ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

7110. 95

7/8/85

SUBJ: RADAR REMOTE WEATHER DETECTION SYSTEM (RRWDS)

1. PURPOSE. This order prescribes policies and procedures for use by Federal Aviation Administration (FAA) air traffic personnel for operation of radar weather displays accessing RRWDS digitizer equipment. It also provides appendices listing the latest available telephone numbers, a chart depicting the RRWDS locations, and ground clutter photographs of 45 WSR-57 and 5 WSR-74 RRWDS sites.

2. DISTRIBUTION. This order is distributed to selected offices in Washington and regional headquarters, area offices, Mike Monroney Aeronautical Center, the FAA Technical Center, and all air traffic facilities.

3. ACTION. Facility managers shall ensure that:

a. All personnel responsible for providing service using the RRWDS derived weather displays are briefed on the policies and procedures contained in this order.

b. The listed telephone numbers are made available and updated as necessary to provide specialists access to remote weather radar sites.

c. All FSS personnel providing service using the RRWDS weather display are trained and certified on equipment operation and operational procedures.

4. BACKGROUND. RRWDS digitizers are operational at 134 National Weather Service (NWS) and air traffic control (ATC) radar sites. RRWDS processors and display consoles are in use in all En Route Flight Advisory Service (EFAS) and Center Weather Service Units (CWSU). Also, RRWDS and other types of equipment capable of accessing the RRWDS digitizers are utilized at many other air traffic and NWS facilities throughout the system. The RRWDS provides users with real-time precipitation intensity patterns. The equipment is used by flight service stations, towers, and CWSU's to alert aviation interests of potentially hazardous weather that can impact safety and/or air traffic flow.

5. EQUIPMENT.

a. Digitizer - RRWDS digitizers are located at the radar sites. They receive and process the weather data and operational status of the radar equipment. The digitizers also generate map overlays, range marks and azimuth lines. RRWDS digitizer units can service up to seven dedicated line users and one dial-up line to provide access to the radar display from remote sites.

b. Processors - RRWDS processors are located at the site of the user facility. Processors receive signals from the digitizer and format the data for presentation on the display console. A processor is capable of accessing up to seven radar digitizer sites by dedicated lines and also provides one dial-up line to obtain weather radar displays from any other radar digitizer site. One processor will drive up to five display consoles.

c. Weather Display Console - The RRWDS display unit is a 25-inch color cathode ray tube and control panel that provides the operator with the selected weather radar presentation, controls, and operational indicators.

6. FEATURES OF RRWDS.

a. A 100 or 200 NM range presentation.

b. A geopolitical and/or ATC route oriented map overlay for each range setting.

c. Range reduction (zoom) to reduce the displayed range by one-half; e.g. 200 to 100 NM.

d. Off-centering to any area of the display.

e. Range marker selection in either 25- or 50-mile increments.

f. An option of displaying azimuth lines in 30-degree increments.

g. A precipitation display in six colors to indicate intensity levels.

h. Blanking or blinking of precipitation intensity levels for analysis or alerting.

7. PROCEDURES.

a. RRWDS Control Facilities - Each weather radar digitizer site has one designated RRWDS control facility. The control facilities associated with a NWS radar site can select either the 100 or 200 NM range setting. RRWDS control facilities associated with ATC radar sites can select range (100 or 200 NM), Log, moving target indicator (MTI), or range gated MTI/Log video. All facilities accessing the radar site will receive the display with the setting established at the control site. If an accessing facility needs to view the presentation in a different range or operational setting it must request the change to be effected at the control facility. Normal operational configurations of RRWDS displays are:

-Range setting: 200 NM ATC and NWS radars
-Gated MTI/Log video ATC radars

Requests for temporary changes to the normal range and operational settings will be honored to the fullest extent possible for a period of up to 15 minutes.

b. Operational Use - The RRWDS displays in flight service station (FSS) and EFAS facilities are used to advise pilots of significant weather that may impact safety of flight and to assist in flight planning. The operator must avoid giving the pilot any impression of having the ability to vector aircraft through or around precipitation areas.

c. Access of Remote Weather Radar Sites - RRWDS equipped facilities can access by dial-in capability any RRWDS digitizer. The digitizer sites are limited in the number of dial-in facilities that can be served. All specialists should consider the need and use of the weather radar information before utilizing this feature. Now-time weather is of little use to a pilot many hours away from the activity area. Better service may be provided using summary and forecast data for flights more than an hour away from the precipitation echoes.

8. LIMITATIONS AND PRECAUTIONS.

a. Type Radar - The operator must be aware of the difference in characteristics of precipitation echoes generated by different types of radar sites. Band width, antenna pattern, and operational mission of the equipment will affect the intensity pattern of the echoes and the coverage of the displayed weather.

b. Operational Configuration - Many control settings at the radar site can adversely affect, or enhance, the radar's ability to display precipitation echoes. Be cognizant of indications on the display of possible erroneous or missing data.

c. NWS Observation - While taking scheduled and unscheduled radar observations, the NWS radar observer will manipulate the antenna to scan heights or selected areas of precipitation echoes. When this is occurring, a non-standard weather presentation may be displayed on the RRWDS. Operators should always note the antenna tilt angle displayed on the equipment status column when interpreting the radar presentation.

d. Ground Clutter - Each radar site has a distinctive ground clutter pattern. Operators should be especially cautious when interpreting echoes observed at remote radar sites that the ground clutter pattern is not mistaken for precipitation echoes. Ground clutter photographs for 45 WSR-57 and 5 WSR-74 sites are included in appendix 3. The photographs are reproductions of a portion of Federal Meteorological Handbook NO. 7, Part C. Action is being taken to obtain ground clutter photographs of all RRWDS digitizer sites. When available, (approximately November 1985) they will be distributed as a revision to this order.

e. Atmospheric Phenomena - The operator must be aware of the affects of atmospheric phenomena in producing false targets or eliminating or distorting actual targets.

f. Obsolete Data - Some partial radar failures stop the flow of data to the RRWDS transmitter. In such cases, the RRWDS may continue to transmit the last valid information provided by the radar site. Observers must consider the date and time, displayed in the radar status column, when interpreting the radar presentation.

9. TRAINING AND CERTIFICATION.

a. All FSS personnel using graphic weather radar displays for pilot briefing purposes must be certified by the NWS on interpretation of weather radar presentations.

b. RRWDS training and certification is mandatory for flight watch specialists, first line supervisors, and training specialists at Flight Watch Control Stations (FWCS). It is recommended for all specialists at locations that have RRWDS equipment. RRWDS training certification procedures are as follows:

1. Only personnel who are NWS weather radar certified may be certified on RRWDS.

2. Personnel that have been issued a waiver to the color vision standard may not be certified on this equipment.

3. Upon completion of training, the certification examination and answer sheets are to be requested from the Academy. They can be obtained by forwarding a speed memo to the Flight Service Development/Revision Unit, AAC-933D.

a. After the examination has been administered, the examination along with the completed answer sheet are to be returned to AAC-933D.

b. AAC-933D will grade the answer sheets and issue a Certificate of Training, AC Form 3000-36, through the Consolidated Personnel Management Information System.

4. Facility managers have the authority to certify specialists/ supervisors who pass the certification examination and a performance evaluation.

5. This training shall be recorded in the employee's Training and Proficiency Record (FAA Form 3120-1), Section V, Supplemental Training. After successful completion of this training, an entry shall be made in Section IV, Equipment Certification, certifying the individual on RRWDS equipment.

6. Employees who do not successfully complete the certification criteria should receive additional training as appropriate. The examination and/or performance evaluation as appropriate should be administered no sooner than 30 days following the previous examination/evaluation.

10. RELATED PUBLICATIONS.

a. Federal Meteorological Handbook No. 7 - Weather Radar Observations.

b. S-5 - FAA Academy, Special Series, Operator Training Guide, Radar Remote Weather Display System
Part 1 - System Operation
Part 2 - System Interpretation

11. APPENDICES.

a. Appendix 1 is a chart showing the approximate location of the 134 RRWDS digitizer sites in the United States, including Puerto Rico.

b. Appendix 2 is a listing of RRWDS digitizer sites, location identifiers, dial-in telephone numbers and control facilities.

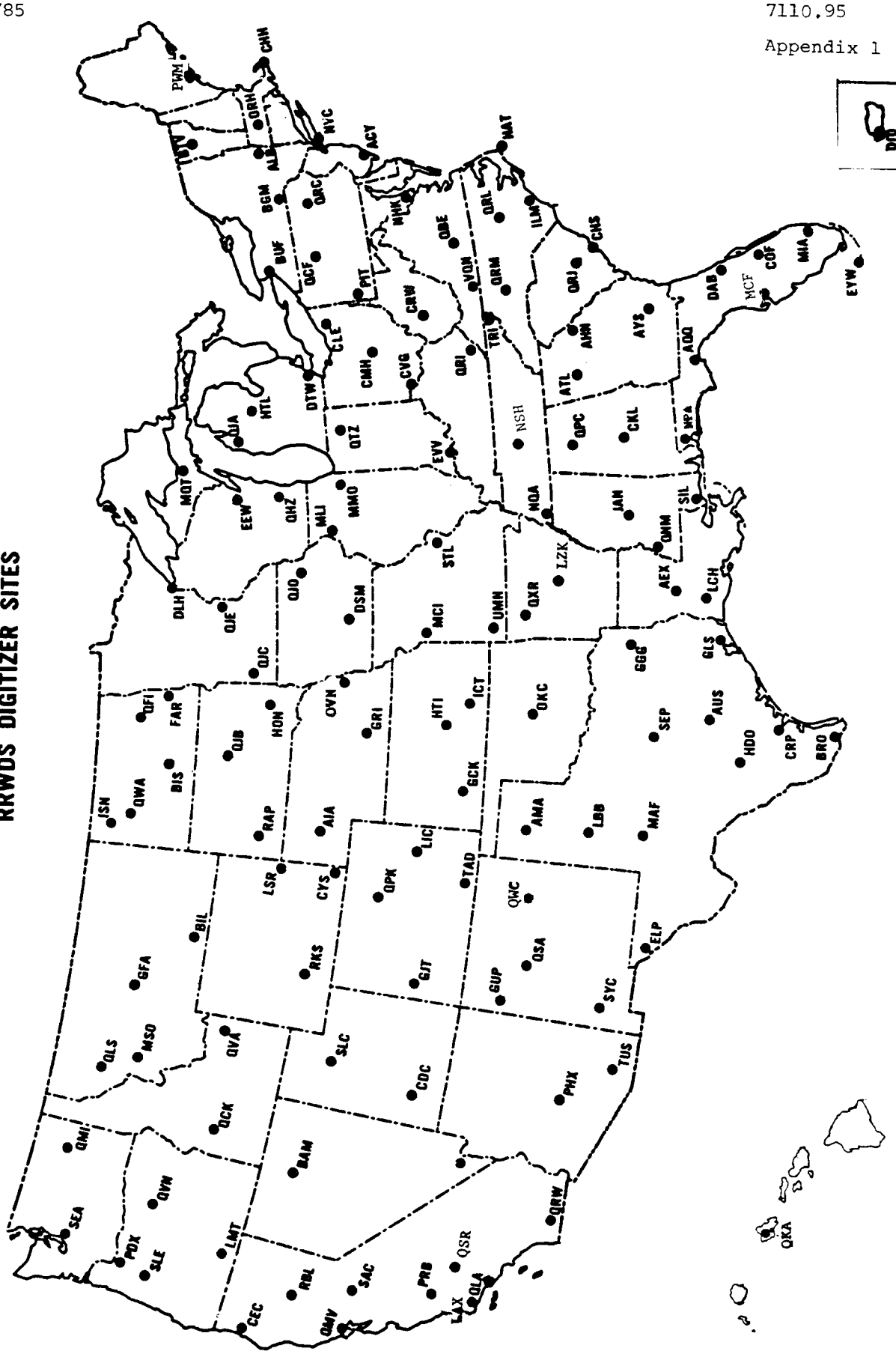
c. Appendix 3 is a collection of 46 WSR-57 and 5 WSR-74 ground clutter photographs.

d. Additions, deletions, or corrections to telephone numbers or other information pertaining to this order should be forwarded to the FSS Procedures Branch, ATO-360, through the regional air traffic division.

RW Barker
for John R. Ryan
Director, Air Traffic Operations Service

Appendix 1

RRWDS DIGITIZER SITES



Appendix 2

RRWDS TELEPHONE NUMBER LISTINGS

LOCATION BY STATE	RADAR SITE IDENTIFIER	RADAR TYPE	TELEPHONE NUMBER	CONTROL FACILITY
ALABAMA				
Centerville	CKL	WSR-57	205-926-9201	BHM EFAS
Haleyville	QPC	FPS-64	205-332-4713	ZME NWS
ARIZONA				
Phoenix	PHK	ARSR-1	602-488-2177	ZAB NWS
Tucson	TUS	WSR-74C	602-889-0060	NWS
ARKANSAS				
N. Little Rock	MII	WSR-57	501-835-1605	NWS
Russelville	QXR	FPS-64	501-331-3674	LIT FSS
CALIFORNIA				
Boron	QSR	FPS-67B	619-762-5478	ZLA NWS
Crescent City	CEC	FPS-67	707-482-3045	ZOA CWSU
Los Angeles	LAX	WSR-74	213-479-5738	ZLA NWS
Mill Valley	QMV	FPS-66A	415-388-1038	ZOA CWSU
Mt. Laguna	QRW	ARSR-3	619-473-8014	ZLA NWS
Paso Robles	PRB	ARSR-1	805-438-5087	ZLA NWS
Red Bluff	RBL	FPS-67	916-529-1087	ZOA CWSU
Sacramento	SAC	WSR-57	916-443-5329	OAK EFAS
San Pedro	QLA	ARSR-1	213-377-1658	ZLA NWS
COLORADO				
Denver	QPK	ARSR-1	303-699-6180	ZDV CWSU
Grand Junction	GJT	ARSR-2	NONE	NWS
Limon	LIC	WSR-57	303-775-9853	ZDV CWSU
Trinidad	TAD	ARSR-2	NONE	DEN NWS
FLORIDA				
Apalachicola	AQQ	WSR-57	904-653-9035	NWS
Daytona Beach	DAB	WSR-57	904-255-8117	NWS
Key West	EYW	WSR-74S	305-296-4322	NWS
Miami	MIA	WSR-57	305-594-4209	MIA EFAS
Patrick AFB	COF	FPS-66	305-777-2519	NWS
Pensacola	NPA	WSR-57	904-456-6914	NWS
Tampa	MCF	WSR-57	813-645-4224	NWS
GEORGIA				
Athens	AHN	WSR-57	404-549-3949	NWS
Atlanta	ATL	WSR-74S	404-767-8975	ATL EFAS
Waycross	AYS	WSR-57	912-287-1963	CHS EFAS
HAWAII				
Mt. Kaala	QKA	ARSR-3		

IDAHO				
Ashton	QVA	ARSR-2	NONE	NWS
Boise	QCK	ARSR-2	NONE	ZLC NWS
ILLINOIS				
Marseilles	MMO	WSR-74S	815-795-2565	CHI EFAS
Moline	MLI	WSR-74	309-797-9210	DSM EFAS
INDIANA				
Evansville	EVV	WSR-57	812-429-0104	NWS
LaGrange	QTZ	ARSR-1	219-463-7352	IND EFAS
IOWA				
Des Moines	DSM	WSR-57	515-285-2467	NWS
Arlington	QJO	ARSR-3	319-633-6835	ZAU CWSU
KANSAS				
Garden City	GCK	WSR-57	316-275-4689	NWS
Hutchinson	HTI	FPS-66	316-663-2152	OKC EFAS
Wichita	ICT	WSR-57	316-943-2512	NWS
KENTUCKY				
Lynch	QRI	ARSR-2	404-589-0869	ZID CWSU
LOUISIANA				
Alexandria	AEX	FPS-20A	318-442-9548	NEW EFAS
Lake Charles	LCH	WSR-57	318-474-2071	NWS
New Orleans	SIL	WSR-57	504-646-2202	NEW EFAS
MAINE				
Portland	PWM	WSR-74S	207-774-5185	NWS
MARYLAND				
Patuxent River	NHK	WSR-57	301-862-9828	DCA EFAS
MASSACHUSETTS				
Chatham	CHH	WSR-74S	617-945-3580	NWS
Worcester	ORH	WSR-74C	617-792-0455	BDR EFAS
MICHIGAN				
Detroit	DTW	WSR-57	313-941-4330	DET EFAS
Empire	QJA	ARSR-3	616-326-5534	ZMP NWS
Houghton Lake	HTL	WSR-74C	517-366-9069	NWS
Marquette	MQT	WSR-74C	906-475-5471	NWS
MINNESOTA				
Duluth	DLH	WSR-74C	218-722-7765	NWS
Minneapolis	QJE	WSR-57	612-726-6453	NWS
Tyler	QJC	ARSR-2	507-658-3339	MSP EFAS

