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USER HANDBOOK
for
HIGH SPEED MORSE TRANSMISSION
WITH
UK/PRC - 316

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UK/PRC - 316 Lightweight HF Radio A.16 Army Code No. 14961

SYNOPSIS

Adaptor Unit AN/GRA-71 - UK/PRC-316 enables items of the U.S. equipment, Coder Burst Transmission Group AN/GRA-71 to be used with RT-316 to provide high-speed (300 w. p. m.) morse transmission facility.

UK/PRC-316 Adapter Unit for Radio A-1, Army Code No. 14901

INTRODUCTION

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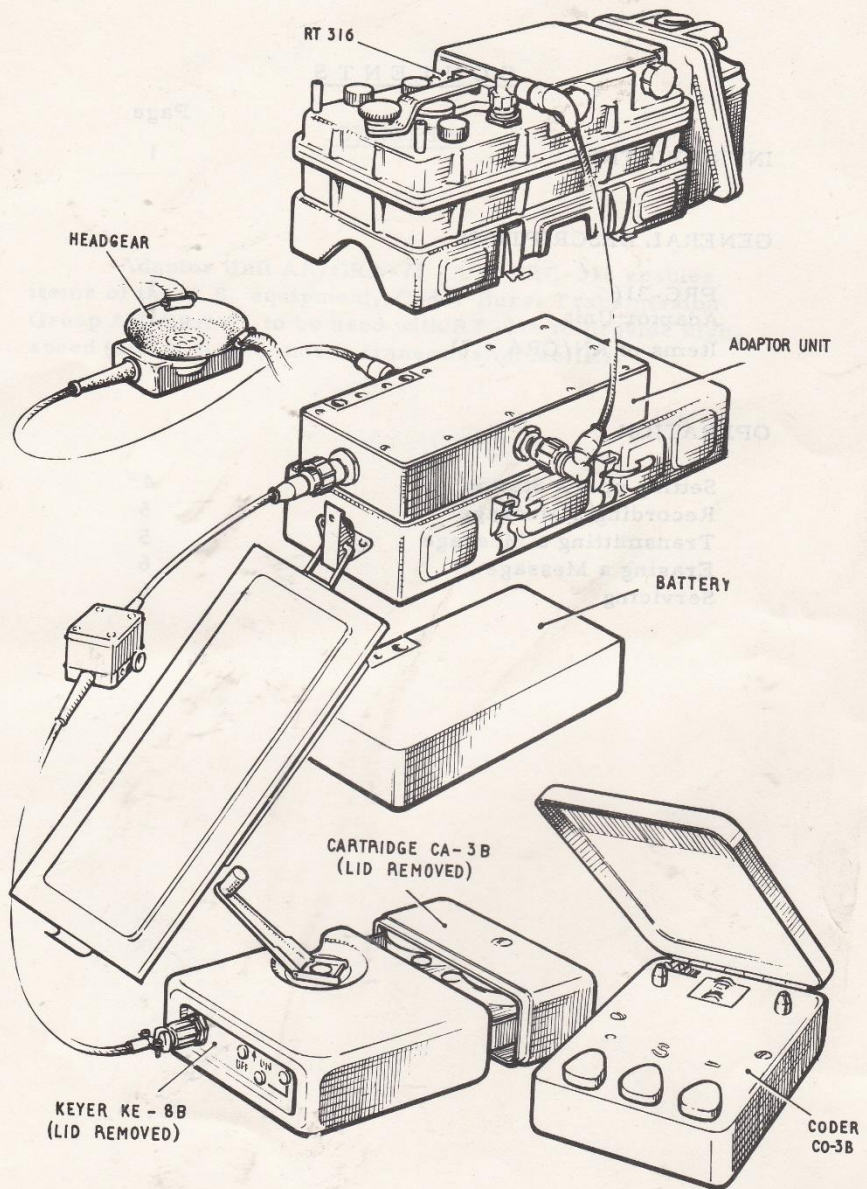


FIG. 1 HIGH SPEED MORSE TRANSMISSION WITH PRC316

INTRODUCTION

Adaptor Unit AN/GRA-71 - UK/PRC-316 enables items of the U.S. equipment, Coder Burst Transmission Group AN/GRA-71 to be used with RT-316 to provide high-speed (300 w. p. m.) morse transmission facility.

When set up for high-speed morse transmission, the normal roles of the PRC-316 remain immediately available to the user.

The PRC-316, Adaptor Unit and items of AN/GRA-71 are shown in Figure 1, as for transmitting.

GENERAL DESCRIPTION

PRC-316

The description and operation of the PRC-316 is given in User Handbook, Army Code No. 14961.

All setting up and operation of the station will be as stated in the handbook, except for any minor variations that may be mentioned below.

