of buffer

**BEEP** produces from 1 to 9 beep sounds. It can be used to signal an event.

NUM= Number of beeps to sound

**CHNG TO SCR** instructs the unit to change to screen number 0 to 9 based on the value in a temporary storage location. A message can be displayed as a result of some condition. For example, after an alarm has been triggered, the display could alternate between the normal screen and one that announces the condition or explains how to reset the alarm.

SLOC= Location holding value of screen number to display

**DISPLAY FLAG** shows the condition of all 8 flags in the form: 00000000. The flags are numbered 0 through 7 starting with the leftmost digit. 1 designates the flag is SET, 0 designates RESET. The flag display can be sent to any screen and placed in any position.

SCRN= Screen number on which to display, 0-9  
 ROW= Screen row number, 0-1  
 COL= Screen column number, 0-15

**DISPLAY NESW** takes the angular wind direction value in degrees from a temporary storage location and displays it in terms of compass point descriptions (N, NNE, NE, ENE, E, etc.). The description can be sent to any display screen and placed in any position. Allow 3 character spaces.

SLOC= Location of angular wind direction value to be displayed as a compass point  
 SCRN= Screen number on which to display, 0-9  
 ROW= Screen row number, 0-1  
 COL= Screen column number, 0-15

**DISPLAY TEXT** displays 7 text characters on any screen at any position. Use this instruction to display a message based on some condition without having to change to another screen. For permanent labels or messages use SET SCREEN TEXT under SETUP, section 5.2.

SCRN= Screen number on which to display text, 0-9  
 ROW= Screen row number, 0-1  
 COL= Screen column number, 0-15  
 TEXT= Text to be displayed, 7 characters

**DISPLAY TIME** displays time from the internal real time clock on any screen at any position. Several formats are available. Leap years are handled automatically.

SCRN= Screen number on which to display time, 0-9  
 ROW= Screen row number, 0-1  
 COL= Screen column number, 0-15

|       |       |                    |          |
|-------|-------|--------------------|----------|
| FRMT= | HOUR  | 00 (24 hour)       | 2 spaces |
|       | MIN   | 00                 | 2 spaces |
|       | SEC   | 00                 | 2 spaces |
|       | HH:MM | 00:00 (24 hour)    | 5 spaces |
|       | H:M:S | 00:00:00 (24 hour) | 8 spaces |
|       | MON   | 00                 | 2 spaces |
|       | DAY   | 00                 | 2 spaces |
|       | YEAR  | 00                 | 2 spaces |
|       | MM-DD | 00-00              | 5 spaces |
|       | M-D-Y | 00-00-00           | 8 spaces |
|       | DD-MM | 00-00              | 5 spaces |
|       | D-M-Y | 00-00-00           | 8 spaces |

**DISPLAY VAL** displays the value from a temporary storage location on any screen at any position. The width can be set from 1 to 9 digits, same for the decimal points. The width value determines the number of spaces to allocate on the screen.

SLOC= Location holding value to be displayed  
 SCRN= Screen number on which to display, 0-9  
 ROW= Screen row number, 0-1  
 COL= Screen column number, 0-15  
 WIDTH= Number of digits allowed in number  
 DECPT= Number of digits after the decimal point

**ELSE** is used with IF statements as a branch when the associated IF tests false. Example:

```
IF LOC 10 = 100.0
BEEP 5
LOC 10 = 0
ELSE
LOC 10 = LOC 10 + 1.0
END IF
```

Only one ELSE statement can be used with an IF. ELSE statements other than the first will be ignored and an ELSE without a preceding IF statement will generate an error when STOP ON ERROR is set.

**END IF** marks the end of an IF block and must be used to conclude every IF statement. END IF without an IF will generate an error when STOP ON ERROR is set.

**FLAG** is used to SET or RESET a flag. Use flags to signify the occurrence of some event and trigger a response (see IF FLAG). There are 8 flags available.

FLAG#= Flag Number, 0-7  
 FCOND= Condition of flag, SET or RESET

NOTE: FLAG 0, when SET, is used to force several instructions to complete their calculation when #SAMP = 0 has been specified in those instructions (see AVERAGE, AVERAGE WD, MAXIMUM, & MINIMUM). If those instructions are not being used, FLAG 0 is available for general use, however, be aware that FLAG 0 IS AUTOMATICALLY RESET AT THE END OF EACH ITERATION OF THE USER PROGRAM.

---

**NOTE FOR ALL "IF" INSTRUCTIONS:**

The depth to which "IF" statements may be nested is limited only by the available space in the user program area. Only one "ELSE" instruction may be used with each "IF" instruction.

---

**IF ERR CODE** tests whether a specific user program execution error has occurred (see section 6.0 for a list of error codes and their description). If the specified error has occurred, the instructions following IF ERR CODE will be executed. Otherwise, the instructions following the next ELSE or END IF statement will be executed. An END IF statement must follow the IF ERR CODE statement:

```
IF ERR CODE
instruction(s)...
ELSE (options)
instruction(s)
END IF
```

CODE= Value of error code to be tested  
(see section 6.0 for list)

This instruction is useful for detecting errors of interest when STOP ON ERROR is set to OFF (see section 2.2 SET ERROR HANDLE).

**IMPORTANT NOTE:** Since each instruction generates an error code value (zero for success or non-zero for an error condition), IF ERR CODE must immediately follow the instruction being monitored for error. If it does not immediately follow, subsequent successful instruction executions will reset the internal error code value to zero before reaching the IF ERR CODE instruction.

**IF FLAG** tests whether a particular flag is SET or RESET. There are 8 flags. If the flag tested is in the same state as the FCOND parameter, the instructions following IF FLAG will be executed. Otherwise, the instructions following the next ELSE or END IF statement will be executed. An END IF statement must follow the IF FLAG statement:

```
IF FLAG
instruction(s)...
ELSE (optional)
instruction(s)... (optional)
END IF
```

FLAG#= Flag Number, 0-7  
FCOND= Condition of flag, SET or RESET

**IF KEYSWITCH** tests whether any of the 6 keys is pressed or not. If the designated key is pressed, the instructions following IF KEYSWITCH will be executed. If the designated key is NOT pressed, the instructions following the next ELSE or END IF statement will be executed. An END IF statement must follow IF KEYSWITCH:

```
IF KEYSWITCH = ENTER
instruction(s)...
ELSE (optional)
instruction(s)... (optional)
END IF
```

Note that in OPERATE mode, the UP, DOWN, and EXIT keys may be used to change screens and exit the program.

KEY= UP  
DOWN  
EXIT  
INS/DEL  
ENTER  
EDIT  
NONE (no key pressed)

**IF L1 ? L2** compares the values in temporary storage locations SLOC1 and SLOC2. If the comparison is true, the instructions following IF L1 ? L2 are executed. If the comparison is false, the conditions following the next ELSE or END IF statement will be executed. An END IF statement must follow IF L1 ? L2:

```
IF L1 > L2
instruction(s)...
ELSE (optional)
instruction(s)... (optional)
END IF
```

SLOC1= Location first value to be compared  
COND?: <, less than  
<=, less than or equal to  
>=, greater than or equal to  
>, greater than  
<>, not equal to  
=, equal to  
SLOC2= Location holding second value to compare

**IF L ? VALUE** compares the value in a temporary storage location to a fixed value. If the comparison is true, the instructions following IF L1 ? L2 are executed. If the comparison is false, the conditions following the next ELSE or END IF statement will be executed. An END IF statement must follow IF L ? VALUE:

```
IF L > 123.45
instruction(s)...
ELSE (optional)
instruction(s)... (optional)
END IF
```

SLOC= Location of first value to be compared  
COND?: <, less than  
<=, less than or equal to  
>=, greater than or equal to  
>, greater than  
<>, not equal to  
=, equal to  
VALUE= floating point value to be compared to

**IF TIME INTR** determines how often to execute the instructions which follow: For example, if the IF TIME INTR minutes parameter is set to 5 then the instructions which follow will be executed at 5 minutes after the hour, 10 minutes after the hour, 15 minutes after the hour, etc., throughout the hour. At all other times the instructions following the next ELSE or END IF statement is executed. An END IF statement must follow IF TIME INTR. Use a -1 value for a 24 hour interval that occurs every midnight. Example:

```
IF TIME INTR = 5
instruction(s)...
ELSE (optional)
instruction(s)... (optional)
END IF
```

MINS= Number of minutes in time interval  
(see text above for note on special values)

**NOTE REGARDING INSTRUCTIONS THAT USE INPUT AND OUTPUT MODULES:**

Up to 4 modules of the same type may be used in the 26700 Translator. For example, 4 26725 Wind Modules. Each module must have a unique module number, 0-3 (see section 7.0). User program instructions that interact with a module have a 2 digit CHANNEL parameter. The first digit refers to the module number (0-3) and the second digit refers to the channel number on that module (varies). Using an instruction without the module present (or correctly numbered) and having the ERROR HANDLE set to STOP ON ERROR (see section 2.2) produces an error when the unit is in OPERATE mode. The error identifies the instruction which refers to the missing module.

**INP CURRENT (mA)** measures current from a MODEL 26732 CURRENT INPUT MODULE. The input range is ±20mA. See Appendix E for wiring details. Use the MULT and OFFS parameters to establish the proper scale for the engineering units being used.

CHAN= 1st digit is module number (0-3)  
 2nd digit is channel number (0-4)  
 MULT= Multiplier  
 OFFS= Offset  
 DLOC= Location where result is stored

**INP FREQ** measures the number of pulses from the Model 26725 WIND INPUT MODULE. The frequency source(s) must be correctly connected to the module for this instruction to produce meaningful measurements. See the wiring diagram in Appendix E for additional details.

The value returned from the counter on the module is the number of pulses counted during the SAMPLE INTERVAL (see section 2.2).

CHAN= 1st digit is module number (0-3)  
 2nd digit is channel number (0-2)  
 MULT= Multiplier  
 OFFS= Offset  
 DLOC= Location where result is stored

**INP PRECIP-T** measures precipitation from a tipping bucket type sensor using the MODEL 26725 WIND INPUT MODULE as a pulse counter. Up to 3 tipping bucket sensors may be connected to one module. (See Appendix E for wiring details).

The RESOLUTION parameter must be set to match the amount of precipitation represented by each tip. This value may vary from manufacturer to manufacturer. Common RESOLUTION values are 0.01 inches per tip and 0.1, 0.2, or 0.25mm per tip. Refer to your precipitation sensor specifications.

The UNIT parameter may be set to inches or millimeters (mm) and simply serves as a reminder in the instruction. It does not enter into the measurement in any way.

MULT is a numeric multiplier that may be used to fine tune the calibration. It is usually set to 1.00000.

This instruction produces several results which are consecutively placed in the temporary storage area beginning with the location designated by DLOC. The results are: CURRENT HOUR PRECIP, LAST HOUR PRECIP, CURRENT 24 HOUR PRECIP, LAST 24 HOUR PRECIP, HOURLY RATE, and RAW COUNT.

CURRENT HOUR PRECIP and CURRENT 24 HOUR PRECIP are updated on every sample. LAST HOUR PRECIP and RAW COUNT are updated every hour. LAST 24 HOUR PRECIP is updated every 24 hours. HOURLY RATE is updated every 5 minutes.

CHAN= 1st digit is module number (0-3)  
 2nd digit is channel number (0-2)  
 RESO= Resolution (amount) of precipitation per tip  
 UNIT= mm or inches (reminder only - see text)  
 MULT= Multiplier  
 DLOC= Location where results are stored:  
 DLOC Current Hour Precip  
 DLOC + 1 Last Hour Precip  
 DLOC + 2 Current 24 Hour Precip  
 DLOC + 3 Last 24 Hour Precip  
 DLOC + 4 Hourly Rate  
 DLOC + 5 Raw Count

**INP PRECIP-S** measures precipitation from a YOUNG self-siphon type sensor using the MODEL 26727 VOLTAGE INPUT MODULE. Up to 4 sensors may be connected to one module. (See Appendix E for wiring details).

The UNIT parameter may be set to mm (millimeters) or inches.

This causes the precipitation measurement values to be scaled properly. If changing from one unit to the other, you must change any labels in the display, record, or printer output areas.

This instruction produces several results which are consecutively placed in the temporary storage area beginning with the location designated by DLOC. The results are:

CURRENT HOUR PRECIP, LAST HOUR PRECIP, CURRENT 24 HOUR PRECIP, LAST 24 HOUR PRECIP, HOURLY RATE, and RAW PRECIP.

CURRENT HOUR PRECIP and CURRENT 24 HOUR PRECIP are updated on every sample. LAST HOUR PRECIP and RAW PRECIP are updated every hour. LAST 24 HOUR PRECIP is updated every 24 hours. HOURLY RATE is updated every 5 minutes.

CHAN= 1st digit is module number (0-3)  
 2nd digit is channel number (0-3)  
 UNIT= mm or inches  
 DLOC= Location where results are stored:  
 DLOC Current Hour Precip  
 DLOC + 1 Last Hour Precip  
 DLOC + 2 Current 24 Hour Precip  
 DLOC + 3 Last 24 Hour Precip  
 DLOC + 4 Hourly Rate  
 DLOC + 5 Raw Precip

**INP SERIAL** accepts 1 or more fields of numeric data via the serial communications port and places that data into designated temporary storage locations. If more than one field is received, the data is stored in consecutive temporary storage locations beginning with the one designated by the DLOC1 parameter. Once the data is in a temporary storage location it can be processed or displayed like any other data.

This instruction extracts numeric data only. The data may be signed or unsigned integers or floating point numbers. Each data field MUST be separated by a space or comma. Normally the incoming data string must end in CR or CR-LF. (For information on receiving data that may contain control codes, text, or begin with CR, see section 2.2 SET COMM | NUM ONLY INP. See INP NMEA for information on receiving NMEA data.)

When the incoming serial data is parsed, the number of data fields extracted must match the number expected or an internal error count is incremented. When that error count reaches the value set by MAX SER ERRS (the default is 10, see section 2.2 SETUP | SET COMM), an internal error flag is set. Each correctly received string resets the error count to zero. If the internal error flag becomes set, each DLOC designated in the INP SERIAL instruction is set to -99999. Also, if SET ERROR HANDLE (see section 2.2) is set to STOP ON ERROR, program execution stops.

Be sure the baud rate and other COMM settings in the 26700 match the settings of the device sending serial data. The INP SERIAL instruction is also useful for operating remote slave displays.

#FLDS= Number of fields of numeric data that will be received  
 DLOC1= First location where incoming data will be stored

**INP SER NMEA** accepts one of three standard National Marine Electronics Association (NMEA) sentences via the RS-232 serial communications port and places the numeric data from the received sentence in designated storage locations. The sentence types are: MWV for wind speed and direction, XDR for transducer data such as temperature, humidity, barometric pressure, general purpose transducers, etc., and HDT for heading data.

