



# RDF PRODUCTS

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## OPERATOR'S MANUAL DFR-1000B WIDE-COVERAGE DF RECEIVER/PROCESSOR





## DANGER

Although the DFR-1000B is completely safe to operate, the user must comply with the following basic rules of safety and common sense:

1. **SAFE DRIVING ISSUES** - *Two people (a driver and DF operator) are required to safely run a mobile DF mission. It is essential that the driver be required *only to drive the vehicle*. One person cannot simultaneously operate the DFR-1000B and safely drive the vehicle. *Failure to observe this two-person rule can result in traffic accidents causing property damage, injury, and even death.**
2. **DF ANTENNA MOUNTING ISSUES** - *It is solely the user's responsibility to verify that a mobile DF antenna is securely mounted to the vehicle so that it won't fall off while the vehicle is in motion. It is similarly the user's responsibility to verify that the aerials (elements) are securely attached to the antenna aerial connectors. Mast-mounted DF antennas must be securely mounted and properly guyed as required. Such installations must be in full compliance with all applicable local ordinances as well as state and federal regulations. *Never install an antenna near electrical power lines.**
3. **AIRCRAFT OPERATION ISSUES** - *If DF antennas are to be aircraft mounted, the installation must be done and formally approved by an FAA certified aircraft mechanic for reasons of public safety. In addition, it is imperative that the pilot be assigned no duties other than safely flying the aircraft.*
4. **REPLACEMENT FUSE ISSUES** - *If it is necessary to replace the fuse, always use the specified GMA 4.0 ampere 5 x 20 mm fast-acting type. *Never attempt to defeat this important safety feature by substituting a slow-blow fuse or one rated for higher current.**

Check RDF Products' website at [www.rdfproducts.com](http://www.rdfproducts.com) for product updates and service bulletins.  
Can we improve this manual? Contact us at [mail@rdfproducts.com](mailto:mail@rdfproducts.com) to offer suggestions.

## **GLOSSARY OF COMMONLY USED ABBREVIATIONS AND ACRONYMS**

AC -	alternating current	Commission (U.S.)
ADF -	automatic (radio) direction finder	FM - frequency modulation
A.I.D. -	Audio Intelligence Devices (1)	FREQ - frequency
AGC -	automatic gain control	GHz - gigahertz (formerly gigacycles)
ALRM -	alarm	GND - ground
AM -	amplitude modulation	GPS - global positioning system
amp -	ampere	HxWxD - height x width x depth
ANT -	antenna	HF - high frequency (officially 3-30 MHz)
AWG -	American Wire Gauge	Hz - Hertz (formerly cycles per second)
BNC -	bayonet naval connector	IF - intermediate frequency
C -	Centigrade, Celsius	INT - internal
CH -	channel	kHz - kilohertz (formerly kilocycles)
CHNL -	channel	lbs - pounds
cm -	centimeters	LCD - liquid crystal display
COMP -	compensation	LED - light emitting diode
CRT -	cathode ray tube (display)	LxWxD - length x width x depth
CW -	continuous wave	m - meters
DC -	direct current	MED - medium
dB -	decibels	MHz - megahertz (formerly megacycles)
dBm -	decibels referenced to 1 milliwatt	mm - millimeters
DF -	(radio) direction finding	mph - miles per hour
DFP -	shorthand for RDF Products Model DFP-1000B DF Bearing Processor	ms - millisecond
DFR -	shorthand for RDF Products Model DFR-1000B DF Receiver/Processor	mW - milliwatt
dip -	dual in-line package	mV - millivolt
EXT -	external	NOR - normal
FAA -	Federal Aviation Administration (U.S.)	PC - personal computer
FCC -	Federal Communications	PDA - personal digital assistant (also handheld computer or pocket PC)
		pF - picofarads

PM -	phase modulation	us -	microsecond
PWR -	power	uV -	microvolts
ppm -	parts per million	uV/m -	microvolts per meter (electric field strength)
RCV -	receive or receiver	V -	volts
RCVR -	receiver	VAC -	volts AC
RCP -	reciprocal	VDC -	volts DC
RDF -	radio direction finding	VPP -	volts peak-to-peak
RF -	radio frequency	VHF -	very high frequency (officially 30-300 MHz)
RMS -	root mean square	VRMS -	volts RMS
sec -	second	W -	watts
SPKR -	speaker (loudspeaker)	w/ -	with
SSB -	single sideband	w/o -	without
S/N -	serial number		
TNC -	threaded naval connector		
T&H -	track and hold		
UHF -	ultra high frequency (officially 300-3000 MHz)		

