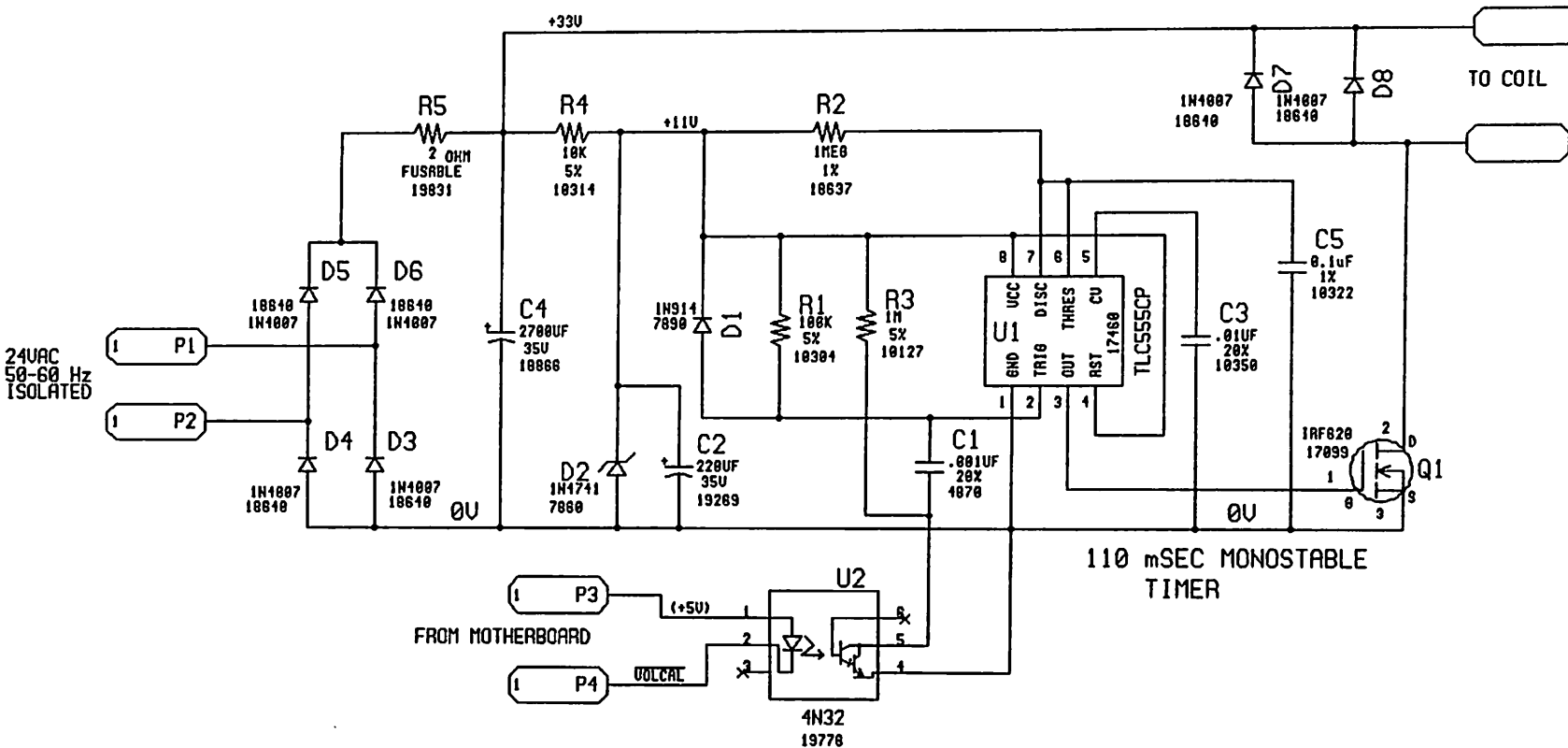
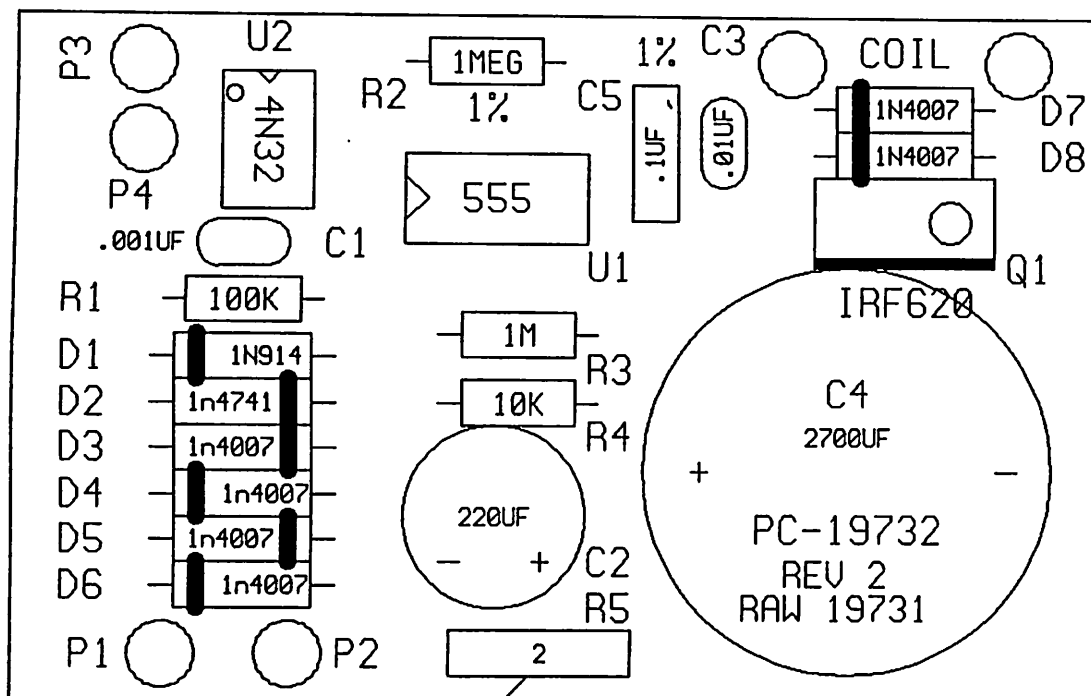




TOLERANCES: (UNLESS OTHERWISE NOTED) ALL RESISTORS $\pm$ 5% ALL CAPACITORS $\pm$ 10%		CAROLINA MEDICAL ELECTRONICS INC. KING, NORTH CAROLINA U.S.A.	
MATERIAL:		TITLE: DRIVE ELECTRONICS FOR VOLUME CALIBRATOR	
DESIGNED:		SIZE: C	DRAWING NO: SC-19731
DATE: 2-5-1992		APP:	PROD: VASCUMAP
		SHEET 1 OF 1	

OK: JC, MD 2/5/92

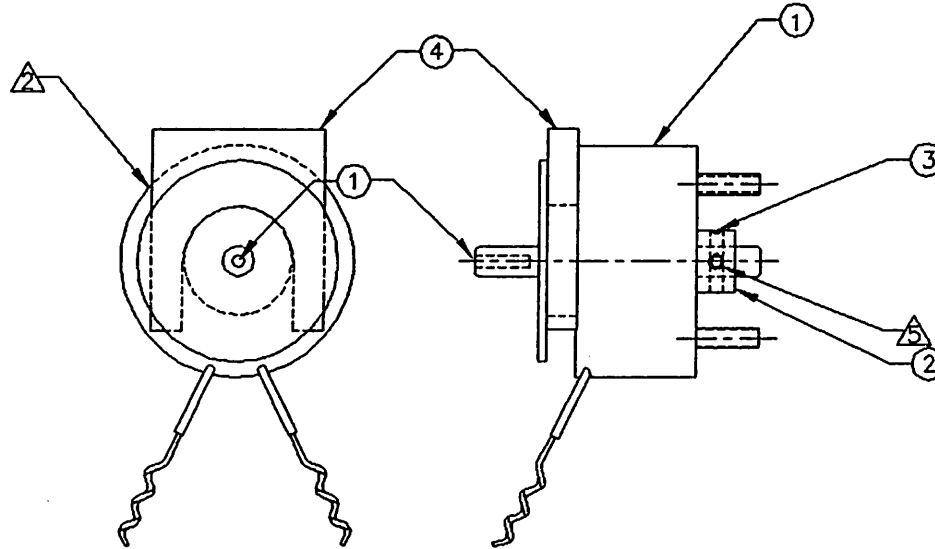


INSTALL R5 1/8" ABOVE PCB.

