

MODEL **FF-1**

FIXED FREQUENCY ADAPTER

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DESCRIPTION

The Model FF-1 Fixed Frequency adapter is a solid state frequency determining unit. It provides crystal control of any two operating frequencies falling within the normal operating range of the TR-4 Transceiver.¹ The FF-1 is well suited for net operation since it provides crystal controlled transmit frequency with VFO controlled receive frequency or crystal controlled transmit and receive frequency. (See "NOTICE" Page 4).

1. Operating frequencies outside normal range may be feasible with realignment depending on the band and frequency excursion. If such operation is desired, write our Customer Service Department and supply the desired operating frequency.

INSTALLATION

Carefully turn the TR-4 upside down so as to expose the bottom cover. Place the decal flange (on top of the FF-1) over the front lip of the TR-4 bottom cover. This front lip then is sandwiched between the flange and the chassis of the FF-1. Slowly engage the FF-1 connector and the socket provided on the bottom of the TR-4. Fasten the retaining latch and tighten the latch screw as shown in the mounting illustration. When properly installed the FF-1 is securely held and suitable for mobile operation.

ADJUSTMENT

Select the proper crystal (see Crystal Calculation Chart) and install in a vacant crystal socket. Position the crystal selector switch so the rocker section flush with the FF-1 panel is nearest the desired crystal. With a screw driver turn the frequency trimmers screw (accessible through a hole in the front) clockwise until the stop is reached. Reverse direction and turn the screw (CCW) one-half revolution. The crystal can now be pulled exactly on frequency by the following method.

In the case of SSB operation, the trimmer should be adjusted for natural voice response of the net control station. If net control is not available, an accurate frequency meter can be set for the operating frequency. The crystal trimmer is then adjusted for zero audio beat. It may be necessary to make a minor adjustment after the net control returns.

For CW operation the trimmer should be set for approximately a one KHz pitch of the net control signal, or accurate frequency meter. When properly adjusted your CW output shifts in frequency and falls in zero beat with the received signal.

OPERATION

With the FF-1 in the "OFF" position the TR-4 functions normally. In the "T" position the transmit frequency is crystal controlled while the receive frequency is controlled by the VFO. In the "T/R" position, transmit and receive frequencies are crystal controlled. In all cases the red indicator lamp lights whenever the FF-1 is activated.

Two switch selected frequency channels are provided. For the relationship between crystal frequency and operating frequency see the "Crystal Calculation Chart" below.

CRYSTAL CALCULATION CHART

DESIRED
OPERATING

<u>RANGE</u>	<u>SSB OPERATION</u>	<u>CW OPERATION</u>
3.5 - 4.1	$F_c = 9.0 \text{ MHz} - F_s$	Add 1KHz to F_c
7.0 - 7.6	$F_c = 12.5 \text{ MHz} - F_s$	Sub 1KHz from F_c
14.5 - 13.9	$F_c = F_s - 9\text{MHz}$	Sub 1KHz from F_c
21.0 - 21.6	$F_c = 26.5 \text{ MHz} - F_s$	Sub 1KHz from F_c
28.0 - 28.6	$F_c = 33.5 \text{ MHz} - F_s$	Sub 1KHz from F_c
28.5 - 29.1	$F_c = 34.0 \text{ MHz} - F_s$	Sub 1KHz from F_c
29.1 - 29.7	$F_c = 34.6 \text{ MHz} - F_s$	Sub 1KHz from F_c

F_c = Crystal Frequency F_s = Desired Operation Freq.

NOTE: On all operating ranges, the crystal frequency will be between 4.9 MHz and 5.5 MHz. This means a

crystal selected for an operating frequency in one range will provide an operating frequency in the six other ranges. In other words, a 5.5 MHz crystal for 3.5 MHz operation will also provide operation on 7.0 MHz, 14.5 MHz, 21.0 MHz, 28.0 MHz, 28.5 MHz and 29.1 MHz.

TRANSCEIVER MODIFICATION FOR MOUNTING THE FF-1

When mounting the FF-1 on some transceivers it may be found the FF-1 extends approximately 1/16" below the TR-4 cabinet legs. This is due to variations in the spacers used on the RV-4 connector.

