BenchMark Wireline Products
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OPERATIONS AND MAINTENANCE MANUAL
WINCH OPERATORS PANEL
AMS4A041

TABLE OF CONTENTS

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1.0 INTRODUCTION

1.1 GENERAL DESCRIPTION

The Kerr AMS4A041 panel is designed to acquire and display depth, tension, and magnetic mark data from a wireline winch unit. The panel provides the operator a means to set and make adjustments to the data as necessary.

Depth is displayed from data provided from an encoder mounted on a measuring device. The encoder quadrature pulses are output to the acquisition system. The tension data is provided by a load pin and is also output to the acquisition system.

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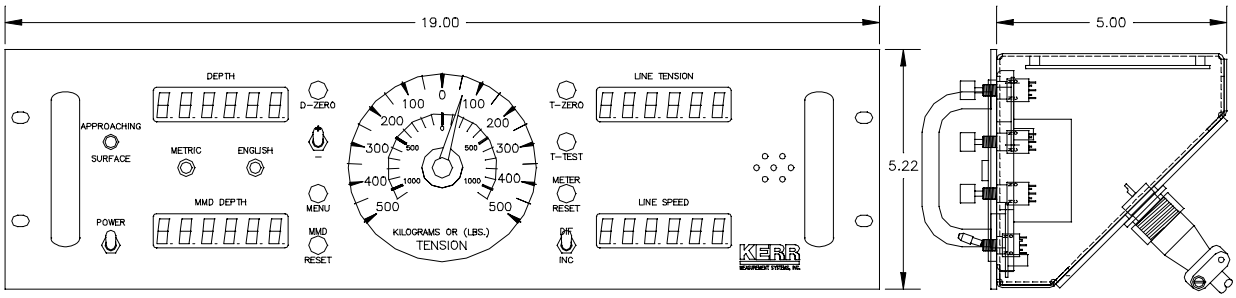
1.2 FEATURES



-- Digital displays for depth, line speed, tension and magnetic marks, CCL depth offset.

-- Analog incremental tension meter, 4 inch (108 mm) dia., 270 degree

-- Differential or Incremental tension zero push button switch

-- Excessive tension alarm setting allows operator to set tension alarm to a predetermined value. Contact closure is provided for winch shutdown

-- Zero Depth button - sets depth to 0. Depressing button again resets depth to previous setting. Only works when line speed is zero

-- Approaching surface alarm

-- Depth adjust up or down switches. Only works when winch is stopped

-- Load cell zero & calibrate controls. Only works when there is no load on cable

-- Depth & tension saved in non-volatile memory at power loss

-- Outputs for Magnetic Marks, Tension and Encoder to interface to an acquisition system. Outputs are compatible with SDS Warrior.

-- RS232 Interface for additional control and data outputs.

-- Can be set to display either English or Metric units or a combination of English and Metric units (i.e. depth in feet, tension in KG).

-- Panel is powered by 12-24vdc. All sensor power (encoder, load pin, MMD, etc) is provided by the panel. No other power supplies are needed.

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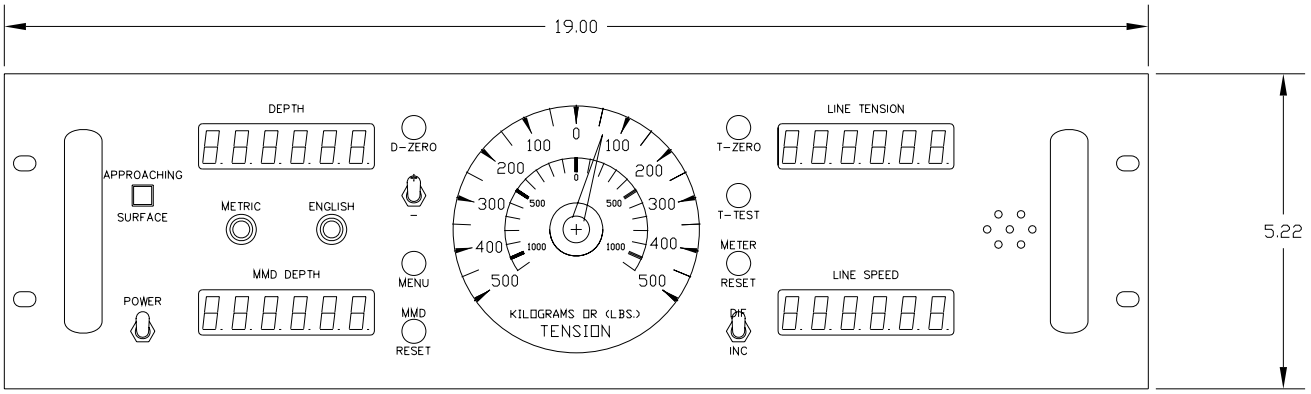
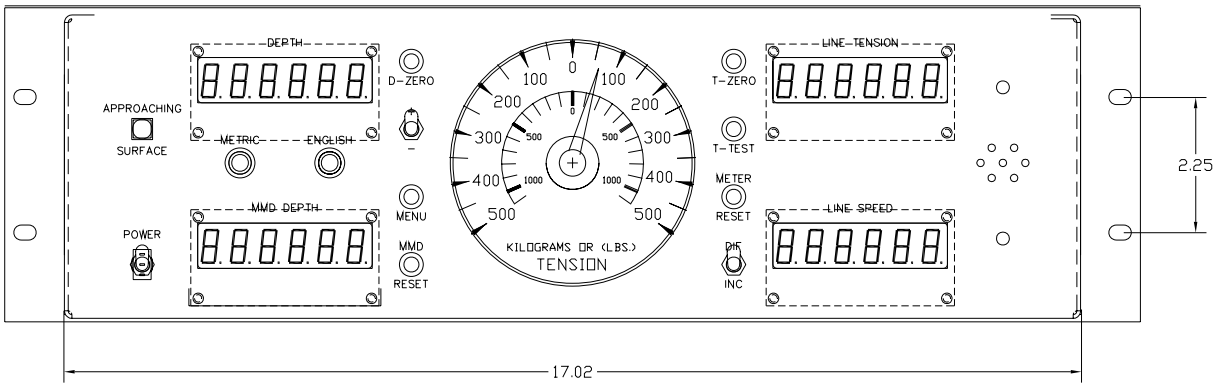
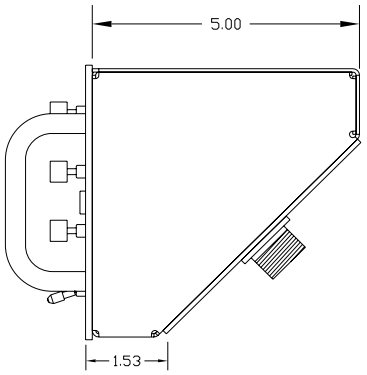
1.3 DIMENSIONS







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2.0 DETAILED DESCRIPTION OF FEATURES

2.1 FRONT PANEL

2.1.1 ANALOG TENSION METER

This meter displays either differential or incremental tension. This provides a more visual display of tension change.

2.1.2 INC / DIF TENSION SWITCH

This switch will change the analog meter from Incremental tension to Differential tension.

Incremental tension provides a high resolution tension scale. It must be periodically reset as tension increases or decreases to keep it from pegging out.

Differential tension provides a delta tension reading. The meter will slowly reset itself to 0 so the reset switch is not necessary.

2.1.3 METER RESET SWITCH

This switch will reset the meter to the 0 (center) position.

2.1.4 DEPTH DISPLAY

This meter provides a digital display of depth.

2.1.5 LINE TENSION DISPLAY

This meter provides a digital display of total line tension.

2.1.6 LINE SPEED DISPLAY

This meter provides a digital display of line speed.

2.1.7 MAGNETIC MARK DISPLAY

This meter provides a digital display of the depth where the last mark was detected. It is also used as a CCL offset display when the panel is configured for cased hole operations (MODE 3).

2.1.8 MAGNETIC MARK RESET

Pressing the MMD reset button clears the last mark setting. The next mark detected will be used to set the window for any subsequent marks.

2.1.9 ZERO DEPTH

Pressing this button will reset the depth to 0. Depressing the button again will reset the depth to the previous setting. The Zero Depth button will only work when the line speed is zero (i.e. winch not moving).

2.1.10 MENU

Pressing this button will activate the menu software. The software feature to be set will be displayed on the DEPTH display. The features can be toggled through by pressing the menu button until the desired feature is displayed.

2.1.11 + / - SWITCH

This switch is used for different functions. It is used to change the depth setting in either an up or down direction. The winch must be stopped before the depth can be set. In menu mode (see section 3.0) the switch is used to set menu parameters.

2.1.12 APPROACHING SURFACE LED AND ALARM

This LED is lit and an audible alarm is sounded when the depth is less than 100' (30 m). This is a warning to the hoist operator that they are approaching surface and should take care to get the equipment safely out of the well. When the LED is depressed, the alarm will stop but the LED will continue to blink. Once the depth reading is greater than 100' (30 m), both the alarm and the LED will turn off.

2.1.13 ENGLISH / METRIC UNITS

These LEDs will indicate if the panel is in English or metric mode. If the depth is set to English, the English LED will be lit. If the depth is set to Metric the Metric LED will be lit. The tension can be set to English (LBS) or Metric (KG) but it will not light the LED.

