du Treil, Lundin & Rackley, Inc.
A Subsidiary of A.D. Ring, P.A.

July 17, 1997

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Via Federal Express

Mr. William F. Caton
Secretary
Federal Communications
Commission
1900 M. Street, NW
Washington, DC 20054

Re: Reply to Petitions for Reconsideration in MM Docket No.87-268

Dear Mr. Caton:

Attached are the original and 11 copies of the reply comments of du Treil, Lundin & Rackley, Inc. to some of the petitions for reconsideration and clarification filed in response the FCC's 5th and 6th Reports and Order in MM Docket No. 87-268.

We would request that you kindly date stamp one copy as received by you and return it to us in the attached stamped, self-addressed envelope.

If there are questions concerning this filing please contact us at the number below.

Sincerely,

Louis R. du Treil

Louis R. du Treil, Sr.

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enclosures

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BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, DC, 20054

In the Matter of Advanced Television Systems & Their Impact upon the Existing Television Broadcast Service	))))	MM Docket No. 87-268

Reply Comments of du Treil, Lundin & Rackley, Inc.
To the Petitions for Reconsideration of the
5th & 6th Reports and Orders

These reply comments are submitted on behalf of the consulting engineering firm of du Treil, Lundin and Rackley, Inc. (**dLR**). This firm and its predecessors have been practicing consulting communications engineering before the Federal Communications Commission (FCC) for more than 50 years. The firm has participated in this ongoing proceeding and commends the FCC for proposing a plan for the monumental task of transitioning from analog (NTSC) to digital television (DTV).

From the more than 200 petitions for reconsideration and clarification (petitions) filed with regard to the FCC's 5th and 6th Report and Orders (R&O), it is apparent that modifications and clarifications must be made to the DTV allotment plan, the DTV standards, and the method of transition. The purpose of **dLR**'s reply comments is to address issues raised in the various petitions for reconsideration and suggest remedies.

I. Low VHF TV Channels (2-6) Must be Retained in Core Band

Several petitions pertained to the uncertainty surrounding the future of low VHF TV channels (2-6)[1]. **dLR** concurs with the parties requesting retention of channels 2 through 6 in the core

[1] Petitioners include MSTV, Cordillera, Granite, Ramar, Certain 2-6, Belo, and Lee.

band. In its November 1996 comments filed in this proceeding, **dLR** urged retention of the low VHF channels in the FCC's core band. As pointed out in the November comments, the Charlotte test results indicated that DTV performance was superior to analog (NTSC) performance on the low VHF channel. The low VHF observations were made on channel 6 with an analog (NTSC) ERP of 10 kW versus a DTV ERP of 0.63 kW. Satisfactory reception occurred at 81.7% of the locations for the DTV operation, and at 39.6% of the locations for the analog operation. In other words, DTV reception was twice as good as analog. Adding 6 dB of power to the DTV operation, from an ERP of 0.63 kW to 2.5 kW, improved satisfactory reception from 82% to 94% of the locations. The Charlotte test reports indicate if the low VHF DTV ERP is increased 10 dB (to an ERP of 6.3 kW), which was anticipated for low VHF DTV operations, then interfering sources would be substantially less effective in producing impairments. The Charlotte report states that DTV performs significantly better than analog (NTSC) at low VHF.

Because of the superior propagation characteristics of low VHF channels, and the ability to truly replicate existing analog (NTSC) service, **dLR** believes the low VHF channels must be retained in the core band. To further support this position, it is noted the FCC DTV rules permit low VHF ERPs up to 10 kW in Zone I and 45 kW in Zones II and III. These DTV power levels are higher than previously contemplated (6.3 kW), lessening the potential for signal impairment from atmospheric and man made noise. A higher noise limited signal was also selected (28 dBu versus the previous 27 dBu) for low VHF DTV operations. The FCC can provide additional protection to low VHF operations by requiring power companies to meet certain emission standards with the power lines.

A review of the FCC's TV database indicates there are 286 licensed low VHF (2-6) stations in the US, making an average of 57 stations per channel. On channels 60 through 69, there are a total of 73 licensed US stations, making an average of 7 stations per channel. It appears obvious from these numbers that relocating the existing channels 60-69 stations will be a lot less of a problem than relocating the channel 2-6 stations. On channels 52 through 69 there are 149 licensed stations in the US, resulting in an average of 8 stations per channel. Not only is the existing low VHF band superior in propagation reach, it is much more spectrum efficient through denser station packing.

In addition, there are 396 licensed high VHF (7-13) stations in the US, for an average of 57 stations per channel. It just makes more sense to keep the all the VHF channels (2-13) in the TV core band. Except for the existing channel 60-69 assignments, all stations should be required to return to their NTSC channel for the final DTV operation. This method realizes equities and an allocation plan which has long been established. Not only is the allocation plan already in place, but maximum transmitting facilities have been established and can be replicated for DTV. Except for the existing channel 60-69 assignments, all stations should be provided with a temporary loaner DTV channel for the transition. The existing channel 60-69 stations should be assigned a new channel for their DTV operation which will replace their existing analog allotment. A station having knowledge, certainty and assurance of the final outcome to DTV has less concern regarding a temporary transitional DTV channel.

II. Intra-band DTV Power Disparities Must be Eliminated

A large number of petitioners complained about the significant DTV power disparities between VHF analog to UHF DTV operations (V/U) versus UHF analog to UHF DTV operations (U/U)[2]. The power disparities result from the FCC's attempt to replicate VHF Grade B coverage on UHF channels; it is not practical to replicate superior VHF propagation with brute force UHF power. This problem can be eliminated by following the method suggested by **dLR** in its November 1996 comments and January 1997 reply comments to the 6th Further Notice in MM Docket No. 87-268. All stations should return to their current analog (NTSC) channel for the final DTV operations. By retaining the low VHF channels in the core band (the high VHF channels were not subject to exclusion of the core), all analog VHF stations will return to their VHF channels after the transition. This eliminates the basis for the vast V/U versus U/U DTV power differences.

All stations returning to their NTSC channels for the final DTV operations should be more cost effective since much of the existing transmitting equipment can be used for the DTV operation.

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[2] Petitioners include Weigel, ALTV, Sinclair, Desoto, Pegasus, Univision, and Paxson.

The present antenna system and transmission line can be employed for the final DTV operation, with only modifications to the transmitter system to reflect DTV operation.

Analog stations on channels 60 through 69 should be assigned DTV channels in the core band, which will become their final location. Otherwise, all eligible stations should be assigned temporary loaner channels for the DTV transition period. Coordination with Canada and Mexico will be simplified under this scenario since only the new DTV allotments for the current channel 60 to 69 stations need be considered. There are a total of 97 assignments on analog channels 60 through 69 in the FCC's allotment tables in the 6th R&O. Of these 34 would involve coordination with Canada and 8 would involve coordination with Mexico. In other words, only 42 new DTV allotments would require coordination with Canada and Mexico combined. All other assignments would operate on their current analog NTSC channels for the final DTV operation, and these channels are already coordinated.

