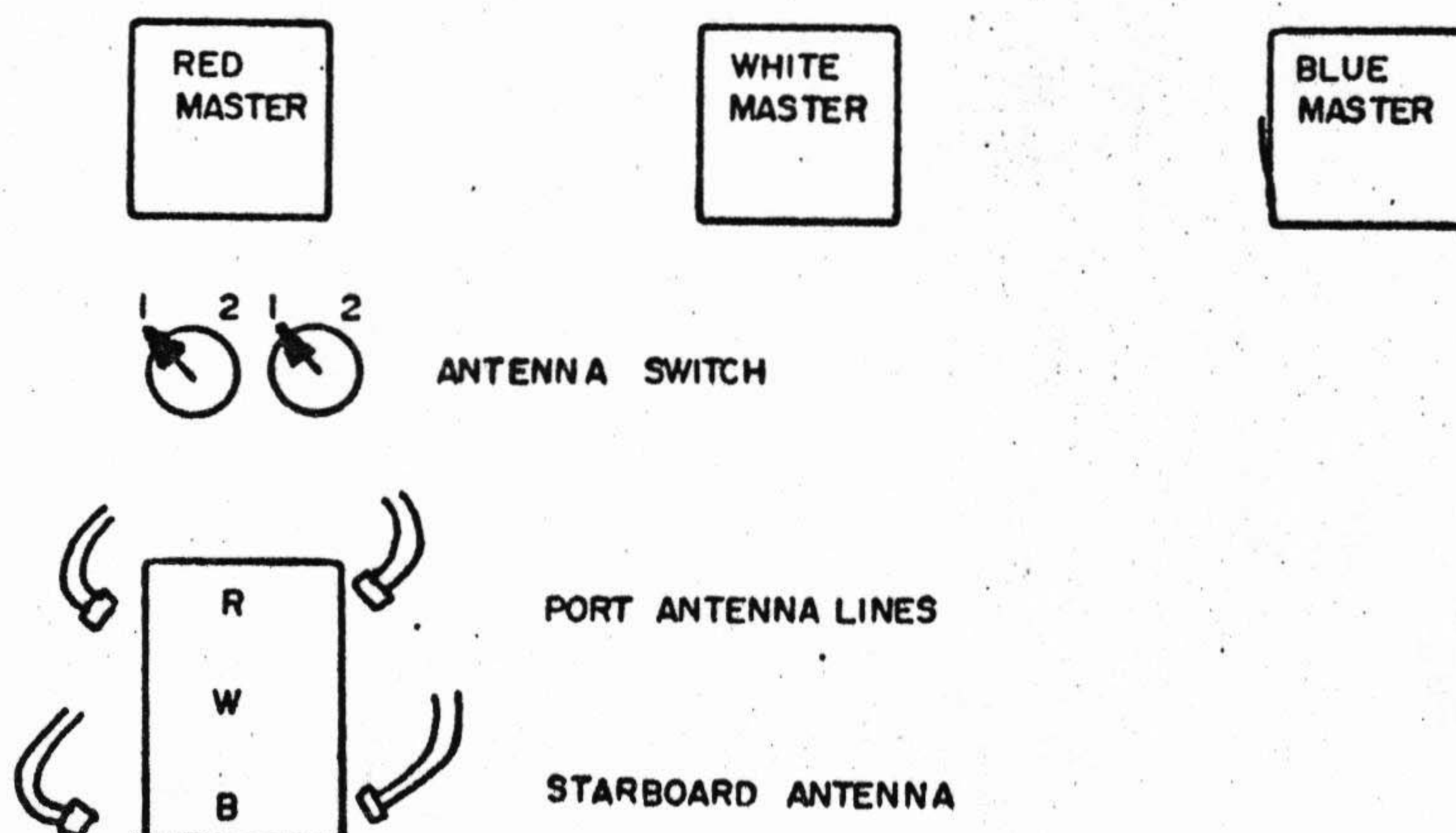


GUIDANCE NOTES FOR AERODIST MASTER OPERATORS

PRELIMINARY

1. Check psychrometer bottle for water and check evaporation sock for wetness before take-off.
2. Switch on aerodist master, chartrecorder, intercom, radio and psychrometer as soon as aircraft is airborne. Master equipment requires 20 minutes to warm up.
3. Check for crystal current after a few minutes - tweak triode if necessary for maximum reading. Kylstron tune should be approx at the centre of its run (ie. about 7 turns from either end).
4. Check master mods after warm up time - A75, B75, C75, D65.
5. Get the remotes switched on to H.T. 15 minutes before they are required. Tune in and check for performance whilst ferrying into the measuring position, if possible.
6. Check the A,B,C and D crystals visual displays on both units.



