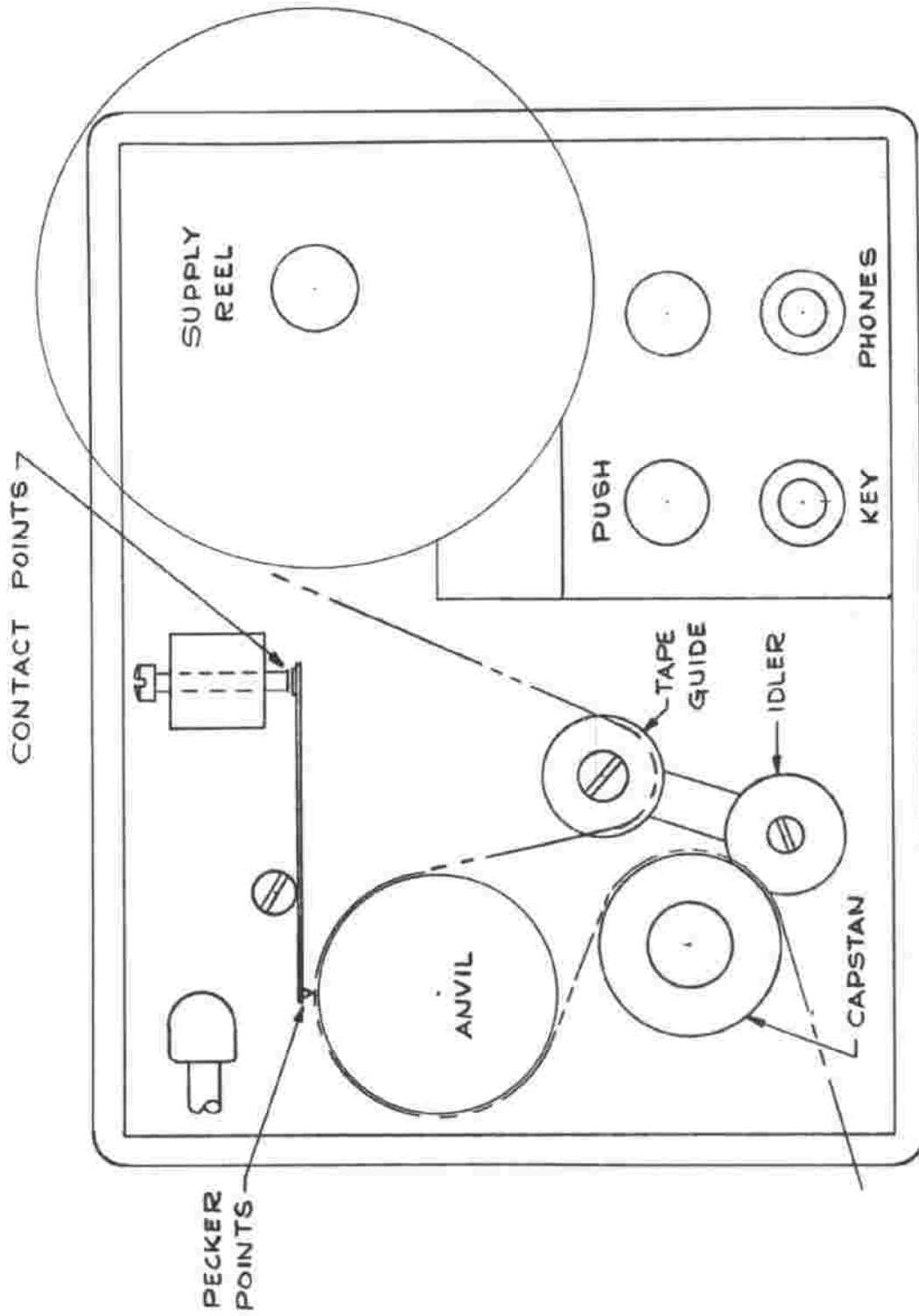


INSTRUCTION MANUAL
Automatic Telegraph Keyer
Atko Mini-Keyer
Model 10 F

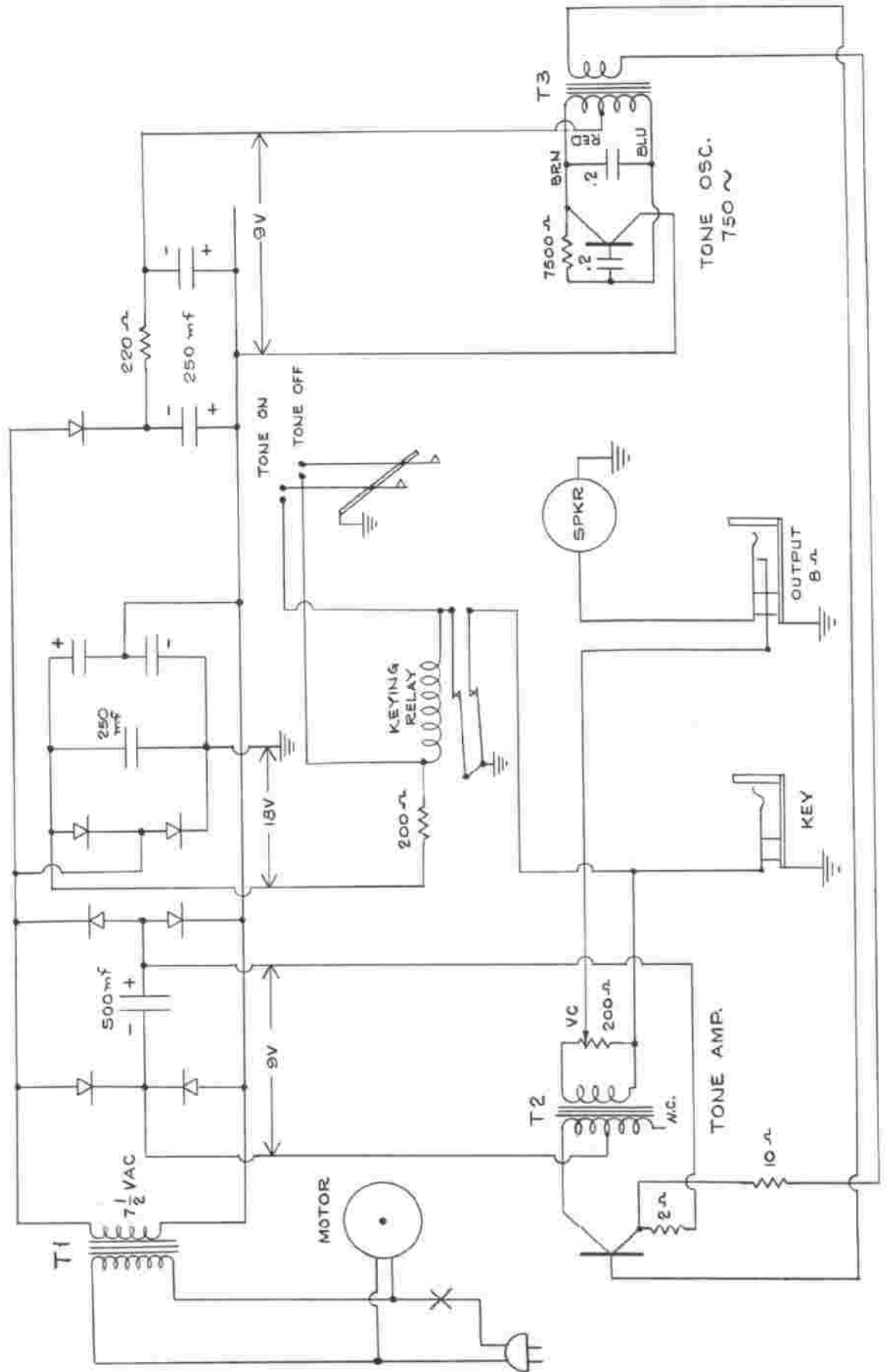
AUTOMATIC TELEGRAPH KEYER CORPORATION
275 Madison Avenue New York, N. Y. 10016



THREADING DIAGRAM

NOV. 10, 1966

FCC KEYSER



I N S T R U C T I O N M A N U A L

Automatic Telegraph Keyer

MODEL 10F

GENERAL

The ATKO Mini-Keyer Model 10F is designed for use in conducting radio operator International Morse Code sending and receiving examinations.

