OWNER'S MANUAL

DMC

Calc-U-Dri
PRINTER

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WARRANTY
for
Calc-u-Dri Printer

The guarantee is for one year from date of installation to be free of defects in material or workmanship when properly installed and operated in accordance with instructions in this booklet. Warranted parts will be exchanged F.O.B. Mason City, Iowa without charge to the user. Damage resulting from negligence voids the warranty. Warranty does not include labor, installation or delivery of replacement parts.

The Warranty and liability of David Manufacturing Company, its distributors, dealers and agents is limited to replacement, without charge, of defective parts, as outlined above. DMC makes no other warranties, express or implied except as stated herein, and disclaims all obligations and liabilities other than specified.

The Manufacturer reserves the right to make changes in specifications or prices without incurring obligation on previously produced merchandise.

SAFETY INFORMATION PLEASE READ

WATCH FOR THIS SYMBOL! IT POINTS OUT IMPORTANT SAFETY PRECAUTIONS. IT MEANS, "ATTENTION ---- BECOME ALERT! YOUR SAFETY IS INVOLVED!"

It is recommended that you review the entire contents of this manual, paying particular attention to items preceeded by this symbol. FAILURE TO HEED THESE INSTRUCTIONS CAN RESULT IN PERSONAL INJURY!

OPERATOR QUALIFICATIONS

Operation of this farmstead equipment shall be limited to competent and experienced persons. In addition, anyone who will operate or work around power equipment must use good common sense. In order to be qualified, he must also know and meet all other requirements, such as:

1. Some regulations specify that no one under the age of 16 may operate power machinery. This includes farmstead equipment. It is your responsibility to know what these regulations are in your own area or situation.

2. Current OSHA regulations state in part: "At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be involved."*

3. Unqualified persons are to stay out the work area. The "Work Area" is defined as any area within the storage bins where this equipment is installed.

4. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine.

*Federal Occupational Safety & Health Standards for Agriculture Subpart D, Section 1928.57 (a)(6).

⚠ CAUTION ⚠

BE A SAFE OPERATOR

1. Read and understand the Owner's Manual.
2. Disconnect all electrical power before servicing or opening control box, adjusting, or lubricating the equipment.
3. All electrical hook-ups should be in accordance to the National Electrical Code.
4. Ground all electrical equipment as well as bin itself.
5. Only knowledgeable and trained personnel should operate this equipment
6. **NEVER WORK IN THE DRYER WITH POWER "ON" AND CONTROLS IN "AUTO"...** automatic controls start without warning! Stay clear of motors, belts and augers.

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.

THE DECALS SHOWN ON THIS PAGE MUST BE DISPLAYED AS SHOWN

REPLACEMENTS ARE AVAILABLE UPON REQUEST

Write to: DMC
               1600 12th Street NE
               Mason City, IA 50401
Phone: 641-423-6182

Please note:
1. The decal on this page is NOT actual size.
2. Keep all decals wiped clean at all times.
3. All decals must be replaced if they are destroyed, missing, painted over, or can no longer be read.

⚠ CAUTION ⚠
DISCONNECT POWER
BEFORE SERVICING
405L004
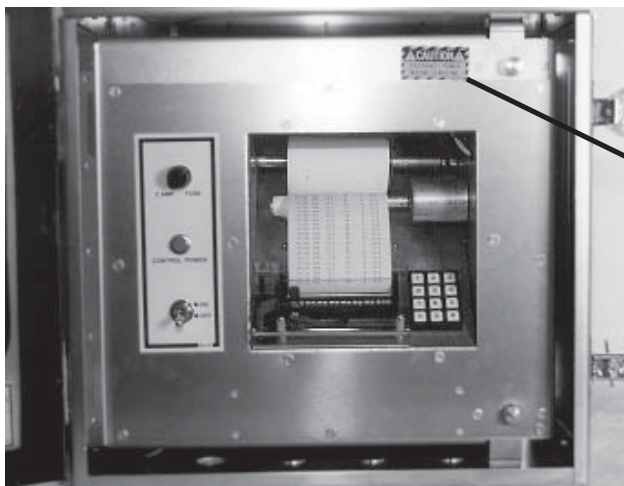
CALC-U-DRI PRINTER INSTALLATION

1. Disconnect all power to the control box to which you are adding the printer option.

2. Mount the printer box within two feet of the control box to use the standard length of wire provided. The unit can be located in a remote location if special wire length is ordered.

3. Four (4) additional holes (three 7/8" diameter and one 1-3/32" diameter) are required for the printer installation. Check the bottom of the control box and add these holes if they are not already provided.

4. Use approximately four (4) feet of liquid tight conduit and connectors between the printer and control box. Feed the printer control cable (five conductor) from the printer box to the control box (the 25 pin connector will be in the printer control box). This does not apply if the printer is installed within a large control box.

