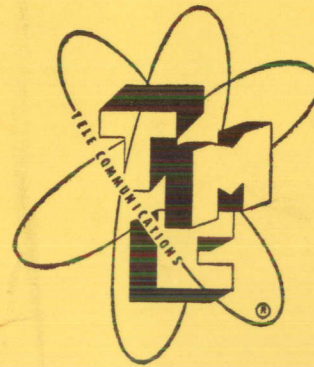


IN - 10011

3359

INSTRUCTION BOOK
for
**SIGNAL
CONTROL UNIT**
MODEL SCU

ROYAL CANADIAN AIR FORCE
RELAY - SWITCH
RE - 5023/G



THE TECHNICAL MATERIEL CORPORATION
Mamaroneck, N.Y. Ottawa, Ontario

ADDENDUM FOR SCU-HANDBOOK

(IN-10011)

It should be noted that RI05 and CR101 combined with the contact tension setting of RY102 is designed to prevent RY102 "following" the applied signal.

Should RY102 follow the signal the contact spring setting should be adjusted to prevent this condition which causes noise and contact wear.

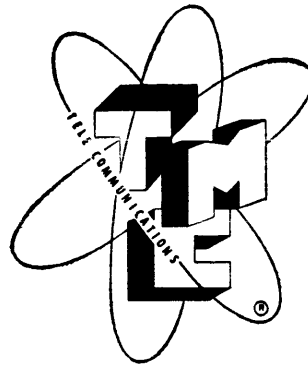
CAUTION:

All settings should be checked with "Mark" line current of 60 M/a correctly polarized

NOTE 2 Figure 7-1

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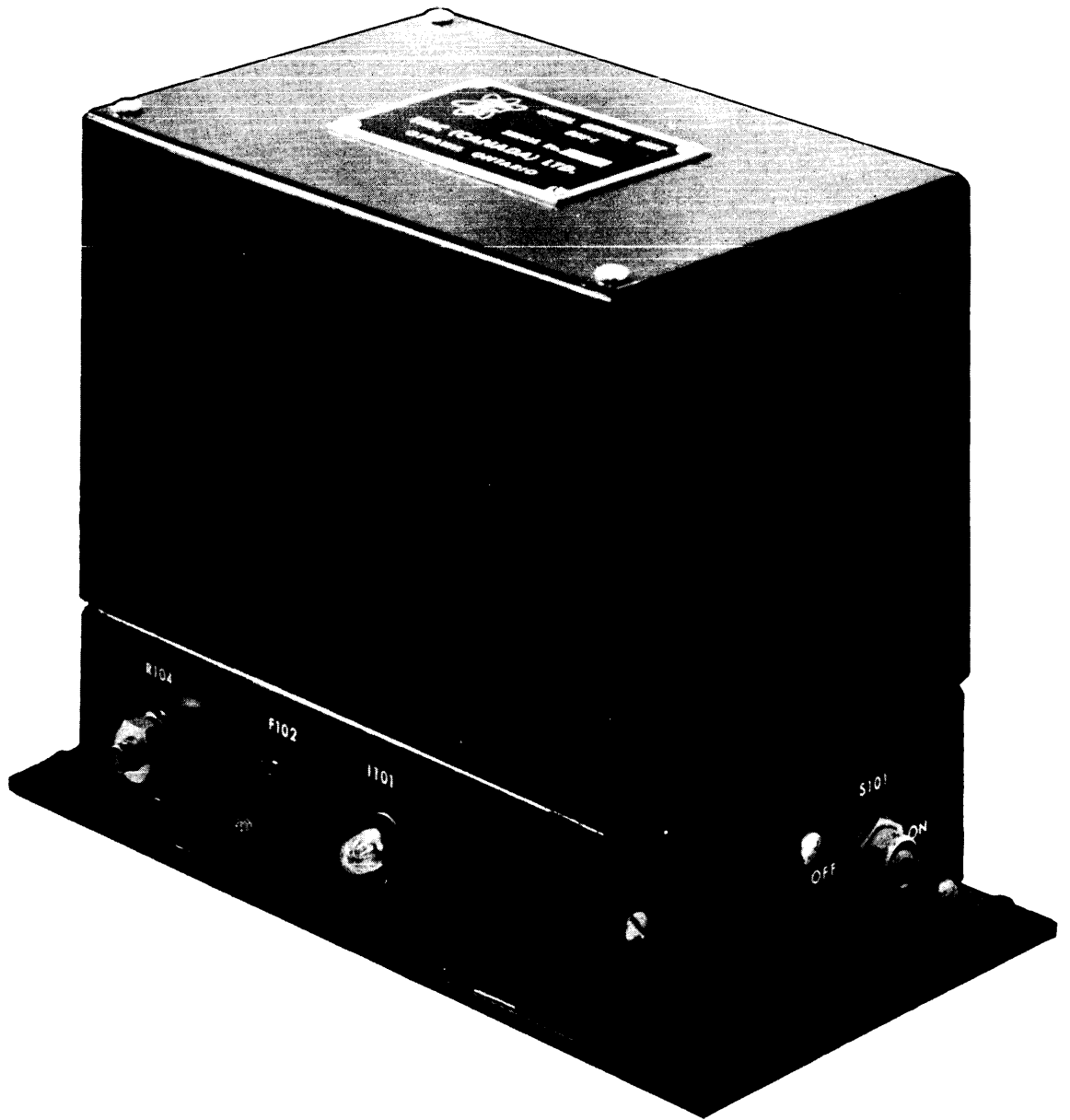