SCOPE OF OPERATION

AUTOMATIC: In this mode of operation, standard Wheatstone tape, perforated in accordance with standard method, is drawn thru the keying head to provide automatic code at selected rates; 13 WPM, 16 WPM, 20 WPM & 25 WPM. The tones of dots & dashes can be heard from the speaker built into the keyer or from remote speakers or headsets plugged-in to the jack marked "PHONES".

HAND KEY: Selection of this type of operation permits the sending of code signals from the built-in oscillator by the use of a hand-key plugged into the jack marked "KEY".

POWER OUTPUT

The power output is 1/2 watt and is sufficient to drive the built-in speaker or an external speaker of 8 ohms impedance. This external speaker like the headphones should be plugged into the PHONE jack. Up to 50 pairs of headphones, connected in parallel, can be driven from the ATKO keyer. The lower the headphone impedance the louder the signals will be.

INPUT POWER

The input power is approximately 15 watts at 120 volts AC. The unit will operate satisfactorily at any voltage between 105 and 130 volts.

EQUIPMENT SUPPLIED

Equipment supplied with the Keyer is the following:

- A - One instruction booklet.
- B - Four capstans. 13, 16, 20 & 25 WPM.

AUTOMATIC CODE TRANSMISSION TAPE

The tape required for the Keyer is standard commercial, canary colored, oiled, paper tape, 15/32" wide and .004" thick. The characters are punched in this tape by a commercial tape perforator. An examination of the tape discloses three sets of holes. The center row of small holes are punched by the perforator but are not used by the Keyer. The larger outer two rows of holes operate the pecker arms of the Keyer. The tape is drawn through the keying head by means of a friction drive mechanism which consists of a capstan and idler wheel. The rotating capstan draws the tape through the keying head while the idler wheel causes the tape to bear against the capstan with sufficient pressure to avoid slippage.

As the tape is drawn through the keying head, the pecker points fall into the larger holes of the tape perforations. This causes an electrical contact to be made at the opposite end of the pecker arm. When the inside pecker arm falls into a perforation an electrical impulse is produced which closes the relay and turns the tone 'on'. In a similar manner, the outside pecker arm falls into a perforation of the tape and turns the tone 'off'.

DRIVING MOTOR

The Keyer drive motor is a 60 cycle synchronous motor which has a built-in speed reduction gear, to provide a capstan speed of exactly 18 RPM. The motor runs with the same precision as an electric clock.

THREADING

The correct method of threading the tape thru the keyer is shown in the simplified diagram on page #1.

The Keyer is delivered prethreaded with a small section of tape, for the purpose of providing an actual illustration of the correct method of threading. The operator is cautioned against threading the tape wrong-side up, or wrong-end first. Observation of the sample will help preclude such errors.

The use of the pointed end of a pencil to lift the pecker points off the anvil will aid greatly in passing the tape under them.

PLACING THE KEYER IN OPERATION

As shown in the illustration appearing on the front page, lay the keyer on its back and then proceed as follows:

1. Select reel of tape.
2. Drop reel over post atop keyer. Make certain square hole of reel is at bottom.

3. Tape must pass under the two small pecker points in upper left hand corner of keyer. See illustration. (Page 1)
4. Feed tape around tape guide and up over anvil and under pecker points. See illustration. A pointed pencil is a big aid in lifting pecker points off anvil so tape can slip under them.
5. Continue tape from anvil down and between drive capstan and rubber tired idler wheel. Check back and make certain tape is properly seated in anvil grooves.
6. Plug keyer cord into any convenient 115 volt AC outlet.
7. Press button on control panel. This will turn power on causing capstan to revolve drawing tape thru keyer. After several feet of tape have been drawn thru keyer pecker points should fall into the larger tape holes.
8. Adjust volume to suit.