5. Pull out the circuit board carefully.   When adding this printer option to the Calc-U-Dri control box, the control board requires that the dip switches be set. Please follow the guide on page 9.

6. Install the two (2) card guides in the double card holder beside the guides that are already installed.

7. Connect the black 36-pin connector as shown in Drawing 1 on page 8. The eleven wires shown on the letter side are already attached to the green connector (approximately 5 inches long with black heat shrink on the ends). Untie these wires from the harness, remove heat shrink and strip 5/8". Connect orange wire to terminal V, violet wire to terminal U, etc. Be sure the larger green wire is installed in "H".

8. Secure the black connector to the card holder with (2) #4-40x1-1/4 screws, lock washers and nuts. DO NOT OVER TIGHTEN. See Photo 1.

9. Attach the five wires from the printer control cable to the black 36-pin connector pins 13, 16, 17 and 18. See Drawing 1.
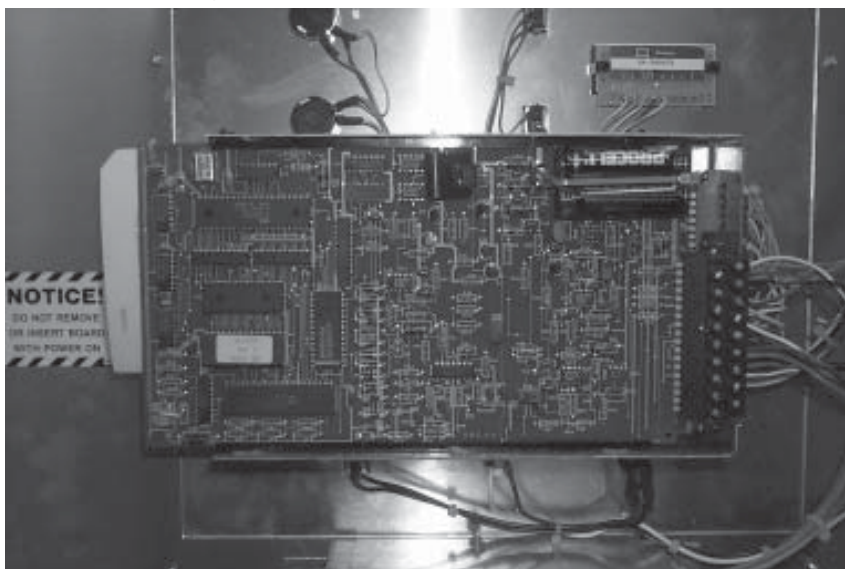
Photo 1

PRINTER INSTALLATION (continued)

10. To mount the plenum temperature sensor, cut a 1-1/4 inch diameter hole in the dryer plenum. Secure the liquid tight and sensor using conduit straps. See Photo on page 7. Wire the temperature sensor into the black connector. Pin #5 to white and #6 to red. See Drawing 1 on page 8.

11. To mount the weather sensor, feed the cable through the 1-3/32 inch diameter hole in the bottom of the control box and secure with the electrical screw bushing. Have the sensor on the outside of the control box. Wire the cable to the black 36 pin connector pins 7 to 11. See Drawing 1.

NOTE:
If the control box is mounted indoors, mount the weather sensor outdoors. The weather sensor obtains ambient temperature and relative humidity data.
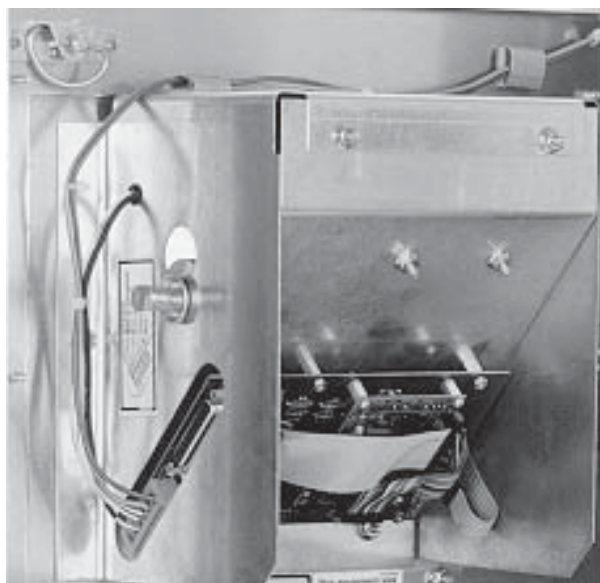

Photo 2

12. Plug in the 25-pin connector to the printer assembly. See Photo 2. Provide 115 Volts AC to the printer control box terminals marked L1 (Line), N (Neutral), and GND Ground). The power source can come from an external source or from the control box. Wire and conduit are provided for the AC power. Do not run the 25 pin control cable in the same conduit as the 115 Volts AC.

