

50-334



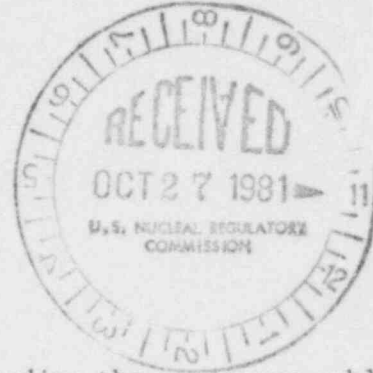
435 Sixth Avenue
Pittsburgh, Pa.
15219

(412) 456-6000

September 23, 1981
NSL:JJM:182

Federal Emergency Management Agency
Attn: Mr. Thomas Hardy
Director, Region III
6th and Walnut Street
Philadelphia, PA 19106

Reference: Beaver Valley Power Station
Emergency Planning Zone
Public Warning System



Dear Mr. Hardy:

In response to your request for information regarding the emergency public warning system currently being installed in the environs of the Beaver Valley Power Station, Duquesne Light is providing the enclosed material for your information.

As you will note from the attached material, the Beaver Valley Power Station EPZ public warning system was designed to comply with the requirements of 10CFR 50.47 and to be responsive to the guidelines of NUREG-0654/REP 1 and FEMA CPG-1-17.

Installation of the sirens is currently underway with approximately 30% of the sirens already in place. Completion of the system is pending delivery of additional sirens and control equipment. On June 26, 1981, Duquesne Light notified the Nuclear Regulatory Commission that, due to delays in equipment delivery, delays in obtaining right-of-ways, and due to other considerations, installation of the system would be delayed beyond July 1, 1981. We currently project installation of the fixed siren system to be complete in late November, 1981 with completion of the entire notification system by the Spring of 1982.

The location of warning equipment and the overall configuration of the system has been coordinated with the emergency management officials in each jurisdiction and has been approved by the respective County Commissioners in each county.

With regard to maintenance, the installation arrangements with the three counties provide for Duquesne Light being responsible for periodic and corrective maintenance. (See attached copy of typical agreement).

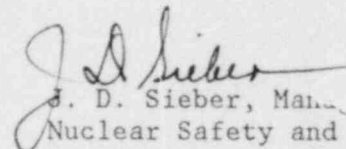
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IE35
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1/1
Aperture Dist
SEND Dwg's to
IE F/ES
IE35

Page 2
September 23, 1981
NSL:JJM:182

Beacuse of the three-state, three-county makeup of the Beaver Valley Power Station EPZ, the control system is configured into three separate portions, one for each county. Each county's sirens are physically activated by the county's emergency personnel at control consoles located within the respective county communications center. There will not be provisions for inter-county activation. There are no formal provisions for coordinating the activation of the sirens between counties. The decision to activate its sirens is a unilateral decision on the part of each county. However, there are memorandums of understanding, between the departments of health/bureaus of radiation protection in each of the three states, dealing with the coordination of protective action implementation, of which the siren warning system is a part.

If you have any additional questions, please contact my office.


J. D. Sieber, Manager
Nuclear Safety and Licensing

enc.

cc: Mr. Steven A. Chestnut
Division of Emergency Preparedness

DUQUESNE LIGHT COMPANY
Engineering & Construction Division
Electrical Engineering Department
Protection and Communications Engineering Section

EED - 00018

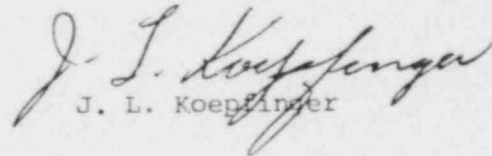
May 19, 1981

Beaver Valley Power Station - Unit #1
Emergency Notification System
OFF: 13159 CO 1321 DCP 345

Mr. J. J. Maracek:

Attached for your information is the Design Criteria, based on population densities, for estimating the alerting ranges of the Emergency Notification System Sirens. This Design Criteria, coupled with the Siren Test Results and a topographic map showing siren location and ranges, should satisfy the documentation requirements of NUREG-0654, Appendix 3.

If you have any questions or comments, please contact Mr. J. C. Glasser at extension 6663.


J. L. Koepfinger

Attachment

cc: J. J. Carey
H. G. Frus
H. A. Van Wassen
J. C. Glasser

Emergency Preparedness Plan

Design Criteria for Beaver Valley Power Station's Emergency Notification System DCP 345 OFE 13159 CO 1321

Introduction

The Outdoor Warning System Guide, FEMA CPG-1-17, dated March 1, 1980, and the Criterion for preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, NUREG-0654/FEMA-REP 1, Rev. 1, dated October 1980; indicates an Outdoor Warning System requires an alerting signal of 10 dB above the normal ambient for effective notification. In addition, Appendix 3 of NUREG-0654/FEMA-REP-1 defines minimum signal levels based on population densities. These minimum levels are:

- For areas with less than 2000 person/square mile, a minimum alerting signal level of 60 dB is required. This reflects a conservative estimate of 50 dB(c) average day-time ambient for areas with less than 2000 persons/square mile.
- For areas with population densities above 2000 persons/square mile, Figure 1 of CPG-1-17 (which is attached) is to be used for estimating siren ranges. The upper curve of Figure 1 results in a minimum signal level of 70 dB, reflecting an estimated average ambient of 60 dB. The lower curve of Figure 1 is based on sirens located below rooftop level in high rise urban areas.

Calculated Siren Ranges

For the Beaver Valley Power Station Emergency Planning Zone, we have calculated effective ranges for the two sizes of sirens we are using. Two ranges for each siren is shown; a range to a 60 dB signal level for areas with less than 2000 persons/square mile, and a range to a 70 dB signal level for areas with greater than 2000 persons/square mile. The following formula was used to calculate the ranges:

$$R_x = R_o 2^{(L_o - L_x)/d}$$

where:

R_x = Range in feet

R_o = Range in feet where SL* is known -- 100 ft.

L_x = Desired SL* at Range R_x

L_o = SL* at Range R_o (siren rating)

d = Loss in dB per distance doubled -- 10 dB

*SL = Sound level in db

Resulting in the following effective ranges:

<u>Siren rating</u>	<u>Ranges to a 70 dB signal</u>	<u>Ranges to a 60 dB signal</u>
125 dB siren	4525 ft.	9050 ft.
112 dB siren	1838 ft.	3676 ft.

Population Densities - Beaver County, PA

To determine the population densities of the communities in Beaver County, for applying emergency notification system sirens, the 1980 census figures were obtained from the U.S. Department of Commerce, Bureau of the Census, and each community's area was obtained from the Beaver County Planning Commission. This data was then used to develop Table I which lists the population density for each Beaver County community within the Emergency Planning Zone of Beaver Valley Power Station.

The following communities have population densities greater than 2000 persons/square mile, and require 70 dB alerting signal levels when applying emergency notification system sirens: Aliquippa Borough, Beaver Borough, Bridgewater Borough, Midland Borough, Monaca Borough, Patterson Heights Borough, South Heights Borough, Patterson Township, and Vanport Township. In addition to the above communities, the eastern portion of Brighton Township, Center Township, and Hopewell Township, while having population densities less than 2000 persons/square mile, were also considered to require 70 dB alerting signal levels due to their close proximity to population centers and potential for population increases.

The remaining communities on Table I have population densities considerably less than 2000 persons/square mile (with the exception of Georgetown and Hookstown Boroughs), and only require an alerting sound level of 60 dB for effective emergency notification. Georgetown and Hookstown Boroughs have population densities approaching 2000 persons/square mile, however, emergency notification system sirens will be located at the center of the communities' population, and ranges to a 60 dB signal level are being applied for the surrounding areas where the population density drops off rapidly.

Population Densities - Hancock County, WV

To determine the population densities in Hancock County for applying emergency notification system sirens, the 1980 census figures were obtained from the U.S. Department of Commerce, Bureau of the Census. This population data is presented on the district level in which Grant and part of Clay districts are within the Emergency Planning Zone for Beaver Valley Power Station. The area within Grant and Clay districts was determined and coupled with the population data to develop Table II - Population Density - Hancock County.

From field observations while selecting sirens, it appears that most of Grant District's population is centered in the Chester-Newell-Lawrenceville and New Cumberland (which is outside the EPZ) areas. Also, the section of Clay District within the Emergency Planning Zone was observed to be rural in nature and sparsely populated.

Using the population densities figures from Table II and field observations, it was determined that the only areas with population densities approaching or exceeding 2000 persons/square mile, and which require a 70 db alerting signal level when applying emergency notification system sirens are: Newell, Chester and Lawrenceville. The remaining portions of the EPZ within Hancock County appear to have population densities considerably less than 2000 persons/square mile and only require an alerting sound level of 60 db for effective notification.

Population Densities - Columbiana County, Ohio

Again the 1980 census figures were obtained for the Columbiana County communities within the Emergency Planning Zone surrounding Beaver Valley Power Station. This population data and the communities' areas were used to develop Table II - Population Density - Columbiana County.

The population density figures from Table II indicated that the Borough of East Liverpool is the only community with a population density greater than 2000 persons/square mile, and thus requiring an alerting signal of 70 dB for effective emergency notification. Liverpool Township, however, with less than 2000 persons/square mile was also considered to require a 70 dB signal due to its close proximity to East Liverpool. Middleton and St. Clair Townships have population densities well below 2000 persons/square mile and only require a 60 dB signal level for emergency notification.

Table I.
Population Densities, Beaver County Commu
within BVPS Emergency Planning Zone

Boroughs	Square Mile Area	Pop. Figures 1980 Census	Population/ Square Mile
Aliquippa	4.74	17,094	3606.3
Beaver	1.01	5,441	5387.1
Bridgewater	.41	879	2143.9
Fallston	.88	312	354.5
Frankfort Springs	.23	187	813
Georgetown	.15	231	1540
Glasgow	.17	106	623.5
Hookstown	.14	228	1628.6
Industry	10.67	2,417	226.5
Midland	1.83	4,310	2355.2
Monaca	2.16	7,661	3546.8
Ohioville	23.66	4,217	178.2
Patterson Heights	.30	797	2656.7
Shippingport	3.90	255	65.4
South Heights	.34	765	2250

Townships	Square Mile Area	Pop. Figures 1980 Census	Population/ Square Mile
Brighton	18.82	7,858	417.5
Center	14.77	10,733	716.7
Chippewa	16.48	7,245	439.6
Greene	26.72	2,422	90.6
Hanover	44.76	3,443	77
Hopewell	15.78	14,662	929.2
Independence	23.66	2,534	107.1
Patterson	1.41	3,288	2331.9
Potter	6.48	605	93.4
Raccoon	19.27	3,133	162.6
South Beaver	28.88	2,932	101.5
Vanport	.95	2,013	2118.9

Table II.