The temporary loaner DTV channels for each assignment in the Canada and Mexico border zones would be based on no interference to existing Canada and Mexico operations within their respective countries. On this basis, the loaner DTV channels should be treated somewhat similar to low power television (LPTV), special temporary authorizations (STA), and/or experimental operations.

III. Interference Must Be Reduced

A substantial number of petitions dealt with unacceptable levels of interference, especially in the congested regions of the country[3]. Of particular concern is interference to existing analog (NTSC) service of full service, LPTV and TV translator stations. This results from a scarce amount of spectrum, and the proposal for DTV assignments to replicate current analog (NTSC) Grade B coverage. Many of the analog VHF petitioners complained that their UHF DTV channel would not enable replication of their analog service. A number of petitioners disagree with the FCC's allotment method and suggest replication of the analog station's Grade A

[3] Petitioners include MSTV, Tribune, Midwest Television, CBA, and Mountain Broadcasting.

service area. This latter suggestion is essentially the recommendation promoted by **dLR** in its earlier comments.

This firm suggested replication of each station's Grade A contour by the temporary DTV loaner channel operation for the DTV transition period. The current analog (NTSC) Grade A signal level is based on an acceptable quality service to 70% of the locations for 90% of the time. It is believed service within the analog Grade A contour represents the "heart" or "core" of the station's coverage. **dLR** suggested the DTV transitional power should be based on replication of the analog Grade A contour with the appropriate DTV noise limited f(70,90) contour. The noise limited contours would be 28 dBu for low VHF (2-6) transitional DTV operations, 36 dBu for high VHF (7-13) transitional DTV, and 41 dBu for UHF (14-69) transitional DTV operations. The distance to the contours would be based on a higher reliability propagation, f(70,90). This is to 70% of the locations for 90% of the time.

The following table provides a summary for typical analog (NTSC) transmitting facilities in the various bands. It is being used for illustrative purposes in the subsequent discussion

	Chan.	NTSC ERP	NTSC HAAT	City Grade	Grade A	Grade B
LOV	2-6	100 kW	305 m	42.3 km	54.7 km	104 km
HIV	7-13	316	305	52.6	64.4	95.7
UHF	14-69	2500	305	51.2	60.2	77.0

The next table provides the DTV ERP in the various bands required to replicate the analog Grade A contours for the above examples with the DTV noise limited f(70,90) contour.

NTSC Chan	NTSC Grade A	DTV ERPs to Replicate Grade A With f(70,90) Noise Limited LOV	HIV	UHF
2-6	54.7 km	0.06 kW	0.18 kW	5.1 kW
7-13	64.4	0.19	0.71	31.9
14-69	60.2	0.12	0.39	14.2

To illustrate, the above table indicates that a transitional UHF DTV ERP need only be 5.1 kW to replicate the analog (NTSC) low VHF Grade A contour with a 41 dBu f(70,90) noise limited DTV contour. The above demonstrates that much lower DTV powers would be employed during the transition period, resulting in lower interference and less impact on full service analog and DTV operations, LPTV operations, non-commercial educational FM (NCE-FM) operations, and land mobile radio service (LMRS) operations.

The following table provides the distance to the normal f(50,90) noise limited contours based on the DTV ERPs shown above to replicate the analog Grade A contour.

NTSC Chan	NTSC Grade A	LOV DTV ERP kW	28 dBu f(50,90) Contour	HIV DTV ERP kW	36 dBu f(50,90) Contour	UHF DTV ERP kW	41 dBu f(50,90) Contour
2-6	54.7 km	0.06	63.4 km	0.18	61.9 km	5.1	62.2 km
7-13	64.4	0.19	73.2	0.71	72.4	31.9	72.2
14-69	60.2	0.12	69.3	0.39	67.7	14.2	67.8

The above table indicates that the DTV noise limited f(50,90) contour will extend approximately 11% further than the analog Grade A contour, falling between the analog Grade A and Grade B contours.

Using this **dLR** suggested DTV transitional method, a computer run was undertaken to determine the number of households within the analog Grade B contour and the transitional DTV noise limited f(50,90) contour. The FCC's TV database was used to consider all licensed US stations, excluding Puerto Rico, the Virgin Islands, and Guam. More than 1500 stations were considered. The extent of the Grade B contour was calculated using the nominal analog transmitting facilities for each station. The extent of the **dLR** suggested transitional DTV f(50,90) noise limited contour was then calculated. The population (1990 Census) was estimated within both contours and divided by 2.63 (the national average for the number of occupants per household). The percentage of transitional DTV household coverage to analog Grade B household coverage was then determined. The following are market summaries of the results.

TV Market		Percentage of Households Transitional DTV/Grade B
1	New York	85%
2	Los Angeles	94%
3	Chicago	92%
4	Philadelphia	79%
5	San Francisco	89%
6	Boston	83%
7	Washington, DC	86%
8	Dallas-Fort Worth	94%
9	Detroit	87%
10	Atlanta	90%
	Average of Top 10	88%
11	Houston	97%
12	Seattle-Tacoma	90%
13	Cleveland	79%
14	Minneapolis-St. Paul	91%
15	Tampa-St. Petersburg	88%
16	Miami-Fort Lauderdale	91%
17	Phoenix	98%
18	Denver	88%
19	Pittsburgh	80%
20	Sacramento-Stockton	65%
	Average of 11-20	87%
	Average of Top 20	87.5%
21	St. Louis	90%
22	Orlando-Daytona Beach	76%
23	Baltimore	78%
24	Portland	89%
25	Indianapolis	80%
26	San Diego	95%
27	Hartford-New Haven	71%
28	Charlotte	77%
29	Raleigh-Durham	75%
30	Cincinnati	77%
	Average of 21-30	81%
	Average of Top 30	85%
Average of All Stations (1500+)		77%

These percentages of household coverage seem very reasonable for the DTV transition period.

In addition, **dLR**'s studies indicate approximately 99% of the total US population receives a predicted Grade B signal from a US licensed TV station. Approximately 97% of the US population would receive a DTV f(50,90) noise limited signal from a temporary transitional DTV operation as suggested by **dLR**.

It is felt both from household and population coverage standpoints that sufficient coverage to the public can be provided by **dLR**'s suggested transitional DTV operations. When DTV receiver penetration reaches a high enough level, the station can either convert to DTV on its NTSC channel, or it can examine the possibility of higher transitional DTV power to reach a higher percentage of households if no prohibitive interference will be caused to other stations. In addition, the FCC can make adjustments if the results of field tests justify it. It is **dLR**'s belief the best means of replicating existing coverage is to return to the existing analog channel for the final DTV operation. For the transition period, a temporary (or STA) loaner channel can be employed until sufficient DTV receiver penetration is reached.