13. Put cable ties approximately every four inches to hold all the loose wires and cables in place. Do not tie any of these wires to the AC leads.

14. Remove the shipping tape and foam from the printer paper and spool.

15. Install the control boards. The control board with the batteries will be installed in the black edge card connector. Be sure that both cards are firmly seated. See Photo 1**.**

SERVICE

The printer control board contains two alkaline AA batteries. It is recommended to replace the batteries every year to eliminate possible corrosive leakage.

If the printer requires service, unplug the 25 pin connector and remove all the wires from the orange terminal. Remove the six bolts that secure the printer. This will be serviced as a complete module. Re-install the new / repaired unit and wire the orange terminal as per the decal. Plug in the 25-pin connector.

CALC-U-DRI PRINTER DEFINITIONS
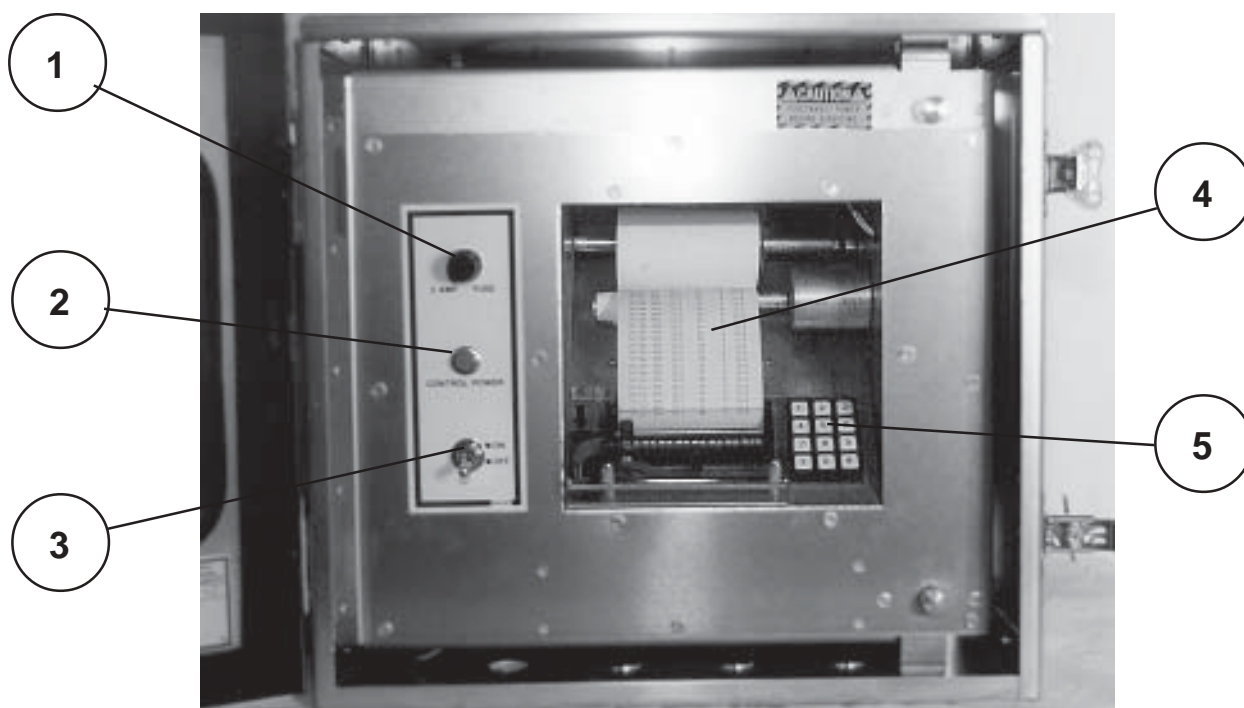
1. Two Amp Fuse: DO NOT OVERSIZE!   Use only AGC2 fuses.

2. Power On Indicator Lamp: Indicates the power switch is "on" and 115 Volts A.C. is present.

3. Power Switch: When "on", this puts 115 Volts A.C. to the printer power supply.   The printer requires 5.0 Volts D.C.

4. Thermal Printer Paper: Provides a written record of the moisture of the grain (temperature corrected), grain temperature, bin number, plenum temperature, humidity, ambient temperature, date and time of day, grain type, and average grain moisture.

5. Printer Keyboard: Used for programming the printer to determine the print interval and bin number to correct date and time to change to a different grain type, and to restart the averaging.

6. For Printout definitions see the next two pages for complete description.

CALC-U-DRI PRINTER DEFINITIONS (continued)
Printer Module and Printout (continued)

A "Cold Start" occurs when batteries are not in-stalled or are weak and need replacing (approx-imately every year.)

This data needs to be entered for operation.

If entry is not accepted the question is repeated. Acceptable number inputs are:
MM = month   01 thru 12
DD = day   01 thru 31
YY = year   00 thru 99
HH = hour   01 thru 12
MM = minute   01 thru 60

Prints out your entered information.