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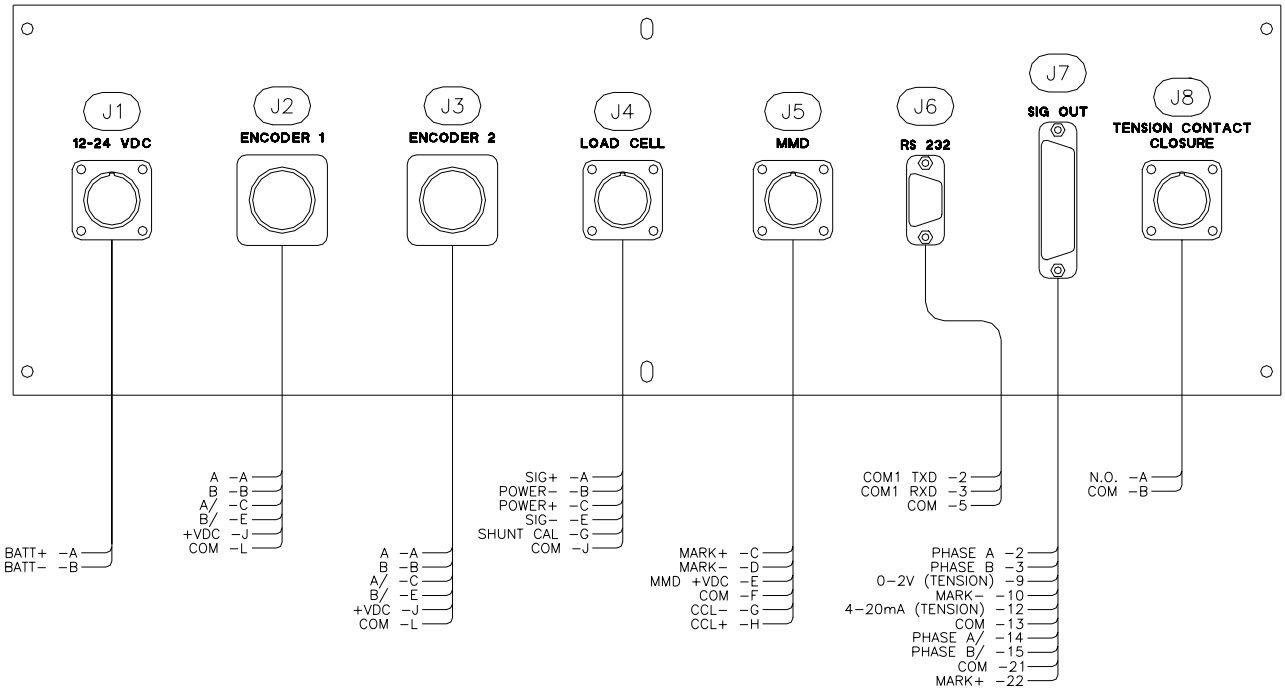
2.1.14 T-ZERO SWITCH

Use this switch to set the tension to 0 at the start of a logging run. This will zero out the tension circuit. The line should be slack through the head at this time.

2.1.15 T-TEST SWITCH

Press T-TEST and verify that the panel tension reads 20000 lbs (MODE 5) or 5000 lbs (MODE 3). Verify tension is being properly recorded on acquisition system.

2.2 REAR PANEL



2.2.1 J1 – POWER INPUT

This connector supplies dc power for the panel operation (9 VDC min, 30 VDC max). The panel can operate on either 12 or 24 vdc (12 vdc is U.S. truck standard voltage, 24vdc is European truck standard voltage). Pin A is positive, pin B is negative.

2.2.2 J2 – J3 ENCODER 1, ENCODER 2,

+5 vdc power is provided to the encoders and signal is received from the encoders on these connectors. Refer to the section 6.0.

2.2.3 J4 – LOAD PIN

+/- 15vdc power is provided to the load pin and signal is received from the load pin on this connector. Refer to the section 6.0 for the pinout listing..

2.2.4 J5 – MAGNETIC MARK

+ 15vdc power is provided to the magnetic mark detector and signal is received from the mark detector on this connector. Refer to the section 6.0 for the pinout listing..

2.2.5 J7 - SIGNAL OUTPUT

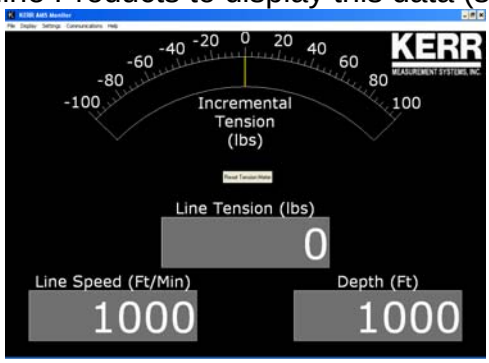
Encoder, tension, and magnetic mark signals, processed and some unprocessed are passed through this connector to the acquisition system.

2.2.6 J8 - OVER TENSION CONTACT

This connector provides a connection to the overtension circuit relay. When an overtension condition is active, the two pins are connected together. In normal position the two pins are open. This feature can be used to interface to the winch unit control system to provide automatic hoist shutdown when an overtension condition is reached.

2.2.7 J6 - RS232 SERIAL INTERFACE

A PC can be used to display depth, tension, and line speed data from the panel. The PC can also be used to set panel parameters. To connect the panel to a computer, connect a serial cable from the PC to J6 on the rear of the panel. A program is available from BenchMark Wireline Products to display this data (see figure below).



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3.0 MENU COMMANDS

This panel has internal software which allows it to be set for various configurations. To change the settings, press the MENU button. The feature to be set will be displayed on the DEPTH display. Press the MENU button again until the feature you want to set is displayed.

The parameters for each feature will be displayed on the LINE TENSION display. Press the +/- switch to cycle through all the available parameters. When the value you want to select is displayed, press the MENU button. ACCEPT will then be displayed. Press + for yes, - for no.

Following is a listing of all the available settings.

Note: These options are for the AM3K measuring head. The software can also be configured for an AM5K measuring head by removing the jumper on JP3.

3.1 TEN ALARM

When preset tension value is reached, alarm sounds and tension display flashes value

Procedure: Use +/- switch to set the tension alarm setting.

Indication: TALARM will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Selection: Each cable size will have a corresponding Tension Alarm setting. Only the setting for the cable size selected (see menu option 1) can be adjusted.

Default Values

7-32	1500
9-32	2400
5-16	2400
3-8	2400
7-16	2400
15-32	2400
15-32HT	2400
SLAM	2400
SLAMHT	2400
S-SLAM	2400
S-SLAMHT	2400

3.2 DELTA TENSION ALARM

When the delta tension setting is reached the alarm sounds. In incremental mode, you must periodically press meter reset or this alarm will sound when the tension reaches the set value. In differential mode, the meter will reset itself and the alarm will only sound on a quick change of tension. The Alarm Reset switch must be pressed to reset the over tension relay.

Procedure: Use +/- switch to set the Delta Tension setting.

Indication: **DTALRM** will be displayed on the DEPTH display and the value being set will be displayed on the TENSION display as it is being adjusted.

3.3 TENSION SHUTDOWN

When value is reached, alarm sounds, tension display flashes value, and tension contact closure switch is closed. This can be used to provide a signal to automatically stop the winch.

Procedure: Use +/- switch to set tension shutdown setting

Indication: OVRTEN will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Selection: Each cable size will have a corresponding Tension Alarm setting. Only the setting for the cable size selected can be adjusted.

Default Values

7-32	2000
9-32	3000
5-16	3500
3-8	3500
7-16	3500
15-32	3500
15-32HT	3500
SLAM	3500
SLAMHT	3500
S-SLAM	3500
S-SLAMHT	3500

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3.4 CABLE SIZE

Cable size selection automatically sets load pin angle setting for the selected cable size.

In mode 3, wheel size is also automatically set for the selected cable size.

If other is selected, the LCA value needs to be entered. This value is based on the bend angle of the cable over the tension wheel. This value is empirically derived and must be furnished by the measuring head manufacturer.

Procedure: Use +/- switch to select cable size.

Indication: CABLE will be displayed on the DEPTH display and the selections will be displayed on the LINE TENSION display.

Cable Size Values available

7-32	
9-32	
5-16	
3-8	
7-16	
15-32	
.472	
.472DG	(use if DEEP GROOVED wheel is installed)
.484	(DEEP GROOVED WHEEL ONLY)
.492	(DEEP GROOVED WHEEL ONLY)
.550	(.550 WHEELS – .500 TO 17/32” CABLE)
.650	(.650 WHEELS - .550 CABLE TO .650 CABLE)
OTHER	

Default value is SLAM

DG – DEEP GROOVE TENSION WHEEL SETTINGS

The DG designates the DEEP GROOVED tension wheel when installed on the AM5K measuring head (refer to AM5K measuring head user manual). This wheel is used for high tension operations or with cable requiring less bend. It can only be used with 15-32 or large cables.

The shallow groove tension wheel available on the AM5K measuring will work with cables for .472 or smaller.

OTHER

If you select the "OTHER" setting, you will be allowed to change the measuring wheel circumference and the load cell factor. This allows the panel to with a different type of measuring head or a different load cell, such as a derrick mounted load cell.

When "OTHER" is selected, two additional inputs will be required:

LCFACTOR and WHLCIR.

LCFACT (Load Cell Factor). This setting determines the ratio between the input signal and the tension value displayed. A setting of 2 will decrease the tension value by ½. A setting of .5 will double the tension reading.

Default value is 1.

WHLCIR (Wheel Circumference). This value is set to the circumference of the measuring wheel to ensure the depth is measured correctly. Default value is 2.0 ft.

3.5 TENCOF

This option provides a means to adjust the tension coefficient used by the panel to calculate tension for different sizes of wirelines. Use the +/- switch to change the coefficient. 10% (+/-) is the maximum adjustment allowed.