Replication of the analog Grade A contour for the transition period will have less impact on low power television (LPTV) stations. In our studies LPTV and TV translator stations are considered the same. A computer program was developed to estimate the number of authorized LPTV stations which will be "bumped" (displaced) by a DTV allotment. Only authorized LPTV stations were considered (license & CP). Only co-channel and adjacent channel conditions were considered pertinent. Calculations of desired and undesired fields were made on a site-to-site basis using the nominal transmitting facilities contained in the FCC TV database, including consideration of directional antennas. A co-channel LPTV to DTV desired-to-undesired (D/U) interference ratio of 21 dB was used, as specified in the recently adopted rules. If the LPTV site was within the DTV noise limited contour it was considered displaced, except in the case of an adjacent channel situation with a separation of less than 5 kilometers (i.e., possible co-location).

If the LPTV interfering contour overlapped a desired DTV noise limited contour a second test was performed before it was considered displaced. If reducing the extent of the interfering contour by 5% cleared the problem, it was anticipated that an LPTV power reduction (or antenna modification) could accomplish this without being displaced.

Our calculations estimate that of the approximately 8,000 authorized LPTV stations, some 2,717 authorized LPTV stations will be displaced by the FCC's proposed DTV allotments. We then modified the DTV allotment table to adjust each DTV entry's ERP to reflect replication of the Grade A contour as suggested by **dLR** and others. On this basis, our calculations indicate 2,349 LPTV stations will be displaced. In other words, by replicating the analog Grade A contour instead of the Grade B contour, an estimated 368 authorized LPTV stations will be saved from displacement by a DTV allotment.

IV. DTV Allotment Assumptions / OET Bulletin No. 69

In addition to the suggested changes noted above, there appear to have been questionable methods employed in the FCC's allotment studies which were not readily apparent. These issues have been raised in some of the petitions, and **dLR** believes they require comment[4].

The rules adopted in the FCC's R&Os made several references to OET Bulletin No. 69. It is understood the methods described in the document are the linchpin to the FCC's entire DTV allotment table. As the FCC is aware, numerous petitions for reconsideration stated that this document must be available to enable proper evaluation of the DTV allotment table. Questions have been raised concerning assumptions made for the FCC's computer studies. Ideally, **dLR** believes OET Bulletin No. 69 should have been released with the 6th Further Notice of proposed Rule Making in MM Docket No. 87-268 (August 1996). In any event, it should at least have been released simultaneously with the FCC's 5th and 6th R&Os. However, the document was not released until July 3, 1997.

[4] Petitioners include Hammett & Edison, KSLS Inc., Speer, Lee, and CBA

A review of OET Bulletin No. 69 indicates that virtually all DTV allotments are based on a directional antenna pattern. Apparently this occurs because of the purported desire to exactly replicate the analog Grade B contour with the DTV noise limited contour along every azimuth. This is an improper attempt to precisely engineer something with approximate tools.

Figures 1A through 1D are polar graphs for 4 TV stations which employ analog (NTSC) operations. The graphs show the FCC's directional antenna patterns for the associated DTV allotments. The following is a summary for each of the examples giving the analog facilities the FCC's proposed maximum directional DTV ERP, and the ERP which would be permitted assuming the station wished to continue using a non-directional pattern for its DTV operation.

Station	NTSC Chan.	NTSC ERP, HAAT	DTV Chan.	FCC DTV Max-DA ERP	DTV ND-ERP
KXGN-TV, Glendive MT	5	14.8 kW, 152 m	15	120.2 kW	31.3 kW
KECI-TV, Missonla, MT	13	302 kW, 610 m	40	1000	372.1
KVIA-TV, El Paso, TX	7	316 kW, 265 m	17	1000	290.5
KWGN-TV, Denver, CO	2	10 kW, 319 m	34	1000	472.0

Developing a directional pattern to match the FCC's DTV requirements for stations KECI-TV, KVIA-TV and KWGN-TV does not appear feasible. It is more likely a non-directional pattern would be best for these stations. However, the non-directional DTV powers permitted would be substantially less than the FCC's maximum, resulting in considerably less replication.

Figures 2A through 2D are examples for 4 stations using directional antenna for its analog system. The solid line shows the analog relative field pattern and the dashed line shows the FCC's relative field pattern for the DTV allotment. The following summary provides the station's analog facilities, the FCC's proposed maximum directional DTV ERP, and the ERP which would be permitted if the station wished to use its existing pattern for the DTV operation.

Station	NTSC Chan.	NTSC ERP, HAAT	DTV Chan.	FCC DTV MAX-DA ERP	DTV ERP Using Analog Pattern
WWLP, Springfield, MA	22	3390 kW-DA, 268 m	33	158 kW	77.4 kW
WHSL, East St. Louis, MO	46	5000 kW-DA, 345 m	47	178.6	76.2
KZAR-TV, Provo, UT	16	5000 kW-DA, 57 m	17	242.2	47.2
WLMT, Memphis, TN	30	5000 kW-DA, 305 M	31	198.7	75.5

The FCC's DTV directional antenna minima for KZAR-TV and WLMT-TV are less than what the FCC's rules currently permit (i.e. 15 dB). Three of the stations (WHSL, KSAR-TV, WLMT) have adjacent channel DTV allotments where use of the same antenna would be feasible.

If the analog operation employs a non-directional antenna system, it is only reasonable to assume the DTV operation will employ a non-directional antenna as well. After all, the FCC has assumed use of the analog site and antenna height for the studies; changing the antenna pattern for the DTV operation does not make sense. Similarly, if the analog station has a directional antenna system, the same shaped pattern should be assumed for the DTV operation regardless of any band difference. Existing stations are employing antenna patterns which best meet their coverage goals. It is unreasonable to now force unrealistic patterns on them in order to replicate existing coverage on paper. There needs to be more flexibility in the replication approach, lessening the burden on stations for the transition from analog (NTSC) to DTV service.

With all stations returning to their NTSC channels for the final DTV operation, the transitional DTV operation only needs to be a reasonable replication of existing service, not an exact duplication requiring compliance to a directional pattern. As noted above, the antennas currently employed for a station's analog operation can then be employed for the station's final DTV operation. The DTV noise limited contour does not have to exactly track the analog Grade B contour, it need only be a good fit to it. The best way to replicate existing analog coverage is for everyone to return to their NTSC channel for the final DTV operation. The existing 97 channels 60-69 analog assignments are the only

exception. All others will operate on a temporary loaner DTV channel for the transition. Every station will stay in band for the final DTV operation avoiding the significant power disparities. They will encounter the same propagation characteristics that they have experienced with their analog operations. All stations will be able to maximize DTV facilities as they now are able to do with their analog operations.

Although there is no opposition to the use of a dipole factor to adjust the signal levels for each frequency, **dLR** feels it is unnecessary based on the process suggested for the transition and implementation of DTV. A temporary DTV loaner channel will be assigned for the transition period, with each station returning to its analog channel for the final DTV operation. All stations will be returning to their current analog channel, or to a lower channel in the case on the analog operations on channels 60-69, eliminating the need for a dipole factor adjustment.

