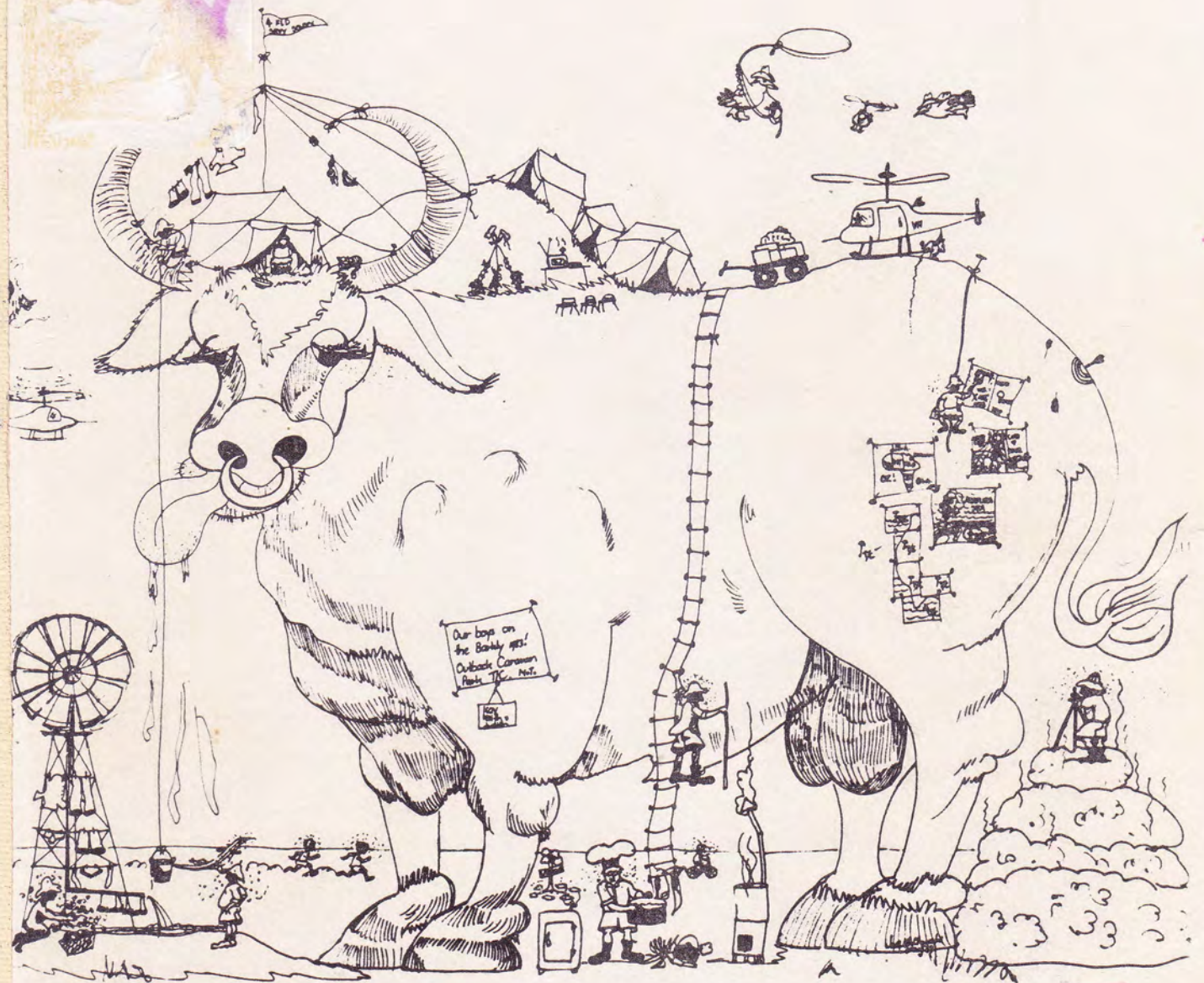


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# OPERATION NEURATION 83



## PROJECT REPORT



4 FIELD SURVEY SQUADRON

ROYAL AUSTRALIAN SURVEY C

ARMY  
56950



4 FIELD SURVEY SQUADRON

PROJECT REPORT

OPERATION NEURATION 83

MARCH - JUNE 1983

AMENDMENT SHEET

PROJECT REPORT

OP NEURATION 83

| Amdt List |      | Amended by: | Date |
|-----------|------|-------------|------|
| No        | Date |             |      |
|           |      |             |      |

Front Cover Acknowledgement: The front cover was produced from a sketch which was presented to the detachment by Mrs Judith Church, a resident of the Outback Caravan Park, Tennant Creek. The sketch has been framed and is now on display in the unit premises.

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PROJECT REPORT

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1983

- References:
- A. Dept of Defence (AO) Op Instr 6/82 dated 20 Aug 82
  - B. HQ FF Comd Warning Order OPS 22184 dated 290010Z Oct 82
  - C. HQ 4 MD Mounting Instr 788/25/46 dated 8 Mar 83
  - D. Dept of Defence (AO) Op Order OPS 008430 dated 160710Z Mar 83

INTRODUCTION

1. This report covers the execution of survey tasks in Northern Territory conducted by Det 4 Fd Svy Sqn during the period 21 Mar to 12 Jun 83. The period so covered is referred to as Operation NEURATION 83.
2. In the original concept of control surveys for 1:50,000 mapping of the Defence Main Supply Routes in Northern Territory, it was envisaged that the areas yet to be controlled be covered by two operations. These areas were known as the Tennant Creek block and the Victoria River Downs block. During the preparation for the Nov 81 Planning Conference, 4 Fd Svy Sqn considered it possible to combine both areas into one operation. This idea was subsequently approved in Dept of Defence (AO) Planning Directive dated 31 Dec 81. The AO covers 270,000 sq km from the Qld border to the WA border and from 100 km north of Alice Springs to 25 km north of Daly Waters. (See Appendix 1 to Annex A for Area of Operations).
3. The preparation for OP NEURATION 83 began in Nov 81 with the initial estimate of resources required to complete the task. Planning was then postponed until the completion of OP NERVOSE 82. In Sep 82, OC 4 Fd Svy Sqn conducted a reconnaissance in the north-west and eastern sectors of the AO. ADMIN OFFR, 4 Fd Svy Sqn completed a preliminary reconnaissance of the southern part of the AO while returning to Adelaide from OP NERVOSE 82.
4. A detailed administrative and logistic reconnaissance of Tennant Creek was then conducted by 2IC 4 Fd Svy Sqn in early Dec 82. Tennant Creek is a major regional centre for the beef industry on the Barkly Tablelands and has an extensive local mining industry. It is the only large town with goods and services, necessary to keep a force in the field over an extended period, between Alice Springs (507 km), Katherine (654 km) and Mt Isa (674 km). As a result of the reconnaissance, it was decided to conduct the Operation from a main support base situated at Tennant Creek.
5. The timings of the Operation were to fit between the end of wet season and OP ARIGHT in Qld commencing 1 Jul 83.

MOUNTING

General

6. An operation conducted by a unit in other than the parent Military District always runs the risk of staffing problems. However, with the experience of past survey operations by 4 Fd Svy Sqn in Northern Territory, a close relationship in mounting this type of operation exists between HQ 4 MD and HQ 7 MD. The following chronology is of major events in mounting the operation:

/a. 20 Aug 82.

- a. 20 Aug 82. Dept of Defence (AO) issued Op Instr 6/82, including OP NEURATION 83 be mounted by FF Comd.
- b. 29 Oct 82. HQ FF Comd issued a Warning Order to HQ 4 MD to mount OP NEURATION 83 during the period 1 Mar to 30 Jun 83. Resources not available in 4 MD to be coordinated by HQ FF Comd.
- c. 24 Nov 82. 4 Fd Svy Sqn submitted request for support required from HQ 7 MD to HQ 4 MD.
- d. 30 Nov 82. HQ 4 MD informed HQ 7 MD of support required and authorised direct liaison between 4 Fd Svy Sqn and HQ 7 MD.
- e. 2 Dec - 3 Dec 82. Administrative and Logistic reconnaissance of Tennant Creek conducted by 2IC 4 Fd Svy Sqn. Although HQ FF Comd and DSVY-A supported in principle the reconnaissance, neither would approve expenditure. HQ 4 MD supported and approved the reconnaissance and the results proved themselves invaluable during the insertion of the Detachment.
- f. 4 Dec - 23 Dec 82. Outline plan finalised by 4 Fd Svy Sqn.
- g. 7 Jan - 16 Mar 83. Continued preparation and in particular arrangements of loan stores and personnel support.
- h. 8 Mar 83. HQ 4 MD issued the Mounting Instruction.
- i. 8 Mar - 16 Mar 83. 4 Fd Svy Sqn issued the Operation Order, Administration Instruction and Movement Instruction.
- j. 16 Mar 83. Dept of Defence (AO) issued OP NEURATION 83 Op Order. Approved expenditure for Travel and Subsistence and Freight and Cartage did not cover movement of the Detachment by train from Adelaide to Alice Springs. OC 4 Fd Svy Sqn arranged funding by HQ 4 MD in consultation with OC 4 Tpt and Mov Gp and SO2 (PRGM/EST).
- k. 16 Mar - 20 Mar 83. All operation details finalised.

#### Logistic Aspects

7. A stores conference of five key personnel of 4 Fd Svy Sqn was convened on 10 Nov 82. All stores required for the operation were identified at this conference. Loan store requirements were detailed, however as some technical aspects were as yet not finalised it was decided to submit the loan vehicle bid by mid December. See Annex C for a list of loan stores. 41 Sup Bn are sincerely thanked for their cooperation in Q aspects. A close liaison between Det SQMS and OLWO 41 Sup Bn ensured that all stores were acquired on time and serviceable.

8. Vehicles. 4 Fd Svy Sqn submitted a list of requested loan vehicles to HQ 4 MD (for information HQ FF Comd) on 14 Dec 82. As a result of an enquiry by FF Comd on 12 Jan 83, 4 Fd Svy Sqn submitted the request directly to HQ FF Comd on 17 Jan 83. HQ FF Comd forwarded the approved request to HQ Log Comd on 20 Jan 83. On 2 Feb 83 HQ FF Comd advised 4 Fd Svy Sqn that some vehicles were not available and requested details of in lieu items. OC 4 Fd Svy Sqn then arranged with OC 4 Tpt and Mov Gp for those vehicles from Adel Tpt Unit on FlA. On 1 Mar 83, HQ FF Comd advised that there was a shortfall of two Landrovers

/from the

from the approved qty six from 32 Sup Bn. HQ 4 MD then directed 144 Sig Sqn to supply two Landrovers to 4 Fd Svy Sqn from 21 Mar 83. This meant that these vehicles were collected only three days prior to movement and did not permit repair if required as they had recently returned from an exercise. The four Series 2A Landrovers supplied by 32 Sup Bn were collected from Broadmeadows by 4 Fd Svy Sqn on 7 Mar 83. All vehicles were examined by Detachment Vehicle mechanics prior to movement. See Annex C for a list of loan and FIA vehicles.

9. Signal Stores. As a result of past experience, and also on advice from SO1 (SVY) FF Comd, it was requested that the signal detachment from 104 Sig Sqn supply their signal stores. This alleviated the problem of unit Q Staff operating with unfamiliar radio equipment and saved the unnecessary transfer of stores. 4 Fd Svy Sqn suggested ANGR 106 sets to operate between main and forward bases, however there were no sets available from 104 Sig Sqn. CY-3700/PRC 47 sets were issued in lieu of the ANGR 106 sets.

10. Stores Preparation and Packing. All Main Base stores were moved to the AO in six Class A BMSS. Three were allocated to Q Store items, one to Transport, one to Kitchen and Rations and one to Canteen stores. All Forward Base and Geceiver party stores were packed into Detachment vehicles. The two Detachment Q staff are to be congratulated on their professional approach to this demanding part of the task. The excellent stores preparation and packing was a major contributing factor to the Geceiver operations commencing within two days of the main body's arrival in the AO.

#### Administration Aspects

11. Personnel. 4 Fd Svy Sqn submitted the personnel support bid to HQ 4 MD on 14 Oct 82. The final dates for the operation were submitted 22 Dec 82. On 4 Feb 83, HQ 4 MD sent a request to HQ Trg Comd and HQ FF Comd for those positions not able to be filled by 4 MD personnel. In mid February all positions except for Med Asst and two Drivers had been filled. The Med Asst position was filled 3 Mar 83 and the two driver positions 9 Mar 83 (nine days before the required date). The Med Asst nomination was then changed within a few days of the required movement.

12. Although all positions were eventually filled, the lateness of selection in some cases must have affected the selection procedures. In all fairness to those who are nominated for long periods of temporary duty in remote areas, personnel should be warned at least one month prior to movement to permit timely personnel administration. See Annex D for Manning Chart and Annex E for Nominal Roll.

13. Procedures. Adopted administration procedures were those that had been experienced by 4 MD and 7 MD on previous survey operations in Northern Territory.

#### INSERTION

14. The insertion of the Detachment went exactly as planned. The timings, in retrospect, were ideal in that the interval of three days between the Advance Party arrival and Main Body arrival allowed rear link communications to be established at Main Base, and all logistic functions in Tennant Creek to be established. The plan as executed was as follows:

/a. 21 Mar 83.

- a. 21 Mar 83. Advance Party consisting of seventeen personnel, seven Detachment vehicles, and a DOAS transport with six Class A BMSS, two boxed 370 litre refrigerators and one boxed four burner stoves, departed Adelaide for Alice Springs by train.
- b. 23 Mar 83. Advance Party arrived at Alice Springs then travelled by vehicle to Tennant Creek. Main Base site at Outback Caravan Park was finalized with the proprietor and setting out of container and tent positions was commenced. A reconnaissance for Forward Base at Barrow Creek was conducted en route.
- c. 24 Mar 83.
  - (1) Main Body comprising twenty three personnel and nine vehicles departed Adelaide for Alice Springs by train.
  - (2) Main Base layout was finalised and erection commenced. Erection was completed by late 25 Mar 83.
- d. 26 Mar 83. Main Body arrived at Alice Springs and travelled by vehicle to the Barrow Creek site of Forward Base. Forward Base convoy was met at Barrow Creek and supplied with AVTUR, MTGAS, LPG and Rations from Tennant Creek.
- e. 27 Mar 83. Three LOH from 161 Recce Sqn Holsworthy arrived at Forward Base Barrow Creek ready to commence operations 28 Mar 83.

#### OPERATIONS

##### General

15. The area of operations covers 348 x 1:50,000 maps of Northern Territory. Existing survey control in the area consists of high order surveys and control for 1:100,000 mapping. The allocated technical tasks were as follows:

- a. Panel approx 71 existing control stations.
- b. Establish approx 69 doppler control stations supplementary to existing stations to satisfy the aerotriangulation requirement for 1:50,000 mapping.
- c. Acquire absolute imagery of all those stations in paras 14.a. and 14.b.

