

Instruction Book
for
Morse Relay Keying Unit
Model MRK-1

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Mamaroneck, New York

Table of Contents

Section I	Description
Section II	Theory of Operation
Section III	Installation
Section IV	Operation
Section V	Parts List

Section I

Description

The Morse Relay Keying Unit, Model MRK-1, is designed specifically for use with the TMC Autohead Drive, Model AHD. When properly connected and adjusted, it will key a tone oscillator or other circuit in accordance with the dots and dashes perforated in the tape at any speed up to approximately 200 words per minute.

Reference Data

- (a) Input: Three contact connector
- (b) Output: Relay contacts
- (c) Controls (top chassis):
 1. Speed Control
 2. Waveform Adjuster
- (d) Input Power Requirements: 110 volts, appr. 10 watts
- (e) Mounting: Spacings for AHD Cover
- (f) Weight: Appr. 3 lbs.

Vacuum Tube Complement

Table 1-1

Symbol	Type	Circuit
V1	117N7GT	Rectifier and Control Tube

Section II

Theory of Operation

The rectifier section of the 117N7GT serves to provide positive and negative voltages for the control section of the tube. When used in conjunction with an Autohead Drive, a negative voltage is supplied to one section of the keying fingers and a short circuit to the other section of the keying fingers. In operation, a negative pulse charges C3a and C3b, driving V1b to cut-off and thus opening the relay contacts. During the "ON" position of the code the grid of the control section is returned to the cathode potential, causing the relay contacts to close.

Section III

Installation

To install the Model MRK-1 Relay, proceed as follows:

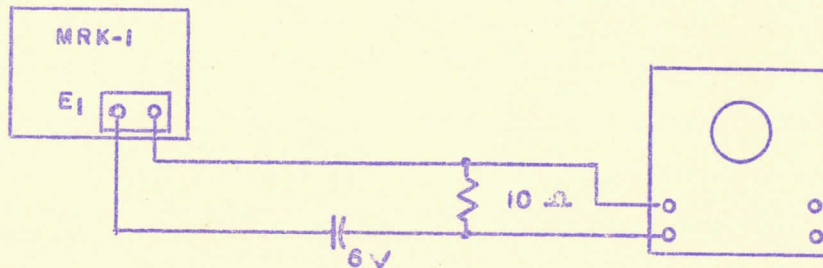
1. Loosen the rear thumb screws on the AHD Cover.
2. Place the relay unit on top of the AHD Cover, and slide the lugs under the thumb screws and tighten the screws.
3. Insert one end of the short special cable into the three hole socket in the AHD and the other end into a similar socket in the back of the relay unit.
4. Insert the line cord into relay unit and connect to 110 volt AC supply.
5. Connect the relay output (E1) to the TMC-Model RAPC Ink Recorder or desired circuit.

Section IV

Operation

When first installed the MRK-1 Relay should be checked by either of the following methods:

1. Connect an oscilloscope, $1\frac{1}{2}$ volt dry cell battery, and a 10 ohm resistor to the Relay unit in accordance with the following diagram:



Put the power switches on the Relay unit, AHD, and the oscilloscope to the "ON" position, and allow a few minutes warm up time. Lower the tape feed roller on the Autohead, and set the speed for approximately 100 wpm. Turn the screwdriver adjustments Speed (R7) and Waveform (R9) to the extreme counter-clockwise position; then rotate the Speed control clockwise until the relay operates. Adjust the oscilloscope to obtain pattern. If the pattern is not an approximate square wave and the Autohead is known to be properly adjusted, correct by means of adjusting the Waveform control until a square wave pattern is obtained.

2. The Model MRK-1 Relay Unit may be adjusted by means of a TMC-Model RAPC Ink Recorder used in place of the oscilloscope, battery, and resistor. Prepare the recorder for operation; then connect the terminals of the Relay Unit to the "Ground" and "Contact" terminals of the Recorder by means of a suitable length of wire. The Relay unit may then be adjusted by observing the square wave pattern on the tape.