7. Adjust the "topping and bottoming" of the chartrecorder channels.
8. Check chart for quality of trace and correctness of aircraft headings.

TONES AND MOD CHECKS TO REMOTES

a) Tones (instruments in measure mode)

Master switches to D.

Remote switches to D tone position and adjusts switching level until D goes negative.

Master stays on D.

Remote switches to A and remote adjusts switching level so that A reads 15 - 25 on meter.

The same procedure can be used to clean up B and C if one is in doubt.

: 2 :

b) Mods.

Remote goes to MOD.

Master switches to A.

Remote adjusts A mod to read 75 then asks master for B.

Master switches to B.

Remote adjusts B to read 75 then asks master for C.

Master switches to C.

Remote adjusts C to read 75 then asks master for D.

Master switches to D.

Remote adjusts D to read 65 and informs master.

TO ADJUST SWITCHING LEVELS AND MODS IN MASTER.

If it is suspected that the master is not switching a pattern in, i.e. not switching on either channel, then adjust the tone levels.

Go measure and turn function switch to mod.

Select A on pattern switch and adjust the mod with a screwdriver to read 75.

Select B on pattern switch and adjust B mod to minimum.

Adjust B tone gain control to 15-20.

Readjust B mod to 75.

The signal now comprises 15-20 tone and mod 75.

Repeat this for C - 15-20 tone and mod 75.

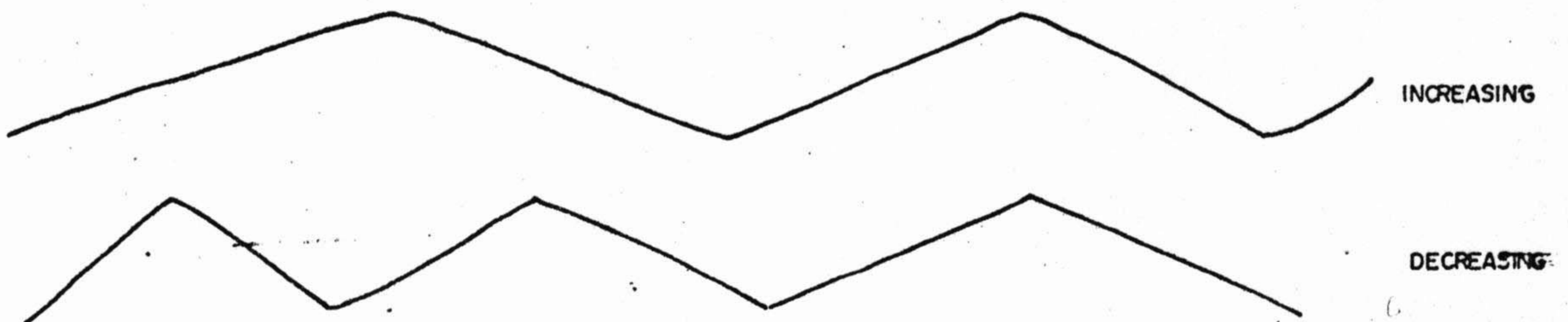
Repeat for D - 15-20 tone and mod 65.

AIRCRAFT HEADINGS

As soon as the aircraft is lined up to come into the crossing position and sufficient signal strength is obtained, briefly check the chart to determine aircraft position in the sky. If equipment adjustment is necessary, determine where the crossing is and ask the pilot to fly backwards and forwards on long runs until the units are set up. This is quite important as the aircraft may fly out of the effective heading range of remotes whilst equipment is being set up.

flatter than the decreasing trace.

E.g.



However, if both the traces are decreasing at the same rate, change heading until one turns over and steepens. Continue until the decreasing trace is twice as steep as the flat increasing trace.

HEADING CHANGES.

To facilitate heading changes it is helpful to have previously determined the bearing of the perpendicular to the line to be measured. Apart from considerations of aircraft drift due to wind, the heading of the aircraft should be within plus or minus 7 degrees of the perpendicular bearing.

To flatten a steep increasing trace the aircraft must be turned towards the station providing that trace. Similarly, to steepen a flat increasing trace, the aircraft heading must be turned away from that station.

If both traces are too flat the heading is too square and must be altered constantly in either direction until one trace is flat and one trace is steep.

If both traces are too steep head squarer-on to the line.

If both traces are decreasing evenly the heading must be changed to force one trace to "turn-over" and start increasing.

An alternate foolproof procedure to correct headings without prior considerations is to always ask for MINUS 5° first and watch for the immediate effect on the trace. If adverse, immediately follow with a PLUS 10° correction and add further 2 or 5 degree increments where appropriate.

If the initial minus 5° heading change has a beneficial effect, continue to take off degrees until the correct heading is obtained.

LOW SIGNAL STRENGTH

The usual procedure is to go closer to the station yielding low signal strength and gain altitude. However the problem is sometimes best overcome by decreasing altitude.