3.6 DEPTH ADJUST (Shim)

The shim amount selected will automatically be added or subtracted from the depth input.

Procedure: Use +/- switch to set the shim setting.

Indication: DP-ADJ will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set. The values are feet / thousand.
Default value is 0.

3.7 DEPTH ALARM

When Alarm depth value is reached, the alarm will sound and LED will flash. Pressing the LED will turn off alarm but the light will continue to flash.

Procedure: Use +/- switch to set the depth alarm value.

Indication: DALARM will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set. Default value is 100'

3.8 MMD or CCL

Either MMD or CCL can be selected. MMD provides a the ability to detect magnetic marks. CCL provides a means to display the offset between the CCL depth and the bull plug depth.

Procedure: Use +/- switch to select either MMD or CCL.

3.8.1 CCL

The CCL depth will be displayed on the MMD meter. This makes it easier to monitor CCL depth in addition to bottom of tool depth. The following menu options are available.

CCL OFFSET

The CCL depth will be displayed on the MMD meter. This makes it easier to monitor CCL depth in addition to bottom of tool depth.

Procedure: Use +/- switch to set the CCL offset depth

Indication: CCL will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

OFFSET
Use +/- switch to set the CCL offset depth

LOG
The following menu options are available:

LOG CCL
Displays latest 100 collars. Will overwrite the oldest collar after 100.

CCL DLY
Use +/- switch to set delay from 1.0 to -0.1 Adds or subtracts to detected collar depth.

CCL_BP
Turns detected CCL audio on or off.

STRCOR (stretch correction)
Use +/- switch to toggle between ON or OFF
When STRETCH Correction is on, the panel will automatically correct depth to compensate for cable stretch. The following information will then be requested:

TOOLWT
The weight of the tool string at the end of the cable. Default value is 1000 lbs.

FLUIDW
The fluid weight of the well bore fluids. Default value is 8.3 lbs.

Stretch in the wireline is compensated in the following manner:

As the tool is lowered into the well the depth traveled is measured using the optical encoders 10 times a second. The tension is used to “back out” the stretch on the wireline for that segment and a non stretched depth is calculated by keeping a tally of all of the segments. This summed value is used in the following manner to calculate the depth:

If the tension is less than the calculated line weight the tool is assumed to be floating or supported in some other manner. The tension is due to the line weight so the stretch added is = summed depth * tension * Ks * 1/2 where Ks is the stretch coefficient. If the tension is greater than the line weight the stretch due to the line weight is calculated as above and all other weight is assumed to be acting over the entire length of the cable or = sum depth *((line weight * ½) + (tension-line weight)) * Ks

CCL LOG

Press the +/- switch and you will be able to see the depth at which each casing collar was detected. The MMD/CCL display will display the depth of each collar when the switch is pressed.

3.8.2 MMD

The following menu options are available.

MMDCOR (MMD Correction)

Use +/- switch to toggle between ON or OFF. If MMD is set to ON the panel will automatically correct depth to correspond to magnetic mark spacing. When depth is automatically added or subtracted it will be done evenly at a rate of 1' per 10'.

STR CORR (Stretch Correction)

Stretch Correction works differently depending if MMD correction is ON or OFF.

If MMD Correction is ON and STRCORR is ON, the panel will automatically correct the MMD WINDOW depth to compensate for cable stretch. The Mark Window will change as the cable stretches to make sure the window is always set properly.

STRCORR can be turned off by selecting OFF. No stretch will be added in this case.

If MMD Correction is OFF or STRCORR is off, no stretch will be calculated.

If STRCORR is turned ON, the following information will be requested:

TOOLWT

The weight of the tool string at the end of the cable. Default value is 1000 lbs.

FLUIDW

The fluid weight of the well bore fluids. Default value is 8.3 lbs.

SPACNG

This is to set the spacing at which the magnetic marks were installed on the wireline.

Use +/- switch to toggle between 100, 25 M, 50 M.

WINDOW

The MMD window determines when the next mark can be detected. The cable must travel at least the distance of the mark spacing (100', 50m or 25m) – the window setting, before a mark can be detected. Marks can only be detected if they occur within this window. If the window is set for 5' and the mark spacing is 100', the cable must travel no less than 95' and no more than 105' from the last mark before a new mark can be detected.

The MMD Depth display will blink when the depth is within the mark Window.

The Window is disabled after the MMD Reset button is pressed and will not be enabled until the first mark is detected.

Procedure: Use +/- switch to change MMD window value.

Indication: MMD will be displayed on the DEPTH display and the window value will be displayed on the TENSION display as it is being set.
Pressing the MMD reset button clears the last mark setting.

MMD LOG

The depth of the first 25 detected marks is stored in memory and can be displayed.

Procedure: Use +/- switch to toggle through all of the marks that have been detected. This starts from the last mark detected. Pressing depth 0 will clear all the stored marks.

Indication: MMD DP will be displayed on the DEPTH display and the mark depth will be displayed on the TENSION display.

3.9 ENCODER SELECT

This function allows the user to change encoders by selecting a different encoder connected to the panel.

Procedure: Use +/- switch to select which encoder input on the rear panel will be used.

Indication: ENCSEL will be displayed on the DEPTH display and the encoder selected appears on the Depth display.
a. ENC 1
b. ENC 2
c. BOTH

If BOTH is selected, the depth will be a composite of ENC 1 or 2. The two encoders are compared 10 times per second and the encoder that moves the furthest at each comparison will be used to increment the composite depth.

Note: Encoder 1 will always turn the opposite direction from encoder 2. In direct mode (see section 3.11), the encoder output will be in the same direction as encoder 1.

3.10 ENCODER PULSES PER REVOLUTION

The value selected will automatically be used as the encoder input pulses per revolution (PPR) setting.

Procedure: Use +/- switch to set the ENCODER Pulse Per Revolution setting.

Indication: ENCDOR will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set. Default value is 1200.

3.11 ENCODER DIRECTION

The value selected will toggle the encoder direction between UP and Down.

Procedure: Use +/- switch to set the ENCODER direction setting.

Indication: ENCDIR will be displayed on the DEPTH display and either UP or DN value will be displayed on the TENSION display. Default value is UP.

3.12 ENCODER OUT – SYSTEM PULSES PER FOOT

This setting determines the encoder pulse rate that will be output to the acquisition system.

Procedure: Use +/- switch to set the encoder output value.

Indication: SYSPPF will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

3.13 DEPTH UNITS

The depth values will be displayed in the units selected.

Procedure: Use +/- switch to set the DEPTH UNITS setting.

Indication: DEPTH will be displayed on the DEPTH display. The selection can be toggled between FEET or METERS. The selection will be displayed on the TENSION display. The ENGLISH (green) LED display will be lit when FEET is selected and the METRIC (red) LED will be lit when METERS is selected.

3.14 TENSION UNITS

The tension value will be displayed in the units selected.

Procedure: Use +/- switch to set the TENSION UNITS setting.

Indication: TENSION will be displayed on the DEPTH display. The selection can be toggled between POUNDS and KILOGM. The selection will be displayed on the TENSION display.

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4.0 SYSTEM OPERATING INSTRUCTIONS

4.1 Power up panel and verify it is working properly.

4.2 Verify the panel is configured to match the system (head type, system output, encoder, etc.)

4.3 Set up acquisition system:

4.4 Press T-Zero and verify that panel tension reads 0. Verify tension is recorded on acquisition system.

4.5 Set line size to match cable size installed in head (refer to section 3).

4.6 Set Tension Alarm value (refer to section 3).

4.7 Set depth adjust value (refer to section 3).

4.8 Install cable in measuring head and lay it slack on the ground.

4.9 Press T-Zero to zero the tension value.

4.10 Press T-Test and verify that panel tension reads 10000 lbs. Verify tension is being properly recorded on acquisition system.

4.11 Pull tool to depth 0 position. Press D-Zero and verify that panel depth reads 0. Set acquisition system depth to 0 at this time.

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5.0 RECOMMENDED SPARE PARTS LIST

AMS4A041 PANEL WINCH OPERATOR DISPLAY PANEL

Kerr p/n	Description	Qty	Reference
AMS4P134E	PC BOARD AMS40 REV E	1	MOTHER BOARD
AMS4P110	METER ANALOG DIFF TENSION (+/- 1000 LBS)	1	M1
AMS4P128	DISPLAY LED .5" SERIAL 2"X3.5"	4	D1 – D4
ACMU1P06	LED RED DIALIGHT 5V	1	APPROACHING SURF
ACMU1P11	SONALERT #SC628D MALLORY	1	ALARM
AMS4P020	SWITCH MTL-106D ALCO LOCKING	2	POWER ON/OFF
AMS4P018	SWITCH MPA-106F ALCO PUSH MOM	5	MENU,T-ZERO,T-TEST,D-ZERO,METER RESET
AMS4P044	SWITCH TOGGLE DPDT MOM OFF MOM	1	+ / -
AMS4P021	SWITCH CAPS ALCO C-22 BLACK	3	T-ZERO,D-ZERO,METER RESET
AMS7P017	SWITCH CAP ALCO C-22 RED	1	D-ZERO, MENU
AMS4P169	CONN KPSE02E12-3S RECEPTACLE	1	J1 – POWER IN
AMS4P179	CONN KPSE02E12-3P RECEPTACLE	1	J8 – OVERTENSION
AMS4P178	CONN KPSE06J12-3P RECEPTACLE	1	J8 - MATING CNTR
AMS4P166	CONN DB25S	1	J7 – SIG OUT
AMS4P171	CONN KPSE02E12-10S RECEPTACLE	1	J4 – LOAD PIN
AMS4P172	CONN KPSE02E14-12S RECEPTACLE	1	J2,J3 - ENCODER
AMS4P170	CONN KPSE02E12-10P RECEPTACLE	1	J5 - MMD
AMS4P041	SWITCH PUSHBUTTON LIGHTED SPST	1	APPROACHING SURF
AMS4P042	LENS RED C&K SWITCH	1	RED LENS
AMS4P043	LED RED FOR C&K PUSHBUTTON SW	1	RED LED

