



Technical Support Package

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Monitor for Electrical-Discharge Machining

NASA Tech Briefs
MFS-29853

TECHNOLOGY UTILIZATION OFFICE

Technical Support Package

For

MONITOR FOR ELECTRICAL-DISCHARGE MACHINING

MFS-29853

NASA Tech Briefs

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MONITOR FOR ELECTRICAL-DISCHARGE MACHINING

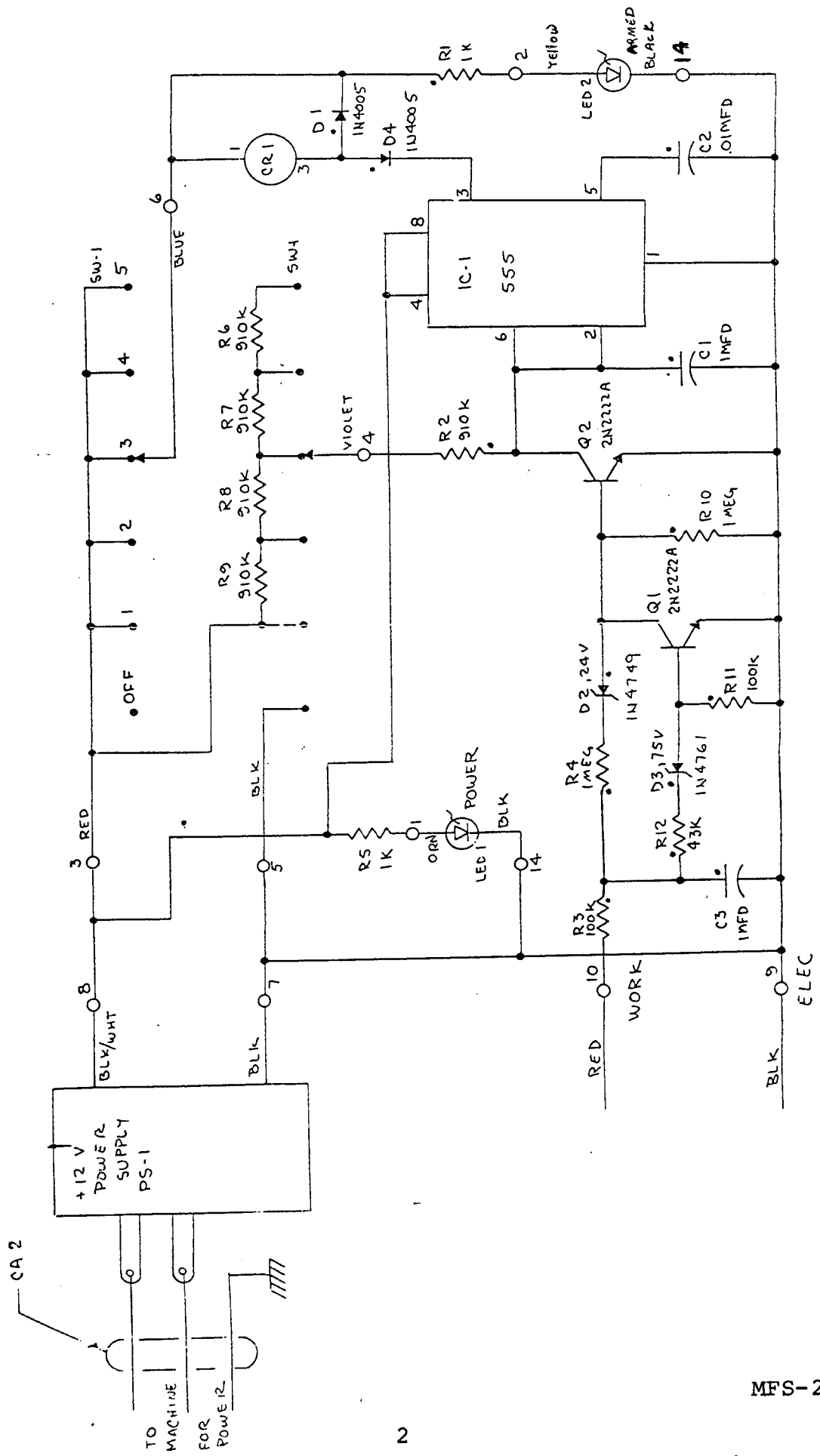
DESCRIPTION

The objective of this electrical-discharge-machining (EDM) process monitor is to eliminate repetitive rejections because of arcing burn marks inside injector parts. These drills/reamers are approximately 18 inches deep inside a tube with an approximate 1/4-inch inside diameter. Therefore, the machine operator does not have visual access to the arcing other than to observe instruments that show amperage, voltage, or depth. But, since the operator runs several machines simultaneously, the arcing occurs while the operator is busy with the other machines. Thus, an arc damage is done before the operator notices the condition.

