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TECHNICAL NOTE NO. DREO TN 71-33

ROBESON CHANNEL EXPERIMENT: MAIN AND RADAR CAMP – PLANS AND OPERATIONS

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ABSTRACT

The operating principles for the base camp at Lincoln Bay are set forth and construction and assembly methods described. Communications, power and heating arrangements are described in detail.

RÉSUMÉ

Les principes de fonctionnement pour le camp situé à Lincoln Bay et les méthodes de construction et d'assemblage sont decrits. Les systemès de chauffage, de communication et de puissance sont detaillés.

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ROBESON CHANNEL PROJECT TASK

CAMP FACILITIES AND THEIR 1971 OPERATION AT LINCOLN BAY

GENERAL PRINCIPLES OF OPERATION

1. Part of the Robeson Channel effort relies on the year-round operation of a radar located on the cliffs near Lincoln Bay, Figure I. A preliminary survey of the area when still frozen indicated a good location for a base camp by a small lake on the south side of Lincoln Bay, within a mile of the proposed radar location.

2. Because of the lack of a suitable STOL aircraft landing strip, and water at the radar site, the base camp was to be set up by the lake to provide living quarters for the radar operators who would stand watches at the radar site. A survey on July 23 before start of construction indicated a better site for the camp 1.5 miles south. The new site had a level area suitable for a 1400' runway.

3. The base camp is not designed to support other parties. Teams employed in surveying, making sea ice measurements, STD operation, or other non-routine operations, will work from tent camps using food, fuel and trail equipment supplied from the Tanquary Fiord base camp.

4. The Lincoln Bay camp is completely air supported and for this reason, radio communication and STOL aircraft airstrip facilities require first priority in camp layout and sighting.

5. All services at the radar and base camps are provided by 110 or 110-220 volt diesel generators. Heating, cooking, water melting, communication, airstrip beacon and lighting all rely on a continuous power supply.

SANITATION & HYGIENE

6. As local sources used for water supply are fed by run-off from the surrounding area which may include the camp, good camp hygiene is important. All garbage shall be incinerated (see para. 9A) to reduce its bulk, then placed on the sea ice in such a way that it will be deposited in deep water when the ice melts.

7. Human waste will be emptied from chemical toilets into 45-gallon drums and disposed of in a similar manner.

8. Forty-five gallon drum "urinals" will be made available at the radar camp, base camp, generator building, airstrip and work areas. Visitors will be informed of the reason for their use.

9. Waste wash water will be drained into 45-gallon drums, these and the urinals will be emptied at an area below the water source level.

9.A Three hundred gallons of used engine oil will be drained from the diesel generators each year, this will be stored in 45-gallon drums and disposed of by burning in a summer garbage pit.

COMMUNICATIONS

10. Routine station reports, radar data, requests for supplies and other administrative traffic shall be sent out by regular mail on routine supply flights.

11. Communication between the radar camp, and base camp shall be via sound powered field telephone, UHF radio* and HF** radio.

12. Communication with Tanquary Base and with DREO field parties shall be via HF 4,221.5 khz USB radio on a daily schedule at 0000 hrs GMT.

13. Communication with DREO and other government agencies shall be via DOT at Resolute or other DOT stations on 4,521.5 khz USB, schedules of operation to be established with DOT operators.

14. Ground to air communication shall be via HF 5680.0 khz AM or 5681.5 khz USB.

15. Communication with Atlas Aviation Resolute Bay regarding flight arrangements shall be via 5478.5 khz USB.

16. The station shall have a low frequency beacon transmitter with a power output of 50 watts†. The antenna used will be a 60' top loaded vertical antenna on a counterpoise consisting of seven 500' radial #12 aluminum wires. The antenna shall be located 50' behind the main camp generator modules and be fed by open wire line. Antenna loading shall be by a loading coil mounted between the top of the 60' tower and the top loading "umbrella" which shall consist of 4 radial 30' wires. Primary power for the beacon (115V AC 60 CPS 1Ø) shall come from the camp's main supply.

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* 173,760 FM

** 4220, 4221.5 USB

† Operating frequency 360 khz, identifier 3J (...-- .---)

17. The orientation of the camp will be such that the 5,478.5 khz antenna shall be directed towards Resolute Bay. The 15,818.5 khz antenna towards Ottawa. For communication with DOT Tanquary and aircraft, a wide band dipole supported between two 40' towers and centred over the camp living quarters, will be used on 4220, 4520 and 5680 khz. A similar dipole between two 40' towers will be centred over the radar camp. For local communications, 173,670.0 khz vertical antennae will be mounted on tripods beside the camp living quarters and the radar camp. One tower at the base camp and one at the radar site will have a double 100 watt red clearance lamp at its top. Field parties will use half wavelength centre-fed dipoles for communication and quarter wavelength vertical antennae for VHF communication.

AIRSTRIP LIGHTING

18. The airstrip will be marked by visual tripod beacons, coloured black and orange. These beacons are approximately 8' high and 8' across the base. For nighttime operation xenon strobe lights will be placed on the runway approaches and battery maintained lamps placed inside "Luma Glow" traffic cones will make the runway boundary.
Emergency runway flare pots consisting of one-gallon "paint" cans containing a toilet paper roll wick and one quart of fuel oil, will be kept in the strip shack along with hand marine distress flares for lighting them. All battery portable lamps will be kept warm in the generator building when not in use.

