REPORT ON THE ESTABLISHMENT OF STATION F-1 AT THE INTERSECTION OF THE B.C.-YUKON BOUNDARY WITH THE BEAVER RIVER 1951

The Geodetic Survey of Canada was requested to establish two precise astronomic stations along the B.C.-Yukon boundary during the summer of 1951. The more westerly of these two stations was to be done by Mr. G.A. Corcoran, transportation to be by packhorses. The easterly station, on the Beaver River, was to be done by myself, transportation to be by river boat. This report deals only with the Beaver River station, which was given the name F-1.

By writing to the Hudson's Bay Company at Fort Nelson, we received reliable information as to the best time to attempt travel on the Fort Nelson, Liard, and Beaver Rivers. The Fort Nelson and the Liard Rivers are navigable at any time once the ice is gone, usually early in May. The Beaver River, however, is quite shallow, and should be navigated while the spring snows are still melting off the mountainsides. This meant that the operation should be commenced early in June to guarantee our not being stranded by shallow water up the Beaver River. The Hudson's Bay Company manager at Fort Nelson, Mr. Stephens, kindly agreed to arrange for a boat and crew for us by the time we should arrive.

Hugh Pettigrew, a student from the University of Toronto, was hired to be my recorder and assistant. The two of us left Ottawa on May 28, after shipping our equipment ahead to Dawson Creek. On June 1, we detrained at Dawson Creek. From here we shipped our equipment to the Hudson's Bay Company at Fort Nelson by truck, and followed along ourselves by bus on June 4. Our first night at Fort Nelson was spent in the hotel at mile 300 on the Alaska

Highway, but this was too far away from the Fort Nelson River to be a practical base for us. Greater Fort Nelson consists of three sections - the settlement at mile 300, called Zero by the local inhabitants, the airport on the west side of the river, and the Indian village around the Hudson's Bay Company and R.C. Mission on the east side of the river. The latter of these three is the original Fort Nelson post. The most convenient spot for us to stay would have been near the Hudson's Bay post, but as no accommodation was available there, the R.C.A.F. very kindly allowed us to bunk in their barracks and to eat at their mess.

We spent from June 5 to June 9 purchasing supplies and waiting for our Indian crew to decide that they were ready to leave. The owner and operator of the boat was an Indian named John Edwards, alias John Mayo, alias John Deer. The boat was a flat-bottomed scow about 35 ft. long and 6 ft. wide. It was powered by an old Dodge truck engine, and drew about 6 inches of water. Its top speed was 8 or 9 m.p.h. Our guide and cook was another Indian named Harry Dickie. Harry used to have a trap line along the Beaver River and knew that country like the inside of his mocassin. Both Indians were intelligent and spoke English well. John was about twenty, and Harry about forty.

On June 10 we left Fort Nelson and made good time down the Fort Nelson River. At John's cabin at the mouth of the Deer River we cached 20 gallons of gas to use on the return trip. By cooking our meals in the bow of the boat we were able to travel without stops, and reached Nelson Forks that night. The next morning Harry set out in the canoe, which we had brought along on top of the big boat, to scout a snye which would provide a short cut to the

Liard River if navigable. The snye proved deep enough, and we saved about two hours travelling by cutting through this snye to the Liard River. Before leaving Nelson Forks we had lightened our load by caching 25 gallons of gas and all our empty drums. This proved to be a wise move since the current in the Liard was very fast, being as much as 6 m.p.h. in the narrower and shallower parts of the river. After about 8 hours travelling we reached an Indian cabin owned by Napoleon Capot-Blanc at the mouth of the Beaver River. Here we cached 15 gallons of gas and more empty drums, and pitched our tents for the night.

On the next day we moved slowly up the Beaver River until we reached the spot chosen off the aerial photographs as being close to the 60th parallel. Here we again pitched camp. Since it was cloudy that night, no preliminary fix could be taken, but the next noon shots were taken on the sun to determine the latitude. These indicated we were about 2000 ft. north of the border. The same day, June 13, we moved camp 2000 ft. south to a spot on the west side of the river where the bank is about 12 ft. high and thus in no danger of flooding. We set everything up ready to observe and then settled down to wait for the weather.