Automatically set at five minutes. Can be set from two minutes thru 30 minutes.

Automatically set at "1", can be numbered up to 999.

```
COLD START - CHECK BATTERIES
ENTER THE DATE     MMDDYY
DAY? - SUN=1 M=2 T=3 W=4 T=5 F=6 SAT=7
ENTER THE TIME     HHMM (12 HR FORMAT)
ENTER 0 FOR AM OR 1 FOR PM
DATE THURSDAY 08-17-89      TIME 08:36A
ENTER 0 TO CHANGE OR # TO ACCEPT
CURRENT INTERVAL IS   5  MINUTES
ENTER 2-DIGITS OR # TO ACCEPT
CURRENT BIN IS #   1
ENTER 3 DIGIT NUMBER OR # TO ACCEPT
```

Menu is printed when any key is pushed.

Data entered at cold start. Battery backup, even with power loss.

Enter if other grain is run:
"1" - corn
"2" - milo
"3" - rice
"4" - wheat
"5" - soybeans
"6" - sunflower
"7" - other

```
GRAIN TYPE? - CORN=1 MILO=2 RICE=3
WHEAT=4 SOYBEAN=5 SUNFLOWER=6 OTHER=7

DATE THURSDAY 08-17-89      TIME 08:54A
1 TO BEGIN PERIODIC READOUT
2 TO CHANGE PRINT INTERVAL--NOW   5 MIN.
3 TO AVERAGE---BEGAN 08-17-89 AT 08:36A
4 TO CHANGE BIN NUMBER--NOW    1
5 TO CORRECT DATE/TIME
6 TO CHANGE GRAIN TYPE--NOW    CORN
```

Set from menu.

From weather station input at time of printing. Reads "0" when not hooked up.

Header always printed after menu, every two hours of running time, Moisture Limit Change, and Moisture Offset Change.

Any time you want to go to the menu, hit any key on the keyboard. This will interrupt the printing and print the menu.

NOTE: After you are finished using the menu, press "1" to again begin the readout. This will not affect the averaging, unless you had reset the averaging.

```
03-11-98      SETPOINT 15.0  BIN #    6

R.H. 67 % CALIBRATION   0.0    PLENUM  82

HIT ANY KEY FOR MENU              CORN
          MACH  GRAIN  GRAIN  AMB   AVE
   TIME   MODE  MOIST  TEMP   TEMP  MOIST
  ------  ----  -----  -----  ----  -----
  09:09A  MON   15.0    77     76   14.8
  09:10A  WET   15.2    77     76   14.8
  09:10A  DRY   14.6    77     76   14.8
```

CALC-U-DRI PRINTER DEFINITIONS (continued)

Sample Printer Readout

Set Point value at time of printing

Calibration:
The number used to correct the grain moisture value.

Time:
Set at cold start. Reset by menu input.