Figure 1-1 Signal Control Unit, Model SCU-2 (RE-5023/G)

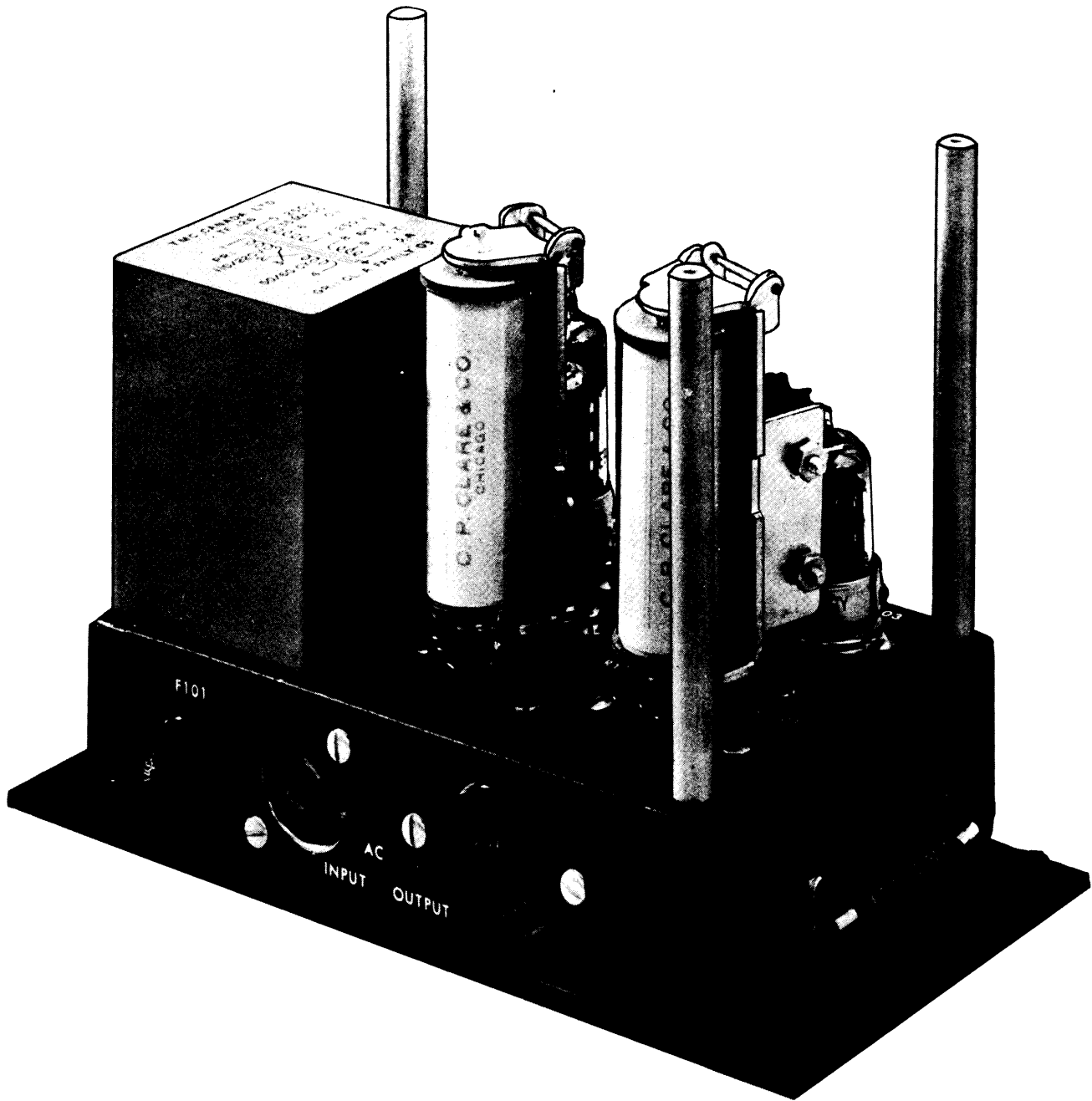


Figure 1-2 Model