CERTIFICATION OF CONSULTANT

The firm of E. Harold Munn, Jr. & Associates, Inc., Broadcast Engineering Consultants, with offices at 100 Airport Drive, Coldwater, Michigan, has been retained for the purpose of preparing the technical data forming this report.

The report has been prepared by properly trained electronics specialists under the direction of the undersigned whose qualifications are a matter of record before the Federal Communications Commission.

I declare under penalty of perjury that the contents of this report are true and accurate to the best of my knowledge and belief.

E. HAROLD MUNN, JR. & ASSOCIATES, INC.

March 24, 1988

By _____
E. Harold Munn, Jr., President

100 Airport Drive, Box 220
Coldwater, Michigan 49036

(517) 278-7339

DISCUSSION

This firm has been retained to prepare the required engineering report in support of an application for a new FM Broadcast Station serving the area of Warner Robins, Georgia.

It has been determined that Educational Reserved Channel 205(C1) 88.9 mHz, may be used at the specified site at Warner Robins, in compliance with the rules of the Commission. In order to maximize service to the area, a directional antenna will be employed, to afford the required protection to the 1.0 mV/m contour of co-channel station WMSL, Athen, Georgia.

The required data concerning the proposed directional antenna is included in this report as Exhibit E-4, pages one through five. An allocation study showing that this proposal affords the required protection to WMSL is included as Exhibit E-6. That exhibit also shows that the spacing to other licensed facilities provides protection to them, in accordance with the rules.

That exhibit also indicates that this application is mutually exclusive with proposed facilities at Macon, Georgia, and Tallahassee, Florida.

The tower proposed to be used by the applicant has been approved by the FAA at the site and height listed in this application, under FAA Case No. 85-ASO-1821-OE.

RADIATION PROTECTION: This proposal has been evaluated for compliance with FCC guidelines concerning human exposure to radiofrequency radiation. The standards employed are detailed in OST Bulletin No.65, October 1985.

Table 1 of Appendix B was employed for this study concerning FM broadcast radiation protection.

For the effective radiated power and type of antenna proposed,the minimum antenna radiation center above ground is specified as 81.7 meters.

This application proposes an antenna height above ground of at least 95.0 meters. Therefore, full compliance with the guidelines is attained by the instant application.

In addition to the protection afforded by the proposed antenna height above ground, the facility will be properly marked with signs, and entry to the facility will be restricted by means of locked fencing.

Any other means as may be required to protect employees and the general public will be employed.

BLANKETING INTERFERENCE: It is believed that no "blanketing" interference will be created as a result of a grant of this application. In the event verified complaints of "blanketing" are received, the applicant will comply with the provisions of Sec. 73.318 of the rules to resolve such complaints.

Frequency: 88.9000 MHz

TABULATION OF PROPOSED 1.0 mV/m CONTOUR

Antenna elevation (AMSL): 230 Meters

AZIMUTH	AVERAGE ELEVATION 2 TO 10 MILES	ANTENNA HEIGHT ABOVE AVERAGE TERRAIN	DEPRESSION ANGLE TO RADIO HORIZON	EFFECTIVE RADIATED POWER	DISTANCES TO CONTOURS CITY GRADE (60 dBu)	URBAN (** dBu)	RURAL (0 dBu)
N .0 E	105 M	125 M	.31 Degs	15.75 dBk	46.1 km	.0 km	.0 km
6.4	103	127	.31	14.50	43.8	.0	.0
8.0	101	129	.31	14.50	44.1	.0	.0
10.0	100	130	.32	14.90	45.1	.0	.0
30.0	94	136	.32	18.50	53.6	.0	.0
45.0	91	139	.33	20.00	57.3	.0	.0
90.0	90	140	.33	20.00	57.4	.0	.0
135.0	103	127	.31	20.00	55.7	.0	.0
180.0	104	126	.31	20.00	55.6	.0	.0
225.0	119	111	.29	20.00	53.0	.0	.0
270.0	131	99	.28	20.00	50.9	.0	.0
315.0	125	105	.28	20.00	52.0	.0	.0
330.0	117	113	.29	20.00	53.4	.0	.0
340.0	113	117	.30	19.40	52.7	.0	.0
350.0	109	121	.30	17.75	49.7	.0	.0
Average of 8 Standard Radials	108 M	122 M					

TABULATION OF INTERFERENCE CONTOURS

DISTANCES TO CONTOURS (Kilometers):

Frequency: 88.9000 MHz

F(50,10) Curves Number of Contours: 1

AZ (degs)	HAAT (m)	ERP (dBk)	CONTOUR LEVELS (dBu): 40.0 To WMSL
330.0	113	20.00	148.6
340.0	117	19.40	145.8
350.0	121	17.75	137.5
.0	125	15.75	127.8
6.4	127	14.50	121.2
8.0	129	14.50	121.5
10.0	130	14.90	123.9
20.0	133	16.90	135.0
30.0	136	18.50	143.9
45.0	139	20.00	153.1

DISTANCES TO CONTOURS (Kilometers):

Frequency: 88.9000 MHz

F(50,10) Curves Number of Contours: 1

AZ (degs)	HAAT (m)	ERP (dBk)	CONTOUR LEVELS (dBu): 59.0 To TV 6
.0	125	15.75	55.9
10.0	130	14.90	54.3
30.0	136	18.50	65.0
45.0	139	20.00	69.8
90.0	140	20.00	69.9

EXHIBIT "A"

The proposed transmitter is located within 10 km of existing or proposed FM and/or TV transmitters. This applicant does not believe that any adverse effects on the operation of any existing or proposed facility would result from a grant of this application. The frequency separations, and the physical distance between the facilities should preclude any effects.

In the event such harmful effects are noted, including but not limited to receiver-induced or other types of modulation, the applicant accepts full responsibility for the elimination of any objectionable interference to facilities in existence or authorized or to radio receivers in use prior to grant of this application.

The applicant will take such engineering steps as may be required to satisfy complaints including, but not limited to, the installation of filters, traps, or other devices.

The applicant will comply with the provisions of 47 C.F.R. Sec. 73.318. The proposed transmitter is so located that there is some resident population within the predicted "blanketing" contour, as defined in 47 C.F.R. Section 73.318. While the number of persons potentially affected is minimal, the applicant agrees that full compliance with the procedures and requirements of 73.318(b) and (d) will be attained.

