

ENDEVCO

2954A

INSTRUCTION MANUAL

INSTRUCTION MANUAL

FOR MODEL 2954A PEAK HOLDING METER

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MODEL 2954A

INSTRUCTION MANUAL

1.0 INTRODUCTION

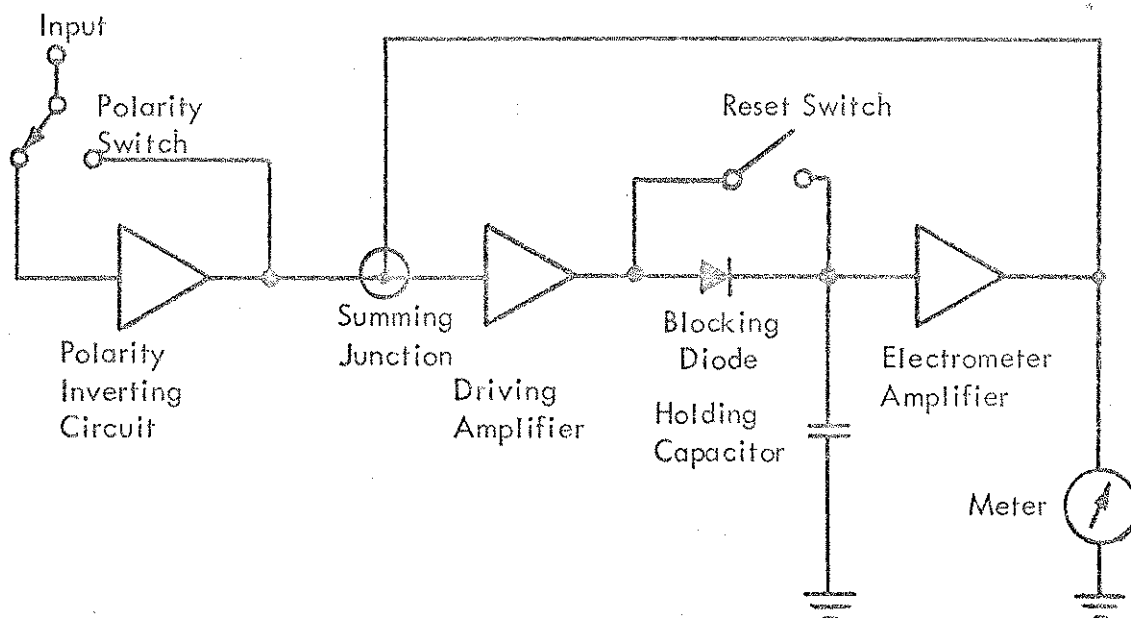
1.1 General Description

The Model 2954A Peak Holding Meter is used with the Model 2718A Shock Amplifier to indicate the maximum amplitude of a single pulse or a series of pulses from any piezoelectric transducer. The peak value is displayed for a limited time until it is either reset manually or until a peak of greater amplitude occurs.

The Model 2954A is mechanically and electrically compatible with the Model 2718A in either the rack-mounted or portable configuration. The 4-1/2" meter on the Model 2954A has two scales, 0 - 25 and 0 - 50, corresponding to the full scale ranges on the charge amplifier.

2.0 THEORY OF OPERATION

The peak holding meter circuit includes: (1) a polarity inverting circuit; (2) a summing junction; (3) a driving amplifier; (4) a holding capacitor and blocking diode; (5) an electrometer amplifier; and (6) an indicating meter.



BLOCK DIAGRAM MODEL 2954A

2.0 THEORY OF OPERATION (continued)

2.1 Polarity

The Polarity Switch, together with the Polarity Inverting Circuit, is used to select the polarity of the pulse to be measured.

2.2 Summing Junction

The input pulse is compared to the electrometer amplifier output voltage at the summing junction. The error signal at the summing junction is amplified by the driving amplifier to charge the holding capacitor to the peak of the input pulse through the blocking diode.

2.3 Holding Circuit

After the peak of the input pulse has passed, the diode does not permit the capacitor to discharge. The potential across the capacitor is measured by the electrometer amplifier which drives the meter.

3.0 EXTERNAL CONTROLS AND CONNECTORS

3.1 Front Panel

3.1.1 Reset - The Reset Switch is a single pole push button switch connected across the blocking capacitor to discharge the holding capacitor; it clears the meter for any incoming signal. When the Reset button on the 2954A is depressed, the meter indicates the dc voltage at the signal output connector of the Model 2718A Amplifier.

3.1.2 Polarity Switch - The Polarity Switch is a two-position toggle switch, which is used to select the polarity of the input pulse to be measured.

3.2 Rear Panel

3.2.1 Power and Signal Connector - The multipin connector J1 accepts power and signal from the Model 2718A through the external interconnect cable assembly.

4.0 INITIAL SETUP AND CHECKOUT

Interconnect the 2954A and 2718A with the 15438 Cable Assembly. Turn on power and allow thirty minutes before starting checkout.