Population Density - Hancock County, West Virginia

District	Square Mile Area	Pop. Figures 1980 Census	Population/Square Mile
Grant	51.7	40,418	781.8
Clay	19.4	10,098	520.3

Population Density - Columbiana County, Ohio

Community	Square Mile Area	Pop. Figures 1980 Census	Population/Square Mile
East Liverpool	4.5	16,687	3,708.2
Liverpool Twp.	8.07	4,921	615.1
St. Clair Twp.	30.0	8,080	269.3
Middleton Twp.	35.5	3,426	96.3

The bottom curve - URBAN HIGH-RISE AREAS (BELOW ROOFTOPS)

is not applicable to Beaver Valley Power Station EPZ

since all sirens will be mounted above roof level.

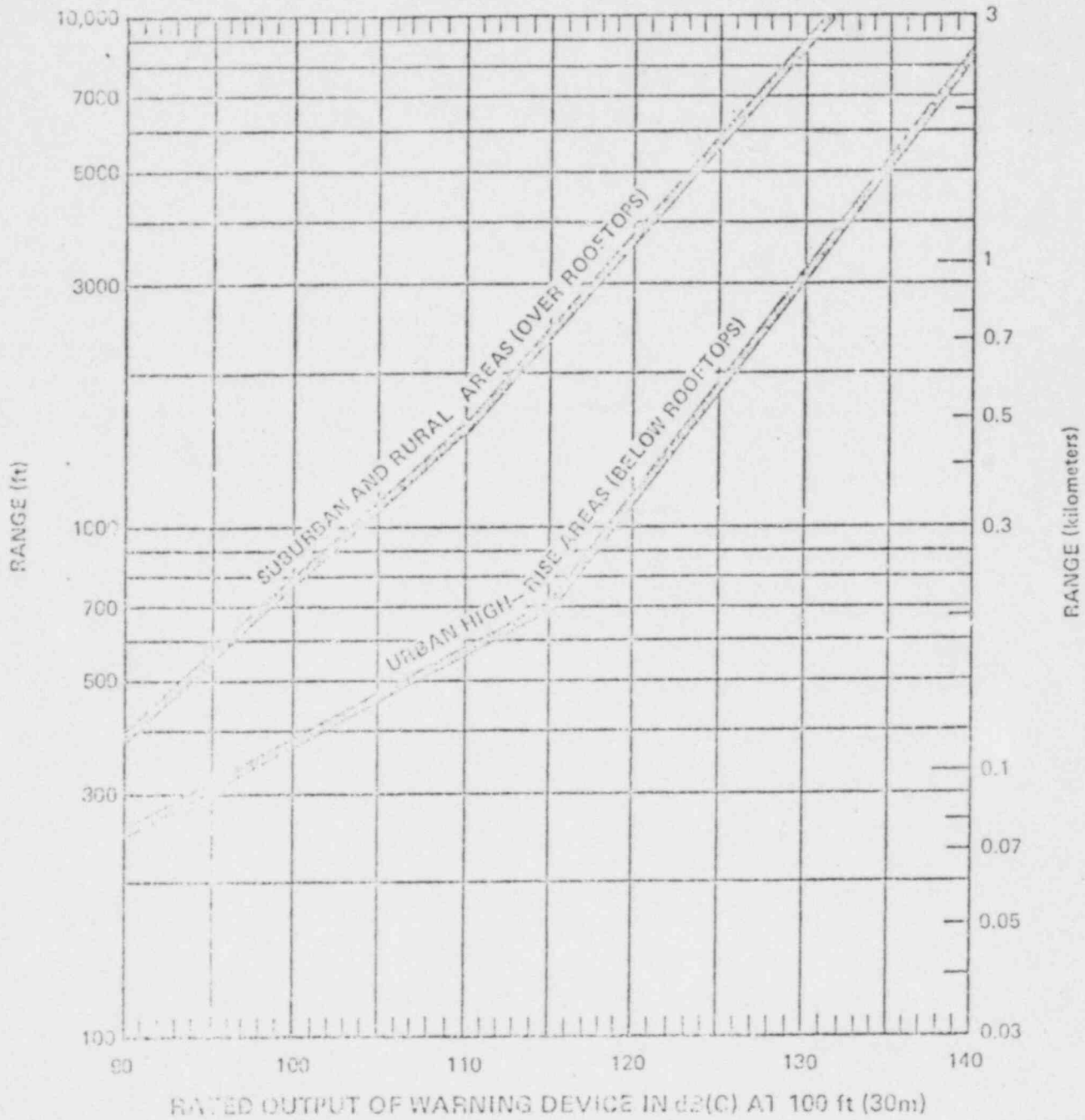


Figure 1

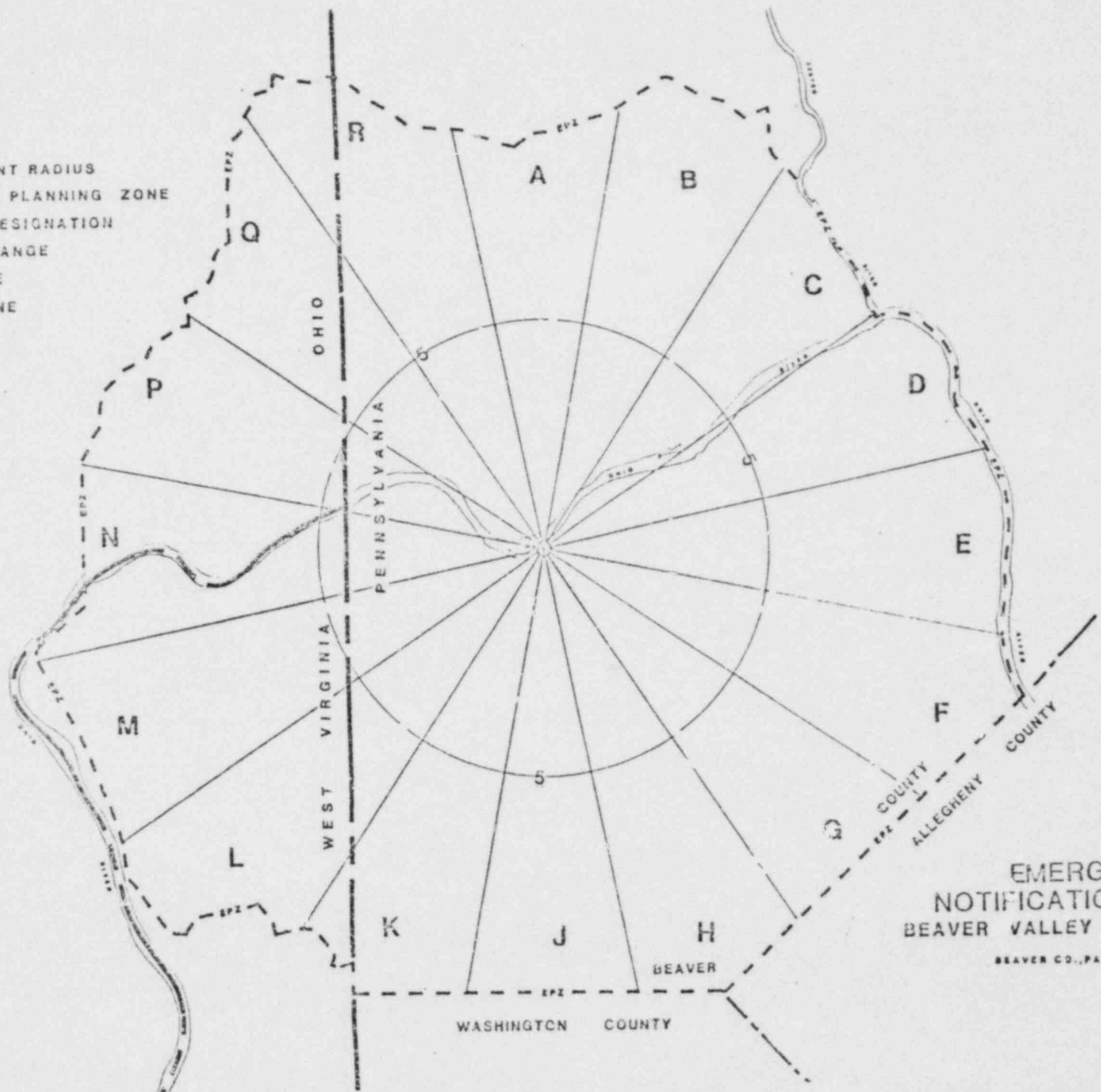
Effective Ranges of Outdoor Warning Devices As a Function of Their Rated Sound Output in dB(C) at 100 ft (30m)

Note: Differences less than ± 2 dB(C) in rated output, and differences less than $\pm 10\%$ in range, are not generally significant

From Outdoor Warning Systems Guide CPG 1-17

LEGEND

- 5 — 5 MILE PLANT RADIUS
- - - EPZ - - - EMERGENCY PLANNING ZONE
- A SEGMENT DESIGNATION
- SEGMENT RANGE
- - - STATE LINE
- - - COUNTY LINE



EMERGENCY NOTIFICATION SYSTEM
BEAVER VALLEY POWER STATION
 BEAVER CO., PA., OH., W. VA.

FIGURE 4

LEGEND

- 5 — 5 MILE PLANT RADIUS
- - - EPZ — EMERGENCY PLANNING ZONE
- A — SEGMENT DESIGNATION
- — — SEGMENT RANGE
- - - STATE LINE
- - - COUNTY LINE

