

received and recognised 21 successive blocks. Further checks are done by both stations in case the sync blocks were due to random noise, before the QSO proper starts.

AMTOR modes

The method of AMTOR operation just described is known as ARQ (Automatic Request) and gives rise to the familiar chirp-chirp signal heard on the air. Another mode known as FEC (Forward Error Correction) is available in which the 7 bit codes are sent twice, and the receiving station computes which is less likely to contain an error (by using the fact that the ratio of 1's to 0's should be 4:3 in each character). Up to half the received codes can thus be in error before errors occur in the output. The second transmission of each character is delayed relative to the first so that a prolonged fade or burst of QRM will only result in one transmission of several characters being mutilated, rather than both transmissions of a few adjacent characters. If both transmissions are mutilated the receiving system suppresses printing completely.

ARQ is very much better than FEC in terms of least received errors. However, FEC is needed because with ARQ, only two stations can take part, whereas with FEC one station can transmit to any number of others.

The AMT-1

With AMTOR now permitted in many other countries, including the USA, its use has increased noticeably over the past year or so. ICS has come into the market with a very useful piece of equipment designed to interface with a home computer or ASCII Terminal, and

gives fairly instant AMTOR operation for anyone requiring it.

The *AMT-1* comes in a professionally finished low-profile case, which must be unique in amateur circles by not having a single knob or button on the front panel. Instead, a long row of LEDs, hidden behind a translucent panel cutout show the status of the unit at any moment — the control over the unit being via the computer keyboard of course.

The status displays are split into three parts — on the right hand side are four red LEDs indicating which of the four principal modes the *AMT-1* is in (ARQ, FEC, RTTY, CW — yes it copies those as well!). In the centre is a tuning display with a high frequency signal appearing at the left of the display, and low at the right. When correctly tuned to RTTY, the display lights continuously. The remaining LEDs comprise a status display, with RQ, ERROR, TRAFFIC, IDLE, OVER, PHASE, STBY 1, ESC and SEND indicators.

There are a number of internal adjustments which can be made to suit your own set-up and these are very fully described in the manual.

It requires +12V DC for operation, introduced via a coaxial socket on the rear panel, which also has two DIN sockets for connecting the terminal and transceiver. Full details of the connections are given in the comprehensive instruction manual which accompanies the unit, together with a set of plugs and leads for interfacing. A very useful summary card which can be placed by the operating position is also provided — this saves delving through the main manual when first learning to drive the unit from the keyboard.

One point to note, which is fully explained, is the need for a reasonably fast changeover from transmit to receive on your

transceiver. If this takes longer than 50mS, then the unit will not operate correctly in ARQ mode, and a much shorter changeover time is in fact preferred. The shorter the delay the longer the distance that can be worked. The reason behind this is that radio waves take a finite time to travel and the ARQ mode allows a maximum of 170mS for the radio signals to travel from one station to the other and back. If there were no other delays, this would give 170 x 300km between ARQ stations or 25,500km. Thus ARQ will not work at greater distances, and any additional delays will reduce this figure. With changeover delays of 10mS at each end, it is just possible to work from one point of the globe to the opposite point on the Earth's surface.

A number of hints on reducing these delays are given, together with a list of rigs which are known to work. Most modern transceivers are covered.

The internal appearance of the unit could not be faulted, and ICS are to be congratulated on a fine piece of workmanship.

G3WPO

THE AMT-1: an owners review

The *AMT-1* Unit contains everything that is needed to convert an amateur station into a fully operational data communication system with optional error correcting facilities. I use it myself with the Commodore *VIC 20*, having an RS232 interface plugged into the user port of the *VIC 20*. There are

Typical AMTOR copy

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CQ CQ CQ CQ CQ CQ CQ CQ DE G3RDS G3RDG G3RDG G3RDG G3RDG G3RDG PSE KK
CQ CQ CQ CQ CQ CQ CQ CQ DE G3RDG G3RDG G3RDG G3RDG G3RDG PSE K K
CQ CQ CQ CQ CQ CQ DE G3RDG G3RDG G3RDG PSE K K K GJGJGJUEXUXDC
G3RDG GJYH3RDG G3RDG DE UBSUCT UBSUCT OK R U RST 5NN 5NN =MY QTH
IS KIEV KIEV KIEV = NAME IS G EG T E GEORGE GEORGE = G3RDG G3RDG
DE UBSUCT UBSUCT FGHDFGGGF RRRRRRR UBSUCT UBSUCT DE G3RDG G3RDG
R R R R OK OM I COPY. NAME HERE IS KEN KEN KEN KEN. QTH IS LONDON
LONDON . RST 589 589 589 OK ? UBSUCT UBSUCT DE G3RDG G3RDG KKK
DE UBSUCT OK MNY TNX FER CALL MY BEDFSFST 73 73 G3RDG DE UBSUCT
KN DE G3RDG VA VA
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