16. In addition, the Detachment was subsequently tasked with the field annotation of 15 x 1:100,000 orthophoto maps in the Stuart Highway corridor from Aileron to Newcastle Waters.

##### Achievement

17. Control Surveys. A total of 73 Doppler stations and 71 panelled stations were completed from 28 Mar - 31 May 83. All stations were photographed from the desired altitude in the period 11 Apr to 6 Jun 83. In

/addition

addition identification photography of 14 stations in OP NERVOSE AO was achieved. A detailed report on all the above technical aspects to these parts of the operation is attached as Annex A to this report.

18. Field Check. All fifteen orthophotomaps were annotated and supplementary photography obtained for a further map. A detailed report is attached at Annex B.

#### Air Support

19. Air support for the operation consisted of three LOH for two on line at all times, and one Porter. Supporting units were 161 Recce Sqn (3 x LOH) from 27 Mar to 26 Apr, 171 Comd and Liaison Sqn (3 x LOH) from 27 Apr to 28 May and 173 Gen Spt Sqn (1 x Porter) from 11 Apr to 20 Apr and 2 May to 10 Jun 83.

20. Task hours flown were 388.5 hr (400 hr allocated) for the LOH, and 160.7 hr (200 hr allocated) for the Porter.

21. All aircraft serviceability was good. The Porter, as always, was extremely reliable. It was unavailable for two days due to routine servicing requirements, although this did not adversely affect the operation. At times an LOH was unserviceable (one aircraft for one period of 11 days). However two aircraft were on line at all times except for one day.

22. The Porter tasking in the majority was on identification photography for the control survey or supplementary photography for the field check. At times the camera was removed for personnel movement or stores movement tasks.

23. The LOH were employed in reconnaissance for new station sites, panelling of existing stations and deployment of Geociever parties.

24. All Porter crews (Pilot and All Tradesmen) were very cooperative, not only with flying related tasks but also with administrative duties necessary in the support bases.

25. The RW support by both Squadrons could not be faulted. Pilots were very cooperative with tasking, and willing to advise on the most economic manner of completing the task.

#### Communications

26. A detailed report on the communications aspects of the operation is attached as Annex F to this report, however the following points are noted:

- a. Radio Serviceability. The two PRC 47 sets for communications between Main Base and Forward Base became unserviceable from day one. Both sets had been tested at 104 Sig Sqn prior to despatch. PRC F1 serviceability was good with minor problems relating to maintenance by operators.
- b. Frequencies. Allocated frequencies were adequate for control of the operation. It is recommended that at least one frequency be allocated for discreet communications between Main and Forward Bases.
- c. PRC F1 Workability. When the PRC 47 sets were found to be OTS, PRC F1 trials to the furthest Forward Base at Kalkaringi (420 km) were conducted. To the surprise of the signal

/detachment

detachment members the trials were successful. Fl communications over this distance were adequate until about 2100 hr. However after this time even with skilled use of available frequencies the quality deteriorated. If 24 hr communications over this distance are required, higher powered sets are necessary.

- d. Rear Links. Telephone and Telex facilities were connected by Telecom and proved to be invaluable.

#### ADMINISTRATION AND LOGISTICS

##### Personnel Aspects

27. Manning. The operation manning was planned on an absolute minimum, commensurate with the requirement for representation of various trade skills in accordance with operational needs. This must be kept in mind when nominating attached personnel to ensure that, if anything, they are more than qualified to provide the service requested rather than less. The only change recommended would be to increase the Reconnaissance and Panelling Team to a minimum of three personnel.
28. Medical and Dental. One member was removed from the operation due to illness. There were no major illnesses, accidents or dental treatment. Facilities were an RAP at Forward Base manned by a CPL Med Asst and a major hospital at Tennant Creek.
29. Pay and Allowances. Normal fortnightly pay was available to all members of the Detachment. AAAvn personnel and their RAEME members were paid in advance. Some attached personnel were unable to make allotments prior to departure from parent units due to the late notice given them. If a member is married it may mean that supply of money to the member's wife is extremely difficult from remote areas. All members should be encouraged to allot most of their pay for the period of a long operation. Requisition for Cash was posted to RFO Darwin in the week prior to payday. The amount was then injected by RFO Darwin to a cheque account opened at Tennant Creek WESTPAC Branch. The Detachment then drew the cash by presenting a cheque for the pay amount. This system worked well even though AUSTPOST registered mail system to Darwin delayed the Requisition for Cash at times. Pay was then acquitted by pay sheet using the normal system. Members are to be paid Incidental Allowance and Remote Locality Allowance in retrospect.
30. Stand Down. It was intended that each member be granted one day stand down each 10-14 days. This proved to be operationally impractical due to the minimum manpower, and each member had one day off in about three weeks. Daily local leave was granted to off duty members in Main and Forward Bases.
31. Discipline. No disciplinary problems were encountered.
32. Security. A 24 hr staff of Duty Officer/SNCO and Duty Picquet for security and emergency duties were rostered daily at Main Base.
33. Morale. A high level of morale was maintained throughout the twelve weeks of the operation. This was attributed to the good rate of progress of the task and the satisfactory living standards.

/34. Amenities

34. Amenities and Recreation. 4 MD Amenities Fund and Detachment Canteen funded the hire of two colour television sets and two video cassette recorders from Alice Springs. Personnel from both bases contributed to the hire of cassettes from Tennant Creek. These amenities were an asset to off duty activities, and many thanks goes to 4 MD Amenities Fund who contributed four-fifths of the total hire fee. Kalkaringi Cricket Club challenged Forward Base to a much publicised match and were the victims of the OIC's Eleven. Newspapers and periodicals purchased by Main Base personnel were distributed to Forward Base and the Geociever parties. Darts and hockey were available at both bases.

35. Visitors. Visitors to the operation were:

- a. Commodore E.E. Johnston AM, OBE, C St J, RANER  
Administrator of Northern Territory - 26 Apr 83.
- b. BRIG L.J. Lewis, COMD 4 MD, 9-10 May 83.
- c. WO1 M.R. Steiger, DSM 4 MD, 9-10 May 83 (accompanying COMD 4 MD).
- d. COL N.R.J. Hillier, DSVY-A, 25-26 May 83.
- e. LTCOL C.T. Barnett, CO 1 Avn Regt, 18 Apr 83 accompanied by RSM, 1 Avn Regt.
- f. LTCOL A.J. George, CO Norforce, 28 Apr 83 accompanied by RSM Norforce.
- g. MAJ E.R. Schulze, OC 4 Fd Svy Sqn, 29 Apr - 2 May 83.
- h. MAJ P.A. Bates-Brownsword, SO2 (OPS) DSVY, 29 Apr - 2 May 83.
- i. MAJ R. Wardrop, RE, Army Svy Regt, 23 May - 1 Jun 83.
- j. MAJ G. Adler, SO2 (OPS) HQ 7 MD, 20 Apr 83.
- k. MAJ T. Hayes, OC 161 Recce Sqn, 12 Apr - 13 Apr 83.
- l. CAPT D. O'Brien, 161 Recce Sqn, 12 Apr - 13 Apr 83.
- m. WO1 R. Adair, OLWO 41 Sup Bn, 30 Apr - 3 May 83.
- n. WO1 D.E. Tucker, WO Tech Svcs 41 Sup Bn, 30 Apr - 3 May 83.
- o. Mr I. Tuxworth, MLA (Member for Barkly), 11 Apr 83.  
(See also para 50)

36. Assistance to the Civil Community

- a. Casevac. Three casualties of a road accident on 4 Apr 83 at Devils Marbles on the Stuart Highway, were evacuated by one LOH sortie from the accident site to the Tennant Creek hospital. A landrover was also used on 23 Apr 83 to carry a woman with a dislocated hip from Renner Springs to meet an ambulance en route from Tennant Creek.
- b. Tennant Creek. In appreciation of the friendliness of the town's residents, Main Base personnel participated in a project of beautification of Anzac Hill. All material was

/supplied

supplied by the Town Council and labour by the Detachment. The project was approved and appreciated by the Dept of Community Development and the Tennant Creek committee for the Keep Australia Beautiful Council. Anzac Hill is now the major tourist lookout for the town. Participants in TAFE Foundation for Employment visited Main Base and were briefed by Detachment members on service life and employment.

#### Logistic Aspects

37. Main Base. The base was situated at the Outback Caravan Park in a circular area which will be developed as a recreation park. The facilities available were Telecom underground telephone and telex board within 15m, access to a sewer main on site, water supply to six outlets on site, toilet and shower facilities within 150m, power board with 10 amp and 15 amp outlets, workshop area and a large area for vehicle parking and fuel drums. Accommodation consisted of 30' x 20' tentage for the Kitchen/Dining area and Canteen and 22' x 11' or 11' x 11' for all workspace and sleeping accommodation. Quarry dust was laid over all tent areas to alleviate the red dust problem.

38. The base layout was designed with the criteria being those facilities described in para 37, as well as considering the prevailing easterly wind at that time of year and the requirement for no vehicles off the external road. All BMSS were positioned before tentage was erected and proved to be excellent for security and ease of stores handling. See Annex G for Base Design.

39. Impregnated hessian flooring was laid in the kitchen/dining tent, orderly room and survey records tent, and after three months use, is still in good condition.

40. The Q Store consisted of bin packs which are ideal for setting up, security and ease of handling and movement.

41. The use of the caravan park was highly successful and is recommended for future operations. The use of existing infrastructure for communications, water supply, waste water disposal, electricity, clothes washing and shower and toilet facilities, relieves the burden of maintaining a field camp and at least three additional personnel. Park charges were \$2 per man per day plus a service charge of \$20 per day for electricity, excess water and workshop facilities. The proprietors were very cooperative and assisted in every possible way.

42. Forward Base. Forward Base was designed as a self sufficient (except for consumables) mobile base capable of moving by 1 x 5 ton Truck GS, 1 x 4 ton Truck CL and 2 x 3/4 ton Landrover GS within a day of commencement of dismantlement. Accommodation consisted of one 30' x 20' tent and the remainder 22' x 11' tents. Power supply was 10 KVA Generator or local supply for 240 Volt power to the Kitchen, and Operations tent with 32 Volt lighting to all tentage. All stores were containerised in bin packs in a similar manner to Main Base. Details of Forward Base activities are included in Annex A to this report. Forward Base was established at Barrow Creek racecourse, Avon Downs Police Station, Renner Springs racecourse and Kalkaringi Police Station. The cooperation of OIC at Avon Downs and Kalkaringi police stations contributed in no small way to the success of the operation.

43. POL

- a. AVTUR. Bulk AVTUR was purchased by SP27 from Tennant Creek and Elliott. All other supply was drums purchased by HQ 7 MD. Det 4 Fd Svy Sqn was deemed a modified POL accounting unit, which meant accounting for all drums. One hundred drums were positioned by HQ 7 MD initially at Tennant Creek and one hundred at Kalkaringi Police Station. An extremely high contamination rate (water and paint) of 25% - 35% increased the drummed requirement by forty and ninety at Tennant Creek and Kalkaringi respectively. HQ 7 MD are aware of the drummed fuel contamination problem in Northern Territory and are investigating. Although all care was taken by Detachment members when repositioning fuel from the two major dumps, the same could not be said for the contractors. Total fuel used was 22,160 litres bulk and 49,400 litres drummed, (excluding contaminated drums and remaining full drums which were returned for credit).
- b. MTGAS and Diesel. Forward Base was supplied by drummed fuel obtained from the Tennant Creek contractor for three of the four bases. All other fuel supplied was by kerbside purchase. A total of 35,450 lt MTGAS and 6,380 lt Diesel was issued during the operation.
- c. Lubricants. Oils and greases were all supplied by Main Base from stocks taken on initial deployment.
- d. LP Gas. Eight 45 kg bottles and three 45 kg decanting bottles were hired from Tennant Creek. A total of 540 kg of Propane gas was consumed by the Main Base and Forward Base stoves, and survey party stoves and lights.

44. Rations. All rations were supplied from 4 Fd Svy Sqn Ration Account. The initial estimate of \$6.00 per man per day was inadequate, and an additional \$0.75 per man per day was approved by 41 Sup Bn after examination of item costs, ration entitlement and Detachment menus. Requisitions for Cash were raised by 41 Sup Bn, and the RFO Adelaide deposited the amounts in the Ration Cheque Account. Accounting procedures were as for an Imprest Account, and entitlement acquitted by FST 66 and FST 61. Total expenditure was \$20,920.42. The standard of catering for the entire period at both the support bases and survey parties was excellent. The interest and dedication of both Detachment cooks in both cooking and resupply was an inspiration to all members. This contributed to the high morale at all levels. The only adverse comments occurred when a larger group (of aviation RAEME) than expected, remained in a Sub-Forward Base for three days. This was unavoidable at the time.

45. Vehicles. Detachment Transport consisted of:

- a. One Truck Cargo 5 ton GS,
- b. Two Truck Cargo Mdm MC4 4 ton CL (one with tail gate loader),
- c. One Truck Cargo 2-1/2 ton GS,
- d. One Truck Cargo Light, MC4, 1 ton CL,
- e. One Truck Carryall MC4 Minibus,

/f. Ten Truck

- f. Ten Truck Landrover 3/4 ton (four Series 2A, two FFR in GS configuration),
- g. Nine trailer cargo 1/2 ton GS.

46. At the initial planning stage it was decided to request CL Vehicles for all resupply between Main and Forward Bases. All bases were connected by Highways that were well maintained. The use of CL Vehicles in this capacity over long lines of resupply in good conditions is highly recommended. All CL vehicles proved to be highly reliable, easy to service and maintain, and suitable for all tasks required of them. The tailgate loader was particularly useful. GS Vehicles were used for survey tasks and fuel dumping. A total of 113,746 km were travelled by all vehicles on the operation. Other aspects are as follows:

- a. Repair. All vehicle repairs were effected by the Detachment Vehicle mechanics. A CL 4 ton truck windscreen, a CL 1 ton truck windscreen and a Hi-Ace windscreen were replaced by a civilian agency in Tennant Creek. The high rate of vehicle serviceability is a result of weekly vehicle inspections by Detachment vehicle mechanics on all vehicles. Annex J shows a summary of mechanical repairs.
- b. Accidents. Two 1/2 ton trailers being towed by Geociever party Landrovers capsized. One remained serviceable and the other returned to Adelaide with the Detachment for repair. They have both since been classified as being beyond economical repair. A civilian vehicle sustained minor damage when some stores slipped from the side of a 4 ton truck.