SCU-2 (RE-5023/G), cover off

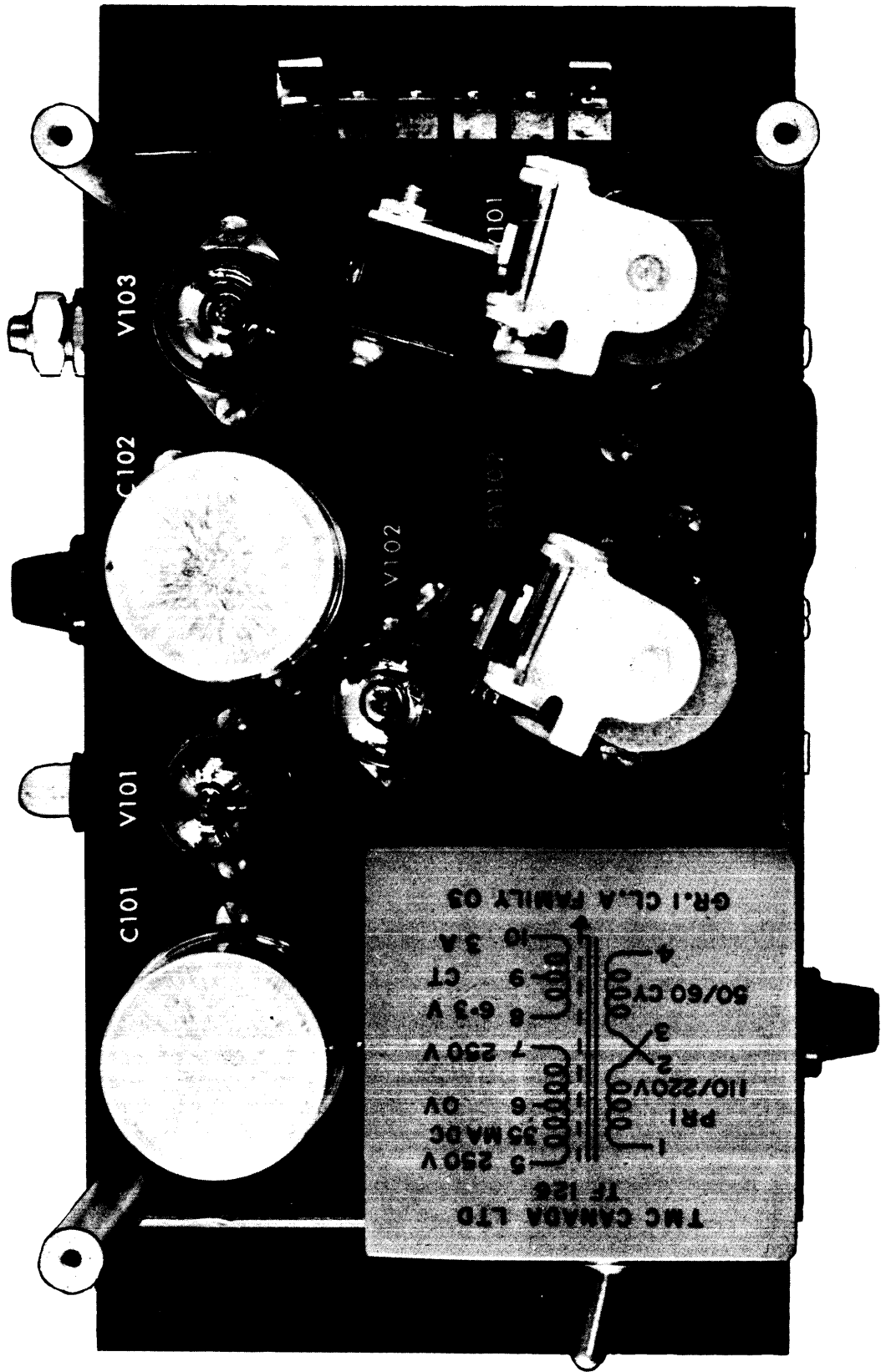


Figure 1-3 Top View, Model SCU-2 (RE-5023/G)