This instruction is intended primarily to allow the 26700 translator to be used as slave indicator(s) in a system where the master 26700 must also provide NMEA format data to a third-party device. Since NMEA transmission sentences are easily constructed with 26700 serial output instructions, INP SER NMEA facilitates systems where both NMEA serial data transmission and slave indicators are required.

This instruction is NOT intended to be an all purpose NMEA input instruction; it looks only for the numeric values contained in the sentence and places those values in designated storage locations. The instruction cannot distinguish reference angle type (true or relative), wind speed units, transducer type or units, or other elements of the NMEA sentence. Any other NMEA sentences sent to the 26700 are ignored.

TYPE = MWV, XDR, or HDT sentence  
 #FLDS = Number of significant data fields. Always 2 with MWV, one for HDT, and one for each transducer with XDR.  
 DLOC = Location where results are stored:  
 DLOC Wind Direction (MWV), Heading (HDT), or Transducer 1 (XDR)  
 DLOC + 1 Wind Speed (MWV) or possible Transducer 2 (XDR)  
 DLOC + 2 Possible Transducer 3 (XDR only)  
 DLOC + 3 Possible Transducer 4 (XDR only) continued...If more XDR transducers...

Since the XDR sentence is limited only by its length, the user must know how many transducer fields to expect and place that value in the #FLDS parameter. If the incoming XDR sentence contains numerous transducer fields, be sure to account for all the storage locations that will subsequently be used.

**IMPORTANT NOTE:** The INP SER NMEA instruction requires a complete sentence prefix of either \$WIMWV, \$WIXDR, or \$HEHDT. Any other prefix, even if it contains MWV, XDR, or HDT will be ignored.

**INP TEMP** measures temperature using the MODEL 26726 TEMPERATURE INPUT MODULE and 1 or 2 RTD temperature sensors. See the wiring diagram in Appendix E for connection details.

The temperature input module can make accurate measurements within  $\pm 0.03$  °C. To achieve measurements with this accuracy may require calibrating the RTD being used. For greater accuracy, stability, and resolution 10 or more temperature measurement samples may be averaged.

Temperature units in degrees C or degrees F can be selected. This will automatically set the correct multiplier and offset values. If the AUTO LBL CHG parameter is set to YES, unit labels on the display, record headers, record labels, and program text instructions will be updated also. (For more information about the AUTO LBL CHG feature, see section 5.1.2 SETUP.) If the SPECIAL unit is selected, the multiplier and offset values must be set by the user.

To get a DELTA T (temperature difference) value, make two temperature measurements and store them in two temporary storage locations. Subtract one value from the other to get DELTA T.

CHAN= 1st digit is module number (0-3)  
 2nd digit is channel number (0-1)  
 TYPE= 1000 ohm RTD (3.75 alpha)  
 100 ohm DIN RTD (0.385 alpha)  
 UNIT= unit of measure (°C, °F, Special)

MULT= Multiplier ( 1.0 for °C, 1.8 for °F, or other for special calibrations )  
 OFFS= Offset ( 0.0 for °C, 32.0 for °F, or other for special calibrations )  
 DLOC= Location where result is stored

**INP VOLTAGE** measures voltage from a MODEL 26727 VOLTAGE INPUT MODULE. The module has 4 input channels which can be configured for single ended or differential measurements. See the wiring diagram in Appendix E for connection details. The input range may be set to  $\pm 5000$ ,  $\pm 500$ , and  $\pm 50$ mV with the RANGE parameter. Use the MULT and OFFS parameters to establish scale or units.

CHAN= 1st digit is module number (0-3)  
 2nd digit: chan# (0-3) for single ended measurements  
 chan # (0 or 2) for differential measurements  
 TYPE= SE, single ended  
 DIFF, differential  
 RANGE= 5000mV  
 500 mV  
 50 mV  
 MULT= Multiplier  
 OFFS= Offset  
 DLOC= Location where result is stored

**INP WIND DIR** measures wind direction using MODEL 26725 WIND INPUT MODULE and one or more wind direction sensors. See Appendix E for wiring details.

The wind input module can measure wind direction with 0.4 degrees accuracy. Use the MULT and OFFS parameters to establish scale and calibrate the sensor.

CHAN= 1st digit is module number (0-3)  
 2nd digit is channel number (0-2)  
 MULT= Multiplier  
 OFFS= Offset  
 DLOC= Location where result is stored

**INP WIND SPD** measures wind speed using MODEL 26725 WIND INPUT MODULE and one or more wind speed sensors. See Appendix E for wiring details.

The TYPE parameter can be set for the correct YOUNG sensor model. For other sensors, use either FREQ for frequency output or VOLTS for DC voltage output sensors. When using FREQ, the value measured will be the number of pulses counted during the SAMPLE INTERVAL (see section 2.2). The SAMPLE INTERVAL must be considered when scaling the raw count value with the MULT parameter.

Wind speed units in M/S (meters per second), MPH (miles per hour), KTS (knots), and KPH (kilometers per hour) can be selected. This will automatically set the correct multiplier and offset values. If the AUTO LBL CHG parameter is set to YES, unit labels on the display, record headers, record labels, and program text instructions will be updated also. (For more information about the AUTO LBL CHG parameter, see SETUP section 2.2.) If the SPECIAL unit is selected, the multiplier and offset values must be entered. Use the MULT and OFFS parameters to establish scale or calibrate the sensor.

CHAN= 1st digit is module number (0-3)  
 2nd digit is channel number (0-2)  
 TYPE= 03XXX Wind Sentry  
 05103 Wind Monitor  
 05305 Wind Monitor-AQ  
 05701 Wind Monitor-RE  
 12102 3-Cup Anemometer

UNIT=      FREQ      AC or pulse output sensors  
             VOLTS     DC voltage output sensors  
             M/S       meters/second  
             MPH       miles/hr  
             KPH       kilometers/hr  
             KTS       knots  
             Special    special calibration  
 MULT=     Multiplier  
 OFFS=     Offset  
 DLOC=     Location where result is stored

"atan2", arctan of two values beginning with SLOC  
 "dewpt", calculates the dew point in °C from RH% and temperature (also °C). The RH% value must be in SLOC and the temperature in SLOC+1  
 "wetbulb", calculates the wetbulb temperature in °C from RH%, ambient temperature in °C (sometimes called dry bulb temperature), and ambient pressure in millibars. RH% must be in SLOC, ambient temperature in SLOC+1, and pressure in SLOC+2.

**L = ERR CODE** sets the value of a storage location (L) to the present value of the error code. This instruction is useful for monitoring and/or recording error events during program operation when STOP ON ERROR is set to OFF (see section 2.2 SET ERROR HANDLE).

DLOC=      Location where result is stored

DLOC =      Location where error code is to be stored (see section 6.0 for error code list)

**L1 = L2** sets the value in one storage location (L2) equal to the value in another storage location (L1).

SLOC=      Location of value L1  
 DLOC=      Location of value L2 that will change

---

**IMPORTANT NOTE:** Since each instruction generates an error code value (zero for success or non-zero for an error condition), L = ERR CODE must immediately follow the instruction being monitored for error. If it does not immediately follow, subsequent successful instruction executions will reset the internal error code value to zero before reaching the L = ERR CODE instruction.

---

**L = TIME** sets the value in a storage location equal to the current time in the real time clock.

DLOC=      Location where time will be stored. (see note below)

**L1 OPER L2** performs a numerical operation using the values in two locations and stores the result. For example, dividing the value in location 10 by the value in location 11 and storing the result in location 12.

FRMT=      hour        hours only (00-23)  
             min        minutes only (00-59)  
             sec        seconds only (00-59)  
             hh:mm     hours and minutes (24 hr format)  
             h:m:s     hours, minutes, seconds (24 hr format)  
             month     current month only (1-12)  
             day        current day only (0-31)  
             year       current year only  
             mm-dd     current month-day  
             m-d-y     current month-day-year  
             dd-mm     current day-month  
             d-m-y     current day-month-year

SLOC1=     Location where first value is stored  
 OPER:     "+", value in SLOC1 plus value in SLOC2  
             "-", value in SLOC1 minus value in SLOC2  
             "\*, value in SLOC1 multiplied by value in SLOC2  
             "/", value in SLOC1 divided by value in SLOC2  
             "pow", value in SLOC1 raised to the power of the value in SLOC2  
             "mod", value in SLOC1 modulo value in SLOC2  
             SLOC2= Location where second value is stored  
 DLOC=     Location where result is stored

If a time format with 2 or more values is selected (hh:mm for example), DLOC will be the location where the first value is stored (hours, in this case). Additional values are stored in successive locations (DLOC + 1, DLOC+2, etc...).

**L OPER VALUE** performs a numerical operation using the value in a temporary storage location and fixed value and stores the result. For example, dividing the value in location 10 by 5.00 and storing the result in location 12.

**L = VALUE** places a fixed value into a memory location.

SLOC=      Location where first value is stored  
 OPER:      "+", value in SLOC plus a fixed value  
             "-", value in SLOC minus a fixed value  
             "\*, value in SLOC multiplied by a fixed value  
             "/", value in SLOC divided by a fixed value  
             "pow", value in SLOC raised to the power of fixed value  
             "mod", value in SLOC modulo the fixed value  
 VAL=      Fixed value  
 DLOC=      Location where result is stored

LOC=      Location where value will be placed  
 VAL=      Fixed value

**MAXIMUM** finds the highest value in a group of samples. When #SAMP is greater than 0, each execution of the instruction stores the greater of SLOC and DLOC1 in DLOC1 until #SAMP values have been taken, then copies DLOC1 to DLOC2 and begins again. (DLOC1 is re-initialized).

**L1 = F(L2)** performs a function on the value in location SLOC and stores the result in location DLOC. For example, find the cosine of the value in location 10 and storing the result in location 12. The atan2 function finds the arctangent using two consecutive arguments beginning with location SLOC. Results are in degrees.

In special applications it may be preferable to collect samples based on other events or times. For these applications #SAMP is set to 0.

When #SAMP=0, each execution of the instruction stores the greater of SLOC and DLOC1 in DLOC1 until FLAG 0 is set (see FLAG instruction), then copies DLOC1 to DLOC2 and begins again. (DLOC1 is re-initialized).

SLOC=      Location where object of function is stored  
 OPER:      "cos", cosine of the value in SLOC  
             "sin", sine of the value in SLOC  
             "acos", arccosine of the value in SLOC  
             "asin", arcsine of the value in SLOC

SLOC=      Location of sample value  
 DLOC1=     Location of current maximum  
 DLOC2=     Location of final maximum  
 #SAMP=     Number of samples to examine (0-32767, note special case for 0)

**MINIMUM** finds the lowest value in a group of samples. When #SAMP is greater than 0, each execution of the instruction stores the lesser of SLOC and DLOC1 in DLOC1 until #SAMP values have been taken, then copies DLOC1 to DLOC2 and begins again. (DLOC1 is re-initialized). In special applications it may be preferable to collect samples based on other events or times. For these applications #SAMP is set to 0.

When #SAMP=0, each execution of the instruction stores the lesser of SLOC and DLOC1 in DLOC1 until FLAG 0 is set (see FLAG instruction), then copies DLOC1 to DLOC2 and begins again. (DLOC1 is re-initialized).

SLOC= Location of sample value  
 DLOC1= Location of current minimum  
 DLOC2= Location of final minimum  
 #SAMP= Number of samples to examine  
 (0-32767, note special case for 0)

**OUTPUT mA** produces a specified output current using MODEL 26729 CURRENT OUTPUT MODULE. Up to 4 current output modules may be installed in the 26700. See the wiring diagram in Appendix E for additional details.

Use the MULT and OFFS parameters to scale the output. Maximum output per channel is 20 mA and only positive current values will be recognized.

SLOC= Location of value to convert to milliamp out put  
 CHAN= 1st digit is module number (0-3)  
 2nd digit is channel number (0-3)  
 MULT= Multiplier  
 OFFS= Offset

**OUTPUT mV** produces a specified output voltage using MODEL 26728 VOLTAGE OUTPUT MODULE. Up to 4 voltage output modules may be installed in the 26700. See the wiring diagram in Appendix E for additional details.

Use the MULT and OFFS parameters to scale the output. Maximum output per channel is ±5000 mV.

SLOC= Location number of value to convert to millivolt output  
 CHAN= 1st digit is module number (0-3)  
 2nd digit is channel number (0-3)  
 MULT= Multiplier  
 OFFS= Offset

**PRN BUF NESW** takes the angular wind direction value from a temporary storage location and puts it in the print buffer in terms of a compass point description (N, NNE, NE, ENE, E, etc...). The description can be placed in any column (buffer position) in the print buffer. Allow 3 character spaces.

SLOC= Location with angular value to print as compass point  
 COL= Column number (position) in print buffer

**PRN BUF OUT** sends the contents of the print buffer to a MODEL 26731 PRINTER MODULE. Up to 4 printer modules may be installed in the 26700.

CHAN= module number (0-3)

**PRN BUF TXT** puts 7 text characters in a specified position in the print buffer. Use this instruction to create labels or special messages. Allow 7 character spaces.

Special ASCII characters may be insert by using the special form "¥hh" where "¥" is the last character in the character selection list and "hh" is the hexadecimal value of the ASCII character. For example, ¥01 represents the ASCII code for CNTL-A. Note that each special character occupies only one character in the print buffer, not 3 as it might appear.

COL= Column number (position) in print buffer  
 TEXT= Text to be placed in print buffer

**PRN BUF TIME** puts the time from the internal real time clock in a specified position in the print buffer. Several time formats are available. Leap years are handled automatically.

COL= Column number (position) in print buffer  
 FRMT= HOUR, 00 24 hour format, 2 spaces  
 MIN, 00 format, 2 spaces  
 SEC, 00 format, 2 spaces  
 HH:MM, 00:00 24 hr format, 5 spaces  
 H:M:S, 00:00:00 24 hr format, 8 spaces  
 MON, 00 format, 2 spaces  
 DAY, 00 format, 2 spaces  
 YEAR, 00 format, 2 spaces  
 MM-DD, 00-00 format, 5 spaces  
 M-D-Y, 00-00-00 format, 8 spaces  
 DD-MM, 00-00 format, 5 spaces  
 D-M-Y, 00-00-00 format, 8 spaces

**PRN BUF VAL** puts a value from a temporary storage location in a specified position in the print buffer. The width can be set from 1 to 9 digits, also the decimal places. The width value determines the number of spaces to allow in the print buffer.

SLOC= Location holding value to put in print buffer  
 COL= Column number (position) in print buffer  
 WIDTH= Number of digits allowed in number  
 DECPT= Number of digits after the decimal point

**RECORD TIME** puts the time from the internal real time clock in the next available data record field(s). Several time formats are available. Leap years are handled automatically. Note below the number of fields occupied for each format.

