

JEFFERSON-TRAVIS

RADIO MFG. CORPORATION

INSTRUCTION MANUAL

FOR

JEFFERSON-TRAVIS

ULTRA-HIGH FREQUENCY TRANSCEIVER

MODEL

UF-1

RESTRICTED

MODEL UF - 1
ULTRA-HIGH
FREQUENCY TRANSCEIVER

Manufactured by

JEFFERSON-TRAVIS

RADIO MFG. CORPORATION

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INSTRUCTION BOOK
JEFFERSON - TRAVIS
MODEL UF-1

I. PURPOSE

The purpose of the Model UF-1 is to provide a lightweight, portable Two-Way Radio capable of transmission and reception at frequencies from 60 to 75 megacycles.

II. DESCRIPTION

A. The equipment consists of the following major items:

1. UF-1 Transceiver.
2. Telephone Handset and Plug.
3. Whip Antenna.
4. Canvas Carrying Case.
5. Wood Transit Case.
6. Vibrapack Power Supply.
7. Batteries.
8. Tubes.

B. Major Units

1. UF-1 Transceiver

The Model UF-1 transceiver consists of a cadmium plated steel chassis and a chrome plated steel panel mounted in a cabinet 11" high, 8" wide and 6" deep. The cabinet is finished in black crystalline lacquer. Space is provided not only for the transceiver, but also for all necessary batteries. The weight of the UF-1 transceiver, fully equipped for battery operation, is approximately 17 pounds exclusive of the wood transit case. The transceiver can be removed from the cabinet by unscrewing the rear and front panels. Installation of tubes and batteries are made by unscrewing the rear cover. Inspection of

the schematic wiring diagram Drawing No. 2062A will show that the transceiver, when used to transmit, employs the following circuit arrangement: one type 1G6-GT/G vacuum tube as a push-pull U.H.F. oscillator. one type 3Q5-GT as a microphone amplifier and driver, and one 1G6-GT/G as a class B push-pull modulator.

When the transceiver is used for reception, the 1G6-GT/G oscillator is switched to become a super regenerative detector. Likewise, the 3Q5-GT is switched for use as a first audio amplifier, and the 1G6-GT/G modulator becomes the output audio amplifier. The Send-Receive Switch SW-2 performs the switching functions. All tubes are of the low drain type and have 1.4 volt filaments.

Attention should be drawn to certain features of the various components. For instance, the transformers are vacuum impregnated with a high melting point wax and will stand a 15 minute immersion test in fresh water at a temperature of 150° F. and then immediate application of 400 volts D. C. between all windings, and also all windings and core. Likewise, the wiring used is of the flame-resistant type.

Drawing 2062A, Issue C, the schematic wiring diagram of the UF-1, is contained at the end of this Instruction Book. The same drawing in reduced size is fastened to the inside of the back cover of the transceiver.

2. Telephone Handset

The handset is a durable, standard telephone type, having a magnetic telephone receiver, and a single button carbon microphone. The receiver impedance is 2000 ohms at 1000 cycles and the microphone resistance is approximately 60 to 100 ohms.

A three conductor cord and plug provide means for connecting the handset to the UF-1 by plugging it into the jack on the upper left-

hand side near the rear of the cabinet. Drawing No. 2090A shows the plug and jack wiring arrangement.

3. Whip Antenna

A nickel plated brass whip antenna is provided, and when not in use is contained in the small pocket at the side of the canvas carrying case. The whip fastens to the two ceramic posts designated by the word ANTENNA on the UF-1 cabinet. Clips and wing nuts permit ready installation. Antenna lengths for each dial setting are given on the tuning chart contained in the transparent holder on the canvas case. The antenna length is approximately 12" collapsed and 48" fully extended.

It should be noted that the upper antenna post on the UF-1 cabinet is provided for support only, and is not electrically connected. The lower antenna post is connected to the antenna coupling coil in the UF-1 transceiver.

4. Canvas Carrying Case

A water-resistant canvas carrying case is provided for carrying the equipment in the field. It has a heavily padded bottom, and the bottom corners are reinforced with leather. The front flap and the various pocket flaps are equipped with snap fasteners. The equipment should be operated in the canvas case, and it is merely necessary to unfasten the front flap to manipulate the controls. If the front flap is folded under the equipment, the tuning chart contained in the transparent card holder will come into a convenient position below the front panel.

Three pockets are provided. The large pocket at the left-hand side is for the telephone handset. Its inside wall is slotted to give access to the jack into which the handset is plugged.

The long pocket of very small diameter at the right rear of the case is for the whip antenna.

The pocket at the back is for the vibrapack cable.

5. Wood Transit Case

The transit case is made of phenolic resin bonded plywood. The case is fitted with felt lined guides to retain the transceiver in position. The design of the case is such as to permit ready stacking of units on top of each other.

6. Vibrapack Power Supply

The vibrapack unit consists of a metal case in which is contained a 12 volt vibrator unit and transformer with R.F. hash filters, smoothing filters, and the necessary dropping resistors. Drawing No. 2009A shows the schematic circuit diagram.

The vibrapack transformer is fitted with an additional magnetic shield within the case and a heavy outside magnetic shield is fastened to the top of the case.

Four drilled and tapped holes in the bottom of the vibrapack unit correspond to the four clearance holes in the bottom of the UF-1 transceiver and are for the purpose of fastening the vibrapack in place. The No. 6 screws required are supplied in the envelope stamped "Hardware."