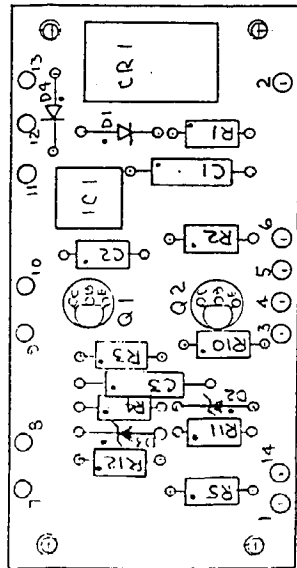
The controller of the new SK-57 EDM process monitor (see figure) is equipped with arc-control circuitry. The controller is mounted onto a special EDM power-control system, which is, in turn, mounted onto a radial-arm-drilling machine. This EDM machine is used to EDM out broken drills and reamers.

NOVEL FEATURES

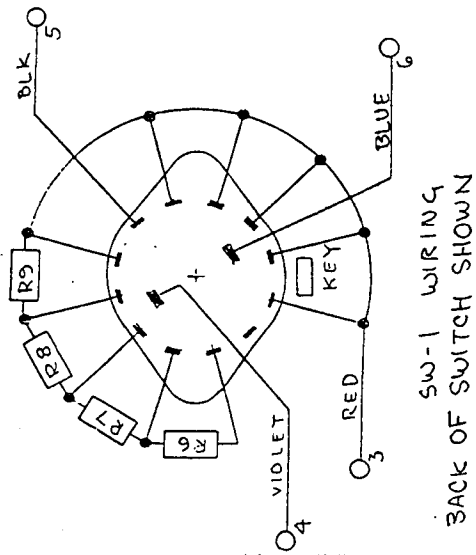
The electrical-discharge-machining (EDM) process monitor has the capability to automatically shut off the power supply when abnormal EDM arcing conditions occur, without the need for constant attention by the machine operator.



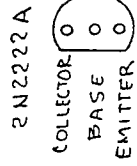
EDM Process Monitor (Sheet 1 of 5)