			CAROLINA MEDICAL ELECTRONICS INC.		
			KING, NORTH CAROLINA U.S.A		
	CHKD BY:		TITLE VASCUMAP VOLUME CALIBRATOR PCB		
	DR BY: D. J. McCREARY				
DATE: 2-5-1992		SIZE A	SCALE N/A	DRAWING NUM. PC 19731	
		APPR. JC/MO 2/5/92		PROJ. VASCUMAP	SHEET 1 OF 1

REVISIONS

REV. #	INIT.	DESCRIPTION	DATE	APPROVED
2	DJM	FOR BELLOWS VOLUME CAL	10-29-91	



- 1 DRILL & TAP SHAFT CENTER FOR 4-40 x0.3" THREADS (USE CAUTION NOT TO DAMAGE OR MISPLACE SOLENOID WASHER).
- 2 PLACE ADJUSTMENT JIG AS SHOWN. SQUEEZE IT TIGHTLY IN THE SOLENOID.
- 3 PRESS SHAFT COLLAR AGAINST SOLENOID BODY AND TIGHTEN SET SCREW.
- 4 CHECK FOR PROPER FIT OF JIG:
A) NO PLAY OF SOLENOID SHAFT.
B) MODERATE "DRAG" ON REMOVING JIG.
C) RE-ADJUST IF NECESSARY.
- 5 WHEN ADJUSTMENT CORRECT:
A) PUT THREAD LOCK ON SETSCREW.
B) DRILL & REAM .0925" HOLE FOR PIN
C) PRESS PIN INTO HOLE.

5	1	DROP	19757	LOCK-TITE THREAD LOCK #290
4	1		19762	ADJUSTMENT JIG
3	1		19742	3/32 X 3/8 DOWEL PIN
2	1		19753	3/16 SHAFT COLLAR
1	1		19752	LOW PROFILE SOLENOID
REF	QTY	CME #	DESCRIPTION	

TOLERANCES:
(UNLESS OTHERWISE NOTED)
ALL .XXX DECIMAL: ±.005
ALL .XX DECIMAL: ±.03
ALL FRACTIONAL: ±1/16
ALL ANGULAR: ±.5°

MATERIAL:

FINISH:



DR. BY: CWD

DATE 5/28/91

CHKD BY:

CAROLINA MEDICAL ELECTRONICS
KING, NORTH CAROLINA U.S.A.

TITLE
VascuMAP
MODIFIED SOLENOID
ASSEMBLY

SIZE
A

SCALE
N/A

DRAWING NO.

EA19763

ECS

APPD.

SHEET 1 OF 1

REVISIONS

REV. #	INIT.	DESCRIPTION	DATE	APPROVED
2		92-051	7/24/92	JC MD

MECHANICAL:

MATERIAL: STEEL CASE

DIMENSIONS (INCHES):

D = 1.34

L = 1.174

H = 0.71

d = 0.188

L-1 = 0.625

L-2 = 0.657

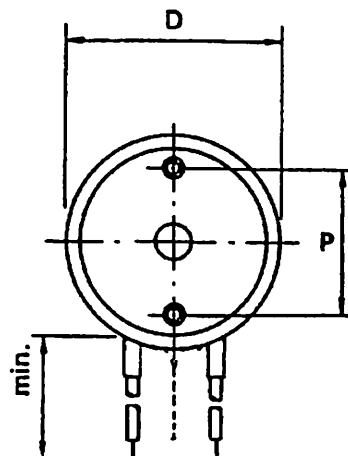
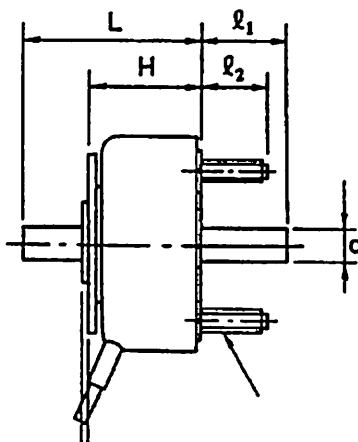
P = 0.874

STUDS = 5-40 THD

WEIGHT

PLUNGER = 0.81 oz

TOTAL = 3.5 oz



ELECTRICAL:

COIL WIRE = 28 ga.

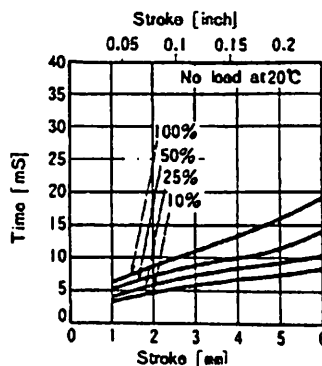
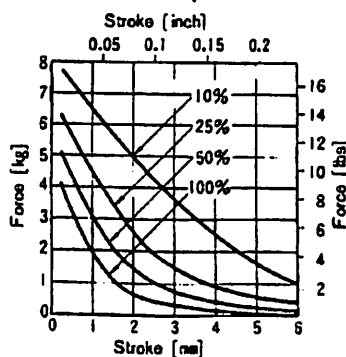
COIL TURNS = 510

WINDING RESISTANCE = 8.02 OHMS

DIELECTRIC STRENGTH = 1000 Vac, 50/60 Hz

ELECTRO-MECHANICAL:

SEE GRAPHS (DUTY CYCLE IS IN PERCENT):

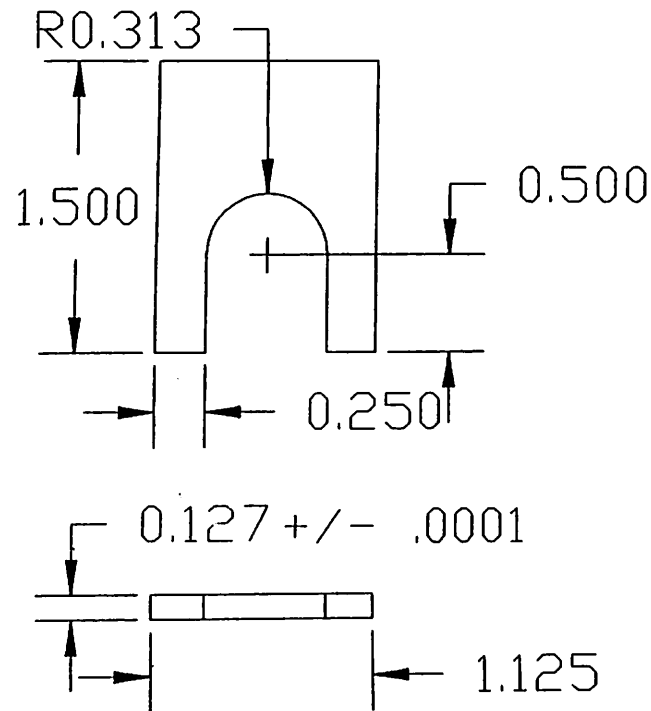


SOURCES:

1) SHINDEGEN ELECTRIC MFG. CO. #F341C28P

TOLERANCES: (UNLESS OTHERWISE NOTED) ALL .XXX DECIMAL: ...005 ALL .XX DECIMAL: ...03 ALL FRACTIONAL: ...1/16 ALL ANGULAR: ...5°			CAROLINA MEDICAL ELECTRONICS KING, NORTH CAROLINA U.S.A. 27021	
			TITLE SOLENOID, LOW-PROFILE PUSH-PULL	
MATERIAL:	DATE <u>5/24/91</u> <u>24 OCT 91</u>		SCALE N/A	DRAWING NO. MS-19752
	DR. BY: JC, MD.			
FINISH:	CHKD BY: JC, MD		ECS	APPD.
			SHEET 1 OF 1	

REVISIONS				
REV. #	INIT.	DESCRIPTION	DATE	APPROVED
2	DJM	FOR BELLOWS SOLENOID	10/25/91	



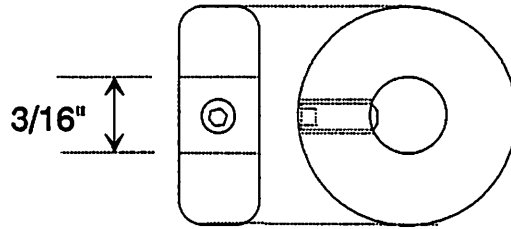
PROPRIETARY INFORMATION supplied only for use in operating and servicing equipment made by Carolina Medical Electronics Inc.; not to be used for any other purpose. This drawing remains the property of Carolina Medical Electronics, Inc. Printed in U.S.A.