Electrical connection to the UF-1 chassis is made by means of plugs and screw terminals. See Drawing No. 2011A. These are the same plugs that are used to connect the batteries when battery operation is employed. A red dot on the central B socket indicates that it is to receive the plug connected to the red wire. Accidental reversal of B plugs will not cause damage, but will render the equipment inoperative. The black wire connected to ground on

the UF-1 chassis must be screwed to the vibra-pack case. On battery operation the black lead is connected to the negative C terminal of the bias battery together with the green C lead.

Note: A piece of horn fibre is supplied with each unit and is used to prevent a short circuit between the vibrapack terminals and the UF-1 rear cover. This paper must be placed in position between the terminals and the cover when using vibrapack operation or damage will result.

The storage battery cable wires are the equivalent of No. 12 B & S gauge and are covered with a tinned braid. The red wire is the positive 12 volt lead and the black wire is negative 12 volts. Clips are provided for ready connection.

A "reduced" schematic diagram is contained within the cover of the vibrapack.

7. Batteries

The batteries required to place the equipment in operation are:

- 2 - Eveready #762 B Batteries
- 1 - Eveready #741 A Battery
- 1 - Burgess 5540 Microphone and
C Battery

UF-1 units purchased for domestic use are shipped with the batteries installed. Export equipments may have the batteries installed or the batteries may be shipped separately. The number of batteries and spare batteries supplied depends on the contractual requirements. The batteries are held in the UF-1 case by means of wooden chocks.

8. Tubes

The UF-1 is usually shipped with one set of tubes installed. Spare tubes are usually

shipped in bulk.

III. INSTALLATION

A. BATTERY OPERATION

While the Model UF-1 is usually shipped with tubes installed, the batteries may have been shipped separately. For instructions as to the method of battery installation, see Section V, "Service and Maintenance", Par. B. To place the equipment in operation, remove the UF-1 from the wooden transit case. Unfasten the front flap on the canvas carrying case and fold it under the unit. Unfasten the left side pocket and remove the telephone handset. Make certain that the handset is plugged into the jack. Extend the handset cord to its fullest length. Remove the telescopic whip from its pocket and fasten it in place by means of the wing nuts on the two ceramic posts identified by ANTENNA on the cabinet. This is illustrated in Drawing No. 2093A. The bottom end of the telescopic whip antenna should just coincide with the bottom edge of the clip on the lower antenna post. The length of antenna to be used for each frequency and dial setting is given on the tuning chart fastened to the cover of the canvas case.

When extending the antenna, always extend the top section first and then each successive section. This method was used during calibration at the Factory. Improper adjustment will be obtained if the same procedure is not followed by the operator.

B. Vibrapack Installation - For 12 Volt Operation Only

When it is desired to use the vibrator power supply, remove the back cover from the Model UF-1 transceiver and remove all batteries. Place the vibrapack unit in the position formerly occupied by the batteries and fasten it in place by means of the 4 screws supplied. The screws should pass through the holes in the

bottom of the UF-1 transceiver case and screw in-
to the tapped holes in the bottom of the vibra-
pack unit.

Plug in the "A" and "B" battery cable plugs as
shown in Drawing #2011A. Make the connections
exactly as shown. Check carefully before con-
necting the battery cable to the storage battery;
otherwise damage may result. Be sure the black
wire which connects to C- on battery operation
is screwed to the vibrapack case.

The battery cable is intended to pass through
the slot in the bottom of the UF-1 transceiver
back cover. However, before replacing the back
cover, place the piece of horn fibre supplied
with the vibrapack between the vibrapack plug
connectors and the back cover. The horn fibre
is also slotted to permit passage of the battery
cable.

The battery cable should be placed in the pocket
provided in the canvas carrying case at the
lower rear. Pass the cable through the slot
in the canvas case into the canvas pocket, and
then coil it up. When it is desired to operate
the equipment the cable should be uncoiled and
extended to its full length. Connect the red
wire on the battery to 12 volts positive, and
the black wire to 12 volts negative.

The "On-Off" switch on the Volume Control turns
the vibrapack "on or off" just as it does on
battery operation.

IV. OPERATION

To operate the transceiver successfully a suitable
site must first be chosen. The ideal site is usually
the highest point of ground available or the top of
a structure or building. Increased height means in-
creased range. However, the model UF-1 will also
operate satisfactorily when placed directly on the
ground. Placing it on a packing case, wooden bench,
etc., will improve the performance. It is prefer-
able to keep the unit 10 to 15 feet away from

lighting poles, motor cars, etc., especially if these objects intervene in the transmission path between stations. Intervening objects in the transmission path should always be avoided when possible.

In general, "line of sight" transmission is by far the best, although this does not necessarily apply to intervening foliage, shrubbery, etc. As an example, some tests have shown that excellent communication of approximately 4 miles was entirely possible with intervening trees, while transmission was impossible when the receiver was located in a gully 1 mile distant. Very often a difference of a few feet in elevation or position makes communication possible when before it was impossible. Vertical metallic structures are sometimes nearly resonant to the transmission frequency and produce "freak" results.

The following controls appear on the front panel:
See drawing #2093A

1. Tuning
2. Volume
3. Send-Receive Switch

Place the SEND-RECEIVE switch in RECEIVE position. To turn the equipment "ON", turn the VOLUME control clockwise until a snap is felt. Turn the VOLUME control to approximately 50. A hiss will be heard in the telephone handset, indicating that the receiver is super-regenerating. Rotate the TUNING dial; when a strong carrier is received, the hiss will disappear entirely. Weaker carriers will permit some of the hiss to remain. To transmit throw the SEND-RECEIVE switch to SEND and talk into the handset in a normally loud voice. The volume control at extreme distances can be advanced toward 100 but the cautions mentioned in Section V Par. F. 5 entitled "Audio Distortion" should be observed.

When several UF-1 units are intercommunicating, all stations should employ the same volume control settings for optimum performance.