

JOHN H. MULLANEY, P.E.
JOHN J. MULLANEY

MULLANEY ENGINEERING, INC.

9049 SHADY GROVE COURT
GAITHERSBURG, MD 20877

301 921-0115

ENGINEERING EXHIBIT EE-3:

RADIO STATION KELP
McCLATCHEY BROADCASTING COMPANY
EL PASO, TEXAS
1590 khz 0.8/5.0 kw DA-2-U Class III

JULY 19, 1989

ENGINEERING STATEMENT IN SUPPORT OF
AN AMENDMENT OF THE
DAYTIME CONSTRUCTION PERMIT
(FILE NO. BP-890123AF)

MULLANEY ENGINEERING, INC.

ENGINEERING EXHIBIT EE-3:

RADIO STATION KELP(AM)
McCLATCHEY BROADCASTING COMPANY
EL PASO, TEXAS
1590 kHz 0.8/5.0 kW DA-2-U

TABLE OF CONTENTS:

1. Declaration of Engineer
2. F.C.C. Form 301, Section V-A
3. Narrative Statement
4. Figure 1, General Design Formulas
5. Figure 2, Theoretical Parameters of Proposed Daytime Array
6. Figure 3, Tabulation of Daytime Standard Horizontal Pattern
7. Figure 4, Plot of Daytime Standard Horizontal Pattern at 1 km.
8. Figure 5, Daytime M-3 Allocation Map
9. Figure 6, Map, Proposed Service Contours
10. Figure 7, Map, Proposed Site & 1000 mV/m Contours
11. Figure 8, 25 mV/m Nighttime Protection to XEJPV, 1560 kHz.
12. Figure 9, Vertical Tower Sketch
13. Figure 10, Plat of Proposed Site

MULLANEY ENGINEERING, INC.

14. Table 1, Tabulation of M-3 Conductivities from Proposed Site

15. Table 2, Tabulation of Distance to Daytime Contours

16. Table 3, Facilities within 8 km of Proposed Site

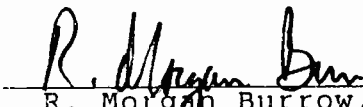
17. Appendix: FAA Form 7460-1 Determination for Proposed Site

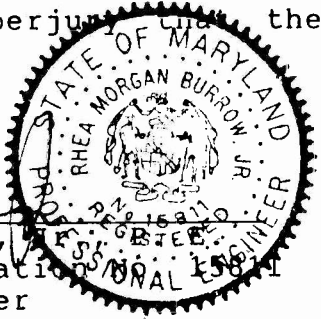
MULLANEY ENGINEERING, INC.

DECLARATION

R. Morgan Burrow, Jr., declares and states that he is a radio engineer whose qualifications are known to the Federal Communications Commission, and that he is an associate engineer in the firm of Mullaney Engineering, Inc., and that the firm has been retained by McClatchey Broadcasting Company, licensee of Radio Station KERP, to prepare an Engineering Statement amending the daytime construction permit to conform the antenna array physical parameters to the nighttime values as a result of staff requests concerning the nighttime proposal.

He further states that various calculations and exhibits associated with this engineering statement were prepared by him personally or by others under his direct supervision. Mr. Burrow is a registered professional engineer in the District of Columbia, the state of Maryland, and the Commonwealth of Virginia. Affiant further states that all facts contained herein are true of his own knowledge, except where stated to be on information or belief, and, as to those facts, he believes them to be true. He declares under penalty of perjury that the foregoing is true and correct.


R. Morgan Burrow, Jr.
Maryland Registered Professional Engineer
Associate Engineer



Executed on this 19th day of July, 1989.

Section V-A - AM BROADCAST ENGINEERING DATA	FOR COMMISSION USE ONLY File No. _____ ASB Referral Date _____ Referred by _____
--	---

Name of Applicant

McClatchey Broadcasting Company

1. Purpose of Application: *(check all appropriate boxes)*

- Construct new station
- Make changes in authorized/existing station
 - Principal authorized/licensed community
 - Frequency
 - Power
 - Main studio location
- Antenna system *(including increase in height by addition of FM or TV antenna)*
 - New antenna construction
 - Alteration of existing structure
 - Increase height
 - Non-DA to DA
 - Decrease height
 - DA to Non-DA

Call Sign KELP

Other *(Summarize briefly the nature of the changes proposed)*

Amend Daytime C.P. (ARN890123AF)

2. Principal community to be served:

State TX	County El Paso	City or Town El Paso
--------------------	--------------------------	--------------------------------

3. Facilities requested:

Frequency: 1590 kHz Hours of Operations: **Unlimited**
 Power: Night: 0.8 kW Day: 5.0 kW Critical hours: --- kW

4. Transmitter location:

State TX	County El Paso	City or Town El Paso
--------------------	--------------------------	--------------------------------

Exact antenna location *(street address)*. If outside city limits, give name of nearest town and distance *(in kilometers)*, and direction of antenna from town. **Chamizal Border Highway and Springfield Road, El Paso, Texas**

Geographical coordinates *(to nearest second)*. For directional antenna give coordinates of center of array. For single vertical radiator give tower location. Specify South Latitude or East Longitude where applicable; otherwise, North Latitude or West Longitude will be presumed.

Latitude	31	44	38	Longitude	106	23	45
----------	----	----	----	-----------	-----	----	----

5. Is the proposed site the same transmitter-antenna site of other stations authorized by the Commission or specified in another application pending before the Commission? Yes No

If Yes, indicate call sign or application file number: 890123AF (Day)

6. Antenna system (including ground or counterpoise system)

Non-Directional Day Night Critical Hours

Estimated efficiency _____ mV/m per kW at one kilometer

If antenna is either top loaded or sectionalized, describe fully in an Exhibit.
(Include apparent electrical height.)

Exhibit No.
EE-3

Directional Day only (DA-D) Night only (DA-N)
 Same constants and power day and night (DA-1)
 Different constants and/or power day and night (DA-2)
 Different constants and/or power day, critical hours and night (DA-3)

Submit complete engineering data in accordance with 47 C.F.R. Section 73.150 for each Directional antenna pattern proposed.

Type of feed circuits (excitation) Series Feed Shunt Feed Other (explain)
 Folded Unipole

TOWERS (In meters, rounded to nearest meter)	1	2	3	4	5	6
Overall height of radiator above base insulator, or above base, if grounded	37.8m	37.8	37.8			
Overall height above ground (include obstruction lighting)	40.8m	40.8	40.8			
Overall height above mean sea level (include obstruction lighting)	1163.8m	1163.8	1163.8			

If additional towers, attach information exactly as it appears above.

7. Has the FAA been notified of the proposed construction? Yes No

If Yes, give date and office where notice was filed and attach as an Exhibit a copy of FAA determination, if available.

Exhibit No.
DNA

On File

Date January 16, 1989 Office where filed Southwest Region, Fort Worth, TX

8. List all landing areas within 8 kilometers of antenna site. Give distances and direction to the nearest boundary of each landing area from the antenna site.

Landing Area	Distance (km)	Direction
(a) <u>El Paso International</u>	<u>7.15</u>	<u>14.2°T</u>
(b) _____	_____	_____
(c) _____	_____	_____

9. Attach as an Exhibit a description and vertical plan sketch including supporting buildings, if any, of the proposed structure, giving heights above ground, in meters, for all significant features. Clearly indicate existing portions, noting lighting, and distinguishing between the skeletal or other main supporting structure and the antenna elements. If a directional antenna, give spacing and orientation of towers.

Exhibit No.
EE-3

If not fully described above, attach as an Exhibit further details and dimensions, including any other antennas mounted on tower and associated isolation circuits.

Exhibit No.
DNA

Attach as an Exhibit, a plat of the transmitter site clearly showing boundary lines, roads, railroads, other obstructions, and the ground system or counterpoise. Show number and dimensions of ground radials or, if a counterpoise is used, show heights and dimensions.

Exhibit No.
EE-3

10. Will the main studio be located within the station's principal community contour as defined by 47 C.F.R. Section 73.24(j)? Yes No

If No, attach as an Exhibit a justification pursuant to 47 C.F.R. Section 73.1126.

Exhibit No.
DNA

11. Is there a remote control location or is one to be established in accordance with 47 C.F.R. Section 73.1400? Yes No

If yes, submit the following:

State TX	County El Paso	City or Town El Paso
Street address (or other identification) To Be Determined		

12. Attach as an Exhibit a sufficient number of aerial photographs taken in clear weather at appropriate altitudes and angles to permit identification of all structures in the vicinity. The photographs must be marked so as to show compass directions, exact boundary lines of the proposed site, and locations of the proposed 1000 mV/m contour for both day and night operation. Photographs taken in eight different directions from an elevated position on the ground will be acceptable in lieu of the aerial photographs if the data referred to can be clearly shown.

Exhibit No.
DNA

On File

13. Is the population within the 1 V/m (1000 mV/m) contour less than 300 persons or less than 10 percent of the population within the 25 mV/m contour? Yes No

If No, attach as an Exhibit a justification pursuant to 47 C.F.R. Section 73.24(g).

Exhibit No.
EE-3

14. Environmental Statement. (See 47 C.F.R. Section 1.1301 et seq.)

Would a Commission grant of this application come within 47 C.F.R. Section 1.1307, such that it may have a significant environmental impact? Yes No

If you answer Yes, submit as an Exhibit an Environmental Assessment required by 47 C.F.R. Section 1.1311.

Exhibit No.
EE-3

If No, explain briefly why not.

15. Allocation Studies

A. Daytime (For assistance, see 47 C.F.R. Section 73.371)

(1) For daytime operation, attach as an exhibit map(s) having appropriate scales, showing the 1000, 5, 2 and 0.5 (0.1, if Class I station) daytime contours in mV/m for both existing and proposed operations. On the map(s) showing the 5 mV/m contours **CLEARLY INDICATE THE LEGAL BOUNDARIES OF THE PRINCIPAL COMMUNITY TO BE SERVED.**

Exhibit No.
EE-3

(2) Does the daytime 5 mv/m contour encompass the legal boundaries of the principal community to be served?

Yes No

If No, attach as an Exhibit a justification for waiver of 47 C.F.R. Section 73.24(j).

Exhibit No.
EE-3

(3) For daytime operation, attach as an Exhibit an allocation study utilizing Figure M-3 (Figure R-3 47 C.F.R. Section 73.1901) or an accurate full scale reproduction thereof and using pertinent field strength measurement data where available, a full scale exhibit of the entire pertinent area to show the following:

Exhibit No.
EE-3

(a) Normally protected and the interfering contours for the proposed operation along all azimuths.

(b) Normally protected and interfering contours of existing stations and other proposed stations in pertinent areas with which prohibited overlap would result as well as those existing stations and other proposals which require study to clearly show absence of prohibited overlap. If prohibited overlap were to occur as a result of the proposal, appropriate justification for waiver of 47 C.F.R. Section 73.37 is to be included.

(c) Plot of the transmitter location of each station or proposal requiring investigation, with identifying call letters, file numbers, and operating or proposed facilities.

(d) Properly labeled longitude and latitude degree lines, shown across entire Exhibit.

(4) For daytime operation, attach as an Exhibit a tabulation of the following:

Exhibit No.
EE-3

(a) Azimuths along which the groundwave contours were calculated for all stations or proposals shown on allocation study exhibits required by (3)(a).

(b) Inverse distance field strength used along each azimuth.

(c) Basis for ground conductivity utilized along each azimuth specified in (4)(a). If field strength measurements are used, the measurements must be either submitted or be properly identified as to location in Commission's files.

(d) Calculated distances.

B. Critical Hours (If applicable, see 47 C.F.R. Section 73.187)

(1) For critical hour operation, attach as an Exhibit map(s) having appropriate scales, showing the 1000, 5 and 0.5 critical hours contours in mV/m for both existing and proposed operations. On the map(s) showing the 5 mV/m contours **CLEARLY INDICATE THE LEGAL BOUNDARIES OF THE PRINCIPAL COMMUNITY TO BE SERVED.**

Exhibit No.
DNA

(2) Does the critical hours 5 mV/m contour encompass the legal boundaries of the principal community to be served?