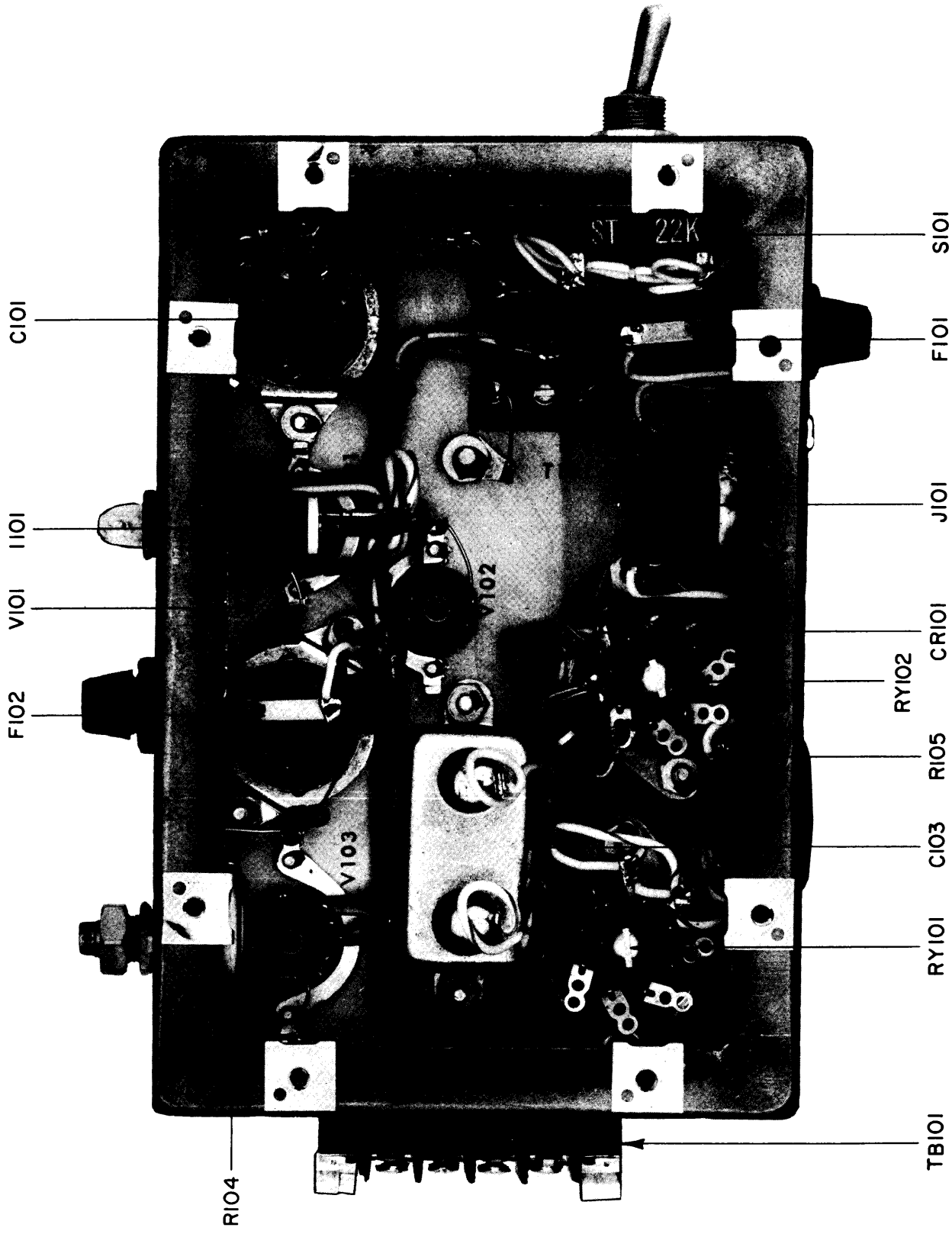


Figure 1-4 Bottom View, Model SCU-2 (RE-5023/G)

SECTION I

GENERAL DESCRIPTION

1. GENERAL DESCRIPTION

The TMC Signal Control Unit, Model SCU is an electronic device designed for insertion in a line carrying signal intelligence. It controls the starting and stopping of electrically driven mechanical devices used to record information from a line or radio circuit, such as a teletype machine or morse ink tape recorder.

The unit is electronic with the exception of two plug-in relays. The plug-in feature of these relays facilitates the changing of the relays to accommodate different values of signal current or different power ratings of the controlled machine. An important feature of the Signal Controlled Unit is that it will always fail "Safe". The failure of any tube, fuse or other component will automatically release the "Power" relay, which will switch "ON" the Controlled Machine and leave it running until manually switched "OFF" or the defect in the Signal Control Unit is rectified. The circuit is so arranged that the opening of the signal line will also switch the Controlled Machine "ON".

2. REFERENCE DATA

(A) INPUT POWER REQUIREMENTS:

115/230 volts, 50/60 cycles, single phase

(B) CONTROLLED POWER RATING:

Normally 115 volts, 3 amp, AC

(C) SIGNAL LINE CURRENT:

60 ma DC (can also be supplied for 20 ma DC).

(D) KEYING SPEED:

Up to 75 words per minute.

(E) CONTROLS:

- (1) "ON-OFF" switch (the switching off of the Signal Control Unit automatically starts the Controlled Machine).
- (2) Time Delay Control (adjustable from approximately 10 seconds to approximately 5 minutes).

(F) WEIGHT:

7-3/4 pounds

(G) SIZE:

Unit: 7 inches long, 4-5/8 inches wide

Base: 9 inches long, 4-5/8 inches wide

Total height with base - 6-5/8 inches

(H) TUBE COMPLEMENT:

One 6X4 (V101)

One OA2 (V102)

One 12AU7 (V103)

SECTION II

THEORY OF OPERATION

1. GENERAL

When connected in series with the DC line carrying signal intelligence to the recording machine, the unit will hold the recording machine in an "OFF" position so long as no signal intelligence is being received. The first signal pulse received will switch "ON" the machine instantaneously,

the only delay being that inherent in the recording machine itself. During the transmission of signal intelligence, the Signal Control Unit will maintain the machine in an "ON" position, but at the completion of the transmission when the circuit has been restored to "Standby" condition, the Signal Control Unit will allow the recording machine to switch "OFF" automatically after a predetermined delay. This delay is adjustable by means of a potentiometer.

