

GENERAL INFORMATION

1.0 SCOPE OF MANUAL

This manual contains descriptive, adjustment, operating and maintenance information for the Two-Wire Current Alarm Model **ALX**, manufactured by MOORE INDUSTRIES INCORPORATED, Sepulveda, California. It consists of six sections as follows:

Section 1, Description, introduces the equipment's function and describes its physical appearance. The equipment specifications and options available for the unit are also presented here along with information on the use and description of the MOORE INDUSTRIES model numbering system.

Section 2, Adjustment/Calibration, provides all the information necessary to adjust the unit before installation. This section contains a list of the tools necessary for adjusting the equipment and illustrates the test set-up essential to performing that task. It also suggests methods for calibrating the unit.

Section 3, Installation and Operation, supplies information needed to install and operate the equipment. This section contains figures that detail the installation requirements for the unit, and text that informs the user of recommended wiring practices and defines the electrical connections for each unit regardless of physical configuration. A brief outline of periodic inspection routines, recommended for continuing operation, is also included.

Section 4, Theory of Operation, gives a brief description of the circuit operating principles in connection with a simplified block diagram, to illustrate the method employed to process signals through the unit. This helps the user to isolate malfunctions to a particular piece of system equipment.

Section 5, Maintenance and Troubleshooting, applies to field operations. This section points out areas that should be protected from accumulations of dust, moisture and extremes of temperature. Go-no-go test measures are also described where appropriate, for use in diagnosing malfunctions.

Section 6, Unit Documentation, contains official company drawings which reflect current revisions of the unit as shipped.

The terms **NOTE**, **CAUTION** and **WARNING** are each used with a specific meaning throughout this manual. A **NOTE**, provides additional information that makes it easier to perform a particular task, for example, a step in wiring or disassembly. Failure to follow a **NOTE** may result in some inconvenience or needless expense, but the unit will not be damaged, or is the instrument technician likely to be injured. A **CAUTION** stresses important details to follow when making electrical connections or cleaning PC board contacts, for example. Failure to heed a **CAUTION** may damage the unit, void the Moore Industries warranty, or even result in minor physical injury to the instrument technician. A **WARNING** provides vital safety information which must not be ignored on any account. **WARNINGS** deal with proper grounding of equipment, use of solvents, etc. More important than the damage that will certainly result to the unit, the instrument technician risks serious personal injury or even death, if the **WARNINGS** are not heeded.

1.1 DESCRIPTION

The ALX is a dc current alarm transmitter, designed to operate from a 2-wire process current loop. The output is an isolated, solid-state SPST relay capable of carrying 1.5Amps @ 120Vac or 125Vdc. The unit can be set to trip at any input current between 0% and 100% of full scale. It is also field settable by plug jumper, to have the output relay either close or open on alarm. A standard 1% deadband is provided to prevent nuisance tripping in the vicinity of the set-point. An adjustable deadband of 1-25% can also be provided as an option.

The ALX is available in the HP, "Hockey Puck" housing or the rail-mount DIN housing.

1.2 SPECIFICATIONS

Table 1-1 is a complete listing of ALX specifications. This table contains information on inputs, outputs, performance capabilities, and mechanical and electrical options. Outline dimensions for the unit can be found in section 6.

1.3 MODEL NUMBER EXPLANATION AND USE

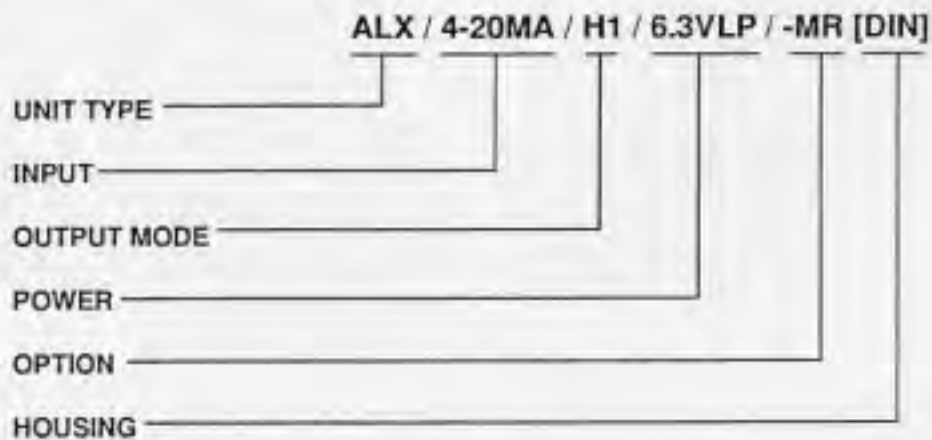
MOORE INDUSTRIES model numbers identify an instrument's type, functional characteristics, operating parameters, and any options ordered. If all accompanying documentation of a unit is missing, the

Table 1-1. ALX Specifications

Characteristics		Ordering Specifications		Housings (Continued)
Performance	<p>Repeatability: Trip point repeats to within $\pm 0.1\%$ of full span</p> <p>Deadband: 1% of span (standard)</p> <p>Response Time: 50ms (typical)</p> <p>Isolation: 1500Vdc (typical) 300Vdc minimum</p> <p>Temperature Effect: Less than $\pm 0.01\%/^{\circ}\text{F}$</p>	Unit	ALX	
Operating Temperature	<p>Ambient: -18°C to $+65^{\circ}\text{C}$ (0°F to $+150^{\circ}\text{F}$)</p>	Input	<p>Current: 4-20mA or 10-50mA</p>	
Input	<p>Range: 4-20mA 10-50mA</p> <p>Trip Point: 0-100% of full scale input span</p>	Output	<p>Jumper Selectable: H1, H2, L1, or L2 (see output characteristics)</p>	
Output	<p>Type: SPST Solid State Relay</p> <p>Rating: 1.5A at 120Vac or 125 Vdc (Consult factory for other ranges.)</p> <p>Indication: LED indicator, ON when solid state relay closed</p> <p>Jumper Selections: H1; output increases thru trip point, relay OPENS H2; output increases thru trip point, relay CLOSES L1; output decreases thru trip point, relay OPENS L2; output decreases thru trip point, relay CLOSES</p>	Options	<p>-AD: Adjustable Deadband (not available with -MR option)</p> <p>-FA: Front accessible terminal blocks (DIN units only)</p> <p>-LV: Low voltage drop</p> <p>-LVDC: Low voltage dc output</p> <p>-MR: Manual reset (not available with -AD option; must be factory set, not field selectable)</p> <p>-RA: Rear accessible terminal blocks (DIN units only, either -FA or -RA option must be selected)</p> <p>-RTB: Removable terminal block (DIN units only); connector rated to 150V max output</p>	
Adjustments	<p>Trip-point: Multi-turn potentiometer</p> <p>Deadband: Multi-turn potentiometer</p> <p>Relay Operation: Jumper selectable</p>	Power	<p>6.3VLP* for 4-20mA</p> <p>7.0VLP* for 10-50mA</p> <p>5.5VLP* for -LV option</p>	
Power	<p>Loop Voltage: 6.3Vdc (max) from 4-20mA; 7.0Vdc (max) from 10-50mA; 5.5Vdc (max) for units with -LV option (no reverse polarity protection or test points)</p>	Housings	<p>DIN: Mounts on TS32 DIN rail**</p> <p>D2: Provides mounting plate and enclosure protecting terminals (meets class I, groups A, B, C, and D, Div. 2)</p> <p>FL: Mounting flanges on HP unit for relay track or screw mounting</p> <p>FLD: Mounting flanges on HP unit for 3.5-inch relay track mounting</p> <p>HP: Hockey-puck housing and spring clips</p> <p>HPD: Clip assembly for high-dome, explosion-proof housing</p>	
Weight	8 ounces (225)			
<p>* VLP = Voltage Loop Power</p> <p>** ALX DIN housing is 25mm wide, ALS -MR DIN is 35mm wide</p> <p>*** For units with CENELEC approval, add "F" to housing designations (e.g., F3LSP)</p>				
<p>When ordering, specify: Unit/Input Range - Input Sensitivity/Output/Power/Options [Housing]</p> <p><i>Example:</i> ALX/4-20mA/H1/6.3VLP/-MR /FA [5IN]</p>				

model number can be used to obtain technical information about the unit by referring to the graphic shown below. On Hockey-puck units, the model number is

stamped on the stainless steel tag fastened to the face of the unit. On DIN units, the model number is located at the lower edge of the front panel.