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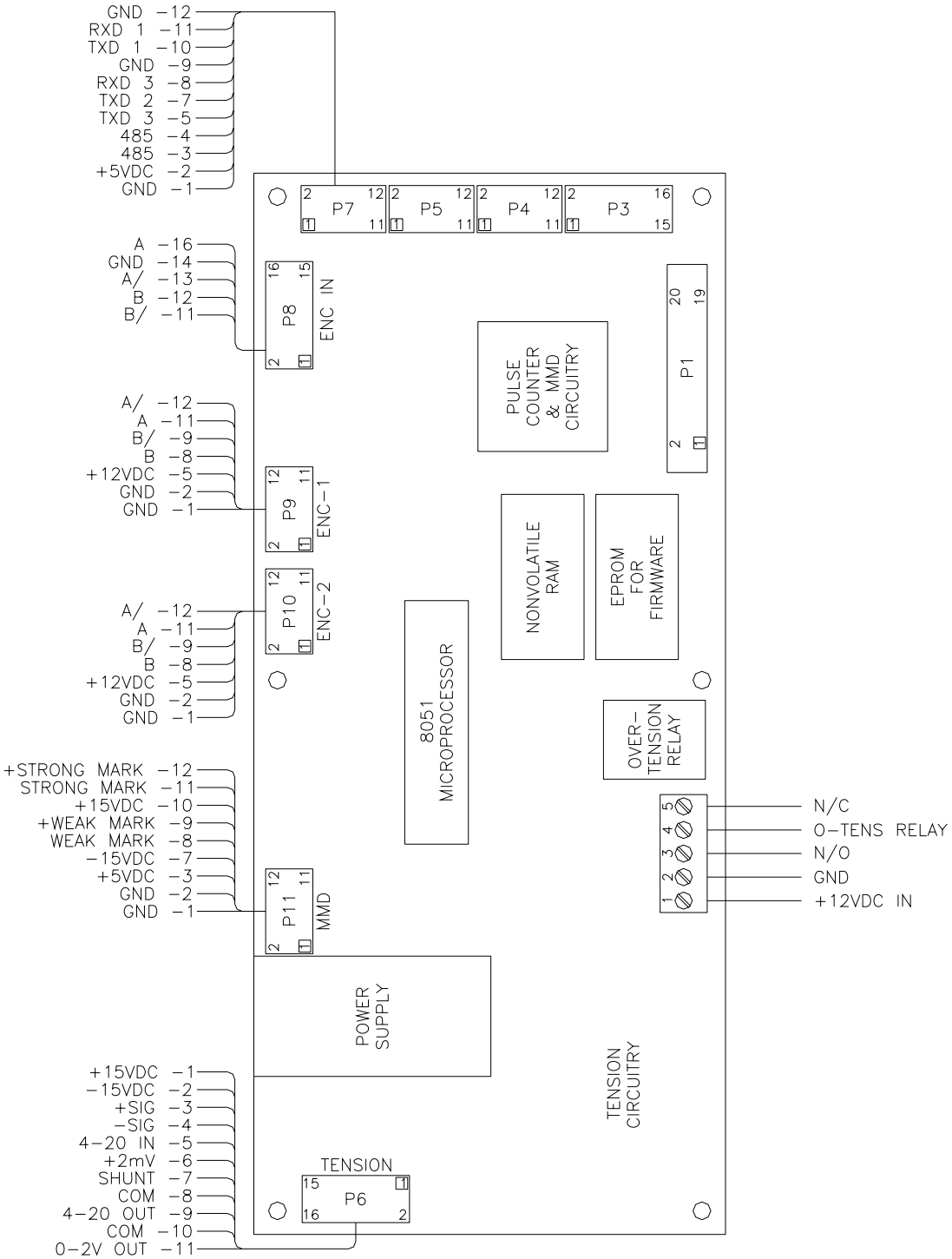
6.0 DRAWINGS AND WIRE LISTS

6.1 Main Processor Board



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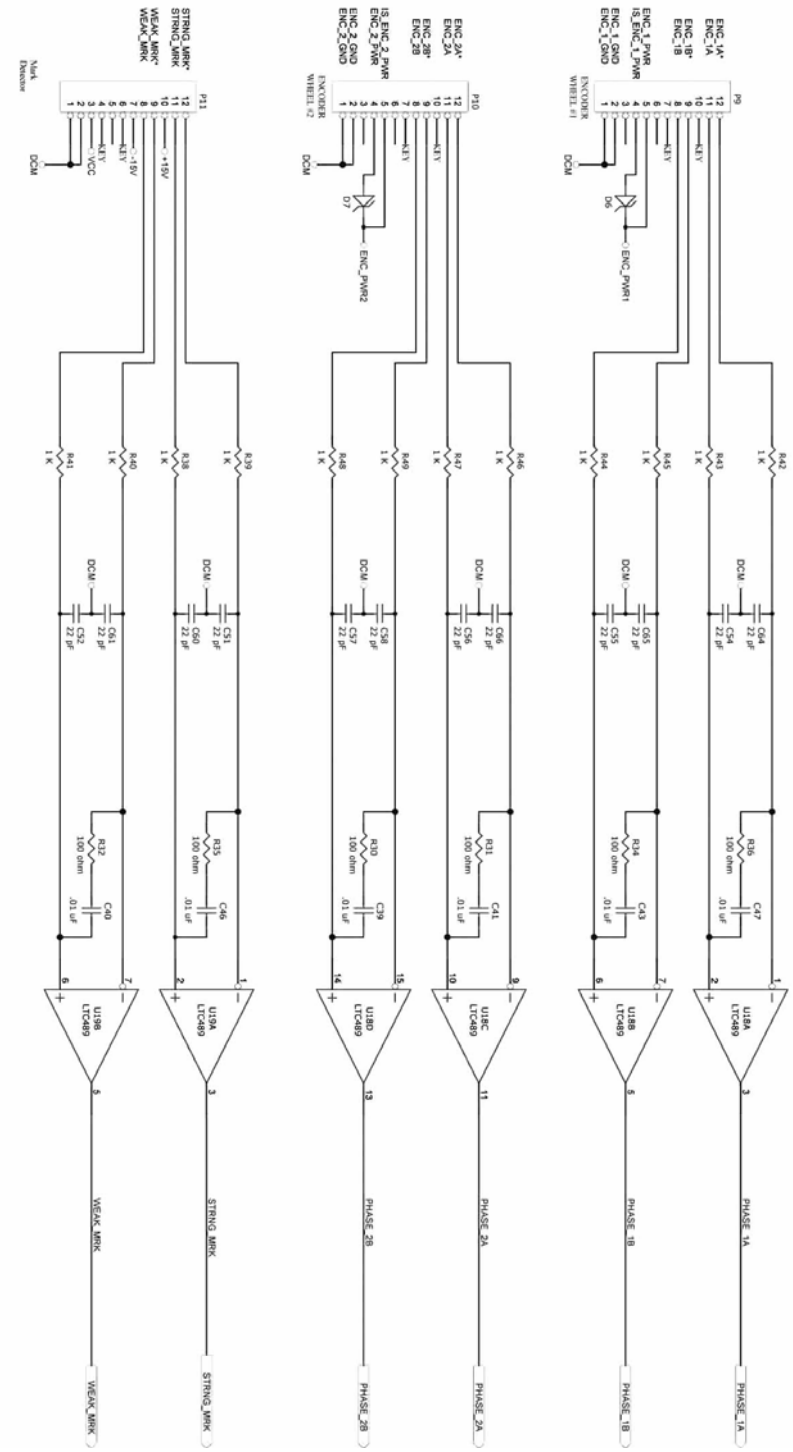
6.1.1 ENCODER AND MMD INPUTS