GENERAL DESCRIPTION OF CAMP CONSTRUCTION

19. The base and radar camps consist of insulated fiberglass modules joined by passageways assembled from insulated plywood panels. These units will be supported by timber joists resting on mud sills. Double wedge blocks are provided for levelling the joists. Floors, ceiling and end walls of the passageways are held together by steel cables tensioned by turnbuckles, one inch square polyeurathane foam weather stripping used between modules and at panel joints. The base camp is assembled from 8 modules, 6 of which are for the living quarters, grouped on each side of a central corridor having small personnel doors and large hinged panels for equipment entry at each end. The diesel generators are housed in two modules separated 150' from the camp to reduce drifting snow and noise. All heating and cooking will be done electrically. The power requirements for this camp will be metered and recorded at weekly intervals. One module will serve as the kitchen, and will be furnished with an electric range, counter and cupboards. A 5-gallon dixie will be used for melting ice for cooking and drinking water. A 45-gallon drum for melting ice or snow for washing. One module will serve as a mess and radio room. The other four modules will be individual accommodation for the operators.

STORAGE

20. The central corridor will be used for food storage (refrigerator)

and as a heated workshop. In addition, 200 wooden boxes 1' X 1' X 2' have been provided. These are to be stacked as storage shelves in the vestibules joining the modules or to be assembled to form a "warehouse" using 3/4" X 4' X 8' plywood floor and roof panels. These boxes will be required for shipping material out when the camp is closed down. Four adjustable shelves are provided in each module, a 3" foam pad on one forms a bed.

POWER DISTRIBUTION

21. Base camp power is provided by two 12 kilowatt diesel generators. These will run one on one standby but phasing lamps will be installed so that both may be synchronized by wiring jumpers into the changeover switch. The generator modules are located 150' from the base camp. A 3 X no. 4 wire buried power cable will join the two module assembly and a 110-220 volt 3-wire system will be used with the neutral wire the only ground. This conductor shall be "grounded" at the center point of the ULF beacon counterpoise. Changeover shall be made at 12 hour intervals. Arrangements for bringing fuel to the generators, and venting generator exhaust and mounting the generators are as follows:

(a) Fuel supplied from manifolded 500 US gallon sealdrums.

(b) Manifold size 1 1/2".

(c) Fuel line from manifold to inside of module 3/4" min. dia.

(d) Fuel line to be vented to remove air.

(e) Exhaust stack thimbles to be self venting.

(f) Generators to be mounted on timber cribs with through bolts and adjustable spacers where they come through the module floor.

COMMUNICATION FREQUENCIES & EQUIPMENT

22. The call symbol for the Lincoln Bay camp is CYZ92. The frequency and allocation for DREO is as follows:-

3,390.0 khz	AM modulation @ 100w
3,391.5 khz	Upper sideband @ 100w PEP
4,220.0 khz	AM modulation @ 100w
4,221.5 khz	Upper sideband @ 100w PEP
5,747.0 khz	AM modulation @ 30w
5,748.5 khz	Upper sideband @ 100w PEP

7,785.0 khz AM modulation @ 30w

7,786.5 khz Upper sideband @ 100w PEP

15,818.5 khz Upper sideband @ 1,000w PEP

173,670.0 khz Frequency modulation @ 8w

Frequency and allocation for other agencies in the area is as follows:-

4,522.0 khz AM modulation DOT

4,523.5 khz Upper sideband DOT

5,478.5 khz Upper sideband Atlas Aviation, DREP

The equipment used is as follows:-

HF SB 60 Base camp and radar camp,

HF SBX 11 Field parties,

VHF-FM, portable mobile, camp and field parties.

(The SB 60 has a 115 volt AC supply and runs off the camp power mains.)

The SBX 11 has nickle cadmium batteries which may be recharged from the camp mains or a 12 volt storage battery, 9 separate alkaline batteries are supplied for emergency operation. The VHF-FM has nickle cadmium batteries which may be recharged from the camp mains, this charging unit has a "monitor" charge rate which maintains the batteries while the set is being used for monitoring at the base and radar camps.

VEHICLE REQUIREMENTS

23. Mechanical assistance is required for the following:-

(a) Maintaining the STOL airstrip.

(b) Moving fuel from the airstrip to the camp.

(c) Lifting fuel bladders for draining.

(d) Transport of people to and from the radar camp.

(e) Preparing camp site foundations.

(f) Moving modules.

(g) Moving and installing generators.

(h) Transporting garbage and waste.

(i) Transport of "flares" for airstrip lighting.

Initially the reconditioned J-5 fitted with an A frame and electric winch will be used. However, this is considered light for the job, particularly (b) and (c). It can be used in setting up the camp because a considerable amount of positioning and moving of supplies has been done by helicopter and further helicopter assistance will be available during the set-up phase in July of 1971.

CONSTRUCTION DRAWINGS

24. The original drawings will be kept in the DREO Earth Sciences Division; the following sketches are included in this memorandum.

Figure 2 - Basic Module

Figure 3 - Base camp layout

Figure 4 - Base camp antennae

Figure 5 - Base camp plan

PHOTOS

Figure 6 - Base camp and generator modules

Figure 7 - Generator hut foundation showing generator crib

Figure 8 - 500 U.S. gallon sealdrums and manifold

Figure 9 - 12KW diesel generator

Figure 10 - Main module cable tiedown and sub-floor ventilation duct

ROBESON CHANNEL EXPERIMENT

A P P E N D I X

An on site survey of the area at Lincoln Bay July 23 indicated a suitable location for the base camp 1.5 miles south of the site originally chosen. A level area suitable for a 1400' runway, radio and beacon towers and the camp were available within 1500' of an adequate water supply.