MISSISSIPPI				
Newport	QNM	ARSR-3	601-472-2081	ZME NWS
Jackson	JAN	WSR-57	601-939-8353	JAN EFAS
MISSOURI				
Kansas City	MCI	WSR-57	816-243-3817	MKC EFAS
Monett	UMN	WSR-57	417-235-6526	NWS
St. Louis	STL	WSR-57	314-447-6971	STL EFAS
MONTANA				
Billings	BIL	WSR-74C	406-256-9348	NWS
Lakeside	QLS	ARSR-3	NONE	
Malstrom	QFA	FPS-65A	406-727-3820	GTF EFAS
Missoula	MSO	WSR-57	406-543-8205	NWS
NEBRASKA				
Alliance	AIA	WSR-74S	308-762-8391	NWS
Grand Island	GRI	WSR-57	308-381-7356	NWS
Omaha	OVN	WSR-74C	402-572-7868	OMA EFAS
NEVADA				
Battle Mt.	BAM	ARSR-2	NONE	ZLC NWS
Las Vegas	QAS	FPS-20	702-384-2140	ZLA NWS
NEW JERSEY				
Atlantic City	ACY	WSR-57	609-646-4310	ZNY CWSU
NEW MEXICO				
Gallup	GUP	ARSR-2	505-777-2257	DEN NWS
Mesa Rica	QWC	ARSR-1	505-821-1695	ZAB NWS
Silver City	SYC	ARSR-2	505-388-5667	ZAB NWS
West Mesa	QSA	FPS-66	505-831-5524	ZAB NWS
NEW YORK				
Albany	ALB	WSR-74	518-869-0180	MPV EFAS
Binghamton	BGM	WSR-74S	607-770-0900	ZNY CWSU
Buffalo	BUF	WSR-57	716-631-0578	BUF EFAS
New York	NYC	WSR-57	212-757-7452	TEB EFAS
NORTH CAROLINA				
Benson	QRL	ARSR-1	919-934-0223	ZDC CWSU
Cape Hatteras	HAT	WSR-57	919-995-4300	NWS
Maiden (Charlotte)	QRM	ARSR-1	704-464-3942	ZTL CWSU
Wilmington	ILM	WSR-57	919-762-3580	ZDC CWSU
NORTH DAKOTA				
Bismark	BIS	WSR-74	701-223-2817	NWS
Fargo	FAR	WSR-74S	701-280-0806	NWS
Finley	QFI	ARSR-3	701-524-1461	GFK EFAS
Watford City	QWA	FPS-66	701-828-3555	GFK EFAS
Williston	ISN	WSR-74C	701-774-2958	NWS

OHIO				
Cincinnati	CVG	WSR-57	606-525-7134	NWS
Columbus	CMH	WSR-74C	614-231-0916	NWS
Cleveland (Brecksville)	CLE	ARSR-2	216-526-6315	CLE FSS
OKLAHOMA				
Academy	OKC	ARSR-1D	None	
Oklahoma City	OKC	WSR-57	405-681-8215	NWS
OREGON				
Fossil	QVN	ARSR-3	503-763-3471	ZSE NWS
Klamath Falls	LMT	FPS-67	503-884-9253	ZSE NWS
Portland	PDX	WSR-74C	503-284-9634	ZSE NWS
Salem	SLE	ARSR-1	503-787-3049	ZSE NWS
PENNSYLVANIA				
Benton	QRC	FPS-67	717-477-3721	ZNY CWSU
Clearfield	QCF	ARSR-3	814-765-9571	ZNY CWSU
Pittsburgh	PIT	WSR-57	412-269-1330	AGC EFAS
PUERTO RICO				
Pico del Este	QJQ	FPS-67		SJU FSS
SOUTH CAROLINA				
Charleston	CHS	WSR-57	803-747-1419	NWS
Jedburg	QRJ	ARSR-60		
SOUTH DAKOTA				
Gettysburg	QJB	FPS-64	605-765-2795	HON EFAS
Huron	HON	WSR-57	605-353-1236	HON EFAS
Rapid City	RAP	WSR-74C	605-348-4123	NWS
TENNESSEE				
Bristol	TRI	WSR-57	615-323-3561	NWS
Memphis	NQA	WSR-57	901-873-0487	MEM EFAS
Nashville	NSH	WSR-57	615-758-5650	ZTL CWSU
TEXAS				
Amarillo	AMA	WSR-57	806-335-2553	NWS
Austin	AUS	WSR-74C	512-480-0769	NWS
Brownsville	BRO	WSR-57	512-544-0344	NWS
Corpus Christi	CRP	WSR-74C	512-289-0465	NWS
El Paso	ELP	ARSR-1	915-852-3099	ELP EFAS
Galveston	GLS	WSR-57	409-765-7400	NWS
Hondo	HDO	WSR-57	512-426-5587	SAT EFAS
Longview	GGG	WSR-74S	214-643-2210	HOU EFAS
Lubbock	LBB	WSR-74	806-765-0509	NWS
Midland	MAF	WSR-57	915-563-2141	NWS
Stephenville	SEP	WSR-57	817-965-2261	FTW EFAS

UTAH				
Cedar City	CDC	ARSR-2	801-586-0724	ZLC NWS
Salt Lake City (Francis Peak)	SLC	ARSR-1	NONE	ZLC NWS
VERMONT				
Burlington	BTV	WSR-74C	802-658-0698	NWS
VIRGINIA				
Bedford	QBE	ARSR-3	703-586-3836	ZDC CWSU
Volens	VQN	WSR-74C	804-349-6500	ZDC CWSU
WASHINGTON				
Seattle	SEA	ARSR-1	206-282-7368	SEA EFAS
Spokane	QMI	FPS-67	509-456-0129	ZSE NWS
West Virginia				
Charleston	CRW	WSR-74C	304-345-1392	CRW EFAS
WISCONSIN				
Horicon	QHZ	ARSR-2	414-387-3691	CHI EFAS
Neenah	EEW	WSR-57	414-836-2138	NWS
WYOMING				
Cheyenne	CYS	WSR-74C	307-634-0551	NWS
Lovell	QSI	ARSR-2	NONE	NWS
Lusk	LSR	ARSR-2	307-334-2238	DEN NWS
Rock Springs	RKS	ARSR-2	307-382-7234	ZLC NWS

Appendix 3

GROUND CLUTTER PHOTOGRAPHS

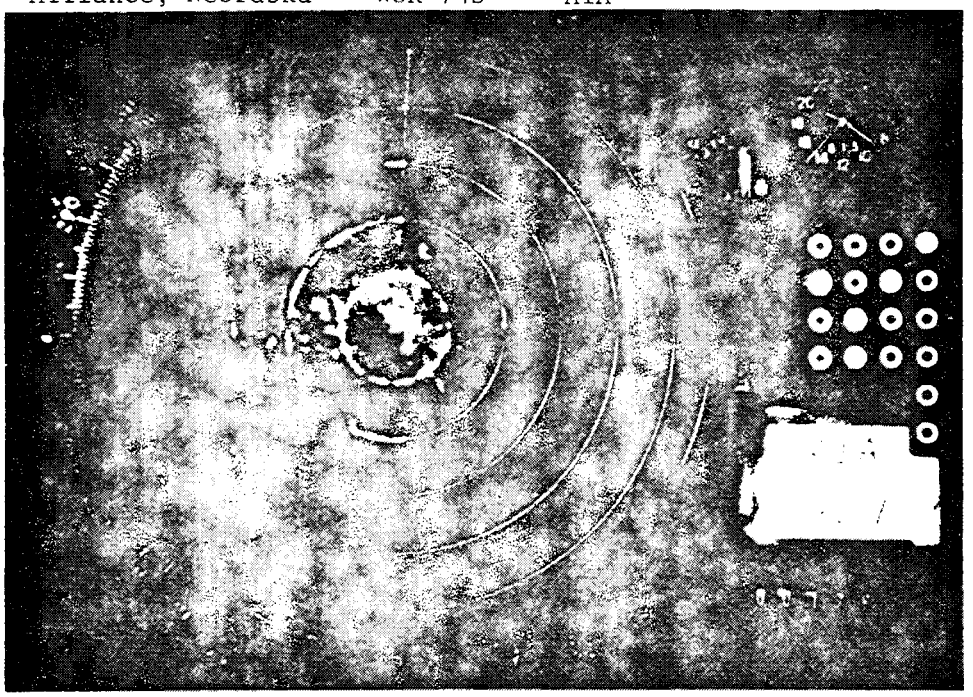
This appendix contains ground clutter photographs of 50 National Weather Service (NWS) weather radar sites. Except where otherwise noted, the following operating control settings were used:
Range - 125nm (230km).
Antenna - 1/2 degree elevation.
LOG receiver.
Long pulse.
Most photographs were taken with the radar site Video Integrator and Processing (VIP) equipment activated.

The photographs used in this appendix were reproduced from Part C of the NWS Federal Meteorological Handbook (FMH) No. 7. An upgraded version of this appendix will be included in a future change to this order.