ADAPTOR UNIT

The Adaptor Unit clips into the underside of the RT-316 in place of the standard battery, and the battery clips into the adaptor unit, with connections carried through the unit from the battery to the radio.

The audio cable from the radio is connected to one side of the unit, and the audio gear plugs into the other side. The keyer connects to one end of the unit, through a connector fitted with a pressel switch. The keyer power supply is fed through this cable and is held to 12V. by a regulating circuit in the pressel box.

When set up, the PRC-316 may be used normally or for high-speed morse transmission.

The electronics within the unit provide a regulated -4.5V, over the input range of 10 to 17 volts of the RT-316 battery. This -4.5V is conveyed through one of the battery guide pins into the radio where it cancels the forward bias on the driver and PA stages (applied when the pressel is operated), and prevents transmission. The removal of the -4.5V by the switching of the keyer, according to the morse code pattern recorded on the magnetic tape, permits transmission to take place.

The transmission rate of 300 w. p. m. is limited by the keyer, the adaptor unit is capable of keying at a much higher rate.

In transit, the battery is removed, and the AN/GRA-71 items, in re-sealable polythene bags, are carried in the battery compartment.

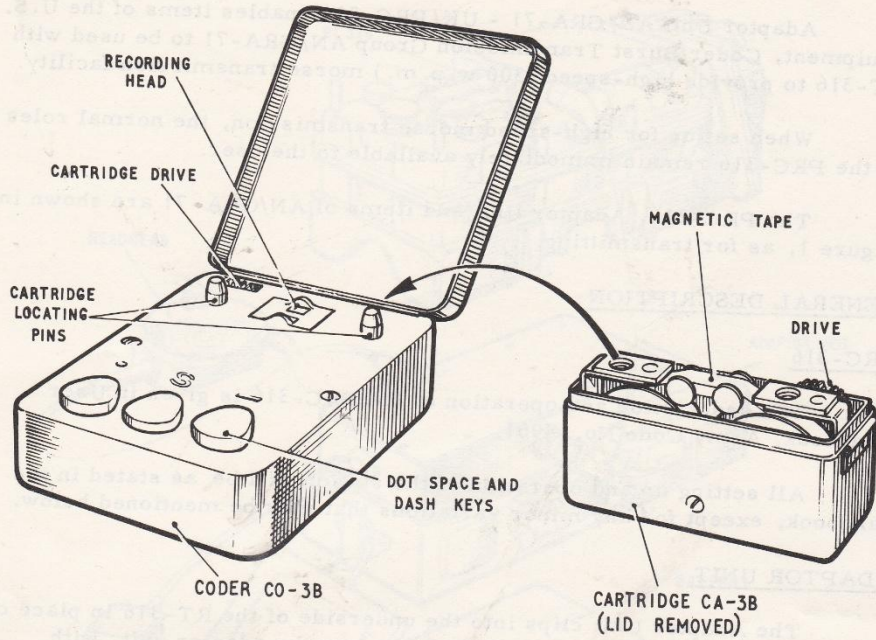


FIG. 2 CODER CO-3B AND CARTRIDGE CA-3B

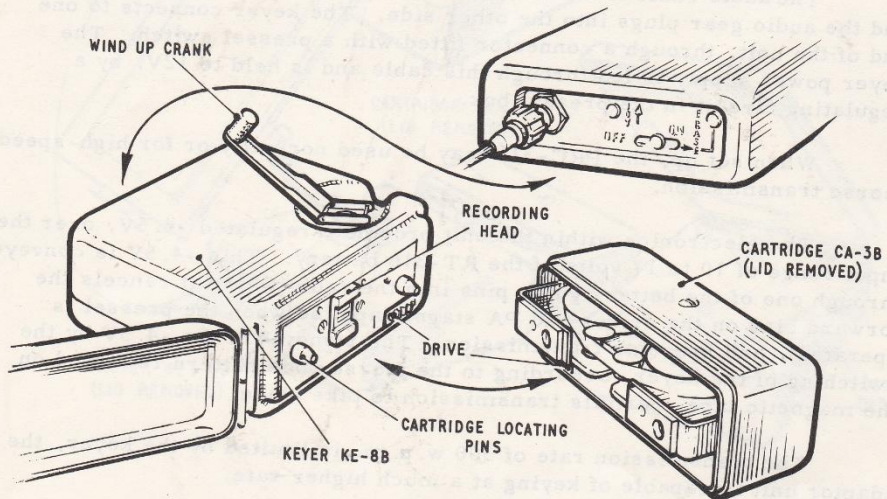


FIG. 3 KEYER KE-8B

ITEMS OF THE AN/GRA-71

The Coder CO-3B and Cartridge CA-3B

The Coder CO-3B is an electro-mechanical morse code generator which enables an operator to record messages on the magnetic tape in the Cartridge CA-3B which clips on the coder. See Figure 2.

