



MEMORAND

CLASSIFICATION

TO
A

OAED

YOUR FILE No.
Votre dossier

OUR FILE No. 8971-W-79
Notre dossier

FROM
De

A/OAEM

DATE 23rd., August,
1979

SUBJECT
Sujet

7 August 1979 - Severe Weather

1. The following are some personal observations of the utility of the satellite and radar observations currently available to OWC in the identification and tracking of severe convective phenomena. While particular emphasis is placed on events of August 7th., it should be pointed out this was the third confirmed tornado touchdown over land surface experienced to date in the 1979 season. Since it is relevant to conclusions to be presented later, it will be stated initially that Exeter Radar did not detect the presence of "hook" echoes with either the Leamington Tornado of April, or the Brampton Tornado of June in this year. Indeed, in the case of the former, I could identify little if anything which could have been readily identified as potentially severe.

2. On August 7th., Satellite Imagery disclosed the presence of two very large and distinctly separate (both in space and time) thunderstorm complexes. The first developed in the very early morning hours over northern Michigan, travelled eastward across northern Lake Huron, then more southeasterly over Georgian Bay, and eventually crossed western Lake Ontario into New York State by 2:30 pm. Widely separated events associated with this complex testify to its huge sphere of influence -

severe thunderstorms and boats driven onshore at
Sault Ste Marie around 6:00 a.m.,

heavy thunderstorms and hail around the Bruce
Peninsula at 11:00 a.m.,

a suspect tornado at Powassan 9:00 a.m.,

and

a funnel sighting at Toronto just before 1:00 p.m.

These events were too widely separated to be linked with any particular portion of the complex as viewed by the satellite. The second complex developed almost explosively after 6:00 p.m. to the west of Lake Ontario, and moved on a general southeast course over eastern Lake Ontario during the next two hours. Again while associated with the Woodstock to Waterford tornado track, little specific information as to where and when severe events were occurring could be readily deduced.

2 ...

3 Despite lack of precise knowledge as to what was happening under the first severe thunderstorm complex, as portrayed in Satellite Imagery, measured CB tops of 63,000 feet on Alpena Radar Summaries prompted the issue of a Severe Thunderstorm/Tornado Warning for Algoma and later northern Georgian Bay Public Weather Regions. An overly large area for a tornado warning; but, commensurate with our ability thus far to discriminate on the basis of Satellite Imagery alone. These warnings lapsed at 10:00 a.m.

4. All Warnings and Watches issued at OWC after 10:00 a.m. were in direct response to radar and visual observations. When Satellite complex no. 1 took a more southern course, Exeter Sceptre exhibited a well-defined line echo wave pattern "LEWP" in an east-west oriented squall line from the base of the Bruce Peninsula to extreme south-eastern Georgian Bay. The 1510Z Exeter output is enclosed to illustrate. A similar, but north-south oriented LEWP, was observed in June on the day of the Brampton tornado. In each case, tornado development took place 1 to 2 hours later (Brampton 7:30 a.m. - Toronto funnel sighting 12:50 p.m.), and not during the period when the LEWP was most readily identifiable. However, weather watcher reports of peculiar sky colouring (green) and hail storm at Winton prompted immediate action for warnings to Simcoe, Grey, Dufferin, and Southern Bruce counties. These were extended a little later to Peel, York, Durham counties, and Metropolitan Toronto.

5. A hiatus in activity occurred from 1:00 p.m. until 6:00 p.m.; but, based on dynamic assessment, a general Watch for Southern Ontario was issued at 3:40 p.m. About 6:00 p.m. when Satellite complex number 2 developed explosively west of Lake Ontario, OWC radar measured tops of cloud east of London increased from 36 thousand to 42 thousand and shortly thereafter to 48 thousand. This sudden development of tops resulted in warning of severe thunderstorms for Perth, Oxford, and Waterloo counties at 6:15 and an hour later for Hamilton-Wentworth, Haldimand, Norfolk and Niagara Regional Municipalities. Reports of hydro tower destruction arriving at OWC prompted an upgrade in the severe thunderstorm warning for R.M. of Haldimand and Norfolk to tornado warning.

6. A more leisurely examination of Exeter radar data has allowed identification of some features which were not identified or could not practically be put to use in the hectic hours of 5 to 9 p.m. on August 7th., 1979.

- (1) A small line formation of cells "A" in accompanying Exeter output 2210, 2220, 2230Z moved eastward to merge with a much larger southward moving complex "B" at about the time and place tornado development followed.
- (2) A "hook" is identified on 2320Z Exeter Sceptre (rotate page slightly compare for size and shape with "hook" identified on Carp output of 27 June 1979).

Annotated diagrams are included.

Regarding the "hook" displayed on Exeter Radar, it can only be readily identified on the 2320Z Sceptre output which arrives at OWC at 2330Z (more than 30 minutes after known tornado development). It should also be noted that in both Carp and Exeter displays the radar views the phenomena from a most favourable position - i.e. on the backside of the main echo clutter which would probably obscure such phenomena if viewed from another vantage point. Although I haven't had an opportunity to view Woodbridge output, I doubt either it or the YZ-C Band would disclose this feature.

7.
ceding discussion:

A number of points emerge from the pre-

- (1) Since reliable pattern recognition techniques have not yet emerged from OWC application of Satellite Imagery to Severe Weather Forecasting, the degree of discrimination required to identify and track tornadoes simply does not exist. Based on experience to date, it cannot be assumed that the most severe event is or will be under highest satellite indicated tops. However, in areas without radar coverage, particularly if some "ground-truthing" is possible, crude areal warnings are possible.
- (2) All tornadoes do not display "hooks".
- (3) When tornadoes exhibit "hooks", they may only be displayed when the phenomena is viewed advantageously by the radar.
- (4) First appearance of the "hook" on a radar scan can by no means be construed to be the first appearance of a tornado. Conversely, disappearance of a "hook" does not necessarily mean disappearance of a tornado. (all of points (2), (3), and (4) must be recognized as serious impediments in radar capability to detect and track tornadoes).
- (5) The ten minute processing time in the Sceptre system is a major obstacle in the path of real time identification and tracking of severe convective phenomena. The thirty minute turn around time for Satellite Imagery while not overly crucial to synoptic scale phenomena is crippling in small scale severe events.
- (6) Radar disclosure of LEWP or merging echoes can be important precursors of severe events. While merging echoes might assist in pinpointing tornado initiation, such is not the case with LEWP.