On June 16 we got enough clear sky to orient the transit into proper azimuth. On June 17 we observed one longitude set. On June 18 we observed 3 pairs of latitude stars, and on June 19 one longitude set and 9 pairs of latitude stars. This was all accomplished by staying up all night to observe through holes in the cloud. The next clear night was June 23, and we pounced on it, forcing it to yield 25 pairs of latitude stars before the

clouds once again moved in. We waited until June 26 in hopes that we might be able to add a few more star shots to strengthen our observations, but the clouds had more staying power than we had. As the river was commencing to drop, we felt we could wait no longer, so packed up and left about noon on June 26.

On the return trip, since we were going downstream on the Beaver and Liard Rivers, it was only a 9-hour journey to Nelson Forks. Going upstream it had taken 16 hours to cover the same distance. We left Nelson Forks on the morning of June 27 and stopped for the night about 35 miles from Fort Nelson. At 1:00 p.m. the next day we arrived back at Fort Nelson. Going downstream from Fort Nelson to Nelson Forks had taken us 10½ hours, whereas the return trip upstream took 19 hours.

The next two days were spent moving the equipment up to the airport, packing it for shipping, and settling accounts with the Hudson's Bay Company and our crew. On July 1, an R.C.A.F. plane flew in from Yellowknife to refuel. On this plane we departed for Yellowknife to commence the second phase of our summer's work. Since this second phase was not concerned at all with the B.C.-Yukon boundary, it will not be described here. However, to avoid leaving this account in mid-air, I shall report that we did eventually arrive safely back in Ottawa shortly after the middle of August.

DESCRIPTION OF LATITUDE STATION F-1, BEAVER RIVER, B.C.-YUKON

W.D. Forrester, Geodetic Survey

General: The station was placed on the west bank of the Beaver River among live spruce trees about 75 ft. to 100 ft. tall. It is atop a bank about 12 ft. above the ordinary level of the river, and back approximately 20 ft. from the bank. It is on ground covered with moss, clay about 1 1/2 ft. thick, and rock below this, well above high water level, and in no danger of being undermined by the water wearing away the bank. The spot is most easily accessible from a landing spot about 25 or 40 ft. north of the station, where the bank drops off to the edge of the water. The landing spot is well marked with blazed trees, so there should be no trouble in finding the spot.

Photographic Identification: The station is pin-pointed on vertical aerial photograph No. A11347-375 which accompanies this report.

Station Marker: A regulation cast-iron post about 2 1/2 ft. long with a 2-inch flange on the bottom and a 3-inch brass plug on the top was buried into the ground for all but 8 inches of its length; it could be buried no deeper because rock was struck which could not be penetrated. The post was then surrounded with a small cairn of rocks level with its top, and a regulation pattern of 4 pits and a mound was built around it.

$\varphi = 59^{\circ}\ 59'\ 52''.08$

$\lambda = 124^{\circ}\ 29'\ 02''.94$

Bearing Trees: The station marker was referenced to three bearing trees, BT1, BT2, and BT3.

BT1 is a live spruce at the edge of the clearing blazed with one short and one long blaze on the trunk about 5 ft. from the ground (blazes 6" and 12" long). The tree is about 10" thick and 60 ft. tall.

BT2 is a live spruce back from the clearing near the bank of the river blazed the same as BT1. It is about 12" thick, and 80 ft. tall.

BT3 is a live spruce at the edge of the clearing blazed the same as BT1. It is about 8" thick, and 50 ft. tall.