Yes No

If No, attach as an Exhibit justification for waiver of 47 C.F.R. Section 73.24(j).

Exhibit No.
DNA

(3) For critical hours operation, attach as an Exhibit an allocation study utilizing Figure M-3 (Figure R-3 47 C.F.R. Section 73.1901) or an accurate full scale reproduction thereof and using pertinent field strength measurement data where available, a full scale exhibit of the entire pertinent area to show the following: The 0.1 mV/m groundwave contour pertinent arcs of Class I stations and appropriate studies to establish compliance with 47 C.F.R. Section 73.187 when operation is proposed on a U.S. Class I channel.

Exhibit No.
DNA

C. Nighttime. (For assistance, see 47 C.F.R. Section 73.182)

(1) For nighttime operation, attach as an Exhibit map(s) having appropriate scales, showing the 1000 mV/m and coverage contours (appropriate minimum protected value for proposed class of station, or RSS nighttime interference-free contour, whichever is the greater value) for both existing and proposed operations. On the map(s) showing the interference-free contours, CLEARLY INDICATE THE LEGAL BOUNDARIES OF THE PRINCIPAL COMMUNITY TO BE SERVED.

Exhibit No. DNA

(2) Does the nighttime coverage contour encompass the legal boundaries of the principal community to be served? DNA

Yes No

If No, attach as an Exhibit justification for waiver of, or exemption pursuant to 47 C.F.R. Section 73.24(j).

Exhibit No. DNA

(3) For nighttime operation, attach as an Exhibit allocation data including the following:

Exhibit No. DNA

(a) Proposed nighttime limitation to other existing or proposed stations with which objectionable interference could result, as well as those other proposals and existing stations which require study to show clearly absence of objectionable interference.

(b) All existing or proposed nighttime limitations which enter into the nighttime RSS limitation of each of the existing or proposed facilities investigated under (3)(a) above.

(c) All existing and proposed limitations which contribute to the RSS nighttime limitation of the proposed operation, together with those limitations which must be studied before being excluded.

(d) A detailed interference study plotted upon an appropriate scale map if a question exists with respect to nighttime interference to other existing or proposed facilities along bearing other than on a direct line toward the facility considered. (Clipping study)

(e) The detailed basis for each nighttime limitation calculated under (3)(a), (b), (c) and (d) above.

18. Attach as an Exhibit a map (7.5 minute U.S. Geological Survey topographic quadrangles, if available) of the proposed antenna location showing the following information:

Exhibit No. EE-3

A. Proposed transmitter location accurately plotted with the latitude and longitude lines clearly marked and showing a scale in kilometers.


B. Heights of buildings or other structures and terrain elevations in the vicinity of the antenna, indicating the location thereof.

C. Transmitter location and call signs of non-broadcast radio stations (except amateur and citizens band), established commercial and government receiving stations in the general vicinity which may be adversely affected by the proposed operation.

D. Transmitter location and call letters of all AM, FM and TV broadcast stations within three (3) kilometers of the proposed antenna location.

CERTIFICATION

I certify that I have prepared this Section of this application on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name (Typed or Printed) R. Morgan Burrow, Jr., P.E.	Relationship to Applicant (e.g., Consulting Engineer) Consulting Engineer
Signature 	Address (Include ZIP Code) Mullaney Engineering, Inc. 9049 Shady Grove Court Gaithersburg, MD 20877
Date July 19, 1989	Telephone No. (Include Area Code) (301) 921-0115

MULLANEY ENGINEERING, INC.

ENGINEERING EXHIBIT EE-3:

RADIO STATION KELP
McCLATCHEY BROADCASTING COMPANY
EL PASO, TEXAS
1590 kHz 0.8/5.0 kW DA-2-U

NARRATIVE STATEMENT:

I. GENERAL:

This engineering statement has been prepared on behalf of McClatchey Broadcasting Company, licensee of Radio Station KELP, El Paso, Texas. The purpose of this statement is to **amend** the daytime construction permit (File No. BP-890123AF). An amendment was requested by the Commission's AM Branch staff via the letter of April 18, 1989 (Reference 8910-JBS) concerning the proposed nighttime service. Subsequent to this, the staff subsequently requested this amendment on account of further inconsistencies in Mexican allocations affecting the nighttime proposal on file. In order to make the nighttime allocation work without another power reduction, it was necessary to slightly change the physical layout of the array. Therefore, amendment of the construction permit for the KELP daytime facility is mandatory. **This amendment supersedes previous daytime proposals for KELP.**

KELP will operate in a directional mode during daytime hours at a power level of 5.00 kW, from a new antenna site 4.13 kilometers (2.57 miles) southeast of the present tower site of KELP. The 5.0 mV daytime contour covers 92 percent of the city limits of El Paso; therefore this proposal shows "substantial compliance" with Section 73.24(j).

The amendment of the daytime construction permit is a **minor change** to the original proposal.

Radio Station KELP presently operates on 1590 kHz, Class III, 5.0 kW-NDA-D with a theoretical RMS at normal operating power of 662.144 mV/m at one kilometer.

KELP is currently facing eviction from its present site. The city of El Paso has zoned KELP to use a vacant parcel of land for the new site. Therefore, the day application and the nighttime application were filed separately to enhance processing of the daytime application due to the eminent eviction and loss of the present site. Therefore, KELP respectfully requests expedited processing of this amendment.

The proposal remains a minor environmental impact, as defined by Section 1.1307 of the Commission's Rules. The amended facility is in full compliance with the FCC / ANSI Radiation Guidelines.

Answers to questions contained in F.C.C. Form 301, Section V-A, are incorporated in the following paragraphs and figures.

II. ENGINEERING DISCUSSION:

A. Proposed Location:

KELP proposes to erect a directional array for night and day operation at a new site approximately 4.88 miles southeast of the present antenna location. The towers will be configured as folded unipoles.

The geographic coordinates of the proposed site as shown in Figure 7, the Ysleta, Texas USGS 7.5 min. topographic map are:

Latitude: 31⁰ 44' 38"
Longitude: 106⁰ 23' 45"

The proposed site is approximately 4.83 kilometers (3 miles) Southeast of the center coordinates of the city of license, El Paso, Texas. The Southern Regional Office of the FAA was notified of this proposal on January 31, 1989.

B. Pre-Sunrise & Post-Sunset Authorizations:

Grant of this application will supersede any existing Pre-Sunrise or Post-Sunset authorizations.

C. Proposed Antenna:

KELP proposes to utilize three uniform-cross-section triangular guyed towers 37.8 meters (124 ft.) tall, with 3.05 meter (10 ft.) foundations, at a ground level of 3685 ft. (1123.2 meters) AMSL, producing an overall height of 1164.0 meters (3819 ft.) AMSL. The 37.8 meter towers will be configured as folded unipoles; the associated ground radials will be 47.25 meters (155 feet) or 1/4 wavelength long. These towers will be used for both daytime and nighttime operation using different electrical parameters for each mode.

Generalized design formulas for the directional antenna are provided in Figure 1. The theoretical daytime antenna parameters are provided in Figure 2. The standard daytime horizontal radiation pattern and plot are given in Figures 3 and 4, respectively. The daytime allocation map and service contour map are provided in Figures 5 and 6, respectively. Tabulations of M-3 conductivities and distances to contours

for KELP's amendment are provided in Tables 1 and 2, respectively. A tower sketch and revised plat showing the location of the towers on the site are provided in Figures 9 and 10. Site photographs are on file with the original application.

A broad band antenna tuning unit with toroidal metering for remote antenna current shall be employed to match each transmission line to the input impedance of each unipole antenna.

D. Daytime Allocation:

Figure 2 provides the amended theoretical parameters for the KELP daytime operation. Figure 3 is a tabulation of the standard horizontal daytime antenna pattern and Figure 4 is a plot of the standard horizontal daytime pattern. Figure 5 is a plot on an M-3 map showing the daytime allocation. The daytime proposal serves 496,150 people within the 0.5 mV/m contour. The requirement for the directional array for daytime operation is the third-adjacent channel facility XEJPV on 1560 kHz. International treaty requires no overlap of the respective daytime 25.0 mV/m ground wave contours.

E. Blanketing Interference:

The proposed transmitter site is in a mixed-use area as directed by the City of El Paso, shown on Figure 7. The worst-case blanketing interference will be during daytime hours with the 5.0 kilowatt operation. The population within the 1000 mV/m daytime blanket contour is 4,146 people; the population within the 25 mV/m contour is 284,773 people. This figure is slightly above the 1.0 percentage specified by Section 73.24(g) of the Commission's rules. The proposed daytime pattern is not significantly different in size or

shape from the pattern KELP holds a construction permit for.

Any interference problems brought to the attention of the applicant from affected entities within the 1000 mV/m contour from the proposed site will be corrected by the applicant as a condition of grant.

F. Other services:

Table 3 is a detail listing of other services within 8 km. of the proposed site. There are three other known U. S. AM broadcast facilities and one Mexican AM Broadcast station within 3.2 kilometers (2 miles) of the proposed site. There are no existing FM facilities and one Mexican TV facility within 8 kilometers (5.0 miles) of the proposed site. There are three two-way facilities within 3.2 km (2 miles) of the proposed site. However, based upon the type of transmitter employed, and the frequency and power involved, no intermodulation problems with existing transmitting facilities should be expected. In the unlikely event some problems would occur, the applicant will correct such cases in accordance with the Commission's Rules.

International agreement requires that the third adjacent channel 25.0 mV/m contours be protected. XEJPV in Zarigoza, CI, Mexico on 1560 kHz. requires protection of its 25 mV/m contour and required KELP to use a directional antenna array from the proposed site. Figure 8 shows the protection afforded to the XEJPV 25.0 mV/m daytime contour.

G. Environmental Assessment Statement:

KELP believes its proposal will not significantly affect the environment since it does not meet any of the criteria specified in Section 1.1307 of the rules. Specifically the proposed facility:

1. Will NOT be located in an officially designated wilderness area.
2. Will NOT be located in officially designated wildlife preserve.
3. Will NOT affect districts, sites, buildings, structures or objects, significant in American history, architecture, archeology or culture, that are listed in the National Register of Historic Places or are eligible for such listing.
4. Will NOT be located in a floodplain.
5. Will NOT result in construction that will involve a significant change in the surface features (e.g. wetland fill, deforestation or water diversion).
6. Will NOT involve the use of high intensity white lights on a structure located in a residential neighborhood, as defined by the applicable zoning laws.
7. Will NOT involve the exposure of workers or the general public to levels of radiofrequency radiation in excess of the "Radio Frequency Protection Guide" recommended by ANSI (C95-1-1982).

The following is a more detailed discussion of this protection standard:

a. National Environmental Policy Act of 1969:

In 1969, Congress enacted the National Environmental Policy Act (NEPA), which requires the FCC to evaluate the potential environmental significance of the facilities it regulates and authorizes. Human exposure to Radio Frequency (RF) radiation has been identified as an issue the FCC must consider.

Beginning with the filing of applications after January 1, 1986, broadcast stations will be required to "certify compliance" with FCC prescribed guidelines on human exposure to RF radiation. The FCC is using as its processing guidelines, the American National Standards Institute's (ANSI) RF radiation protection guides (ANSI C95.1-1982). These exposure limits are expressed in terms of milli-watts per centimeter squared.

These exposure limits are time averaged over any six minute period and vary depending upon the frequency involved:

Frequency Range (MHz) *****	Power Density (mW/cm.sq.) *****	
0.3 to 3	100	AM
3 to 30	$900/(\text{Freq}^2)$	
30 to 300	1.0	VHF TV & FM
300 to 1,500	$\text{Freq}/300$	UHF TV
1500 to 100,000	5.0	

(same as ANSI standard)

For AM Broadcast Stations which operate between 540 to 1600 KHz the relevant quantities to be evaluated are the electric field strength (in Volts per Meter) and the magnetic field strength (in Amperes per Meter). Consequently, the 100 milli-watts per centimeter squared limit given above converts to an electric field strength limit of 632 V/M and a magnetic field strength limit of 1.58 A/M.