The base camp was established and the radar module set up 500' to the east. Power to this module is supplied through a buried cable from the main generator module. Subsequently, the two 3KW generator modules and one lab module not required for the radar site are used for food and storage.

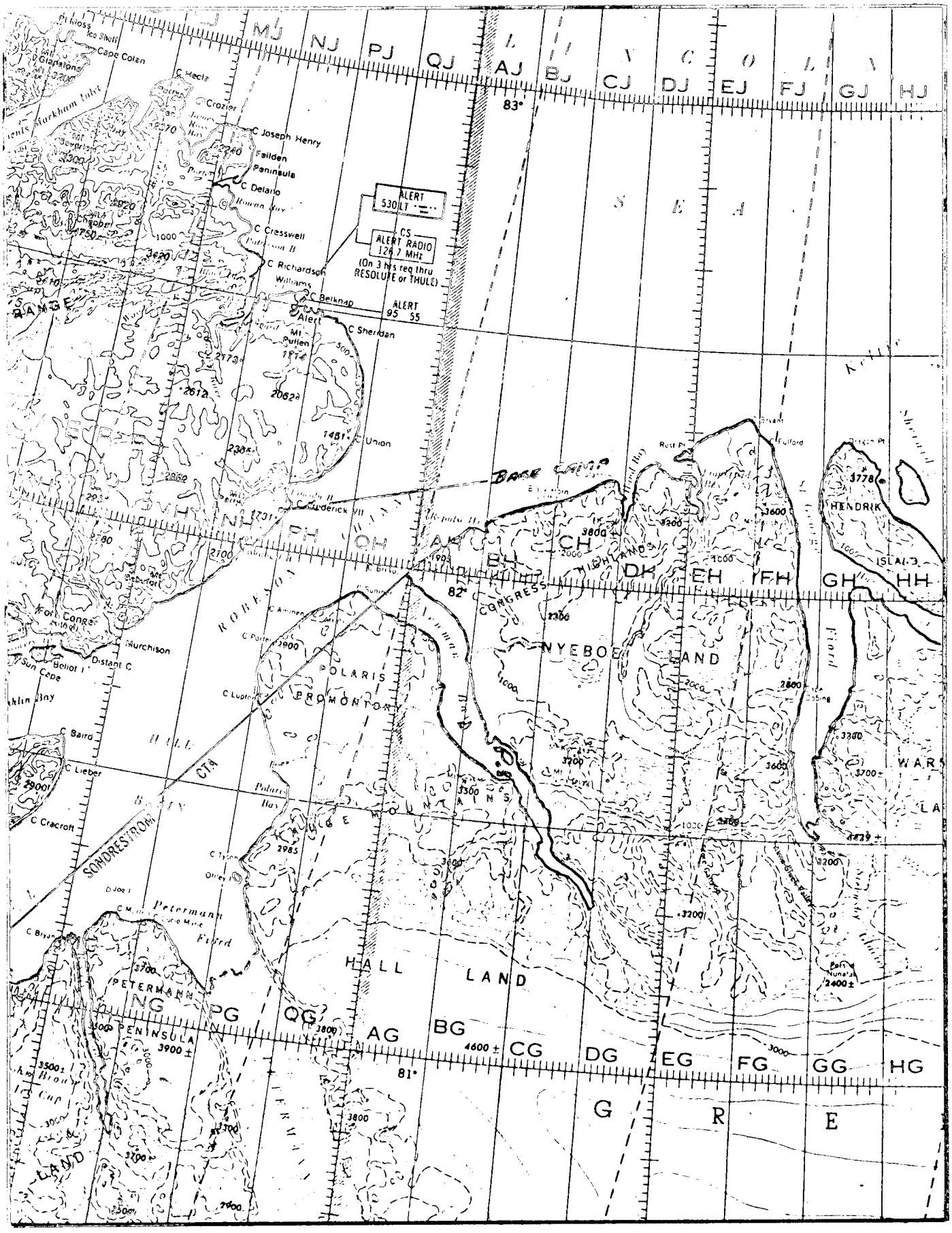
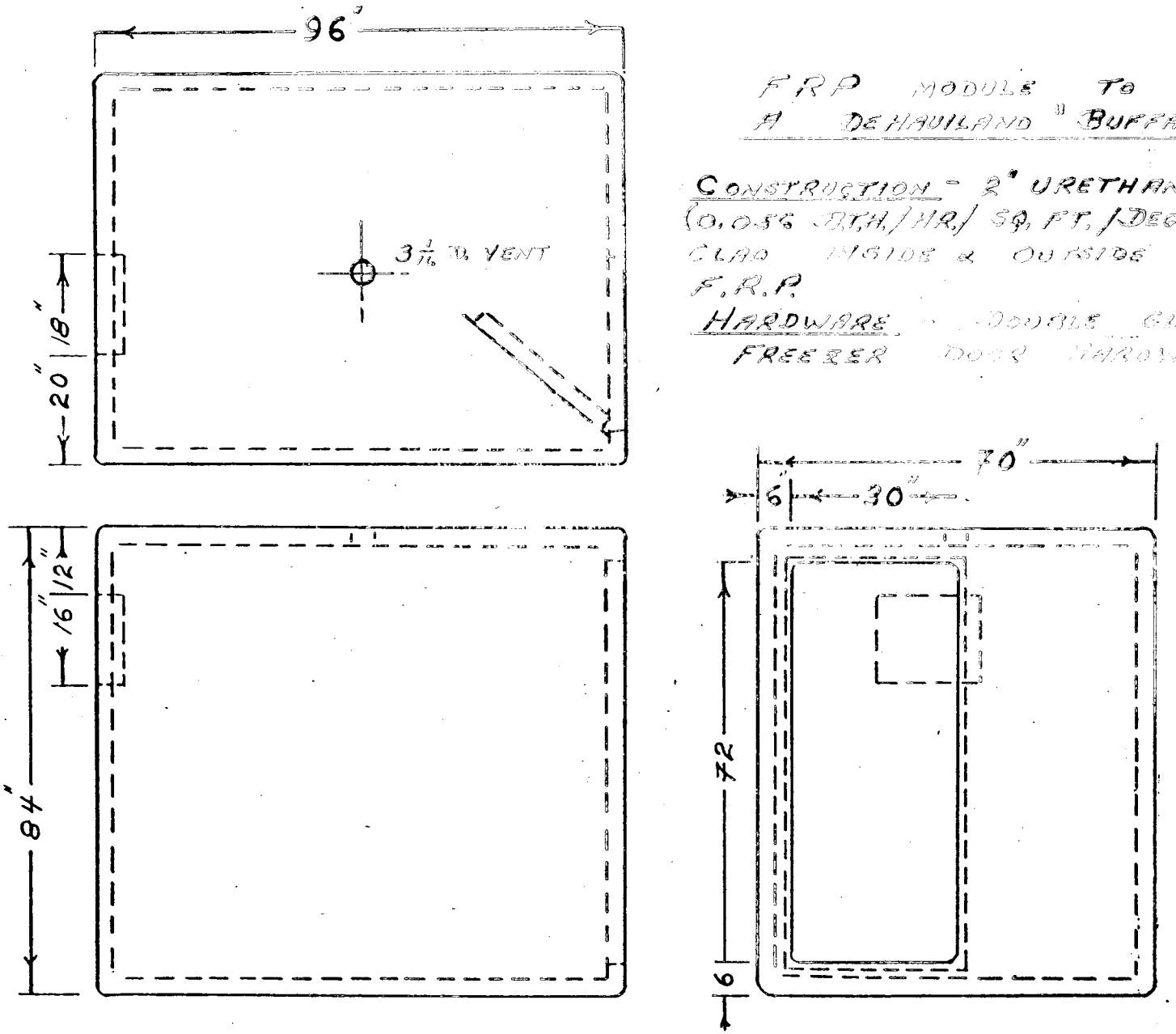