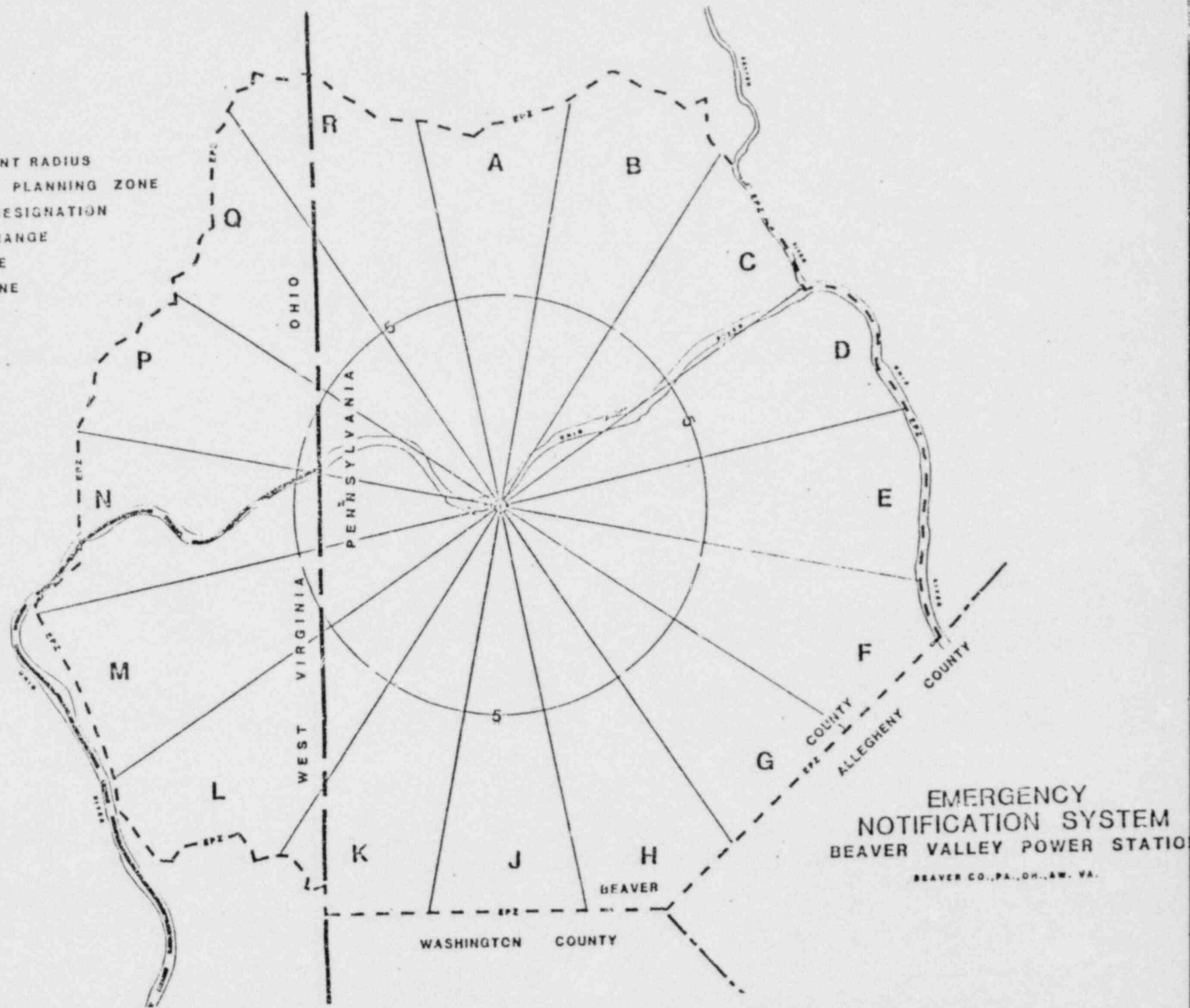


FIGURE 4

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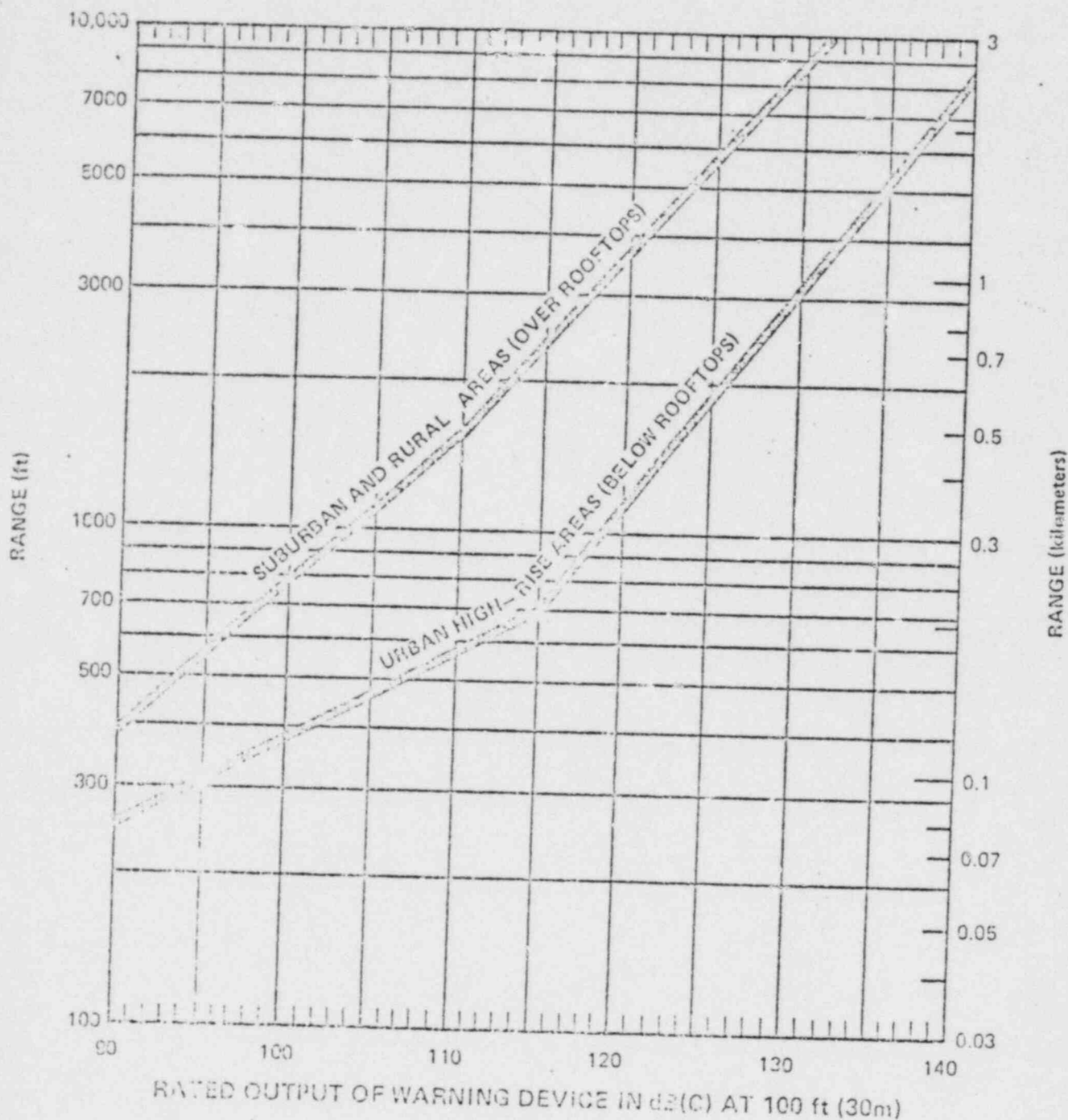


Figure 1

Effective Ranges of Outdoor Warning Devices As a Function of Their Rated Sound Output in dB(C) at 100 ft (30m)

Note: Differences less than ± 2 dB(C) in rated output, and differences less than $\pm 10\%$ in range, are not generally significant

From Outdoor Warning Systems Guide CPG J-17

SIREN LOCATIONS BEAVER COUNTY WITHIN 5 MILES RADIUS

SIREN NO.	ADDRESS	dB LEVEL @ 100'	DISTANCE (Ft.) @ 70 dB	DISTANCE (Ft.) @ 60 dB ✓
* 1	Shippingport Volunteer Fire Department - Route 168 Shippingport	125	4525	9050
2	Off Wolf Run Road, Industry Boro	112	1,838	3,676
3	Route 18 North of Holt Road, Raccoon Township	125	4,525	9050
4	Engle Road, Western Beaver High School, Industry Boro	125	4,525	9050
* 5	Industry Boro Fire Hall, Industry Boro	125	4,525	9050
6	Mowry Across From Potter Township Municipal Building	112	1,838	3,676
7	Pleasant Drive, Potter Township	125	4,525	9,050
100	Barclay Hill Road Near Private Drive, Industry Boro	112	1,838	3,676
10	Barclay Hill Road Near Station No. 0 (LR.04033), Industry Boro 45	112	1,838	3,676
11	Route 18 Near T527 and LR 04077 Intersection, Raccoon Township	125	4,525	9,950
12	Raccoon Elementary School, Patterson Road, Raccoon Township	112	1,838	3,676

* DENOTES EXISTING SIREMS

Revised May 12, 1981

SIREN LOCATIONS BEAVER COUNTY WITHIN 5 MILES RADIUS

SIREN NO.	ADDRESS	dB LEVEL @ 100'	DISTANCE (Ft.) @ 70 dB	DISTANCE (Ft.) @ 60 dB
13	Clearview Road North of Davis, Raccoon Township	112	1,838	3,676
14	Raccoon Boro Building, Raccoon Township	112	1,838	3,676
*15	Route 151, Raccoon Township, Raccoon VFD #2	112	1,838	3,676
* 16	Hookstown Fire Department, Route 168, Greene Township	125	4,525	9,050
17	LR 0404 West of Shaffer, Greene Township	112	1,838	3,676
102	T312 North of Route 30, Greene Township	125	4,525	9,050
103	Route 168 and Route 30 Intersection, Greene Township	112	1,838	3,676
20	Route 151 and Route 30 Intersection, Greene Township	112	1,838	3,676
21	Route 30 North of Langhan Drive and Woodland Acres, Greene Township	112	1,838	3,676
* 22	Georgetown Fire Hall, Georgetown	125	4,525	9,050
* 23	Midland Boro Building, Route 68 and 8th Street Midland Boro	125	4,525	9,050
24	T310 North of Route 68, Ohioville Boro	112	1,838	3,676

*DENOTES EXISTING SIRENS

Revised May 12, 1981

SIREN LOCATIONS BEAVER COUNTY WITHIN 5 MILES RADIUS

SIREN NO.	ADDRESS	dB LEVEL @ 100'	DISTANCE (Ft.) @ 70 dB	DISTANCE (Ft.) @ 60 dB
* 25	Midland Heights Volunteer Fire Department #2	112	1,838	3,676
26	T592 South of State Game Lands No. 173, Ridgemont Drive Ohioville Boro	112	1,838	3,676
27	Route 168 South of Meadowbrook Road, Ohioville Boro	125	4,525	9,050
105	LR No. 04080 Near Pipe Line Crossing South of Middle Road, Ohioville Boro	112	1,838	3,676
* 30	Ohioville Volunteer Fire Department Route 168 and Tuscarawas	125	4,525	9,050
31	Reed Road East of Engle Road, Ohioville Boro	125	4,525	9,050
124	Route T370, Greene Township	125	4,525	9,050
125	Route T367, Greene Township	112	1,838	3,676
126	Barclay Hill Road (LR 04033) South of Todd Road Brighton Township	112	1,838	3,676
127	Holt Road (LR 04068) West of Christie Drive Raccoon Township	125	4,525	9,050

* DENOTES EXISTING SIRENS

Revised May 12, 1981

SIREN LOCATIONS BEAVER COUNTY WITHIN 10 MILE RADIUS OF E.P.Z.

