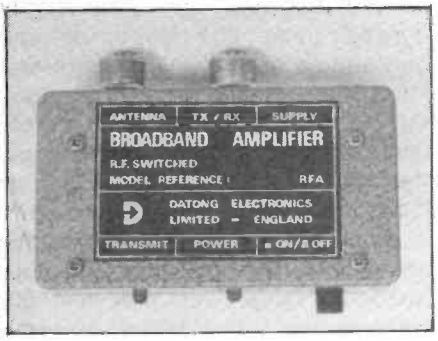

Datong RFA

across the entire band. Please note that the specification, as published in current advertisements, has been a claim of 1dB noise figure and 20dB gain. We are surprised that SEM claim such a gain from a BF981, let alone a noise figure of 1dB from their circuit.

The Chris Moulding preamp gave a useful noise figure, but was so asymmetrical in gain performance that I must infer that it had been poorly aligned.

The Datong *RFA* is an absolutely fascinating product, as it employs the proved negative feedback technique also used by Packer Communications and Mutek. The original principle was written up in VHF Communications. Packer, I believe, was the first to make available a commercial product. In this design the output is, in fact, placed in series effectively with the input source, by using a minute transformer with several windings on it. Datong uses a single transistor, and with 50 ohm output loading achieves a useful noise figure over an extremely broad range of frequencies. The review sample was RF sensed with a small bypass relay, which switched over with an input from a transceiver of only 15mW, but the hold-on time was too short. The two Wood and Douglas preamps were better for noise figure, and the Microwave Modules better still. This preamp was also RF sensed, but most surprisingly required 2.5W to pull it to the straight-through mode. In my opinion, therefore, it is only suitable for FM installations with a minimum power of 3W or so reaching it, or in SSB installations where at least 25W peaks pass through. The hold-time from transmit is very short, which would be annoying. By far the best noise figure was measured on the Dressler VV200 GaAs, at 1dB. This preamp is certainly excellent for almost all applications, as far as the noise figure is concerned, but see comments later on RFIM. We have, incidentally, recently measured an SSB Products model (GaAsFET) at an amazing 0.5dB!

The Wood and Douglas *PA3* had the highest gain, which, however, I feel is excessive, unless you have an incredibly long, lossy aerial cable. The Wood and Douglas *PA4* also had a very high gain, but an internal attenuator of three resistors is provided for in the circuit, and you can change the values to fit your requirement. The Dressler had around 18dB gain and considering it is designed to go at masthead on an installation that would probably be a fairly good one, I feel the gain to be rather excessive. The Microwave Modules *MMA144V* had just about the right sort of gain for a medium quality system, having a few dB cable loss interconnected with an average noisy black box, taking everything into consideration. The Chris Moulding's gain was incredibly assymmetric across the band, having an extremely low gain at the bottom end, and nearly 2½ times the gain at the top end. The Datong, on 2m, had a very low gain of 9dB, but this is very useful, as any more gain would cause problems to broadband receivers, for which it was particularly designed. It will almost certainly hot up a *Bearcat,* without excessively degrading the already poor RFIM. This little unit is so adaptable, and I prefer to regard its RF sensing as a protection device in case you inadvertantly stuff RF through it! The SEM *Sentinel* gain was originally just under 4dB more than its noise figure, when measured at band centre. I suppose it could make a marginal improvement to some deaf black boxes, especially the *Liner 2*.

Bandwidth

The narrowest bandwidth of any of the preamps was in the Dressler. Note the response shown in the table. It will reduce, but by no means eliminate, interference from police transmitters HF of the band, and it could significantly improve the rejection of some annoying strong interference from various strange transmissions below 142MHz. The bandwidth of the Moulding preamp is very sharp indeed, peak gain on the review sample being set at just over 146MHz. If the equipment were properly aligned it would obviously have a very sharp bandwidth indeed which could actually be useful. We did not attempt re-alignment, since the box was sealed. The manufacturer will obviously have to take more care in alignment, for the review sample had a response which was ridiculous. The Wood and Douglas preamps had a reasonably controlled bandwidth of around 6MHz for 3dB points, the response falling reasonably outside this. The Microwave Modules is much wider than I like to see, the 3dB bandwidth covering 25MHz. The 20dB bandwidth is very wide indeed at 83MHz, although the PMR band around 165MHz is quite usefully attenuated. The SEM *Sentinel* had a 3dB bandwidth of 43MHz which is absurdly wide in the context of being claimed as a 2m band preamplifier. The Datong is a very special case, as it is marketed as a very broadband amplifier, having useful gain down to 1MHz. Depending on how you look at this, the LF response is either grossly too extended, or useful. My opinion is that a very steep cut should be built in below 20MHz or so, allowing it to be used for frequencies above this, but keeping out all the very strong lower frequency shortwave signals, and more importantly, medium wave. If you are using an ATU, then this will help a lot, but be careful about attempting to hot up a cheap receiver over most of its coverage, for you may have trouble. You will probably be all right using it on most VHF systems with aerials such as multi element log beams of discones as these reject lower frequencies anyway. Note that the gain is most useful up to well above the specified 200MHz.

It is in the performance field of radio frequency intermodulation that we saw the biggest differences in the preamps, which we found one of the biggest led downs. The Dressler would give a 1μV product from two 21mV ones on the band, and so matters could be very serious if there