Plenum:
Temperature at plenum sensor - reads low when not hooked up.

```
03-11-98        SETPOINT 15.0 / BIN #     6

R.H. 67 % CALIBRATION    0.0    PLENUM  82

HIT ANY KEY FOR MENU                CORN
             MACH  GRAIN  GRAIN  AMB   AVE
     TIME    MODE  MOIST  TEMP   TEMP  MOIST
     ------  ----  -----  -----  ----  -----
     09:09A  MON   15.0    77     76   14.8
     09:10A  WET   15.2    77     76   14.8
     09:10A  DRY   14.6    77     76   14.8
```
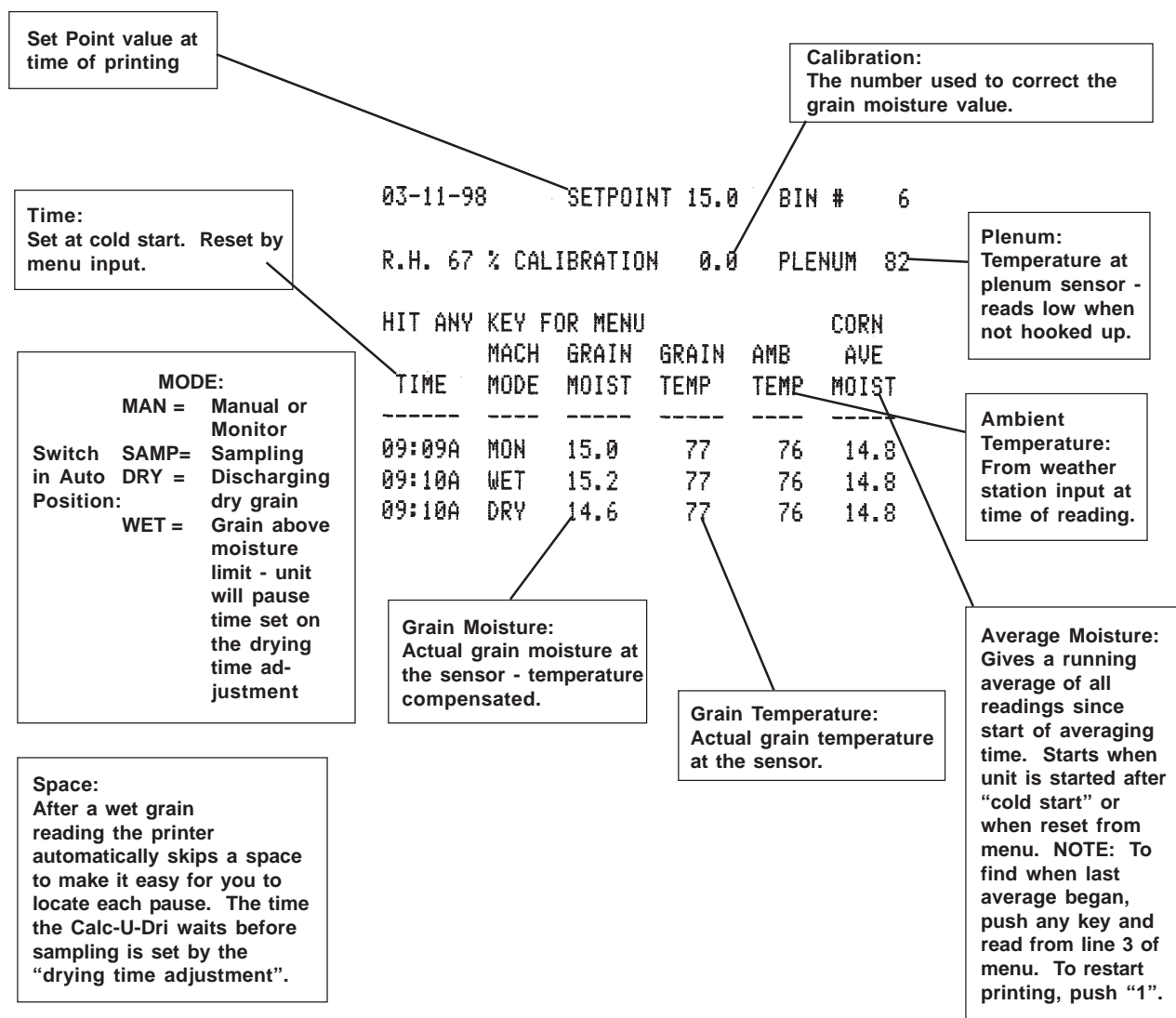
MODE:
MAN = **Manual or Monitor**
Switch **SAMP=** **Sampling**
in Auto **DRY =** **Discharging**
Position: **dry grain**
WET = **Grain above moisture limit - unit will pause time set on the drying time ad-justment**

Ambient Temperature:
From weather station input at time of reading.

Grain Moisture:
Actual grain moisture at the sensor - temperature compensated.

Grain Temperature:
Actual grain temperature at the sensor.

Average Moisture:
Gives a running average of all readings since start of averaging time. Starts when unit is started after "cold start" or when reset from menu. NOTE: To find when last average began, push any key and read from line 3 of menu. To restart printing, push "1".

Space:
After a wet grain reading the printer automatically skips a space to make it easy for you to locate each pause. The time the Calc-U-Dri waits before sampling is set by the "drying time adjustment".

NOTE:
The batteries need replacing every year, use two "AA" alkaline batteries.