7. In conclusion, it must be stated that although the efficacy of radar systems is probably highly overrated by the public and some meteorologists in severe weather situations, it is our most reliable tool at the moment. There is much need in training both meteorologists and technicians in the recognition of severe and potentially severe weather manifestations on radar. Turn around time of our Satellite and

Satellite and -

Radar systems coupled with human delays in identifying and manually tracking small scale severe events presents a powerful case for pursuing automation of all steps now carried out by humans.



GWG/cf

(G. W. Gee),
A/Officer-in-Charge.

Atts. 6

SSC

no time stamp on

332

#	exam time	hand in	sent on 170	re in wg	SSC	SSC
75	1535	1536	1541	—	1538-56*	1541-57*
75c	1730	1729	7m	1732	—	—
76	1655	1700	1703	—	1700	1702
76c	1750	1749	1752	—	—	—
77	1700	m	1725	1727	—	—
77c	1915	m	1932	—	—	—
78	1940	1941	1949	1952	—	—
79	2215	2216	2232	2232	—	—
80	2300	2245	2252	—	—	—
81	2315	2315	2339	2342	—	—
81c	6030	6035	6038	—	—	—
79c	2330	2347	2352	—	—	—
82	2355	2358	2403	2407	2400	2401
82c	0100	0103	0118	—	—	—
83	0030	0026	0032	—	0030	0032
83c	0230	0233	0240	—	—	—
84	0115	m	0120	—	—	—