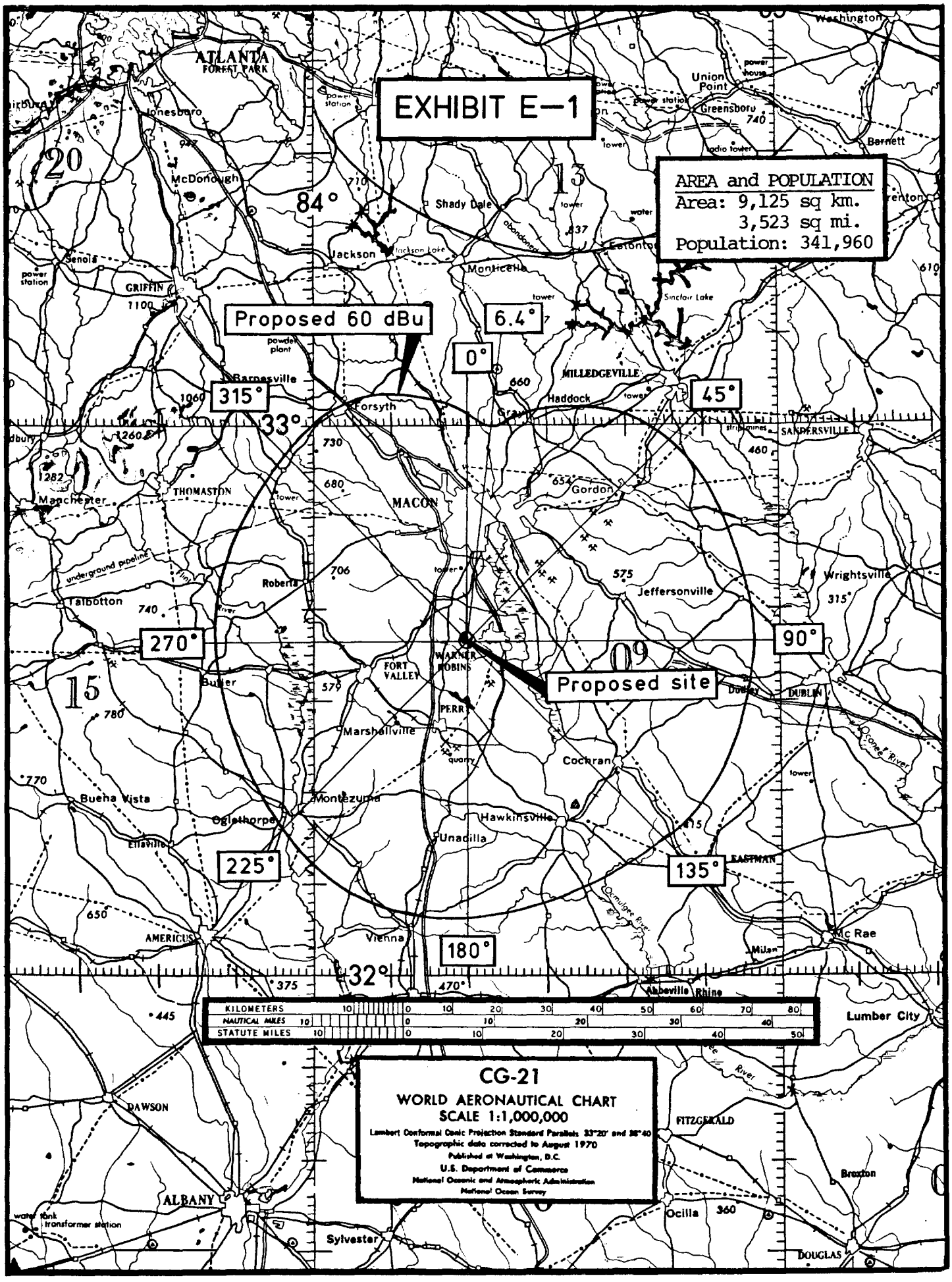


EXHIBIT E—1
AREA and POPULATION
Area: 9,125 sq km.
3,523 sq mi.
Population: 341,960
Proposed 60 dBu
Proposed site
0°
45°
90°
135°
180°
225°
270°
315°
6.4°
84°
33°
32°
ATLANTA
FORREST PARK
Jonesboro
McDonough
Shady Dale
Jackson
Jackson Lake
Monticello
Eatonton
Sinclair Lake
Union Point
Greensboro
Barnett
Washington
Senoia
GRIFFIN
Barnesville
Forsyth
MILLEDGEVILLE
Haddock
SANDERSVILLE
Manchester
THOMASTON
MACON
Gordon
Roberta
Talbotton
Jeffersonville
Wrightsville
Butler
FORT VALLEY
WARNER ROBINS
PERR
DUBLIN
Marshallville
Cochran
Buena Vista
Montezuma
Oglethorpe
Hawkinsville
Unadilla
Ellaville
EASTMAN
AMERICUS
Vienna
Mc Rae
Milan
Abbeville
Rhine
Lumber City
DAWSON
ALBANY
Sylvester
FITZGERALD
Ocilla
Broxton
DOUGLAS
KILOMETERS
NAUTICAL MILES
STATUTE MILES
CG-21
WORLD AERONAUTICAL CHART
SCALE 1:1,000,000
Lambert Conformal Conic Projection Standard Parallels 33°20' and 36°40'
Topographic data corrected to August 1970
Published at Washington, D.C.
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Survey

EXHIBIT E-2

ANALYSIS OF TOPOGRAPHIC DATA EMPLOYED

The topographic data employed in this application is based on the National Geophysical Center thirtysecond point topography data base (TPG-0050).

The averages calculated include 81 points between 3 and 16 km

The transmitter site elevation was determined by means of 7.5' series topographic mapping. The site coordinates were also developed from the 7.5' series map. A portion of that map is included in this report as Figure 5.

A detailed topographic analysis using 7.5' topographic maps will be supplied to the Commission if requested.

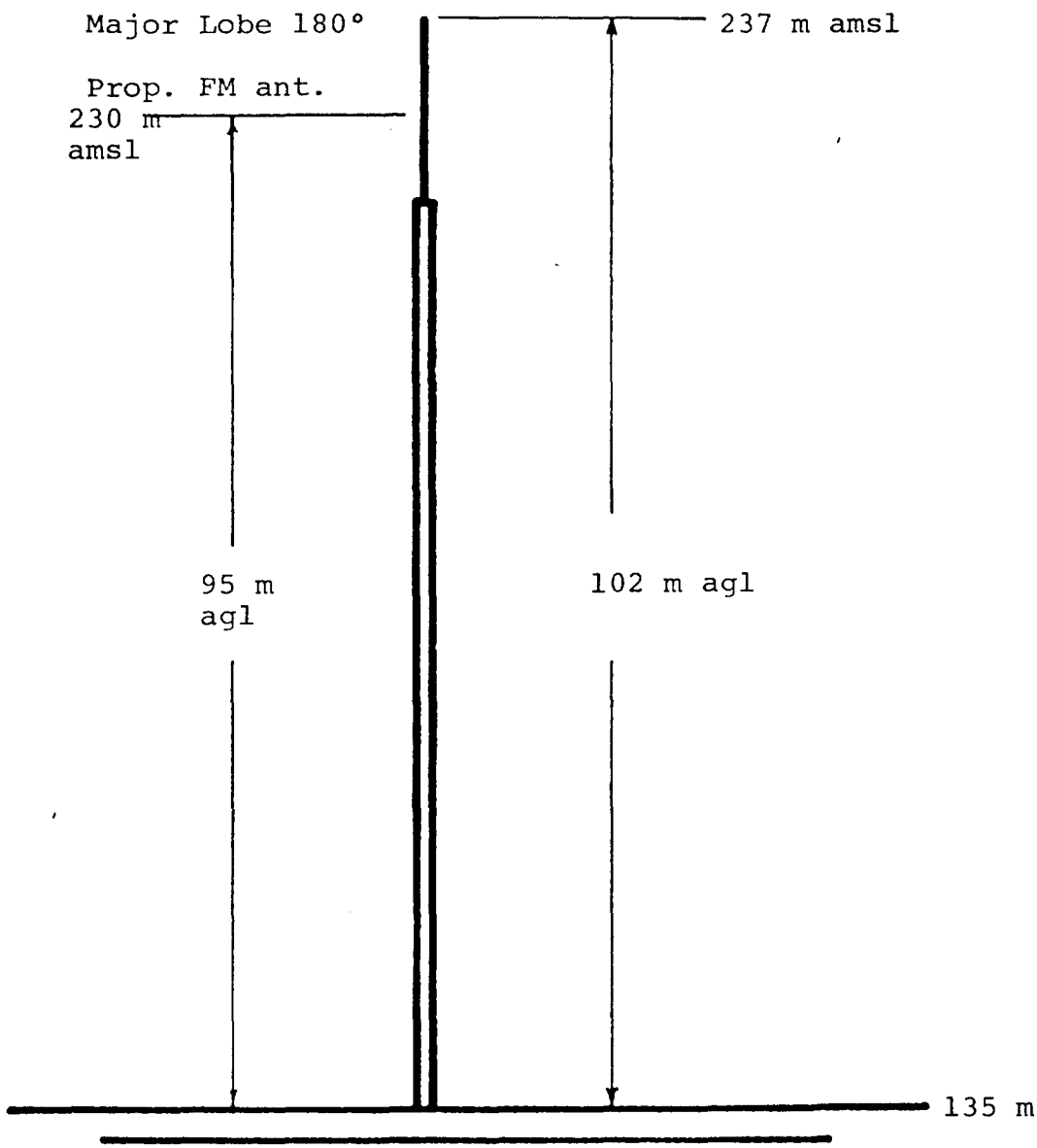
EXHIBIT E-3

VERTICAL PLAN

SITE LOCATION

Single, guyed steel tower to support FM Broadcast antenna. FAA approval granted in case no.85-ASO-1821-OE

NL 32°36'55"
WL 83°40'03"
2601 Watson Blvd,Warner Robins, Houston Co., Ga. 31056



not to scale

guys not shown

E. HAROLD MUNN, JR.
& ASSOCIATES, INC.
Broadcast Engineering Consultants
Coldwater, Michigan

EXHIBIT E-4

FM OPERATING SPECIFICATIONS - PROPOSED

Applicant: Warner Robins Christian Academy

Frequency: 88.9 mHz Channel: 205(C1) ERP: 100 kW HAAT: 122 m

Transmitter:

Manufacturer: Harris Type No.: FM-35K Power: 35 kW

Antenna:

Manufacturer: Shively Type No.: 6810-5(DA) No. Sec.: 5

Power Gain: 3.37 Field Gain: 1.83 mV/m/kW: 252

Transmission Line:

Manufacturer: Cablewave Type No.: HCC-300-50 Description: air dielectric coax.