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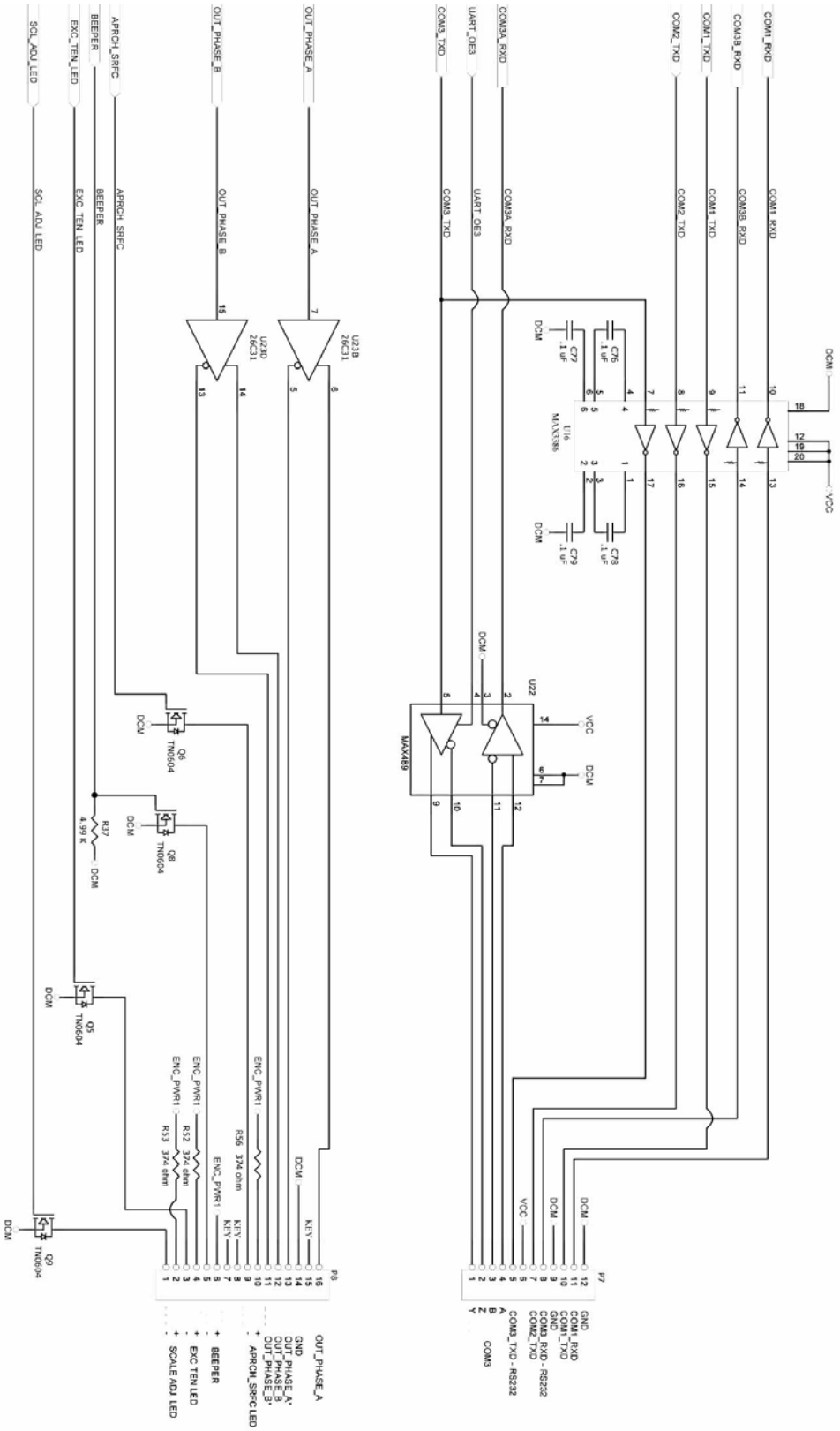
6.1.2 ENCODER OUTPUT AND COM PORT I/O



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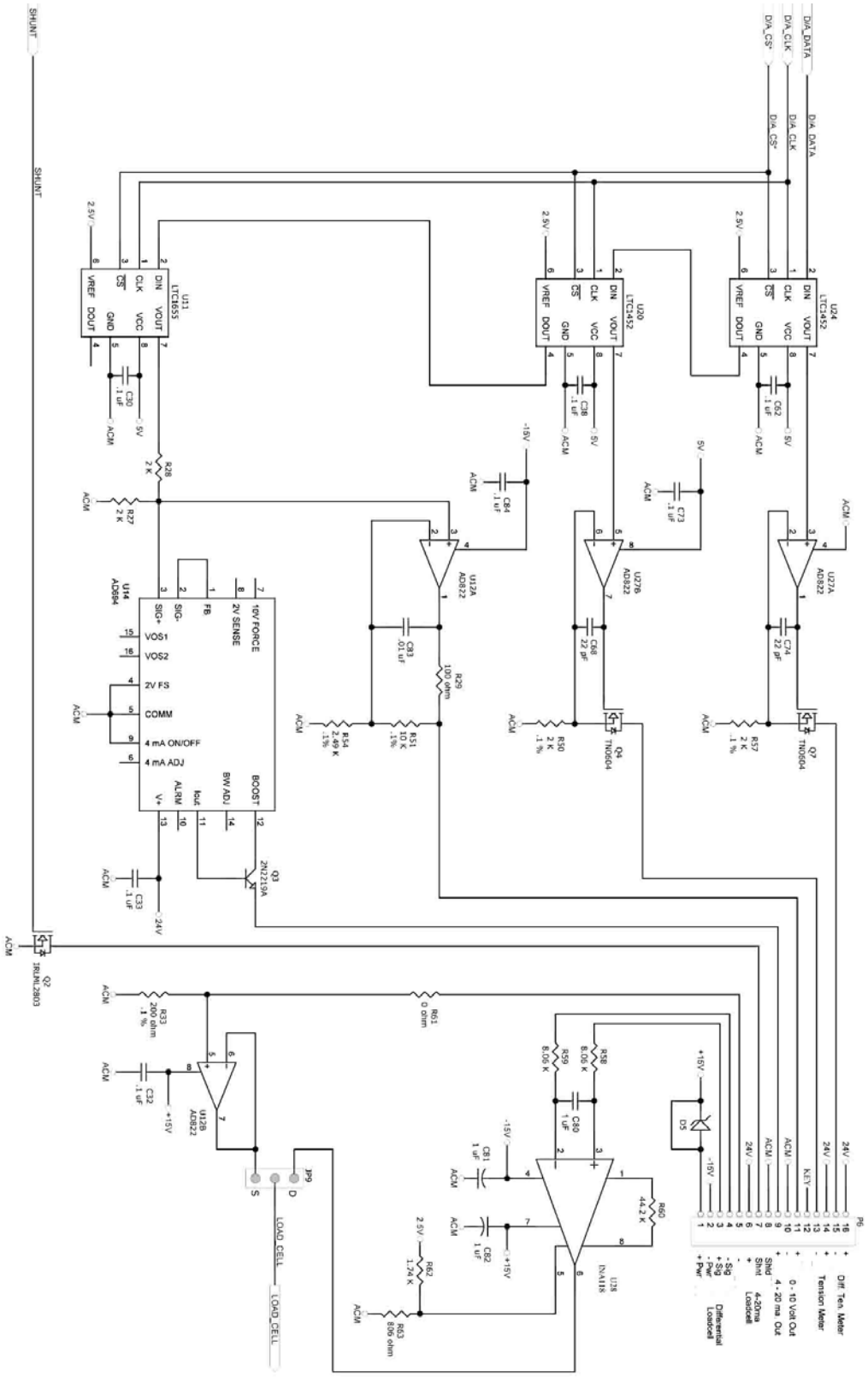
6.1.3 LOAD PIN AND TENSION I/O



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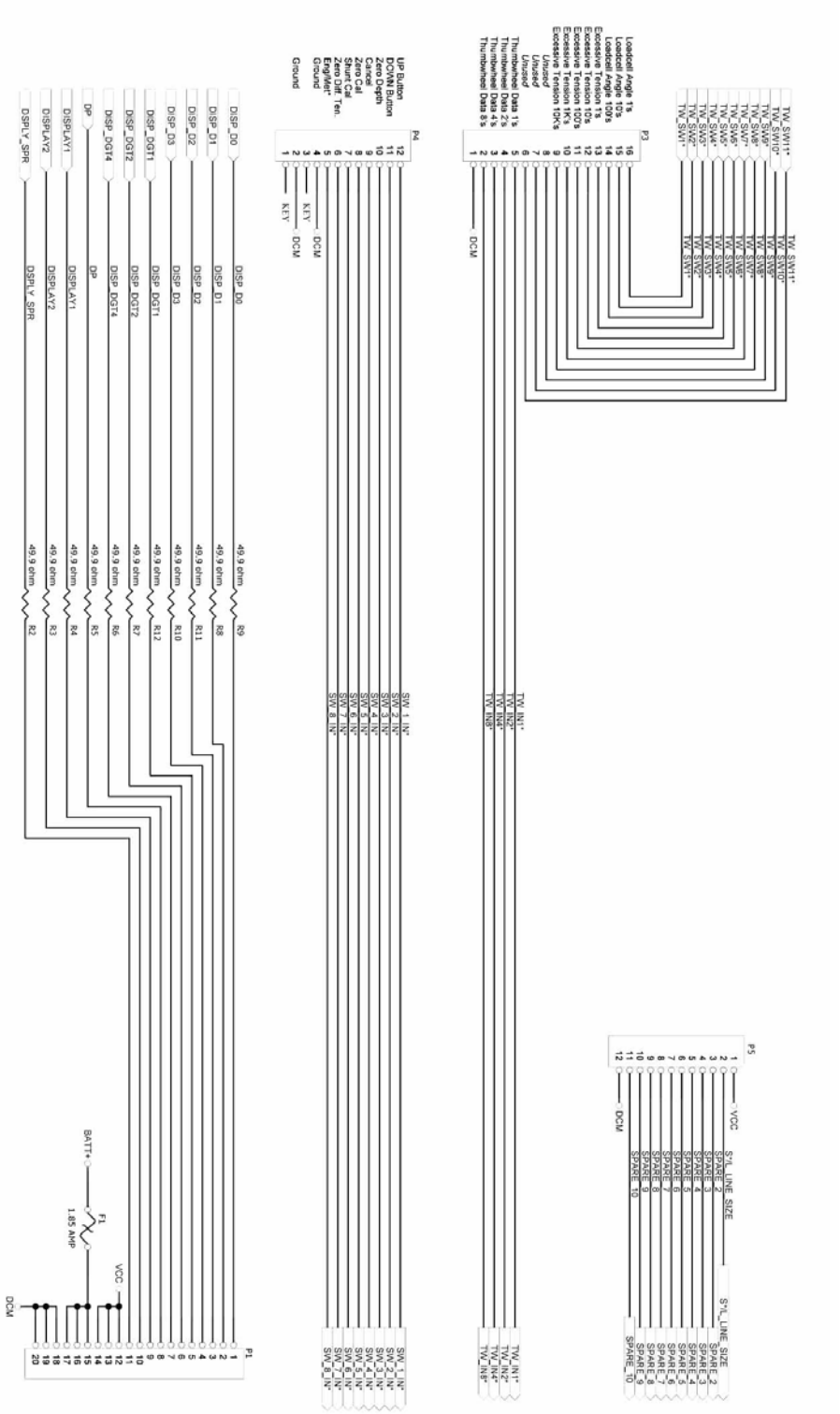
6.1.4 JUMPERS – BUTTONS