The following table indicates the minimum safe distance that a human must be from an AM tower for various power levels:

Transmitter Power (KW) *****	Distance (Meters) *****	Transmitter Power (KW) *****	Distance (Meters) *****
0.10	<2	5.0	5
0.25	<2	10.0	7
0.50	<2	25.0	9
1.00	3	50.0	12
2.50	4		

(1 Meter = 3.2808 Feet)

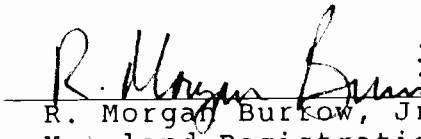
The proposal will operate with no more than 5.00 KW in any mode (day or night) from any one tower and therefore applicant plans to install a wooden fence which will restrict access by humans within a radius of 5.0 Meters or 16.4 feet of the base of the tower. Consequently, through the use of a fence No **AM** Radiation Hazard will exist.

RADIO STATION KELP
1590 kHz - EL PASO, TEXAS

MULLANEY ENGINEERING, INC.

III. SUMMARY:

McClatchey Broadcasting Company, licensee of KELP, amends its daytime construction permit to conform the physical parameters of the directional antenna array to those required for the nighttime operation as directed by the Commission's April 18, 1989 letter and subsequent requests by the staff. This engineering amendment is in full compliance with the Commission's Rules. No further information is believed necessary to conform this amendment.


R. Morgan Burkow, Jr.
Maryland Registration No. 15811
Associate Engineer



July 19, 1989

FIGURE 1

GENERAL
DESIGN FORMULAS

A computer program utilizing the theoretical formulas modified in accordance with the Commission's Rules has been used to determine the final values of fields, RMS, RSS, etc.

The standard field is computed as follows:

$$E(\phi, \theta)_{th} = \left| k \sum_{i=1}^n F_i f_i(\theta) \frac{E_i \cos \theta \cos(\phi_i - \phi) + \psi_i}{\sin \theta} \right| \quad (1)$$

where:

- $E(\phi, \theta)_{th}$ Represents the theoretical inverse distance fields at one mile for the given azimuth and elevation.
- k Represents the multiplying constant which determines the basic pattern also. It shall be chosen so that the effective field (RMS) of the theoretical pattern in the horizontal plane shall be no greater than the value computed on the assumption that nominal station power (see § 73.14(e)) is delivered to the directional array, and that a lumped loss resistance of one ohm exists at the current loop of each element of the array, or at the base of each element of electrical height lower than 0.25 wavelength, and no less than the value required by § 73.189(b)(2) of this part for a station of the class and nominal power for which the pattern is designed.
- n Represents the number of elements (towers) in the directional array.
- i Represents the i^{th} element in the array.
- F_i Represents the field ratio of the i^{th} element in the array.
- θ Represents the vertical elevation angle measured from the horizontal plane.
- $f_i(\theta)$ Represents the vertical plane distribution factor of the i^{th} antenna.

For a typical vertical antenna with a sinusoidal current distribution:

$$f(\theta) = \frac{\cos(G \sin \theta) - \cos G}{(1 - \cos G) \cos \theta} \quad (2)$$

where G is the electrical height of the tower.

See also Section 73.190, Figure 5.

- E_i Represents the electrical spacing of the i^{th} tower from the reference point.
- ϕ_i Represents the orientation (with respect to true north) of the i^{th} tower.
- ψ_i Represents the azimuth (with respect to true north).
- ψ_i Represents the electrical phase angle of the current in the i^{th} tower.

The standard radiation pattern shall be constructed in accordance with the following mathematical expression:

$$E(\phi, \theta)_{std} = 1.05 \sqrt{|E(\phi, \theta)_{th}|^2 + Q^2} \quad (3)$$

where:

- $E(\phi, \theta)_{std}$ Represents the inverse fields at one mile which are deemed to be produced by the directional antenna in the horizontal and vertical planes.
- $E(\phi, \theta)_{th}$ Represents the theoretical inverse distance fields at one mile as computed in accordance with Eq. 1, above.
- Q is the greater of the following quantities:

$$0.025 g(\theta) E_{rss}$$

or

$$0.0 g(\theta) \sqrt{P_{nom}}$$

where:

- $g(\theta)$ is the vertical plane distribution factor, $f(\theta)$, for the shortest element in the array (see Eq. 2, above; also see Section 73.190, Figure 5). If the shortest element has an electrical height in excess of 0.5 wavelength, $g(\theta)$ shall be computed as follows:

$$g(\theta) = \frac{\sqrt{|f(\theta)|^2 + 0.0625}}{1.030776} \quad (4)$$

- E_{rss} is the root sum square of the amplitudes of the inverse fields of the elements of the array in the horizontal plane, as used in the expression for $E(\phi, \theta)_{th}$ (see Eq. 1, above), and is computed as follows:

$$E_{rss} = \sqrt{\sum_{i=1}^n F_i^2} \quad (5)$$

- P_{nom} is the nominal station power, expressed in kilowatts; see Section 73.14(e). If the nominal power is less than one kilowatt, $P_{nom} = 1$.

MULLANEY ENGINEERING, INC.

FIGURE 2:

RADIO STATION KELP
EL PASO, TEXAS

FREQUENCY 1590 KHZ

POWER

5.000 KW

TABULATION OF DAYTIME ANTENNA PARAMETERS

TOWER NUMBER	HEIGHT DEGREES	FIELD RATIO	SPACING DEGREES	ORIENTATION DEGREES	PHASING DEGREES
1(S)	72.00	1.485	117.330	219.270	116.204
2(C)	72.00	1.000	0.000	0.000	0.000
3(N)	72.00	0.138	98.341	52.322	77.891

TOWER NUMBER	HEIGHT FEET	SPACING FEET	LOSS RESISTANCE	TYPE OF TOWER	SIDE OF TOWER	PARASITIC REACTANCE
1(S)	123.72	201.61	1.00	SERIES	12.0	-1000.97
2(C)	123.72	0.00	1.00	SERIES	12.0	-1000.97
3(N)	123.72	168.98	1.00	SERIES	12.0	-1000.97

THEORETICAL (AT ONE KM) STANDARD

RSS	727.741	764.128
RMS	685.425	719.696
RSS/RMS RATIO	1.062	1.062
K	405.285	425.550
Q-FACTOR		22.361

LOSS RESISTANCE 1.000 OHMS

MULLANEY ENGINEERING, INC.

FIGURE 3:

RADIO STATION KELP
EL PASO, TEXAS

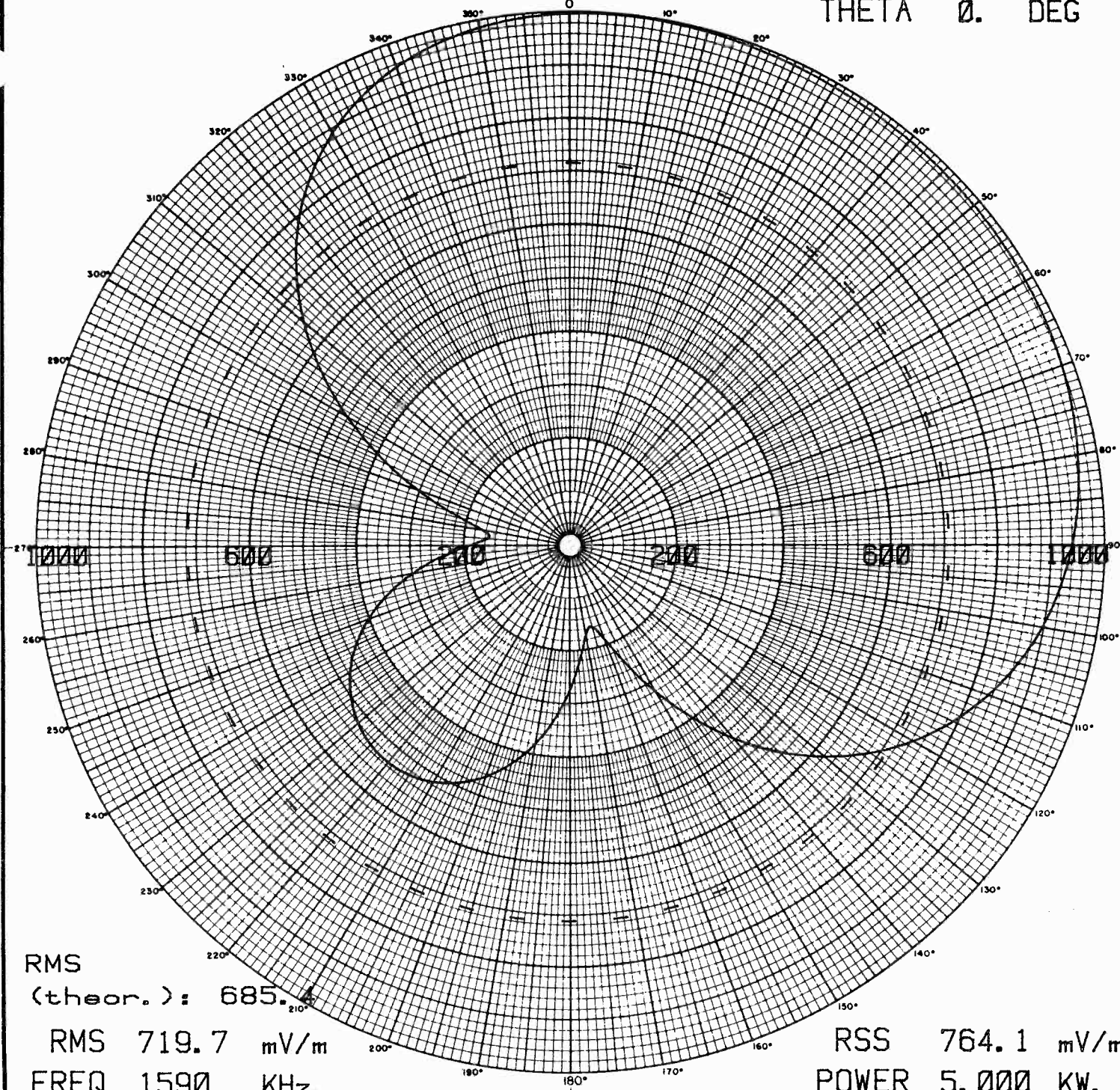
TABULATION OF STANDARD HORIZONTAL DAYTIME PATTERN AT ONE KM

TRUE BEAR.	FIELD MV/M	TRUE BEAR.	FIELD MV/M	TRUE BEAR.	FIELD MV/M	TRUE BEAR.	FIELD MV/M
0.0	1002.35	90.0	953.43	180.0	282.34	270.0	180.38
5.0	1004.30	95.0	934.27	185.0	338.21	275.0	150.55
10.0	1004.51	100.0	910.16	190.0	389.40	280.0	168.47
15.0	1003.73	105.0	880.46	195.0	433.89	285.0	228.35
20.0	1002.51	110.0	844.54	200.0	470.76	290.0	308.45
25.0	1001.27	115.0	801.83	205.0	499.61	295.0	396.21
30.0	1000.26	120.0	751.91	210.0	520.32	300.0	485.30
35.0	999.58	125.0	694.59	215.0	532.93	305.0	571.84
40.0	999.27	130.0	630.06	220.0	537.49	310.0	653.03
45.0	999.20	135.0	558.96	225.0	534.08	315.0	726.83
50.0	999.19	140.0	482.52	230.0	522.72	320.0	791.81
55.0	998.95	145.0	402.73	235.0	503.42	325.0	847.16
60.0	998.11	150.0	322.73	240.0	476.16	330.0	892.71
65.0	996.23	155.0	247.82	245.0	441.00	335.0	928.78
70.0	992.84	160.0	188.15	250.0	398.14	340.0	956.15
75.0	987.41	165.0	161.60	255.0	348.16	345.0	975.91
80.0	979.42	170.0	179.40	260.0	292.37	350.0	989.34
85.0	968.28	175.0	226.12	265.0	233.88	355.0	997.74

TRUE STANDARD RMS: 720.079

LAT: 31 44' 38"
 LON: 106 23' 45"

STD. AT 1 KM
 THETA 0. DEG



RMS
 (theor.): 685.4
 RMS 719.7 mV/m
 FREQ 1590 KHz.