Fig. 1. Location Map.

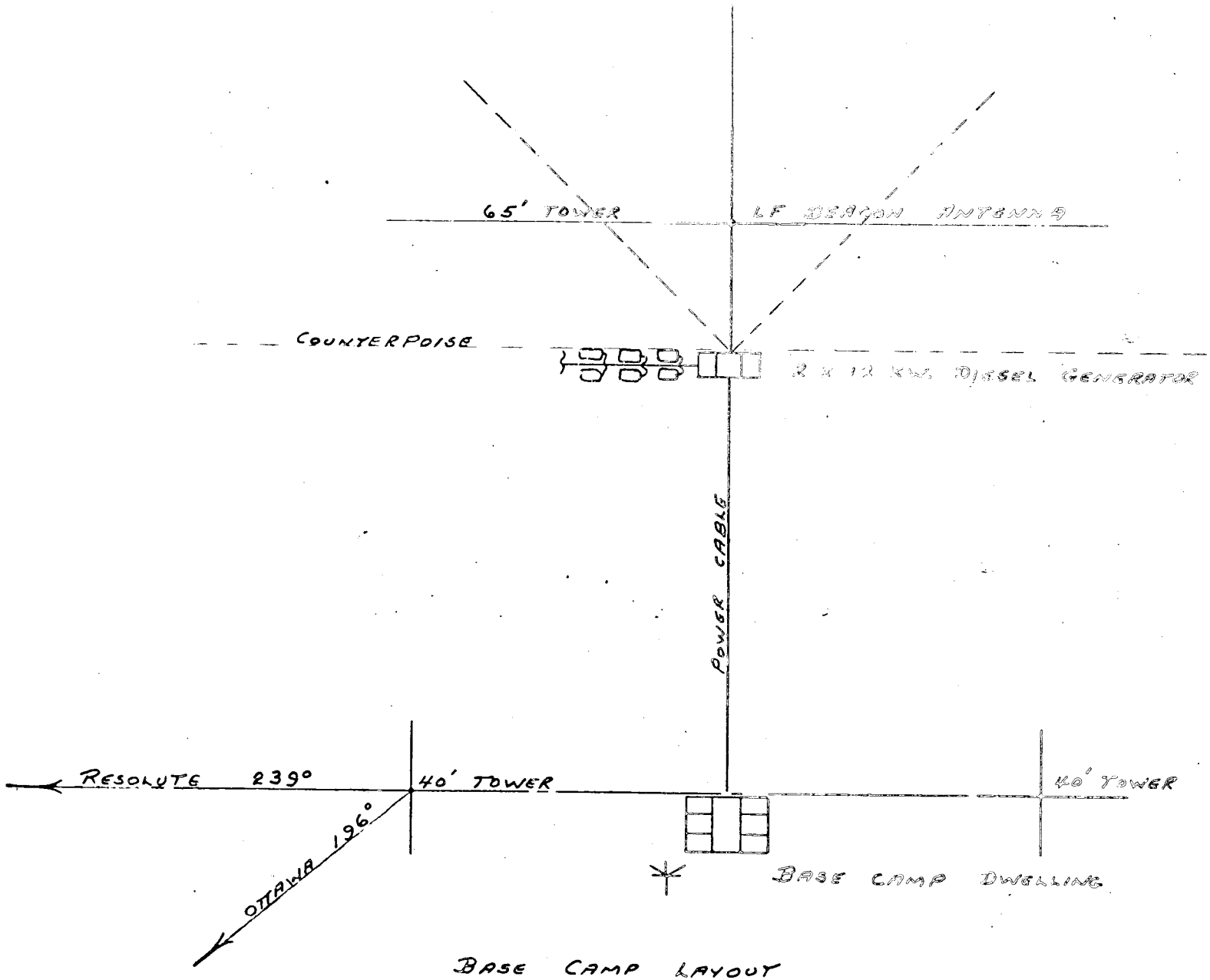


FRP MODULE TO FIT IN A DEHAVILAND "BUFFALO" DHC-5

CONSTRUCTION - 2" URETHANE FOAM, (0.056 BTU/HR/SQ. FT./DEG. F. "U" FACTOR) CLAD INSIDE & OUTSIDE WITH ⅛" F.R.P.

HARDWARE - DOUBLE GLAZED SASH, FREEZER DOOR HARDWARE & SEAL.

Fig. 2.



BASE CAMP LAYOUT

Fig. 3.