TOLERANCES: (UNLESS OTHERWISE NOTED) ALL .XXX DECIMAL: ±.005 ALL .XX DECIMAL: ±.03 ALL FRACTIONAL: ±1/16 ALL ANGULAR: ±.05°				CAROLINA MEDICAL ELECTRONICS KING, NORTH CAROLINA U.S.A.	
MATERIAL: TOOL STEEL		DR. BY: CWD		TITLE VascuMAP ADJUSTMENT JIG	
FINISH: BREAK ALL SHARP EDGES		DATE 5/28/91		SIZE B	SCALE 1" = 1"
		CHKD BY:		DRAWING NO. MH19762	SHEET 1 OF 1
		ECS		APPD.	

MH-19762

REVISIONS

REV. #	INIT.	DESCRIPTION	DATE	APPROVED
2		92-051	7/24/92	JC, MD



MECHANICAL:

INTERNAL BORE DIAMETER: 0.187" (3/16")
 OUTER DIAMETER: 0.4375" (7/16")
 THICKNESS: 0.25"
 SET SCREW: 8-32

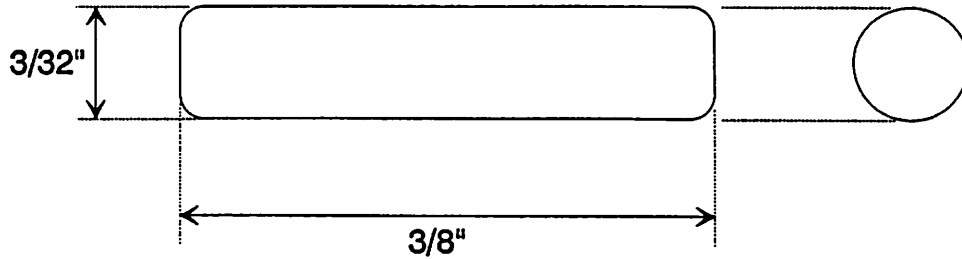
SOURCES:

1) Small Parts, Inc., Miami, Fla., #D-SC-3

TOLERANCES: (UNLESS OTHERWISE NOTED) ALL .XXX DECIMAL: ...005 ALL .XX DECIMAL: ...03 ALL FRACTIONAL: ...1/16 ALL ANGULAR: ...5°			CAROLINA MEDICAL ELECTRONICS KING, NORTH CAROLINA U.S.A. 27021	
			TITLE SHAFT COLLAR, 3/16" Set Screw Type	
MATERIAL:	DATE 24 OCT 1991 5/24/91	DR. BY: JC, MD	SCALE N/A	DRAWING NO. MS-19753
	FINISH:			
		ECS	APPD.	SHEET 1 of 1

REVISIONS

REV. #	INIT.	DESCRIPTION	DATE	APPROVED
2		92-051	7/24/92	JC, MD



MATERIAL:

Hardened Steel, Rockwell C 60 or greater

DIMENSIONS:

Diameter: 0.09375" +/- .0002"

Length: 0.375" +/- .010"

SOURCES:

- 1) MSC Industrial Supply , Plainview, NY # 06021034
- 2) Automotive Fasteners, Inc, Winston-Salem, NC (order generically)

TOLERANCES:
(UNLESS OTHERWISE NOTED)
ALL .XXX DECIMAL: ...005
ALL .XX DECIMAL: ...03
ALL FRACTIONAL: ...1/16
ALL ANGULAR: ...5°



CAROLINA MEDICAL ELECTRONICS
KING, NORTH CAROLINA U.S.A. 27021

TITLE

DOWEL PIN, STEEL
3/32" x 3/8"

MATERIAL:

DATE ~~24 OCT 1991~~ 5/10/91

FINISH:

DR. BY: JC, MD

A

SCALE

N/A

DRAWING NO.

MS-19742

CHKD BY: JC, MD

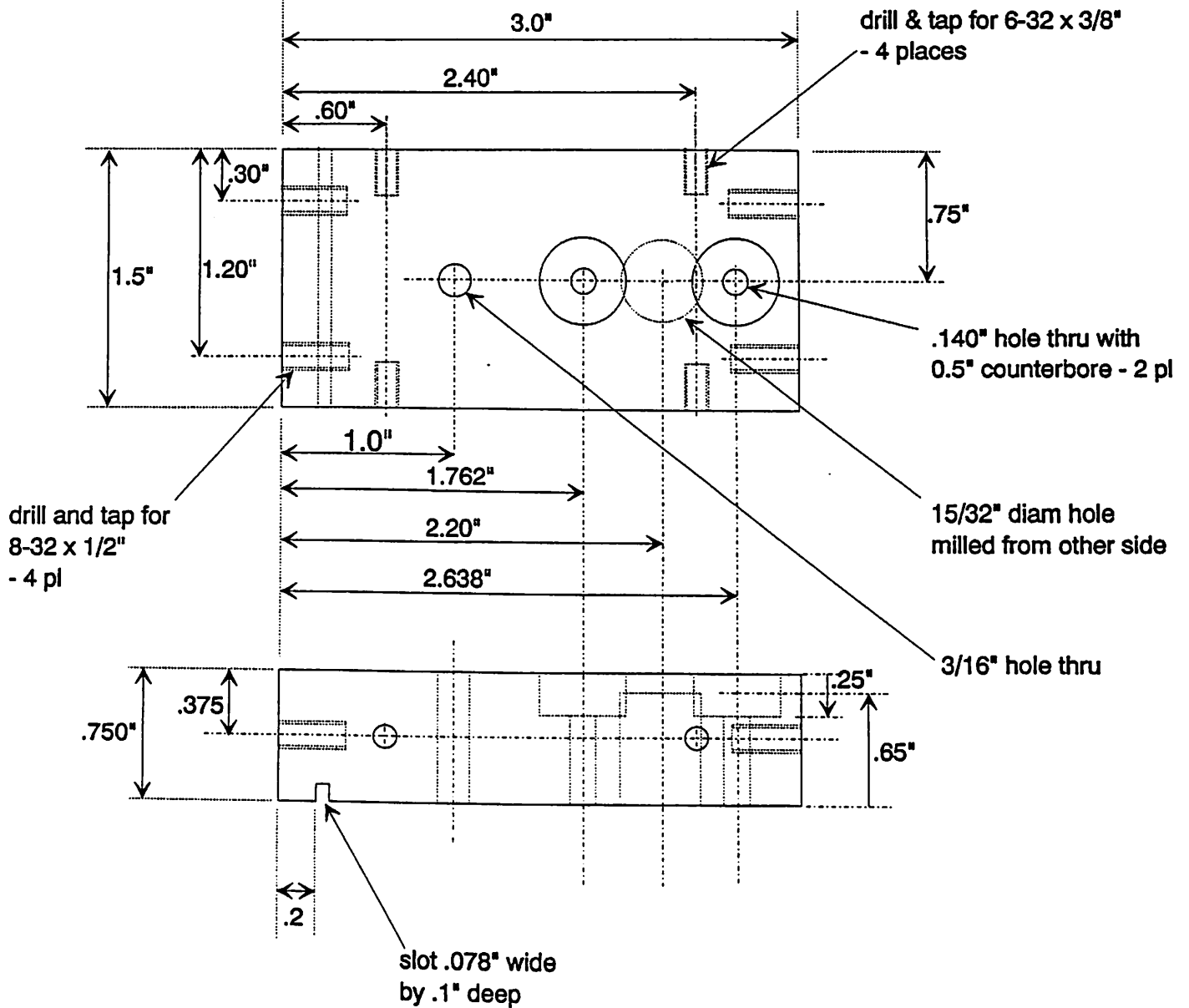
ECS

APPD.