FRMT= HOUR, 24 hour format, 1 field  
 MIN, 1 field  
 SEC, 1 field  
 HH:MM, Hour:Min 24 Hour format, 2 fields  
 H:M:S, Hour:Min:Sec 24 hour format, 3 fields  
 MON, Month, 1 fields  
 DAY, Date, 1 fields  
 YEAR, 1 fields  
 MM-DD, Month-Day, 2 fields  
 M-D-Y, Month-Day-Year, 3 fields  
 DD-MM, Day-Month, 2 fields  
 D-M-Y, Day-Month-Year, 3 fields

**RECORD VAL** puts a value from a temporary storage location in the next available record field.

SLOC= Location holding value to record

**RELAY** controls the relay switches on the MODEL 26730 ALARM MODULE. Up to 4 alarm modules may be installed in the 26700. See the wiring diagram in Appendix E for additional details.

CHAN= 1st digit is module number (0-3)  
 2nd digit is relay switch number (0-3)  
 SW= ON, relay switch contacts are closed  
 OFF, relay switch contacts are open



**SER BUF CHKSUM** calculates a checksum based on the contents of the serial output buffer and places it in a designated location. After using this instruction to calculate the checksum, use the SER BUF VAL instruction to put it in the serial buffer.

DLOC= Location where checksum will be placed

**SER BUF NESW** takes the angular wind direction value in degrees from a temporary storage location and puts it in the serial output buffer in terms of a compass point description (N, NNE, NE, ENE, E, etc...). The description can be placed in any column (buffer position) in the serial output buffer. Allow 3 character spaces.

SLOC= Location with angular value to print as compass point  
COL= Column number (position) in serial output buffer

**SER BUF OUT** transmits the contents of the serial output buffer through the serial port on the 26700. See section 2.2, SET COMM, and the SER BUF TXT instruction for additional information.

**SER BUF TXT** puts 7 text characters in a specified position in the serial output buffer. Allow 7 character spaces to be occupied in the serial buffer.

Control codes may be inserted by entering a '¥' character followed by the hexadecimal value for the control code. For example, ¥01 represents the code for ASCII CTRL A. The '¥' character is the last one in the character list. Up to two control codes may be entered with each SER BUF TXT instruction. Note that each control code occupies only one character space in the serial buffer.

Use the special control code ¥FF to manually mark the end of the buffer. When this code is encountered, the buffer is truncated and the BUFFER END codes (CR, LF, or CRLF - see SET COMM, section 5.2) are sent.

COL= Column number (position) in serial output buffer  
TEXT= Text to be placed in serial output buffer

**SER BUF TIME** puts the time from the internal real time clock in a specified position in the serial output buffer. Several time formats are available. Leap years are automatically handled. Note the number of spaces (character positions) each format occupies in the serial output buffer.

COL= Column number (position) in serial output buffer  
FRMT= HOUR, 00 24 hour format, 2 spaces  
MIN, 00 format, 2 spaces  
SEC, 00 format, 2 spaces  
HH:MM, 00:00 24 hr format, 5 spaces  
H:M:S, 00:00:00 24 hr format, 8 spaces  
MON, 00 format, 2 spaces  
DAY, 00 format, 2 spaces  
YEAR, 00 format, 2 spaces  
MM-DD, 00-00 format, 5 spaces  
M-D-Y, 00-00-00 format, 8 spaces  
DD-MM, 00-00 format, 5 spaces  
D-M-Y, 00-00-00 format, 8 spaces

**SER BUF VAL** puts a value from a temporary storage location in a specified position in the serial buffer. The width can be set from 1 to 9 digits, same for the decimal points. The width value determines the number of spaces to allow in the print buffer. Note that if the LEAD 0s parameter is set in SET COMM (see section 2.2), values which occupy less than the allotted width are padded on the left with 0s.

SLOC= Location of value to put in serial output buffer  
COL= Column number (position) in serial output buffer  
WIDTH= Number of digits allowed in number  
DECPT= Number of digits after the decimal point

**STD DEV** calculates the standard deviation of up to 32767 samples. Account for the relationship between the number of samples in this instruction and the SAMPLE INTERVAL under SETUP. For example, calculating the standard deviation of 600 samples with a 1 second sample interval produces a 10 minute (600 seconds), standard deviation. For wind direction standard deviation, use the STD DEV WD instruction.

SLOC= Location of values for standard deviation calculation  
DLOC= Location where result will be placed  
#SAMP= Number of samples to use in calculation (32767 max)

**STD DEV WD** is similar to the STD DEV instruction except that it calculates a standard deviation using 0 to 360° angular wind direction values using the Yamartino method. This method is approved by the US EPA for use in Air Quality monitoring applications.

SLOC= Location of angles for standard deviation calculation  
DLOC= Location where result will be placed  
#SAMP= Number of samples to use in calculation (32767 max)

**SUBR BEGIN** marks the beginning of a subroutine. The subroutine number is assigned in the SUBR# parameter. The subroutine is called from elsewhere in the program by a SUBR CALL instruction. The subroutine block must end with a SUBR END statement. For example,

```
instruction(s)...\nSUBR CALL 01\ninstruction(s)...\n\nSUBR BEGIN 01\ninstruction(s)...\nSUBR END
```

When all instructions in the subroutine block have been executed, program execution resumes with the instruction following the one which called the subroutine. As many subroutines may be used as will fit in the program area and they may be nested to any depth. A SUBR BEGIN without a SUBR END will cause an error if the ERROR HANDLE is set to STOP ON ERR and the unit is in OPERATE mode.

SUBR#= Number of this subroutine block

**SUBR CALL** calls a numbered subroutine. The subroutine number being called is designated by the SUBR# parameter. After a called subroutine is finished, program execution resumes with the instruction following the SUBR CALL. Calling a SUBR that is incorrectly numbered or does not exist will cause an error if the ERROR HANDLE is set to STOP ON ERR and the unit is in OPERATE mode.

SUBR#= Number of subroutine block being called

**SUBR END** ends a subroutine block. A SUBR BEGIN without a SUBR END will cause an error if the ERROR HANDLE is set to STOP ON ERR and the unit is in OPERATE mode.

**UVW CORRECT** applies the Horst correction algorithm to raw UVW values. The 3 raw UVW values must be contiguous starting with the location designated by the SLOC parameter. The results, 3 corrected UVW values, are placed contiguously beginning with the location designated by the DLOC parameter. Corrections for 4 different propeller types are available as designated by the PROP parameter.

SLOC= Location number of first of 3 contiguous raw UVW values  
 SLOC = raw U  
 SLOC + 1 = raw V  
 SLOC + 2 = raw W

DLOC= Location of first of 3 contiguous corrected UVW values  
 DLOC = corrected U  
 DLOC + 1 = corrected V  
 DLOC + 2 = corrected W

PROP= 8254, Young CFT propeller  
 8254EX, Young CFT propeller w/ shaft ext  
 8274, Young EPS propeller  
 8274EX, Young EPS propeller w/ shaft ext

**UVW VECTOR** converts orthogonal UVW values to wind velocity, azimuth, and elevation vector values. The 3 UVW values must be contiguous starting with the location designated by the SLOC parameter. The wind velocity, azimuth, and elevation values are placed contiguously beginning with the location designated by the DLOC parameter. Wind velocity will be calculated in the same units as the UVW values. Azimuth and elevation will be in degrees.

SLOC= Location of first of 3 contiguous UVW values  
 SLOC = U  
 SLOC + 1 = V  
 SLOC + 2 = W

DLOC= Location of first of 3 contiguous output values  
 DLOC = wind velocity  
 DLOC + 1 = azimuth  
 DLOC + 2 = elevation

**WD 540** converts 0-360° wind direction values to a 0-540° range for output to pen-type chart recorders. The 0-540° range helps prevent chart "painting" when wind direction oscillates about the 0/360° transition.

SLOC= Location of 0-360° wind direction value  
 DLOC= Location of 0-540° wind direction value

## 4.0 RECORDING DATA

The 26700 can record up to 24,000 data points in its internal memory. Values are recorded in groups called RECORDS with each value occupying a FIELD within the record. The number of RECORDS can be limited in the SET RECORDS parameter (see section 5.2). Values are recorded so the most recent values occupy the end of the record list.

As an example, suppose you want to record 7 values every 10 minutes (6 times per hour) and have records from only the last 24 hours available. The values you want to record are hours, minutes, seconds, average wind speed, maximum wind speed, average wind direction, and temperature. The SETUP parameters (see section 2.2) would be set as follows:

SAMPLE INTERVAL: 01 1 sample per second  
 FIELDS/REC: 7 fields per record  
 RECORDS: 1446 times/hour x 24 hrs

The PROGRAM instructions would be entered as follows:

```

INP WIND SPEED
  CHAN=00          WIND, channel 00 input
  TYPE= 05XXX     For Young Model 05103 Wind Monitor
  UNIT= M/S       meters per second
  DLOC= 00        Store measurement in
                  location 00

INP WIND DIR
  CHAN= 01        WIND, channel 01 input
  MULT=1.0000
  OFFS= 0.0000
  DLOC= 01        Store measurement in location 01

INP TEMP
  CHAN= 00        TEMP, channel 00 input
  TYPE= 1000     1000 ohm RTD temperature sensor
  UNIT = C        degrees Celsius
  OFFS= 0.0000
  DLOC= 02        Store measurement in location 02

AVERAGE
  SLOC= 00        Average the values in loc 00
                  (wind speed)
                  Store the result in location 10
                  10 min x 60 sec/min x
                  1 sample/sec

DLOC= 10
#SAMP=00600

MAXIMUM
  SLOC= 00        Take the maximum value in loc 00
                  (wind speed)
                  Store the result in location 11
                  10 minutes worth

DLOC= 11
#SAMP=00600

AVERAGE WD
  SLOC=01         Average the values in loc 01
                  (wind direction)
                  Store the result in location 12
                  10 minutes worth

DLOC= 12
#SAMP=00600

IF TIME INTR
  MINS= 10        Execute following instructions every
                  10 minutes

RECORD TIME
  FRMT= HMS       Record hours, minutes, and
                  seconds

RECORD VAL
  SLOC= 10        Record average wind speed from
                  location 10

RECORD VAL
  SLOC= 11        Record maximum wind speed from
                  location 11

RECORD VAL
  SLOC= 12        Record average wind direction from
                  location 12

RECORD VAL
  SLOC= 02        Record temperature from location 02

END IF           End the IF block

PGM END         Program end
  
```

With this arrangement, whenever you EXAMINE RECORDS in the TEST area or retrieve them via serial communications, the hours, minutes, seconds, average wind speed, maximum wind speed, average wind direction, and temperature will always be grouped together and only the last 24 hours of data will be available.

This same scheme can be adapted to numerous applications involving many different measured and calculated values over different time frames.

## 5.0 SERIAL COMMUNICATIONS

The 26700 base unit includes a standard 9-pin RS-232 port for serial communications. Using appropriate cables, the port can be connected to a computer, modem, remote display, another 26700, or other instrument using serial communications. Recorded data, program instructions, setup information, and measurement data may be accessed through this serial connection. Refer to Appendix E for serial wiring details.

Although the 26700 works with almost any general purpose PC communication program, it is supplied with RMYCOMM - a program designed specifically for it. Both Windows 95/98 and DOS versions are supplied. Refer to the README.TXT files on the supplied disk for instructions regarding installation and use.

### IMPORTANT NOTES:

When the 26700 is set to NUM ONLY INP (see section 2.2 SET COMM), the unit will NOT respond to most serial communication control commands.

If you use the 26700 with your own serial communications software (other than RMYCOMM), refer to the DOS version README.TXT file for information on commands and their functions. Also, your communications software MUST provide a 0.1 second delay at the end of each line sent to the 26700. This is especially important when sending a user program.

The 26700 has program instructions allowing it to send and receive measurement values in real-time while in OPERATE mode. These are INP SER and the SER BUF group.

Here is an example of a system using two 26700 Translators. The first 26700 (Local) makes wind speed measurements, displays them, and sends them to the other 26700 (Remote). The Remote unit functions only as a remote display.

### The Local unit program:

```
INP WIND SPD
  CHAN= 00      Measure wind speed on module 0,
                channel 0
  TYPE= 05103   For Young 05103 Wind Monitor
  UNIT= M/S     Units are meters/second
  DLOC=00      Store measurement in location 00

DISPLAY VAL
  SLOC= 00      Take wind speed measurement
                from source location 00
  SCRN=0       Display on Screen 0
  ROW=0        Top row on screen
  COL= 00      Leftmost column of screen
  WIDTH =8     Occupy 8 spaces
  DECPT=1      Display to one decimal place

SER BUF VAL
  SLOC=00      Take wind speed measurement
                from source location 00
  COL= 000     Place at beginning of serial out buffer
  WIDTH= 8     Occupy 8 spaces
  DECPT= 1     Display to one decimal place
  SER BUF OUT  Transmit the serial buffer

PGM END        End of program in Local unit
```

### The Remote unit program:

```
INP SERIAL
  #FLDS=01     Input 1 field
                (wind speed from master)
  DLOC1=00     Place it in location 00

DISPLAY VAL
  SLOC= 00     Take wind speed measurement
                from source location 00
  SCRN= 0      Display on screen 0
  ROW=0        Top row on screen
  COL= 00      Leftmost column of screen
  WIDTH=8      Occupy 8 spaces
  DECPT=1      Display to one decimal place

PGM END        End of program in Remote unit
```

## 6.0 ERROR MESSAGES

When an error occurs during OPERATE mode, the 26700 generates a code identifying the specific type of error. If STOP ON ERROR is set to ON (see section 2.2 SET ERROR HANDLE) and an error occurs, the 26700 will stop operation and display the type of error and the instruction number where it occurred. If STOP ON ERROR is set to OFF and an error occurs, the 26700 continues to operate without stopping. See the IF ERR CODE and L = ERR CODE instructions for information on detecting errors when STOP ON ERROR is OFF. The following list summarizes each error type and its error code value:

- 1 ADC ERROR** indicates that the analog-to-digital converter (ADC) chip on the module in question has taken too long to make a conversion or produced an error code of its own. The Temperature Module can cause this error if it is operated without a sensor connected.  
  
If the ADC error source is anything other than a temperature measurement instruction to an unconnected temperature input channel, contact your supplier.
- 2 MODULE MISSING** indicates that the instruction number shown in the error message refers to a module which is not present. Make sure that the module is actually installed. If it is, check the two digit CHAN parameter in the instruction. It should agree with the module to which the instruction refers. Make sure two or more of the same module type with the same module number are not installed.
- 3 DIVIDE BY ZERO** indicates that an instruction is attempting to divide by zero. Check values or parameters that would cause this to occur in the instruction showing the error.
- 4 ELSE WITHOUT IF** indicates an ELSE statement without a matching IF statement is being used. Check the program listing to find where the missing IF needs to be entered or delete the offending ELSE.
- 5 END IF WITHOUT IF** indicates an END IF statement without a matching IF is being used. Check the program listing to find where the missing IF needs to be added or delete the offending END IF.
- 6 INVALID DATA** indicates that a value is unacceptable. For example, if both values for the ATAN2 instruction are 0.0, this error will be generated. Check the values or parameters for the instruction showing the error.

**7 INVALID PARAMETER** indicates some parameter is unacceptable in the instruction showing the error. For example, displaying a value in row 5 on the screen will cause this error since only rows 0 and 1 are valid.