All stations returning to their NTSC channels for the final DTV operation is better from an allocation standpoint, since interference conditions for analog (NTSC) operations are more restrictive than for DTV. The FCC will be better able to evaluate spectrum use and project impact of additional spectrum recapture in the future.

Furthermore, with the vast majority of stations returning to their NTSC channels for the final DTV operation, it is expected to be much easier to retain currently vacant allotments, both non-commercial and commercial. It is possible that some currently vacant TV allotments may need to be used for new DTV allotments for those stations now on channels 60-69. It is also possible some vacant allotments may need to remain vacant until after the transition to permit sufficient spectrum for existing services.

The FCC appears to have implemented an extra 19 dB of protection into the the rules for the analog (NTSC) to DTV desired-to-undesired (D/U) co-channel interference ratio. From Appendixes A and B attached to the FCC's 6th R&O and OET Bulletin No. 69, it appears a co-channel D/U interference ratio of 2 dB was used for calculating analog to DTV interference. However, new Sections 73.623(c) and 74.706(d) refer to a 21 dB D/U ratio.

Similarly, an extra 8 dB of protection appears for the co-channel interference ratio between DTV stations. A D/U ratio of 15 dB seems to have been used in the FCC's DTV allotment process. However, new Section 73.62(C) refers to a 23 dB co-channel DTV-DTV interference ratio.

Adjacent channel DTV to analog D/U interference ratios of -17 dB and -12 dB have been indicated in the FCC's 6th FNPRM, 6TH R&O and OET Bulletin No. 69. However, the note following new Section 73.622(h) indicates that a +12 dB D/U ratio may involve interference. This equates to a 24 dB swing for the adjacent channel interference ratio. These ambiguities raise speculation that coverage (service) has been overestimated and interference has been underestimated. The FCC should clarify this issue.

It appears that different receiving antenna characteristics are assumed for analog reception versus digital reception in the FCC's DTV allotment process. This creates more "apples and oranges" and "cooking the books" questions. Assuming different receiving antenna characteristics essentially equates to the unrealistic belief that the consumers are going to replace their receiving antennas for DTV reception. Furthermore, the use of different receiving antennas tends to overestimate DTV coverage and underestimate DTV interference. This increases speculation that less replication will result than has been alleged. For purposes of evaluating and comparing analog versus DTV coverage and interference, **dLR** believes the same receiving antenna characteristics must be assumed for both operations.

Although **dLR** does not oppose the FCC's use of standard vertical plane radiation patterns in the calculations, it seems to be an unnecessary refinement. It is assumed the reason the analog vertical patterns are different from the DTV in the same band is that it is believed lower gain antennas will be used for DTV because of the lower power levels. For analog (NTSC) operations we are dealing with peak power, while for DTV operations we are dealing with average power. The following are the current analog (NTSC) and DTV ERP maximums from the FCC rules.

Band	Maximum ERP NTSC	DTV
Low VHF (2-6)	100 kW	45 kW
High VHF (7-13)	316	160
UHF	5000	1000

When one equates average to peak power values, **dLR** does not see the power savings to justify use of different transmitting antenna vertical patterns.

OET Bulletin No. 69 indicates the FCC employed a 3 second digitized terrain database to calculate the antenna HAATs every 45 degrees (8 bearings), with linear interpolation used for each 1 degree bearing in between. These antenna HAATs were used to calculate the extent of the analog Grade B contour, and to determine the DTV ERP necessary to place the noise limited contour at the same distance. The 3 second terrain database was also employed to obtain the terrain elevation at rather large 1 kilometer (0.6 mile) increments for the paths to grid cells where Longley-Rice propagation calculations were made. Considering the apparent attempts for precision in the FCC's DTV allocation studies, **dLR** finds it curious that the 3 second digitized terrain database was not used at : (1) more than the 8 standard bearings to more accurately determine antenna HAATs and the extent of contours, and (2) at more frequent distance intervals along the paths to grid cells to more accurately determine the terrain impact on the Longley-Rice field strength calculations.

Under **dLR**'s suggested method for the transition to DTV scaling down DTV power would not be an issue. However, **dLR** is compelled to respond to the method employed by the FCC and described in OET Bulletin No. 69. In calculating the DTV ERPs along each of 360 radials to precisely replicate the existing analog Grade B contour, if the maximum DTV ERP was 2000 kW, the FCC reduced the ERPs along all bearings by a factor of 2 regardless whether the ERP along a bearing exceeded the 1000 kW level. If the goal of the DTV allotment process was replication of existing analog coverage as stated in the FNPRM and R&O, the FCC should have truncated the DTV ERPs instead of scaling them down. It is obvious that DTV power

truncation would better replicate existing service than scaling down.

In its description for the application of the Longley-Rice methodology in OET Bulletin No. 69, the FCC indicates that TV service is calculated with the location variability set at 50%, the time variability at 90% and the confidence factor at 50%. This appears fine for calculating DTV service. However, it does not appear proper for calculating analog (NTSC) service. Although Grade B signals are defined as an acceptable picture at 50% of the locations for 90% of the time, the specified field strength values (47 dBu for low VHF, 56 dBu for high VHF, 64 dBu for UHF) have been adjusted for determination using propagation conditions for 50% of the locations for 50% of the time.

The FCC and industry have traditionally assumed a receiving antenna height of 30 feet (9.1 meters) above ground level in calculating TV field strengths. This is reflected in the FCC rules. dLR does not understand why a receiving antenna height of 10 meters (32.8 feet) was employed by the FCC in the DTV studies (Table 4 of OET Bulletin No. 69). **dLR** believes the traditional value of 30 feet (9.1 meters) for the receiving antenna height should be employed.

If as described in OET Bulletin No. 69, grid cells of 4 square kilometers (2 km on a side) were used in calculating service and interference, **dLR** is not sure why the FCC's area figures for service and interference are not integer factors of 4.

As we are sure the FCC is aware, there can be error conditions encountered when using the Longley-Rice propagation model. OET Bulletin No. 69 contains no explanation on how these situations are treated in the studies. The FCC must clarify this issue.

V. LPTV & TV Translators

In referring to low power television (LPTV) operations in this document, **dLR** is also including TV translator operations.

dLR concurs with the National Translator Association's

(NTA) petition requesting the FCC to delete the numerous Docket No. 85-172 proposed land mobile radio entries in the FCC's TV database. There is no apparent reason to keep these entries in the database, nor should they prevent LPTV use of a channel.

dLR concurs with the Community Broadcasters Associations (CBA) request that analog LPTV stations should be required to accept an offset, or be required to change to another offset, in order to accommodate a proposed analog LPTV operation. Obviously the offset change must not cause prohibited interference. **dLR** believes the cost of the offset change should be the responsibility of the proponent.