CHANGING CAPSTANS:

Grasp capstan firmly with thumb and forefinger of left hand. With thumb and forefinger of right hand (loosen by turning counterclockwise) capstan retaining knob. Move rubber tired idler wheel to the side and slide capstan off motor shaft.

Place new capstan on motor shaft and allow idler wheel to spring back against capstan. Again grasp capstan firmly with thumb and forefinger and with right hand screw back capstan retaining knob. Hold capstan firmly between fingers while tightening capstan retaining knob. A loose knob will permit shaft to turn without also turning capstan.

REWINDING:

To rewind, merely release the tape from between the capstan and idler wheel and from under the pecker points. Then place the tip of your fingers on the metal reel and revolve the reel clockwise to rewind the tape. Use your other hand to guide the tape back on the reel.

If the Keyer is placed near the edge of a table so that when the keyer is in operation, the tape can flow over the table edge into a clean smooth box or basket, no trouble will be had in rewinding.

MAINTENANCE

The keyer requires no lubrication or maintenance of any kind. After long periods of use or disuse, keying failure may occur due to dirt under the electrical contacts of the pecker arms. To correct this, remove the black metal cover which is held in place by the small screw at its top. DO NOT ATTEMPT TO TURN THE LARGE SCREW.

To clean contacts use a commercial contact cleaner and a small piece of CLEAN rag. Make certain no oil or grease from fingers reaches contact points. Very fine sandpaper may also be used, wiping off any residue with a clean cloth. Be careful. Do not bend pecker arms.

If contacts are clean, keying failure does sometimes happen due to wearing and flattening of the contact points. This requires adjustment of the contact points. This adjustment is not critical but a definite make and break must occur while the tape is passing through the keying head. Ordinarily, the contacts separate during operation about 1/16" or less. Opening this gap as much as possible without causing keying failure will give the dots greater "weight". That is, dots will be of shorter duration.

The two contact screws can easily be adjusted by first loosening their locknuts and then by turning the screws clockwise about 1/2 turn. This will bring the contacts closer together. Be sure to retighten the small locknuts. Make certain the small solder lugs to which the wires are attached do not touch one another.

ELECTRICAL CIRCUITS

The electrical circuits of the keyer can be broken down into six basic circuits.

- A. Audio Tone Generator
- B. Audio Tone Amplifier
- C. Keying Head and Relay Circuit
- D. Rectifier and Filter Circuit supplying Tone Amplifier
- E. Rectifier and Filter Circuit supplying Audio Tone Generator
- F. Rectifier and Filter Circuit supplying Keying Head & Relay Circuits.

AUDIO TONE GENERATOR

The audible dots and dashes produced by either automatic or manual operation originates in the audio tone generator. This generator supplies a fixed tone of approximately 750 cycles per second. It is a modified Hartly type oscillator operating at low level.

AUDIO TONE AMPLIFIER

The power tone amplifier amplifies the tone from the audio tone oscillator and transfers this signal to an output transformer for the purpose of providing electrical isolation and a low impedance output source. It is a conventional transistor type Class "A" amplifier.

KEYING HEAD AND RELAY CIRCUIT

The Relay circuit has two states of operation. When the keying heads inner contact closes, while the outer contact is open, the relay coil is energized causing it to close its contacts and thus turn ON the tone from the output of the tone amplifier, delivering the tone to the headphones or speaker. When the outside electrical contact is closed the relay coil is deenergized opening its contacts and turning OFF the tone.

RECTIFIER AND FILTER SUPPLYING AUDIO TONE GENERATOR

The half-wave rectifier circuit appearing in the upper right-hand corner of the Keyer schematic diagram consists of a single diode and two 250 mfd capacitors. This rectifier and associated components develops 10 volts DC and its sole task is to power the Audio Tone Oscillator.