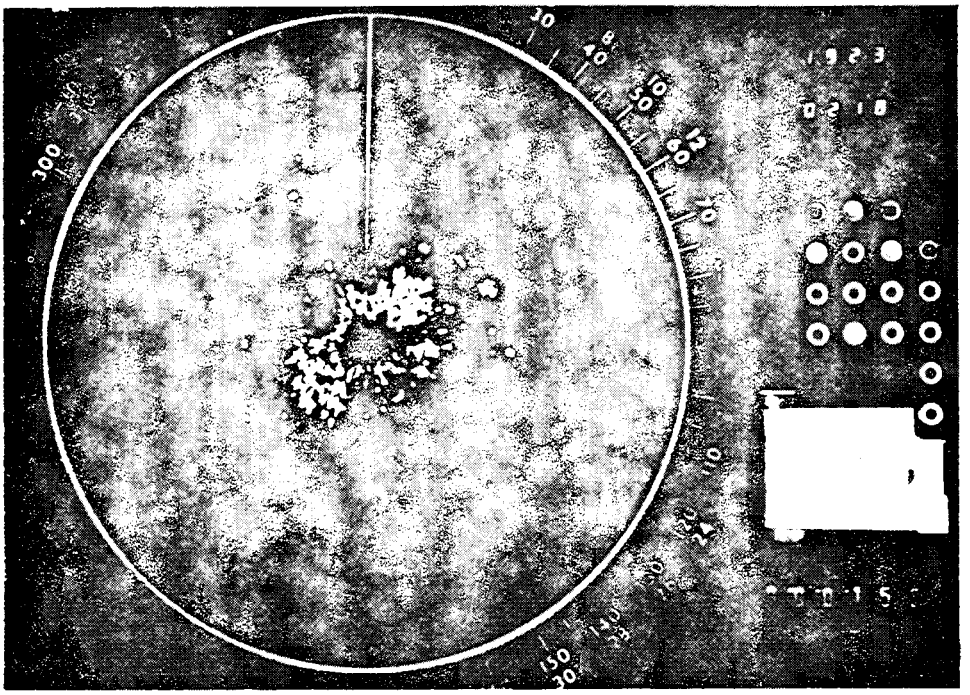
Appendix 3

GROUND CLUTTER PHOTOGRAPHS

Alliance, Nebraska WSR-74S AIA

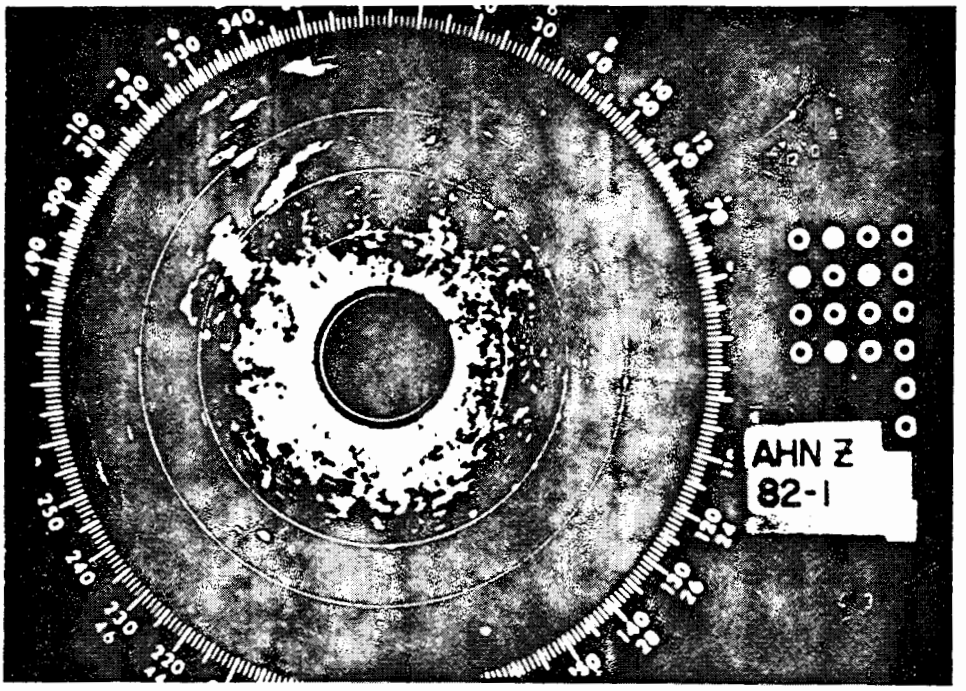


Amarillo, Texas WSR-57 AMA



GROUND CLUTTER PHOTOGRAPHS

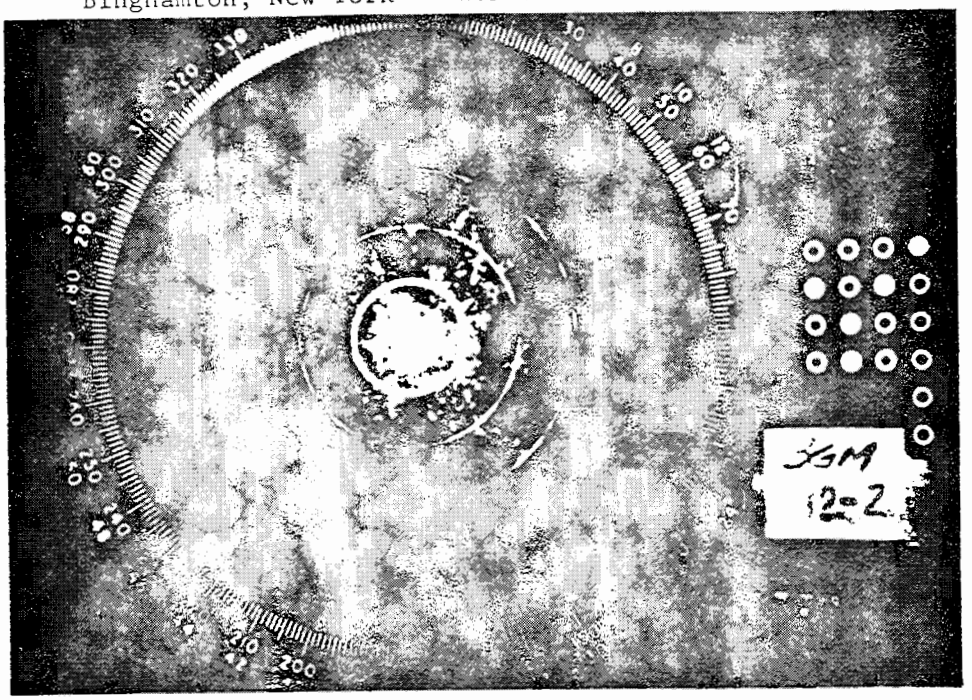
Athens, Georgia WSR-57 AHN



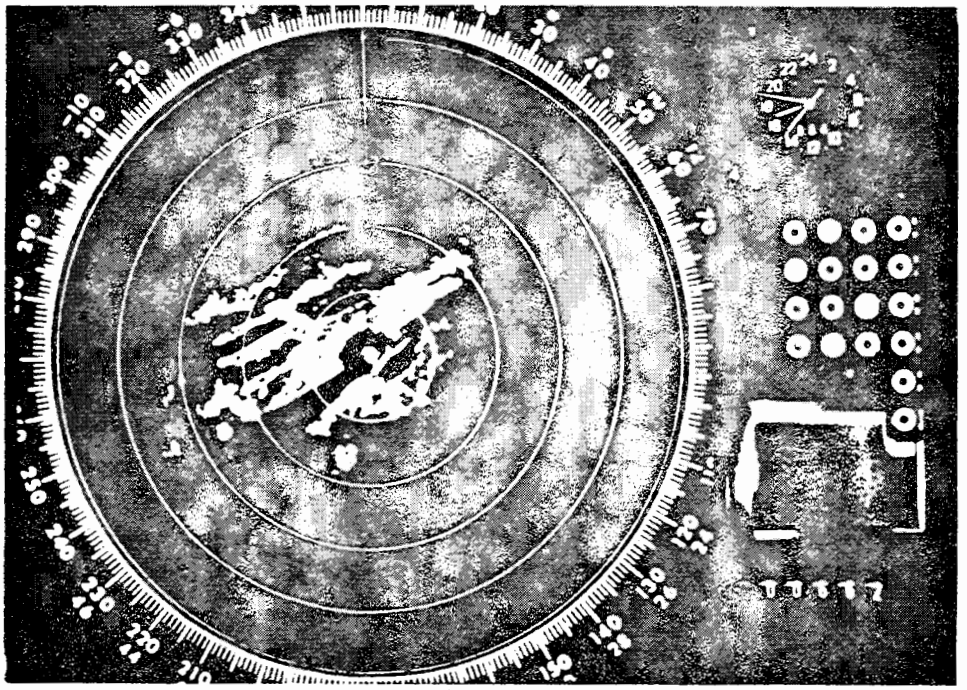
Atlantic City, New Jersey WSR-57 ACY

GROUND CLUTTER PHOTOGRAPHS

Binghamton, New York WSR-74S BGM

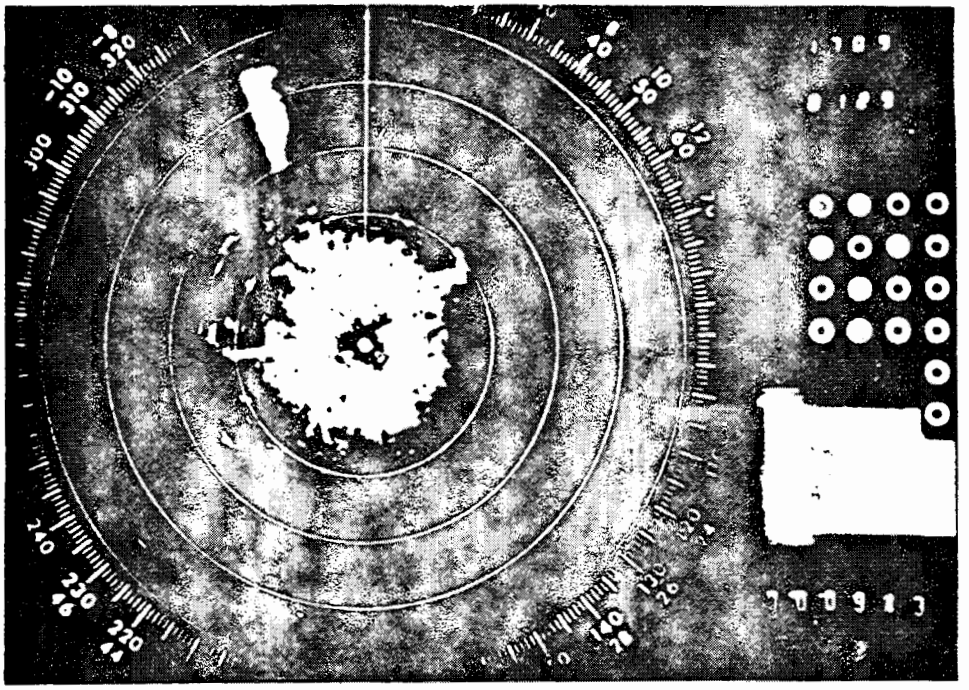


Bristol, Tennessee WSR-57 TRI

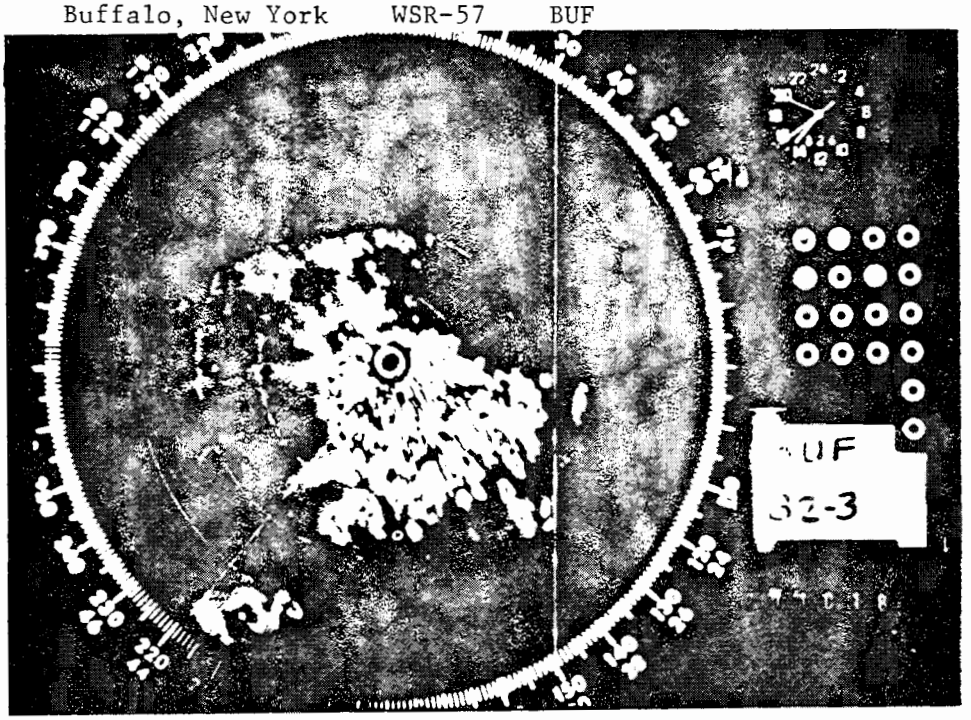


GROUND CLUTTER PHOTOGRAPHS

Brownsville, Texas WSR-57 BRO

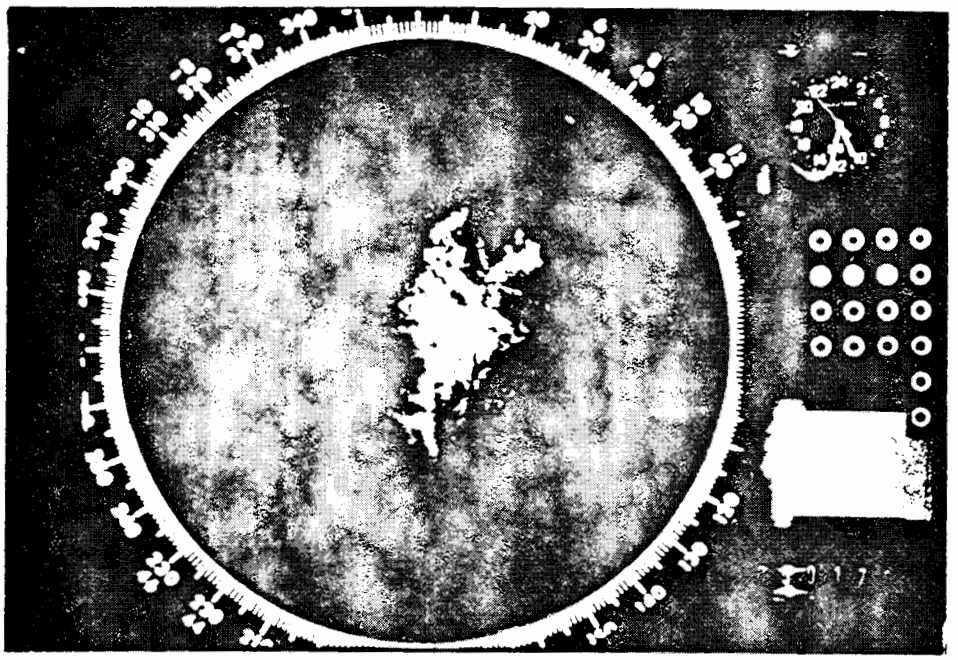


Buffalo, New York WSR-57 BUF

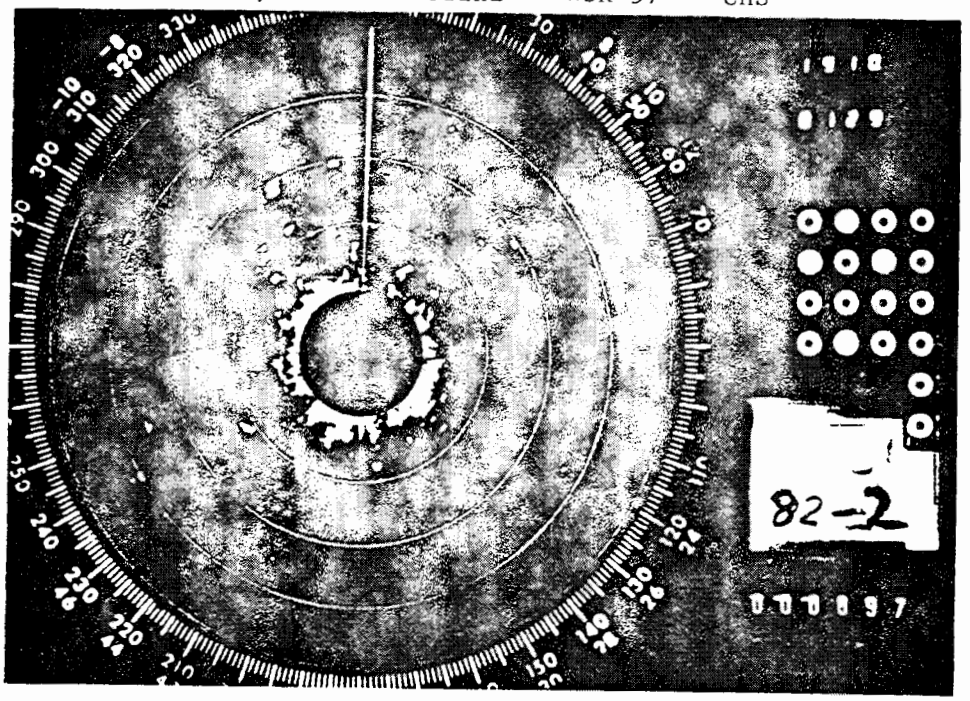