1.4 SERIAL NUMBER USE AND LOCATION

A complete history is kept on every Moore Industries' unit. This information is keyed to the serial number. Whenever service data is needed on a unit, it is neces-

sary to provide the factory with the serial number as well as the model number. This information is usually located with the model number as discussed in paragraph 1.3.

CALIBRATION PROCEDURES

2.0 INTRODUCTION

This section provides information necessary for unit adjustment and calibration. Units with standard input and output levels are normally adjusted at the factory. After the unit is unpacked, general operating level checks are recommended. Usually these checks, specified in this section, require little or no adjustment.

2.1 CONTROLS, DESCRIPTION AND LOCATION

The external controls consist of TRIP POINT and DEADBAND adjustments (When the -DA option is purchased) located on the front panel of the unit. Each control is a multiturn potentiometer that is adjusted with a blade screwdriver.

CAUTION

USE A BLADE SCREWDRIVER NOT MORE THAN 2.5mm (0.1 INCH) WIDE. A WIDER BLADE MAY PERMANENTLY DAMAGE THE POTENTIOMETER MOUNTING. WHEN ADJUSTING AN RF OPTION UNIT, A SCREWDRIVER WITH A PLASTIC SHANK MUST BE USED. A METAL SHANK TOOL CAN CIRCUMVENT THE RF IMMUNITY AND COMPROMISE THE ADJUSTMENTS.

The adjustment pots usually require 22 turns of the shaft to move the wiper from one end of its range to the other. The pot is equipped with a slip clutch at either end of its travel to prevent damage if it is turned beyond the wiper stops. Slightly more torque is required to turn the shaft when the clutch is slipping. If this change cannot be detected however, either end of the pot can be reached by 22 turns of the shaft in the desired direction. Clockwise on the control increases the quantity or makes it more positive. Counterclockwise decreases the quantity or makes it more negative.

2.2 TEST EQUIPMENT AND TOOLS REQUIRED

Test equipment and tools required for adjustment and checkout of the unit are described in Table 2-1. They are not supplied and must be provided by the customer at the installation or test site.

2.3 TEST EQUIPMENT SET-UP

The test connection diagram in this section shows typical hookup requirements for the purchased model. Units are adjusted and checked for proper performance at the factory before they are shipped. However, unless adjustment was requested to a specific set of input-output values, the unit performance should be checked by the user before the unit is placed into service. Adjustment consists of simulating the operating signal input and adjusting the unit to obtain the specified output.

NOTE

REFER TO PARAGRAPH 1.3 FOR INFORMATION ON HOW TO USE THE MODEL NUMBER TO OBTAIN THE SPECIFIED VALUES OF MINIMUM AND MAXIMUM INPUTS AND OUTPUTS.

2.4 ADJUSTMENT PROCEDURE

General:

Adjustment consists of simulating an input signal to the ALX unit, monitoring the output, and adjusting the controls to obtain the desired results. Adjustments will be provided as standard or set to special values if specified at the time of purchase.

Details:

Assemble the equipment as show in the test connection diagram, Figure 2-1. Set the power supply voltage to zero and turn on prime power. Set the input current to approximately 12mA and allow the unit to stabilize for 10 minutes.

- Set the power supply voltage adjustment to obtain a simulated loop current equal to the desired set point, observing that the DVM indicates 100mV per milliamp of input current.
- If the unit under test is in the H2 configuration and "increase-to-alarm" mode, set the trip point adjustment pot so that the output relay just opens when the adjustment pot is being turned clockwise. This is indicated by both the lamp extinguishing and the front panel LED (extinguishes when relay opens and illuminates when relay closes). If the output configuration is L2 (decrease to alarm) the procedure is changed only in that the trip point is set so that the output relay just closes and lamp illuminates when the adjustment pot is being turned counterclockwise.

(The combinations of alarm conditions and output relay statuses are shown in table 2-2.)

- c) To check the DEADBAND, change the input current from the trip point level in the direction of normal operating current and note the input current when the ALX resets from alarm status. The difference between TRIP POINT current and RESET current is the DEADBAND. Verify that the DEADBAND is not less than 1 percent of full span.
- d) While checking the DEADBAND, verify that the alarm repeatability is within 0.1 percent of full span.
- e) If the Adjustable Deadband Option (-AD) was purchased, verify that the deadband can be adjusted by turning the deadband adjustment pot fully clockwise. Change the input current from the trip point level to the desired amount of deadband up to 25 percent.

Turn the deadband adjustment pot counterclockwise until the output resets from alarm status.

- f) If the Manual Reset (MR) Option was purchased, the DEADBAND circuit is not available. Verify that the unit latches upon alarm and will reset only by shorting the MR terminals together with an external switch or by removing the input current.

NOTE

THE OUTPUT RELAY IS ALWAYS AN OPEN CIRCUIT WHEN THE INPUT CURRENT GOES TO ZERO, REGARDLESS OF ALARM STATUS; H1 AND L1 ARE THE FAIL SAFE INDICATIONS.

Table 2-1. Test Equipment and Tools Required

EQUIPMENT	CHARACTERISTIC	PURPOSE
Power Supply	Adjustable; 0-14Vdc	Simulate loop current
Precision Resistor	110Ω, ±0.05%	To facilitate input current measurement
Digital Voltmeter	Accuracy of ±0.05%	Measure input current
Lamp and Power Supply	24Vdc	Detect solid-state output relay operation
Screwdriver	Blade width: 0.1 inches, max	Potentiometer adjustments

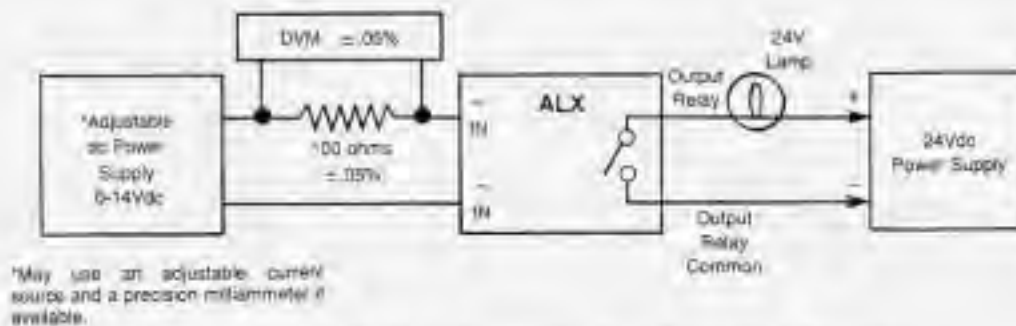


Figure 2-1. ALX Alarm Transmitter Test Connection Diagram

Table 2-2. Jumper Requirements for Available Alarm Configurations

Code	Configuration	Output Switch Status	Required Jumpers
H1 L2	Increase to Alarm Decrease to Alarm	Opens Closes	J1, J2, and J5 J1, J2, and J4
H2 L1	Increase to Alarm Decrease to Alarm	Closes Opens	J3 and J5 J3 and J4

INSTALLATION & OPERATION

3.0 INSTALLATION AND OPERATION

The model ALX is available in two physical configurations, namely the HOCKEY PUCK housing (HP) and the RAIL MOUNT housing (DIN). Installation information for the unit purchased can be found on the Outline and Installation Drawing contained in Section 6.