Size: 3"(7.62 cm) Loss-dB/100m: 0.403 Length: 91 m (300')

Efficiency: 0.918

PROPOSED OPERATION:

Effective Radiated Power: 100 kW Max DA Antenna Input Power: 29.7 kW

Line Loss: 2.65 kW Transmitter Output Power: 32.35 kW

Modulation Monitor: as needed

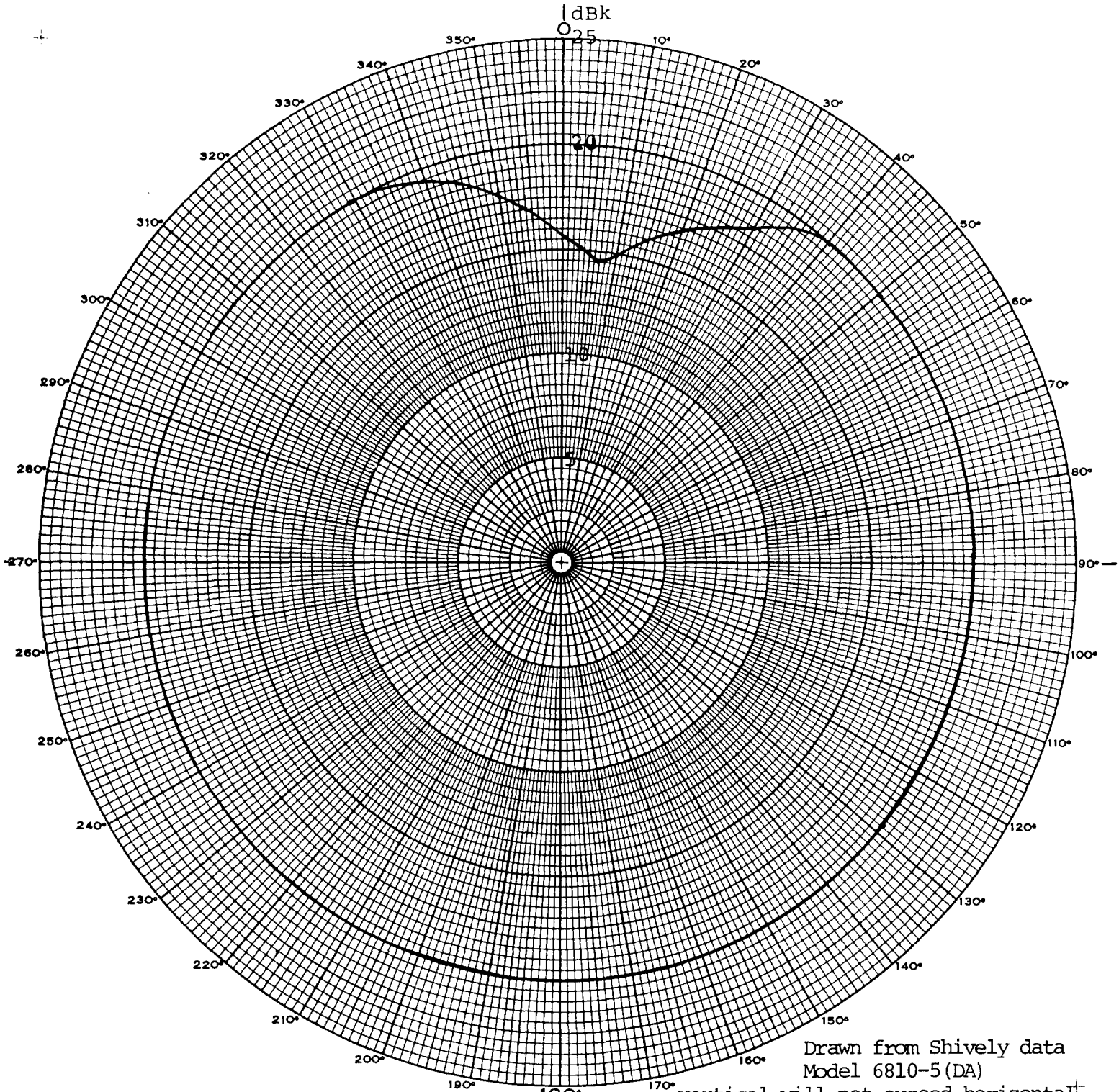
Manufacturer: Type No.:

FMTVDA 03-24-1988 15:53:53
MAJOR LOBE ERP IN KW = 100
MAJOR LOBE MV/M = 1373

EXHIBIT E-4 p.2

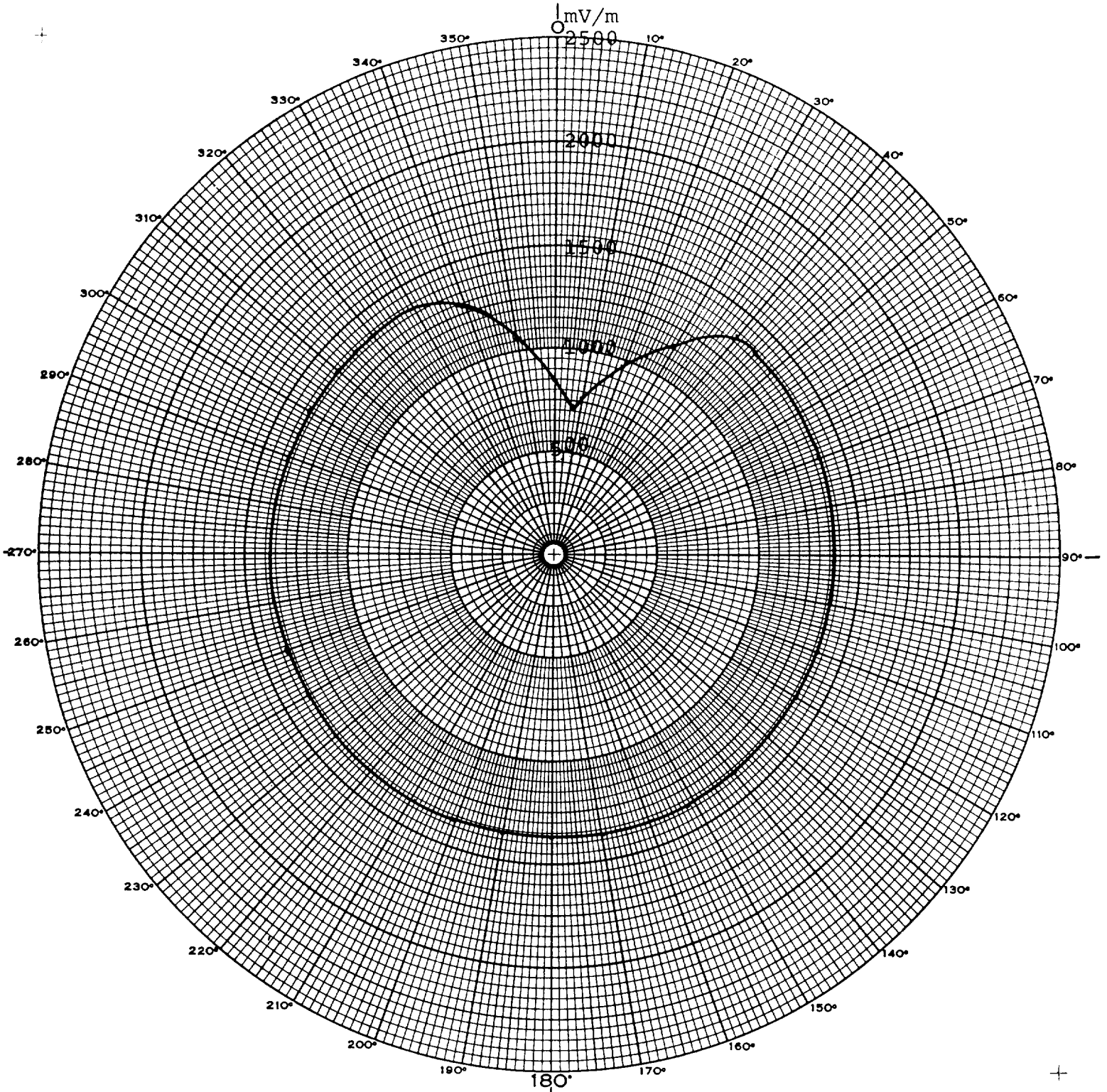
AZIMUTH	FIELD	ERP	DBK	MV/M
0	0.61	37.6	15.75	842
6	0.53	28.2	14.50	729
8	0.53	28.2	14.50	729
10	0.56	30.8	14.90	762
20	0.70	49.0	16.90	961
30	0.84	70.7	18.50	1155
40	1.00	100.0	20.00	1373
45	1.00	100.0	20.00	1373
50	1.00	100.0	20.00	1373
60	1.00	100.0	20.00	1373
70	1.00	100.0	20.00	1373
80	1.00	100.0	20.00	1373
90	1.00	100.0	20.00	1373
100	1.00	100.0	20.00	1373
110	1.00	100.0	20.00	1373
120	1.00	100.0	20.00	1373
130	1.00	100.0	20.00	1373
135	1.00	100.0	20.00	1373
140	1.00	100.0	20.00	1373
150	1.00	100.0	20.00	1373
160	1.00	100.0	20.00	1373
170	1.00	100.0	20.00	1373
180	1.00	100.0	20.00	1373
190	1.00	100.0	20.00	1373
200	1.00	100.0	20.00	1373
210	1.00	100.0	20.00	1373
220	1.00	100.0	20.00	1373
225	1.00	100.0	20.00	1373
230	1.00	100.0	20.00	1373
240	1.00	100.0	20.00	1373
250	1.00	100.0	20.00	1373
260	1.00	100.0	20.00	1373
270	1.00	100.0	20.00	1373
280	1.00	100.0	20.00	1373
290	1.00	100.0	20.00	1373
300	1.00	100.0	20.00	1373
310	1.00	100.0	20.00	1373
315	1.00	100.0	20.00	1373
320	1.00	100.0	20.00	1373
330	1.00	100.0	20.00	1373
340	0.93	87.0	19.40	1281
350	0.77	59.6	17.75	1060

NOTE: "Ideal" pattern which will be modified after grant and construction and measurement of the antenna. Form 340 for modification to measured pattern data will be filed prior to license of the facility.