GROUND CLUTTER PHOTOGRAPHS

Centreville, Alabama WSR-57 CKL

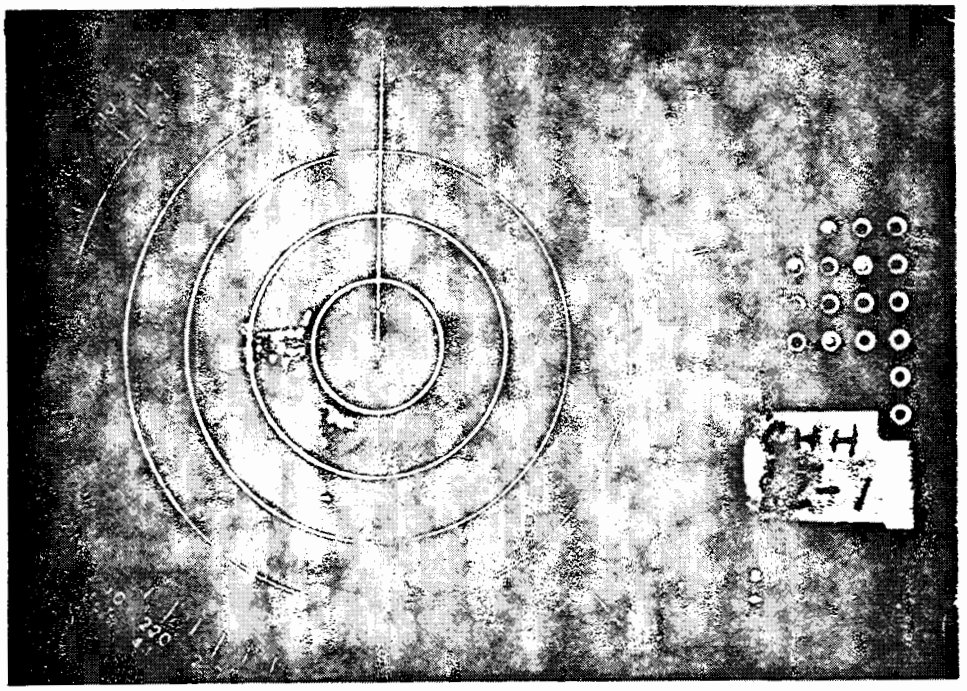


Charleston, South Carolina WSR-57 CHS

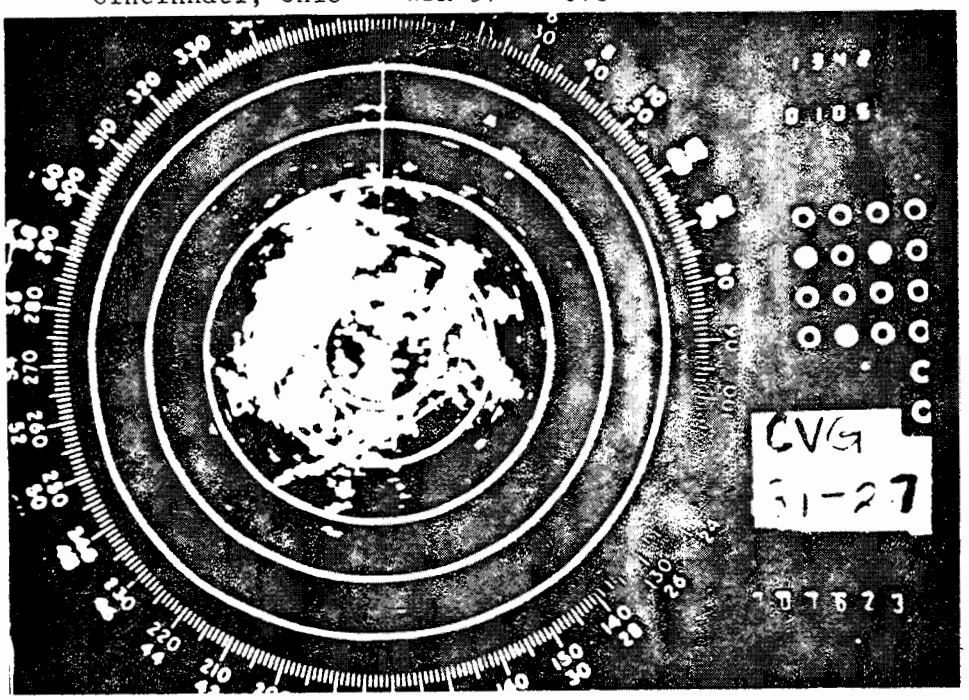


GROUND CLUTTER PHOTOGRAPHS

Chatham, Massachusetts WSR-57 CHH

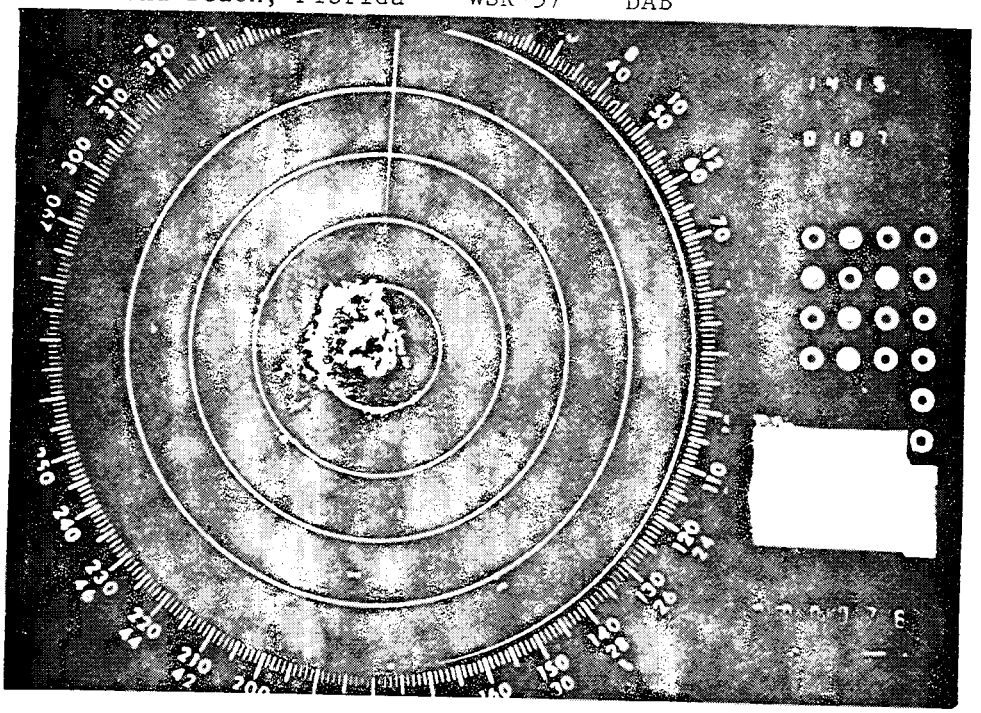


Cincinnati, Ohio WSR-57 CVG

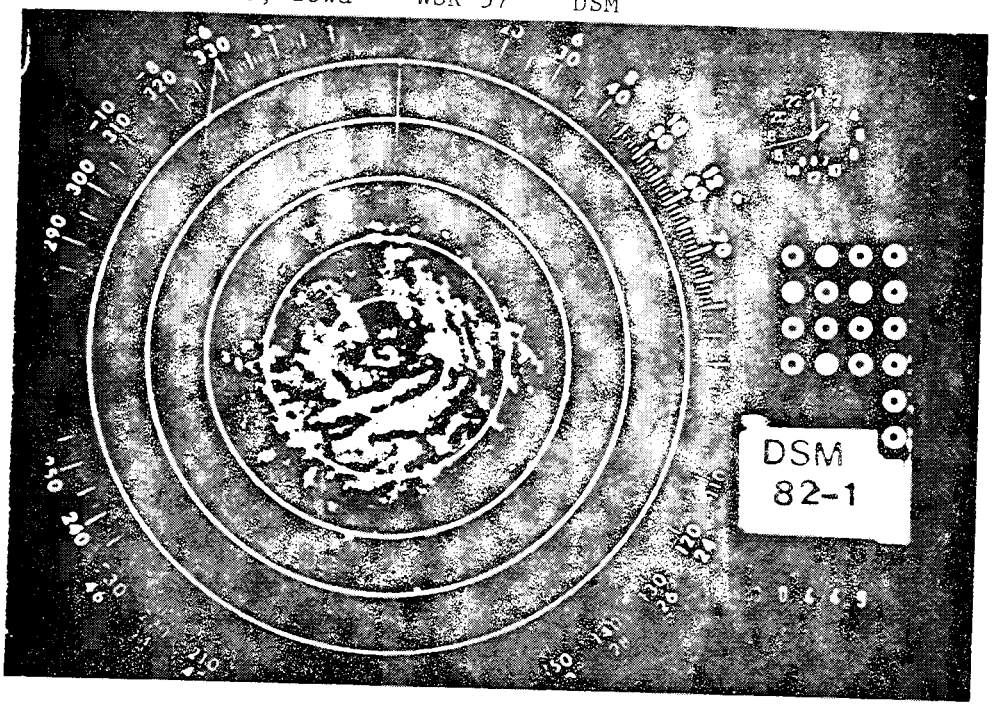


GROUND CLUTTER PHOTOGRAPHS

Datona Beach, Florida WSR-57 DAB

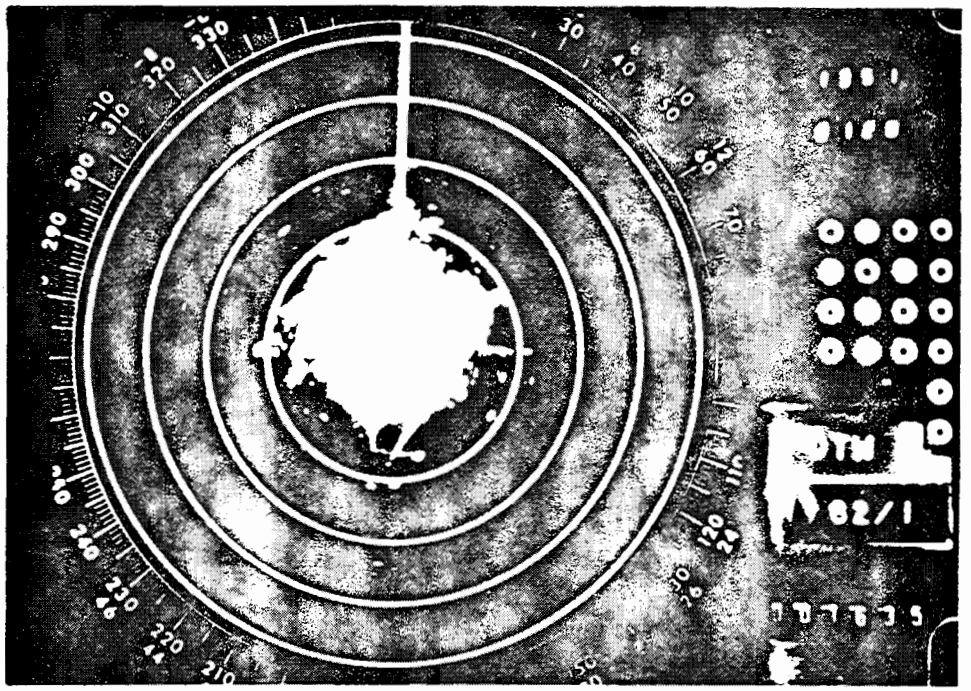


Des Moines, Iowa WSR-57 DSM

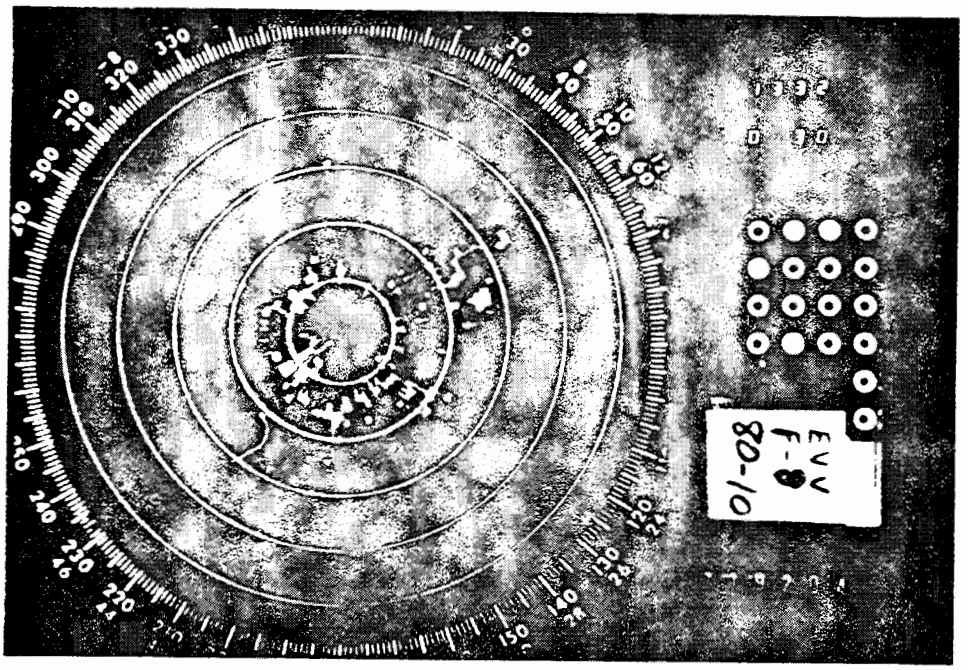


GROUND CLUTTER PHOTOGRAPHS

Detroit, Michigan WSR-57 DTW

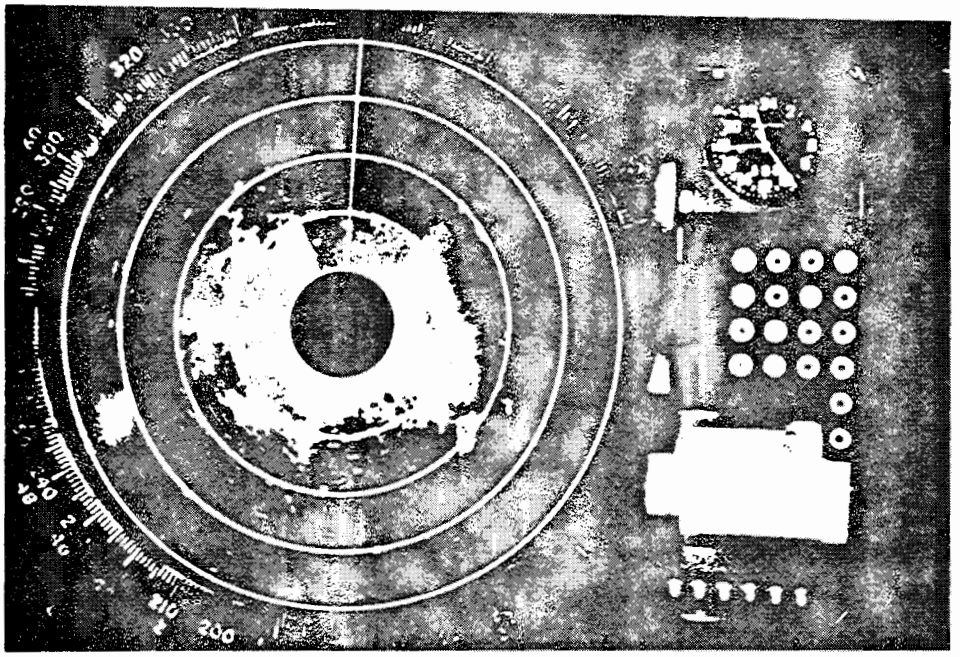


Evansville, Indiana WSR-57 EVV

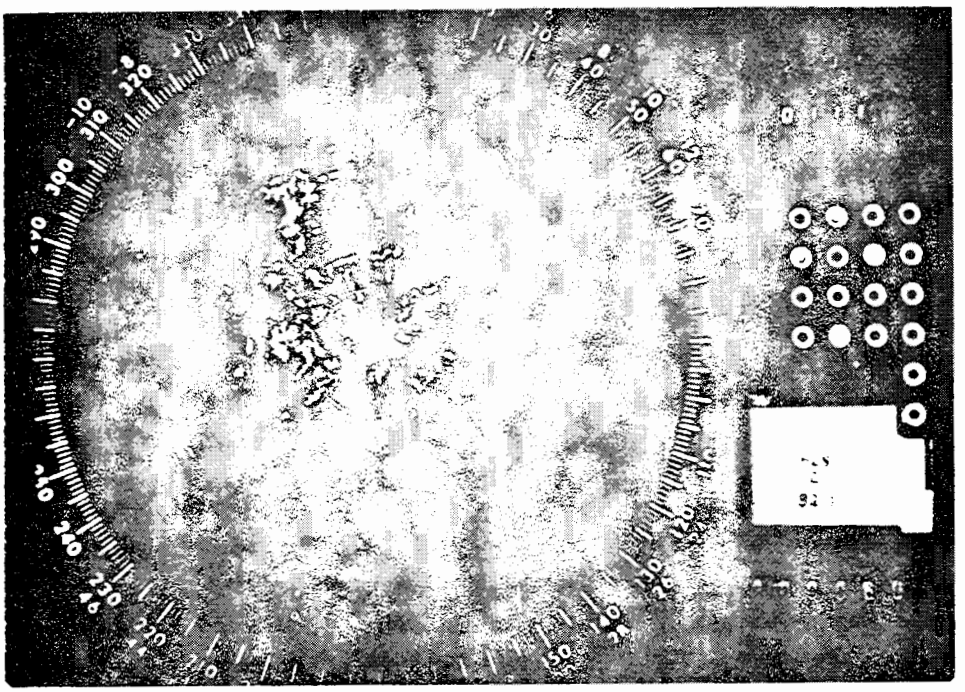