RSS 764.1 mV/m
 POWER 5.000 KW.

PROPOSED KELP DA-D

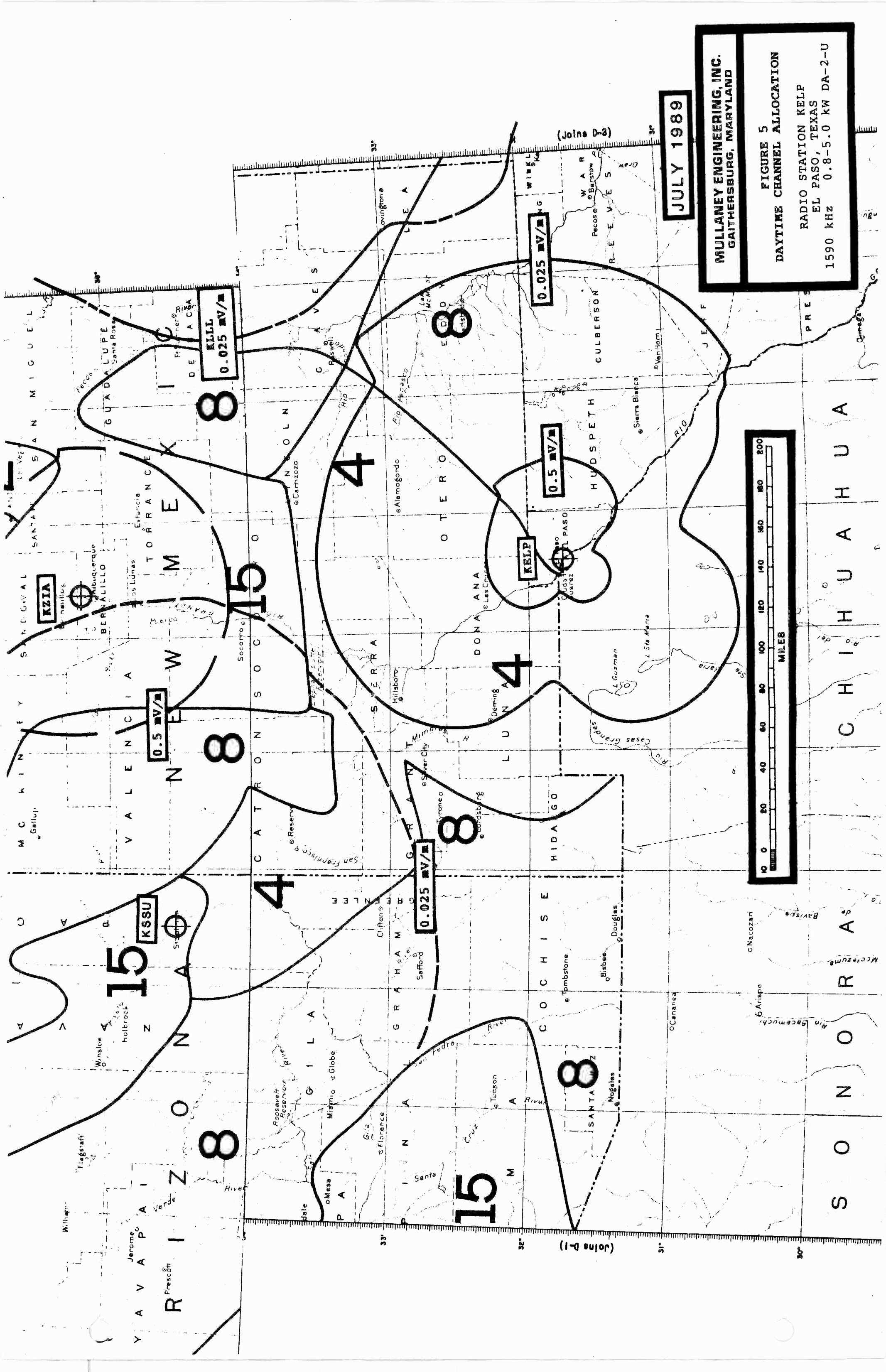
TABULATION OF ANTENNA PARAMETERS

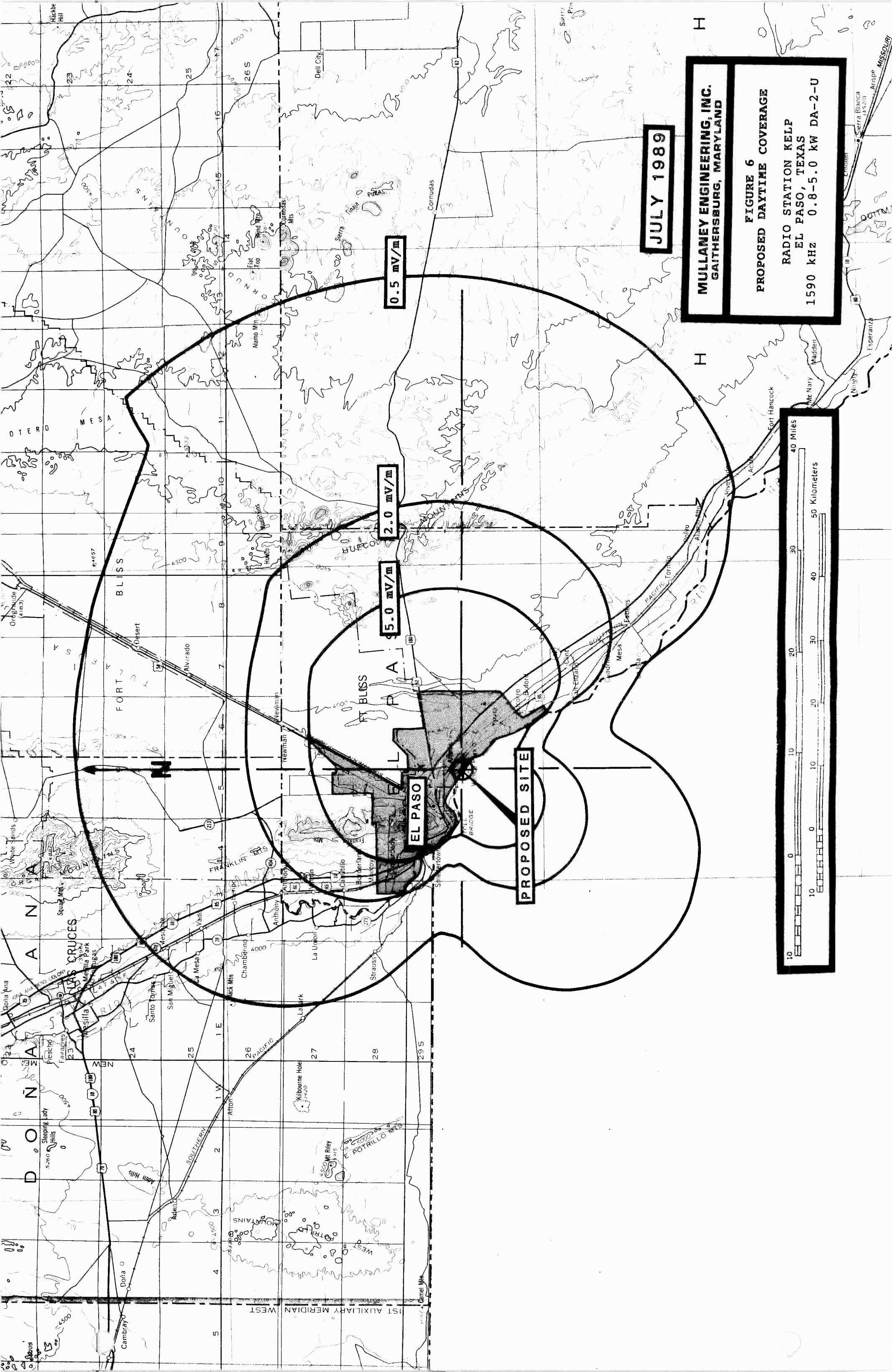
TOWER #	HEIGHT DEGREES	FIELD RATIO	SPACING DEGREES	BEARING DEGREES	PHASING DEGREES
1	72.00	1.485	117.330	219.270	116.204
2	72.00	1.000	0.000	0.000	0.000
3	72.00	0.138	98.341	52.322	77.891

