PACIFIC REGION TECHNICAL NOTES

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BRITISH COLUMBIA FOREST SERVICE LIGHTNING LOCATION PROJECT

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INTRODUCTION

In the spring of 1980, the B.C. Forest Service, Kamloops Region, installed lightning location equipment. Installation was under the direction of D.E. Gilbert, Staff Specialist, Planning and Development Branch, Victoria Headquarters. Day to day operation of the unit is by Jane Eart, a fourth year Physics student at the University of Victoria.

HARDWARE

The system uses equipment that has had extensive use during the last few years in the U.S. Pacific Northwest. It is built and marketed by Lightning Location and Protection Inc., Tucson Arizona.

The unit consists of 5 modules. Three magnetic direction finders (DF) have been set up in the Kamloops Region. Number one DF is at the Kamloops Air Tanker Base, Kamloops Airport. Number two DF is located near Vavenby, and number three is at Lumby. Input data from the DF sites is relayed to a central mini-computer in the B.C. Forest Service Headquarters building in Kamloops. A HP72255A plotter is used to plot incoming data. See Figures 1 and 2.

OPERATION

Very simply stated; it has been found that "cloud to cloud" lightning, and "cloud to ground lightning" produce electrical disturbances that differ from each other. The computer at Kamloops HQ is programmed to reject all input except those showing the characteristics of cloud to ground lightning. This equipment only records lightning strikes.

Each DF will indicate an angle from the lightning strike to the DF site, and when two or more DFs register the strike, the computer by triangulation, will give a printed readout of angle and distance (in KM) to the strike, the time of the strike, the number of return strokes and the intensity of the strike. The location of the strike is plotted on a map.

PROBLEMS

There has been some difficulty with the system, but these are being overcome. In one case there was extensive interference with DF number 1 from a nearby fluorescent lightning and DF number 3 was disabled by a close lightning strike.

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A major problem has been the verifying of lightning strikes. One attempt to do this was to send small printed cards to field stations to record visual observations of lightning strikes. These have been slow to return and the information on the returned cards is sometimes too vague to be of any real value. Data from A.E.S. observing sites within the Region has been very useful in verifying the occurrence of thunderstorms. In addition cool wet weather since the system was put in operation has prevented the fires that would normally result from some of the strikes.

ADVANTAGES

The system has exceeded expectations. The area of coverage was only planned to be the Kamloops Forest Region, but it is evident from the attached maps that actual coverage is far larger than just the Kamloops Region.

There are features in the computer that have not been used as yet. One is a program that assigns a different symbol to each hour that a map remains on the plotter-very handy for overnight use. Another is a "storm-tracking" program that will plot and time the progress of a thunderstorm, giving the rate of movement in KM/H.

OPERATIONAL USE

Copies of lightning maps are already being sent to other regions that border on the Kamloops Region. These are being used to set up air patrols.

Some of this information is being relayed by phone to the Kamloops Weather Office for distribution on the Meteorological teletype network. A typical copy of one of these reports is included on fig. 3.

THE FUTURE

While attending the Fire Weather Symposium in Seattle in April this year, I learned that considerable effort is being made to develop a method of identifying lightning strikes that will start fires, and this appears to be the future hope of the B.C. Forest Service.

CONCLUSION

This device has the capability of being very useful, not only to the B.C. Forest Service but to the A.E S. as well. The lightning location project often picks up thunderstorms well before they are spotted by weather observers. In a number of cases, they have also provided a verification of the forecast when thunderstorms were not close enough to any observing site to be recorded.

FIGURE 1.