Select the proper outline and dimension figure in Section 6 which is applicable to the unit purchased. Be sure to observe any special procedures and precautions given with the illustration. Although the units are designed for convection cooling, it is advisable to mount the unit on a surface made of material that can serve as a heat sink, and located in an area that is protected from dust, moisture and corrosive atmospheres. Installation details can be found in the referenced outline and installation drawing.

3.1 ELECTRICAL CONNECTIONS

Connections to the ALX are made to the terminal block on the front of the unit for the HP and DIN Models, (also optionally rear mounted terminals on DIN) Terminal locations and pin functions for the unit purchased are identified on the Outline and Installation drawing included in Section 6 of this manual. Only four connections are necessary; = Input current and Output Relay and Relay Common. No special wire or cable is required to complete power input and signal output connections however, when installing the HP and DIN configuration, it is recommended that #20 AWG wire be used when connecting to the compression screw terminals used on these models.

No terminating lugs are necessary for this type of terminal. Simply strip the insulation from the end of the wire, tin the ends with 60/40 solder, insert in the terminal socket and tighten the screw.

3.2 FIELD CHANGES

In order to take advantage of the field selectable performance parameters built-in to the ALX, it is first necessary to gain access to circuit board PC1. By reviewing the assembly drawing of this board, located in Section 6 of this manual and referring to Table 2-2, the positions of the jumpers can be determined that will provide any of the available performance configurations.

To gain access to the circuit board in the HP enclosure, first remove the 4 hex-head screws from the front cover and save for reinstallation. Remove the cover with the circuit board attached and invert the assembly to locate the select jumper pins. After positioning the jumper blocks in accordance with the preceding paragraph, replace the cover and reinstall the 4 screws.

To make field changes in the Rail Mount configuration, first remove the 6 Phillips-head screws holding the right side cover in place and remove the cover. Refer to the circuit board assembly drawing in Section 6 to locate the jumpers called out in Table 2-2 and make changes as required. Reinstall the side cover.

3.3 OPERATION AND PERIODIC INSPECTION

Once adjusted and installed, the unit may be operated unattended. The only controls on the outside of the unit are the TRIP POINT and DEADBAND adjustment potentiometers, which, after initial adjustments, need no further attention. (note: the DEADBAND Adjust Pot is used only with the -DA option) Because the circuit uses highly reliable solid-state components with no moving parts, the ALX will operate virtually maintenance free for extended periods of time. If however, at a future time, a malfunction is isolated to the ALX transmitter, refer to Section 5 for recommendations on solving the problem.

A unit may become warm during operation, especially where the ambient temperature is elevated. This is perfectly normal and should not be cause for alarm unless a malfunction is also observed.

THEORY OF OPERATION

4.0 THEORY OF OPERATION

This section describes the theory of operation of the ALX, based on the simplified schematic diagram in Figure 4-1. A detailed schematic diagram can be found in Section 6, UNIT DOCUMENTATION.

The purpose of this description is to show how signals are processed through the unit should it become necessary to troubleshoot the data loop to isolate a malfunction to a particular piece of equipment.

4.1 OPERATION

The ALX 2-Wire current alarm is energized by loop power and provides an adjustable alarm trip at any input current from 4 to 20mA dc. The alarm signal is announced by both a 1.5Amp, solid-state relay transfer and a panel mounted LED indicator. The alarm is field selectable as "make-on-trip" or "break-on-trip". The relay is normally open with loop power removed.

Power Supply

Process variable 4-20mA current enters the unit at terminal +IN and flows through a voltage reference generator circuit, producing a signal voltage, a signal common level and a negative bias voltage. The

minus bias is applied to a dc-to-dc converter which produces a complementary plus bias for the circuit operational amplifiers as well as primary excitation for an isolation transformer. The transformer secondary voltage is rectified and filtered to provide operating bias for the opto-isolator and solid-state output Relay.

Signal Processing

The signal between +IN and signal common, is applied to a buffer amplifier which has the TRIP POINT adjustment pot in the output circuit. This determines the input current level at which the following comparator stage will just trip. A DEADBAND adjustment pot is provided to avoid nuisance tripping when the input current is in the vicinity of the trip point. If MANUAL RESET is ordered at the time of purchase, the DEADBAND adjustment pot will be omitted automatically since it would have no purpose. In this case, when the alarm trips, it latches in the alarm condition and remains so until the Manual Reset is activated. The comparator output signal drives a relay control discrete transistor stage with plug switchable emitter and collector to allow the H1/L2 changeover in the field. (Refer to Table 2-2 for jumper requirements.)

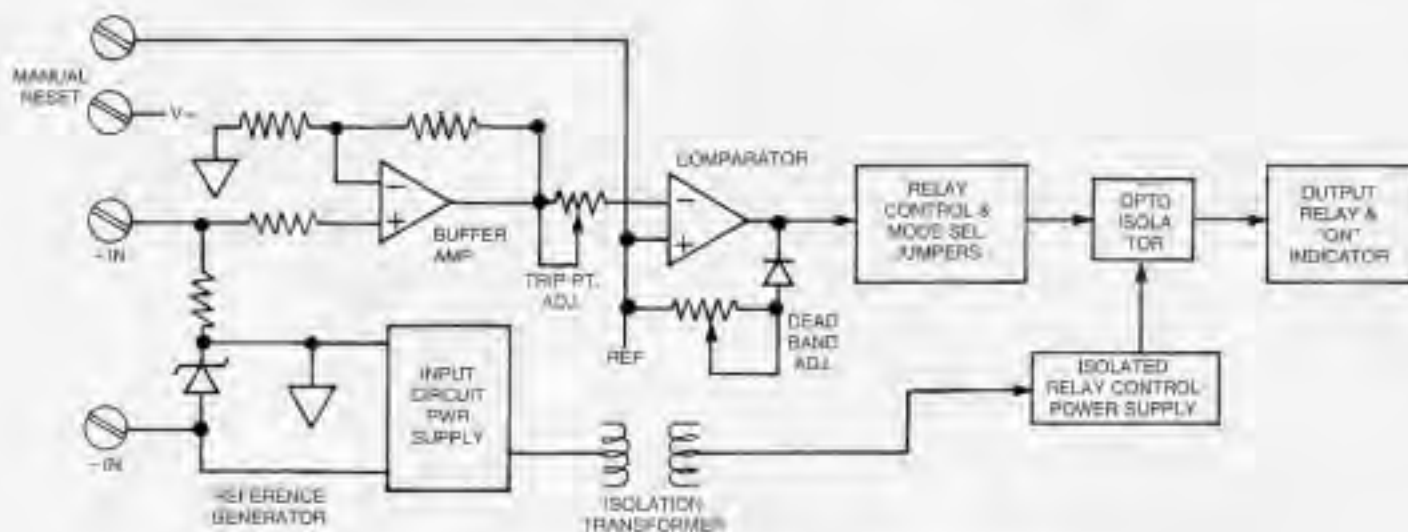


Figure 4-1. Simplified Functional Diagram, ALX Alarm

MAINTENANCE & TROUBLESHOOTING

5.0 GENERAL

To achieve and maintain the high level of performance built in to the Moore Industries Signal transmitters, many components have been group selected using a computer-aided design program. This makes field repair generally inconsistent with maintaining performance as set forth in the included specifications. It is therefore recommended that any unit found to be performing below specifications, be returned to the factory for service in accordance with the instructions found on the inside of the back cover of this manual. If the urgency of repair does not allow time to send the unit back to the factory for service, then it is recommended that the user contact the Moore Industries Customer Service department at the number shown on the inside of the back cover of this manual for verbal assistance in diagnosing a transmitter problem and recommending steps for emergency repairs.

