

ASTRID

Automatic Satellite Telemetry Receiver & Information Decoder



DATA FROM SPACE!

ASTRID is a COMPLETE Satellite receiving and decoding package that allows data from UoSAT satellites to be displayed on your home computer, via it's serial interface. The UoSAT "birds" transmit masses of information, all of which can be assessed free of charge without even a telephone bill! Behind the scenes news of the latest rocket launches, what really happened to that new weather satellite, has that Russian spacecraft Radio Sputnik 2 finally given up the ghost? The news bulletins are full of interesting gen. There is also lots of info on UoSAT 1 and UoSAT 2 themselves, and what's happening about UoSAT 3.

The UoSAT 1 weekend NEWS BULLETINS let you know exactly what experiments are being conducted and why. They tell you what the satellites will be doing over the coming week, on a day to day basis.

SATELLITE STATUS AND EXPERIMENTAL DATA is sent in data block format, which can be decoded with a look-up table, or with a computer. Software is available from AMSAT UK (The non profit making organisation for amateur satellite enthusiasts in the UK.) Sensors on the satellites feed information into the spacecraft computer enabling the data to be generated. Currents, voltages and powers in various critical areas are monitored; i.e. Solar Array current, Battery voltage, Transmitter O/P power and spacecraft Computer current. Temperatures on all planes of the spacecraft and many individual units are also indicated. Other sensors measure radiation levels, magnetic field levels, sun position, horizon location, and levels of space dust particles encountered. In all there are 60 data channels being transmitted by each of the UoSAT satellites.

Messages on the ELECTRONIC MAILBOX system can be read. These messages are sent by licensed amateur radio transmitting stations as part of the DIGITAL COMMUNICATIONS EXPERIMENT (DCE) to investigate various packet radio protocols for future electronic mail systems.

ORBIT INFORMATION is sent about UoSAT 1 and 2 (also about other communications and weather satellites) enabling times of passes and positions in the sky to be predicted. Standard computer programs, as available from AMSAT UK, can be updated using this up to the minute data to enable very accurate predictions to be made.

The DIGITAL TALKER SPEECH TELEMETRY experiment demonstrates how simple ground station equipment can be, the spacecraft computer speaks all the data; real voices from Space stuff but obviously very slow compared with the four seconds taken to send a 1200 baud data block of 60 channels!! UoSAT 2's digtalker has an extended vocabulary so that it is even capable of reading the news.

The on board TV CAMERAS are of the CCD type (Charge Coupled Device) and the data is transmitted in digital format (rather than the analogue systems used on the present weather satellites). UoSAT 1's camera does not work very well so all future pictures will be from UoSAT 2. As this is being written the camera is being set up to get the most out of its 384 by 256 pixel resolution with 7 grey scales. The easy way to resolve the greys is to use different colours and then turn the colour control on your TV down.

UoSAT DATA SHEETS are available from the University of Surrey (UoSAT), Guildford, Surrey, GU2 5XH giving full information on the satellites. Answerphone services for news and orbit data are on Guildford (0483) 61707 for UoSAT 1 and Guildford (0483) 61202 for UoSAT 2.

Books, software and information are available from AMSAT UK, c/o Mr. R. Broadbent, 94 Herongate Rd., London, E12 5EQ. Please send large stamped self addressed envelopes for details.

TECHNICAL DETAILS

ASTRID is a vhf radio receiving system which converts signals received from the UoSAT satellites on 145.825 Mhz, into data tones. These tones can be recorded automatically by a standard tape recorder, using the remote microphone facility. If the tape recorder is operated on batteries then no power is consumed by the tape recorder on "stand-by" as the remote control switches the battery output.

The data tones can be fed back into ASTRID to be converted into digital ones and noughts for driving the serial port of your computer. (1200 baud TTL signals ASCII text, format 1 start, 7 data, 1 even parity, and 2 stop bits.)

The antenna comes complete with 8 metres of 75 ohm standard TV feeder and plug. It does not need to be moved to follow or "track" the satellites. ASTRID is so sensitive that a large steerable antenna is not required.

A squelch control is provided so that when no signals are being received, the volume control does not have to be turned down to stop the loud hissing noise. As soon as signals are received the audio will be heard from the loudspeaker.

The power supply unit plugs into the mains and gives about 16 volts dc for feeding into the ASTRID unit.

An extension loudspeaker socket is provided, this mutes the internal loudspeaker when used.

Signals may be decoded "live". If no plugs are inserted into the MIC and EAR sockets of ASTRID, the hardware decoder is automatically connected in circuit and TTL data will appear at the TTL socket. For best results the antenna should be adjusted to minimise pick-up of interference from the computer.

When the decoder is being used, if ASTRID receives a live signal from a satellite this may be recorded from the MIC socket on a separate recorder without affecting the operation of the decoder.

The volume control on ASTRID is independent of the record level. The volume control setting of the tape recorder is not critical as ASTRID has an automatic levelling circuit on the decoder input.

SPECIFICATIONS

Receiver Type	:	Dual conversion superhetrodyne
Frequency	:	145.825 Mhz nominal
Bandwidth	:	12 khz
Sensitivity	:	0.2 microvolts for 10 dB S/N ratio
Audio Output	:	0.3 watts into 8 ohms
Aerial Impedance	:	75 ohms
DC Power consumption	:	100 mA standby (at 16 volts)
Remote switching	:	Up to 2 amps at 24 volts
O/P level to tape	:	50 mV p/p approx (from 47k source)
Decoder I/P level	:	200 mV p/p minimum
TTL O/P	:	Collector O/P with 1k pull up.

The COMPLETE ASTRID SYSTEM consisting of Receiver/Decoder unit, Power supply unit, Aerial and feeder, Test tape, Manual and all connecting leads is available price £149.00 fully inclusive from;

M M Microwave Limited,
Thornton Road, Industrial Estate,
PICKERING,
North Yorkshire.
YO18 7JB
Tel. (0751) 75455.