Section V

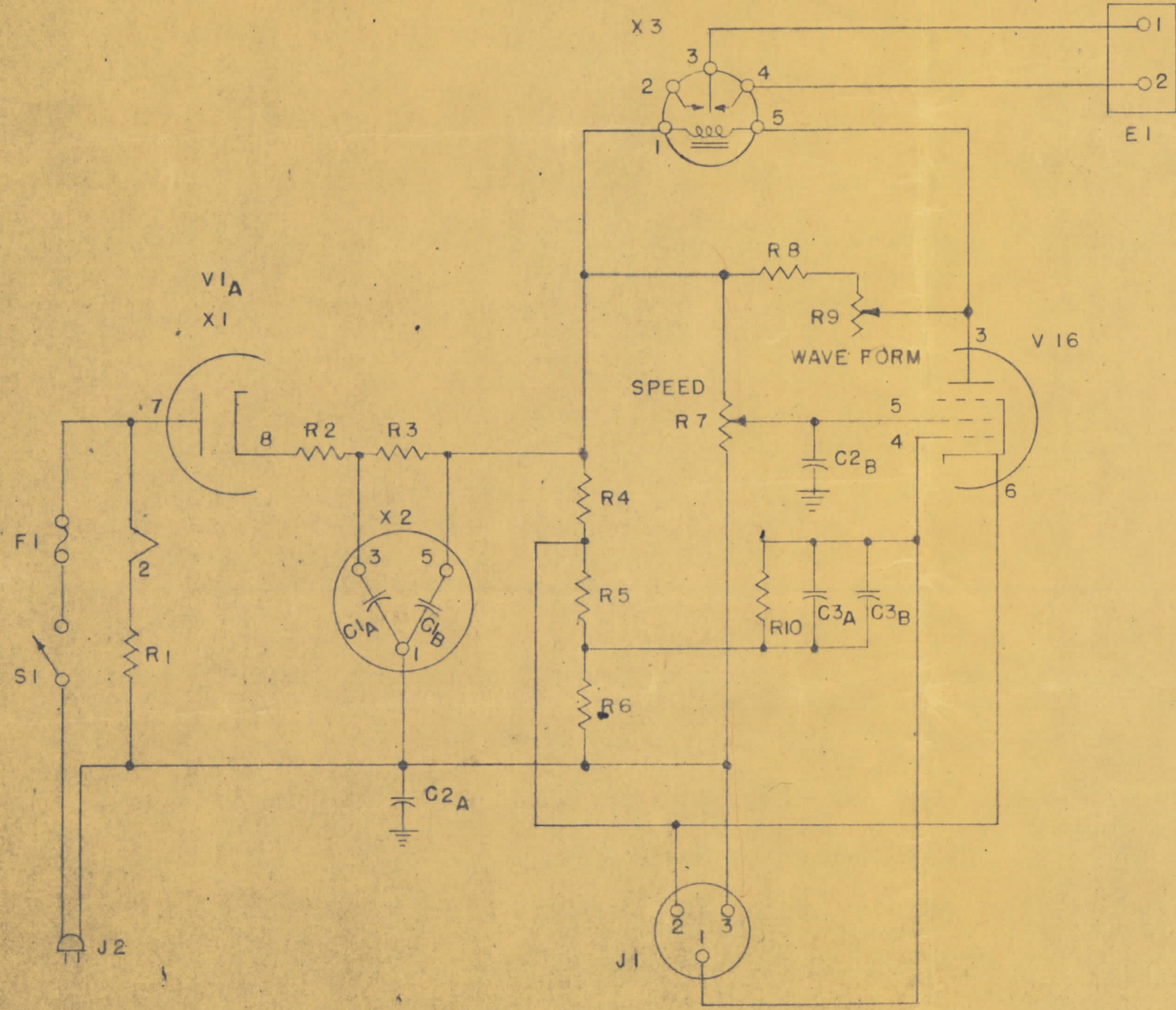
Parts List

Symbol	Description	Function	TC Part No.
C1a, C1b	Capacitor, fixed: electrolytic; dual unit, 20 mfd. ea. sect; 450 wvdc	Filter Condensers	CE52D20CR
C2a, C2b	Capacitor, fixed: paper dual unit .1 mfd, $\pm 15\%$, ea. sect; 600 wvdc; oil filled and impregnated, hermetically sealed metal case.	Filter Condensers	CP69B4EF104L
C3a, C3b	Capacitor, fixed: paper; dual unit .1 mfd, $\pm 15\%$ ea. sect; 600 wvdc; oil filled and impregnated, hermetically sealed case	Time Constant	CP69B4EF104L
E1	Board, terminal: general purpose barrier type; two terminals, 6-32 x 5/16 Binder Head Brass Nickel Plated Machine Screw	Output Terminals	TM-100=2
F1	Fuse, cartridge: 1 amp	Line Fuse	FU-100=1.0
J1	Connector, female contact: three contact shielded miniature type	Input from ADK	JJ-102=3
J2	Connector, male contact: two non-polarized blades	Power input jack	JJ-101
K1	Relay, sensitive: 3000 ohm coil	Keying relay	RL-100
R1	Resistor, fixed: composition; 180 ohms, $\pm 10\%$, 2 watts	Filament dropping resistor	RC42GF181K
R2	Resistor, fixed: composition; 180 ohms, $\pm 10\%$; 2 watts	Filter resistor	RC42GF181K
R3	Resistor, fixed: composition; 180 ohms, $\pm 10\%$; 2 watts	Filter resistor	RC42GF181K
R4	Resistor, fixed: wire wound; 5000 ohms, $\pm 10\%$; 5 watts	Voltage divider	RW-103
R5	Resistor, fixed: composition; 470 ohms, $\pm 10\%$; 2 watts	Voltage divider	RC42GF181K
R6	Resistor, fixed: composition; 470 ohms, $\pm 10\%$; 2 watts	Voltage divider	RC42GF181K
R7	Resistor, variable: composition; 100,000 ohms, $\pm 10\%$; 1/2 watt: linear taper; 1/4" lg. x 1/4" rd. slotted shaft, with 3/8-32 x 3/8" lg. bushing	Speed Control	RV3A TSA104A