SHEET 1 OF 1

REVISIONS

REV. #	INIT.	DESCRIPTION	DATE	APPROVED



TOLERANCES:
(UNLESS OTHERWISE NOTED)
ALL .XXX DECIMAL: ...005
ALL .XX DECIMAL: ...03
ALL FRACTIONAL: ...1/16
ALL ANGULAR: ...5°

MATERIAL:
ALUMINUM

FINISH:



DATE 15 NOV 91

DR. BY: JC, MD

CHKD BY:

CAROLINA MEDICAL ELECTRONICS
KING, NORTH CAROLINA U.S.A. 27021

TITLE

**VOLUME CALIBRATOR CASE
SOLENOID END**

A

SCALE

1:1

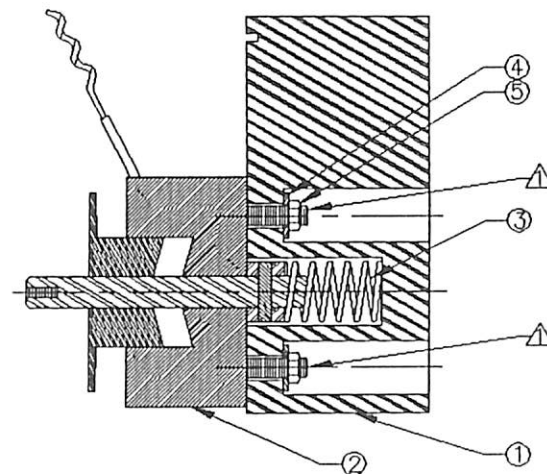
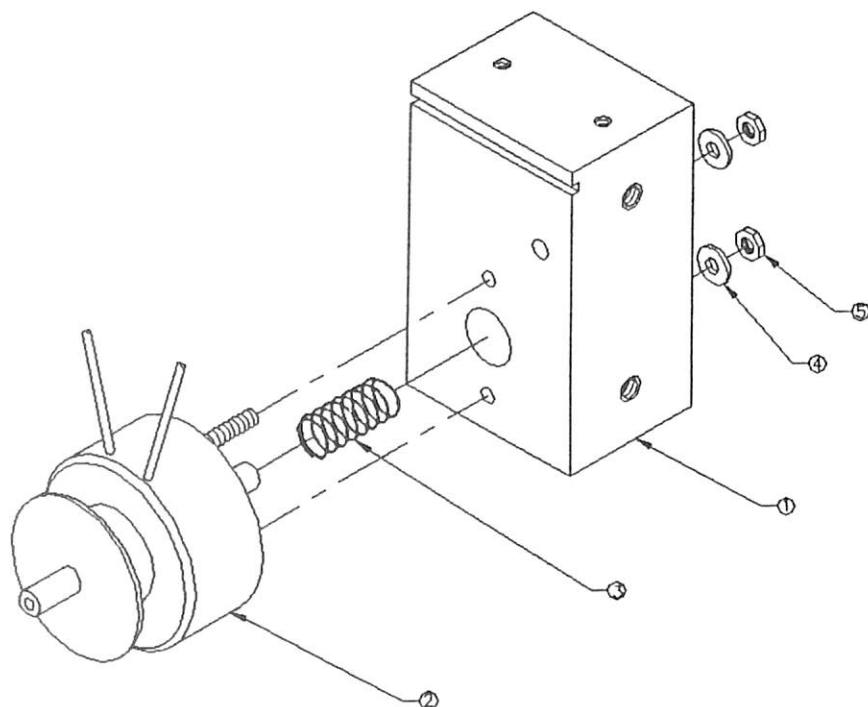
DRAWING NO.

MH-19737

ECS

APPD.

SHEET 1 OF 1



HALF SECTION
OF COMPLETE ASSEMBLY

REF	CME #	QTY	DESCRIPTION
6	19757	2 DROPS	LOCK-TITE THREAD LOCK #290
5	19825	2	#5-40 NUT
4	19826	2	#5 EXT. STAR WASHER
3	19754	1	COMPRESSION SPRING
2	19763	1	MODIFIED SOLENOID ASSEMBLY
1	19737	1	CASE, SOLENOID END

TOLERANCES:
(UNLESS OTHERWISE NOTED)
ALL .XXX DECIMAL: $\pm .005$
ALL .XX DECIMAL: $\pm .03$
ALL FRACTIONAL: $\pm 1/16$
ALL ANGULAR: $\pm .5^\circ$

MATERIAL:

FINISH:



DR. BY: CWD

DATE 10/29/91

CHKD BY: *J Campbell MD*

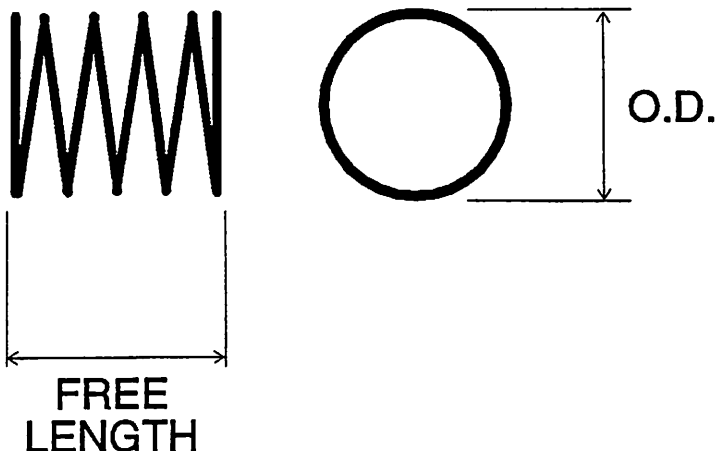
CAROLINA MEDICAL ELECTRONICS
KING, NORTH CAROLINA U.S.A.

TITLE
**VascuMAP
SOLENOID MOUNT
ASSEMBLY**

SIZE A SCALE NA DRAWING NO. EA19764

ECS APPD. SHEET 1 OF 1

REVISIONS				
REV. #	INIT.	DESCRIPTION	DATE	APPROVED
2	CWD	92-051	7/17/92	JC, MD



MECHANICAL:

MATERIAL: STEEL MUSIC WIRE

FREE LENGTH: 0.50"
 SPRING RATE 54 lb/in.
 WIRE DIAMETER: .047"
 SOLID HEIGHT: .218"
 OUTSIDE DIAMETER: 0.420"
 TO WORK IN HOLE SIZE: 0.5"