4.1 Model 2718A Shock Amplifier Checkout

To check out the Model 2718A and the Model 2954A as a system, first follow the initial setup and checkout procedure outlined in the Model 2718A Shock Amplifier Instruction Manual. When this has been accomplished, continue with the Model 2954A checkout.

4.2 Peak Holding Circuit

The meter will display the peak value of the highest output pulse or the peak value of the sinusoidal signal from the charge amplifier.

4.2.1 Zero - To adjust the meter to zero, first depress and release the Reset button on the 2718A, then depress and hold the 2954A Reset button. Turn the Zero adjust on 2718A for zero on the meter.

4.2.2 Full Scale - Apply a signal to the input of the 2718A. Follow the procedure outlined in the 2718A Initial Checkout. With the Low Frequency Cutoff Switch at 0.7 Hz, Calib-Operate switch at Operate, Full Scale g at 25 (black), and Sensitivity Dial at 1.0 (black), the 2954A Meter should read Full Scale for a 1000 Hz, 17.7 mV rms (25 mV pk) signal applied to the 2718A through the shielded, precision 1000 pF capacitor. This input signal will result in a 2718A output of 5.0 pk V.

4.2.3 Accuracy - The accuracy of the meter indication should be within $\pm 2\%$ of the peak output of the charge amplifier for half-sine pulses of 1 msec or greater duration, or continuous signals. The over-all accuracy of the Model 2718A with the Model 2954A readout is better than $\pm 3.5\%$ of full scale when the input is a 1000 Hz sinusoidal signal.

CAUTION: When the input signal is sinusoidal and/or continuous, depress and release the Reset Button on the 2954A before reading the meter to eliminate the effect of spurious peaks.

4.2.4 Calibration - With no signal applied to the 2718A, set the Calib-Operate switch to Calibrate. Depress and release the Reset button on the 2954A. The meter should read at one-half full scale, regardless of the position of the Full Scale range switch on the amplifier. Accuracy of the reading is $\pm 2\frac{1}{2}$ divisions ($\pm 5\%$ of full scale).

5.0 OPERATING INSTRUCTIONS

5.1 Mounting

The Model 2954A Peak Holding Meter can be mounted with the Model 2718A Shock Amplifier in either a rack or portable configuration. To mount the 2954A in the Model 4992A Rack, slide in the 2954A Module, tighten the two captive thumb screws on the front and then tighten the two Phillips screws on the rear skirt. The same procedure is followed for mounting the 2954A in the Model 2991A or 2992A Portable Carrying Cases.

5.2 Power

The Model 2954A is energized when the Model 2718A Shock Amplifier is turned on.

5.3 Zero Adjust

The Model 2954A is designed to be sensitive to and hold a transient input signal. Spurious, unwanted transients may appear at the input to the circuit from the following or other sources:

1. Turning amplifier on,
2. Changing ranges on the 2718A,
3. Operating the Calib-Operate switch,
4. Connecting or disconnecting a transducer.

Most transients will swing the meter to only a fraction of full scale and the meter is quickly reset by depressing the meter Reset button. Large transients may cause the circuits in the 2718A Amplifier to saturate, upsetting the dc output level of the amplifier. When the 2954A button is depressed and held, the meter indicates the dc level of the amplifier output.

When large transients are applied to the amplifier, the recovery time may be as long as 1-1/2 minutes, particularly if the Low Frequency Cutoff is set at 0.03 Hz. Alternately depress and release the Reset button on the amplifier then the Reset button on the meter, until the meter reading is stable.

To adjust the meter needle to zero, first press and release the amplifier Reset button, then press and hold the meter Reset button. With a small screwdriver turn the Zero potentiometer on the amplifier until the meter reads zero.

CAUTION: Before each measurement the meter zero should be checked by first depressing and releasing the amplifier Reset button, then the meter Reset button.

5.4 Polarity Switch

The Peak Holding Meter will display the peak value of the positive or the negative portion of the input pulse depending on the setting of the Polarity Switch. The meter zero should be checked whenever the Polarity Switch is operated.

5.5 Meter

The meter indicates full scale when a 5.0 volt peak signal is applied to the input of the Peak Holding Circuit.

6.0 CIRCUIT DESCRIPTION (See Drawing C-2954-501C)

The input signal for the Peak Holding Meter is taken from the Signal Output of the charge amplifier. Switch S1 is the polarity switch and applies the input signal to either the polarity reversing circuit or the summing junction. The polarity reversing circuit, consisting of Q1, Q2, and Q3, has a gain of one. The input signal and the electrometer output voltage are applied to the summing junction at the base of Q4. Transistors Q4, Q5, Q6, Q7 and Q8 make up the driving amplifier.

The holding capacitor, C3, is charged through the blocking diode, CR3. The peak voltage across the capacitor is sensed by electrometer tube, VI. Transistor Q9 regulates the screen and filament voltage of VI.

Transistors Q10, Q11, Q12 and Q13 form an electrometer amplifier and power amplifier to drive the meter.

Plus and minus 30 volt power is obtained from the charge amplifier.