AIRCRAFT ALTITUDE

As a general rule about 1,000 feet of altitude for every 10 miles of line length produces good charts e.g. 60 mile line - 6,000 ft altitude.

However 1,000 ft less is sometimes better, depending on terrain. To lessen the effect of height errors, the aircraft altitude should, as a general principle, be kept as low as possible.

INTERFERENCE.

If the trace repeatedly breaks or gets hairy with sudden loss of signal strength at a particular point on the run eg. just south of crossing, this indicates that there may be interference on line, such as a tree, cairn or high ground. Generally the aircraft will need to gain a higher angle on the ray path from that station by going closer or higher. The remote setup may also be shifted in the case of local interference.

TROUBLE SHOOTING

Master:

1. If no signal is picked up from a remote, confirm that the remote is switched on and pointed at the right line.
2. Check that correct antenna connections to required Masters are being used, and check that the antenna switch is in the appropriate position for the present aircraft heading.
3. If contact is made with a remote, but signal strength is low, the remote should DF carefully.
4. If contact continues to be poor, but speech communication exists, check triode tune on remote and transmission on remote. Have remote operator check reflector tune and maximum deviation position on his unit.
5. If signal strength is good, but there is no speech, to one remote either way, and no FM is received, it is most likely that the lead to the remote IF is disconnected, or faulty.
6. If the signal strength is adequate, but the A trace very noisy or wide, whereas B, C and D are clean, check that A pattern is not over-modulating by first checking the master, and then having the remote operator reduce his switching level to zero. If this gives a clean trace, the problem is then reduced to setting up mods and tones. If only one pattern is clean, it suggests that that pattern is not switching out and is over-laying each of the other patterns.

Generally, if there is no technician in the plane, take adequate notes and keep the chart for reference so that the fault can be diagnosed on the ground. Try to determine whether the malfunction is in Master or Remote by trying other remotes of the same colour if available.

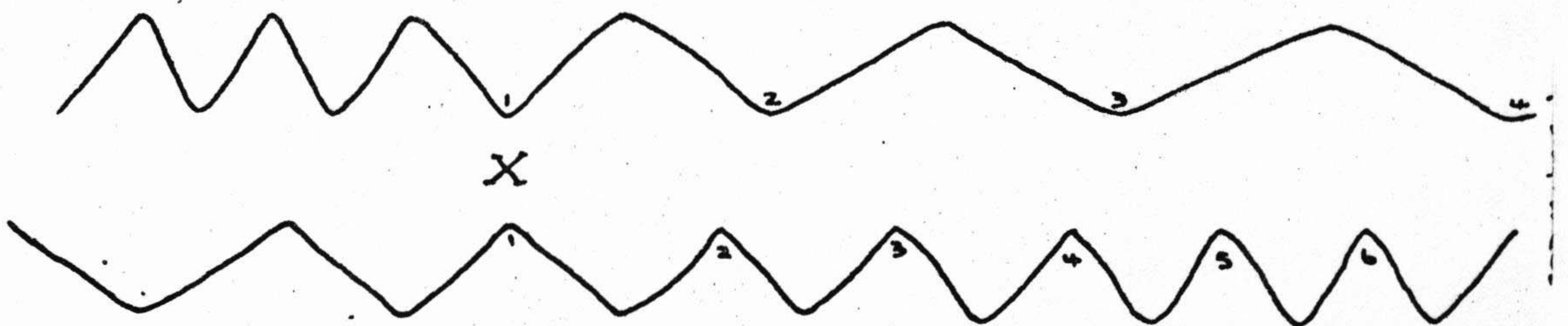
LENGTH OF LINE

A difference of 200 metres should be aimed for, between the MINSUM from the crossing sum and the sums at the ends of each run.

Less than 100 metres difference is unacceptable.

: 6 :

A cross should be made on the chart at the crossing point and 200 metres counted from there, allowing more for head wind where necessary to avoid a short run-in in the other direction.



BOOKING

All marginal lines should be booked unless obviously hopeless, and a short annotation made if the line is considered unusable. 7 acceptable lines is the minimum requirement, and an extra one should always be taken where the aircraft has to head back through the line at the finish.

The foot and metric altimeters should ideally be read simultaneously at the crossing point, and at least one set of readings should be compared by the feet to metres conversion graph as a gross error check.

The readout on the psychrometer thermocouple is in volts, where 0.4 volts equals 10 degrees. Care must be taken to ensure that values are read on the correct scale. If in doubt about the wet bulb reading, the sock should be checked in flight.

NAVIGATION

A visual check on the pilot's navigation during ferry flights and approaches to crossing lines is well worthwhile, and sometimes explains perplexing problems of poor signal strength and strange charts.