SECTION III

INSTALLATION

1. GENERAL

When the equipment is received, it should be checked for any damage that may have occurred during shipment or storage.

NOTICE

Unless otherwise indicated by an appropriate tag on the equipment, the unit has been wired for 115 volt operation and for a signal line current of 60 ma DC. A power cord, Part No. CA-103 is provided apart from the unit and is to be used for connection to a standard AC outlet.

2. INSTALLATION

(a) Connect the unit to an AC source by means of the power cord CA-103. The

female plug on the cord connects to the input of the unit which consists of a twist lock jack (J101) marked "Input".

- (b) Insert the plug of the AC power cord of the recording machine into the socket J102 on the Signal Control Unit marked "Output".
- (c) Connect the terminal block TB101 in the DC signal line*.
- (d) Switch on toggle switch S101.

* CAUTION

Terminal #4 of terminal block TB101 must be positive with respect to terminal #1.

SECTION IV

OPERATION

1. OPERATION

The normal condition for operation of the SCU is considered to be at the part of the sequence of operation when no signals are being passed; a 60 ma DC line (holding) current is present and the recording machine is switched off. In this condition, relay RY102 is energized and contacts 1 and 2 are broken thus removing the negative bias from the grid of the relay amplifier tube V103. The plate current increases and relay RY101 will be energized; its microswitch contact will be opened and the AC supply to the recording unit broken.

When an interrupted 60 ma DC signal is received, RY102 releases on the first

pulse and contacts 1 and 2 close. The negative bias is applied to the grid of V103 which causes the plate current to decrease and RY101 releases closing the microswitch contacts 1 and 2 applying AC to the recording unit. During the train of interrupted pulses on the signal line the negative bias on V103 is maintained by the charge on C102

When the line signal ceases uninterrupted (holding current comes on (normal condition), and RY102 will open. The recording unit will remain operative until condenser C102 discharges through R103/104. This CR time constant can be varied by manipulation of R104.

SECTION V

MAINTENANCE

WARNING

Never replace a fuse with one of higher rating. If a fuse burns out immediately after replacement DO NOT replace it a second time until the cause of the failure has been located and corrected.

C101 and C102 are dual plug in capacitors. If one side of either of these capacitors becomes defective the other side may be plugged in the circuit.