5.1 MAINTENANCE

The design of the ALX transmitter limits maintenance primarily to keeping the input and output terminals and conductors clean and tight and maintaining a heat conduction path to a suitable heat sink. This is best accomplished by initially tinning the ends of all hookup wire, as called out in Section 3 and installing the unit in an area protected from dust, heat, moisture and corrosive atmospheres. A thorough cleaning of terminal blocks requires complete disassembly and can only be accomplished at the factory. It is recommended that the user check the terminations every 6 months of service to verify that they are secure and free of oxidation scale.

5.2 TROUBLESHOOTING

If a problem is suspected with the ALX transmitter, it is suggested that the following check list be run as a preliminary step:

- a) Verify that all electrical connections are clean and tight.
- b) Verify that the ALX loop voltage is between 7 and 42Vdc and input polarity is in accordance with the hook-up diagram in Section 2.
- c) Verify that the measuring instrument used for input current is of the proper range and accuracy.
- d) Verify that the output circuit is electrically isolated from the input circuit.
- e) Verify that the output relay external alarm bias voltage is present and is connected through a known functional indicator.

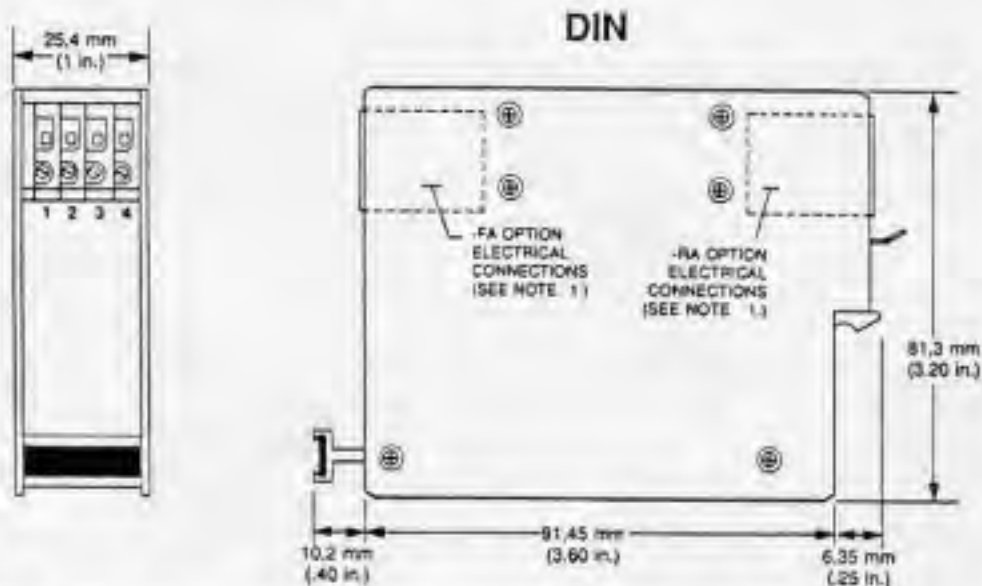
If the problem still exists after correcting any problems in the above list, the unit is probably defective and should be returned to the factory for repair in accordance with the instructions found on the inside of the back cover of this manual.

UNIT DOCUMENTATION

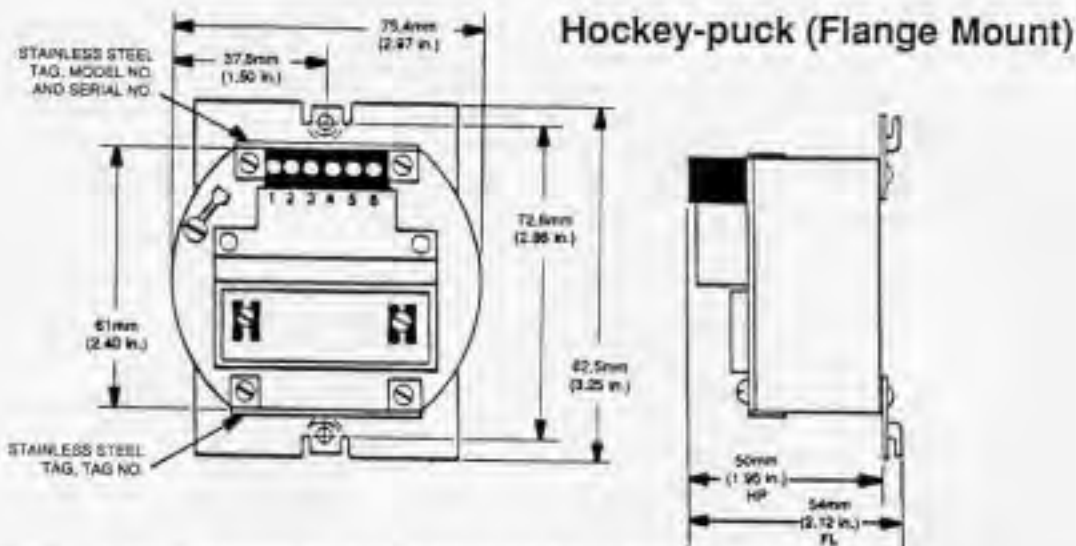
6.0 DRAWINGS

This section contains the drawings necessary to install, operate, and maintain the ALX. These drawings in-

clude schematics, assembly drawings, and unit outline dimensions. Both HP- and DIN-type units are represented.



- NOTES: 1. All units must be ordered with either front access (-FA) or rear access (-RA) electrical connection. (-FA option is illustrated here.)
2. Electrical adjustments and test jacks are located on the front panel.