7.0 MAINTENANCE AND TROUBLESHOOTING

7.1 Maintenance

See Model 2718A Instruction Manual for general information.

7.1.1 Peak Holding Meter - Before making any adjustments in the Peak Holding Meter, the plus and minus power supply voltages should be measured.

7.2 Troubleshooting

If the trouble is in the Peak Holding Meter, the dc voltages on the circuit board should be measured and compared with the voltages in Table I.

7.3 Calibration Procedure for Adjustment of Peak Holding Meter Model 2954A

The Model 2954A Peak Holding Meter is set at the factory before shipment to an indicated accuracy of $\pm 2\%$ of full scale. Normally, this adjustment will remain stable within this range of accuracy and no readjustment is necessary. Only when careful and accurate measurements demonstrate that the indication on the meter is not within the specified accuracy, the following procedure is recommended for readjusting the meter. Use voltmeter, John Fluke 801B, or equal.

- a. Connect the Model 2954A to the Model 2718A Charge Amplifier.
- b. Turn on power and allow at least one hour for warmup.
- c. Set the Full Scale switch on the 2718A to its highest position (5000 g black).

7.3 Continued

References. When a reference is made to components within the amplifier or meter circuit, the component designations will be followed by a number in parenthesis which refers to the following sections:

- (1) Denotes Model 2718A Charge Amplifier
- (2) Denotes Model 2954A Peak Holding Meter circuit

Identification of Components.

- a. R46 (1) is the Zero Adjust potentiometer located on the lower left corner of the charge amplifier panel.
- b. J3 (1) is the Signal Output connector for the charge amplifier. It is the BNC connector on the rear panel. The voltage on this connector is identical to the signal applied to the input of the Peak Holding Meter circuit.
- c. R23 (2), R27 (2), and R37 (2) are located on the circuit board assembly behind the indicating meter. See Drawings C-12678-C and C-2954-501C.
- d. S1 (2) is the polarity selection toggle switch on the meter.
- e. S2 (2) is the push button Reset switch on the meter.

Reset Switch. Always depress and release the meter Reset switch, S2 (2), before reading the meter to discharge the holding capacitor.

7.3.1 Peak Meter Bias

Test Condition:	Full Scale	5000 Black
	S1 (2)	Positive

- a. With R46 (1), adjust the voltage at J3 (1) to 0 ± 10 mV dc.
- b. Depress and hold the Reset switch, S2 (2). The voltage across resistor R23 (2) should be 500 ± 10 mV dc. If the voltage is not within these limits, adjust R27 (2). Release the Reset switch.

7.3.2 Peak Meter Full Scale Adjust

- a. With the polarity switch S1 (2) in "Positive" position, adjust zero potentiometer, R46 (1), until meter reads zero. Measure and record the voltage at J3 (1), which should be 0 ± 50 mV dc (positive zero voltage).

7.3.2 Peak Meter Full Scale Adjust (continued)

- b. Adjust R46 (1) until the voltage at J3 (1) is a change of -5.000 Vdc from "positive zero voltage."
- c. Adjust R37 (2) until the meter reads exactly full scale.
- d. With the polarity switch S1 (2) in "Negative" position, adjust R46 (1) until the meter reads zero. Measure and record the voltage at J3 (1) (negative zero voltage) which should be within 250 mV of the "positive zero voltage" recorded above.
- e. Adjust R46 (1) until the voltage at J3 (1) is a change of $+5.000$ Vdc from the "negative zero voltage." Record the meter indication as a deviation from full scale which should be less than 2% of full scale.
- f. Adjust R37 (2) until the deviation is cut in half.
- g. Recheck the positive full scale reading by repeating Steps a and b.

NOTE: If it is not possible to obtain a 5.000 Vdc change in Steps b and e, use a magnitude of 4.000 Vdc change and change the words "full scale" in Steps c and e to "80% of full scale." The excellent linearity of the meter will permit the 80% point of the meter to be used as a reference without loss of accuracy.

8.0 FACTORY REPAIRS AND WARRANTY

Endevco Corporation warrants each new instrument to be free from defective material and workmanship for one year from date of sale to the original purchaser. A copy of the warranty is contained in the back of this manual.

If serious trouble occurs, the instrument should be carefully packed and returned to the factory for repair. Whenever possible, it should be accompanied by supplementary information, describing in particular the fault noted.

If upon examination it is found that the defect is not within the scope of this warranty, a statement of repair charges and a request for authorization to proceed will be submitted.

Address all shipments and correspondence to:

Endevco
801 South Arroyo Parkway
Pasadena, California 91109

TABLE I - TYPICAL DC OPERATING VOLTAGES

Conditions

Model 2954A Peak Holding Meter coupled to Model 2718A Charge Amplifier and zeroed.