GROUND CLUTTER PHOTOGRAPHS

Fargo, North Dakota WSR-74S FAR

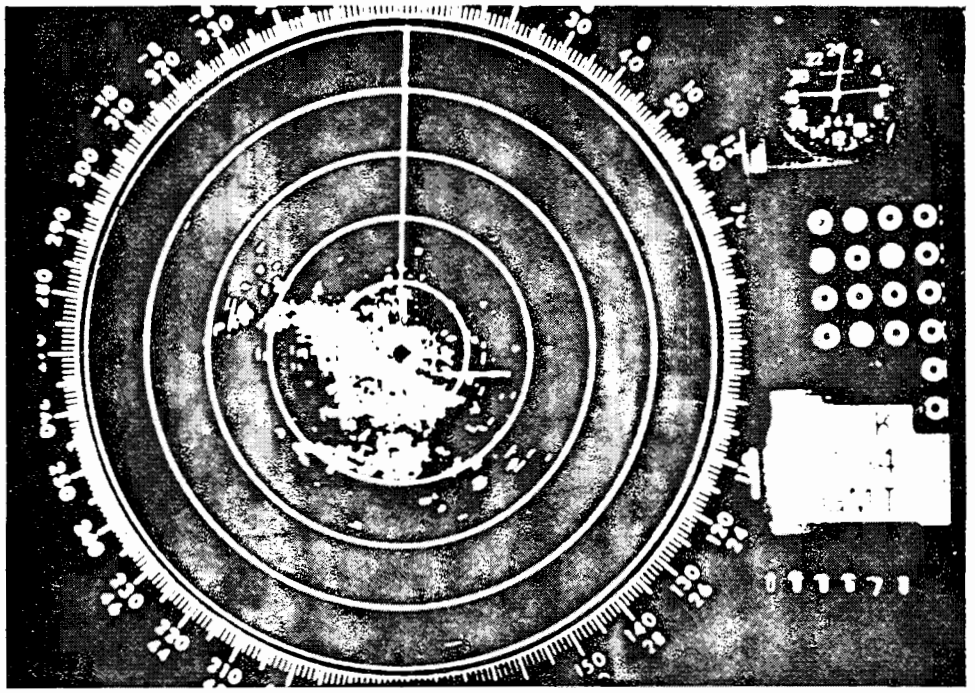


Galveston, Texas WSR-57 GLS

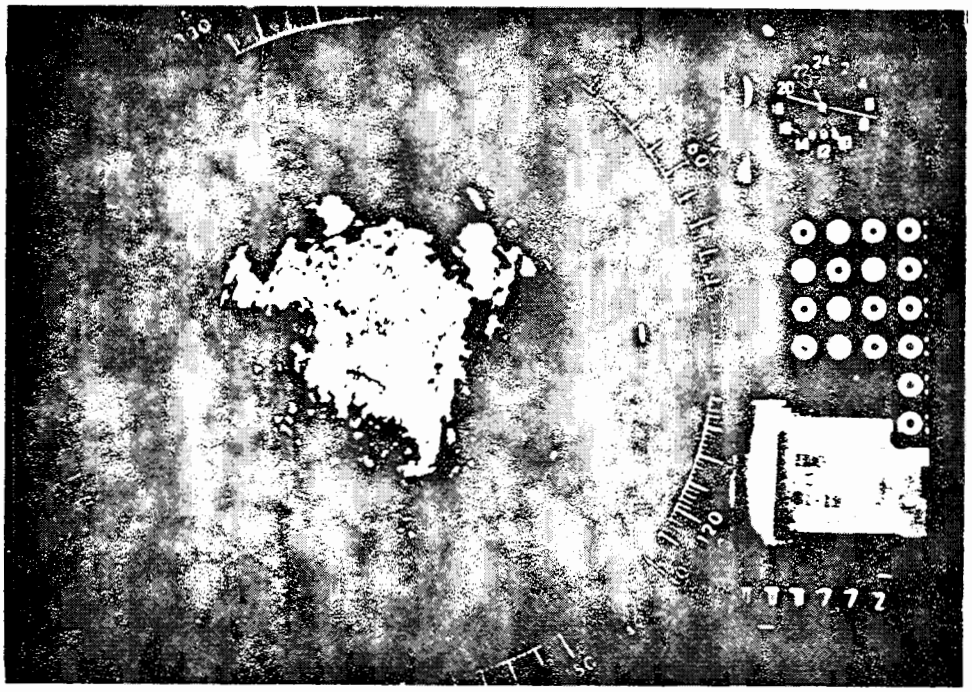


GROUND CLUTTER PHOTOGRAPHS

Garden City, Kansas WSR-57 GCK



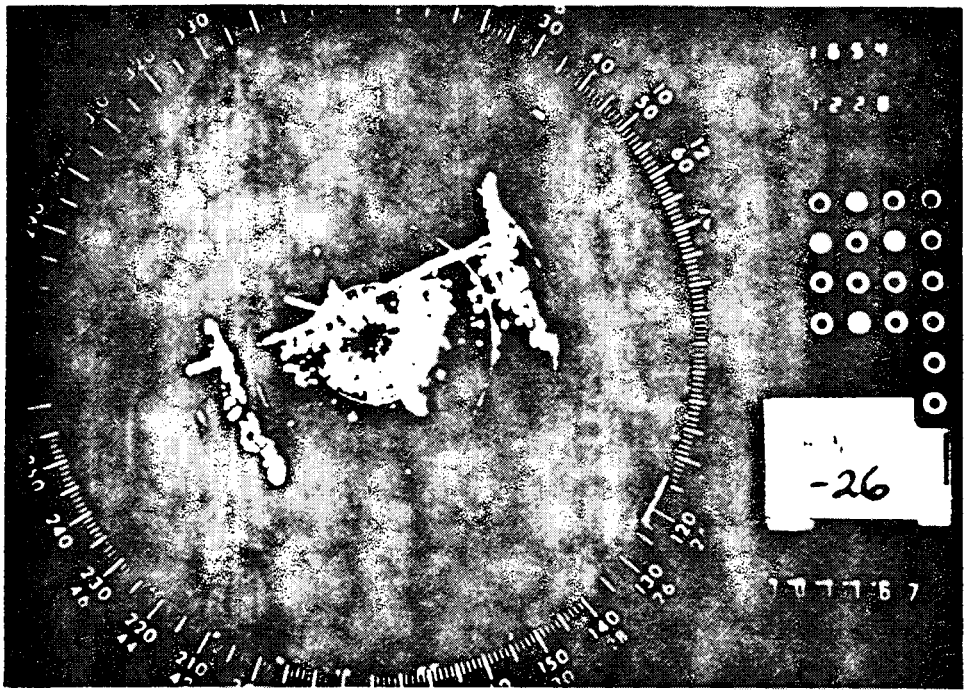
Hondo, Texas WSR-57 HDO



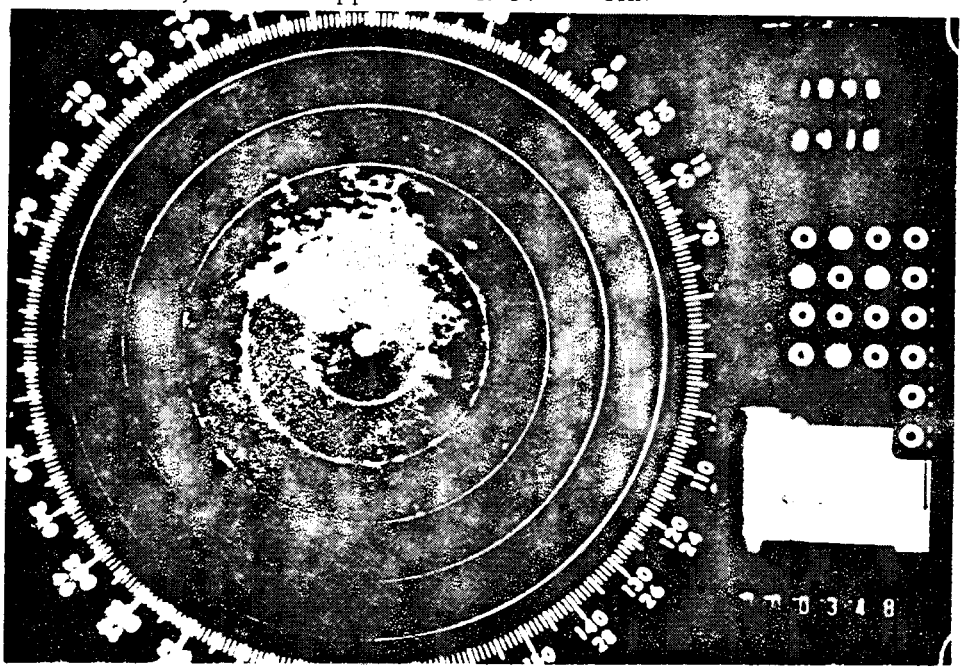
Appendix 3

GROUND CLUTTER PHOTOGRAPHS

Huron, South Dakota WSR-57 HON

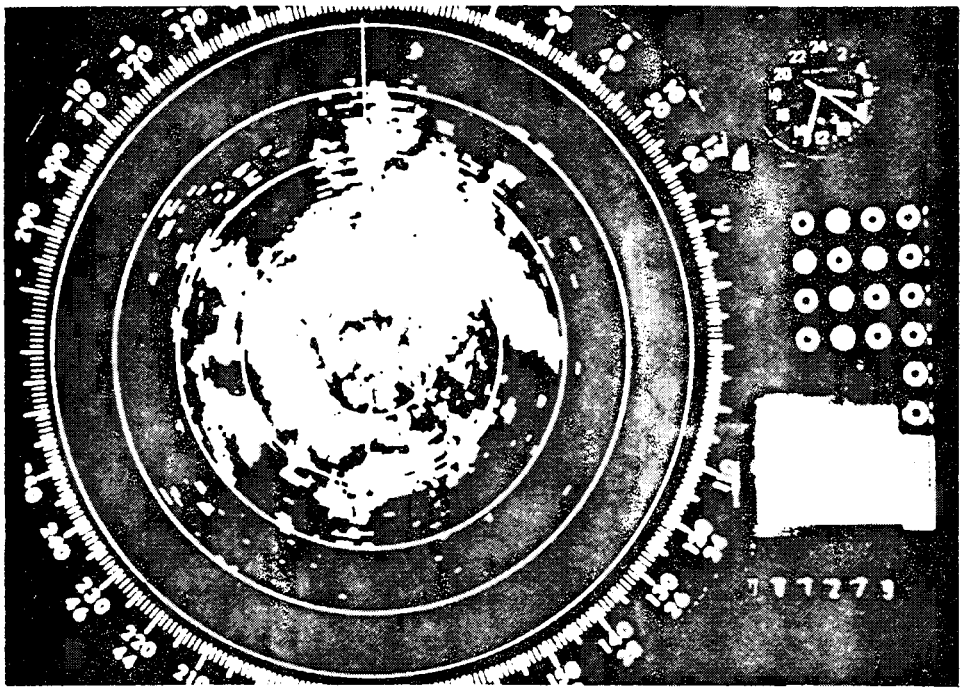


Jackson, Mississippi WSR-57 JAN

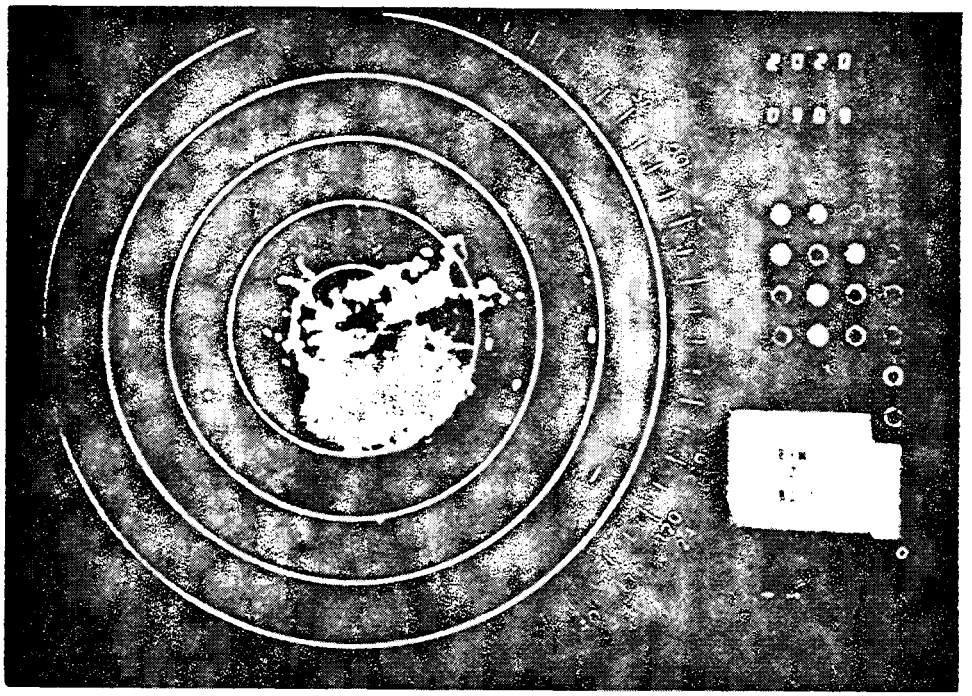


GROUND CLUTTER PHOTOGRAPHS

Kansas City, Missouri WSR-57 MCI

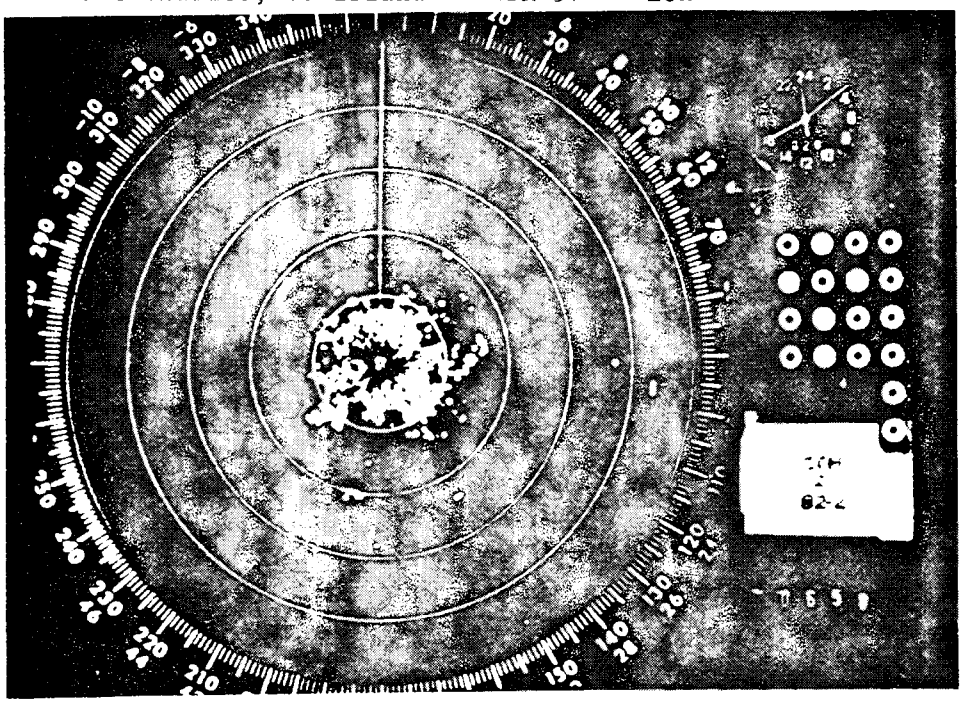


Key West, Florida WSR-57 EYW

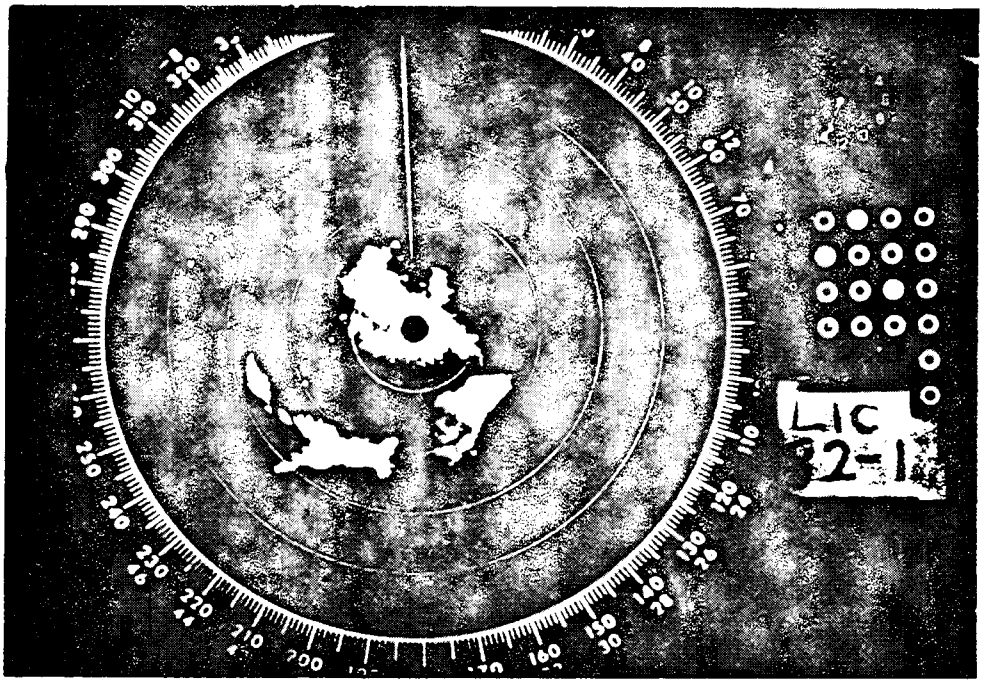