**8 TIMEOUT ERROR** indicates that the time required for the program to execute all of its instructions exceeds the sample interval time. Either increase the sample interval or eliminate instructions.

**9 SUBROUTINE WITHOUT END** indicates that a subroutine has no matching SUBR END statement. Insert the needed SUBR END statement or delete the offending SUBR statement.

**10 CALL WITHOUT SUBROUTINE** indicates a call was made to a nonexistent subroutine. Make sure the number of the subroutine matches the number of the subroutine being called.

**11 END WITHOUT SUBROUTINE** indicates a SUBR END statement has no matching SUBR statement. Insert the needed SUBR statement or delete the offending SUBR END statement.

**12 DATA OVERRUN** indicates the data being loaded in either the serial or printer output buffers exceeds their capacity. Either increase the buffer size in SETUP or make sure the data stays within the buffer size limit.

**13 SERIAL INPUT ERROR** indicates that an incorrect number of fields has been received by the INP SERIAL instruction. The number of fields transmitted must agree with the number expected as set by the #FLDS parameter in the INP SERIAL instruction.

**14 IF WITHOUT END IF** indicates an IF statement is being used without a matching END IF statement. Check the program listing to find where the missing END IF needs to be entered or delete the offending IF.

**15 PRINTER ERROR** indicates the following possible conditions: printer off-line, out of paper, cable disconnected, printer is off or has no power.

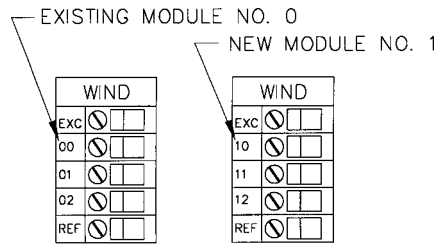
**16 DATA OFF-SCALE** indicates that values sent to the OUTPUT mV or OUTPUT mA instructions exceed the allowable output range.

## 7.0 INSTALLING PLUG-IN MODULES

Additional modules are easily installed in the 26700. Modules are available from your YOUNG representative. To install a new module, follow these steps (make sure power is off):

1. Check the module number against modules of the same type already installed. The first digit of the new module (0, 1, 2 or 3) should be different. (See following diagram)
2. Remove 4 screws securing back panel. Remove back panel; sensor wires can remain attached.
3. Carefully plug new circuit module into next available slot in translator mother board. Be sure connector is fully inserted.
4. Remove filler door covering back panel opening.
5. Replace back panel and screws.
6. Connect sensor wires to new module.

Additional program instructions may be required when modules are added. Be sure to use the correct two-digit channel number when setting instruction parameters.



EXAMPLE SHOWING CORRECT INSTALLATION OF 2 WIND MODULES

## 8.0 OPTION JUMPERS

There are 6 staking pin type jumpers on the Model 26724 POWER SUPPLY module that establish several default conditions when power is applied. Their functions are outlined below.

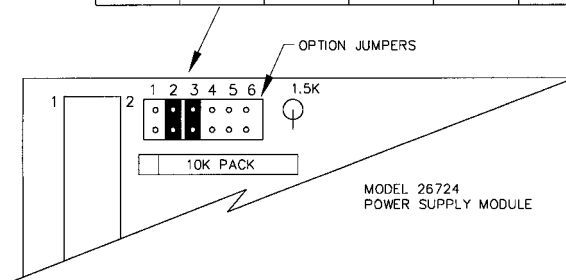
### JUMPER FUNCTION

- 1 First power-up override. Factory only. Do not use.  
Baud rate
- 2 & 3 2 & 3 - 9600 baud  
2 - 4800 baud  
3 - 2400 baud  
none - 1200 baud
- 4 Force first power-up reset. Factory only. Do not use.
- 5 Force auto-start to OPERATE mode on power-up.
- 6 Force auto-start to OPERATE mode on power-up & lock out key switches.

Configuring the jumpers should be performed only by a qualified technician.

To access the OPTION JUMPERS, disconnect the power source, remove the 4 screws holding the top cover and remove it. The Power Supply module is the one that connects to the power source (wall adapter or otherwise). The OPTION JUMPERS are along the top edge of the circuit board toward the front of the unit and appear as shown in the illustration below. Configure the shorting blocks to the desired pattern then replace the top cover and screws. Reconnect the power source.

| JUMPER  | 1   | 2 & 3 = | BAUD    | 4      | 5        | 6 |
|---------|-----|---------|---------|--------|----------|---|
| BYPASS  | 0 0 | 1200    | FORCE   | FORCED | LOCK     |   |
| FIRST   | 0 1 | 2400    | FIRST   | AUTO   | OUT      |   |
| POWERUP | 1 0 | 4800    | POWERUP | START  | KEY      |   |
| RESET   | 1 1 | 9600    | RESET   |        | SWITCHES |   |



## 9.0 WARRANTY

---

This product is warranted to be free of defects in materials and construction for a period of 12 months from date of initial purchase. Liability is limited to repair or replacement of defective item. A copy of the warranty policy may be obtained from R. M. Young Company.

## 10.0 CE COMPLIANCE

---

This product, has been tested and shown to comply with European CE requirements for the EMC Directive (see Declaration of Conformity below). Please note that shielded cable and Model 26760 RF Suppression Kit (or equivalent) must be used.

### Declaration of Conformity

**Application of Council Directives:**  
89/336/EEC

**Standards to which Conformity is Declared:**  
EN 50081-1  
EN 55022 (CISPR 22 class A)  
EN 50082-1 (IEC 801-2, 3, 4)

**Manufacturer's Name and Address:**  
R. M. Young Company  
Traverse City, MI, 49686, USA

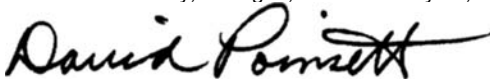
**Importer's Name and Address:**  
See Shipper or Invoice

**Type of Equipment:**  
Meteorological Instruments

**Model Number / Year of Manufacture:**  
26700/1996

I, the undersigned, hereby declare that the equipment specified conforms to the above Directives and Standards.

**Date / Place:**  
Traverse City, Michigan, USA February 19, 1996



David Poinsett  
R & D Manager, R. M. Young Company

## 11.0 REPLACING THE BACKUP BATTERY

---

When the 26700 is not powered, the realtime clock, recorded data, user program, and setup parameters are maintained by a lithium battery on the backside of the microprocessor module. Each time the unit is powered up, the battery condition is checked and displayed momentarily on the screen. The battery is also checked periodically during operation and the 26700 will beep once per minute if the battery needs replacing.

When indicated, the battery should be replaced by a qualified technician. To replace the battery:

1. Disconnect all power.
2. Remove the 26700 back panel.
3. Remove the Microprocessor Module. (It has the DB-9 connector on it.)
4. Carefully remove the lithium battery from its holder.
5. Place the new battery (type DL-2450) in the holder.
6. Carefully replace the microprocessor module in the case. Be sure the board connector is fully inserted and properly seated.
7. Replace the 26700 back panel.
8. Reconnect power.

The 26700 realtime clock will need to be reset (see section 2.2 SET TIME/DATE) and the user program and setup parameters re-entered (see sections 2.2 SETUP, 3.0 PROGRAMMING, or 5.0 SERIAL COMMUNICATIONS). Any data recorded prior to replacing the battery should be considered invalid.

## APPENDIX A

---

### SPECIFICATIONS - 26700 SERIES PROGRAMMABLE TRANSLATOR

---

Dimensions 3.1 in (79 mm)H x 8.5 in (216 mm)W x 8.8 in (224 mm)D  
Weight: Base Unit 2.8 lb (1.26 kg), Each Module 0.22 lb (0.10 kg)  
Construction: Aluminum case, thermoplastic front and back panels.  
Operating Temp/Humidity: 0° C to 50° C, 0 to 95% RH (non-condensing).  
Storage Temperature: -30° C to 80° C  
Display: 2 rows x 16 columns alpha-numeric LCD with back-lighting  
Power Requirements: 7 - 30 VDC, 9W  
24VDC wall adapter supplied, UL & CSA or VDE listed  
Serial Interface: RS-232, 9-pin, 300 to 9600 baud, 9600 baud default  
Record Memory: 24,000 data points with battery back-up. Values are stored as single precision floating point numbers, Value range : -3.4E-38 to 3.4E38, Approx 6-digit precision (Base 10).

Modules: 5 available slots for modules. Modules may be used in any combination. Up to 4 of any module type may be used in the same enclosure. The specifications listed below are for the modules only and do not represent the accuracy of the sensors to which they are connected.

26725 Wind Speed/Direction Input:  
3 input channels per module. Each channel may be configured for wind speed or wind direction. Wind speed channel may be configured for voltage or frequency input through software instructions.  
Frequency Input (low level sine or square wave, 4KHz max), internal counter has 16-bit capacity (0 to 65,535) Voltage Input Range 0 to 5VDC for wind speed or direction, 10-bit resolution and accuracy (1/1023). 5.00VDC excitation for wind direction sensors

26726 Temperature Input:  
2 channels per module. Software configurable for 100 ohm DIN or 1000 ohm RTD sensors. Scaling and offset also software configurable (°F and °C std). 60 Hz rejection, 5 ppm/°C tempco. ±0.01°C resolution, ±0.03°C uncalibrated accuracy.

26727 Voltage Input:  
Software configurable as 4 single ended, 2 single ended and 1 differential, or 2 differential inputs per module. Input range, multiplier, and offset also software configurable. ±12-bit resolution (±1/4095), 0.1% uncalibrated accuracy, 15 ppm/°C tempco.  
Input Ranges: ±50mV, ±500mV, ±5000mV

26728 Voltage Output:  
4 channels per module. Output range -5000mV to +5000mV. 14-bit resolution (0.6mV). 0.1% uncalibrated accuracy, 15 ppm/°C tempco.

26729 Current Output:  
4 channels per module. Output range 0 to 24mA. 14-bit resolution (0.001mA). 0.1% uncalibrated accuracy, 15 ppm/°C tempco. Maximum load resistance is 300 ohms for each output.

26730 Alarm/Relay Module:  
4 relays per module. Contacts rating : 5A resistive, 2A inductive @ 24 VAC, 30 VDC

26731 Parallel Printer Module:  
Output for standard parallel printer. Cable included

26732 Current Input:  
Same as 26727 Voltage Input module except all 4 input channels configured for single ended current input. Input Range 0 to 22mA.

## APPENDIX B

### PROGRAM EXAMPLES

The following sample program measures Wind Speed, Wind Direction, Temperature and Relative Humidity. It contains useful programming examples. The actual program in your unit may be different.

Comments are added here for clarity.

| Instruction Number | Name/Parameters  | Comment   |
|--------------------|--|---|
| 1                  | IF TIME INTR<br>mins=60  | If time is at the top of the hour   |
| 2                  | FLAG<br>flag#=7<br>fcond=set   | Set flag number 7.  |
| 3                  | END IF   |   |
| 4                  | INP WIND SPD<br>chan=00<br>type=05103<br>unit=MPH<br>mult=0.21922<br>offs=0.00000<br>dloc=00 | Input a wind speed signal from Wind Input module 0, channel 0. Sensor is a Young Model 05103. Measurement units are miles per hour. Multiplier for MPH units. Offset is zero. Store measurement in location 00. |
| 5                  | AVERAGE<br>sloc=00<br>dloc=01<br>#samp=00060   | Calculate the average of the value in location 00 and store the result in location 01. Use 60 samples to calculate average.   |
| 6                  | DISPLAY VAL<br>sloc=00<br>scrn=0<br>row=0<br>col=03<br>width=5<br>decpt=0                    | Display the instantaneous wind speed from location 00 on screen 0, row 0, column 3, using 5 spaces with no decimal point.   |
| 7                  | DISPLAY VAL<br>sloc=01<br>scrn=0<br>row=0<br>col=08<br>width=4<br>decpt=0                    | Display the average wind speed from location 01 on screen 0, row 0, column 8, using 4 spaces with no decimal point.   |
| 8                  | IF FLAG<br>flag#=7<br>fcond=set  | If flag 7 is set (top of the hour has occurred)   |
| 9                  | AVERAGE<br>sloc=00<br>dloc=02<br>#samp=03600   | Calculate the average wind speed from location 00 and store the result in location 02. Use 3600 samples to calculate the average.   |
| 10                 | MAXIMUM<br>sloc=00<br>dloc1=03<br>dloc2=04<br>#samp=03600                                    | Calculate the maximum wind speed from location 00. Store the current maximum in location 03. Store the last maximum value in location 04. Use 3600 samples to calculate the maximum.                            |
| 11                 | DISPLAY VAL<br>sloc=03<br>scrn=0<br>row=0  | Display the current maximum from location 03 on screen 0, row 1,  |

|    |  |  |
|----|--|--|
|    | col=12<br>width=4<br>decpt=0   | column 12,<br>using 4 spaces<br>with no decimal point.   |
| 12 | END IF   |  |
| 13 | INP WIND DIR<br>chan=01<br>mult=1.00000<br>offs=0.00000<br>dloc=10                             | Measure wind direction<br>from Wind Input module 0, channel 1.<br>Use a multiplier of 1,<br>an offset of 0,<br>and send the result location 10.  |
| 14 | AVERAGE WD<br>sloc=10<br>dloc=11<br>#samp=00060  | Calculate the average wind direction<br>from location 10.<br>Put the result in location 11.<br>Use 60 samples to calculate it.   |
| 15 | STD DEV WD<br>sloc=10<br>dloc=12<br>#samp=00060  | Calculate the standard deviation of wind direction<br>from location 10<br>and store the result in location 12.<br>Use 60 samples for the calculation.  |
| 16 | DISPLAY VAL<br>sloc=10<br>scrn=1<br>row=0<br>col=04<br>width=4<br>decpt=0                      | Display the wind direction<br>from location 10<br>on screen 1,<br>row 0,<br>column 4,<br>using 4 spaces<br>with no decimal point.  |
| 17 | DISPLAY VAL<br>sloc=11<br>scrn=1<br>row=0<br>col=08<br>width=4<br>decpt=0                      | Display the average wind direction<br>from location 11<br>on screen 1,<br>row 0,<br>column 8,<br>using 4 spaces<br>with no decimal point.  |
| 18 | DISPLAY VAL<br>sloc=12<br>scrn=1<br>row=0<br>col=12<br>width=4<br>decpt=0                      | Display the std deviation of wind direction<br>from location 12<br>on screen 1,<br>row 0,<br>column 12,<br>using 4 spaces<br>with no decimal point.  |
| 19 | IF FLAG<br>flag#=7<br>fcond=set  | If flag 7 is set (top of the hour has occurred)  |
| 20 | AVERAGE WD<br>sloc=10<br>dloc=13<br>#samp=03600  | Calculate the average wind direction<br>from location 10.<br>Put the result in location 13.<br>Use 3600 samples to calculate the average.  |
| 21 | STD DEV WD<br>sloc=10<br>dloc=14<br>#samp=03600  | Calculate the std deviation of wind direction<br>from location 10.<br>Put the result in location 14.<br>Use 3600 samples to calculate the std deviation.   |
| 22 | END IF   |  |
| 23 | INP VOLTAGE<br>chan=00<br>type=diff<br>range=5000mV<br>mult=0.18000<br>offs=-58.000<br>dloc=20 | Input the temperature voltage signal<br>from voltage input module 0, channel 0.<br>Measurement is differential.<br>Input Range is $\pm 5000$ mV.<br>Multiplier is 0.18 (for Fahrenheit).<br>Offset is -58 (for Fahrenheit).<br>Put temperature measurement in location 20. |



