

pole now marks the zenith, and the grid now represents the horizon system. The lines now represent Azimuth Circles and Parallels of Equal Altitude

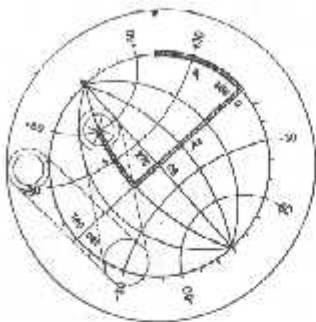


Figure 2. ARG grid at horizon system in zenith mode
Latitude = $4(N) 50^{\circ}$
Altitude = 60°
Azimuth = 120°

Description Of The ARG1 And Accessories

The instrument (see photographs 1 & 2) has a diameter of 21.6 cm, a height of 19 cm and weighs 1.8 kgs. The front of the instrument is an alloy ring with a central plate-glass window of 10 cm diameter, through which the grid is visible. This grid is a photographic transfer on glass. The original drawing for the grid was made on a quadrant of one metre radius, and co-ordinate points were put in for intervals of 2° by means of a Zeiss stereo-comparator. Straight lines were then connected between adjacent points (the inaccuracy due to straight rather than curved lines does not exceed 0.5 minutes of arc). Intermediate lines were then interpolated and the quadrant was then photographed in four positions to form a master negative. Subsequently, over 4000 numbers were put in by hand. The declination circles are inscribed on the grid at 10 minute intervals, (as are the time angle circles) up to 60° of declination. Time angle and azimuth is figured from 0 to 180 degrees (right to left and below the equator line) and from 180 to 360 degrees (left to right and above the equator line) for the western celestial hemisphere. Near the poles the intervals of time angle become 30' at 60° , 1° at 80° , 2° at 86° , 5° at 88° and 10° at 89° . On the alloy ring is a focusing fixed microscope (1) of x14 power which enables the latitude to be set on a scale marked from $+90^{\circ}$ to -90° at intervals of $10'$, interpolation being possible to $1'$. The latitude is set (and the grid therefore rotated) by turning a knob (4) which is set diametrically opposite the fixed microscope. Connected to the housing of the fixed microscope by an elbow joint linkage (5) is a focusing moveable microscope of x28 power (2) which can be moved to any part of the grid over the plate glass window, and by which the grid co-ordinates are set and read after grid rotation. Fine adjustment of the moveable

microscope is obtained by operation of the two knobs disposed at right-angles to it (3), in order that the cross in the field of view can be synchronised with the desired co-ordinates. The bottom of the moveable microscope has a spring-loaded cap which is covered with soft leather and which bears on the plate glass window. This tends to both keep the window free of dust and adds a little friction to maintain the moveable microscope in position once it has been set. The markings on the grid enable settings to be made accurately to $10'$ and by estimation to $1'$. Since on moving the grid the cross in the moveable microscope will not be parallel to the lines on the grid, a rotating spring-loaded ring is provided which rotates the cross about the optical axis of the microscope thus enabling the arms of the cross to be set temporarily parallel to the grid marking for ease of reading.

Shown in Figure 3 is the view through the moveable microscope with a typical reading of Hc $-44^{\circ} 13'$ and azimuth of $69^{\circ} 51'$.

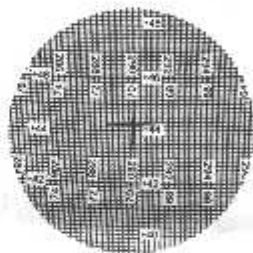


Figure 3 - View through moveable microscope.

The rear face of the instrument is a bakelite moulding (6) provided with a circular indented handle, in the centre of which is fitted a detachable lamp-holder (covered by a red filter), and reflector, which provides 24v illumination inside the instrument. On the rear face of the instrument is a two-pin plug used for the electrical lead (7) and a rheostat (8) for controlling the brightness. On some instruments the rheostat is omitted and the lamp is connected to a 2.5v supply or to a small accumulator provided in the storage box.

Mounted on the front face of the instrument are five plaques.

Identification Plaque

Astronomisches Rechengerät.	= Astronomical Calculator
Gerät Nr.	= Part No.
Anforderz.	= Requisition No.
Werk Nr.	= Serial No.
Hersteller.	= Manufacturers code (bic = Zeiss)

Instruction Plaque

Stelle Breite auf -90°	= Set latitude to $+90^{\circ}$
Stelle Gest. Zeitw. (...) und Abweichung (...) ein.	= Set time angle and declination
Stelle Breite des astr.	