Notes:

1. A.I.D. is a registered trademark of Audio Intelligence Devices of Fort Lauderdale, FL

## TABLE OF CONTENTS

<b>SECTION I - GENERAL DESCRIPTION</b> .....	1
<b>A. INTRODUCTION</b> .....	1
<b>B. EQUIPMENT SUPPLIED</b> .....	2
<b>C. EQUIPMENT REQUIRED BUT NOT SUPPLIED</b> .....	2
<b>D. SPECIFICATIONS</b> .....	3
<b>SECTION II - INSTALLATION AND OPERATION</b> .....	5
<b>A. UNPACKING AND INSPECTION</b> .....	5
<b>B. INSTALLATION</b> .....	5
<b>C. AR8600 Mk2 CONFIGURATION SETUP</b> .....	6
<b>D. DFP-1000B CONFIGURATION SETUP</b> .....	8
<b>E. OPERATION</b> .....	8
1. OVERVIEW .....	8
2. RECEPTION MODE .....	8
3. FREQUENCY SELECTION .....	8
4. DF OPERATION .....	9
5. LISTEN-THROUGH .....	9
6. ATTENUATOR .....	10
7. AFC (Automatic Frequency Control) .....	10
8. NOISE LIMITER .....	10
9. AR8600 Mk2 OPERATING MANUAL .....	10
<b>F. AR8600 Mk2 MODIFICATION ISSUES</b> .....	11
1. GENERAL ISSUES .....	11
2. FINE TUNE ISSUES ( <b>*IMPORTANT - MUST READ*</b> ) .....	11
3. USING THE AR8600 Mk2 FOR NON-DF APPLICATIONS .....	11

## LIST OF ILLUSTRATIONS

Figure 1 - DFR-1000B Rear-Panel .....	6
Figure 2 - Properly Configured AR8600 Mk2 Configuration Setup .....	7
Safety Warning .....	Front Cover



## **SECTION I - GENERAL DESCRIPTION**

### **A. INTRODUCTION**

The RDF Products Model DFR-1000B is a compact, self-contained DF receiver and bearing processor/display designed for both mobile and fixed-site DF applications. Frequency coverage is 100 kHz - 3000 MHz, subject to the frequency coverage limitations of the attached DF antenna. RDF Products offers a wide variety of compatible mobile and fixed-site DF antennas in the 20-1600 MHz range.

The DFR-1000B is actually an RDF Products Model DFP-1000B DF bearing processor/display unit that has been electrically and mechanically integrated with an AOR AR8600 Mk2 compact wideband communications receiver, with the AR8600 Mk2 mounted atop the DFP-1000B. In this respect, the DFR-1000B is very similar to the earlier DFR-1000A dual-band DF receiver and its companion DFS-1000 frequency synthesizer that the DFR-1000B replaces. With its much wider frequency coverage, however, the DFR-1000B is far better suited for the wide frequency coverage requirements of most current DF applications. The AR8600 Mk2 can be easily dismounted and disconnected from the DFP-1000B so that the DFP-1000B can be employed with an alternative user-supplied receiver, if desired.

The DFR-1000B employs a 360° real-time polar TFT bearing display that is unsurpassed in dynamic DF environments where either the signal source or the DF station is in motion. This highly intuitive bearing display format greatly aids the operator in discriminating valid bearings from reflections and interference, and is far superior to the inexpensive non-polar azimuth ring displays employed by competing units.

For fixed-site or other applications where remote operation is required, the built-in RS-232 computer interface allows the DFR-1000B to be directly connected to the serial port of any suitable host computer. With the supplied Windows software package (DefCon2b), a true real-time emulation of the polar TFT bearing display is presented on the computer monitor, along with a numerical bearing read-out with resolution down to 0.1°. Other features include signal-strength meter emulation, selectable averaging time, selectable azimuth offset, DF antenna band selection, supply voltage monitoring, and data logging. In addition, DefCon2b includes a full-featured receiver controller capable of operating the AR8600 Mk2 as well as other receivers. Finally, the "open protocol" RS-232 command set allows users to conveniently write their own custom software.