|    |  |  |
|----|--|--|
| 24 | <pre> DISPLAY VAL   sloc=20   scrn=2   row=0   col=03   width=5   decpt=1 </pre>                     | <p>Display temperature<br/>from location 20<br/>on screen 2,<br/>row 0,<br/>column 3,<br/>using 5 spaces<br/>with 1 decimal place.</p>   |
| 25 | <pre> IF FLAG   flag#=7   fcond=set </pre>   | <p>If flag 7 is set (top of the hour has occurred)</p>   |
| 26 | <pre> AVERAGE   sloc=20   dloc=21   #samp=03600 </pre>   | <p>Calculate the average temperature<br/>from the values in location 20.<br/>Store the result in location 21.<br/>Use 3600 samples to calculate the average.</p>   |
| 27 | <pre> MINIMUM   sloc=20   dloc1=22   dloc2=23   #samp=03600 </pre>                                   | <p>Calculate the minimum temperature<br/>from location 20.<br/>Store the current minimum in location 22.<br/>Store the last minimum in location 23<br/>Use 3600 samples the calculate the minimum temperature.</p>                                     |
| 28 | <pre> MAXIMUM   sloc=20   dloc1=24   dloc2=25   #samp=03600 </pre>                                   | <p>Calculate the maximum temperature<br/>from location 20.<br/>Store the current maximum in location 24.<br/>Store the last maximum in location 25.<br/>Use 3600 samples to calculate the maximum temperature.</p>                                     |
| 29 | <pre> DISPLAY VAL   sloc=22   scrn=2   row=0   col=08   width=4   decpt=0 </pre>                     | <p>Display the current minimum temperature<br/>from location 22<br/>on screen 2,<br/>row 0,<br/>column 8,<br/>using 4 spaces<br/>with no decimal point.</p>  |
| 30 | <pre> DISPLAY VAL   sloc=24   scrn=2   row=0   col=12   width=4   decpt=0 </pre>                     | <p>Display the current maximum temperature<br/>from location 24<br/>on screen 2,<br/>row 0,<br/>column 12,<br/>using 4 spaces<br/>with no decimal point.</p>   |
| 31 | <pre> END IF </pre>  |  |
| 32 | <pre> INP VOLTAGE   chan=02   type=diff   range=5000mV   mult=0.10000   ofs=0.00000   dloc=40 </pre> | <p>Input the RH voltage signal<br/>from Voltage Input module 0, channel 1.<br/>Measurement is differential.<br/>Input range is <math>\pm 5000</math> mV.<br/>Multiplier is 0.1 for 0 to 100% RH.<br/>Offset is 0.<br/>Store result in location 40.</p> |
| 33 | <pre> DISPLAY VAL   sloc=40   scrn=3   row=0   col=04   width=4   decpt=0 </pre>                     | <p>Display the RH value<br/>from location 40<br/>on screen 3,<br/>row 0,<br/>column 4,<br/>using 4 spaces<br/>with no decimal point.</p>   |
| 34 | <pre> IF FLAG   flag#=7   fcond=set </pre>   | <p>If flag 7 is set (top of the hour has occurred)</p>   |
| 35 | <pre> AVERAGE   sloc=40   dloc=41   #samp=03600 </pre>   | <p>Calculate the average RH<br/>from location 40.<br/>Store the result in location 41.<br/>Use 3600 samples to calculate the average RH.</p>   |

|    |   |   |
|----|---|---|
| 36 | MINIMUM<br>sloc=40<br>dloc1=42<br>dloc2=43<br>#samp=03600                 | Calculate the minimum RH<br>from location 40.<br>Store the current minimum in location 42.<br>Store the last minimum in location 43<br>Use 3600 samples the calculate the minimum RH. |
| 37 | MAXIMUM<br>sloc=40<br>dloc1=44<br>dloc2=45<br>#samp=03600                 | Calculate the maximum RH<br>from location 40.<br>Store the current maximum in location 44.<br>Store the last maximum in location 45.<br>Use 3600 samples to calculate the maximum RH. |
| 38 | DISPLAY VAL<br>sloc=42<br>scrn=3<br>row=0<br>col=08<br>width=4<br>decpt=0 | Display the current minimum RH<br>from location 42<br>on screen 3,<br>row 0,<br>column 8,<br>using 4 spaces<br>with no decimal point.   |
| 39 | DISPLAY VAL<br>sloc=44<br>scrn=3<br>row=0<br>col=12<br>width=4<br>decpt=0 | Display the current maximum RH<br>from location 44<br>on screen 3,<br>row 0,<br>column 12,<br>using 4 spaces<br>with no decimal point.  |
| 40 | END IF  |   |
| 41 | IF TIME INTR<br>mins=60   | If the time is at the top of the hour   |
| 42 | RECORD TIME<br>frmt=mm-dd   | Record the month and day.   |
| 43 | RECORD TIME<br>frmt=hh:mm   | Record the hours and minutes.   |
| 44 | RECORD VALUE<br>sloc=02   | Record the average wind speed<br>from location 02.  |
| 45 | RECORD VALUE<br>sloc=04   | Record the maximum wind speed<br>from location 04.  |
| 46 | RECORD VALUE<br>sloc=13   | Record the average wind direction<br>from location 13.  |
| 47 | RECORD VALUE<br>sloc=14   | Record the std deviation of wind direction<br>from location 14.   |
| 48 | RECORD VALUE<br>sloc=21   | Record the average temperature<br>from location 21.   |
| 49 | RECORD VALUE<br>sloc=23   | Record the minimum temperature<br>from location 23.   |
| 50 | RECORD VALUE<br>sloc=25   | Record the maximum temperature<br>from location 25.   |
| 51 | RECORD VALUE<br>sloc=41   | Record the average RH<br>from location 41.  |
| 52 | RECORD VALUE<br>sloc=43   | Record the minimum RH<br>from location 43.  |
| 53 | RECORD VALUE<br>sloc=45   | Record the maximum RH<br>from location 45.  |
| 54 | END IF  |   |
| 55 | PGM END   |   |

Typical program as it appears when uploaded using the CTRL-U command:

| CODE |    |         |         |         |         |    | DESCRIPTION                         |
|------|----|---------|---------|---------|---------|----|-------------------------------------|
| 8233 |    |         |         |         |         |    | Program header code                 |
| 17   | 60 |         |         |         |         |    | If time interval                    |
| 12   | 7  | 1       |         |         |         |    | Flag set                            |
| 11   |    |         |         |         |         |    | End if                              |
| 24   | 00 | 1       | 1       | 0.21922 | 0.00000 | 00 | Input wind speed                    |
| 1    | 00 | 01      | 00060   |         |         |    | Calculate avg wind speed            |
| 9    | 00 | 0       | 0       | 03      | 5       | 0  | Display wind speed                  |
| 9    | 01 | 0       | 0       | 08      | 4       | 0  | Display avg wind speed              |
| 13   | 7  | 1       |         |         |         |    | If flag set                         |
| 1    | 00 | 02      | 03600   |         |         |    | Calculate average wind speed        |
| 31   | 00 | 03      | 04      | 03600   |         |    | Calculate max wind speed            |
| 9    | 03 | 0       | 0       | 12      | 4       | 0  | Display max wind speed              |
| 11   |    |         |         |         |         |    | End if                              |
| 23   | 01 | 1.00000 | 0.00000 | 10      |         |    | Input wind direction                |
| 2    | 10 | 11      | 00060   |         |         |    | Calculate avg wind direction        |
| 50   | 10 | 12      | 00060   |         |         |    | Calculate std dev of wind direction |
| 9    | 10 | 1       | 0       | 04      | 4       | 0  | Display wind direction              |
| 9    | 11 | 1       | 0       | 08      | 4       | 0  | Display avg wind direction          |
| 9    | 12 | 1       | 0       | 12      | 4       | 0  | Display std dev of wind direction   |
| 13   | 7  | 1       |         |         |         |    | If flag set                         |
| 2    | 10 | 13      | 03600   |         |         |    | Calculate avg wind direction        |
| 50   | 10 | 14      | 03600   |         |         |    | Calculate std dev of wind direction |
| 11   |    |         |         |         |         |    | End if                              |
| 22   | 00 | 1       | 0       | 0.18000 | -58.000 | 20 | Input voltage as temperature        |
| 9    | 20 | 2       | 0       | 03      | 5       | 1  | Display temperature                 |
| 13   | 7  | 1       |         |         |         |    | If flag set                         |
| 1    | 20 | 21      | 03600   |         |         |    | Calculate avg temperature           |
| 32   | 20 | 22      | 23      | 03600   |         |    | Calculate min temperature           |
| 31   | 20 | 24      | 25      | 03600   |         |    | Calculate max temperature           |
| 9    | 22 | 2       | 0       | 08      | 4       | 0  | Display current min temperature     |
| 9    | 24 | 2       | 0       | 12      | 4       | 0  | Display current max temperature     |
| 11   |    |         |         |         |         |    | End if                              |
| 22   | 02 | 1       | 0       | 0.10000 | 0.00000 | 40 | Input voltage as RH                 |
| 9    | 40 | 3       | 0       | 04      | 4       | 0  | Display RH                          |
| 13   | 7  | 1       |         |         |         |    | If flag set                         |
| 1    | 40 | 41      | 03600   |         |         |    | Calculate avg RH                    |
| 32   | 40 | 42      | 43      | 03600   |         |    | Calculate min RH                    |
| 31   | 40 | 44      | 45      | 03600   |         |    | Calculate max RH                    |
| 9    | 42 | 3       | 0       | 08      | 4       | 0  | Display current min RH              |
| 9    | 44 | 3       | 0       | 12      | 4       | 0  | Display current max RH              |
| 11   |    |         |         |         |         |    | End if                              |
| 17   | 60 |         |         |         |         |    | If time interval (60 minutes)       |
| 40   | 8  |         |         |         |         |    | Record time (month and day)         |
| 40   | 3  |         |         |         |         |    | Record time (hour and minute)       |
| 41   | 02 |         |         |         |         |    | Record avg wind speed               |
| 41   | 04 |         |         |         |         |    | Record max wind speed               |
| 41   | 13 |         |         |         |         |    | Record avg wind direction           |
| 41   | 14 |         |         |         |         |    | Record std dev of wind direction    |
| 41   | 21 |         |         |         |         |    | Record avg temperature              |
| 41   | 23 |         |         |         |         |    | Record min temperature              |
| 41   | 25 |         |         |         |         |    | Record max temperature              |
| 41   | 41 |         |         |         |         |    | Record avg RH                       |
| 41   | 43 |         |         |         |         |    | Record min RH                       |
| 41   | 45 |         |         |         |         |    | Record max RH                       |
| 11   |    |         |         |         |         |    | End if                              |
| 0    |    |         |         |         |         |    | End of program                      |

Continued on next page...

| <u>CODES</u> | <u>DESCRIPTION</u> | <u>CODES</u>     | <u>DESCRIPTION</u> |
|--------------|--------------------|------------------|--------------------|
| 00144        | 144 Records        | 9                | Field 17           |
| 14           | 14 Fields          | 1                |                    |
| R M YOUNG    | Record Header 1    | FLDLABEL1        |                    |
| 26700 SERIES | Record Header 2    | FLDLABEL2        |                    |
| 5            | Field 1 Width      | 9                | Field 18           |
| 0            | Field 1 Decimal    | 1                |                    |
| DATE         | Field 1 Label 1    | FLDLABEL1        |                    |
| MON          | Field 2 Label 2    | FLDLABEL2        |                    |
| 5            | Field 2            | 9                | Field 19           |
| 0            |                    | 1                |                    |
| DATE         |                    | FLDLABEL1        |                    |
| DAY          |                    | FLDLABEL2        |                    |
| 5            | Field 3            | 9                | Field 20           |
| 0            |                    | 1                |                    |
| TIME         |                    | FLDLABEL1        |                    |
| HR           |                    | FLDLABEL2        |                    |
| 5            | Field 4            | 9                | Field 21           |
| 0            |                    | 1                |                    |
| TIME         |                    | FLDLABEL1        |                    |
| MIN          |                    | FLDLABEL2        |                    |
| 7            | Field 5            | 9                | Field 22           |
| 1            |                    | 1                |                    |
| WS:AVG       |                    | FLDLABEL1        |                    |
| MPH          |                    | FLDLABEL2        |                    |
| 7            | Field 6            | 9                | Field 23           |
| 0            |                    | 1                |                    |
| WS:MAX       |                    | FLDLABEL1        |                    |
| MPH          |                    | FLDLABEL2        |                    |
| 7            | Field 7            | 9                | Field 24           |
| 0            |                    | 1                |                    |
| WD:AVG       |                    | FLDLABEL1        |                    |
| DEG          |                    | FLDLABEL2        |                    |
| 7            | Field 8            | 9                | Field 25           |
| 0            |                    | 1                |                    |
| WD:SDV       |                    | FLDLABEL1        |                    |
| DEG          |                    | FLDLABEL2        |                    |
| 7            | Field 9            | MPH              | Screen 0,          |
| 1            |                    | WIND ins avg max |                    |
| T:AVG        |                    | 1                |                    |
| DEG F        |                    | DIR              | Screen 1           |
| 7            | Field 10           | WIND deg avg sdv |                    |
| 1            |                    | _F               | Screen 2           |
| T:MIN        |                    | TEMP ins min max |                    |
| DEG F        |                    | RH%              | Screen 3           |
| 7            | Field 11           | HUM ins min max  |                    |
| 1            |                    | UNUSED           | Screen 4           |
| T:MAX        |                    | SCREEN 4         |                    |
| DEG F        |                    | UNUSED           | Screen 5           |
| 7            | Field 12           | SCREEN 5         |                    |
| 0            |                    | UNUSED           | Screen 6           |
| RH:AVG       |                    | SCREEN 6         |                    |
| %            |                    | UNUSED           | Screen 7           |
| 7            | Field 13           | SCREEN 7         |                    |
| 0            |                    | UNUSED           | Screen 8           |
| RH:MIN       |                    | SCREEN 8         |                    |
| %            |                    | UNUSED           | Screen 9           |
| 7            | Field 14           | SCREEN 9         |                    |
| 0            |                    | <b>CODES</b>     | <b>DESCRIPTION</b> |
| RH:MAX       |                    |                  |                    |
| %            |                    |                  |                    |
| 9            | Field 15           | 1                | Serial Buffer End  |
| 1            |                    |                  | Code               |
| FLDLABEL1    |                    | 0                | Leading Zero Flag  |
| FLDLABEL2    |                    |                  |                    |
| 9            | Field 16           |                  |                    |
| 1            |                    |                  |                    |
| FLDLABEL1    |                    |                  |                    |
| FLDLABEL2    |                    |                  |                    |

## **APPENDIX C**

---

### **PROGRAM WORKSHEETS**

---

Copy the blank worksheets and fill in the copies as needed.