14
8

LAPPI 240KI AUG 07
1.5KM LO/INTS 1510Z 15

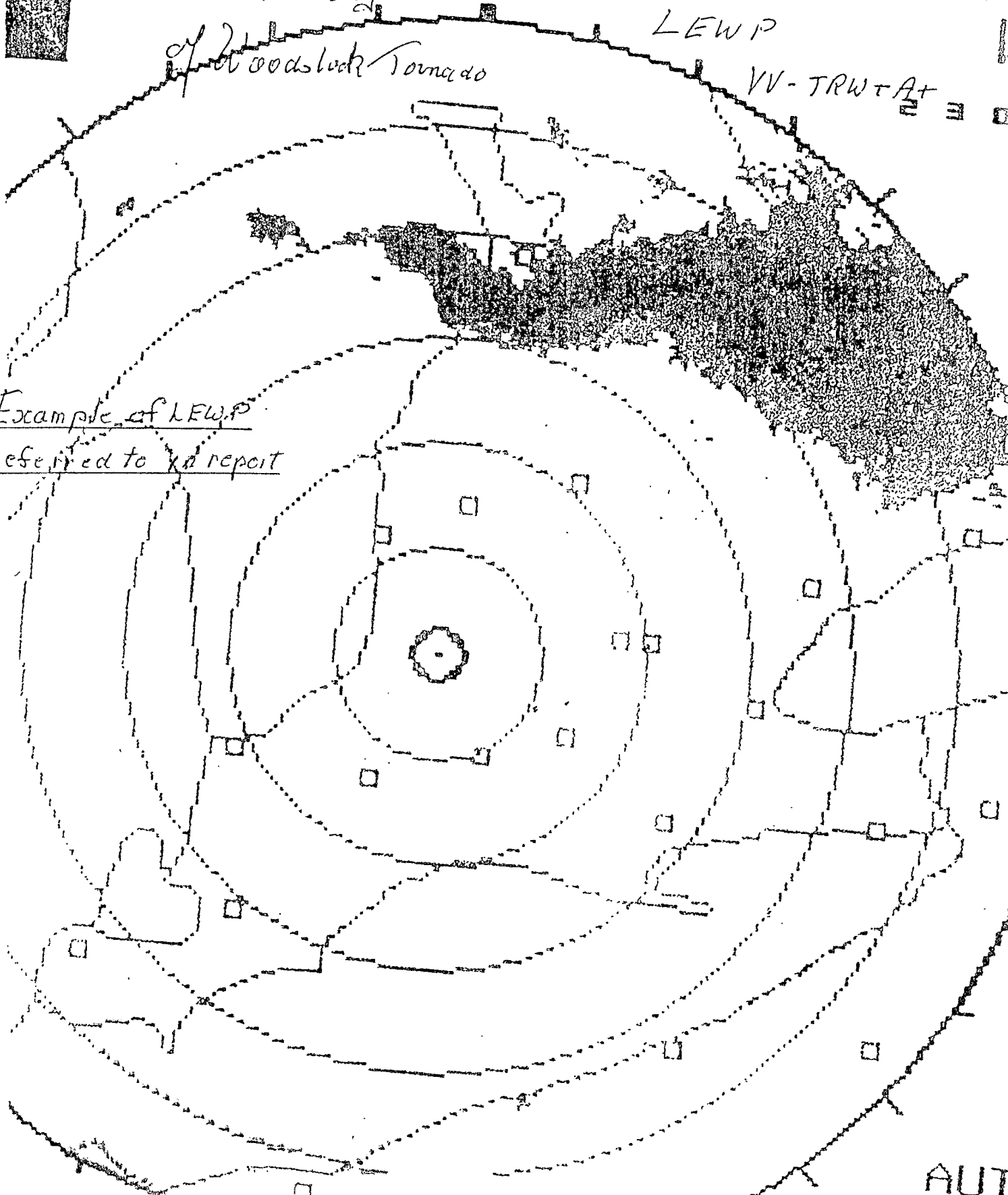
Earlier in day

LEWP

of Woodstock Tornado

VV-TRW+_{A+}

Example of LEWP
referred to in report

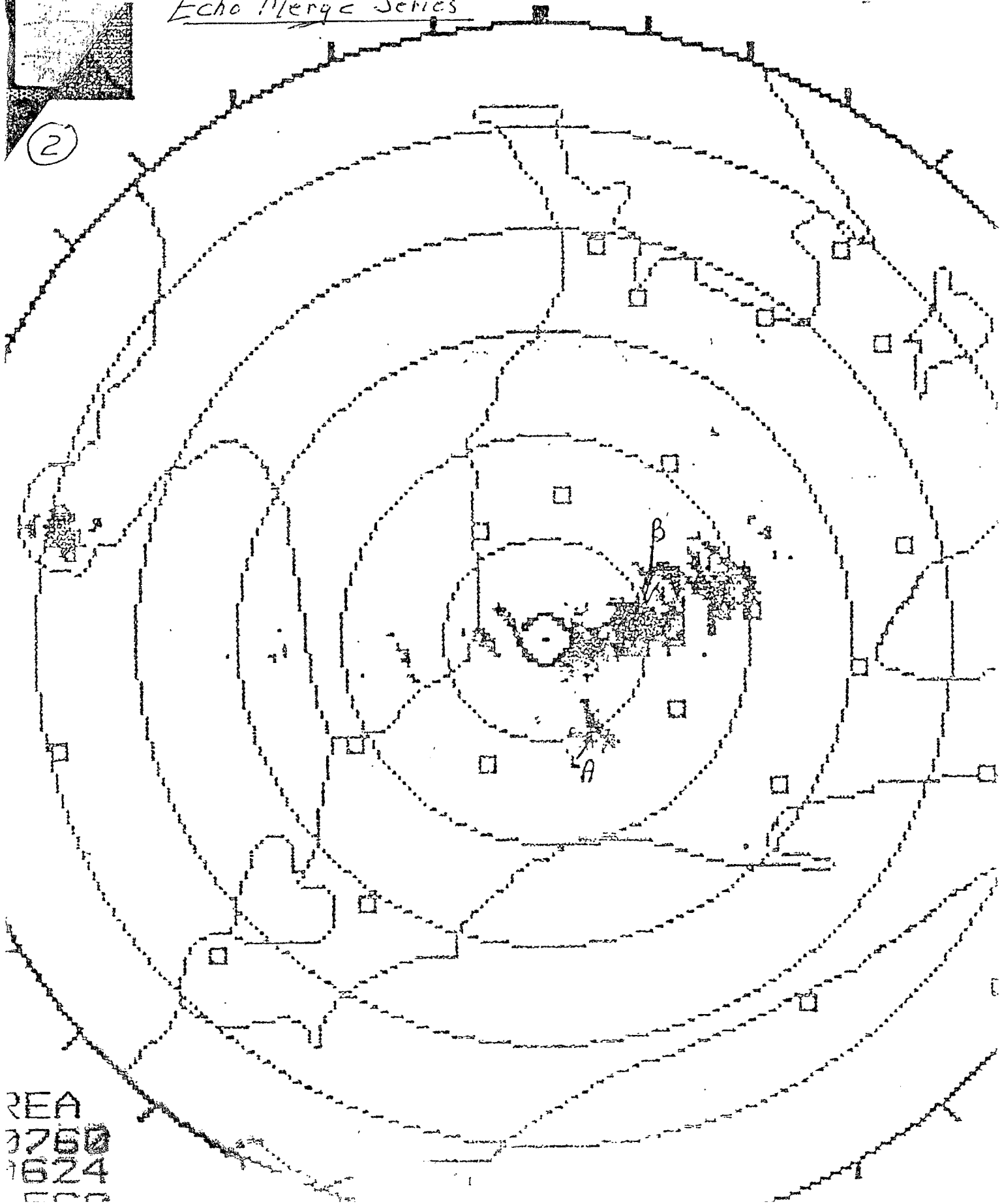


APP1 240KM A.JG 0
1.5KM LO. INTS 2

22102

Echo Merge Series

(2)