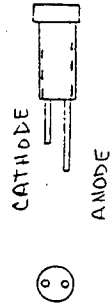
3



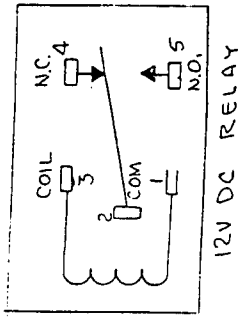
SW-1 WIRING
BACK OF SWITCH SHOWN



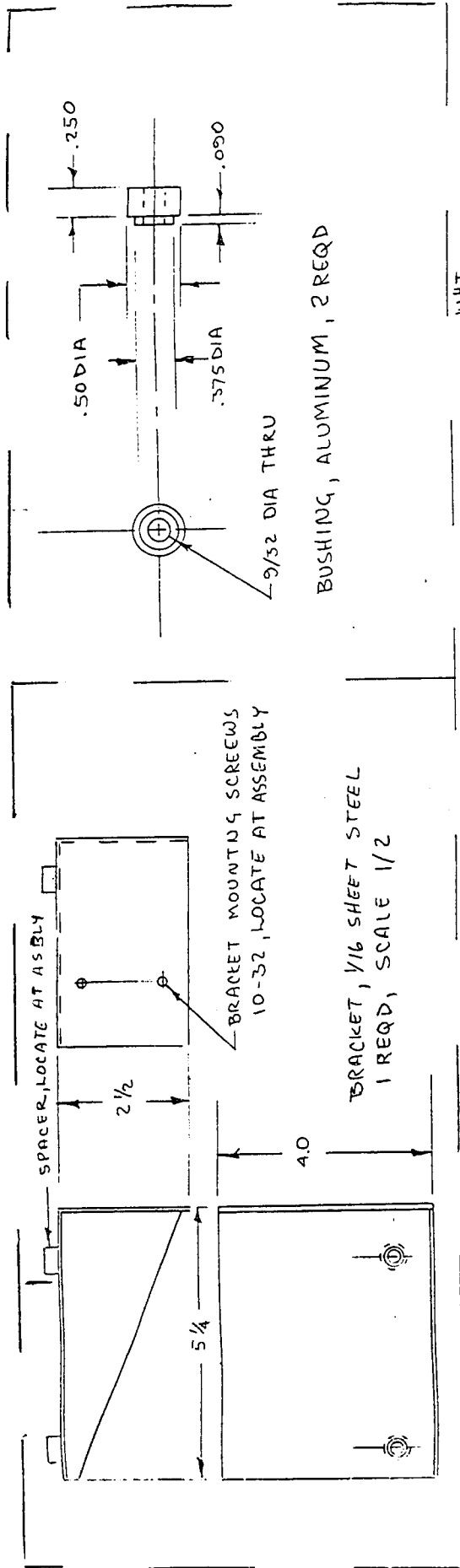
2N2222A



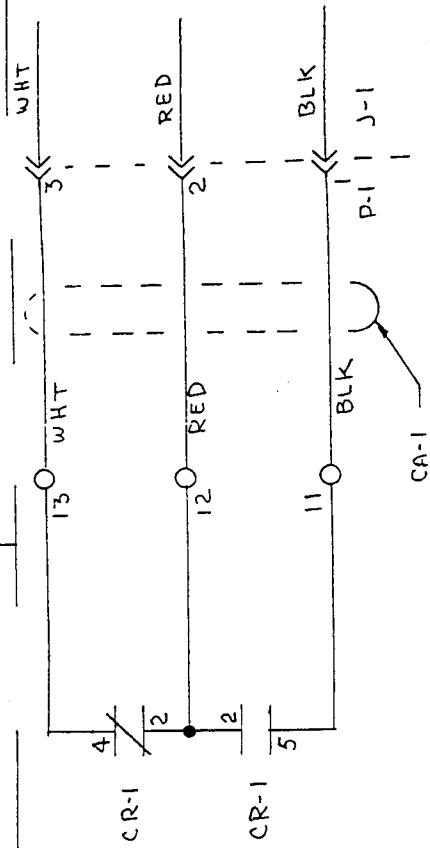
LED INDICATOR



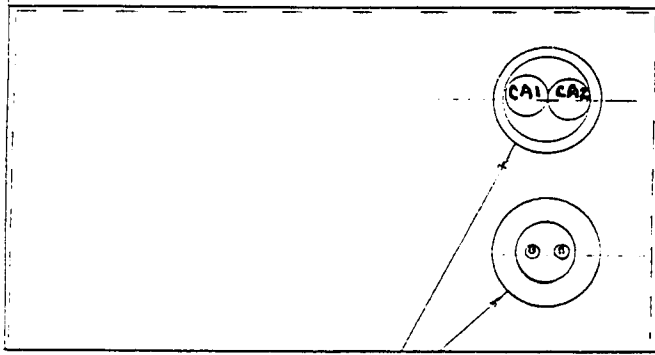
12V DC RELAY



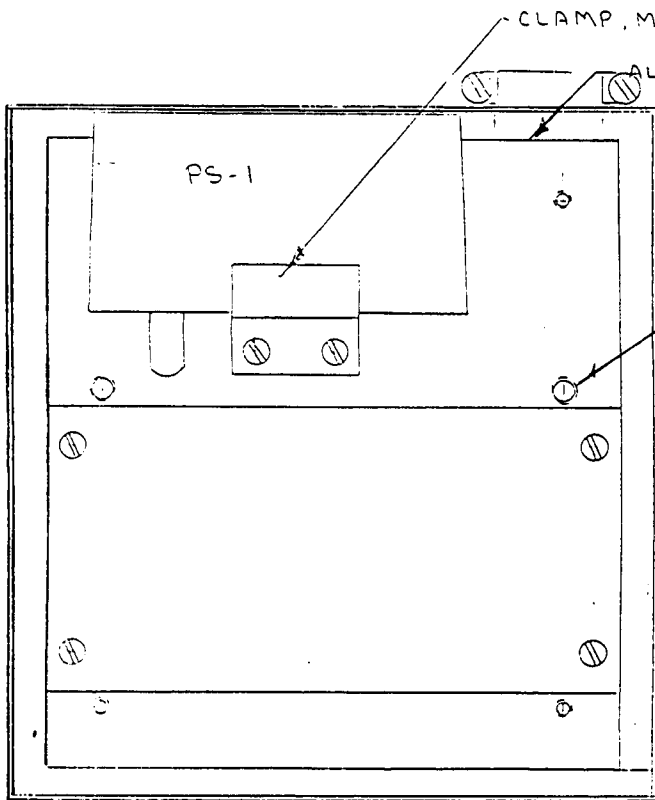
BUSHING, ALUMINUM, 2 REQD



EDM Process Monitor (Sheet 3 of 5)