MULLANEY ENGINEERING, INC.
 GAITHERSBURG, MARYLAND

FIGURE 4
 DAYTIME HORIZONTAL
 RADIATION PATTERN

RADIO STATION KELP
 EL PASO, TEXAS
 1590 kHz 0.8-5.0 kW DA-2-U



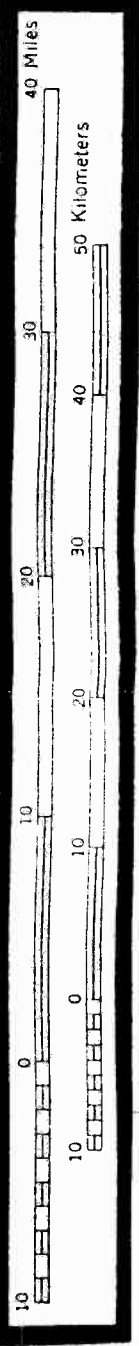


JULY 1989

**MULLANEY ENGINEERING, INC.
GAITHERSBURG, MARYLAND**

**FIGURE 6
PROPOSED DAYTIME COVERAGE**

**RADIO STATION KELP
EL PASO, TEXAS
1590 kHz 0.8-5.0 kW DA-2-U**



PROPOSED SITE

5.0 mV/m

2.0 mV/m

0.5 mV/m

EL PASO

FT BLISS

BLISS PLAZA

HUFFCO

Alamo Mtn

Flat Top

Cornudas

Dell City

Sierra Pri

Camel Mtn

Kilbourne Hole

La Parke

La Union

Strauss

WALL BRIDGE

Silverton

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

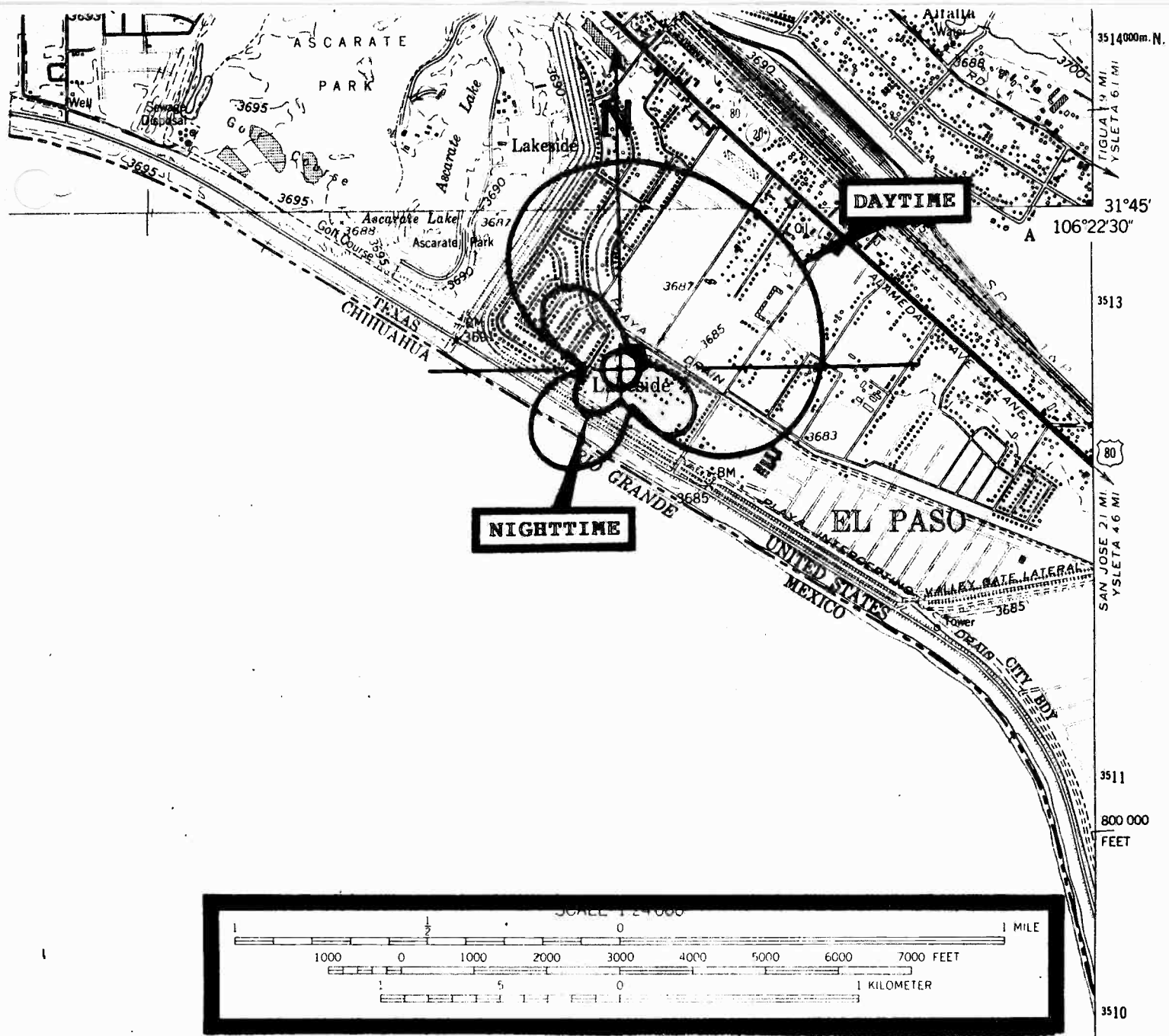
NEWMAN

NEWMAN

NEWMAN

NEWMAN

NEWMAN

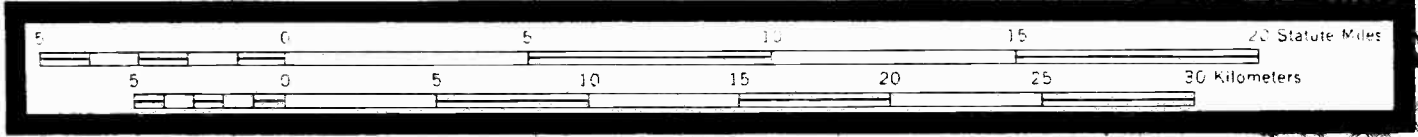
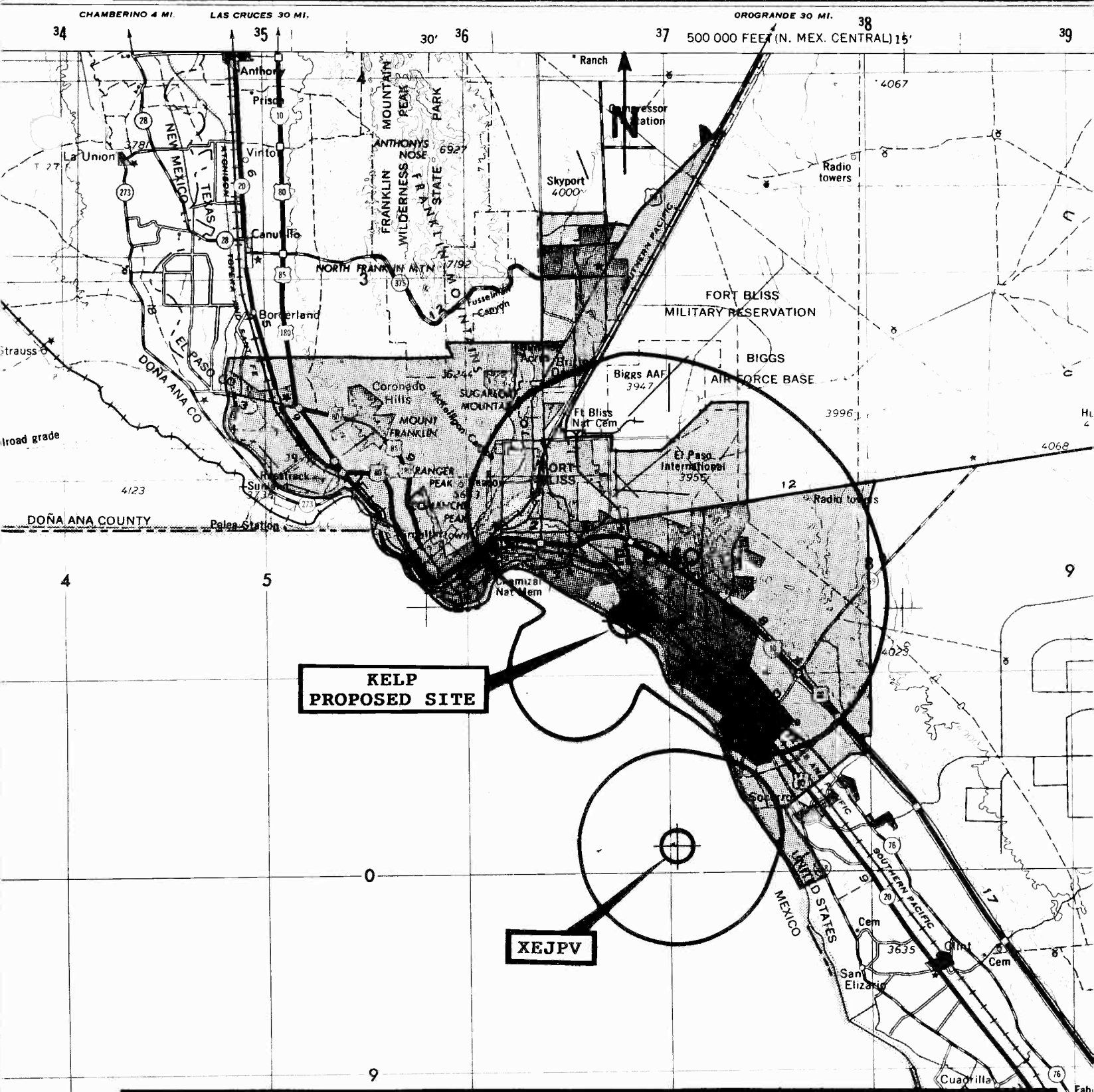


JULY 1989

MULLANEY ENGINEERING, INC.
GAITHERSBURG, MARYLAND

FIGURE 7
1000 mV/m BLANKET CONTOURS

RADIO STATION KELP
EL PASO, TEXAS
1590 kHz 0.8/5.0 kW DA-2-U

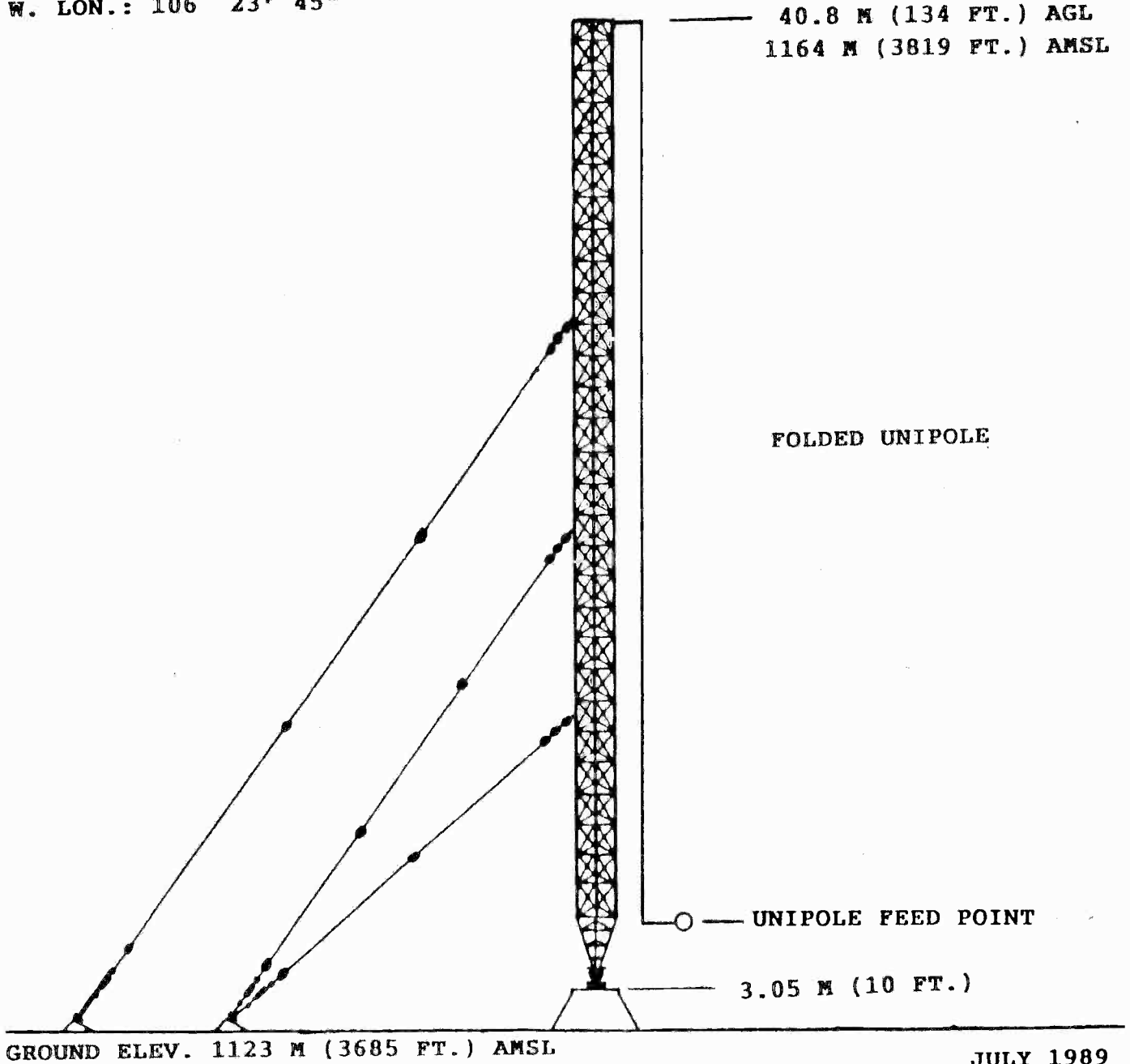


25.0 μ V/m DAYTIME PROTECTION TO XEJPV
RADIO STATION KELP EL PASO, TEXAS
1590 kHz 0.8/5.0 kW DA-2-U

MULLANEY ENGINEERING, INC.
GAITHERSBURG, MARYLAND
FIGURE 8
JULY 1989

PAINTING AND LIGHTING IN ACCORDANCE WITH F.A.A. SPECIFICATIONS.