Turn off power to the unit, replace the batteries, then turn on power and reprogram if "Cold Start" notation is printed.
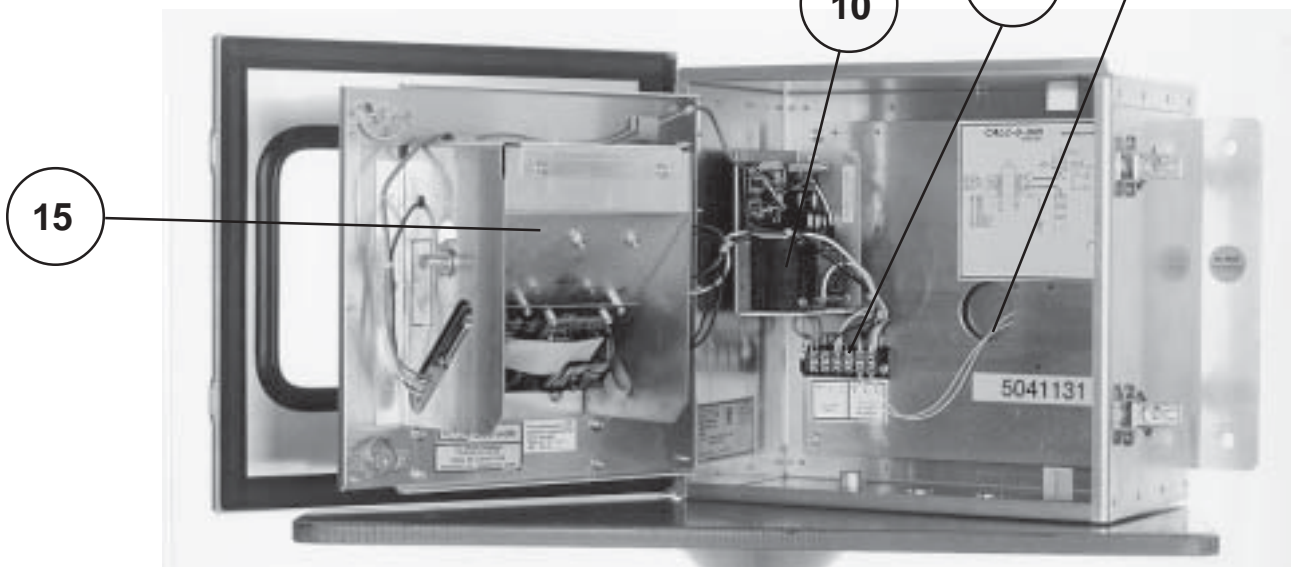
CALC-U-DRI PRINTER PARTS LIST
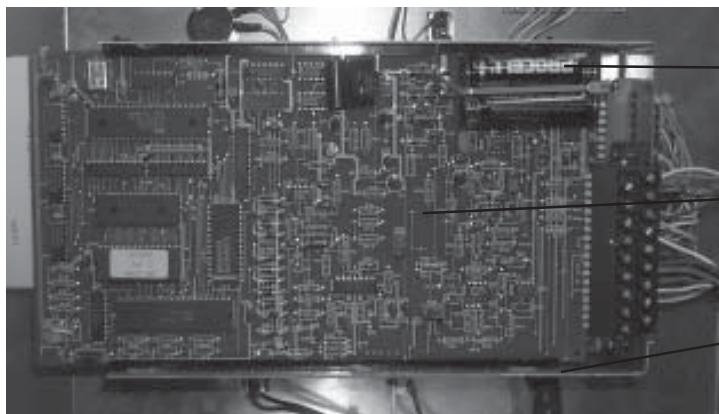
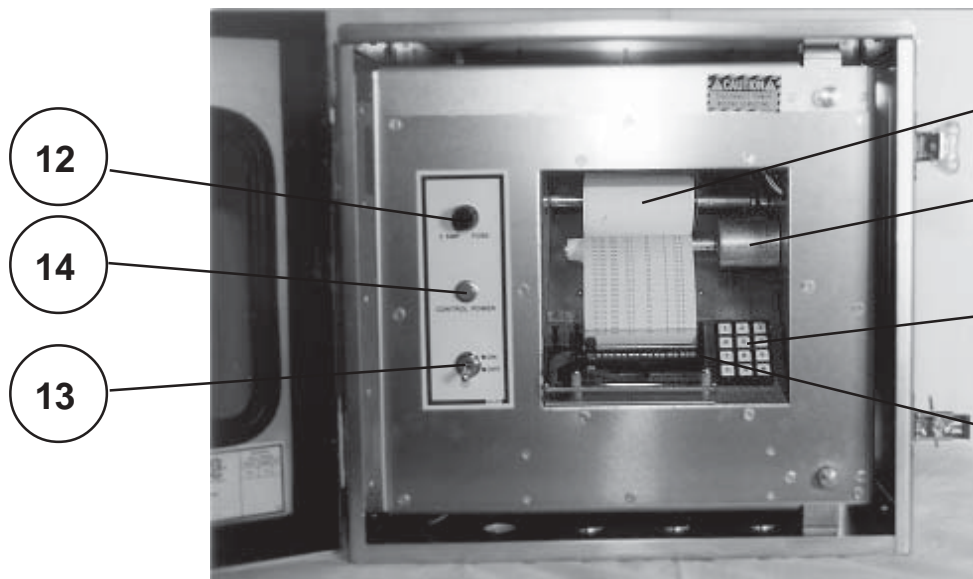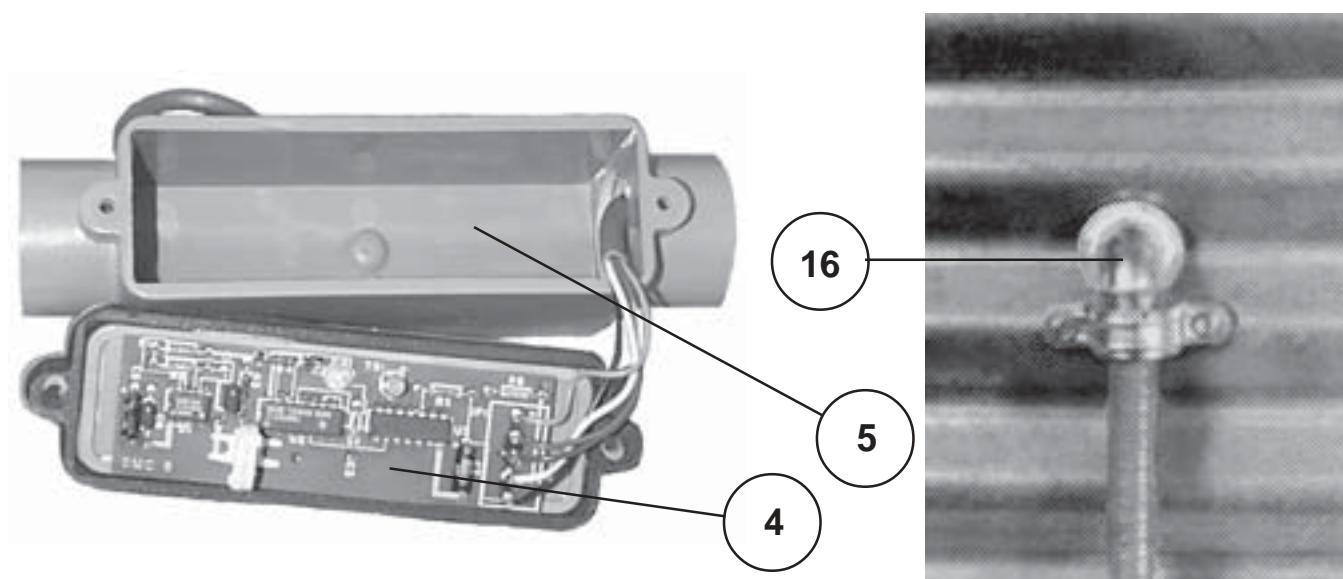## CALC-U-DRI PRINTER PARTS LIST (continued)