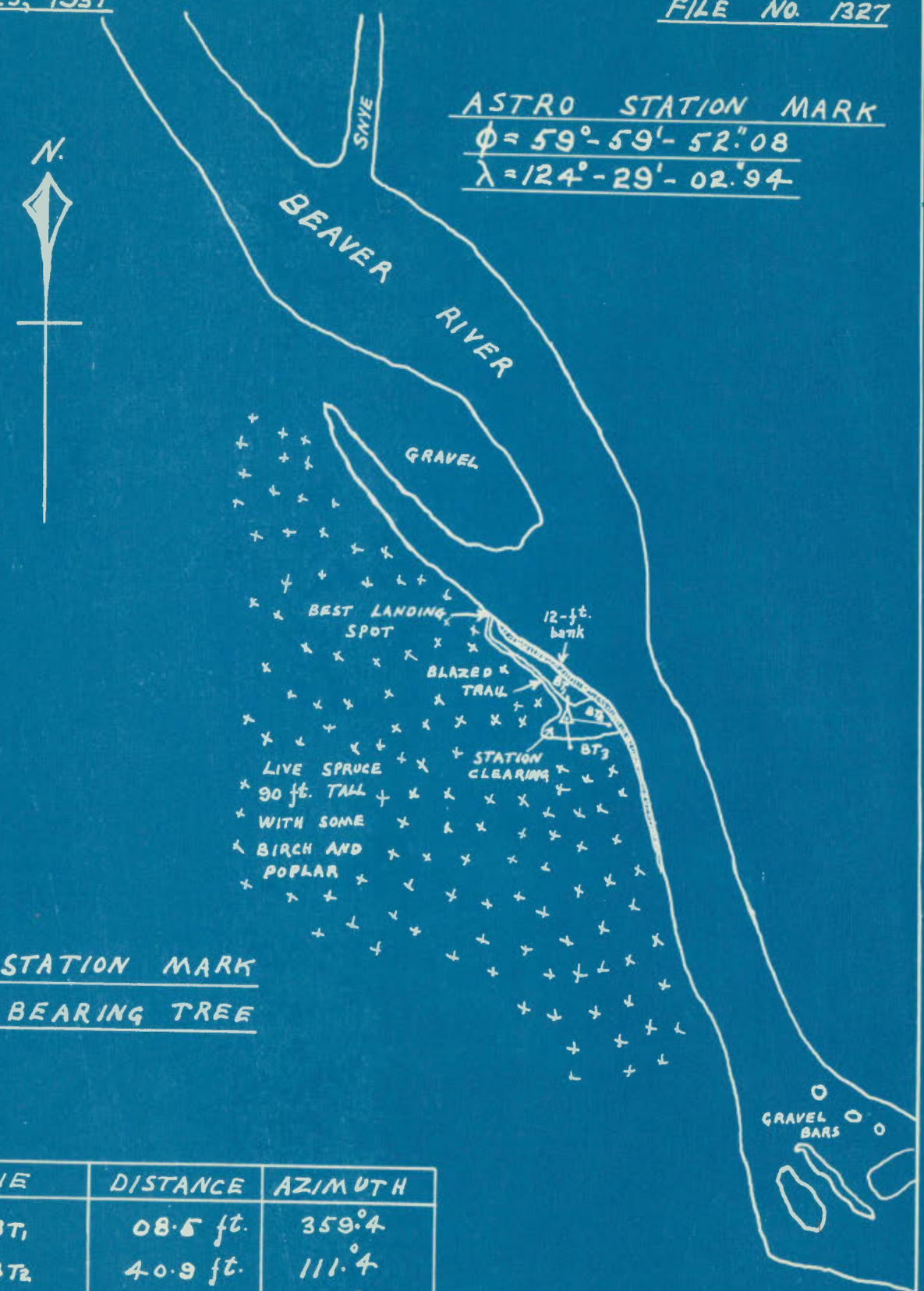
For picture of relative positions of marker and bearing trees with respect to topography, and for tabulation of azimuths and distances, see sketch and table of observed local survey, which is attached to this report.