N. LAT.: $31^{\circ} 44' 38''$
W. LON.: $106^{\circ} 23' 45''$

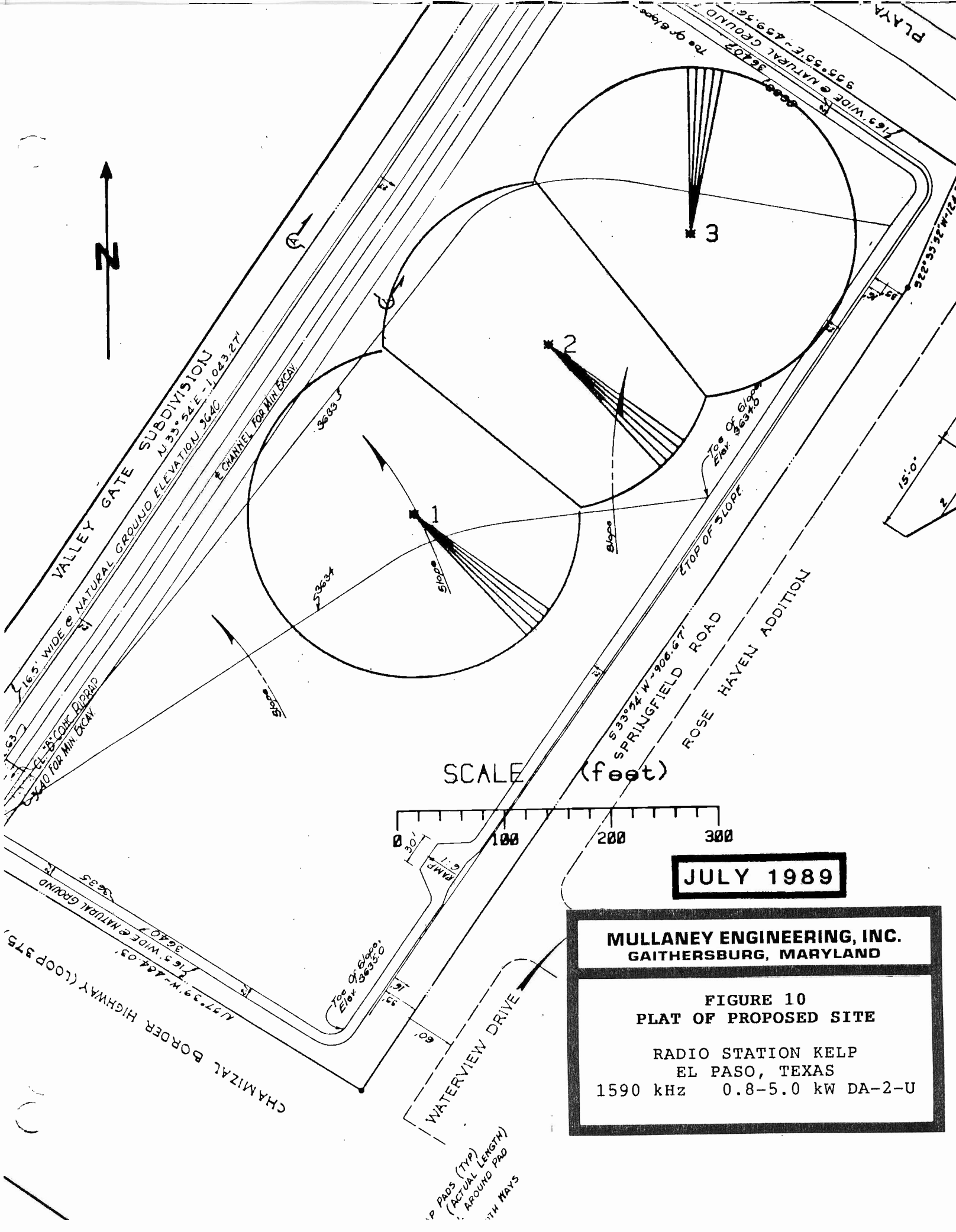


JULY 1989

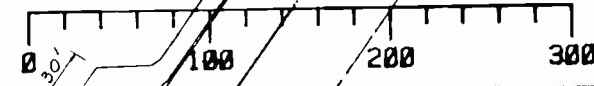
MULLANEY ENGINEERING, INC.
GAITHERSBURG, MARYLAND

FIGURE 9
VERTICAL TOWER SKETCH

RADIO STATION KELP
EL PASO, TEXAS
1590 kHz 0.8-5.0 kW DA-2-U



SCALE (feet)



JULY 1989

MULLANEY ENGINEERING, INC.
GAITHERSBURG, MARYLAND

FIGURE 10
PLAT OF PROPOSED SITE

RADIO STATION KELP
 EL PASO, TEXAS
 1590 kHz 0.8-5.0 kW DA-2-U

P PADS (TYP)
 (ACTUAL LENGTH)
 : AROUND PAD
 WITH MAYS

MULLANEY ENGINEERING, INC.

TABLE 1:

M-3 CONDUCTIVITY TABULATION

RADIO STATION KELP
EL PASO, TEXAS

1590 KHZ N.LAT: 31 44 38 W.LON: 106 23 45

' ' MEANS ESTIMATED CONDUCTIVITY, FROM M-3 MAP
'M*' MEANS MEASURED CONDUCTIVITY (MAIN BEARING)

ALL DISTANCES ARE IN KILOMETERS (Metric curves)
ALL DISTANCES ARE CUMULATIVE
ALL RADIATIONS ARE IN MV/M AT ONE KILOMETER

AZIMUTH	DAYTIME RADIATION	REGION		REGION		REGION	
		COND	DIST	COND	DIST	COND	DIST
*****		*****		*****		*****	
0.0	1002.4	8.0	13.3	4.0	209.8	15.0	463.7
		4.0	568.3	2.0	1000.0		
5.0	1004.3	8.0	14.3	4.0	212.5	15.0	434.9
		4.0	517.6	2.0	584.6	4.0	715.3
		8.0	851.5	15.0	900.9	8.0	1000.0
10.0	1004.5	8.0	15.6	4.0	216.9	15.0	408.6
		2.0	667.3	8.0	702.4	15.0	936.8
		8.0	1000.0				
15.0	1003.7	8.0	17.2	4.0	224.0	15.0	574.7
		2.0	615.2	15.0	982.2	8.0	1000.0
20.0	1002.5	8.0	19.4	4.0	235.6	8.0	401.1
		15.0	1000.0				
25.0	1001.3	8.0	22.4	4.0	229.9	8.0	380.0
		15.0	1114.9				
30.0	1000.3	8.0	25.5	4.0	226.7	8.0	354.7
		15.0	976.1	30.0	1000.0		
35.0	999.6	8.0	29.7	4.0	226.8	8.0	298.5
		15.0	901.8	30.0	1000.0		
40.0	999.3	8.0	35.7	4.0	228.7	8.0	269.0
		15.0	592.9	30.0	1000.0		
45.0	999.2	8.0	45.3	4.0	168.7	8.0	233.7
		15.0	480.3	30.0	816.1	15.0	817.0
		30.0	1000.0				
50.0	999.2	8.0	243.0	15.0	440.8	30.0	646.7
		15.0	674.6	30.0	752.7	15.0	841.1
		30.0	1000.0				
55.0	999.0	8.0	255.1	15.0	482.4	30.0	654.0
		15.0	852.0	30.0	1000.0		

TABLE 1 (continued):

RADIO STATION KELP
EL PASO, TEXAS

KELP-P 1590 KHZ N.LAT: 31 44 38 W.LON: 106 23 45

AZIMUTH	DAYTIME	REGION		REGION		REGION	
		COND	DIST	COND	DIST	COND	DIST

60.0	998.1	8.0	270.0	15.0	549.6	30.0	673.6
		15.0	871.3	30.0	927.1	15.0	963.0
		8.0	1000.0				
65.0	996.2	8.0	288.2	15.0	587.8	30.0	717.7
		15.0	808.1	30.0	953.7	15.0	1000.0
70.0	992.8	8.0	308.4	15.0	525.6	30.0	931.3
		15.0	1000.0				
75.0	987.4	8.0	333.2	15.0	531.0	30.0	741.8
		15.0	885.2	30.0	1000.0		
80.0	979.4	8.0	364.0	15.0	564.6	8.0	636.6
		15.0	897.5	30.0	1011.4		
85.0	968.3	8.0	404.5	15.0	492.0	8.0	656.2
		15.0	935.2	30.0	965.2	8.0	1000.0
90.0	953.4	8.0	738.8	15.0	863.0	30.0	892.5
		15.0	932.3	4.0	1000.0		
95.0	934.3	8.0	842.4	30.0	893.3	15.0	953.7
		4.0	1000.0				
100.0	910.2	8.0	836.4	15.0	1000.0		
105.0	880.5	8.0	808.0	15.0	949.0	30.0	1000.0
110.0	844.5	8.0	703.8	15.0	921.0	30.0	998.8
		5000.0	1000.0				
115.0	801.8	8.0	495.4	3.0	541.3	8.0	543.8
		3.0	548.3	8.0	567.0	3.0	570.0
		8.0	725.0	15.0	912.6	30.0	990.3
		5000.0	1000.0				
120.0	751.9	8.0	429.2	3.0	674.7	8.0	773.2
		15.0	929.3	30.0	1000.0		
125.0	694.6	8.0	423.7	3.0	839.3	15.0	992.3
		30.0	1000.0				
130.0	630.0	8.0	435.2	1.5	582.7	3.0	986.3
		20.0	1000.0				
135.0	559.0	8.0	95.2	4.0	109.1	8.0	143.6
		4.0	169.8	1.5	205.8	8.0	419.5
		1.5	716.7	3.0	1000.0		
140.0	482.5	8.0	2.0	4.0	2.9	8.0	49.2
		4.0	181.5	1.5	254.8	8.0	326.9
		1.5	328.0	8.0	335.7	1.5	1000.0
145.0	402.7	8.0	1.8	4.0	5.2	8.0	42.6
		4.0	200.4	1.5	1000.0		

TABLE 1 (continued):

RADIO STATION KELP
EL PASO, TEXAS

1590 KHZ N.LAT: 31 44 38 W.LON: 106 23 45

AZIMUTH *****	DAYTIME RADIATION	REGION		REGION		REGION	
		COND *****	DIST *****	COND *****	DIST *****	COND *****	DIST *****
150.0	322.7	8.0	1.6	4.0	26.3	8.0	37.9
		4.0	233.5	1.5	614.4	4.0	1000.0
155.0	247.8	8.0	1.5	4.0	308.8	1.5	344.6
		4.0	1000.0				
160.0	188.2	8.0	1.4	4.0	1000.0		
165.0	161.6	8.0	1.4	4.0	906.9	2.0	1000.0
170.0	179.4	8.0	1.3	4.0	758.2	2.0	1008.7
175.0	226.1	8.0	1.3	4.0	627.3	2.0	808.4
		4.0	1000.7				
180.0	282.3	8.0	1.2	4.0	528.5	2.0	695.9
		4.0	952.9	5000.0	1000.0		
185.0	338.2	8.0	1.2	4.0	454.4	2.0	664.7
		4.0	859.7	5000.0	1000.0		
190.0	389.4	8.0	1.2	4.0	406.5	2.0	633.6
		4.0	811.0	5000.0	1000.0		
195.0	433.9	8.0	1.2	4.0	374.8	2.0	592.3
		4.0	747.8	5000.0	1000.0		
200.0	470.8	8.0	1.2	4.0	350.0	2.0	538.7
		4.0	726.3	5000.0	728.7	4.0	735.9
205.0	499.6	5000.0	954.9	2.0	1000.0		
		8.0	1.3	4.0	331.7	2.0	485.3
		4.0	653.5	5000.0	659.5	4.0	716.8
210.0	520.3	5000.0	907.8	3.0	983.9	5000.0	1000.0
		8.0	1.3	4.0	317.3	2.0	450.1
		4.0	642.6	5000.0	866.0	3.0	958.9
215.0	532.9	5000.0	1000.0				
		8.0	1.3	4.0	307.3	2.0	429.5
		4.0	622.0	5000.0	827.3	3.0	958.2
220.0	537.5	5000.0	1000.0				
		8.0	1.4	4.0	298.2	2.0	417.6
		4.0	627.7	5000.0	772.8	3.0	892.0
225.0	534.0	5000.0	1000.0				
		8.0	1.5	4.0	288.9	2.0	407.4
		4.0	592.8	5000.0	753.1	3.0	762.3
230.0	522.7	5000.0	772.9	3.0	846.6	5000.0	1000.0
		8.0	1.6	4.0	278.9	2.0	397.2
		4.0	620.4	5000.0	749.7	3.0	866.0
		5000.0	1000.0				

MULLANEY ENGINEERING, INC.