NOTE: Ends gound flat

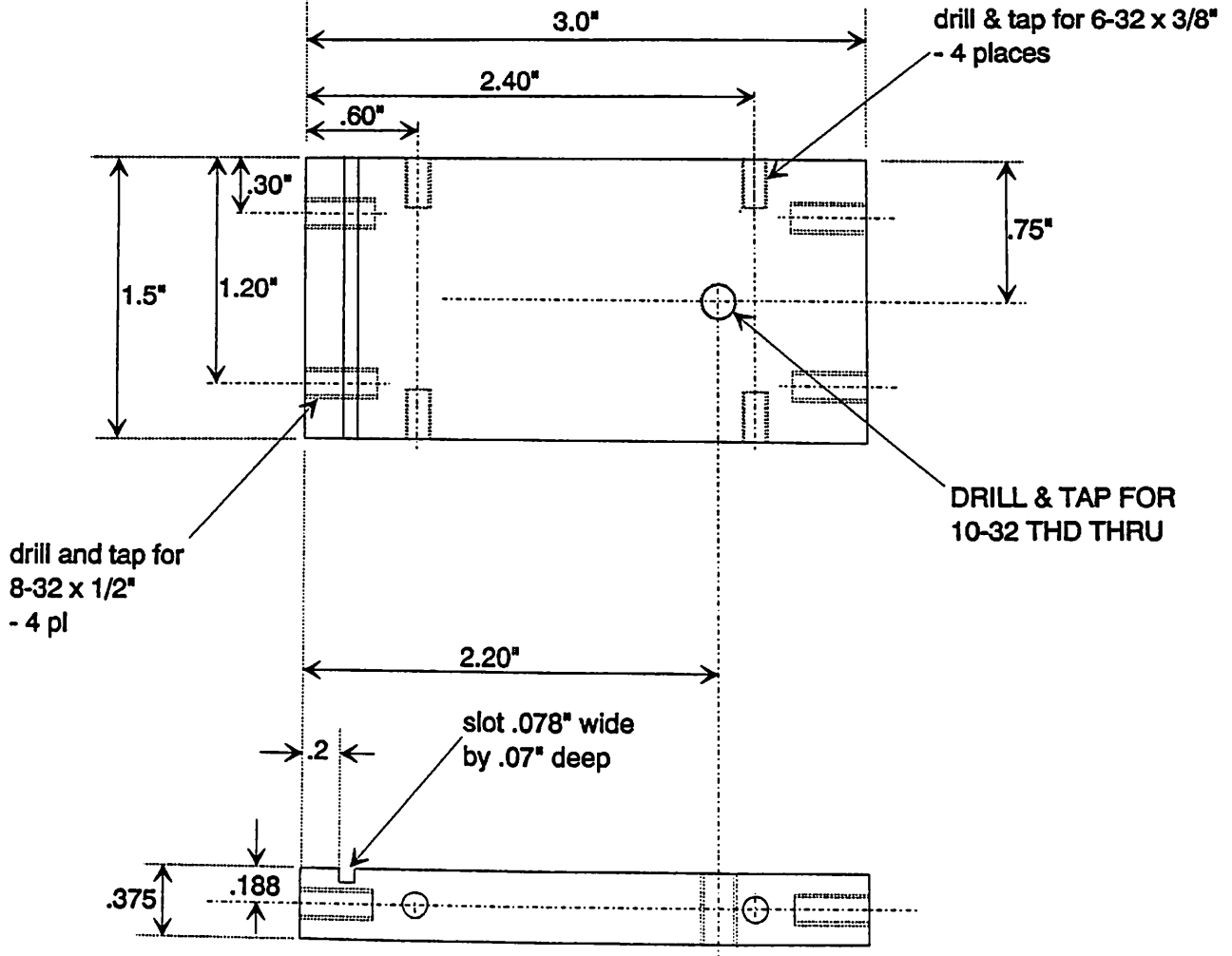
SOURCES:

1) Lee Spring Company #LC-047F-1-MW

TOLERANCES: (UNLESS OTHERWISE NOTED) ALL .XXX DECIMAL: .005 ALL .XX DECIMAL: .03 ALL FRACTIONAL: 1/16 ALL ANGULAR: .5				CAROLINA MEDICAL ELECTRONICS KING, NORTH CAROLINA U.S.A.	
MATERIAL:		DATE		TITLE COMPRESSION SPRING 1/2" FREE LENGTH	
		10/24/91			
FINISH:		DR. BY:		SIZE	SCALE
		JC, MD		A	N/A
		CHKD BY:		DRAWING NO.	
		JC, MD 7/22/92		MS19754	
				EC3	APPD. RAH
				SHEET 1 OF 1	

REVISIONS

REV. #	INIT.	DESCRIPTION	DATE	APPROVED



TOLERANCES:
(UNLESS OTHERWISE NOTED)
ALL .XXX DECIMAL: ...005
ALL .XX DECIMAL: ...03
ALL FRACTIONAL: ...1/16
ALL ANGULAR: ...5°

MATERIAL:

ALUMINUM

FINISH:



DATE 30 OCT 91

DR. BY: JC, MD

CHKD BY:

CAROLINA MEDICAL ELECTRONICS
KING, NORTH CAROLINA U.S.A. 27021

TITLE

VOLUME CALIBRATOR CASE
BELLOWS END

A

SCALE

1:1

DRAWING NO.

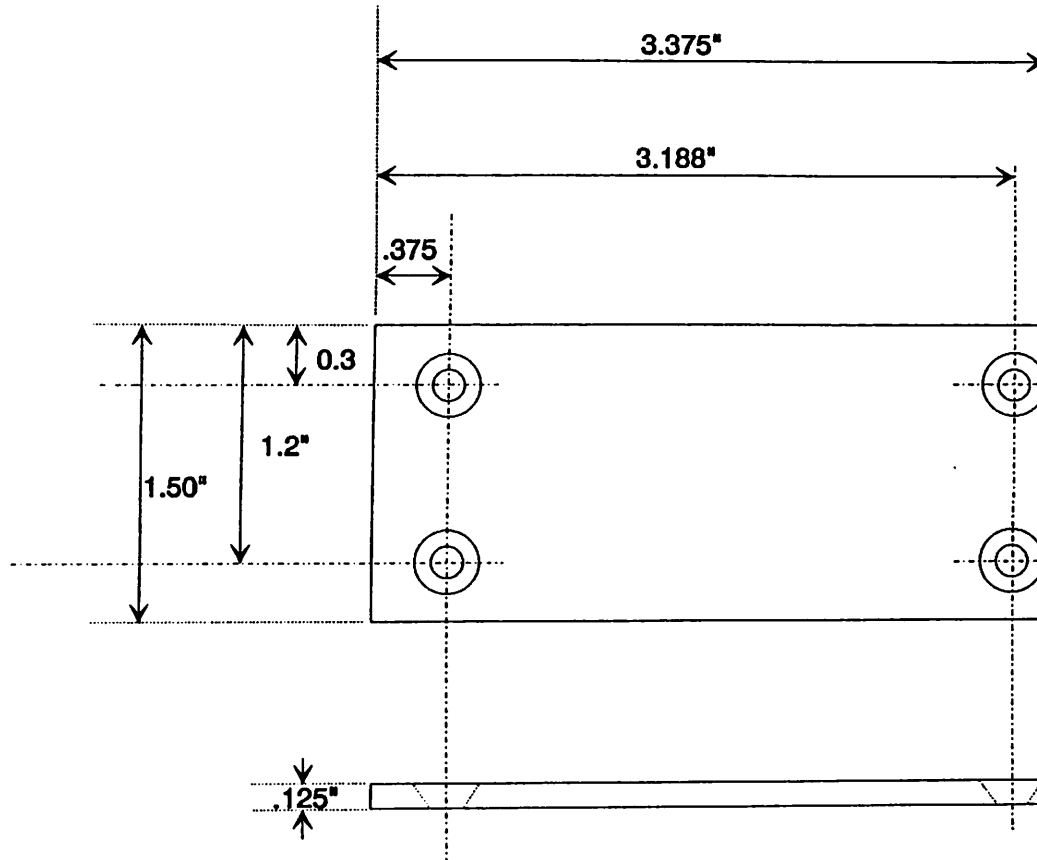
MH-19738

ECS

APPD. *PAH*

SHEET 1 OF 1

REVISIONS				
REV. #	INIT.	DESCRIPTION	DATE	APPROVED



TOLERANCES:
(UNLESS OTHERWISE NOTED)
ALL .XXX DECIMAL: ...006
ALL .XX DECIMAL: ...03
ALL FRACTIONAL: ...1/16
ALL ANGULAR: ...5°

MATERIAL:
ALUMINUM

FINISH:



DATE 10/28/91

DR. BY: JC, MD

CHKD BY:

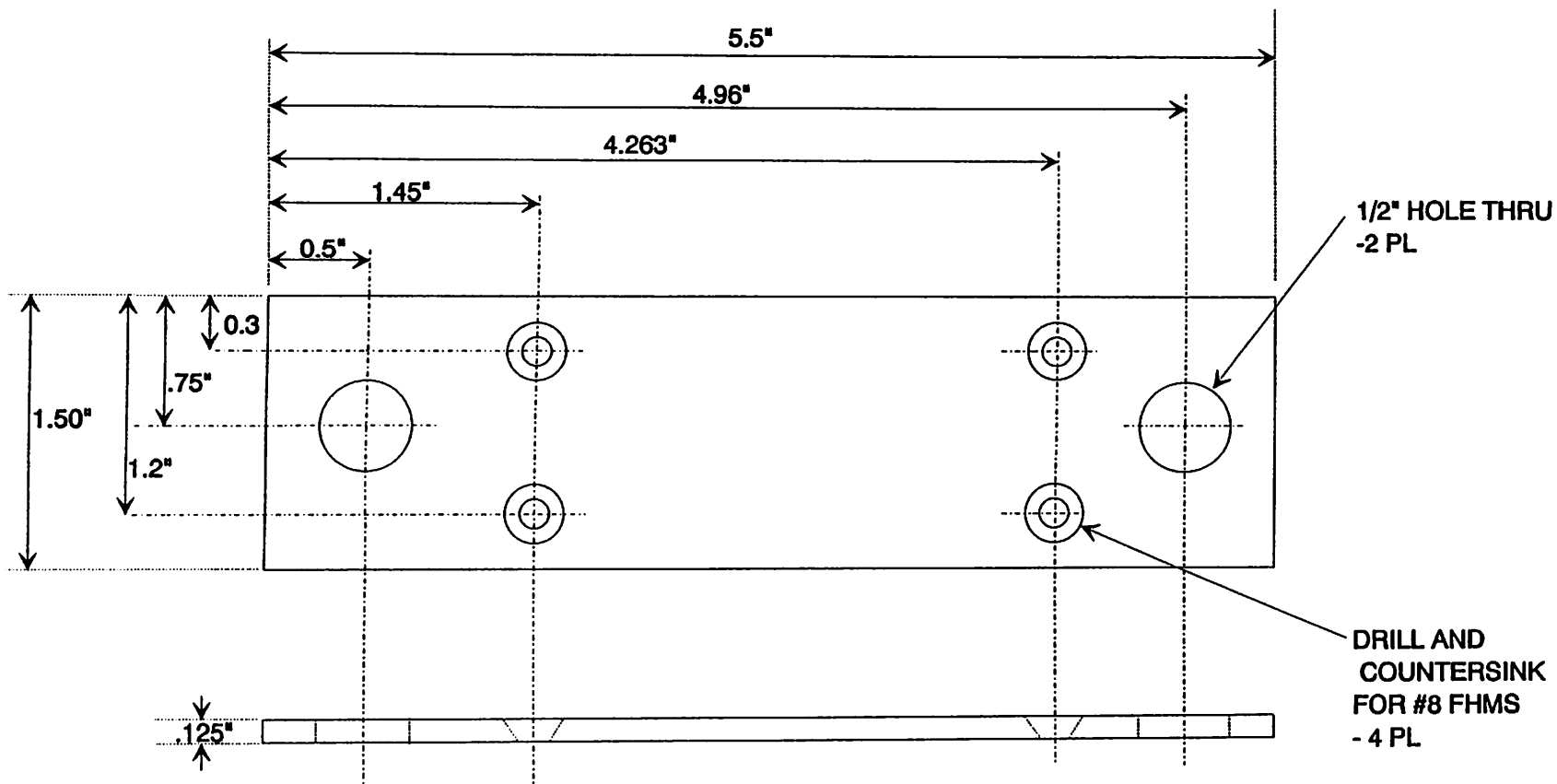
CAROLINA MEDICAL ELECTRONICS
KING, NORTH CAROLINA U.S.A. 27021

TITLE **VOLUME CALIBRATOR CASE
SHORT SIDE**

A SCALE 1:1 DRAWING NO. MH19739

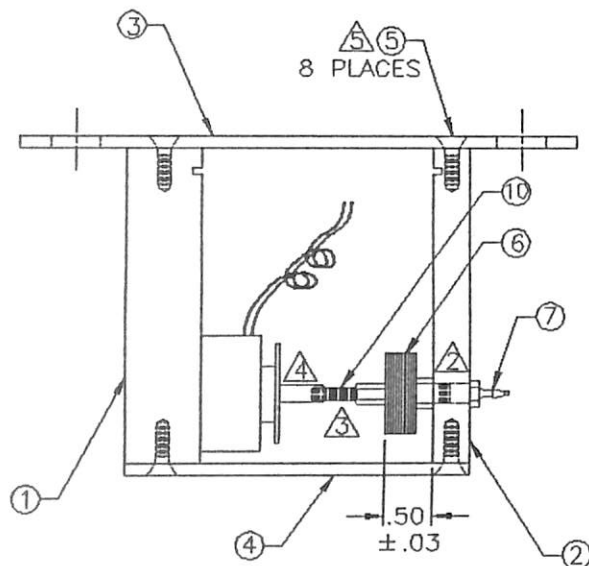
ECS APPD. *[Signature]* SHEET 1 OF 1

REVISIONS				
REV. #	INIT.	DESCRIPTION	DATE	APPROVED



TOLERANCES: (UNLESS OTHERWISE NOTED) ALL .XXX DECIMAL: ...006 ALL .XX DECIMAL: ...03 ALL FRACTIONAL: ...1/16 ALL ANGULAR: ...5°		CAROLINA MEDICAL ELECTRONICS KING, NORTH CAROLINA U.S.A. 27021	
MATERIAL: ALUMINUM		DATE 10/28/91	TITLE VOLUME CALIBRATOR CASE LONG SIDE
FINISH:	DR. BY: JC, MD CHKD BY:	A SCALE 1:1	DRAWING NO. MH19740 EC8 APPD. <i>[Signature]</i> SHEET 1 OF 1

EA-19765



REVISIONS

REV. #	INIT.	DESCRIPTION	DATE	APPROVED
2	CWD	92-019, 92-020	4/15/92	RAH
2	CWD	92-051	7/8/92	Jc, md

NOTES:

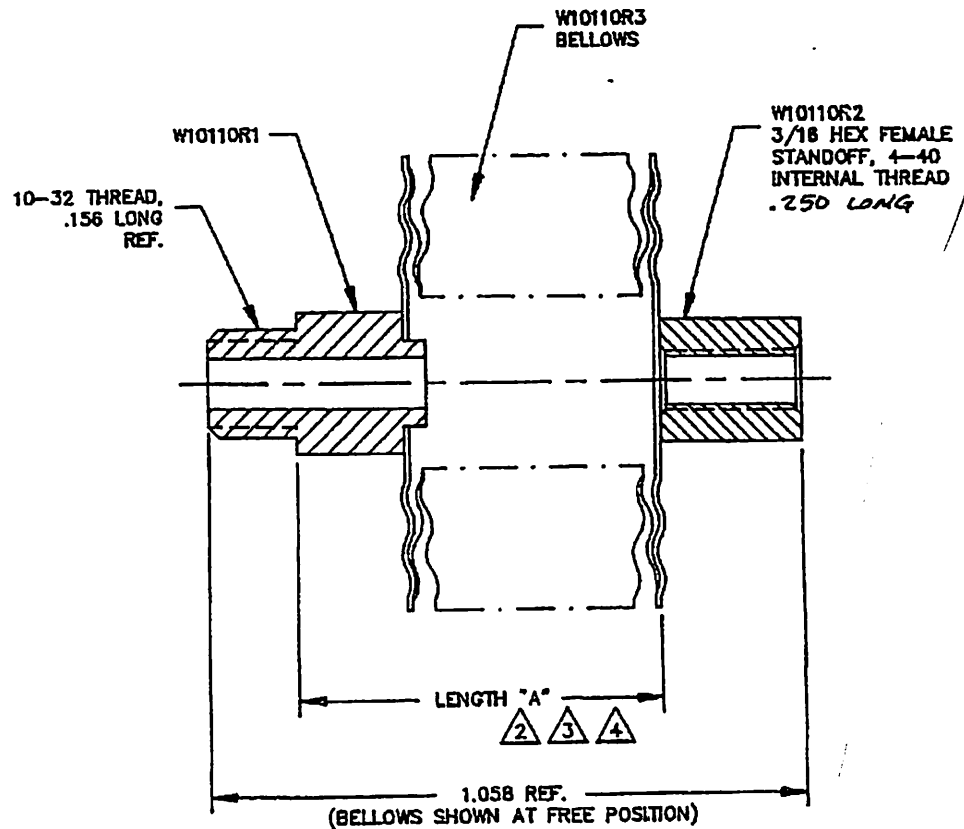
- 1) ASSEMBLE ①, ③, & ④ WITH SCREWS ⑤ AND THREAD LOCK ⑨.
- 2) APPLY ⑧ TO ⑥ AND SCREW INTO ②.
- 3) SCREW THREADED ROD INTO ⑥ FULLY.
- 4) WITH ② IN APPROXIMATE POSITION, ROTATE THE SOLENOID ARMATURE TO JOIN ⑥ ⑩ AND THE SOLENOID.
- 5) INSERT SCREWS ⑤ USING ⑨ TO HOLD ② IN PLACE.
- 6) BY ROTATING THE SOLENOID ARMATURE ADJUST THE BELLOWS SO THAT IT IS COMPRESSED TO .50" ± .03 AS SHOWN. USE CALIPERS TO MEASURE. WHEN POSITION IS SATISFACTORY, SECURE BOTH ENDS OF THE SHAFT ⑩ USING ⑨.
- 7) FINALLY, APPLY ⑧ TO ⑦ AND SCREW INTO ②.