47. Stores. Stores control and care and maintenance were generally good throughout the operation. The main area of concern was the lack of consideration to vehicles and stores by some attached personnel. It was only after considerable explanation that they really understood the importance of better than normal care and maintenance on survey operations in remote areas where the job must be done with the support on hand. Two Inspecting Officer reports were raised during the operation, and total value of items written off was \$2,438.79 (see Annex H). This does not include the replacement cost of the two trailers (total \$1,604.30). Other aspects are as follows:

- a. Stores demand. All demands were processed through 4 Fd Svy Sqn and movement coordinated by 4 Tpt and Mov Gp. Urgent items were despatched by air freight and other items by surface means. Although despatching agencies adhered to the priority system for movement, once in the civil contractor's hands some stores took longer than expected. At no time was the operation progress impeded due to lack of stores.
- b. Survey stores. A Magnavox Geociever MX1502 was loaned to the Detachment by SA Lands Dept for a period of one month. All five RASvy Magnavox Geociever ANPRR14 loaned to the Detachment were employed in the field from end March to end May. A detailed report on survey equipment performance is included in Annex A to this report.

48. Canteen. The canteen account opened with an interest free loan of \$1500 from 4 Fd Svy Sqn Regt Funds. The ADMIN OFFR managed the canteen very efficiently and of a total turnover of \$8,949.29 the only complaint of supply

/was from

was from a Geociever party who had requested a particular item of chocolate confectionery. Overall profit at the close of trading was \$731.17.

49. Petty Cash. A Petty Cash advance of \$500 was issued by RFO Adelaide. This amount is recommended for future operations as reimbursement may be slow.

50. Support to Exercises, Units and Other Operations. Sixty one personnel from 1 BDE TEWT and admin support element were collocated with Main Base from 20 Apr to 23 Apr 83. One tent 11' x 11' and one landrover were loaned to NORFORCE for the May day display. Thirty three personnel from Op DESOLATE DATUM used Main Base facilities 23 May and five personnel from same Op 28 May and 29 May 83. Four personnel in support of Op DESOLATE DATUM were accommodated at Forward Base Kalkaringi 21 May and 23 May 83.

51. Operation Budget. Expenditure against Travel and Subsistence, Freight and Cartage, Rations, POL and Aircraft Hours was under all forecasts. A detailed summary of expenditure of funds is attached as Annex K to this Report.

#### EXTRACTION

52. Dates for extraction of the Detachment were finalised in late April. Approval from HQ 4 MD was granted for the nine attached personnel from 2 MD to fly to Sydney from Alice Springs, and both the Main Body and Rear Party travel by train from Alice Springs to Adelaide. On 23 May approval was granted for C130 extraction of 171 Comd and Liaison Sqn personnel and unserviceable LOH parts. The Detachment was then granted approval to transport stores and personnel to Oakey and Richmond as required, using the virtually empty C130. The Detachment then issued a Movement Instruction and executed the plan as follows:

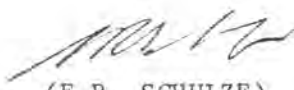
- a. 27 May 83. Control survey operations ceased at Forward Base Kalkaringi and three LOH released from task.
- b. 28 May 83. Forward Base departed Kalkaringi for Tennant Creek.
- c. 29 May 83. Forward Base arrived at Tennant Creek.
- d. 30 May 83. Nine attached personnel from 2 MD, three Geociever ANPRR14, two Astromast Towers, empty RC10 Camera boxes, Geociever spares kits, and 171 Comd and Liaison Sqn personnel and stores departed Tennant Creek by C130 for Oakey and Richmond.
- e. 31 Mar 83. Main Base dismantled (80%) and packed ready for movement. BMSS loaded onto civil transport.
- f. 1 Jun 83. Main body of fifteen personnel, ten vehicles and three trailers departed Tennant Creek for Alice Springs, and loaded onto the train. (Field check phase of the operation commenced.)
- g. 3 Jun 83. Main body arrived at Adelaide. Civil transport travelled on the same train.
- h. 10 Jun 83. The Porter was released from survey duties and departed Tennant Creek for Oakey. Rear party of twelve personnel, six vehicles and six trailers departed Tennant Creek for Alice Springs, and loaded onto the train.
- i. 12 Jun 83. Rear party arrived at Adelaide.

/CONCLUSION

CONCLUSION

53. All OP NEURATION 83 technical objectives were completed within the timings estimated and under all budget forecasts. All Detachment members returned from the operation with a sense of achievement knowing that the job had been well done at minimum cost. Junior Officers and junior NCOs experienced command for a prolonged period for the first time. Their experience and new found knowledge will stand their units and the Army in good stead in the future. The experience gained by 4 Fd Svy Sqn, HQ 4 MD and HQ 7 MD in mounting and executing this very successful operation, will be invaluable for future operations. This operation completes the horizontal control survey programme for all proposed 1:50,000 defence mapping of Northern Territory.

19 Aug 83

  
(E.R. SCHULZE)  
MAJ  
OC

- Annexes:
- A. Control Survey Technical Report
  - B. Field Check Technical Report
  - C. Loan Stores and Vehicles
  - D. Manning Chart
  - E. Nominal Roll
  - F. Communications
  - G. Main Base Layout
  - H. Stores Written Off
  - I. Summary of Expenditure
  - J. Summary of Mechanical Repairs

CONTROL SURVEY TECHNICAL REPORT  
OPERATION NEURATION 83  
NORTHERN TERRITORY

INTRODUCTION

General

1. This report covers the technical aspects of the control survey phase of the operation.
2. It describes the planning prior to the operation and the Detachment modus-operandi.

Area of Interest

3. The area of operations covered eighty seven 1:100,000 map areas of the southern transport corridor, the eastern transport corridor and 200 km south of the existing NT Tac Map area. The AO is shown at Appendix 1 to this Annex.
4. The topography changes from steep scarp plateaus to sanddunal desert. Open savannah and spinifex grass are the predominant vegetation associations.

Objectives

5. The Operation included the following objectives:
  - a. Acquire control for 1:50,000 mapping (consistent with 1:25,000 specifications) suitable for aerotriangulation on the existing 1:80,000 photography.
  - b. Panel all new stations and chosen existing stations which satisfy the positional requirement for aerotriangulation.
  - c. Acquire identification photography of all panelled stations.
  - d. Acquire control and ident photography of one station in the Brass Key 76 AO.

Available Data

6. Aerial Photography. The existing photographic coverage of the project area is as follows:
  - a. 1962 - 1971 SWA photography at a scale of 1:80,000 over the entire area.
  - b. NT Lands Dept large scale project photography over some areas.
  - c. 1:10,000 and 1:25,000 photography for ASO for proposed railway corridor.
7. Horizontal Control. Existing horizontal control was as follows:
  - a. A primary traverse along the Stuart Highway and Tablelands Highway.

/b. A primary

- b. A primary traverse from Banka Banka on Stuart Highway to 18°S on WA border.
- c. Secondary and Tertiary triangulation networks between Alice Springs and Tennant Creek.
- d. Aerodist trilaterated network on 1° intersections over entire AO.
- e. Geociever Doppler control on WA border.
- f. Geociever Doppler control on southern boundary adjoining Op CYNTHIA AO.
- g. Tertiary traverse on northern boundary, adjoining Op BRASS KEY 76 AO.
- h. Aerodist trilaterated control on Qld Border.

#### PLANNING

8. Technical planning at 4 Fd Svy Sqn commenced in Nov 81. The planning criteria was aerotriangulation blocks of 1:250,000 map areas, horizontal control required at every sixth/seventh model on the top and bottom runs of the blocks, and on the first, tenth and last model of Run 4 or 5 (preferably in overlap).

9. In Sep 82 Army Survey Regiment submitted a revised technical plan. The changes were in Runs 4 or 5 where control was required on every seventh model and not the tenth model. This plan was used as the basis for all operational and logistic planning.

10. In Dec 82 additional information on the proposed railway corridor prompted a suggested change in the AO boundaries. A further change to reduce the area of the AO was then suggested on 28 Jan 83. This correspondence initiated further assessment of the control by DSVY, Army Svy Regt, and 4 Fd Svy Sqn. It was not until 16 Mar 83 that the amended AO boundary and control configuration was approved by DSVY.

11. If timely and accurate forecasts of resources required are to be made, the technical plan should be finalised at least two months prior to the commencement of the operation. Existing control suitability should be based on an analytic assessment and not merely a 'gut feeling' that it should be OK.

12. Geociever Operations. Operation timings in the broadest sense were estimated employing five Geocievers but only relying on four and taking four days per station (including movement), which is one station completed each day. This was assumed to be the worst possible case but was the planning figure used.

#### /EXECUTION

EXECUTIONGeceiver Operations

13. Deployment Rate. The normal rate of deployment was to arrive on station in the afternoon, set up and track until the third night, and move on to the next station on the following morning, ie 2 full days and 3 nights tracking. Where equipment serviceability allowed, this gave ample time to get the required number of passes. Travel time, equipment unserviceability and rest time added to the overall time required to give an average of 4.45 days per station for each geceiver. Except for short term fluctuations, this rate was almost linear for the entire period of geceiver deployment.

14. Satellites Observed. The serial numbers of the satellites observed were:

- a. 059,
- b. 060,
- c. 068,
- d. 077, and
- e. 105.

15. No of Passes. The minimum requirement was for 25 "well balanced" passes. The criteria for a well balanced pair was:

- a. one north going satellite, one south going; and
- b. the satellites within 10° of altitude.

To achieve this it was sometimes necessary to track over 30 good passes. Where logistic constraints temporarily precluded redeployment of the party (eg during the night), up to 35 passes were tracked.

16. Quality Control. Quality control of data was achieved as follows:

- a. Pass Balance. As well as plotting the satellite paths graphically to check the balance of the passes, parties relayed the pass numbers to Forward Base for checking, or referral to Main Base in marginal cases.
- b. Alternate Data Checks. The teletype at Main Base was used to break out data tapes to enable rapid alternate data checks. This is in addition to the checks done on station.
- c. Station Documentation. Upon completion of occupation of a station, the station documents and data were forwarded by safe hand to Forward Base. Here they were checked for completeness prior to onforwarding to Main Base for checking of accuracy.

17. Equipment Problems. General equipment serviceability was good, with the following exceptions:

- a. Generators. Although tested prior to deployment, many of

/the 500W

the 500W generators gave problems, especially early in the operation. To maintain operability, it was necessary to hold nine sets in addition to the five deployed with field parties. It is recommended that service manuals be obtained to allow more accurate tuning after Main Base repairs, as a significant number of repairs were undertaken without a knowledge of adjustment specifications.

- b. Geocivers. The most frequently occurring problems in this area were with mechanical defects in the tape punch. These were compounded during adverse weather conditions by the ingress of dust into the mechanisms or moisture into the paper tape. Instrument number DHQ-051 also had a persistent trait of losing lock on high altitude passes. The antenna was swapped with one sent from Sydney Workshop Coy but this had no effect. However, the loss of passes did not significantly delay the progress of the field party. Two further instances occurred of animals chewing through connecting cables.
- c. Tape Readers. The two tape readers (HP9863A) broke down on 8 Apr 83 and 28 Apr 83 respectively. Unsuccessful attempts were made to repair them in the field and they were then sent to Adelaide. As no tape readers were available until the end of the operation, the observed doppler data could not be copied onto magnetic tape. As a precaution against loss of data, the tapes were duplicated using the telex machine at Main Base before being despatched to DSVY-A.
- d. Calculators. The HP9815A calculators also gave problems. However, as the tape readers were not serviceable, their repair was not urgent. The calculators also interfered with HF communications and had to be sited away from the radio installation.

18. Station Marking. In all cases, station marking consisted of an RASVY brass plaque stamped with station identification, set in a precast concrete block as ground mark. Three recovery marks, each of 1 cm diameter brass rod in a pre-cast concrete block, and a 6cm diameter galvanized iron pipe painted white, capped and stamped with station identification were used to aid future recovery.

19. Panelling. A two man party was responsible for the majority of the 74 stations panelled in addition to those occupied by geociver parties. IC of this party was also responsible for reconnaissance by LOH of new station sites where necessary. At times, other Forward Base personnel were used for panelling/reconnaissance if available.

20. Astronomy Observations. Precise navigation by LOH in some areas was extremely difficult. The problem of lack of landmarks was compounded by the fact that the available photography was so old (1962-1971) that it bore little resemblance to the ground. To overcome this, observations were made on the sun for latitude and longitude when positioning new stations in difficult areas. This procedure was used for stations U752 and U805.

21. MX1502 Deployment. To reduce the time taken and positional uncertainty when using astronomy for navigation, a Magnavox MX1502 was borrowed from SA Dept of Lands. The instrument was also used to assist in finding existing stations. A minimum of two passes was used to confirm a location. Although useful in this mode, a gap in available satellites during mid afternoon limited the number of points determined in a day. The procedure was used for stations NMG228, NMG 229, U783, U786, U790, U806 and U807.

22. Forward Bases. Forward Bases were established consecutively at Barrow Creek, Avon Downs, Renner Springs and Kalkaringi. See Appendix 1 for the areas covered from each forward base. A sub forward base at Old Top Springs was established for 10 days to enable efficient resupply and redeployment of field parties in that area. Prior to moving, forward base was packed progressively over 1-1/2 days. On arrival at the next location, it was fully operational within 36 hours. Main base being at Tennant Creek enabled a particularly smooth transition between the first three forward bases, without ceasing operations, as forward base functions could be handled from there during the moves. During these moves, field parties were deployed to stations in close proximity to Tennant Creek.

23. LOH and Veh Deployment. Where possible, field parties were deployed by landrover with trailer. About 50% of the new stations established were occupied using LOH. Generally three loads were required to establish a station. Later in the operation, an all up aircraft weight limitation of 3000 lb meant that four loads were required. To economise on aircraft hours, parties would sometimes drive to a pickup point and be ferried by LOH from there.

24. Operational Difficulties. The following problems hampered operational progress:

- a. Rainfall. At the beginning of the operation, recent rains had left surface water in the AO. Subsequent rains meant the expenditure of more LOH hours than would have been necessary at that stage.
- b. High Temperatures. High temperatures and strong winds in the Avon Downs area hindered LOH movements. They caused a decrease in payload and cruising speed, plus an increase in fuel consumption. This, combined with a high contamination rate of AVTUR, meant that an extraordinarily large number of drums had to be placed in each of the fuel dumps. Aircraft hours expended were also higher than anticipated for the area.
- c. Entry to Aboriginal Lands. On arrival in the AO, permission had not yet been obtained to enter the recently proclaimed Alyawarra Aboriginal Lands. The Central Lands Council was approached and a meeting was arranged for 20 Apr 83 between SO2 (OPS) HQ 7 MD, OIC Det 4 Fd Svy Sqn, and representatives of the Sacred Sites Authority and Central Lands Council. From this, the Central Lands Council contacted the traditional owners of the Alyawarra Lands and arranged for OPSO of the Det to visit on 20 May 83. Once the detachment's area of

/interest

interest and objectives were explained, the owners were happy to allow access. The delays in obtaining permission meant that the station (U741) was one of the last to be occupied.