TABLE 1 (continued):

RADIO STATION KELP
EL PASO, TEXAS

1590 KHZ N.LAT: 31 44 38 W.LON: 106 23 45

AZIMUTH	DAYTIME RADIATION	REGION		REGION		REGION	
		COND	DIST	COND	DIST	COND	DIST
*****		*****		*****		*****	
235.0	503.4	8.0	1.7	4.0	271.5	2.0	381.5
		4.0	622.0	5000.0	749.1	3.0	896.1
		5000.0	1000.0				
240.0	476.2	8.0	1.9	4.0	264.2	2.0	354.6
		4.0	627.8	5000.0	733.2	3.0	921.6
		5000.0	1000.0				
245.0	441.0	8.0	2.1	4.0	256.2	2.0	313.2
		4.0	622.5	5000.0	732.1	3.0	831.6
		5000.0	1000.0				
250.0	398.1	8.0	2.4	4.0	248.9	2.0	275.6
		4.0	632.1	5000.0	749.1	3.0	833.3
		5000.0	1000.0				
255.0	348.2	8.0	2.8	4.0	245.4	2.0	252.5
		4.0	631.1	5000.0	773.4	3.0	872.6
		5000.0	1000.0				
260.0	292.4	8.0	3.4	4.0	179.8	8.0	244.8
		4.0	643.1	5000.0	803.9	3.0	916.3
		5000.0	1000.0				
265.0	233.9	8.0	4.4	4.0	188.9	8.0	425.4
		4.0	635.9	5000.0	795.3	3.0	922.9
		5000.0	1000.0				
270.0	180.4	8.0	6.4	4.0	198.9	8.0	519.5
		15.0	528.8	4.0	693.0	5000.0	720.5
		4.0	731.5	5000.0	800.9	3.0	953.4
		5000.0	1000.0				
275.0	150.6	8.0	9.8	4.0	204.0	8.0	366.2
		15.0	613.5	8.0	664.2	4.0	807.5
		3.0	990.2	5000.0	1000.0		
280.0	168.5	8.0	9.5	4.0	204.5	8.0	365.9
		15.0	632.9	8.0	771.1	15.0	791.0
		3.0	798.2	15.0	889.0	4.0	971.7
		8.0	1006.1				
285.0	228.4	8.0	9.2	4.0	202.7	8.0	386.7
		15.0	943.3	2.0	955.4	4.0	1020.6
290.0	308.5	8.0	9.1	4.0	200.9	8.0	442.4
		15.0	831.2	8.0	1000.0		
295.0	396.2	8.0	9.0	4.0	199.9	8.0	653.1
		15.0	838.7	8.0	1000.0		

MULLANEY ENGINEERING, INC.

TABLE 1 (continued):

RADIO STATION KELP
EL PASO, TEXAS

N.LAT: 31 44 38 W.LON: 106 23 45

AZIMUTH	DAYTIME RADIATION	REGION		REGION		REGION	
		COND	DIST	COND	DIST	COND	DIST
*****		*****		*****		*****	
300.0	485.3	8.0	9.0	4.0	199.1	8.0	234.8
		4.0	301.5	8.0	749.9	15.0	902.8
		8.0	1000.0				
305.0	571.8	8.0	9.1	4.0	198.7	8.0	216.1
		4.0	379.9	8.0	806.4	15.0	967.0
		8.0	1000.0				
310.0	653.0	8.0	9.2	4.0	441.8	8.0	841.8
		15.0	997.3	4.0	1000.0		
315.0	726.8	8.0	9.4	4.0	258.1	8.0	273.9
		4.0	427.2	15.0	662.6	8.0	867.7
		15.0	995.5	4.0	1000.0		
320.0	791.8	8.0	9.7	4.0	240.7	8.0	288.8
		4.0	384.8	15.0	523.2	8.0	565.0
		15.0	759.1	8.0	803.8	30.0	907.3
		15.0	1000.0				
325.0	847.2	8.0	10.1	4.0	224.8	8.0	302.8
		4.0	311.0	8.0	489.2	15.0	539.7
		8.0	718.9	15.0	774.2	8.0	940.5
		15.0	1000.0				
330.0	892.7	8.0	10.6	4.0	226.4	8.0	700.4
		15.0	768.8	8.0	982.0	15.0	1000.0
335.0	928.8	8.0	11.0	4.0	223.5	15.0	266.5
		8.0	602.3	15.0	946.6	8.0	983.1
		4.0	1033.9				
340.0	956.2	8.0	11.2	4.0	217.1	15.0	318.4
		8.0	474.0	15.0	663.9	4.0	789.6
		15.0	860.0	4.0	991.7	15.0	1000.0
		8.0	11.5	4.0	212.7	15.0	581.3
345.0	975.9	4.0	776.5	15.0	878.7	8.0	962.2
		15.0	1000.0				
		8.0	12.0	4.0	210.0	15.0	526.1
350.0	989.3	4.0	732.6	15.0	808.9	8.0	995.7
		15.0	1000.0				
		8.0	12.6	4.0	208.9	15.0	489.8
355.0	997.7	4.0	621.5	2.0	956.0	8.0	1000.0

MULLANEY ENGINEERING, INC.

TABLE 2:

RADIO STATION KELP
EL PASO, TEXAS

1590 KHZ N.LAT: 31 44 38 W.LON: 106 23 45

CONDUCTIVITIES ARE FROM M-3 MAP

ALL DISTANCES ARE IN KILOMETERS (Metric curves)

ALL RADIATIONS ARE IN MV/M AT ONE KILOMETER

AZIMUTH *****	RADIATION *****	DISTANCE TO DAYTIME CONTOURS					
		1000.000 *****	25.000 *****	5.000 *****	2.000 *****	0.500 *****	0.025 *****
0.0	1002.4	0.88	13.36	23.69	33.76	60.91	194.65
5.0	1004.3	0.89	13.39	24.05	34.13	61.30	195.11
10.0	1004.5	0.89	13.39	24.50	34.57	61.75	195.57
15.0	1003.7	0.89	13.39	25.06	35.12	62.30	196.09
20.0	1002.5	0.89	13.38	25.80	35.86	63.01	196.77
25.0	1001.3	0.88	13.37	26.79	36.85	63.98	197.70
30.0	1000.3	0.88	13.36	27.78	37.84	64.96	198.64
35.0	999.6	0.88	13.36	28.78	39.09	66.21	199.87
40.0	999.3	0.88	13.36	28.77	40.86	67.97	201.63
45.0	999.2	0.88	13.36	28.77	42.85	70.62	208.99
50.0	999.2	0.88	13.36	28.77	42.85	79.40	237.82
55.0	998.9	0.88	13.35	28.77	42.85	79.39	237.80
60.0	998.1	0.88	13.35	28.76	42.83	79.36	237.74
65.0	996.2	0.88	13.34	28.73	42.80	79.29	237.61
70.0	992.8	0.88	13.31	28.69	42.73	79.18	237.36
75.0	987.4	0.87	13.27	28.62	42.63	78.99	236.97
80.0	979.4	0.87	13.21	28.52	42.48	78.72	236.40
85.0	968.3	0.86	13.13	28.38	42.27	78.33	235.59
90.0	953.4	0.85	13.02	28.18	41.98	77.81	234.51
95.0	934.3	0.83	12.88	27.93	41.62	77.14	233.09
100.0	910.2	0.81	12.70	27.61	41.15	76.27	231.27
105.0	880.5	0.79	12.48	27.21	40.56	75.19	228.99
110.0	844.5	0.76	12.19	26.71	39.83	73.84	226.15
115.0	801.8	0.72	11.85	26.11	38.94	72.17	222.65
120.0	751.9	0.68	11.43	25.37	37.87	70.15	218.25
125.0	694.6	0.63	10.93	24.48	36.59	67.66	212.94
130.0	630.1	0.58	10.33	23.43	35.08	64.72	206.53
135.0	559.0	0.51	9.63	22.18	33.30	61.29	184.62
140.0	482.5	0.45	8.45	20.35	30.87	54.88	162.47
145.0	402.7	0.38	6.34	17.47	27.32	48.97	149.81
150.0	322.7	0.30	5.24	11.87	17.97	36.25	130.00
155.0	247.8	0.24	4.48	10.46	15.95	29.68	114.37
160.0	188.2	0.18	3.78	9.13	14.06	26.19	102.38
165.0	161.6	0.16	3.43	8.45	13.11	24.44	96.18
170.0	179.4	0.17	3.65	8.90	13.74	25.60	100.39
175.0	226.1	0.22	4.19	9.96	15.25	28.42	110.23

MULLANEY ENGINEERING, INC.

TABLE 2 (continued):

RADIO STATION KELP
EL PASO, TEXAS

1590 KHZ N.LAT: 31 44 38 W.LON: 106 23 45

AZIMUTH *****	RADIATION *****	DISTANCE TO DAYTIME CONTOURS					
		1000.000 *****	25.000 *****	5.000 *****	2.000 *****	0.500 *****	0.025 *****
180.0	282.3	0.27	4.77	11.07	16.85	31.44	120.33
185.0	338.2	0.32	5.29	12.04	18.27	34.16	129.05
190.0	389.4	0.36	5.73	12.86	19.45	36.46	136.14
195.0	433.9	0.40	6.08	13.51	20.42	38.34	141.77
200.0	470.8	0.44	6.36	14.03	21.18	39.83	146.12
205.0	499.6	0.46	6.57	14.42	21.75	40.96	149.33
210.0	520.3	0.48	6.72	14.69	22.16	41.75	151.56
215.0	532.9	0.49	6.82	14.86	22.41	42.23	152.89
220.0	537.5	0.50	6.86	14.93	22.51	42.41	153.38
225.0	534.1	0.49	6.85	14.91	22.46	42.30	153.04
230.0	522.7	0.48	6.80	14.79	22.27	41.90	151.87
235.0	503.4	0.47	6.69	14.57	21.93	41.20	149.84
240.0	476.2	0.44	6.54	14.24	21.43	40.18	146.87
245.0	441.0	0.41	6.33	13.81	20.76	38.83	142.83
250.0	398.1	0.37	6.07	13.26	19.92	37.11	137.55
255.0	348.2	0.33	5.77	12.59	18.89	35.01	130.87
260.0	292.4	0.28	5.43	11.81	17.68	32.52	122.55
265.0	233.9	0.22	5.15	10.99	16.36	29.73	112.59
270.0	180.4	0.17	4.57	10.43	15.28	27.17	102.12
275.0	150.6	0.15	4.00	10.85	15.38	26.37	96.10
280.0	168.5	0.16	4.35	11.22	15.94	27.48	100.42
285.0	228.3	0.22	5.41	12.52	17.84	31.07	113.18
290.0	308.5	0.29	6.64	14.01	20.01	35.22	127.04
295.0	396.2	0.37	7.80	15.41	22.06	39.21	139.48
300.0	485.3	0.45	8.85	16.67	23.91	42.85	150.20
305.0	571.8	0.53	9.52	17.79	25.57	46.10	159.28
310.0	653.0	0.59	10.07	18.79	27.04	48.96	167.34
315.0	726.8	0.66	10.58	19.66	28.33	51.45	173.67
320.0	791.8	0.71	11.04	20.43	29.45	53.58	178.90
325.0	847.2	0.76	11.46	21.12	30.42	55.38	183.12
330.0	892.7	0.80	11.88	21.73	31.26	56.88	186.47
335.0	928.8	0.82	12.17	22.19	31.89	58.03	189.02
340.0	956.1	0.85	12.39	22.52	32.36	58.88	190.91
345.0	975.9	0.86	12.60	22.82	32.75	59.54	192.31
350.0	989.3	0.87	12.82	23.10	33.10	60.07	193.34
355.0	997.7	0.88	13.07	23.38	33.42	60.51	194.08

MULLANEY ENGINEERING, INC.

Mullaney Engineering, Inc.
Gaithersburg, Maryland

TABLE 3 Page 1
January 10, 1989

Site survey program within 8.0 km

Title: KELP-P EL PASO, TEXAS

Coordinates: 31-44-38 106-23-45

The nearest FCC monitoring station is 310 km distant at Douglas, AZ

This site is 0 km distant from the US/Mexican border.

*** Check appropriate US/Mexican agreements ***

This site is 1918 km distant from the US/Canadian border.