Equipment

Simpson Meter Model 260 (or equivalent)

<u>Q</u>	<u>BASE</u>	<u>EMITTER</u>	<u>COLLECTOR</u>
1	0	-0.6 V	+9.6 V
2	0	-0.6 V	+8.2 V
3	+9.8 V	+9.8 V	+30 V
4	+1.5 V	+0.6 V	+0.8 V
5	0	+0.8 V	+15 V
6	+1.0 V	+0.8 V	+0.8 V
7	+0.8 V	+0.8 V	+30 V
8	-9 V	0	+30 V
9	+15 V	+15 V	+7.0 V
10	+15 V	+15 V	+30 V
11	+16 V	+15 V	+19 V
12	+15 V	+15 V	+0.5 V
13	-0.4 V	+0.3 V	-3.6 V

ELECTRICAL PARTS LIST

FOR

MODEL 2954 A

<u>Des. No.</u>	<u>Part</u>	<u>Value and Description</u>	<u>Manufacturer and Part No.</u>	<u>Endevco Part No.</u>
C1	Capacitor	220 pF, $\pm 5\%$, 500 V, Silver Mica	Elmenco DM-15-221J	EC236
C2	Capacitor	.05 μ F, $\pm 20\%$, 50 V, Ceramic	Sprague 55C23A1	EC324
C3	Capacitor	.1 μ F, $\pm 5\%$, 100 V	Electro-Cube 411D1B104J	EC306
C4	Capacitor	20 pF, $\pm .5$ pF, 300 V, Silver Mica	Elmenco DM-15	EC12
C5	Capacitor	.005 μ F, $\pm 20\%$, 50 V, Ceramic	Sprague 40C172A5	EC239
CR1	Diode	Zener, 1N961	Motorola	ECR62
CR2	Diode	Zener, 1N961	Motorola	ECR62
CR3	Diode		Fairchild FD300	ECR113
J1	Receptacle Mating Connector (right angle)		Cannon WK-5-32S Cannon WK-5-23C	EJ251 EP299
M1	Meter			12696
R1	Resistor	10.0 k Ω , $\pm 1\%$, 1/2 W, Carbon	Dale DCS-1/2	ER160
R2	Resistor	20 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER671
R3	Resistor	15 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER168
R4	Resistor	15 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER168
R5	Resistor	5.1 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER763
R6	Resistor	10.2 k Ω , $\pm 1\%$, 1/2 W, Carbon Depos.	Dalohm DCS-1/2	ER999
R7	Resistor	15 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER168
R8	Resistor	100 Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER171
R9	Resistor	10 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER182
R10	Resistor	10 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER182
R11	Resistor	10 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER182
R12	Resistor	10 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER182

ELECTRICAL PARTS LIST (continued)

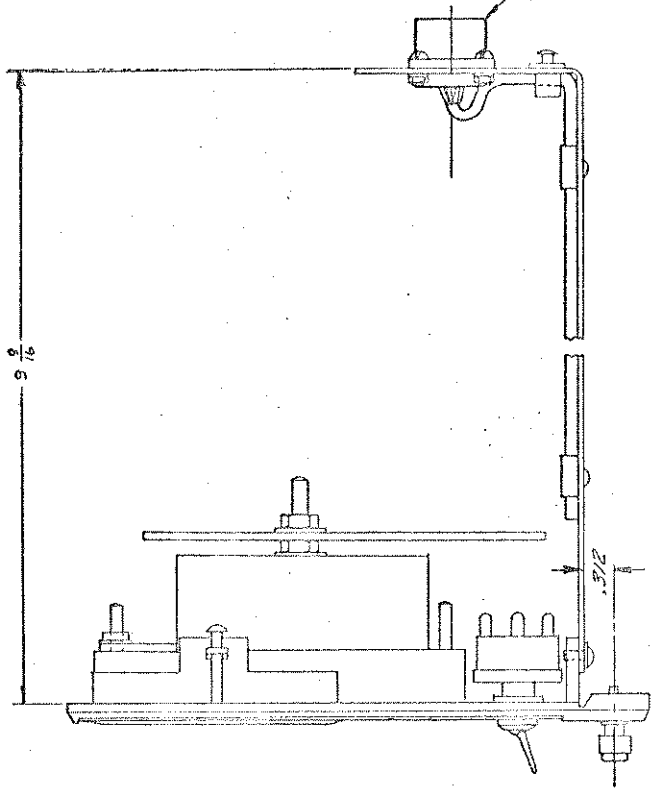
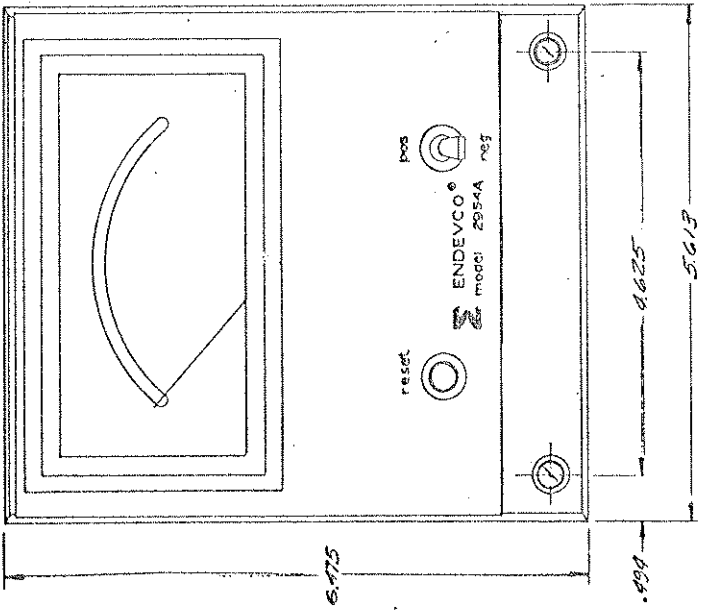
<u>Des. No.</u>	<u>Part</u>	<u>Value and Description</u>	<u>Manufacturer and Part No.</u>	<u>Endevco Part No.</u>
R13	Resistor	6.2 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER932
R14	Resistor	7.5 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER719
R15	Resistor	5.1 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER763
R16	Resistor	6.2 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER932
R17	Resistor	27 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER820
R18	Resistor	3 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER158
R19	Resistor	100 Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER171
R20	Resistor	10 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER182
R21	Resistor	100 Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER171
R22	Resistor	390 Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER184
R23	Resistor	47 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER125
R24	Resistor	1.5 k Ω , $\pm 1\%$, 1/4 W, WW	Riedon SM-7	ER1676
R25	Resistor	3 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER158
R26	Resistor	3 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER158
R27	Potentiometer	1 k Ω , $\pm 10\%$, 3/4 W, Met. Film	Beckman 77P	ER1794
R28	Resistor	560 k Ω , $\pm 10\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER280
R29	Resistor	200 Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER165
R30	Resistor	10 Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER945
R31	Resistor	2.7 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER197
R32	Resistor	100 Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER171
R33	Resistor	6.2 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER932
R34	Resistor	3 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER158
R35	Resistor	7.5 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER719
R36	Resistor	30 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER672
R37	Potentiometer	10 k Ω , $\pm 10\%$, 3/4 W, Met. Film	Beckman 77P	ER1723
R38	Resistor	43 k Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER1002
R39	Resistor	20 Ω , $\pm 5\%$, 1/2 W, Comp.	Allen Bradley Type EB	ER1003