The DFR-1000B features excellent listen-through capability. With most signal formats, undistorted signal audio output is obtainable simultaneously with DF operation. Demodulators are included for AM, FM, CW/SSB with built-in speaker or external headset audio output. Other features include 6/15/30/200 kHz selectable IF bandwidths, bearing display track & hold, multiple selectable bearing integration times, and pulse response down to 35 ms.

Since the DFP-1000B is a major component of the DFR-1000B, the user is referred to the DFP-1000B Operator's Manual for the bulk of the discussion relating to the specifics of radio direction finding operation. This DFR-1000B Operator's Manual addresses primarily overall system issues as well as those relating specifically to the AR8600 Mk2 receiver.

## **B. EQUIPMENT SUPPLIED**

The following equipment is supplied:

1. DFR-1000B Wide-Coverage DF Receiver/Processor (comprising DFP-1000B DF Processor/Display and modified AR8600 Mk2 Wideband Communications Receiver).
2. DPC-030B 3m +13.8 VDC power cable (w/cigarette lighter plug).
3. DFP-1000B to AR8600 Mk2 interface cable set.
4. 3' BNC coaxial signal cable (male to male).
5. 6' serial computer interface cable; DB9 male to DB9 female - wired "straight-through" (2 ea.).
6. Phono male to BNC female adaptor.
7. 4-pin female mobile plug.
8. Dummy audio plug.
9. 5-1/2" Velcro hook strips (2 ea.).
10. 5-1/2" Velcro ring strips (2 ea.).
12. DFR-1000B Operator's Manual.
13. DFP-1000B Operator's Manual.
14. AR8600 Mk2 Operating Manual.
15. RDF Products Publications CD (inserted in DFR-1000B Operator's Manual; includes DefCon2b Windows user software).

## **C. EQUIPMENT REQUIRED BUT NOT SUPPLIED**

A suitable RDF Products mobile or fixed-site DF antenna appropriate for the desired frequency range(s) is necessary (see DFP-1000B Operator's Manual Appendices E and F for a listing of RDF Products DF antenna models and their frequency ranges, as well as the appropriate Product Data Sheets available from the RDF Products Publications CD or website). For 28 VDC aircraft applications, we recommend the Astron Model 2412 or similar commercial 28-to-12 VDC power converter with an output current capacity of at least 3 amperes. For applications where the unit is to be powered from the 115 VAC 60 Hz power



mains, we recommend the Astron Model RS-7A AC power supply or similar. Other models are also available for 230 VAC 50 Hz mains, as well as other commonly-used AC voltages.

If the RS-232 interface feature is to be used, a suitable host computer is required. To run the provided Windows 95/98/NT4/2000/ME/XP software, a Pentium-class computer should be employed with a clock speed of at least 500 MHz for best results.

#### **D. SPECIFICATIONS (for DFP-1000B except where noted)**

DF Technique:	Single-channel Watson-Watt
Frequency Coverage:	Limited only by the frequency coverage of the host receiver and DF antenna
Antenna Band Control:	Up to 15 antenna bands using 4-bit parallel antenna code (bands selectable with front-panel control)
Bearing Displays:	Real-time 360° polar TFT and 3-1/2 digit numeric display
Bearing Resolution:	0.5°/0.1° (local/remote)
Bearing Accuracy:	0.5° RMS
Host Receiver Signal Interface:	10.7 MHz IF, custom IF, or AM audio output
IF Signal Input:	-30 to -127 dBm into 50 ohms
Requirements:	
AM Audio Signal Input Requirements:	15 mV-1.5V RMS with 0-600 ohm source impedance
Host Receiver Delay Compensation:	Up to 5000 microseconds of host receiver group delay can be accommodated
IF Bandwidths:	6/15/30/200 kHz (independently selectable)
Adjacent Channel Rejection:	70 dB typical (using National Institute of Justice measurement procedure)
AGC Figure-of-Merit:	65 dB typical (for 6 dB output reduction)
Maximum Undistorted Audio Output:	>3 watts RMS into 4 ohms (external speaker impedance must be 4 ohms or higher)
Audio Frequency Response:	250-3300 Hz nominal @ -3 dB (measured at headset jack)
Line Audio Output:	600 ohms nominal (unbalanced)
Bearing Integration:	35/50/80/160/200/275/400 milliseconds nominal
Track & Hold:	2.5 second nominal holding time (when enabled)
Power Requirements:	11-16 VDC @ 1.6 amperes maximum (negative ground; includes AR8600 Mk2)
Over- And Reverse-Voltage Protection:	18 volt shunt power zener diode blows fuse
Operating Temperature:	0 to +50 degrees C
Storage Temperature:	-40 to +70 degrees C
Humidity:	0-95% (no condensation)
Dimensions:	7.0"x8.25"x12.0" (HxWxD; includes height of AR8600 Mk2)
Weight:	10 lbs (includes AR8600 Mk2; less DPC-030B power cable)