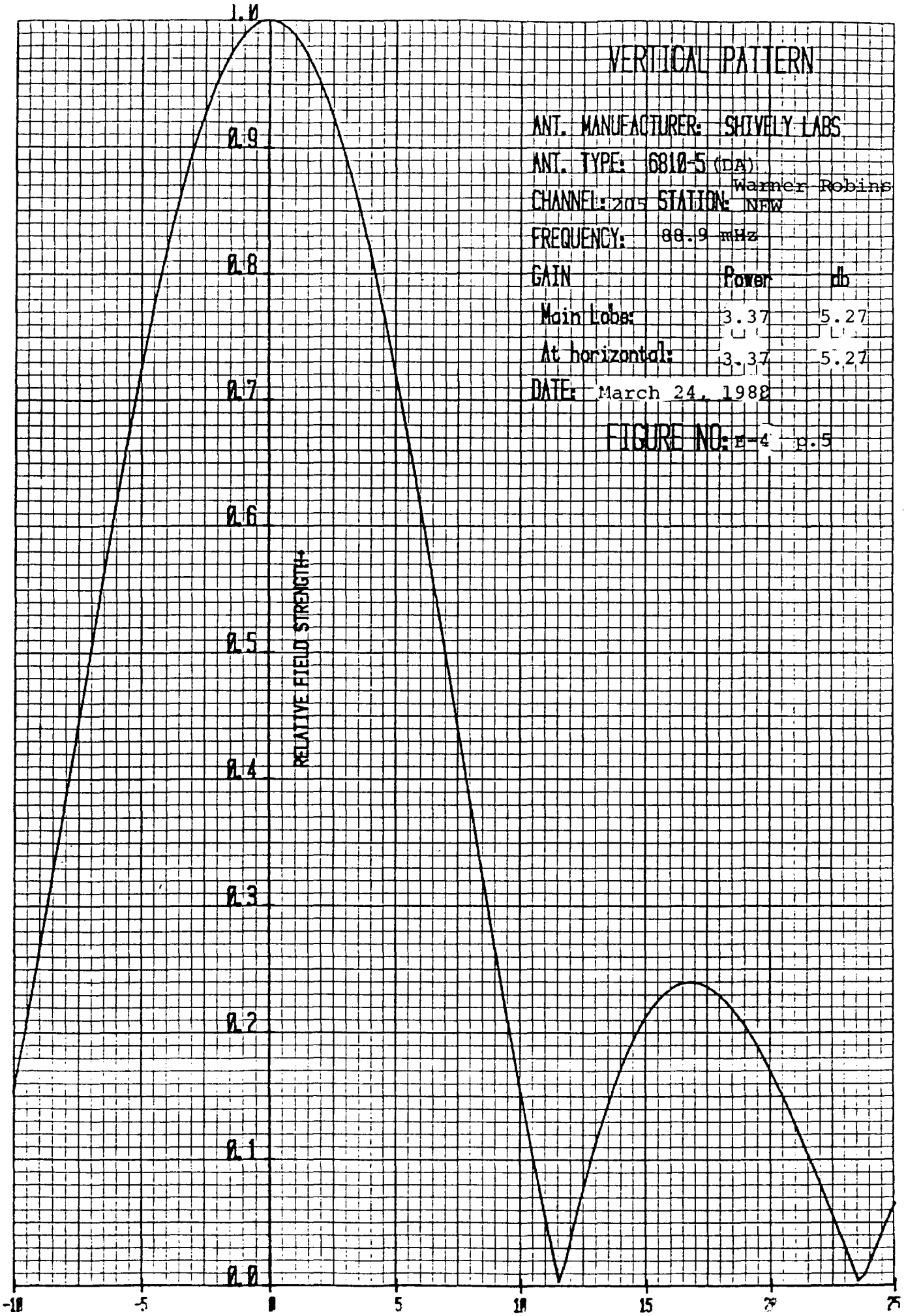
Drawn from Shively data
Model 6810-5(DA)
vertical will not exceed horizontal
polarization field

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE E-4 p3	STATION DATA
	TOWER No.	ELECTRICAL HEIGHT G°	SPACING S°	PHASING ψ°	FIELD RATIO F	PROPOSED FM-DA	CALL NEW
	1						FREQ 88.9 mHz
	2					PATTERN IN dBk	POWER 20 dBk max
	3						TYPE FM-DA
	4					Warner Robins,Ga	TIME Unlimited
	5						LAT. 32°36'55"
	6					Horizontal Pol.	LONG. 83°40'03"
	DAYTIME OPERATION ☐		NIGHTTIME OPERATION ☐			$\theta^\circ = 0$	E. HAROLD MUNN, JR. & ASSOCIATES, INC. COLDWATER, MICH.



vertical will not exceed horizontal

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE E-4 p4	STATION DATA
	TOWER No.	ELECTRICAL HEIGHT G°	SPACING S°	PHASING V°	FIELD RATIO F	PROPOSED FM-DA	CALL NEW
	1						FREQ 88.9 mHz
	2					PATTERN IN MV/M	POWER 100 kW max
	3						TYPE FM-DA
	4					Warner Robins,Ga	TIME Unlimited
	5						LAT. 32°36'55"
	6					Horizontal Pol.	LONG. 83°40'03"
	DAYTIME OPERATION ☐		NIGHTTIME OPERATION ☐			$\theta^{\circ}=0$	E. HAROLD MUNN, JR. & ASSOCIATES, INC. COLDWATER, MICH.



46 0780

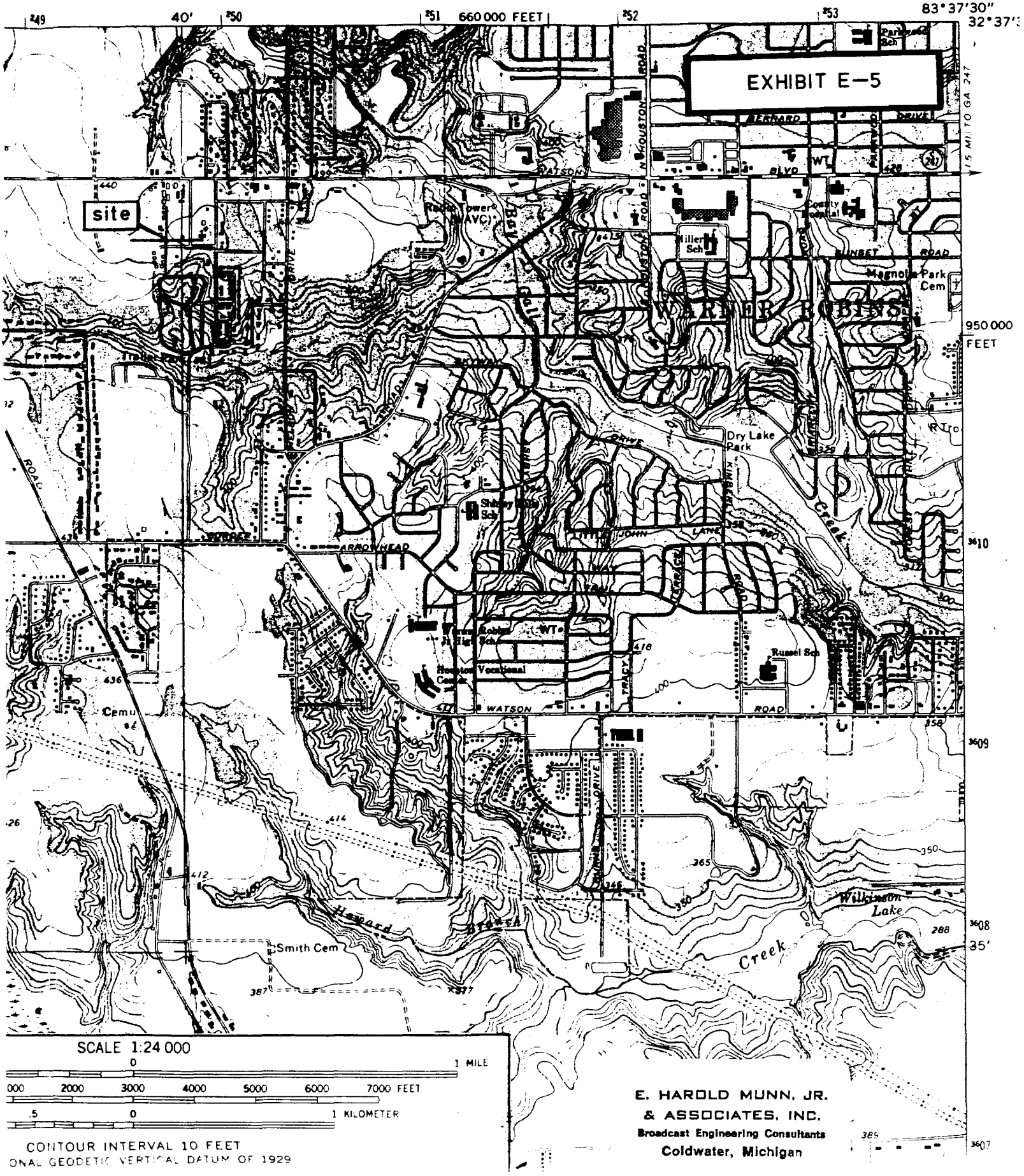
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