# 26700 Display Worksheet

Screen Number

Row

|   | Column |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
|---|--------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
|   | 0      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 0 |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| 1 |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |

Screen Number

Row

|   | Column |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
|---|--------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
|   | 0      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 0 |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| 1 |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |

Screen Number

Row

|   | Column |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
|---|--------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
|   | 0      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 0 |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| 1 |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |

Screen Number

Row

|   | Column |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
|---|--------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
|   | 0      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 0 |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| 1 |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |

Screen Number

Row

|   | Column |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
|---|--------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
|   | 0      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 0 |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| 1 |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |

## 26700 Temporary Storage Location Worksheet

| Loc | Contents | Loc | Contents | Loc | Contents | Loc | Contents |
|-----|----------|-----|----------|-----|----------|-----|----------|
| 00  |          | 25  |          | 50  |          | 75  |          |
| 01  |          | 26  |          | 51  |          | 76  |          |
| 02  |          | 27  |          | 52  |          | 77  |          |
| 03  |          | 28  |          | 53  |          | 78  |          |
| 04  |          | 29  |          | 54  |          | 79  |          |
| 05  |          | 30  |          | 55  |          | 80  |          |
| 06  |          | 31  |          | 56  |          | 81  |          |
| 07  |          | 32  |          | 57  |          | 82  |          |
| 08  |          | 33  |          | 58  |          | 83  |          |
| 09  |          | 34  |          | 59  |          | 84  |          |
| 10  |          | 35  |          | 60  |          | 85  |          |
| 11  |          | 36  |          | 61  |          | 86  |          |
| 12  |          | 37  |          | 62  |          | 87  |          |
| 13  |          | 38  |          | 63  |          | 88  |          |
| 14  |          | 39  |          | 64  |          | 89  |          |
| 15  |          | 40  |          | 65  |          | 90  |          |
| 16  |          | 41  |          | 66  |          | 91  |          |
| 17  |          | 42  |          | 67  |          | 92  |          |
| 18  |          | 43  |          | 68  |          | 93  |          |
| 19  |          | 44  |          | 69  |          | 94  |          |
| 20  |          | 45  |          | 70  |          | 95  |          |
| 21  |          | 46  |          | 71  |          | 96  |          |
| 22  |          | 47  |          | 72  |          | 97  |          |
| 23  |          | 48  |          | 73  |          | 98  |          |
| 24  |          | 49  |          | 74  |          | 99  |          |





## APPENDIX D

### MENU STRUCTURE & PROGRAM INSTRUCTIONS

#### OPERATE SETUP

SET TIME/DATE  
SET SAMPLE INTERVAL  
ENTER/EDIT PROGRAM  
ERASE PROGRAM  
SET RECORDER  
  SET HEADER 1  
  SET HEADER 2  
  FIELDS PER RECORD  
  RECORDS  
  SET FIELDS  
    FIELD NUMBER  
    WIDTH  
    DECPT  
    LABEL  
  CLEAR RECORDS  
SET SCROLL  
  SCROLL (Y/N)  
  INTERVAL  
  END SCREEN  
  SET SCREEN TEXT  
  SCREEN NUMBER  
SET COMM  
  BAUD RATE  
  DATA BITS  
  PARITY  
  BUFFER LENGTH  
  BUFFER END  
  ECHO (Y/N)  
  LEAD 0s (Y/N)  
  INIT STR LEN  
  INIT STR  
  NUM ONLY INP  
  MAX SER ERRS  
SET PRINTER  
  LINE LENGTH  
  PAGE LENGTH  
  INIT STR LEN  
  INIT STR  
SET AUTO-START  
SET ERROR HANDLE  
SET AUTO LABEL CHANGE  
SET ACCESS LEVEL  
  FULL  
  PARTIAL  
  NONE

#### TEST

TEST LCD  
TEST RAM  
TEST ROM  
TEST PROGRAM CHECKSUM  
TEST SERIAL I/O  
TEST PRINTER  
TEST VOUTPUT  
TEST V INPUT  
TEST I OUTPUT  
TEST I INPUT  
TEST WIND INPUT  
TEST TEMP INPUT  
TEST RELAYS  
TEST BEEP  
RESET  
TEST OPTION BLOCK

Codes for program instructions as they appear when retrieved with the CNTL-U command.

#### CODE PROGRAM INSTRUCTION

|    |   |
|----|---|
| 57 | ALARM   |
| 58 | ALARM WD  |
| 63 | AQ STATS  |
| 1  | AVERAGE   |
| 2  | AVERAGE WD  |
| 66 | AVG MOV   |
| 67 | AVG WD MOVE   |
| 3  | BEEP  |
| 4  | CHANGE TO SCREEN  |
| 5  | DISPLAY FLAGS   |
| 6  | DISPLAY NESW  |
| 7  | DISPLAY TEXT  |
| 8  | DISPLAY TIME  |
| 9  | DISPLAY VALUE   |
| 10 | ELSE  |
| 11 | END IF  |
| 12 | FLAG  |
| 61 | IF ERR CODE   |
| 13 | IF FLAG   |
| 14 | IF KEYSWITCH  |
| 15 | IF L1 ? L2 (<,<=,>,>=,<>,<=)  |
| 16 | IF L ? VALUE (<,<=,>,>=,<>,<=)  |
| 17 | IF TIME INTERVAL  |
| 18 | INPUT CURRENT (mA)  |
| 19 | INPUT FREQUENCY   |
| 59 | INP PRECIP-T  |
| 60 | INP PRECIP-S  |
| 20 | INPUT SERIAL  |
| 64 | INP SER NMEA  |
| 21 | INPUT TEMP  |
| 22 | INPUT VOLTAGE   |
| 23 | INPUT WIND DIRECTION  |
| 24 | INPUT WIND SPEED  |
| 25 | L1 OPER L2 (+,-,*,/, power, mod)                                      |
| 26 | L OPER VALUE (+,-,*,/, power, mod)                                    |
| 62 | L=SCREEN  |
| 27 | L1 = F (L2) (cos, sin, acos, asin, atan, dewpt, wet bulb, wind chill) |
| 28 | L1 = L2   |
| 65 | L=SCREEN  |
| 29 | L = TIME  |
| 30 | L = VALUE   |
| 31 | MAXIMUM   |
| 32 | MINIMUM   |
| 33 | OUTPUT mA   |
| 34 | OUTPUT mV   |
| 35 | PRINT BUFFER NESW   |
| 36 | PRINT BUFFER OUT  |
| 37 | PRINT BUFFER TEXT   |
| 38 | PRINT BUFFER TIME   |
| 39 | PRINT BUFFER VALUE  |
| 40 | RECORD TIME   |
| 41 | RECORD VALUE  |
| 42 | RELAY   |
| 43 | SERIAL BUFFER CHECKSUM  |
| 44 | SERIAL BUFFER NESW  |
| 45 | SERIAL BUFFER OUT   |
| 46 | SERIAL BUFFER TEXT  |
| 47 | SERIAL BUFFER TIME  |
| 48 | SERIAL BUFFER VALUE   |
| 49 | STANDARD DEVIATION  |
| 50 | STANDARD DEVIATION - WD   |
| 51 | SUBROUTINE BEGIN  |
| 52 | SUBROUTINE CALL   |
| 53 | SUBROUTINE END  |
| 54 | UVW CORRECTIONS   |
| 55 | UVW VECTOR  |
| 56 | WIND DIRECTION - 540  |

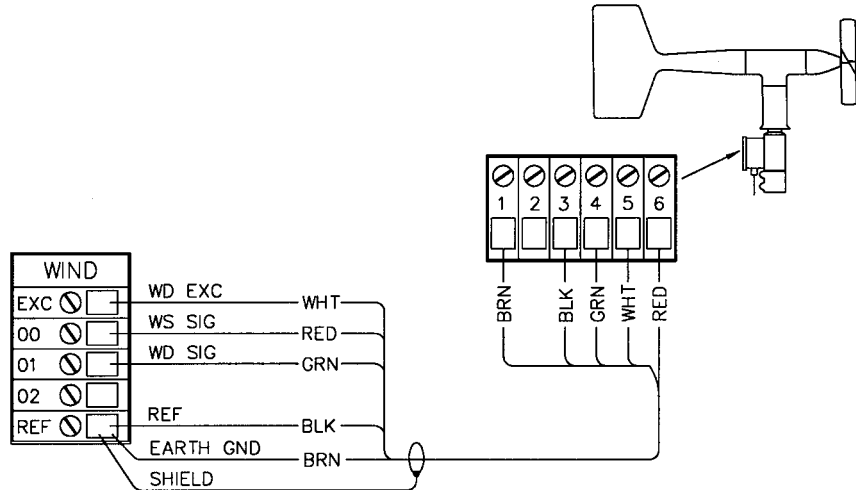
# APPENDIX E

## WIRING DIAGRAMS

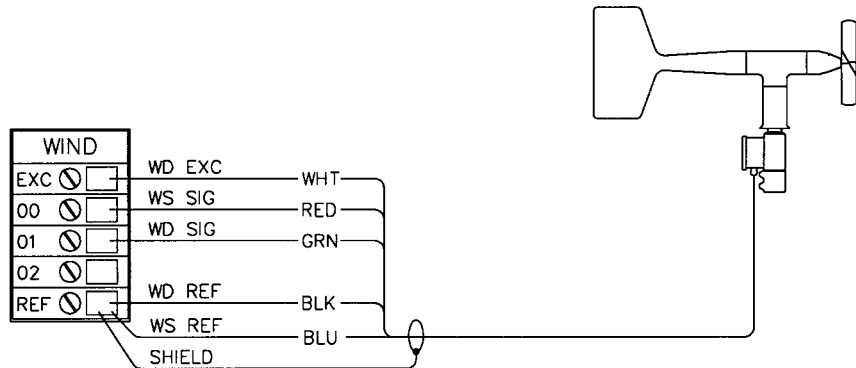
The 26700 Series Translator works with all YOUNG sensors and sensor combinations. Many other sensor types can be connected directly to the unit. A separate wiring list printout is sent with each 26700 showing the exact terminal connections for the unit ordered. Use the printout along with the following examples when connecting both YOUNG sensors and those from other manufacturers. Color code shown depicts wiring using YOUNG supplied cables. Refer to sensor instruction manual for specifics regarding sensors.

**Note:** Earth ground connection to ground terminal (  $\perp$  ) on back of 26700 Translator required.

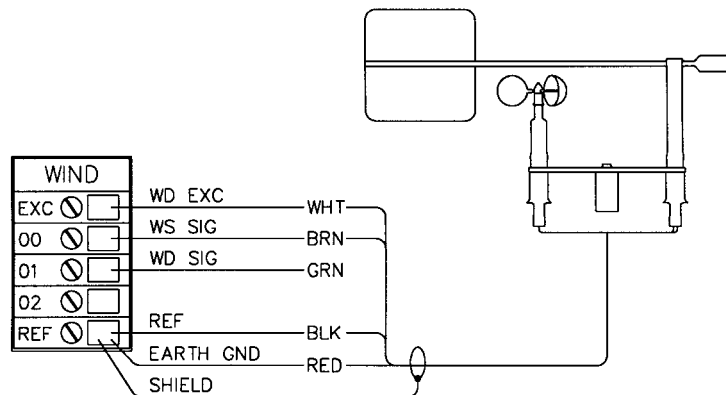
WIND MONITOR  
05103, 05305, 05701



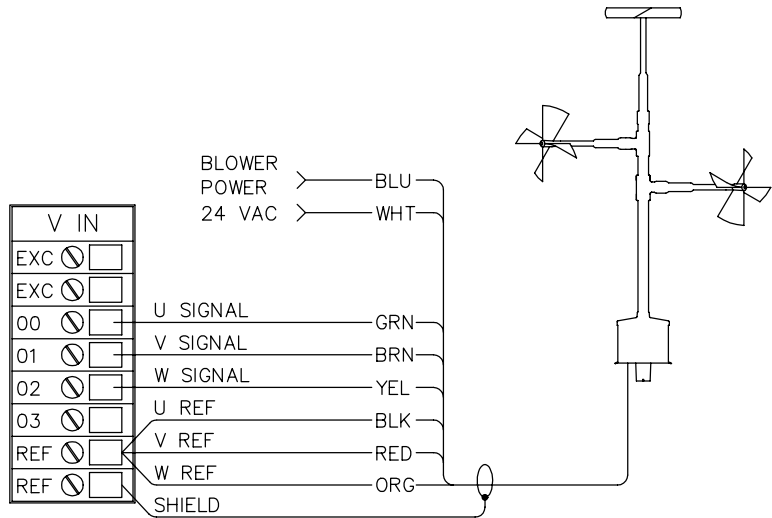
WIND MONITOR  
05106



MICROVANE & 3-CUP  
ANEMOMETER  
12002, 12005,



UVW ANEMOMETER  
27005/27005T

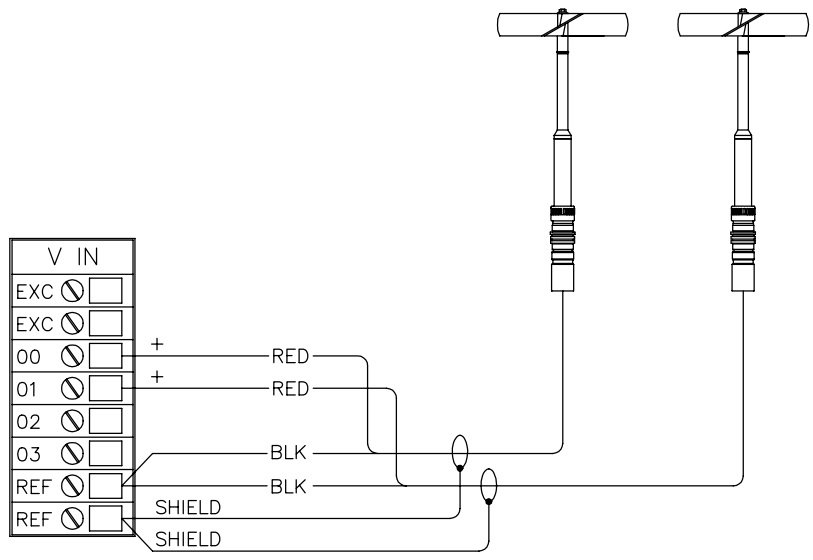


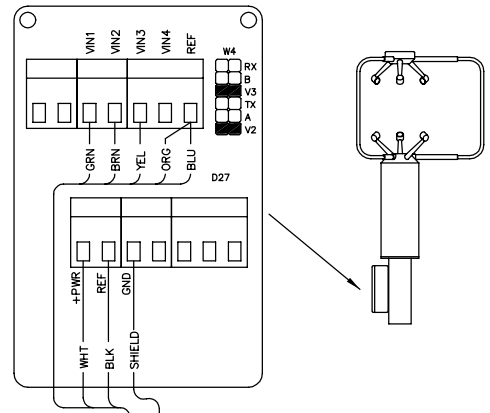
PROPELLER  
ANEMOMETERS  
27106

OR

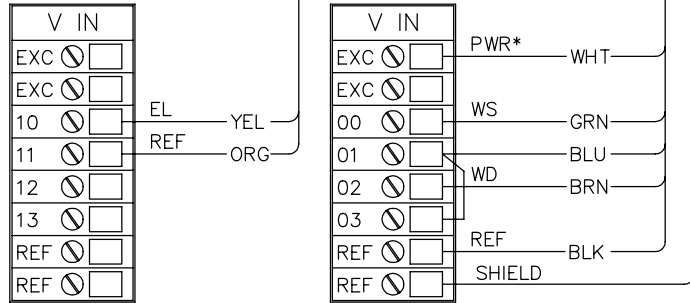
CUP ANEMOMETERS  
12102

(UP TO 4 MAY  
BE CONNECTED)