Note: Specifications are subject to change without notice.



## SECTION II - INSTALLATION AND OPERATION

### A. UNPACKING AND INSPECTION

Carefully examine the shipping carton for damage before it is opened. If damage is evident, have the carrier's agent present, if possible, when the equipment is unpacked. If the carrier's agent cannot be present, retain the cartons and packing material for the carrier's inspection if the equipment is subsequently found to be damaged after unpacking.

To ensure that the shipment has been received complete, inventory all items against the packing list. If a discrepancy is found, immediately notify us.

The equipment was thoroughly inspected and factory adjusted for optimum performance prior to shipment and is therefore ready for immediate use. If evidence of damage during shipment is found, immediately notify us.

### B. INSTALLATION

Installing the DFR-1000B is very straightforward. Essentially, the following steps are required:

1. Install the DF antenna.
2. Connect the DF antenna RF cable to the AR8600 Mk2 rear-panel **ANT** (antenna input) BNC connector (see Figure 1).
3. Connect the DF antenna control cable to the DFP-1000B rear-panel **ANTENNA CONTROL** jack (see Figure 1).
4. Connect the IF signal interface/DC power cable harness between the DFP-1000B and AR8600 Mk2. As illustrated in Figure 1, the coaxial signal cable connects the AR8600 Mk2 10.7 MHz **IF OUT** BNC connector to the DFP-1000B **SIGNAL INPUT** BNC connector, while the twin-conductor DC power cable connects the *upper* DFP-1000B 11-16 VDC power connector to the AR8600 Mk2 **DC 12V** power input connector.
5. Connect the 3m DC power cable from the *lower* DFP-1000B rear-panel 11-16 VDC power connectors to a suitable 11-16 VDC (negative ground) power source (see Figure 1).
6. If desired, use the supplied Velcro strips to provide a convenient means of mounting the AR8600 Mk2 receiver atop the DFP-1000B.

For clarity of illustration, the DF antenna RF and control cables are not shown in Figure 1 (although the connectors for these cable ends are called out).



**Figure 1 - DFR-1000B Rear-Panel**

Note that although the AR8600 Mk2 receives its DC power from the DFP-1000B (so that the user can avoid the inconvenience of having to make two connections to the DC power source), *the DFP-1000B auxiliary DC power connector is neither fused nor switched. Refer to the more extensive discussion of this and related DC power issues in Sections II-B-3 and II-B-4 of the DFP-1000B Operator's Manual for important information.*

Refer to the DFP-1000B Operator's Manual for a more detailed discussion of installation issues in general.

### **C. AR8600 Mk2 CONFIGURATION SETUP**

Although we have pre-configured the AR8600 Mk2 for the user's convenience, the appropriate settings are listed below for convenience of reference:

Verify that the AR8600 Mk2 is set to its normal "2VFO" tuning mode (explained in greater detail below) as indicated by the appearance of "2VFO" on the left side of the LCD display. If this is not the case, press the **2VFO** button so that either VFO A (V-A) or VFO B (V-B) is selected (although both VFO frequencies are displayed, the selected VFO frequency is indicated by the larger frequency numerals).

In general, we recommend that the AR8600 Mk2 be set to its **WFM** reception mode. When set to **WFM**, the receiver AGC (automatic gain control) is disabled, which is preferable for DF

operation. As is the case for tuning increment, **WFM** must be selected for both V-A and V-B. *Once done, turn the **PWR/VOL** control to **OFF** and then back on again to lock-in these settings.*

For reasons discussed in paragraph II-E-2 below, *the AR8600 Mk2 should be configured so that its main tuning dial increments in steps of **10 kHz**.* To do this, press **FUNC**, then **2**, then use the tuning knob or right/left arrows to select the **10 kHz** tuning increment, then press **ENT**.