GROUND CLUTTER PHOTOGRAPHS

Lake Charles, Louisiana WSR-57 LCH

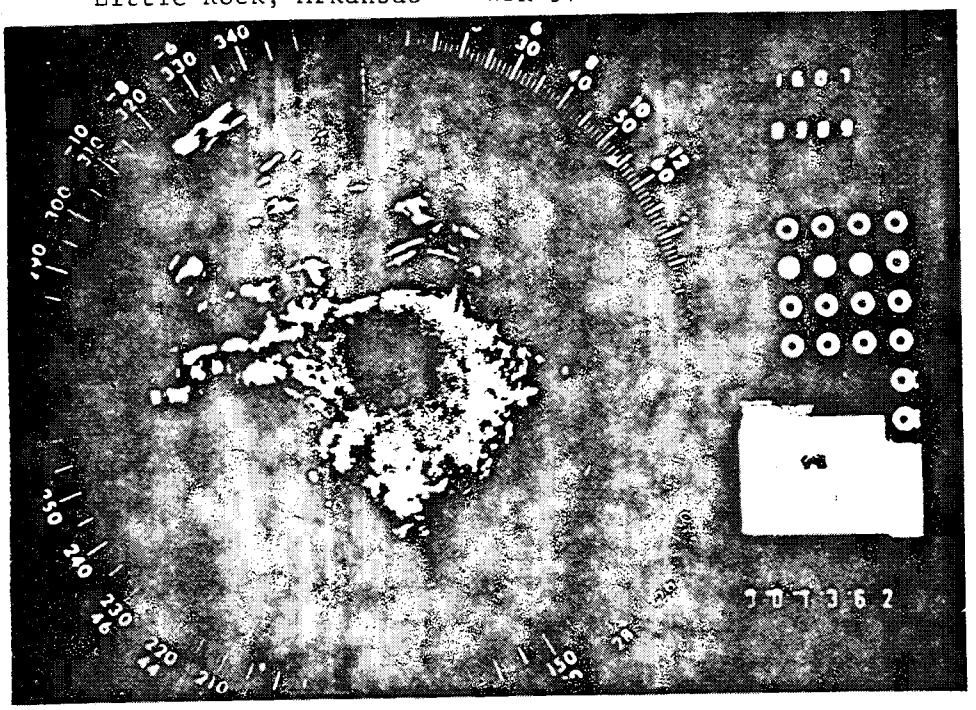


Limon, Colorado WSR-57 LIC

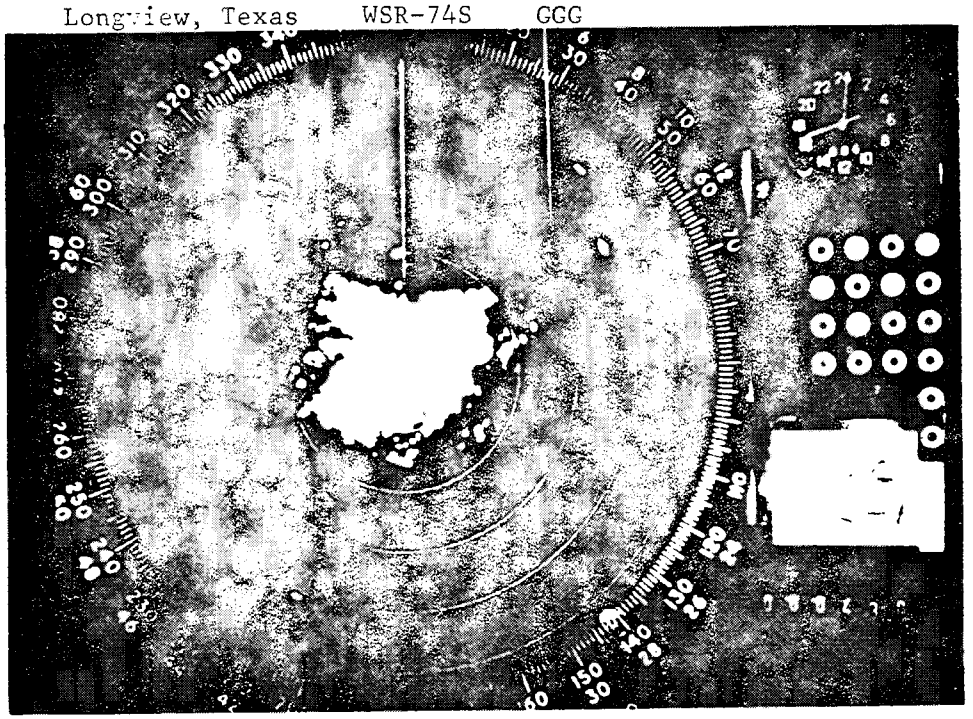


GROUND CLUTTER PHOTOGRAPHS

Little Rock, Arkansas WSR-57 LIT

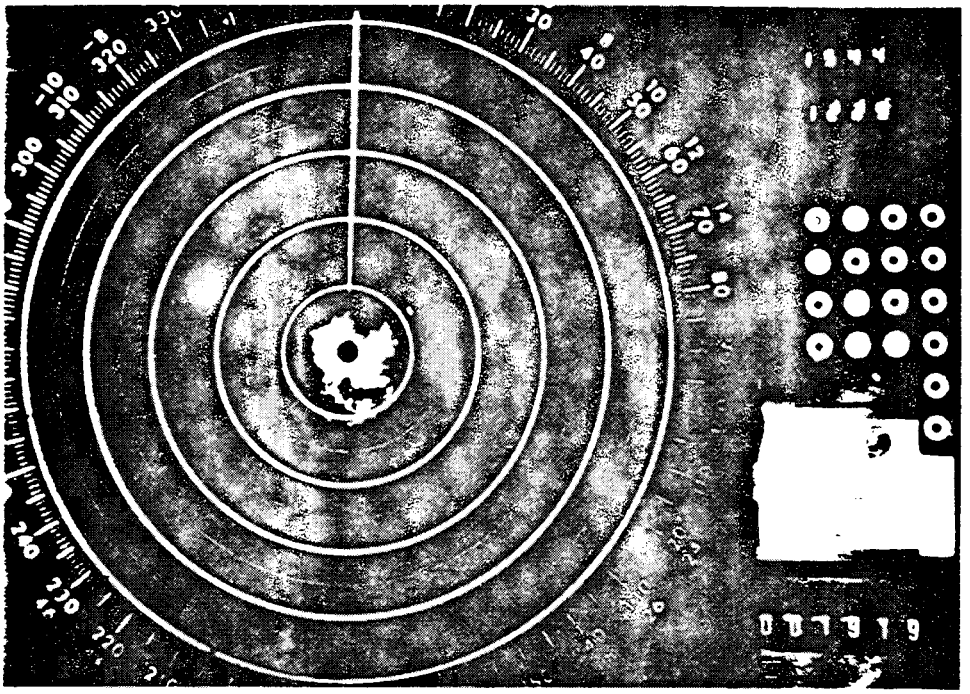


Longview, Texas WSR-74S GGG

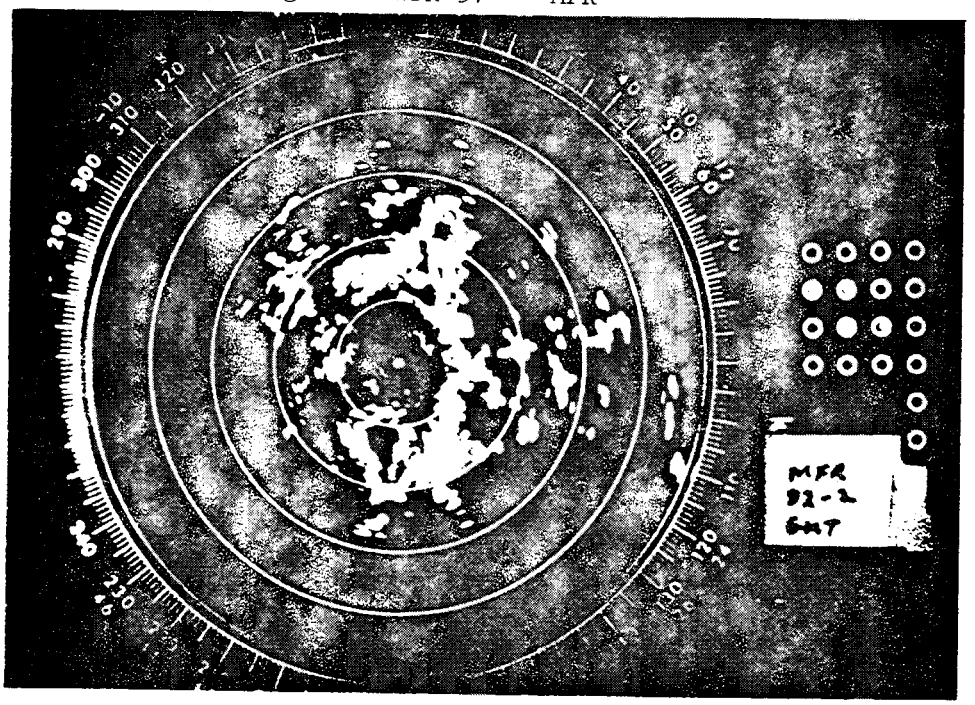


GROUND CLUTTER PHOTOGRAPHS

Marseilles, Illinois WSR-57 MMO

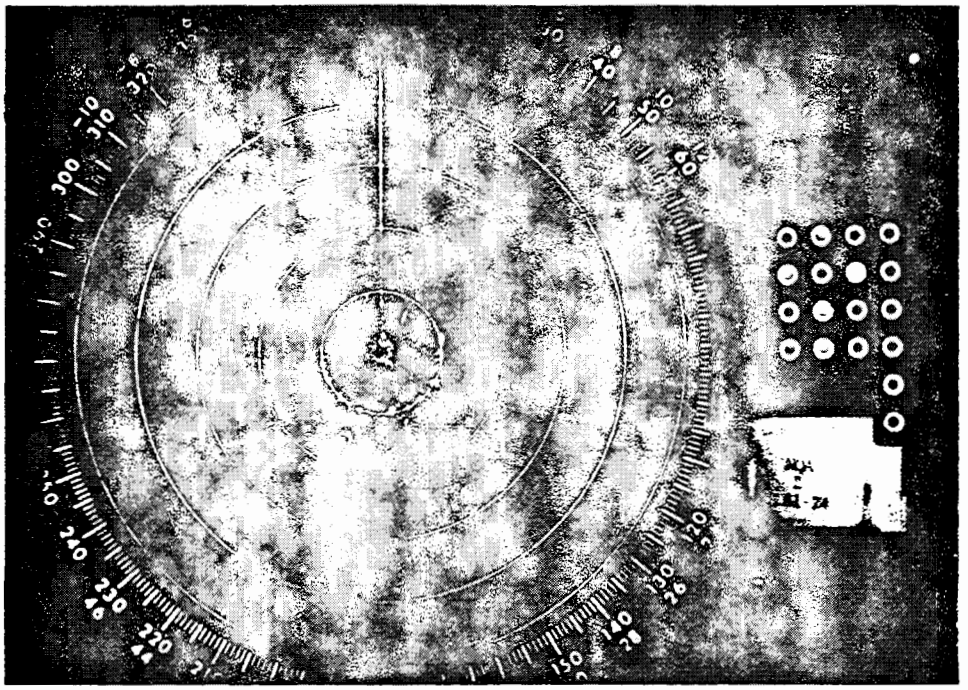


Medford, Oregon WSR-57 MFR

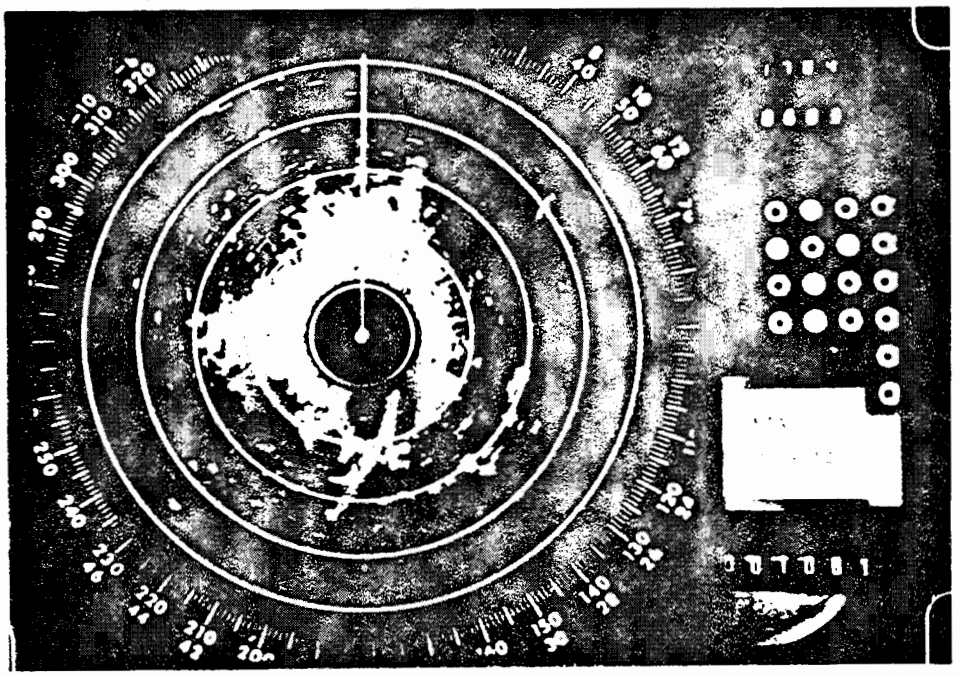


GROUND CLUTTER PHOTOGRAPHS

Memphis, Tennessee WSR-57 NQA

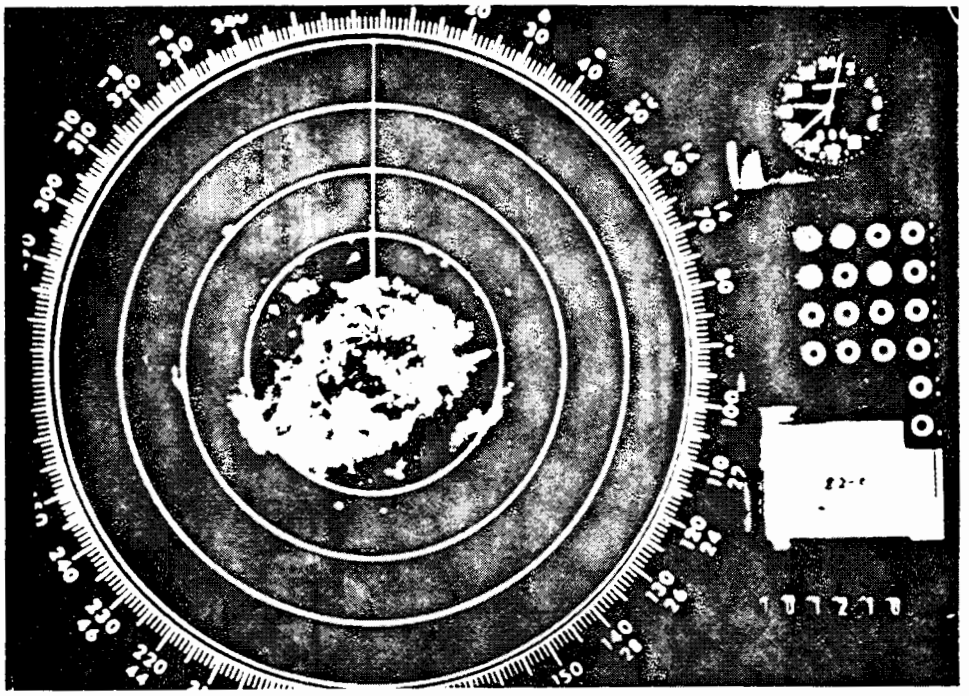


Miami, Florida WSR-57 MIA

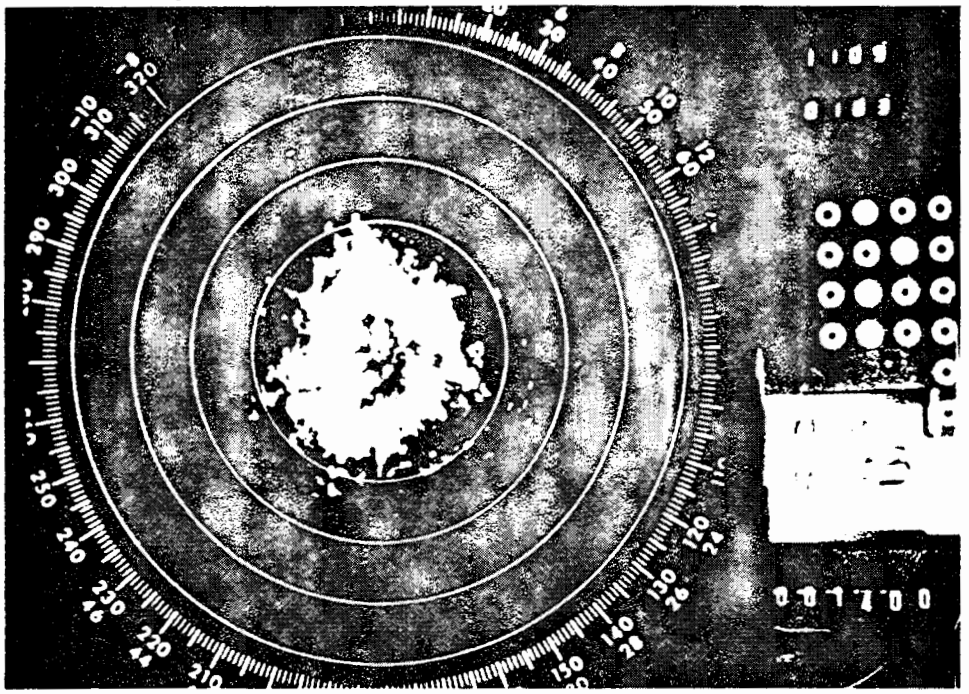