REA
0760
1624
0000

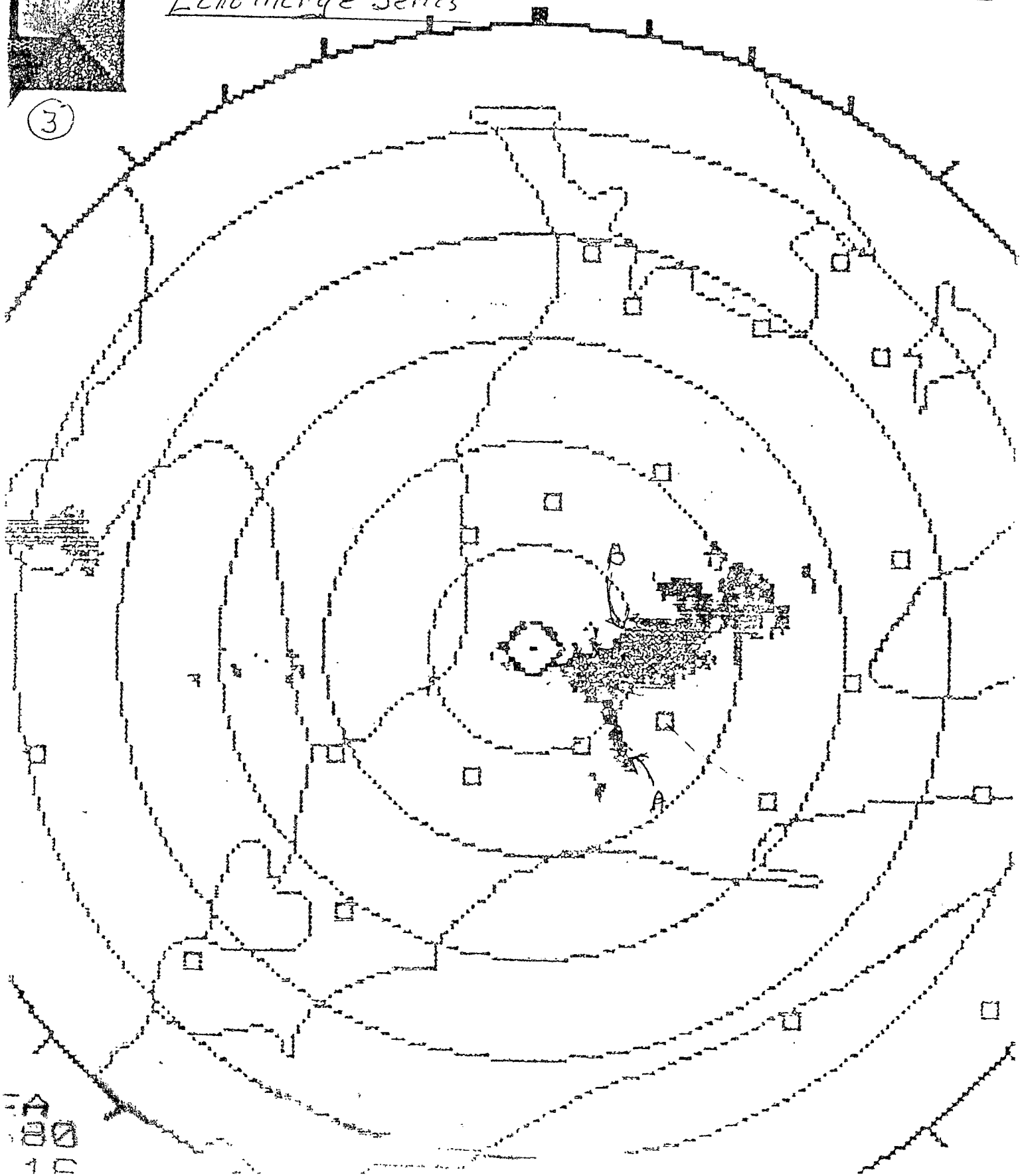
LAPPI 240 KM
1.5 KM LO/INTS

AUG 01
21

Echo Merge Series

2220Z

3

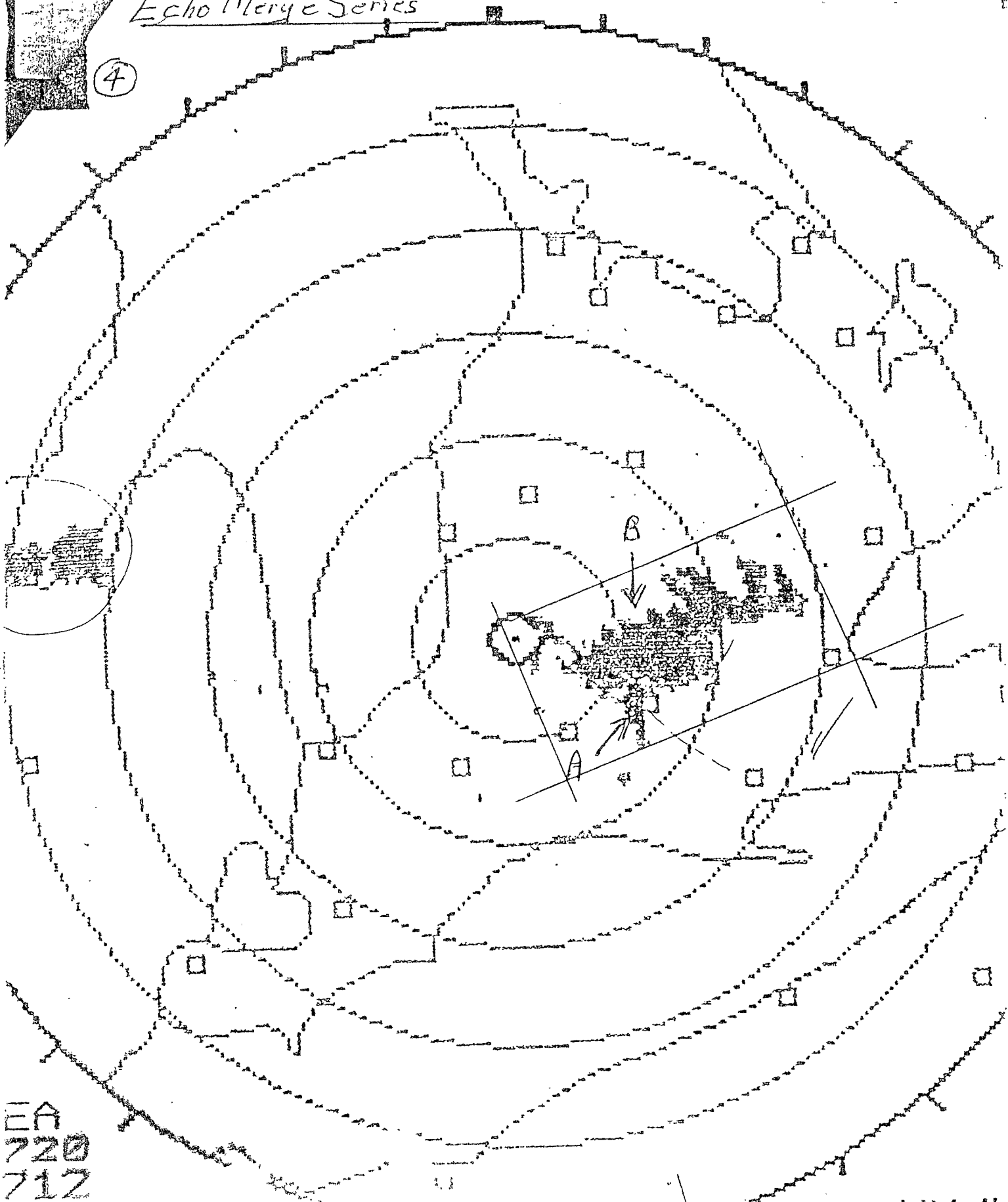


PP1 240KM A 07 07.
5KM LO/INTS 22

Echo Merge Series

22302

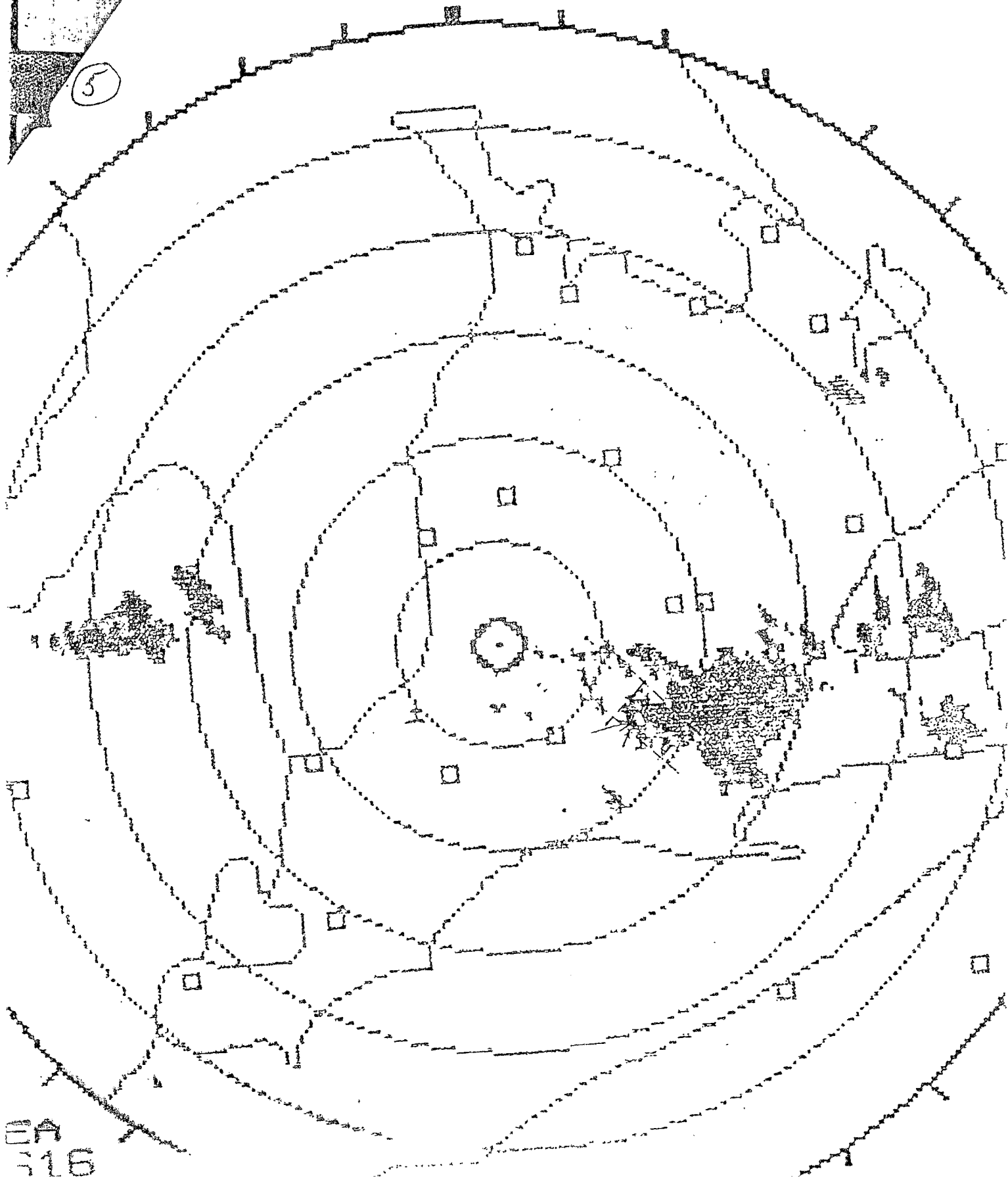
④



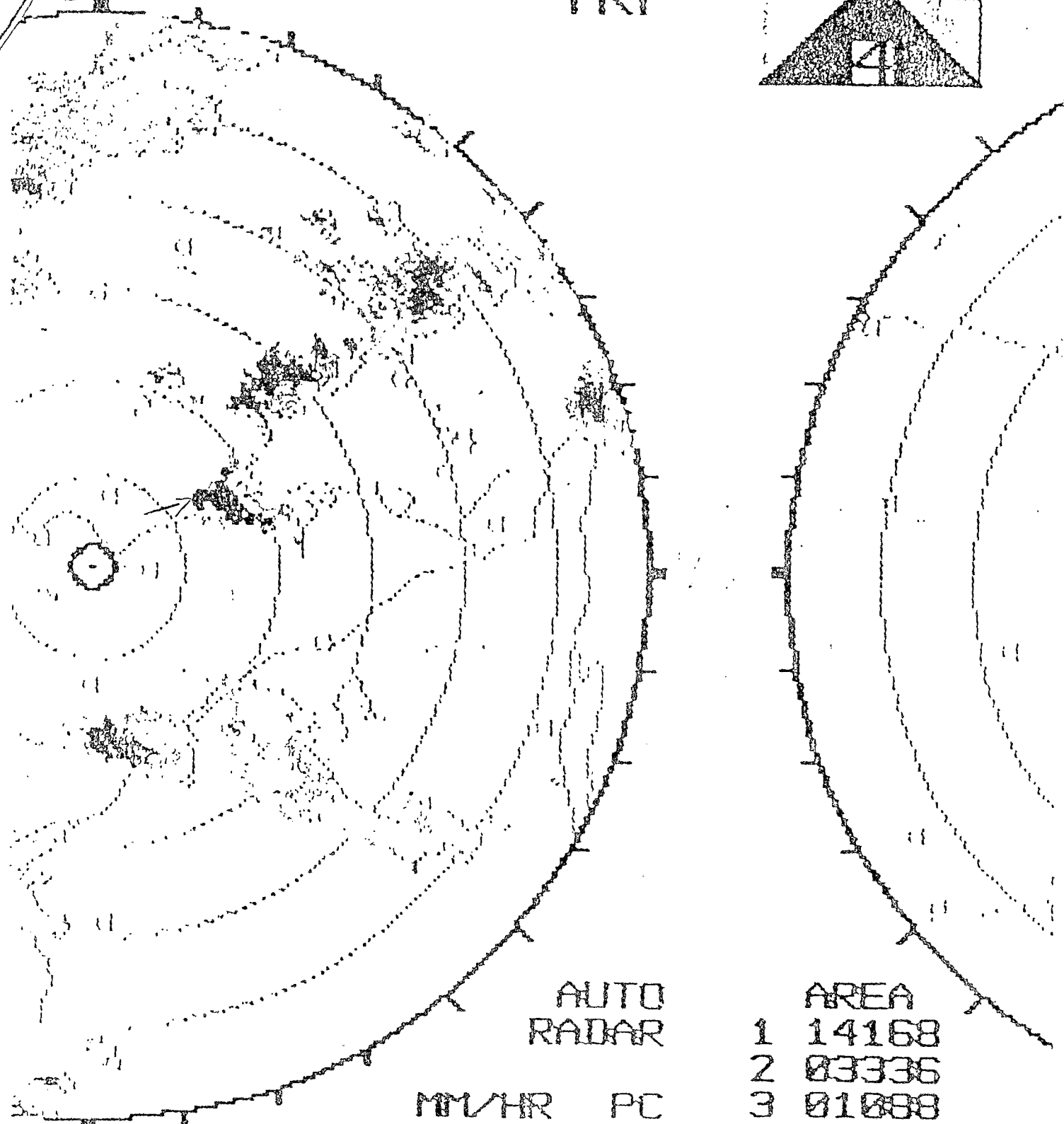
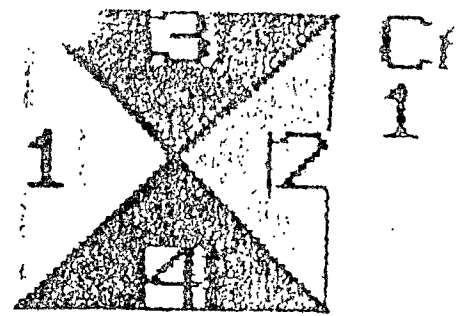
EA
720
712

PI 240KM AL
SKM LO/INTS

077
232
W



AKM JUN 27/79
 1/NORM 2130Z
 YRP



AUTO
RADAR

AREA

	MM/HR	PC		
700 0000	1 0.25	08	1 14168	
700 0000	2 0.50	02	2 03336	
700 0000	3 0001	.60	3 01088	
	4 0.02	.48	4 00708	T+2
			5 00172	H 2
			6 00004	MT0
			7 00000	MT1