SIREN NO.	ADDRESS	dB LEVEL @ 100'	DISTANCE (Ft.) @ 70dB	DISTANCE (Ft.) @ 60 dB
32	Tuscarawas Road West of Lisbon Road, Brighton Township	112	1838	1838
* 33	Brighton Township Volunteer Fire Department Station No. 2, Tuscarwaras and B. V. Express	112	1838	3676
* 34	Brodhead Road Near T471 and LR 04043, Center Township Center Twp. #1 VFD	125	4525	9050
* 35	Brighton Township Volunteer Fire Department, Intersection of Dutch Ridge and Chapel Road	112	1838	3676
36	Tuscarawas East of Northview, Brighton Township	125	4525	9050
37	Vanport VFD, Intersection of Jefferson & Maplewood Vanport Boro	125	4525	9050
* 40	Center VFD #3, Monaca Road, Center Township	112	1838	
* 42	Monaca #5 VFD, Jackson Street, Monaca Boro	125	4525	
* 43	Beaver County Courthouse, Route 68 and Market, Beaver	127	5000	

* DENOTES EXISTING SIRENS

REVISED MAY 18, 1981

SIREN LOCATIONS BEAVER COUNTY WITHIN 10 MILE RADIUS OF E.P.Z.

SIREN NO.	ADDRESS	dB LEVEL @ 100'	DISTANCE (FT.) @ 70 dB	DISTANCE (FT.) @ 60 dB
46	Dutch Ridge Road East of Wildwood Road, Brighton Township	125	4525	
* 47	Fallston Boro Building, Beaver Street	112	1838	
51	Rt. 51, Brodhead Road, Near Maplewood, Center Township	125	4525	9050
52	Aliquippa H.S. Stadium off Harvey Street, Aliquippa Boro.	125	4525	
*53	Mill Street & 21st Street at New Sheffield School Aliquippa Boro	125	4525	
54	Forge Drive off Route 51, Hopewell Township	125	4525	
*55	Bridgewater Boro Building, Market Street Bridgewater Boro	112	1838	

SIREN LOCATIONS BEAVER COUNTY WITHIN 10 MILE RADIUS OF E.P.Z.

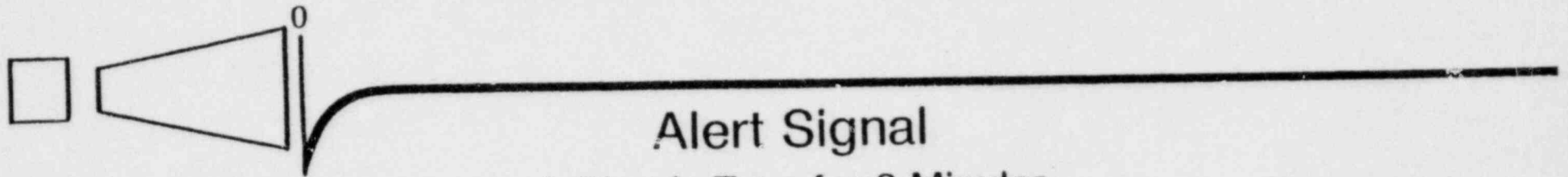
SIREN NO.	ADDRESS	dB LEVEL @ 100'	DISTANCE (Ft.) @ 70dB	DISTANCE (Ft.) @ 60 dB
* 56	Independence VFD, Rt. 151 & T514, Independence Township	112		3676
57	Near Intersection of Route 18 and Route 168, Hanover Township	112		3676
72	Green Garden Road (LR 04123) East of T520 Raccoon Twp.	125		9050
73	Rt. 151 at T345, Independence Twp.	112		3676
74	Rt. 30 Marshville Sub. Sta. Hanover Twp.	125		9050
75	Rt. 30, Traverse Run Sub. Sta. Independence Twp.	125		9050
76	LR #04046 at T356, Hanover Twp.	125		9050
77	Rt. 168 at T316, Hanover Twp.	125		9050
101	Barclay Sub. Sta. off Tuscarawas Road, Brighton Twp.	112		3676
104	Rt. 168 North of Tomlinson Run Road Greene Twp.	112		3676
106	Rt. 51, Brodhead Road South of Rt. 18 near Beaver Valley Mall, Center Twp.	125	4525	

* DENOTES EXISTING SIRENS

SIREN LOCATIONS BEAVER COUNTY WITHIN 10 MILE RADIUS OF E.P.Z.

SIREN NO.	ADDRESS	dB LEVEL @ 100'	DISTANCE (FT.) @ 70 dB	DISTANCE (FT.) @ 60 dB
107	Center Grange Rd. & T485 Intersection Center Twp.	125	4525	
*110	Patterson Twp. Municipal Bldg., Darlington Road Patterson Twp.	125	4525	9050 ✓
*111	Chippewa Boro Bldg., Rt. 51 & Rt. 251 Intersection Chippewa Twp.	112		3676 ✓
116	T359 West of T494 Independence Twp.	125		9050 ✓
120	Rt. 151 East of T344, Becktown Independence Twp.	112		3676 ✓
121	LR. 04084 South of LR 04070, Independence Independence Twp.	112		3676 ✓
122	Todd Road off Sebring Road (LR 04041) Brighton Twp.	125	4525	9050 ✓
*123	Monaca Boro Building, Pennsylvania & 10th Street Monaca Boro	112	1838	
130	4th St. near Municipal Pool West Aliquippa, Aliquippa Boro	112	1838	
131	Shaeffer Road near Penn - McDonald Heights Aliquippa Boro.	112	1838	
132	Taylor Avenue Booster Station West of Linden Monaca Boro	125	4525	
133	Water Tower & Swim Club on Martin off Rt. 151 Hopewell Twp.	125	4525	

THREE SIGNAL WAIL



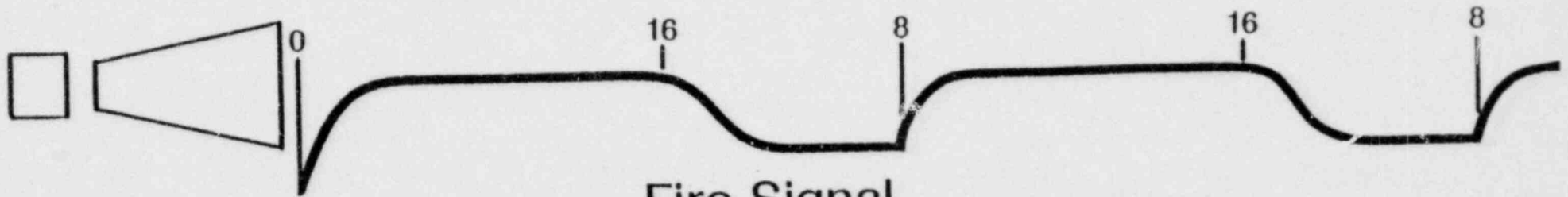
Alert Signal

A Steady Tone for 3 Minutes



Attack Signal

A Wavering Tone On for 6 Seconds and Off for 5 Seconds Repeated for 3 Minutes



Fire Signal

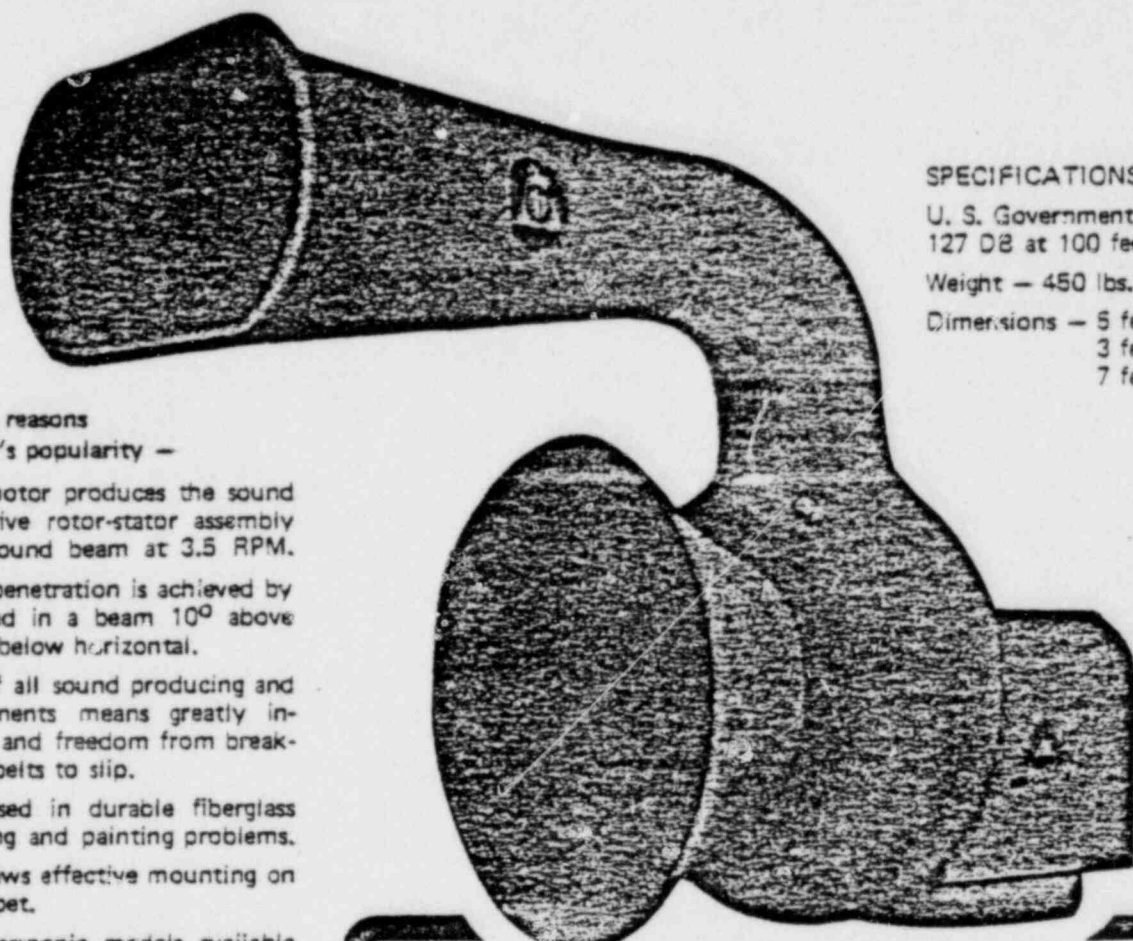
A Wavering Tone On for 16 Seconds and Off for 8 Seconds Repeated for 1.5 Minutes

The ALLERTOR

ROTATING DIRECTIONAL

SIREN

ENCLOSED IN FIBERGLASS FOR SUPERIOR WEATHER RESISTANCE



SPECIFICATIONS:

U. S. Government tested —
127 DB at 100 feet

Weight — 450 lbs.

Dimensions — 5 feet high
3 feet wide
7 feet long

Here are some of the reasons
for the Allertor's popularity —

- A single 10 HP motor produces the sound through direct drive rotor-stator assembly and rotates the sound beam at 3.5 RPM.
- Maximum sound penetration is achieved by directing the sound in a beam 10° above horizontal to 15° below horizontal.
- Direct coupling of all sound producing and rotational components means greatly increased reliability and freedom from break-downs. No drive belts to slip.
- Completely enclosed in durable fiberglass to eliminate rusting and painting problems.
- Unified design allows effective mounting on pole, roof or parapet.
- Dual tone, non-harmonic models available in 523-698 hertz or other special frequencies and with two or three signal capabilities.
- All sirens are tested before shipment.
- Guaranteed — 3 years on siren parts and one year on electrical parts.