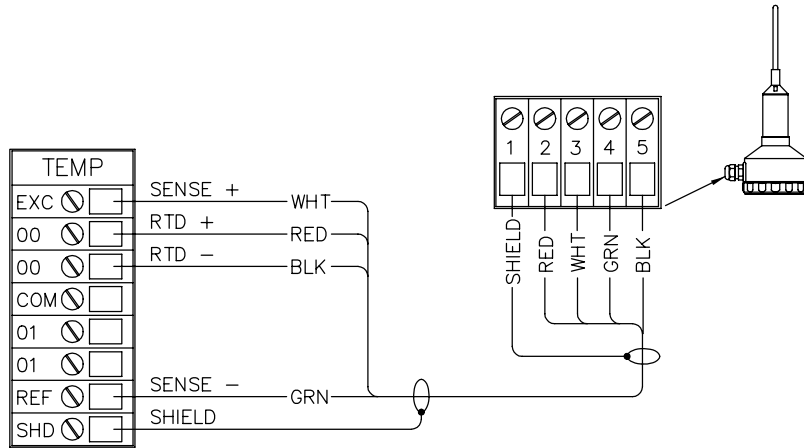


ULTRASONIC ANEMOMETER 81000  
(USING VOLTAGE OUTPUTS)



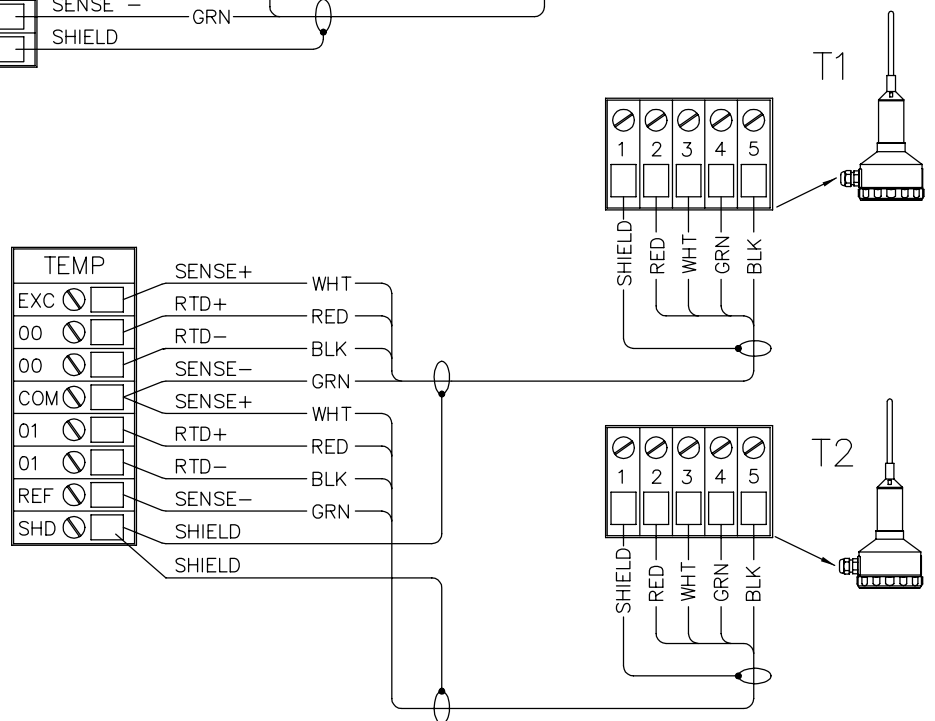
\*NOTE:  
TOTAL POWER REQUIRED BY ALL SENSORS PLUS 26700 MUST NOT EXCEED POWER RATING OF A.C. ADAPTER 18822/18822H

PLATINUM RTD TEMPERATURE PROBE 41342

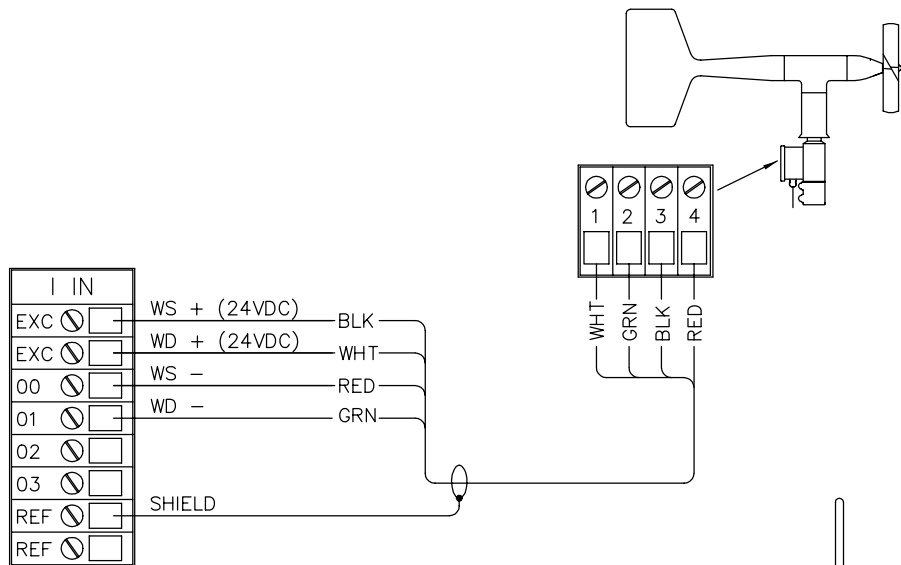


TWO PLATINUM RTD TEMPERATURE PROBES 41342

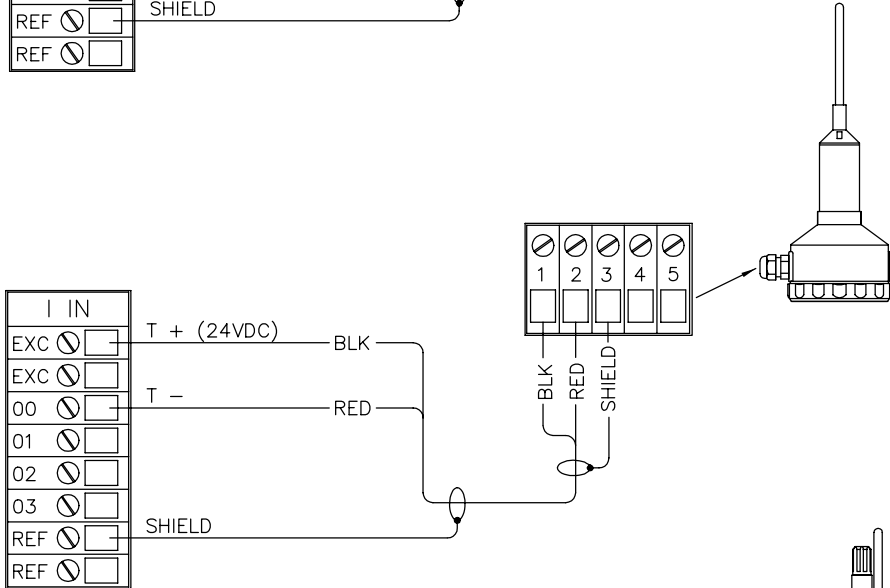
FOR DELTA T APPLICATIONS 43408 ASPIRATED SHIELD IS RECOMMENDED



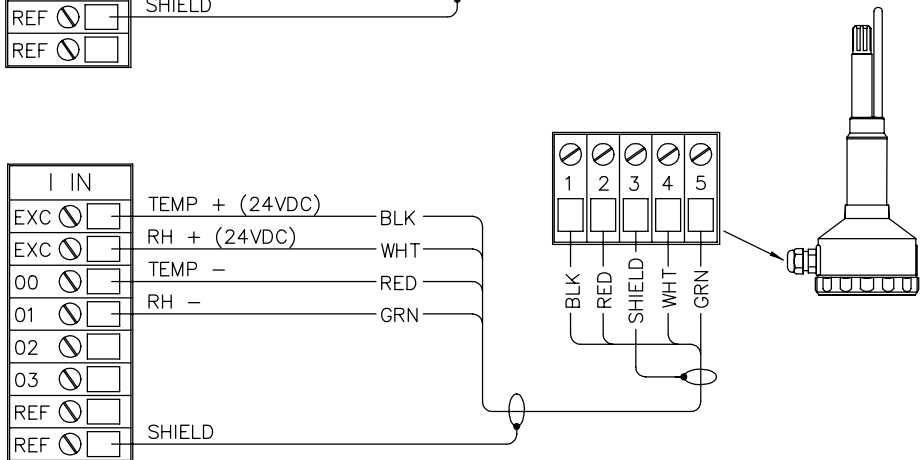
WIND SENSOR  
WITH 4-20mA OUTPUTS



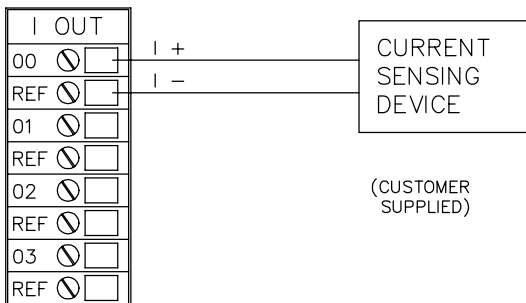
TEMPERATURE PROBE  
WITH 4-20mA OUTPUT  
41342LC



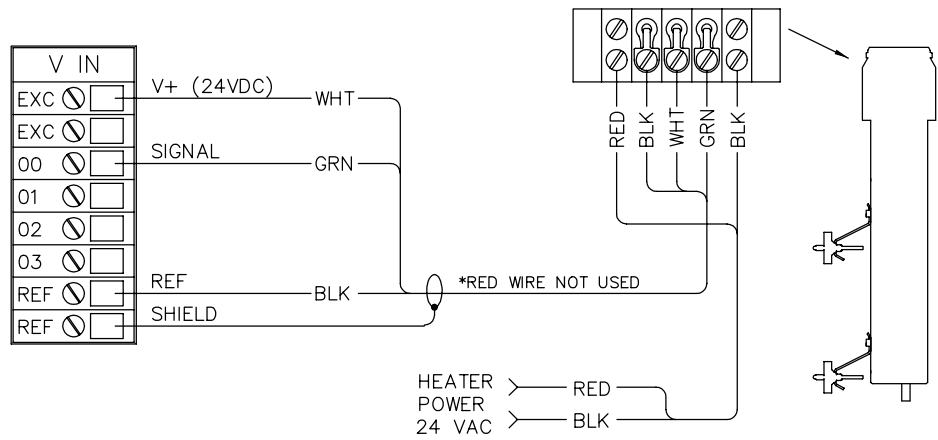
RELATIVE HUMIDITY/  
TEMPERATURE PROBE  
WITH 4-20mA OUTPUTS  
41372LC



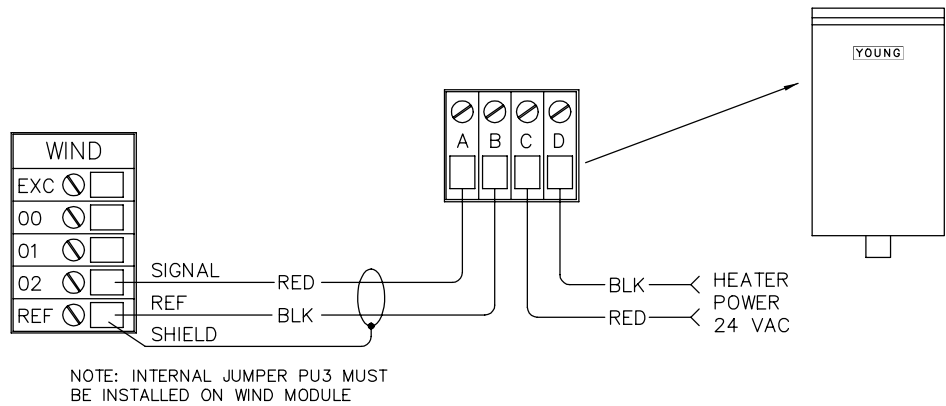
CURRENT OUTPUT  
(GENERAL)



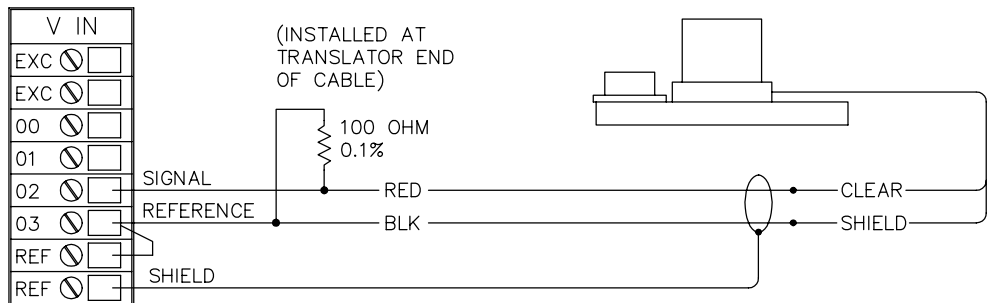
PRECIPITATION GAUGE  
50202, 50203



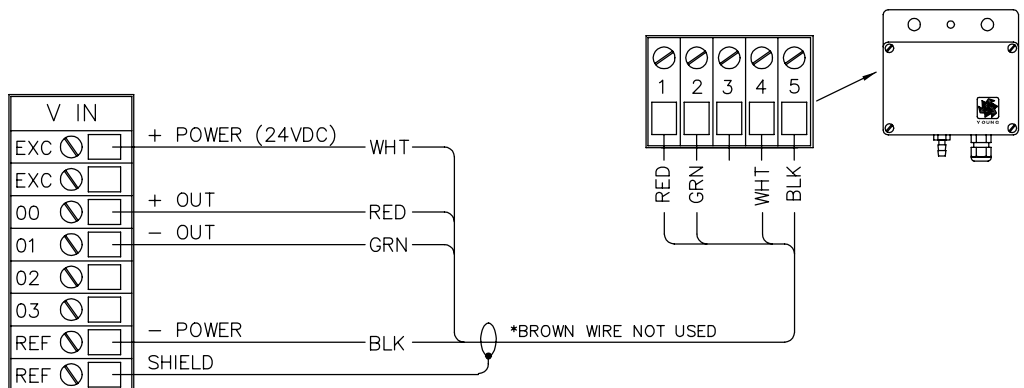
TIPPING BUCKET  
RAIN GAUGE  
52202/52203