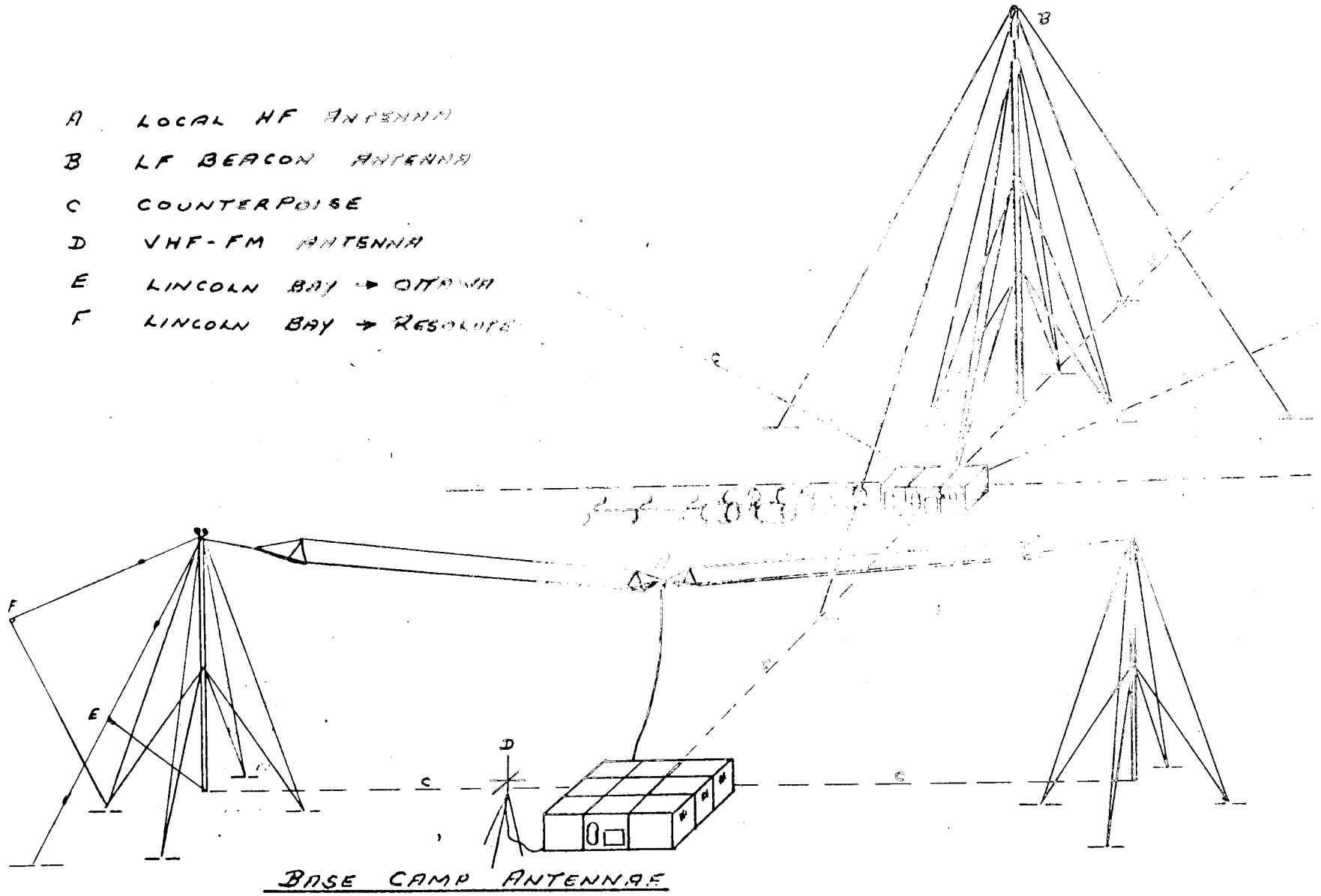
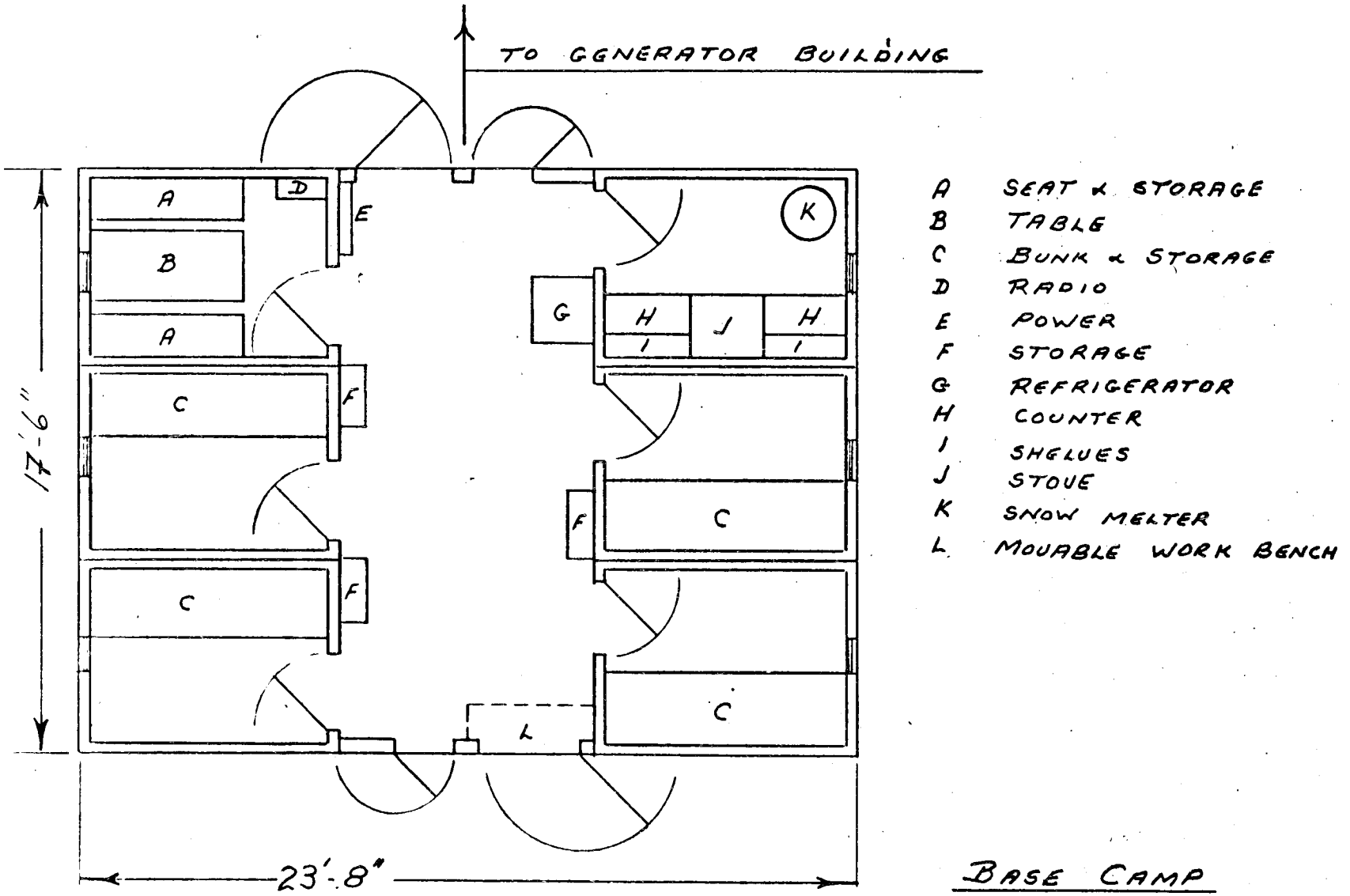

A LOCAL HF ANTENNA
B LF BEACON ANTENNA
C COUNTERPOISE
D VHF-FM ANTENNA
E LINCOLN BAY → OTTAWA
F LINCOLN BAY → RESOLUTE
B
F
E
D
C
C
BASE CAMP ANTENNAE

Fig. 4.