WARNER ROBINS SW QUADRANGLE

GEORGIA

7.5 MINUTE SERIES (TOPOGRAPHIC)

SW/4 WARNER ROBINS 15' QUADRANGLE



SCALE 1:24 000

0 — 1 MILE

000 2000 3000 4000 5000 6000 7000 FEET

.5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

ONAL GEODETIC VERTICAL DATUM OF 1929

E. HAROLD MUNN, JR.
& ASSOCIATES, INC.
Broadcast Engineering Consultants
Coldwater, Michigan

STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
GEOLOGIC AND WATER RESOURCES DIVISION

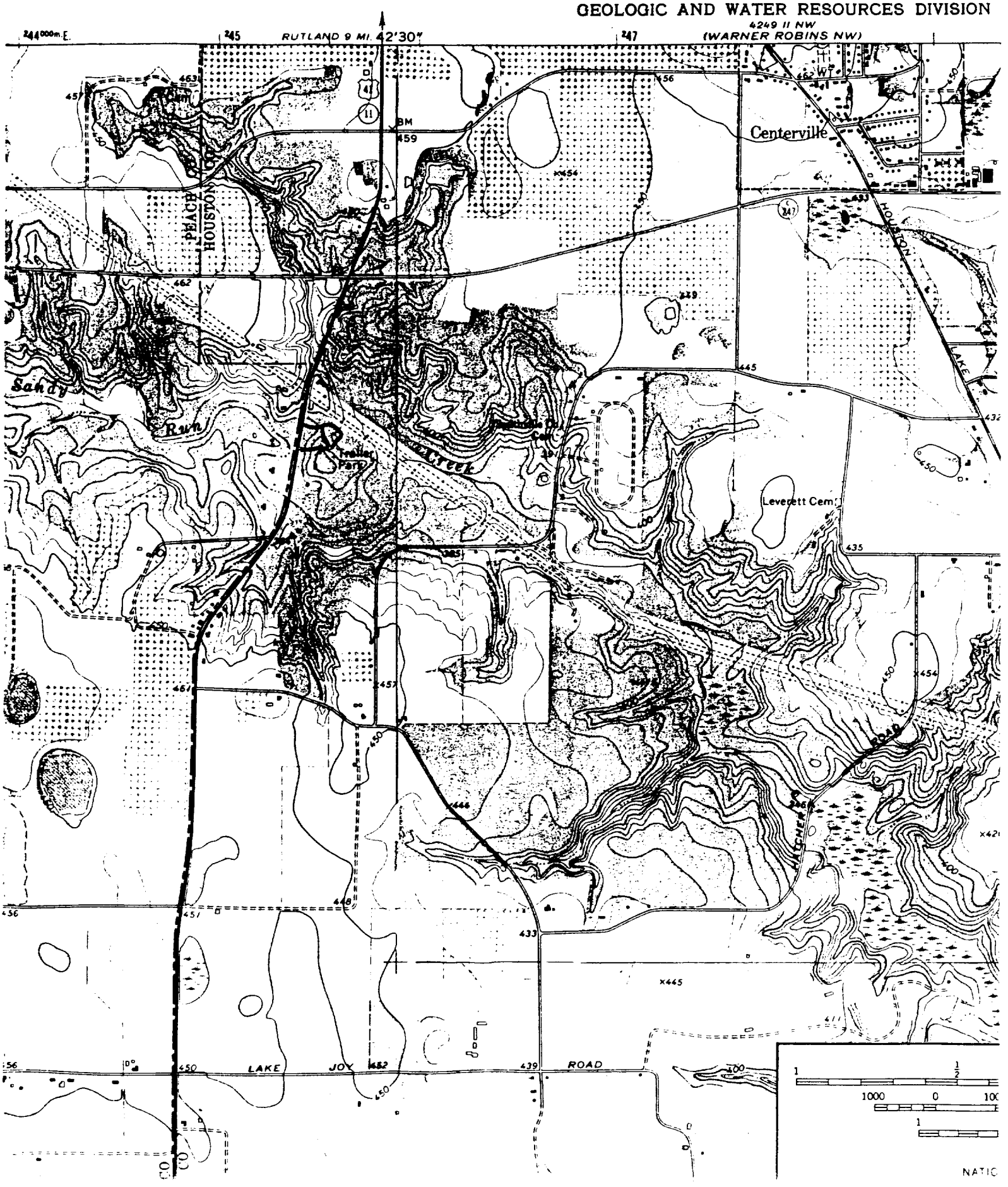


EXHIBIT E-5A
SITE
100/SFC
100/25
100/20
100/15
14
11
10
33
MACON TRSA
SEE TWR FREQ TAB
MACON
MONTEZUMA
HAWKINSVILLE
PULASKI CO
BAY CREEK
BEP
VIENNA
116.5 Ch 12 VNA
MOODY 1 MOA
Kilometers
Nautical Miles
Statute Miles
E. HAROLD MUNN, JR.
& ASSOCIATES, INC.
Broadcast Engineering Consultants
Coldwater, Michigan

TABULATION OF SPACINGS IN CHANNEL ALLOCATION

Site shown is that of an approved tower location per FAA notification.

FM SEARCH RESULTS FOR: W R CHRISTIAN ACADEMY - WARNER ROBINS GA N 32-36-55 W 83-40-03 CHANNEL # 205C1

CALL	LOCATION	STATE	CHANNEL	STATUS	N. LATITUDE	W. LONGITUDE	AZ DEG.	SEPARATION IN KM ACT	REQ	RESULT:
870513MC	DADEVILLE	AL	204C2	APP	32 51 20	85 46 31	278.3	199.0	158	CLEAR 41.0 KM
WRWA	DOTHAN	AL	204C2	LIC	31 12 30	85 36 51	230.1	241.0	158	CLEAR 83.0 KM
WLBF	MONTGOMERY	AL	206C1	APP	32 24 13	86 11 50	265.0	239.0	177	CLEAR 62.0 KM
WLBF	MONTGOMERY	AL	206C2	LIC	32 24 13	86 11 50	265.0	239.0	158	CLEAR 81.0 KM
WLBF	MONTGOMERY	AL	206C2	CP	32 24 13	86 11 50	265.0	239.0	158	CLEAR 81.0 KM
880120MG	TALLAHASSEE	FL	205C	APP	30 40 13	83 56 26	186.9	217.0	270	*SHORT* 53.0 KM
WMSL	ATHENS	GA	205A	CP	33 54 25	83 29 35	6.4	144.0	196	*SHORT* 52.0 KM
WRAS	ATLANTA	GA	203C1	CP	33 41 4	84 17 23	334.2	132.0	82	CLEAR 50.0 KM
WRAS	ATLANTA	GA	203C2	LIC	33 48 40	84 21 50	334.2	148.0	79	CLEAR 69.0 KM
WRFG	ATLANTA	GA	207C2	LIC	33 44 56	84 24 26	331.6	143.0	79	CLEAR 64.0 KM
WYFK	COLUMBUS	GA	208C2	CP	32 40 3	84 57 19	273.1	121.0	79	CLEAR 42.0 KM
WBCX	GAINESVILLE	GA	206A	LIC	34 19 1	83 49 45	355.5	189.0	129	CLEAR 60.0 KM
870417MB	MACON	GA	205C2	APP	32 46 55	83 41 39	352.3	19.0	224	*SHORT* 205.0 KM
WXGC	MILLEDGEVILLE	GA	205D	LIC	33 4 44	83 13 55	38.2	66.0	0	FYI
WBPS	WINDER	GA	208A	CP	33 59 32	83 45 15	357.0	153.0	74	CLEAR 79.0 KM
840629IO	AIKEN	SC	206C1	APP	33 24 15	81 50 19	62.3	192.0	177	CLEAR 15.0 KM

The map included as page 2 of this Exhibit shows the required protection for the licensed operation of WMSL, Athens, Georgia on Channel 205(A).

This application is mutually exclusive with BPED-870417MB, at Macon, Georgia, and with BPED-880120MG at Tallahassee, Florida.

No other stations require special consideration, due to the antenna height and power proposed in this application.

