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SB-002

Service Bulletin

INSTALLING MODIFICATION WORK ORDER MWO-03 ON THE DFP-1000 DF BEARING PROCESSOR AND DFR-1000 DUAL-BAND VHF/UHF DF RECEIVER

MWO-03 is a user-installable modification to the DFP-1000 DF Bearing Processor and DFR-1000 Dual-Band VHF/UHF DF Receiver that allows wide/narrow IF bandwidth selection in the CW reception mode for both units. MWO-01 (a simpler modification that hard-wires the DFP/DFR-1000 for wide IF bandwidth only) is also presented.

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I SB-002 OVERVIEW

The DFR-1000 has two IF bandwidths (wide and narrow; normally 15 kHz and 6 kHz respectively) that are automatically selected in tandem with the front-panel 3-position reception **MODE** switch. In the **AM** and **FM** reception modes, IF bandwidth selection is user-programmed for either wide or narrow via the appropriate rear-panel configuration setup dip-switches (**AMN/AMW** and **FMW/FMN**; dip-switches #6 and #7 respectively).

In the **CW** reception mode, however, no IF bandwidth selection is available, and the receiver is hard-wired for the narrow IF bandwidth. This can be disadvantageous in certain user applications in that the narrow IF bandwidth is not particularly forgiving of frequency netting errors between the transmitter and receiver (i.e., channel crystal frequency drift and aging at either the transmitter or receiver can result in the transmitter signal frequency falling outside the receiver IF passband, thereby causing diminished performance). The problem can be especially troublesome in UHF bands.

Although the DFR-1000 front-panel **FINE TUNE** control allows operators to correct for such frequency netting errors, this may be inconvenient in certain applications. In some instances, operators may not even recognize that frequency drift has occurred and fail to make the necessary fine tuning corrections.

This issue was addressed in the DFR-1000A (the immediate successor to the DFR-1000) by having the IF bandwidth user-progammable in the **CW** reception mode. This was accomplished at the expense of eliminating the IF bandwidth user-progammability feature for **FM** (because of the limited number of rear-panel dip-switches, the receiver had to be hard-wired for the wide IF bandwidth in that reception mode). Since there are virtually no applications for FM reception with 6 kHz IF bandwidths in the VHF/UHF range, however, this trade-off results in no practical disadvantage.

Operationally, the only difference is that in modified units, rear-panel dip-switch #7 selects the **CW** rather than **FM** IF bandwidth.

DFR-1000s can be modified to incorporate this same improvement. The procedure to implement this is embodied in Modification Work Order MWO-03, which is presented below.

Users who do not need the narrow IF bandwidth capability can obtain similar results by means of a simpler alternative modification whereby the unit is simply hard-wired for the wide IF bandwidth in *all* reception modes. The procedure to implement this is embodied in Modification Work Order MWO-01, which is also presented below. *Note that only one of these MWOs should be implemented.*

Both MWO-01 and -03 are applicable to all DFR-1000 DF Receivers having serial numbers 119 and below. *Since units with serial numbers 120 and above (DFR-1000As) already incorporate the full benefit of the performance enhancements provided by these modifications, MWO-01 and -03 should not be applied to DFR-1000As.*

We strongly recommend that the DFR-1000 Dual-Band VHF/UHF DF Receiver User Functional Test Procedure (available in PDF format from the “DF Applications Literature” page of our web site) be conducted prior to implementing MWO-01 or -03. By doing so, users

can repeat this test following MWO installation to verify that the unit has not been inadvertently damaged in the process.

The same general considerations apply to the DFP-1000 DF Bearing Processor. Although the receive frequency is controlled by the external host receiver in this case, the advantages of applying these MWOs are substantially the same. For DFP-1000s, applicable serial numbers are 098 and below (units with serial numbers 099 and above are DFP-1000As that already incorporate the full benefit of the performance enhancements provided by these modifications). The appropriate test document for the DFP-1000 is the DFP-1000 DF Bearing Processor User Functional Test Procedure (available in PDF format from the "DF Applications Literature" page of our web site).