ELECTRICAL PARTS LIST (continued)

<u>Des. No.</u>	<u>Part</u>	<u>Value and Description</u>	<u>Manufacturer and Part No.</u>	<u>Endevco Part No.</u>
Q1	Transistor	2N3904	Motorola	EQ130
Q2	Transistor	2N3904	Motorola	EQ130
Q3	Transistor	2N388A	Texas Instruments	EQ81
Q4	Transistor	Matched Pair		16051
Q5	Transistor			
Q6	Transistor	2N388A	Texas Instruments	EQ81
Q7	Transistor	2N388A	Texas Instruments	EQ81
Q8	Transistor	2N388A	Texas Instruments	EQ81
Q9	Transistor	2N404A	Texas Instruments	EQ82
Q10	Transistor	2N3904	Motorola	EQ130
Q11	Transistor	2N3904	Motorola	EQ130
Q12	Transistor	2N404A	Texas Instruments	EQ82
Q13	Transistor	2N1381	Texas Instruments	EQ29
S1	Switch		Arrowhart 83054C	ES56
S2	Switch		Micro Switch 1PB13	ES68
V1	Tube		CK5886	EV20

LIST OF MATERIAL		
PART NO	DESCRIPTION	QTY
2954A	PEAK HOLDING METER ASSY.	1
15438	CABLE, INTERCONNECT	1

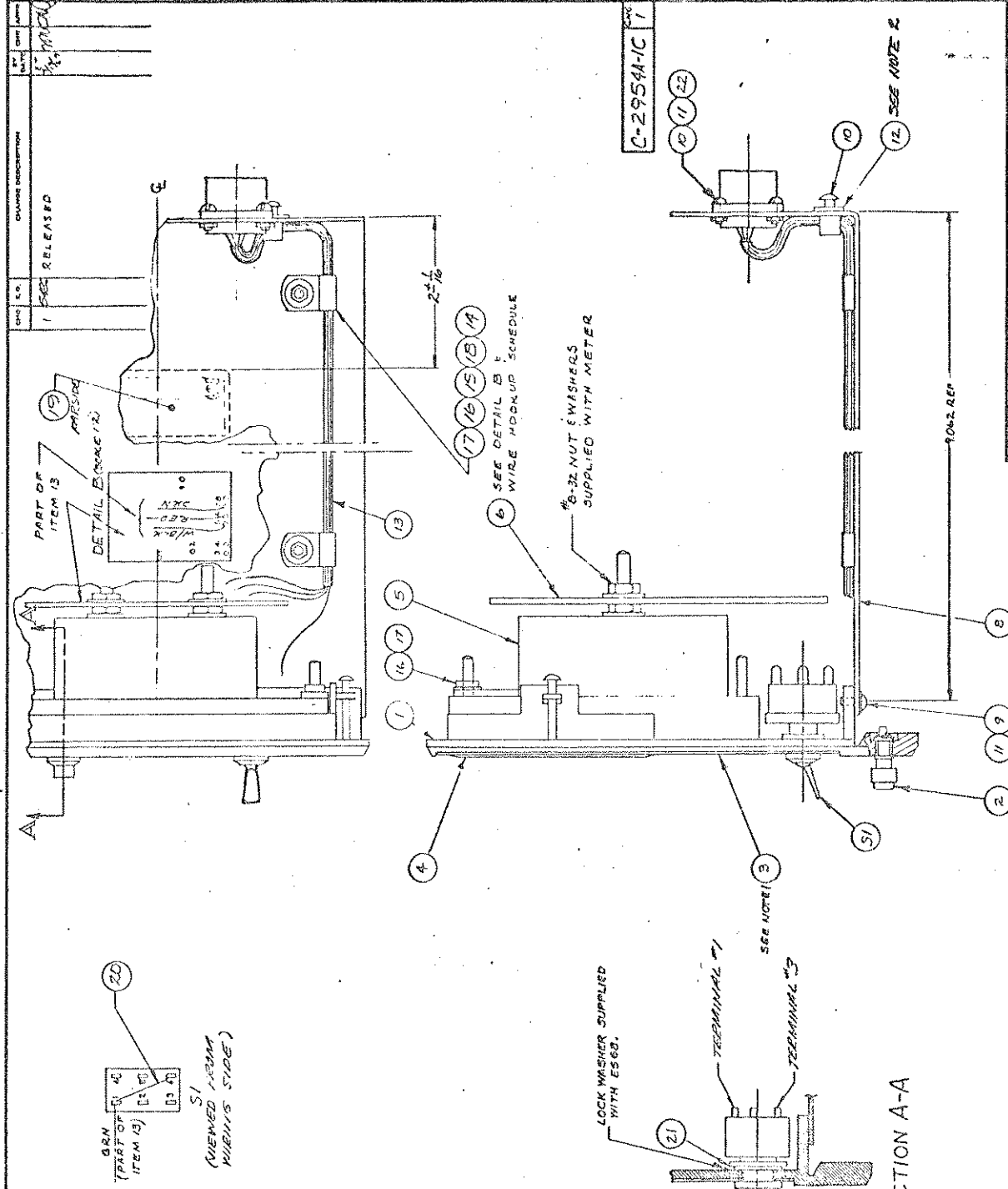
DATE	REV	BY	CHK	APP
1				
CHANGE DESCRIPTION				
1 ADD RELEASED				



ENDEVCO CORPORATION NATIONAL DIVISION		FIG. CODE 5011
SPECIFICATIONS UNLESS OTHERWISE NOTED		
LISTED OF SIZE 1. FACE TO FACE INCLUDING FACE 2. SURFACE DIMENSION BY MICROCHORD AND M.A.E. 3. DIMENSIONS TO BE CONSIDERED WITHIN .0001 IN.	FINISH	