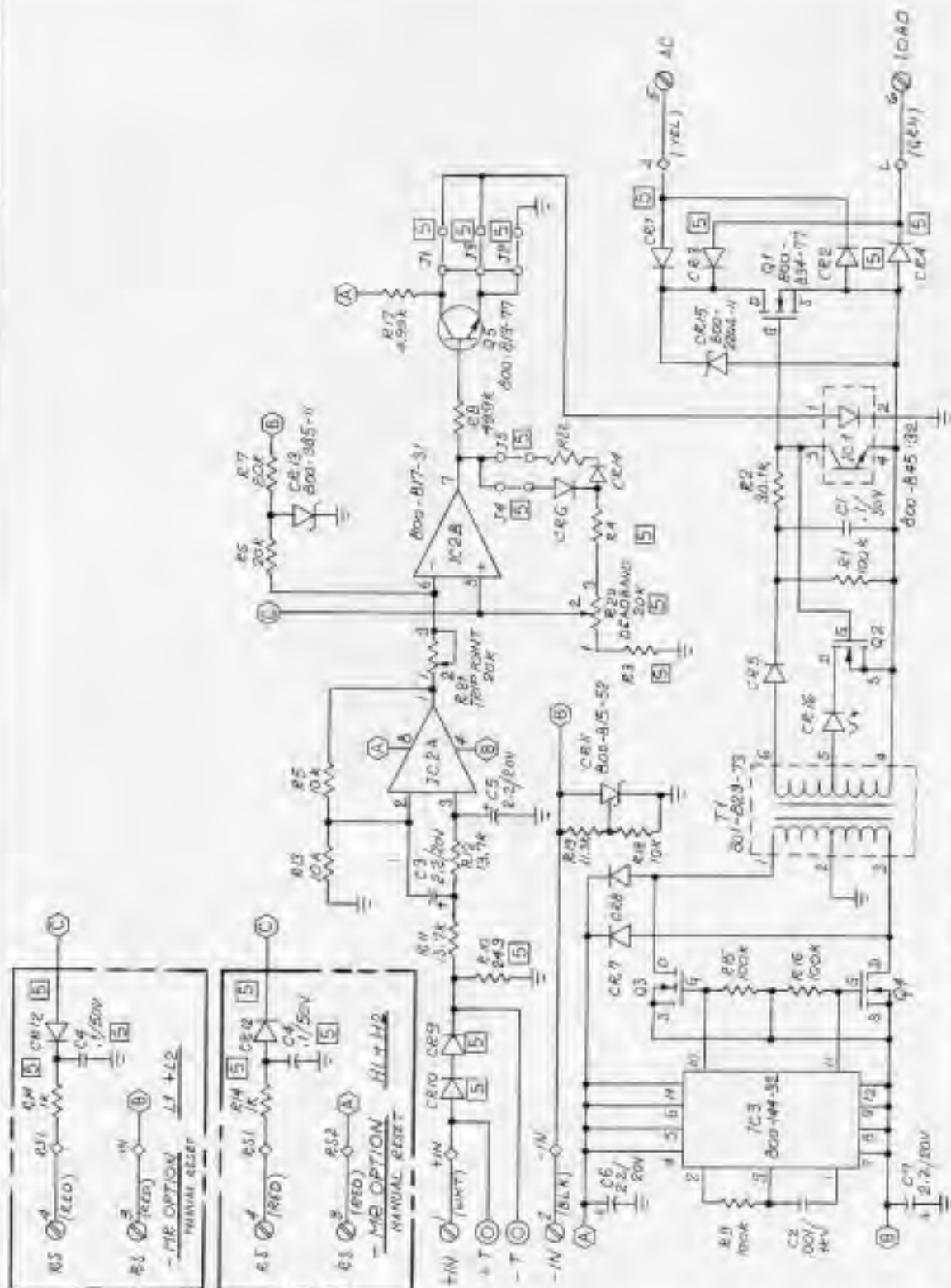
- NOTES: 1. HP-type housings are available with spring clips for explosion-proof enclosures.
2. See Data Sheet 700-710-64 for enclosures compatible with HP housings.

DO NOT SCALE DRAWING

TOLERANCES UNLESS NOTED	FINISH	PLATING
X ±.1	AP	None
XX ±.03	None	None
XXX ±.010	None	None
ANGLES = 30°	None	None

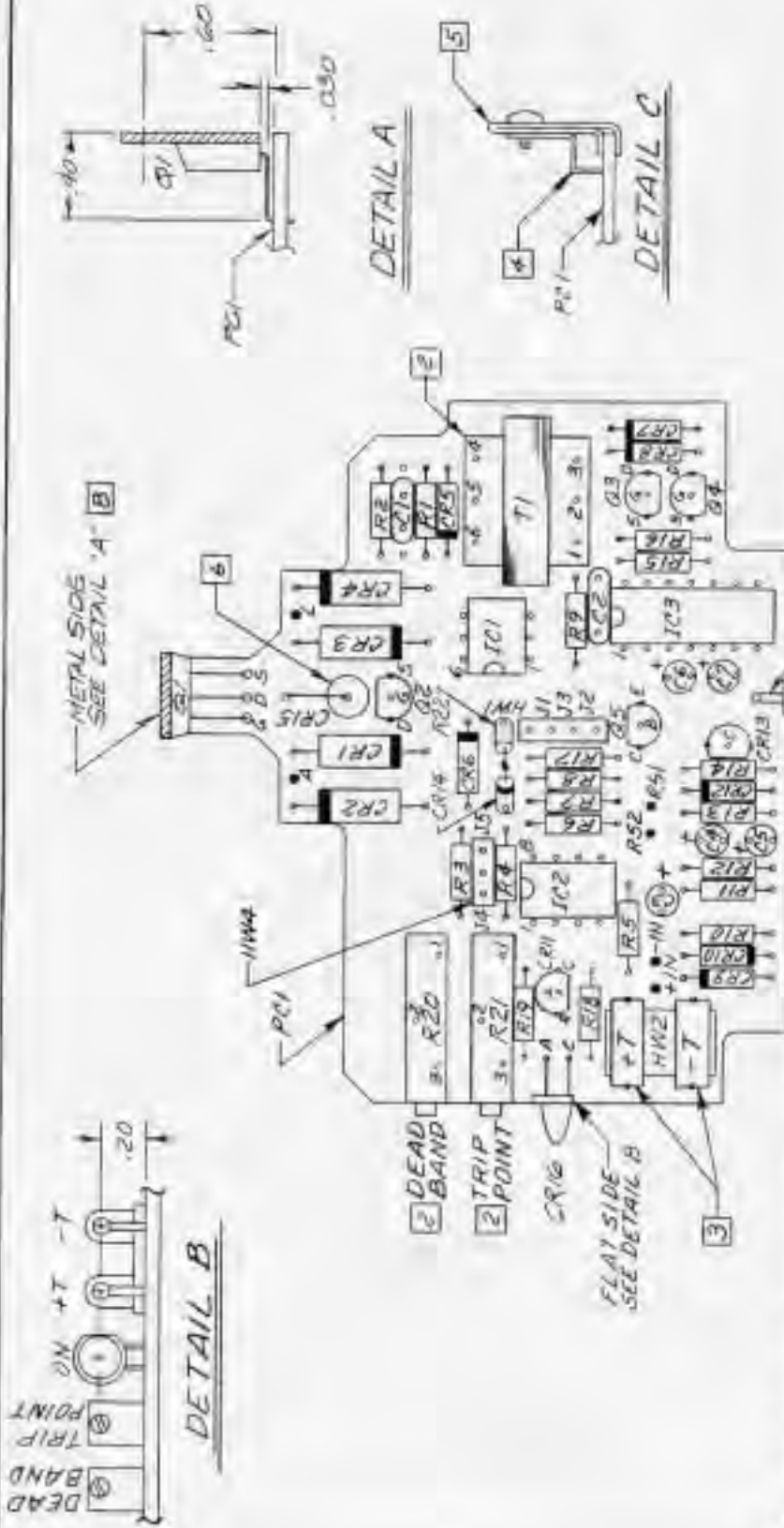
ALX-DIN,
PC1

BOARD NUMBER	REV	DATE	BY	APPROVED
174-403-00				
SCHEMATIC				
REVISED BY	DATE	BY	APPROVED	
ELO 6561				



- 1. TEST JACK OF FRONT PANEL FOR .080 ANGLE TIP PROBE.
 - 2. 0 WING AND ON PC BOARD.
 - 3. SCREW TERMINAL CONNECTION.
 - 4. SEE LIST OF MATERIALS FOR VALUE, PART NO. AND/OR ANGLE UNLESS OTHERWISE SPECIFIED.
 - 5. TRANSISTORS ARE 800-B10-07.
 - 6. ALL DIODES ARE 800-4148-0 (N4148).
 - 7. ALL RESISTORS ARE 1/2W (5% TOL) METAL FILM, 1% 5% 1/4 W.
 - 8. RESISTANCE IN OHMS; CAPACITANCE IN MICROFARADS.
- NOTES: UNLESS OTHERWISE SPECIFIED