MWO-01 and -03 should not be attempted on DFP-1000s supplied without IF boards. These units are designated by the "/NIF" suffix on the model number printed on their serial number labels.

Users preferring not to implement MWO-01 or -03 on their own may alternatively return the unit to the factory for retrofit and recalibration. In this event, please contact us in advance to make the necessary arrangements.

II MWO-03 INSTALLATION PROCEDURE

Installing MWO-03 is a straightforward procedure requiring only basic electronic shop tools and supplies. A 100k 1/8 watt 5% carbon film resistor and 1N4148 or similar silicon signal diode is also required. To install MWO-03, proceed as follows:

1__ Disconnect the DFP/DFR-1000 from its power source. Set the unit upside down on the bench and remove the four #6 stainless-steel screws securing the outer cabinet to the chassis.

2__ Remove the chassis from the outer cabinet by sliding it out backwards through the cabinet rear opening.

3__ Set the chassis upright on the bench so that the front-panel faces toward the right (this exposes the IF board).

4__ Obtain a 1N4148 or similar silicon signal diode and trim both leads to 1/4".

5__ Bend the cathode lead (the lead closest to the end of the diode having the black band) 90°, insert it into the open solder pad as illustrated in Figure 1 below, and solder.

6__ Cut a 4-3/4" length of #26 solid insulated wire and trim 1/8" of insulation off one end and 1/4" of insulation off the other end.

7__ Bend the 1/4" uninsulated end into a U-shaped hook using a long-nosed plier. Similarly bend the unsoldered end of the 1N4148 diode into a U-shaped hook as well.

8__ Fasten the hooked ends of the wire and diode together and crimp with the long-nosed plier to hold them together. Once done, solder this connection so that the wire is permanently connected to the diode. Trim any excess wire from the soldered joint using a small wire cutter.

Figure 1 - DFP/DFR-1000 IF Board (circuit side)

9__ If heat-shrink tubing and a heat gun are available, cut a 1/4" length of suitable heat shrink, slide over wire so that it completely covers the soldered connection, and apply heat (see Figure 1). Otherwise, place a small piece of electrical tape directly underneath the soldered connection so that it is completely insulated from the underlying PC (printed circuit) board.

10__ Bend a loop in the other end of the wire using the long-nosed plier and solder to J2 pin 2 as illustrated in Figure 1. Route the wire along the board as illustrated.

11__ Cut a 1-1/8" length of #26 solid insulated wire and trim 1/8" of insulation off each end. Bend loops at both ends using the long-nosed plier and solder as illustrated in Figure 1 (route the wire near U11 as illustrated). Note that this wire is connected to double solder pads at each end. Since the two pads in each pair are connected to each other via PC board traces, each wire end can be soldered to either pad of the pair.

12__ Obtain a 100k 1/8 watt 5% carbon film resistor and trim each lead to 7/8". Install 3/4" lengths of insulated sleeving on each end and install the resistor as illustrated in Figure 1. Note that both resistor leads are inserted through small-diameter vias (vias are small solder pads with plated-through holes that allow connections between the top- and bottom-sides of the PC board). One of these vias is connected to U11 pin 6 and the other to J2 pin 2 (the same pin to which the 4-3/4" wire was connected in step 10 above). Route the resistor as illustrated.

13__ Remove the two #6 zinc-plated screws (and their lockwashers) securing the PC board

to its support rail and turn the DFP/DFR-1000 so that it is resting on its right side (CRT down).

14__ Fold-out the PC board so that it is resting on the bench (this exposes the component side).

15__ Using an X-ACTO knife or similar sharp-bladed instrument, carefully cut the two PC board traces at the locations indicated by the two “X” marks in Figure 2. Be sure to remove any resulting debris and carefully inspect the cuts to verify that the traces have been completely severed.