Type	Call sign	Chan	Auth	Height (m)	Power (kW)	City	State	Bear. (deg)	Dist. (km)
PL						FORT BLISS	TX	340.1	7.47
AM	KEZB	1150	CP	71	1	EL PASO	TX	299.5	2.20
AM	KBNA	920	CP	106	1	EL PASO	TX	112.8	2.31
AM	KTSM	1380	LIC	91	5	EL PASO	TX	325.9	2.39
AM	KEZB	1150	LIC	55	1	EL PASO	TX	296.9	2.53
AM	XEZOL	860	LIC	75	1	CIUDAD JUAREZ	CH	177.0	3.48
AM	KVIV	1340	CP	58	1	EL PASO	TX	331.8	3.71
AM	XEFV	1000	LIC	87	1	CIUDAD JUAREZ	CH	238.4	4.07
AM	KELP	1590	LIC	46	1	EL PASO	TX	314.7	4.13
AM	KELP	1590	CP	46	5	EL PASO	TX	314.7	4.13
AM	KVIV	1340	LIC	76	1	EL PASO	TX	296.6	4.29
AM	XEF	1420	LIC	92	5	CIUDAD JUAREZ	CH	273.3	4.30
AM	KBNA	920	LIC	106	1	EL PASO	TX	296.5	4.37
AM	XEWG	1240	LIC	45	1	CIUDAD JUAREZ	CH	255.6	5.60
AM	XEPZ	1190	LIC	63	1	CIUDAD JUAREZ	CH	234.3	5.82
AM	XEPZ	1190	CP	63	1	CIUDAD JUAREZ	CH	234.3	5.82
AM	XEP	1300	LIC	63	1	CIUDAD JUAREZ	CH	234.3	5.82
AM	XEYC	1460	LIC	63	1	CIUDAD JUAREZ	CH	234.3	5.82
AM	NEW	650	CP	115	.100	CIUDAD JUAREZ	CH	152.3	7.62
AM	XENVA2	890	CP	84	5	CIUDAD JUAREZ	CH	152.3	7.62
AM	XEJ	970	LIC	70	10	CIUDAD JUAREZ	CH	152.3	7.62
AM	XECJC	1490	LIC	36	.50	CIUDAD JUAREZ	CH	265.5	7.81
FM	PRM	290				CIUDAD JUAREZ	CH	265.9	7.26
TV	XEDI-TV	11		30	5	JUAREZ	CH	266.8	7.80
TW				71		EL PASO	TX	299.5	2.20
TW	6501 TROWBRIDGE			92		EL PASO	TX	3.3	2.28
TW				55		EL PASO	TX	296.9	2.53
TW	6842 INDUSTRIAL AVE.			18		EL PASO	TX	13.5	3.26
TW	6501 TROWBRIDGE			109		EL PASO	TX	345.2	3.38
TW	NW OF INT CLARK & WE			60		EL PASO	TX	331.8	3.71
TW	W. END OF FLOWER STR			110		EL PASO	TX	291.9	4.08
TW	5516 EAST PAISANO DR			16		EL PASO	TX	324.0	4.24
TW	6209 AIRPORT RD			24		EL PASO	TX	350.5	5.09
TW				18		EL PASO	TX	19.2	5.65
TW	6257 AIRPORT RD					EL PASO	TX	350.8	5.74
TW	3707 ADMIRAL ST			14		EL PASO	TX	28.4	6.45

MULLANEY ENGINEERING, INC.

Mullaney Engineering, Inc.
Gaithersburg, Maryland

TABLE 3 Page 2
January 10, 1989

Site survey program within 8.0 km

Title: KERP-P EL PASO, TEXAS

Coordinates: 31-44-38 106-23-45

Type	Call sign	Chan	Auth	Height (m)	Power (kW)	City	State	Bear. (deg)	Dist. (km)
TW	2331 WYOMING ST			44		EL PASO	TX	299.3	7.65
TW	FT BLISS BLDG 56			47		EL PASO	TX	333.7	7.98
HP	REDDINGTON BUILDING			1195		EL PASO	TX	321.0	6.04
AP	EL PASO INTL			1206		EL PASO	TX	14.2	7.15



US Department of Transportation
Federal Aviation Administration

NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION Southwestern Region

Aeronautical Study Number

89-ASW-0189-OE

1. Nature of Proposal

Type	B. Class	C. Work Schedule Dates
<input type="checkbox"/> New Construction	<input type="checkbox"/> Permanent	Beginning After FCC Grant
<input type="checkbox"/> Alteration	<input type="checkbox"/> Temporary (Duration _____ months)	End TBD

2. Complete Description of Structure

- A. Include effective radiated power and assigned frequency of all existing, proposed or modified AM, FM, or TV broadcast stations utilizing this structure
- B. Include size and configuration of power transmission lines and their supporting towers in the vicinity of FAA facilities and public airports
- C. Include information showing site orientation, dimensions and construction materials of the proposed structure

**5 KW Directional,
3 Tower**

Am Broadcast ARray

1590 KHZ

(if more space is required, continue on a separate sheet.)

3A. Name and address of individual, company, corporation, etc. proposing the construction or alteration. (Number, Street, City, State and Zip Code)

(915) 779-0016
area code Telephone Number

TO
Arnie McClatchey
McClatchey Broadcasting Company
Radio Station KELP
5300 El Paso Drive
El Paso, TX 79905

B. Name, address and telephone number of proponent's representative if different than 3 above

R. Morgan Burrow, Jr., P.E.
Mullaney Engineering, Inc.
9049 Shady Grove Court
Gaithersburg, MD 20877 (301) 921-0115

4. Location of Structure

A. Coordinates (To nearest second)	B. Nearest City, Town and State	C. Name of nearest airport, heliport, flightpark, or seaplane base
31° 44' 38" N Latitude	El Paso, TX	El Paso International
106° 23' 45" W Longitude	(1) Distance to 4B Within City Limits	(1) Distance from structure to nearest point of nearest runway 7.15 KM
	(2) Direction to 4B DNA	(2) Direction from structure to airport 14.2°T

5. Height and Elevation (Complete to the nearest foot)

A. Elevation of site above mean sea level	3685'
B. Height of Structure including all appurtenances and lighting (if any) above ground, or water if so situated	134'
C. Overall height above mean sea level (A + B)	3819'

D. Description of location of site with respect to highways, streets, airports, prominent terrain features, existing structures, etc. Attach a U.S. Geological Survey quadrangle map or equivalent showing the relationship of construction site to nearest airport(s). (if more space is required, continue on a separate sheet of paper and attach to this notice.)
Adjacent to Springfield Road and Chamizal Border Highway
(See Topo Map)

Notice is required by Part 77 of the Federal Aviation Regulations (14 C.F.R. Part 77) pursuant to Section 1101 of the Federal Aviation Act of 1958 as amended (49 U.S.C. 1101) Persons who knowingly and willingly violate the Notice requirements of Part 77 are subject to a fine (criminal penalty) of not more than \$500 for the first offense and not more than \$2,000 for subsequent offenses, pursuant to Section 902(a) of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1472(a))

I HEREBY CERTIFY that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to obstruction mark and/or light the structure in accordance with established marking & lighting standards if necessary.

Date	Typed Name/Title of Person Filing Notice	Signature
01/16/89	R. Morgan Burrow, Jr., P.E.	<i>R. Morgan Burrow, Jr.</i>

FOR FAA USE ONLY

FAA will either return this form or issue a separate acknowledgement.

The Proposal:

- Does not require a notice to FAA.
- Is not identified as an obstruction under any standard of FAR, Part 77, Subpart C, and would not be a hazard to air navigation.
- Is identified as an obstruction under the standards of FAR, Part 77, Subpart C, but would not be a hazard to air navigation.
- Should be obstruction MARKED, lighted per FAA Advisory Circular 70/7480-1, Chapter(s) _____
- Obstruction marking and lighting are not necessary.

Supplemental Notice of Construction FAA Form 7480-2 is required any time the project is abandoned, or

- At least 48 hours before the start of construction.
- Within five days after the construction reaches its greatest height

This determination expires on 8/13/89 unless:

- (a) extended, revised or terminated by the issuing office;
- (b) the construction is subject to the licensing authority of the Federal Communications Commission and an application for a construction permit is made to the FCC on or before the above expiration date. In such case the determination expires on the date prescribed by the FCC for completion of construction, or on the date the FCC denies the application.

NOTE: Request for extension of the effective period of this determination must be postmarked or delivered to the issuing office at least 15 days prior to the expiration date.

If the structure is subject to the licensing authority of the FCC, a copy of this determination will be sent to that Agency.

Remarks:

Issued In	Signature	Date
<i>Forster Worth, Ill</i>	<i>Stan L. Hale</i>	<i>2/13/89</i>

JOHN H. MULLANEY, P.E.
JOHN J. MULLANEY

MULLANEY ENGINEERING, INC.

9049 SHADY GROVE COURT
GAITHERSBURG, MD 20877

301 921-0115

July 19, 1989

Arnie McClatchey
Owner
KELP Radio Station
5300 El Paso Drive
El Paso, Texas 79905

RE: KELP Amendments

Dear Arnie:

Enclosed are two copies of the engineering amendments for your files. Jeff Southmayd's office requested us to separate the daytime and nighttime amendments into separate documents; therefore this material supersedes the material furnished recently in response to the Commission's requests.

You will note that we have **inverted** the array design. You will be able to see this readily by comparison of the earlier plat and the plat furnished in these documents. We recommend that this revised plat be furnished to your surveyor. We opted for the inversion since it would improve the power distribution in the towers and facilitate easier adjustment of the array.

We will custom design a phasor and coupling system for your proposed DA-2 installation for \$3,000.00. This fee includes the preparation of the schematics, component lists, and other documents necessary for the manufacturer to construct the phasor will be furnished. Dave Stewart informed me that you intend to place a metal building near the center tower to house the transmitter and phasing equipment. Please review the preliminary **RF Phasing System Design** material enclosed carefully with Dave and return to us replies to the questions in Section H and a marked copy of the plat confirming the location of the building.

Arnie McClatchey
KELP Amendments
July 19, 1989

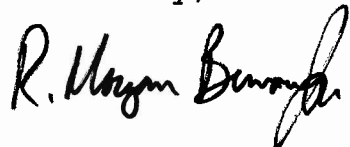
MULLANEY ENGINEERING, INC.

It cannot be overemphasized that a **licensed, bonded** surveyor be retained to locate the tower foundations on the site **according to the plat and the Figure 1 specifications**. The surveyor should use **astronomical sighting of Polaris** or a similar high precision technique to locate the tower foundations.

We recommend that you specify to the utility companies that electrical and telephone service be brought in via underground cables - overhead service in close proximity to the array will affect the adjustment and performance of a directional antenna.

Please call or write if you have any questions concerning this material. Construction of a new directional antenna represents a sizeable capital investment and it is much cheaper to proceed into the construction phase with all questions answered and all contractors' responsibilities and scheduling defined to avoid expensive duplication of work.

Sincerely,



R. Morgan Burrow, Jr., P. E.

Enclosure

cc: Jeffrey Southmayd, Esquire

JOHN H. MULLANEY, P.E.
JOHN J. MULLANEY

MULLANEY ENGINEERING, INC.

9049 STADY GROVE COURT
GAITHERSBURG, MD 20877

301-921-3115

HAND DELIVERED

July 19, 1989

Jeffrey Southmayd, Esquire
Southmayd, Powell, & Taylor
1764 Church Street, N. W.
Washington, DC 20036

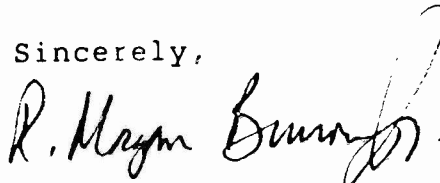
RE: KELP Amendments

Dear Jeff:

Enclosed herewith is an original and five copies of the above engineering. We sent two copies to Arnie McClatchey for his file.

Call us if you need anything additional.

Sincerely,



R. Morgan Burrow, Jr., P. E.

Enclosure -- 5 Sets Engineering

cc: Arnie McClatchey