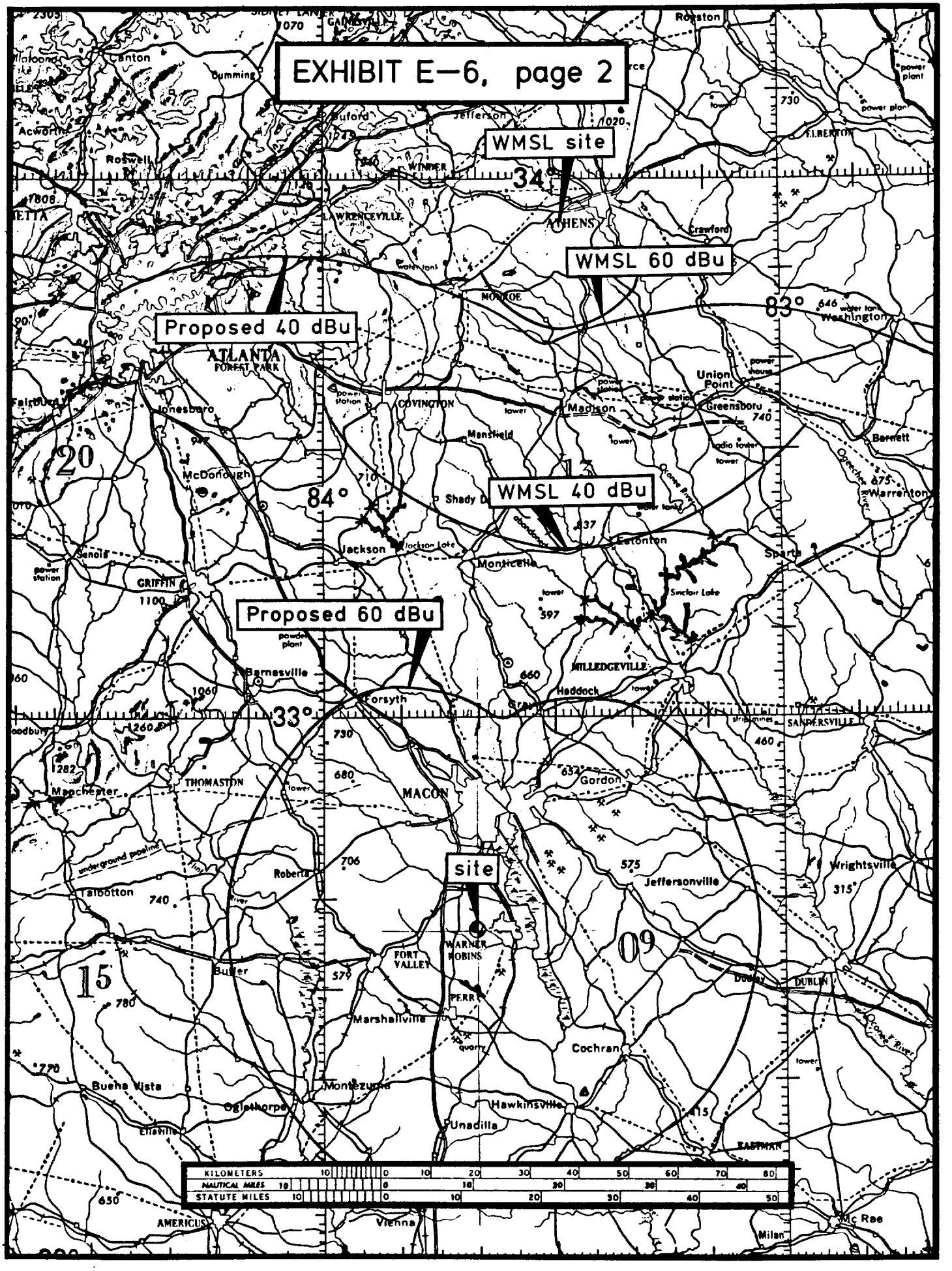
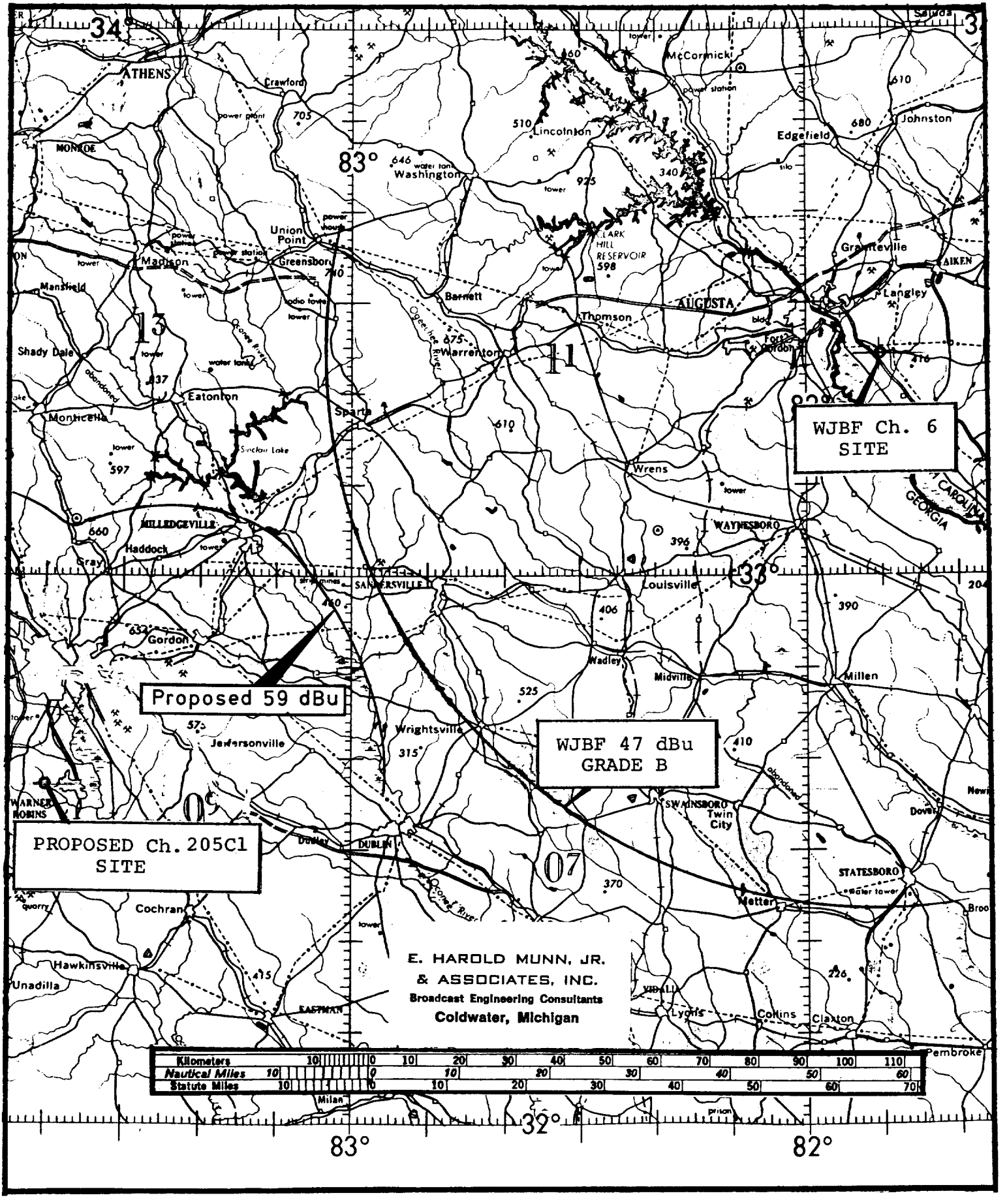


EXHIBIT E-6, page 2
WMSL site
WMSL 60 dBu
Proposed 40 dBu
WMSL 40 dBu
Proposed 60 dBu
site
34°
83°
84°
33°
20
15
09
ATLANTA
FOREST PARK
ATHENS
MONROE
COVINGTON
Madison
Greensboro
Union Point
Washington
Barnett
Warrenton
Jackson
Monticello
Eatonton
Sparta
Sinclair Lake
MILLEDGEVILLE
Haddock
Gordon
SANDERSVILLE
Jeffersonville
Wrightsville
DUBLIN
Dudley
Cochran
Hawkinsville
Unadilla
Marshallville
FORT VALLEY
WARNER ROBINS
PERRY
Roberta
MACON
Forsyth
Barnesville
GRIFFIN
Senoia
McDonough
Jonesboro
Fairburn
Canton
Cumming
Buford
Jefferson
Roswell
Acworth
LAWRENCEVILLE
WINDER
Crawford
Royston
ELBERTON
Mansfield
Shady D
Oconee River
Ogeechee River
Flint River
Manchester
THOMASTON
Talbotton
Butler
Buena Vista
Oglethorpe
Montezuma
Ellaville
AMERICUS
Vienna
Milan
Mc Rae
KILOMETERS
NAUTICAL MILES
STATUTE MILES