TOLERANCES	UNLESS SPECIFIED
X	± .1
XX	± .05
XXX	± .020
ANGLES	± .50
	2-1



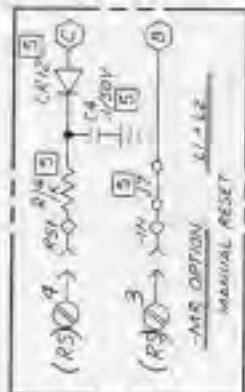
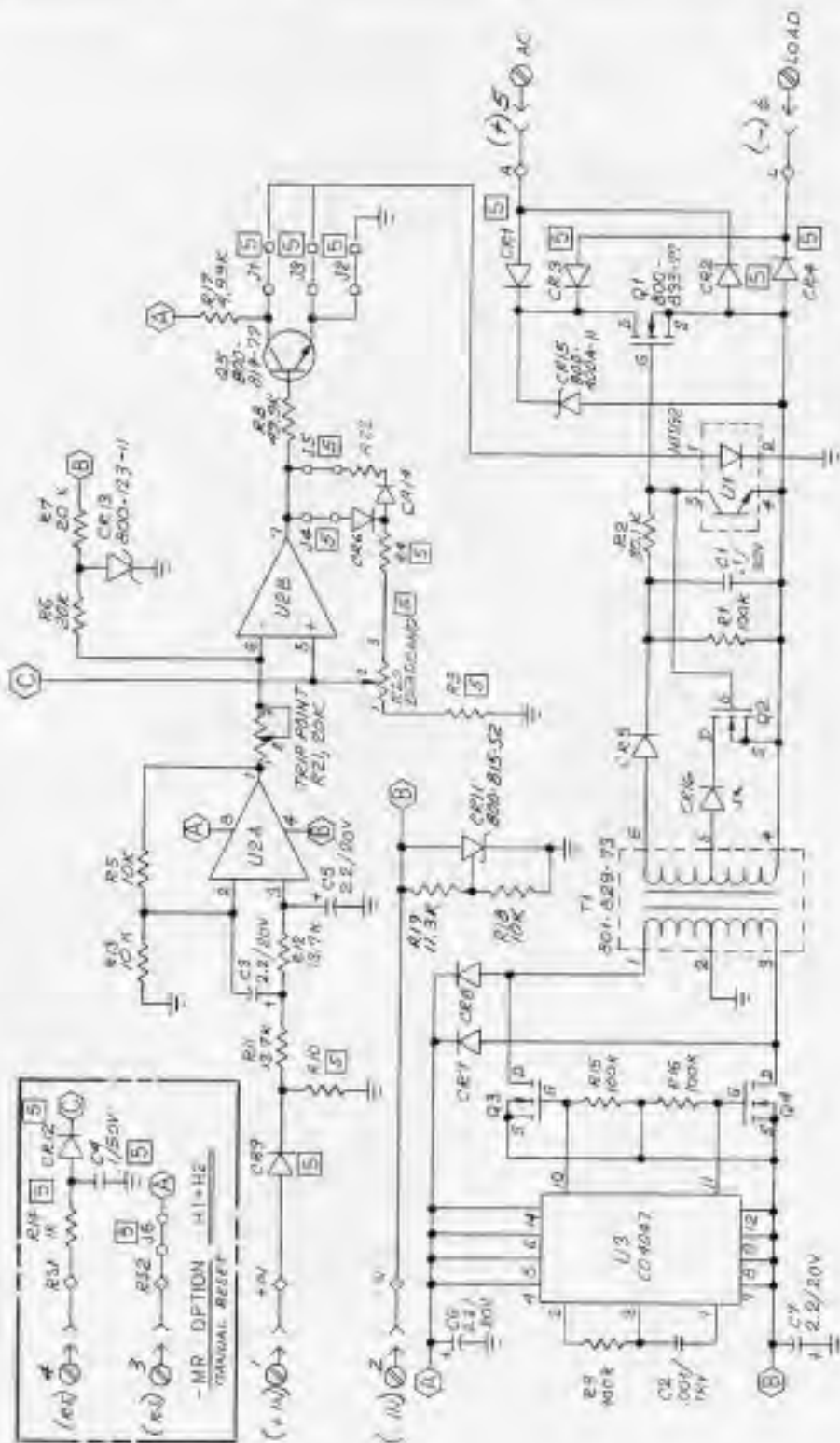
- 1. USE FIXTURE 200-213-14-2 TO BEND ϕ LEAD.
- 2. COVER #1 THRU #5 DURING PC BOARD CLEAR COATING.
- 3. CATHODE (BAND) FACES UP.
- 4. USE FIXTURE 200-213-10 TO HOLD HW3 IN PLACE WHILE SOLDERING.
- 5. USE FIXTURE 200-213-11 TO BEND HW3 LEAD.
- 6. INSTALL HW2 SPACER UNDER #1 & -T.
- 7. DEAD BAND AND TRIP POINT MUST SIT FLAT ON P.C. BOARD.
- 8. ALL LEADS TO BE SOLDERED TO PADS, FAR SIDE.

NOTES: UNLESS OTHERWISE SPECIFIED.

TOLERANCES	UNLESS NOTED	UNITS	414 F	5/8/84
X	±.1	INCHES		
XX	±.03			
XXX	±.010			
ANGLES	±30°			
DATE	NONE			

ALX-HP

PROJECT NO.	174-402-00	REVISED	E
TITLE	SCHEMATIC		
DATE	6/20/85	BY	



1. 0 WIRING PAD ON PC BOARD.
 2. SEEW TERMINAL CONNECTION (REMOVABLE PLUG)
 3. SEE LIST OF MATERIALS FOR VALUE, PART NO. AUGUR VISAGE
 4. TRANSISTOR ARE 800-810-37
 5. ALL DIODES ARE 800-8148-11 (1N4148)
 6. ALL RESISTORS ARE (EN55C) METAL FILM, ±1%, 1/10W
 7. RESISTANCE IN OHMS; CAPACITANCE IN MICROFARADS.
- NOTES: UNLESS OTHERWISE SPECIFIED