RECTIFIER AND FILTER SUPPLYING AUDIO TONE AMPLIFIER

The Full-wave Bridge circuit appearing in the upper left-hand corner of the Keyer schematic diagram consists of four diodes and one 500 mfd capacitor. This rectifier and associated components develop 10 volts DC and its sole task is to power the Audio Tone Amplifier.

RECTIFIER AND FILTER CIRCUIT SUPPLYING KEYING HEAD AND RELAY CIRCUIT

The Voltage Doubling circuit appearing at top center of the Keyer schematic diagram consists of two diodes and three electrolytic capacitors. The doubler develops 20 volts and its sole task is to power the Relay.

The three above mentioned rectifiers and filter systems are all fed from a common, 7 1/2 volt transformer. This system has been found necessary in order to eliminate chirping, tone instability and motorboating.

ELECTRONIC PARTS LIST FOR
ATKO MINI-KEYER MODEL 10F

<u>Quantity per Unit</u>	<u>Part Name & Description</u>	<u>Source</u>
1	TRANSFORMER 7½V 1Amp. (filament)	Stancor - Chicago, Ill.
1	TRANSFORMER Output (TA2)	Stancor - Chicago, Ill.
1	TRANSFORMER Oscillator Tone (AR120)	Argonne Electronics, N.Y.C.
1	SPEAKER 8 ohm .1W TS 20	Philmore Mfg. Co., Richmond Hill, NY
1	MOTOR 18 RPM Synchronous special shaft	Hansen Mfg. Co., Princeton, Ind.
1	RELAY special DPDT	Automatic Telegraph Keyer Co., NYC
1	JACK ¼ in. std. open circuit	Philmore Mfg. Co., Richmond Hill, NY
1	JACK ¼ in. std. closed circuit	Philmore Mfg. Co., Richmond Hill, NY
1	CAPACITOR (Blue Beaver) electrolytic 500mfd 25V	Cornell Dubilier, Plainfield, N. J.
2	CAPACITOR (Blue Beaver) electrolytic 250mfd 25V	Cornell Dubilier, Plainfield, N. J.
3	CAPACITOR 100mfd 15V electrolytic	Philmore Mfg. Co., Richmond Hill, NY
4	CAPACITOR mylar 0.1 mfd 100V	Philmore Mfg. Co., Richmond Hill, NY
1	VOLUME CONTROL 200 ohm WW	Kelvin Electronics, Farmingdale, NY
1	SWITCH Push Pull 125V 1Amp.	Leviton, New York

ELECTRONIC PARTS LIST FOR
ATKO MINI-KEYER MODEL 10F

PAGE 2

<u>Quantity per Unit</u>	<u>Part Name & Description</u>	<u>Source</u>
1	RESISTOR fixed 220 Ohm 1Watt	Standard
1	RESISTOR fixed 220 Ohm $\frac{1}{2}$ Watt	Standard
1	RESISTOR fixed 2.2 Ohm 1 Watt	Standard
1	RESISTOR fixed 7500 Ohm $\frac{1}{2}$ Watt	Standard
1	RESISTOR fixed 10 Ohm $\frac{1}{2}$ Watt	Standard
7	DIODES epoxy diodes $\frac{1}{2}$ Amp. 100V	Standard
2	TRANSISTORS RCA 2N301	Radio Corporation of America

