are any very high power stations around. Someone running 400W PEP into a high gain antenna pointing across you from several miles away could cause you serious aggro if the Dressler was switched on, even if you had a bomb proof receiving system following it. The calculated intercept point at -22dBm(22mV PD on 50ohms) is easily the worst in the survey, and Dressler will have to improve on it. We should look at both the input levels required for -60dB 3rd order products, and the calculated intercept point which we derived from at least two levels. Looking at all these measurements, the Wood and Douglas *PA3,* and the Moulding were not particularly good either, although appreciably better than the Dressler. Of the remainder, the SEM *Sentinel,* the Microwave Modules and the Wood and Douglas *PA4* were good, with the Datong outstanding. The fascinating point about the Datong is that its onset of IM is remarkably sudden, IPs at lower levels being almost immeasurable, which is absolutely fascinating, and due to the negative feedback circuit employed. Incidentally, the intercept point will apparently be different depending upon how you estimate it, and there is a great danger in getting the wrong apparent point with only one reading. We drew graphs from two or more points to see a reasonable point, but of course this is always an imaginary one, as you cannot actually get a real 0dB figure.

All the preamps in combination with a rig having a bad RFIM performance will not contribute a marked degradation in RFIM, other than that given by the gain of a preamp, but the better your rig is, or the higher the loss between the preamp and the rig, the more important becomes the performance of the preamp.

Overall conclusions

As a double check on the effect of noise figure and gain we interposed each preamp in turn between a Marconi *2019* signal source, delivering 1kHz modulation at 4kHz deviation with attenuators on the output, and the *IC251E* with Mutek front end, as reviewed in the last issue. Give or take a small fraction of a dB, the noted improvement (or degradation) was as expected, with the exception that the Datong gave a significant lack of degradation which required much investigation, for we expected around 0.75dB degradation. Please note that the *251E* front end is already extremely good, and all the preamps would probably make at least a marginal improvement to the average black box with its usual 6 or 7dB noise figure. Returning to the Datong, as the input impedance follows in the same direction as that of the load on the output, and the Icom rig has a very high input impedance, the Datong preamp input would be at a significantly higher impedance, than with the output loaded with 50 ohms. It seems clear that the Datong noise matches slightly better with a 75 ohm, (or higher) output load. What is more important is that the Datong performance may vary considerably depending on the length of line between its output and the effective input of the preamp circuit of the main rig. Making the line longer or shorter might make a dramatic difference to the Datong's input impedance, and so it's worth trying a few different coax leads of different lengths. If you are using the Datong over a wide frequency range, you may find the performance to be better in some frequency bands than others, for the same reason. A half-wavelength at a particular frequency, or a multiple, will reflect the same impedance both ends, whereas a ¼-wave will give the maximum effective transformation ratio.

Taking all measurements into

Table 1: Lab tests & data

1. Gain

Preamp	Gain at 144 MHz (dB)	Gain at 145 MHz (dB)	Gain at 146 MHz (dB)
Dressler *VV200* GaAs	17.5	18.0	17.0
Chris Moulding *MPA-2*	6.5	12.5	16.5
Mic. Modules *MMA144V*	15.0	15.0	15.0
Wood & Douglas *PA3*	22.0	23.5	25.0
Wood & Douglas *PA4*	18.5	19.0	19.0
SEM *Sentinel Auto*	8.2	8.9	9.2

2. Noise figure

	Noise figure at 144 MHz (dB)	Noise figure at 145 MHz (dB)	Noise figure at 146 MHz (dB)
Dressler *VV200* GaAs	1.1	1.0	0.8
Chris Moulding *MPA-2*	2.5	2.4	2.3
Mic. Modules *MMA144V*	1.4	1.4	1.4
Wood & Douglas *PA3*	1.8	1.8	1.9
Wood & Douglas *PA4*	1.9	1.9	2.0
SEM *Sentinel Auto*	5.4	5.0	5.3

3: Datong *RFA* measurements

Frequency (MHz)	Gain (dB)	Noise figure (dB)
10	8.8	5.0
20	8.7	4.2
30	8.7	1.8
40	8.7	1.8
50	8.7	1.9
60	8.7	1.9
70	8.7	2.1
80	8.8	2.2
90	8.9	2.3
100	8.9	2.2
110	9.0	2.2
120	9.1	2.2
130	9.2	2.2
145	9.1	2.6
160	9.1	2.5
170	8.9	2.6
180	8.7	2.7
190	8.8	3.0
200	8.5	3.0