25. Landowners. Prior to commencement of the Op, HQ 7 MD sent Land Clearance letters to all landowners in the AO. However, this information was not necessarily passed on to the station managers. The det OPSO endeavoured to telephone each station manager, and where operationally practicable, field parties visited the homesteads prior to entry onto private land. Station staff were very hospitable, and provided much assistance and useful information.

#### Ident Photographs Operations

26. Wild RC10 camera no 2612 was used to obtain ident photography of all panelled points in the AO. The following criteria apply:

- a. Flying height 10000' ASL (except Central Mount Stuart and Mt Stirling - See Appendix 3).
- b. Overlap of approximately 60%.
- c. At least three exposures for each point.
- d. All targets have been proven on the negative.
- e. The direction of flight for any point was such as to allow the maximum number of points to be photographed in any sortie, and hence make most efficient use of air hours.
- f. Lens - SWA 88 mm.

27. A total of 147 idents were photographed in the AO. In addition 14 points were photographed in the OP NERVOSE AO (See Appendix 3). Cloud cover precluded any further photography of points in the OP NERVOSE AO and also affected available flying height.

28. Processing. Processing was done by the camera operator in B8 tanks at the Tennant Creek Hospital X-ray Dept. Drying of the film was done at the local Boy Scout Hall on string lines.

29. Despatch. All of the station numbers have been marked on the negatives and the films were despatched to SO2 (SVY) HQ 3 MD on 22 Jul 83.

#### Additional Photography

30. In addition to the ident photography, the following was flown:

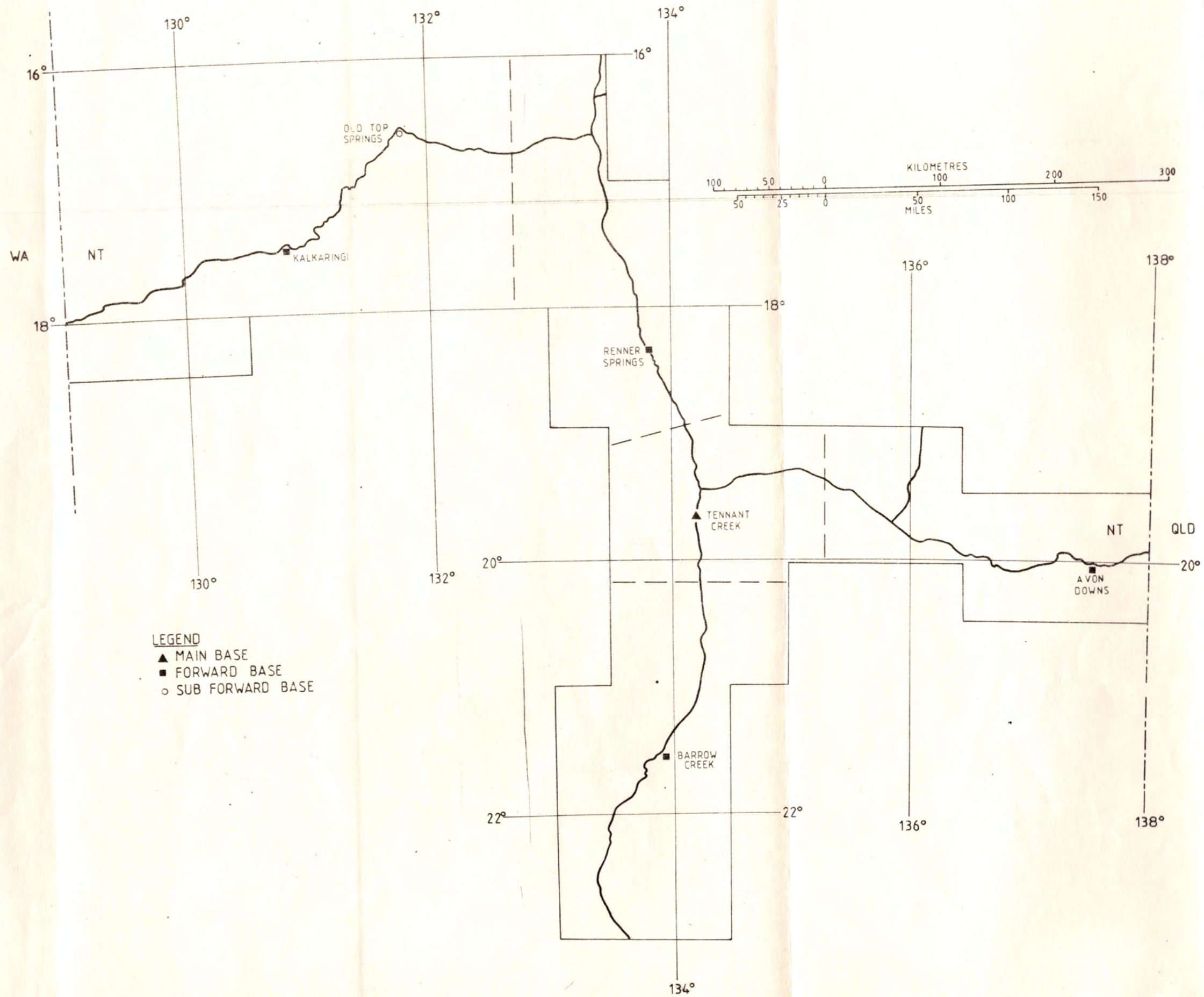
- a. Supplementary photography for field annotation (See Annex B), and
- b. Colour photography in the Tennant Creek area (RC10 and hand held 35 mm) to assist in colour matching of OPM produced in the area.

/Appendices:

- Appendices:
1. Area of Operations
  2. Geociever Stations Occupied
  3. Existing Stations Photographed
  4. LOH hr vs Time
  5. Porter hr vs Time

OPERATION NEURATION 83  
AREA OF OPERATIONS

APPENDIX 1 TO  
ANNEX A TO  
PROJECT REPORT  
OF NEURATION 83






GEOCEIVER STATIONS OCCUPIED

| <u>Station</u> | <u>Lat (Approx)</u> | <u>Long (Approx)</u> | <u>Process No</u> | <u>Remarks</u> |
|----------------|---------------------|----------------------|-------------------|----------------|
| U736           | 22° 45'             | 133° 00'             | 11330 -           |                |
| U737           | 22° 44'             | 134° 30'             | 11326 -           |                |
| U738           | 21° 31'             | 133° 30'             | 11344             |                |
| U739           | 22° 00'             | 134° 29'             | 11327 -           | — —            |
| U740           | 21° 39'             | 133° 00'             | 11328 -           |                |
| U741           | 21° 41'             | 134° 30'             | 11320 -           |                |
| U742           | 21° 19'             | 133° 00'             | 11321             |                |
| U743           | 21° 16'             | 134° 30'             | 11322 -           |                |
| U744           | 21° 00'             | 133° 31'             | 11323 -           |                |
| U745           | 21° 00'             | 134° 00'             | 11324 -           |                |
| U746           | 21° 01'             | 134° 30'             | 11325 -           |                |
| U747           | 20° 42'             | 133° 30'             | 11314 -           |                |
| U748           | 20° 32'             | 134° 59'             | 11315 -           |                |
| U749           | 20° 18'             | 133° 30'             | 11316 -           |                |
| U750           | 20° 18'             | 135° 00'             | 11310 -           |                |
| U751           | 20° 00'             | 134° 30'             | 11311 -           |                |
| U752           | 20° 30'             | 136° 29'             | 11312             |                |
| U753           | 20° 30'             | 137° 00'             | 11313 -           |                |
| U754           | 20° 30'             | 137° 28'             | 11317 -           |                |
| U755           | 20° 00'             | 135° 30'             | 11318 -           |                |
| U756           | 19° 30'             | 136° 30'             | 11319 -           |                |
| U757           | 20° 12'             | 136° 30'             | 11307 -           |                |
| U758           | 20° 13'             | 138° 00'             | 11308 -           |                |
| U759           | 20° 00'             | 136° 00'             | 11309 -           |                |
| U760           | 19° 42'             | 133° 30'             | 11331 -           |                |
| U761           | 19° 40'             | 135° 00'             | 11332 -           |                |
| U762           | 19° 16'             | 133° 30'             | 11333 -           |                |

| <u>Station</u> | <u>Lat (Approx)</u> | <u>Long (Approx)</u> | <u>Process No</u> | <u>Remarks</u> |
|----------------|---------------------|----------------------|-------------------|----------------|
| U763           | 19° 00'             | 133° 30'             | 11329 -           |                |
| U764           | 19° 01'             | 134° 29'             | 11334 -           |                |
| U765           | 19° 43'             | 136° 30'             | 11335 -           |                |
| U766           | 19° 15'             | 136° 30'             | 11336 -           |                |
| U767           | 19° 00'             | 135° 29'             | 11337 -           |                |
| U768           | 19° 45'             | 137° 59'             | 11338 -           |                |
| U769           | 19° 30'             | 137° 00'             | 11339 -           |                |
| U770           | 19° 30'             | 137° 30'             | 11340 -           |                |
| U771           | 18° 42'             | 134° 30'             | 11341 -           |                |
| U772           | 18° 15'             | 133° 00'             | 11342 -           |                |
| U773           | 18° 16'             | 133° 30'             | 11345 -           |                |
| U774           | 18° 15'             | 134° 29'             | 11343 -           |                |
| U775           | 18° 02'             | 133° 30'             | 11306 -           |                |
| U776           | 18° 00'             | 134° 01'             | 11305 -           |                |
| U777           | 18° 01'             | 134° 30'             | 11282 -           |                |
| U778           | 17° 40'             | 133° 30'             | 11346 -           |                |
| U779           | 17° 44'             | 134° 00'             | 11296 -           |                |
| U780           | 17° 17'             | 134° 00'             | 11297 -           |                |
| U781           | 18° 43'             | 133° 00'             | 11298 -           |                |
| U782           | 18° 42'             | 133° 30'             | 11347 -           |                |
| U783           | 18° 00'             | 132° 30'             | 11299 -           |                |
| U784           | 17° 41'             | 132° 00'             | 11300 -           |                |
| U785           | 17° 18'             | 132° 00'             | 11301 -           |                |
| U786           | 17° 00'             | 132° 30'             | 11293 -           |                |
| U787           | 16° 40'             | 132° 00'             | 11294 -           |                |
| U788           | 16° 20'             | 131° 59'             | 11295 -           |                |
| U789           | 16° 00'             | 132° 30'             | 11292 -           |                |
| U790           | 17° 59'             | 131° 30'             | 11303 -           |                |
| U791           | 17° 40'             | 130° 30'             | 11291 -           |                |

| <u>Station</u> | <u>Lat (Approx)</u> | <u>Long (Approx)</u> | <u>Process No</u> | <u>Remarks</u> |
|----------------|---------------------|----------------------|-------------------|----------------|
| U792           | 17° 18'             | 130° 30'             | 11283 -           |                |
| U793           | 17° 00'             | 130° 30'             | 11287 -           |                |
| U794           | 16° 40'             | 130° 30'             | 11284 -           |                |
| U795           | 16° 20'             | 130° 30'             | 11302 -           |                |
| U796           | 16° 00'             | 131° 30'             | 11285 -           |                |
| U797           | 17° 00'             | 131° 29'             | 11286 -           |                |
| U798           | 18° 16'             | 130° 30'             | 11304 -           |                |
| U799           | 18° 30'             | 130° 00'             | 11279 -           |                |
| U800           | 17° 40'             | 129° 00'             | 11288 -           |                |
| U801           | 17° 00'             | 129° 30'             | 11289 -           |                |
| U802           | 16° 40'             | 129° 00'             | 11280 -           |                |
| U803           | 16° 20'             | 129° 00'             | 11290 -           |                |
| U804           | 15° 30'             | 132° 00'             | 11281 -           |                |
| U805           | 19° 58'             | 135° 00'             | 11348             |                |
| U806           | 18° 00'             | 132° 00'             | 11349             |                |
| U807           | 18° 00'             | 131° 00'             | 11350             |                |
| U808           | 20° 00'             | 133° 30'             | 11351             |                |

Note: All stations targetted with standard  configuration unless noted. All photographed at 10,000 feet.

AMENDED AS PER R7881712  
 FOLIO 39  
 SPR. J.S. LINE

APPENDIX 3 TO  
 ANNEX A TO  
 PROJECT REPORT  
 OP NEURATION 83

EXISTING STATIONS PHOTOGRAPHED

|                         | <u>REMARKS</u>             |
|-------------------------|----------------------------|
| A439                    |                            |
| A440                    |                            |
| A442                    |                            |
| A445                    |                            |
| A450                    |                            |
| A454                    |                            |
| A456                    | —<br>                      |
| CENTRAL MOUNT<br>STUART | 13,000                     |
| FINNISS                 |                            |
| FREELING                |                            |
| HARPER                  |                            |
| HARRIS                  |                            |
| LUCY                    | /                          |
| NMB 184                 |                            |
| NMB 286                 |                            |
| NMG 1                   |                            |
| " 3                     |                            |
| " 6                     |                            |
| " 7                     |                            |
| " 9                     |                            |
| " 14                    |                            |
| " 15                    | —  and Y (See recon notes) |
| " 17                    | >                          |
| " 55                    |                            |
| " 77                    | >                          |
| " 78                    | >                          |
| " 83                    |                            |

|        | <u>REMARKS</u> |
|--------|----------------|
| NMG 84 | * ↑            |
| " 94   | >              |
| " 97   | >              |
| " 133  |                |
| " 135  |                |
| " 153  |                |
| " 154  |                |
| " 158  |                |
| " 163  |                |
| " 164  |                |
| " 168  |                |
| " 169  |                |
| " 170  |                |
| " 186  |                |
| " 187  |                |
| " 191  |                |
| " 201  |                |
| " 203  |                |
| " 207  |                |
| " 208  |                |
| " 209  |                |
| " 211  |                |
| " 228  |                |
| " 229  |                |
| " 235  |                |
| " 239  |                |

| <u>REMARKS</u> |         |
|----------------|---------|
| NMG 241        |         |
| " 248          |         |
| " 277          |         |
| " 280          |         |
| " 281          |         |
| " 282          |         |
| " 283          |         |
| " 285          |         |
| " 302          |         |
| " 309          |         |
| " 240          |         |
| NANCY          |         |
| NTL 1050       |         |
| NTS 071        |         |
| NTS 159        |         |
| NTS 164        |         |
| STIRLING       | 12,000' |
| TAYLOR         | 9,400'  |
| WYCLIFFE       | 9,500'  |
| U101           |         |

Notes: 1. All stations targetted with standard configuration unless noted. All photographed at 10,000 ft unless noted.