In the Coder, the DOT and DASH keys operate an electrical generating system which generates an impulse to form a dot or dash element on the tape. The dot magnetic impulses are recorded on one track of the tape and the dash impulses on another track. The DOT and DASH keys also operate the drive mechanism to the cartridge which moves the tape and provides the correct spacing between dot and dash elements. The SPACE key provides the spaces between characters, depressing once between characters and twice between words.

The Cartridge, with the lid removed, locates on pins on the coder, the drive engages, and the tape passes over the recording head. Depressing the keys on the coder, now records impulses on the tape. The tape is standard 1/4" magnetic recording tape, 12½ ft. long and it will carry at least 125 five-letter words, plus spaces. The cartridge contains an automatic rewind that returns the tape to its starting point whenever the cartridge is detached from either coder or keyer. A whole tape rewinds in about 5 seconds. Messages can be erased using the Keyer KE-8B, as described under Operation below.

The Keyer KE-8B

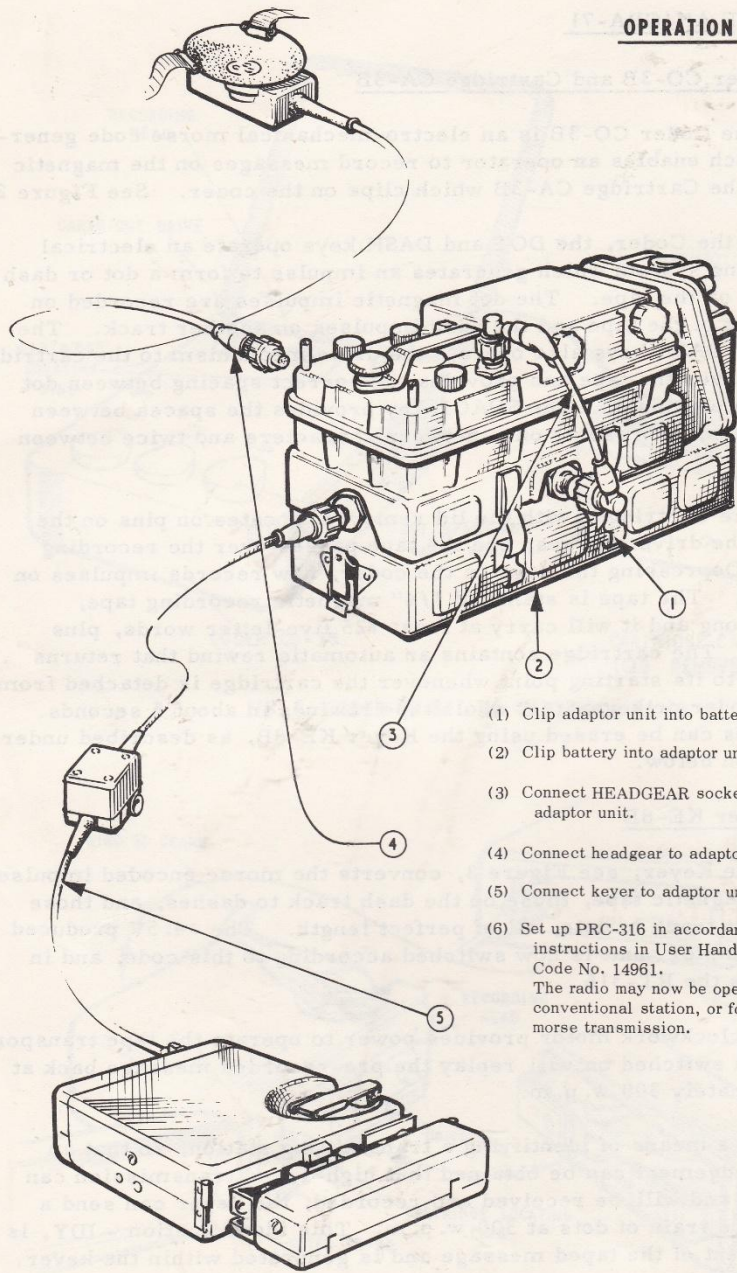
The Keyer, see Figure 3, converts the morse encoded impulses on the magnetic tape, those on the dash track to dashes, and those on the dot track to dots, all of perfect length. The -4.5V produced in the adaptor unit is now switched according to this code, and in turn keys the RT-316.

A clockwork motor provides power to operate the tape transport and when switched on will replay the pre-recorded message back at approximately 300 w. p. m.

As a means of identifying a transmitting station, so that an acknowledgement can be obtained that high-speed transmission can go ahead and will be received and recorded, the keyer can send a continuous train of dots at 300 w. p. m. This identification - IDY, is independent of the taped message and is generated within the keyer.

