

THE
SARC
MAGAZINE

Issue 8 - January 1986

From your Chairman

Now that the hiatus of Christmas is behind us, I hope that each member will make a belated New Year Resolution to contribute something positive to SARC during 1986. There is certainly no shortage of tasks awaiting action - high priority must be given to the recruitment of new members, and your committee would welcome the involvement of everyone in a concerted effort to achieve this important objective.

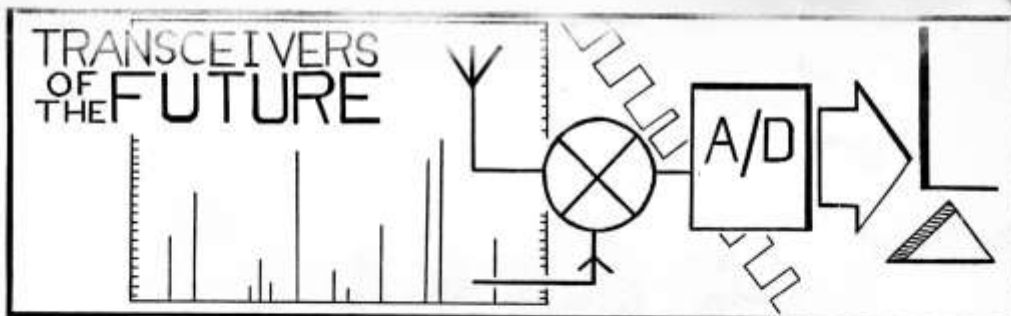
Forward planning must be undertaken as we move towards the contest season and consideration given to filling those blank spaces on the Club's Calendar of Friday night activities.

The recent DTI announcement confirming our acquisition of a new frequency allocation at 50 MHz surely adds credence to the belief that Amateur Radio is still an expanding hobby.

I therefore wish you all a prosperous new year and hope that we may witness real growth within the Club during 1986.

Steve, G4BWE

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Twyford House, Lower High Street, Shirehampton, Bristol.



Within only two frantic decades we've witnessed the valve being replaced by transistors and the emergence of rigs which contain large scale integrated circuits (lsi) such as the ubiquitous microprocessor. When studying the numerous features offered by a contemporary hf transceiver like the Yaesu FT-757GX, we might be excused for thinking that the big Japanese manufacturers are now telling their top designers to take a long and well deserved holiday... But nothing, I suspect, could be further from the truth and it's probably fair to say that "we ain't seen nothing yet!"

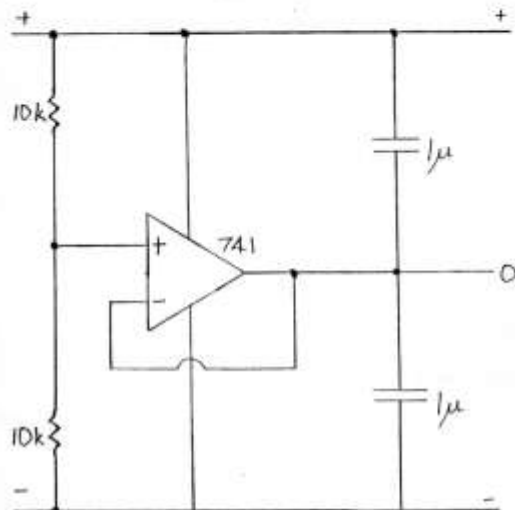
Firstly, it is important to remember that the receiver section in virtually all present day transceivers is provided with just one output device; namely a small, moving coil loudspeaker. Furthermore, signal processing remains entirely analogue and comprises merely amplification, mixing, filtering and automatic gain control. Consequently, the only modes in which the current rig is entirely self-supporting are phone (ssb, fm and possibly am) and cw. Microprocessors are mainly employed in the frequency synthesizer, but may also act as system manager for various control functions, e.g. mode and band change. In order to achieve transceive capability in rtty, amtor, data and stv, specialized peripherals are currently required such as the teletype terminal unit, which is a form of modem (modulator/demodulator). The home computer has caused something of a revolution here and it can provide many useful facilities:

- (1) Running software which both generates and decodes the modes listed above.
- (2) The display of messages (or images) sent and received on a tv screen.
- (3) Provision of an alphanumeric keyboard to enter messages and control words.

This use of home computers in amateur radio provides a clear indication of likely trends in transceiver design over the next two decades. The higher speed and greater processing power of projected microprocessor systems, plus the emergence of array processors and the Inmos transputer means that there is absolutely no reason why future rigs cannot have all conceivable modes built-in. There will then be no need for the separate terminal units, computers and untidy connections necessary at present. But what happens if a new mode or transmission standard is introduced following the purchase of such a rig? Simple; every transceiver will be fitted with sockets so that small ROM (read only memory) modules containing additional software may be added at any time. Indeed the keyword will be flexibility - although it's probably wise to bear in mind that some manufacturers may still try and introduce a degree of built-in obsolescence for purely commercial reasons! The rig's loudspeaker will be complemented by a sophisticated, front panel display, measuring approximately seven inches across. In order to save space, a flat screen - possibly of the plasma type (see Wireless World, July 1985) could well be employed, but the problems associated with manufacture of this precision component at reasonable cost, plus the undoubted requirement for high resolution and full colour, cannot be overestimated. Aside from message display, the screen will provide frequency read-out, S-meter and power level indication plus all the other relevant information, e.g. mode and transmission speed. There will be a wide choice of display formats and special options might include panoramic spectrum monitoring, so that you can gauge at a glance, the relative strength and spacing of all signals occupying a particular band. Although building everything into a single box makes good engineering sense, it is probable that for ergonomic reasons the keyboard will be made separate.

A simple power supply

Sometimes while experimenting, it is necessary to provide a split power supply, for example +/-9 volts. This simple circuit below will do this from a single-ended supply.



The non-inverting input of the 741 is at half the supply potential, so for example if the input is at 20 V, the three output terminals will be +10 V, 0 V and -10 V.

Component values are not critical, the only critical point is that the two resistors should be matched. If the input is connected to a variable psu, a maximum input of 36 V can be applied, yielding +/-18 V. As the input from the variable psu is reduced, it can be seen that the positive and negative outputs fall accurately.

Dave, G4DPJ

Tranceivers

Running parallel with the developments already discussed will be the introduction of the digital signal chain. Digital receivers are just beginning to appear in the professional sphere (see TechTopics, RadComm, May 1985 for a description of the Collins HF2050) and the digitization of the signal at the point where it emerges (on receive) from the output of the first mixer offers mind boggling possibilities!

In digital signal processing, software (a sequence of essentially mathematical instructions stored within the system) literally replaces physical components such as the IF crystal filter. Once again, flexibility is one of the major advantages realized and it will be possible to modify the rig's performance using keyboard commands - so in the year 2000 it won't be necessary to purchase an expensive CW filter, you'll just type in "BW 250 Hz" instead!

Steve, G4BNE

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EVENTS

24 January

Inside the FT-757GX

31 January

Chat evening

7 February

G4BWB tv spectacular

14 February

Chat evening

21 February

To be announced