TABLE 3

Orbital Parameters

	OSCAR-8	*OSCAR-9*	*RS-3 to RS-8*
Period (minutes)	103.223	95.3	118.519 to 119.765
Longtitude increment (degrees)	25.807	23.86	29.7566 to 30.0683
Inclination (degrees)	98.898	97.46	82.9542 to 82.9629
Mean altitude (kilometres)	910	550	1633 to 1675

shared between all relayed signals, transmissions could be only a few milliwatts per signal. The performance of most amateur band HF receivers falls off in the 10 m band particularly at the high end. A simple low noise preamplifier to provide about 20 dB of gain will greatly improve reception.

ANTENNAS FOR SATELLITE COMMUNICATION

A simple dipole or ground plane aerial will enable good signals to be heard from the nearer passes but for serious DX sork at horizon distances, a low angle beam of some kind should be considered. Simple and compact beams with good gain for their size are the HB9CV and ZL-special designs. A compressed version of the latter will be found in Short Wave Magazine, September 1972. For the near overhead passes, a fixed dipole running north-south, or crossed dipoles will be sufficient for 10 meter reception.

OSCAR-9 and transmissions on 2 meter uplinks can be expected to be adequate if the beam is correctly aimed. A small amount of elevation on a 2 m beam can be advantageous for terrestrial as well as satellite communications; typically an elevation of about 15° on a six element beam gives quite an improvement. For the very high angle passes there is frequently sufficient RF off the side of the beam, but a dipole, or crossed dipole mounted above a reflector gives better results.

POLARISATION

A satellite in orbit without a sophisticated stabilization system will roll and tumble due to external influences of solar and terrestrial origin. The orientation of the satellite's aerials, as seen from the ground, change in direction. The polarization to cater for all orientations is circular. Good results can be obtained with horizontal or vertical polarization alone for most of the time but fading could be troublesome. Better reception can be obtained by having both horizontal and vertical polarization available and switching between them to select the strongest signal. Some satellite's aerial systems are circular polarized, ground stations using the same sense of circular polarization will show some signal advantage when the satellite aerial is pointing towards the observer.

Other times selected linear polarization will be better, the best all-round results will be achieved by the station who can switch between horizontal, slant, vertical or left or right hand circular polarization; a means of obtaining these options from a crossed yagi array is detailed in the RSGB VHF/UHF Manual. Polarizations used in current orbital systems are shown below.

BAND PLANS

As with other amateur allocations, there are band plans for the orderly use of the space sections of the downlink bands. (See figure 4).

It is essential that terrestrial QSO's are not held on satellite channels, a large number of DX contacts have been ruined by ignorant operators holding local QSO's on satellite channels. They fondly believe that because they are not members of AMSAT or RSGB they do not have to comply with channelising or other protocols concerning Ham Radio.

RANGE OF COMMUNICATION

For a station at sea level in the British Isles, the horizon distance to OSCAR 8 is approximately 3740km, equivalent to a ground distance of

TABLE 4

Satellite Aerial Polarizations

System	Polarization
OSCAR 8: 2 m uplink, mode A	Left-hand
OSCAR 8: 2 m uplink, mode J	Right-hand
OSCAR 8: 10 m downlink	Linear
OSCAR 8: 70 cm downlink	Linear
OSCAR 9: 7/14/21/29 MHz	Linear
RS3-8: 2 m uplink	Linear
RS3-8: 10m downlink	Linear
OSCAR 9: 2m/ 70cm/2.4 GHz/10 GHz	Left-hand

Circular polarization for OSCAR 8 only is true for northern hemisphere and reverse for the southern hemisphere.