CORD GRIP

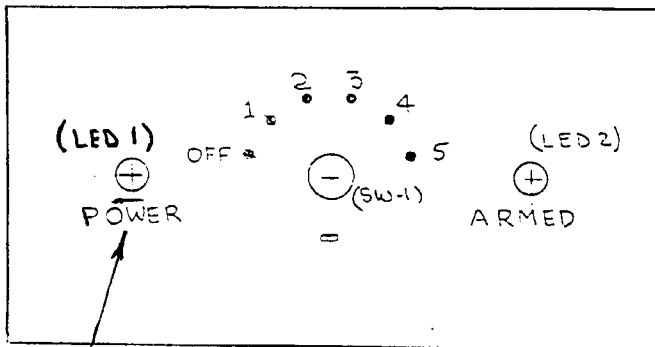


CLAMP, MAKE FROM .035 THK STEEL

ALUMINUM PLATE, 3/16 THK
FASTEN WITH 4EA 4-40
FLAT-HEAD SCREWS USING
EXISTING HOLES

THREAD THRU 10-32 FOR BOX
MOUNTING SCREWS. LOCATE
AT ASSEMBLY

KNOB



LABEL BOX FRONT AS SHOWN
USING RUB ON TRANSFER SEAL
AFTER APPLICATION.
DONT DUPLICATE CHARACTERS IN ()

MFS-29853

PARTS LIST

ID	NO. REQD	DESCRIPTION
R1, R5	2	RESISTOR, 1/2W, 5%, 1000 Ω
R2, R6- R9	5	RESISTOR, 1/2W, 5%, 910K Ω
R4, R10	2	RESISTOR, 1/2W, 5%, 1 MEG Ω , RS# 271-059
R3, R11	2	RESISTOR, 1/2W, 5%, 100K Ω , RS# 271-045
D1, D4	2	DIODE, SILICON, 1A, 600V, CAT. NO. 276-1104
D2	1	DIODE, ZENER, 24V 1N4749
D3	1	DIODE, ZENER, 75V 1N4761
C1, C2	2	CAPACITOR, 1 MFD, CAT. NO. 272-1055
C3	1	CAPACITOR, .001 MFD, CAT. NO. 272-105
IC-1	1	555 TIMER, CAT. NO. 276-1723
Q1, Q2	2	TRANSISTOR, 2N2222A, CAT. NO. 276-2009
LED 1, LED 2	2	RED SUBMINIATURE LED INDICATOR LAMP 2/PKG RADIO SHACK CAT. NO. 276-068A
CR-1	1	12VDC, PC RELAY, SPDT CONTACTS RATED 5 AMPS AT 120VAC RADIO SHACK CAT. NO. 275-219
SW-1	1	ROTARY SWITCH, 2 POLE 6 POSITIONS CAT. NO. 275-1386
	1	METAL CABINET, 3 x 5 1/2 x 5 7/8 CAT. NO. 270-253
KNOB	1	KNOB, JUMBO, 4/PKG, 274-416
PS-1	1	12VDC ADAPTER, 500 MA CAT. NO. 273-1653
	1	PREDRILLED BOARD, CAT. NO. 276-147
P-1	1	PLUG, 3 COND, CANNON NO. XLR-3-11C
J-1	1	RECEPTACLE, 3 COND, CANNON NO. XLR-3-32
CA-1 + CA2	5 FT 6 FT	RUBBER CABLE, 20AWG, 4/COND, NO. 1734 CONSOLIDATED WIRE AND ASSOCIATED CORR.
	20 FT	MACHINE TOOL WIRE, 18AWG, RED
	20 FT	MACHINE TOOL WIRE, 18AWG BLACK
	2	CORD GRIP, THOMAS & BETTS NO. 3301
R12	1	RESISTOR, 1/2W, 5%, 43,000

NOTE: SCALE PRINT EXCEPT AS NOTED

NOTE: ALL CAT. NO. FROM RADIO SHACK CATALOG
EXCEPT AS NOTED