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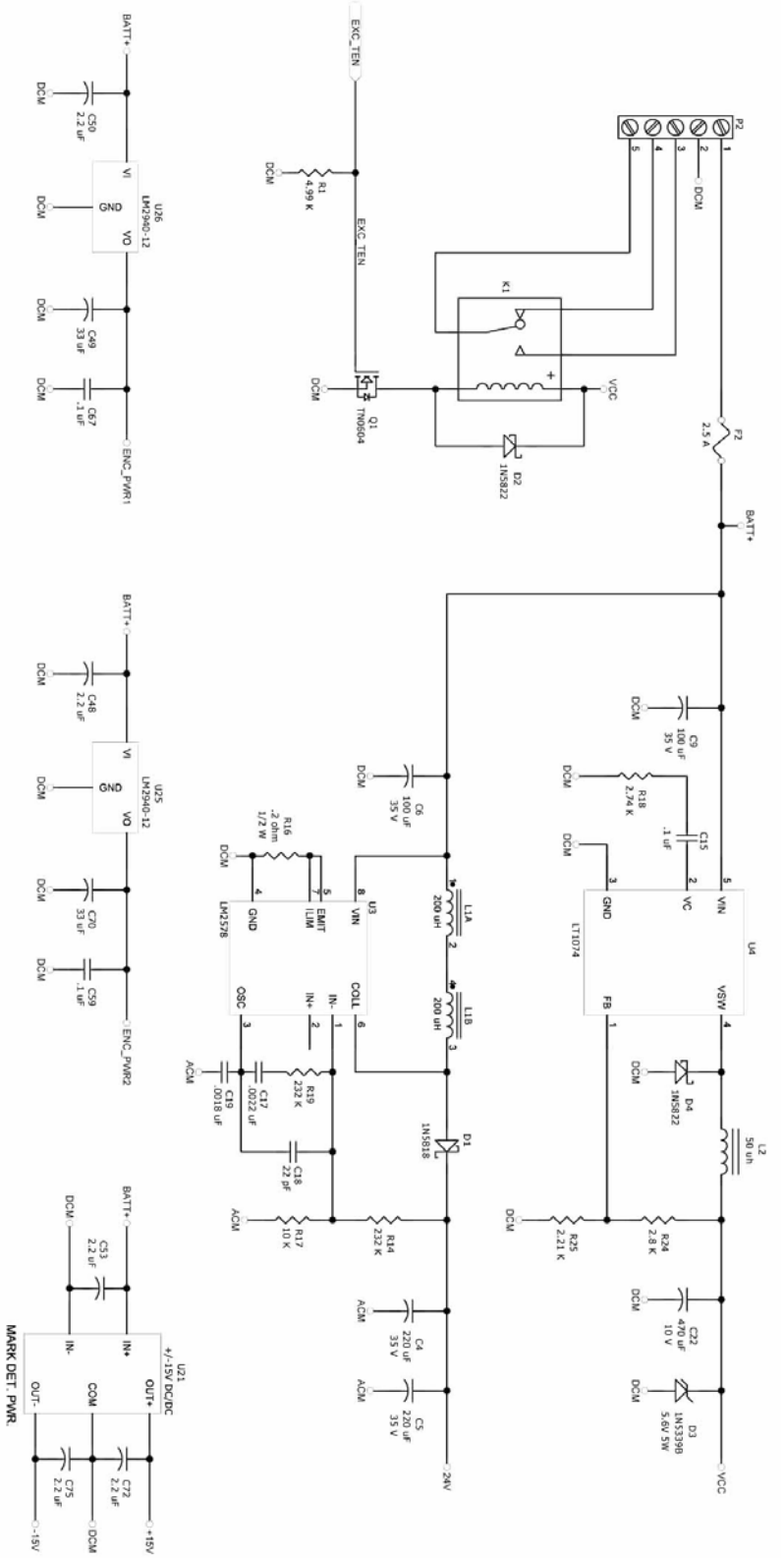
6.1.5 POWER SUPPLIES



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6.2 BACK PANEL CONNECTOR PINOUT

POWER INPUT

J1 - A	BATT +
J1 - B	BATT -

ENCODER 1

J2 - A	ENCODER 1A
J2 - B	ENCODER 1B
J2 - C	ENCODER 1A*
J2 - E	ENCODER 1B *
J2 - J	ENCODER1 PWR
J2 - L	COMMON

ENCODER 2

J3 - A	ENCODER 2A
J3 - B	ENCODER 2B
J3 - C	ENCODER 2A*
J3 - E	ENCODER 2B *
J3 - J	ENCODER2 PWR
J3 - L	COMMON

LOAD PIN

J4 - A	LOAD PIN SIG+
J4 - B	LOAD PIN POWER -
J4 - C	LOAD PIN POWER +
J4 - E	LOAD PIN SIG-
J4 - G	SHUNT CAL ENABLE
J4 - J	COMMON

MAGNETIC MARK/CCL

J5 - C	MARK+
J5 - D	MARK-
J5 - E	MMD POWER +
J5 - F	COMMON
J5 - G	CCL -
J5 - H	CCL+

RS232

J6 - 2	COM1 TXD
J6 - 3	COM1 RXD
J6 - 5	COMMON

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SYSTEM OUTPUTS

J7 - 2	PHASE 1A
J7 - 3	PHASE 1B
J7 - 9	0-2V OUT (TENSION)
J7 - 10	MARK- (OUT TO SYSTEM)
J7 – 12	4-20MA OUT
J7 - 13	COMMON
J7 - 14	PHASE 1A*
J7 - 15	PHASE 1B*
J7 - 21	COMMON
J7 - 22	MARK+ (OUT TO SYSTEM)

OVERTENSON

J8 - A	CONTACT CLOSURE N.O.
J8 - B	CONTACT CLOSURE COM

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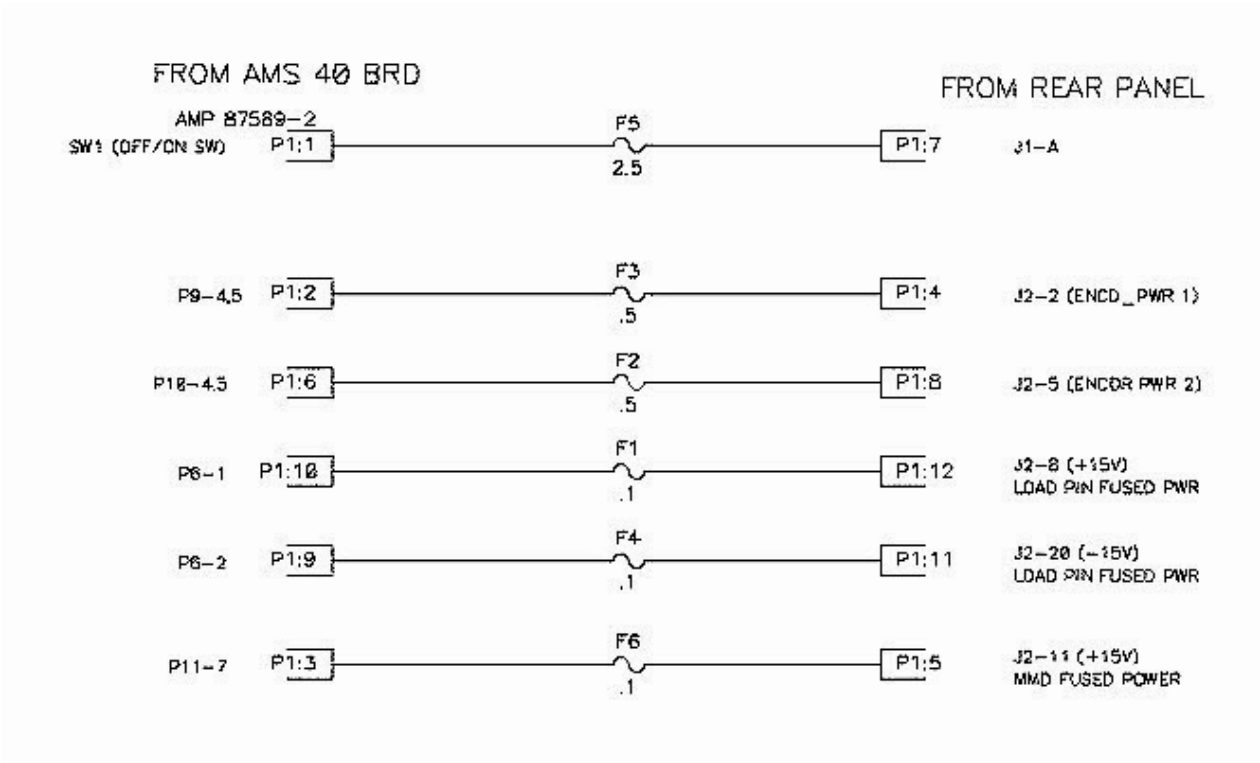
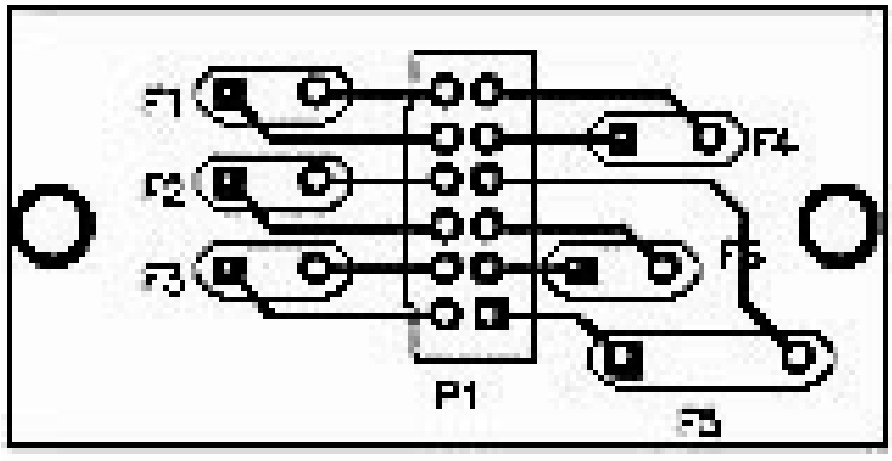
6.3 FUSE BOARD AND POWER WIRING

Refer to 5.2 for wirelist





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6.4 DIGITAL DISPLAY SETUP

The four digital displays can be set for address, baud rate, and brightness.