2. Ground mark for NMG 15 disturbed. RM panelled as follows:

RM (Telegraph Pole)



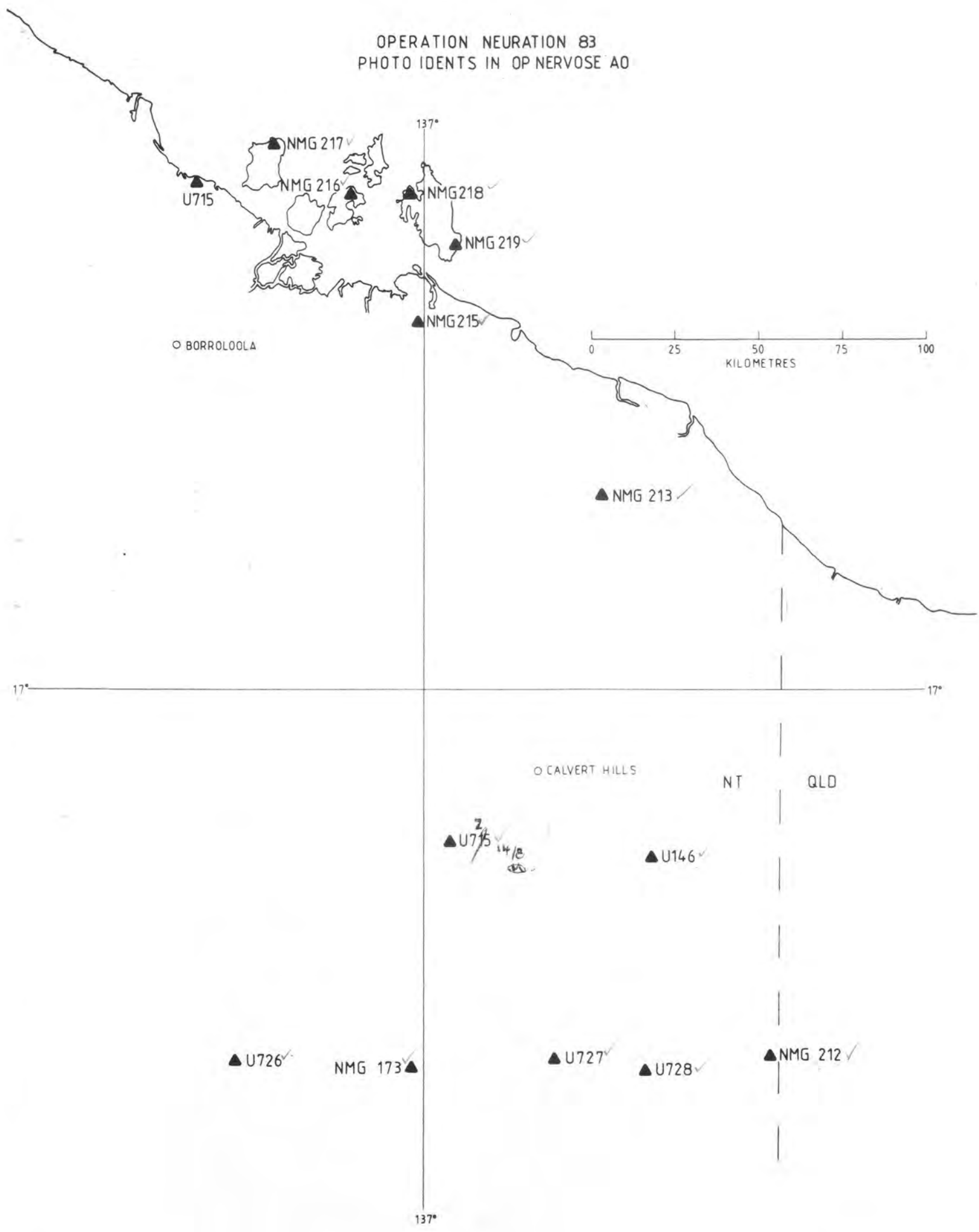
RM (Western)



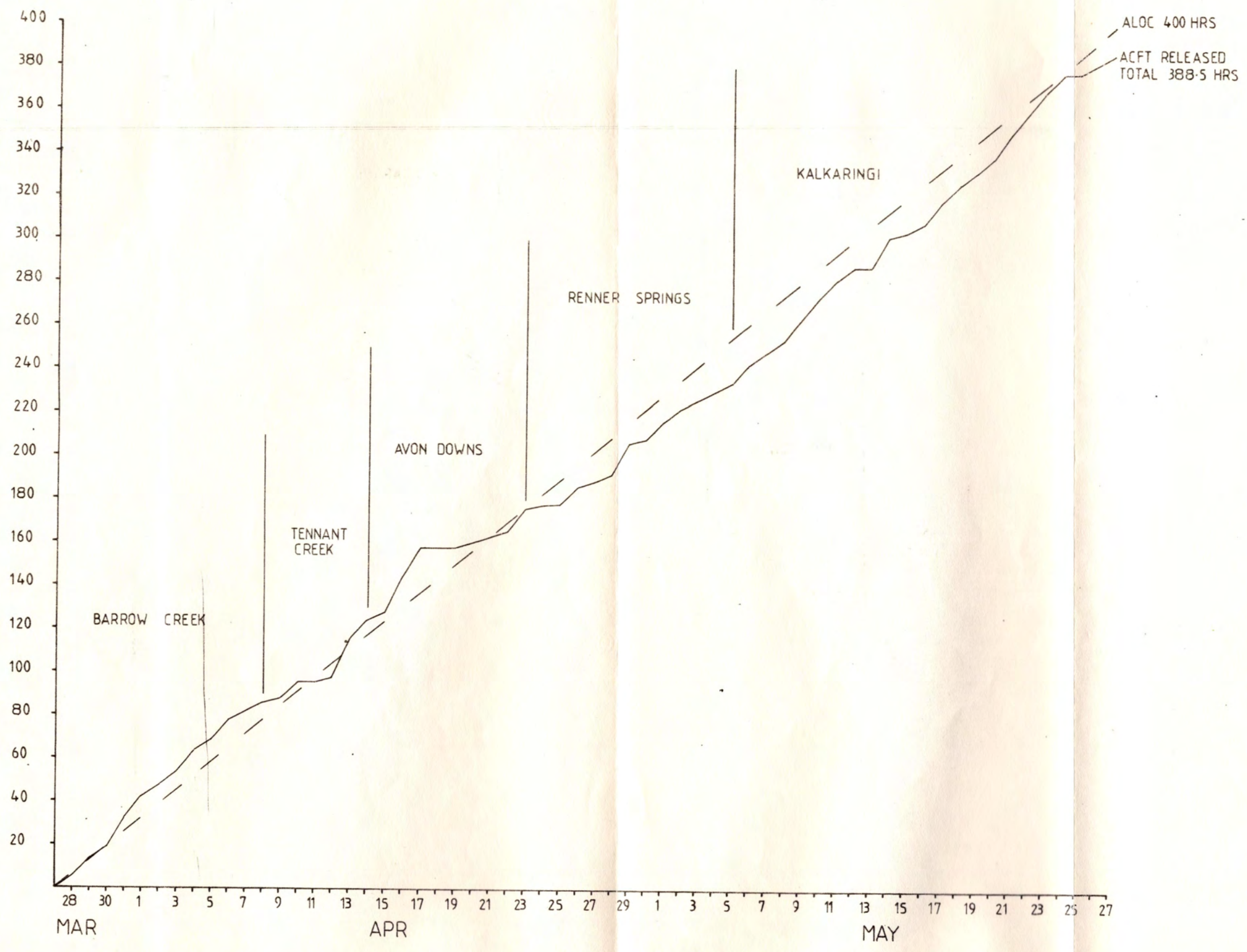
EXISTING STATIONS PHOTOGRAPHED  
OP NERVESE AO

| <u>Station</u> | <u>Flying Height ASL (Feet)</u> | <u>Target</u> |
|----------------|---------------------------------|---------------|
| NMG 173 ✓      | 10,000                          |               |
| NMG 212 ✓      | 10,000                          | — —           |
| NMG 213 ✓      | 10,000                          |               |
| NMG 215 ✓      | 6,000                           |               |
| NMG 216 ✓      | 6,000                           |               |
| NMG 217 ✓      | 10,000                          |               |
| NMG 218 ✓      | 6,500                           |               |
| NMG 219 ✓      | 6,000                           | — —           |
| U146           | 10,000                          |               |
| U715           | 5,000                           |               |
| U725           | 4,500 and 10,000                |               |
| U726           | 10,000                          |               |
| U727           | 10,000                          |               |
| U728           | 10,000                          |               |

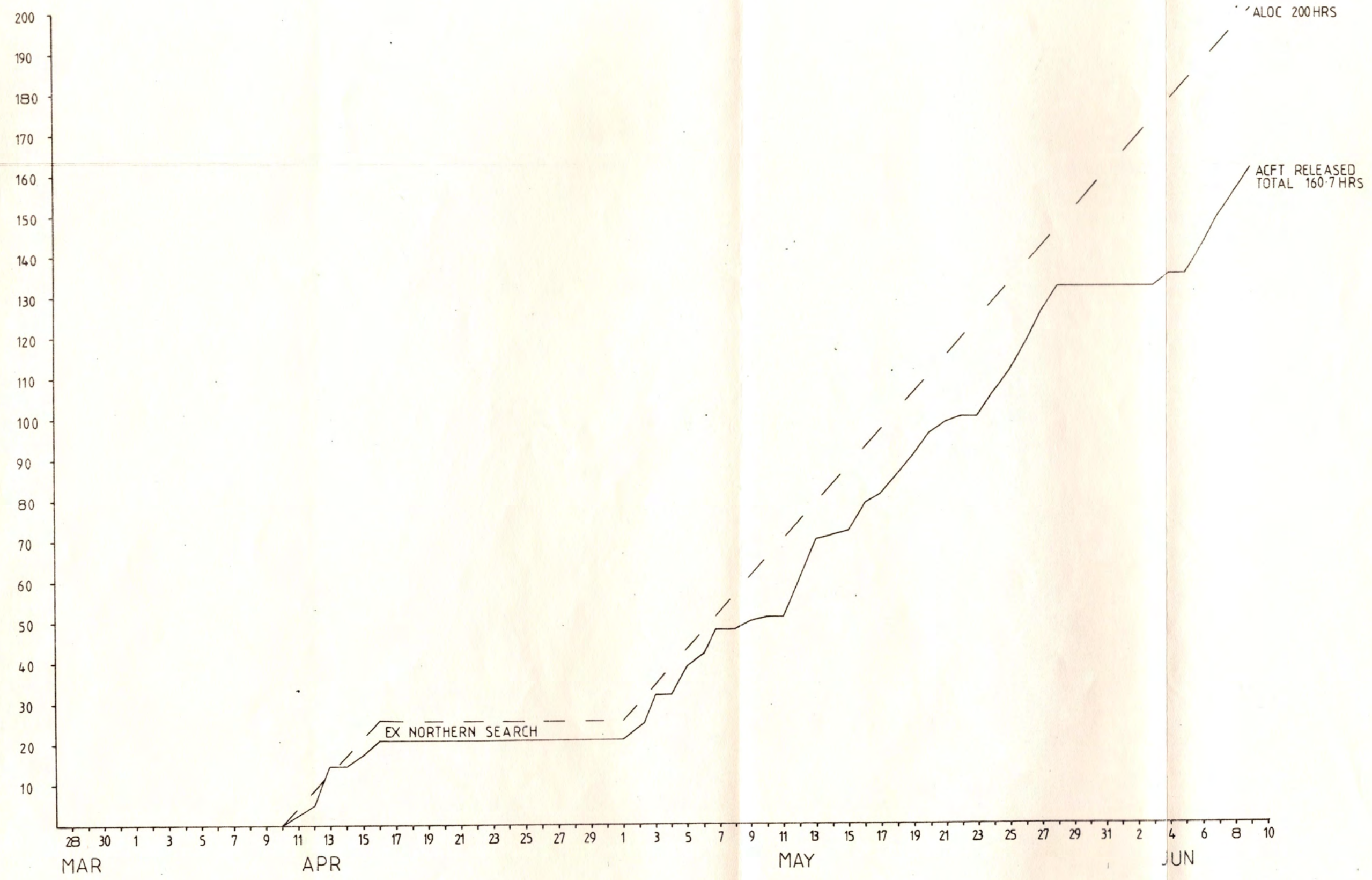
OPERATION NEURATION 83  
PHOTO IDENTS IN OP NERVOSE AO



LOH HOURS vs CALENDAR DAYS  
OP NEURATION 83



PORTER HOURS vs CALENDAR DAYS  
OP NEURATION 83



FIELD ANNOTATION REPORT  
OPERATION NEURATION 83  
NORTHERN TERRITORY

Introduction

1. Whilst deployed on Op Neuration 83, Det 4 Fd Svy Sqn was tasked to field annotate 16 x 1:100,000 OPM. The maps cover the Stuart Highway from 90 km north of Alice Springs to Newcastle Waters.

Task

2. To field annotate the following 1:100,000 OPM:

- a. 5563 Newcastle Waters
- b. 5662 Elliott
- c. 5661 Helen
- d. 5660 Muckety
- e. 5760 Brunchilly
- f. 5759 Flynn
- g. 5758 Tennant Creek
- h. 5757 Bonney
- i. 5756 Wauchope
- j. 5755 Taylor
- k. 5655 Crawford
- l. 5654 Barrow
- m. 5554 Anningie
- n. 5553 Tea Tree
- o. 5552 Aileron
- p. 5652 Bushy Park

Execution

3. Reconnaissance. Reconnaissance was conducted by Porter prior to commencement of the annotation to assess the requirements and to take supplementary photography of areas of cultural development.

4. Field Parties. Four two-man field parties were deployed in landrovers. They commenced work at the extremities of their area of operations and worked towards Tennant Creek. The parties were made up of

/the following

the following pers:

- a. SSGT Lutwyche, SPR Rundle;
- b. SGT Tewson, SPR Beavis;
- c. CPL Longbottom, SPR Purdey; and
- d. LCPL Johnson, SPR Langeberg.

5. Timings. Reconnaissance was conducted in conjunction with the control survey part of the operation. Field annotation commenced on 1 Jun 83 and was completed on 8 Jun 83.