TOLERANCES FRACTIONAL 1/16 DECIMAL 2-DIGIT SCALE	DIMENSIONS UNLESS OTHERWISE NOTED DATE: 8/27/71 DRAWN BY: [Signature]	
PART NAME: PEAK HOLDING METER ASSEMBLY PRODUCT:	PART NO.: C 2954A-C 1	

NOTES:
 1. THIS DRAWING IS SUBJECT TO FUTURE CHANGE WITHOUT NOTICE.

ITEM PART NO	DESCRIPTION	QTY
1	FACE PLATE	1
2	FASTENER, TURN-LOC	2
3	METAL CAL	1
4	BASE	1
5	METER	1
6	CIRCUIT BOARD ASSY	1
7	SWITCH TOGGLE	1
8	SWITCH	1
9	NUT, FINISH	1
10	BASE	1
11	SCREW 4-40 X 1/4	2
12	SCREW 4-40 X 1/8	6
13	LOCK WASHER #4	6
14	WASHER, RANT, FIBER	2
15	CABLE, FIBER OPTIC	1
16	SCREW 4-32 X 1/8	2
17	LOCK WASHER #6	2
18	WASHER, FLAT #2	4
19	NUT, KEY 1/32	4
20	CLAMP, CABLE	2
21	SOLE-SERIAL FLATE	1
22	WIRE, BUS ANG #2	1/2
23	WASHER, FLAT - ORG TRK	1
24	NUT, HEX #-60	4
25	ADHESIVE, EASTMAN 910 #B	1/2



ENDVCO CORPORATION		FIG. C-29544-1C	
1. REVISIONS		SPECIFICATIONS UNLESS OTHERWISE NOTED	
REV.	DATE	BY	CHKD.
1	1/17/67		
LIST OF SIZE		MATERIAL	
1	ANGULAR	1	ALUMINUM
2	FRONTAL	2	ALUMINUM
3	INTERNAL	3	ALUMINUM
4	MATERIAL	4	ALUMINUM
SCALE: 1/2"		DRAWN BY: GPT/1/17/67	
PART NAME: PEAR HOLDING METER		DATE: 1/17/67	
PRODUCT: MAIN ASSEMBLY		C-29544-1C	
IMPORTANT: INTERFERENCES ENCLOSURE BY THE INVENTOR'S AUTHORITY FORWARDED TO THE			