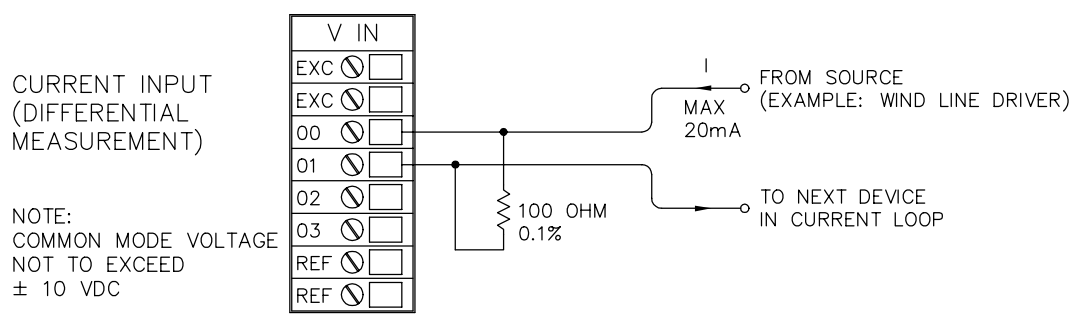
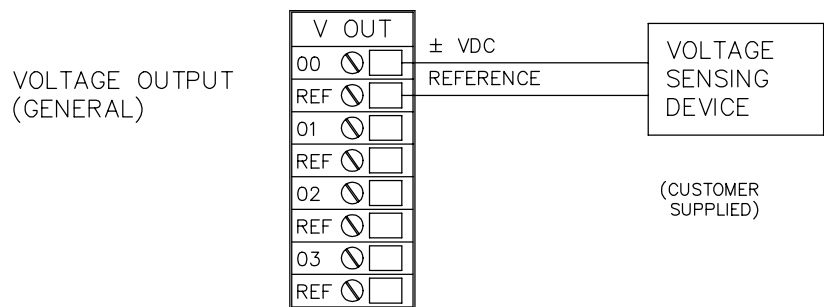
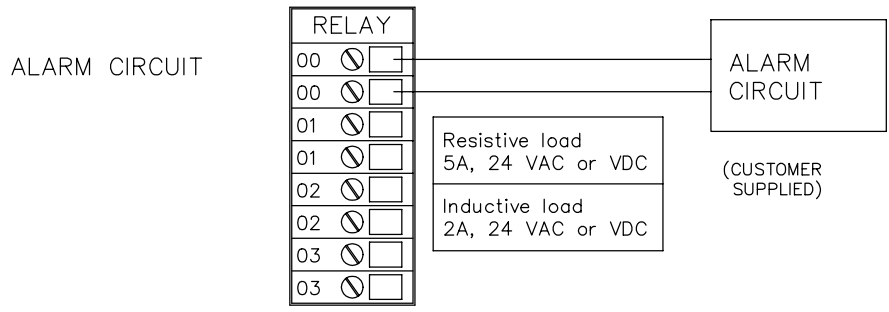
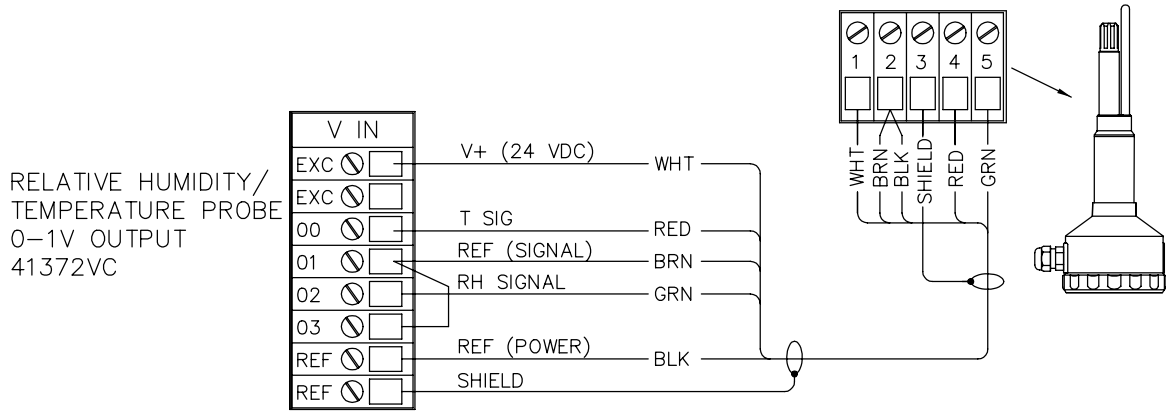


PYRANOMETER  
70090



BAROMETRIC PRESSURE  
SENSOR  
61201





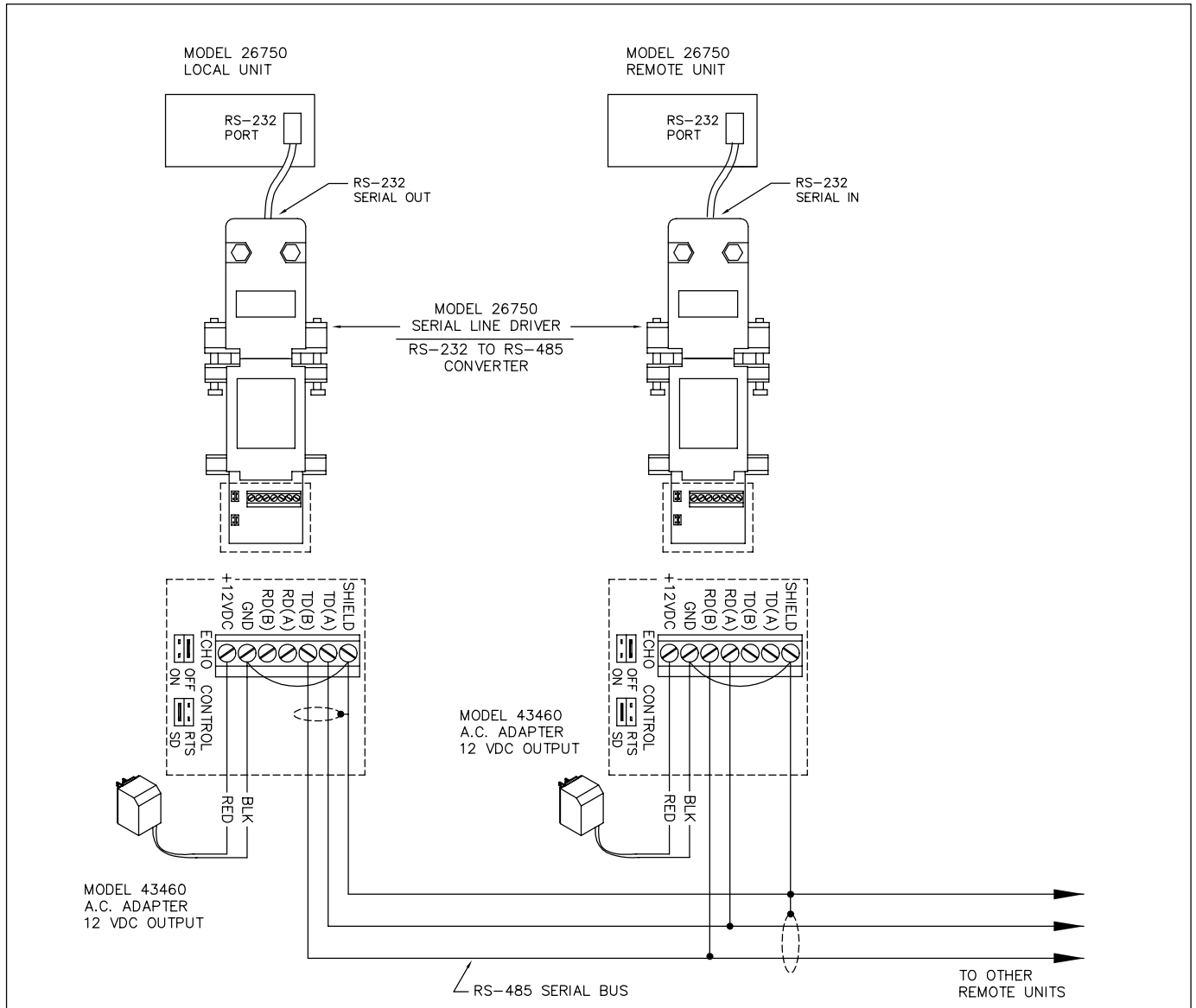


SERIAL CABLE WIRING (RS-232)

| MODEL 26753    |                   | MODEL 26753<br>(USING ALTERNATE DB-25) |                   | MODEL 26754 |                   |
|----------------|-------------------|--|-------------------|-------------|-------------------|
| PC SERIAL PORT | 26700 SERIAL PORT | PC SERIAL PORT                         | 26700 SERIAL PORT | MODEM       | 26700 SERIAL PORT |
| DB9 FEMALE     | DB9 FEMALE        | DB25 FEMALE                            | DB9 FEMALE        | DB25 MALE   | DB9 FEMALE        |
| RX 2           | 2 RX              | TX 2                                   | 2 RX              | 8           | 1 CD              |
| TX 3           | 3 TX              | RX 3                                   | 3 TX              | 3           | 2 RX              |
| DTR 4          |                   | RTS 4                                  |                   | 2           | 3 TX              |
| GND 5          | 5 GND             | CTS 5                                  |                   | 20          | 4 DTR             |
| DSR 6          |                   | GND 7                                  | 5 GND             | 7           | 5 GND             |
| RTS 7          | 7 RTS             | DSR 6                                  |                   | 6           | 6 DSR             |
| CTS 8          | 8 CTS             | DTR 20                                 | 7 RTS             | 4           | 7 RTS             |
|                |                   |  | 8 CTS             | 5           | 8 CTS             |

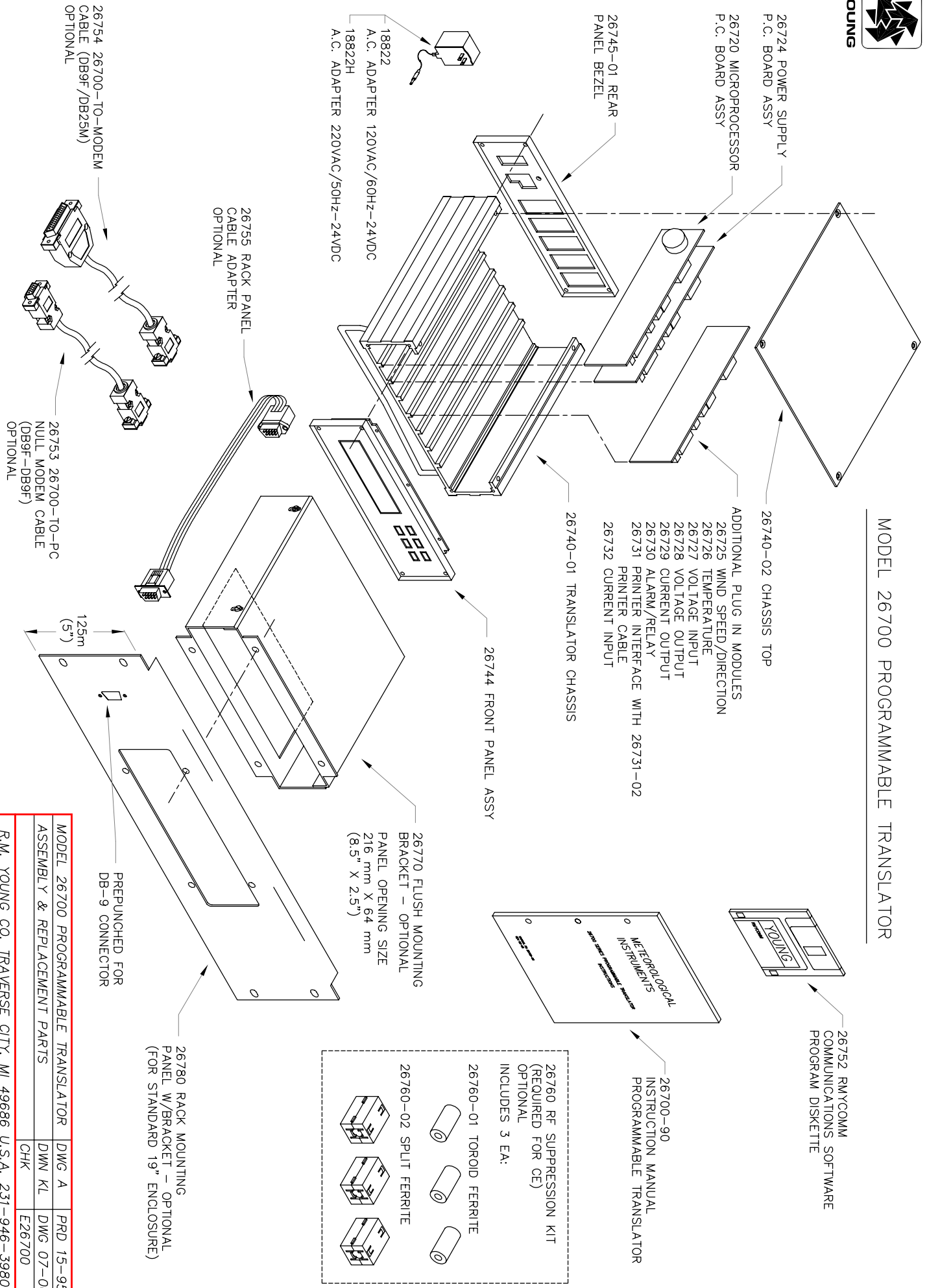
8 BIT DATA, 1 START, 1 STOP, NO PARITY. 9600 BAUD DEFAULT

TYPICAL LOCAL - REMOTE 26700 TRANSLATOR WIRING





# MODEL 26700 PROGRAMMABLE TRANSLATOR



|  |        |           |
|--|--------|-----------|
| MODEL 26700 PROGRAMMABLE TRANSLATOR ASSEMBLY & REPLACEMENT PARTS | DWG A  | PRD 15-95 |
|  | DWN KL | DWG 07-00 |
|  | CHK    | E26700    |

R.M. YOUNG CO. TRAVERSE CITY, MI 49686 U.S.A. 231-946-3980