Once done, press the **2VFO** button to change the VFO selection, from V-A to V-B (or V-B to V-A depending upon the initial selection), and repeat the above procedure to select a tuning increment of 10 kHz. This ensures that the desired 10 kHz tuning step is in force for both VFO selections. *Finally, turn the **PWR/VOL** control to **OFF** and then back on again to lock-in these settings.*

When properly configured, the AR8600 Mk2 display should appear similar to that shown in Figure 2 (i.e., “2VFO”, “WFM”, and “10.0k”). Of course, the entered frequencies will be different than 30.8400/88.0000 MHz.



**Figure 2 - Properly Configured AR8600 Mk2 Configuration Setup**

An exception to this **WFM** recommendation is for applications where the receiver frequency scanning features are used. Since the scanning modes do not work well in **WFM** as compared to other reception modes (e.g., **AM**, **NFM**, **SFM**, etc.), it is better to set up scanning in these other modes. Although the receiver AGC is active in the non-WFM modes, only minor (and likely unnoticeable) DF performance degradation will result.

If the reception mode is changed, *always be sure to verify that the tuning increment is still 10 kHz in the new reception mode for both VFO-A and VFO-B.* If a different tuning increment is displayed, correct this as necessary using the above procedure.

Scanning is a complex topic that is beyond the scope of this manual. Users who are interested in this feature should study the extensive discussion of this topic in the AR8600 Mk2 Operating Manual.

Another exception to this **WFM** recommendation is in applications where the user wants to use the AR8600 Mk2 for listen-through. This issue is discussed in depth in Section D5 below.

Other recommended configuration setups are as follows:

Lamp Mode - The AR8600 Mk2 Lamp Mode should be set for Continuous. To do this, press **FUNC**, then **7**, then use the up/down arrow keys to select **LAMP**, then use the tuning knob or right/left arrow keys to select **CONT**. When done, press **ENT** to exit the menu.

Display Contrast - The AR8600 Mk2 display contrast should be set for the most presentable display appearance (or alternatively can be left at its default factory setting for most applications). To change the setting, press **FUNC**, then **7**, then use the up/down arrow keys to select **CONTRAST**, then use the tuning knob or right/left arrow keys to adjust contrast to suit personal preference. When done, press **ENT** to exit the menu.



Baud Rate - The AR8600 Mk2 RS-232 connection baud rate should be set for 19200 (for compatibility with the RDF Products DefCon2b Windows controller software package. To do this, press **FUNC**, then **7**, then use the up/down arrow keys to select **BAUD RATE**, then use the tuning knob or right/left arrow keys to select **19200**. When done, press **ENT** to exit the menu.

Opening Message Mode - The AR8600 Mk2 Intro Opening Message Mode should be set for Quick. To do this, press **FUNC**, then **7**, then use the up/down arrow keys to select **OPENING MESSAGE**, then use the tuning knob or right/left arrow keys to select **QUICK**. When done, press **ENT** to exit the menu.

The remaining options in the **FUNC 7** configuration menu should be left at their factory default settings in most cases.

## **D. DFP-1000B CONFIGURATION SETUP**

The DFP-1000B requires no special configuration setup for use as the DF processor component of the DFR-1000B other than that the rear-panel IF GAIN adjustment (located behind the rear-panel configuration setup cover plate) should be at its default *maximum gain* setting (i.e., this adjustment should be set *fully clockwise*).

## **E. OPERATION**

### **1. OVERVIEW**

There are fundamentally two components to DFR-1000B operation. The first of these is frequency selection, which (aside from the related issue of DF antenna band selection) is accomplished primarily with the AR8600 Mk2. All operational controls relating specifically to DF are accomplished at the DFP-1000B front-panel (including DF antenna band selection).

### **2. RECEPTION MODE**

IF bandwidth and demodulation mode are established exclusively by the DFP-1000B control settings. In effect, the modified AR8600 Mk2 functions only as a tuner (tuneable down-converter), providing a 10.7 MHz output for the DFP-1000B. As mentioned above, the AR8600 Mk2 should be set to its **WFM** mode for DF operation unless the receiver frequency scanning features are used or unless there is a specific need for AR8600 audio listen-through.