Questions have been raised in some of the petitions concerning LPTV interference to analog and DTV operations[5]. The FCC has changed the LPTV power basis from a transmitter output power limit to an ERP limit. It had been anticipated the FCC would include a maximum permitted directional antenna maximum-to-minimum signal ratio for interference calculation purposes. For instance, something which is reasonable and measurable, such as in the range from 30 to 35 dB.

Reference is made to a term called "regularly viewed" in the FCC's recently adopted LPTV rules (see Section 74.705 for instance). It is suggested the FCC clearly define what is meant by "regularly viewed" so there is no ambiguity within the industry.

VI. LMRS

In the allotment of DTV channels, the FCC appears to have over reacted in its protection of land mobile radio services sharing channels 14 through 20 in the 13 urbanized markets[6]. It also appears to have taken extreme measures avoiding use of channels 60 through 69, especially in the congested market areas. However, there does not appear to have been consideration given for DTV use of channels 14 and 69 in urban areas where adjacent channel problems with LMRS operations are likely to occur. For instance, the FCC allotted DTV channel 14 to the following cities:

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[5] Petitioners include MSTV, CBA, Paxson, Trinity, and Univision.
[6] Petitioners include MSTV and Fouce.

Montgomery, AL	St. Louis, MO
Phoenix, AZ	Buffalo, NY
Fresno, CA	Columbus, OH
Orlando, FL	Dallas, TX
New Orleans, LA	Norfolk, VA
Detroit, MI	Tacoma, WA
Kansas City, MO	

Although DTV Channel 69 was allotted to Riverside, California, it is understood that this is in the band subject to prompt recapture. It is anticipated that the channel 14 DTV operations in major urbanized area will encounter problems with LMRS operations on the lower adjacent frequencies.

Using temporary DTV channels at power levels replicating the analog station's Grade A contour will enable additional use of channels 14-20 near the 13 designated land mobile radio markets, as well as other urbanized markets, for the transition period. The FCC can relax the 250 kilometers co-channel and 176 kilometers adjacent channel separation requirements.

VII. Experimental DTV Operations

The FCC is encouraged to make public announcements when DTV experimental reports are filed. It is to the industry's benefit for this information to be analyzed to determine if DTV is behaving as expected and/or if adjustments may be necessary.

VIII. DTV ERP Reduction with Antenna HAAT

The FCC DTV rules included a combination of tables and formulas for calculating the permitted ERP for over height conditions. **dLR** believes the tables used for low VHF, high VHF and UHF stations in Section 73.622(f) of the rules should be replaced by formulas.

In summary, dLR believes with the methods suggested herein, an orderly transition to DTV can be accomplished with minimum impact to existing service.

