Interoffice

National Radio Astronomy Observatory

Very Large Array   June 15, 1981

THE ESSCO CONTRACT

To: C. W. Findlay, H. Hvatum

From: W. Horne

Subject: Response to Memo #48

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1. Since JWF states in Memo #48 that he proposes to accept in essence
    ESSCO document D81-15 down to a point 7 lines from the end of page 13
    I feel sure John intends to take the same exception that I have in
    that I see no justification for computing any overall aggregate RMS.
    This kind of figure juggling is superflows and is only useful in
    trying to secure acceptance of a few panels which do not meet the
    agreed panel RMS which will be written for individual panels. I
    would prefer to leave to the discretion of the AUI inspector whether
    or not a few panels which marginally exceed the contract RMS would
    be accepted.

2. I take exception to the subtraction of the average deviation for a
    panel from the measured deviation in the computation of the RMS for
    that panel. If this is permitted it would require that a history of
    each panel be utilized in panel setting so that the average deviation
    curve for individual panels are made to coincide with the design curve
    for the antenna. THis of course could be done by prior calculation of
    offsets required at the control points during the setting program. My
    main objection to the subtraction of the average deviation in the com-
    putation of the RMS however is that it brings up the danger of one row
    of panels having a curvature greater than the design curvature while
    the other row has a curvature less than the design curvature (due to
    mold fabrication) yet when the average deviation is subtracted out
    the panels would meet the specification. We would then have one row
    of panels with one focal length and the second row with a different
    focal length. It will be recalled that the 140' telescope panels were
    accepted based on a subtraction of the average deviation in RMS com-
    putation and we ended up with focal lengths of 713 inches for inner
    panels, 717 inches for intermediate panels and 720 inches for the outer
    panels.

3. On page 13 of the ESSCO document the statement that Cos θ accounts for
    the fact that the path length change is twice the axial component of
    the deviation measured perpendicular to the surface is pure baloney.
    Since the deviation is measured perpendicular to the panel slope angle
    θ the actual path length change is twice the measured deviation divided
    (not multiplied) by the cosine of the slope angle θ.

4. Note that ESSCO uses tooling holes in both mold and panel which are then used to locate the panel on the measuring machine. These tooling holes must be the prime control points, must have the same antenna coordinates for each type of panel and all other points on the panel are related in the measuring machine to these points.