The Allertor has assumed the envied position of leader in its class. It exceeds the output rating requirements for CDI-103 Size B and CDI-107 Size 3B3 sirens. Because of its basic simplicity and proven dependability, it has been specified for numerous U. S. Government installations and a multitude of local municipal applications.

200 purchased by U. S. Army Electronics Command under Contract DAAB07-74-0343 for Washington D. C. area.



A.C.A.

YOU CAN DEPEND ON US

Our sirens have been in use around the world for more than 37 years. Entire communities depend on reliable A.C.A. siren systems for disaster warning and signaling applications. Every siren is pre-tested and warranted by A.C.A.

Manufactured by

ALERTING COMMUNICATORS OF AMERICA

10255 N. ENTERPRISE DRIVE, 66W • MEQUON, WISCONSIN 53092

TELEPHONE (414) 242-2800

The SCREAMERS

5 POWERFUL MODELS - NON-DIRECTIONAL SIRENS

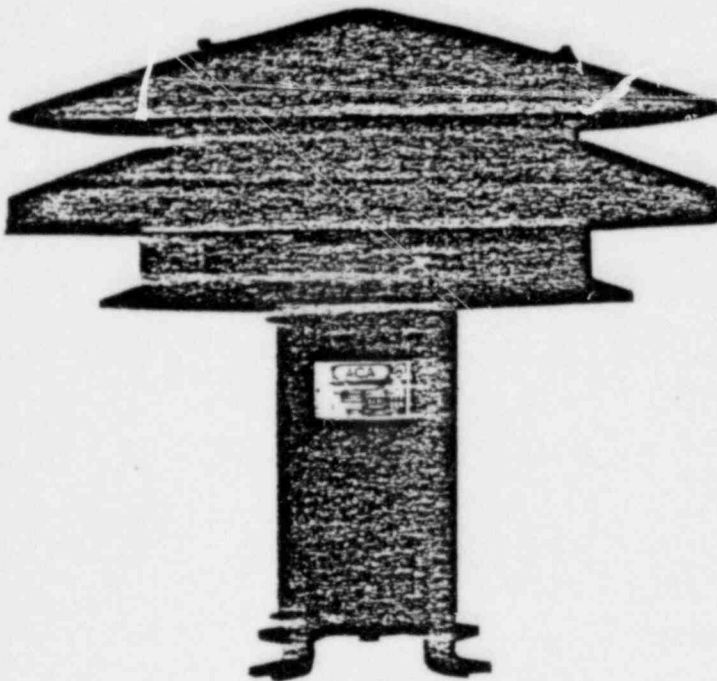
ENCLOSED IN FIBERGLASS FOR SUPERIOR WEATHER RESISTANCE

5 MODELS SERVE MANY NEEDS

The Screamer series of non-directional sirens was designed to provide a wide selection of models for applications where smaller sirens are adequate or where concentrated multiple coverage is desired.

Every Screamer is designed and manufactured in accordance with rigid ACA quality and performance standards. The following features are common to all models:

- Vertical shaft, direct coupled motors — weather protected.
- 230/460 volt 3 phase or 240 volt single phase.
- Fiberglass housings with through color impregnation — never require painting — can't rust.
- Screened intake and exhaust.
- Maximum signal production with minimum power requirement.
- Designed to eliminate maintenance problems.
- Overhanging hoods prevent accumulation of ice and snow and direct the sound for effective coverage and penetration.
- All sirens are tested before shipment.
- Guaranteed — 3 years on siren parts and one year on electrical parts.



Model	Size	No. of Signals	H.P.	Rated Output*
S-2	B	2	2	101 DB
S-3	B	2	3	103 DB
S-5	C	2 or 3	5	105 DB
S-7½	D	2 or 3	7½	110 DB
S-10	E	2 or 3	10	115 DB

*Sound measured at 100 feet.

YOU CAN DEPEND ON US

Our sirens have been in use around the world for more than 31 years. Entire communities depend on reliable A.C.A. siren systems for disaster warning and signaling applications. Every siren is pre-tested and warranted by A.C.A.

Manufactured by

ALERTING COMMUNICATORS OF AMERICA

40255 N. ENTERPRISE DRIVE 66W. • MEDWON, WISCONSIN 53092

TELEPHONE (414) 247-2800



A.C.A.

SPECIAL DESIGN FEATURES

- Allertor (125 dB)), Rotating Siren
 - Fiberglass Horn –Color Impregnated to Eliminate Painting
 - Aluminum Cabinet
 - Aluminum Cast Rotors and Stators
 - Direct Drive Rotating Mechanism
 - Chain Drive –No Belts to Tighten
- Banshee (112 dB), Nondirectional Siren
 - Fiberglass Housing –Color Impregnated to Eliminate Painting
 - Aluminum Cabinet
 - Aluminum Cast Rotors and Stators

MAINTENANCE—ALLERTOR (125 dB) ROTATING SIREN

- Lubrication—Once per Year
 - Change Gearbox Oil
 - Grease Rotational Bearing
 - Grease Drive Chain
- Electrical Inspection—Once per Year
 - Check Tension on Collector Ring Brushes
 - Check Electrical Connections for Corrosion and Tightness
 - Exercise Circuit Breakers

MAINTENANCE – BANSHEE (112 dB) NONDIRECTIONAL SIREN

- Lubrication – None Required (Sealed Bearings)
- Electrical Inspection – Once per Year
 - Check Electrical Connections for Corrosion and Tightness
 - Exercise Circuit Breakers

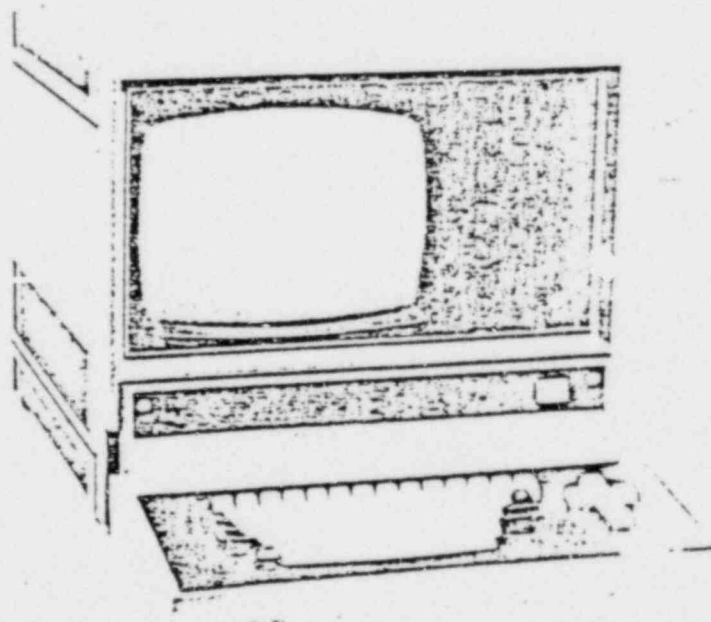
ELECTRICAL REQUIREMENTS

- Allertor (125 dB, 10 HP) Rotating Siren
 - Voltage, $240 \pm 10\%$ VAC, Single Phase
 - Operating Current, $53 \pm 10\%$ AMPS
 - Starting Current, $290 \pm 10\%$ AMPS
- Banshee (112 dB, 10 HP) Nondirectional Siren
 - Voltage, $240 \pm 10\%$ VAC, Single Phase
 - Operating Current, $47 \pm 10\%$ AMPS
 - Starting Current, $290 \pm 10\%$ AMPS

MODEL 120 INTELLEC® SERIES II MICROCOMPUTER DEVELOPMENT SYSTEM

- Complete microcomputer development system in one package for MCS®-48 and MCS-80/85 microprocessor families
- Single LSI electronics board with CPU, 32K bytes RAM memory, and 4K bytes ROM memory
- Self-test diagnostic capability
- ISIS-II disk operating system
- Built-in interfaces for high speed paper tape reader/punch, printer and Universal PROM Programmer
- Integral 250K-byte floppy disk with total storage capacity expandable to over 2M bytes
- Available with user's choice of MCS®-48 or 8080/8085 macroassembler
- Software compatible with previous Intellec® systems

The Model 120 Intellec Series II Microcomputer Development System is a complete microcomputer development system integrated into one compact package. It includes a CPU with 32K bytes of RAM memory, 4K bytes of ROM memory, a 2000-character CRT, detachable full ASCII keyboard with cursor controls and upper/lower case capability, and a 250K-byte floppy diskette drive. Powerful ISIS-II Operating System software allows the Model 120 to be used quickly and efficiently for assembling, compiling and debugging programs for Intel's MCS-48, MCS-80/85 and all other currently supported Intel microprocessor families. ISIS-II performs all file handling operations for the user, leaving him free to concentrate on the details of his own application. When used in conjunction with an optional in-circuit emulator (ICE™) module or the HSE-49™ High-Speed Emulator, the Model 120 provides all the hardware and software development tools necessary for the rapid development of a microcomputer-based product.



The following are trademarks of Intel Corporation and may be used only to describe Intel products: Intel, Intellec, HSE, MCS, ICE and MULTIBUS, and the computer names MCS, MCS or ICE and a numerical suffix. Intel Corporation assumes no responsibility for the use of any circuitry other than circuitry embodied in an Intel product. No other patents or patent licenses are implied.

Keyboard

Width — 17.37 in. (44.12 cm)
 Height — 3.0 in. (7.62 cm)
 Depth — 9.0 in. (22.0 cm)
 Weight — 6 lb (3 kg)

Electrical Characteristics
DC Power Supply

Volts Supplied	Amps Supplied	Typical System Requirements
+ 5 ± 5%	30.0	7.5
+ 12 ± 5%	2.5	0.2
- 12 ± 5%	0.3	0.05
- 10 ± 5%	1.5	0.15
+ 15 ± 5%	1.5	1.3*
+ 24 ± 5%	1.7	1.2*

*Not available on bus.