To remedy this, remove the bottom cover of the transceiver. Replace the brass spacers of the RV-4 connector with those supplied. Replace the bottom cover and proceed with FF-1 mounting.

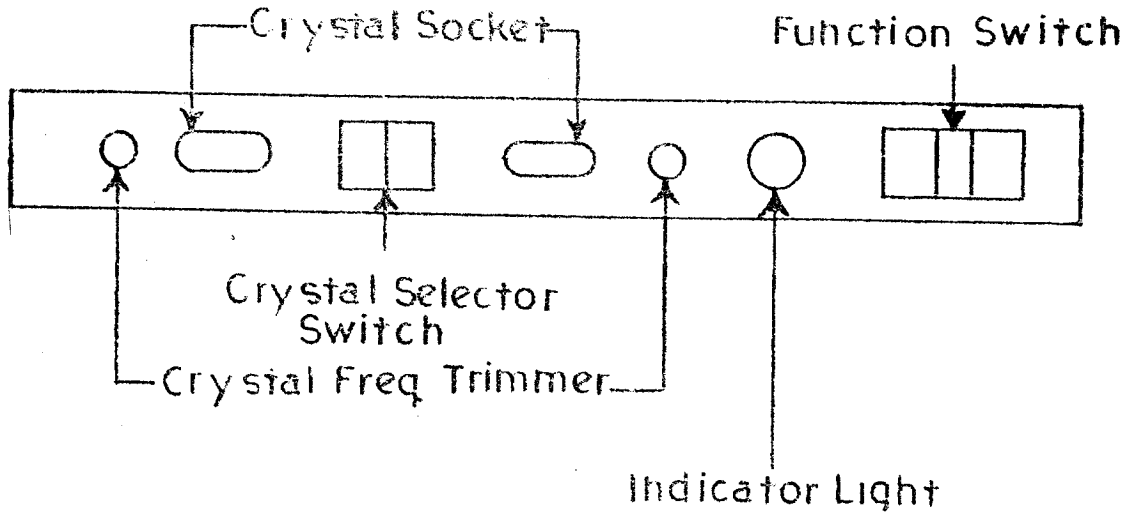
IMPORTANT NOTICE

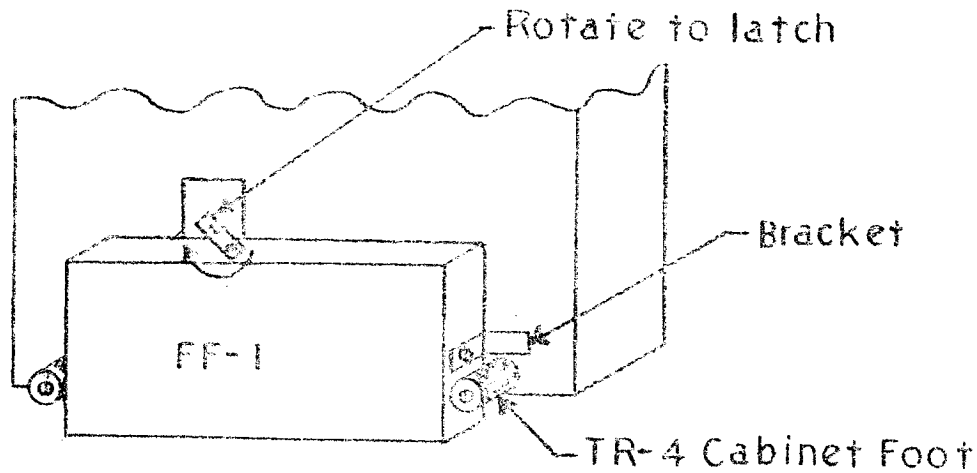
The right angle securing bracket is in a shipping configuration. To mount the FF-1, remove this bracket, turn it over, and relocate it as shown in the FF-1 Mounting View. When the FF-1 is secured the right angle bracket will be rotated clockwise slightly to rest on the TR-4 cabinet leg.

FF-1 ACCESSORIES

Operating crystals-----	\$7.50
Patch Cord (necessary to separate the FF-1 from the TR-4 for servicing.)-----	\$4.75

PANEL VIEW OF FF-1





MOUNTING VIEW OF FF-1
ON the TR-4 Chassis

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