

# U. S. Army Field Radio Set

THE photographs and diagram herewith show the general appearance and also the connections of the various parts making up the portable radio pack set as used by the U. S. Signal Corps.

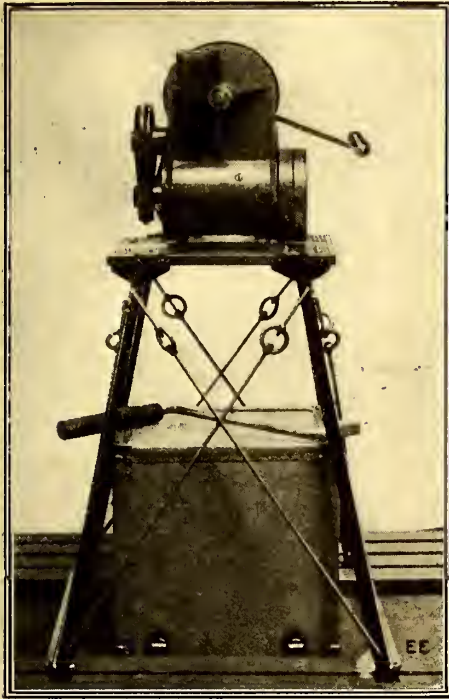


Fig. 1. Compact 250 Watt Hand-driven 500 Cycle A. C. Generator Used to Supply Power for U. S. Signal Corps Radio Pack Set.

The photograph Fig. 1 illustrates the hand-driven dynamo, rated at 250 watts, which can be disassembled in a few minutes so as to be readily packed on a mule's back. Photograph Fig. 2 shows the very compact arrangement of the transmitting and receiving apparatus, including the quenched spark gap, oscillation transformer and loading inductance, the latter being of the flatwise wound ribbon type. These pancake coils forming the oscillation transformer can be swung toward or away from one another, as they are mounted on hinges. On the shelf in the cabinet containing this apparatus is mounted the spark gap, as well as the radiation hot-wire ammeter and the transmitting key. Under the shelf there is mounted the receiving apparatus inductance, and also the step-up transformer of the sending set, as well as the high tension condensers, etc.

Switching means are provided on this set for quickly throwing the aerial and ground terminals onto the receiving or transmitting apparatus. All of the instruments used in the make-up of this outfit are first-class in every particular, the best possible being purchased, as becomes requisite for military requirements.

The small-size hand-driven dynamo utilized in this set can be operated by two men nicely, and is especially geared up with enclosed gears as perceived, so as to give the proper speed when the crank handles are turned at a fair velocity. This style of radio pack set can transmit 20 to 30 miles under average conditions, and can receive over distances of a couple of hundred miles or more in connection with the collapsible mast and antenna wires used in conjunction with it. The whole outfit, including the mast, can be erected in a few minutes' time, ready for service.

Referring to the diagram of connections

Fig. 3 as used with this set, they in general follow regular radio engineering practise. As will be evident, there is employed for receiving a switch type loose coupler with primary and secondary windings, and several unique features not commonly found, on experimental radio sets at least, are herewith to be noted.

Among these features is the inductive coupling of the *buzzer test* with the primary coil of the loose coupler. This is arranged on any receiving set very easily by simply winding a few turns of wire around the primary coil or by placing these few turns of wire at the end of the primary, so as to react on same by induction. Another feature which works very nicely, and also one that is invariably used on all commercial radio sets nowadays, is the *safety spark gap* placed across the aerial and ground connections of the receiving apparatus proper. Any heavy static or lightning discharges will jump this gap in preference to passing through the high resistance and reactance of the coupler windings. This indirectly protects the sensitive and expensive head phones, as well as the mineral detector. Also in some cases where such protective spark gap were not used it has happened that the coupler was burned out by an extra heavy static surge through the circuit, occasioned by the close proximity of an electric storm while operating the set.