AC Requirements

110V, 60Hz — 5.9 Amp
 220V, 50 Hz — 3.0 Amp

Environmental Characteristics

Operating Temperature — 16°C to 32°C (61°F to 90°F)
 Operating Humidity — 20% to 80% relative humidity

Equipment Supplied

Model 120 chassis
 Integrated processor board (IPB)
 I/O controller board (IOC)
 CRT and keyboard
 250K-byte floppy disk drive

ROM resident system monitor

ISIS-II system diskette

MCS-48 macroassembler diskette (supplied with MCI-120/48-Kit)

MCS-80/MCS-85 macroassembler diskette (supplied with DS-120/80-Kit)

Reference Manuals

9800556 — A Guide to Microcomputer Development Systems (SUPPLIED)

9800559 — Intellec Series II Installation and Service Manual (SUPPLIED)

9800306 — ISIS-II System User's Guide (SUPPLIED)

9800556 — Intellec Series II Hardware Reference Manual (SUPPLIED)

9800553 — Intellec Series II Hardware Interface Manual (SUPPLIED)

9800605 — Intellec Series II System Monitor Source Listing (SUPPLIED)

9800554 — Intellec Series II Schematic Drawing (SUPPLIED)

9800255 — MCS-48 and UPI-41 Assembly Language Programming Manual (SUPPLIED with MCI-120/48-Kit)

9800301 — 8080/8085 Assembly Language Programming Manual (SUPPLIED with DS-120/80-Kit)

Reference manuals are shipped with each product only if designated SUPPLIED (see above). Manuals may be ordered from any Intel sales representative, distributor office or from Intel Literature Department, 3065 Bowers Avenue, Santa Clara, California 95051.

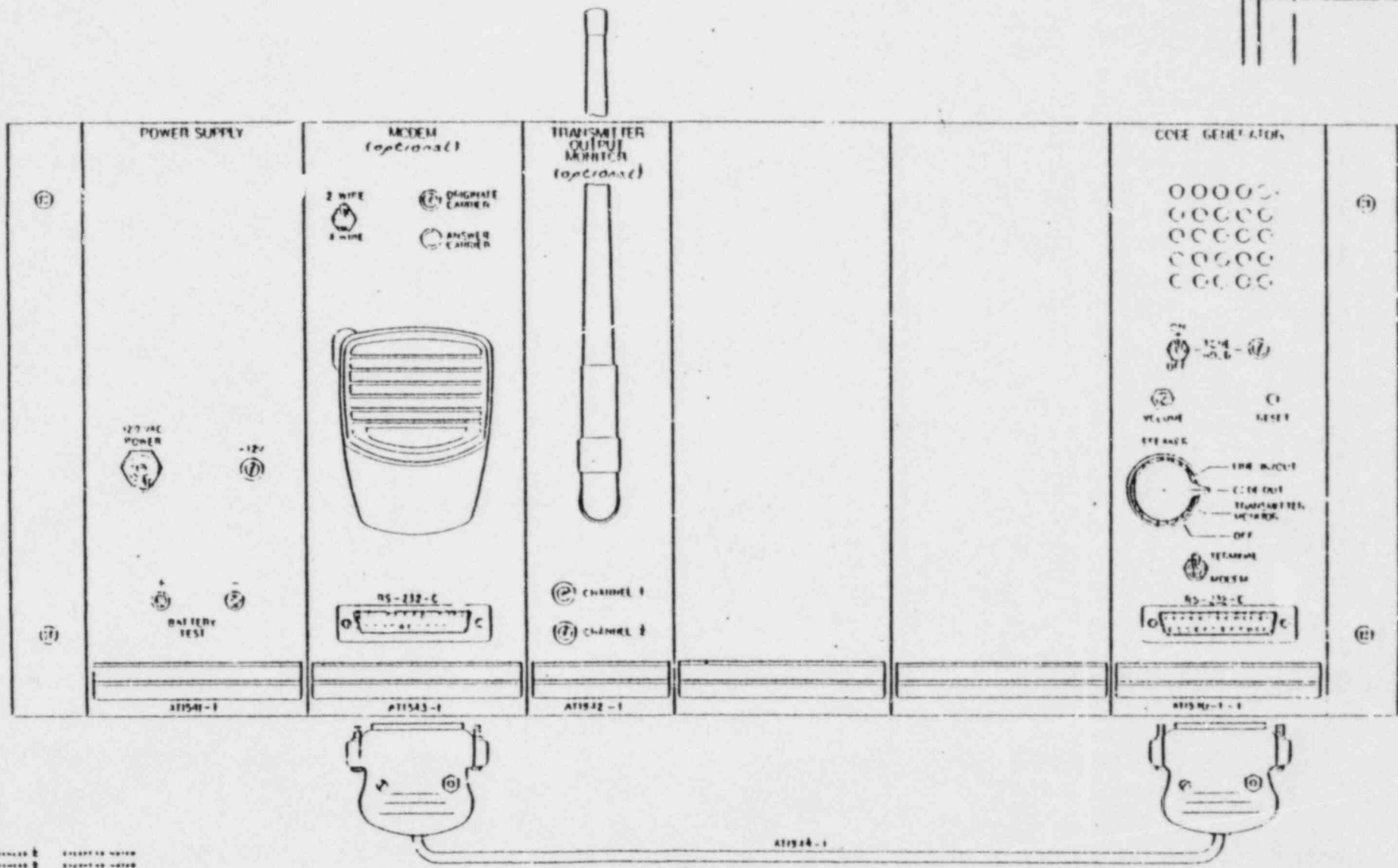
ORDERING INFORMATION

Part Number	Description
MCI-120/48-Kit (110V/60 Hz)	Intellec Series II Model 120 micro-computer development system with MCS-48 macroassembler
DS-120/80-Kit (110V/60 Hz)	Intellec Series II Model 120 micro-computer development system with MCS-80/MCS-85 macroassembler
MDS-120* (110V/60 Hz)	Intellec Series II Model 120 micro-computer development system
MDS-121* (220V/50 Hz)	Intellec Series II Model 121 micro-computer development system

*"MDS" is an ordering code only, and is not used as a product name or trademark. MDS[®] is a registered trademark of Mohawk Data Sciences Corp.

APPENDIX VII: STANDARD UNIT FRONT PANEL

CABLE CONNECTIONS	
NO.	DESCRIPTION
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DO NOT SCALE DRAWING

ORIGINAL TECHNOLOGICAL CENTER TO NOTED
 AMPLIFIER TECHNOLOGICAL CENTER TO NOTED
 ORIGINAL TECHNOLOGICAL CENTER TO NOTED

DUQUESNE LIGHT CO. COPY

THIS AGREEMENT

MADE this _____ day of _____, 1981, by and between the COUNTY OF BEAVER, a political subdivision of the Commonwealth of Pennsylvania, hereinafter sometimes called "County," party of the first part,

AND

DUQUESNE LIGHT COMPANY, a Pennsylvania corporation, having its principal office at 435 Sixth Avenue in the City of Pittsburgh, Allegheny County, Pennsylvania, hereinafter sometimes called "Duquesne," party of the second part.

WHEREAS, Duquesne is engaged in providing for the installation of certain equipment for the Beaver County Warning System ("Warning System"); and

WHEREAS, County has the responsibility for the testing and activation of said Warning System; and

WHEREAS, County and Duquesne desire to set forth their mutual understandings and agreement whereby the system will be installed, maintained, tested and activated.

NOW, THEREFORE, THIS AGREEMENT WITNESSETH THAT:

1. Duquesne shall provide for the construction and maintenance of said Warning System. County shall be responsible for activating said Warning System in accordance with the requirements of all applicable Federal and State Regulations. If a decision is made to activate said Warning System, County shall determine whether to activate the entire Warning System simultaneously or in a graduated or staged manner. County shall be responsible for conducting reasonable and necessary testing procedures for verification that said Warning System is continuously in an operable condition.

2. Duquesne shall not be liable to County for damages by reason of either the failure of said Warning System to operate or the inadvertent use of said Warning System. County hereby agrees to indemnify, protect, defend and save harmless Duquesne from and against all loss, cost, damage and expense, and claims and demands therefore, for injury or death to persons, including but not limited to employees of County, or damage to property, caused by or growing out of either the failure of said Warning System to operate or the inadvertent use of said Warning System.

3. Unless modified in writing, this agreement shall constitute the complete agreement between County and Duquesne for said Warning System. No unwritten representations or agreements shall have the effect of modifying any of the provisions of this agreement.

4. This agreement and all of the conditions and covenants contained herein shall be binding upon and inure to the benefits of the parties hereto, and their respective successors and assigns. Duquesne may upon 60 days notice to County, terminate this Agreement.

5. Duquesne shall file a copy of this agreement with the Public Utility Commission pursuant to Section 507 of the Public Utility Code, as amended, and this agreement shall become effective in accordance therewith.

6. County is authorized to enter into this agreement pursuant to Resolution No. _____ of 1981, adopted on _____ day of _____, 1981, a copy of which shall be attached to this agreement as Attachment No. 1 upon execution of this agreement by County.

IN WITNESS WHEREOF, the parties hereto, intending to be legally bound hereby, have executed and sealed this agreement the day and year first above written.

ATTEST:

Secretary

DUQUESNE LIGHT COMPANY

By: _____
Vice President

ATTEST:

Secretary

COUNTY OF BEAVER

Board of County Commissioners

APPROVED AS TO FORM:

County Solicitor

Form D18-5084 (1-80)

SUB. NO.		RECORD TYPE		RECORD DATE		KEY DATA		SOURCE		DESTINAT.		TRANSMITTAL NUMBER: EED-345-1	
162	01	002	006	81	2	6	141						
CONTROLLED DOCUMENT TRANSMITTAL DUQUESNE LIGHT COMPANY ENGINEERING AND CONSTRUCTION DIVISION BEAVER VALLEY POWER STATION UNIT							016	345	D.C.P.	ISSUED FOR:	<input checked="" type="checkbox"/>	USE	PAGE 1 OF 1
							130	13159	O.F.E.		<input type="checkbox"/>	INFORMATION ONLY	
							103	1321	C.O.		<input type="checkbox"/>	HISTORICAL FILE	

DOCUMENT NUMBER	REVISION NO. OR DATE	DOCUMENT SUPERSEDED	DESCRIPTION
	Revised 2/18/81	Original Dated 9/24/80	Emergency Notification System - Siren Test Plan & Results

DISTRIBUTION:

1 COPIES TO E. J. Woolever
 1 COPIES TO H. G. Frus
 1 COPIES TO J. L. Koepfinger
 1 COPIES TO H. A. Van Wassen
 1 COPIES TO J. J. Carey
 6 COPIES TO J. J. Maracek
 TO _____

_____ COPIES TO _____
 _____ COPIES TO _____
 _____ COPIES TO _____
 _____ COPIES TO _____
 _____ COPIES TO _____
 _____ COPIES TO _____
 _____ TO _____

DUQUESNE LIGHT COMPANY

NOTE: Superseded documents should be removed from your files and destroyed.

by: _____
 (per Project Manager)

ONE COPY OF THIS TRANSMITTAL SHALL BE SIGNED AND RETURNED TO THE PROJECT MANAGER TO ACKNOWLEDGE THE RECEIPT OF THE ABOVE MENTIONED DOCUMENTS .

The above listed documents were received in good condition and superseded documents have been voided or destroyed.

Signed _____ Date _____

2/18/81

Emergency Preparedness Plan
DCP 345 OFE 13159 CO 1321
Emergency Notification System
Siren Test Plan and Results

Summary

Review of the data obtained during the siren testing conducted on the 18th of September indicates more conservative siren coverage ranges (than recommended in the Alan M. Voorhees & Associates Mass Notification Study Report) will have to be applied to the Beaver Valley Power Station Emergency Planning Zone. This will lead to an increase in the number of siren locations and/or re-evaluation of the siren types (sound output levels) at recommended siren locations.