TO GENERATOR BUILDING
A
B
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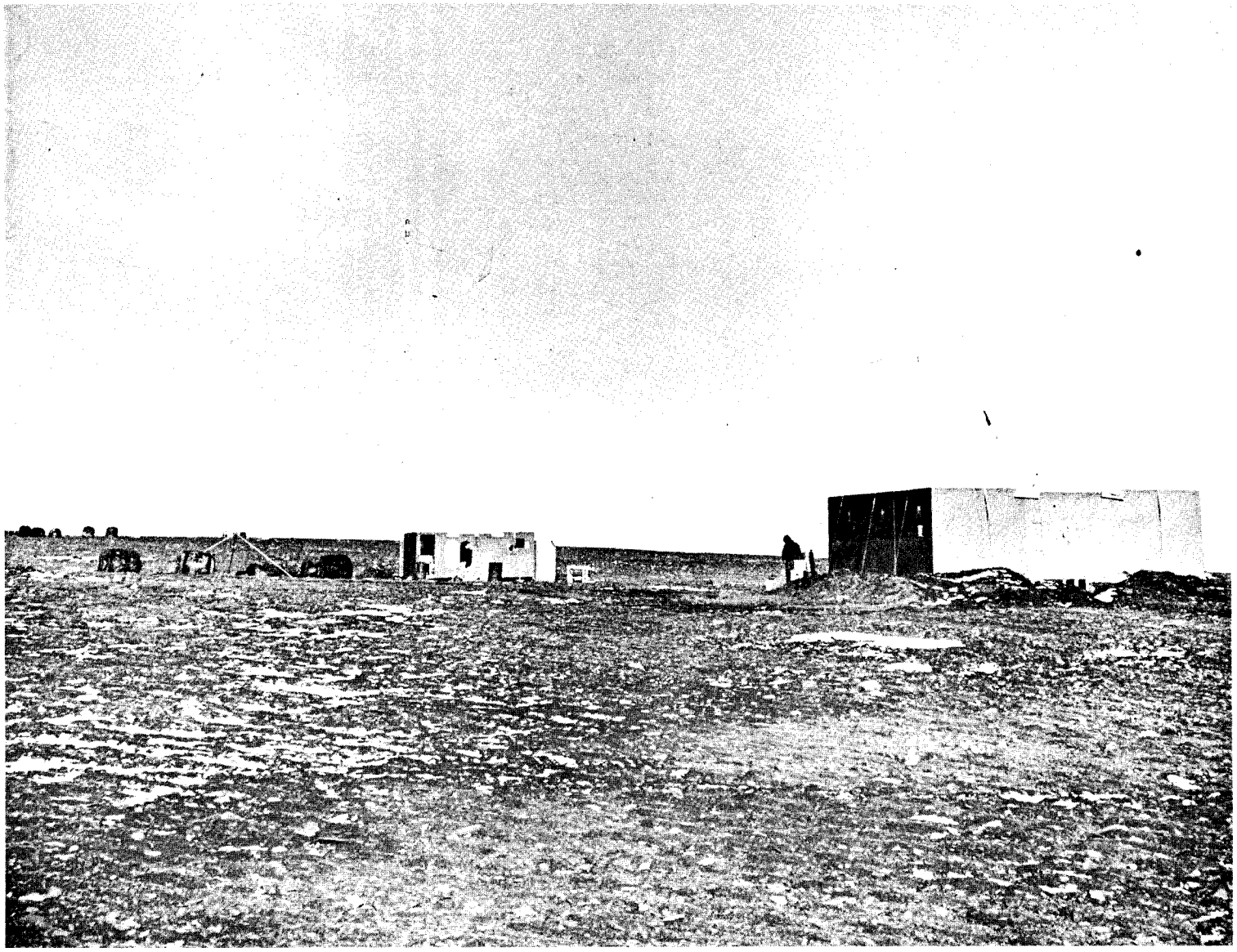
D
E
K
G
H
I
J
H
I
C
F
C
F
C
F
C
L
C
17'-6"
23'-8"
A SEAT & STORAGE
B TABLE
C BUNK & STORAGE
D RADIO