F-1 O
File # 1327
AF 1347-375

SKETCH MAP OF AREA AROUND STATION F1, AT THE B.C.-YUKON BORDER ON THE BEAVER RIVER

JUNE 23, 1951

FILE NO. 1327



ASTRO STATION MARK

$\phi = 59° - 59' - 52.''08$

$\lambda = 124° - 29' - 02.''94$

△ - STATION MARK

BT - BEARING TREE

LINE	DISTANCE	AZIMUTH
△ - BT_1	08.5 ft.	359.°4
△ - BT_2	40.9 ft.	111.°4
△ - BT_3	19.7 ft.	170.°2

W. D. FORRESTER
GEODETIC SURVEY OF CANADA

TABULATION OF OBSERVATIONS AT STATION F-1, 1951

Date	Latitude	V	V^2
June 16, 1951	59° 59′ 51.″92	0.01	0.00
" "	51.44	0.49	0.24
June 18	52.32	0.39	0.15
" "	51.48	0.45	0.20
" "	51.50	0.43	0.18
" "	53.12	1.19	1.42
" "	51.82	0.11	0.01
June 19	52.22	0.29	0.08
" "	52.25	0.32	0.10
" "	52.01	0.08	0.01
" "	50.88	1.05	1.10
" "	51.67	0.26	0.07
" "	52.50	0.57	0.32
" "	52.44	0.51	0.26
" "	52.78	0.85	0.72
" "	51.79	0.14	0.02
June 23	53.04	1.11	1.23
" "	51.63	0.30	0.09
" "	51.20	0.73	0.53
" "	51.11	0.82	0.67
" "	51.26	0.67	0.45
" "	51.53	0.40	0.16
" "	51.97	0.04	0.00
" "	51.64	0.29	0.08
" "	52.43	0.50	0.25
" "	51.70	0.23	0.05
" "	52.21	0.28	0.08
" "	51.94	0.01	0.00
" "	51.35	0.58	0.34
" "	51.83	0.10	0.01
" "	52.43	0.50	0.25
" "	52.60	0.67	0.45

TABULATION OF OBSERVATIONS AT STATION F-1 (Continued)

Date	Latitude	V	V^2
June 23, 1951	59° 59' 51".83	0.10	0.01
" "	52.88	0.95	0.90
" "	51.56	0.37	0.14
" "	51.02	0.91	0.83
" "	50.17	1.76	3.10
" "	52.21	0.28	0.08
" "	51.95	0.02	0.00
" "	51.71	0.22	0.04
" "	52.72	0.79	0.62
" "	52.25	0.32	0.10
" "	52.53	0.60	0.36
		Sum of V^2 =	15.70

Probable error of result = $\pm$0".06

Mean value of 43 pairs = 59° 59' 51".93 $\pm$0".06

Reduction to site of marker = +00".15

Latitude of Post F-1 = 59° 59' 52".08 $\pm$0".06

Longitude:

June 17 = 124° 29' 00".96

" 19 = 124° 29' 00".13

Mean value = 124° 29' 00".54

Personal equation = +02".10

Reduction to site of marker = +00".30

Longitude of Post F-1 = 124° 29' 02".94

DAILY DIARY AND ITINERARY FOR B.C.-YUKON BOUNDARY SURVEY ON BEAVER RIVER 1951

May 28

Left Ottawa by train.

May 29

On train.

May 30

On train.

May 31

Arrived Edmonton in morning. Left for Dawson Creek by N.A.R. in afternoon.

June 1

Arrived Dawson Creek in afternoon.

June 2

Shipped equipment to Fort Nelson.

June 3

In Dawson Creek waiting for bus.

June 4

Left Dawson Creek by bus in morning. Arrived Fort Nelson in evening.

June 5

Moved to R.C.A.F. base. Bought supplies from Hudson's Bay Company.

June 6

Continued preparations to leave.

June 7

Hired John Edwards and his boat.

June 8

Hired Harry Dickie as guide and cook.

June 9

Loaded everything aboard boat.

June 10

Left Fort Nelson at 12:30 p.m. Arrived Nelson Forks 11:00 p.m.

June 11

Left Nelson Forks at 1:30 p.m. Arrived at mouth of Beaver River at 9:45 p.m.

June 12

Left mouth of Beaver River at 11:45 a.m. Arrived at border at 6:00 p.m.

June 13

Took sun shots for preliminary latitude. Moved to new site.

June 14

Set up equipment for observing.

June 15

Cloudy.

June 16

Oriented transit in azimuth and observed 2 pairs of latitude stars.

June 17

Observed one set of longitude.

June 18

Observed 3 pairs of latitude stars.

June 19

Observed one set of longitude and 9 pairs of latitude stars.

June 20

Cloudy.

June 21

Cloudy.

June 22

Cloudy.

June 23

Observed about 25 pairs of latitude stars.

June 24

Cloudy.

June 25

Cloudy.

June 26

Left station today since river dropping. Left at 1:15 p.m. and arrived Nelson Forks at 7:45 p.m.

June 27

Left Nelson Forks at 8:15 a.m. Stopped for night at 10:00 p.m.

June 28

Set out at 7:30 a.m. and arrived Fort Nelson at 1:00 p.m.

June 29

Paid off crew and moved equipment up to airport.

June 30

At Fort Nelson waiting for plane.

July 1

Departed by plane for Yellowknife.

W. K. Forrester,

Geodetic Survey of Canada.