AUGUS



Headquarters
22ND NORAD REGION
Hornell Heights, Ontario
POH 1PO

3275-1 (220WX)

17 August 1979

Ontario Weather Centre
Atmospheric Environment Service
Toronto International Airport
P.O. Box 159
Toronto ONT, Ont.
L5P 1M1

Attention: Officer in charge -
Ontario Weather Centre

Dear Sir:

STORM DAMAGES - Aug 07/79 - POWASSAN AREA

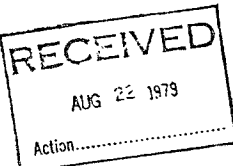
MWO Guindon and myself toured the Powassan area on Friday, August 10, three days after the storm struck. Although much of the damage had already been cleared, a fairly consistent pattern of damage was evident. Nearly all of the destruction occurred to trees rather than to buildings. In most cases the trees toppled from the S to SW towards the North. Some were split near the base, others fell intact exposing the root system. The damage tended to be grouped, that is 2 or 3 trees in a small area were struck but nothing between the trees, including at times vulnerable sheds or small buildings, were affected.

We identified 3 or 4 such areas in town and several at nearby farms. One such farm, belonging to Mr. R. Fielding, is located about 3 miles NE of Powassan. A large metal shed, containing more than 1000 chickens, had its front doors pushed "inwards" and permanently creased. These doors face northwards.

We spoke to Mrs. Fielding, who observed the damage, to two other individuals who also observed storm damage in other areas and to the local RCMP detachment. No one saw, heard of a funnel cloud. There were no hail reports although very strong winds and heavy rain were consistently observed.

In the opinion of MWO Guindon and myself this was not a tornado. On the other hand there is no question that this was a severe weather event accompanied by very strong squalls and possibly some cloud rotation aloft.

D. Bernachi
D. Bernachi
Officer in Charge
CFRC North Bay





MEMORANDUM

CLASSIFICATION

TO
A

OAED

YOUR FILE No.
Votre dossier

OUR FILE NoS 8750-0;
Notre dossier 8971-W-79

FROM
De

A/OAEM

DATE 23rd., August, 1

LD

SUBJECT
Sujet

Detection of Severe Weather

1. Reference is made to your request for information in responding to 8750-1 (AFWC), d/14 Aug 79.
2. A summary report is enclosed on events of 7th August 1979. I believe M. Newark and C. Klaponski of OWC will be preparing a more formal text and recommendations in the future.
3. It should be noted opinion stated in the accompanying text is my own; but, at least in so far as conclusions are concerned, these have been discussed with M. Newark who is in agreement.
4. Incidentally, I am forwarding a copy of a report on the Powassan incident of the same day prepared by D. Bernachi who proceeded to the site following conversation with myself.

GWG/cf

(G. W. Gee),
A/Officer-in-Charge.

Atts: 2



MEMORANDU

CLASSIFICATION

TO
A OAED

YOUR FILE No.
Votre dossier

OUR FILE No.
Notre dossier 8971-2-Vol.2/
2000-K


DATE 13th., August, 197

FROM
De A/OAEM

SUBJECT
Sujet Preliminary Report
Events of 7th August 1979.

1. Carole Klaponski of O.W.C. was despatched to the scene of the "Woodstock Tornado" on August 8 and 9, to conduct an aerial and ground survey of the events.
2. Her preliminary findings are enclosed.
3. Times indicated have been determined from bench marks established in destruction of hydro towers (courtesy Dave Aparrow). Time annotation of tornado tracks continues.

gwg/cf


(G. W. Gee),
A/Officer-in-Charge.

RECEIVED

AUG 14 1979

Encl. 1

Carole, There is a copy of this in your file, but, thought you might

Tornadoes - Southern Ontario

7 August, 1979

Here are some of my preliminary findings on the tornadoes in the Woodstock area.

There were two tornadoes, and I suspect each had double vortices at the same stage, (from as yet unconfirmed eye witness accounts, as well as ground evidence).

The first touched down southeast of Stratford at about 1820 lcl and moved southeast for about 15 miles before curving northeast. It continued on the ground for another 5 miles before lifting at about 1900 lcl.

The second tornado touched down to the northwest of Woodstock at 1855 lcl, immediately north of county road 17. It moved southeastward at approximately 35 mph (as did the first), and lifted southeast of Waterford at about 1955 lcl. Large hail (golf ball, hen's eggs, and some larger) fell from 2 miles south of Waterford to south of Renton.

I am still tracking down eyewitnesses and attempting to get more precise times of sightings. Pictures should be back mid-week.

Mike and I intend to collaborate on a paper giving a brief documentation, but emphasizing impact of the warning system and effectiveness of:

- 1) the watcher network,
- 2) the forecast procedure
- and
- 3) the communication system.

We will conclude with recommendations in those areas, as well as in the area of organizing future investigations of similar nature.

CEK/cf

Carole Klaponski.

13/8/79

Will back
call 2:30-3PM
Metro OPP

Hughes 500 FTUQ

Cpl Dave Craig
News Bureau

Rick
Cane 10
Blenkins
eyewitness saw it
split in two

⑥
① E of Bingham moving
tornado ~~fellows~~ ENE
corn damage
~ 5 mi length
barn roof off sheds demolished

Hickson ⑦
hydro towers down

⑨ ⑩ Woodstock

729 Colborne

MTC 30801
Maps of counties

30151 Sam Went

7848 OPP
965-~~1111~~ News Bureau

~~454-8522~~
Rick Arnett

~~454-8522~~

454-8587

Jim Copeland

Woodstock.

Nesbitt Crs.