E POWER
F STORAGE
G REFRIGERATOR
H COUNTER
I SHELVES
J STOVE
K SNOW MELTER
L MOVABLE WORK BENCH
BASE CAMP

Fig. 5.



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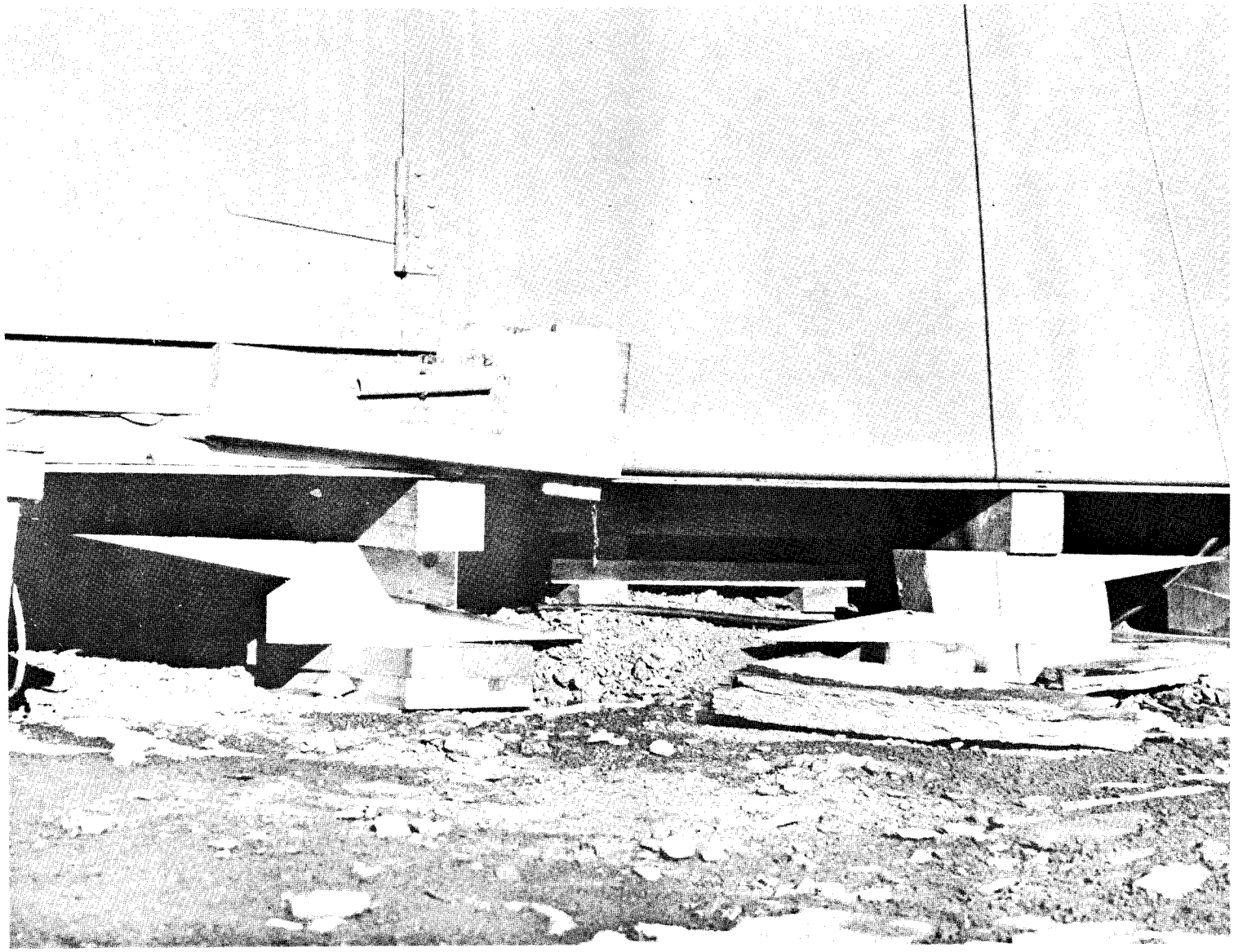