The button nearest the connector selects the parameter (address, baud rate, brightness).
The center button increments the parameter up
The end button increments the parameter down.
After the parameter is set, press the parameter button again to store it.

The addresses should be set as follows:

- Line Tension = 1
- Line Speed = 2
- Depth = 3
- MMD = 4

Set Baud Rate to 9600
Set Brightness to 15

6.5 RS232 SERIAL INTERFACE

The wiring is as follows:

DB9 PIN OUT: 2 = TRANSMIT, 3 = RECEIVE, 5 = GROUND

Run a program such as MS Windows HyperTerm using the following parameters

BAUD	38,400
BITS	8
PARITY	N
STOP	1

Press H or ? to display the help screen

```
            * * * AMS41 Help Screen * * *

H,? - This screen.
D   - Display units, direction, depth, speed, and tension.
L   - Modify load cell angle (factor) Usage: L1.2
P   - Modify encoder pulses/revolution. Usage: P600
V   - Verify WDDU setup status.
W   - Modify wheel size (line other) (feet) Usage: W4.0
Z   - Preset depth.Usage: Z0.0  |_|--> New depth.
U   - Modify units of measure
      UF (feet); UM (meters); UP (pounds); UK (kilograms);
A   - Depth Alarm. Usage: A100  |_|--> Depth Alarm.
N   - Line Size
            N0 7/32; N1 ¼; N2 9/32; N3 5/16; N4 3/8; N5 7/16;
```

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```
            N6 15/32; N7 .472; N8 .472DG; N9 .484; N10 .492;
            N11 .550; N12 .650
M  -  Tension Alarm. Usage: 'M2500' for 2500 pound alarm.
J  -  Depth Adjust. Usage: 'J-1' for -1 ft per 1000 feet
S  -  System PPF Usage: 'S125' for 125 PPFoot to system
B  -  Enter Mud Weight B12.3 lbs/gal
T  -  Enter Tool Weight T1000 lbs
k  -  Toggle stretch correction on/off
p  -  Display depth and stretch data
m  -  Use MMK Correction
C  -  Toggle D string depth/ccl display  (CCL depth or MAIN depth)
```

Press V to display the Verification Screen

```
      * * * AMS4A041 Setup Status * * *

Software revision              S4100.01
Line Size =                    slam
Depth Units =                  Feet
Depth Units =                  Pounds
Depth alarm =                  100 ft
Tension alarm =                2400 lbs
Tension shutdown =             3500 lbs
Encoder PPR =                  1200
Depth Adjust =                 0.0
Wheel Circumference  =         2.000 feet
Load Cell Angle Factor  =      1.00
System Pulse per Foot =        600.0
Cable volume  =                2118 cubic inches per 1000 feet
Cable weight  =                1.0
Weight fluid =                 8.300
Cable weight fluid =           1.000
Tool weight =                  1000
Stretch Corr is                OFF
MMK correction is              OFF
Line stretch tool =            8.3
D string =                     DEPTH or CCL
```

Press D to display the Data Screen

```
DATA STRING DESCRIPTION
12345678901234567890123456
U D Zddddd.d ssss.s tttttt<CR><LF>