6. Supplementary Photography. RC10 aerial photography was taken over selected areas to assist in the transfer of new detail. Approximately 400 frames were taken. Including reconnaissance flights, 49.2 hr were flown in the Porter for the OPM annotation. Developing and some printing of the aerial photos was done at the Tennant Creek Hospital. The remainder of the prints were done on return to Adelaide.

7. Source Data. The OPM bases were produced by the Division of National Mapping from photography circa 1962-1971. Appendix 1 shows a list of material provided for the task.

8. Field Annotation. Field annotation responsibilities included the checking and addition of cultural detail, road classification and place names. Difficulties were encountered with the accurate placement of new detail for the following reasons:

- a. Contours were not shown on the sheets.
- b. The photography used to make the OPM base was between 12 and 20 years old.
- c. Enhancement of the photo base was limited and was available for only ten of the 16 sheets. As the photobase is so old, much detail could not be detected on the map and it was difficult to relate the map to the ground.
- d. Much of the enhanced detail shown appeared to be generalised and therefore inaccurate.

9. Addition of Detail. Due to the above difficulties, it was not always possible to add the new detail to the OPM base. In many cases, the cultural detail could only be positioned as accurately as possible on Pastoral Lease plans and/or 1:250,000 Series R502 maps. Supplementary photography was then flown to allow more accurate transfer. However, it was not practicable to cover the whole area in this manner, and much of the detail shown on the maps will have to be labelled "position approximate".

#### Admin/Log

10. Rations. The field parties took their ration requirements with them on deployment from Tennant Creek.

11. Accn. Tents were used for accommodation throughout.

12. POL. Petrol was purchased at Barrow Creek and Elliott using SP27. Consumption is included in the overall figure for Op NEURATION 83.
13. Comms. An HF listening watch was maintained during daylight hours at Tennant Creek on the hour. Parties reported their progress daily between 1730 and 1830 hr.

Conclusion

14. The completeness and quality of the material available was below that normally required for annotating 1:100,000 mapping. This made annotation inordinately difficult and will directly affect the accuracy of the product.

Appendix: 1. Source Data

SOURCE DATA

1. Half Tone Photomosaics. Two half tone photo mosaics for all OPM except 5652 Bushy Park (No material was supplied for Bushy Park).
2. Half Tone Photomosaics with Cultural Planimetric Detail Overprint. One copy for each of the fol maps:
  - a. 5758 Tennant Creek,
  - b. 5757 Bonney,
  - c. 5756 Wauchope,
  - d. 5755 Taylor,
  - e. 5655 Crawford,
  - f. 5654 Barrow,
  - g. 5553 Tea Tree, and
  - h. 5552 Aileron.
3. Ozafilm and Dyeline Copies of Planimetric Detail. Copies were provided for each map area shown in paragraph two, plus the following areas:
  - a. 5662 Elliott, and
  - b. 5759 Flynn.
4. Cronaflex Grids. Cronaflex grids plus up to five ozafilm copies of grid were provided for all maps except 5652 Bushy Park.
5. Mapping Photography. A copy of the mapping photography was available.
6. Pastoral Plans
  - PL 518 PHILLIP CREEK
  - PL 524 HELEN CREEK
  - PL 574 SINGLETON
  - PL 622 ANNINGIE
  - PL 626 TEA TREE
  - PL 636 MT SKINNER
  - PL 641 AILERON
  - PL 646 McLAREN CREEK
  - PL 648 PINE HILL
  - PL 655 NAPPERBY
  - PL 656 NAPPERBY
  - PL 677 BRUNCHILLY
  - PL 755 BANKA BANKA
  - PL 771 STIRLING
  - PL 772 MURRANJI
  - PL 775 NEUTRAL JUNCTION

PL 779 TENNANT CREEK  
PL 790 MURRAY DOWNS  
PL 814 MUCKATY  
PL 849 NEWCASTLE WATERS  
PL 850 POWELL CREEK  
PL 851 TANDYIDGEE

LOAN STORES AND VEHICLES

1.

Stores

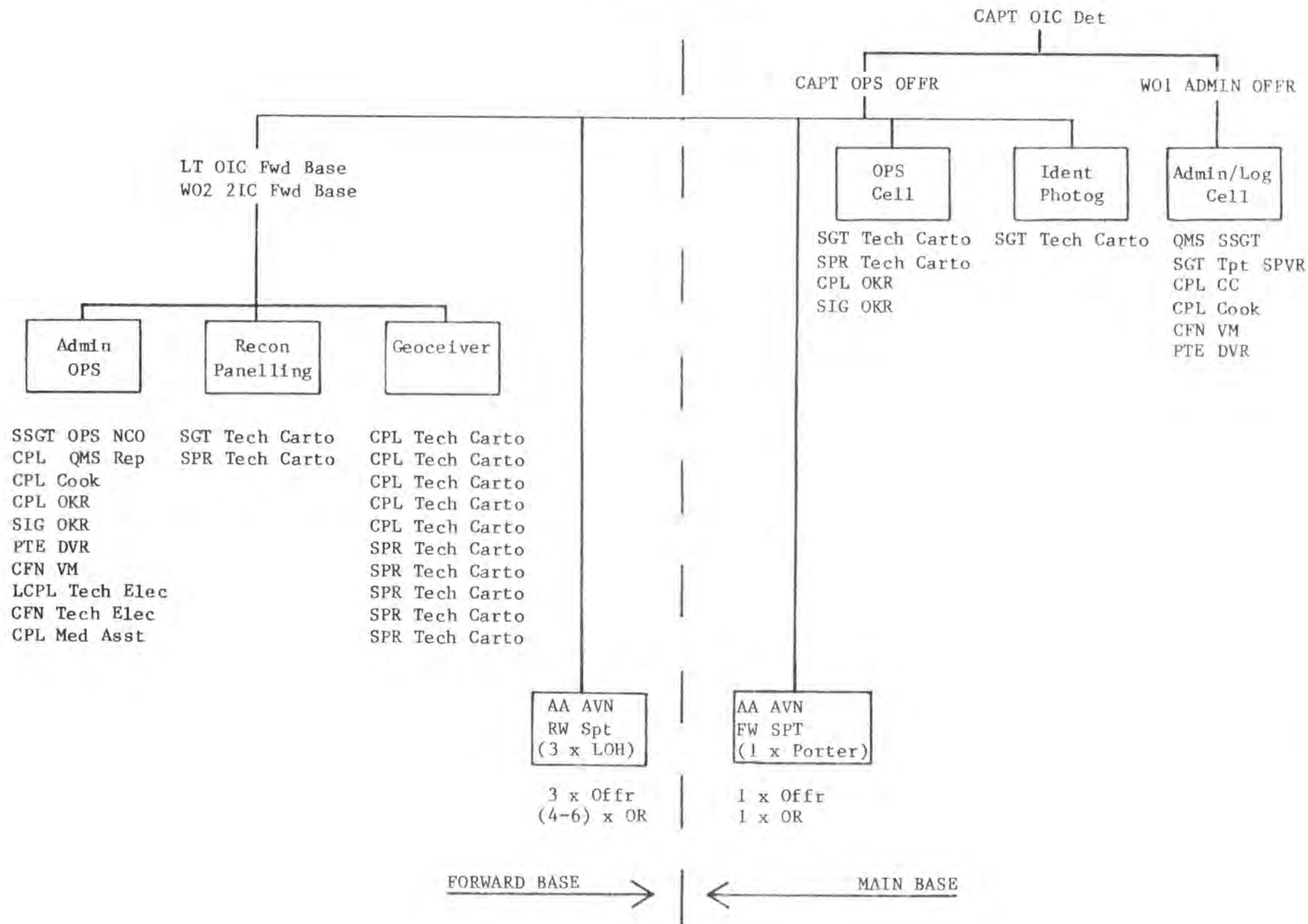
| <u>Item</u>                     | <u>Qty</u> |
|---------------------------------|------------|
| F1 Batteries                    | 12         |
| Gen Set 500W                    | 8          |
| 370 Litre Refrigerator Electric | 3          |
| Tables FS Large                 | 25         |
| 100 gal Water Bladder           | 2          |
| Tent 11' x 11'                  | 16         |
| Tent Ext 11' x 11'              | 7          |
| Arm Chair                       | 10         |
| Chair Steel Folding             | 23         |
| 240/32V 1KVA Transformer        | 4          |
| Washing Machine                 | 1          |
| Dark Room Portable              | 1          |
| Geoceiver ANPRR14               | 5          |
| Astromast Tower                 | 2          |
| Calculator HP9815A              | 2          |
| HP Interface                    | 2          |
| HP 9863A Tape Reader            | 2          |
| Waterpump Truck 5 ton GS        | 2          |
| Contact Printer KG 30           | 1          |
| Aerial Camera RC10              | 1          |
| Developing Tanks B8             | 1          |

2.

Vehicles

| <u>Veh</u>                                      | <u>Qty</u> | <u>Unit</u>       |
|---|------------|-------------------|
| Truck Utility 3/4 ton GS Landrover<br>Series 2A | 4          | 32 Sup Bn         |
| Truck Utility 3/4 ton FFR Landrover<br>Series 3 | 2          | 144 Sig Squ       |
| Truck Cargo 5 ton GS W/W                        | 1          | 41 Sup Bn         |
| Truck Cargo 4 ton CL                            | 1          | Adelaide Tpt Unit |
| Truck Cargo 4 ton CL, Tailgate Loader           | 1          | Adelaide Tpt Unit |
| Truck Cargo 1 ton CL                            | 1          | Adelaide Tpt Unit |
| Microbus CL Toyota Hiace                        | 1          | Adelaide Tpt Unit |
| Trailer 1/2 ton                                 | 4          | 41 Sup Bn         |

MANNING CHART



NOMINAL ROLL

| Regt No | Rank | Name            | Unit                | Appointment                            |
|---------|------|-----------------|---------------------|--|
| 1202474 | CAPT | P.A. Jensen     | 4 Fd Svy Sqn        | OIC                                    |
| 49975   | CAPT | M.L. Heinrich   | 4 Fd Svy Sqn        | Ops Offr                               |
| 22557   | LT   | O.F. Moss       | 4 Fd Svy Sqn        | OIC Fwd Base                           |
| 41896   | WO1  | W.A. Munro      | 4 Fd Svy Sqn        | ADMIN OFFR                             |
| 1202502 | WO2  | P.C. Warwick    | 4 Fd Svy Sqn        | 2IC Fwd Base<br>(21 Mar - 28 Apr 83)   |
| 517658  | SSGT | J.R. Sargeant   | 4 Fd Svy Sqn        | QMS                                    |
| 6708956 | SSGT | B.J. Lutwyche   | 4 Fd Svy Sqn        | Ops NCO Fwd Base                       |
| 61800   | SGT  | W.M. Tewson     | 4 Fd Svy Sqn        | Recon/Panelling                        |
| 47823   | SGT  | R.C. Parslow    | 4 Fd Svy Sqn        | Tpt Spvr                               |
| 45650   | SGT  | R.P. Garritty   | 4 Fd Svy Sqn        | Ident Photog<br>(24 Mar - 26 May 83)   |
| 314445  | SGT  | R.J. Rees       | 4 Fd Svy Sqn        | IC Svy Records                         |
| 1205262 | CPL  | J.E. Aller      | 4 Fd Svy Sqn        | QMS Rep Fwd Base                       |
| 46632   | CPL  | M.D. Cotton     | 4 Fd Svy Sqn        | CC                                     |
| 424853  | CPL  | P.D. Rockley    | 4 Fd Svy Sqn        | CPL Cook                               |
| 48823   | CPL  | G.S. Campbell   | 4 MD Cat Pool       | CPL Cook                               |
| 63195   | CPL  | R. Warsing      | 4 Fd Svy Sqn        | Ident Photog<br>(1 Jun - 12 Jun 83)    |
| 226223  | CPL  | G.J. Honan      | 4 Fd Svy Sqn        | Geoceiver Party                        |
| 552471  | CPL  | R.D. Clarke     | 4 Fd Svy Sqn        | Geoceiver Party                        |
| 49654   | CPL  | P.D. Longbottom | 4 Fd Svy Sqn        | Geoceiver Party                        |
| 3176518 | CPL  | A.R. Hawkins    | 4 Fd Svy Sqn        | Geoceiver Party                        |
| 320155  | LCPL | B.D. Johnson    | 4 Fd Svy Sqn        | Geoceiver Party                        |
| 512083  | CPL  | R.F.F. Guy      | 104 Sig Sqn         | OKR                                    |
| 229860  | CPL  | G.E.A. Dignam   | 104 Sig Sqn         | OKR                                    |
| 321968  | SPR  | S.E. McGuinness | 4 Fd Svy Sqn        | Geoceiver Party                        |
| 4401491 | SPR  | P.P. Langeberg  | 4 Fd Svy Sqn        | Geoceiver Party                        |
| 4401213 | SPR  | R. Stark        | 4 Fd Svy Sqn        | Geoceiver Party<br>(24 Mar - 3 May 83) |
| 180949  | SPR  | R.P. Beavis     | 4 Fd Svy Sqn        | Geoceiver Party                        |
| 228115  | SPR  | S.C. Rundle     | 4 Fd Svy Sqn        | Geoceiver Party                        |
| 4401663 | SPR  | O.M. Jones      | 4 Fd Svy Sqn        | Recon/Panelling                        |
| 4401748 | SPR  | T.M. Purdy      | 4 Fd Svy Sqn        | Svy Records                            |
| 49725   | SIG  | P. Straschko    | 104 Sig Sqn         | OKR                                    |
| 553956  | SIG  | D.M. Tassicker  | 104 Sig Sqn         | OKR                                    |
| 4400611 | PTE  | G.P. Dover      | Adelaide Tpt Unit   | Driver                                 |
| 229129  | PTE  | A.A. Dodd       | Singleton Tpt Unit  | Driver                                 |
| 2105538 | PTE  | K. Richardson   | Liverpool Tpt Unit  | Driver                                 |
| 227539  | CFN  | N.B. Hitchings  | Adelaide Wksp Coy   | Vehicle Mechanic                       |
| 1205581 | CFN  | D.J. Prince     | Adelaide Wksp Coy   | Vehicle Mechanic                       |
| 227843  | CFN  | R. Brown        | Sydney Wksp Coy     | Tech Elec                              |
| 323906  | CFN  | C. Thompson     | Sydney Wksp Coy     | Tech Elec                              |
| 3142873 | CPL  | D.M. Niblock    | 1 Fd Hosp           | Med Asst                               |
| 418587  | SPR  | N.E. Gerrie     | 4 Fd Svy Sqn (ARES) | Recon/Panelling<br>(24 Mar - 8 Apr 83) |