REF. NO.	PART NO.	NO. REQ'D	DESCRIPTION
1	602E149	1	#4-A Printer Interface Board
2	1EL0850	1	Card Guide, 8 inch
3	1EL0813	2	AA Battery, Alkaline
4	602E151	1	#6 Weather Sensor Circuit Board
5	602E148	1	Weather Sensor Assembly
6	602E155	1	Printer Paper Take-Up Assembly
7	602E172	1	Printer with Flat Cable
8	2EL0299	1	Keyboard, 12 button
9	MS0306	1	Thermal Paper for Printer
10	602E159	1	Printer Power Supply
11	1EL1525	1	Heater Strip
12	1EL0719	1	Fuse, 2 Amp
13	2EL0633	1	Toggle Switch, Two-Position
14	2EL1161	1	Red Indicator Light
15	602E184	1	Printer, Assembly
16	602E180	1	Thermal Couple Wire Assy'., 50 ft.
17	2EL1167	1	Lamp, 5 Volt
18	602E430	1	Surge Absorber

PRINTER ASSEMBLY
(602E184)
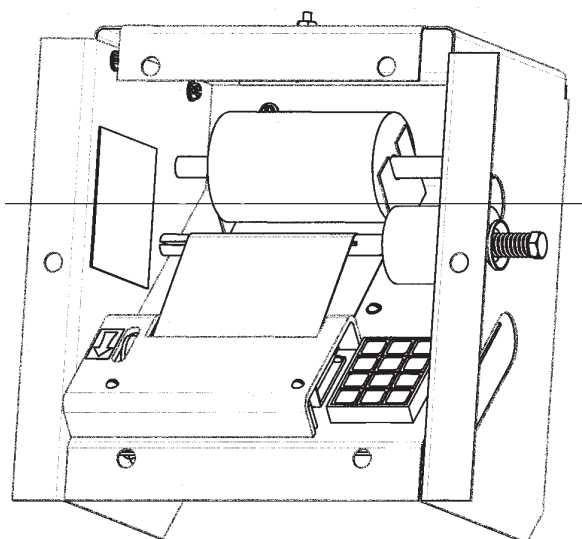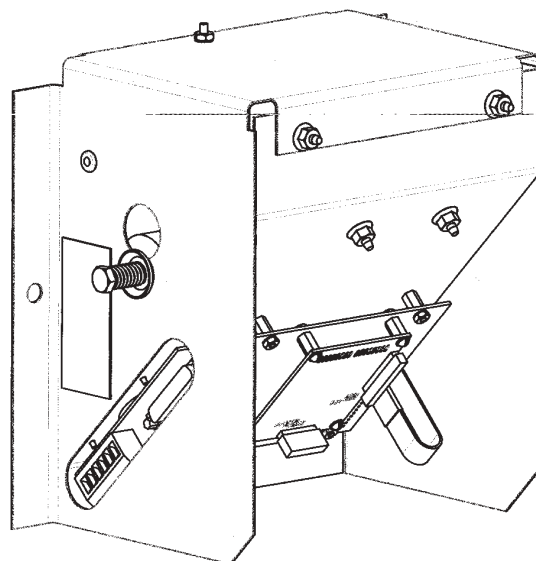
FRONT　　　　　　　　　　　　　　　**BACK**

