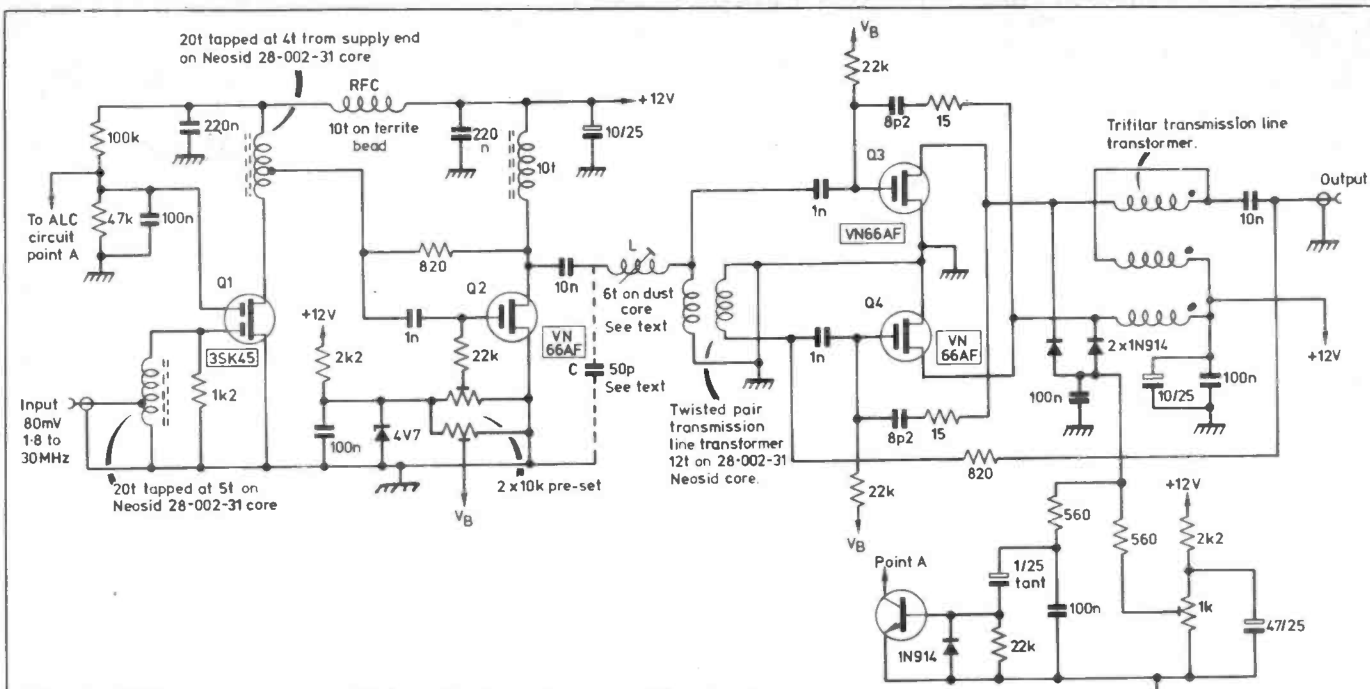

Fig. 2. QRP output stage (5W) of Project Omega. The basic response is 1 to 120MHz but see text.

And some success

One reason that makes me press on with the system outlined above is the unquestionable success that I have had with straightforward single ended and push-pull MOSFET output stages. They are great. They are almost indestructible — SWR protection is completely unnecessary — and they possess excellent linearity with almost total frequency gain flatness. The *Project Omega* QRP output stage is shown in **Fig. 2.** To illustrate a point, the basic circuit with its transmission line transformers exhibits a 3dB point at 120MHz. Voltage gain from the input of Q2 to the output, is flat to all intents and purposes from 1MHz to 100MHz at +26dB. Saturated output power is around 6W with a 12V supply.

The intended application called for a total voltage gain of around 50dB or perhaps slightly less. At the same time, a voltage controlled gain element was required for ALC and drive control purposes. The dual gate MOSFET Q1 was added to provide this. Although the broadband stage gain is around 23dB on the lower HF bands there is some rolloff on 15 and 10 metres. This is due, in the main, to the self capacitance of the 3SK45 device. Rather than add a further transistor to the strip, I decided to sacrifice the gain flatness of the power MOSFET parts by putting in a peaking network between the driver and output stage. This puts a bump in the gain towards 30MHz. The 'C' part of the peaking network is made up of the capacity between the drain tab on Q2, the insulating washer and the heatsink. I should have said before. The standing current of Q2 is in the region of 200mA (Q3, Q4 total 100mA) to that things would get too hot without a heatsink used for these devices.

The design of the PA strip will be covered in greater detail within our *Project Omega* series, probably in the October issue of the magazine.

23cm superregenerator

Once again, this project falls into the category of "in need of further development" but is interesting all the same. What I have in mind is this: a cross town chat box using 23cm operating frequency, around six transistors (cheap ones) an audio IC and not much else.

The people who are used to buying their Japanese technology off the shelf of their local 'emporium' will probably pour buckets of scorn of the idea of an AM (yes, amplitude modulated) superregenerative (SR) transceiver for the band. I say, stuff them. It's great fun making something simple once in a while and it should be a quick way of filling the 23cm amateur band with signals before the Ministry of Defence takes it over for good.

This type of circuit has got itself a very bad name beacuse a) it tends to radiate and b) has a selectivity about as wide as a barn door. What may not be appreciated is that the basic circuit is highly sensitive and also enjoys a commendable level of automatic gain control. What I propose is the construction of a Gigahertz SR set brought bang up to date with modern components. My aim in writing this is to prod someone else into a few experiments so that I have got another station to work, preferably in the Haywards Heath, West Sussex area! First, I will refresh a few memories about how SR detectors work.

The principle

The basics of an SR system is shown in **Fig. 3.** A high Q, low loss tuned circuit is closely coupled to the input of a low noise amplifier. Part of the output of the amplifier is coupled back to the input tuned circuit, the tank, in phase. The amount of coupling, in phase with the input, is adjusted to maintain the circuit in oscillation but no more. A third winding, this time closely coupled is used to inject signal energy into the tank circuit.

There are two remaining elements to an SR system. The first is a low frequency (1MHz) quenching