N side of Dundas

looking at SW corner of Woodstock

black cloud with lots of lightning moving
from W to E. 3 or 4 fingers coming down
& started to rotate (about 2 1/2 miles
away

Woodstock

401° 59 school, Church, ^{Kobacks} welding factory
put roof removed demolished demolished

3rd concession houses demolished

- OPP has in-service training centre

New Durham area harder hit than
Woodstock

see Training Branch in Toronto

Staff Capt B. Luckers in charge Training &

291 Sherbourne

development

Ontario Police College

WATCH/ WARNING	FOR	ISSUE	Time IN	Time ON 170	ACVD IN. YUG	IN SSC	OUT SSC	BROAD CAST NEWS	MIN FM ISSUE TO ON LINE AT BN
75	SIMCOE GREY DUFFERIN BEECE	1535	1536	1541		1538	1541	1546	11
76	PEEL YORK DURHAM * METRO	1655	1700	1703		1700	1702	1810	75
77	MARINE LK OUT	1700	M	1725	1727			1815	75
75 c	CNCLTN SIMCOE GREY DUFFERIN BEECE	1730	1729	M	1732			1816	46
76 c	CNCLTN PEEL YORK DURHAM METRO	1750	1749	1752				1812	22
77 c	CNCLTN MARINE LK OUT	1915	M	1932 *				1950	35 *
78	WATCH FOR LK ST CLAIR LK HILARY SLO GERRA WEN LK ONT	1940	1941	1949	1952			1956	16
79	PERTH WATERLOO OXFORD	2215	2216	2232 *	2232			LOST OUT OPERAND ERROR	1 *
80	WATCH UPDATE 72 FOR LK ST CLAIR LKEIE SAV LE HILL WEN LK ONT NIAGARA	2300	2245	2252				2332	32
81	BRANT, HAMILTON WENTWORTH, HILL INDIAN-NORFOLK NIAGARA	2315	2315	2339 *	2342			2353	38 *
79 c	CNCLTN PERTH WATERLOO OXFORD	2330	2347	2352 *				NOT FOUND	1 *
82	TORONTO WENTWORTH-NORFOLK	2355	2358	0003	0007	0000	0001	0017	22
83	MARINE ERIE LK ERIE	0030	0026	0032		0030	0032	0039	9
81 c	CNCLTN BRANT HILL-WENTWORTH INDIAN-NORFOLK NIAGARA	0030	0035	0038				0044	14
82 c	CNCLTN TORONTO WENTWORTH HILL-NORFOLK	0100	0103	0118 *				0124	24 *
84	WATCH LK ST CLAIR LK ERIE NIAGARA XTRM SECN LK HILL	0115	M	0120				0129	14
83 c	CNCLTN MARINE ERIE LK ERIE	0230	0233	0240				0244	14

* INDICATES LENGTHY DELAY 77Z (15 MIN) OF MORE FM ISSUE TO ON (70)

WATCH / JOURNALING	FOR	ISSUE	Time IN	Time ON 170	ACQD IN. YUG	IN SSC	OUT SSC	BROAD CAST NEWS	TIME ISSUED TO ON LINE AT BN
75	SIMCOE GREY DUFFERIN Beauce	1535	1536	1541		1538	1541	1546	11
76	PEEL YORK DUFFERIN METRO	1655	1700	1703		1700	1702	1810	75
77	MARINE LK ONT	1700	M	1725	1727			1815	75
75 c	CNCLTN Simcoe Grey Dufferin Beauce	1730	1729	M	1732			1816	46
76 c	CNCLTN Peel York Dufferin METRO	1750	1749	1752				1812	22
77 c	CNCLTN MARINE LK ONT	1915	M	1932 *				1950	35 *
78	WATCH FOR LK ST CLAIR LK Huron SRA Genoa Wren LK ONT	1940	1941	1949	1952			1956	16
79	PERTH WATERLOO OXFORD	2215	2216	2232 *	2232			Lost due original error	1 *
80	WATCH UPDATE 78 For LK ST CLAIR LKERIE SRA LK Huron Wren LK ONT NIAGARA	2300	2245	2252				2332	32
81	BRANT, HAMILTON WENTWORTH, HILL ONT NIAGARA	2315	2315	2339 *	2342			2353	38 *
79 c	CNCLTN PERTH WATERLOO OXFORD	2330	2347	2352 *				NOT FOUND	1 *
82	TORONTO WENTWORTH NIAGARA	2355	2358	0003	0007	0000	0001	0017	22
83	MARINE ERN LK ERIE	0030	0026	0032		0030	0032	0039	9
81 c	CNCLTN BRANT HAMILTON WENTWORTH NIAGARA	0030	0035	0038				0044	14
82 c	CNCLTN TORONTO WENTWORTH HILL NIAGARA	0100	0103	0118 *				0124	24 *
84	WATCH LK ST CLAIR LK ERIE NIAGARA KITHEN SRA LK Huron	0115	M	0120				0129	14
83 c	CNCLTN MARINE ERN LK ERIE	0230	0233	0240				0244	14

INDICATES LENGTHY DELAY Y/YZ (15 MIN OR MORE FM ISSUE TO ON 170)

OUTLINE OF A REPORT ON THE WOODSTOCK TORNADO

1 DOCUMENTATION

Brief description of the synoptic situation

Storm track and dimensions

Physical Events

2 IMPACT (of THE WARNING SYSTEM)

Severe weather messages issued by OWC

Which agencies received the messages

Survey of people who heard the messages, the time lead, and what actions, if any, they took.

3 EFFECTIVENESS

Of the watcher network

Of the forecast procedure

Of the communication system

4 CONCLUSION AND RECOMMENDATION

- organization of investigation

MS

170

YXU ATTN

ALL SINS NOTE

STATEMENT CONCERNING TORNADOES IN SOUTHWESTERN ONTARIO
DURING THE EVENING OF TUESDAY AUGUST 7 1979.

TUESDAY EVENING AT APPROXIMATELY 7.00 PM EDT ONE AND
POSSIBLE TWO TORNADOES STRUCK THE AREA FROM WOODSTOCK
SOUTHEASTWARDS TOWARDS LAKE ERIE. THE ONTARIO WEATHER
CENTRE AT TORONTO TRACKED THE STORM CELLS BY WEATHER RADAR
AND ISSUED SEVERAL WATCH AND WARNING MESSAGES TO THE
APPROPRIATE COUNTIES. THE FIRST MESSAGE, SEVERE WEATHER
WATCH NUMBER 78, WAS ISSUED AT 3.40 PM EDT, GIVING MORE THAN
3 HOURS ADVANCE NOTICE OF SEVERE STORM POTENTIALLY PERTH,
WATERLOO AND OXFORD COUNTIES WERE SPECIFICALLY MENTIONED IN
WARNING NUMBER 79 ISSUED AT 6.15 PM EDT AND REMAINING AREAS
DOWNSTREAM ALONG THE STORM TRACKS WERE ALERTED AT 7.00
PM EDT AND WARNED AT 7.15 PM EDT.

SEVERAL CALLS WERE RECEIVED FROM VOLUNTEERS OF THE WEATHER
WATCH PROJECT WHICH AIDED THE ONTARIO WEATHER CENTRE
IN ISSUING THE TIMELY MESSAGES. THE WEATHER WATCH PROJECT
HAS A TOTAL OF 2000 VOLUNTEER WATCHERS AND WAS INITIATED THIS
SPRING TO HELP THE ONTARIO WEATHER CENTRE REACT MORE QUICKLY
TO EVENTS SUCH AS THE WOODSTOCK TORNADO.