WHERE:
U – UNITS (Depth,   Tension)
      'E' - English, English,   'G' - English, Metric,
      'M' - Metric,  Metric,      'F' - Metric,  English
D - DIRECTION     ('U' - UP; 'D' - DOWN; 'S' - STOPPED)
Z - ZERO DEPTH REF. ('+' BELOW GROUND; '-' ABOVE GROUND)
d - DEPTH
s - LINE SPEED
t - TENSION
<CR> - CARRIAGE RETURN, <LF> - LINEFEED
```

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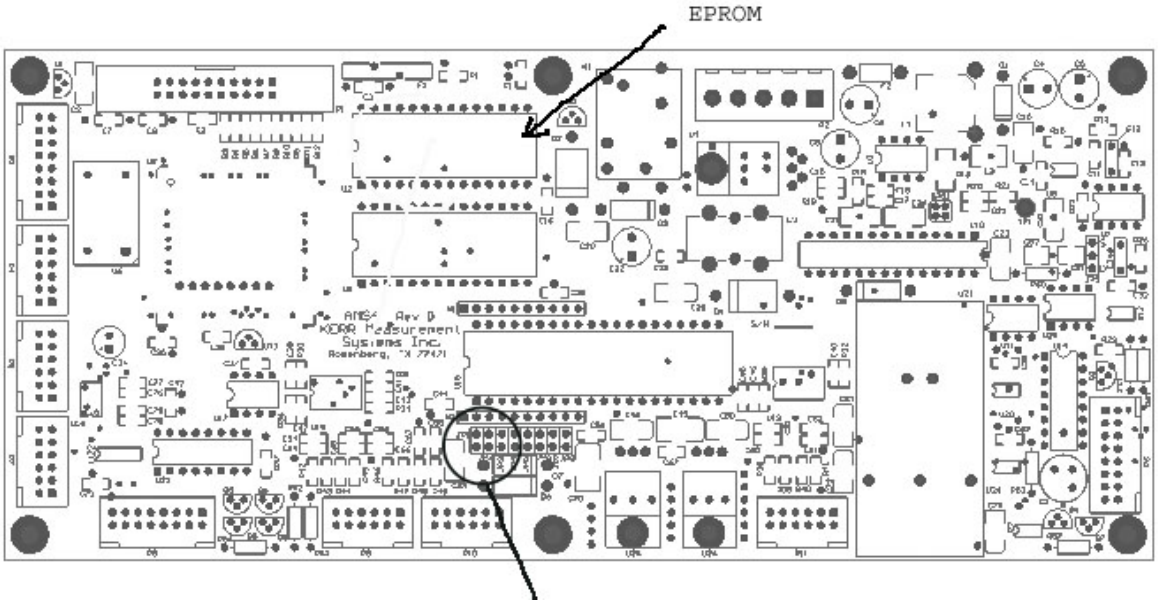
INSTALLING NEW SOFTWARE

7.1 SOFTWARE MODIFICATION BY REPLACING THE EPROM

The software that controls this panel is stored in an EPROM Integrated Circuit located at U2 (see drawing on next page). To upgrade the software to a new version, simply remove the eprom I.C. and install a new eprom I.C. (be careful not to bend the legs during installation). The current revision is 4100.17.

After new software is installed, make sure and "reboot" the panel by turning off the panel, depressing the T-ZERO and T-TEST buttons simultaneously then turn the power back on while the buttons are depressed.



7.2 SOFTWARE MODIFICATION USING THE SERIAL PORT

7.2.1 PREREQUISITES:

1. The real-time data acquisition board must have a socket for the MicroController and a CPU piggy-back PCB installed in that socket with a DS98C450 MicroController installed.

2. A computer with a serial port, and installed Hyperterminal program.

3. The new revision real-time data acquisition HEX file program.

7.2.2 PROCEDURE:

1. Transfer the new revision HEX file to your PC.

2. Connect your PC to the serial port at the rear of the panel.

3. Turn power on to the Hoistman's panel.

4. Open a Hyperterminal session. Use the following settings:

Serial Port: COM1
Baud Rate: 57600
Data Bits: 8
Parity: None
Stop Bits: 1
Flow Control: None

5. Set the switches on the CPU PCB to PROGRAM mode as follows:

1 - AWAY FROM CPU
2 – AWAY FROM CPU
3 - TOWARD CPU

6.Open the Hyperterminal connection and then press the keyboard ENTER key. The MicroController ROM Loader will respond with a banner and then a '>' prompt.

7. Type an uppercase 'K' and the ROM Loader will Klean-erase the Flash.

8. Type an uppercase 'L' and the ROM Loader will wait to Load a HEX file.

9. Pull down the Hyperterminal TRANSFER menu and choose: Send Text File. The file browser will open, so ensure that the file filter is set to:
Files of type - All files (*.*) and then choose the new revision HEX file to transfer.

10. The ROM Loader will begin programming the Flash and will report a GOOD status for the duration of the programming procedure as follows:

GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG

GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG

11. After the ROM Loader is finished programming the Flash set the switches on the CPU piggy-back PCB as follows:

1 - TOWARD CPU
2 - TOWARD CPU
3 - AWAY FROM CPU

12. To operate from an EPROM instead of the Micro-Controllers internal memory, set the switches on the CPU piggy-back PCB as follows:

1 - TOWARD CPU
2 – TOWARD CPU
3 - TOWARD CPU

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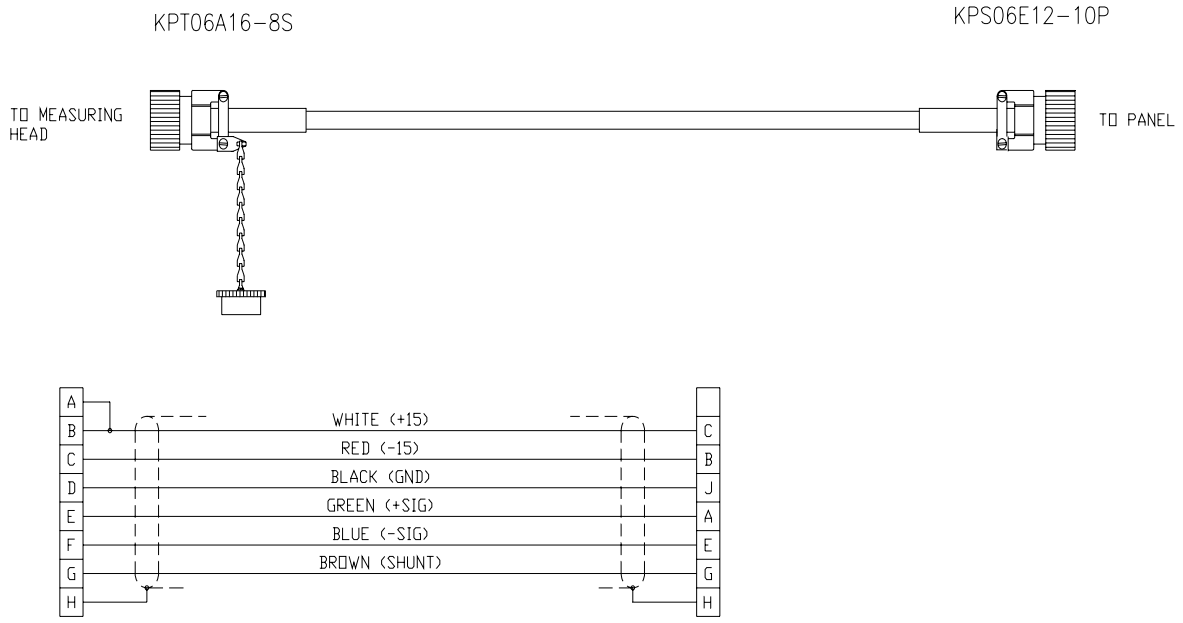
8.0 CABLE DIAGRAMS

8.1 AMS4A110 CABLE ASSEMBLY – LOAD PIN



AMS8P057	CONN KPT06A16-8S STR PLUG	1	EA	LOAD PIN END
AMS4P181	CONN KPSE06J12-1P STR PLUG	1	EA	UNIT END
AMS4P221	CABLE 20/8 ALPHA 25468 BLACK	20	FT	
AMS8P060	DUST CAP SHELL SIZE 16	1	EA	

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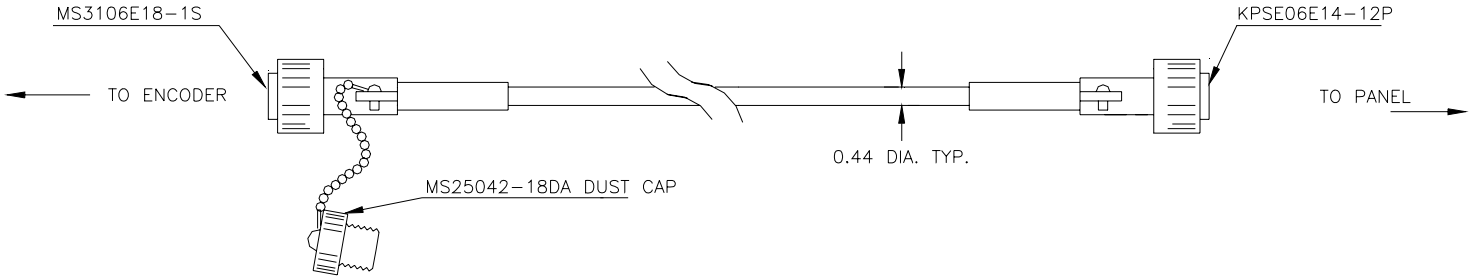
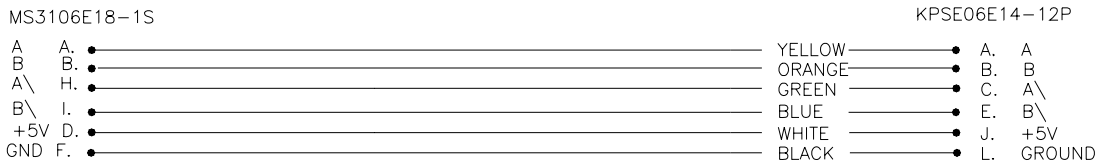
8.2 AMS4A108 CABLE ASSEMBLY – ENCODER





AMS1P028	CONN MS3106E-18-1S	1	EA	ENCODER END
AMS4P182	CONN KPSE06J14-12P STR PLUG	1	EA	PANEL END
AMS4P221	CABLE 20/8C ALPHA 25468 BLACK	20	FT	
AMS1P029	DUST CAP MS25042-18DA	1	EA	

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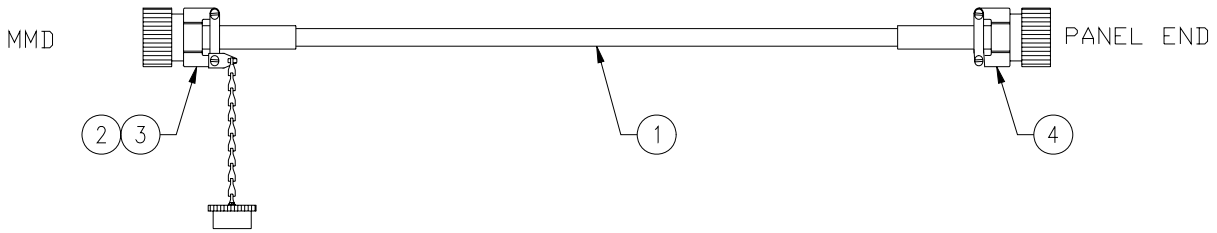
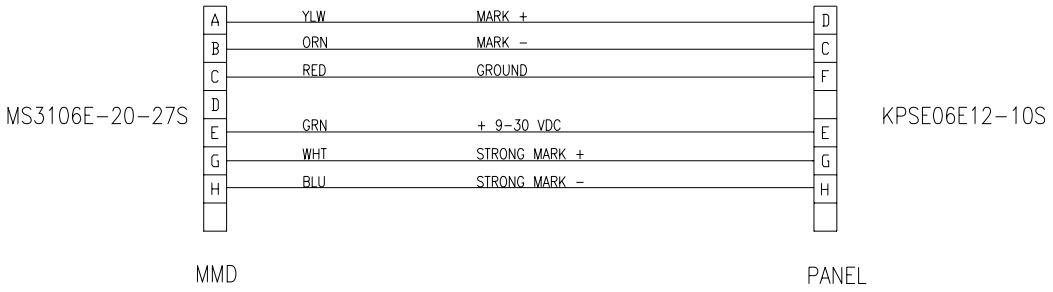
8.3 CCL / MARK DETECTOR CABLE AMS4A109





ACMU2P21	CONN MS3106E-20-27S	1	EA
AMS4P180	CONN KPSE06J12-10S	1	EA
AM5KP093	CABLE 20/8	20	FT
ACMU2P24	DUST CAP 25042-20DA	1	EA

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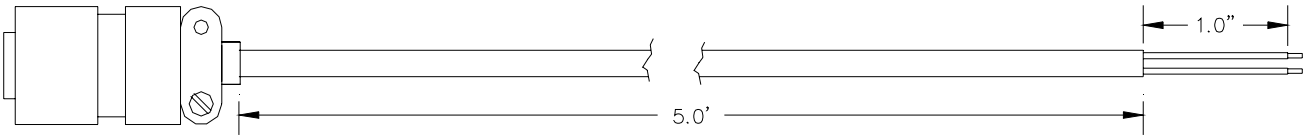
8.4 AMS4A807 CABLE ASSEMBLY – DC POWER IN

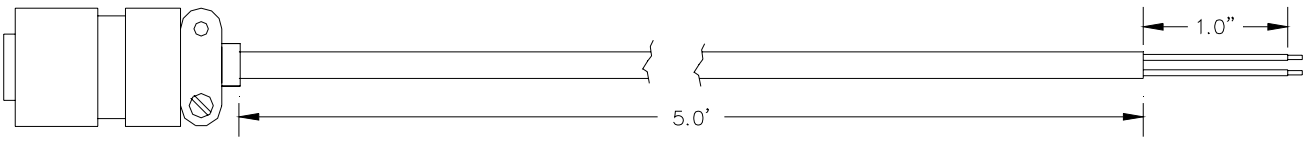


A – WHITE
B – BLACK

A = +
B = -

AMS4P177	CONN KPSE06J12-3S STR PLUG SOCKET	1	EA
AMS7P061	CABLE 16-2 SJ CORD	20	FT

8.5 AMS4A806 CABLE ASSEMBLY – OVER TENSION SHUTDOWN



A – WHITE
B – BLACK

AMS4P178	CONN KPSE06J12-3P STR PLUG PINS	1	EA
AMS7P061	CABLE 16-2 SJ CORD	20	FT