R8	Resistor, fixed: composition; 10,000 ohms, $\pm 10\%$; 1/2 watt	Plate resistor	RC20GF103K
R9	Resistor, variable: composition; 50,000 ohms, $\pm 10\%$; 1/2 watt, linear taper; 1/4" lg. x 1/4" rd slotted shaft, with 3/8-32 x 3/8" lg. bushing	Waveform adjuster	RV3A TSA503A
R10	Resistor, fixed: composition; 3.3 megohms, $\pm 10\%$; 1/2 watt	Time Constant	RC20GF335K
S1	Switch, toggle: SPST	Power On	ST12A
V1	Tube, electron: 117NGT	Relay Control & Rectifier	117N7GT
X-1	Socket, tube; octal	V1 socket	TS101P01
X-2	Socket, tube; octal	C1a, C1b socket	TS101P01

Symbol	Description	Function	TMC Part No.
X-3	Socket, tube: 5 prong	□ socket	TS-100-1
W1	Cable Assembly: consists of two three contact male plug type connectors, interconnected by 10" three conductor cable		CA-101
W2	Cable Assembly: power; consists of one non-polarized straight type molded female receptacle, 6 ft. cable, one male non-polarized plug		CA-102-1
XF1	Holder: fuse		FH-100-2

IF IT IS FOUND DESIRABLE TO CHANGE ANY TOLERANCE OR OTHER DETAIL SPECIFIED ON THIS DRAWING NOTIFY THE PURCHASER PROMPTLY.

MAXIMUM ALLOWABLE TOLERANCES HAVE BEEN DETERMINED AND DEVIATIONS WILL BE CAUSE FOR REJECTION. REMOVE ALL BURRS AND SHARP EDGES



REQ.	ITEM	PART NO.	DESCRIPTION	SYMBOL
		#	THE TECHNICAL MATERIEL CORP.	
		STOCK SIZE	MAMARONECK, NEW YORK	
		MATERIAL		
		WEIGHT PER PC.		
		TYPE & TEMPER		
		HEAT TREAT. SPEC.		
		FINISH & SPEC. NO.		
			SCHEMATIC DIAGRAM	
			CDD 8-22-52	
			DRAWN	ELEC. DES. APP. MECH. DES. APP.
			CHECKED	FINAL APPROVAL
				CR 409

ISSUE	ITEM	CHANGED FROM	DATE	CN. NO.	DRAFTS	CHECKER	ENG. APP.
TOLERANCES		SCALE:					
ALL OTHERS		DRILL, PUNCH, COMMERCIAL STOCK SIZES AND MANUFACTURERS TOLERANCES ARE NOT INCLUDED.					

MRK-1	102		
MODEL	PROJECT NO.	ASS'Y. NO.	DATE
USED ON			