SGD M.J. NEWARK.....FOR P.J. PENDER...O.I.C. ONTARIO WEATHER CENTRE

OWC 080900

745-5079

Here are some of my preliminary findings on the tornadoes in the Woodstock area.

There were two tornadoes, and I suspect each had double vortices at the same stage, (from as yet unconfirmed eye witness accounts, as well as ground evidence).

The first touched down southeast of Stratford at about 1820 lcl and moved southeast for about 15 miles before curving northeast. It continued on the ground for another 5 miles before lifting at about 1900 lcl. *24 km*
7 km

SS kmh The second tornado touched down to the northwest of Woodstock at 1855 lcl, immediately north of county road 17. It moved southeastward at approximately 35 mph (as did the first), and lifted southeast of Waterford at about 1955 lcl. Large hail (golf ball, hen's eggs, and some larger) fell from 2 miles south of Waterford to south of Renton.

I am still tracking down eyewitnesses and attempting to get more precise times of sightings. Pictures should be back mid-week.

Mike and I intend to collaborate on a paper giving a brief documentation, but emphasizing impact of the warning system and effectiveness of:

- 1) the watcher network,
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CEK/cf

Carole Klaponski.

13/8/79

NEWARK 3513

~~0615~~
Contact with ^{urgent, regular, D priority}
Broadcast News 36 King E. 364-3172

Jennifer Dundas - ~~St Louis~~

Everything from weather office has time
at bottom placed there by computer. It is
then held on a spike for 16 hours

estimated 15-20 minutes.

editor monitors output from computer, decides
on a priority & outputs the file

warnings are not routinely given an
urgent priority - it is judged on

6.26 on skt 170

Evaluating our communications network since
we have no evidence that anything went out beyond
our 3.40 watch

	Cancellation	issue	WG	
# 75		1730Z	1732	
	76	1730Z		B.N
# 77	Mar.	1700	1727	
78		1940	1952	1956
* 79		2215	2232	16 min delay from input to hand copy
80				24 min " " "
81		2315	2342	1932
82		2355	0007	24 min 1953

Wase Traider 36 King St. E. 6th floor.
general executive formerly general
~~responsible~~ for radio
news editor for several years.

Woodstock case involved human error

No sign of #79 in hardcopy - apparently it was lost due to operator error

BN

78	1940	1952	1956
80			32

Phil Adler general news editor had first 3 lines on spike * D. Maize believes that P.A. was looking at them following day

81	2315	2342	2353
	cancelled		0044
82	2355	0007	0017
	cancelled		0124
83			0039
	cancelled		0244
84			0129

CITOK (CKJD) in Burma uses American products

75

~~1546~~ 1546 Z + 1607 Z
(sent twice reason unknown)

76

~~180~~ 1810 Z

76 cancellation

1812 Z

77

1815 Z

75 cancelled

1816 Z

77 cancelled

1950 Z

perhaps our computer could talk directly to BN

Pat:

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Carol.

YYZ

YWG

BN

#83

0030

0039

Marine for
Eastern Rk line

#82 cancelled 0100

0124

#81 cancelled 0030

0044

#83 cancelled 0230

0244

#84 watch 0115

0129

Rk to Clear Rk line Niagara
extreme south Rk Heron

WEST ZORRA

A 269
268

JACK WETTLAUER
CLARENCE WILKER

655-2210
655-3138
519-~~655-2785~~

A 135

ALAN INNES

(475-4388)

STRATFORD CITY

A 069

SEWAGE TREATMENT PLANT M.O.E.

519-271-9071

DELHI

A 199

MR. WALLY ORTH

519-582-1950

	ANGLE X	KM
TAU STOCK ✓	97°	45
HICKSON ✓	108°	49
BRIGHT ✓	101°	60
STRATFORD ✓	90°	33
OXFORD CENTER ✓	118°	65
NEW DURHAM ✓	119°	76
VANESSA	119°	93
WATERFORD	119°	102

B 724

WM JEFFERY

519-877-2775

723

MRS JESSIE EASEY

A 280-293

TEXACO

MR RD CAMERON

519-587-2467

- hail at golf course ^{marble - size to 1"} larger than golf ball
golf ball & some tennis ball size hail covered ground

- Kenton smaller hail

- farmer 1/4 mi north tennis ball size hail

heavy rain in Port Dover

News Bureau is in contact with
Broadcast News and can voice over into
news rooms in event of unavailability.

Sign up radio stations

every 6 weeks OPP Review possible
article ? → OPP retype in YYZ to
Telex to Telexnet to YXU
YXU retype to C Pex to Woodstock

ASA 400

^H
CNR

— 426-7700

~~1737~~

3189

~~Dave Spenser~~ 592-4480

0740^a later

Al Fraser

592-4479

leaves at 3

College & University (Queens Pk.)
200 University, 4th floor

Tower

weight 8T

250 m.

pictures
on Tues.

1737

2 towers N of Hickson

1758

11 or 12 in ^{around} Woodstock

1820

~~1819~~

10 towers S of N Durham
between Kitching &

1832

~~1837~~

1 or 2

S of Vanessa

from outage log / ^{times} corrected Dec 19 by telephone
& Al Fraser)

2 funnel join

Josep TZLADISLAW
ZBRYNSKI

as told to Al Fraser

Jaylor ^{rain gauge}

C 310

3.1 inches

3-5 min

NW

Woodstock

~~Keep this~~
~~242-224~~

Sequence of watches / Waps

Aug 7 / 1979

	YYZ	YWG	BN
# 75	1535 1730	(1735)	1546Z = 1607
SIMCOE GREG DUFFERIN & SRN BRUCE			
# 76	1655		1810 Z
PEEL YORK DURNAM METRO			
# 76 cancelled	1750		1812 Z
# 77	1700	1727	1815Z
Marine Rk Out			
# 75 cancelled	1730	1732?	1816 Z
# 77 cancelled	1915		1950Z
# 78	1940	1952	1956
watch for Rk St Clair Rk then Rk then Rk Wm Rk Out			
# 79	2215	2232	lost due op. error
Perth Waterloo Oxford			
# 80 watch	2300		2332
for Rk St Clair Rk Cnr then Rk then Wm Rk Out Niagara			
# 81	2315	2342	2353
Brant Horn-Grant Held Norfolk & Niagara			
# 79 cancelled	2330	2330	not sent
# 82	2355	0007	0017
Journals for Haldimand Norfolk			