NOTES:

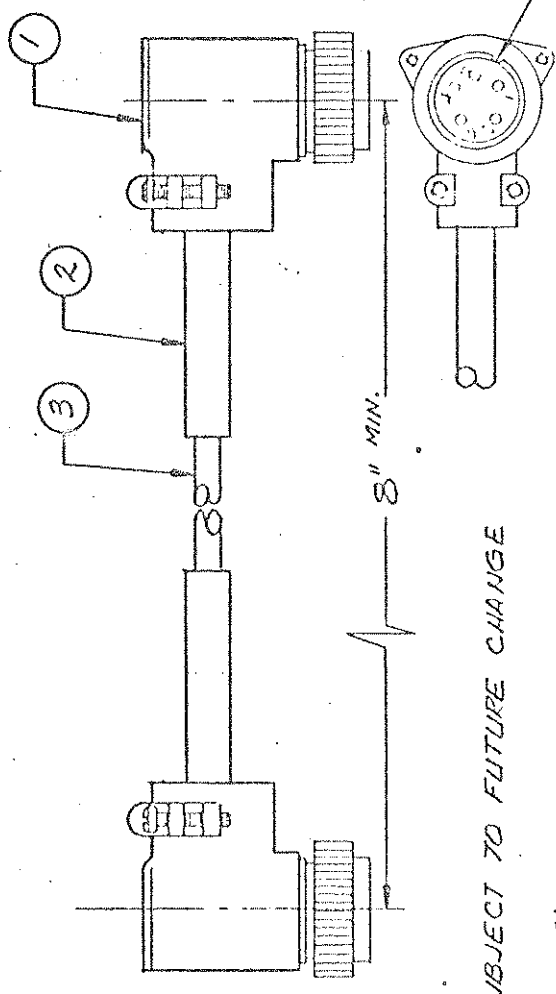
- ITEM 5 TO BE FIRED TO ITEM 1, USING ITEM 1 AS TEMPLATE
- CUT METER OPENING IN ITEM 3.
- CEMENT ITEM 12 TO ITEM 8 USING ADHESIVE ITEM 25
- MODEL SERIAL PLATE (ITEM 19) TO BE AD: 'PEAR HOLDING METER NSY' MODEL: '29544' SERIAL NUMBER TO BE SUPPLIED BY PRODUCTION.
- THIS DRAWING IS SUBJECT TO FUTURE CHANGE WITHOUT NOTICE.

ITEM	COLOR	FROM	TO
6	WHT/GRN	ITEM 6-1	51-2
7	WHT/BLU	ITEM 6-2	51-3
8	BLU	ITEM 6-3	51-5
9	WHITE	ITEM 6-4	51-4
10	WHT/GRN	ITEM 6-5	51-3
11	WHT/RED	ITEM 6-6	52-1
20	GRN	51-1	51-6