Neither of the sirens tested showed any significant superiority when comparing sound level measurements taken at 100 feet from the siren, however the Federal Signal Corporation siren sound level measurements were slightly higher (1 to 3 dB(c)) at observer locations 5000 to 12000 feet from the siren.

Objective

Determination of siren sound coverage characteristics when applied to the predominantly rugged terrain within Beaver Valley Station's Emergency Planning Zone. Results obtained will be used to evaluate the proposed siren locations and to determine final siren system design

Scope

The test sirens were positioned in their approximate mounting configuration (approximately 60 ft. above ground level) and operated for two minutes. Observers stationed at predetermined locations, recorded sound levels before and during siren operation. All sound level measurements were taken on C scale weighting networks and with the meter on fast response.

The sirens tested at each siren test site were:

- 1) Federal Signal Corporation - THUNDERBOLT, Model 1000BT single phase) Siren, 125 db(c) at 100 ft.
- 2) Alerting Communicators of America - Allertor, (single phase) Siren, 125 db(c) at 100 ft.

Power supplied was 240 VAC, single phase.

Testing Locations

Siren Test Sites: Site #4, Industry Borough, on Industry-Fairview Road in Western Beaver High School's parking lot.

Site #31, Ohioville Township, located at the end of Reed Road of Engle Road.

Observer Sites: See attached site sketches. Observer sites were chosen from topographic maps (MIDLAND QUADRANGLE, PENNSYLVANIA - BEAVER CO. 7.5 MINUTE SERIES) and elevation profiles, to determine sound characteristics in rugged terrain (valleys) as well as a determination of siren coverage ranges. Each observer was assigned a group of observer locations and given detailed direction for each site.

Weather Conditions on Test Date (9/18/80)

Information from Greater Pittsburgh International Airport, National Weather Service.

<u>Time</u>	<u>Temp.</u>	<u>Wind (Speed & Direction From</u>
10 am	60 F	7 mph NE (20°)
11 am	61 F	6 mph E (70°)
12 noon	63 F	4 mph NE (30°)
1 pm	66 F	8 mph NW (300°)
2 pm	65 F	7 mph W (260°)
3 pm	70 F	7 mph W (250°)
4 pm	69 F	7 mph W (270°)
5 pm	71 F	5 mph W (240°)

Party cloudy (morning) to clear (afternoon).

Press. - 30.16; Humidity - 59%.

Instruments

7 - General Radio - 1565-B Sound Level Meters, Type 2 (ANSI S1.4, 1971) with wind screens

1 - General Radio - Type 1551-C Sound Level Meter

Instrument calibration checked prior to testing. All meters calibrated.

Conclusion

Review of the test data (shown on the attached site sketches and

data sheets) indicate the siren coverage ranges, as recommended in the Alan M. Voorhees & Associates - Evacuation and Mass Notification Study Report, cannot be achieved in the Beaver County Area. The data indicates the recommended ranges could be achieved at observer sites at approximately the same elevations, without obstructions (heavily treed areas and/or hills) between the observer site and siren. However, observer sites in valleys and/or heavily treed areas were from 5 to 15 dB(c) less than the predicted levels depending on the distance from the siren and terrain of each location.

The siren ranges recommended by the Evacuation and Mass Notification Study Report were taken from figure 1 of the Outdoor Warning System Guide (FEMA CPG 1-17) dated March 1, 1980. The test data indicates a loss factor of 10dB per distance doubled is more appropriate for the rugged terrain and heavily treed characteristics of Beaver County. Below is a comparison of the recommended siren ranges and calculated siren ranges using a 10dB(c) loss factor.

Siren Size (Rated sound level at 100 feet)	Recommended Ranges		Calculated Ranges	
	To 70 dB(c)	To 60 dB(c)	To 70 dB(c)	To 60 dB(c)
125 dB(c)	6000 ft	1200 ft	4525 ft	9050 ft
115 dB(c)	2500 ft	5000 ft	2262 ft	4500 ft
107 dB(c)	1250 ft	2500 ft	1299 ft	2598 ft

The Calculated Ranges were determined using the following formula:

$$R_x = R_o 2^{(L_o - L_x)/d}$$

where: Rx = Range in feet
 Ro = Range in feet where SL* is known (100 ft)
 Lx = Desired SL* at Range Rx
 Lo = SL* at Range Rx (siren rating)
 d = Loss in dB(c) per distance doubled (10 db(c))

*SL = Sound Level in dB(c)

Review of the siren test data taken at close ranges (SIREN TEST - DATE SHEET, Sheet #4), reveals almost equal performance between the two sirens tested. Sound level measurements were taken approximately 100 ft. from the sirens (which were elevated 60 ft. above ground level), at ground level and 10 feet below the siren "on horn axis". Siren

outputs of 114 dB(c) were recorded at ground level and 120-121 dB(c) 10 feet below "on horn axis". Both sirens were measured at 4 to 5 dB(c) less than their output ratings (measured 10 feet below "on horn axis"). The siren ratings have been based on the traditional method of testing sirens, as described in FCDA Specification No. 101 and 103, where sirens are tested 20 feet above ground level. With a siren 20 ft above ground level, siren output measurements at 100 ft can be enhanced as much as 6dB(c) due to ground reflection. Above approximately 50 ft mounting height, ground reflection is almost negligible 100 feet from the siren. Since our testing was conducted with the siren elevated 60 feet above ground level, free field (without sound reflections) siren output was measured.

Review of the test data taken at the observer location (SIREN TEST - DATA SHEET, Sheets #1, #2 and #3), indicates the Federal Signal Corporation THUNDERBOLT siren has a slight coverage edge (1 to 3 dB(c)) over the Alerting Communicators of America ALLERTOR siren at some locations. The slight coverage difference between the two sirens appears to be due to different siren sound level frequencies (sound attenuation in air increase as sound level frequency is increased). However, the increase in sound coverage area appears too small to be of any significance.

One interesting observation from the siren testing is that siren coverage is somewhat dependent on sound beam characteristics. The ACA ALLERTOR siren was tested with an optional horn (projector) which directed the sound in a narrower beam pattern, therefore, increasing its range and reducing the sound level underneath the siren. However, a narrower sound beam appears to reduce the sirens ability to reach downward into valleys.

SIREN TEST DATA SHEET
All Sound Levels in db(c)

Test Siren: ACA - ALLERTOR

Test Site: #4

<u>Location #</u>	<u>Time</u>	<u>Ambient Level</u>	<u>Siren Level</u>	<u>Remarks</u>
4-1	10:17 am	45 db	60 db	None
4-2	10:33 am	45 db	56 db	None
4-3	10:17 am	49 db	55 db	Siren echoes in valley
4-4	10:33 am	50 db	60 db	None
4-5	10:17 am	47 - 60 db	64 db	Ambient peaked due to lawn mower
4-6	10:33 am	48 db	55 db	None
4-7	10:17 am	51 db	76 db	None
4-8	10:33 am	48 db	53 db	None
4-9	10:33 am	60 db	64 db	Workmen in area did not react. Continued working
4-10	10:17	50 db	53 - 63 db	Farmland (open)

Test Siren: Federal Signal - Thunderbolt

Test Site: #4

<u>Location #</u>	<u>Time</u>	<u>Ambient Level</u>	<u>Siren Level</u>	<u>Remarks</u>
4-1	11:29 am	45 db	50 db	None
4-2	11:39 am	45 db	50 db	None
4-3	11:29 am	46 db	59 db	Siren echoes in valley
4-4	11:39 am	51 db	59 db	None
4-5	11:29 am	51 db	64 - 67 db	Dog barking during measurement
4-6	11:39 am	51 db	60 db	None

Test Siren: Federal Signal - Thunderbolt

Test Site: #4

<u>Location #</u>	<u>Time</u>	<u>Ambient Level</u>	<u>Siren Level</u>	<u>Remarks</u>
4-7	11:29 am	51 db	72 db	None
4-8	11:39	49 db	52 db	None
4-9	11:39	56 db	63 db	Workmen in area did not react. Continued working.
4-10	11:29	51 db	54 db	Farmland (open)

SIREN TEST - DATA SHEET
All Sound Levels in db(c)

Test Siren: Federal Signal - Thunderbolt

Test Site: #31

<u>Location #</u>	<u>Time</u>	<u>Ambient Level</u>	<u>Siren Level</u>	<u>Remarks</u>
31-1	2:00 pm	50 db	78 db	Siren echoes in valley
31-2	2:19 pm	54 db	-	Siren sound level less than ambient
31-3	2:00 pm	50 db	57 db	None
31-4	2:19 pm	50 - 55 db	52 db	None
31-5	2:00 pm	49 db	54 db	None
31-6	2:19 pm	49 db	54 db	None
31-7	2:00 pm	50 db	54 db	None
31-8	2:19 pm	54 db	-	Road noise above siren level
31-9	2:36 pm	50 db	53 db	
31-10	2:46 pm	46 db	48 db	
31-11	2:36 pm	55 db	72 db	
31-12	2:46 pm	52 db	56 db	
31-13	2:36 pm	49 db	63 db	
31-14	2:46 pm	52 db	55 db	
31-15	2:36 pm	52 db	68 db	
31-16	2:46 pm	45 db	76 db	
31-17	2:19 pm	64 db	72 db	Children in playground did not react to siren.
31-18	2:46 pm	60 db	-	Siren audible, but during test gym class raised ambient

Test Siren: Federal Signal - Thunderbolt

Test Site: #31

<u>Location #</u>	<u>Time</u>	<u>Ambient Level</u>	<u>Siren Level</u>	<u>Remarks</u>
31-19	2:36 pm	64 db	78 db	
31-20	2:19 pm	45 db	55 db	Location in valley heavily treed

SIREN TEST DATA SHEET
All Sound Levels in db(c)

Test Siren: ACA - ALLERTOR

Test Site: #31

<u>Location #</u>	<u>Time</u>	<u>Ambient Level</u>	<u>Siren Level</u>	<u>Remarks</u>
31-1	3:56 pm	52 db	74 db	Siren echoes in valley
31-2	3:45 pm	59 db	-	Siren audible, but less than ambient
31-3	3:45 pm	49 db	53 db	
31-4	3:56 pm	45 db	46 db	
31-5	3:56 pm	50 db	54 db	
31-6	3:45 pm	45 - 55 db	56 db	Chain saw going during test
31-7	3:56 pm	49 db	52 db	
31-8	3:45 pm	50 db	51 db	
31-9	3:30 pm	48 db	52 db	
31-10	3:22 pm	46 db	47 db	
31-11	3:30 pm	52 db	56 db	
31-12	3:22 pm	50 db	52 db	
31-13	3:30 pm	55 db	58 db	
31-14	3:22 pm	55 - 65 db	-	Tractor noise above siren level, siren audible
31-15	3:30 pm	52 db	62 db	
31-16	3:22 pm	47 db	66 db	
31-17	3:30 pm	58 db	65 db	
31-18	3:56 pm	50 db	70 - 74 db	No gym class, contributing to ambient
31-19	3:30 pm	64 db	77 db	

Test Siren: ACA - ALLERTOR

Test Site: #31

<u>Location #</u>	<u>Time</u>	<u>Ambient Level</u>	<u>Siren Level</u>	<u>Remarks</u>
ACA ALLERTOR tested with optional "PENETRATOR" projector.				
31-20	3:45 pm	45 db	50 db	
31-1	4:22 pm	50 db	54 db	
31-4	4:22 pm	49 db	49 db	No change from ambient
31-5	4:22 pm	50 db	56 db	
31-7	4:22 pm	48 db	-	Ambient increased during test unable to measure

SIREN TEST DATA SHEET
All Sound Levels in db(c)

Test Location #4

Sound level measured 100 ft. from siren at ground level.