GROUND CLUTTER PHOTOGRAPHS

Midland, Texas WSR-57 MAF

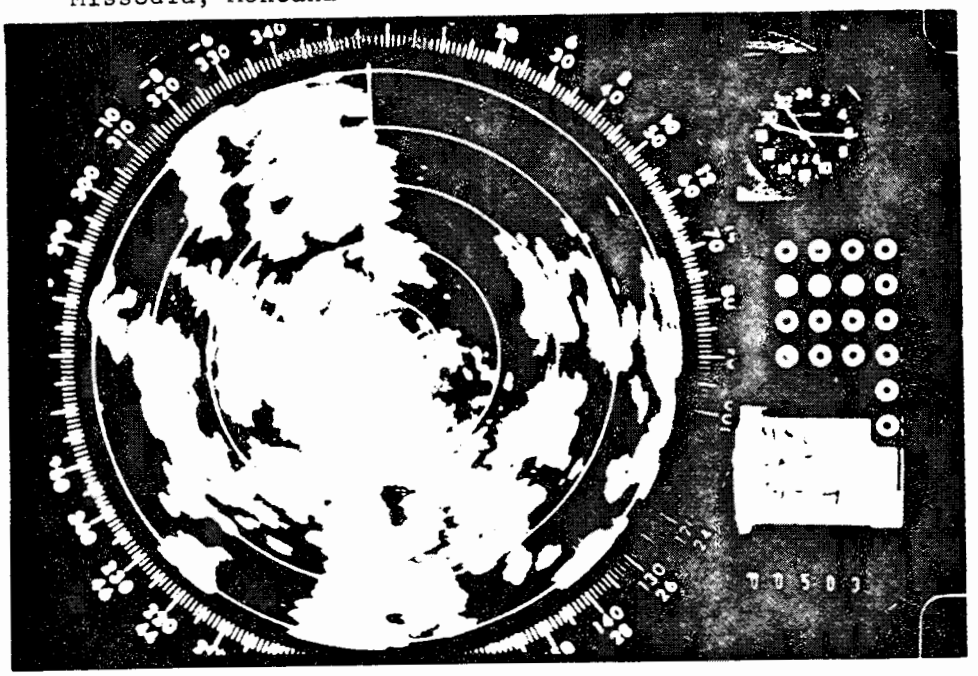


Minneapolis, Minnesota WSR-57 MSP

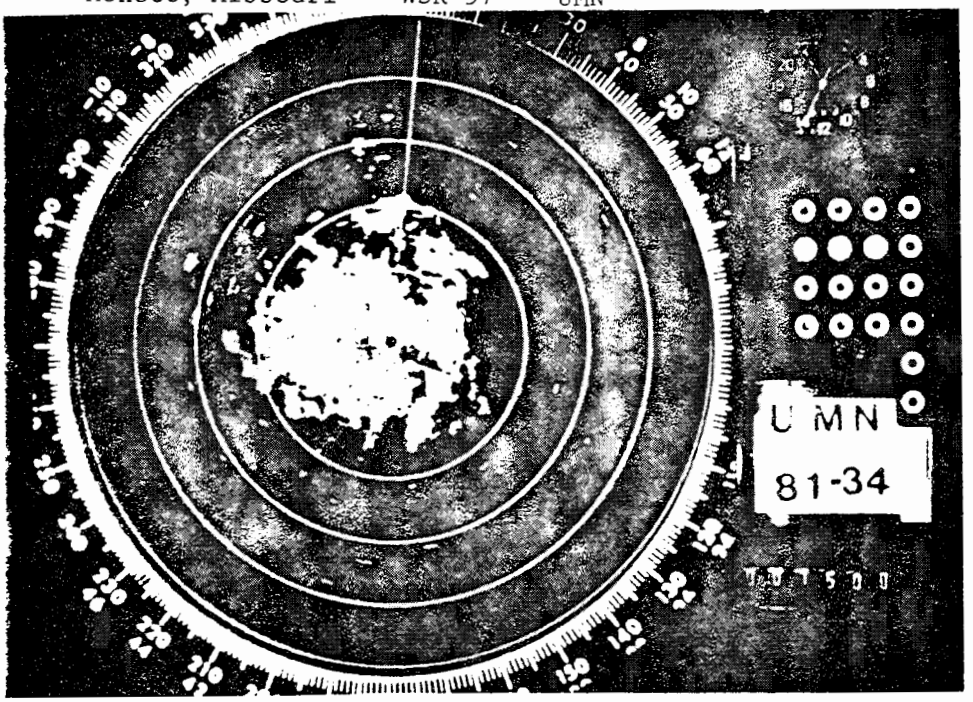


GROUND CLUTTER PHOTOGRAPHS

Missoula, Montana WSR-57 MSO

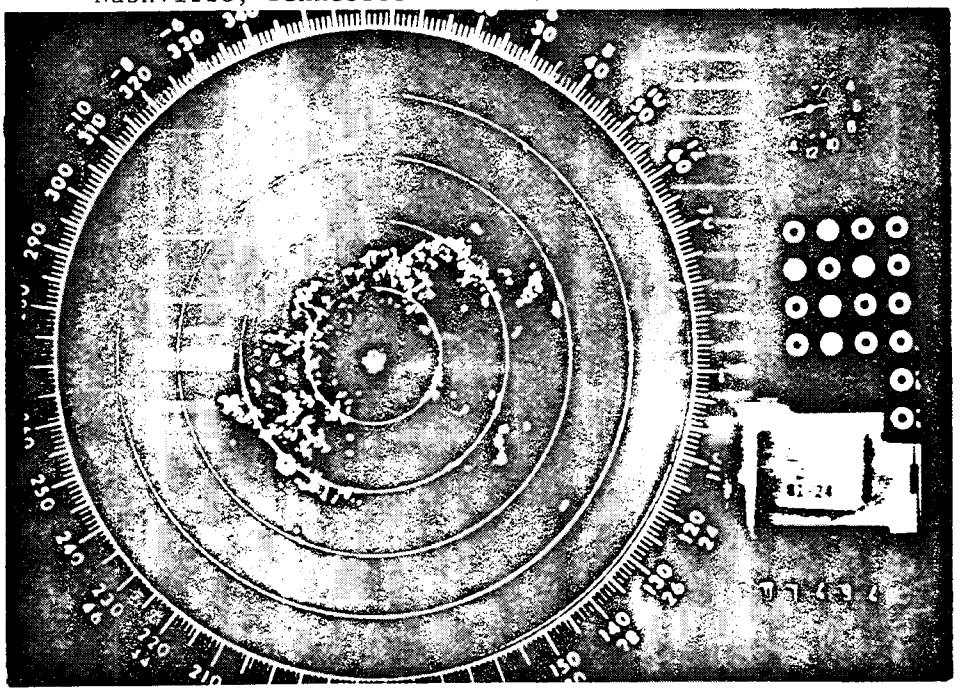


Monett, Missouri WSR-57 UMN

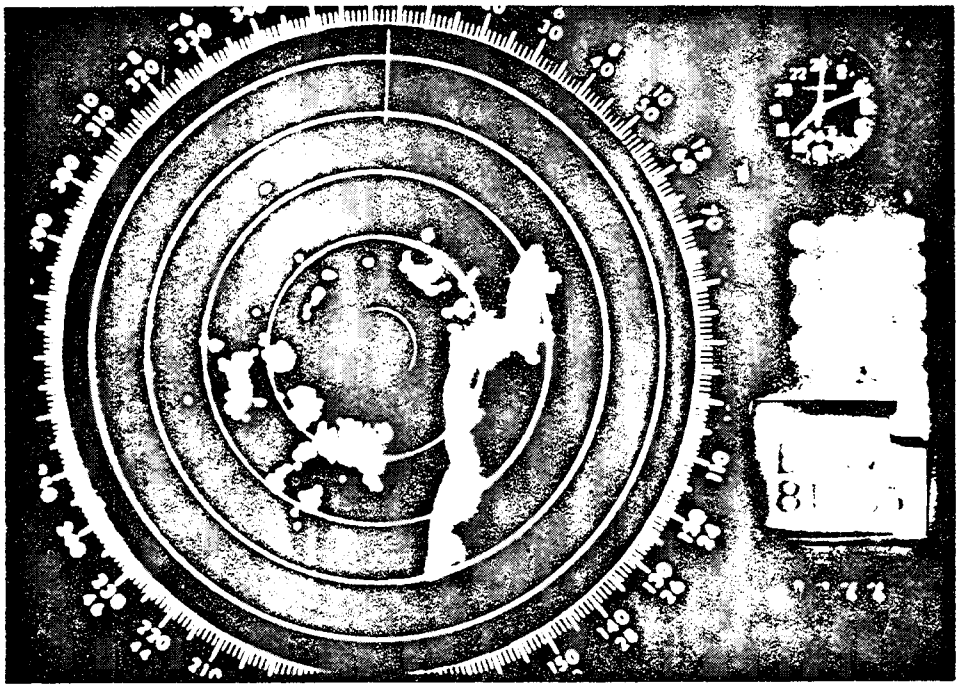


GROUND CLUTTER PHOTOGRAPHS

Nashville, Tennessee WSR-57 NSH

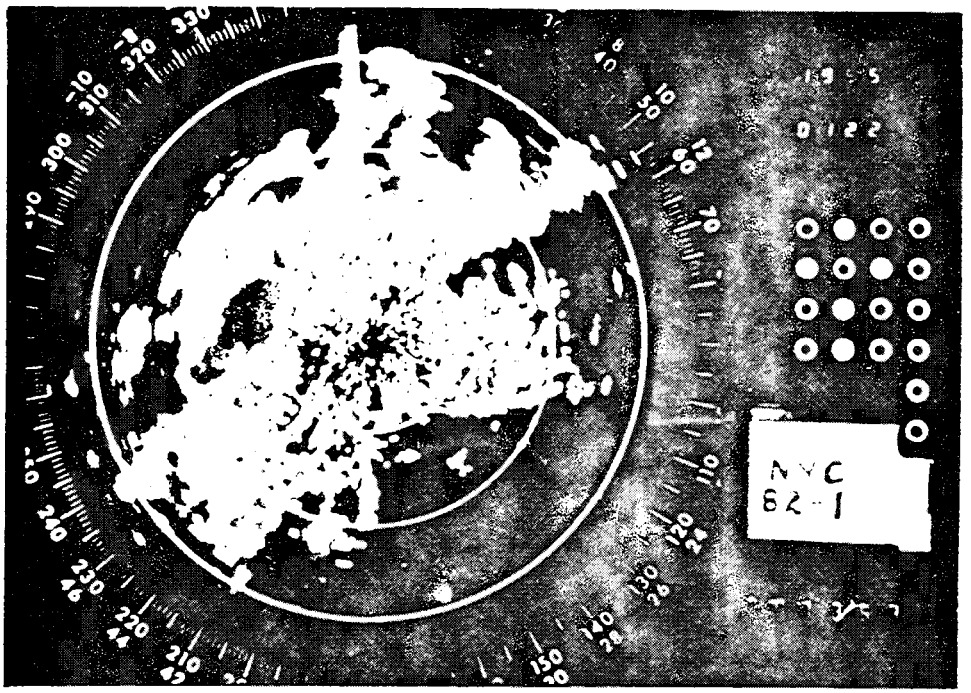


Neenah, Wisconsin WSR-57 EEW

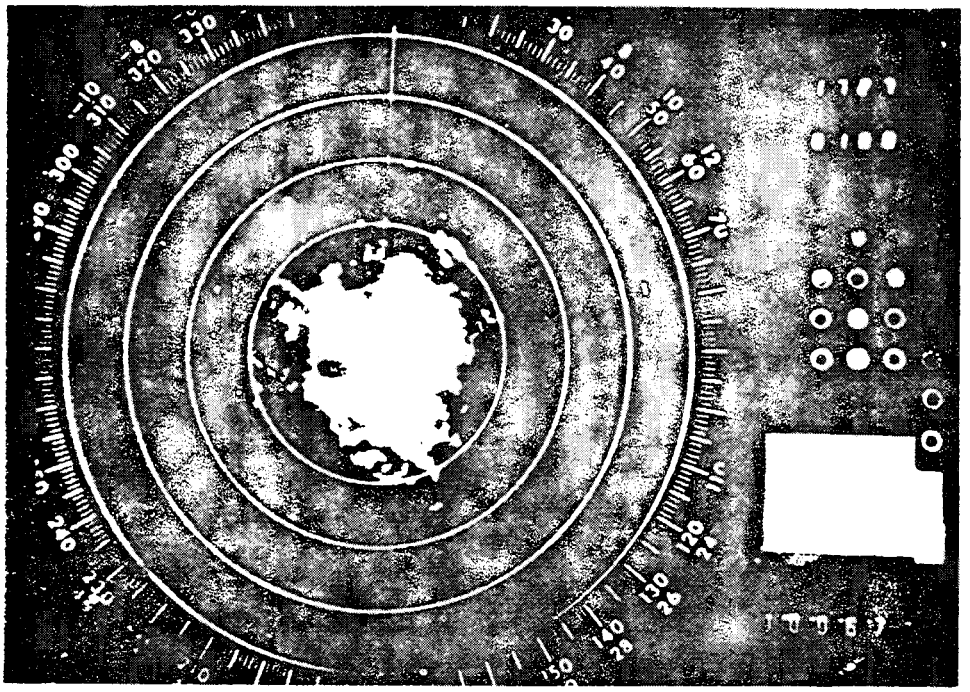


GROUND CLUTTER PHOTOGRAPHS

New York City, New York WSR-57 NYC



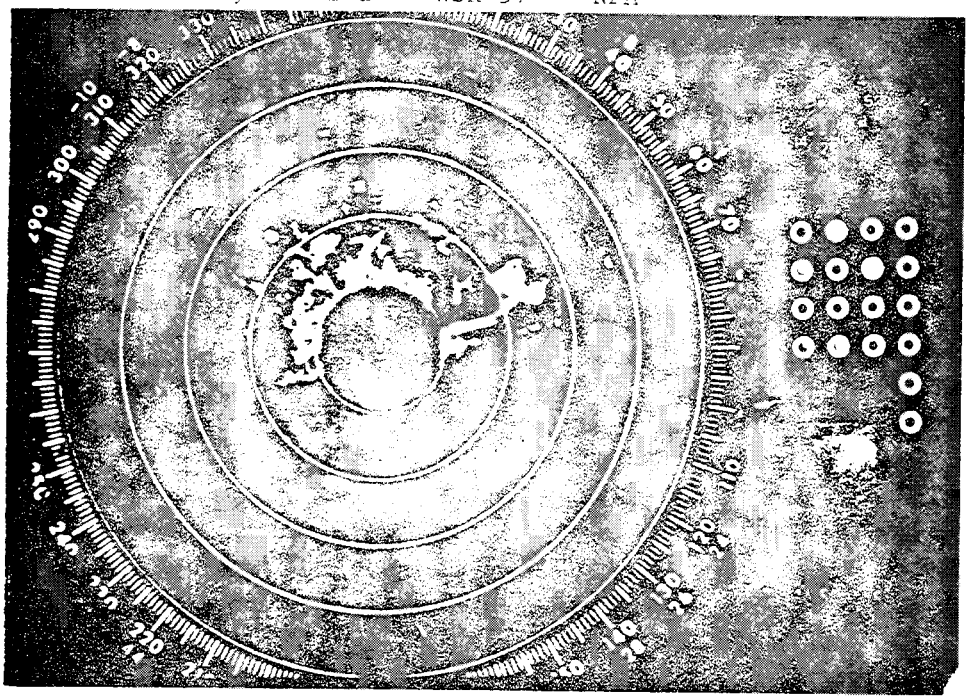
Oklahoma City, Oklahoma WSR-57 OKC



GROUND CLUTTER PHOTOGRAPHS

