FT 2000 Tests and Notes.

N3RD was kind enough to lend me his new radio for testing. Some of these tests are routine to get the general flavor of the radio performance. Some are numbers contesters are interested in and may not show up in the magazines and some are comparisons with the Mark V Field, which has proven to be a fine radio for contesting.

OBSERVATIONS

The FT 2000 is the same size as the FT 1000MP. Radio operation is intuitive, particularly for people familiar with the 1000MP. The analog meter is a welcome addition. The display is excellent. Construction is very rugged with a die cast chassis and lots of shielding. The radio handles very well, particularly on CW. It has front panel controls for the side tone and the key up delay. The CW side tone is excellent. Six meters works very well and there is a second antenna jack available which can be used for this. The band data jack drives a Top Ten decoder correctly and keys the amplifier antenna relay. The rear key jack can be set independently from the front jack. The internal keyer takes precedence over the second keying input. There is no noticeable IF hiss as the antenna noise covers it.

SENSITIVITY Noise Floor, 500 Hz bandwidth, CW

Front end selection	7040 kHz	28040 kHz	50125 kHz
IPO	-126 dBm	-123	-122
AMP1	-136	-135	-134
AMP2	-141	-140	-140

Comment: Sensitivity is excellent and equal to the best radios available.

SELECTIVITY 7040 kHz, CW NAR 500 Hz, 10 dB below AGC, HP8640B
At each point the level is raised 10 dB to measure bandwidth. This is tough on the radio, but it's realistic.

Level	Bandwidth	FT1000MV (Pair of 500s)
0	0 Hz	0Hz
-3	480	250
-6	500	410
-10	525	510
-20	580	570
-30	630	620
-40	720	670
-50	760	710
-60	900	760
-70	2250	1140

Comment: Selectivity is excellent and better than most DSP radios.

DYNAMIC RANGE Tones from low noise crystal oscillators. Tone spacing = 5 kHz. Bandwidth = 500 Hz.

FT 2000	87 dB	3 kHz roofing filter selected.
FT 1000 MV	91 dB	Inrad roofing filter in place.

Comment: Two tone dynamic range is very good.

BLOCKING DYNAMIC RANGE

Weak signal set to 10 dB below the AGC threshold. Strong signal from a low noise crystal oscillator.

Tone spacing	5 kHz	20 KHz	
FT 2000	101 dB	109 dB	3 kHz roofing filter selected.
FT 1000 MV	123	150 dB	Inrad roofing filter in place.

Comment: Blocking dynamic range is not as high as other contest grade radios.

PHASE NOISE

Low noise 7035 kHz crystal oscillator as the reference.

Offset	FT 2000 dBC/Hz	FT000MV dBC/Hz
5 kHz	-122	-120
10	-130	-130
20	-137	-140
50	-144	-147
100	-150	-154

WIDEBAND TRANSMITTED NOISE

FT 2000 and FT 1000 MV measure the same.

Radio in transmit with key up.

Noise = -120 dBm/Hz, or -93dBm in a 500 Hz bandwidth. This requires an isolation of about 43 dB so as not to hear it in a second radio. This level of noise has proven to be of little trouble in a M/M station environment.

POWER OUTPUT

100 Watts on all bands. Internal meter reads slightly lower.

KEYING

Menu Setting	Rise	Fall	Bandwidth at -60dBC
6mS	2.5	2.5	0.7 kHz
4	2.0	2.0	1.1
2	1.0	1.0	1.8
1	0.5	0.5	3.4

Settings of 2 and 1 will give excessive key clicks.

Dots are about 4 mS shorter than the key down time. This is negligible at normal speeds to 50 WPM.

Key down to RF output is 16 mS. The amp ground signal is delayed 2 mS.

Comment: Keying is very good and key clicks are gone for a menu setting of 6mS. It would be even better if it really was 6 mS. (Note that the actual rise and fall times are somewhat shorter than the menu setting would imply.) The 14mS delay between amp ground and RF output should allow direct keying of QSK amplifiers without additional timing circuits.

SSB TALK POWER

White noise applied to the microphone input. Level set according to the operator's manual. Power out set to 100 Watts. Average power measured at 7050 kHz with a Bird Wattmeter.

Setting	Normal	Processor on.	
FT 2000	17.5 W	21 W	Processor set to +10 dB Bw set to 4-26
FT 1000 MV	22.5	45	Compression set to +6 dB

Comment: The speech processor does not increase average power as well as the best contesting radios.

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