**Dip Switch settings when adding a Printer to a Control Box
with a DMC 18 (602E460) Board or a DMC 12 (602E458) Board**
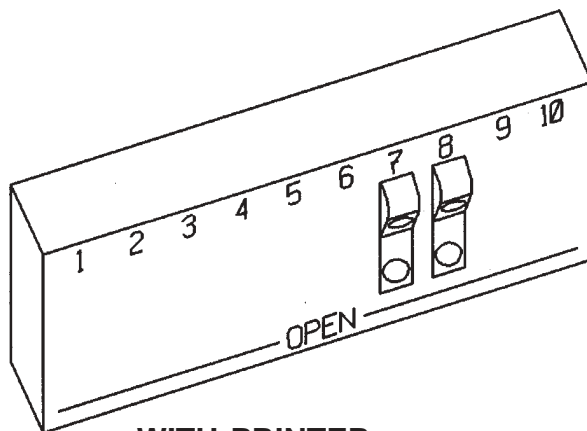
7 - OPEN

8 - OPEN

WITH PRINTER

**SEE CONTROL BOX OWNER'S MANUAL FOR
DIP SWITCH SETTINGS OTHER THAN #7 AND #8**

CALC-U-DRI PRINTER WIRING DIAGRAM

TROUBLE SHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	SOLUTION
Blowing control fuses	1. Check for loose or shorted leads 2. Shorted surge absorber 3. Bad component - check by isolating one component at a time.	1. Isolate and correct. 2. Replace (602E430) 3. Replace bad compoent
Printer spaces several lines but nothing is printed.	1. Paper installed with the wrong side up or the wrong type of paper. 2. Print head is plugged or bad.	1. Turn over the paper or install correct thermal paper (MS0306)
Printer spaces one line, nothing more.	1. Computer control card not seated correctly or bad. 2. 5 conductor cable loose or installed in error.	1. Insert the computer card or replace card. 2. Refer to the decal for correct wiring at the computer jack. Insert the 25 pin jack at the printer.
Printer does not space, no night light and the paper take-up motor not working.	1. No DC power or no AC power or not hooked up.	1. If 5V DC is missing, replace the power supply or repair loose or broken power leads (red and green) or (white and violet).
Printer does not space but light is on.	1. Printer motor not plugged in.	1. Plug in the flat, gray cable on the printer and check if broken.
Prints characters that are unintelligible.	1. Memory not working.	1. Power down the main control box and retry.
Top part of the characters are missing.	1. Plastic guard too close. 2. Dirt on the print mandral (Bar behind the paper)	1. Raise the plastic shield. 2. Clean
Part of each character is missing.	1. Head cable loose or print head bad.	1. Reseat the flat brown cable or replace the printer.
Paper take-up not rolling up the paper.	1. Loss of power or bad motor or aluminum shaft binding against the motor.	1. The orange and orange / white wire loose or broken. Re-tighten or replace the motor assembly or adjust the aluminum shaft by loosening the allen screw.

DMC

NOTE

1. Never unplug or plug in the circuit board with power on.

2. Do not make field adjustments on the circuit board. This is a factory adjustment only.

3. Contact your dealer or DMC if you have any questions on the operation or service of your Calc-U-Dri Printer.

Take Time
for
Proper Installation

It
Saves
Service Calls

DMC

Calc-U-Dri
PRINTER

DMC markets across the U.S. and around the world.

For more information, contact the DMC Distribution Center nearest you.

DMC's Corporate Headquarters, Factory and North Central Sales Center
1600 12th Street N.E.
Mason City, Iowa 50401
Phone: 641-423-6182
FAX: 641-423-0234
Email: dmc@netins.net

Dakota Distribution Center
3520 Ninth Avenue S.W.
Watertown, South Dakota 57201
Phone: 605-882-3210
FAX: 605-882-3211

Ft. Wayne Distribution Center
310 North Taylor Road
P.O. Box 30
Garrett, Indiana 46738-0030
Phone: 219-357-5767
FAX: 219-357-4699

Illiana Distribution Center
515 West Main
P.O. Box 557
Oakland, Illinois 61943-0557
Phone: 217-346-3116
FAX: 217-346-3208

Southern Distribution Center
11523 Highway 70
Proctor, Arkansas 72376
Phone: 870-732-4962
FAX: 870-732-4966

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Hampton, Nebraska 68843
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FAX: 402-725-3513