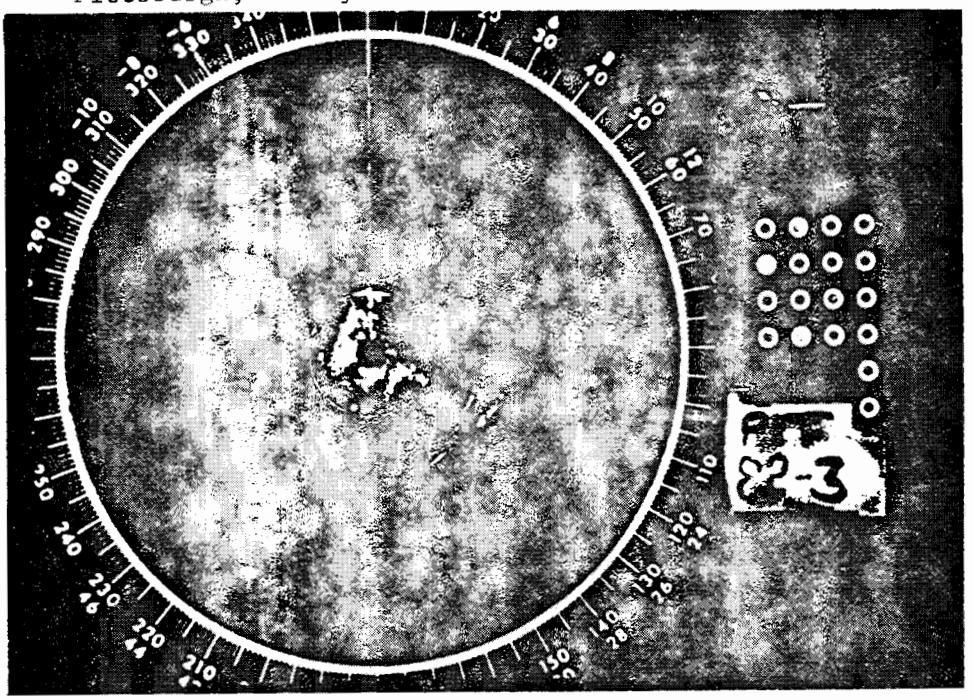
Patuxent River, Maryland WSR-57 NHK

Pensacola, Florida WSR-57 NPA

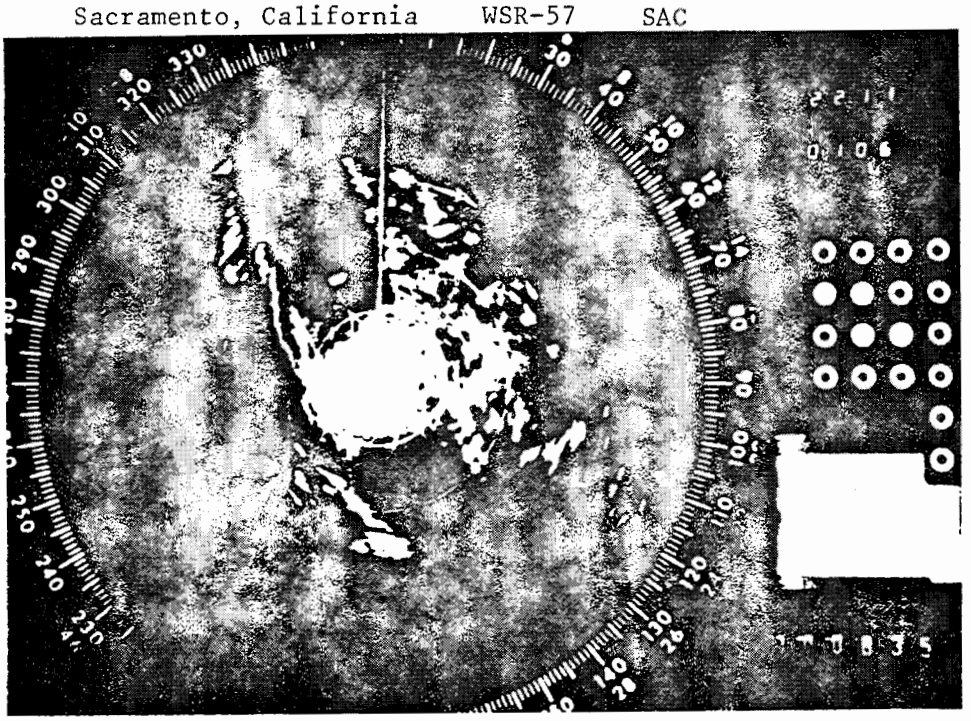


GROUND CLUTTER PHOTOGRAPHS

Pittsburgh, Pennsylvania WSR-57 PIT

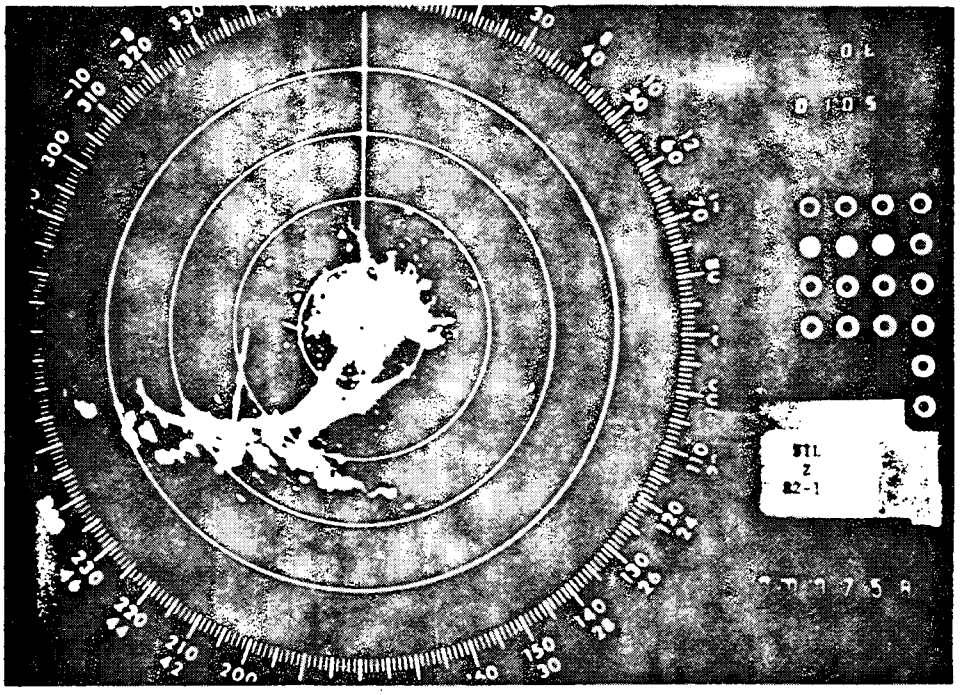


Sacramento, California WSR-57 SAC

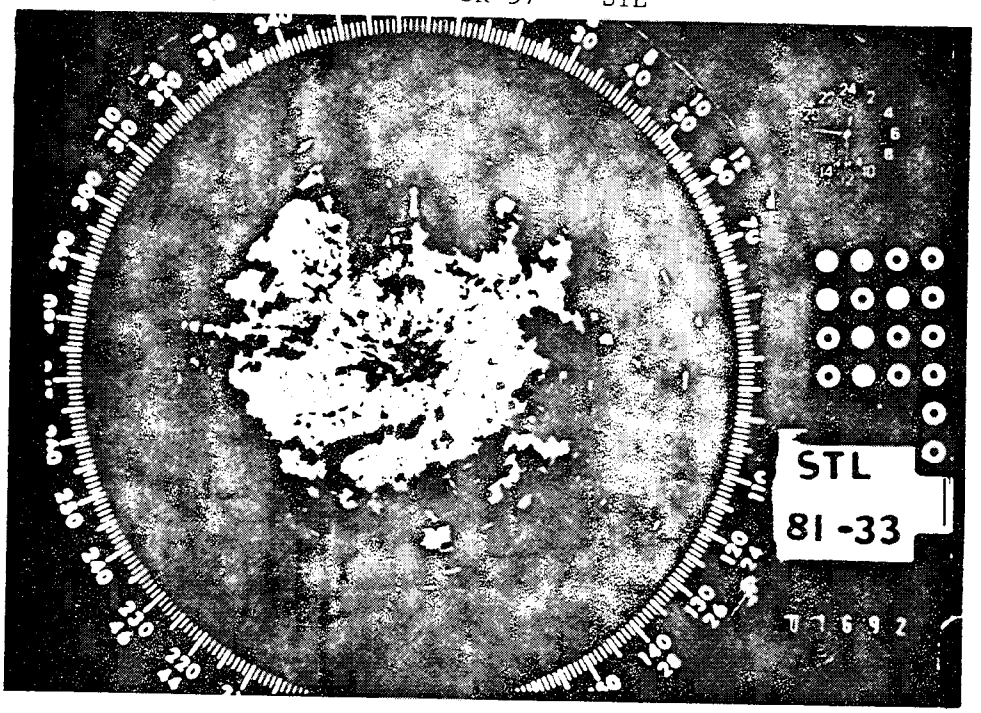


GROUND CLUTTER PHOTOGRAPHS

Slidell, Louisiana WSR-57 SIL

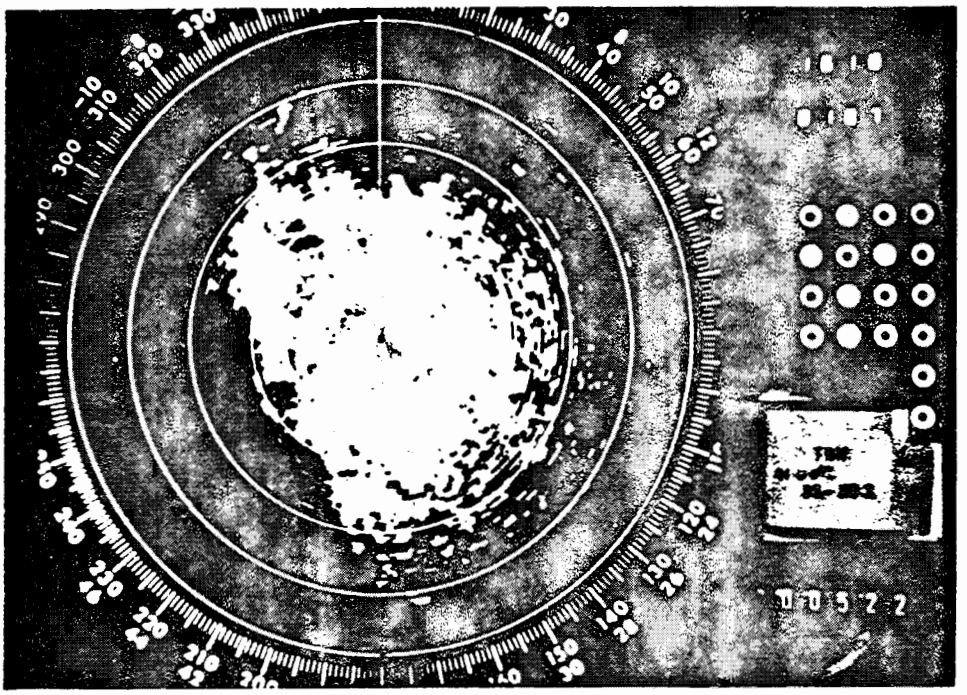


St. Louis, Missouri WSR-57 STL

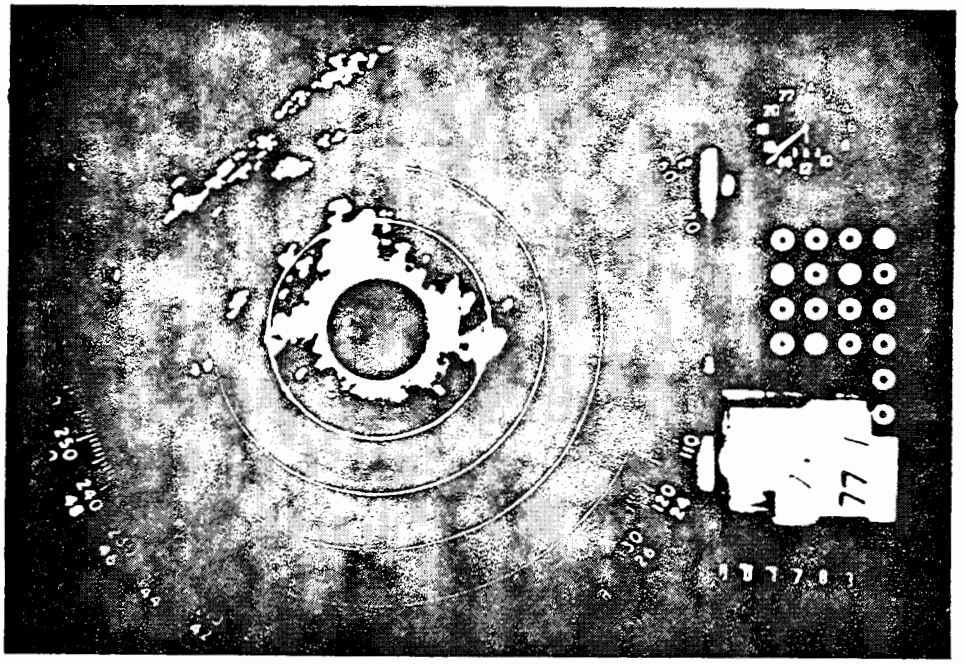


GROUND CLUTTER PHOTOGRAPHS

Tampa, Florida WSR-57 TBW

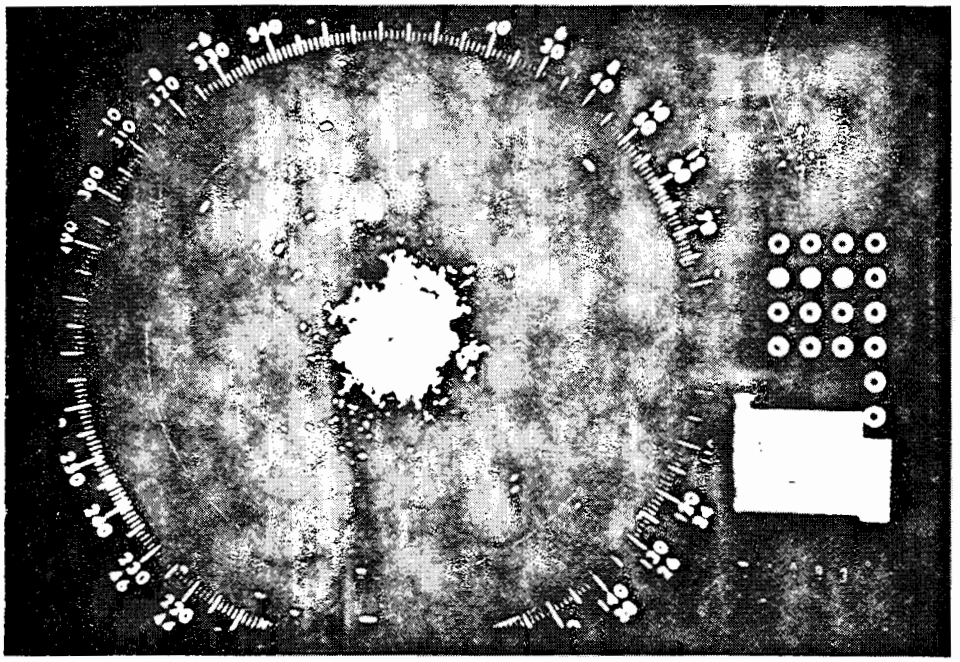


Volens, Virginia WSR-74S VQN



GROUND CLUTTER PHOTOGRAPHS

Waycross, Georgia WSR-57 AYS



Wichita, Kansas WSR-57 ICT