### **3. FREQUENCY SELECTION**

AR8600 Mk2 frequency selection can be accomplished via direct keypad entry, with the tuning knob, or by selecting user pre-programmed memory channels. Refer to the supplied AR8600 Mk2 Operating Manual for a more detailed explanation of receiver frequency selection options.

Normally, frequency selection should be done in the “2VFO” mode. The AR8600 Mk2 has two manually-operated VFOs (frequency selectors; derived from the term “variable frequency oscillator” employed in the early days of radio). VFO A (V-A on the LCD display) is associated with a frequency, reception mode, and tuning increment. VFO B (V-B on the LCD display is similarly associated with its own frequency, reception mode, and tuning increment). As per the Configuration Setup section above, however, the tuning increment and reception mode should be **10 kHz** and **WFM** respectively for both VFO selections.

The active VFO is selected using the **2VFO** button (pressing this button toggles between the two VFOs). The active VFO frequency is displayed in larger numerals (whereas the inactive VFO frequency is displayed in smaller numerals immediately below the active VFO frequency). Having two VFOs can be convenient in that the user can rapidly toggle back and forth between two frequencies.

Regardless of the frequency selection method employed, it is important that frequency selection be coordinated with DF antenna band selection (which is implemented using the DFP-1000B front-panel antenna band selection toggle). More specifically, *the user must verify that the selected AR8600 Mk2 frequency is within the selected DF antenna band at all times*, since out-of-band operation will likely result in greatly diminished DF performance. For single-band DF antennas, this means that the selected AR8600 Mk2 frequency must be within the frequency range of the DF antenna. For multi-band DF antennas, the user must additionally verify that the appropriate DF antenna band has been selected. Frequency and band selection information for all RDF Products DF antennas is printed on the associated serial number label, and can also be displayed on the DFP-1000B.

The newer “B-series” RDF Products antennas contain DF antenna “personality modules” that contain frequency/band information. This information can be downloaded to the DFP-1000B (using its “Ant Check” feature) so that it is conveniently presented on the DFP-1000B display. See DFP-1000B Operator’s Manual Section IV-C-7 for a detailed explanation of this important feature.

#### 4. DF OPERATION

Since the DFP-1000B component of the DFR-1000B is a standard, unmodified unit, the user is referred to the detailed and extensive discussion relating to DF operation in the appended DFP-1000B Operator’s Manual.

#### 5. LISTEN-THROUGH

Signal audio listen-through is provided both by the DFP-1000B and AR8600 Mk2. In most instances, we strongly recommend that users rely on the listen-through audio provided by the DFP-1000B, which provides all controls associated with audio listen-through (volume, squelch, and reception mode). By doing so, the user benefits from the DFP-1000B’s superior adjacent channel signal rejection capability, better IF bandwidth selection, and its superior performance in general.

To avoid confusion and unnecessary distraction, we have “enforced” this recommendation by supplying the AR8600 Mk2 with a dummy audio plug inserted in the rear-panel **EXT. SP** (external speaker) phone connector in order to disable the speaker audio.

There are some scanning applications, however, where it is preferable to rely on the AR8600 Mk2 for listen-through audio. More specifically, if the programmed scan frequency channels are set up for different demodulation modes (i.e., some for AM and some for FM), monitoring AR8600 Mk2 listen-through audio is advantageous in that the receiver can be set up to appropriately change its demodulation mode on-the-fly. This in turn allows undistorted listen-through for both AM and FM signals as appropriate. For such applications, the user can restore AR8600 Mk2 listen-through audio by simply removing the dummy audio plug from the rear-panel **EXT. SP** phone connector.

Of course, setting up the AR8600 Mk2 to dynamically change its demodulation mode on-the-fly requires careful scanning mode setup, which in turn requires that the user carefully study the extensive discussion of this topic in the receiver Operating Manual. In contrast, the DFP-1000B demodulation mode is established by the setting of its MODE/DF RESPONSE switch, and cannot dynamically change as a function of frequency.

Note that the DFP-1000B is mostly “agnostic” with respect to reception mode for DF purposes. In other words, when receiving an FM signal, for example, it makes no difference for DF purposes whether the MODE/DF RESPONSE switch is set to AM/Med or FM/Med. In this case the MODE/DF RESPONSE switch simply selects the appropriate demodulator output (AM or FM) for listen-through purposes.