CHG	R.O.	CHANGE DESCRIPTION	CHK APPR
2	RM	REVISED & REDRAWN	RM
14	RL	DELETE VIEW A-A, ADDED TABLE A KEYWAY	RL

LIST OF MATERIALS		
ITEM	DESCRIPTION	QTY
1	PLUG # WK-5-23C - 3/8	2
2	BUSHING, TELESCOPING	2
3	CABLE, 4 COND #22 AWG	3/2

B-15438-C-2A



PIN	WIRE COLOR
1	RED
2	WHT
3	GRN
4	BLK
5	BLANK

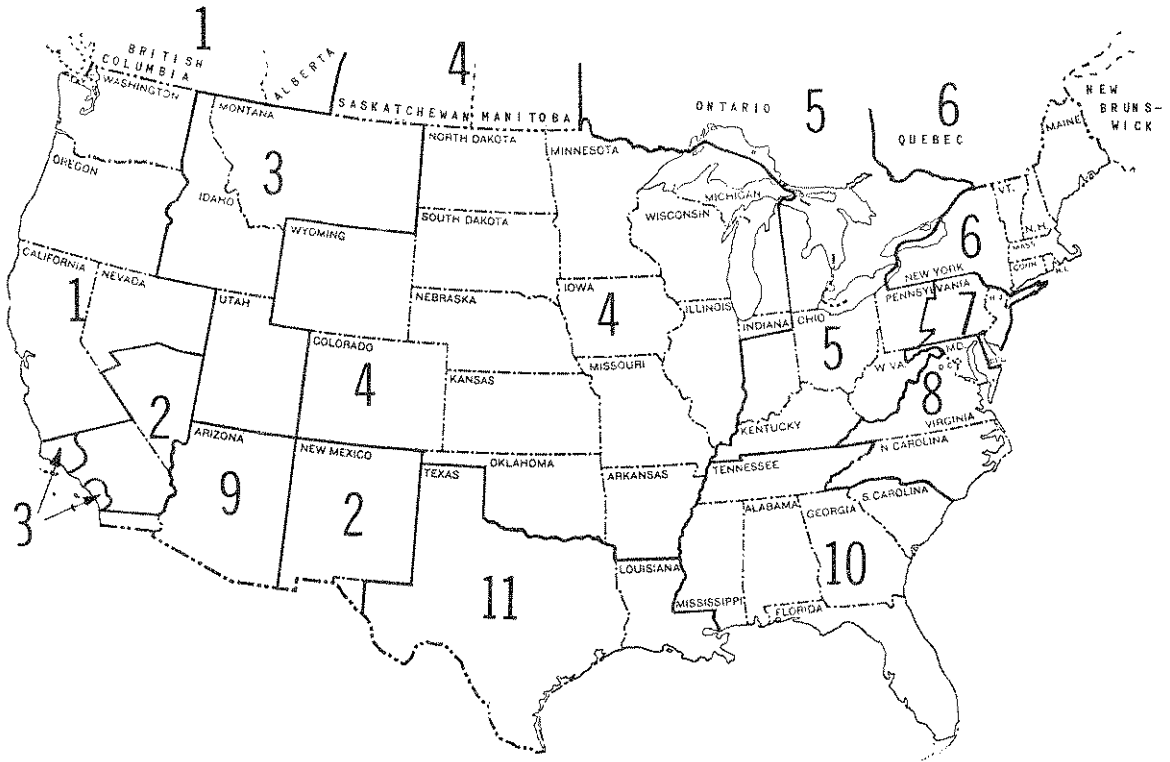
- NOTES:
1. THIS DRAWING SUBJECT TO FUTURE CHANGE WITHOUT NOTICE.
 2. STRIP OUTER JACKET $\frac{5}{16}$ LONG BOTH ENDS.
 3. STRIP WIRE ENDS $\frac{1}{4}$ " & TIN.

ORIENT KEYWAY AS SHOWN (TYP)

ENDEVCO Pasadena, California Division of Decca, Dickinson and Company		FSC 4811 DO NOT SCALE DRAWING
SPECIFICATIONS UNLESS OTHERWISE NOTED 1. BREAK ALL SHARP EDGES 0.05 MAX. 2. SURFACE ROUGHNESS 63 MICR INCH RMS MAX. 3. DIAMETERS TO BE CONCENTRIC WITHIN 0.001 I.R. 4. HOLE TOLERANCE PER ANSI Q97 5. ALL DIMENSIONS IN INCHES 6. FILLET RADIUS 0.10 MAX		
LIMITS OF DIMS. ANGULAR ± — FRACTIONAL ± — DECIMAL ± —		SCALE: 1/1 DRAWN BY: GEF/4/5/63 CHECKED BY: M/1
MATERIAL: LISTED		PROJ. ENG. AL
FINISH:		SIZE: B
PART NAME: CABLE INTERCONNECT		Dwg No. 15438C
PRODUCT: 2718A 2-2354A		CHG: RA



ENDEVCO FIELD ENGINEERING OFFICES



PACIFIC SALES REGION

- 2 BOB CLARK, Regional Sales Manager
ENDEVCO (Main Plant)*
- 1 WARREN ZUCKERT, District Sales Manager
ENDEVCO
1121 San Antonio Road
Palo Alto, California 94303
(415) 969-3212
- 3 FRANK BENEDICT, District Sales Manager
ENDEVCO (Main Plant)*
- 9 AL GREEN, District Sales Manager
ENDEVCO (Main Plant)*

MID-AMERICA SALES REGION

- 4 BOB KARLSON, Regional Sales Manager
ENDEVCO
I-C Crystal Lake Plaza, Post Office Box 444
Crystal Lake, Illinois 60014
(815) 459-7226
- 10 DICK ARONE, District Sales Manager
ENDEVCO
965 Virginia Avenue
Atlanta, Georgia 30354
(404) 761-4996
- 11 CAL TRAYLOR, District Sales Manager
ENDEVCO
5625 FM 1960 West, Suite 513
Houston, Texas 77069
(713) 440-3850

ATLANTIC SALES REGION

- 5 HAL GILMORE, District Sales Manager
ENDEVCO
1448 Graham Road
Silver Lake, Ohio 44224
(216) 929-3811
- 6 CARL NICOLINO, District Sales Manager
ENDEVCO
Post Office Box J
Bedford, Massachusetts 01730
(617) 969-8063
- 7 LEN LEOPOLD, District Sales Manager
ENDEVCO
6 South Haddon Avenue, Post Office Box 361
Haddonfield, New Jersey 08033
(609) 428-5285
- 8 TOM MACALUSO, District Sales Manager
ENDEVCO
320 Hillen Road
Towson, Maryland 21204
(301) 752-0688

*MAIN PLANT AND OFFICES

BRUCE TOFFELMIER
General Sales Manager
ENDEVCO
Rancho Viejo Road
San Juan Capistrano, California 92675
(714) 493-8181