MECHANICAL PARTS LIST FOR
ATKO MINI-KEYER MODEL 10F

2	CABINET	Davis Molding Co., Chicago, Ill.
1	PANEL Steel special	Automatic Telegraph Keyer Corp., NYC
1	DUST COVER (for keying head)	Automatic Telegraph Keyer Corp., NYC
1	CONTACT BLOCK lucite	Automatic Telegraph Keyer Corp., NYC
2	FECKER ARMS (Tape sensing feelers) matched pair	Automatic Telegraph Keyer Corp., NYC
1	ANVIL Grooved aluminum	Automatic Telegraph Keyer Corp., NYC
1	IDLER ARM Complete assembly	Automatic Telegraph Keyer Corp., NYC
1	REEL POST	Automatic Telegraph Keyer Corp., NYC
1	NAME PLATE	Automatic Telegraph Keyer Corp., NYC
1	CAPSTAN 13 WPM	Automatic Telegraph Keyer Corp., NYC
1	CAPSTAN 15 WPM	Automatic Telegraph Keyer Corp., NYC
1	CAPSTAN 20 WPM	Automatic Telegraph Keyer Corp., NYC
1	CAPSTAN 25 WPM	Automatic Telegraph Keyer Corp., NYC

FEDERAL COMMUNICATIONS COMMISSION
Field Engineering Bureau
Washington, D. C. 20554

May 14, 1969

Project XT-18

TO ENGINEERS IN CHARGE (FOD)

Project Title: New Code Keyers for Examination Use

Subject: Audio Tone Frequency

The Engineer in Charge at the Buffalo, New York, Field Office advises that he has noted considerable difference in audio tones of the two ATKO Model 10F code test keyers in that office. Measured audio tone frequencies were 870 Hz and 1050 Hz. The Washington originated purchase request for these keyers specified 750 Hz \pm 10% for the audio output frequency. If complaints have been received from examinees about the audio frequency used in testing, it is suggested that those offices measure the tone frequency of their keyers to determine if they are within \pm 10% of 750 Hz.

The Buffalo office has found that the tone can be easily adjusted within certain limits by replacing the 7500 ohm fixed resistor connected across the primary winding of transformer T3 as shown in the schematic diagram for this unit. This resistor can easily be located for changing by removing the keyer from its plastic case. The resistor is mounted on the bottom circuit board. The Buffalo district office found it necessary to use replacement resistor values of approximately 12 k or 13 k to obtain a 750 Hz tone for their two units. They further indicate that there is sufficient space within the keyer to mount a small variable potentiometer to facilitate tone frequency adjustment. Field offices are authorized to install either a fixed or variable resistor to adjust the tone frequency to the 750 Hz specification, if they so desire.


J. Patrick Scanlon
Chief, Field Offices Division

FEDERAL COMMUNICATIONS COMMISSION
FIELD ENGINEERING BUREAU
Washington, D. C. 20555

AIRMAIL WEST OF THE MISSISSIPPI

December 27, 1966

MEMORANDUM TO ALL ENGINEERS IN CHARGE, (ENFORCEMENT)

SUBJECT: ATKO Automatic telegraph keyers.

REFERENCE: Our ditto memorandum dated November 15, 1966

The ATKO keyers are now arriving at the various district offices. One point which was omitted from the instruction manual concerns the use of high impedance head sets instead of a loudspeaker. The instruction reads as follows:

"If high impedance headphones are used with the keyer, it may be necessary to connect a 1000 OHM resistor across the phone plug terminals in order to eliminate a back tone which otherwise may be present."

It may be desirable to construct a special phone plug with the resistor connected inside the case.

An additional ditto memorandum will be forwarded within a few weeks concerning the availability of code test tapes.

H. C. Looney
for J. Patrick Scanlon
Chief, Field Offices Division

FEDERAL COMMUNICATIONS COMMISSION

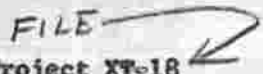
DEC 29 1966

PORTLAND, OREGON

FE-788

FEDERAL COMMUNICATIONS COMMISSION
Field Engineering Bureau
Washington, D. C. 20555

FILE 1220

FILE 
Project XT-18
May 17, 1967

TO ENGINEERS IN CHARGE (FOD)

Project Title: New Code Keyers for Examination Use

Subject: Improvements to Atko Mini-Keyer Case Latch

The Engineer in Charge, Buffalo has furnished information which describes the methods he has utilized to improve the latch and certain mounting screws for this instrument. His report is as follows:

"We experienced difficulty with the cases of both of the ATKO MINI-KEYER units at this office in that they easily popped open, especially when placed with the carrying handle up. We have corrected the problem with two minor modifications. The cases now stay closed under normal handling.

