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→ R/S CN
 10/2/69
 WEAPONS
 2x

FM AUM352

TO ARMY CANBERRA

INFO DSD

WEAPONS SALISBURY

AD(C)

ZEM

~~SECRET~~ SPOKE SECTION ONE OF TWO

SIGS 055. FOR M18. DSD FOR AD(C), AD(D).

WRE FOR MR R F TREHARNE.

FOR CO FROM HART.



SHORT CELL REPORT.

ONE. CAPT JOHN DUNCAN DUE RTA 4 FEB. I HAVE TO HAND HIS

DRAFT COPY OF TECHNICAL NOTES COVERING THE INSTALLATION AND

PRELIMINARY TESTS OF SHORT CELL SYSTEM AT NUI DAT. WHILST ALL

ADDRESSEES WILL RECEIVE A COPY OF THE FINAL REPORT IN DUE

COURSE, I THOUGHT IT EXPEDIENT AT THIS TIME TO FORWARD A BRIEF

RESUME OF THE RESULTS OF BEARING AND RANGE PROGRAMME,

AS WELL AS HIS CONCLUSIONS AND RECOMMENDATIONS.

TWO. IN GENERAL, THE TRAILS WERE RETARDED BY A LACK OF

SUITABLE TARGET TRANSMISSIONS FOR OUR CHECK BEARING PROGRAMME.

MOST ALLIED SERVICE STATIONS IN THE FREQ BAND OF INTEREST ARE
MULTITONE TRANSMISSIONS AND ARE LESS SUITABLE FOR TESTING THAN
INTERRUPTED CARRIER TRANSMISSIONS. DESPITE OVERTURES TO
VARIOUS AGENCIES IN THE COUNTRY FOR ASSISTANCE IN PROVIDING TEST
TRANSMISSIONS, IT WAS NOT UNTIL 24 JAN THAT WE WERE ABLE TO ARRANGE
SUITABLE TRANSMISSIONS FROM SIG SQN IN FOR SHORT
HAUL (LESS THAN KMS) TESTS. UP TO THIS DATE, TESTS FOR
LONG HAUL (IN EXCESS OF KMS) WERE CARRIED OUT USING 2
COMMERCIAL STATIONS IN
THREE. LONG HAUL TASKS. MORE THAN 20 TASKS, CONSISTING OF BETWEEN
4 AND 20 COMPLETE BEARING AND RANGE RESULTS, WERE TAKEN ON A
COMMERCIAL FSK TX IN . COMPUTER ANALYSIS OF EACH RESULT
SHOWED AN ACCURACY OF PLUS OR MINUS : DEGREES AND PLUS OR MINUS
: KMS. HOWEVER, FOR REASONS NOT YET ESTABLISHED, APPROX FIVE
PERCENT OF THESE RESULTS GAVE A GOOD BEARING, BUT WITH A POSITIVE
ERROR IN RANGE OF TEN TO FIFTEEN PERCENT. THE SAME PATTERN OF
RESULTS WERE OBTAINED ON THE SECOND STATION, A RVN FORCES
VOICE STATION ON KHZ. ALTHOUGH IN EXCESS OF KMS AND
CONSEQUENTLY CONSIDERED UNSUITABLE FOR TILT CORRECTION, TILT READINGS
WERE TAKEN. IN A FEW CASES, TILT CORRECTION IMPROVED ANGLE ERROR,
BUT SLIGHTLY INCREASED RANGE ERROR.
FOUR. SHORT HAUL TASKS. A NUMBER OF TASKS WERE COMPLETED ON A
HAND SPEED MORSE TX AT AS EXPECTED RESULTS WERE

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IMPROVED BY USING LAYER TILT CORRECTION. HOWEVER RESULTS OFTEN PRODUCED A LARGE POSITIVE RANGE ERROR, IN ONE CASE UP TO PERCENT, BUT AVERAGING APPROX PERCENT. AT THE MOMENT THERE IS NOT SUFFICIENT DATA TO EXPLAIN THESE ERRORS. MOST OF THE RESULTS WERE TAKEN IN THE EARLY MORNING BEFORE THE MAGNETIC EQUATORIAL SPORADIC E (MEQES) LAYER DEVELOPES. HOWEVER, IT IS ASSUMED THAT THE ERRORS WERE DUE TO AN IONOSPHERIC PHENOMENA, POSSIBLY CAUSED BY BENDING THROUGH A VERY WEAK MEQES LAYER THAT WAS NOT DICERNABLE ON OUR LOW-POWERED SONDE.

FIVE. CONCLUSIONS. PRESENT INDICATIONS ARE THAT THE EQPT IS OPERATIONALLY USEFUL FOR APPROX 2 HOURS AFTER SUN RISE AND 2 HRS BEFORE SUNSET. ON OCCASIONS DURING THE DAY, IT IS POSSIBLE TO USE MEQES AND F LAYERS. IN PERIOD 7-14 DEC APPROX, A STRONG MEQES LAYER WAS AVAIL DAILY FOR PERIODS UP TO 2 HRS. IT IS NOT KNOWN WHETHER THESE WERE EXCEPTIONAL CONDITIONS OR SEASONAL EFFECTS. SINCE JAN 13, ON ONLY 3 OCCASIONS DURING THE DAY WAS THE MEQES LAYER DENSE ENOUGH FOR SSL OPERATION IN GENERAL, THE GREATEST DIFFICULTY IS THE MEQES LAYER, WHICH PERSISTS FROM 2 HRS AFTER SUN RISE TO 2 HRS BEFORE SUNSET. DURING THIS PERIOD IT IS OFTEN TOO WEAK TO BE USED AS A NORMAL ES, BUT JUST STRONG ENOUGH TO MODULATE SIGS USING THE F LAYER, THUS MAKING IT DIFFUCULT TO OPERATE SSL SYSTEM. IT IS HOPED THAT A MORE

POWERFUL SONDE WILL BE FITTED INTO NUI DAT, IN ORDER TO PROVIDE
CONTINUOUS AUTOMATIC IONOGRAMS. IT IS ESSENTIAL THAT EVALUATION
TESTS AND NORMAL TASKING CONTINUES. TO ACHIEVE THIS, ADDITIONAL
STAFF MUST BE POSTED INTO THE AREA. ALTHOUGH USEFUL OPERATING
HOURS MAY BE LIMITED, IT HAS ALREADY CONFIRMED KNOWN TASKS
MANY TIMES AND HAS BEEN AN AID FOR THE TASKING OF ARDF ON SEVERAL
OCCASIONS. ON 1 FEB, SSL LOCATED REGT, WHICH HAD MOVED AND
COULD NOT BE FOUND BY ARDF. ARDF WAS TASKED IN THE GENERAL AREA
AND THE HQ WAS RECOVERED.

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