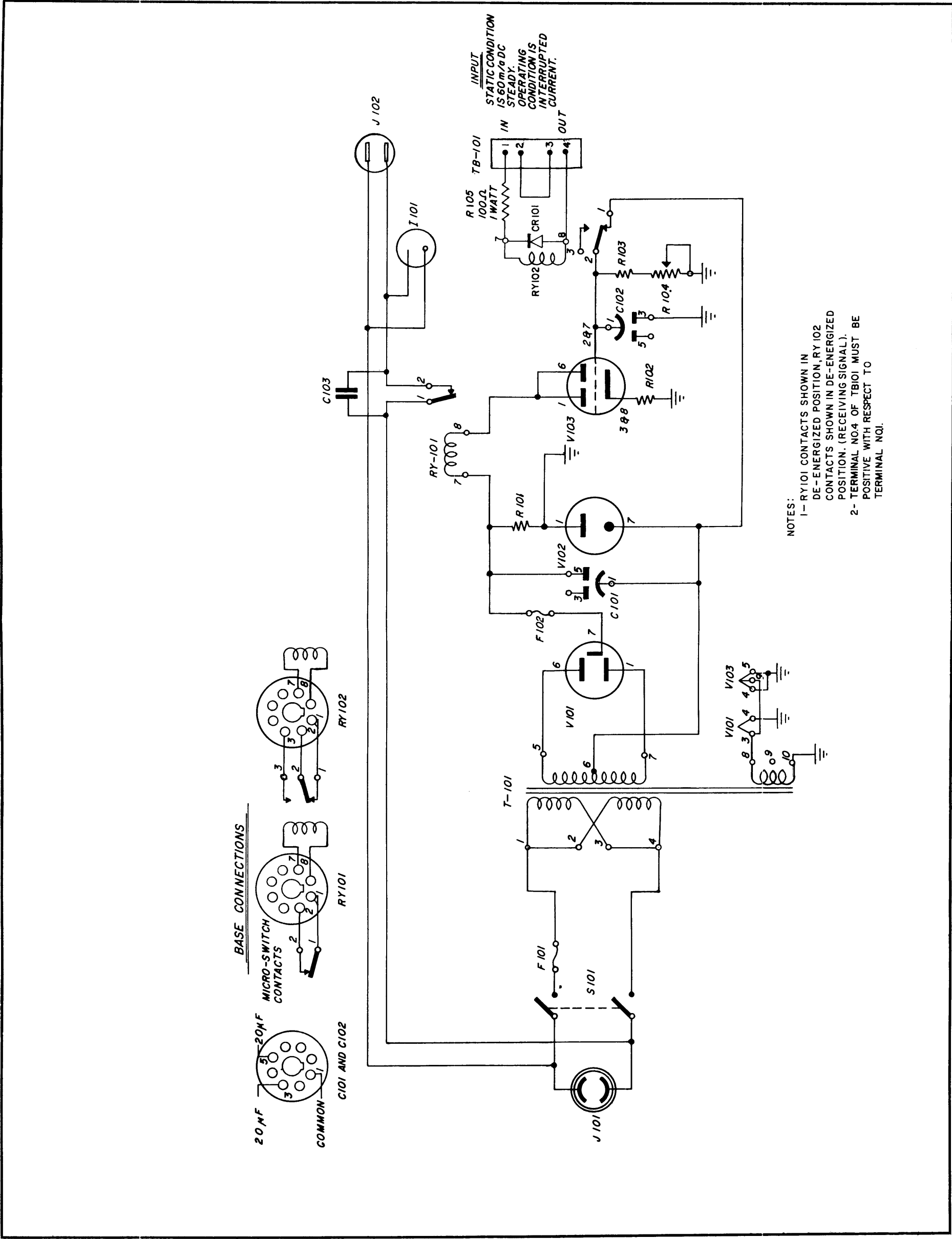
The relay contacts should be cleaned periodically with an approved type of contact cleaner while normal precautions should be taken against accumulation of dust and other foreign matter particularly in or near the relay mechanisms.

SECTION VI PARTS LIST

Ref. Symbol	Quan.	Description	Function	TMC Part No.	RCAF Replacement Ref. No.
C101	1	CAPACITOR: fixed, dry electrolytic, polarized 20 - 20 uf, 450 VDCW	Filter Condenser	CE52F200R	
C102	1	CAPACITOR: fixed, dry electrolytic, polarized 20 - 20 uf, 450 VDCW	Time Delay - Grid Capacitor	CE52F200R	
C103	1	CAPACITOR: fixed, bathtub case, 0.1 uf, 600 VDCW, ±10%	Contact Bypass Capacitor	CP54BIEF104K	10EC/52185
CR101	1	DIODE: germanium, 1N478	Germanium Diode	1N478	
F101	1	FUSE: cartridge, 1/2 amp.	Input Power Fuse	FU-100-.500	5CB/328
F102	1	FUSE: cartridge, slow-blowing, 1/32 amp.	H. T. Fail Safe Fuse	FU-102-.032	5CB/880
I101	1	LIGHT: indicator, with non-replaceable neon lamp	Pilot Light	BI-10001	
J101	1	CONNECTOR: receptacle, male twist lock	Power Input	JJ-100	10EC/5935
J102	1	CONNECTOR: receptacle, 15 amp. at 110 volts, 10 amp. at 230 volts.	Power Output	JJ-122	
P101	1	CONNECTOR: plug p/o W101			
R101	1	RESISTOR: fixed, wirewound, 15,000 ohms, 10 watts	H. T. Load Resistor	RW-109-36	10EC/38501
R102	1	RESISTOR: fixed, composition, 470 ohms, ± 10%, 1/2 watt.	Cathode Resistor	RC20GF471K	10EC/32861
R103	1	RESISTOR: fixed, composition, 100,000 ohms, ± 10%, 1/2 watt.	Time Delay Resistor	RC20GF104K	10EC/32736
R104	1	RESISTOR: variable, composition, 5 megohms, 2 watts, no switch, locking slotted shaft, 5/8 inch shaft, linear taper, 10%	Time Delay Potentiometer	RV4ATXA505A	10EC/35324
R105	1	RESISTOR: fixed, composition, 100 ohms, ± 10%, 1 watt.	Line Limiting Resistor	RC30GF101K	10EC/42500