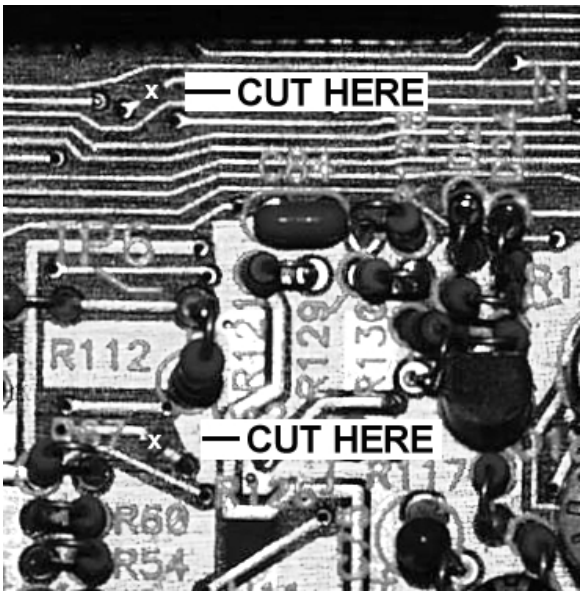

Figure 2 - DFR-1000 IF Board
(component side)

16__ Fold the board back into the DFP/DFR-1000 chassis and secure it using its two #6 zinc-plated screws and lockwashers.

17__ Secure the added wires and components on the circuit side of the IF board by staking them down to the board with *non-corrosive* RTV (Dow Corning 3140 or similar). Be sure to stake the 4-3/4" wire at several points.

*** CAUTION ***

Most brands of RTV designed for household applications are corrosive. If non-corrosive RTV is unavailable, use model airplane cement or a similar adhesive. If a suitable adhesive cannot be conveniently found, use electrical tape instead.

18__ After allowing sufficient time for the RTV or other adhesive to completely cure, re-install the DFP/DFR-1000 chassis back into its outer cabinet, sliding the unit forward into the cabinet rear opening.

19__ Secure the cabinet to the chassis using the four #6 stainless-steel screws.

20__ Using an ink pen, mark out “FMW/FMN” on the rear-panel configuration setup label

and mark “CWW/CWN” to the immediate left in its place.

21__ Using a laundry marking pen or other indelible writing instrument, mark “MWO-03" in a prominent location on the rear-panel.

22__ If the recommended User Functional Test Procedure was conducted prior to implementing this MWO, repeat this test now to confirm that the unit has not been inadvertently damaged during the above procedure.

III MWO-01 INSTALLATION PROCEDURE

1__ Disconnect the DFP/DFR-1000 from its power source. Set the unit upside down on the bench and remove the four #6 stainless-steel screws securing the outer cabinet to the chassis.

2__ Remove the chassis from the outer cabinet by sliding it out backwards through the cabinet rear opening.

3__ Set the chassis upright on the bench so that the front-panel faces toward the right (this exposes the IF board).

4__ Cut a ½" length of #22 uninsulated solid wire and connect it between the two holes of JP1. To locate these two holes, refer to Figure 1 (one of the illustrations presented to facilitate the installation of MWO-03 above). Notice in Figure 1 that one of the holes of JP1 is used as a solder connection point for the 1N4148 diode (added for MWO-03 only; not included as part of this MWO). The other hole is 0.2" to the left of the first hole. Once the wire has been connected, solder at both holes, being sure to keep the wire low to the board.

5__ Re-install the DFP/DFR-1000 chassis back into its outer cabinet, sliding the unit forward into the cabinet rear opening.

6__ Secure the cabinet to the chassis using the four #6 stainless-steel screws.

7__ Using an ink pen, mark out “FMN” and “AMN” on the rear-panel configuration setup label.

8__ Using a laundry marking pen or other indelible writing instrument, mark “MWO-03" in a prominent location on the rear-panel.

9__ If the recommended User Functional Test Procedure was conducted prior to implementing this MWO, repeat this test now to confirm that the unit has not been inadvertently damaged during the above procedure.

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