| Regt No | Rank | Name            | Unit                   |                   |
|---------|------|-----------------|------------------------|-------------------|
| 223688  | CAPT | R.A. Newnham    | 161 Recce Sqn          | (28 Mar - 27 Apr) |
| 320308  | LT   | I.M. Salau      | " " "                  | (28 Mar - 7 Apr)  |
| 291358  | 2LT  | P.F. Smith      | " " "                  | (28 Mar - 27 Apr) |
| 225223  | LT   | P.G. Lewis      | " " "                  | (12 Apr - 27 Apr) |
| 1202413 | SGT  | R.J. Perkins    | " " "                  | ( 3 Apr - 26 Apr) |
| 424510  | CPL  | G. Mecurie      | " " "                  | (28 Mar - 17 Apr) |
| 1205037 | CPL  | J.R. Farrow     | " " "                  | ( 3 Apr - 26 Apr) |
| 552077  | CFN  | I.E. Phillips   | " " "                  | (28 Mar - 17 Apr) |
| 63174   | CFN  | C.F. Hanna      | " " "                  | (18 Apr - 26 Apr) |
| 552422  | CFN  | S.A. Madsen     | " " "                  | (18 Apr - 26 Apr) |
| 224825  | CAPT | M. Patch        | 171 Comd & Liaison Sqn | (26 Apr - 17 May) |
| 320854  | LT   | K.A. Pye        | " " " "                | (26 Apr - 17 May) |
| 179978  | LT   | J.W. Stark      | " " " "                | (26 Apr - 17 May) |
| 18810   | SGT  | M. Lonerigan    | " " " "                | (26 Apr - 17 May) |
| 1201810 | CPL  | L.N. Kaplick    | " " " "                | (26 Apr - 17 May) |
| 552681  | CPL  | S.M. Tilbee     | " " " "                | (26 Apr - 17 May) |
| 58479   | CFN  | P.J. Griechen   | " " " "                | (26 Apr - 30 May) |
| 317834  | CFN  | C.W. Sanders    | " " " "                | (26 Apr - 30 May) |
| 319683  | CFN  | A.G. Saxby      | " " " "                | (26 Apr - 30 May) |
| 282019  | CAPT | M.H. Sedsman    | " " " "                | (14 May - 27 May) |
| 1204636 | LT   | B.R. Heathwood  | " " " "                | (14 May - 27 May) |
| 161017  | LT   | M. Power        | " " " "                | (14 May - 27 May) |
| 45328   | SGT  | A.P. Hart       | " " " "                | (14 May - 27 May) |
| 61881   | CPL  | J.I. Costelloe  | " " " "                | (14 May - 27 May) |
| 313207  | CPL  | W.F. Treble     | " " " "                | (14 May - 30 May) |
| 323452  | LT   | S.J. McLenahan  | 173 Gen Spt Sqn        | (11 Apr - 19 Apr) |
| 1204956 | LT   | M.J. Sterling   | " " " "                | ( 1 May - 17 May) |
| 225753  | LT   | J.M. Buckett    | " " " "                | (14 May - 10 Jun) |
| 5411483 | CPL  | G. McDermott    | " " " "                | (11 Apr - 19 Apr) |
| 553209  | CFN  | G.A. Turner     | " " " "                | ( 1 May - 17 May) |
| 227338  | CFN  | J.R. Aulsebrook | " " " "                | (14 May - 10 Jun) |

COMMUNICATIONS

1. Communications were by the following means:
  - a. Post Office Box,
  - b. Telephone,
  - c. Telex,
  - d. HF radio, and
  - e. VHF radio.
2. Post Office Box. Mail was held at Tennant Creek Post Office for daily collection by det pers.
3. Telephone. A telephone (with lock) was installed by Telecom in the Orderly Room. As there was no public telephone facility in close proximity, it was made avail to det members after hours on a repayment basis.
4. Telex. A telex machine was installed in the orderly room by telecom. The prime purpose was to allow timely despatch and receipt of hard copy messages. 59 messages were received, and 105 messages despatched. It was also used to read geociever tapes to verify data, and when the HP 9863A tape readers broke down, to duplicate paper tapes for safeguard against loss or damage.
5. HF Radio. Initially, comms between main and forward bases were to be by PRC 47 sets (ANGRC 106 sets being unavailable). However these became unserviceable and PRC F1 sets were used for all ground installations. The F1 sets proved workable over all the distances encountered (up to 420 km), although atmospheric interference generally made comms unworkable after 2100 hr.
6. HF Antennas. Both horizontal dipole and inverted V antennas were used. Careful alignment of antennas assisted comms over long distances (it was necessary to relocate the antennas a number of times). The HP 9815A and HP9863A had to be relocated away from the antennas to minimise interference with HF comms.
7. VHF Radio. A VHF net was established to allow main and forward bases to communicate with supporting aircraft in their area. However, this was of limited use due to the distances involved. Messages were often passed through Flight Services Tennant Creek, and if necessary the Porter could be notified to tune into the HF net by these messages.

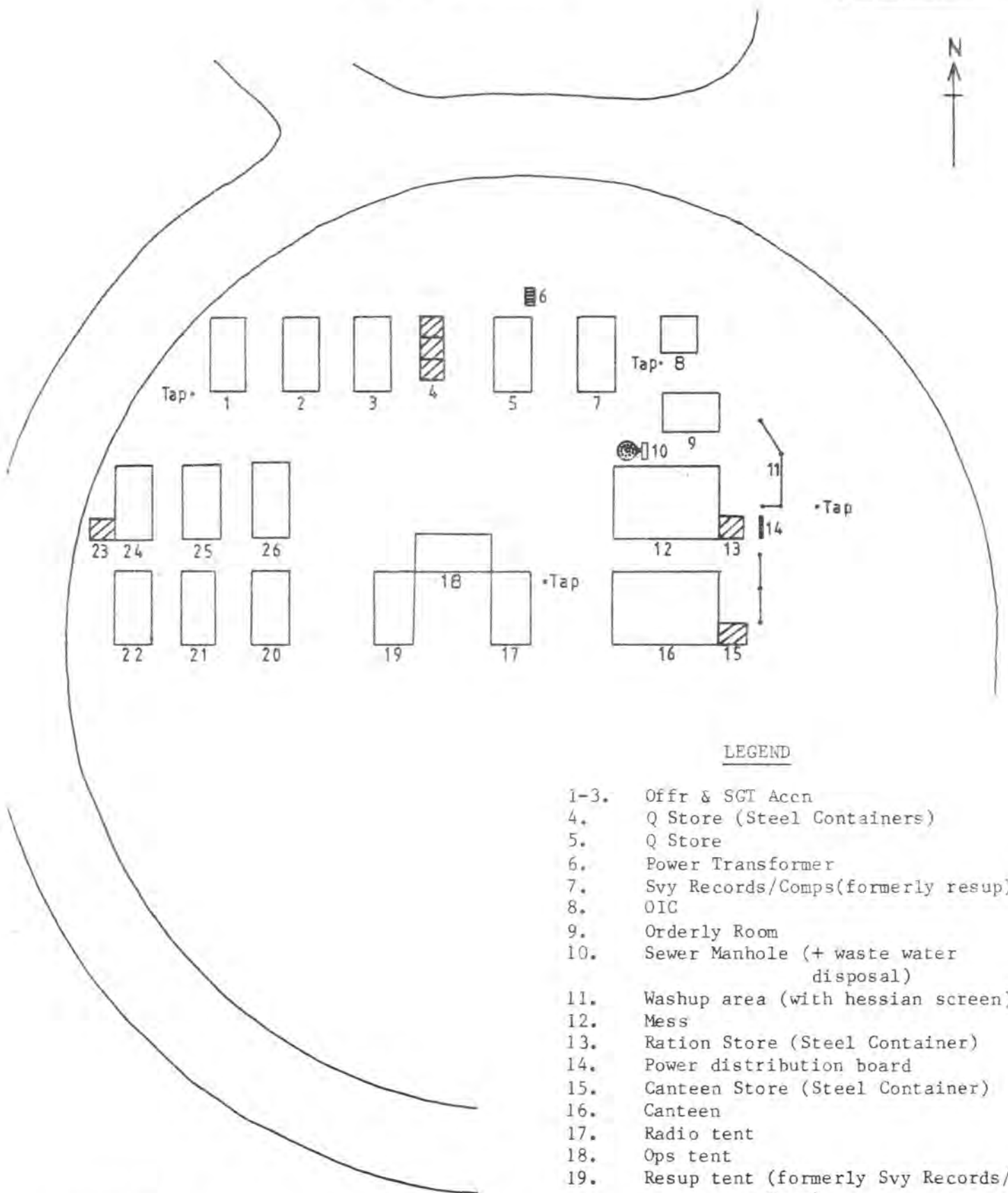
8. Frequencies

| HF (KHz) | VHF (MHZ) |
|----------|-----------|
| 3151     | 38.15     |
| 3460     | 41.20     |
| 5498     | 41.80     |
| 5722     | 50.20     |
| 6652     | 54.50     |
| 8498     | 60.45     |

9. Net Operating Times. The HF net was opened at 0700 hr daily. Closing time was around 1830 hr (as directed daily by OPSO). When a party was having geociever equipment problems, it was sometimes necessary to keep the net open so that advice may be passed on.

MAINBASE TENNANT CREEK  
OP NEURATION 83

ANNEX G TO  
PROJECT REPORT  
OP NEURATION 83



LEGEND

- 1-3. Offr & SGT Accn
- 4. Q Store (Steel Containers)
- 5. Q Store
- 6. Power Transformer
- 7. Svy Records/Comps(formerly resup)
- 8. OIC
- 9. Orderly Room
- 10. Sewer Manhole (+ waste water disposal)
- 11. Washup area (with hessian screen)
- 12. Mess
- 13. Ration Store (Steel Container)
- 14. Power distribution board
- 15. Canteen Store (Steel Container)
- 16. Canteen
- 17. Radio tent
- 18. Ops tent
- 19. Resup tent (formerly Svy Records/Comp)
- 20-22. Transit OR accn
- 23. Tpt Stores (Steel Container)
- 24. Tpt Office
- 25-26. OR Accn

Scale. 1:500 5m 0 10 20m

Note: 32V lighting used throughout.  
240V outlets provided for tents 5,7,8,  
9,12,16,17,18,19 and 24. Distribution  
was overhead from power board (14).

STORES WRITTEN OFF

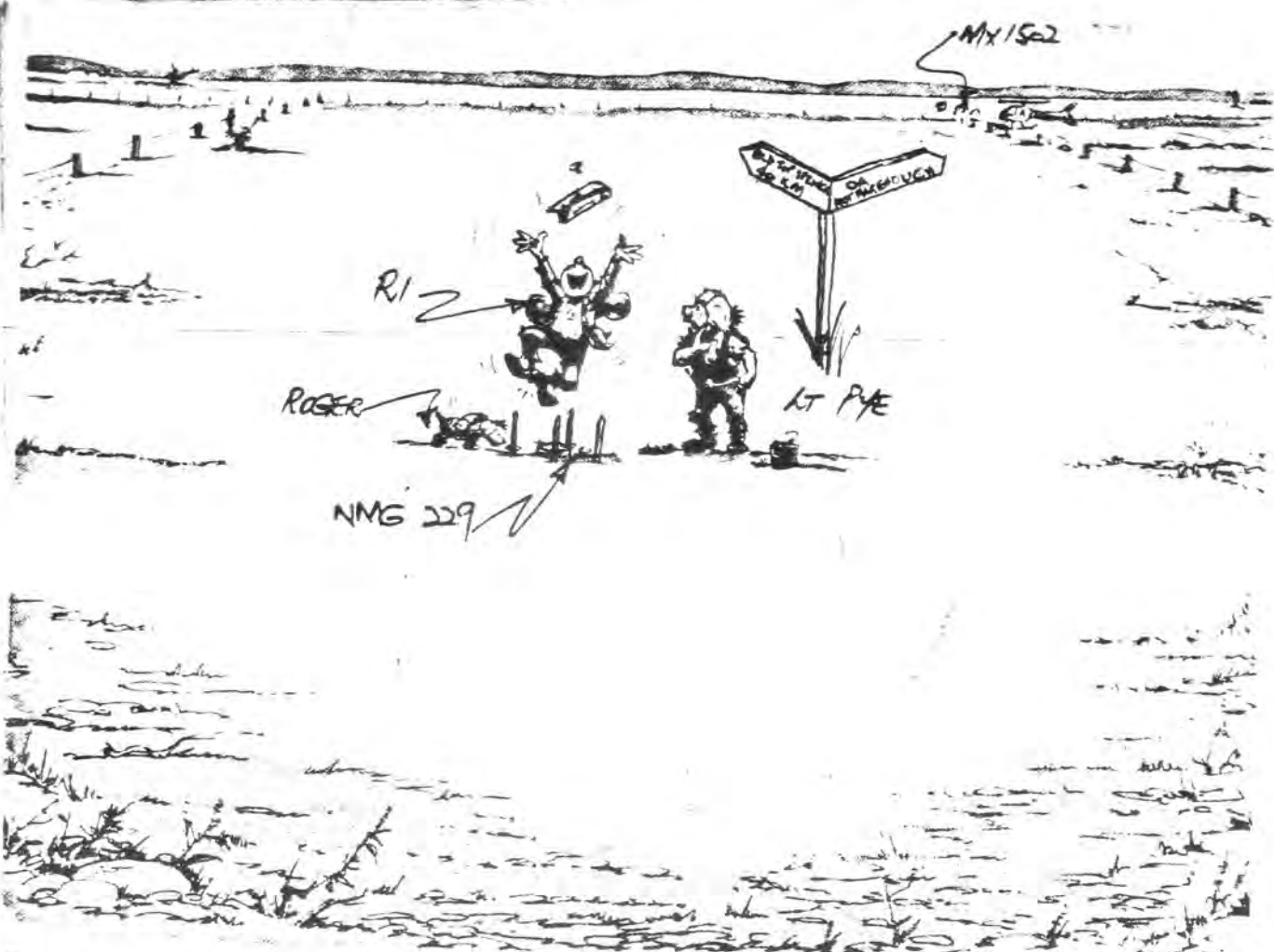
| <u>ITEM</u>                    | <u>QTY</u> | <u>REPLACEMENT COST</u> |
|--------------------------------|------------|-------------------------|
| Battery, storage 12V           | 2          | 54.32                   |
| Chair, folding, arm            | 3          | 24.00                   |
| Chair, folding, camp           | 3          | 17.94                   |
| Compass, mariner               | 1          | 60.00                   |
| Compass, prismatic             | 1          | 32.00                   |
| Cot, folding, canvas           | 5          | 118.00                  |
| Cover, fitted, body, Landrover | 1          | 190.31                  |
| Extinguisher, fire, BCF, 6lb   | 2          | 100.00                  |
| Frame, towing, A               | 1          | 180.90                  |
| Sleeping bag, cool weather     | 1          | 29.50                   |
| Tyre, pneumatic, 750 x 16      | 10         | 861.42                  |
| Tyre, pneumatic, 1200 x 20     | 4          | 668.00                  |
| Wheel, disk, tyre, 16 inch     | 1          | 30.00                   |
| Wheel, disk, tyre, 1200 x 20   | 2          | 72.40                   |
|                                |            | <hr/>                   |
|                                | TOTAL      | \$2438.79               |
|                                |            | <hr/>                   |