STUDY SHOWING NO INTERFERENCE TO CHANNEL 6 EXHIBIT E-7



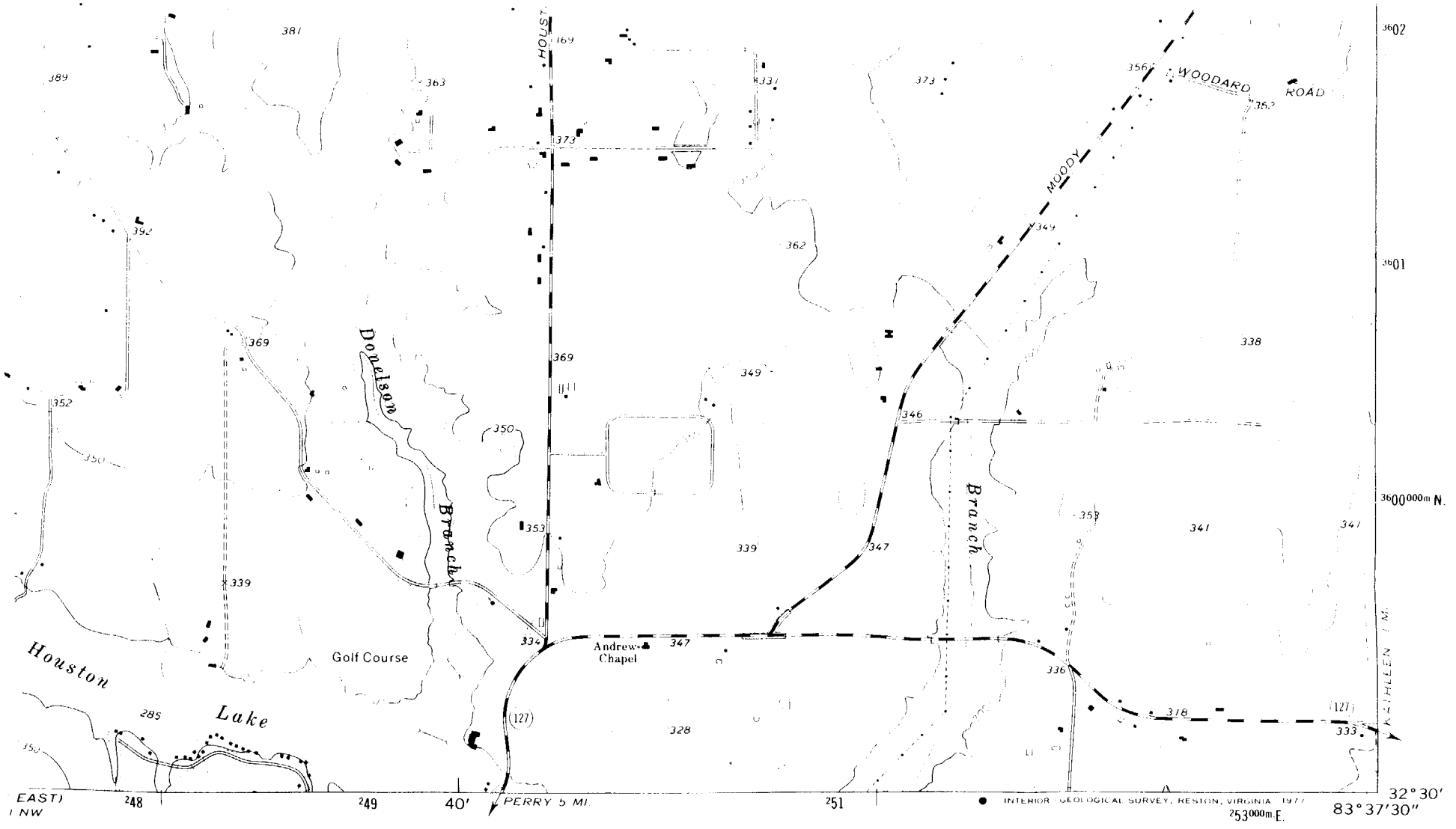
ADDITIONAL DATA CONCERNING TELEVISION CHANNEL 6

The closest Channel 6 television station to the proposed site at Warner Robins, Georgia, is WJBF, Augusta, Georgia. The details concerning the protection to WJBF are shown on the map, page 1, of this exhibit.

There is another Channel 6 television station located within 225 km of the proposed FM station, WCTV, Tallahassee Florida-Thomasville Georgia. The spacing to WCTV is 217 km. The WCTV Grade "B" (47 dBu) contour extends 129 km toward Warner Robins.

The proposed FM 59 dBu contour (50/10) will extend 68 km toward WCTV. Thus, there is 20 km clearance between the WCTV Grade B contour and the proposed FM interference contour.

Full compliance with Sec.73.525 of the rules is attained by this application.



1:24 000

1 MILE

0 4000 5000 6000 7000 FEET

1 KILOMETER

RVAL 10 FEET
RTICAL DATUM OF 1929

QUADRANGLE LOCATION

ROAD CLASSIFICATION

Primary highway, hard surface

Light-duty road, hard or improved surface

Secondary highway, hard surface

Unimproved road

Interstate Route U. S. Route State Route

(HAYNEVILLE) 4248 I NE

WARNER ROBINS SW, GA.