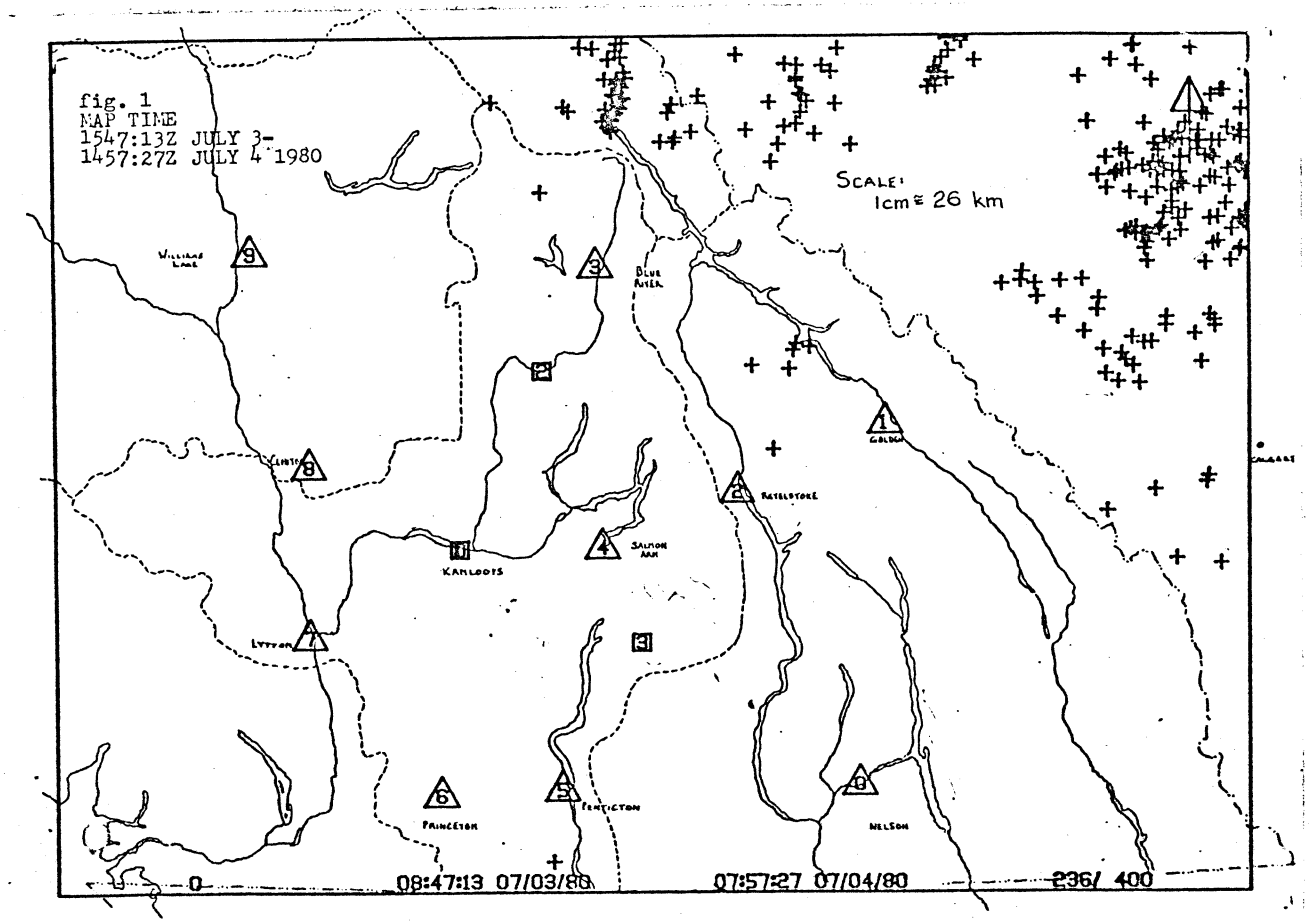


fig. 1
MAP TIME
1547:13Z JULY 3-
1457:27Z JULY 4 1980
SCALE:
1cm ≈ 26 km
BLUE RIVER
KAMLOOPS
SALMON ARM
REVELSTOKE
PRINCETON
PENTICTON
NELSON
08:47:13 07/03/80
07:57:27 07/04/80
236/ 400

FIGURE 2.