A simple aerial switch effects the change-over from transmitting to receiving set. The transmitting apparatus is very simple and will be readily understood from the diagram. It comprises a primary coil in the oscillation transformer, and this reacts by induction on three secondary spirals, any one or all of which may be joined in the

cated clearly, and the step-up transformer of the *resonance type*, especially designed for this work, is air insulated. Alternating current of the proper voltage and 500 cycles frequency is supplied by the hand-driven self-exciting generator previously described. This machine is fitted with an automatic centrifugal cut-out switch which does not permit operating the set until the

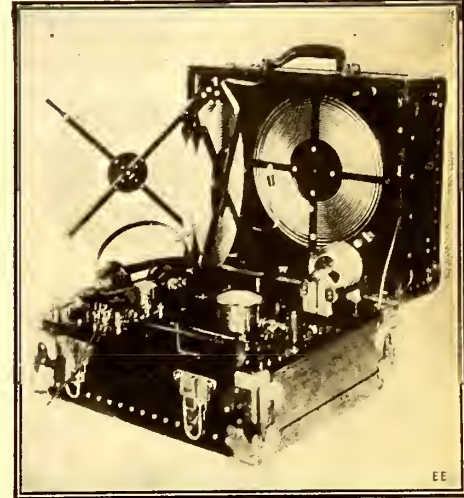


Fig. 2. Showing Neat Arrangement of Complete Portable Radio Transmitting and Receiving Apparatus in Army Pack Set. Note Use of Several "Pancake" Style Helices.

proper speed is reached, and consequently the critical frequency produced by the dynamo. This is necessary for several reasons when maximum efficiency is to be at-

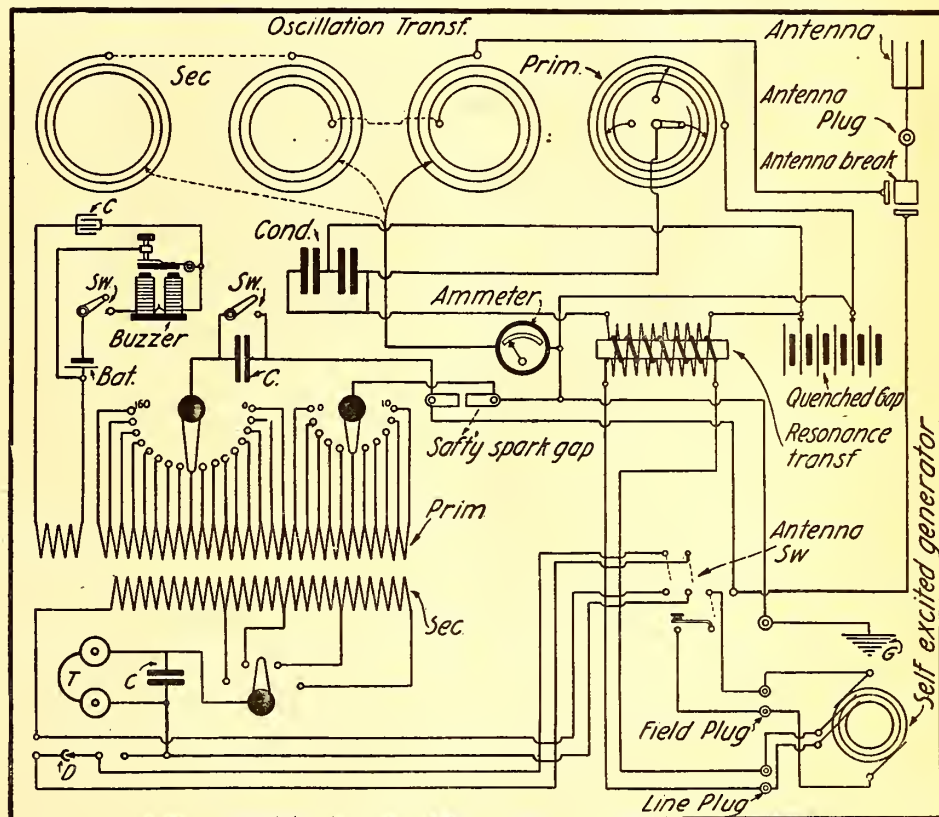


Fig. 3. Diagram of Connections for Transmitting and Receiving Instruments in Radio Pack Set. Note "Buzzer Test" Inductively Coupled.

circuit as different wave lengths are required. The quenched gap, condenser and hot-wire ammeter connections are indi-

tained by such a set, and particularly due to the utilization of the resonance type of transformer incorporated in this design.