Fig. 7.

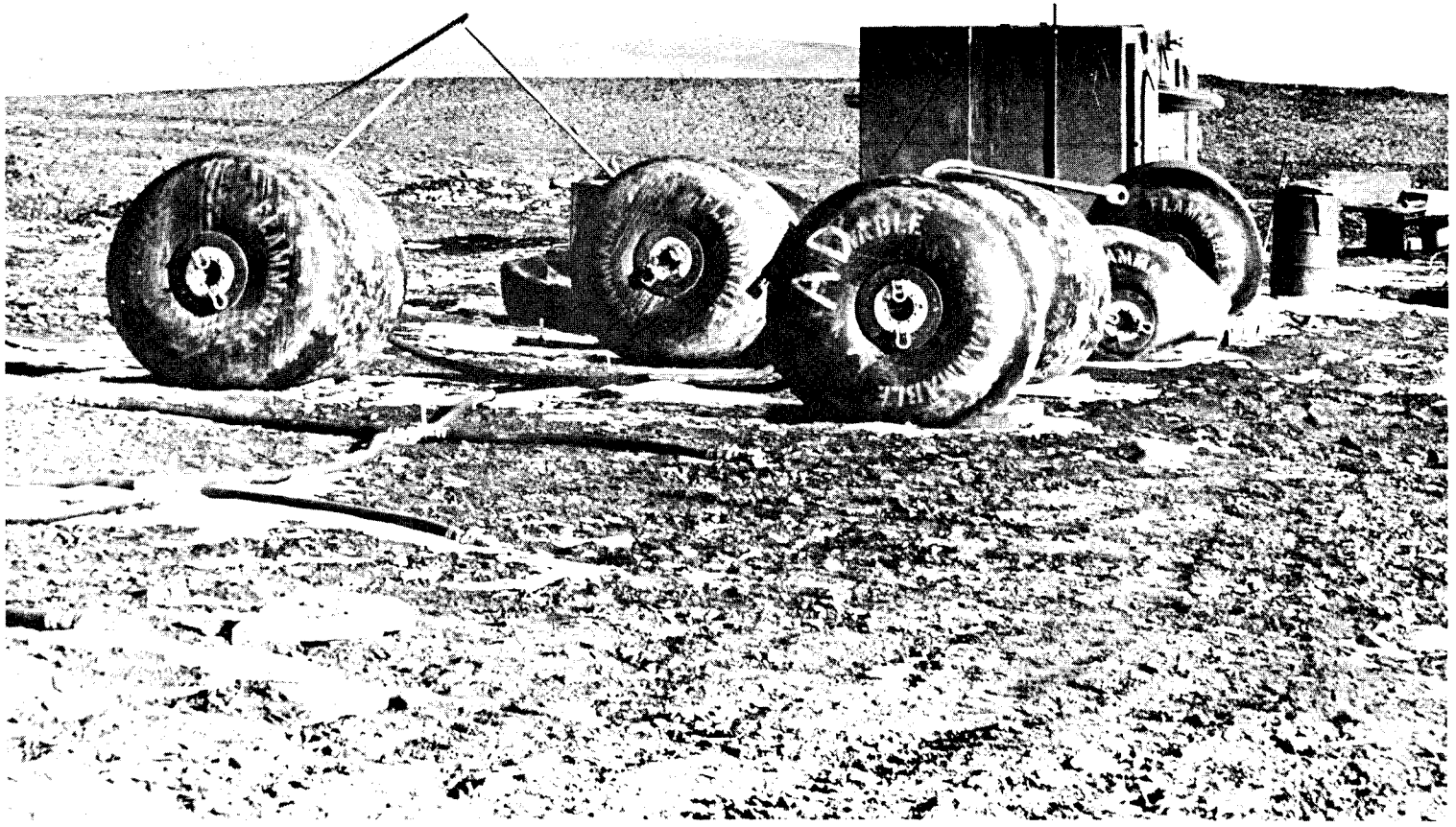

Fig. 8.

Fig. 9.

Fig. 10.

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