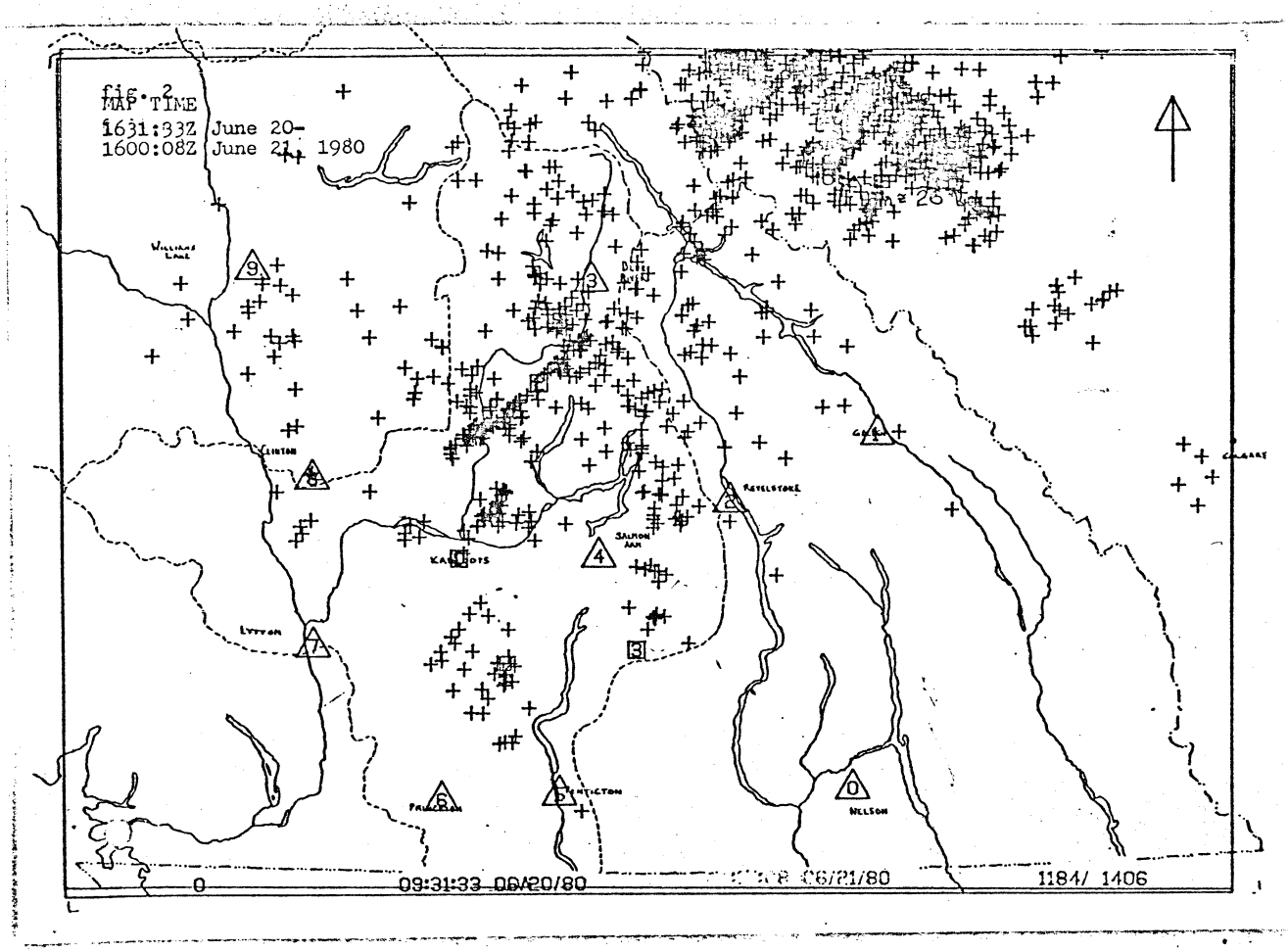
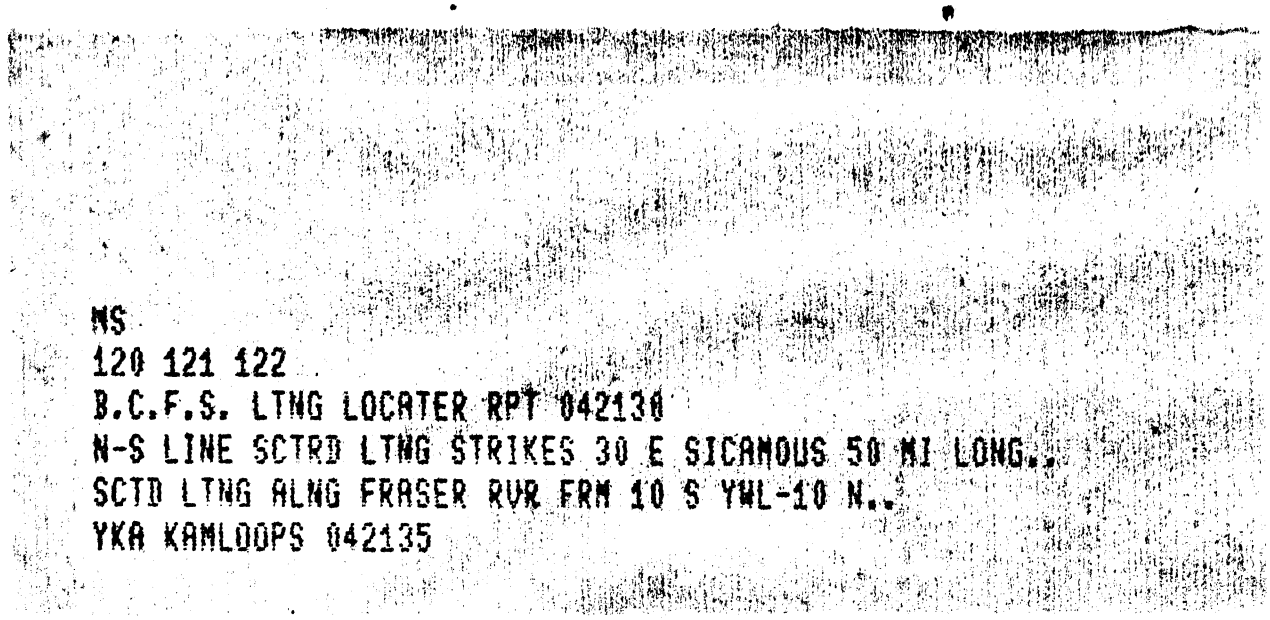


fig. 2
MAP TIME
1631:33Z June 20-
1600:08Z June 21, 1980
0
09:31:33 06/20/80
06/21/80
1184/ 1406

Fig.3

Sample of Lightning data transmitted on A.E.S. network.



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MEMORANDUM **NOTE DE SERVICE**

TO / À: PAEWM-Kamloops

FROM / DE: R. O. Duffy

SECURITY CLASSIFICATION - DE SÉCURITÉ	
OUR FILE - N/RÉFÉRENCE	8330
YOUR FILE - V/RÉFÉRENCE	
DATE	July 4, 1980

SUBJECT / OBJET: B.C. Forest Service Lightning Location Project

1. Attached are a few note on the above mentioned project.

2. Please forward this information to M. Horita at PWC with a view to having them published as a Regional Technical Note.

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