"The first modification was to reshape the case latching catch hook with a fine tool-maker's file. It was noted that the original latching surface of the catch hook was tapered so that the catch would easily slide open. By reshaping the hook as shown in the sketch below, the latch holds securely.

"The second modification was to replace the two screws holding the power cord storage bracket. We found that a twisting motion on the case cover causing the case to pop open was the result of the protruding heads on the screws used to hold the power cord bracket on the case end. We replaced the binder head screws with 1/4" x 6-32 FLAT HEAD machine screws. We countersunk the screw heads into the case by drilling the case with a 5/16" drill. The screw heads are flush with the case surface.

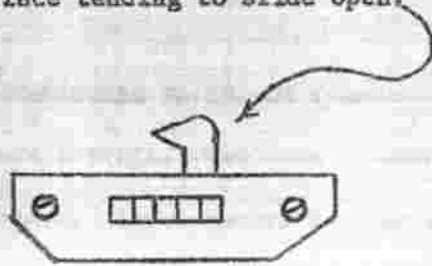
"This office has a supply of finished 1/4" x 6-32 flat head screws and can send them to any office requesting them."

FEDERAL COMMUNICATIONS COMMISSION

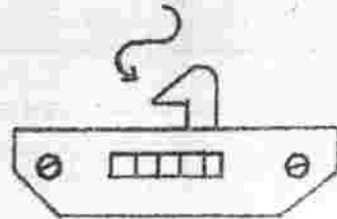
MAY 22 1967

PORTLAND, OREGON

Original shape of latching hook
surface tending to slide open.



Modified shape of hook
latching surface holds without
sliding open.



J. Patrick Scanlon
J. Patrick Scanlon
Chief, Field Offices Division

FE-788

LT-NOTE

FEDERAL COMMUNICATIONS COMMISSION
Field Engineering Bureau
Washington, D. C. 20555

*File in
ATKO
Instns - FILE*

May 31, 1967
Project XT-18
File: 1220

TO ENGINEERS IN CHARGE (TOD)

PROJECT TITLE: New Code Keyers for Examination Use

SUBJECT: Improvements in Atko Mini-Keyer Reliability

The Engineer in Charge, Buffalo has supplied information which specifies a method for correcting erratic operation of the Mini-Keyer keyer arm. The pertinent portions of this report are as follows:

"During the recent license examinations at Pittsburgh, Pa., it was found that the examiner's Atko Keyer acted in an intermittent manner during a preliminary inspection of the equipment.

"When the defective keyer was returned to the office it performed perfectly. The engineer advised that he had determined that the upper "pecker arm" definitely did not work satisfactorily during his inspection runs.

"It was determined that the erratic pecker arm action became evident when the metal cover plate was moved over so as to bear against the pecker arm bearing. In this particular unit the metal cover plate is low enough to permit this to occur. A slight pressure from the cover plate will render the unit inoperative or at least embarrassing for code test purposes.

"CORRECTIVE ACTION: We removed the plate and bent it upwards so as to prevent the plate from contacting the pecker arm bearing. The plate now rests at the middle of the large screw head and is quite stationary.

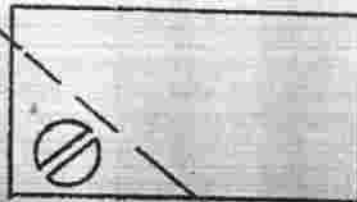
"These units are individually manufactured. It was noted that our second keyer had a smaller hole for the large screw head and, therefore, the plate could not interfere."



FEDERAL COMMUNICATIONS COMMISSION

JUN 6 1967

PORTLAND, OREGON



*Approved
Chief of Bureau*

J. Patrick Scanlon
J. Patrick Scanlon
Chief, Field Offices
Division