Respectfully Submitted,

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W. Jeffrey Reynolds

July 17, 1997

Figure 1A

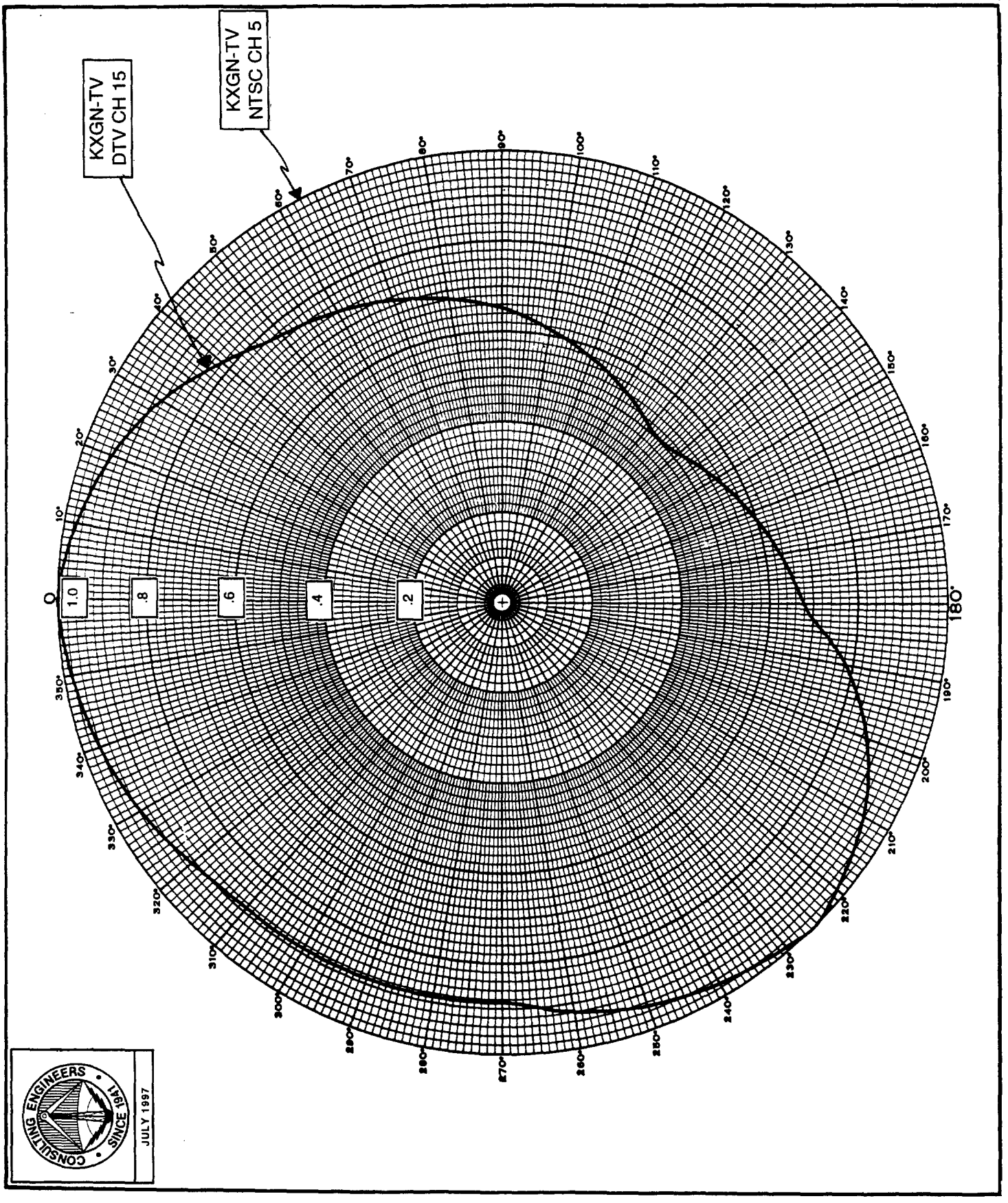

KXGN-TV
DTV CH 15
KXGN-TV
NTSC CH 5
0
180°
1.0
.8
.6
.4
.2
CONSULTING ENGINEERS
SINCE 1941
JULY 1997

Figure 1B

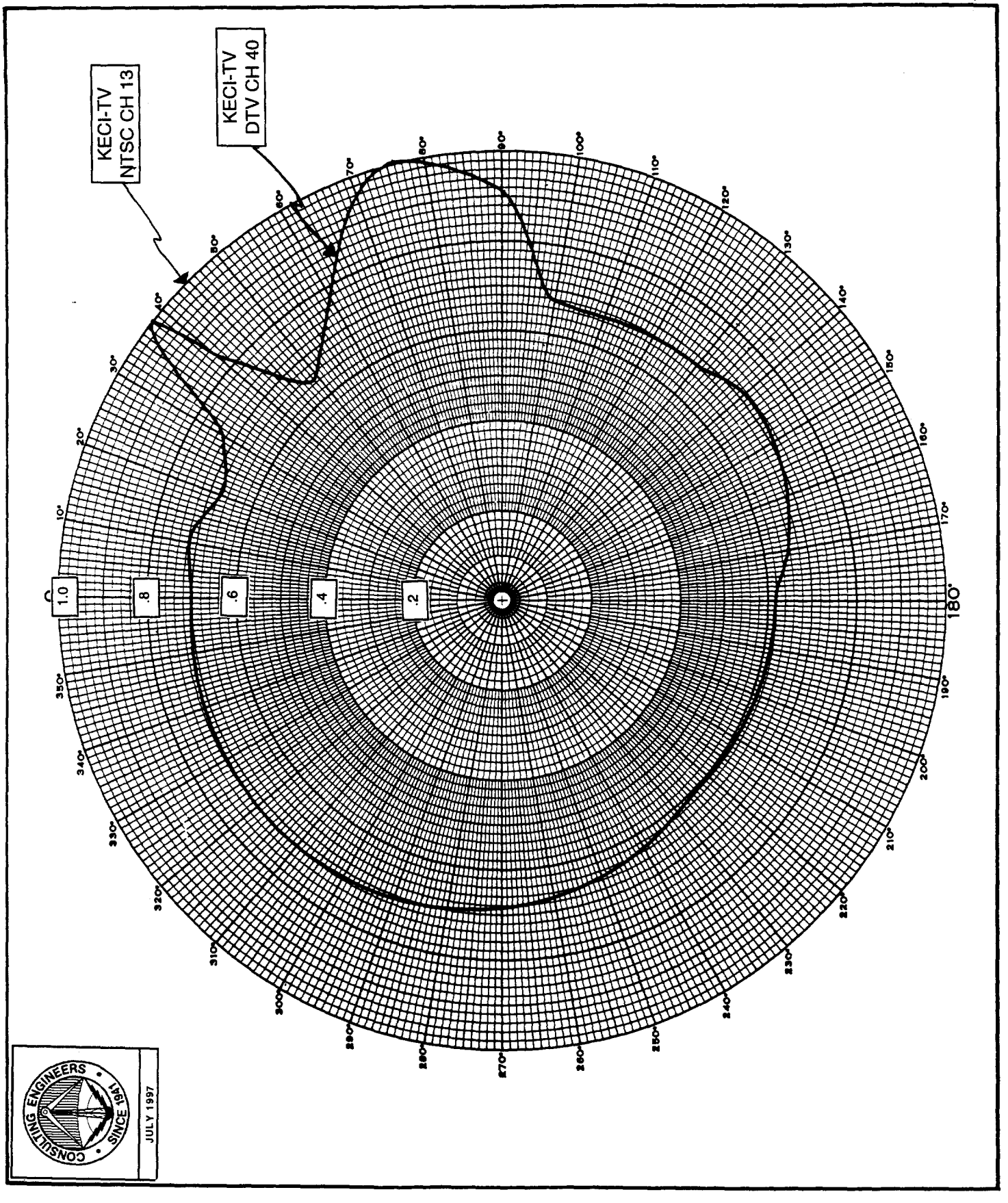
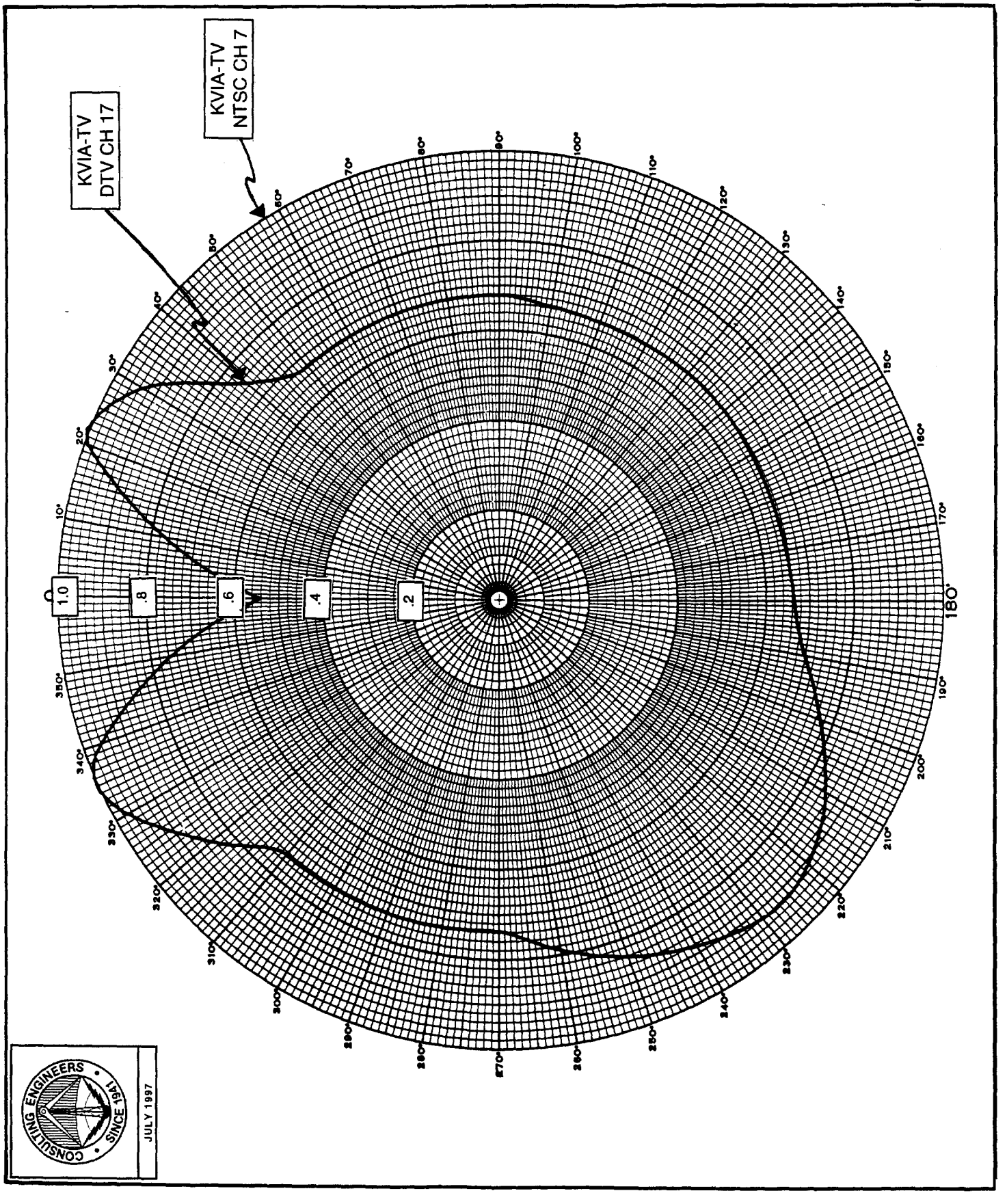