The keyer also provides a means of erasing a tape.

OPERATION



- (1) Clip adaptor unit into battery compartment.
- (2) Clip battery into adaptor unit.
- (3) Connect HEADGEAR socket on radio to adaptor unit.
- (4) Connect headgear to adaptor unit.
- (5) Connect keyer to adaptor unit.
- (6) Set up PRC-316 in accordance with the instructions in User Handbook, Army Code No. 14961.
The radio may now be operated as a conventional station, or for high-speed morse transmission.

SETTING UP THE STATION

RECORDING A MESSAGE

- (1) Remove the lid of the Cartridge CA-3B; open the lid of the Coder CO-3B and fit the cartridge to the coder.
- (2) Depress the SPACE key on the coder about 10 times before starting the message, to provide a leader before the message proper starts.
- (3) Record the message, depressing the DOT and DASH keys to form the appropriate characters, and the SPACE key, once between characters and twice between words.
- (4) Complete the message and remove the cartridge from the coder.

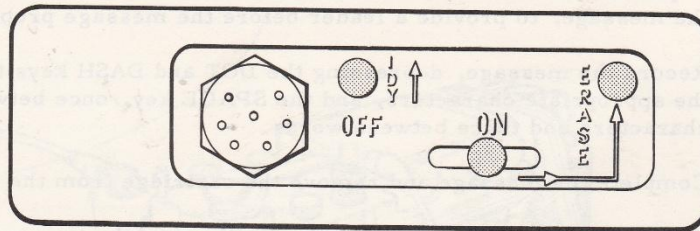
(Removing the cartridge at any time will cause the tape to rewind, and if the message has not been completed, what has been recorded, will have to be erased and the whole message re-recorded).

TRANSMITTING A MESSAGE

- (1) On the Keyer KE-8B, check that the motor ON-OFF switch is OFF.
- (2) Wind the crank clockwise till the tape gear drive begins to rotate - about 30 turns for a fully run down motor.
- (3) Connect the keyer to the RT-316 if not already connected.
- (4) Fit the Cartridge CA-3B, with message recorded, to the keyer.
- (5) Hold down the pressel in the radio-to-keyer connector and press up the IDY switch on the keyer and hold it for the required interval of IDY transmission.
- (6) Release IDY and pressel switches and listen for acknowledgement from distant station.
- (7) Transmit message
 - (a) Hold down the pressel in the radio-to-keyer connector.
 - (b) Switch motor ON-OFF switch at keyer - ON.
The message will now be transmitted.
 - (c) Sidetone in headgear and antenna current in radio will indicate that transmission is taking place.
 - (d) When tape has run through, switch motor OFF and release pressel.
 - (e) Remove cartridge from keyer. This will allow the tape to rewind, so that if necessary, it can be transmitted again.

ERASING A MESSAGE

- (1) Leave the keyer connected to the radio as for transmitting a message.
- (2) Ensure that the keyer drive motor is fully wound.



BASE OF KEYER

- (3) Attach the cartridge containing the message to be erased, to the keyer.
- (4) Hold down the pressel on the radio-to-keyer connector.
- (5) On keyer, slide the ERASE switch up in the direction of the arrow and hold it there. Then slide the motor ON-OFF switch to full ON. This will lock the release switch in position. Hold the motor ON-OFF switch against the stop until the tape has run completely through.
- (6) Switch motor ON-OFF to OFF. The erase switch will automatically return to its original position.
- (7) Release the pressel on the radio-to-keyer connector.
- (8) Disconnect the keyer from the RT-316.
- (9) Remove the cartridge from the keyer.

During erase, it might be advisable to switch OFF the RT-316 to conserve the battery.

SERVICING

PRC-316

The RT-316 is a fully-sealed radio and it must not be opened except in workshops.

Limited operator servicing is given in User Handbook Army Code No. 14961.

Adaptor Unit

The components in the unit are epoxy resin coated and will withstand immersion. The water should be well shaken out before use.

This unit must not be opened by the operator. Keep it clean and dry. Remove dirt from plugs and sockets. Examine connectors for damaged insulation.

Items of AN/GRA-71

These items contain delicate mechanical, or electro-mechanical devices as well as miniaturised electronics. They will not withstand immersion and must be kept in the polythene bag provided, when in transit or not in use.

They must not be opened by the operator.

Items will be kept clean and dry at all times.

On the coder and keyer, recording heads must be kept spotlessly clean.

Clean the heads regularly by wiping them with a soft lintless cloth moistened with a suitable cleaning solvent such as medicinal alcohol or carbon-tetrachloride, then wipe them dry and polish thoroughly.

All other maintenance and repairs must be carried out in workshops.