MOORE INDUSTRIES
16150 Schmalehorn Street
Sepulveda, California 91349

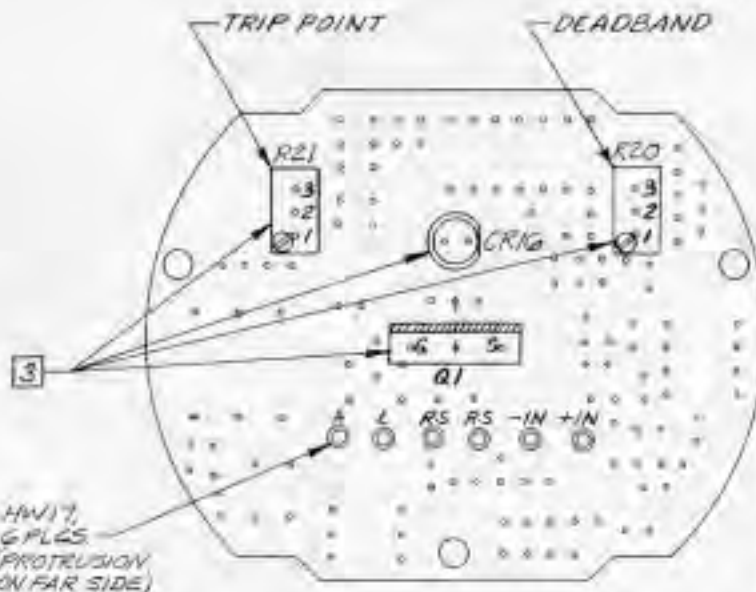
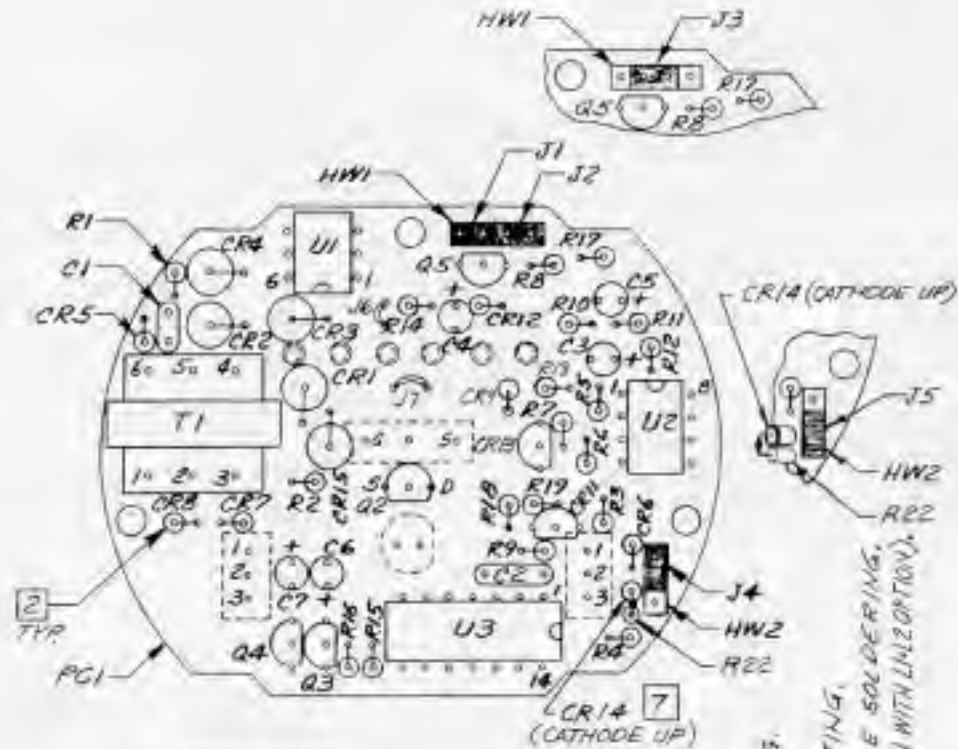
DO NOT SCALE DRAWING

TOLERANCES
X ±.1
XX ±.03
XXX ±.010
ANGLES ±.30

DATE: R. Keller 7/84
DRAWN: [Signature]
CHECKED: [Signature]
REV: 2-1

ALX-HP
PCI

174-502-00
PC ASSEMBLY
ECO 6561



7 SOLDER CATHODE OF CR14 TO TOP OF R22.

HW17,
6 PLS
(PROTRUSION
ON FAR SIDE)

6. CONFIRMAL D.I.T ENTIRE ASSEMBLY AFTER TEST.
5. JUMPEES, SOCKETS, PINS, AND P.O.T SCREWS TO BE FREE OF COATING.
4. JUMPEES TO BE 22AWG, SLEEVE AS REQD. (J4 & J7).
3. COVER IN THRU-HOLE HW17 (6 PLS) DURING PCI CLEAR COATING.
2. USE TOOLING FIXTURE 200-213-40 TO POSITION WHILE SOLDERING.
1. CATHODE (BAND) FACES UP ON ALL DIODES (CR12, FACES DOWN WITH LM2 OPTON).
1. ALL LEADS MUST BE SOLDERED TO PADS.

NOTES: UNLESS OTHERWISE SPECIFIED.



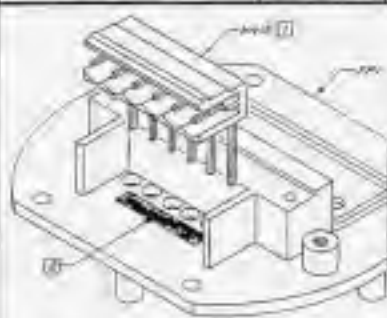
MOORE INDUSTRIES
16550 Scheerborn Street
Sepulveda, California 91342

DO NOT SCALE DRAWING

TOLERANCES UNLESS NOTED	DATE	REV
X .5	2-80	1/1W
XX .03		
XXX .010		
ANGLES >30°		

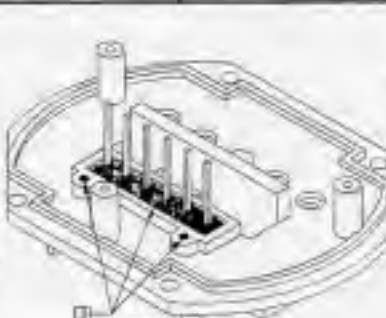
ALX-HF
FRONT PANEL
ASSEMBLY
PC1

NAME SHEET	174-502-00 (REV 2-80)	1/1
ISSUED	PC ASSEMBLY	
DATE		
BY		
CHECKED		



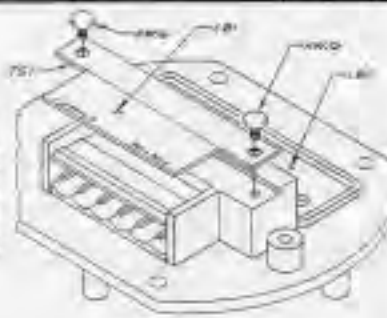
DETAIL 1A

- BEFORE INSTALLING HEADER (HW1) IT SHOULD BE THOROUGHLY CLEANED OF OILING RESIDUES.
- USE A SMALL DROP OF "SUPER" GLUE TO HOLD HEADER (HW1) IN PLACE ON FRONT PANEL (HW2).



DETAIL 1B

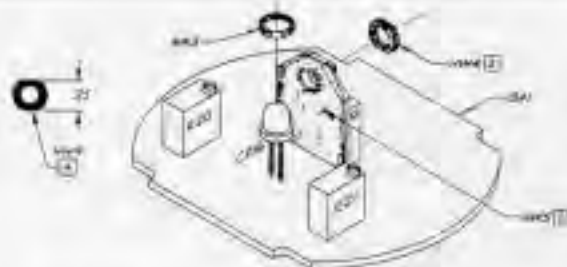
- PROPERLY USE SPOT & FILL WHERE YOUR WORKING HEADER HAS A TIGHT HOLE AS SHOWN.