Ref. Symbol	Quan.	Description	Function	TMC Part No.	RCAF Replacement Ref. No.
RY101	1	RELAY: 1 form B microswitch contact, 2000 ohm coil, octal pin plug	Keying Relay	RL-10008	
RY102	1	RELAY: type C, 1 form C code 4 contact, 100 ohm coil, octal pin plug	Time Delay Relay	RL-10009	
S101	1	SWITCH: toggle, DPST, 1 amp, 250 volts	Power On/Off	ST-22K	10EC/32456
T101	1	TRANSFORMER: power; primary: 110/220 volts, 50/60 CPS, single phase; secondary # 1: 250-0-250 volts RMS, 35 ma DC; secondary # 2: 6.3 volts centre tapped at 3 amps; insulated for 1000 volts.	Power Transformer	TF-126	
TB101	1	BOARD: terminal, 4 6-32 x 1/4 inch binder head machine screws, black bakelite body, with 1/16" bakelite marker plate and 2 clips	Output Terminal Board	TM-0005	
V101	1	TUBE: electron, 7 pin miniature	Rectifier	6X4	10EC/30136
V102	1	TUBE: electron, 7 pin miniature	Voltage Regulator	OAZ	10EC/30134
V103	1	TUBE: electron, 9 pin miniature	Keying Tube	12AU7	10EC/24362
W101	1	CORD ASSEMBLY: power, 6 foot, rubber covered, 2-prong plug one end, female twist-lock receptacle other end	Power Cord	CA-103-72	10EC/42597
XC101	1	SOCKET: tube, octal	Socket C101	TS101PO1	10EC/28274
XC102	1	SOCKET: tube, octal	Socket C102	TS101PO1	10EC/28274
XF101	1	HOLDER: fuse	Holder F101	FH-10001-1	10EC/42598
XF102	1	HOLDER: fuse	Holder F102	FH-10001-1	10EC/42598
XRY101	1	SOCKET: octal, moulded - in - plate	Socket RY101	TS-121	
XRY102	1	SOCKET: octal, moulded - in - plate	Socket RY102	TS-121	

Ref. Symbol	Quan.	Description	Function	TMC Part No.	RCAF Replacement Ref. No.
XV101	1	SOCKET: tube, 7 pin miniature	Socket V101	TS102PO1	10EC/29469
XV102	1	SOCKET: tube, 7 pin miniature	Socket V102	TS102PO1	10EC/29469
XV103	1	SOCKET: tube, 9 pin miniature	Socket V103	TS103PO1	10EC/29468



NOTES:
1- RY101 CONTACTS SHOWN IN DE-ENERGIZED POSITION, RY102 CONTACTS SHOWN IN DE-ENERGIZED POSITION. (RECEIVING SIGNAL).
2- TERMINAL NO.4 OF TB101 MUST BE POSITIVE WITH RESPECT TO TERMINAL NO.1.

Figure 7-1 Schematic Diagram, Model SCU-2 (RE-5023/G)