REF	CME #	QTY	DESCRIPTION
10	19988	1	4-40 X 5/8" THREADED ROD
9	3675	2 drops	LOCK-TITE THREAD LOCK #290
8	19771	qs	PIPE SEALANT
7	19811	1	BRASS ORIFICE
6	19818	1	VOLCAL BELLOWS
5	10393	8	8-32 X 1/2" FHMS
4	19739	1	CASE, SHORT SIDE
3	19740	1	CASE, LONG SIDE
2	19738	1	CASE, BELLOWS END
1	19764	1	SOLENOID MOUNT ASSY

TOLERANCES: (UNLESS OTHERWISE NOTED) ALL .XXX DECIMAL: ± .005 ALL .XX DECIMAL: ± .03 ALL FRACTIONAL: ± 1/16 ALL ANGULAR: ± .5°				CAROLINA MEDICAL ELECTRONICS KING, NORTH CAROLINA U.S.A.	
MATERIAL:		DR. BY: CWD		TITLE VascuMAP VOLCAL MECHANICAL ASSEMBLY	
DATE 2/3/92		DATE 7/9/92		SIZE A	SCALE NA
CHKD. BY: Jc, md		DRAWING NO. EA19765		ECS	APPD. RAH
				SHEET 1 OF 1	

REVISIONS

REV. #	INIT.	DESCRIPTION	DATE	APPROVED
2	JC, MD	CHANGES FOR OPERATION IN COMPRESSION	7-2-92	JC



NOTES:

- BELLOWS DATA:
 - O.D.: .800 I.D.: .300
 - MATERIAL: AM-350
 - CONDITION: HEAT TREATED
 - SPRING RATE: 22 LBS/IN $\pm 15\%$
 - EFFECTIVE AREA: .24 SQ. IN. $\pm 2\%$
 - STROKE FOR 0.5cc DISPLACEMENT = .127 IN.

- AT THE FREE POSITION, THE LENGTH "A" TO BE $.652 \pm .025$ IN.
- ASSEMBLY TO BE INSTALLED SO THAT LENGTH "A" IS .50 IN.
- OPERATING RANGE OF BELLOWS TO BE FROM THE INSTALLED LENGTH ("A" = .50 IN.) TO A STROKE OF .127 IN. ("A" = .627 IN.).

SOURCES:

- ROBERTSHAW WELDED BELLOWS DIV., COOKEVILLE, TN.
THEIR DWG NUMBER: W10110, REV 3.

TOLERANCES:
(UNLESS OTHERWISE NOTED)
ALL .XXX DECIMAL: ...005
ALL .XX DECIMAL: ...03
ALL FRACTIONAL: ...1/16
ALL ANGULAR: ...5°



CAROLINA MEDICAL ELECTRONICS
KING, NORTH CAROLINA U.S.A. 27021

TITLE

VascuMAP
VOLUME CALIBRATOR BELLOWS

MATERIAL:

DATE 1 JULY 92

FINISH:

DR. BY: JC, MD.

A

SCALE

N/A

DRAWING NO.

MS-19818

CHKD BY: JC, MD 7/1/92

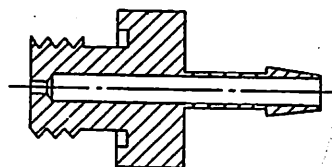
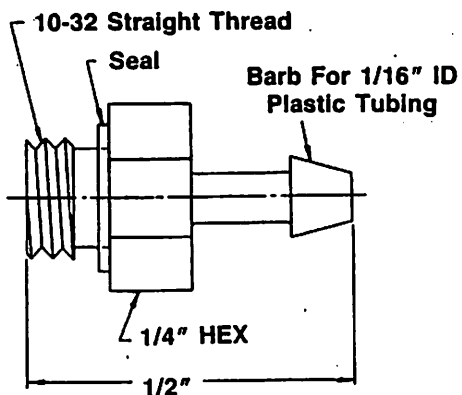
ECS

APPD.

SHEET 1 OF 1

REVISIONS

REV. #	INT.	DESCRIPTION	DATE	APPROVED
1				



Body - Brass
Orifice - Brass, 0.017" DIAM.
Thread - 10- 32 UNF
Thread Seal - Buna-N Gasket
Barb - For 1/16" ID Tubing

SOURCES:

1) O'KEEFE CONTROLS CO , MONROE , CT.
 PART # M-17

TOLERANCES:
 (UNLESS OTHERWISE NOTED)
 ALL DIMENSIONS ±.005 INCHES
 ALL ANGULAR DIMENSIONS ±.5°
 ALL FRACTIONAL DIMENSIONS ±1/64



CAROLINA MEDICAL ELECTRONICS
 KING, NORTH CAROLINA U.S.A.

MATERIAL:

DRAWN BY: JC, MD
 DATE: 2/2/92

TITLE

BRASS ORIFICE 0.017"
 IN 10-32 TO 1/16" BARB
 HOUSING

FINISH:

CHKD BY: JC, MD
 DATE: 2/2/92

SIZE

A

SCALE

N/A

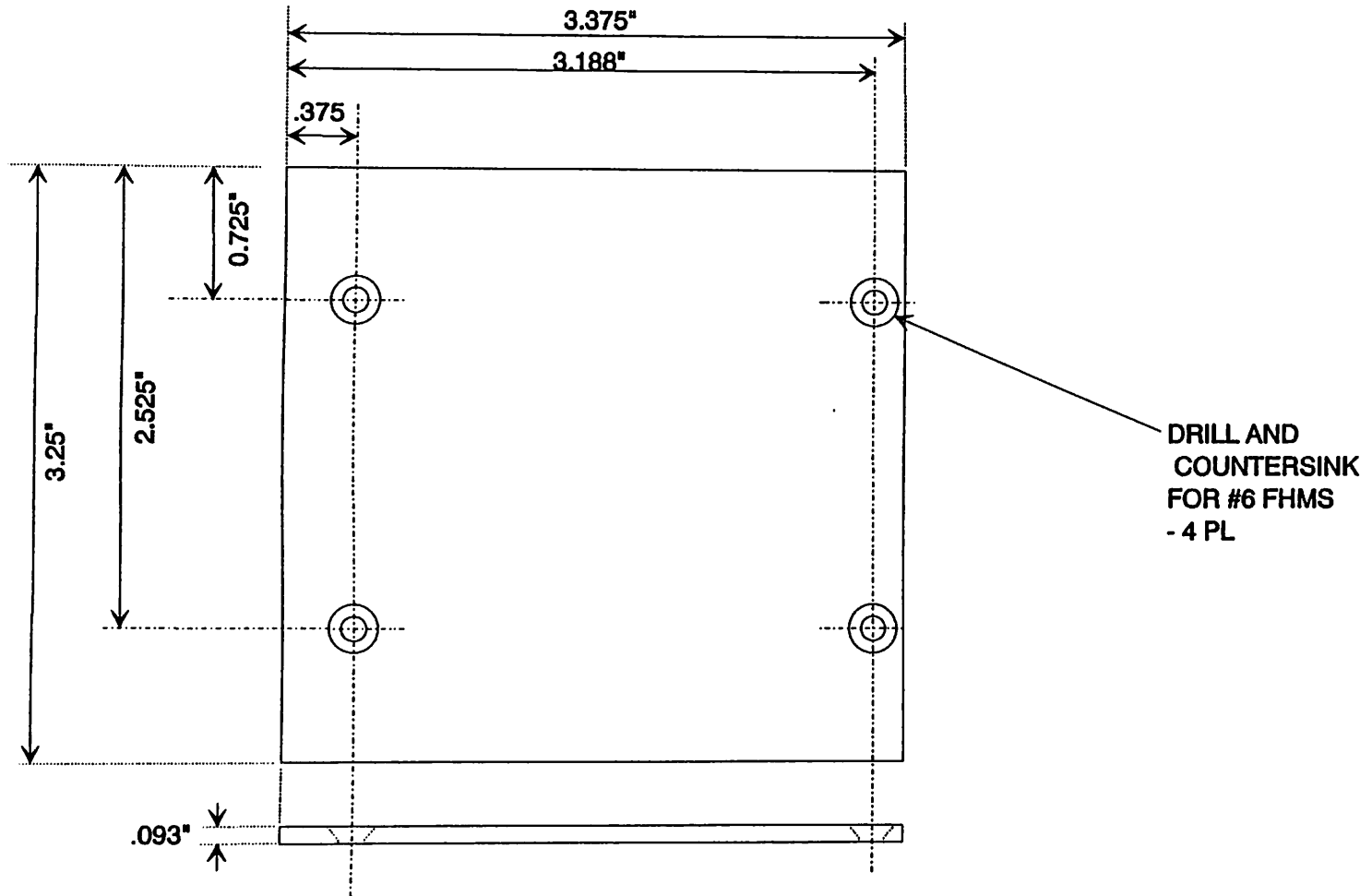
DRAWING NO.