DETAIL 1C

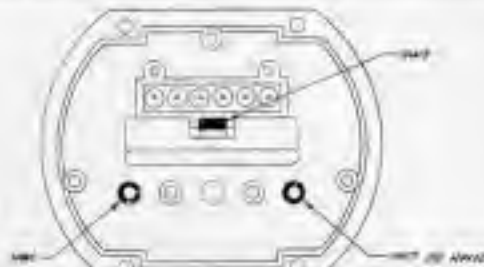
- INSTALL TERMINAL COVER (TS1) TO FW1 WITH DRIVE SCREWS (TS2) AS SHOWN.
- INSTALL LABEL (L2) AS SHOWN.

—STEP ONE—



DETAIL 2A

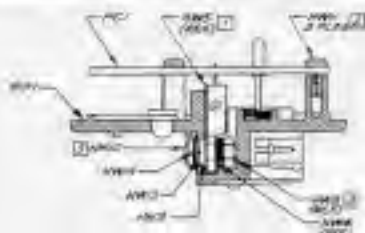
- USE D-RING (D1) AND NUT (N1) TO SECURE TO (1) TRANSLATOR WITH A SMALL DROP OF "SUPER" GLUE AT TOP OF D1 (DO NOT USE GLUE AT BOTTOM).
- WASH INSULATOR THE SIDE TOP OF D1 TRANSLATOR IS AT A SMALL amt. OF SUPER GLUE TO HOLD IN PLACE.



DETAIL 2B

- INSTALL D-RING (D1) AS SHOWN. ALSO INSTALL O-RING (D2) ON HOLE PLATE (HW3) FROM PART KIT. (DO NOT USE D2 UNTIL STEP 4).
- SLIDE SET NUT (N1) INTO NUT SLOT IN FW1 AS SHOWN. USE A SMALL AMOUNT OF THERMAL GREASE TO HOLD IN PLACE.
- SLIDE SLIDING LUBRICANT TO INSIDE SURFACE OF D-RING.

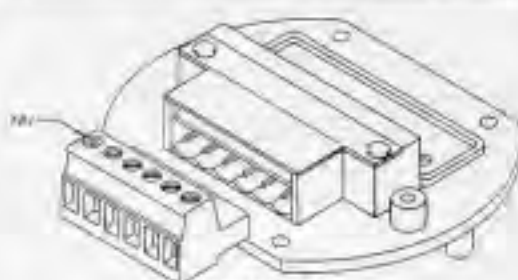
—STEP TWO—



DETAIL 3A

- GENTLY SLIDE (3A) ASSEMBLY INTO POSITION ON END OF BASE. WASH INSULATOR REMAINS VERTICALLY ALIGNED WITH TRANSLATOR.
- AFTER INSULATOR IS ALIGNED, ALL COMPONENTS TO BE SECURED TO FW1 WITH NUT (N1) ON ENDING HEAD SCREWS (HW3) & WASHERS.
- SLIDE O-RING (D2) OVER D-RING & SET IT UNDER SCREW (N1) AND WASHER (W1) BEHIND INSULATOR. THEN INSTALL THE NUT (N1) ON THE SCREW.

—STEP THREE—



DETAIL 4A

- SLIDE IN VERTICALLY SLIDE (FW3).

—STEP FOUR—



—REFERENCE INFORMATION—

RETURN PROCEDURES

To return equipment to Moore Industries for repair, follow these four steps:

1. Call Moore Industries and request a Returned Material Authorization (RMA) number.

Warranty Repair –

If you are unsure if your unit is still under warranty, we can use the unit's serial number to verify the warranty status for you over the phone. Be sure to include the RMA number on all documentation.

Non-Warranty Repair –

If your unit is out of warranty, be prepared to give us a Purchase Order number when you call. In most cases, we will be able to quote you the repair costs at that time. The repair price you are quoted will be a "Not To Exceed" price, which means that the actual repair costs may be less than the quote. Be sure to include the RMA number on all documentation.

2. Provide us with the following documentation:
 - a) A note listing the symptoms that indicate the unit needs repair
 - b) Complete shipping information for return of the equipment after repair
 - c) The name and phone number of the person to contact if questions arise at the factory
3. Use sufficient packing material and carefully pack the equipment in a sturdy shipping container.
4. Ship the equipment to the Moore Industries location nearest you.

The returned equipment will be inspected and tested at the factory. A Moore Industries representative will contact the person designated on your documentation if more information is needed. The repaired equipment, or its replacement, will be returned to you in accordance with the shipping instructions furnished in your documentation.

WARRANTY DISCLAIMER

THE COMPANY MAKES NO EXPRESS, IMPLIED OR STATUTORY WARRANTIES (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY GOODS OR SERVICES SOLD BY THE COMPANY. THE COMPANY DISCLAIMS ALL WARRANTIES ARISING FROM ANY COURSE OF DEALING OR TRADE USAGE, AND ANY BUYER OF GOODS OR SERVICES FROM THE COMPANY ACKNOWLEDGES THAT THERE ARE NO WARRANTIES IMPLIED BY CUSTOM OR USAGE IN THE TRADE OF THE BUYER AND OF THE COMPANY, AND THAT ANY PRIOR DEALINGS OF THE BUYER WITH THE COMPANY DO NOT IMPLY THAT THE COMPANY WARRANTS THE GOODS OR SERVICES IN ANY WAY.

ANY BUYER OF GOODS OR SERVICES FROM THE COMPANY AGREES WITH THE COMPANY THAT THE SOLE AND EXCLUSIVE REMEDIES FOR BREACH OF ANY WARRANTY CONCERNING THE GOODS OR SERVICES SHALL BE FOR THE COMPANY, AT ITS OPTION, TO REPAIR OR REPLACE THE GOODS OR SERVICES OR REFUND THE PURCHASE PRICE. THE COMPANY SHALL IN NO EVENT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES EVEN IF THE COMPANY FAILS IN ANY ATTEMPT TO REMEDY DEFECTS IN THE GOODS OR SERVICES. BUT IN SUCH CASE THE BUYER SHALL BE ENTITLED TO NO MORE THAN A REFUND OF ALL MONIES PAID TO THE COMPANY BY THE BUYER FOR PURCHASE OF THE GOODS OR SERVICES.

ANY CAUSE OF ACTION FOR BREACH OF ANY WARRANTY BY THE COMPANY SHALL BE BARRED UNLESS THE COMPANY RECEIVES FROM THE BUYER A WRITTEN NOTICE OF THE ALLEGED DEFECT OR BREACH WITHIN TEN DAYS FROM THE EARLIEST DATE ON WHICH THE BUYER COULD REASONABLY HAVE DISCOVERED THE ALLEGED DEFECT OR BREACH, AND NO ACTION FOR THE BREACH OF ANY WARRANTY SHALL BE COMMENCED BY THE BUYER ANY LATER THAN TWELVE MONTHS FROM THE EARLIEST DATE ON WHICH THE BUYER COULD REASONABLY HAVE DISCOVERED THE ALLEGED DEFECT OR BREACH.

RETURN POLICY

For a period of thirty-six (36) months from the date of shipment, and under normal conditions of use and service, Moore Industries ("The Company") will at its option replace, repair or refund the purchase price for any of its manufactured products found, upon return to the Company (transportation charges prepaid and otherwise in accordance with the return procedures established by The Company), to be defective in material or workmanship. This policy extends to the original Buyer only and not to Buyer's customers or the users of Buyer's products, unless Buyer is an engineering contractor in which case the policy shall extend to Buyer's immediate customer only. This policy shall not apply if the product has been subject to alteration, misuse, accident, neglect or improper application, installation, or operation. THE COMPANY SHALL IN NO EVENT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.



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