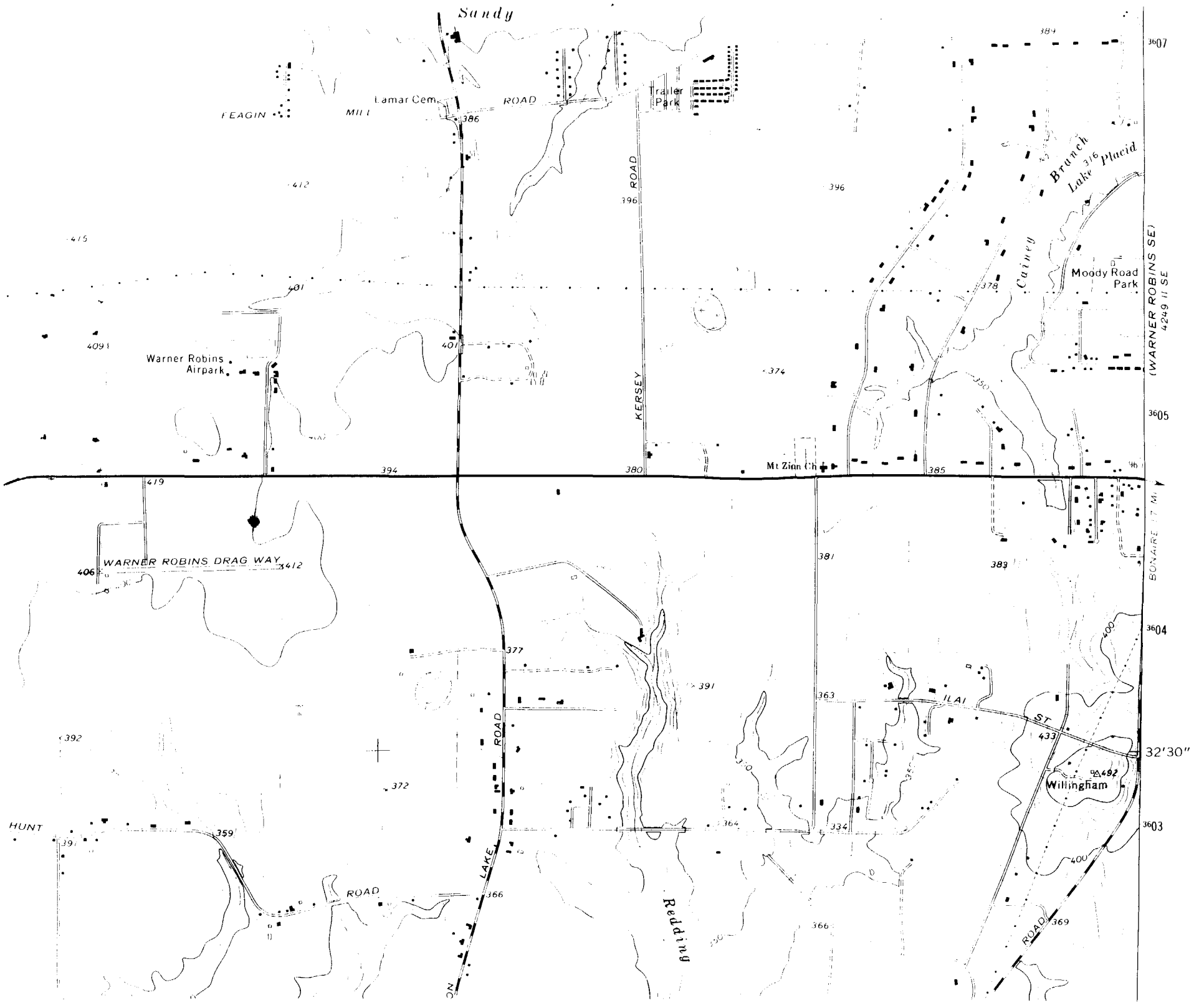
SW/4 WARNER ROBINS 15' QUADRANGLE

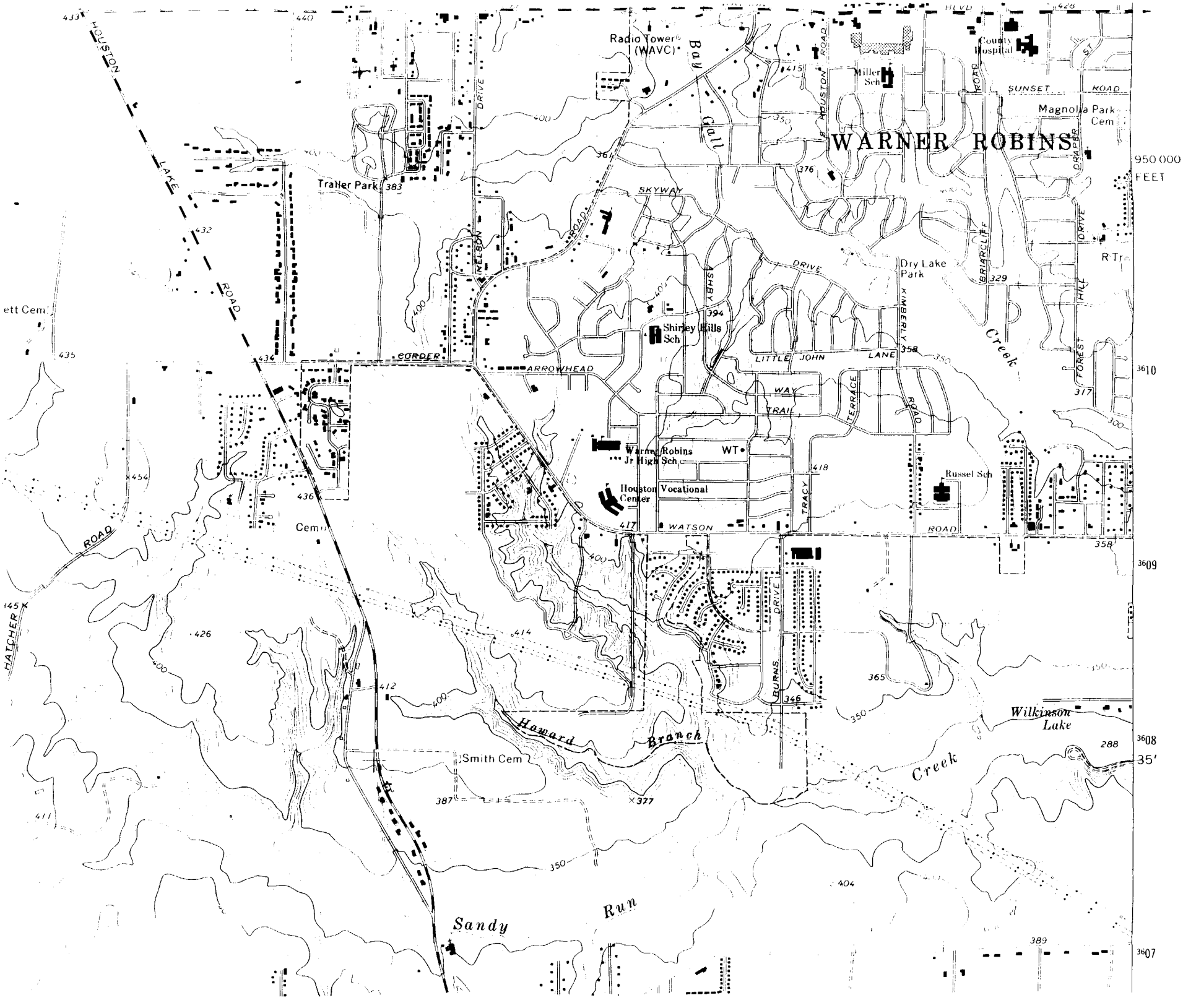
N3230—W8337.5/7.5

1973

AMS 4249 II SW—SERIES V845

AL MAP ACCURACY STANDARDS
URVLY, RESTON, VIRGINIA 22092
AND SYMBOLS IS AVAILABLE ON REQUEST


Sandy
FEAGIN
MILL
Lamar Cem
ROAD
Trailer Park
KERSEY
ROAD
Branch
Lake Placid
Cainey
Moody Road Park
Warner Robins Airpark
Mt Zion Ch
WARNER ROBINS DRAG WAY
LAKE
ROAD
HUNT
ROAD
Redding
ILAI
ST
Willingham
ROAD
(WARNER ROBINS SE)
4249 II SE
BONAIRE 17 MI
3607
3605
3604
3603
32'30"

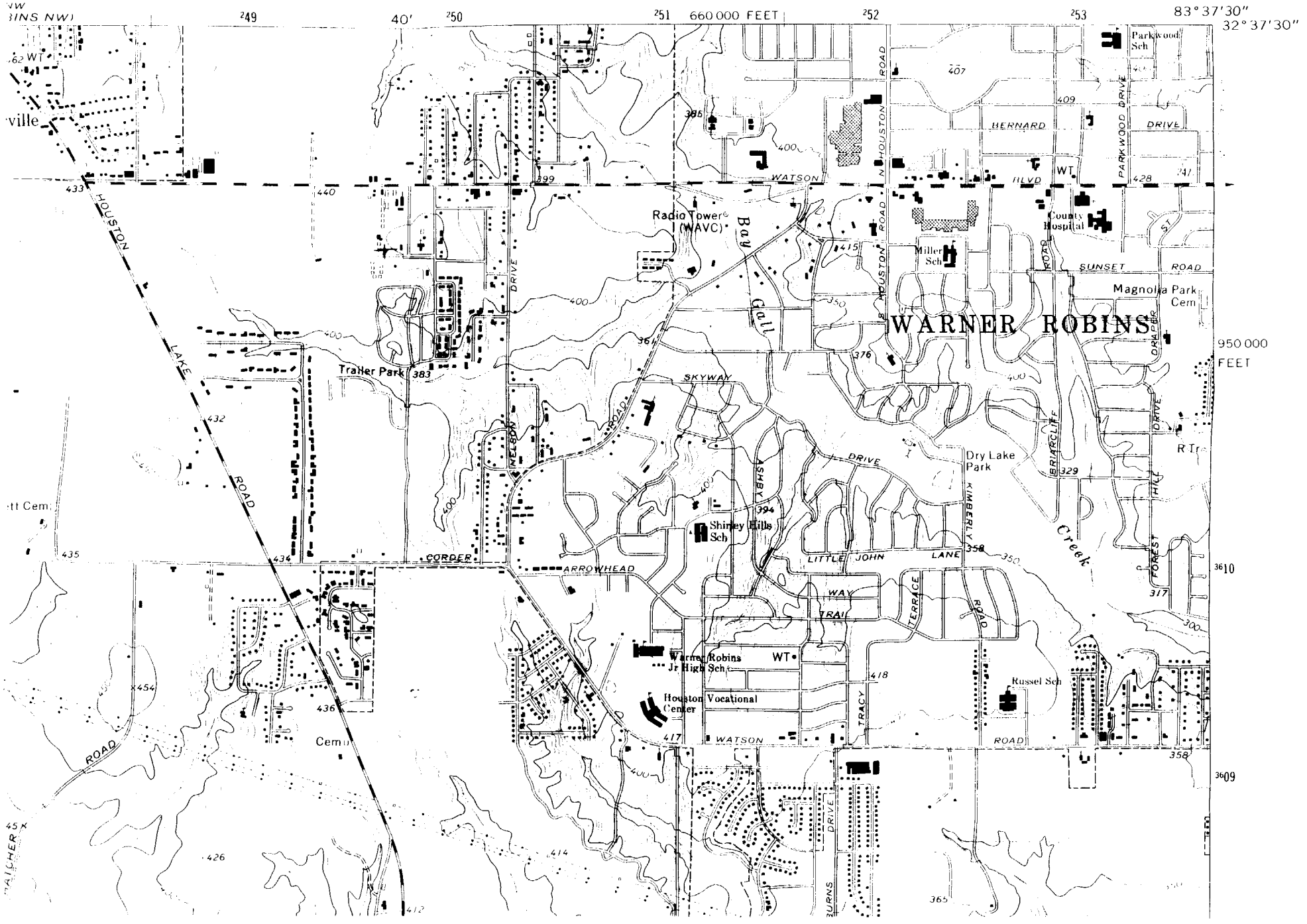

WARNER ROBINS
Radio Tower (WAVC)
County Hospital
Miller Sch
Magnolia Park Cem
Trailer Park
Dry Lake Park
Shirley Hills Sch
Warner Robins Jr High Sch
Houston Vocational Center
Russel Sch
Smith Cem
Wilkinson Lake
Bay Gall Creek
Howard Branch
Sandy Run
Creek
HOUSTON LAKE ROAD
HATCHER ROAD
NELSON DRIVE
SKYWAY ROAD
CORDER ROAD
ARROWHEAD DRIVE
ASHBY DRIVE
KIMBERLY ROAD
LITTLE JOHN LANE
TRAIL WAY
TRACY TERRACE
WATSON ROAD
BURNS DRIVE
SUNSET ROAD
DRAPER ST
BRIARCLIFF DRIVE
FOREST HILL
950 000 FEET
3610
3609
3608
35'

GEORGIA
TURAL RESOURCES
RESOURCES DIVISION

WARNER ROBINS SW QUADRANGLE

GEORGIA

7.5 MINUTE SERIES (TOPOGRAPHIC)

SW/4 WARNER ROBINS 15' QUADRANGLE

4249 II NE (WARNER ROBINS NE)