KECI-TV
NTSC CH 13
KECI-TV
DTV CH 40
1.0
.8
.6
.4
.2
0
180°
CONSULTING ENGINEERS
SINCE 1941
JULY 1997

Figure 1C


KVIA-TV
DTV CH 17
KVIA-TV
NTSC CH 7
1.0
.8
.6
.4
.2
0
180°
CONSULTING ENGINEERS
SINCE 1941
JULY 1997

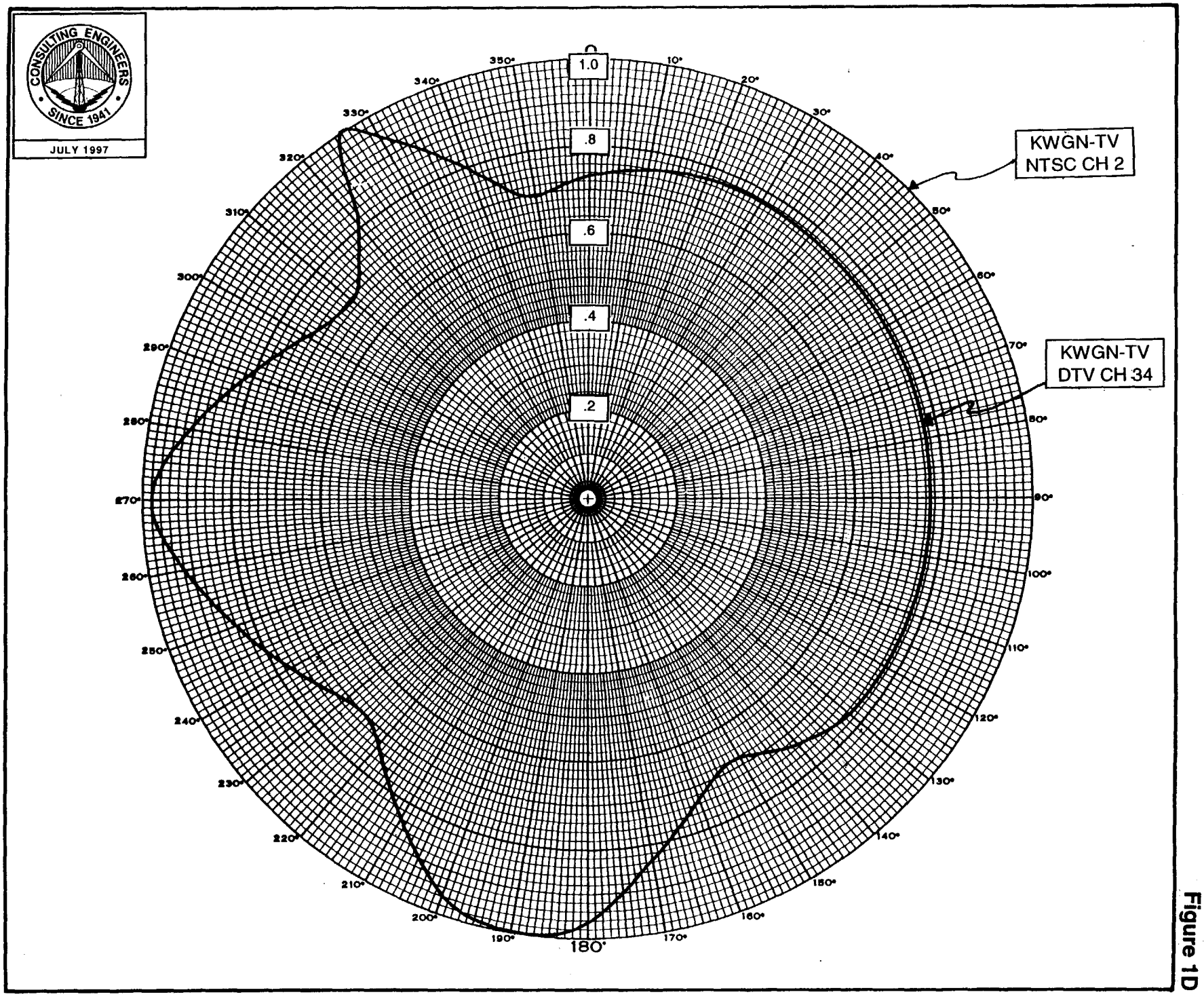

CONSULTING ENGINEERS
SINCE 1941
JULY 1997
1.0
.8
.6
.4
.2
0
10°
20°
30°
40°
50°
60°
70°
80°
90°
100°
110°
120°
130°
140°
150°
160°
170°
180°
190°
200°
210°
220°
230°
240°
250°
260°
270°
280°
290°
300°
310°
320°
330°
340°
350°
KWGN-TV
NTSC CH 2
KWGN-TV
DTV CH 34