## 6. ATTENUATOR

The AR8600 Mk2 features an on/off selectable 10-db front-end attenuator which can improve reception when very strong signals are present (although at the expense of sensitivity). To activate the attenuator, press **FUNC**, then **1**. Attenuator operation is indicated by the appearance of **ATT** in the LCD display upper left corner. To disable the attenuator, toggle it off using the same command sequence.

## 7. AFC (Automatic Frequency Control)

The AR8600 Mk2 AFC will result in erratic performance for DF operation and should therefore not be used.

## 8. NOISE LIMITER

The AR8600 Mk2 noise limiter is ineffective for DF operation and should not be used.

## 9. AR8600 Mk2 OPERATING MANUAL

The AR8600 Mk2 is a very capable receiver with many operating features. Although some of these features require considerable time and effort to learn and use, the unit is designed with good human engineering in that the most commonly used features are also the ones that are most easily accessible. Fortunately, DF operation normally requires that only the receiver's most basic features be mastered. Even so, we highly recommend that the user spend some time studying the Operating Manual prior to using the AR8600 Mk2 and retain it as a reference so that more advanced features can be used if the need arises.



## F. AR8600 Mk2 MODIFICATION ISSUES

### 1. GENERAL ISSUES

The AR8600 Mk2 is modified electrically to yield best DF performance when used with the DFP-1000B. *Since these modifications greatly improve DF system performance when the AR8600 Mk2 is used with the DFP-1000B, users should not attempt to substitute an unmodified AR8600 Mk2 for the modified version that is supplied as a component of the DFR-1000B.* A modification label has been attached to the AR8600 Mk2 to identify it as a special “DF-ready” unit suitable for use with the DFP-1000B.

Additional modifications include the construction of a power/signal interface cable (so that the AR8600 Mk2 can be conveniently connected to the DFP-1000B) and the replacement of the cabinet mounting feet with smaller rubber feet so that the unit can be more conveniently mounted atop the DFP-1000B. (The original mounting feet and front tilt bracket are included in the shipping carton so that they can be re-installed if desired.)

Note that the modifications applied to the AR8600 Mk2 are not hardware-specific with regard to the DFP-1000B. In other words, *any AR8600 Mk2 with these modifications can be used with any DFP-1000B.* Also, since no modifications have been applied to the DFP-1000B, it can be used with other host receivers subject only to the limitations discussed in the DFP-1000B Operator’s Manual.

### 2. FINE TUNE ISSUES (\*IMPORTANT - MUST READ\*)

There is an anomaly in the AR8600 Mk2 tuning scheme that the user should recognize. Although the AR8600 Mk2 offers tuning increments as small as 50 Hz, the minimum tuning increment at the 10.7 MHz IF output port (which is the signal interface port to the DFP-1000B) is 10 kHz. As a result, the 10.7 MHz IF output signal presented to the DFP-1000B can be off by as much as 5 kHz, even when the AR8600 Mk2 is optimally tuned onto frequency.

To accommodate this, the DFP-1000B has been equipped with a front-panel **FINE TUNE** control. This **FINE TUNE** control allows for a minimum of +/-5 kHz of frequency offset. When the control’s white marker line is vertical, the DFP-1000B is set very close to its 10.700 MHz center frequency. If the **FINE TUNE** control is rotated fully counter-clockwise to its **OFF** position, the **FINE TUNE** feature is disabled and DFP-1000B tuning is automatically centered at 10.700 MHz. The DFP-1000B display also includes a tuning meter which is a very convenient tuning aid when using the **FINE TUNE** control.

### 3. USING THE AR8600 Mk2 FOR NON-DF APPLICATIONS

Although the AR8600 Mk2 has been modified so that it is expressly suited for DF operation as a host receiver in tandem with the DFP-1000B DF processor, it retains its ability to function for its original purpose as a scanner/communications receiver. For use in non-DF applications, it is necessary only to remove the dummy audio plug installed in the rear-panel **EXT. SP** jack to restore speaker audio and appropriately procure and wire a suitable mating connector for the rear-panel **DC 12V** power connector.

Although the AOR factory-supplied telescoping aerial and miniature broadcast-band ferrite

antenna cannot be used for DF applications, they are included in the event that the user might want them for non-DF applications. <>