ACA	ALLERTOR	Ambient - 73 db	Siren Sound Level - 114 db
Federal	- THUNDERBOLT	Ambient - 73 db	Siren Sound Level - 114 db

Sound level measured 100 ft. from siren approximately 50 feet above ground level. Siren 60 ft. above ground level.

ACA	- ALLERTOR	Siren Sound Level - 121 db
Federal	- THUNDERBOLT	Siren Sound Level 1 122 db

Test Location #31

Sound level measured 100 ft. from siren at ground level.

ACA	- ALLERTOR	Ambient - 93 db	Siren Sound Level - 114 db
**ACA	- ALLERTOR	Ambient - 93 db	Siren Sound Level - 110 db
Federal	- THUNDERBOLT	Ambient - 93 db	Siren Sound Level - 114 db

Sound level measured 100 ft. from siren approximately 50 feet above ground level. Siren 60 ft. above ground level.

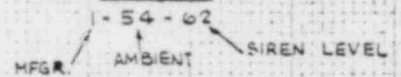
ACA	- ALLERTOR	Siren Sound Level - 119-120 db
**ACA	- ALLERTOR	Siren Sound Level - 120-121 db
Federal	- THUNDERBOLT	Siren Sound Level - 120-121 db

** ACA - ALLERTOR tested with optioal "Penetrator" projector.

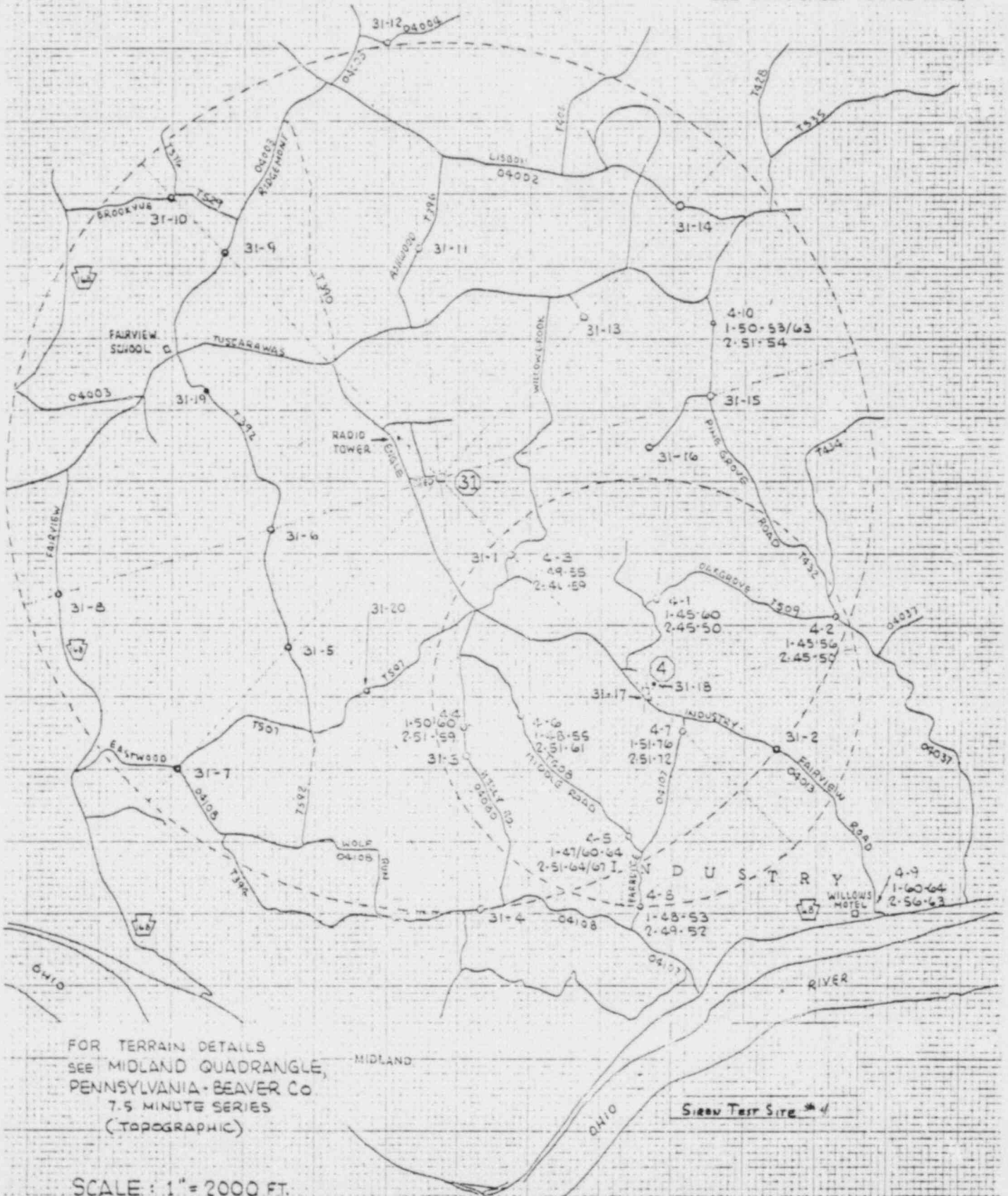
LEGEND

- 1 - A.C.A.
- 2 - FEDERAL
- 3 - A.C.A. (PENETRATOR PROJECTOR)

EXAMPLE



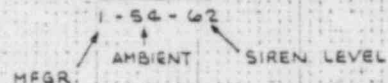
SEE DATA SHEET FOR REMARKS



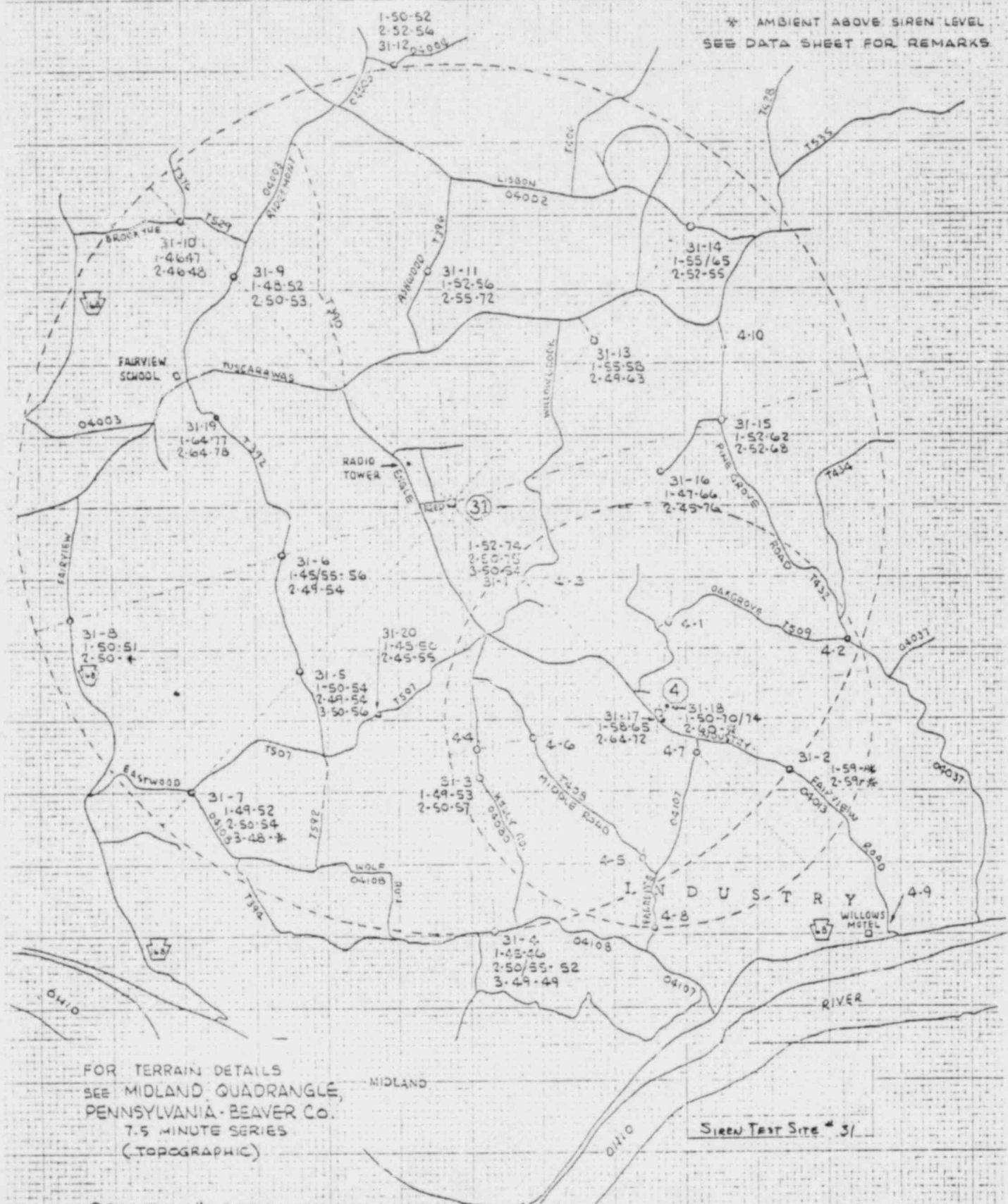
LEGEND

- 1 - A.C.A.
- 2 - FEDERAL
- 3 - A.C.A. (PENETRATOR PROJECTOR)

EXAMPLE



* AMBIENT ABOVE SIREN LEVEL
SEE DATA SHEET FOR REMARKS



FOR TERRAIN DETAILS
SEE MIDLAND QUADRANGLE,
PENNSYLVANIA-BEAVER CO.
7.5 MINUTE SERIES
(TOPOGRAPHIC)

SCALE: 1" = 2000 FT.

Siren Test Site # 31

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