Figure 1D

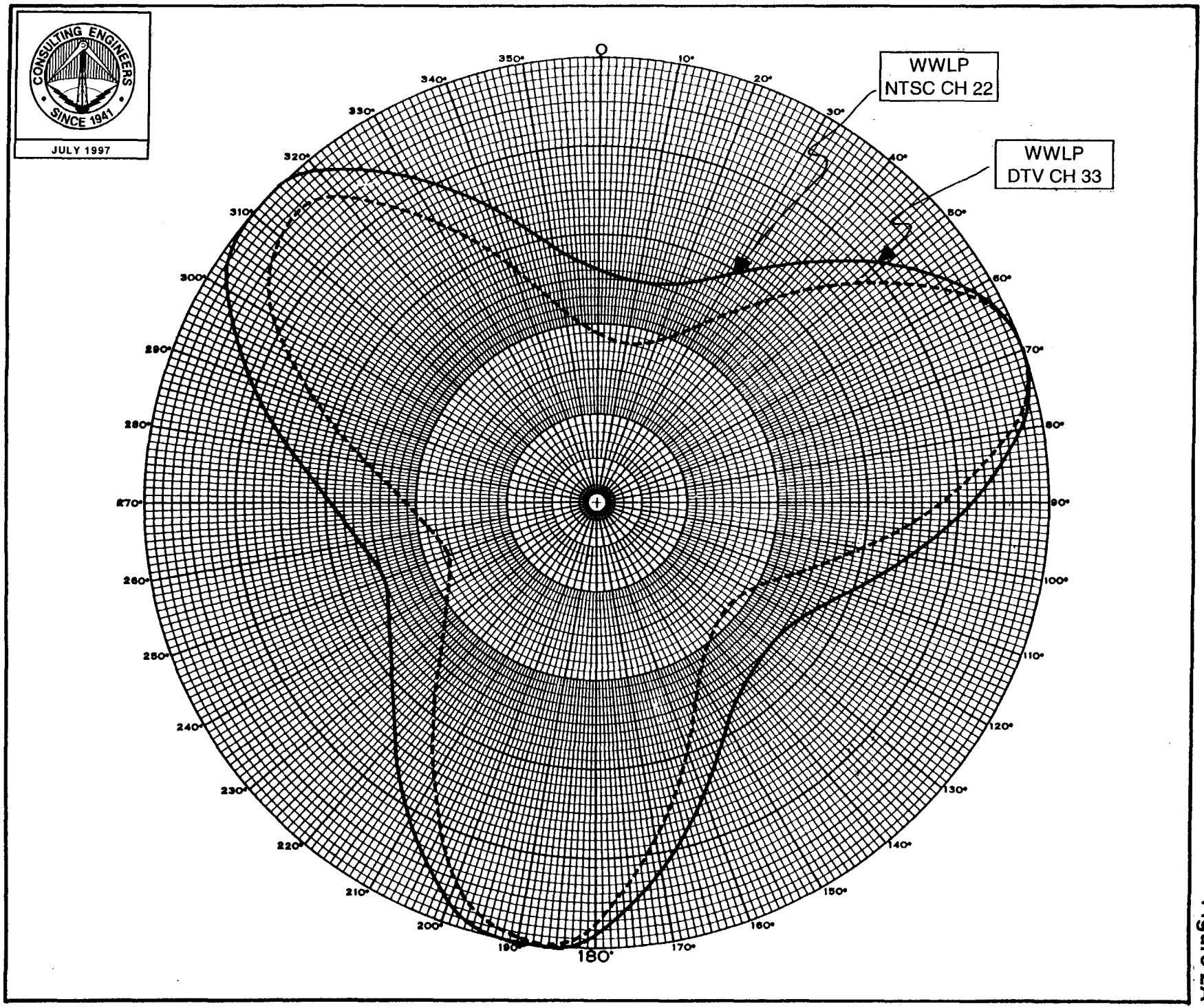
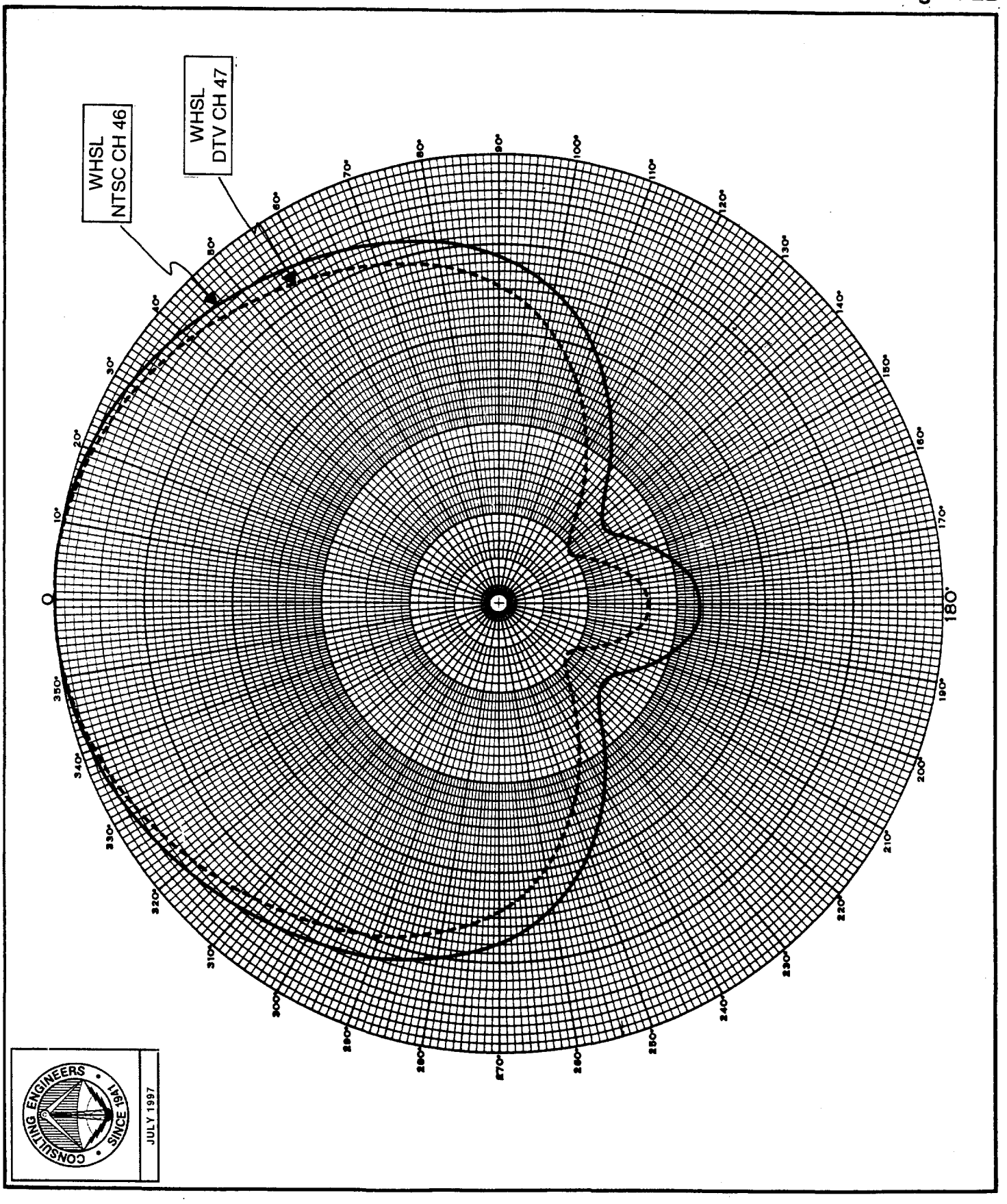

CONSULTING ENGINEERS
SINCE 1941
JULY 1997
WWLP
NTSC CH 22
WWLP
DTV CH 33
0
10°
20°
30°
40°
50°
60°
70°
80°
90°
100°
110°
120°
130°
140°
150°
160°
170°
180°
190°
200°
210°
220°
230°
240°
250°
260°
270°
280°
290°
300°
310°
320°
330°
340°
350°

Figure 2A

Figure 2B


WHSL
NTSC CH 46
WHSL
DTV CH 47
0
180°
CONSULTING ENGINEERS
SINCE 1947
JULY 1997