SUMMARY OF EXPENDITURE

|    |   |             |
|----|---|-------------|
| 1. | <u>ITEM 234-2-03 POL</u>                    | \$52,460.00 |
| 2. | <u>ITEM 234-2-02 RATIONS</u>                | \$20,920.00 |
| 3. | <u>ITEM 233-1-01 TRAVEL AND SUBSISTENCE</u> | \$22,135.00 |
| 4. | <u>ITEM 233-1-05 FREIGHT AND CARTAGE</u>    | \$19,296.00 |

SUMMARY OF MECHANICAL REPAIRS

| VEH/EQUIP        | REPAIR/REMARK   |
|------------------|---|
| Microbus         | Windscreen replaced )   |
| Truck 1 ton CL   | " " )   |
| Truck 4 ton CL   | " " )   |
| Landrover        | Clutch replaced   |
| Landrover        | Gearbox replaced  |
| Landrover        | Broken rocker arm. Recovered to Adelaide  |
| Truck 2-1/2 ton  | Starter Motor replaced  |
| Truck 5 ton      | Distributor replaced  |
| Generator 10 KVA | Decokes required due to excessive carbon buildup as standard petrol is difficult to obtain in NT  |
| Trailer          | Two trailers overturned during redeployment of geociever field parties. Both have since been classified as being beyond economical repair |
| Generator 500W   | Numerous repairs and faults including loose exhaust flanges, broken pull starts, broken canrod  |
| General          | Veh mechanics were kept busy carrying out general servicing, tune-ups and minor repairs in addition to those listed above.                |



"KEEP YOUR VOICE DOWN! DO YOU WANT EVERYONE TO KNOW WE FOUND IT? THINK OF THE HOURS WE CAN FLY STILL LOOKING FOR IT!!"

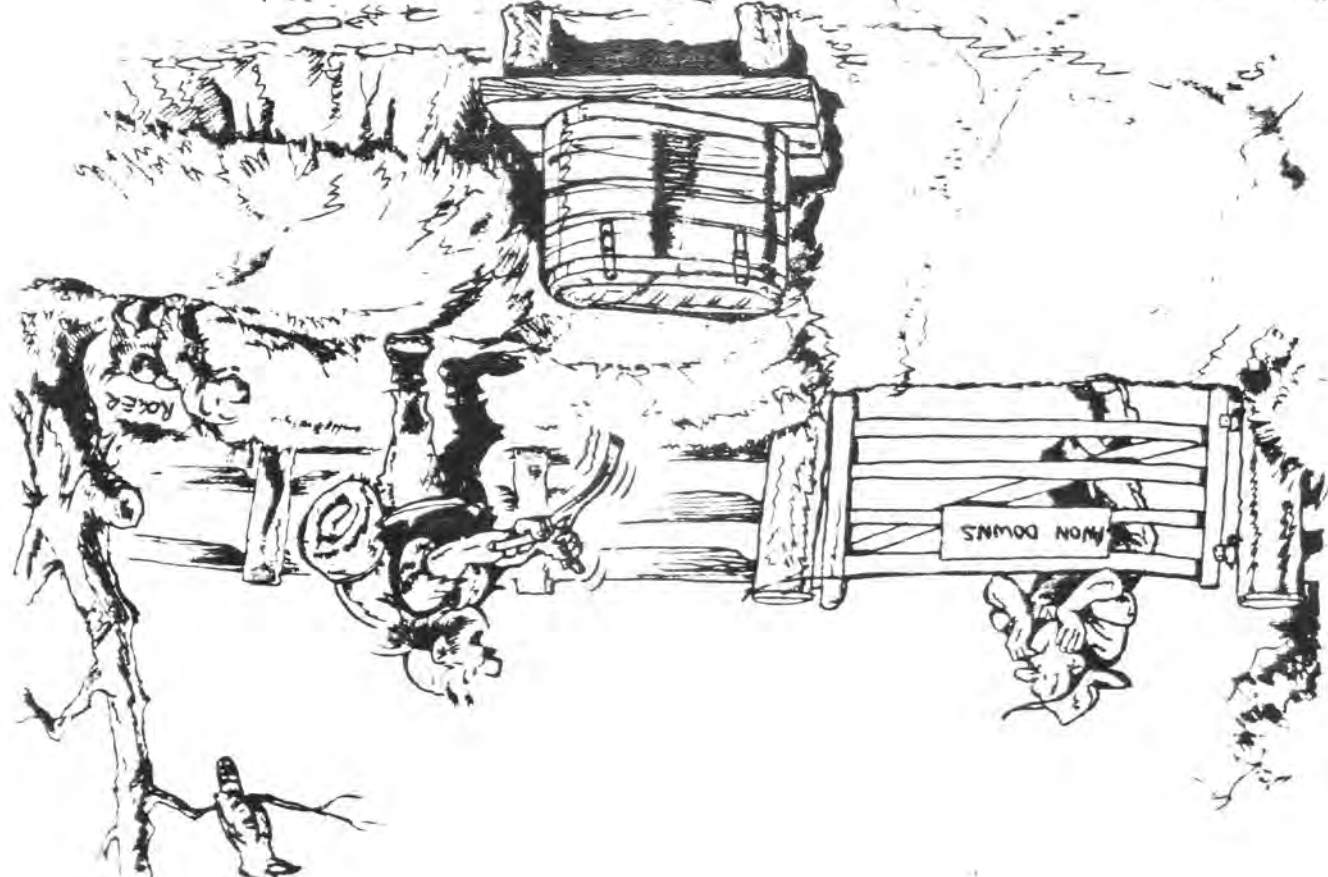


"OA SAID THAT'S WHERE THEY WANT THE STATION, SO THAT'S WHERE IT GOES!"

"CRIPES! LOOK AT RO'S! WE'VE BEEN ROSTERED AS ICE QUALITY CONTROLLERS AT FWD BASE!"

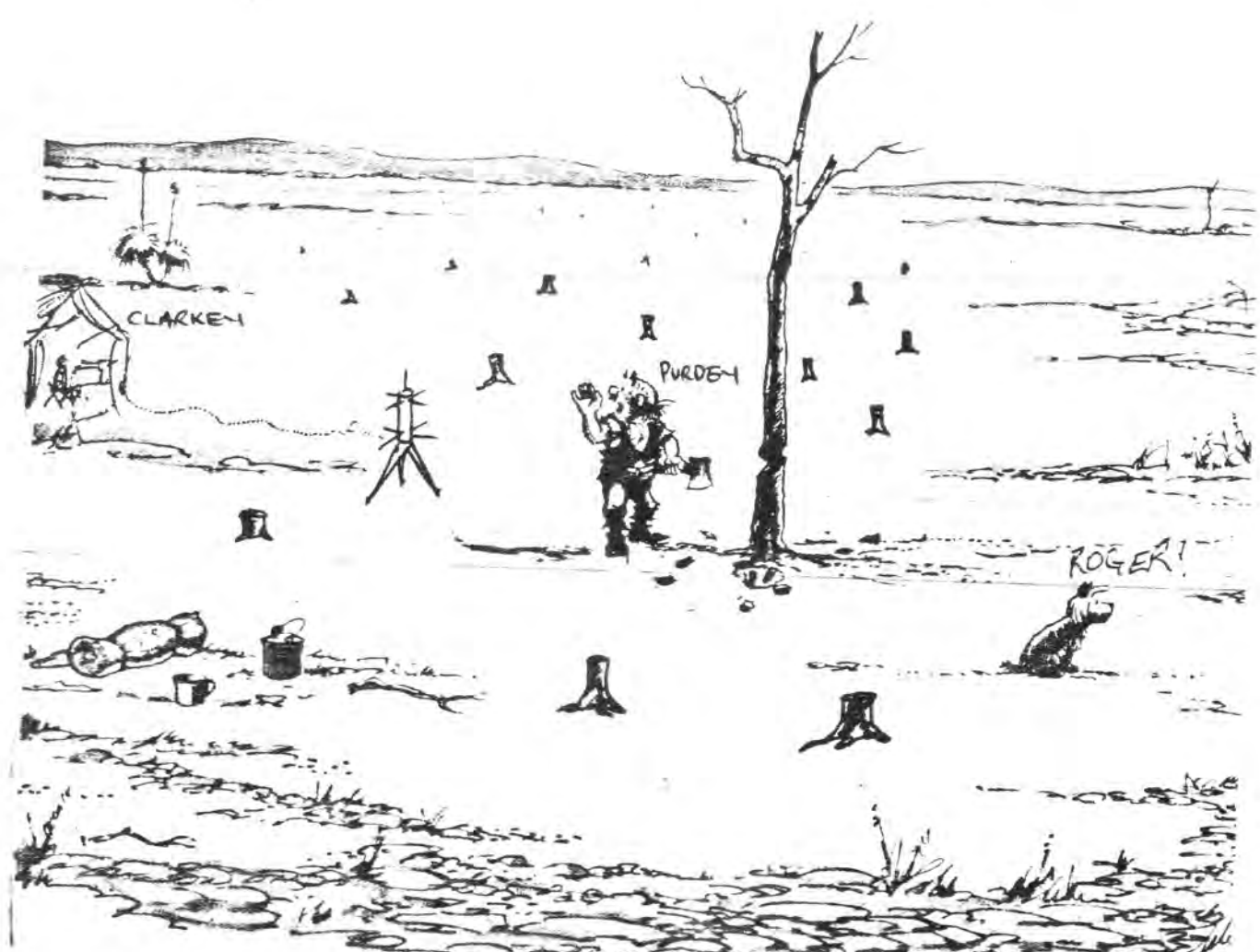


"I CHARGE ONE DOLLAR AN HOUR FOR DIVING WATER, OR FIVE DOLLARS FOR ICE. I'M MAKING A FORTUNE FROM THE SUCKERS IN THE GEESEIVER PARTIES!"

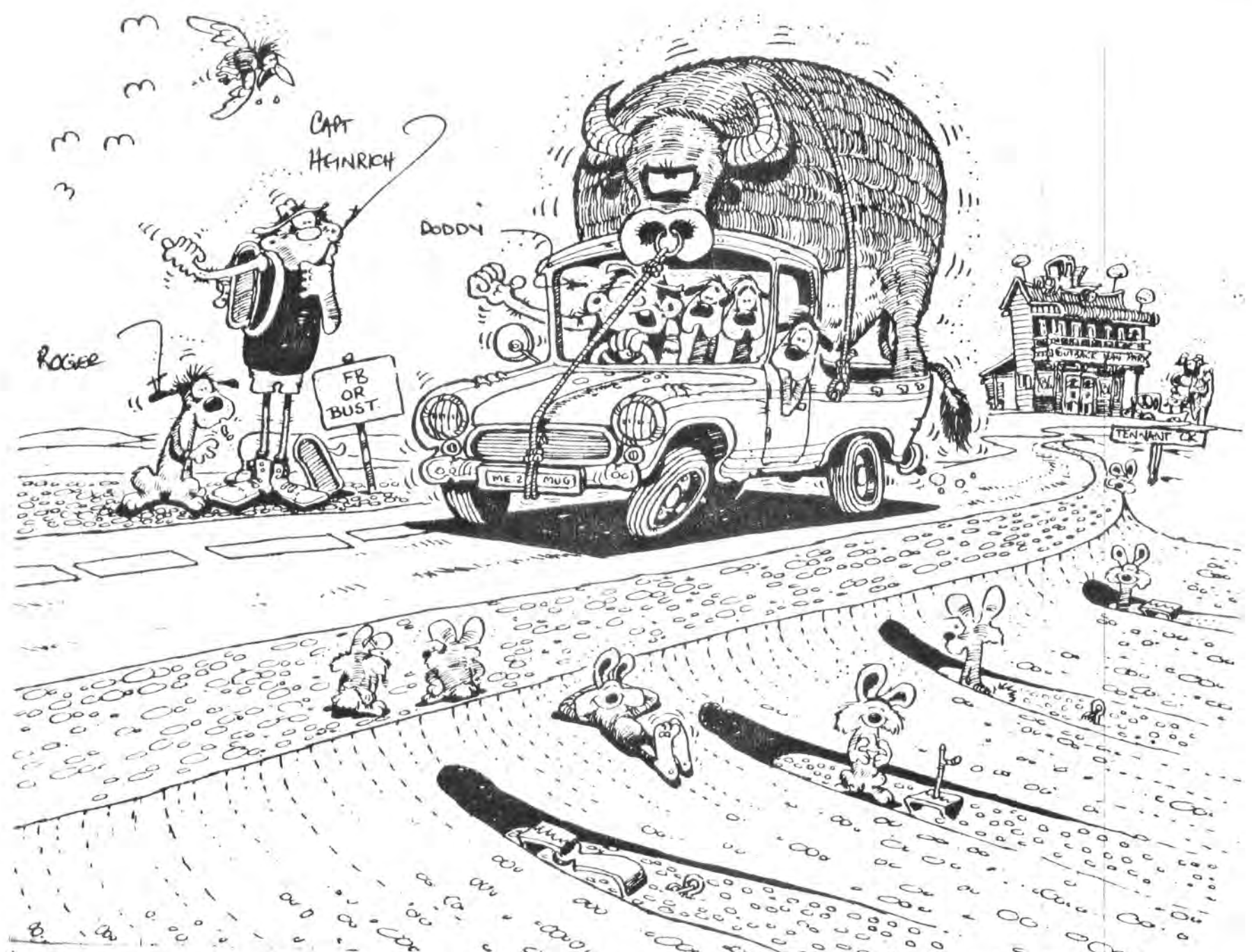




"JUST IGNORE HIM. HE'S ONLY DOING IT TO START AN ARGUMENT."



"THE OTHER PILOT SAID HE WOULDN'T LAND UNLESS WE CLEARED A HELIPAD"



"THOSE GEODECIVER PARTIES WILL NEVER COMPLAIN ABOUT THE SIZE OF THE STEAKS AFTER I DROP THIS LOT OFF!"



"FAREWELL AT OLD TOP SPRINGS"