MS-19811

SHEET

1 OF 1

REVISIONS				
REV. #	INIT.	DESCRIPTION	DATE	APPROVED



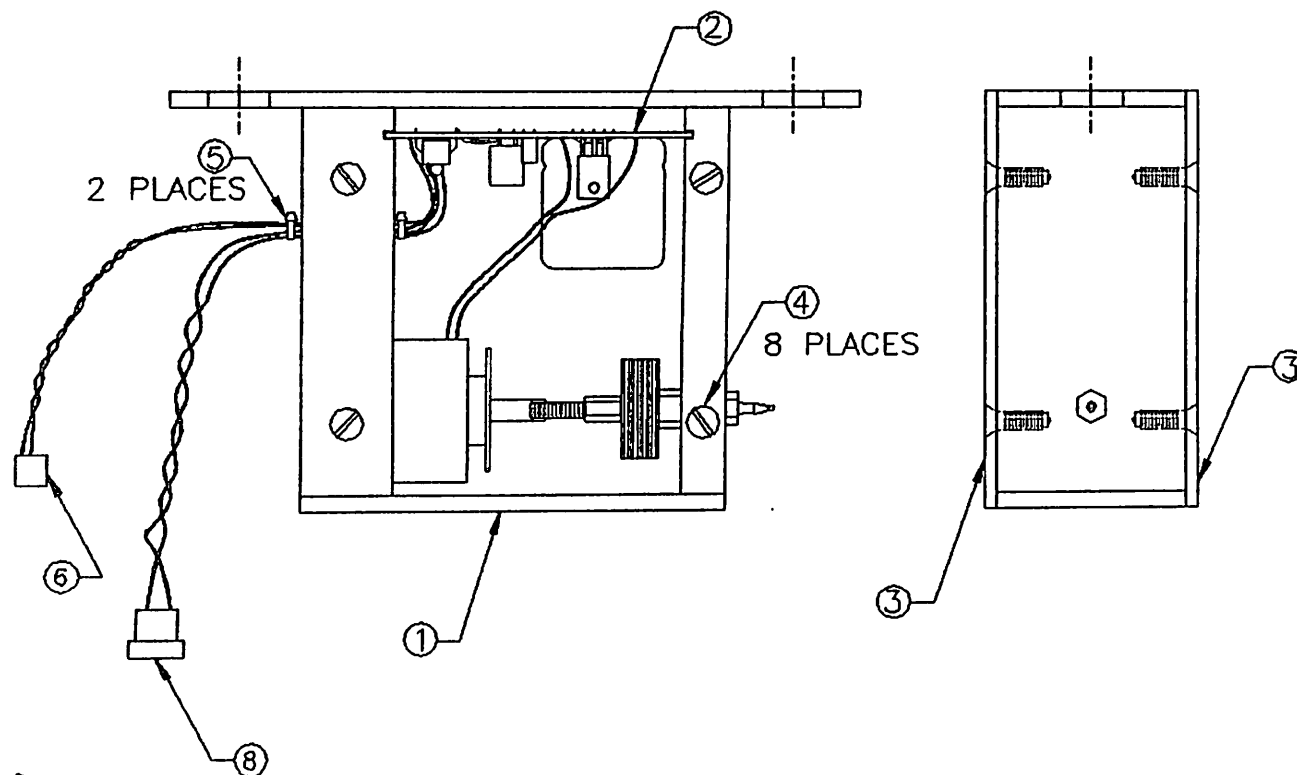
TOLERANCES: (UNLESS OTHERWISE NOTED) ALL .XXX DECIMAL: ...005 ALL .XX DECIMAL: ...03 ALL FRACTIONAL: ...1/16 ALL ANGULAR: ...5°		CAROLINA MEDICAL ELECTRONICS KING, NORTH CAROLINA U.S.A. 27021		
MATERIAL: 0.093" POLYCARBONATE		DATE 10/29/91	TITLE VOLUME CALIBRATOR CASE TOP OR BOTTOM COVER	
FINISH: CLEAR	DR. BY: JC, MD CHKD BY:	A SCALE 1:1	DRAWING NO. MH19741	ECS APPD. <i>[Signature]</i> SHEET 1 OF 1

REVISIONS

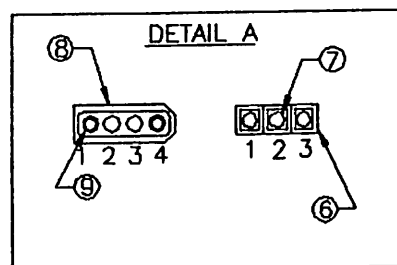
REV. #	INT.	DESCRIPTION	DATE	APPROVED
2	CWD	92-051	7/8/92	JC, MD

WIRE RUN LIST

FROM	DESCRIPTION	TO
SOLENOID	LEAD 2-3/4"	"COIL"
SOLENOID	LEAD 2-3/4"	"COIL"
P3	YELLOW 10"	BERG-PIN1
P4	VIOLET 10"	BERG-PIN2
P1	ORANGE 5-1/2"	MOLEX-PIN1
P2	ORANGE 5-1/2"	MOLEX-PIN4



EA-19904



REF	CME #	QTY	DESCRIPTION
12	4568	10"	24 GA STRANDED WIRE, VIOLET
11	4558	10"	24 GA STRANDED WIRE, YELLOW
10	4564	11"	24 GA STRANDED WIRE, ORANGE
9	16125	2	MOLEX MALE PIN
8	16707	1	MOLEX 4 POS. PLUG SHELL
7	16315	4	FEMALE BERG PINS
6	10625	1	3 PIN BERG HOUSING
5	2196	2	SMALL TIE WRAP
4	10523	8	6-32 X 3/8" FHMS
3	19741	2	TOP/BOTTOM COVER
2	19732	1	VOLCAL CIRCUIT BOARD - ASSEMBLED
1	19765	1	VOLCAL MECHANICAL SUB-ASSEMBLY

TOLERANCES: (UNLESS OTHERWISE NOTED)
ALL .XXX DECIMAL: ±.005
ALL .XX DECIMAL: ±.03
ALL FRACTIONAL: ±1/16
ALL ANGULAR: ±.5°
MATERIAL:
FINISH:

DR. BY:
CWD
DATE
2/12/92
CHKD BY:
JC, MD

CAROLINA MEDICAL ELECTRONICS KING, NORTH CAROLINA U.S.A.			
TITLE VascuMAP VOLCAL FINAL ASSEMBLY			
SIZE	SCALE	DRAWING NO.	
A	NA	EA19904	
ECS	APPD.	SHEET 1 OF 1	